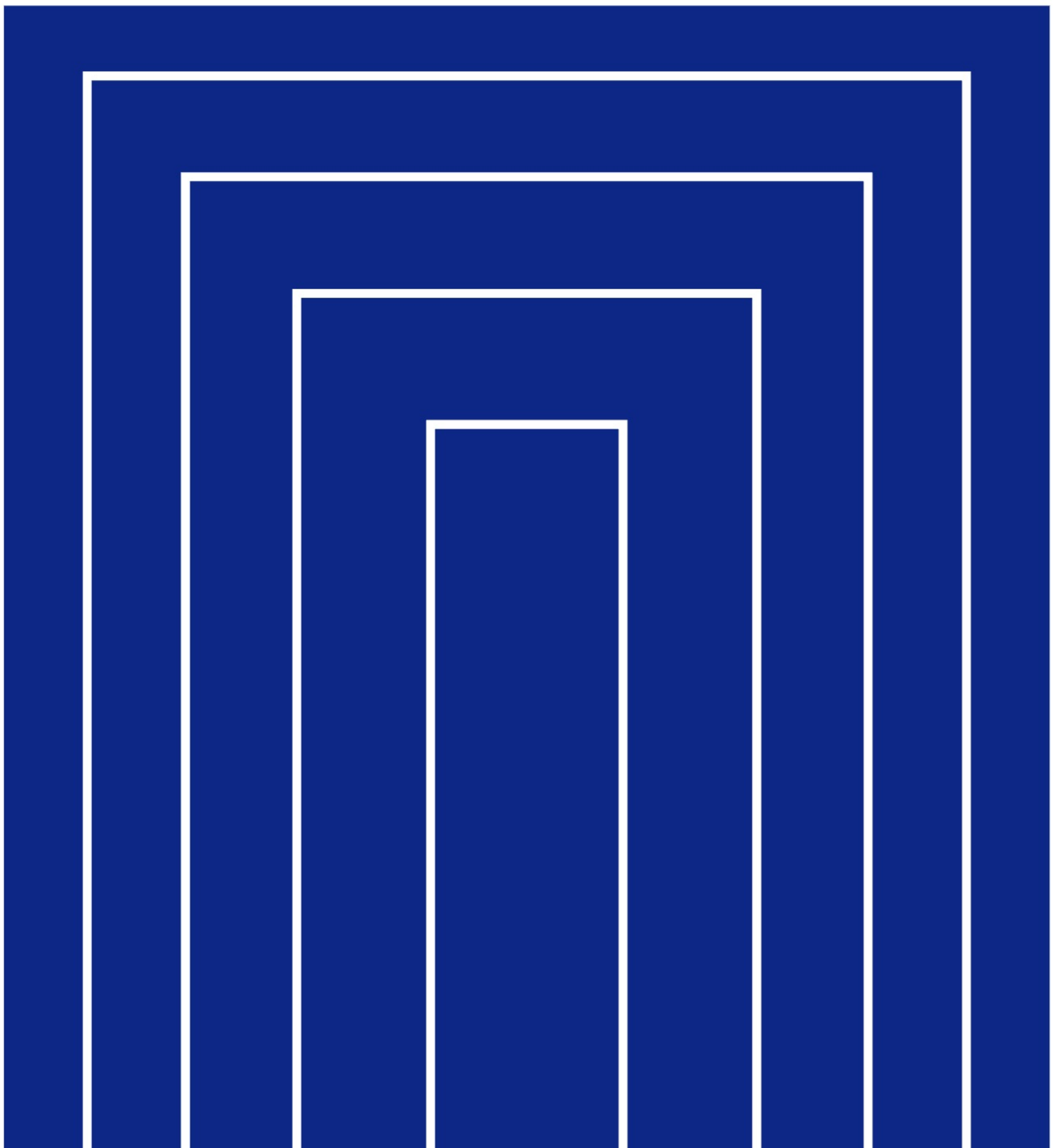
TOYOTA

A442F

AUTOMATIC TRANSMISSION

REPAIR MANUAL

Aug., 1992



Pub. No. RM314E

FOREWORD

This repair manual has been prepared to provide information covering general service repairs for the Automatic Transmission A442F.

Applicable models: FZJ80, HDJ80 series

For the service specifications and repair procedure of the above model other than those listed in this manual, refer to the following manuals.

Manual Name	Pub. No.
• Land Cruiser (Hardtop, Canvastop and Station Wagon) Chassis and Body Repair Manual Supplement	RM315E
• A442F Automatic Transmission Hydraulic Circuit Diagram	ATH031F

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

TOYOTA MOTOR CORPORATION

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INTRODUCTION AUTOMATIC TRANSMISSION

INTRODUCTION

HOW TO USE THIS MANUAL ..... IN– 2
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ABBREVIATIONS USED IN THIS MANUAL ..... IN– 7
STANDARD BOLT TORQUE SPECIFICATIONS ..... IN– 8

HOW TO USE THIS MANUAL

IN002–0C

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

IN

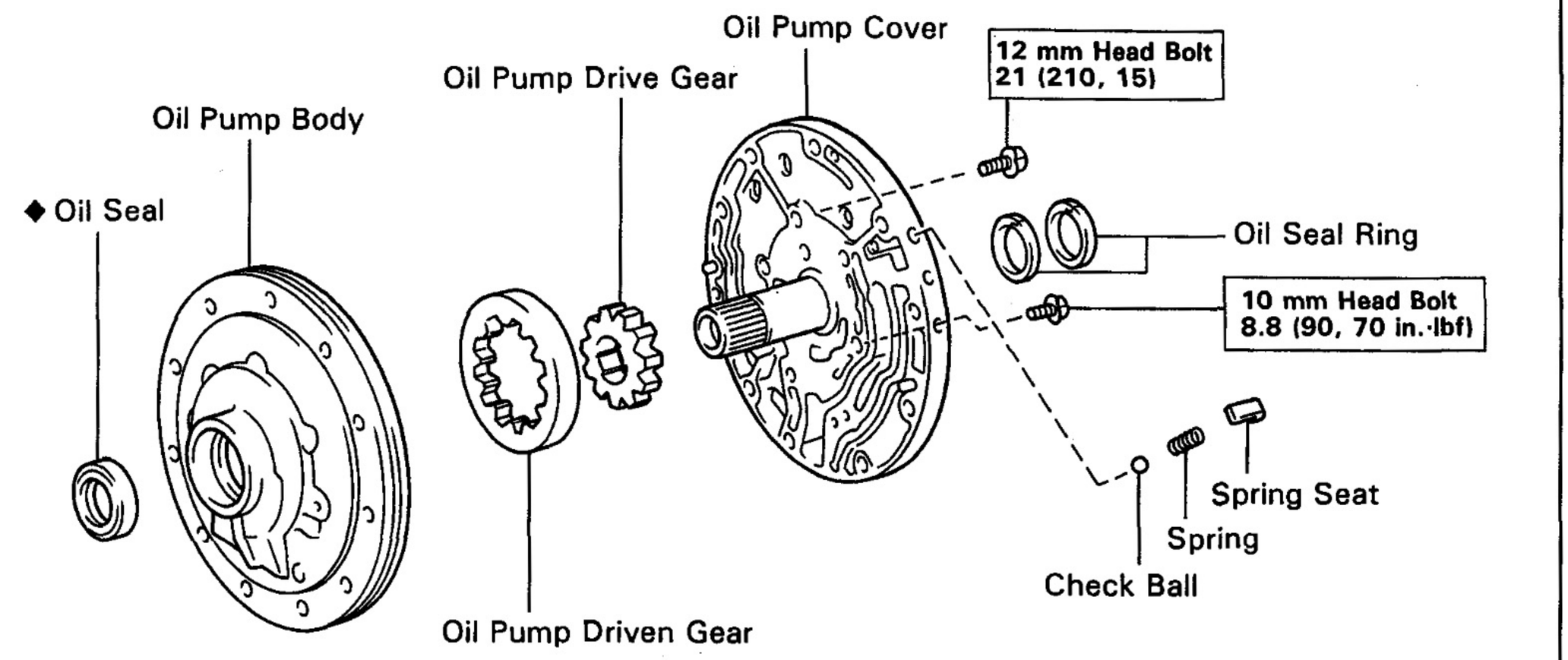
PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

REPAIR PROCEDURES

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

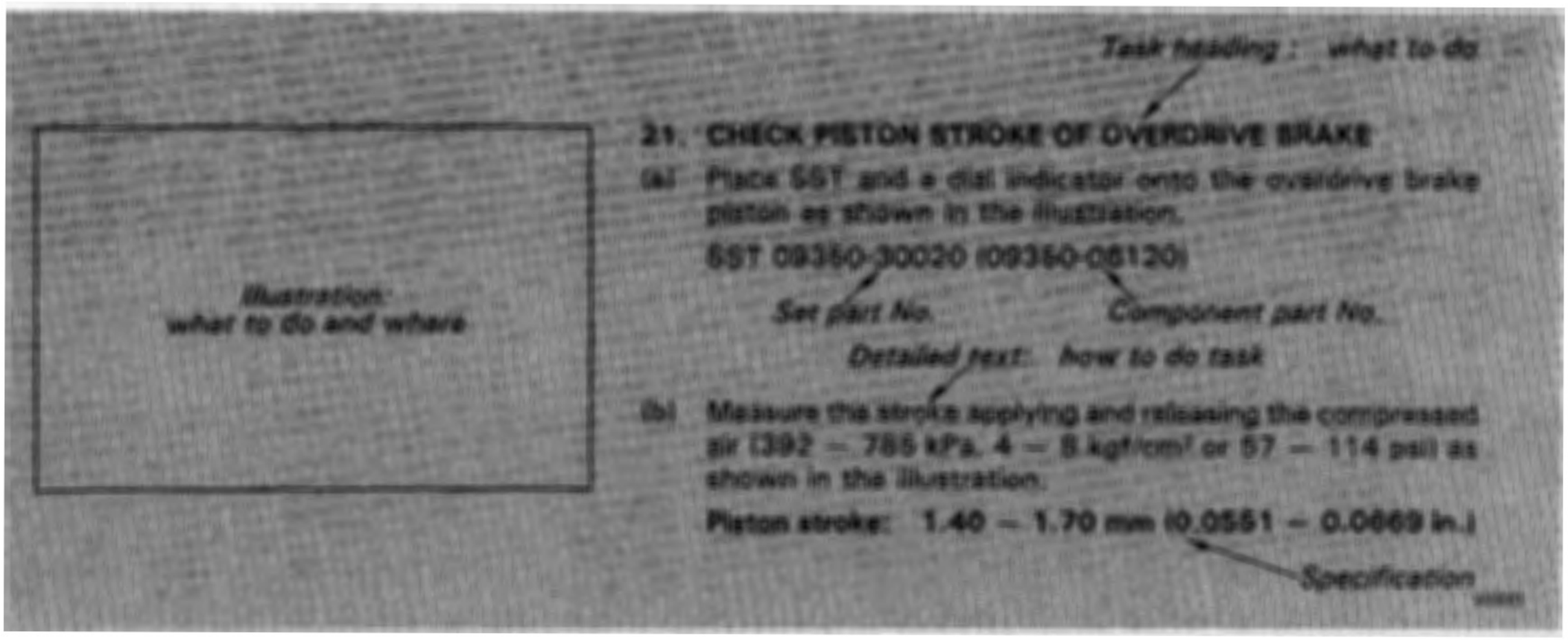
Example:



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

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

Example:



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

REFERENCES

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

SPECIFICATIONS

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

CAUTIONS, NOTICES, HINTS:

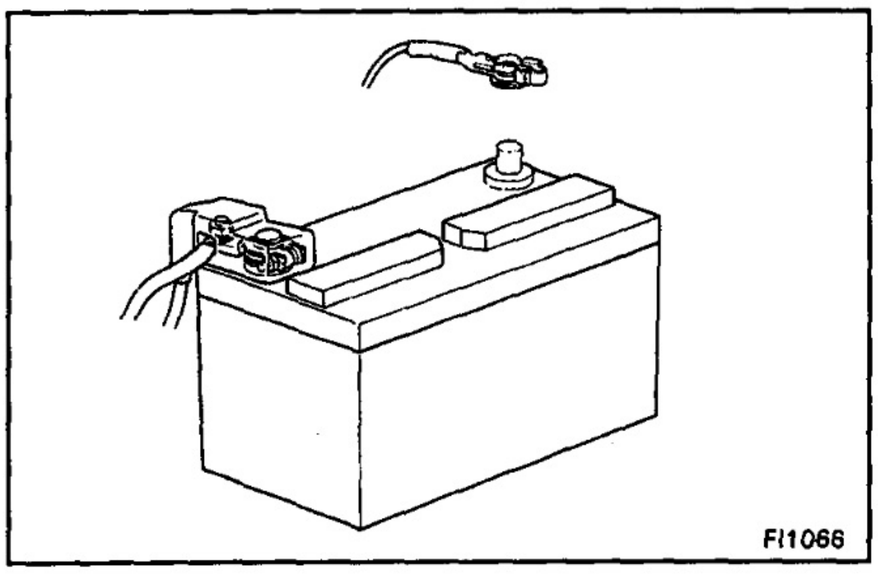
- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide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

SI UNIT

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

Example:

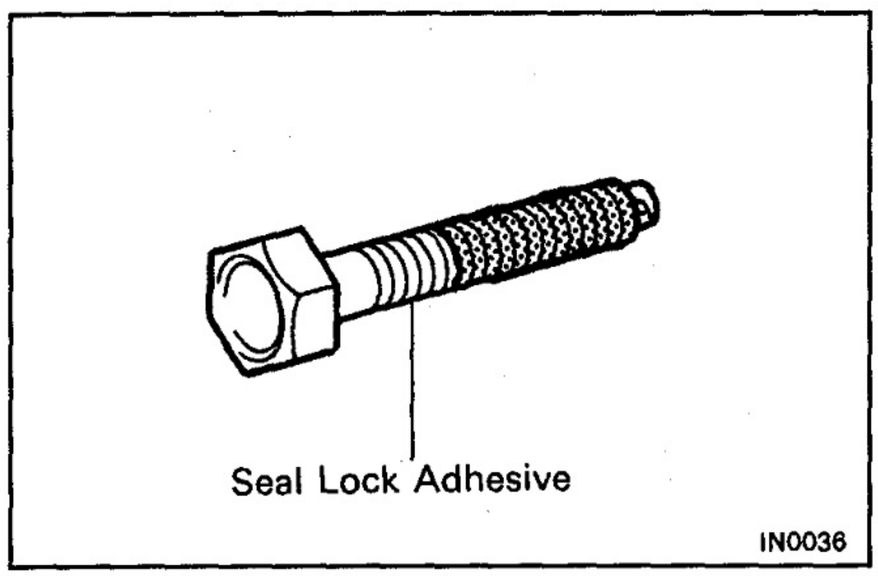
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)



GENERAL REPAIR INSTRUCTIONS

IN01G-02

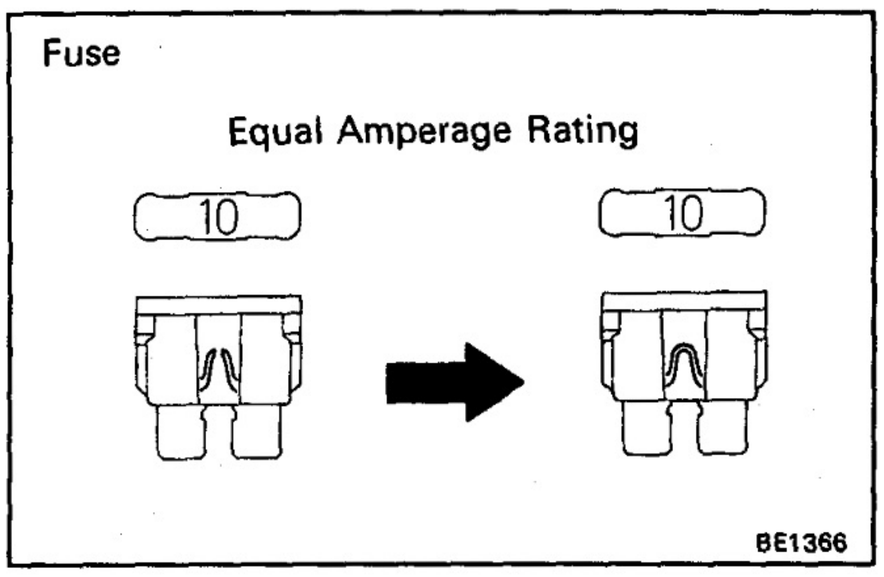
1. Use fender, seat and floor covers to keep the vehicle clean and prevent damage.
2. During disassembly, keep parts in the appropriate order to facilitate reassembly.
3. Observe the following:
   (a) Before performing electrical work, disconnect the negative cable from the battery terminal.
   (b) If it is necessary to disconnect the battery for inspection or repair, always disconnect the cable from the negative (−) terminal which is grounded to the vehicle body.
   (c) To prevent damage to the battery terminal post, loosen the terminal nut and raise the cable straight up without twisting or prying it.
   (d) Clean the battery terminal posts and cable terminals with a clean shop rag. Do not scrape them with a file or other abrasive objects.
   (e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation. Do not use a hammer to tap the terminal onto the post.
   (f) Be sure the cover for the positive (+) terminal is properly in place.
4. Check hose and wiring connectors to make sure that they are secure and correct.
5. Non−reusable parts
   (a) Always replace cotter pins, gaskets, O−rings and oil seals etc. with new ones.
   (b) Non−reusable parts are indicated in the component illustrations by the "◆" symbol.



6. Precoated parts
   Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
   (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.

(b) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.
(c) Precoated parts are indicated in the component illustrations by the "★" symbol.

7. When necessary, use a sealer on gaskets to prevent leaks.
8. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.
9. Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found at the preparation of AT section.



10. When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.
11. Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.
(a) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels at the opposite end in order to ensure safety.
(b) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

ABBREVIATIONS USED IN THIS MANUAL

IN01H–04

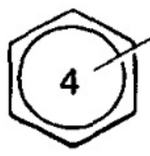
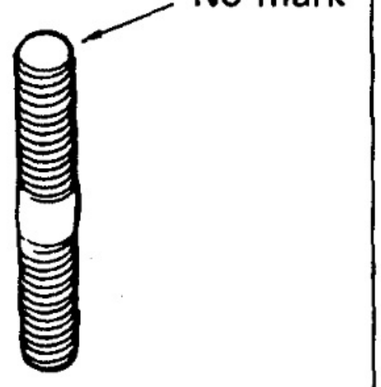
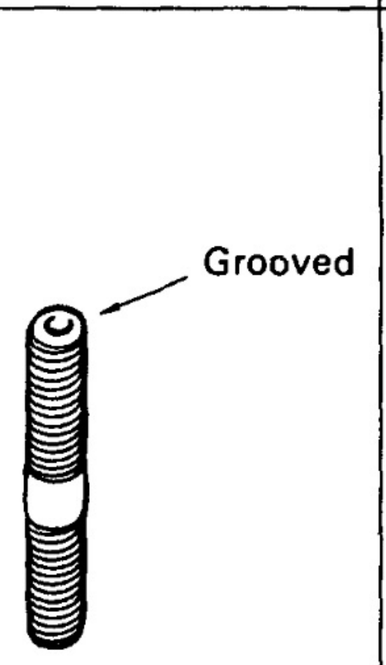
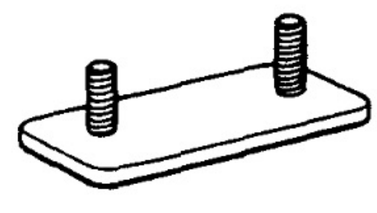
ATF	Automatic Transaxle Fluid
B_0	Overdrive Brake
B_2	2nd Brake
B_3	1st and Reverse Brake
C_0	Overdrive Direct Clutch
C_1	Front Clutch
C_2	Rear Clutch
D	Disc
Ex.	Except
F	Flange
F_0	Overdrive One–way Clutch
F_2	No.2 One–way Clutch
MP	Multipurpose
O/D	Overdrive
P	Plate
SSM	Special Service Materials
SST	Special Service Tools
w/	with

STANDARD BOLT TORQUE SPECIFICATIONS

IN006–02

IN

HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt		4T 5T 6T 7T 8T 9T 10T 11T	Stud bolt		4T
	 No mark	4T			6T
Hexagon flange bolt w/ washer hexagon bolt	 No mark	4T			
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			

V00078

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	—	—	—
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	—	—	—
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	—	—	—
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	—	—	—
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

AUTOMATIC TRANSMISSION

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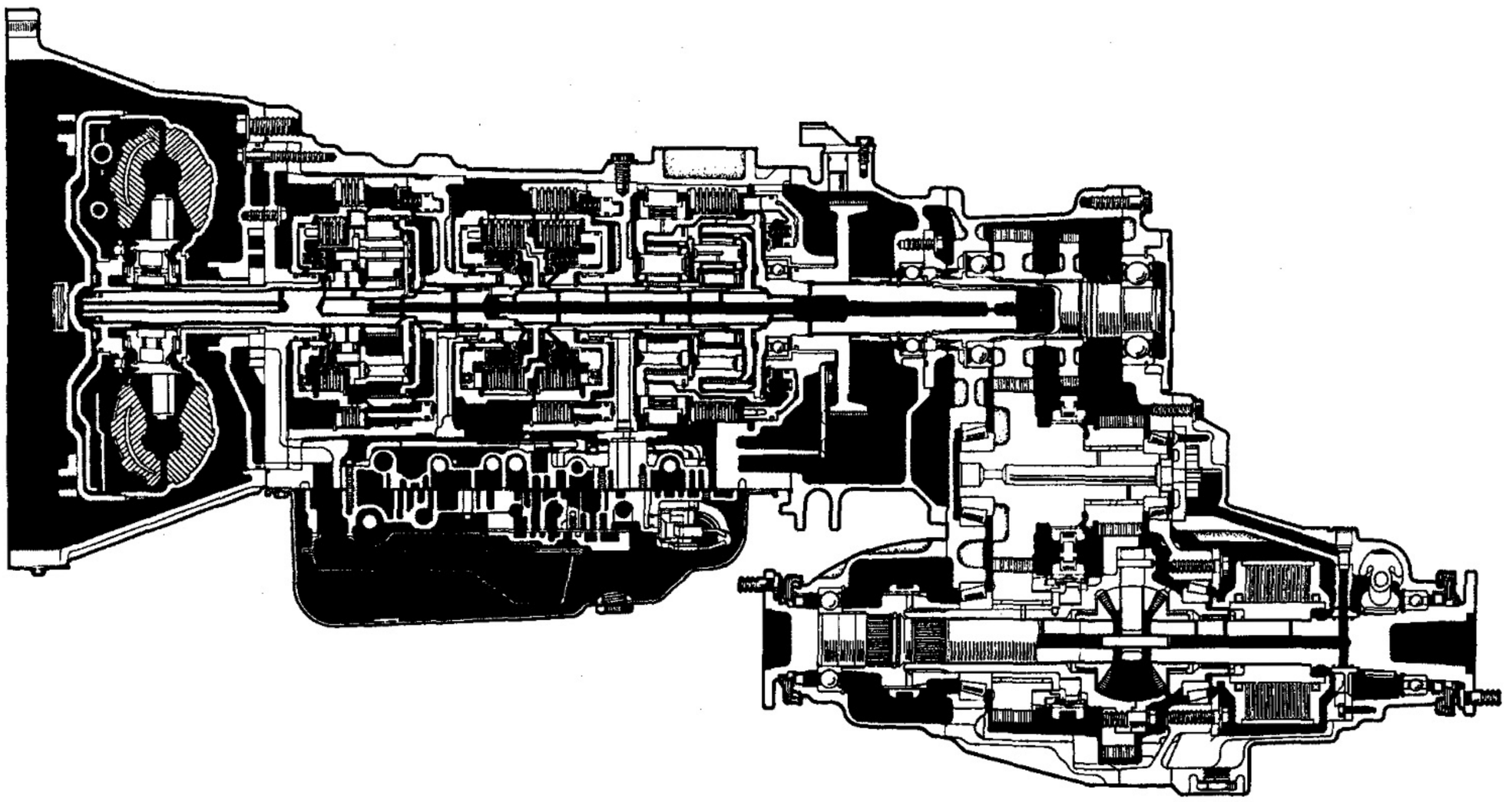
DESCRIPTION

GENERAL

AT07G–01

The new A442F automatic transmission is a 4–speed Electronic Controlled Automatic Transmission and has following features;

- Electronic control provides shift and lock–up points most appropriate for the power characteristics of each engine and improves shift response.
- A high–performance super flow torque converter is used to improve starting off, acceleration and fuel economy.
- For easier operation, the shift lever positions have been reduced from 7 (P,R,N,D,3,2,L) to the 6 positions (P,R,N,D,2,L) used in passenger vehicles, and an O/D main switch has been provided on the shift lever.
- On vehicles using the 1FZ–FE engine, shift response has been greathly improved by communication between the Engine ECU and ECT ECU to momentarily reduce engine output when shifting.



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AT07H-01

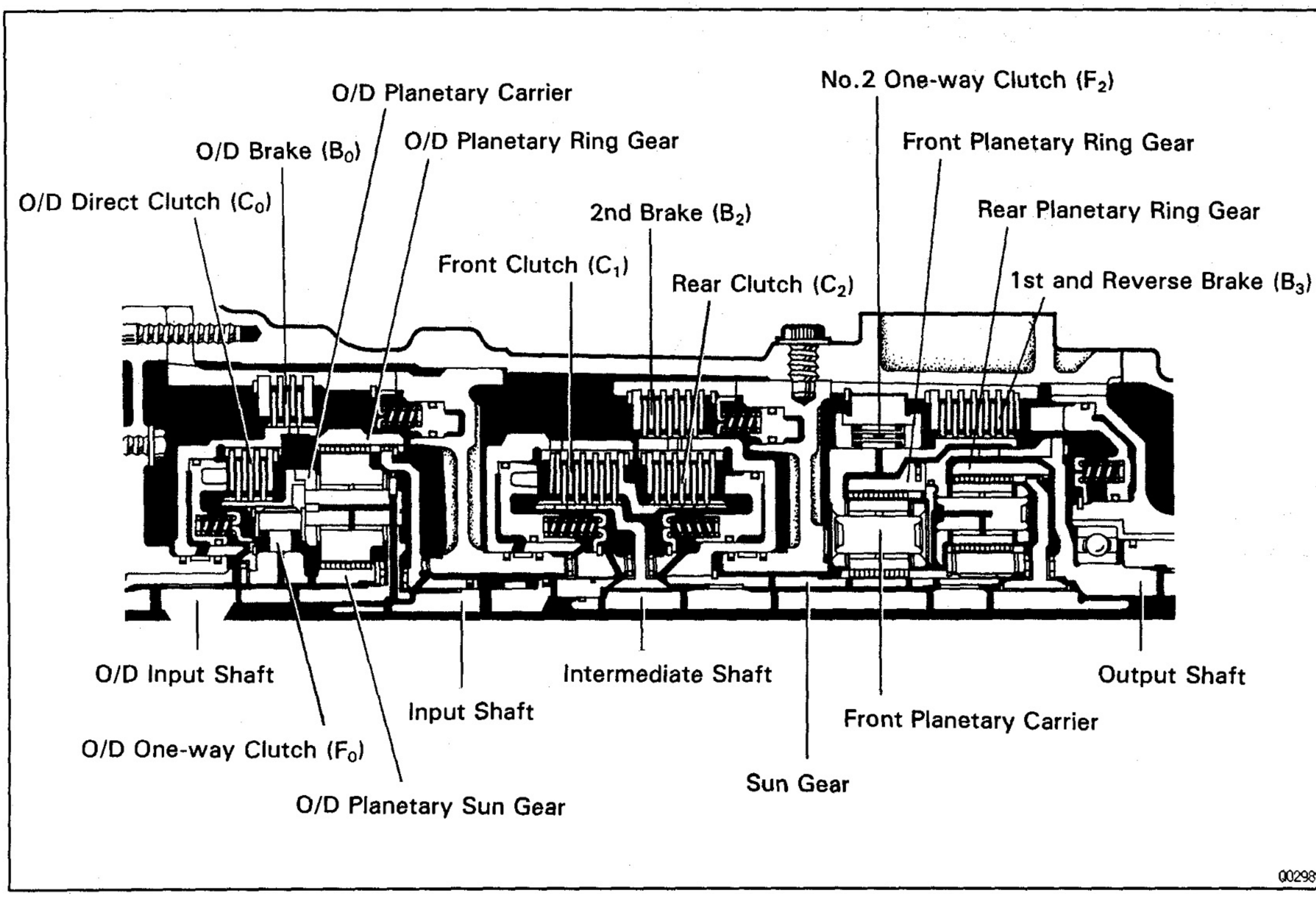
GENERAL SPECIFICATIONS

Type of Transmission		A442F	←
Type of Engine		1FZ-FE	1HD-T
Torque Converter Stall Torque Ratio		1.8 : 1	2.0 : 1
Lock-up Mechanism		Equipped	←
Gear Ratio	1st Gear	2.950	←
	2nd Gear	1.530	←
	3rd Gear	1.000	←
	O/D Gear	0.765	←
	Reverse Gear	2.678	←
Number of Discs and Plates (Disc and Plate)			
	Front Clutch (C_1)	6 / 6	7 / 7
	Rear Clutch (C_2)	5 / 5	←
	O/D Direct Clutch (C_0)	3 / 3	←
	2nd Brake (B_2)	5 / 5	←
	1st and Reverse Brake (B_3)	6 / 6	←
	O/D Brake (B_0)	3 / 3	←
ATF Type		ATF DEXRON® II	←
Capacity (US pts, Imp. qts)	Total	15.0 (15.9, 13.2)	←
	Drain & Refill	6.0 (6.3, 5.3)	←

AT

OPERATION
OPERATING CONDITIONS

AT07J-01



002989

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

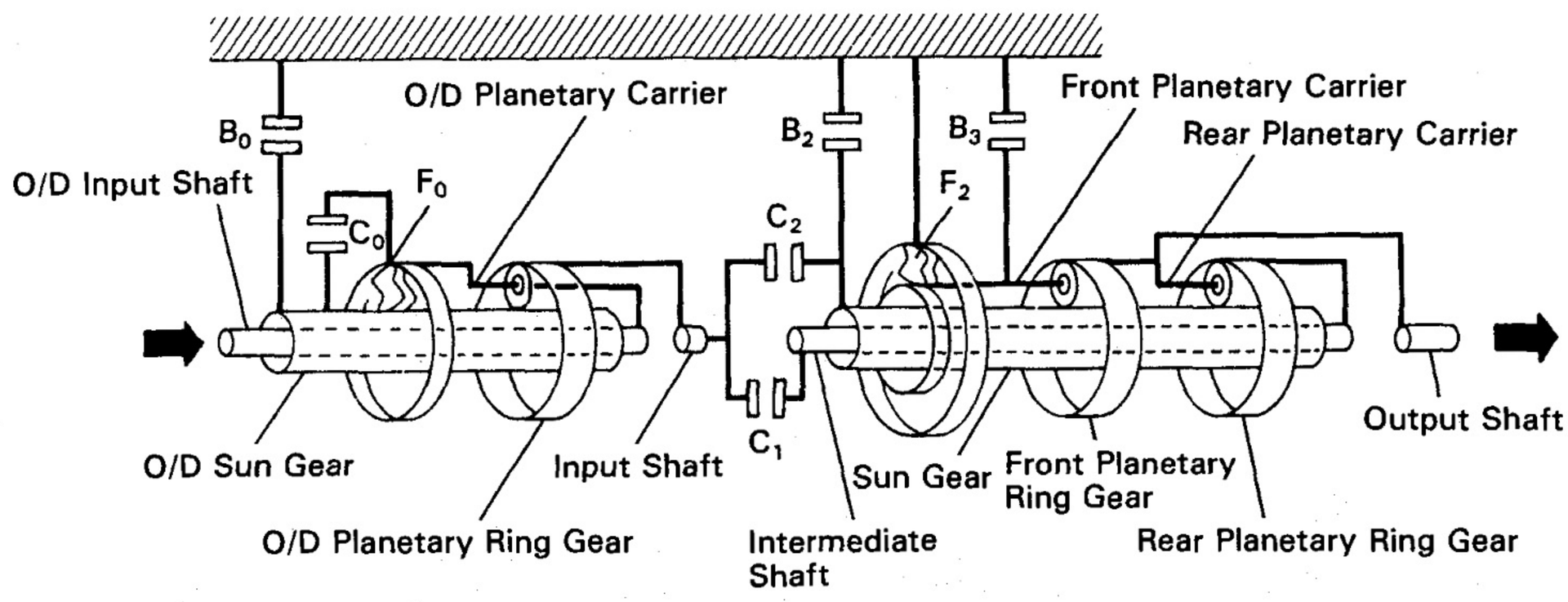
○.....Operating

V01779

AT07K—01

FUNCTION OF COMPONENTS

NOMENCLATURE	OPERATION
O/D Direct Clutch (C_0)	Connects overdrive sun gear and overdrive carrier
O/D Brake (B_0)	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch (F_0)	When transmission is being driven by engine, connects overdrive sun gear and overdrive carrier
Front Clutch (C_1)	Connects input shaft and intermediate shaft
Rear Clutch (C_2)	Connects input shaft and front & rear planetary sun gear
2nd Brake (B_2)	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
1st & Reverse Brake (B_3)	Prevents front planetary carrier from turning either clockwise or counterclockwise
No.2 One-Way Clutch (F_2)	Prevents front planetary carrier from turning counterclockwise



AT3917

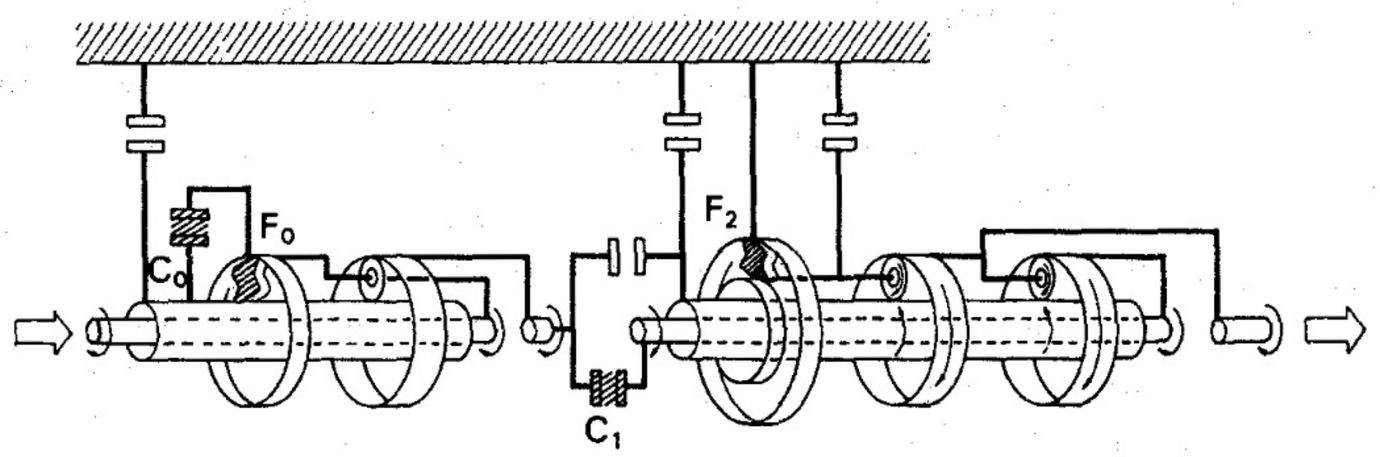
AT

V01780

The condition of operation for each gear position are shown on the following illustration:

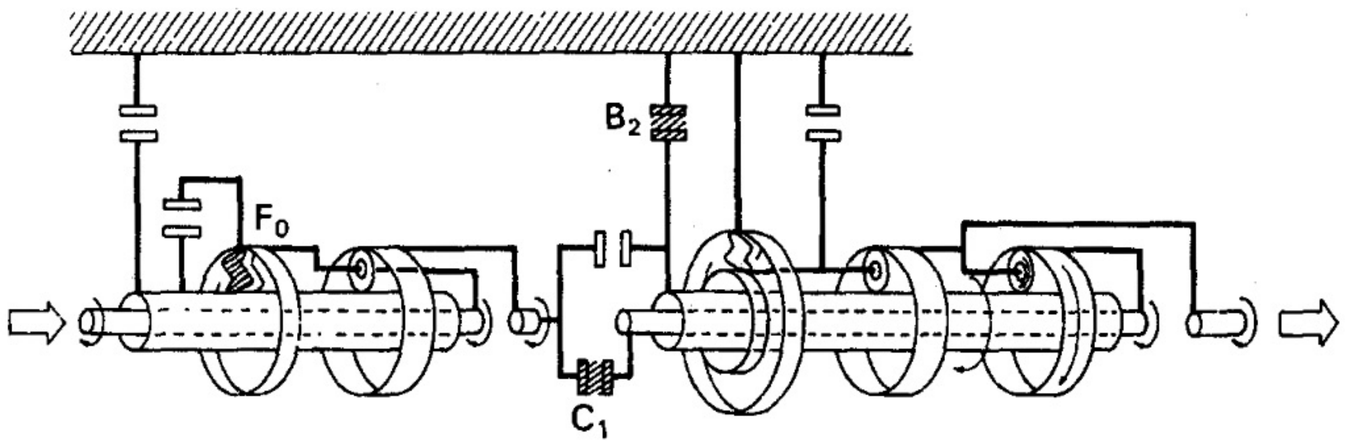
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D or 2 Position 1st Gear



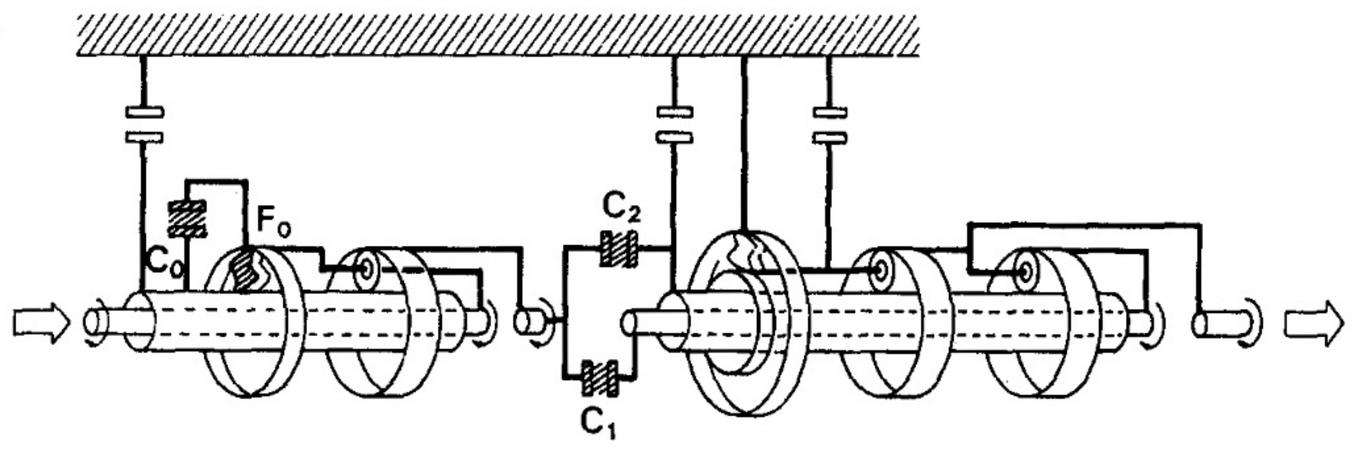
AT5949

D or 2 Position 2nd Gear



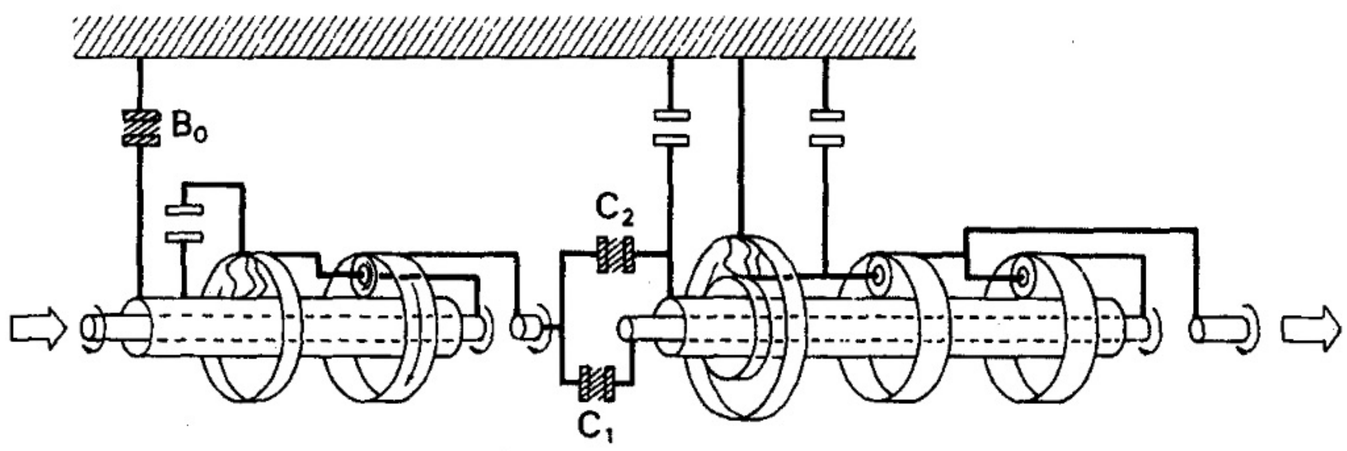
AT5950

D Position 3rd Gear



AT5951

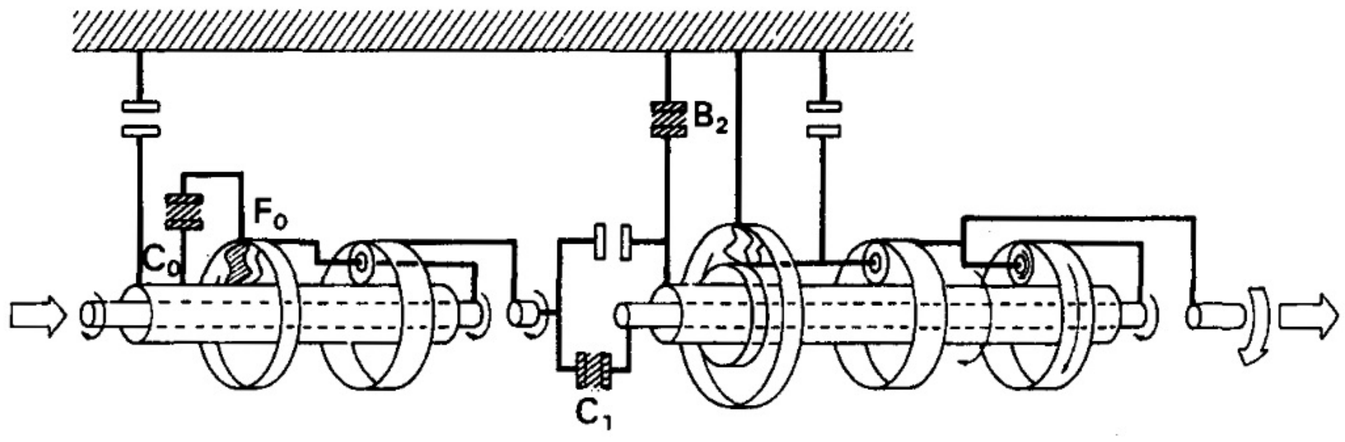
D Position O/D



AT5952

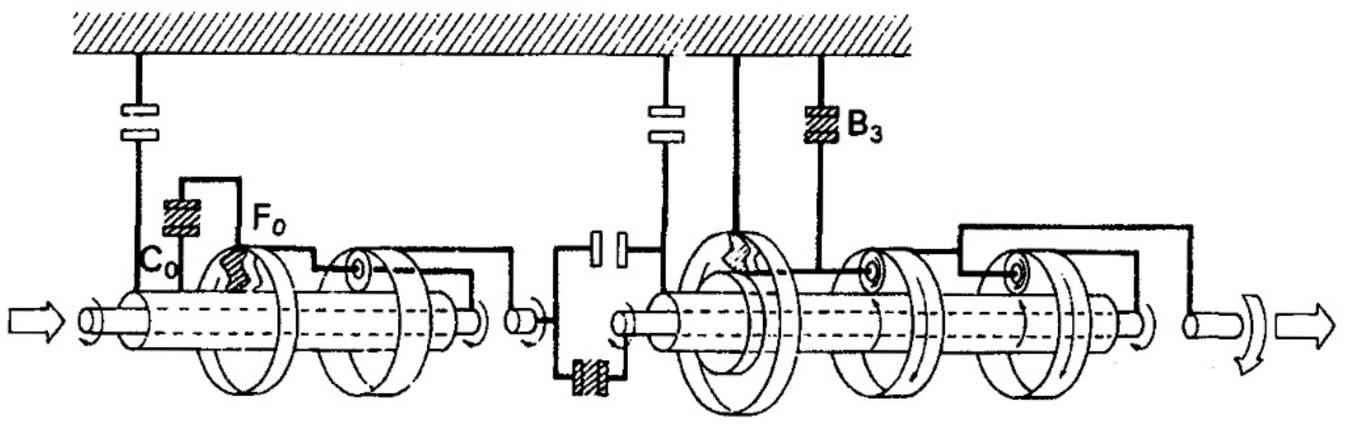
V01781

2 Position 2nd Gear



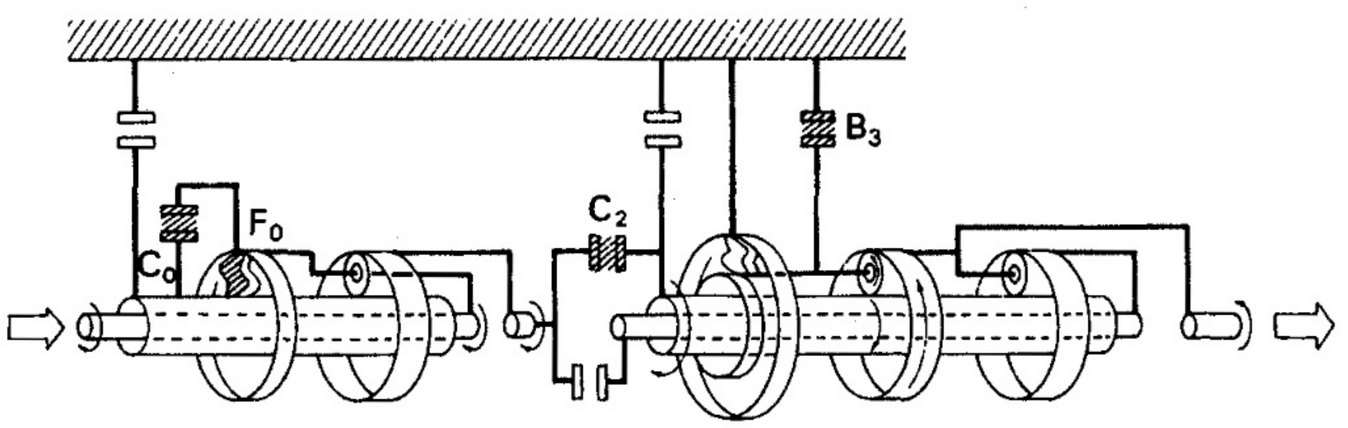
AT5953

L Position 1st Gear



AT5954

R Position Reverse Gear



AT5955

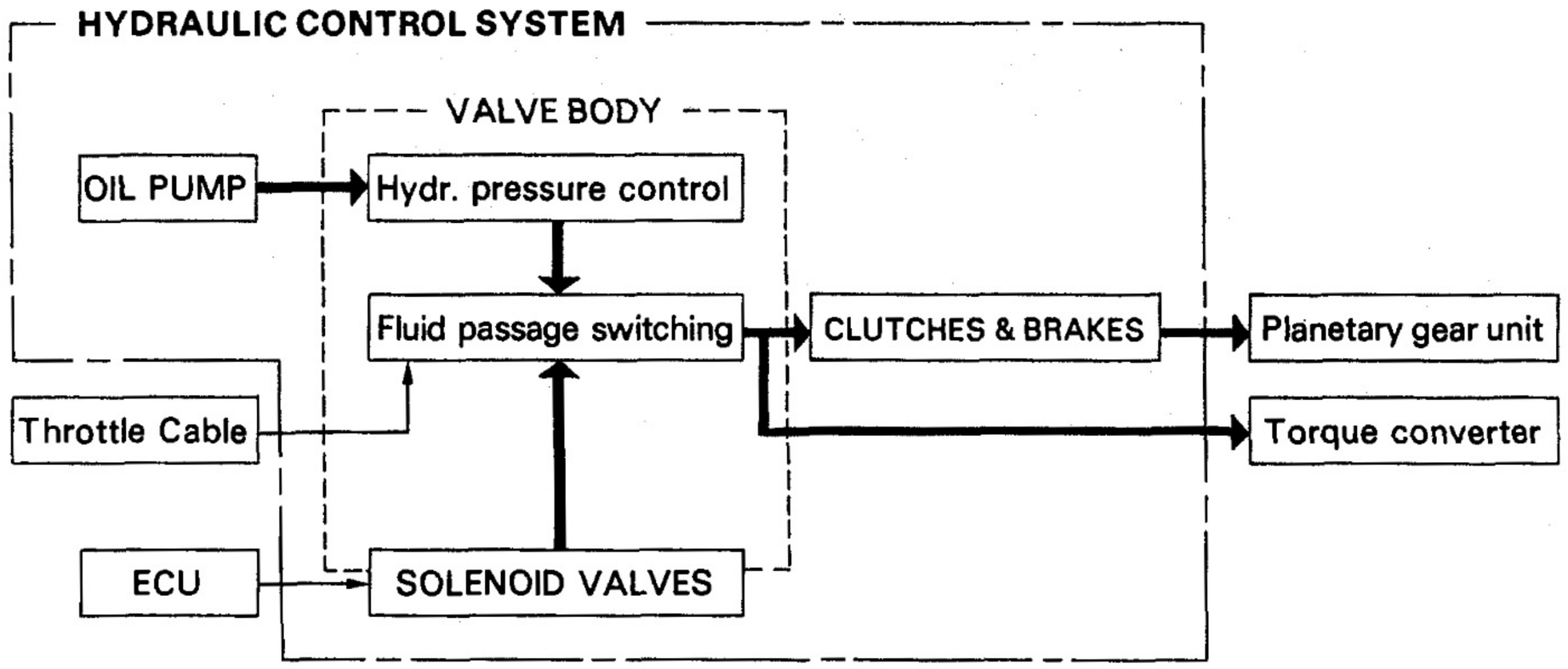
AT07L–02

HYDRAULIC CONTROL SYSTEM

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

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

There are solenoid valves on the valve body.



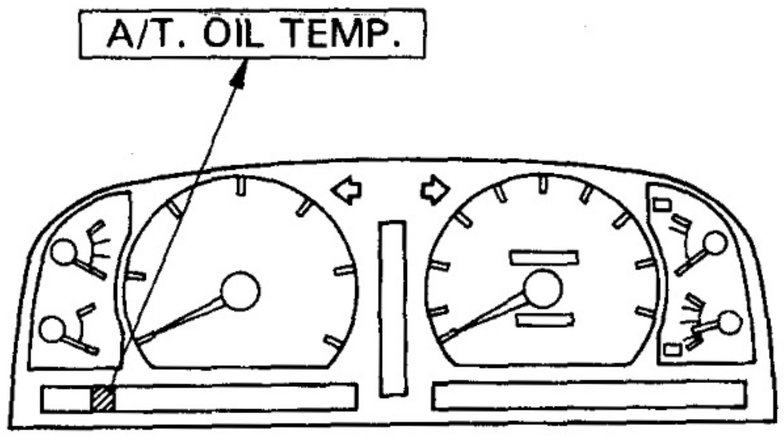
V00332

AT07M-02

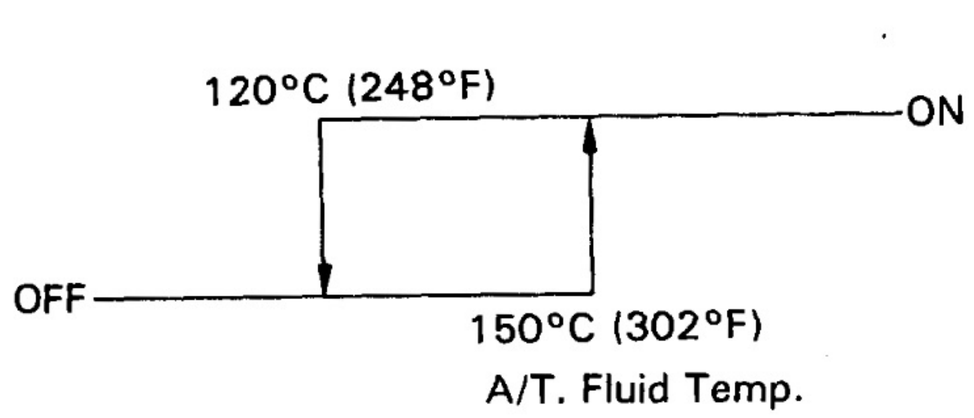
WARNING AND INDICATOR LIGHTS

A.T FLUID TEMPERATURE WARNING SYSTEM

The ECT ECU detects the transmission fluid temperature by means of a fluid temperature sensor fitted to the union. The transmission fluid may become extremely hot when the vehicle is under and extreme load, as when driving on sand or climbing uphill. Should the fluid temperature increases above 150 °C (302°F), the ECT ECU lights the warning light located the combination meter, The light goes off when the temperature falls below 120 °C (248 °F).



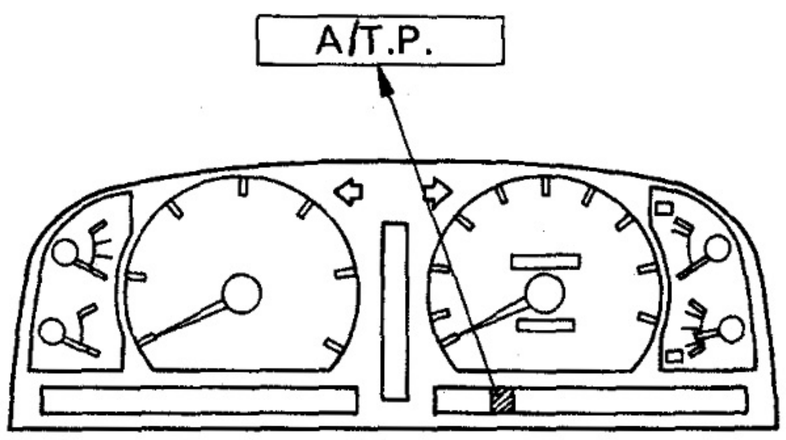
AT6023



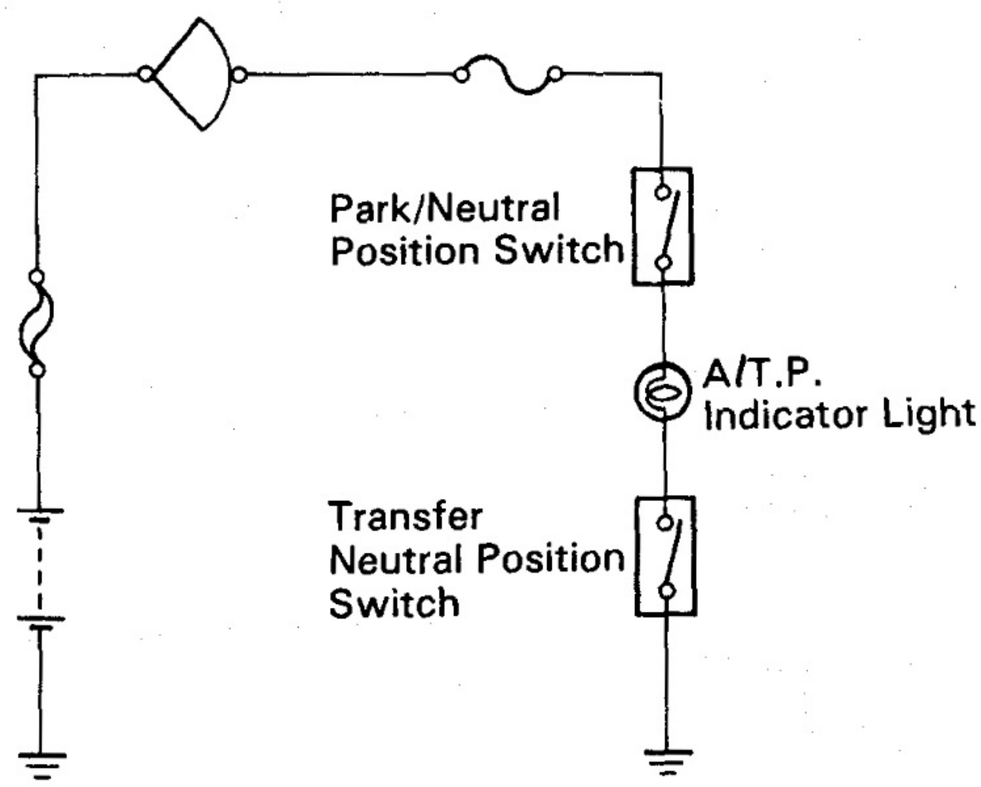
V01585

A.T.P. (Automatic Transmission Parking) INDICATOR

The rear propeller shaft and rear wheels are free even when the transmission shift lever is set to "P" as long as the transfer shift lever is in "neutral" position. The A.T.P. indicator lights up to warn the driver that the propeller shaft and wheels are not locked, If the A.T.P. indicator light does on, the transfer shift lever should be shifted to out of "N" position.



AT6024 AT3920

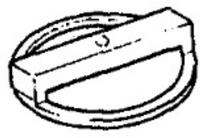
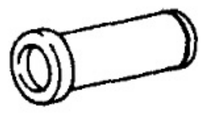
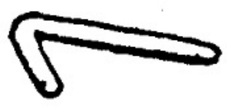


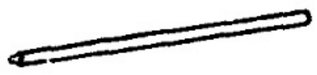
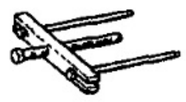
V01586

PREPARATION

SST (SPECIAL SERVICE TOOLS)

AT07N-01

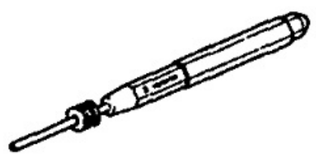
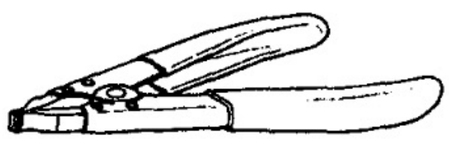
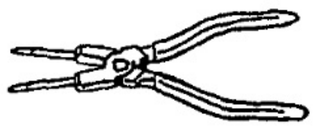
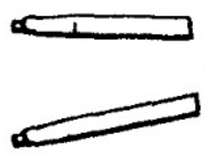
	09032-00100 Oil Pan Seal Cutter	
	09350-36010 TOYOTA Automatic Transmission Tool Set	
	(09350-06010) No.2 Piston Spring Compressor	
	(09350-06020) No.3 Piston Spring Compressor	
	(09350-06030) No.1 Piston Spring Compressor	
	(09350-06035) Attachment	
	(09350-06040) Oil Seal Replacer	
	(09350-06050) Handle	
	(09350-06060) Transmission Rear Bearing Replacer	
	(09350-06090) Plate	
	(09350-06100) Check Ball Spring Compressor	
	(09350-06110) No.1 Measure Terminal	
	(09350-06120) No.2 Measure Terminal	

	(09350–06130) Extension Bar	
	(09350–06140) Oil Pump Puller	
	(09350–06150) Oil Seal Replacer	

AT

AT07P–01

RECOMMENDED TOOL

	09031–00030 Pin Punch	
	09905–00012 Snap Ring No. 1 Expander	
	09905–00013 Snap Ring Pliers	
	(09904–00090) Claw Set	

AT07Q–01

EQUIPMENT

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

AT07R-01

LUBRICANT

Item	Capacity	Clacification
Dry fill	15.4 liters (16.3 US qts, 13.6 Imp.qts)	ATF DEXRON® II
Drain and refill	6.0 liters (6.3 US qts,	

AT07S-01

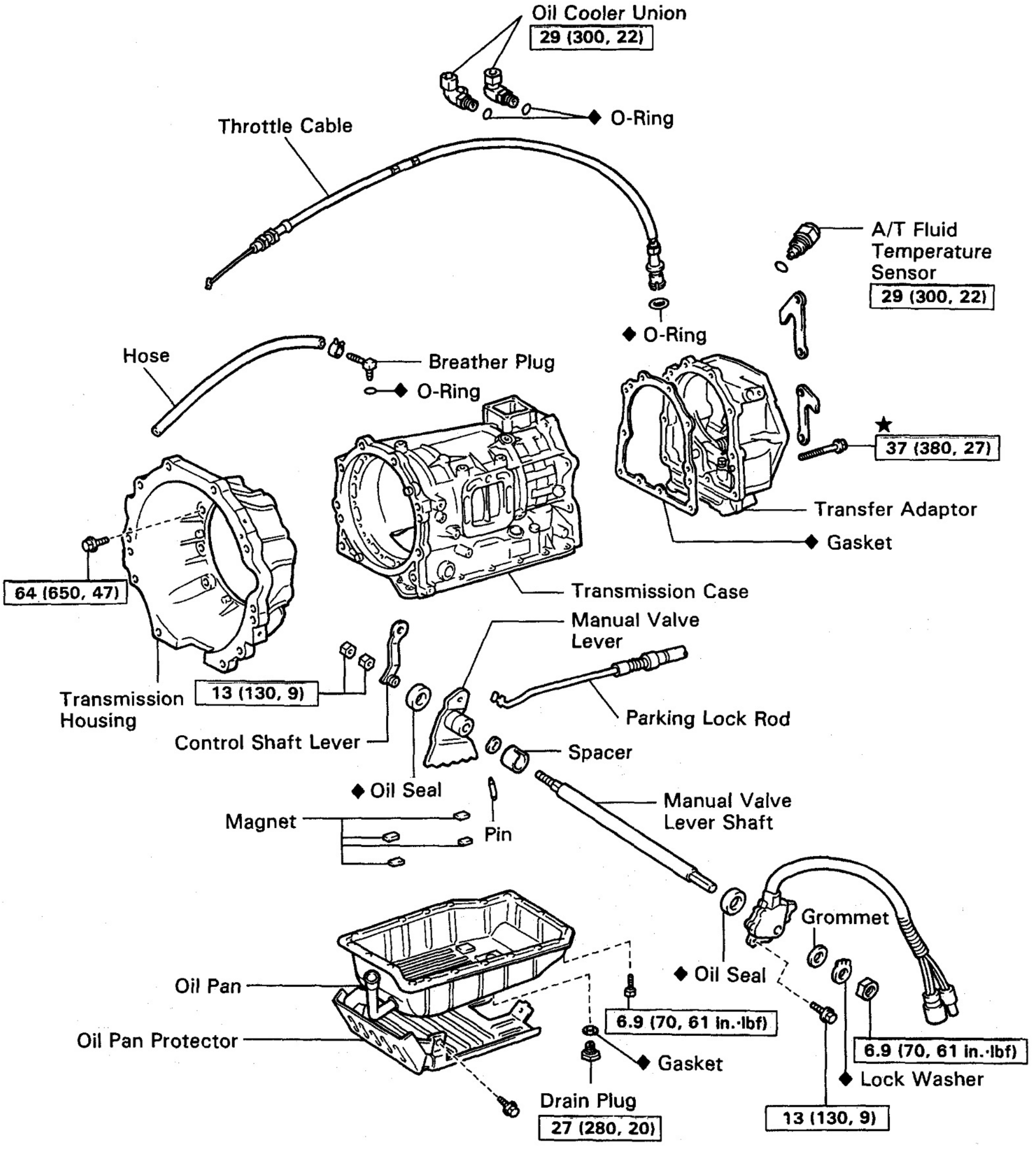
SSM (SPECIAL SERVICE MATERIALS)

08826–00090	Seal Packing 1281, Three bond 1281 or equivalent	
08833–00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	

COMPONENT PARTS REMOVAL

AT07T-01

COMPONENTS

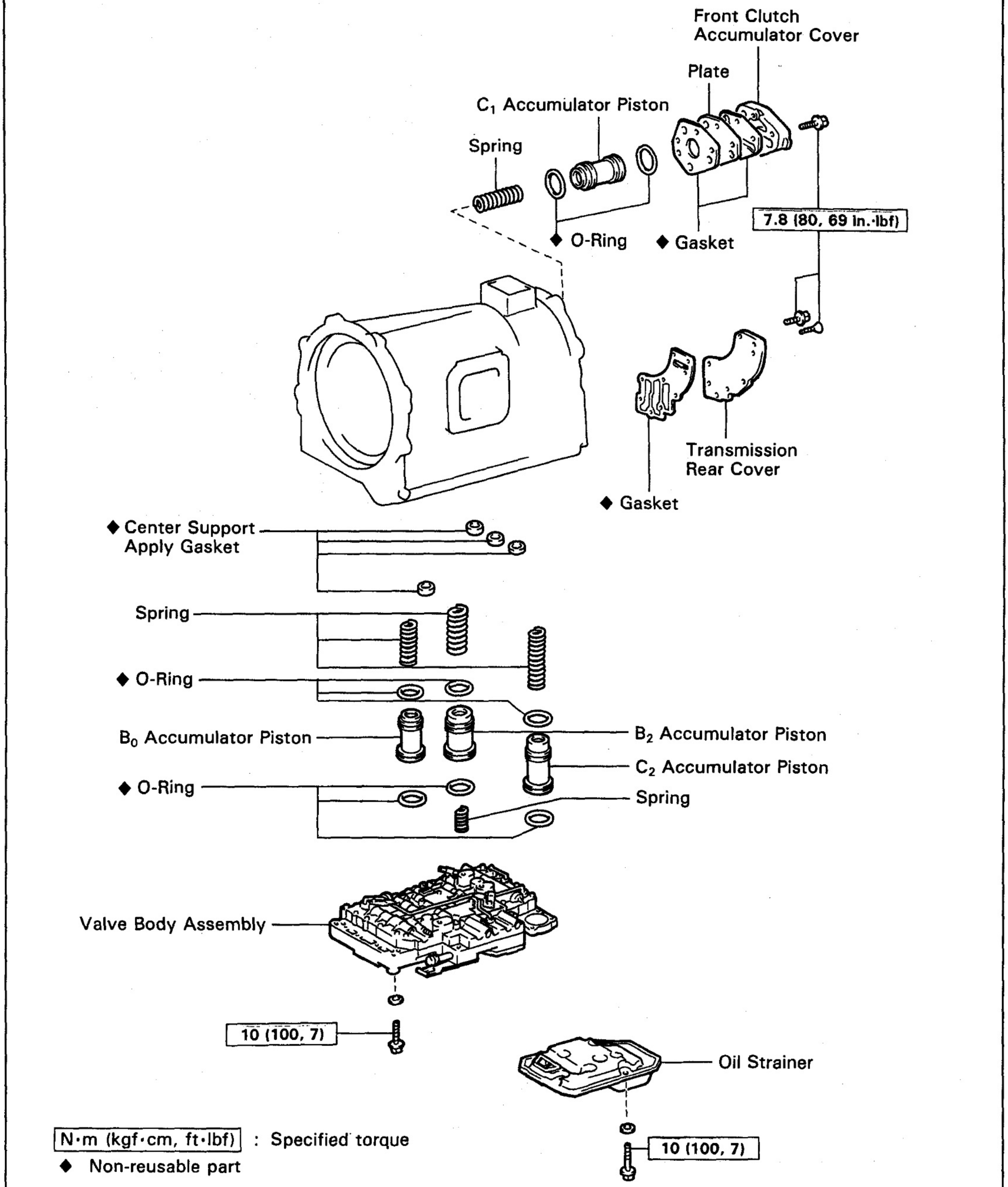


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

★ Precoated part

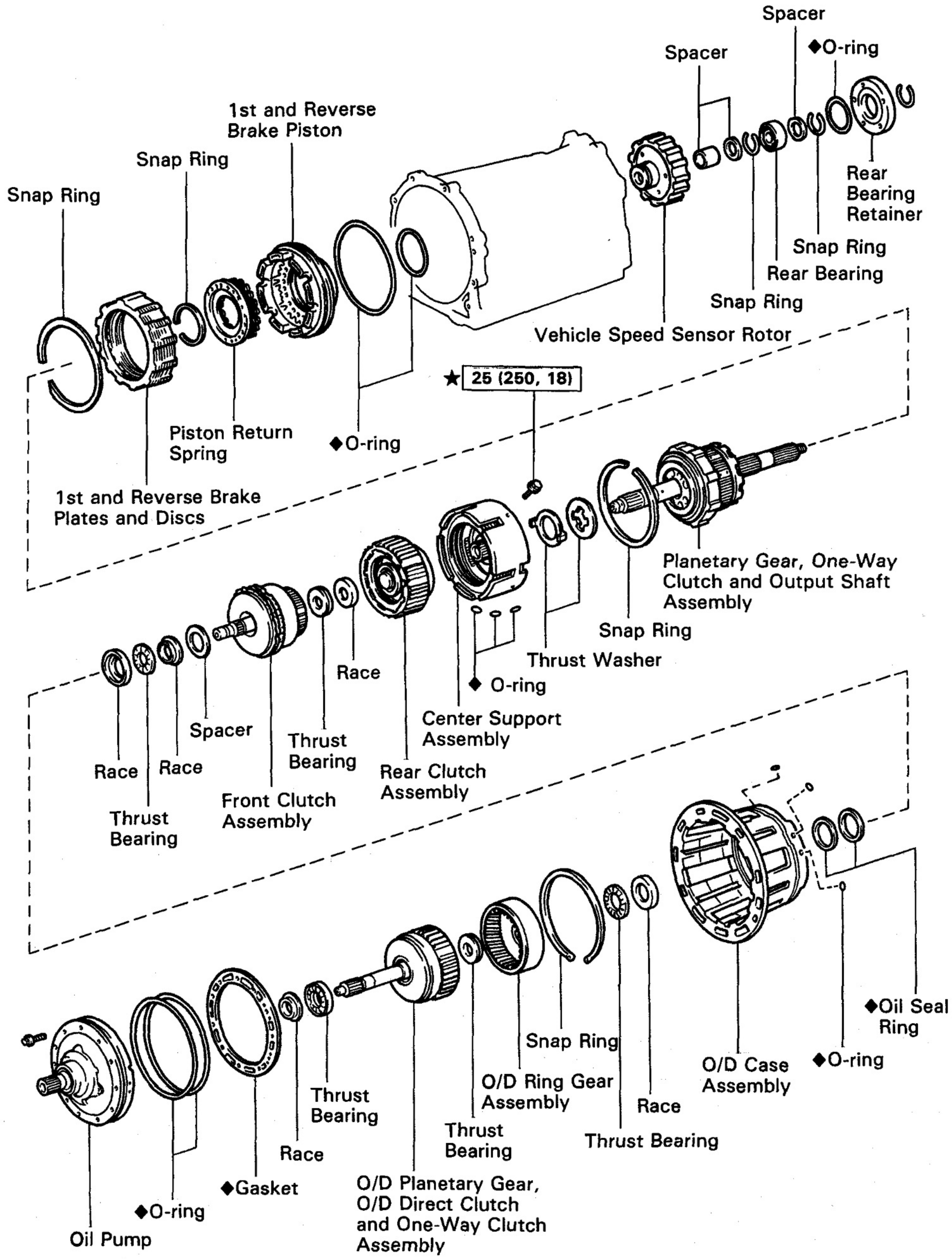
Q02654



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

◆ Non-reusable part

Q02655



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

◆ Non-reusable part

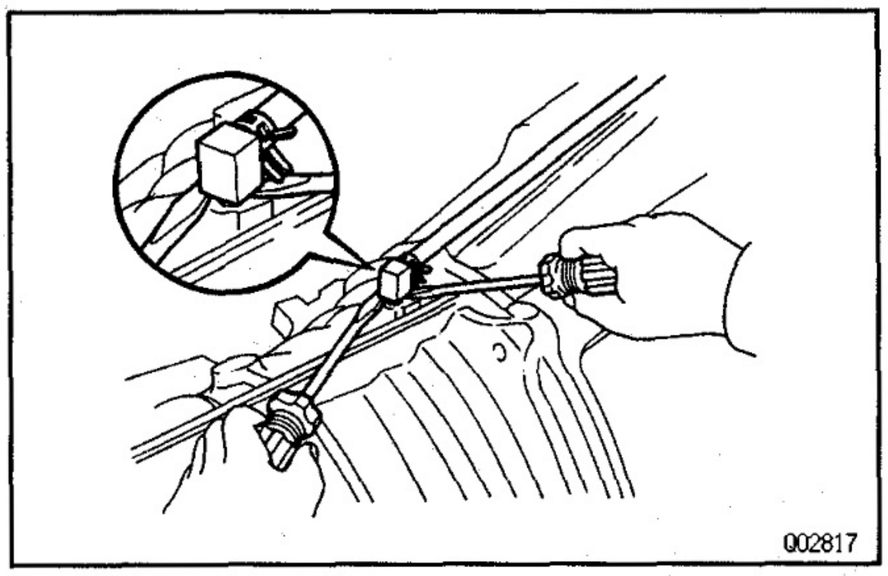
★ Precoated part

Q02656

AT

AT092–02

SEPARATE BASIC SUBASSEMBLY



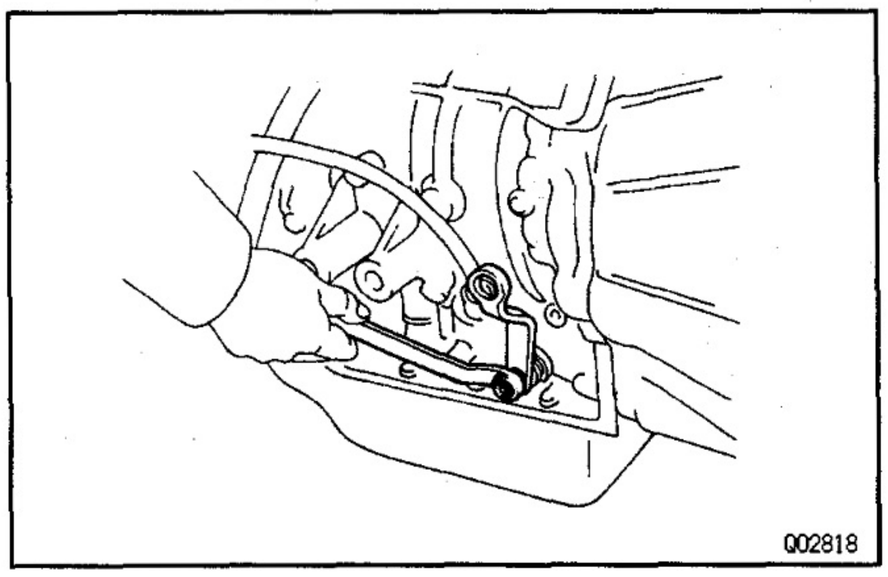
1. REMOVE TRANSMISSION WIRING

Disconnect the connectors, and remove the transmission wiring.

2. REMOVE BREATHER LUG AND HOSE

(a) Using two screwdrivers, pry out the breather plug.

(b) Remove the O–ring from the breather plug.



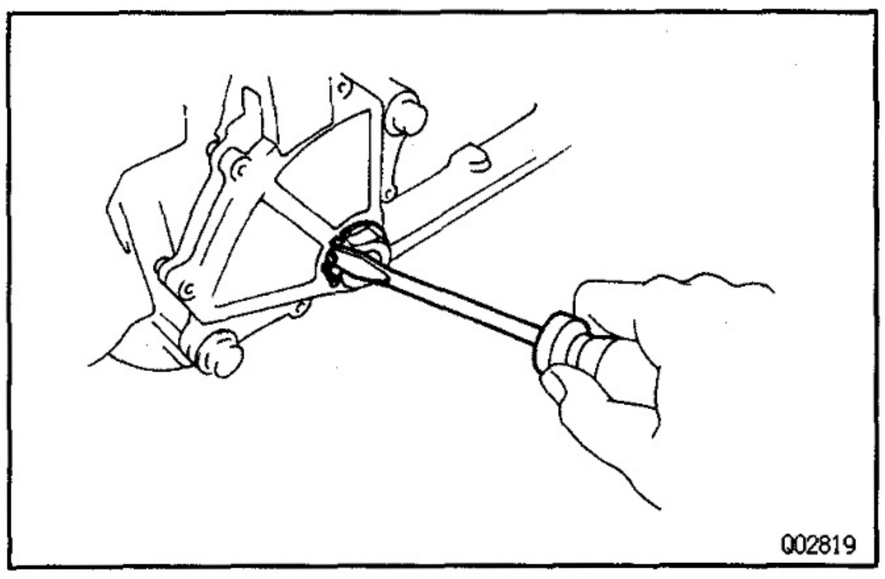
3. REMOVE CONTROL SHAFT LEVER

Remove the two nuts and the lever.

4. REMOVE OIL COOLER PIPES

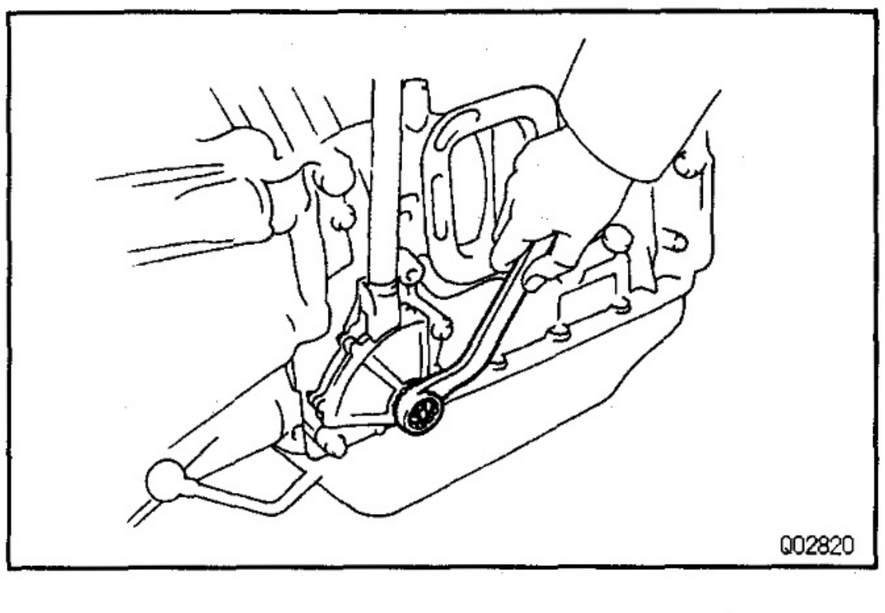
(a) Remove the mount stay bolt.

(b) Loosen the tow union bolts, and remove two cooler pipe assembly.

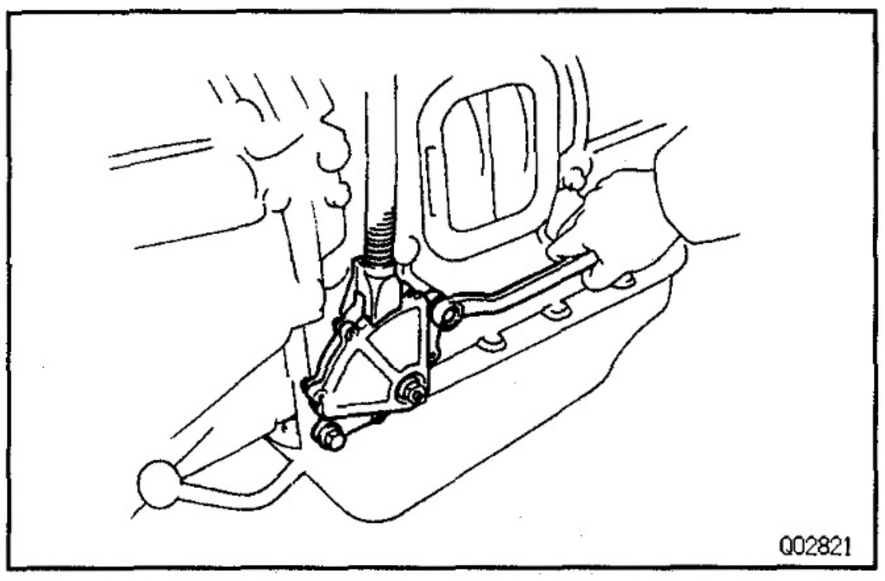


5. REMOVE NEUTRAL START SWITCH

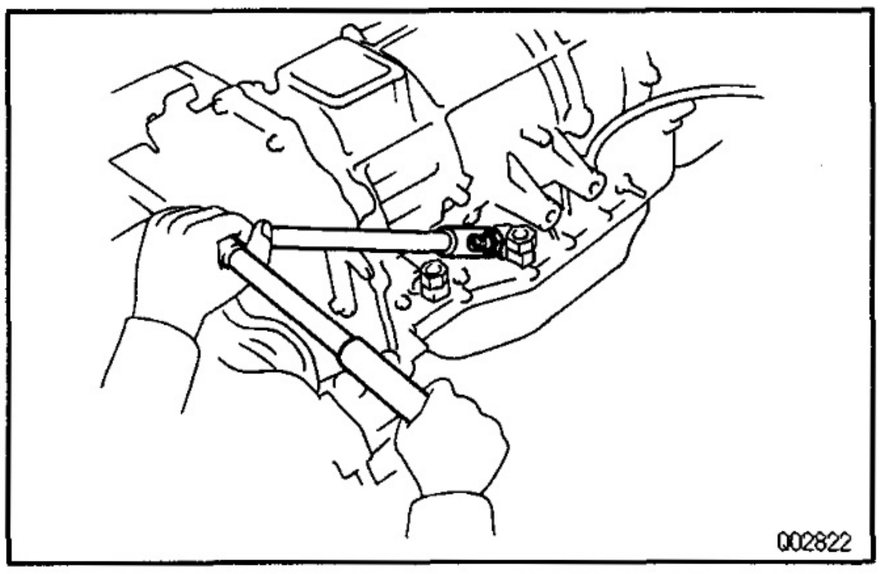
(a) Unstake the lock washer.



(b) Remove the nut, lock washer and grommet.



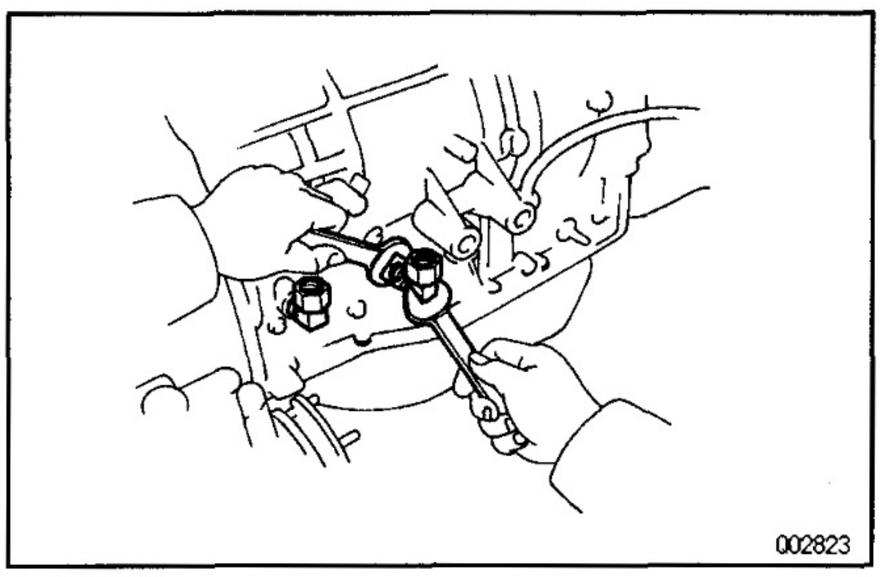
(c) Remove the two bolts and neutral start switch.



6. REMOVE TRANSMISSION TEMPERATURE SENSOR

(a) Remove the sensor from front union.

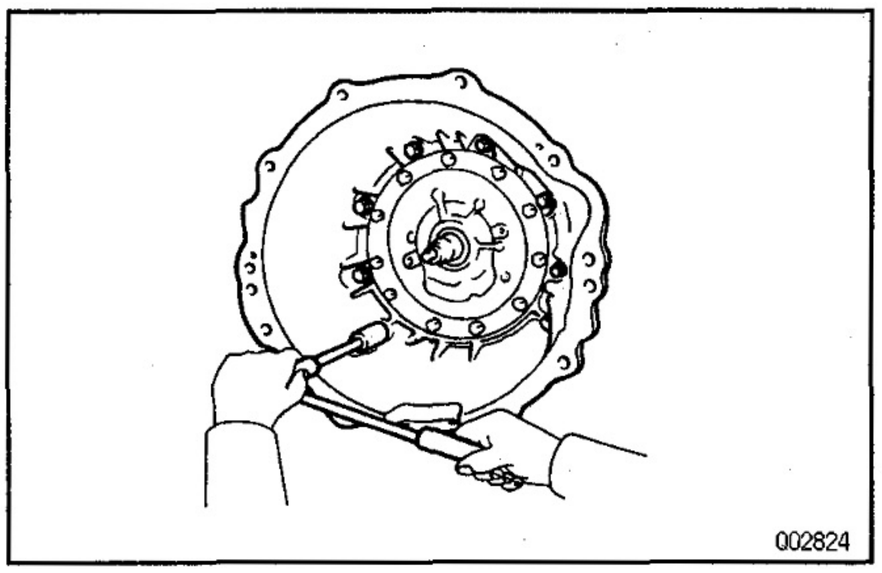
(b) Remove the O—ring from the sensor.



7. REMOVE OIL COOLER UNIONS

(a) Remove the two unions.

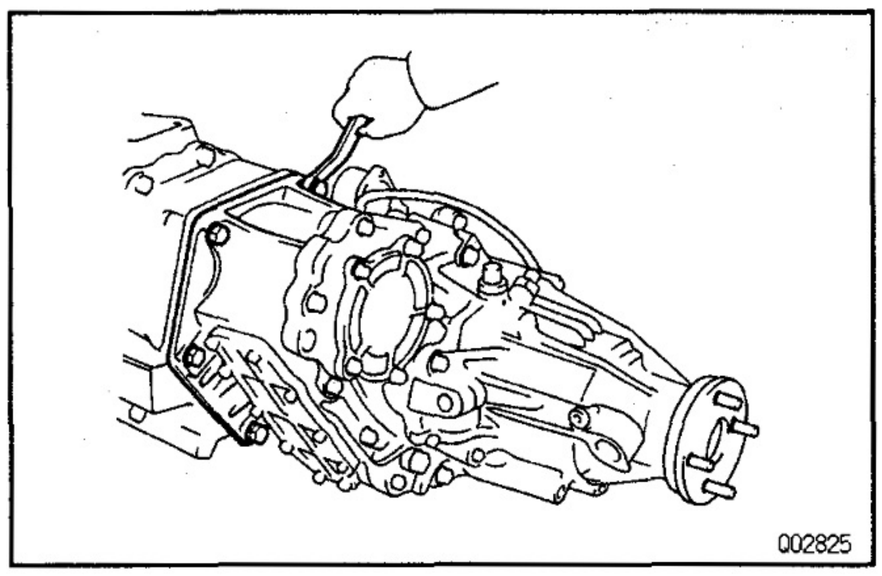
(b) Remove the O—rings from the both unions.



8. REMOVE TRANSMISSION HOUSING

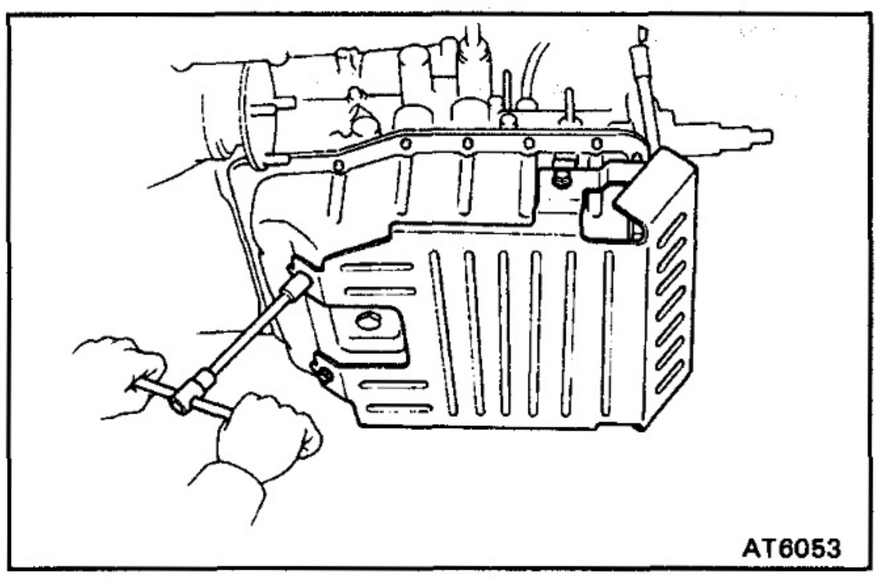
(a) Remove the throttle cable clamp bolt.

(b) Remove the eight bolts and transmission housing.



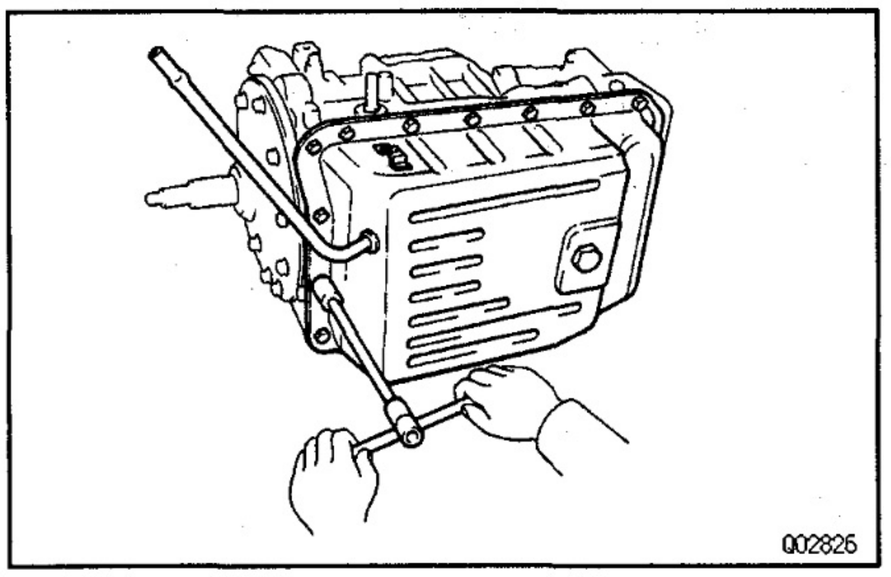
9. REMOVE TRANSFER ASSEMBLY

Remove the six bolts and the transfer.



10. REMOVE OIL PAN PROTECTOR

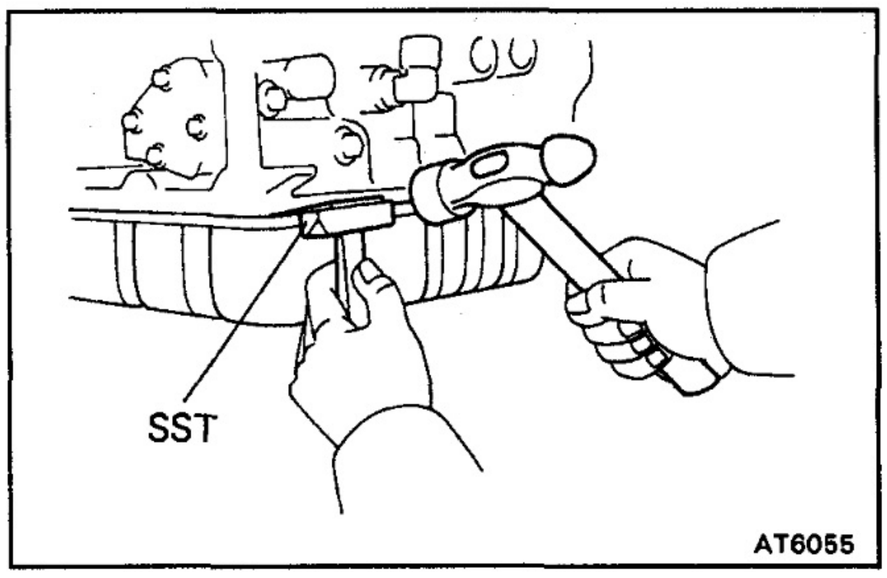
Remove the four bolts and protector.



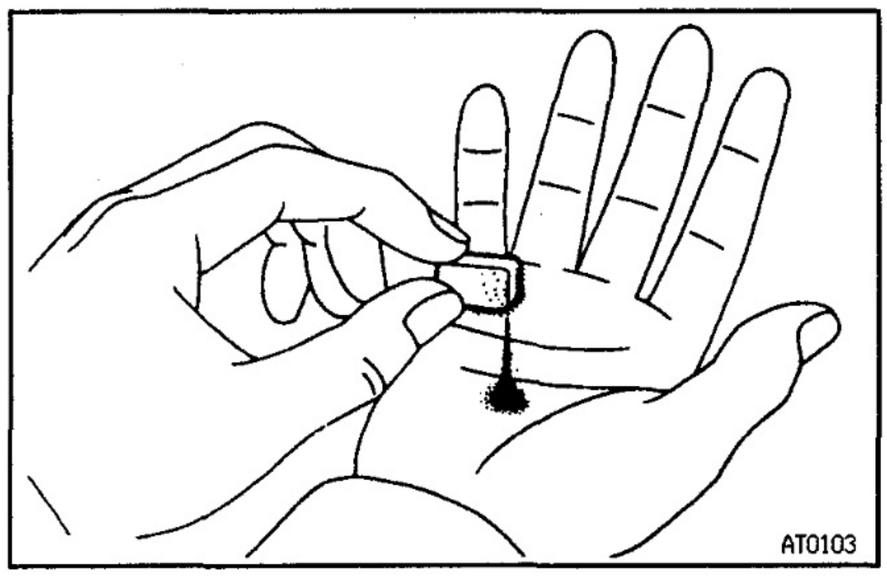
11. REMOVE OIL PAN

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

(a) Remove the twenty bolts.



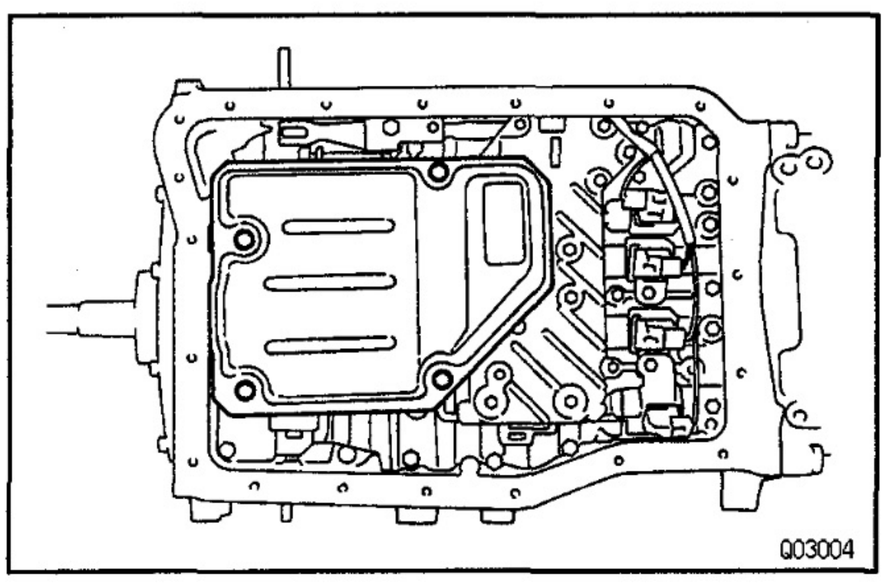
(b) Tap in the blade SST between the transmission and oil pan, cut off applied sealer.
SST 09302—00100
NOTICE: Be careful not to damage the oil pan flange.



12. EXAMINE PARTICLES IN PAN

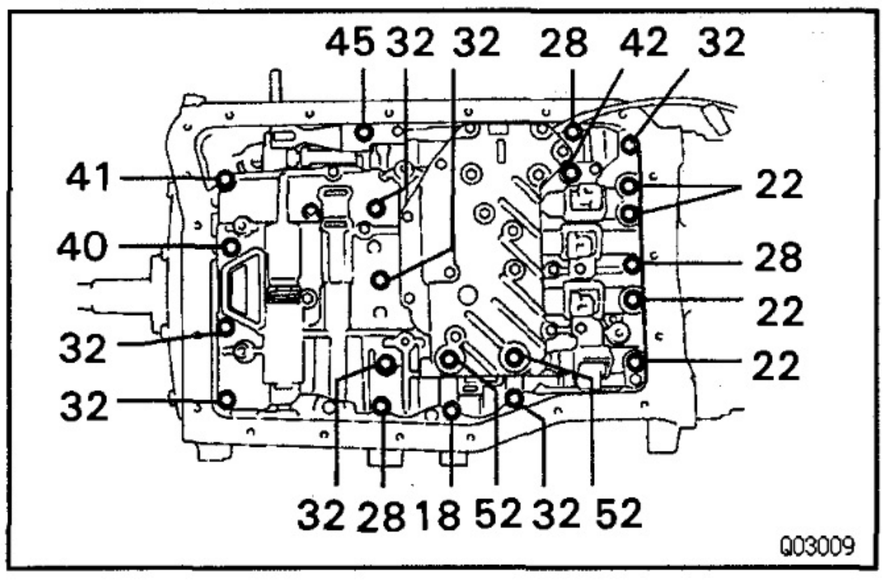
Remove the magnets and use them to collect any steel particles.
Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission:

- **Steel (magnetic): Bearing, gear, and clutch**
- **Brass (non—magnetic): Bushing wear**



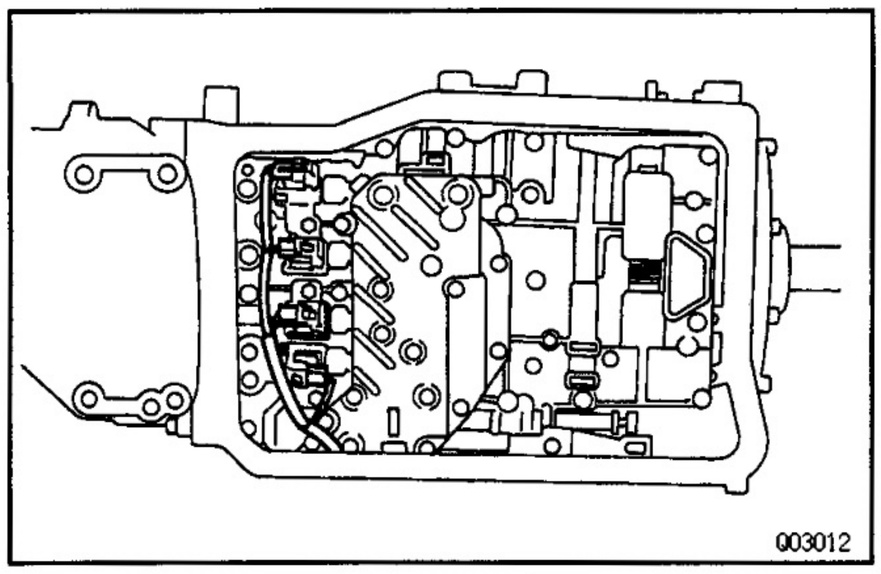
13. REMOVE OIL STRAINER

Remove the four bolts and oil strainer.

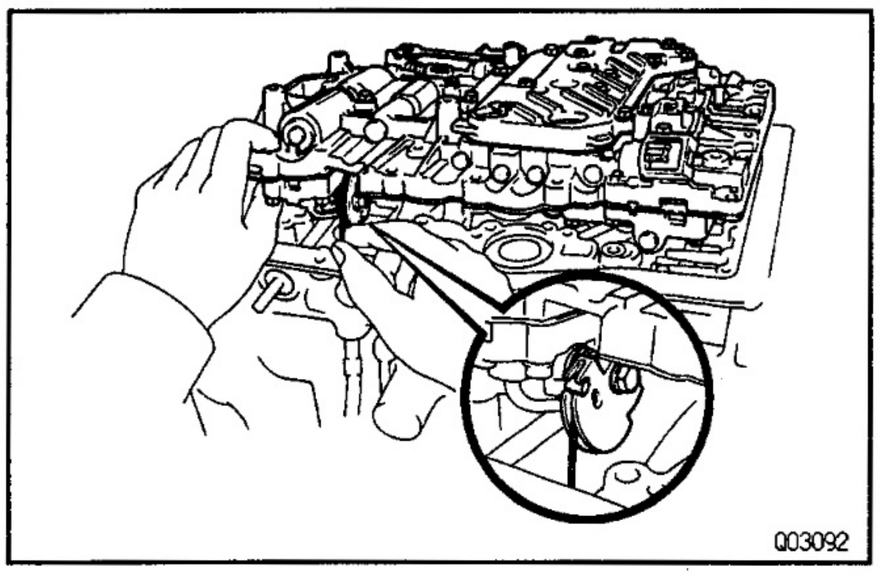


14. REMOVE VALVE BODY

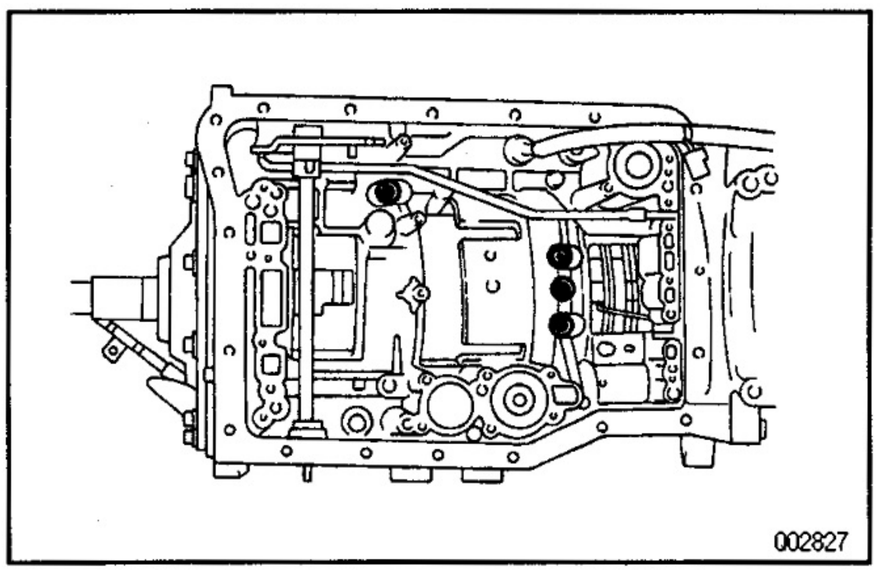
(a) Remove the twenty one bolts.



(b) Disconnect the four connectors from the solenoids.

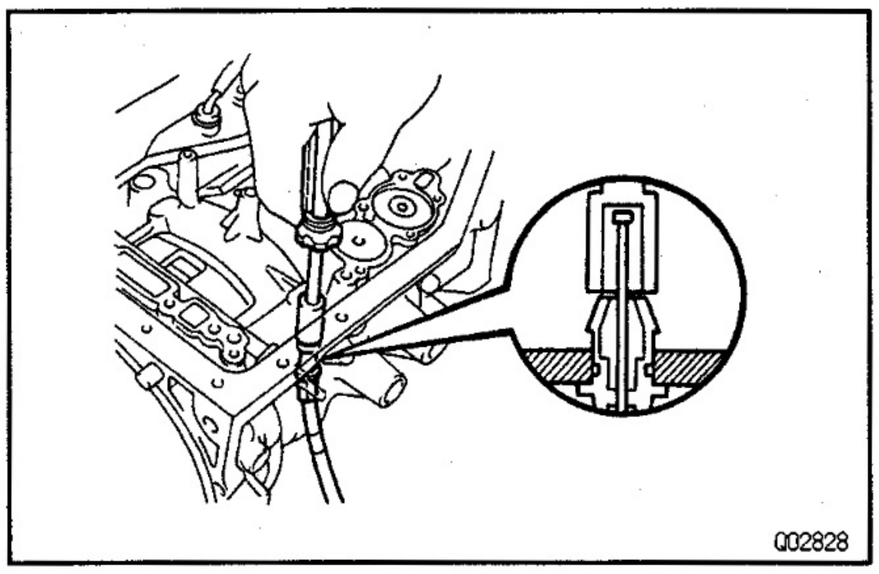


(c) Disconnect the throttle cable from the cam and remove the valve body.



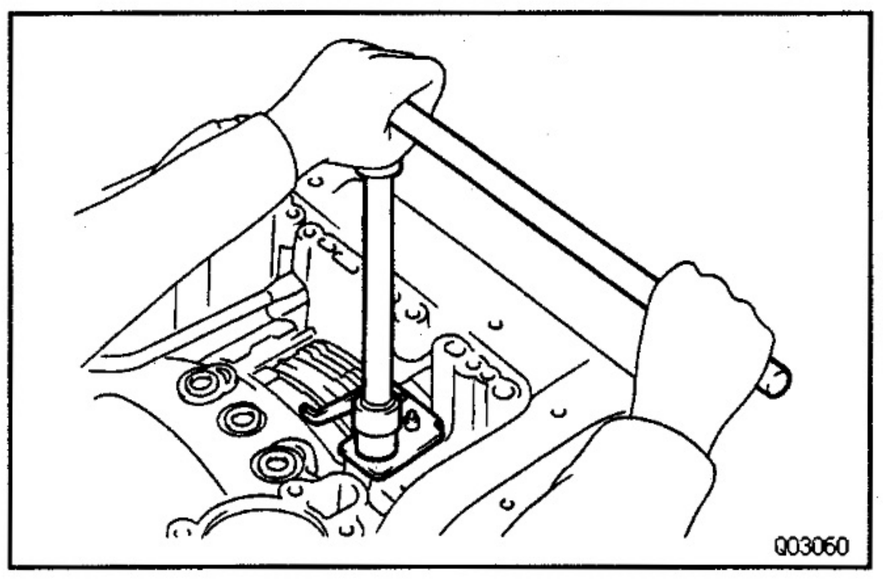
15. REMOVE O / D CASE AND CENTER SUPPORT APPLY GASKETS

Remove the four apply gaskets.

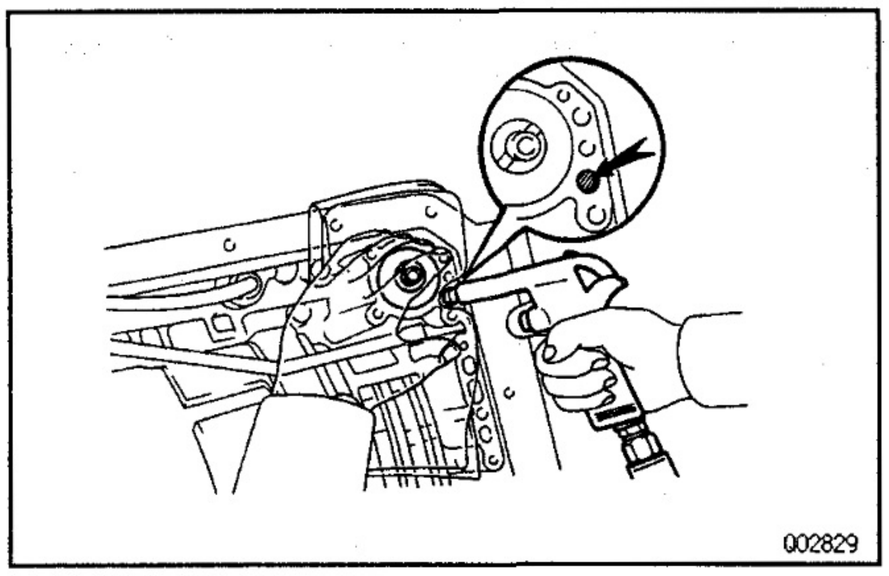


16. REMOVE THROTTLE CABLE

Using 10 mm socket driver, remove the throttle cable by pushing the retainer portion of the throttle cable.

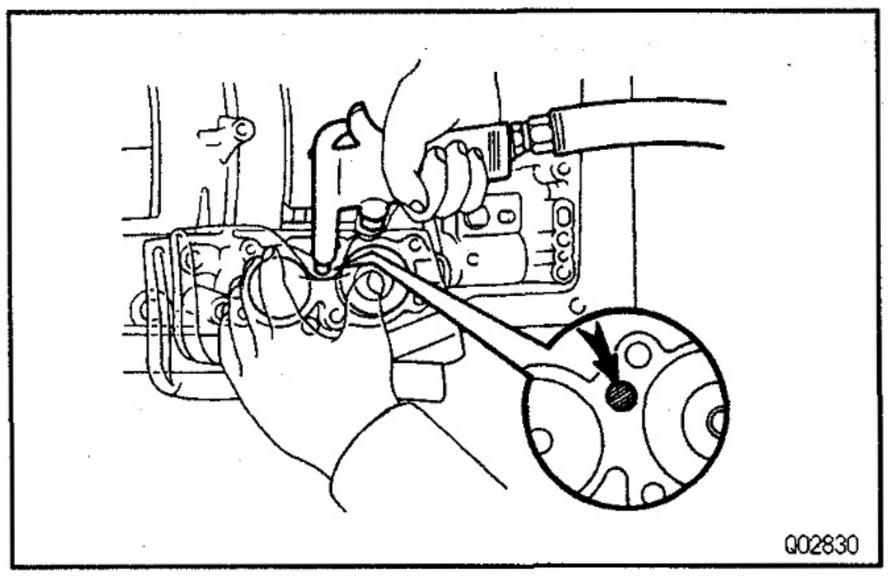


17. REMOVE ONE–WAY CLUTCH RETAINER

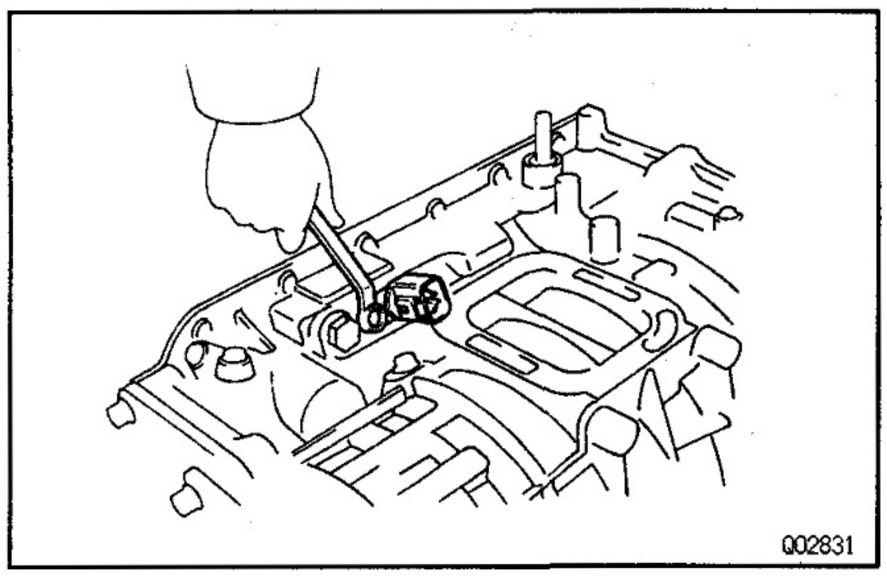


18. REMOVE C_2 B_0 B_2 ACCUMULATOR PISTONS AND SPRINGS

(a) Remove the C_2 accumulator piston and spring by applying compressed air to the oil hole.

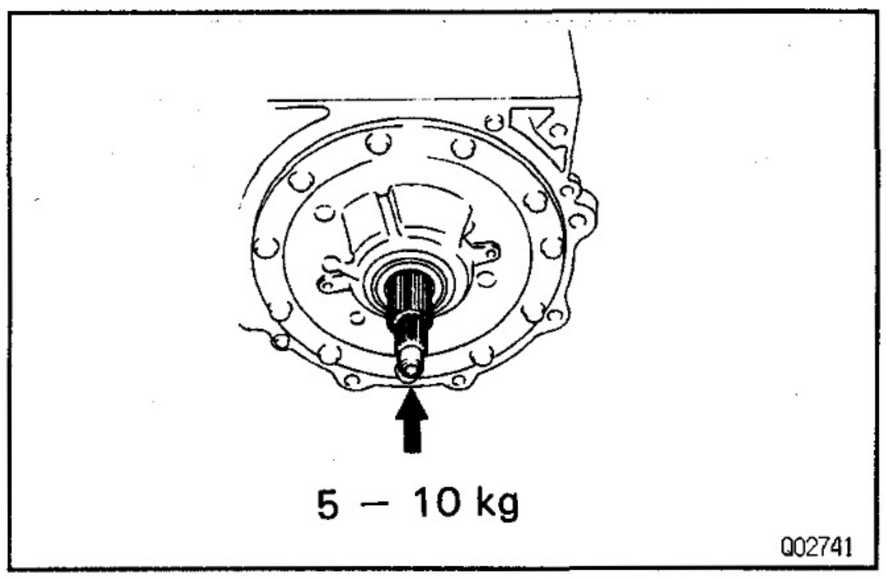


(b) Remove the B_0 accumulator piston together with the B_2 accumulator piston by applying compressed air to the oil hole.
(c) Remove the B_0 and B_2 accumulator pistons.
(d) Remove the O—ring from the accumulator pistons.



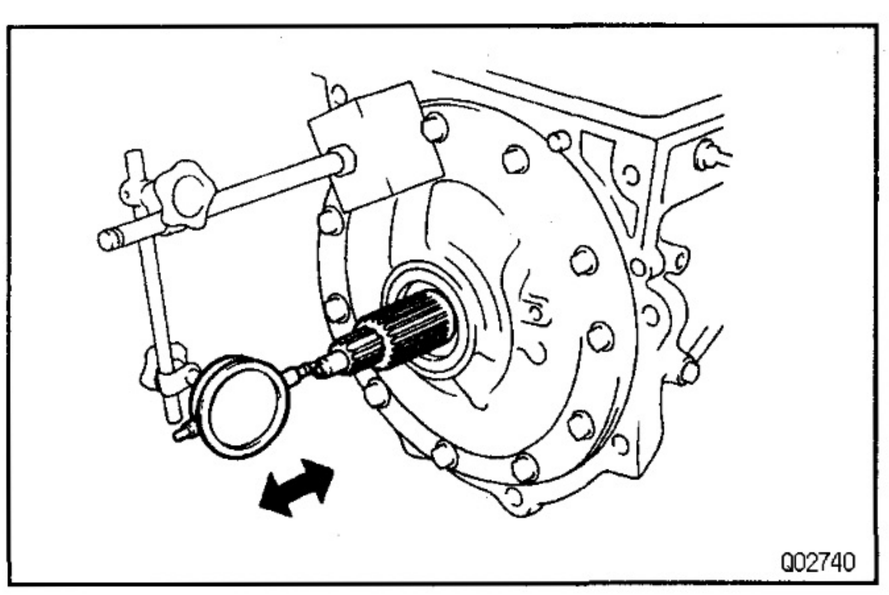
19. REMOVE SOLENOID WIRING

(a) Remove the bolt and the solenoid wiring.
(b) Remove the O—ring from it.



20. CHECK THRUST CLEARANCE OF OVERDRIVE INPUT SHAFT (OVERDRIVE PLANETARY GEAR)

(a) Push the O/D input shaft toward the rear of the transmission by applying a force of 49—98 N (5—10 kgf, 11.0—22.0lbf)



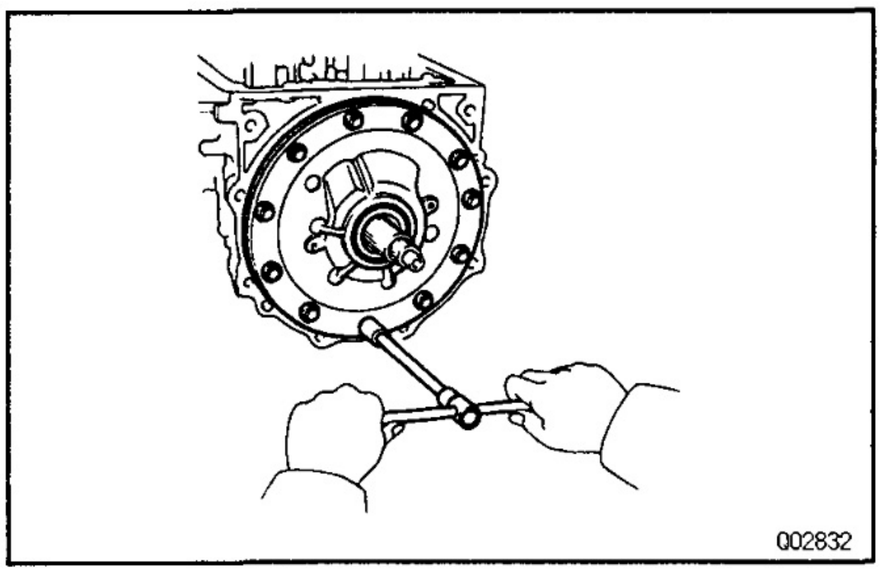
(d) Using dial indicator, measure the thrust clearance of the input shaft.

Standard thrust clearance:

0.40—0.90 mm (0.0157—0.0354 in.)

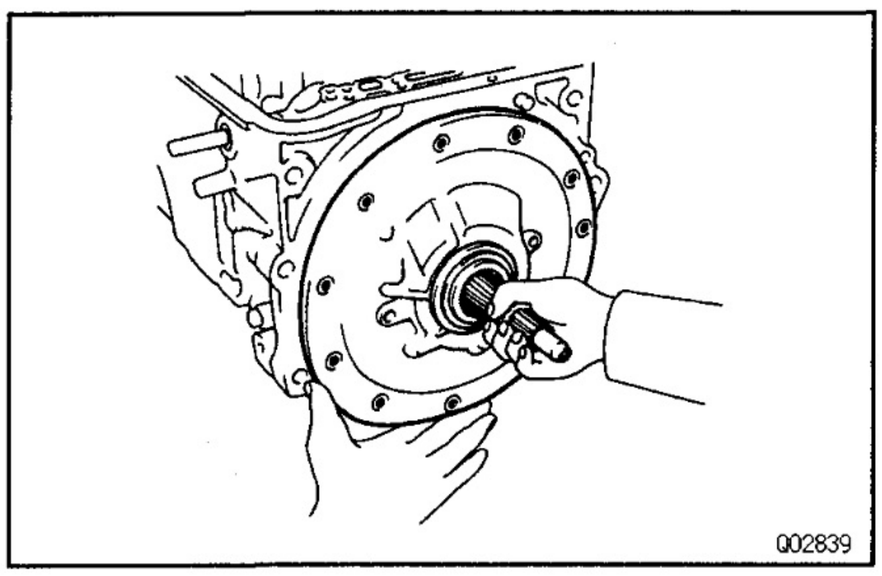
Maximum thrust clearance:

0.90 mm (0.0354 in.)

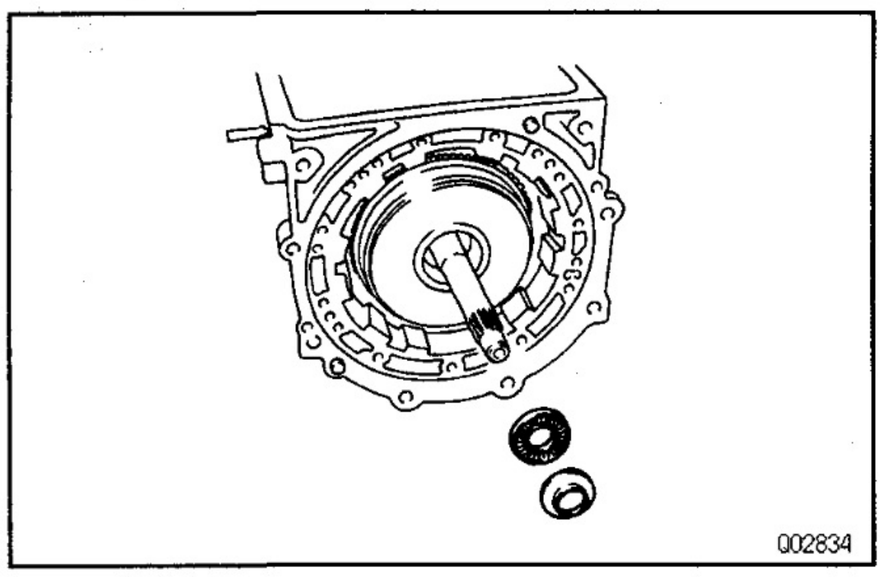


21. REMOVE OIL PUMP

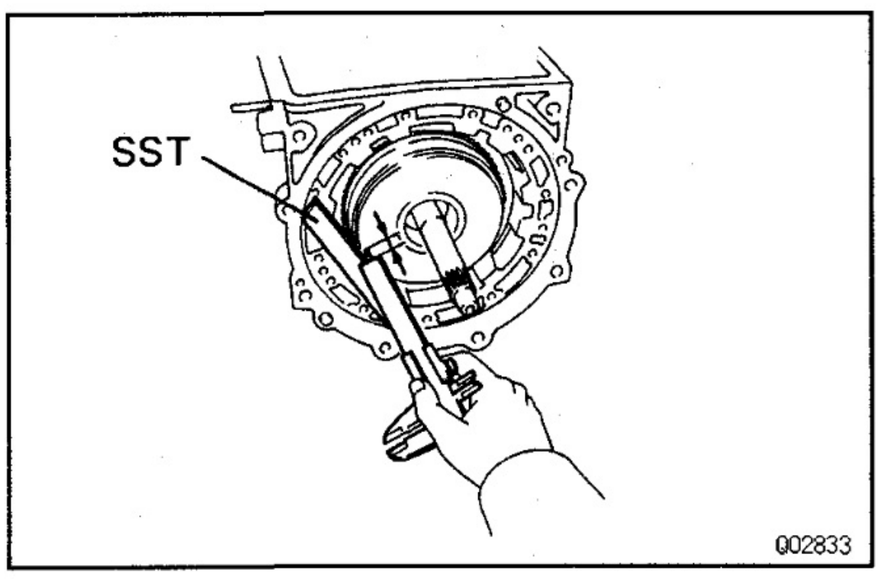
(a) Remove the eleven bolts holding the oil pump to the transmission case.



(b) Remove the oil pump and gasket.
(c) Remove the O–ring from the oil pump.
(d) Remove the oil pump gasket.



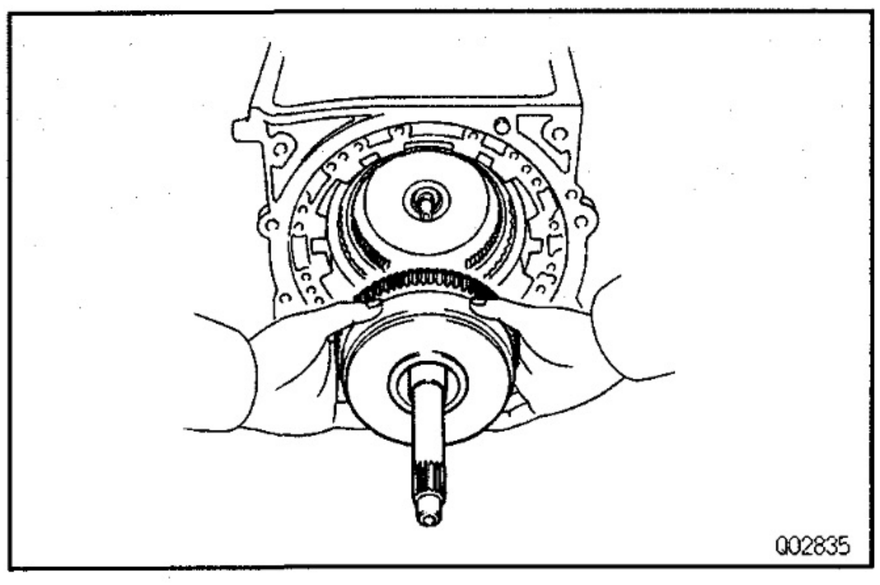
(d) Remove the race and thrust bearing from the O/D direct clutch drum or oil pump.



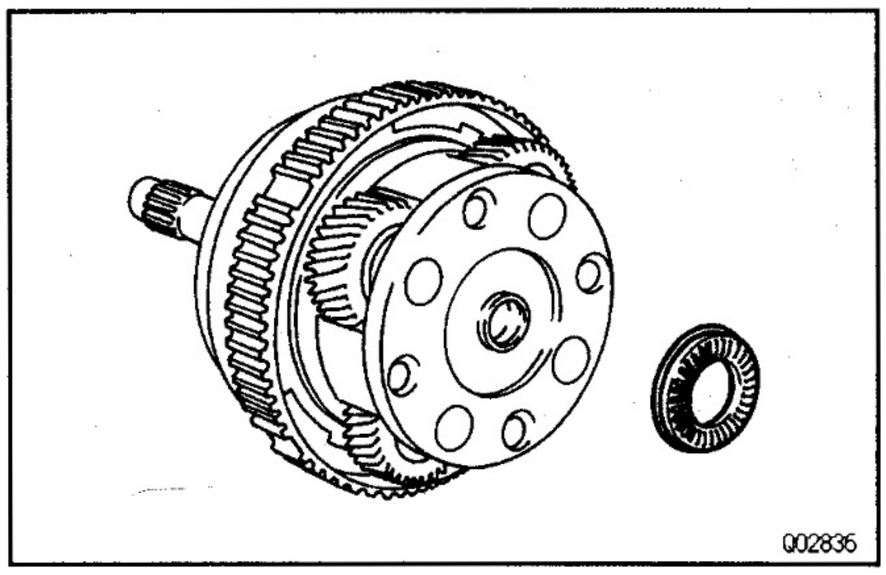
22. REMOVE OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH ASSEMBLY

(a) Place SST on the installation surface of the oil pump.
09350–36010(09350–06090)

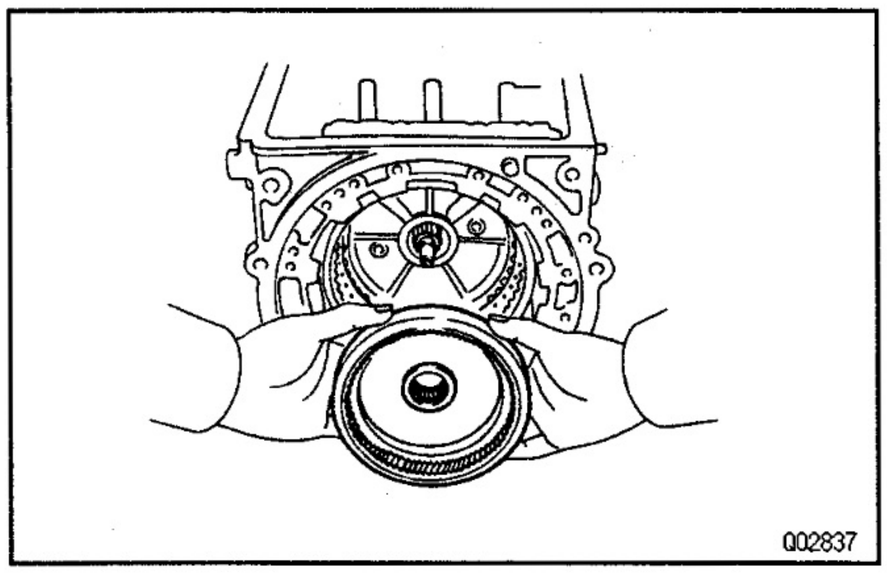
(b) Using calipers, measure the distance between the tops of SST and the clutch drum for assembly.



(c) Remove the O/D planetary gear, direct clutch and one –way clutch assembly.

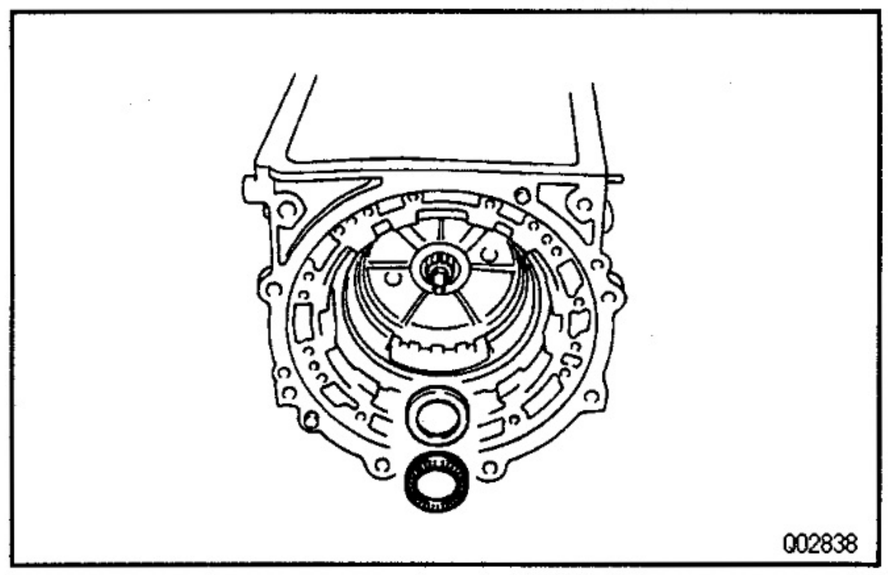


(d) Remove the bearing from the O/D planetary gear or ring gear flange.

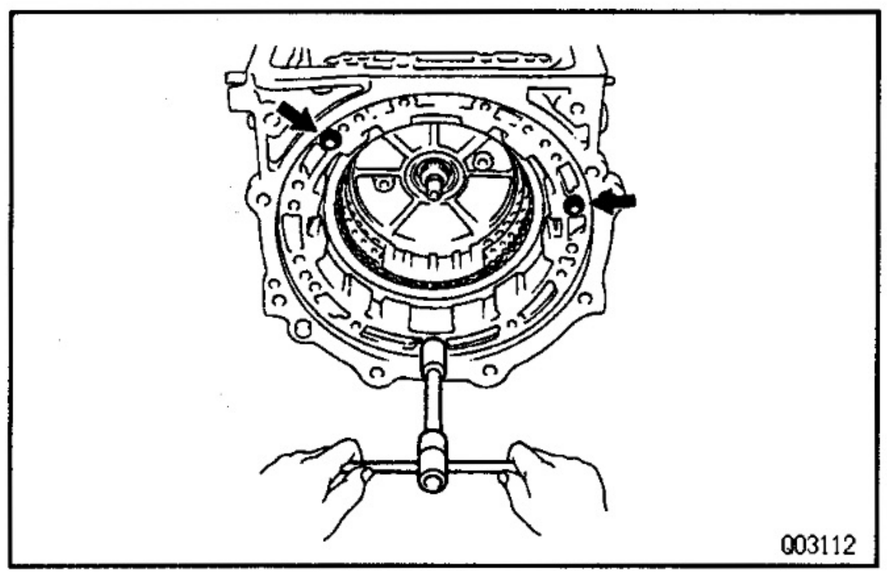


23. REMOVE OVERDRIVE PLANETARY RING GEAR ASSEMBLY

(a) Remove the ring gear assembly from the O/D case.

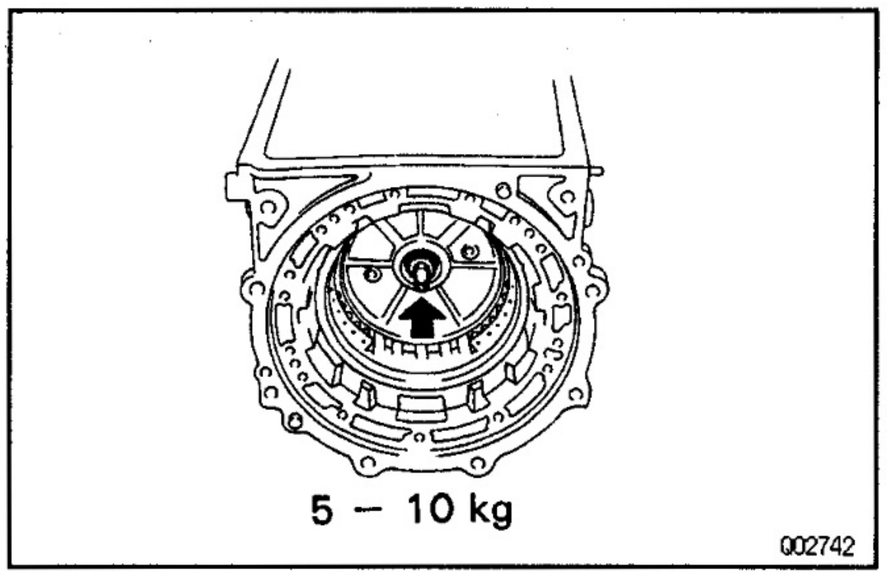


(b) Remove the thrust bearing and race from the O/D case or ring gear flange.

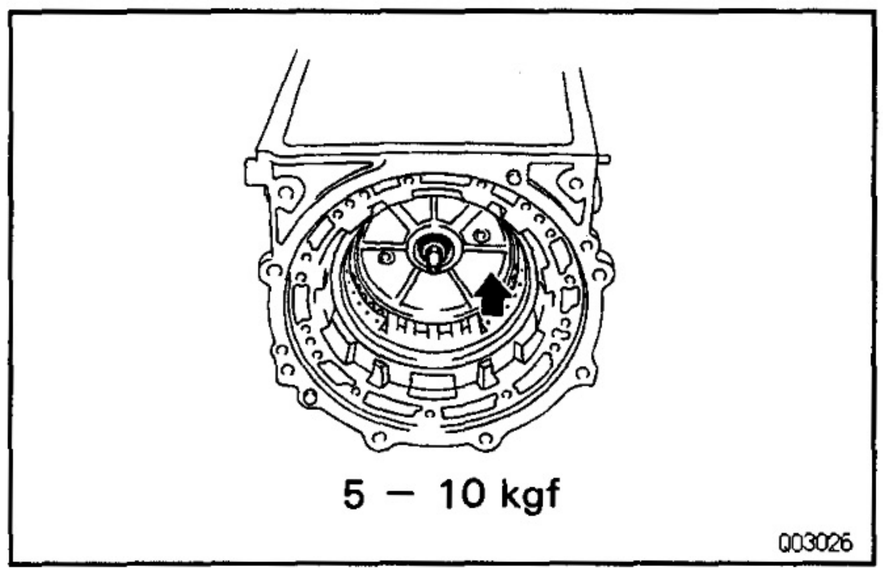


24. CHECK THRUST CLEARANCE OF INPUT SHAFT (FRONT CLUTCH DRUM)

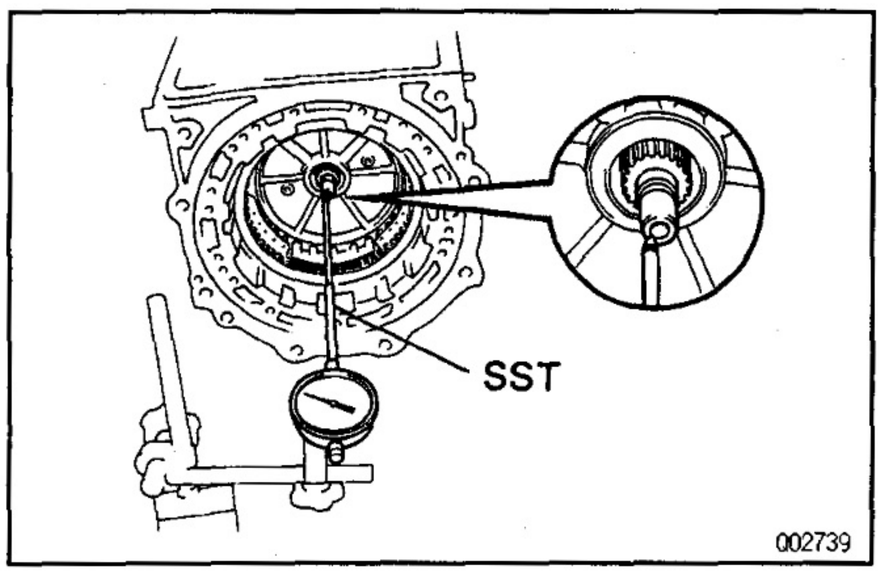
(a) Temporarily install the three bolts.



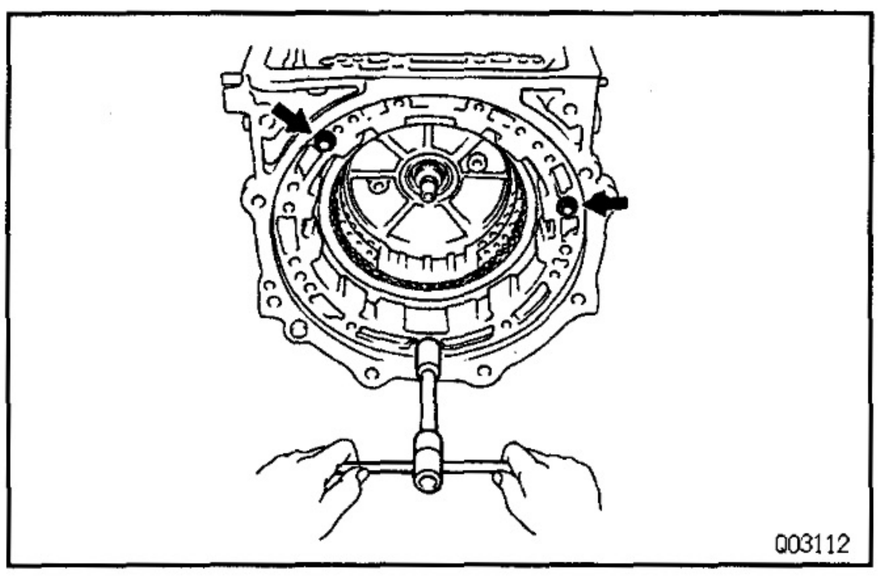
(b) Push the transmission output shaft toward the front of the transmission by applying a force of 49—98 N (5—10 kgf, 11.0—22.0 lbf).



(c) Push the O/D case toward the rear of the transmission by applying a force of 49–98 N (5–10 kgf, 11.0–22.0 lbf)

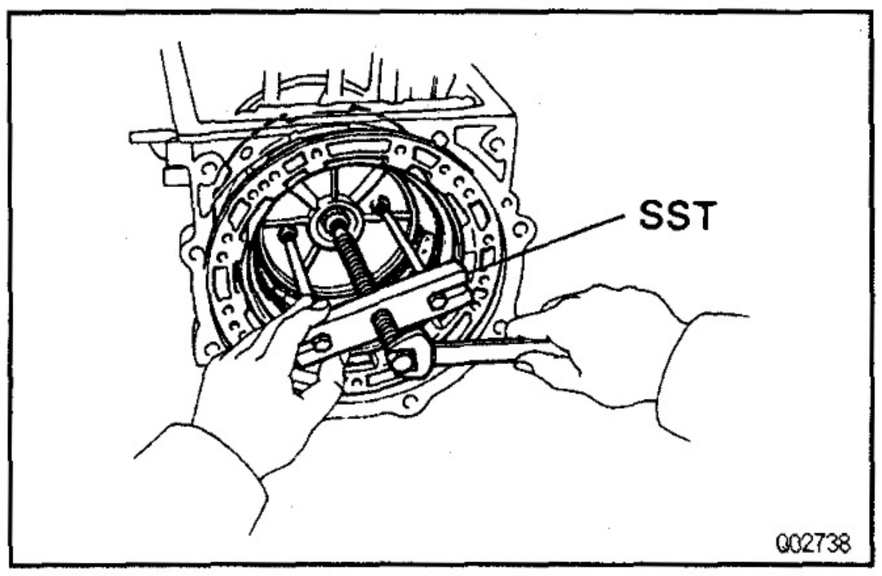


(d) Using SST and dial indicator, measure the thrust clearance of the input shaft.
SST 09350–36010(09350–06130)
Standard thrust clearance:
0.30–0.70 mm (0.0118–0.0276 in.)
Maximum thrust clearance:
0.70 mm (0.0276 in.)



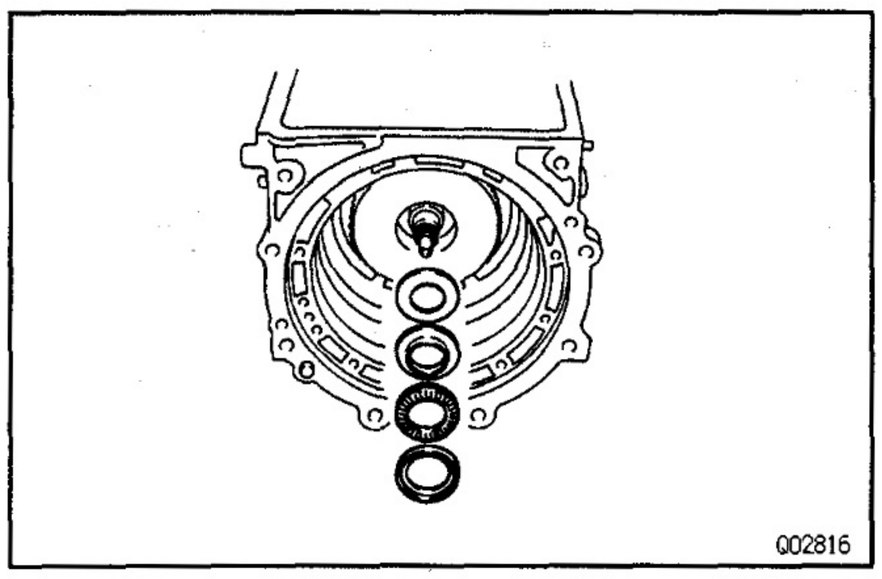
25. REMOVE OVERDRIVE CASE ASSEMBLY

(a) Remove three bolts.



(b) Using SST, remove the O/D case assembly.
SST 09350–36010(09350–06140)

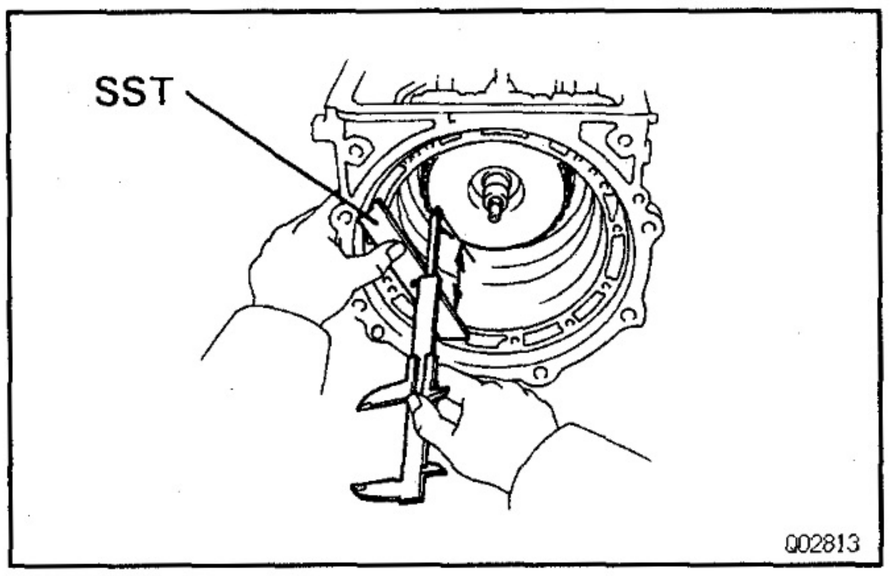
(c) Remove the three O–rings from the oil holes of the O/D case.



(d) Remove the oil seal ring from the input shaft.

(e) Remove the two races, thrust bearing and spacer from the front clutch drum or O/D case.

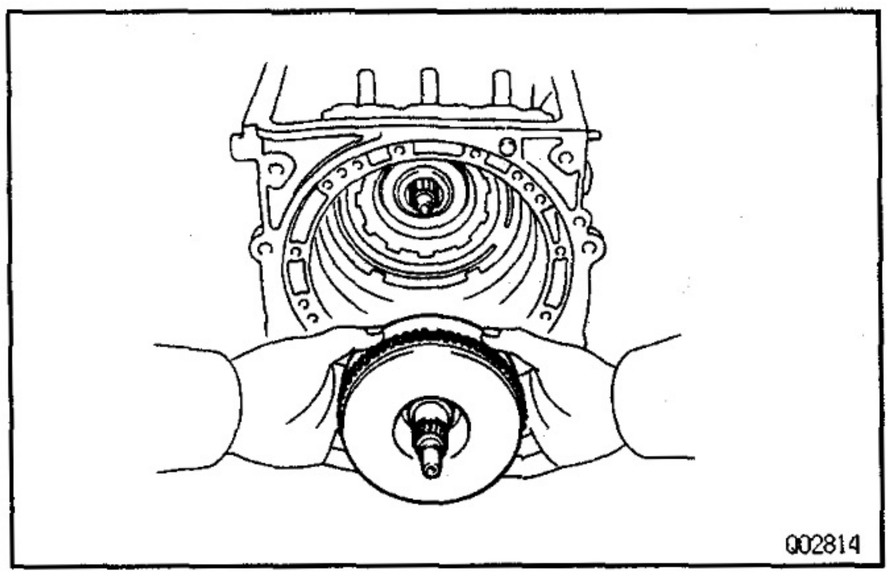
(f) Reinstall the oil seal ring to the input shaft.



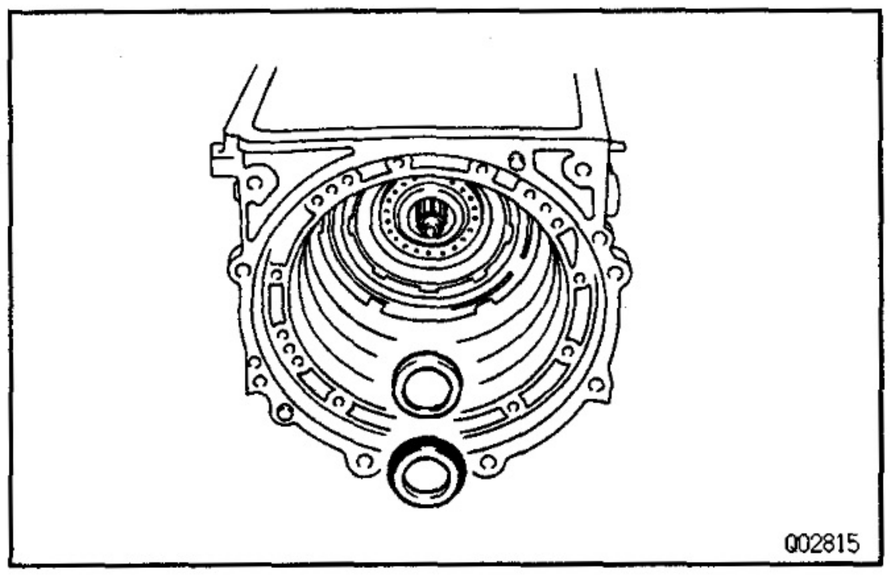
26. REMOVE FRONT CLUTCH ASSEMBLY

(a) Place SST, on the installation surface of the oil pump.
SST 09350–36010(09350–06090)

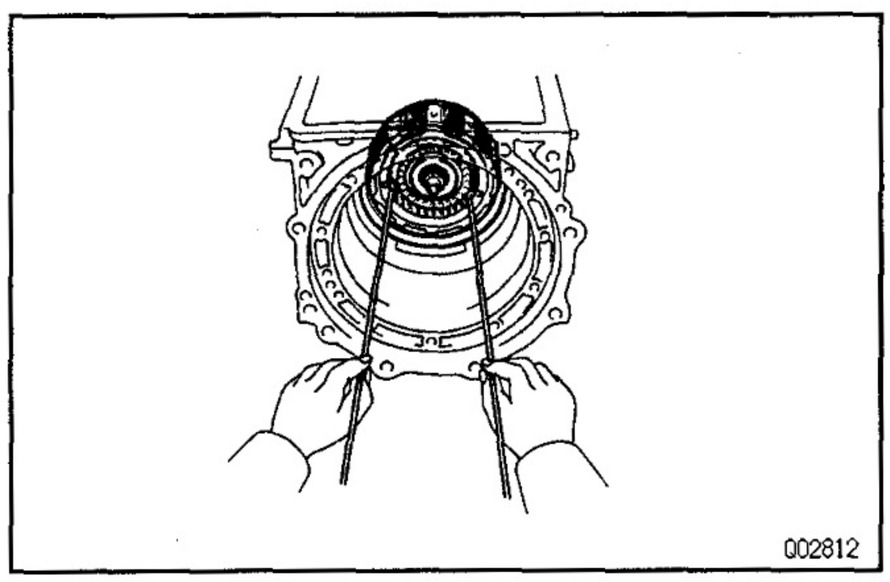
(b) Using calipers, measure the distance between the tops of SST and the clutch drum for assembly.



(c) Remove the front clutch assembly.

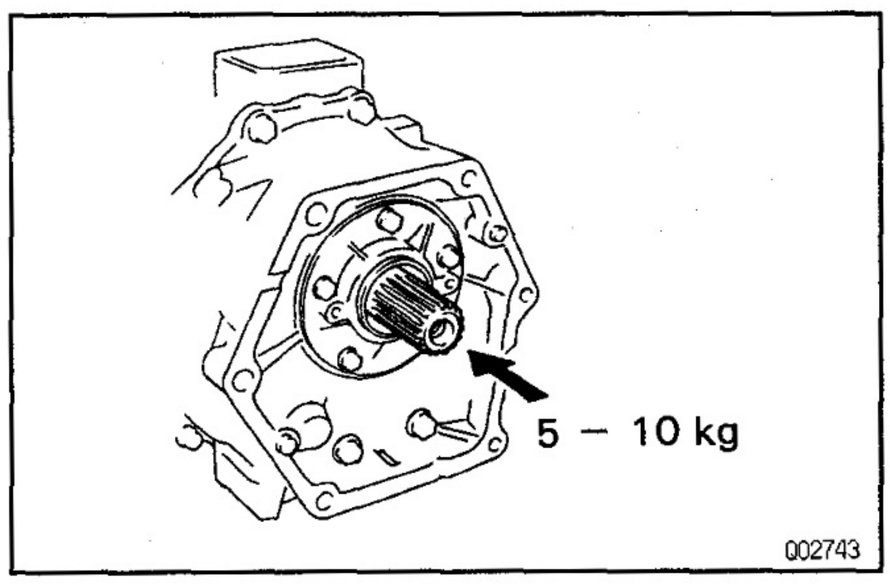


(d) Remove the race and thrust bearing from the rear clutch drum or front clutch hub.



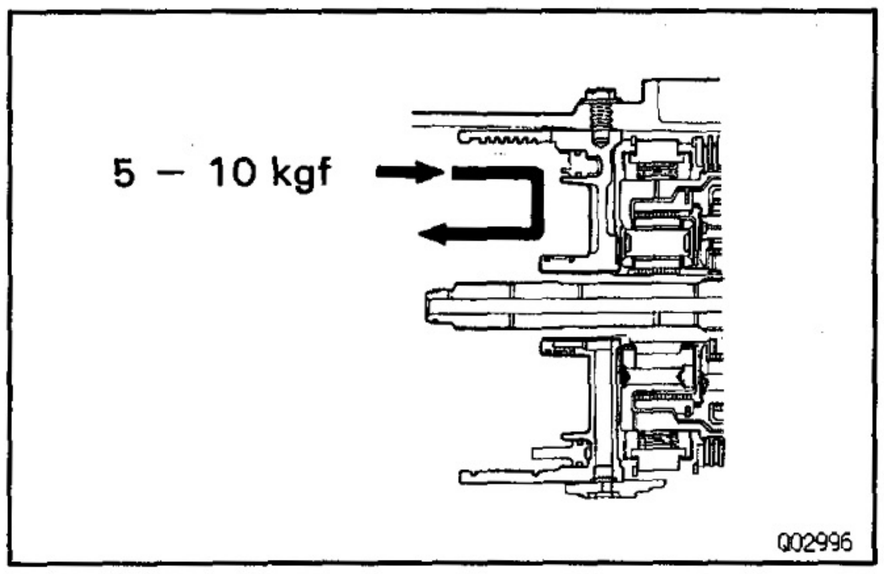
27. REMOVE REAR CLUTCH ASSEMBLY

Install two wires into flukes of the clutch discs, and remove the rear clutch assembly.

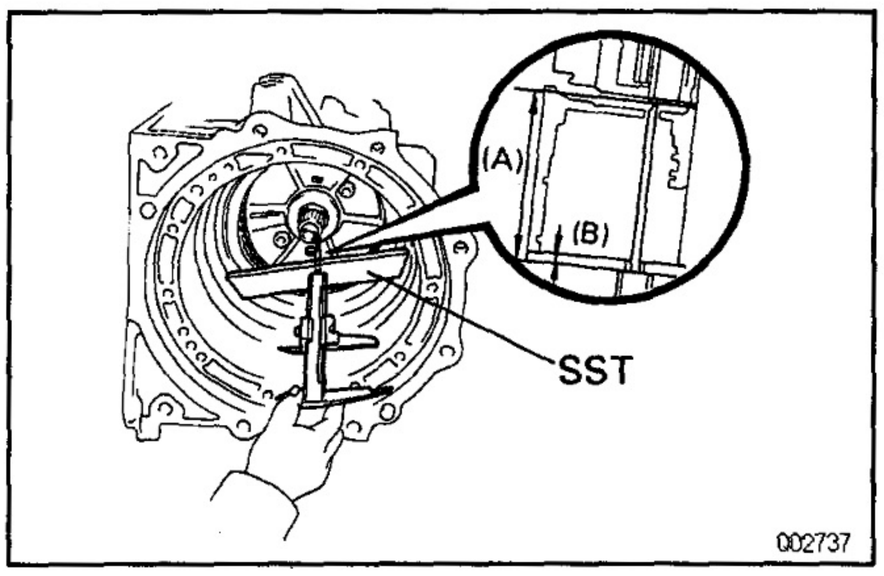


28. CHECK THRUST CLEARANCE OF CENTER SUPPORT, AND REMOVE CENTER SUPPORT ASSEMBLY

(a) Push the transmission output shaft toward the front of the transmission by applying a force of 49–98 N (5–10 kgf, 11.0–22.0 lbf).



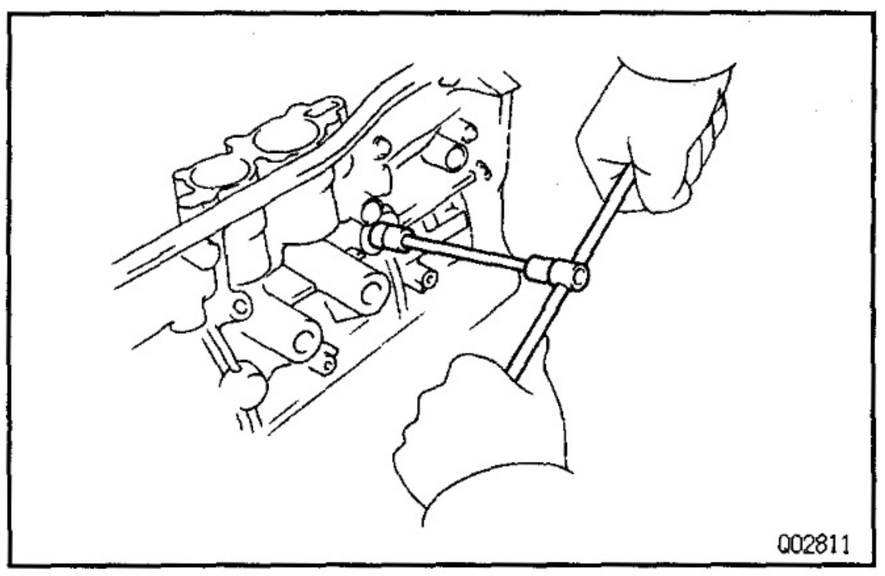
(b) Push the center support toward the rear of the transmission by applying a force of 49—98 N (5—10 kgf, 11.0—22.0 lbf), then pull with the same amount of force.



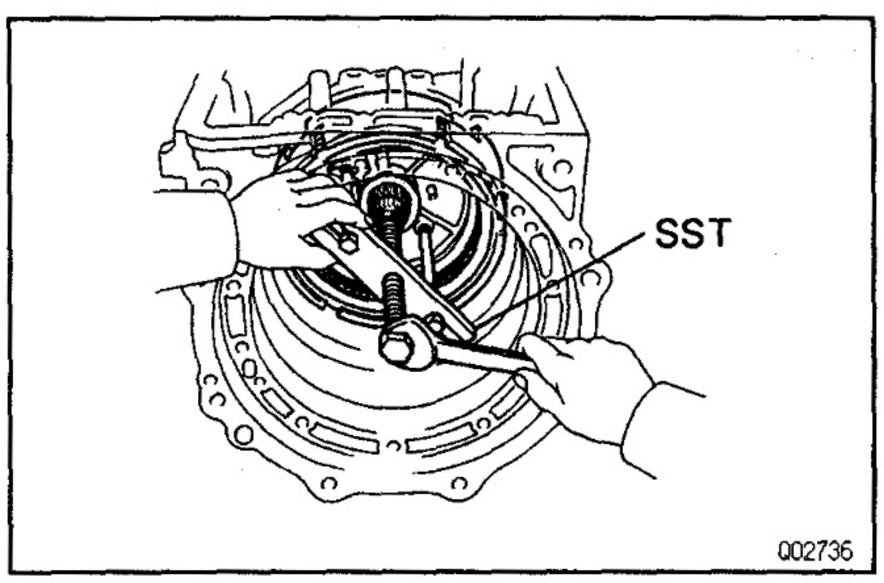
(c) Place SST on the center support.
SST 09350—36010(09350—06090)

(d) Using calipers, measure distance (A) between the tops of SST and the thrust washer on the front planetary gear.

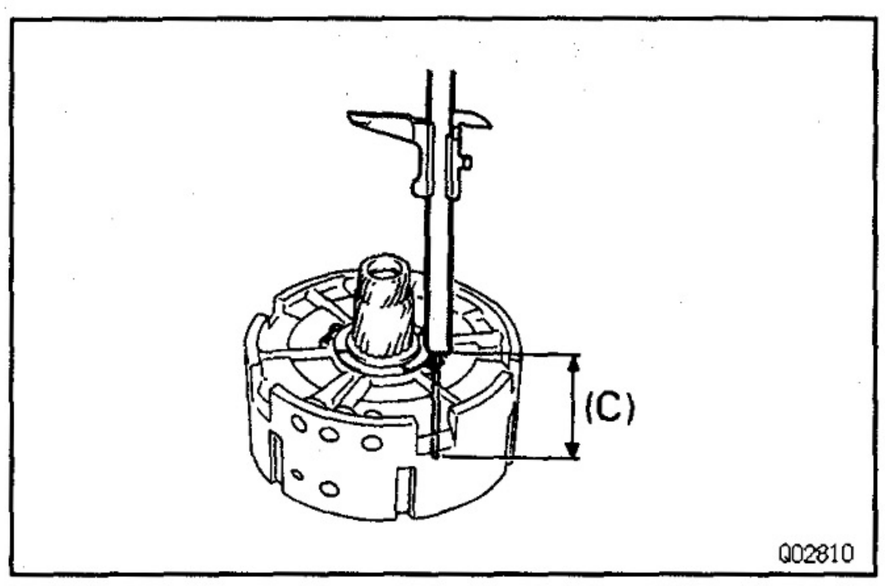
(e) Using calipers, measure the thickness (B) of SST.



(f) Remove the three center support set bolts.



(g) Using SST, remove the center support assembly.
SST 09350—36010(09350—06140)



(h) Turn the center support together with the thrust washer, and place it on that surface.

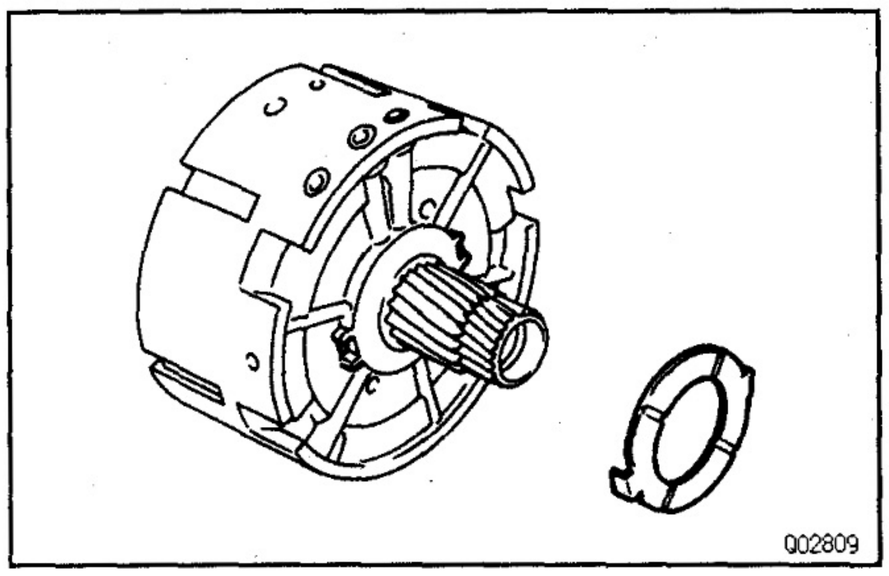
(i) Inserting the calipers into the thrust washer hole, measure the distance (C) between it and the flat surface.

Center support thrust clearance:

A—(B+C)

Standard thrust clearance:

0.30—0.70 mm (0.0118—0.0276 in.)

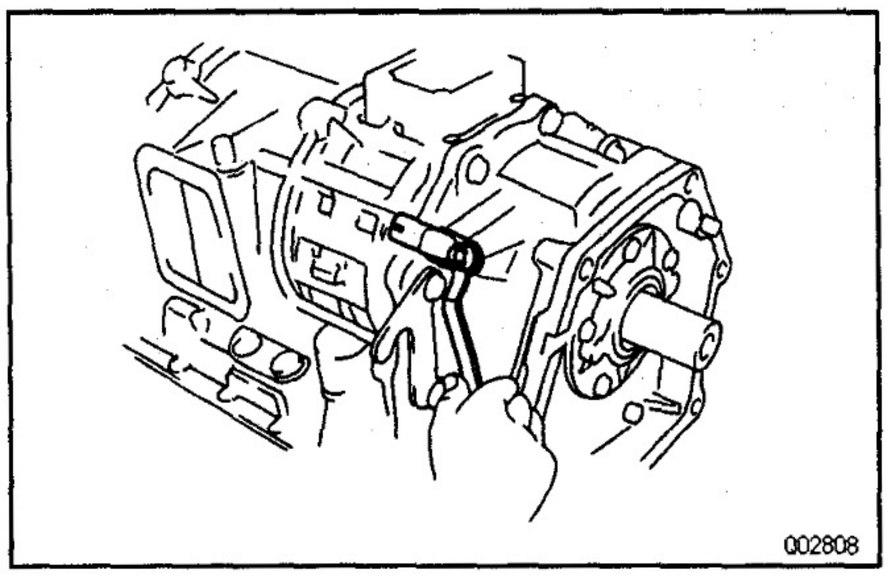


Maximum thrust clearance:

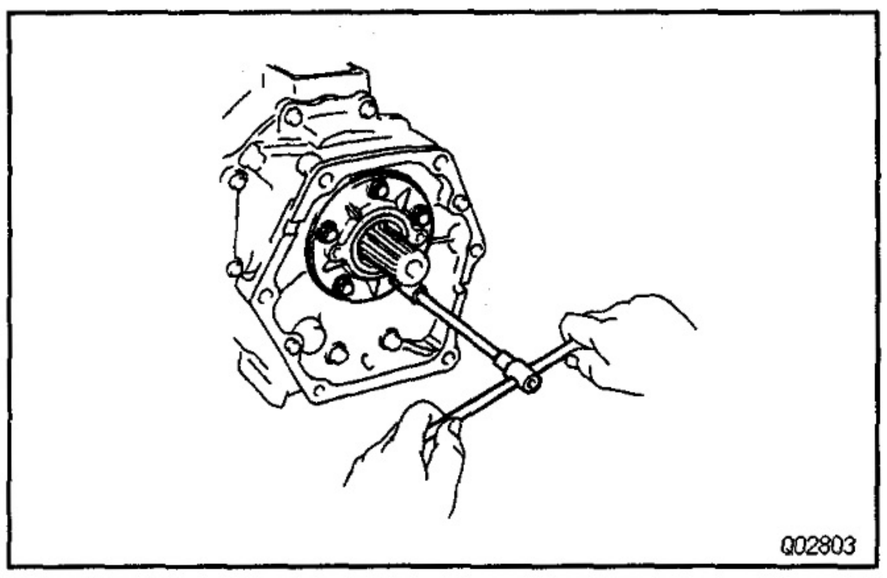
0.90 mm (0.0354 in.)

(j) Remove the thrust washer from the center support.

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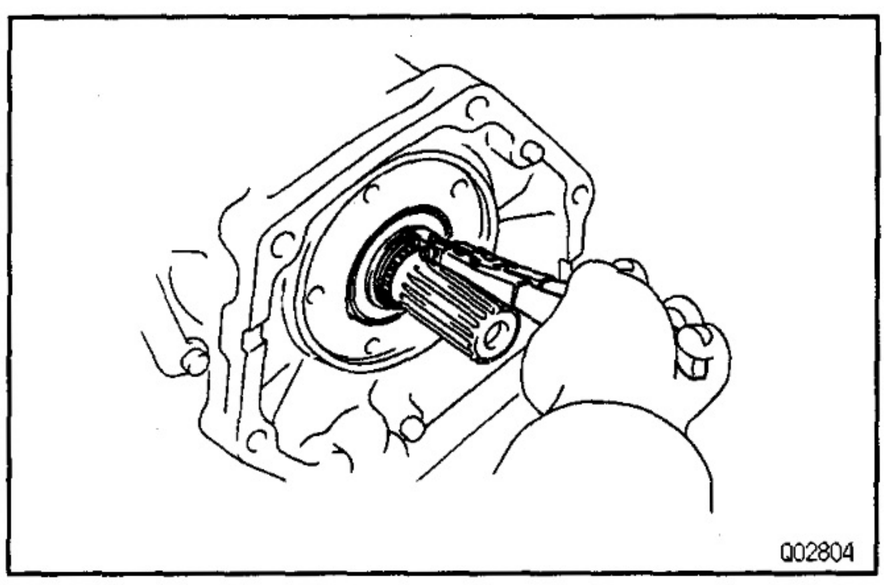


29. REMOVE SPEEDSENSOR

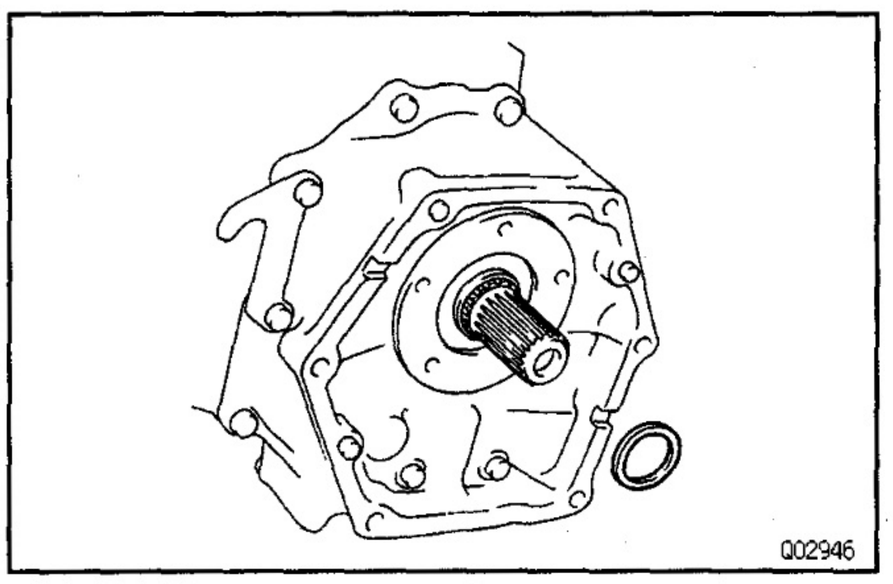


30. REMOVE TRANSFER ADAPTOR AND OUTPUT SHAFT REAR BEARING

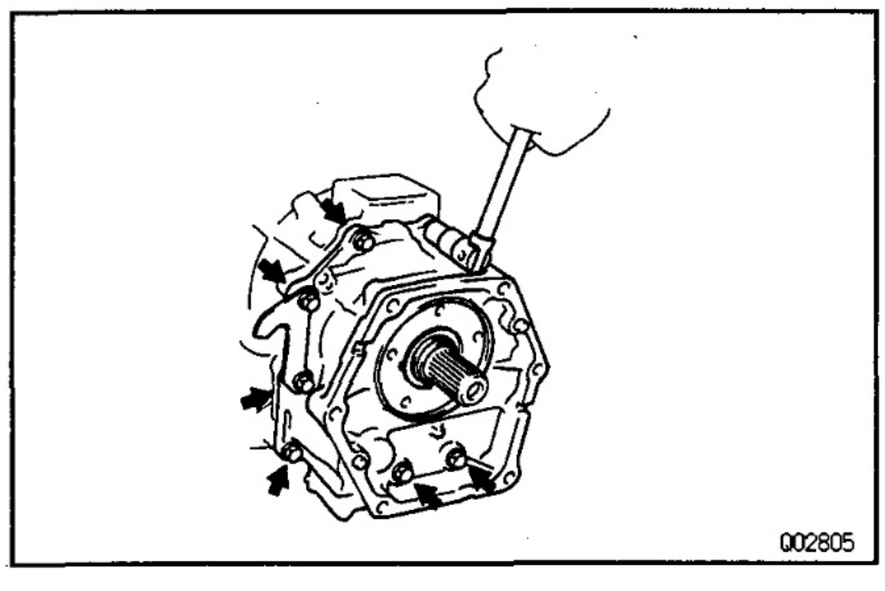
(a) Remove the five bolts and the tear bearing retainer.



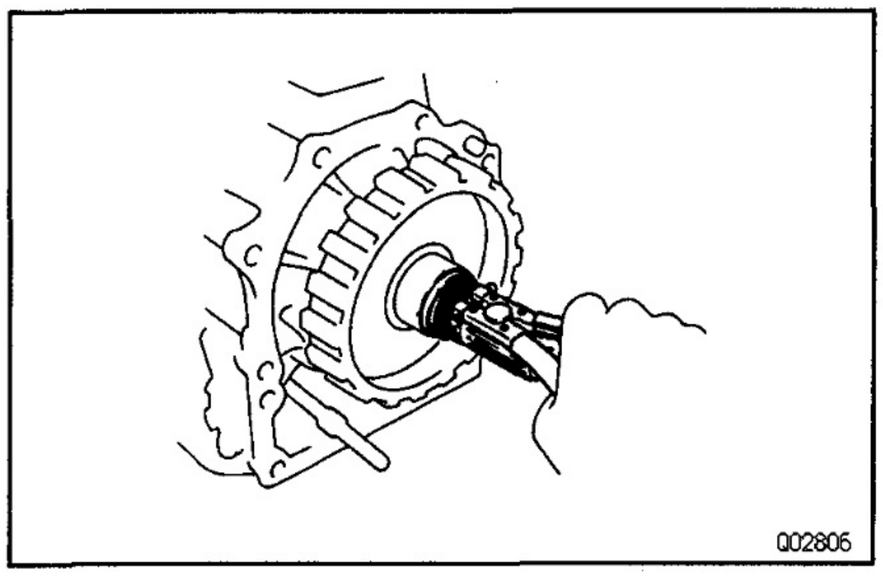
(b) Using snap ring pliers, remove the snap ring.



(c) Remove the spacer from the output shaft.

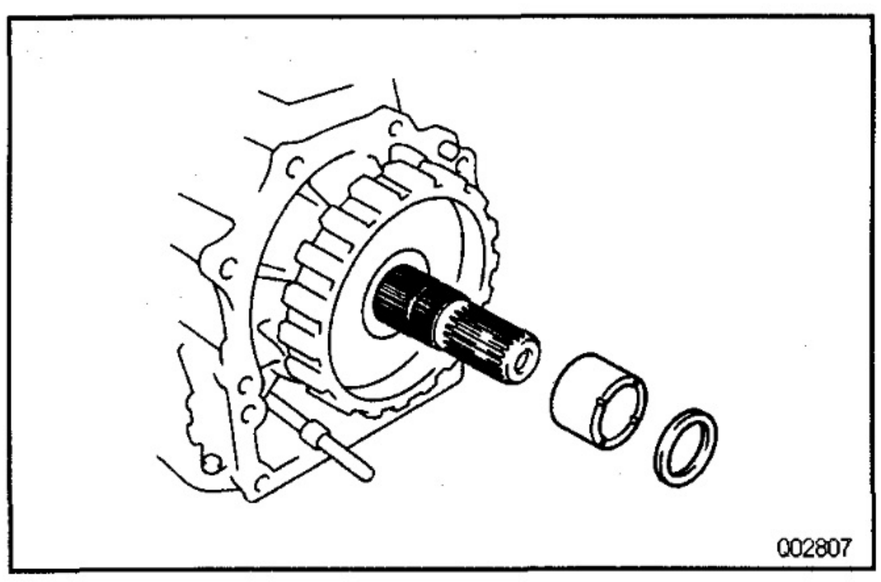


(d) remove the ten bolts and the adaptor.
(e) Remove the gasket.

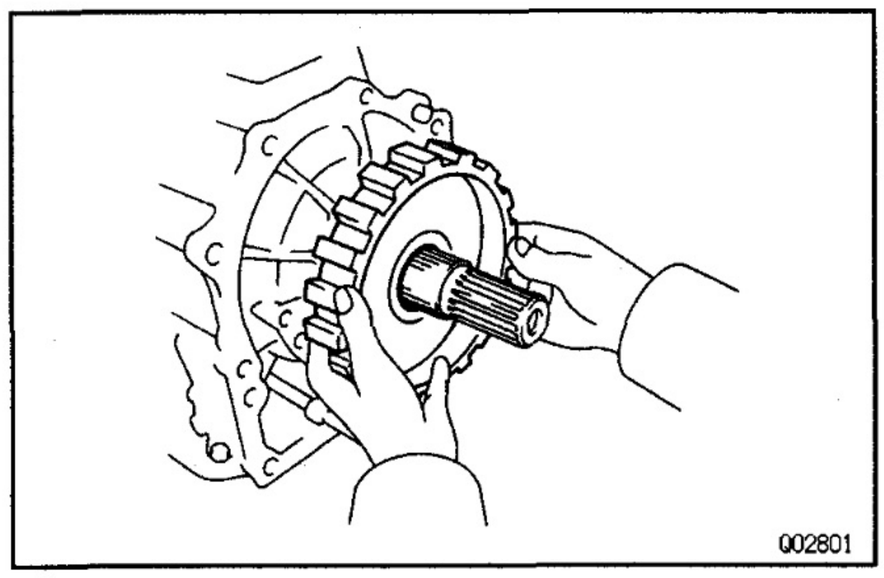


31. REMOVE OUTPUT SHAFT SPACER

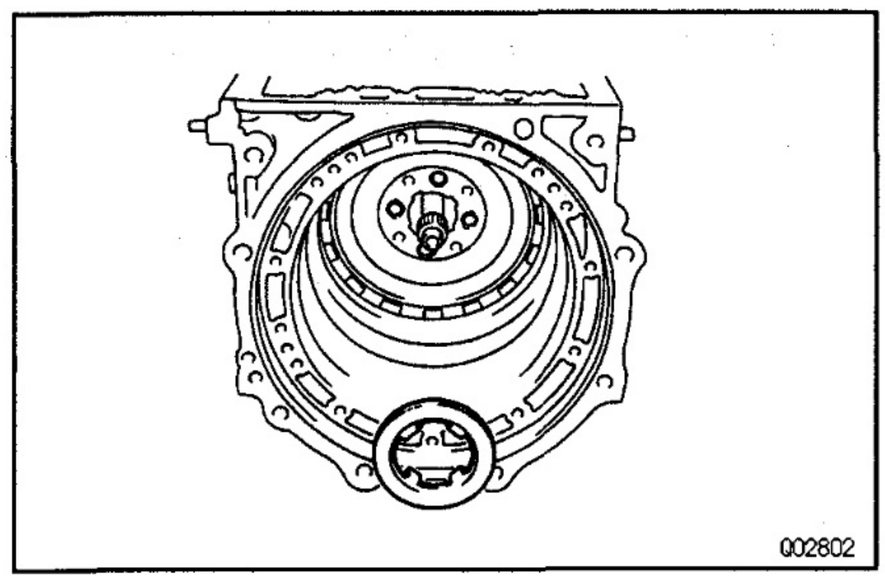
(a) Using snap ring pliers, remove the snap ring.



(b) Remove the output shaft spacer.

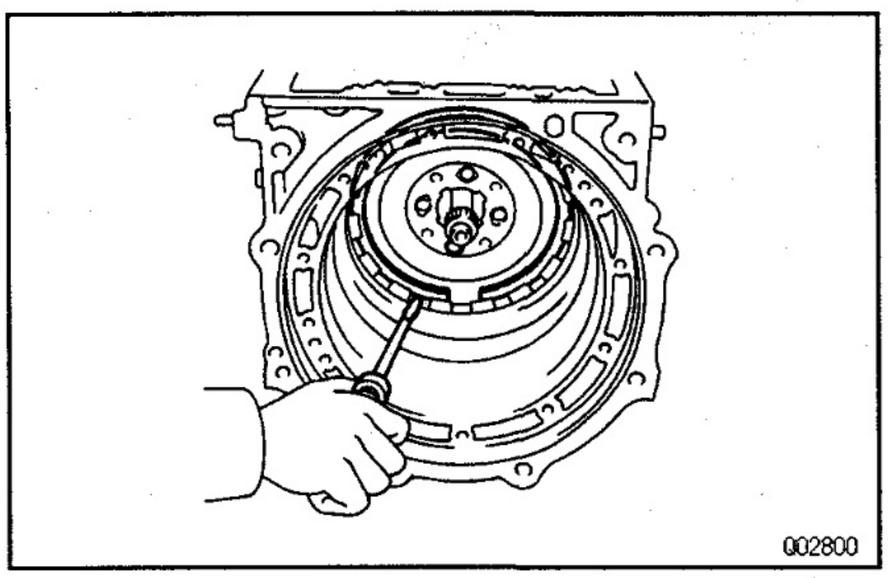


32. REMOVE SPEED SENSOR ROTOR

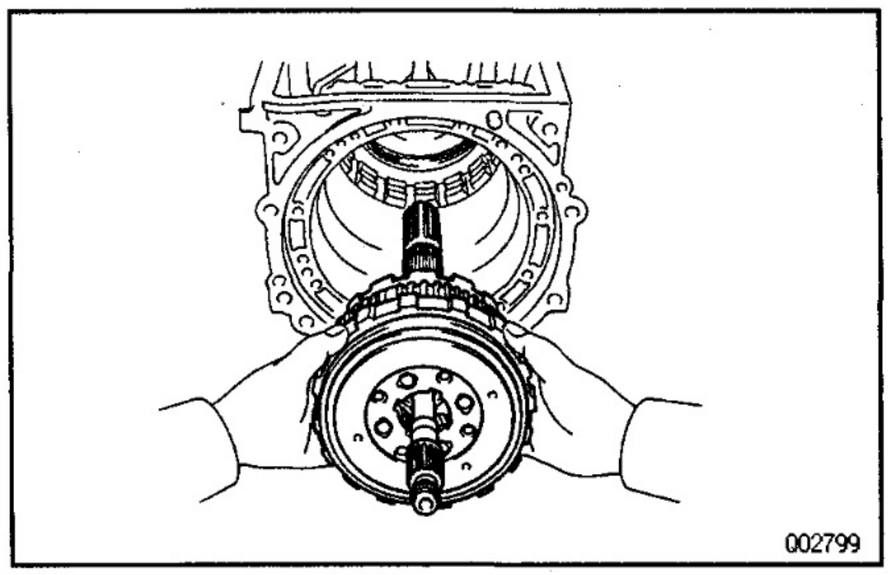


33. REMOVE PLANETARY GEARS, ONE – WAY CLUTCH AND OUTPUT SHAFT ASSEMBLY

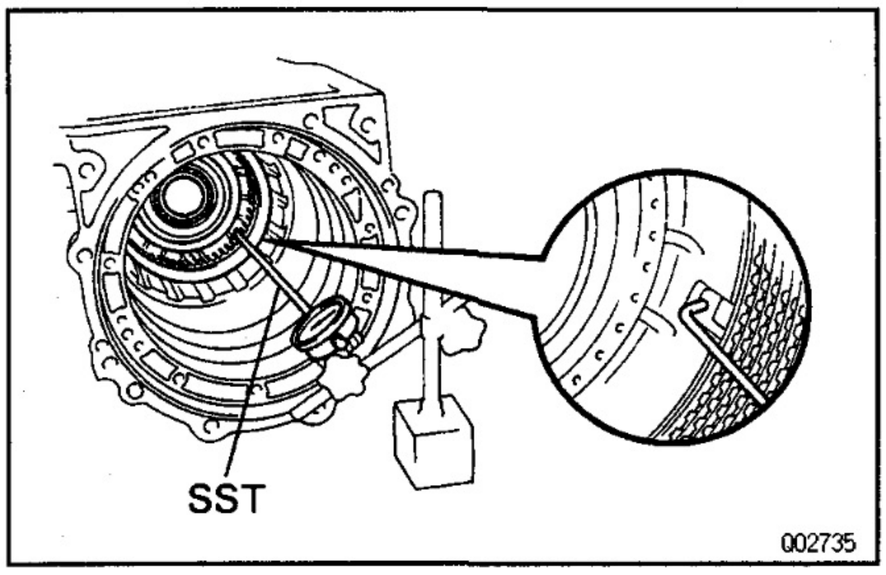
(a) Remove the thrust washer from the planetary gear.


002800

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


002799

(c) Remove the planetary gears, one—way clutch and output shaft assembly.



002735

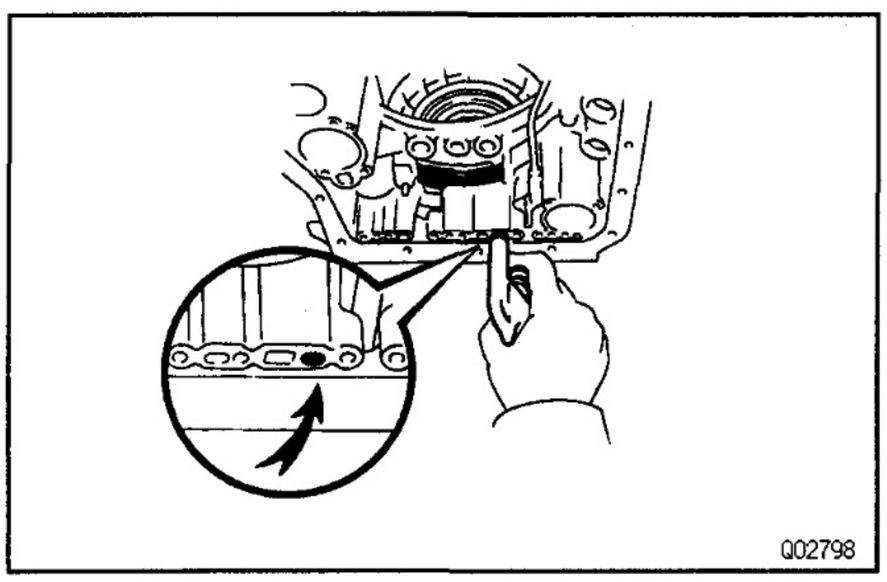
34. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE PISTON

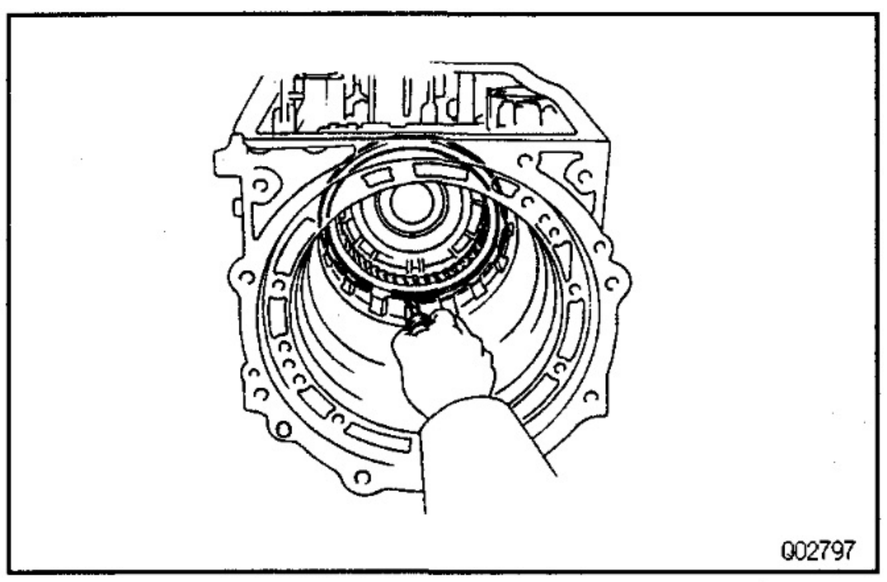
Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392—785 kPa (4—8 kgf/cm², 57—114 psi) sa shown.
SST 09350—36010(09350—06130)

Piston stroke:

3.30—3.80 mm (0.1299—0.1496 in.)

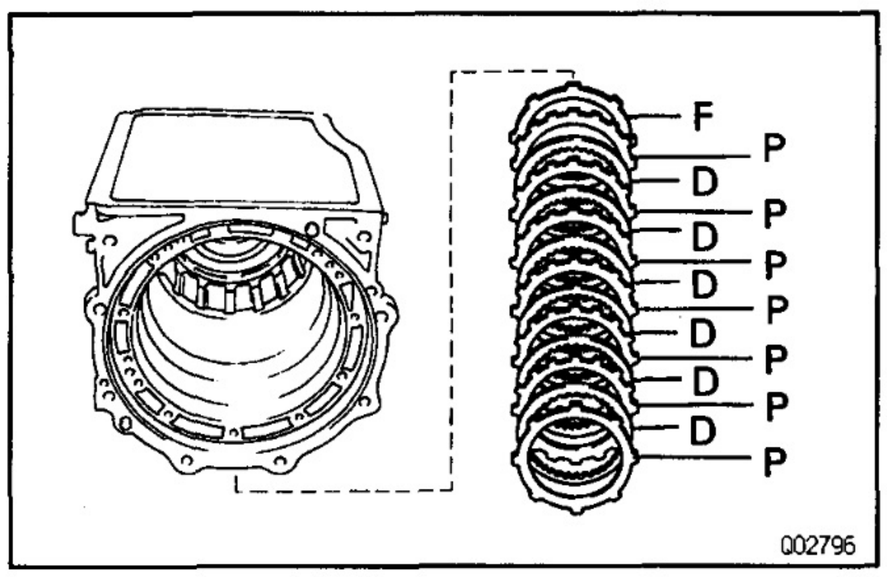
If the piston stroke is not as specified, inspect the discs.


Q02798

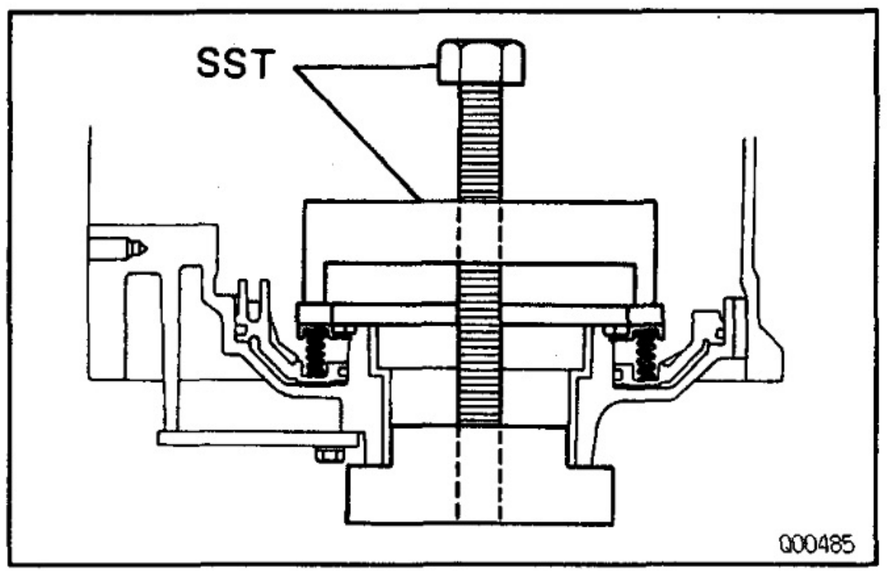

Q02797

35. REMOVE FIRST AND REVERSE BRAKE PISTON

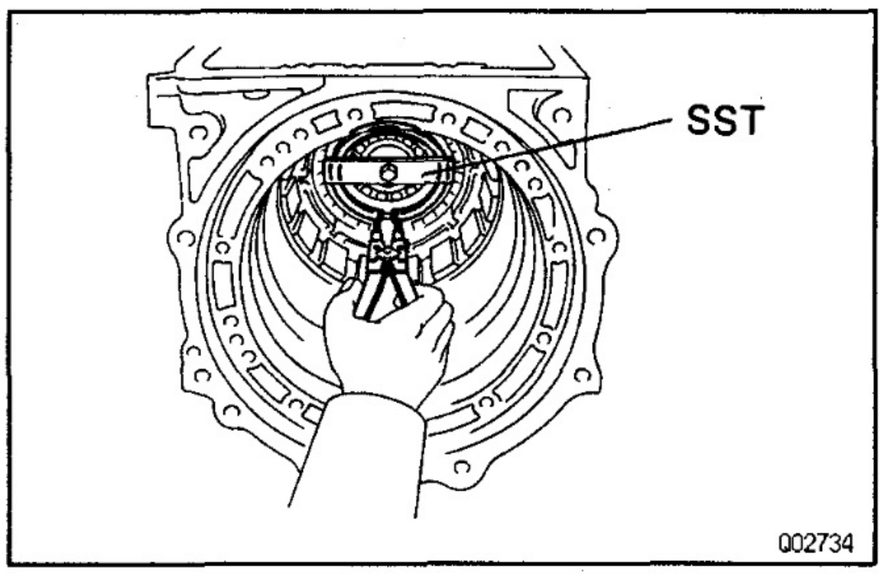
(a) Using a screwdriver, remove the snap ring.



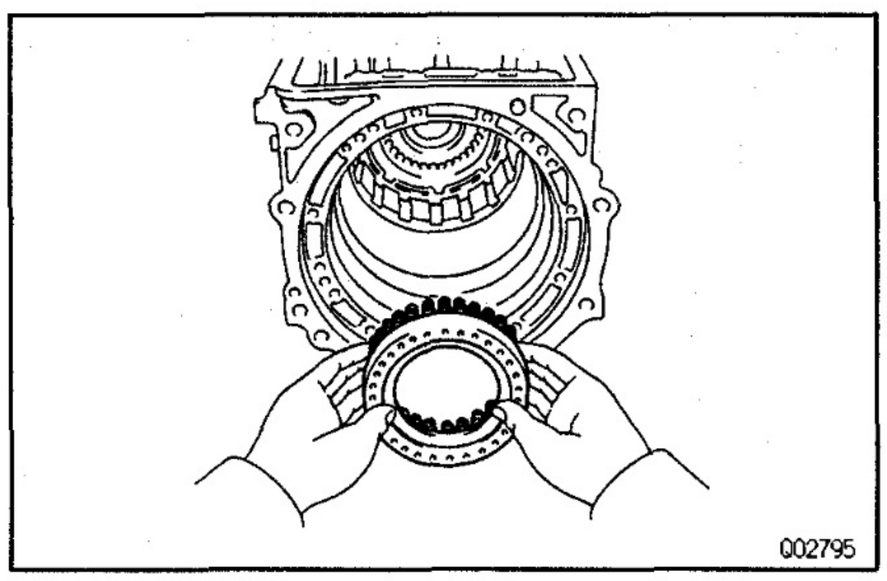
(b) Remove the flange, six plates and cushion plate.



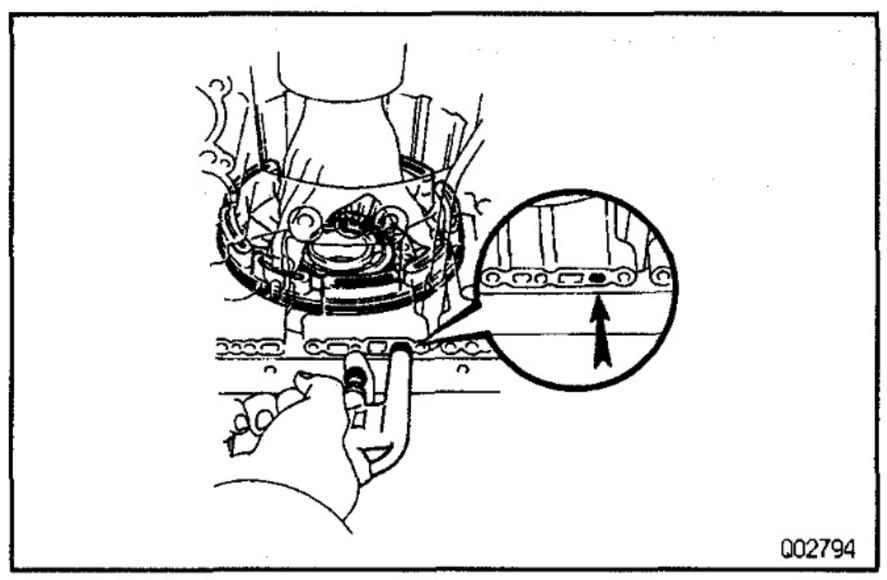
(c) Set SST on the spring retainer, and compress the return spring.
SST 09350−36010(09350−06030)



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

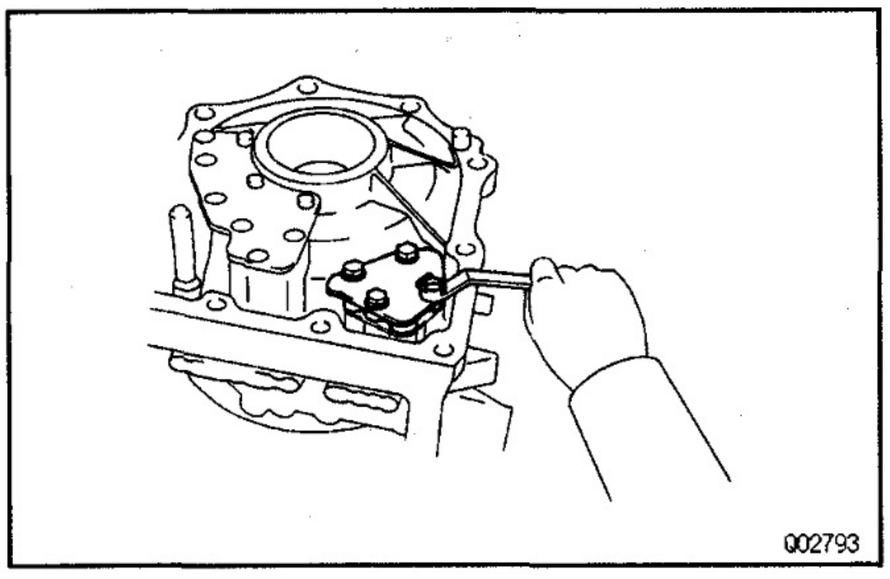


(e) Remove the piston return spring.



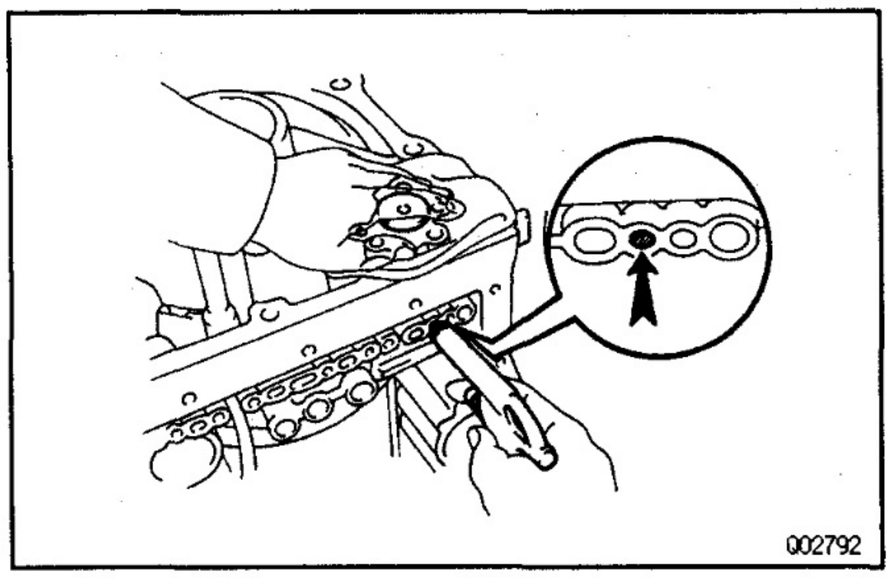
(f) Hold first and reverse brake piston with hand, remove first and reverse brake piston by applying compressed air into the oil hole of the transmission case.
(g) Remove the two O−rings from brake piston.

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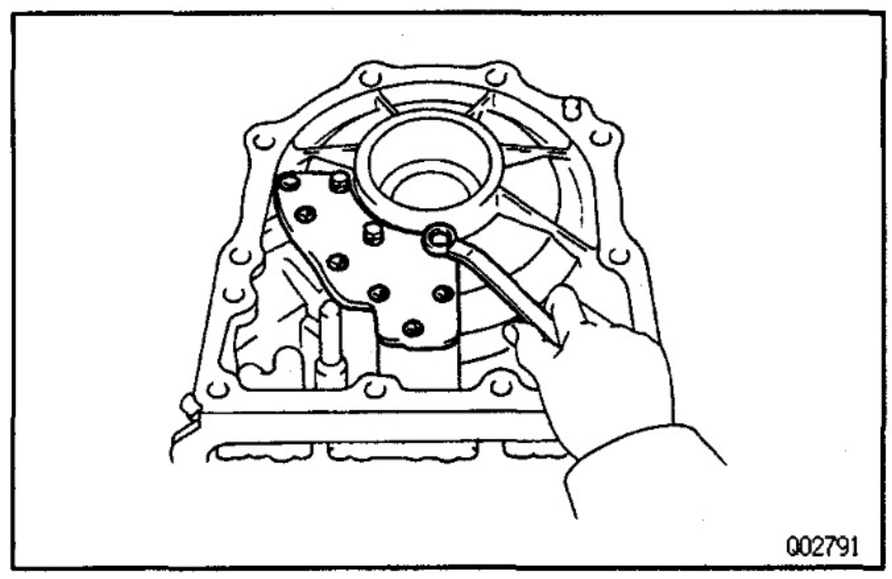
36. REMOVE C_1 ACCUMULATOR PISTON AND SPRING

(a) Remove the four bolts, front clutch accumulator cover, two gaskets and plate.



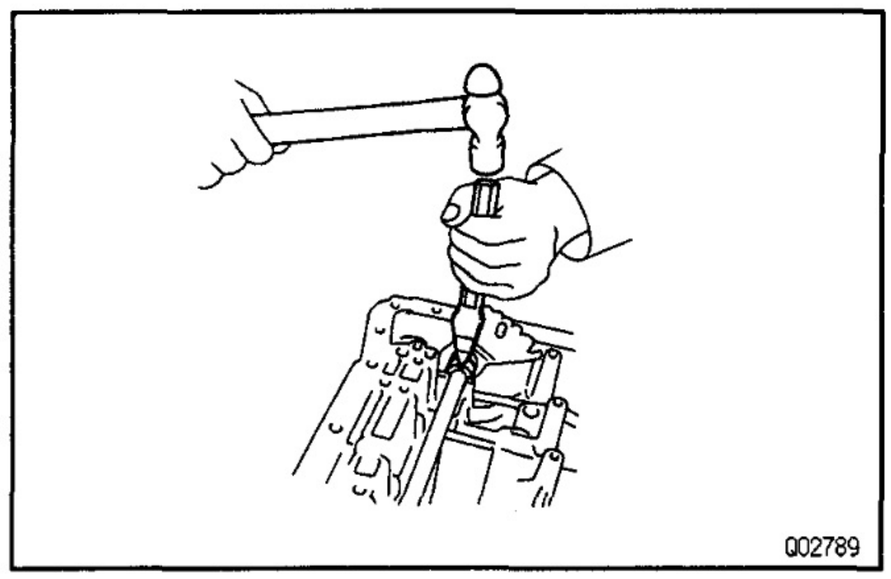
(b) Remove the accumulator piston and spring by applying compressed air to the oil hole.

(c) Remove the O—rings from accumulator piston.



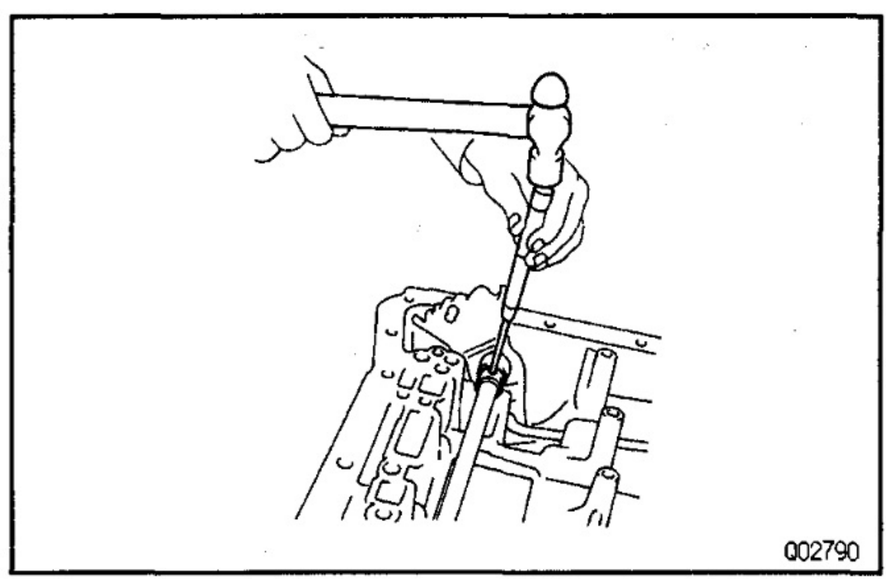
37. REMOVE TRANSMISSION REAR COVER

Remove the three bolts, six screws, rear cover and gasket.

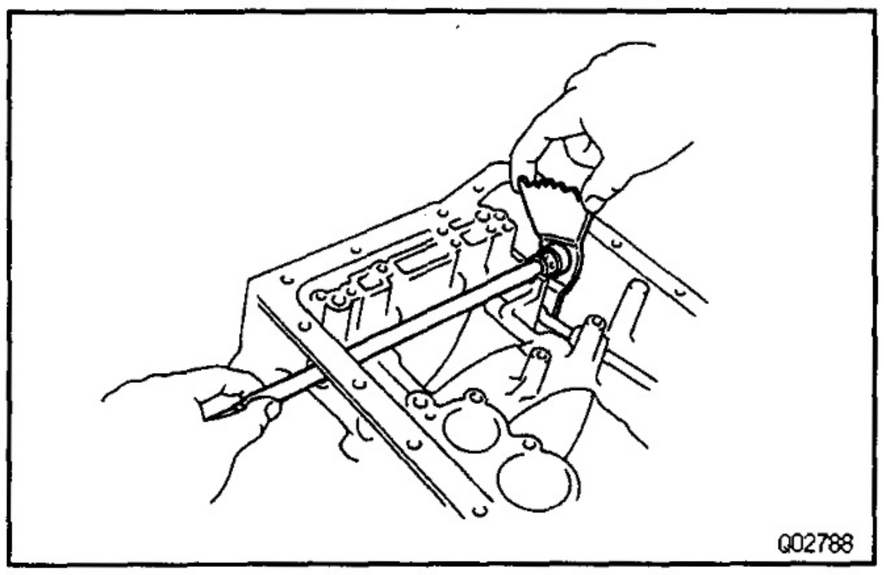


38. REMOVE MANUAL VALVE LEVER, SHAFT AND OIL SEALS

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

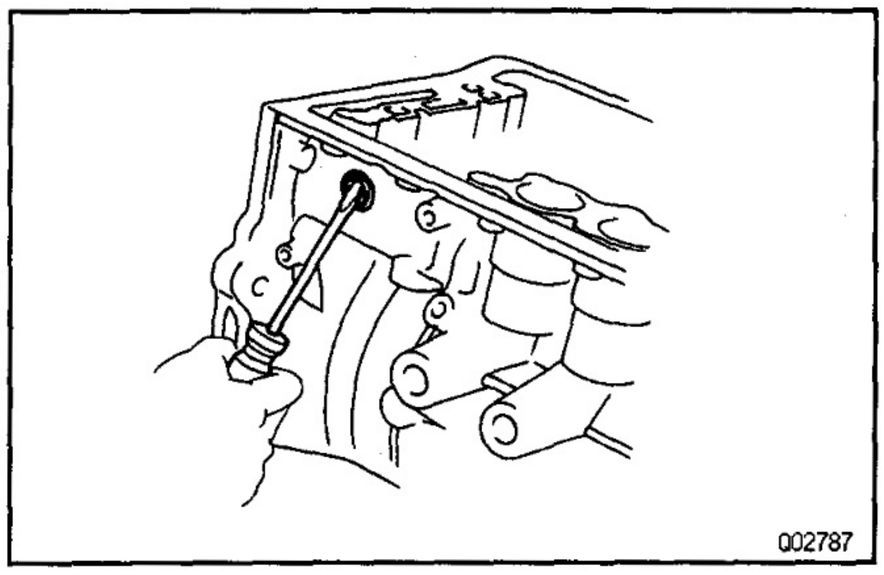


(b) Using a pin punch, tap out the pin.



(c) Pull the manual valve lever shaft out through the case, remove the manual valve lever, parking lock rod assembly, the two plate washers and wave washer.

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



(e) Using a screwdriver, pry out the two oil seals.

AT07V-01

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 pats 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 fluid of the automatic transmission is ATF type 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:

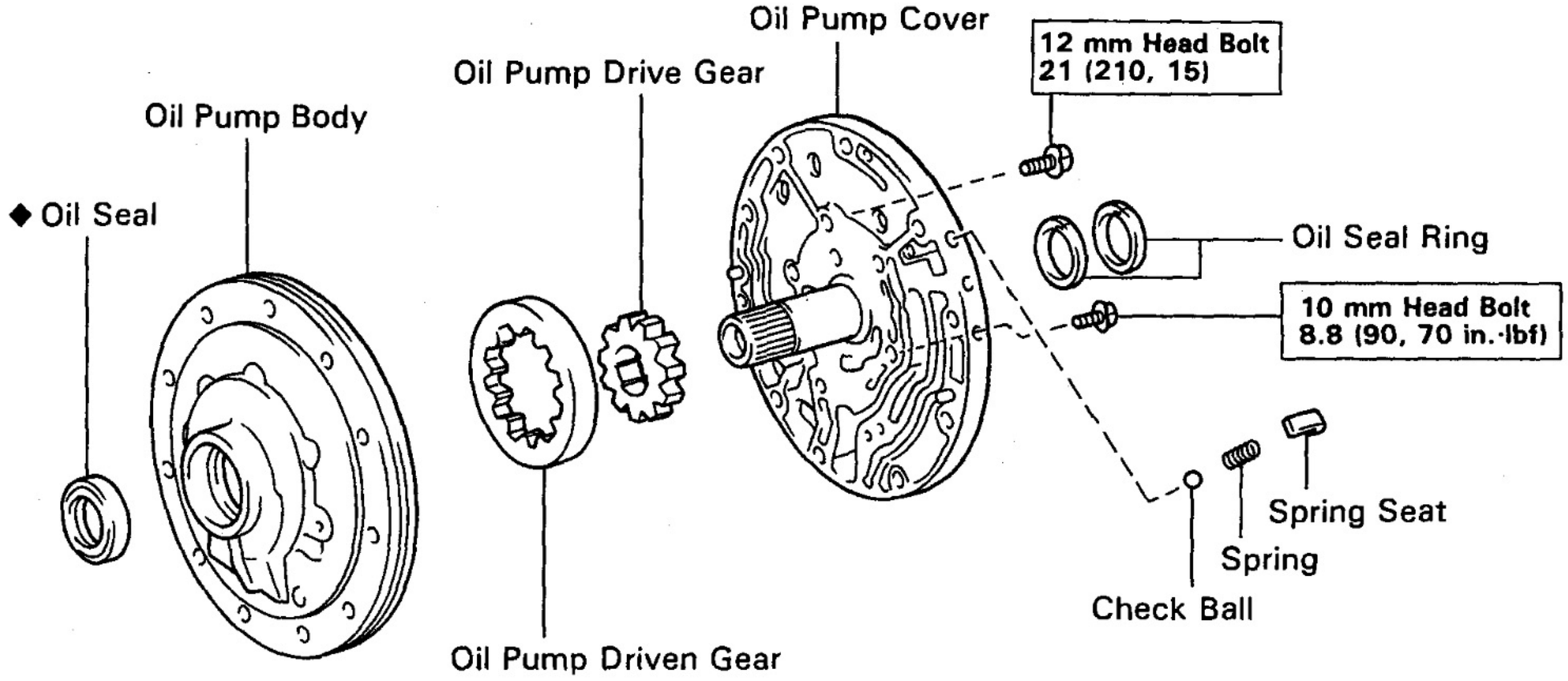
1. After cleaning, the parts should be arranged in proper order to allow performing inspection, repairs and reassembly with efficiency.
2. When disassembling valve body, be sure to keep each valve together with the corresponding spring.
3. New disc for the brakes and clutches that are to be used for replacement must be soaked in transmission fluid for at lease 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. Make sure that the ends of snap ring are not aligned with one of the cutouts and ate installed in the groove correctly.
4. If 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.

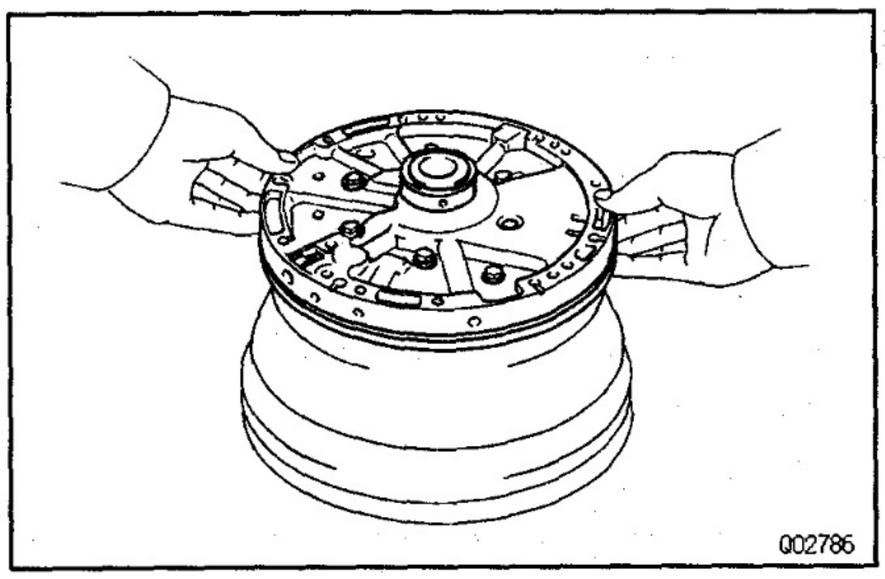
OIL PUMP
COMPONENTS

AT094–01



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

Q02657

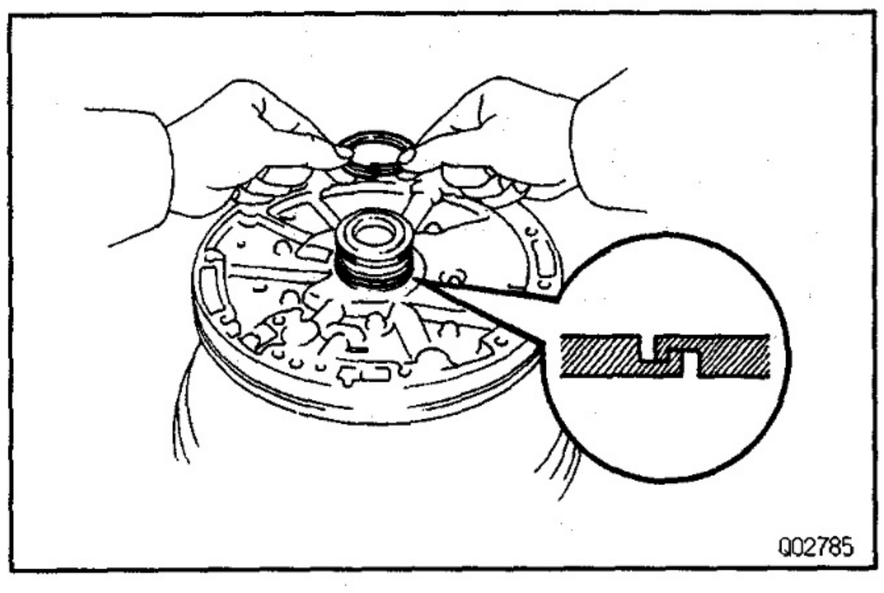


Q02786

AT07W–02

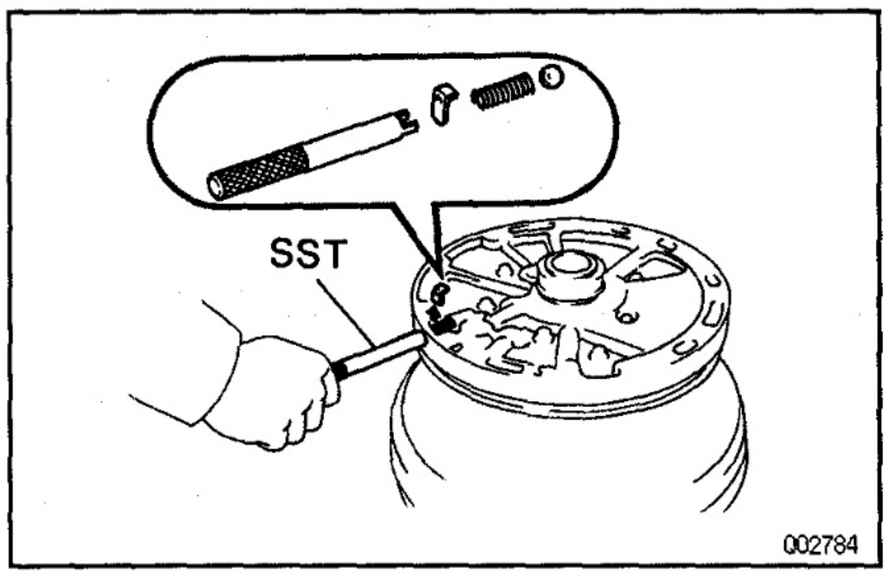
COMPONENTS DISASSEMBLY

1. USE TORQUE CONVERTER AS WORK STAND



Q02785

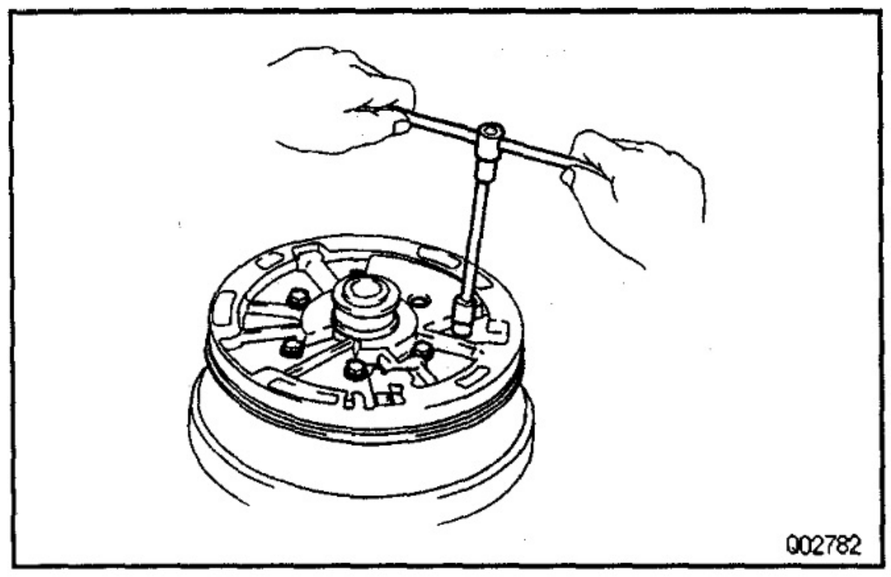
2. REMOVE OIL SEAL RINGS
remove the two oil seal rings.



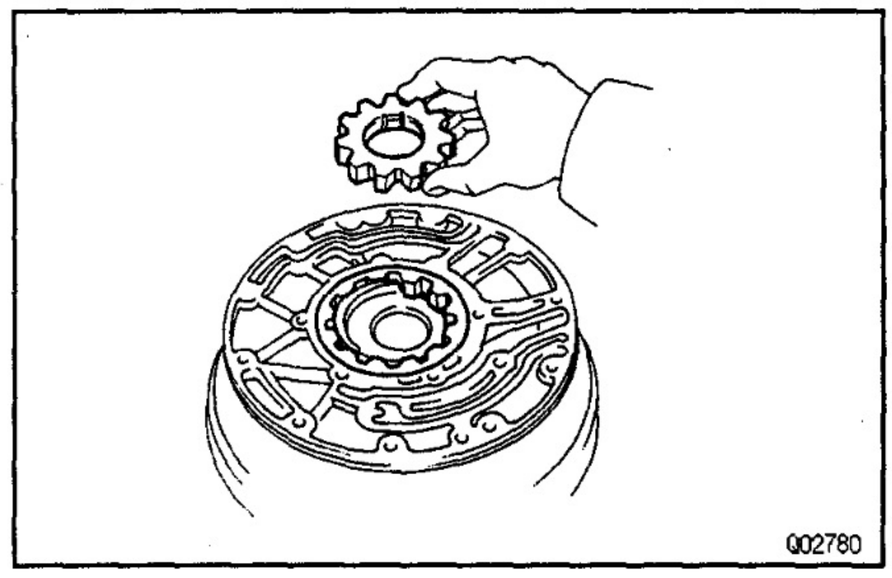
3. REMOVE CHECK BALL

(a) Using SST, compress the spring and remove the spring seat.
SST 09350–36010(09350–06100)

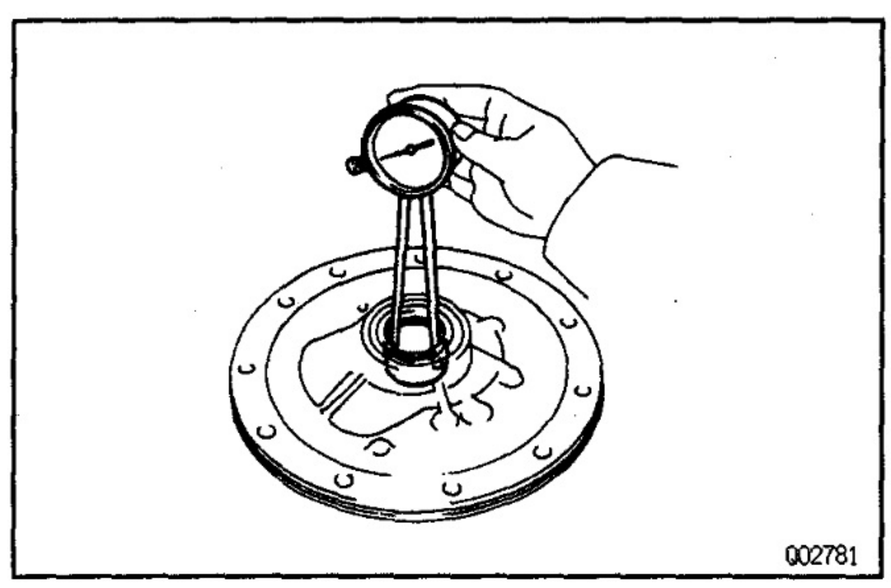
(b) Remove the spring and check ball.

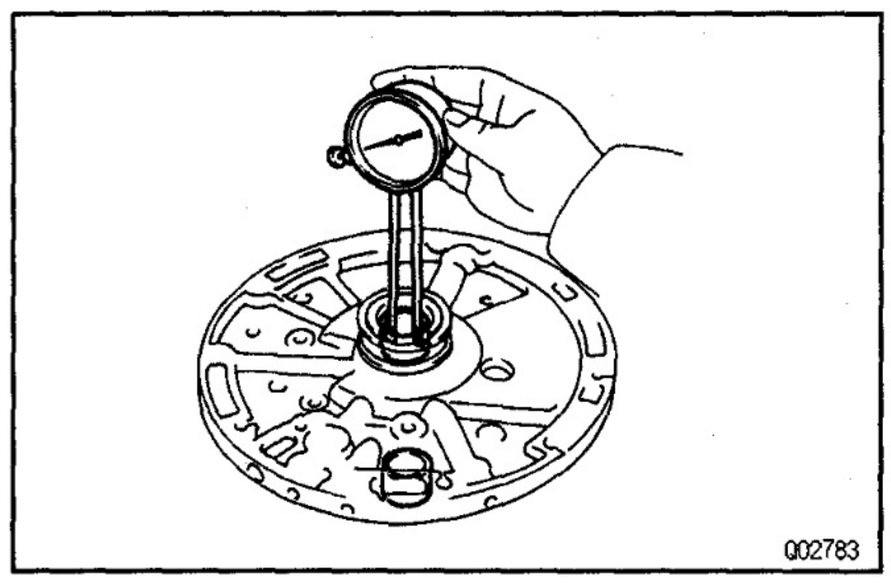


4. REMOVE EIGHT BOLTS AND PUMP COVER



5. REMOVE OIL PUMP DRIVE AND DRIVEN GEARS





OIL PUMP INSPECTION

AT07X–01

1. INSPECT BUSHING OF OIL PUMP BODY

Using a dial indicator, measure the inside diameter.

Standard inside diameter:

42.050–42.075 mm (1.6555–106565 in.)

Maximum inside diameter:

42.13 mm (1.6587 in.)

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

2. INSPECT BUSHINGS OF OIL PUMP COVER

Using a dial indicator, measure the inside diameter.

Front bushing standard inside diameter:

24.000–24.021 mm (0.9449–0.9457 in.)

Rear bushing standard inside diameter:

26.500–26.521 mm (1.0433–1.0441 in.)

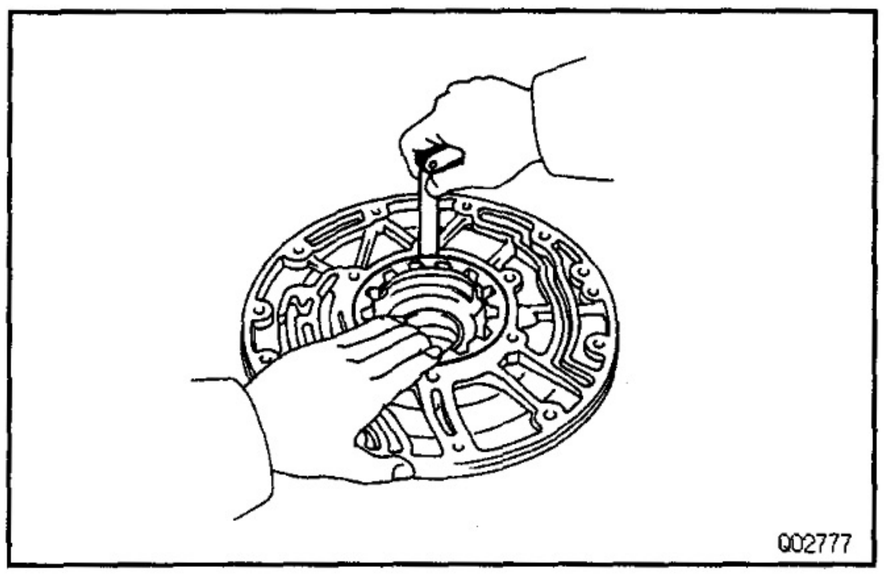
Front bushing maximum inside diameter:

24.07 mm (0.9476 in.)

Rear bushing maximum inside diameter:

26.57 mm (1.0461 in.)

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



3. INSPECT BODY CLEARANCE OF DRIVEN GEAR

(a) Push the driven gear to one side of the body.

(b) Using a feeler gauge, measure the clearance between the driven gear and body.

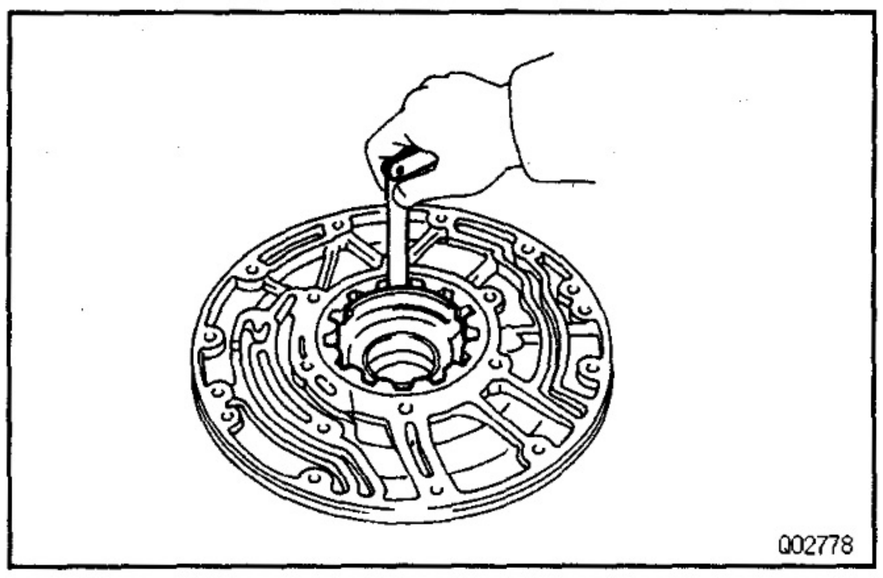
Standard body clearance:

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 gears and pup body as a set.



4. INSPECT TIP CLEARANCE OF DRIVEN GEAR

Using a feeler gauge, measure the clearance between the gear teeth and the crescent–shaped part of the pump body.

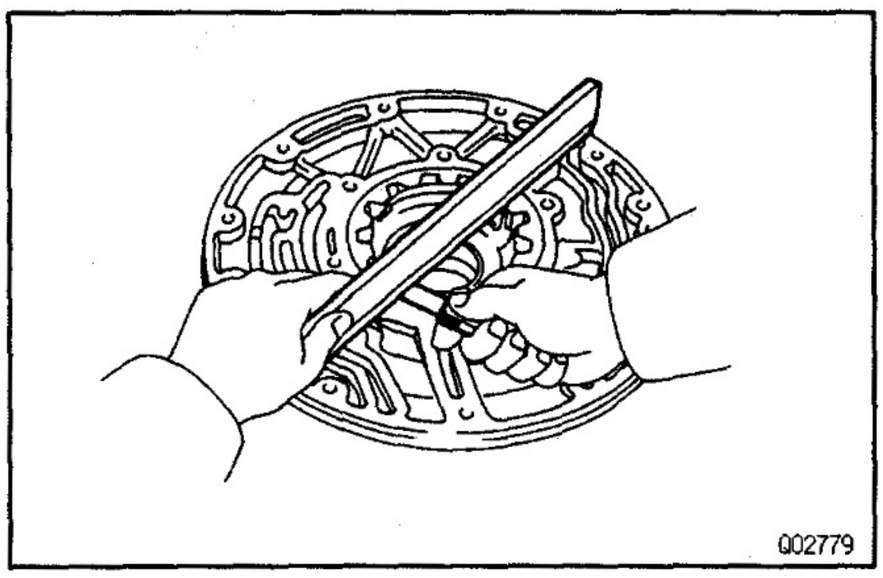
Standard tip clearance:

0.14–0.24 mm (0.0055–0.0094 in.)

Maximum tip clearance:

0.3 mm (0.012 in.)

If the tip clearance is greater than the maximum, replace the gears and pump body as a set.



5. INSPECT SIDE CLEARANCE OF DRIVE AND DRIVEN GEARS

Using a steel straight edge and a feeler gauge, measure the clearance between the gears and steel straight edge.

Standard side clearance:

0.02–0.05 mm (0.0008–0.0020 in.)

Maximum side clearance:

0.1 mm (0.004 in.)

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

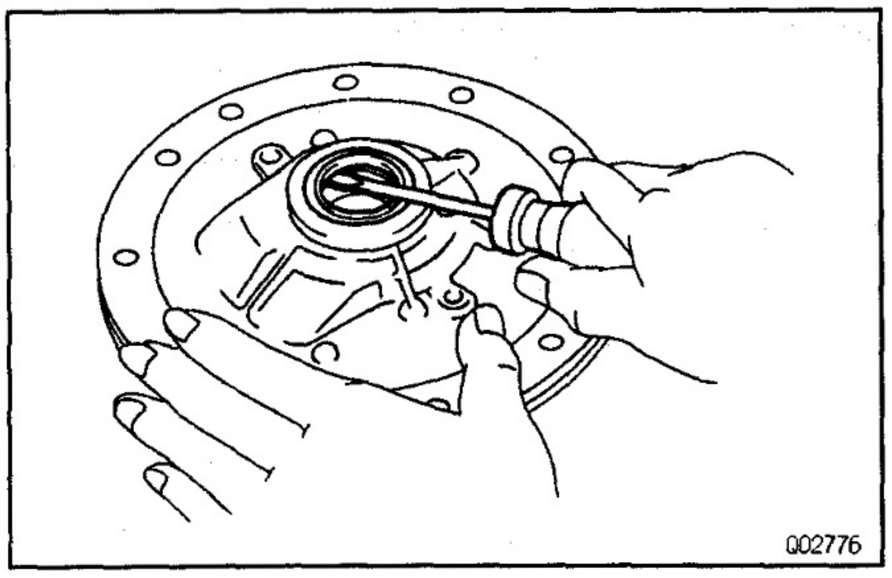
HINT: There are two difference thicknesses for drive and driven gears.

Gear thickness:

18.435–18.450 mm (0.7258–0.7264 in.)

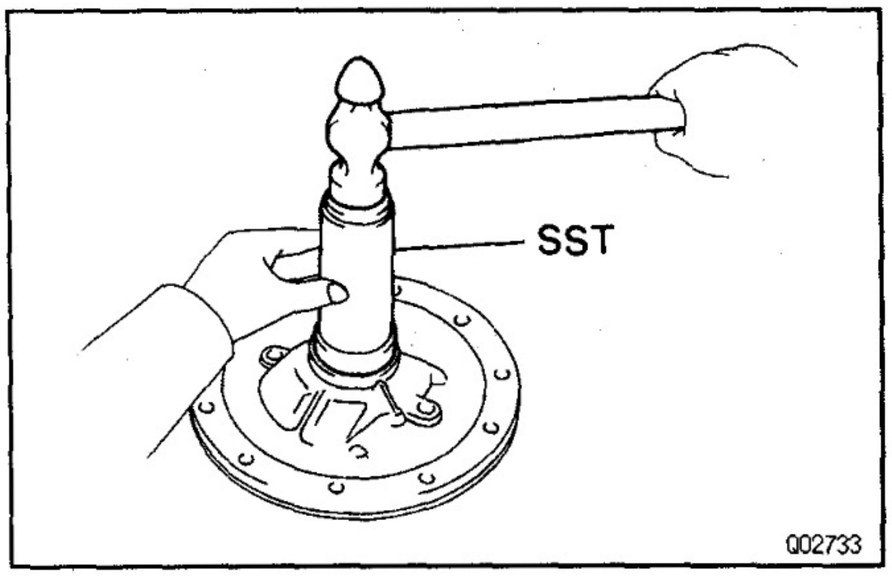
18.451–18.486 mm (0.7264–0.7278 in.)

If necessary, replace the pump body.



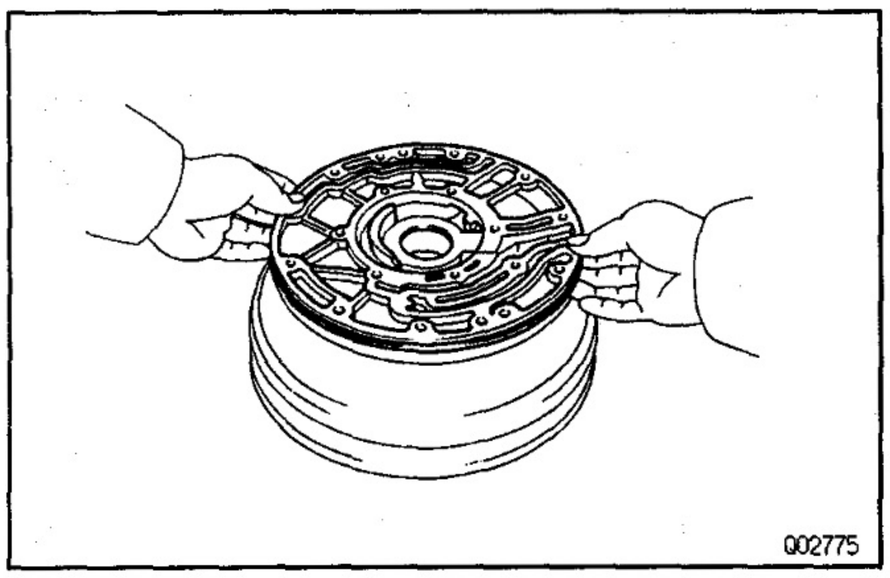
6. IF NECESSARY, REPLACE OIL SEAL

(a) Using a screwdriver, pry off the oil seal.



(b) Using SST, tap in a new oil seal. The oil sel end should be with the outer edge of the pump body.
SST 09350–36010(09350–06040)

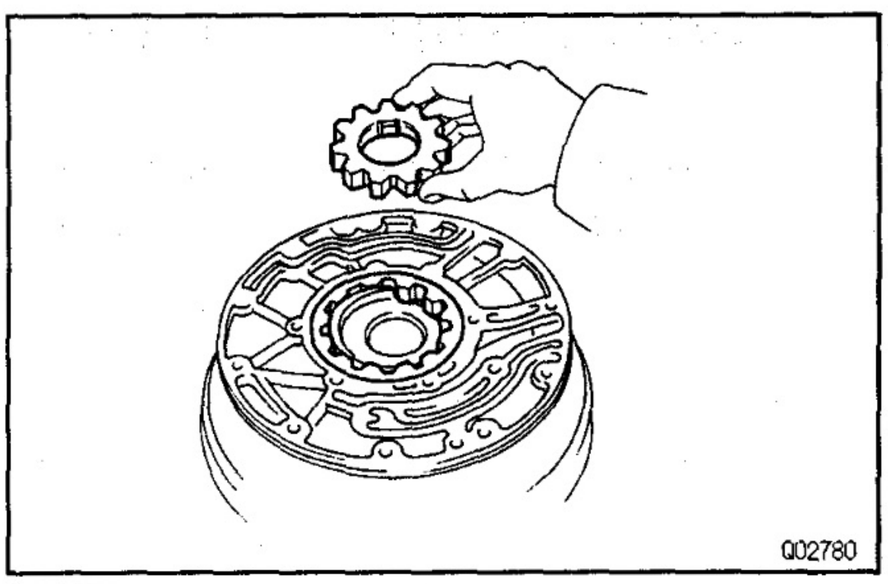
(c) Apply MP grease to the oil seal lip.



OIL PUMP ASSEMBLY

AT07Y–02

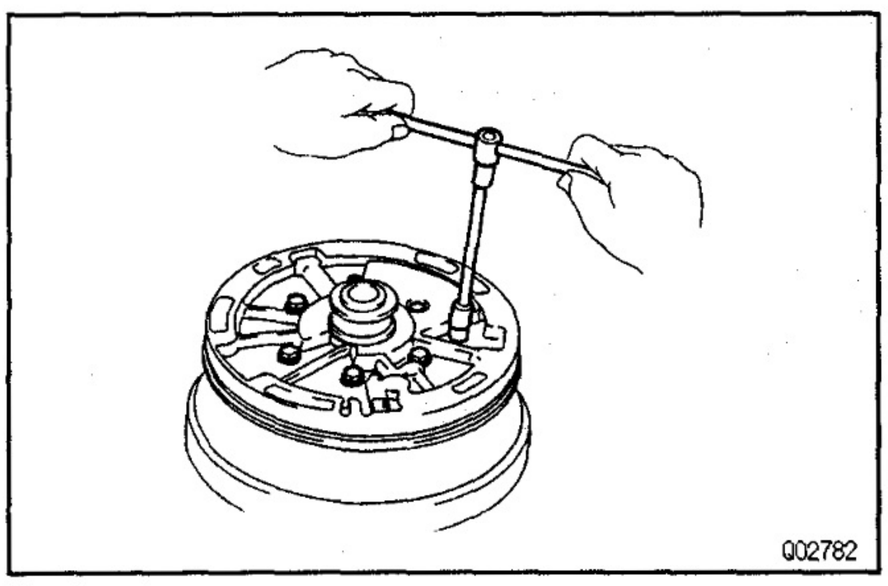
1. PLACE OIL PUMP BODY ONTO TORQUE CONVERTER



2. INSTALL DRIVEN AND DRIVE GEARS TO OIL PUMP BODY

(a) Coat the driven and drive gears with ATF.

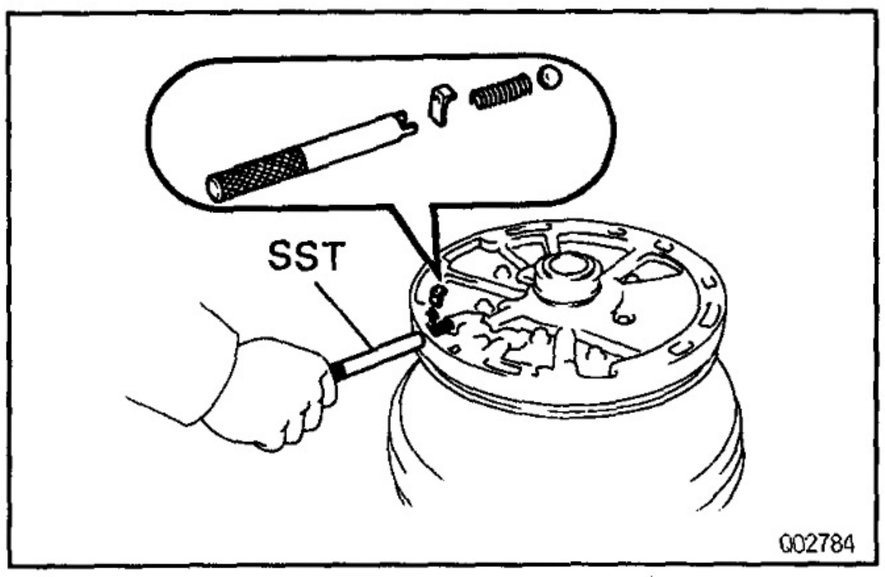
(b) Install the driven and drive gears.



3. INSTALL OIL PUMP COVER TO OIL PUMP BODY

(a) Align the bolt holes of the oil pump body and cover.

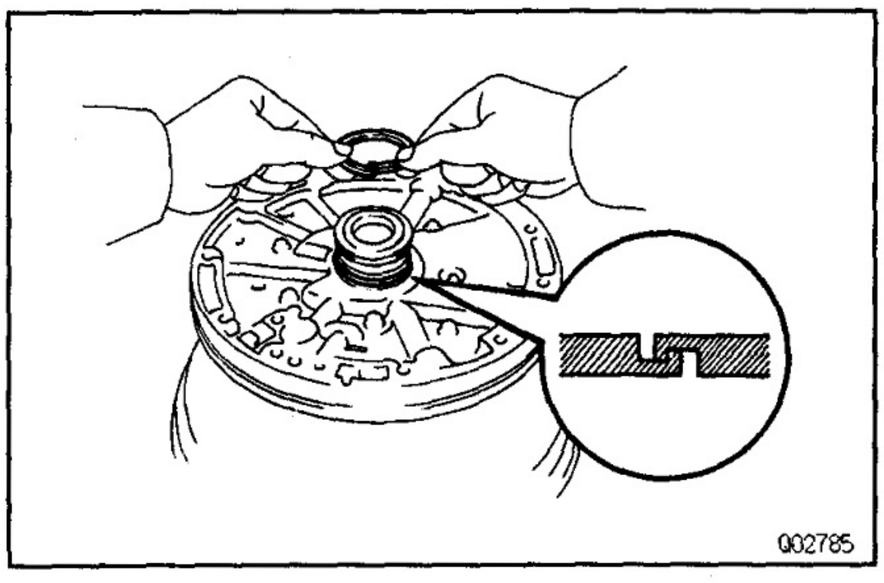
(b) Install the pump cover with the eight bolts.
Torque (10 mm head bolt): 8.8 N·m (90 kgf·cm, 78 in.·lbf)
Torque (12 mm head bolt): 21 N·m (210 kgf·cm,15 ft·lbf)



4. INSTALL CHECK BALL

(a) Install the check ball and spring.

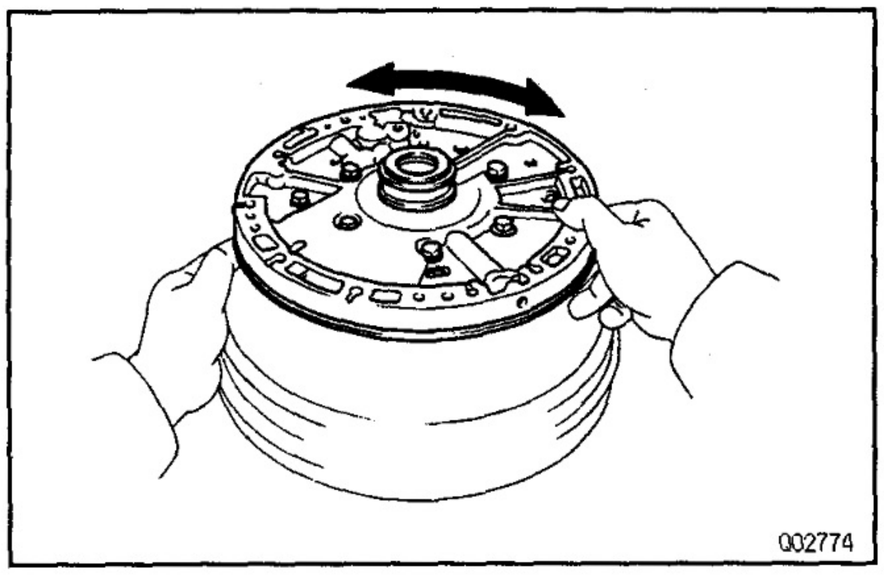
(b) Using SST, compress the spring and install the spring seat.
SST 09350–36010(09350–06110)



5. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seal rings, and install them onto the stator shaft.
NOTICE: Do not spread the ring ends too match.
HINT: After installing the oil seal rings, check that they rotate smoothly.

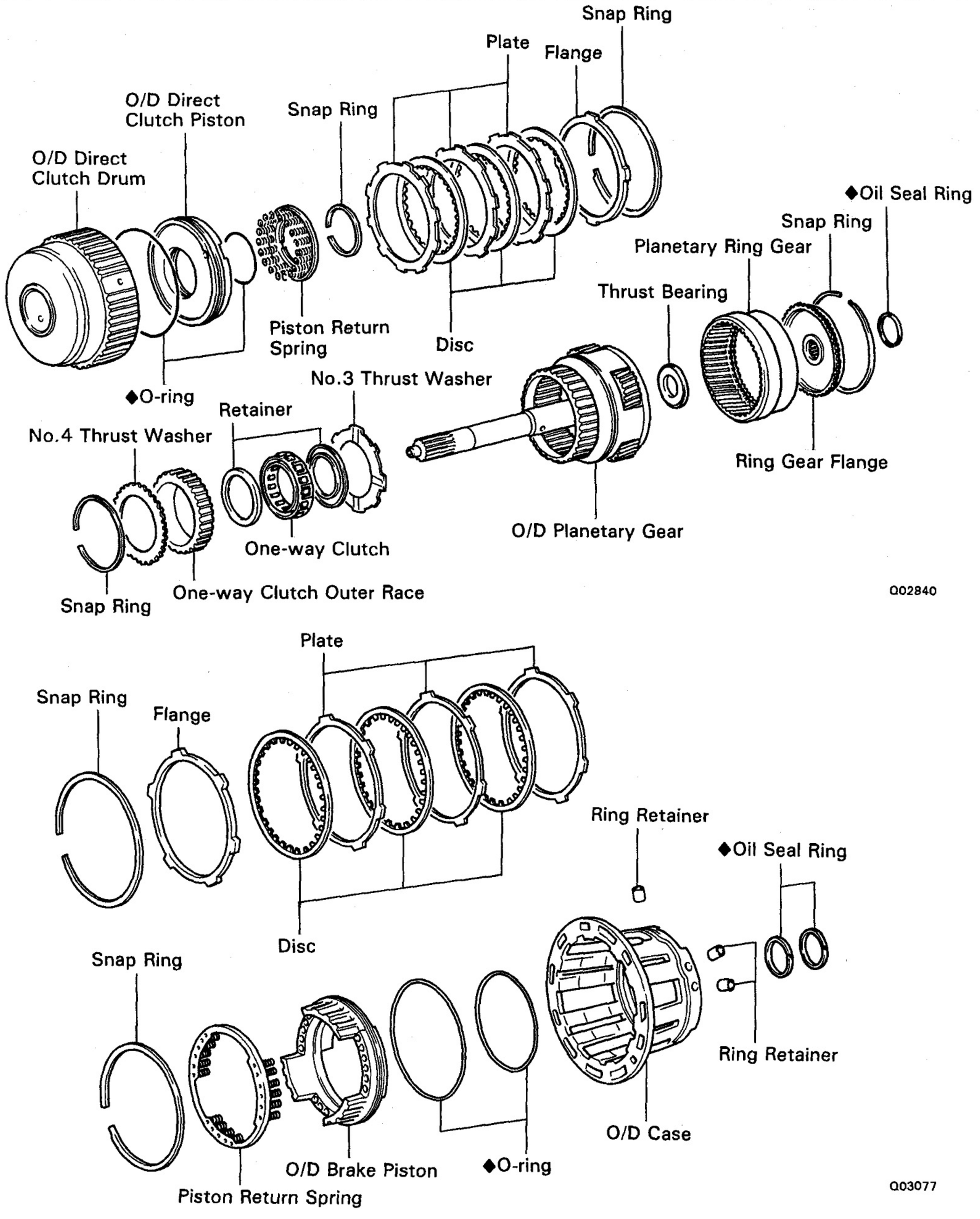


6. CHECK OIL PUMP DRIVE ROTATION
Make sure the drive gear rotates smoothly when installed to the torque converter.

AT

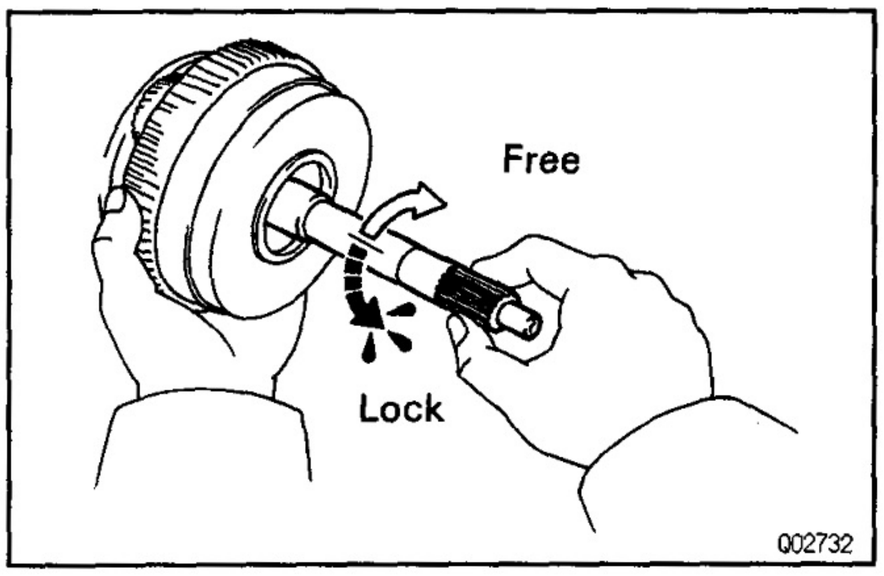
OVERDRIVE UNIT
COMPONENTS

AT07Z–01



◆ Non-reusable part

Z04681

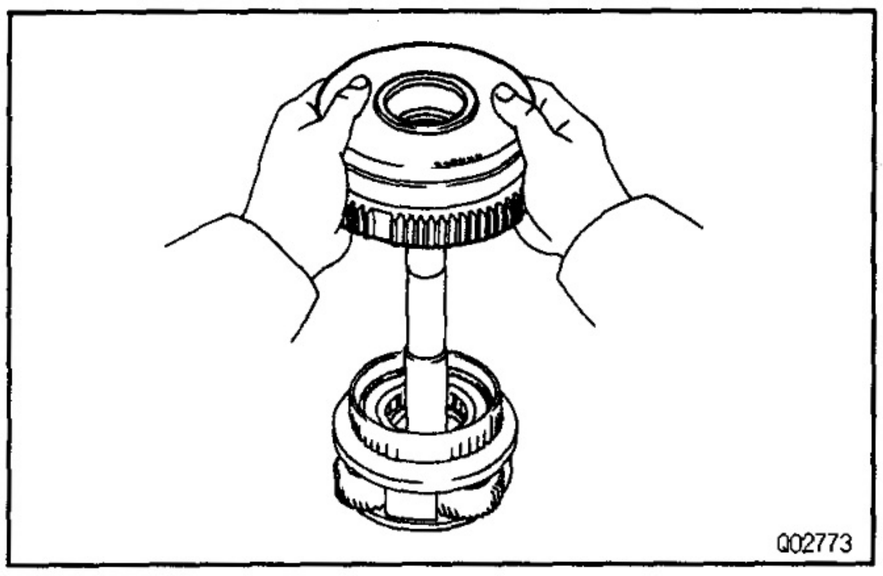


OVERDRIVE GEAR UNIT DISASSEMBLY AT080-02

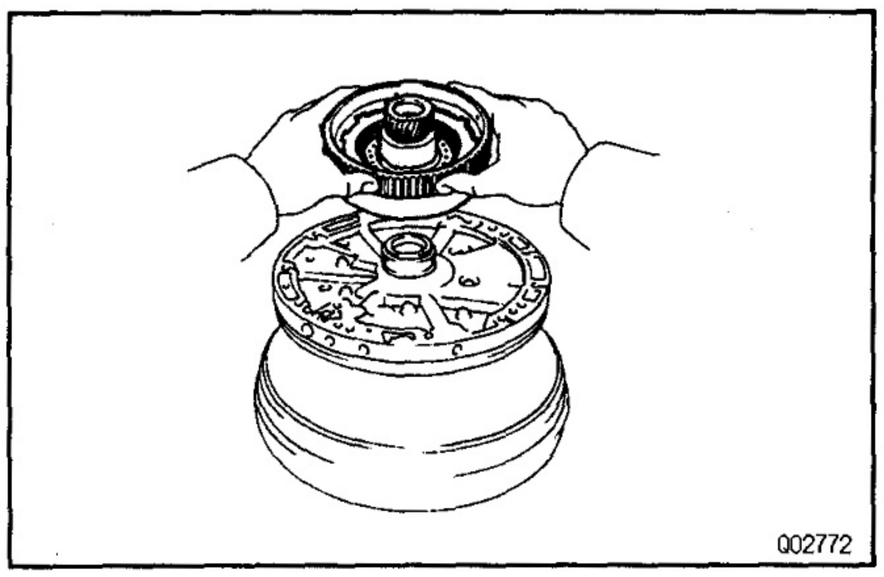
1. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the O/D direct clutch drum and turn the input shaft.

The input shaft should turn freely clockwise and should lockcounterclockwise.

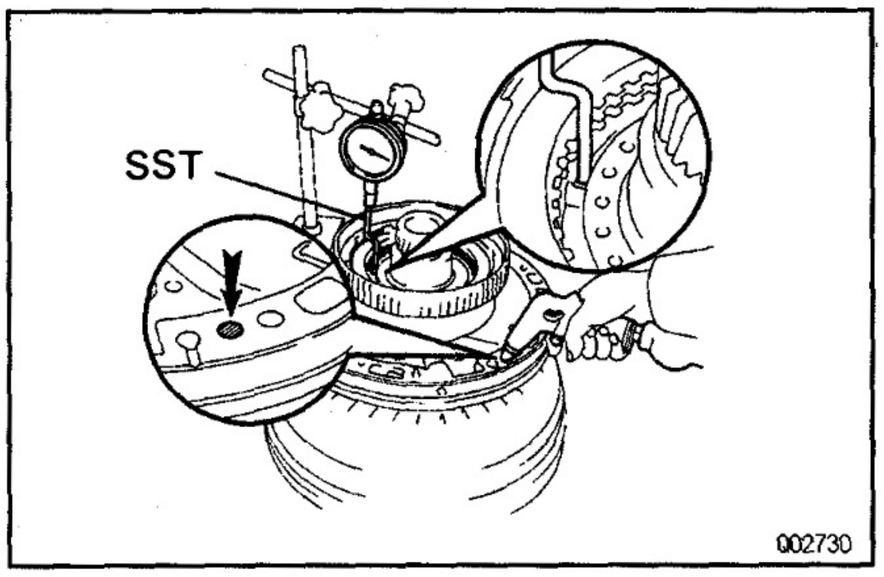


2. REMOVE OVERDRIVE DIRECT CLUTCH ASSEMBLY FROM OVERDRIVE PLANETARY GEAR



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.



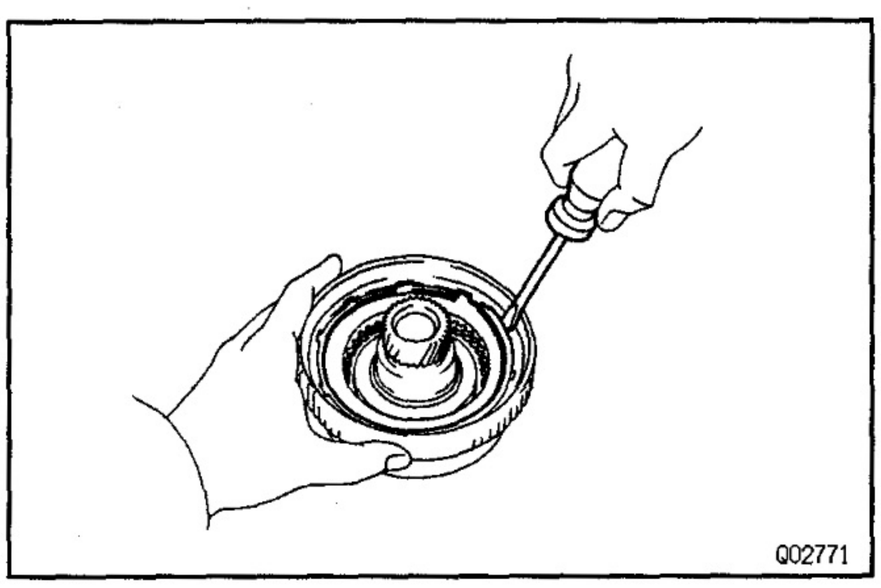
(b) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392 – 785 kPa (4 – 8 kgf / cm², 57 – 114 psi) as shown.

SST 09350-36010(09350-06110)

Piston stroke:

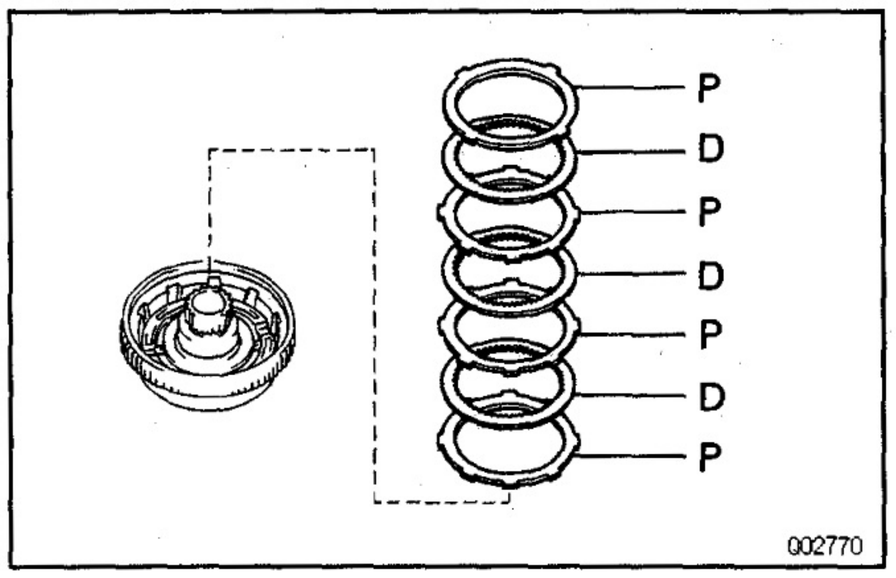
1.80-2.00 mm (0.0709-0.0787 in.)

If the piston stroke is not sa specified, inspect the discs.

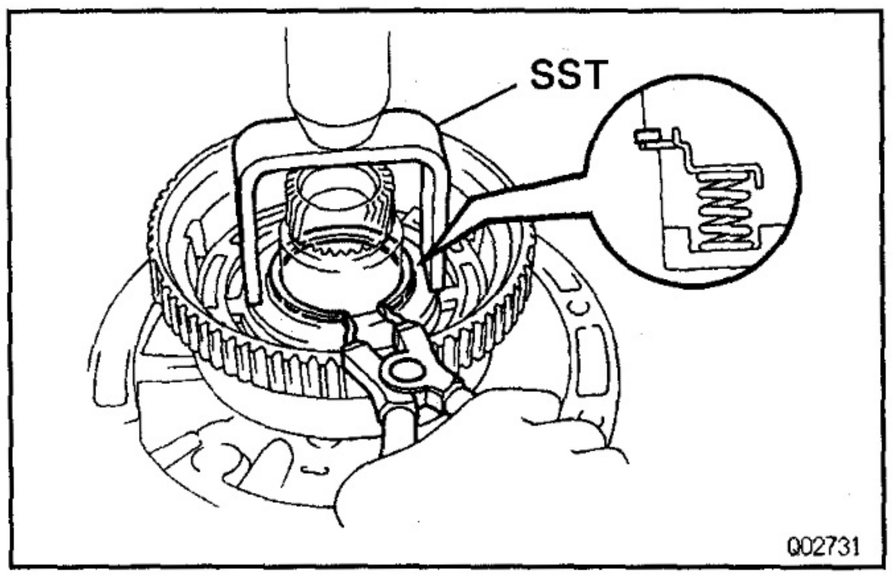


4. REMOVE FLANGE, PLATES AND DISCS

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

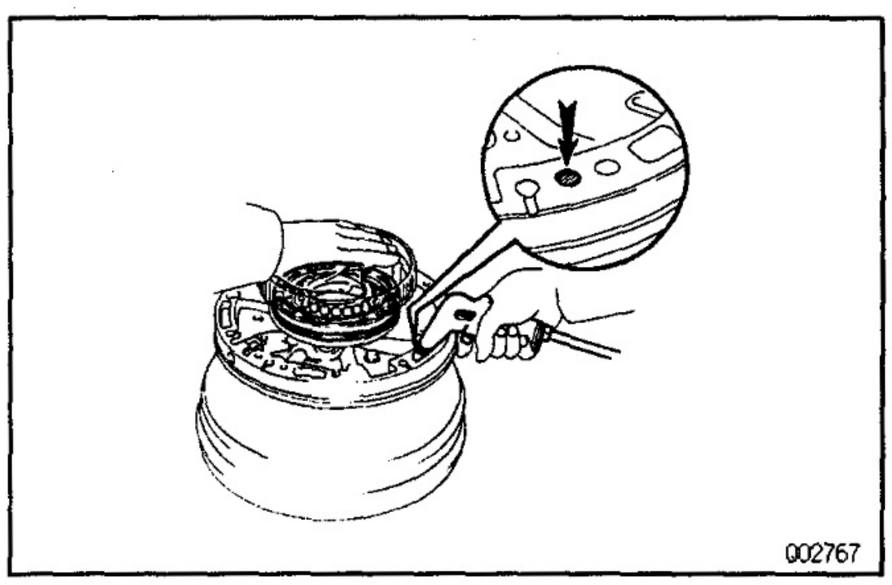


(b) Remove the flange, three discs and three plates.



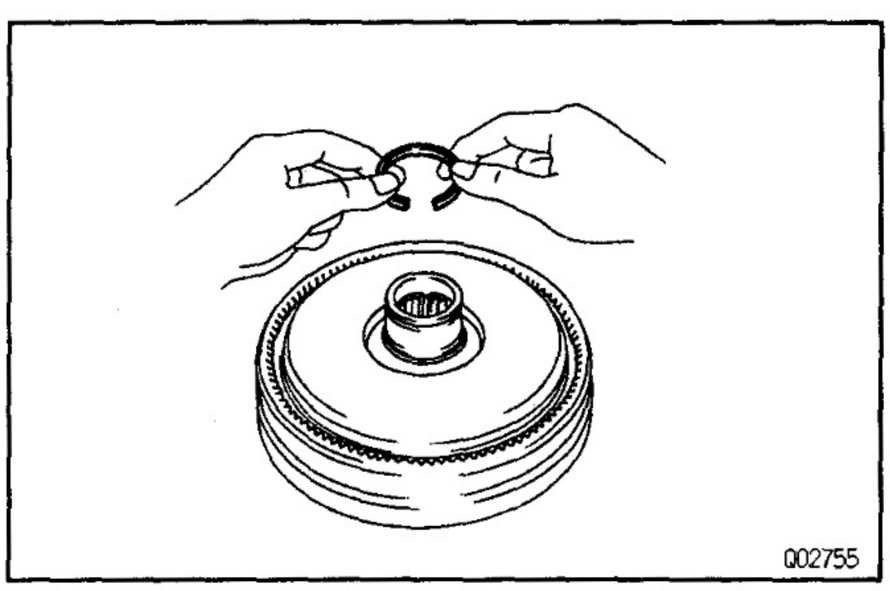
5. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring seat, and compress the return spring with a shop press.
SST 09350−36010(09350−06010)
(b) Using snap ring pliers, remove the snap ring.
(c) Remove the spring seat and twenty — four return springs.

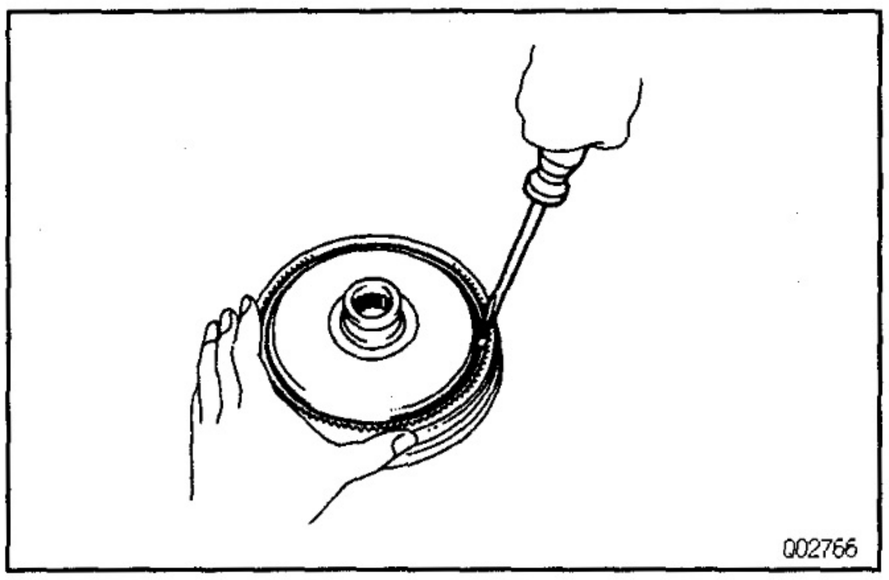


6. REMOVE OVERDRIVE DIRECT CLUTCH PISTON

(a) Place the oil pump onto the torque converter, and then place the O/D direct clutch onto the oil pump.
(b) Hold the clutch piston with hand, apply compressed air into the oil hole of the oil pump to remove the clutch piston.
(b) Remove the two O−rings from the clutch piston.

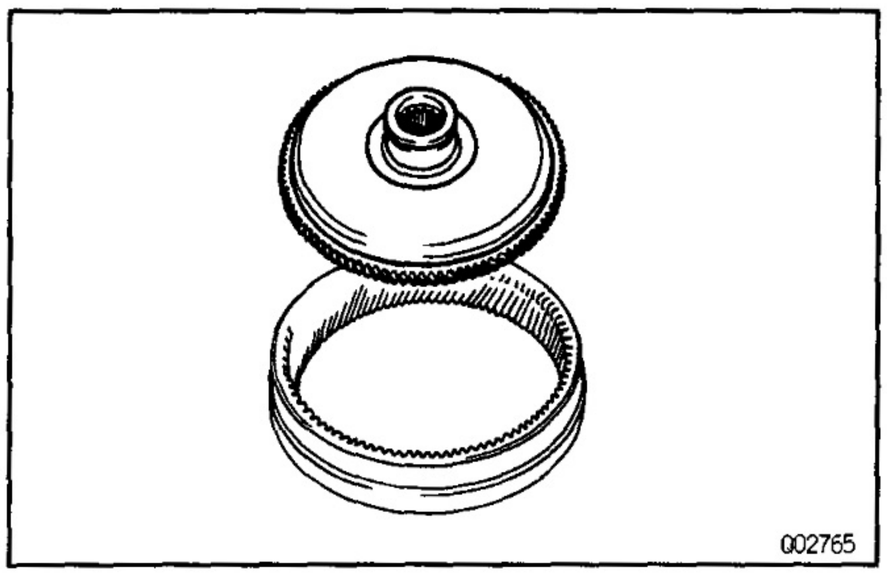


7. REMOVE OIL SEAL RING FROM RING GEAR FLANGE



8. REMOVE RING GEAR FLANGE

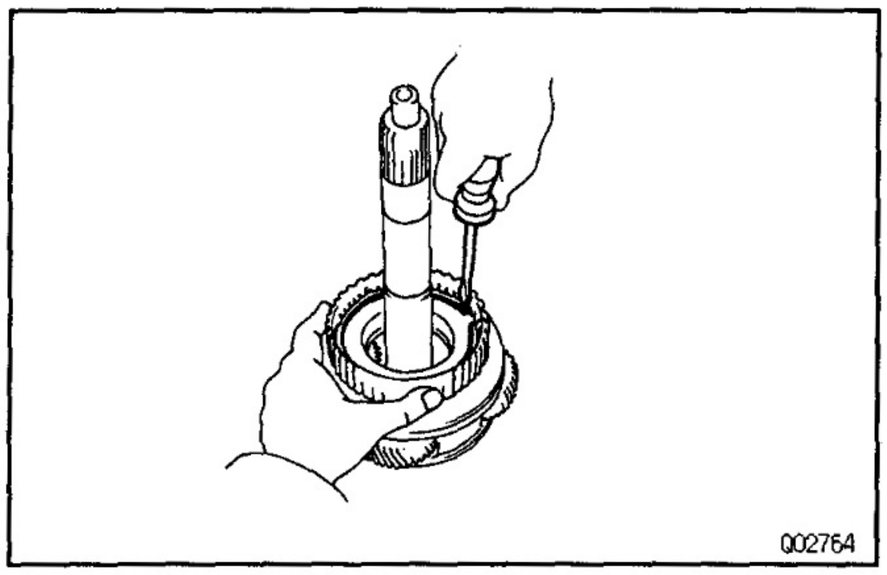
(a) Using a small screwdriver, remove the snap ring.

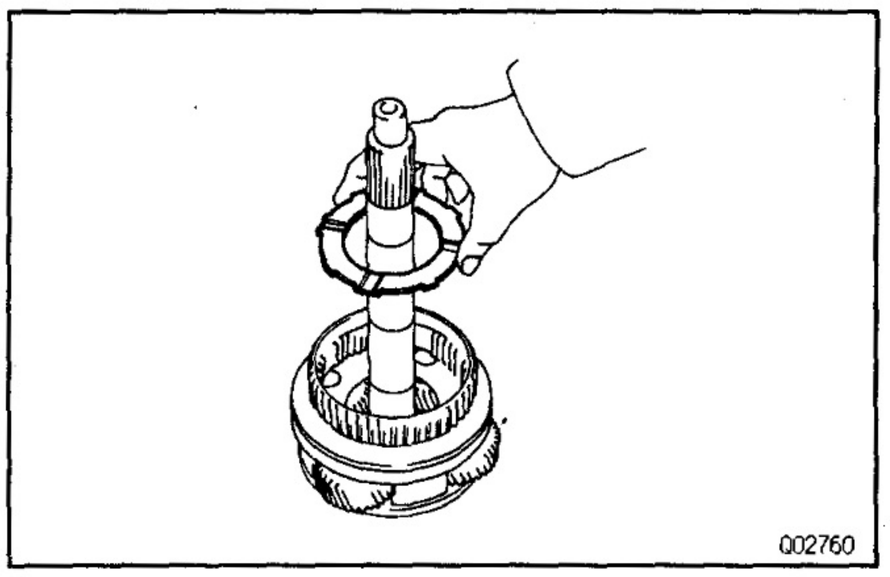


(b) Remove the ring gear flange.

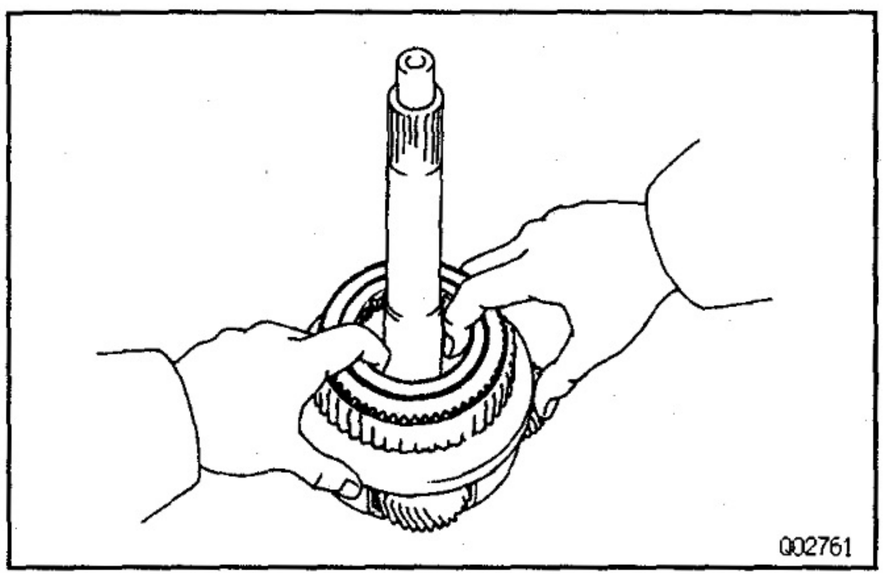
9. REMOVE ONE–WAY CLUTCH FROM OVERDRIVE PLANETARY GEAR

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

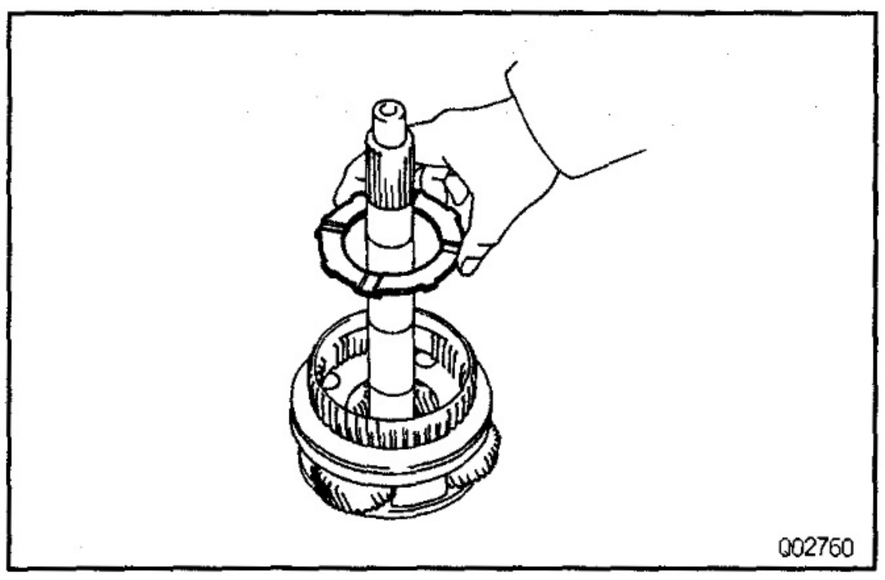




(b) Remove the No.4 thrust washer.

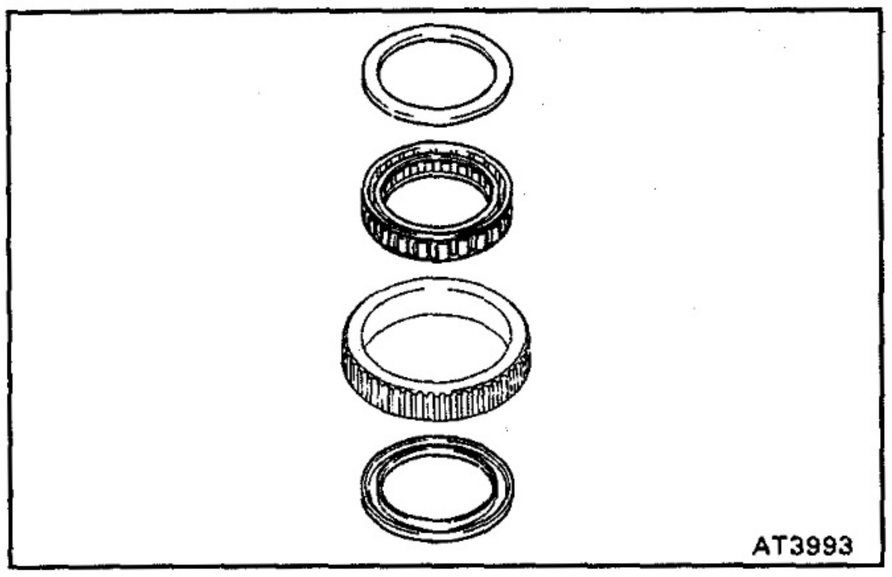


(c) Remove the one–way clutch together with the outer race.

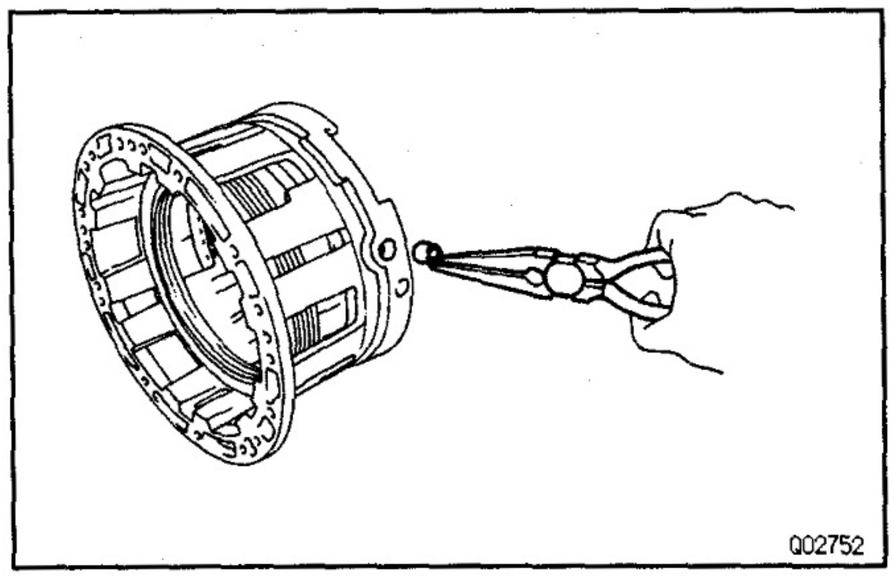


(d) Remove the No.3 thrust washer.

AT

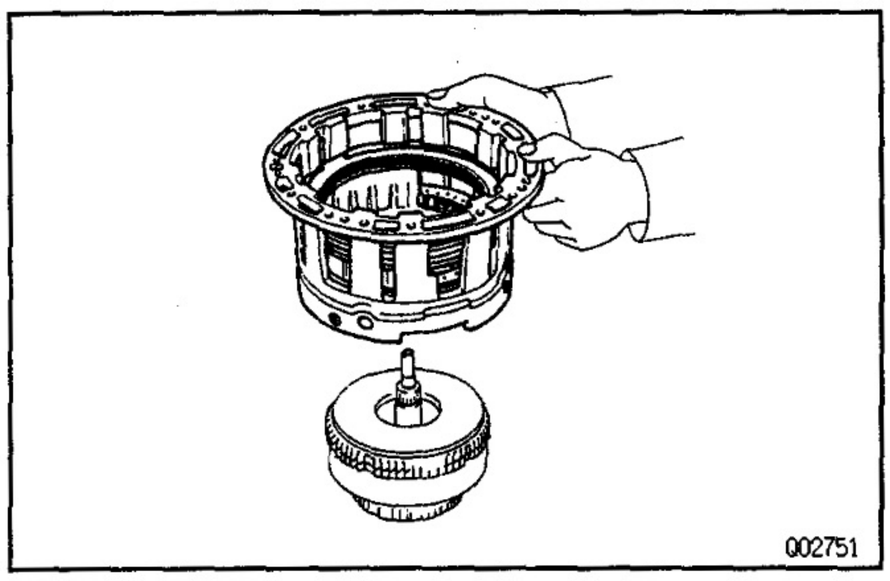


(e) Remove the two retainers and one–way clutch from the outer race.



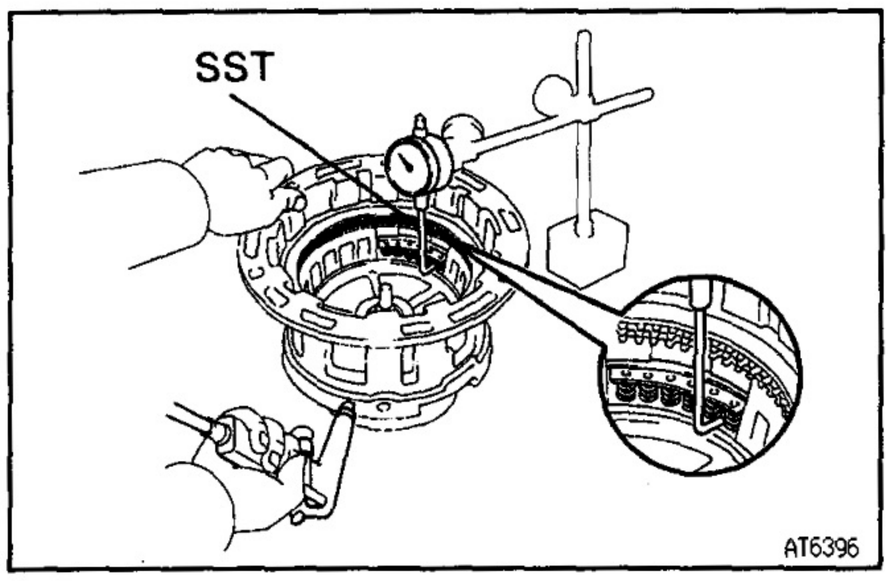
10. REMOVE RING RETAINERS

Using needle nose pliers, remove the three ring retainers from the oil holes of O/D case.



11. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place the O/D case assembly onto the rear clutch assembly.



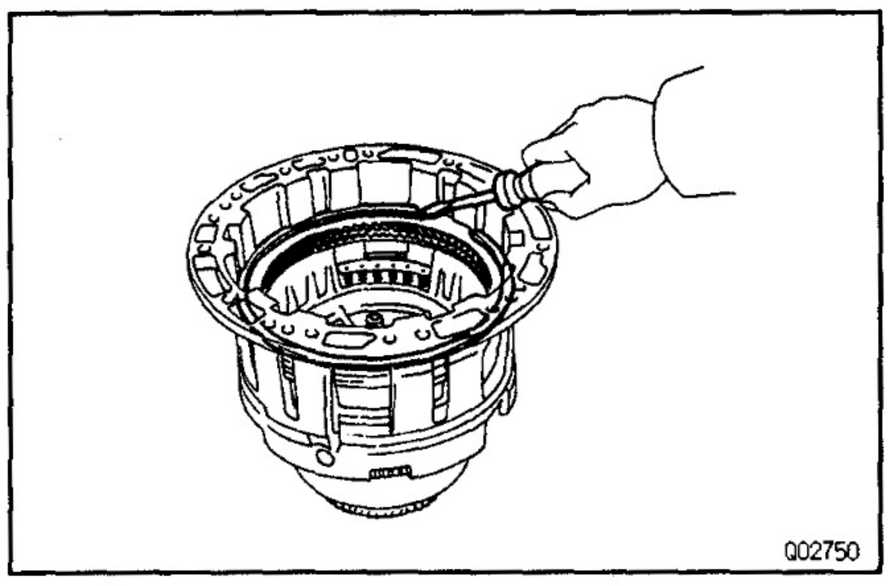
(b) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi)as shown.

SST 09350–36010(09350–06120)

Piston stroke:

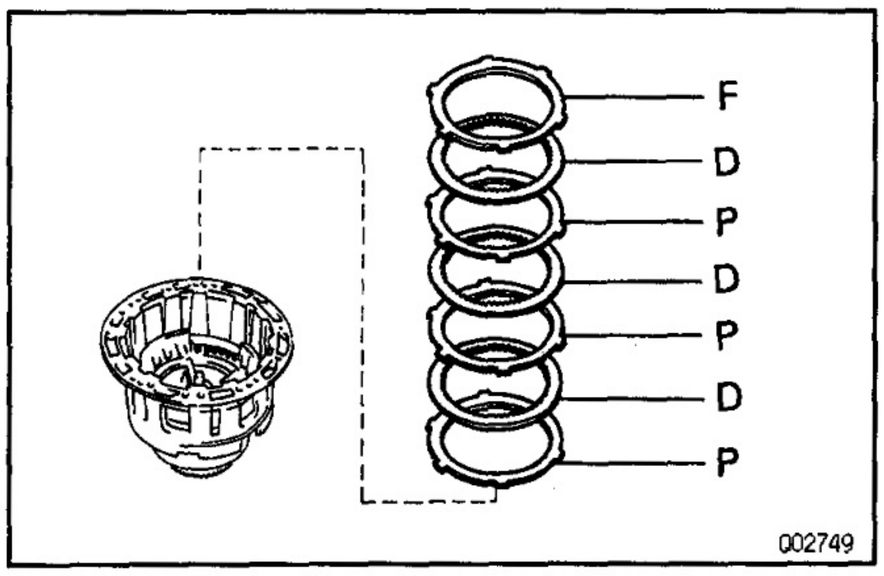
1.25–1.85 mm (0.0492–0.0728 in.)

If the piston stroke is grater than specified, inspect the discs.

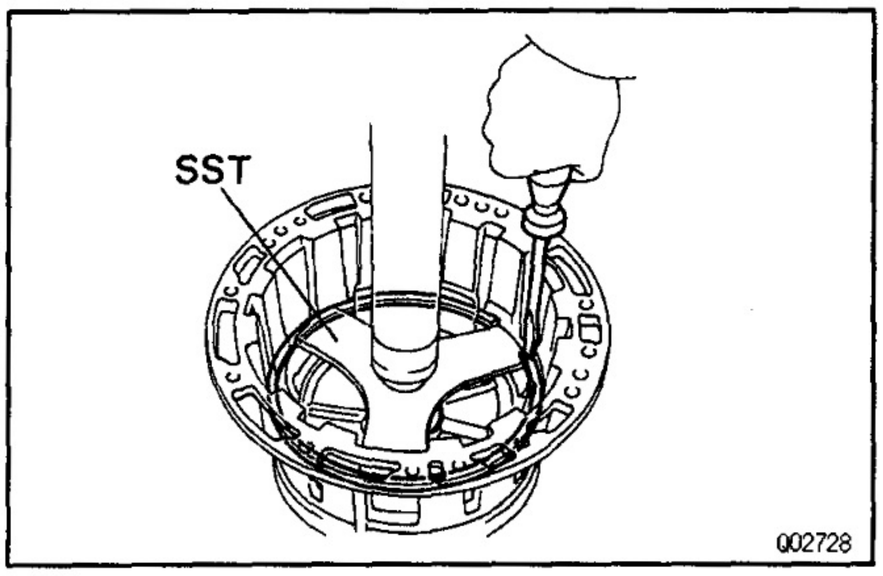


12. REMOVE FLANGE, DISCS AND PLATES

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



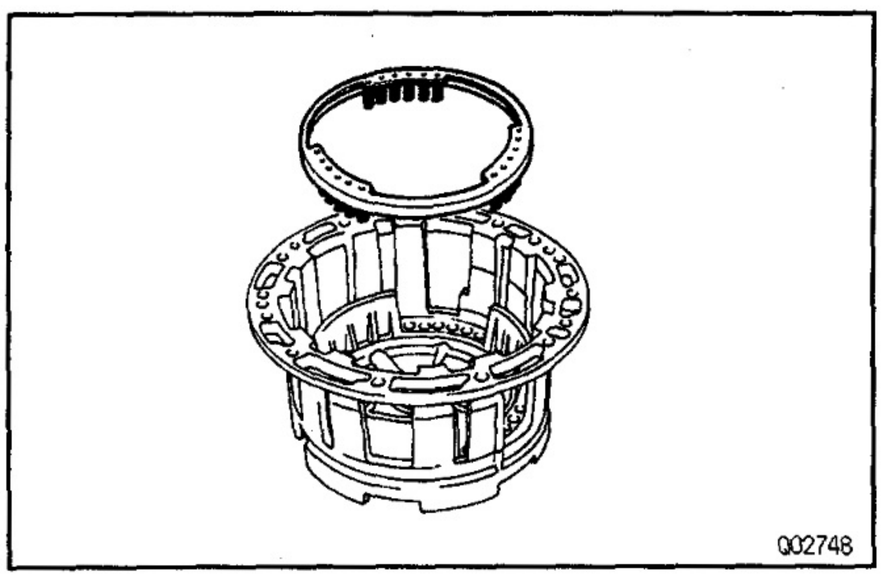
(b) Remove the flange, three discs and three plates.



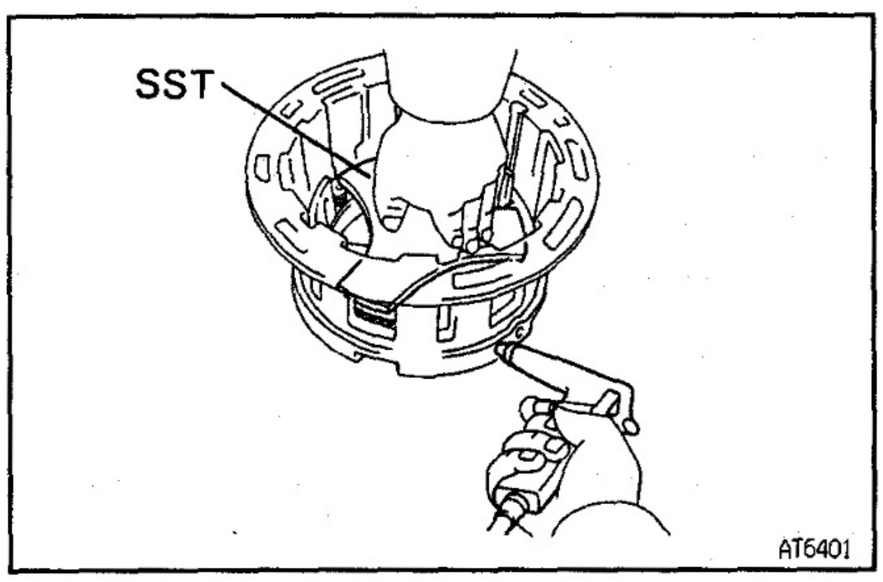
13. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring seat, and compress the return spring with a shop press.
SST 09350–36010(09350–06020)

(b) Using screwdriver, remove the snap ring.



(c) Remove the return spring.

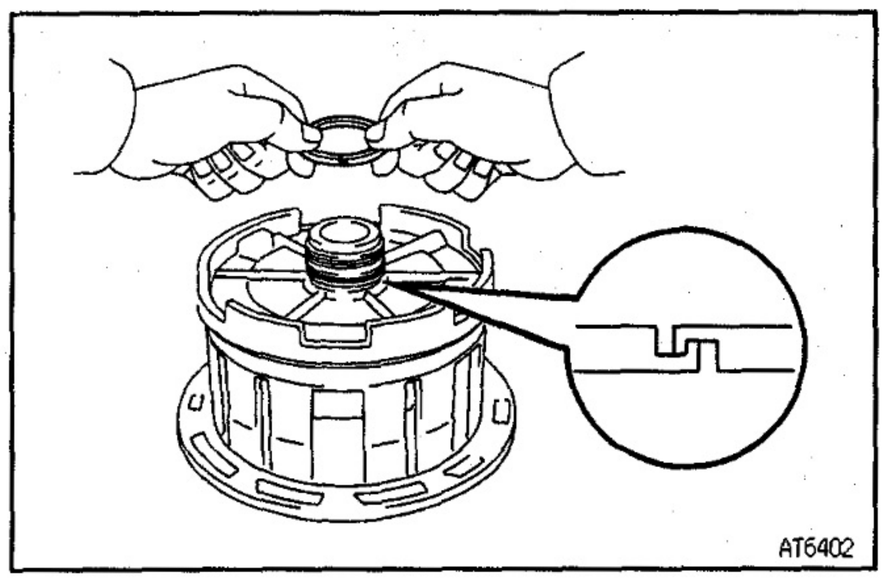


14. REMOVE OVERDRIVE BRAKE PISTON

(a) Place the return spring on the brake piston, and then place SST on the return spring.
SST 09350–36010(09350–06020)

(b) Hold SST so it does not slant, and apply compressed air into the oil hole of the O/D case to remove the brake piston.
SST 09350–36010(09350–06020)

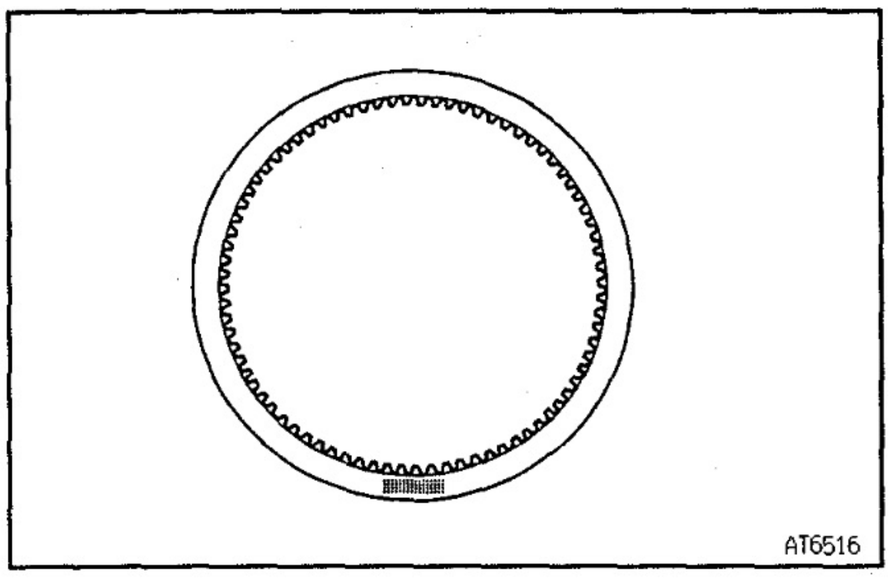
(c) Remove the two O–rings from the brake piston.



15. REMOVE OIL SEAL RINGS

Remove the two oil seal rings from the O/D case.

AT


AT6516

AT081-01

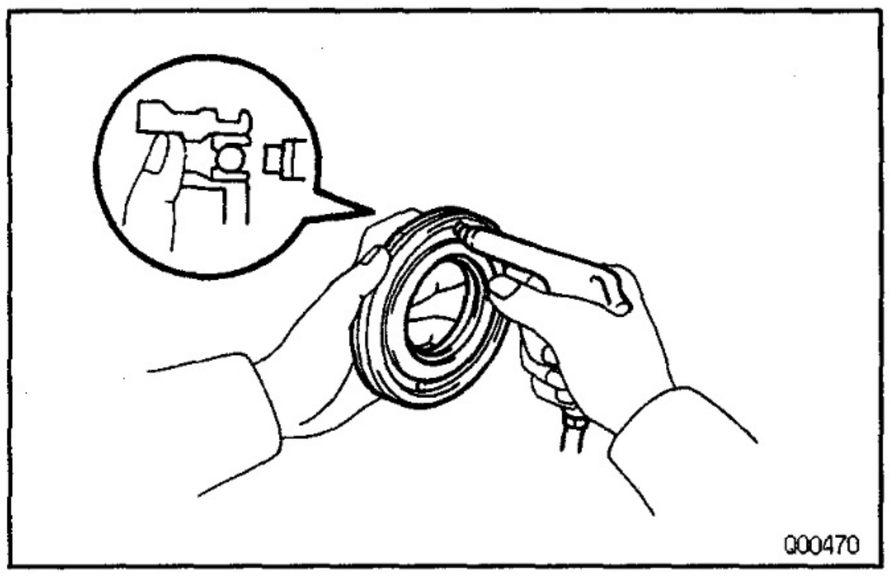
OVERDRIVE UNIT INSPECTION

1. INSPECT DISCS, PLATES AND FLANGE

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

HINT:

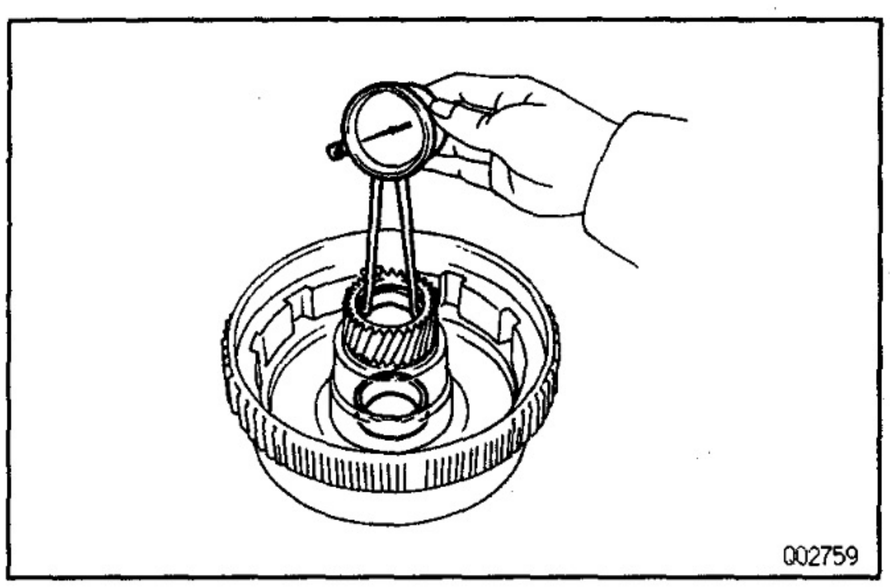
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.


Q00470

2. INSPECT 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.


Q02759

3. INSPECT BUSHINGS OF OVERDRIVE DIRECT CLUTCH DRUM

Using a dial indicator, measure the inside diameter

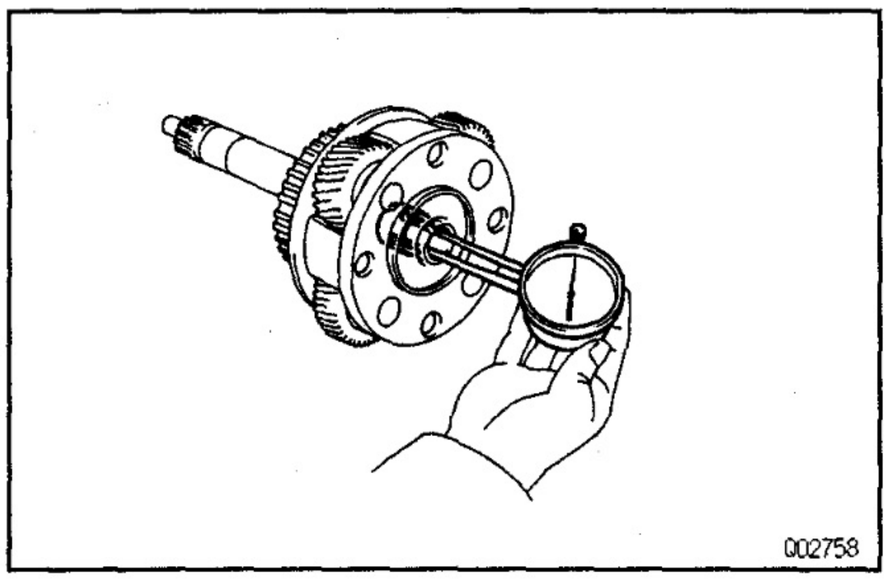
Standard inside diameter:

26.500–26.521 mm (1.0433–1.0441 in.)

Maximum inside diameter;

26.57 mm (1.0461 in.)

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


Q02758

4. INSPECT BUSHINGS OF OVERDRIVE PLANETARY GEAR

Using a dial indicator, measure the inside diameter.

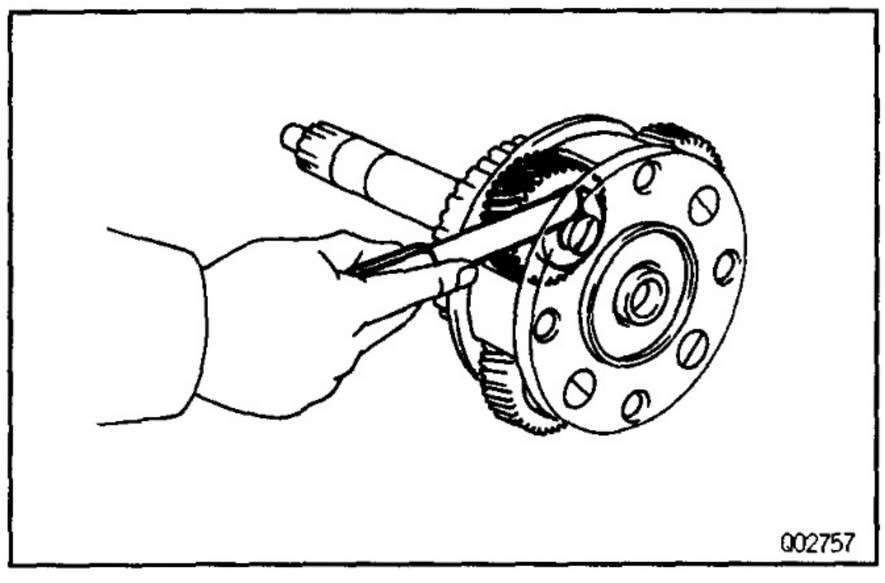
Standard inside diameter:

12.000–12.018 mm (0.4724–0.4731 in.)

Maximum inside diameter:

12.070 mm (0.4752 in.)

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


002757

5. INSPECT PLANETARY PINION GEAR THRUST CLEARANCE

Using a feeler gauge, measure the clearance between the pinions and carrier.

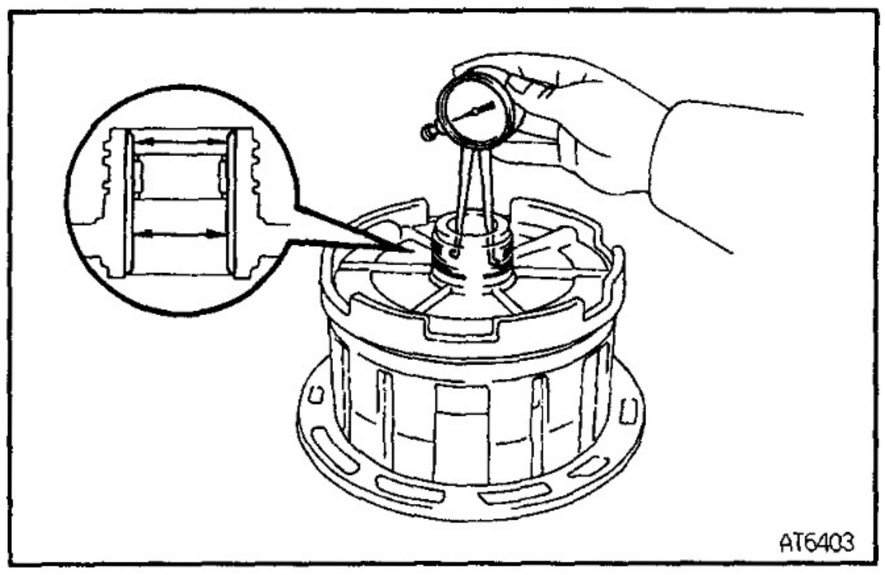
Standard clearance:

0.20–0.59 mm (0.0079–0.0232 in.)

Maximum clearance:

0.80 mm (0.0315 in.)

If the thrust clearance is grater than maximum, replace the planetary gear.


AT6403

6. INSPECT BUSHING OF OVERDRIVE CASE

Using a dial indicator, measure the inside diameter.

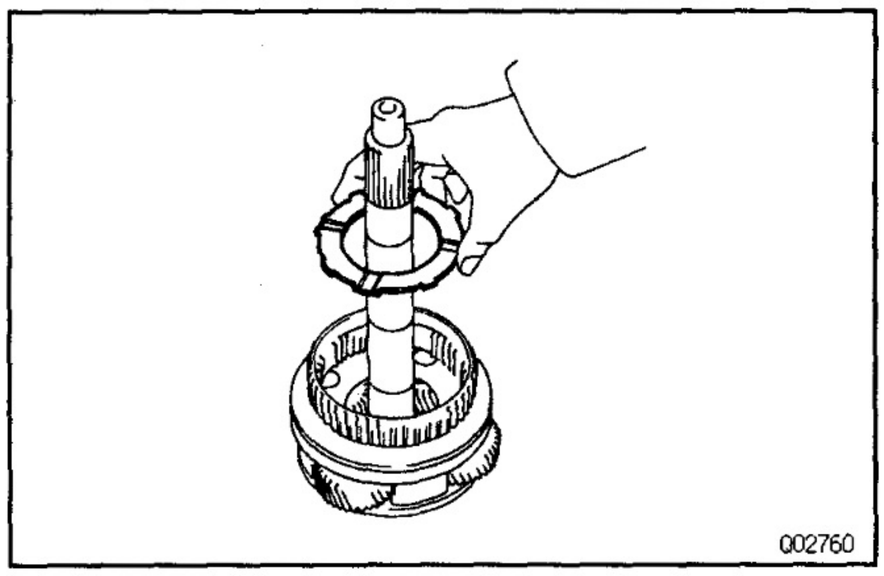
Standard inside diameter:

33.10–33.50 mm (1.3031–1.3189 in.)

Maximum inside diameter:

33.20 mm (1.3071 in.)

If the inside diameter is greater than the maximum, replace the O/D case.

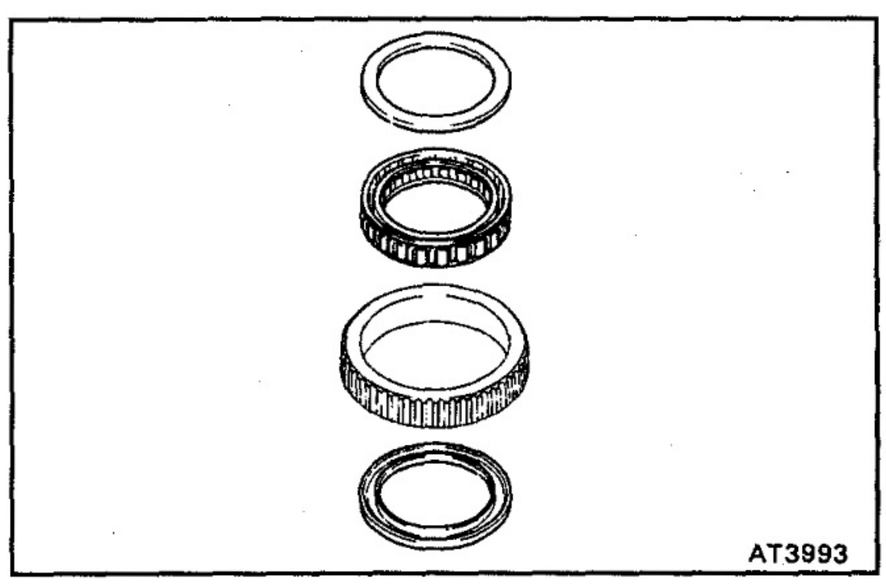

002760

OVERDRIVE UNIT ASSEMBLY

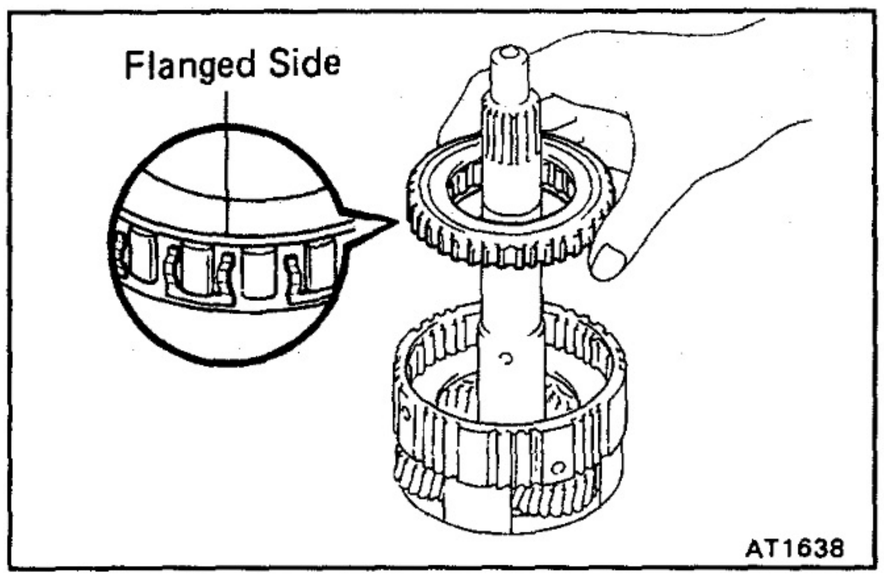
AT082–02

1. INSTALL ONE – WAY CLUTCH TO OVERDRIVE PLANETARY GEAR

(a) Install the No.3 thrust washer, facing the grooved side upward.

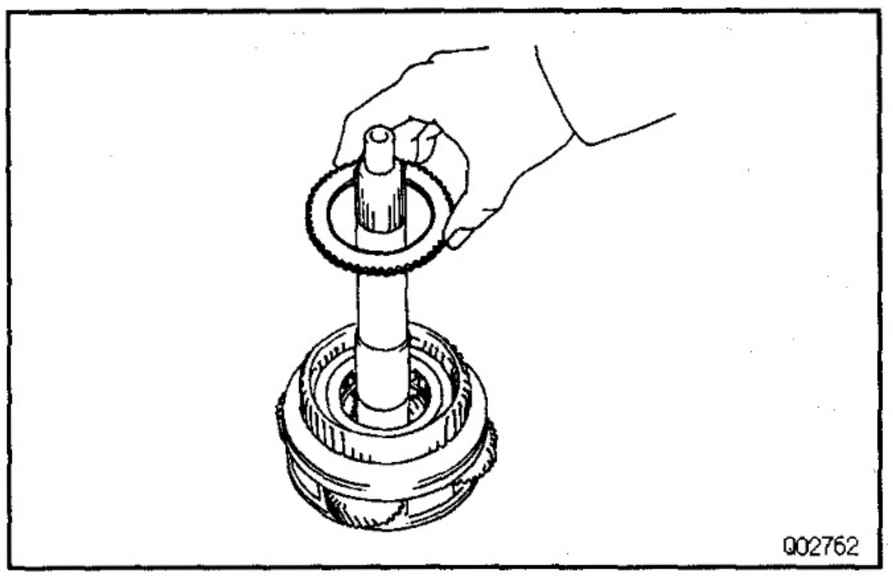

AT3993

(b) Install the one–way clutch and two retainers into the outer race.

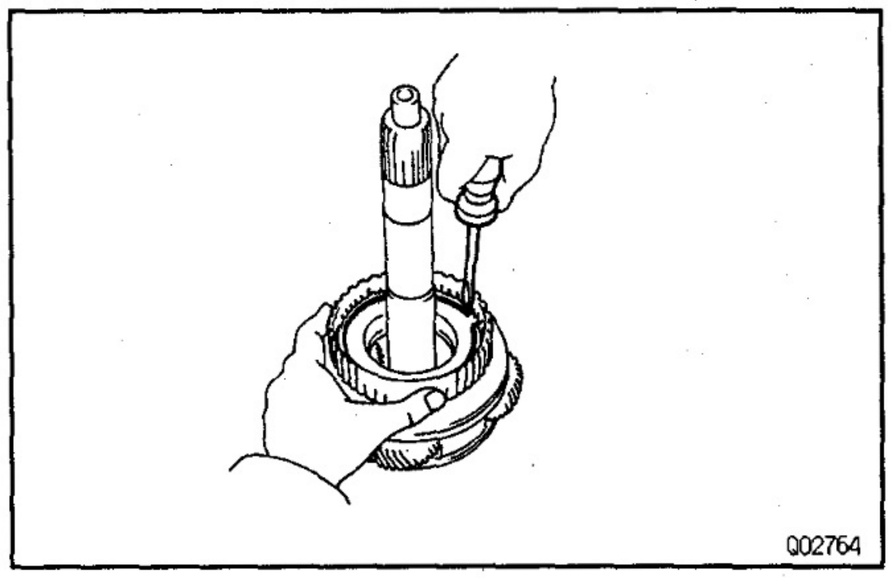


AT1638

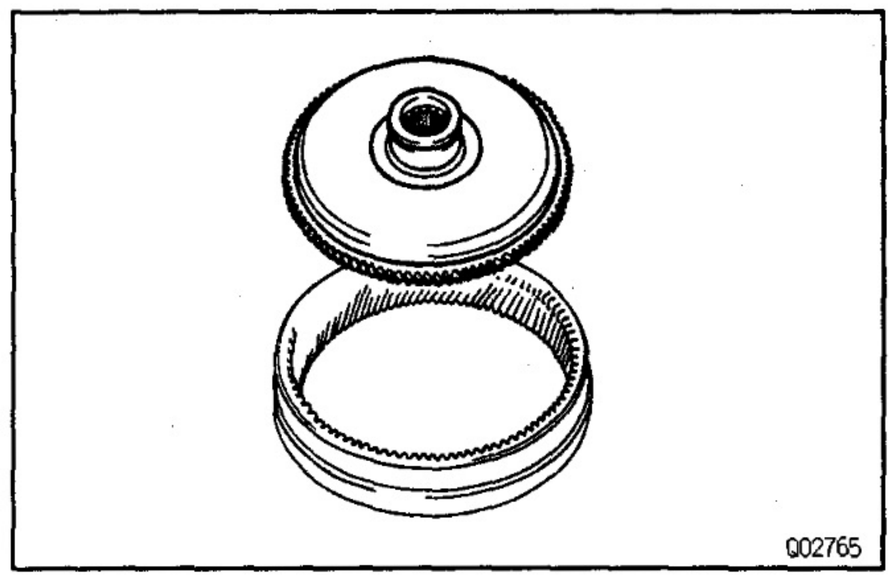
(c) Install the one–way clutch and outer race assembly, facing the flanged side of the one–way clutch upward.



(d) Install the No.4 thrust washer.

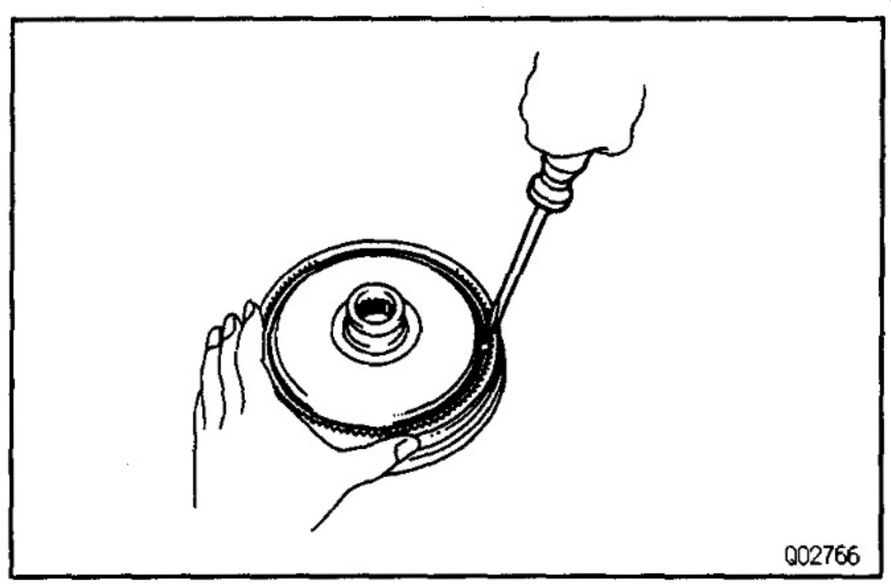


(e) Using a screwdriver, install the snap ring.

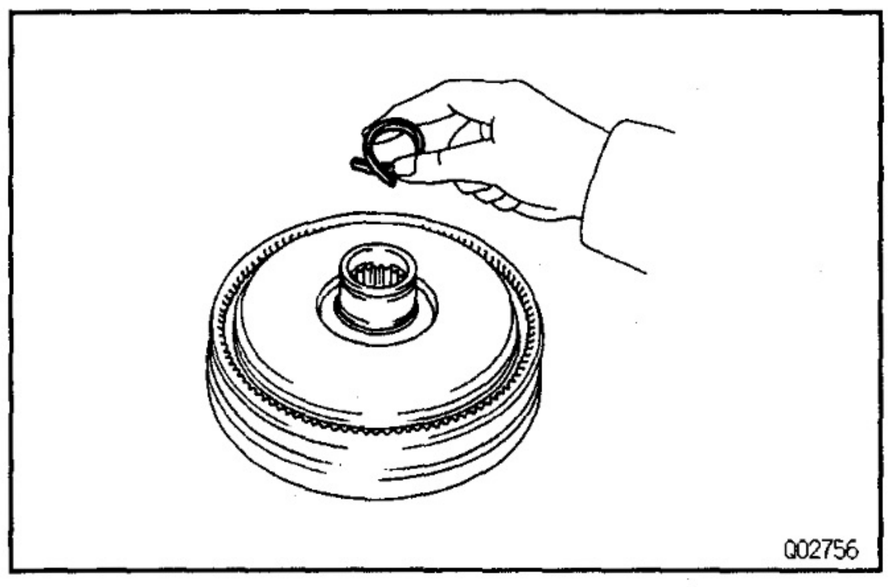


2. INSTALL RING GEAR FLANGE TO OVERDRIVE PLANETARY RING GEAR

(a) Install the gear flange as shown.



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

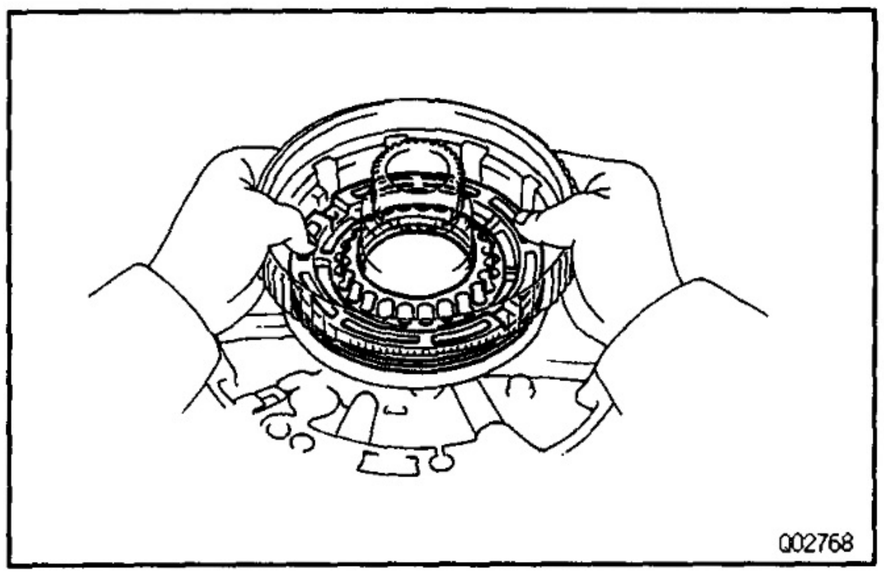


3. INSTALL OIL SEAL RING

Coat the oil seal ring with ATF, and install it to the ring gear flange.

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

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

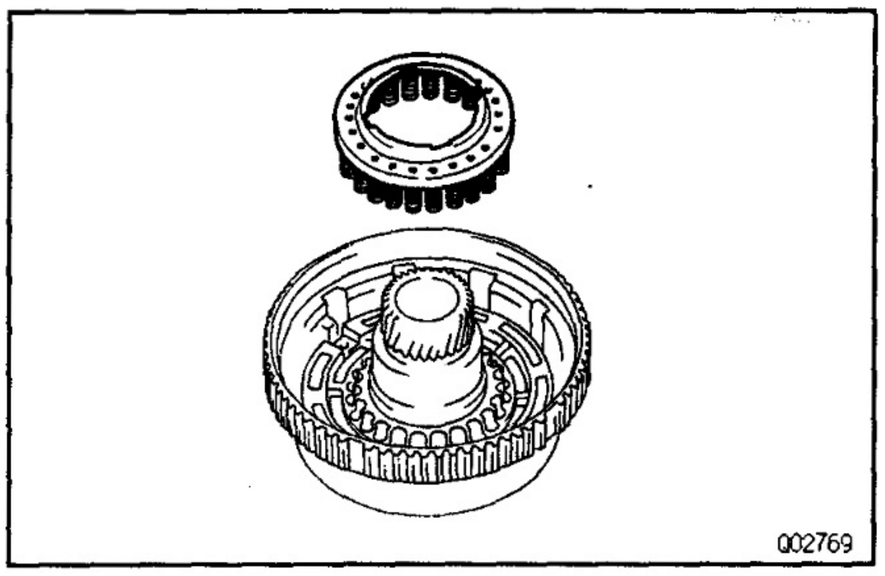


4. INSTALL OVERDRIVE DIRECT CLUTCH PISTON

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

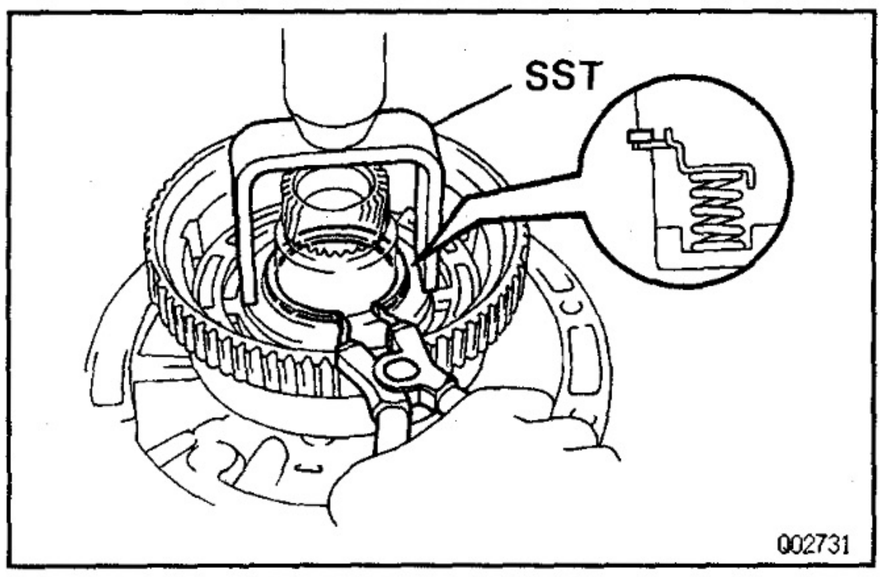
(b) Push in the clutch piston into the clutch drum with both hands.

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



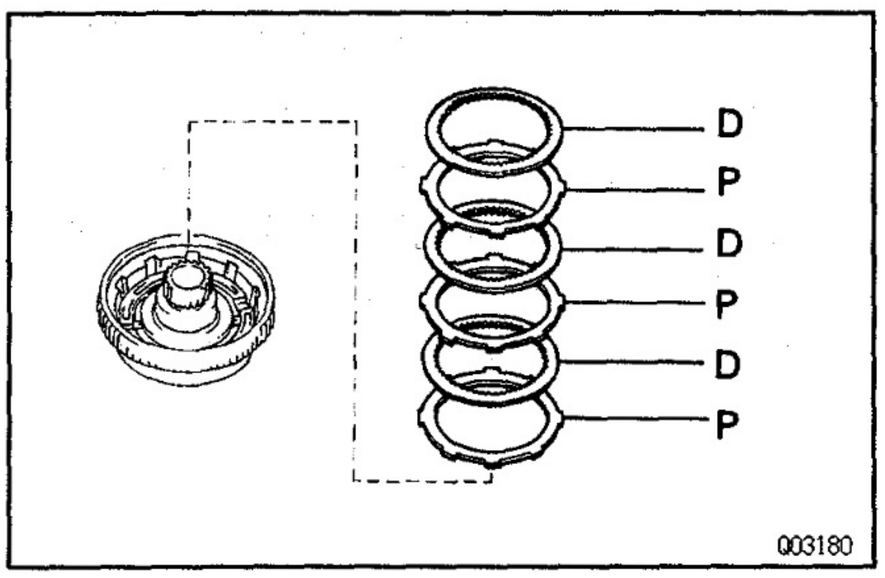
5. INSTALL PISTON RETURN SPRING

(a) Place the piston return spring on the clutch piston.



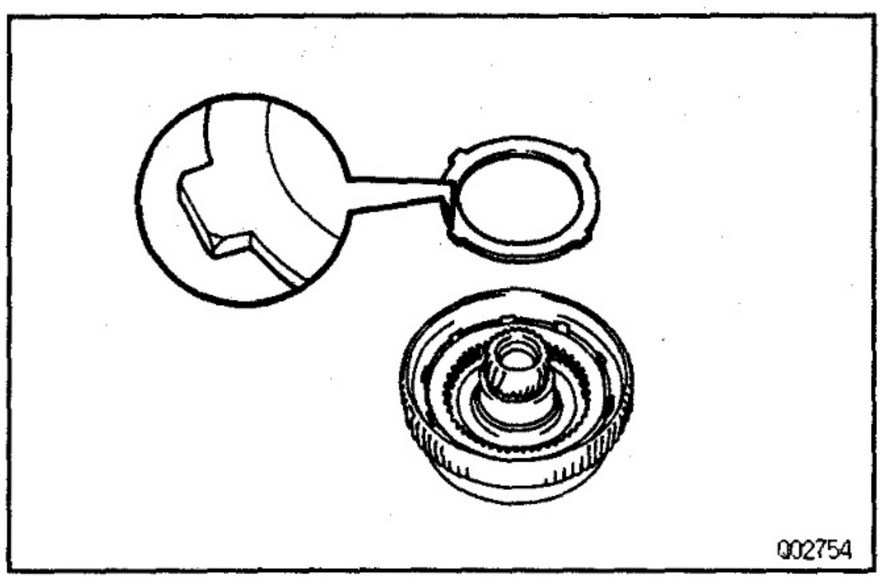
(b) Place SST on the spring seat, and compress the return spring with a shop press
SST 09350—36010(09350—06010)

(c) Using snap ring pliers, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the spring retainer claw.

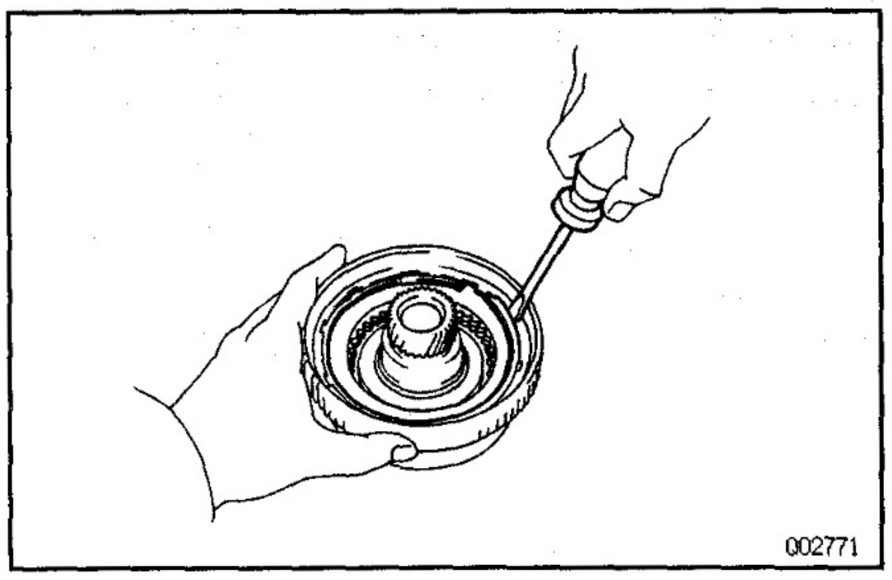


6. INSTALL PLATES, DISCS AND FLANGE

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

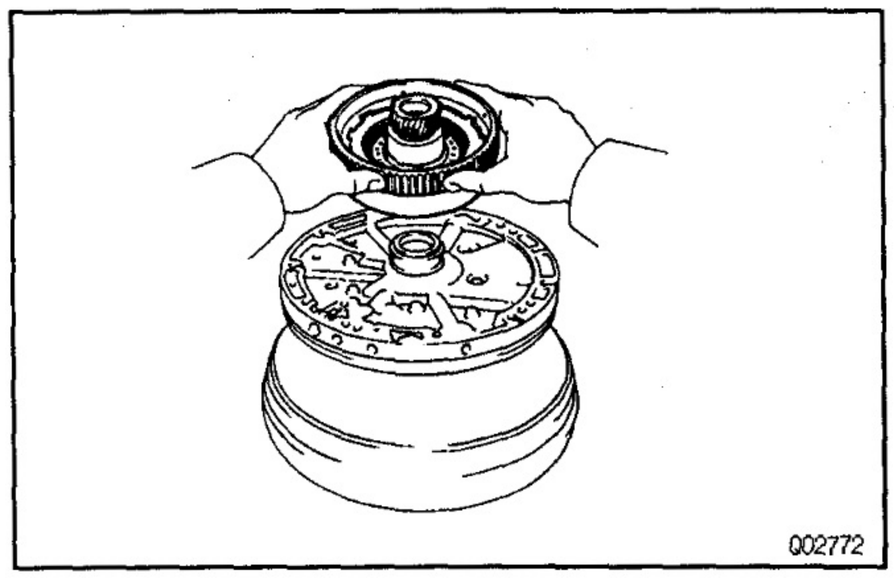


(b) Install the flange, fasing the rounded edge upward.



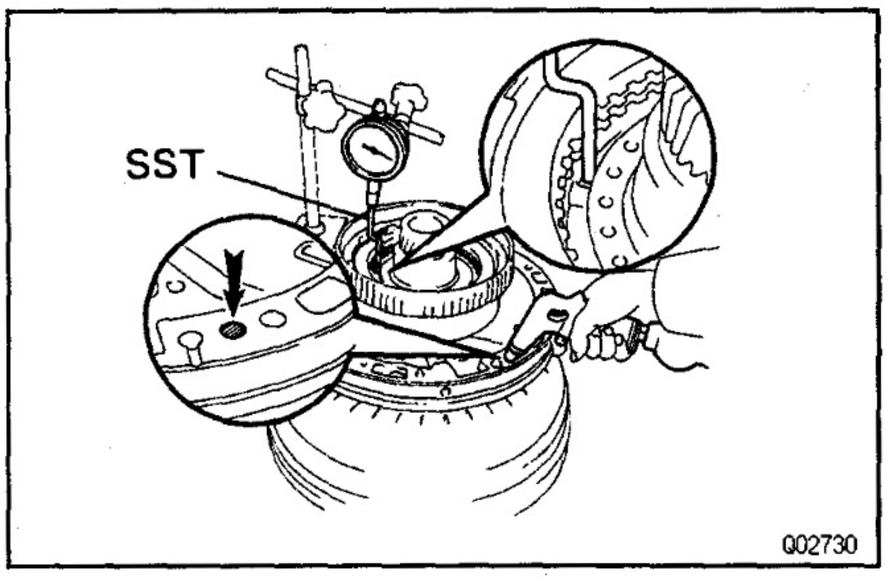
(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the cutout portion of the clutch drum.

AT



7. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

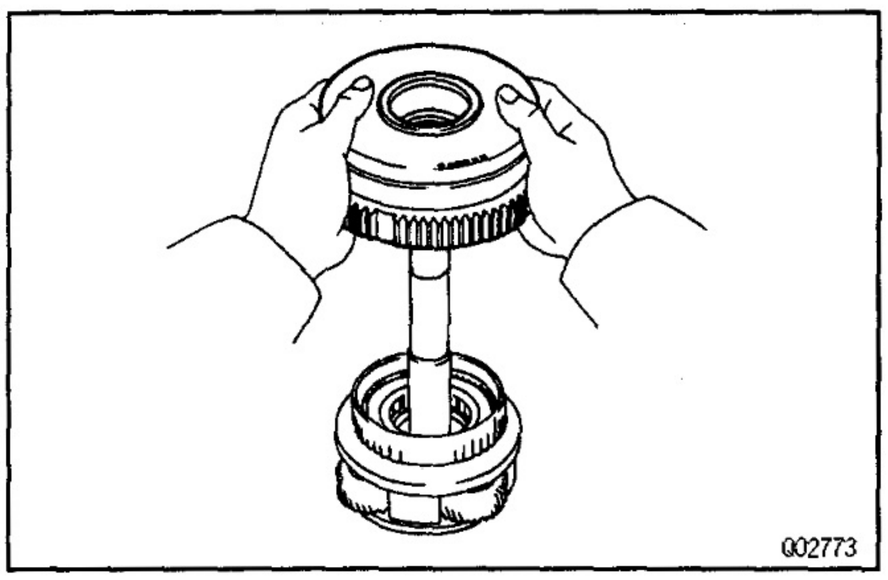
(a) Place the oil pump onto the torque converter, and then place the O/D direct clutch assembly onto the oil pump.



(b) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392 – 785 kPa (4 – 8kgf/cm², 57 – 114 psi) as shown.
SST 09350 – 36010(09350 – 06110)
Piston stroke:

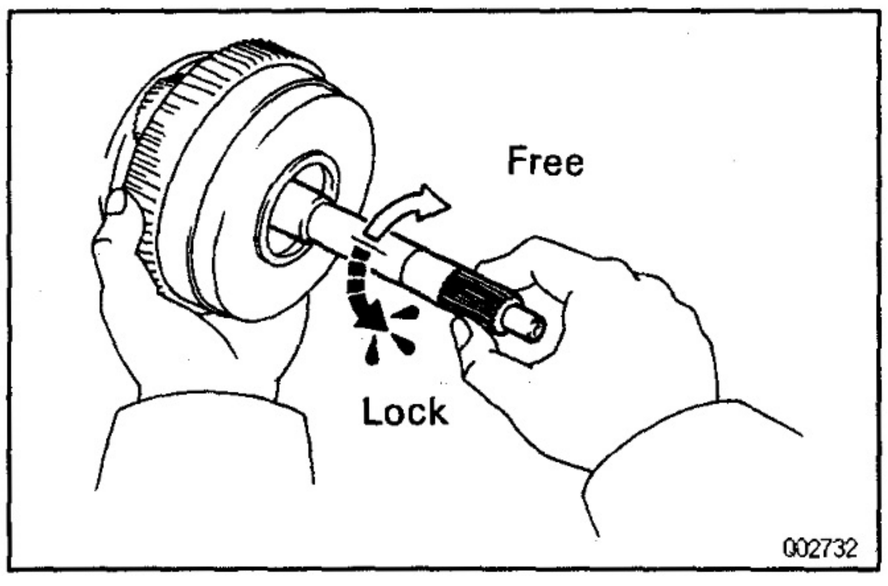
1.80 – 2.00 mm (0.0709 – 0.0787 in.)

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



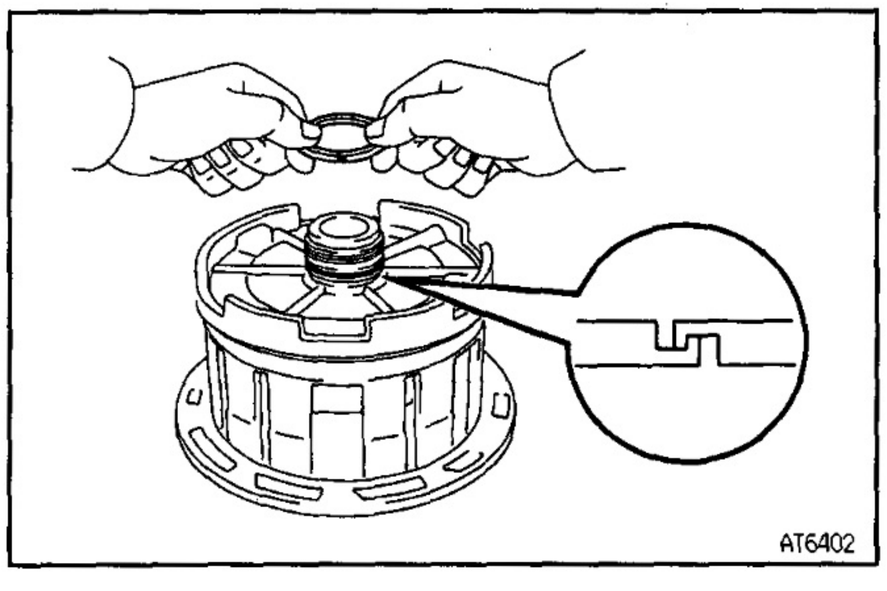
8. INSTALL OVERDRIVE DIRECT CLUTCH ASSEMBLY

Install the direct clutch assembly onto the O/D planetary gear.
HINT: Mesh the spline of the O/D planetary gear with the flukes of the discs by rotating and pushing the O/D direct clutch counterclockwise.



9. CHECK OPERATION OF ONE – WAY CLUTCH

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



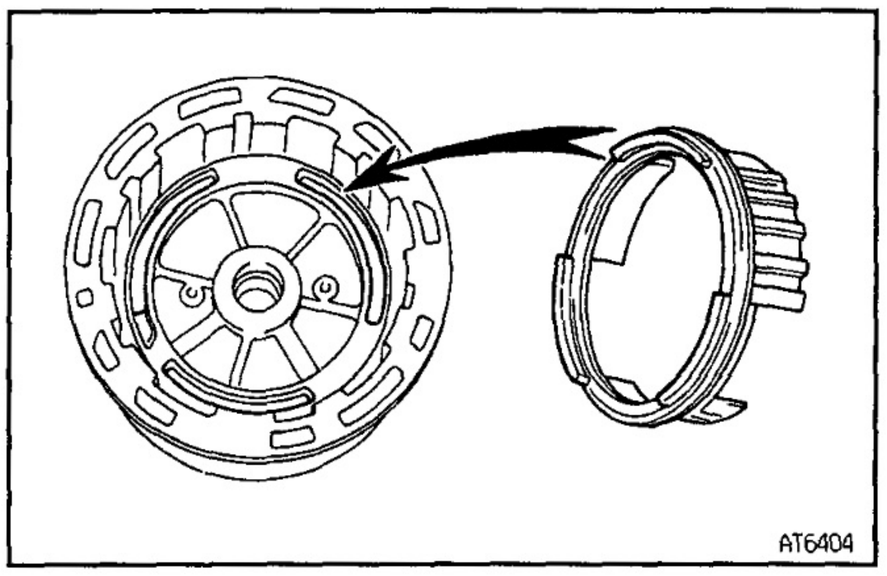
10. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seals, and install them onto the O/D case.

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

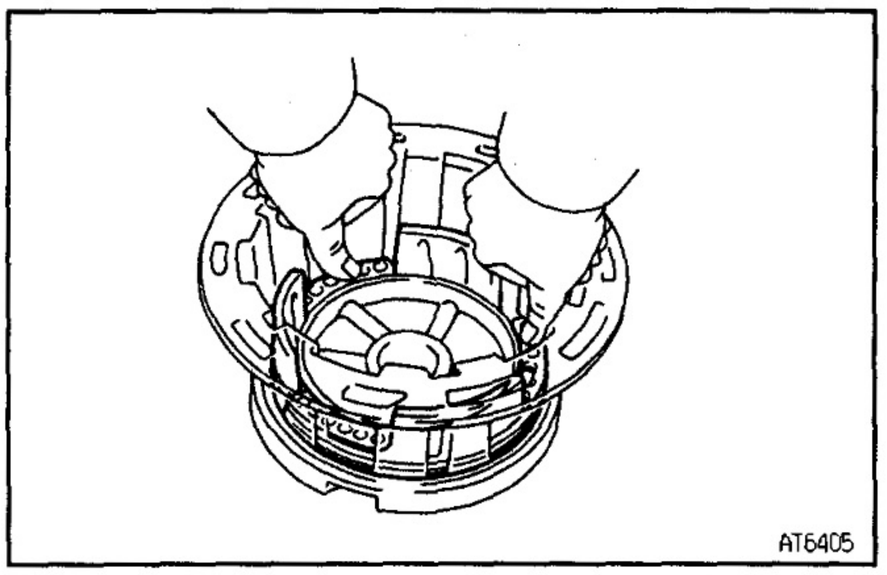
HINT: After installing the oil seal rings, check that they rotate smoothly.



11. INSTALL OVERDRIVE BRAKE PISTON

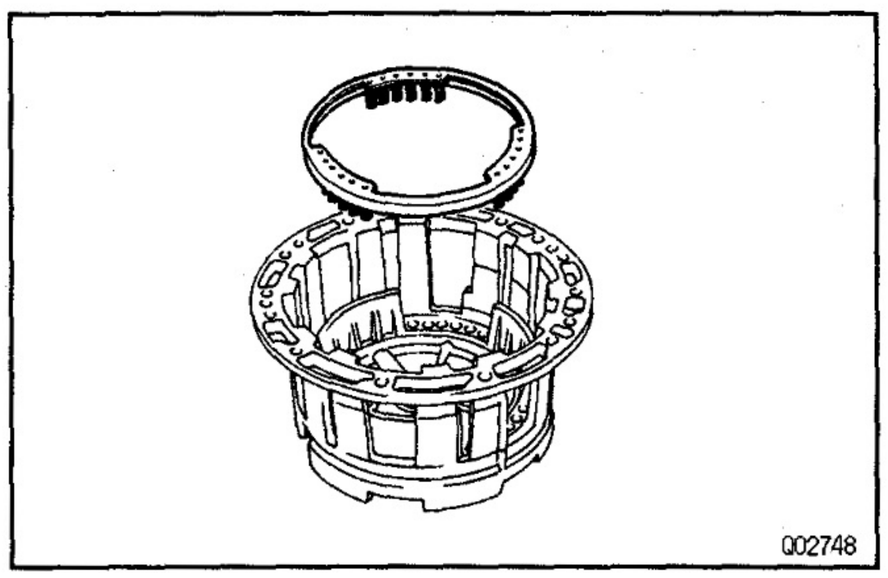
(a) Coat new two O–rings with ATF, and install them on the brake piston.

(b) Align the protrusions of the brake piston with the grooves of the O/D case.



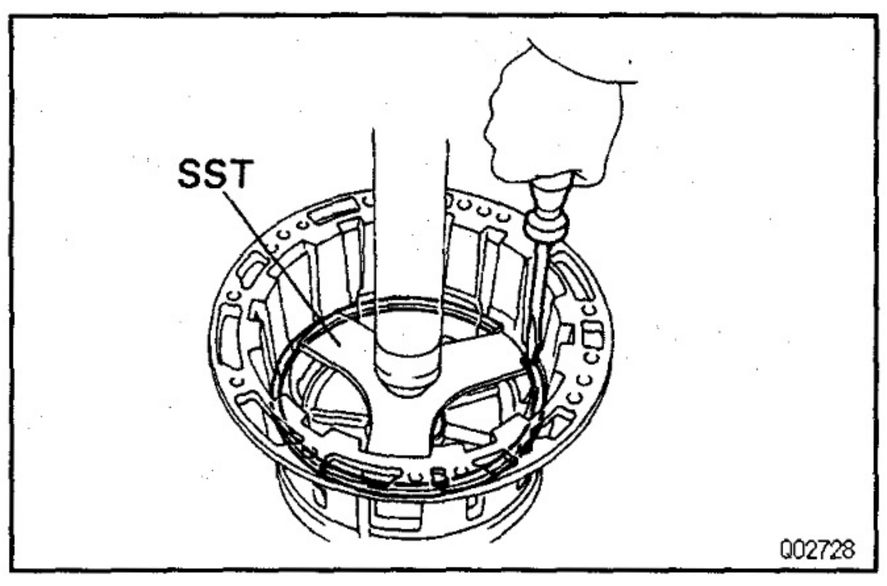
(c) Push in the brake piston into the O/D case with both hands.

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



12. INSTALL PISTON RETURN SPRING

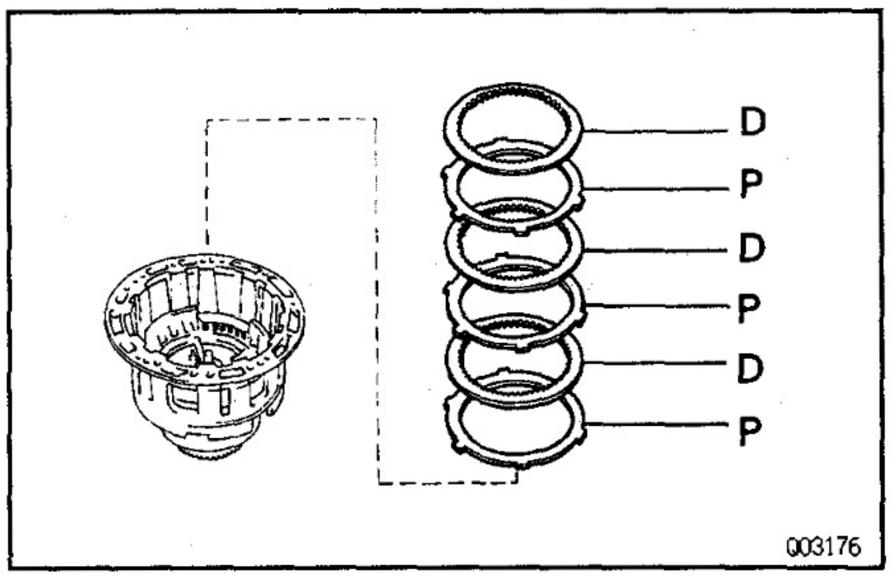
(a) Place the return spring on the brake piston.



(b) Place SST on the spring on the spring seat, and compress the return spring with a shop press.
SST 09350–36010(09350–06020)

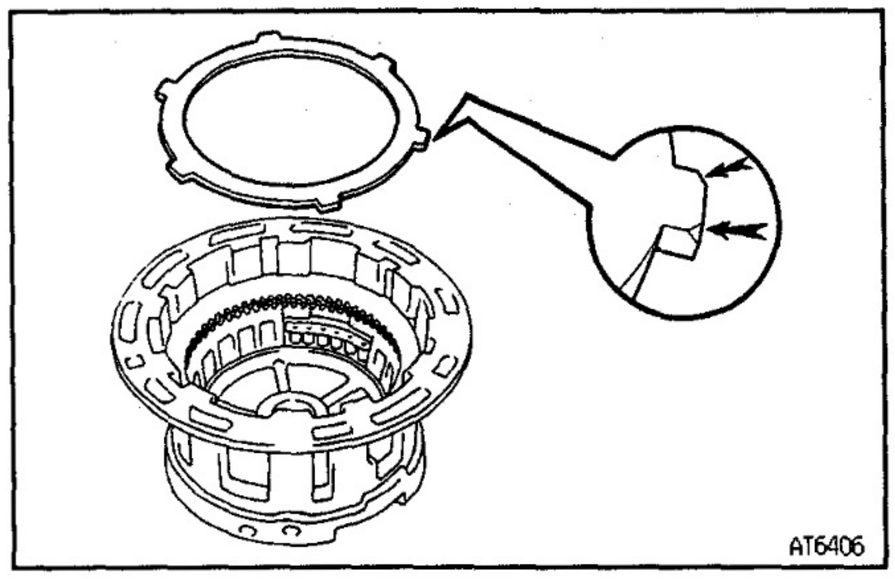
(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring in not aligned with the cutout portion of the O/D case.

AT

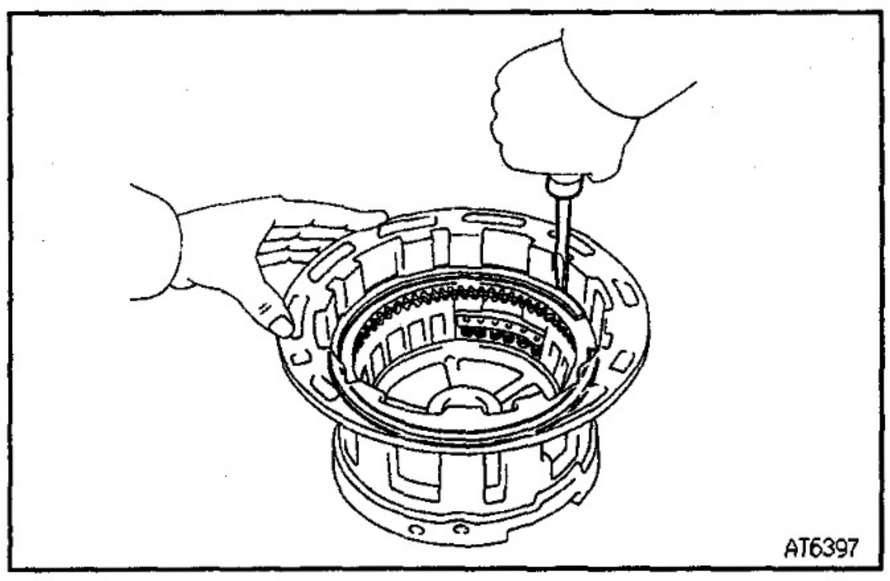


13. INSTALL PLATES, DISCS AND FLANGE

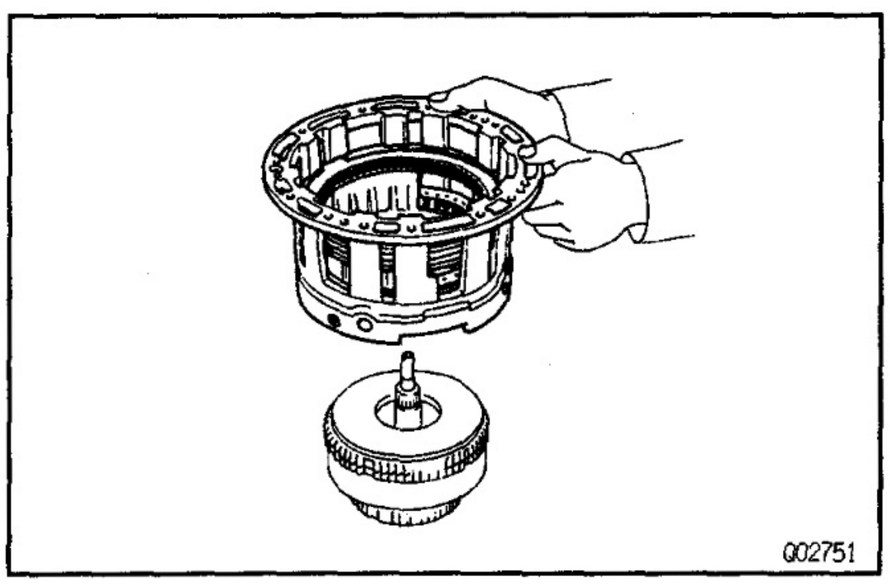
(a) Install the three plates and three discs in order:
P = Plate D = Disc
P–D–P–D–P–D



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

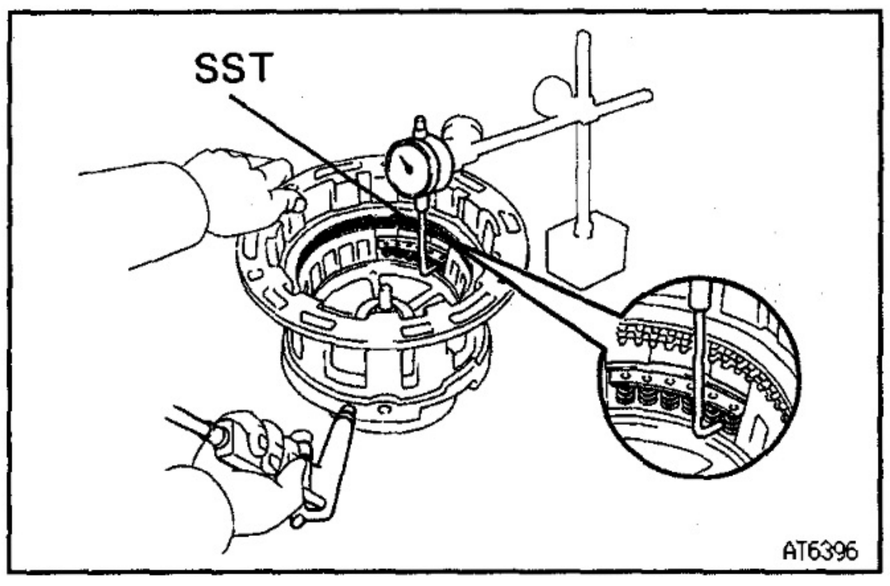


(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the cutout portion of the O/D case.



14. CHECK PISTON STROKE OF OVERDRIVE BRAKE

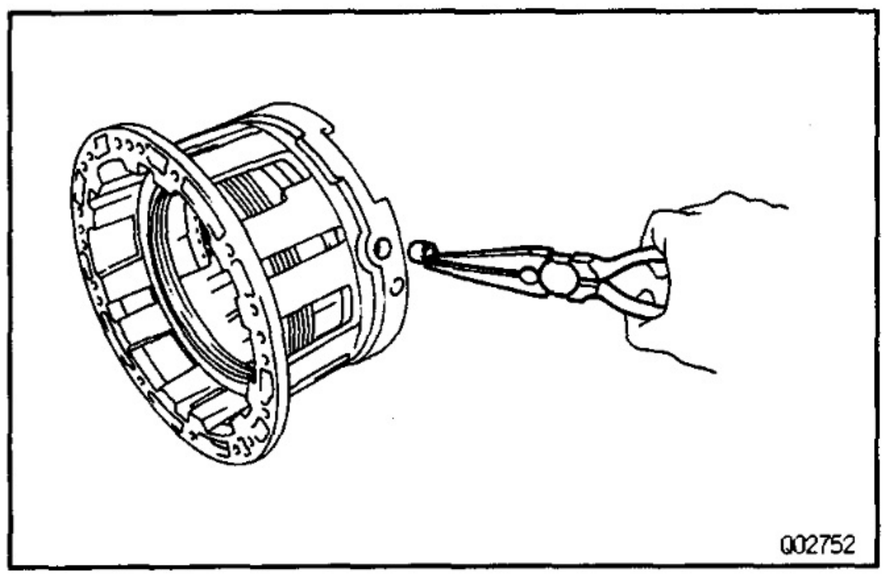
(a) Place the O/D case assembly onto the rear clutch assembly.



(b) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi) as shown.
SST 09350–36010(09350–06120)
Piston stroke:

1.25–1.85 mm (0.0492–0.0728 in.)

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

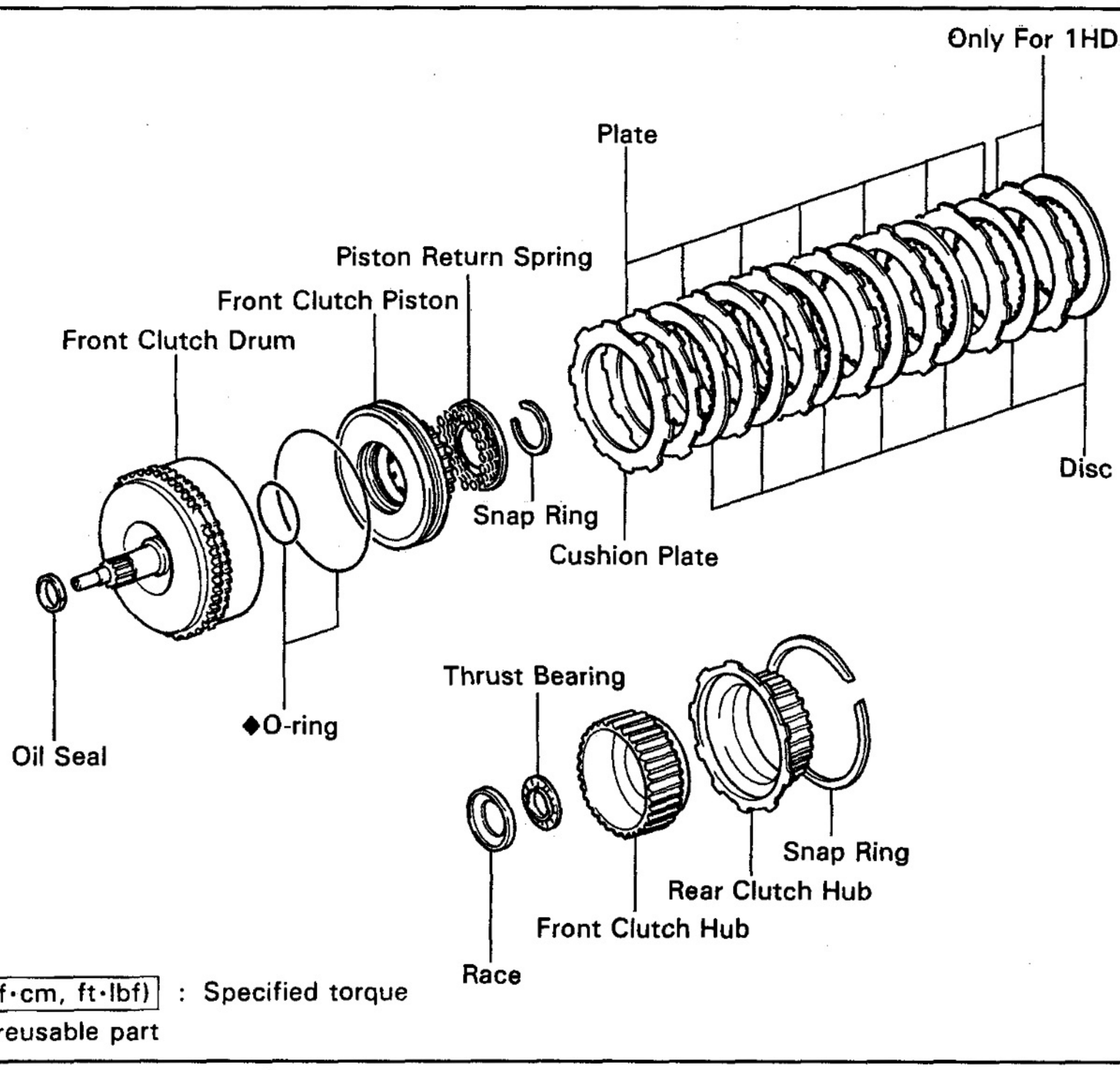


15. INSTALL RING RETAINERS

Using needle nose pliers, install the three ring retainers into the oil holes of the O/D case.

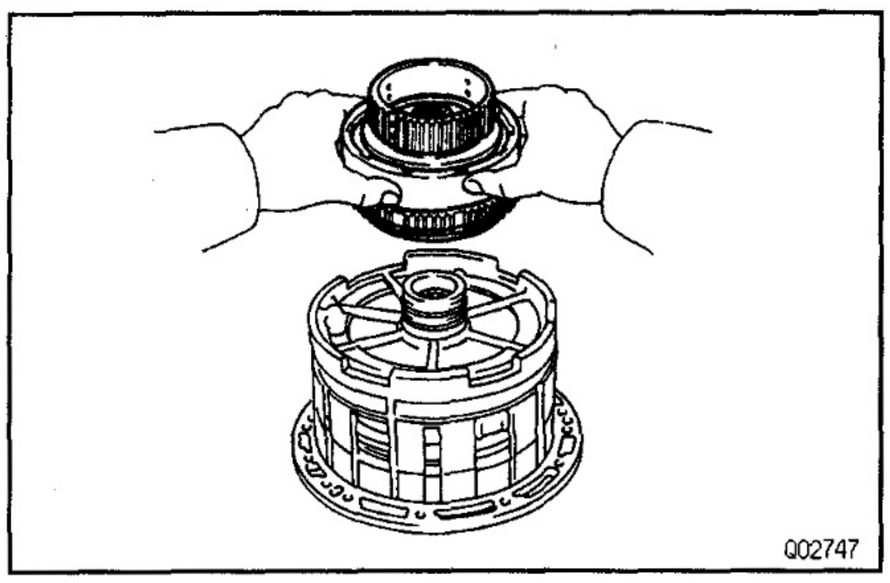
FRONT CLUTCH
COMPONENTS

AT083–02



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

003191

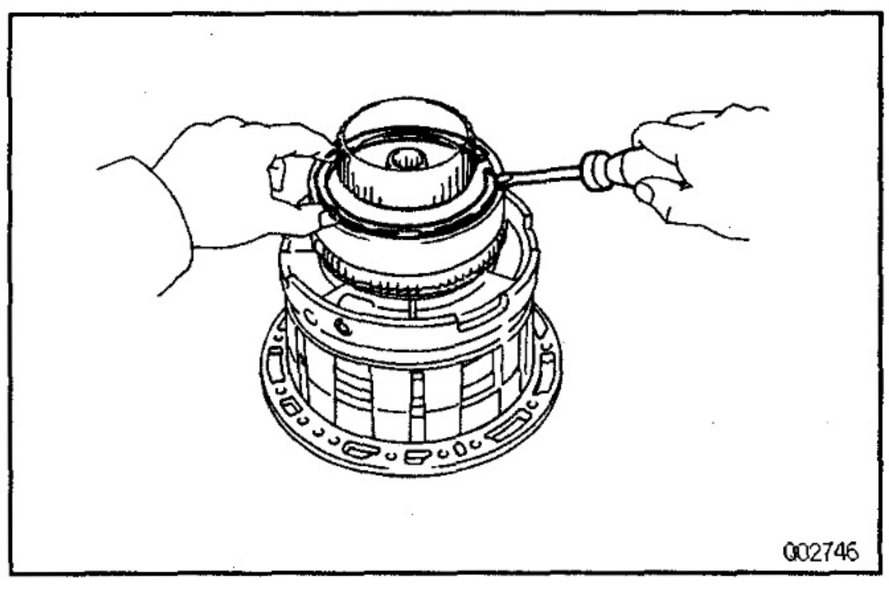


Q02747

AT084–02

FRONT CLUTCH DISASSEMBLY

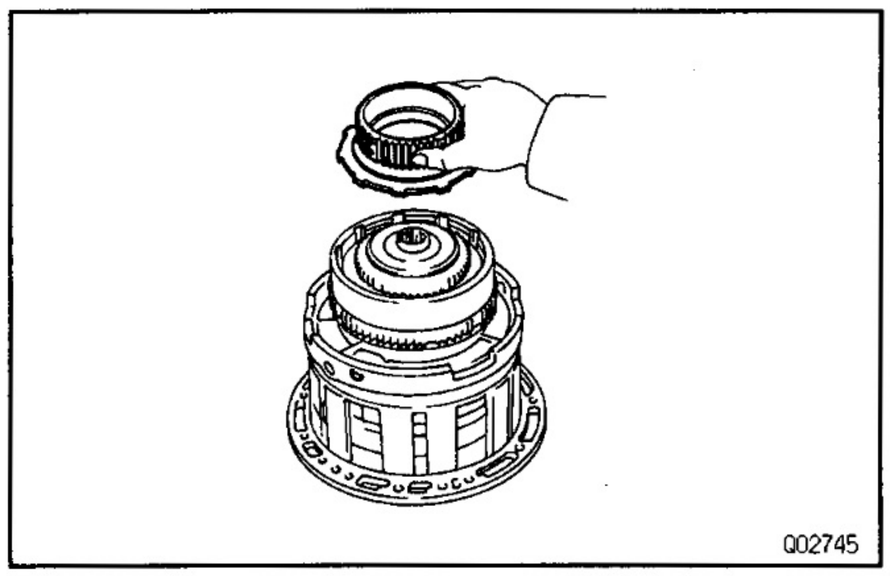
1. PLACE FRONT CLUTCH ASSEMBLY ONTO OVER-DRIVE CASE ASSEMBLY



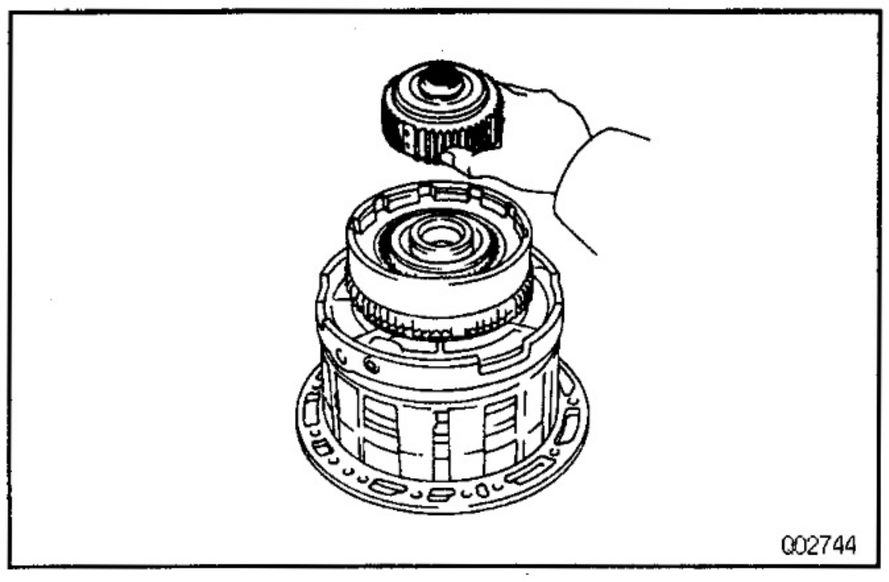
Q02746

2. REMOVE REAR AND FRONT CLUTCH HUBS

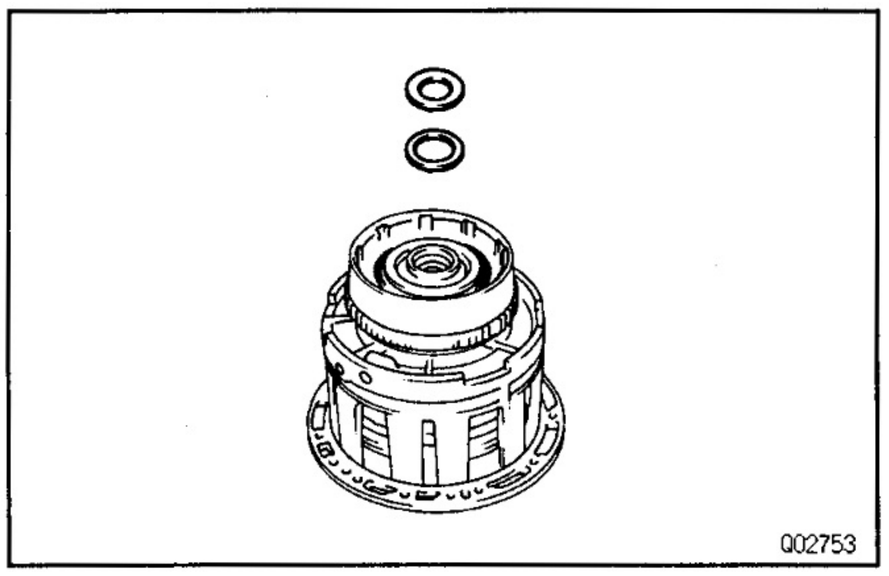
(a) Using a screwdriver, remove the snap ring.


Q02745

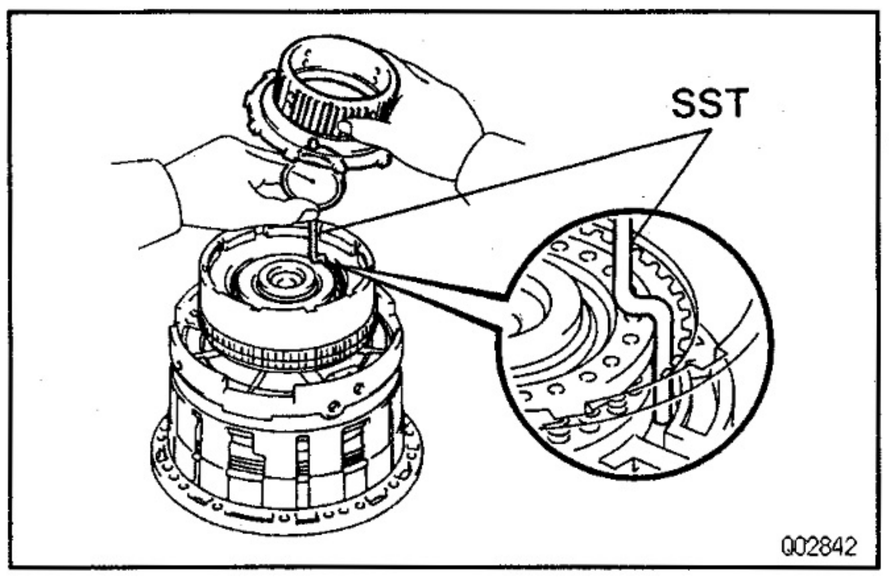
(b) Remove the rear clutch hub.


Q02744

(c) Remove the front clutch hub.


Q02753

(d) Remove the race and thrust bearing.



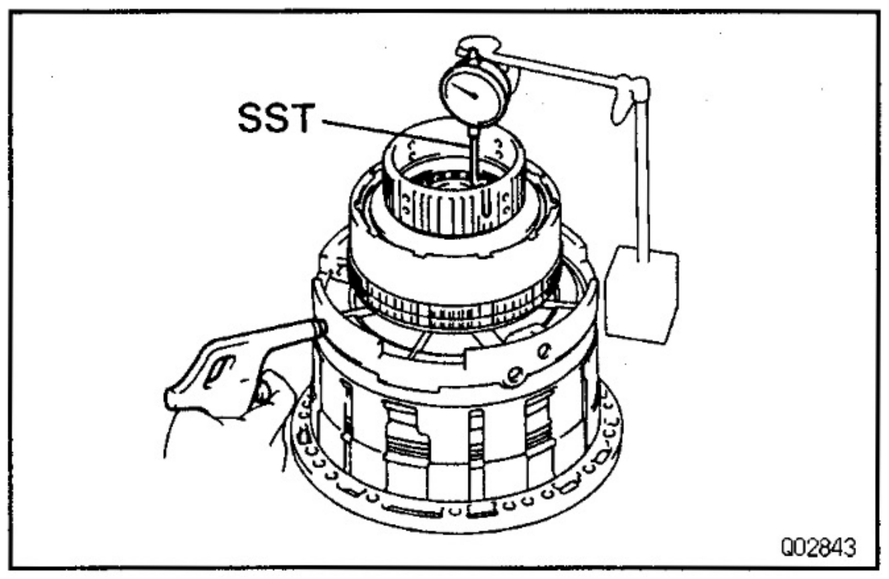
Q02842

3. CHECK PISTON STROKE OF FRONT CLUTCH

(a) Install SST to a dial indicator.
SST 09350–36010(09350–06110)

(b) Place the assembled SST and a dial indicator on the clutch piston.

(c) Install the rear clutch hub with the snap ring.



Q02843

(d) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi) as shown.
SST 09350–36010(09350–06110)

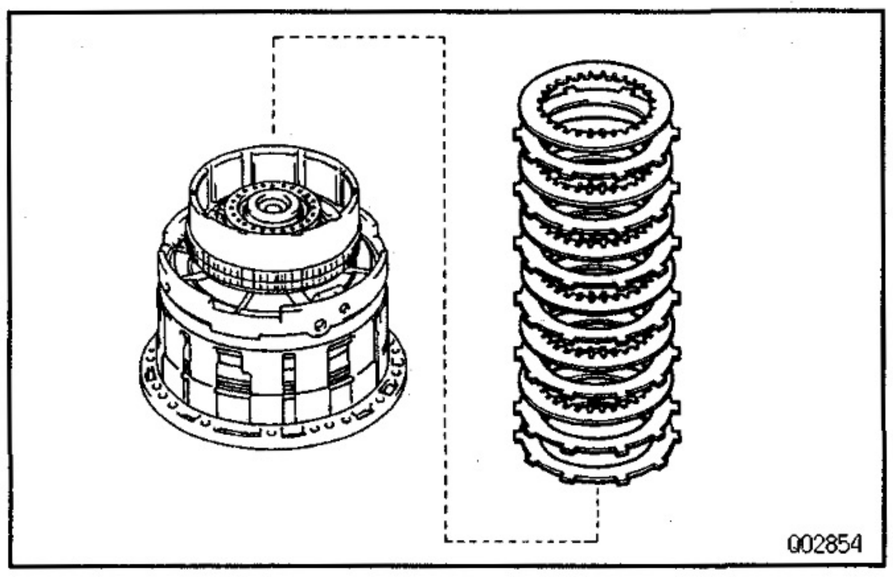
Piston stroke:

3.93–4.23 mm (0.1547–0.1665 in.)

If the piston stroke is grater than specified, inspect the discs.

(e) Remove the snap ring and rear clutch hub.

AT



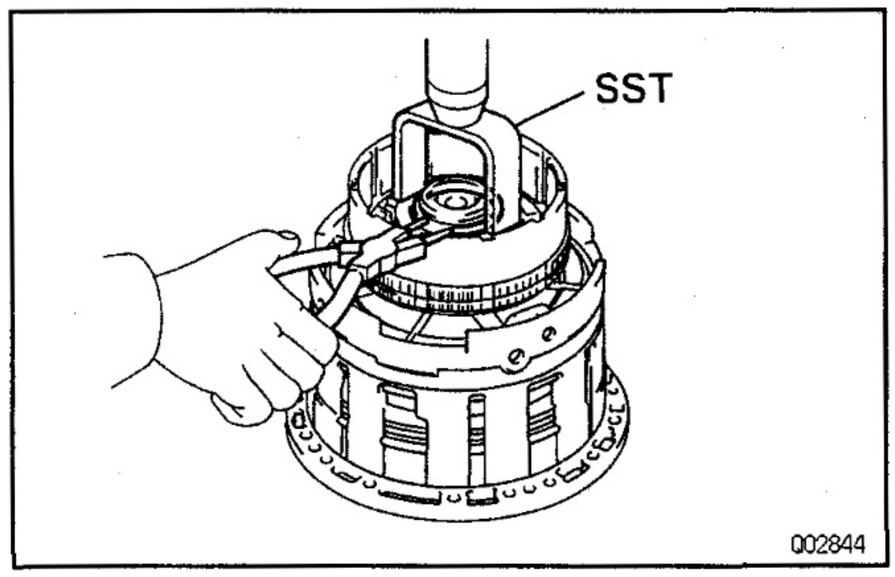
4. REMOVE DISCS, PLATES AND CUSHION PLATE

(1FZ–FE Engine)

Remove the six discs, six plates and cushion plate.

(1HD–T Engine)

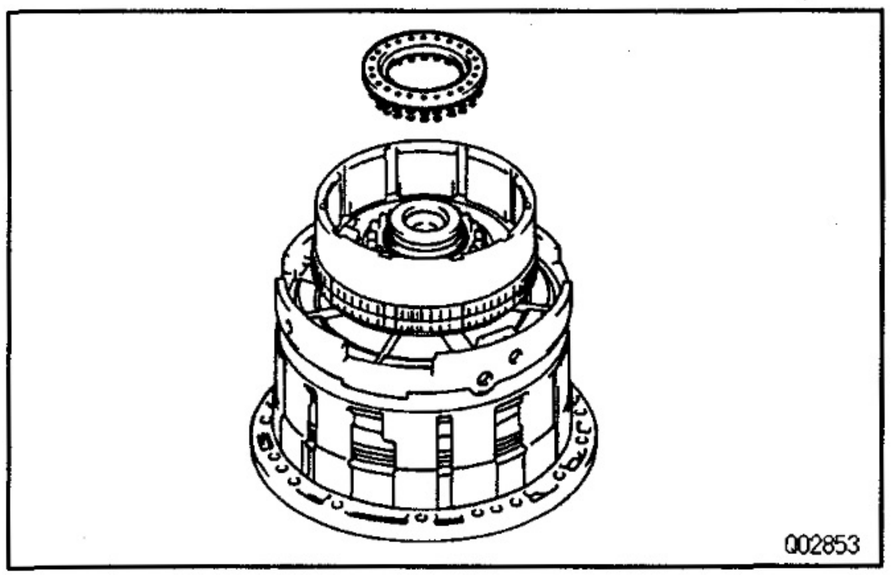
Remove the seven discs, seven plates and cushion plate.



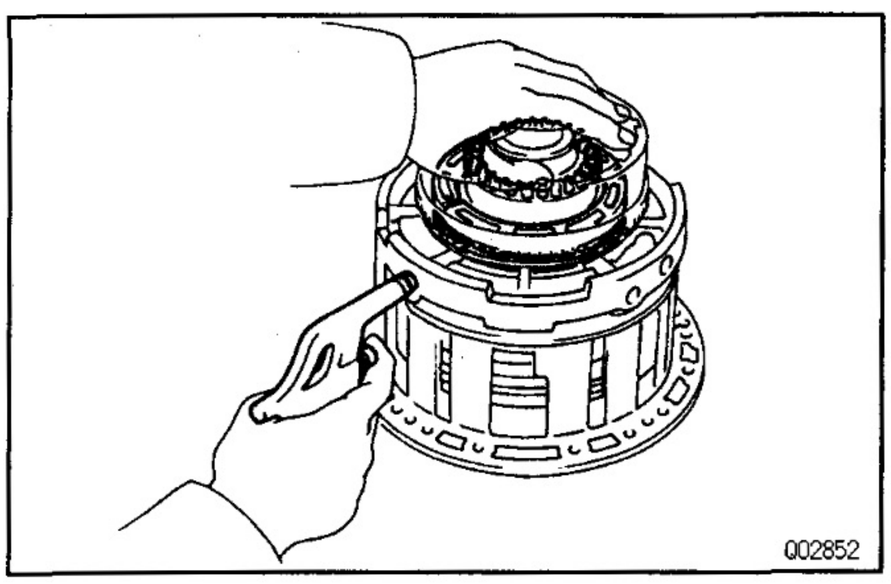
5. REMOVE PISTON RETURN SPRINGS

(a) Place SST on the spring seat, and compress the return springs with a shop press.
SST 09350–36010(09350–06010)

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



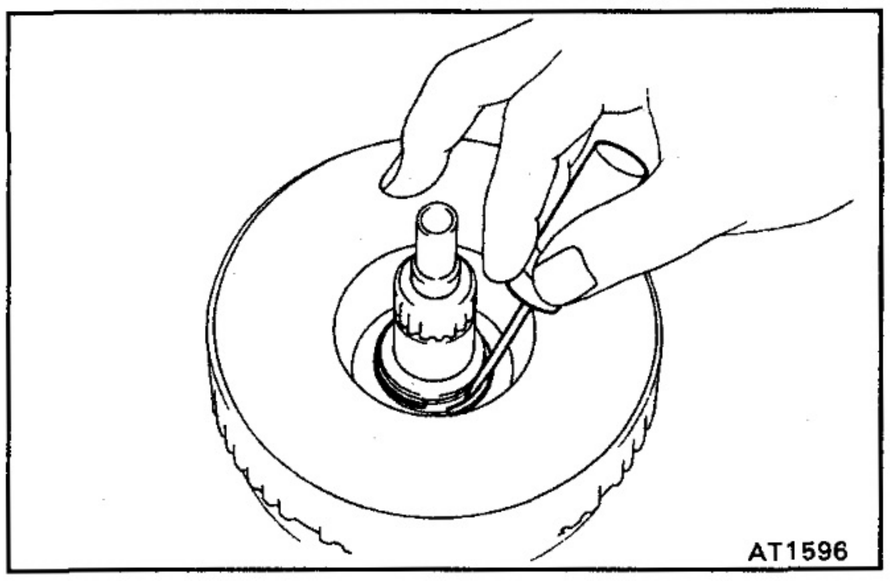
(c) Remove the piston return spring.



6. REMOVE FRONT CLUTCH PISTON

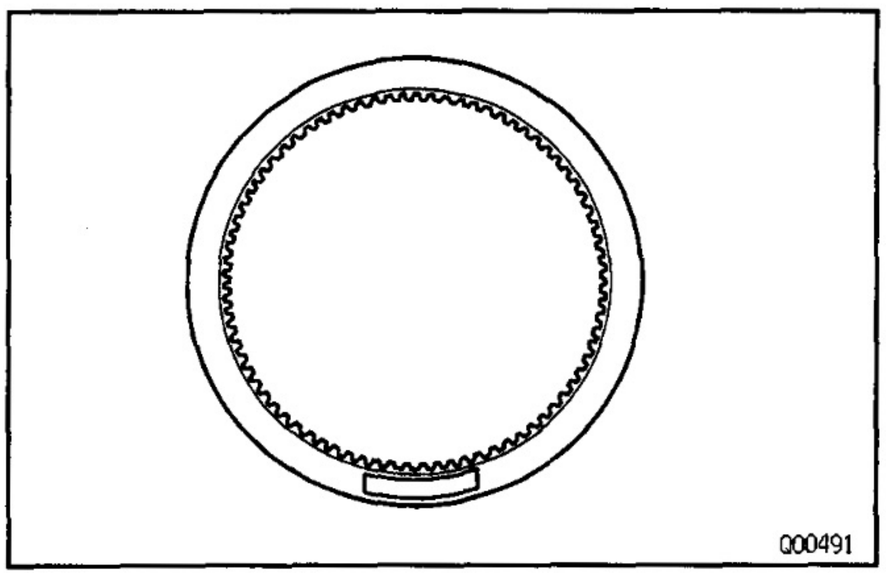
(a) Hold the clutch piston by hand, apply compressed air into the oil hole of the O/D case to remove the clutch piston.

(b) Remove the two O–rings from the clutch piston.



7. REMOVE OIL SEAL RING

Using a small screwdriver, remove the oil seal ring from the clutch drum.


Q00491

AT0B5–01

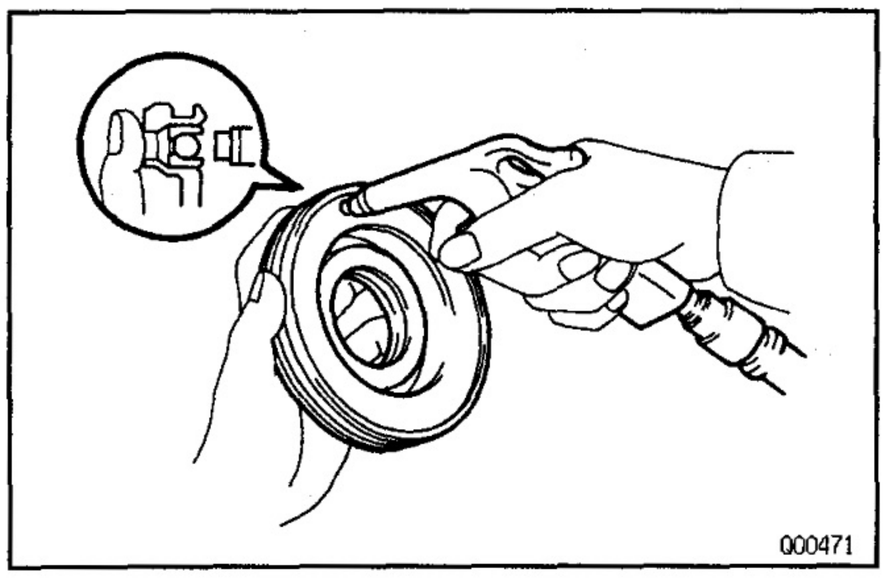
FRONT CLUTCH INSPECTION

1. INSPECT DISCS, PLATES AND CUSHION PLATE

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

HINT:

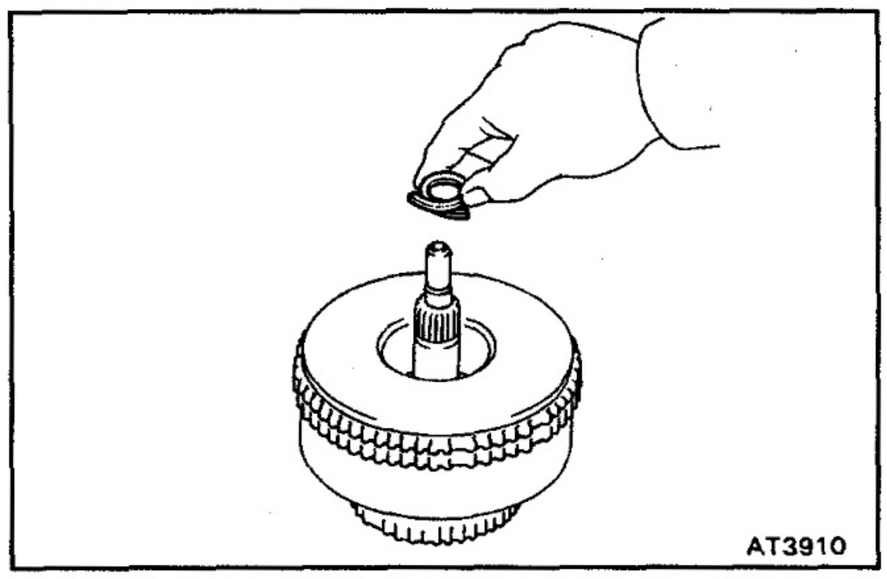
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.


Q00471

2. INSPECT FRONT 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.


AT3910

AT0A9–01

FRONT CLUTCH ASSEMBLY

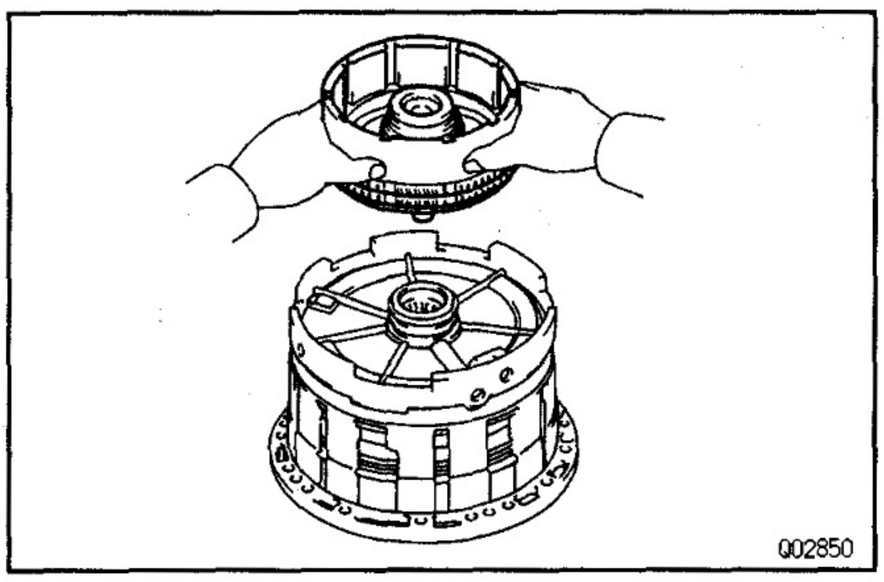
1. INSTALL OIL SEAL RING

(a) Coat the oil seal ring with ATF.

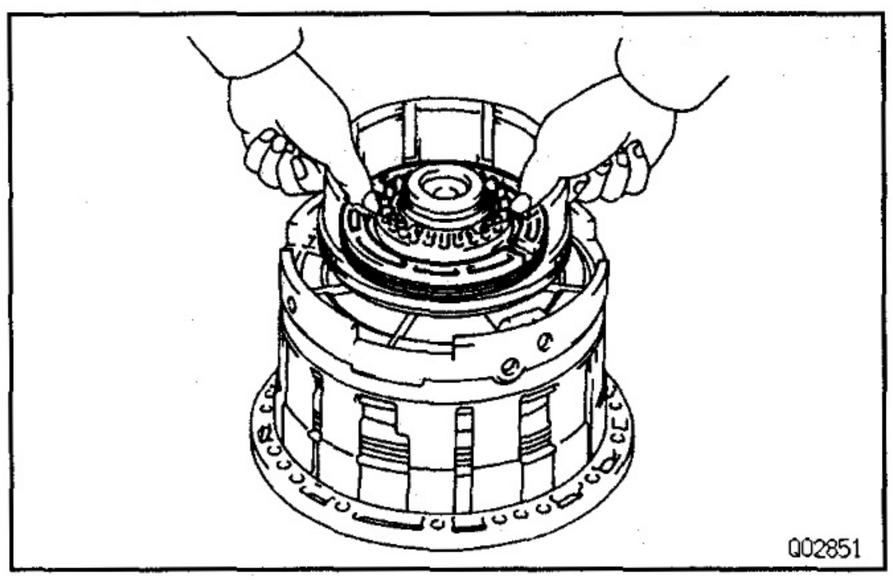
(b) Contract the oil seal ring as shown, and install it onto the clutch drum.

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

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


Q02850

2. PLACE FRONT CLUTCH DRUM ONTO OVERDRIVE CASE ASSEMBLY

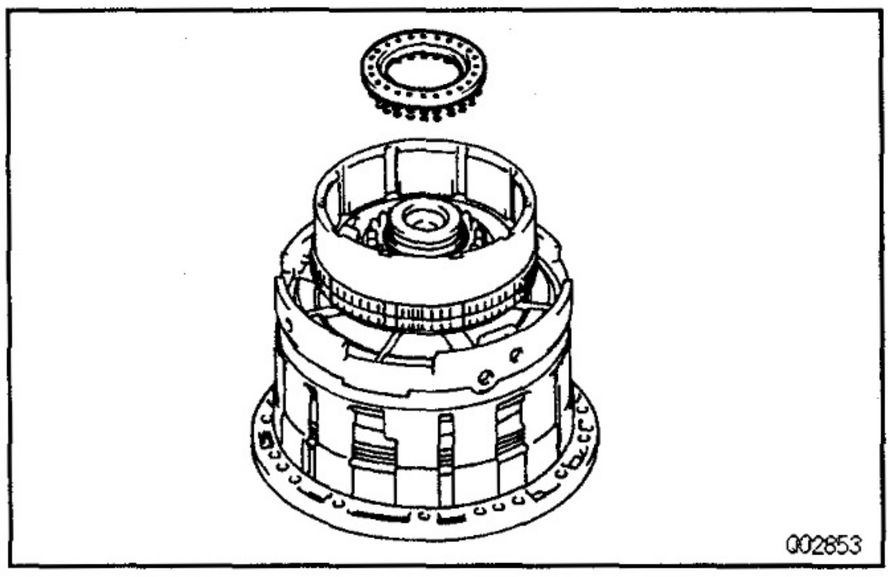


3. INSTALL FRONT CLUTCH PISTON

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

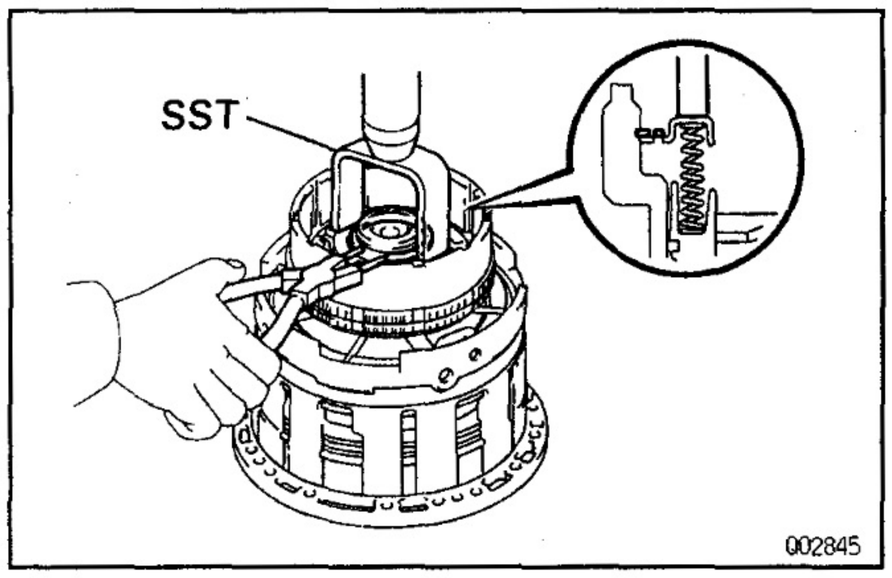
(b) Push in the clutch piston into the clutch drum by both hands.

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



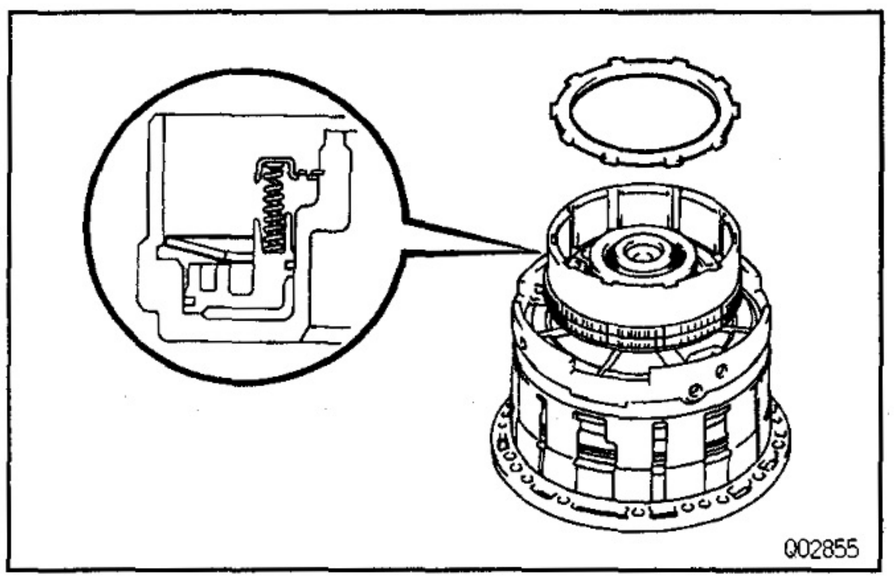
4. INSTALL PISTON RETURN SPRINGS

(a) Install the piston return spring.



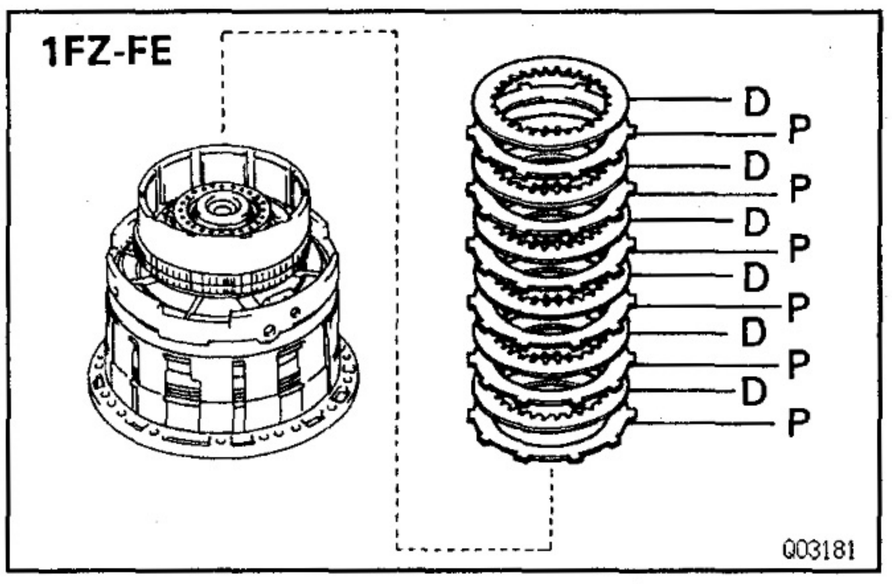
(b) Place SST on the spring seat, and compress the return springs with a shop press.
SST 09350–36010(09350–06010)

(c) Using snap ring pliers, install the snap ring.
HINT: Be sure the end gap of the ring in not aligned with the spring seat claw.

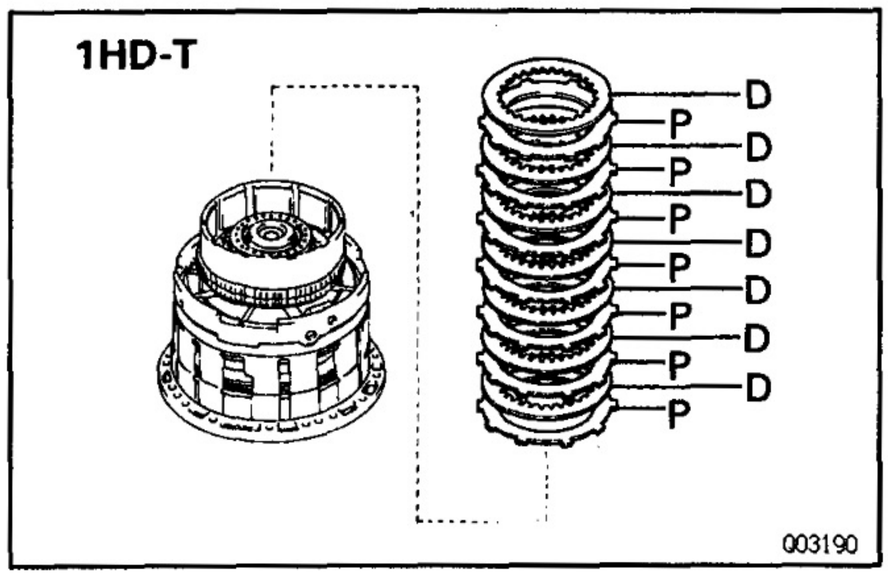


5. INSTALL CUSHION PLATE, PLATES AND DISCS

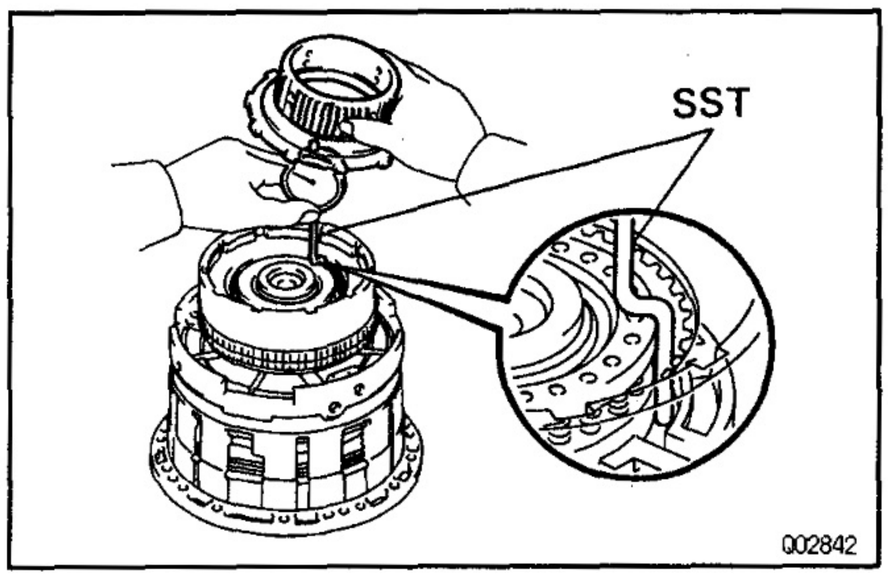
(a) Install the cushion plate, facing the rounded edge downward.



(b) (1FZ–FE Engine)
Install the six plates and six discs in order:
P = Plate D = Disk
P–D–P–D–P–D–P–D–P–D–P–D



(c) (1HD–T Engine)
Install the seven plates and seven discs in order:
P = Plate D = Disk
P–D–P–D–P–D–P–D–P–D–P–D–P–D

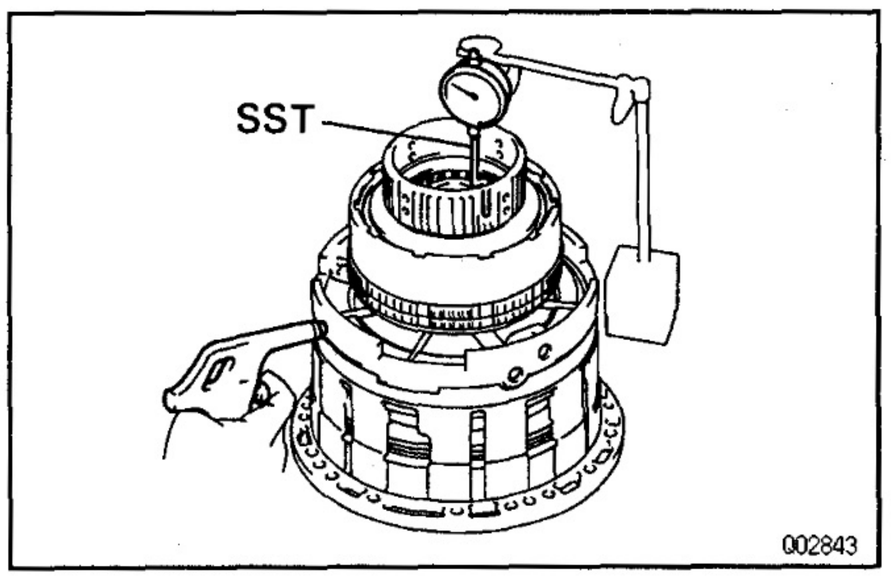


6. CHECK PISTON STROKE OF FRONT CLUTCH

(a) Install SST to a dial indicator.
SST 09350–36010(09350–06110)

(b) Place the assembled SST and a dial indicator on the clutch piston.

(c) Install the rear clutch hub with the snap ring.



(d) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi) as shown.
SST 09350–36010(09350–06110)

Piston stroke:

3.93–4.23 mm (0.1547–0.1665 in.)

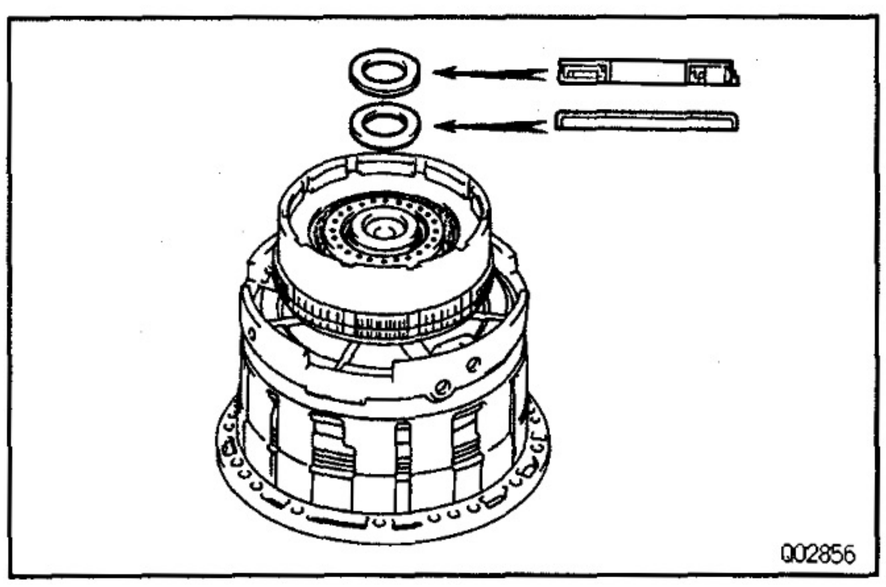
If the piston stroke is less than specified, parts may have been assembled incorrectly, check and reassemble again.

If the piston stroke is not as specified, select another plate.

HINT: There are four different thicknesses for plate.

Thickness mm (in.)	Thickness mm (in.)
1.8 (0.071)	2.2 (0.087)
2.0 (0.079)	2.4 (0.094)

(e) Remove the snap ring and rear clutch hub.

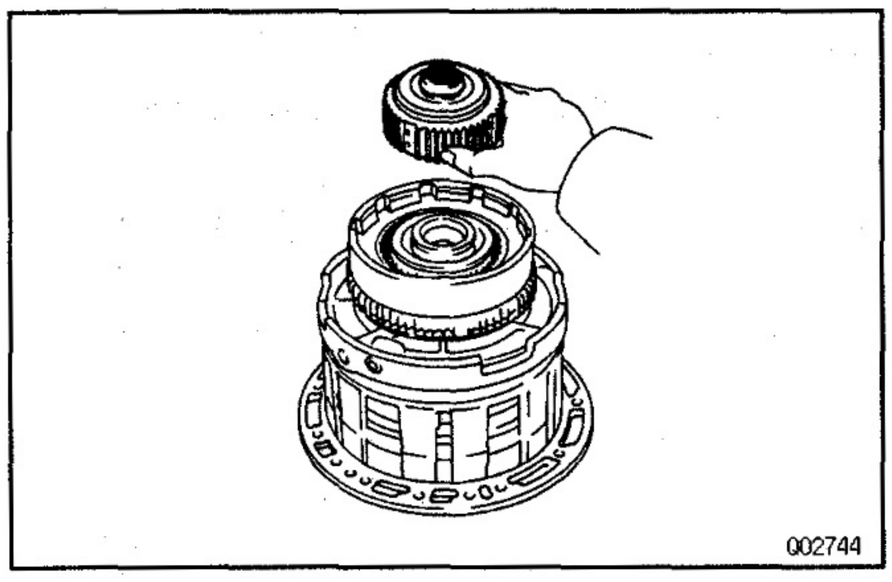


7. INSTALL FRONT AND REAR CLUTCH HUBS

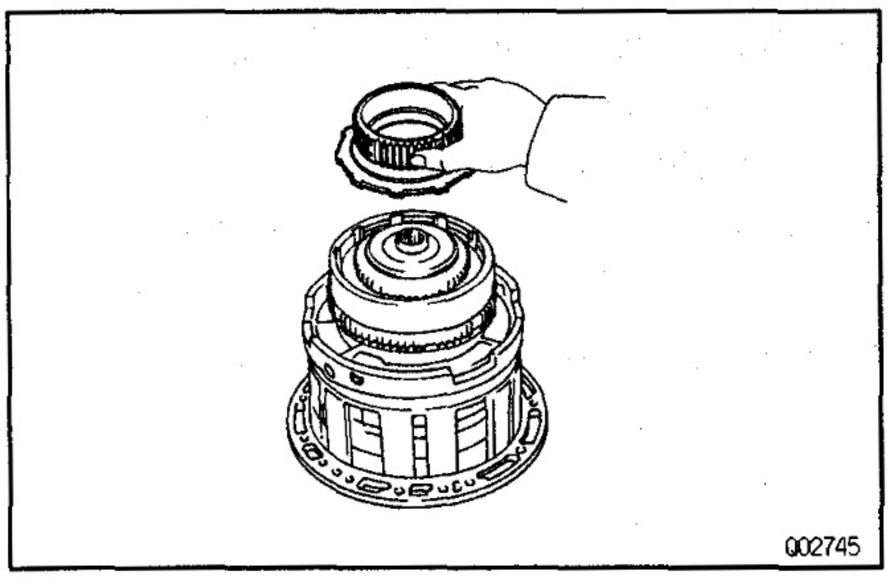
(a) Coat the race and thrust bearing with petroleum jelly, and install them onto the front clutch drum.
HINT: Race and bearing diameter

Diameter mm (in.)	Inside	Outside
Bearing	32.8 (1.291)	52.0 (2.047)
Race	37.0 (1.457)	52.0 (2.047)

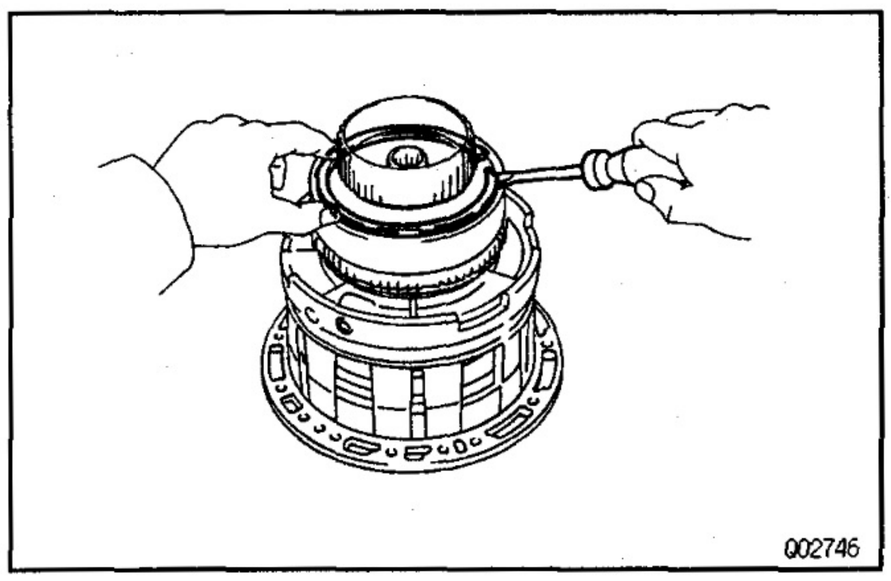
AT



(b) Install the front clutch hub into the clutch drum.
HINT: Mesh the spline of the front clutch hub with the flukes of the discs by rotating the front clutch hub clockwise or counterclockwise.



(c) Install the rear clutch hub onto the clutch drum.

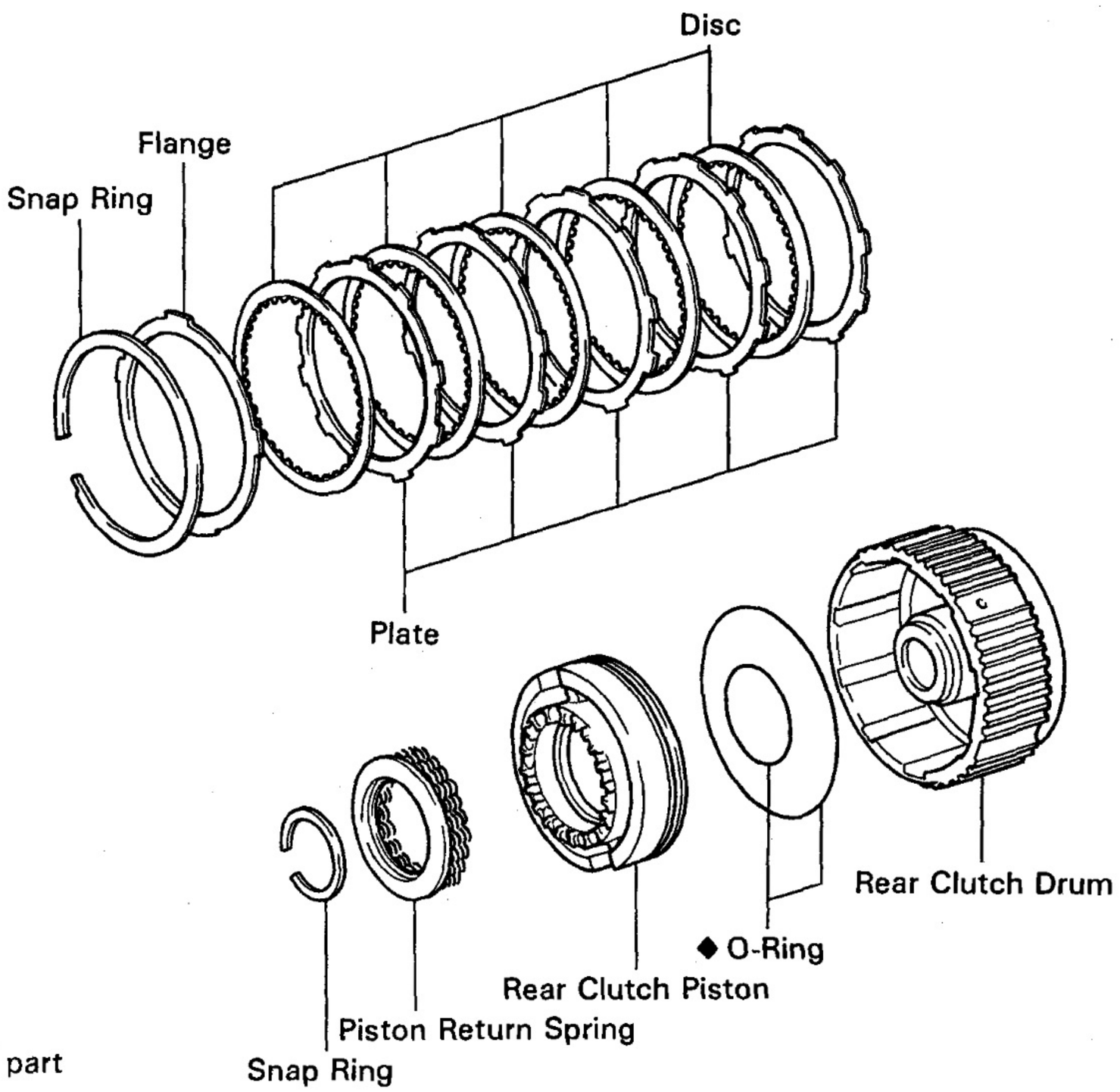


(d) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the cutout portion of the front clutch drum.

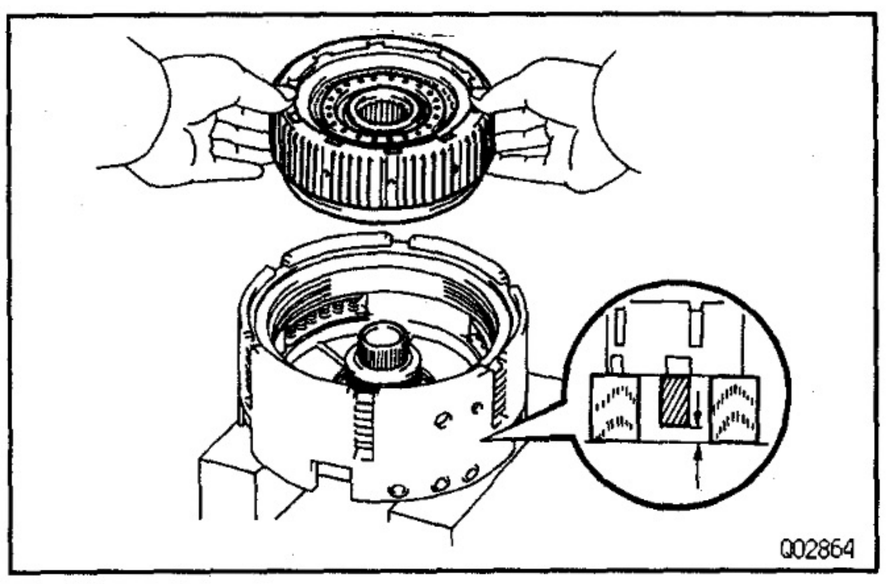
AT

REAR CLUTCH
COMPONENTS

AT087–01



002660



002864

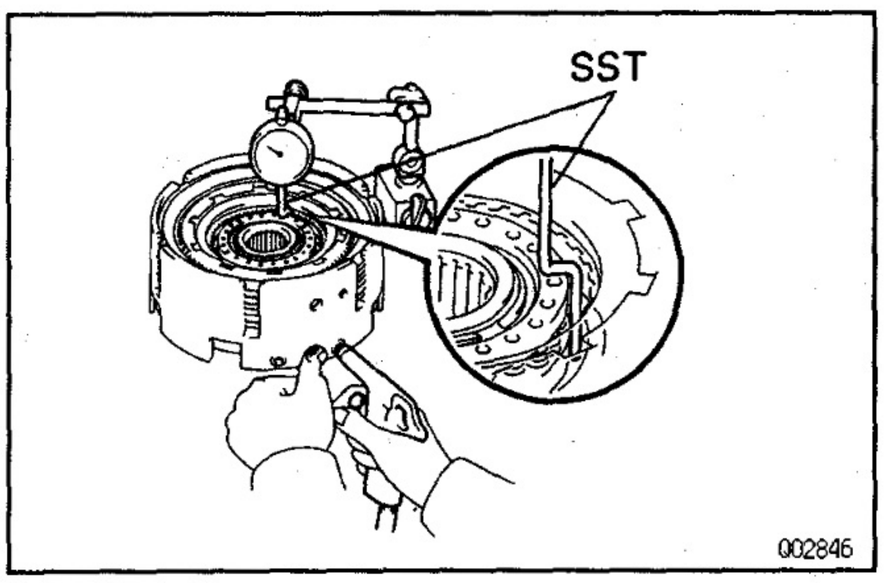
AT088–01

REAR CLUTCH DISASSEMBLY

1. CHECK PISTON STROKE OF REAR CLUTCH

(a) Place the center support assembly on wooden blocks.
HINT: Provide clearance so that the sun gear does not touch the rear clutch drum.

(b) Place the rear clutch assembly into the center support assembly.



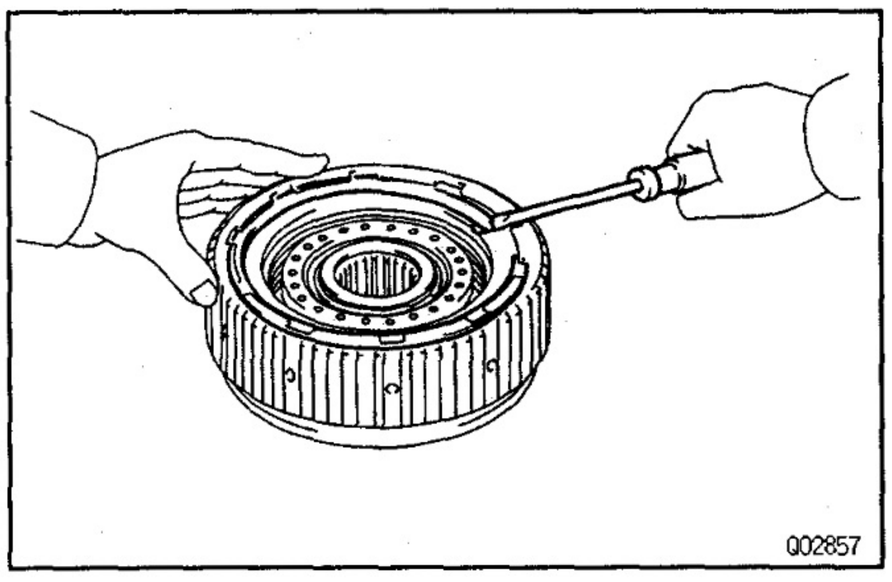
002846

(c) Using SST and a dial indicator, measure the piston stroke by applying the compressed air 392—785 kPa (4—8 kgf/cm², 57—114 psi) as shown.
SST 09350—36010(09350—06110)

Piston stroke

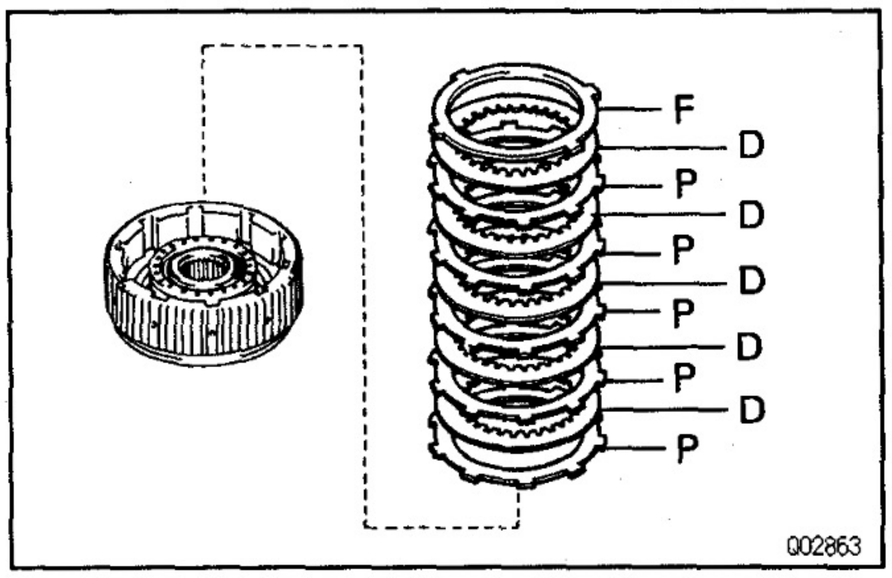
2.00—2.20 mm (0.0787—0.0866 in.)

If the piston stroke is grater than specified, inspect the discs.

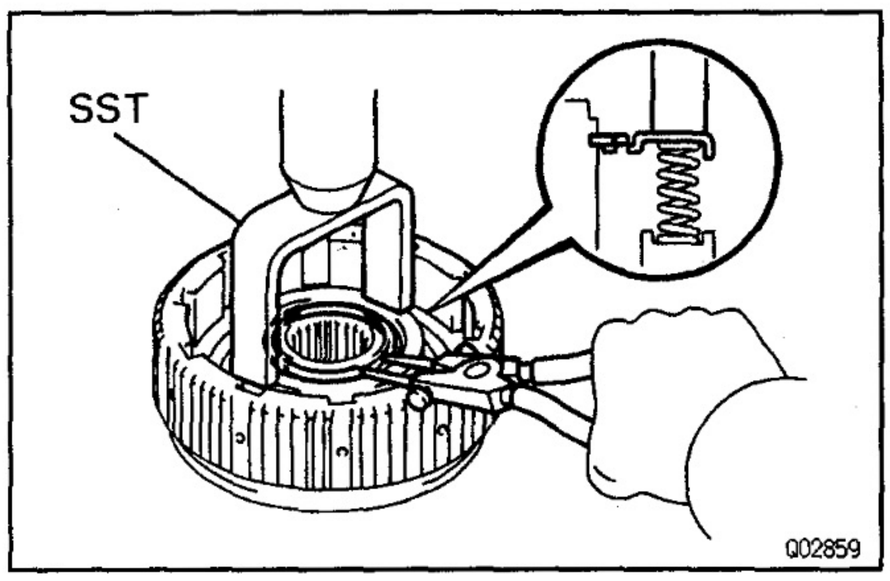


2. REMOVE FLANGE, DISCS AND PLATES

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



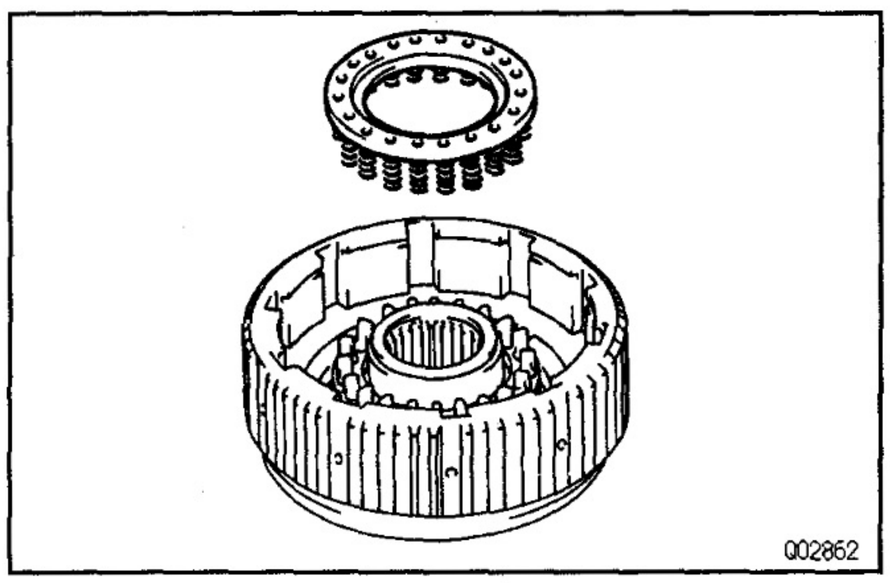
(b) Remove the flange, five discs and five plates.



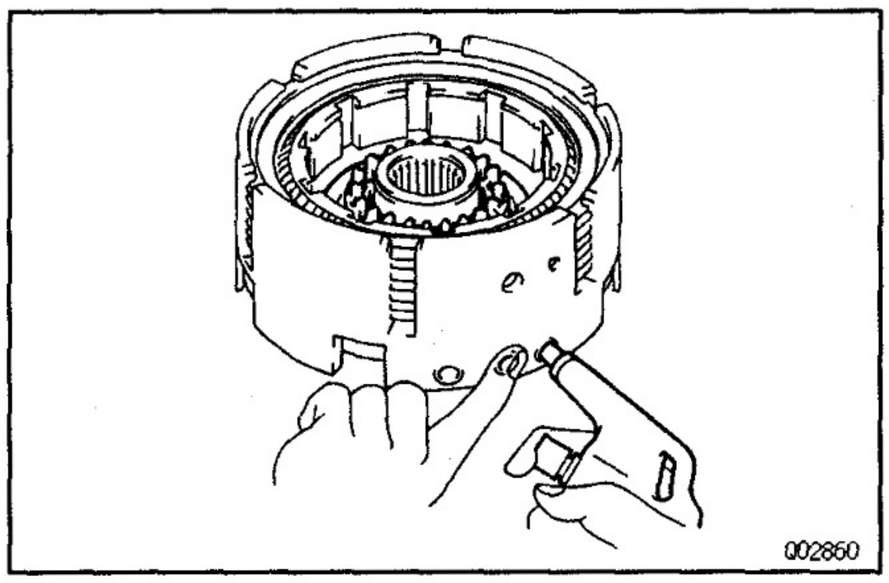
3. REMOVE PISTON RETURN SPRINGS

(a) Place SST on the spring seat, and compress the return spring with a shop press.
SST 09350–36010(09350–06010)

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



(c) Remove the piston return spring.



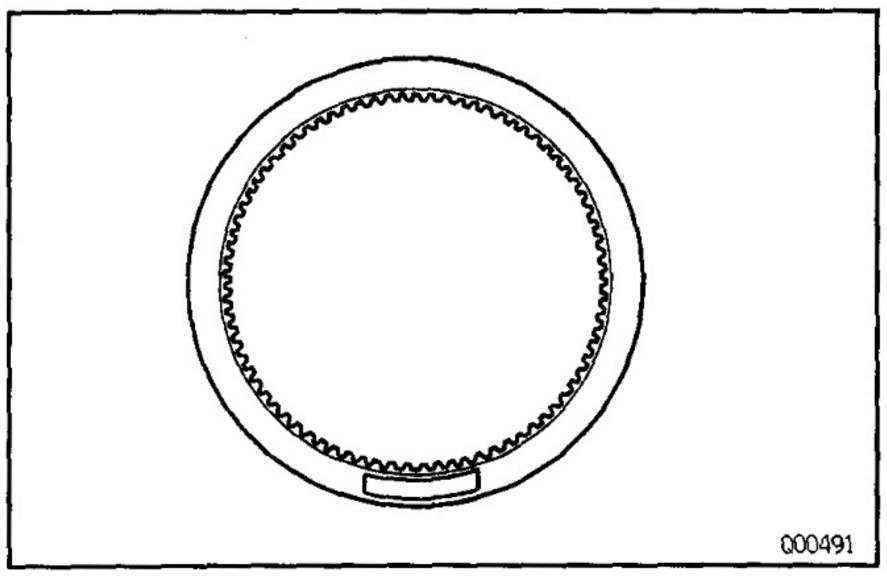
4. REMOVE REAR CLUTCH PISTON

(a) Place the center support assembly on wooden blocks.

(b) Place the clutch drum onto the center support assembly.

(c) Hold the piston with hand, apply compressed air into the oil hole of the center support to remove the clutch piston.

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



000491

AT089-01

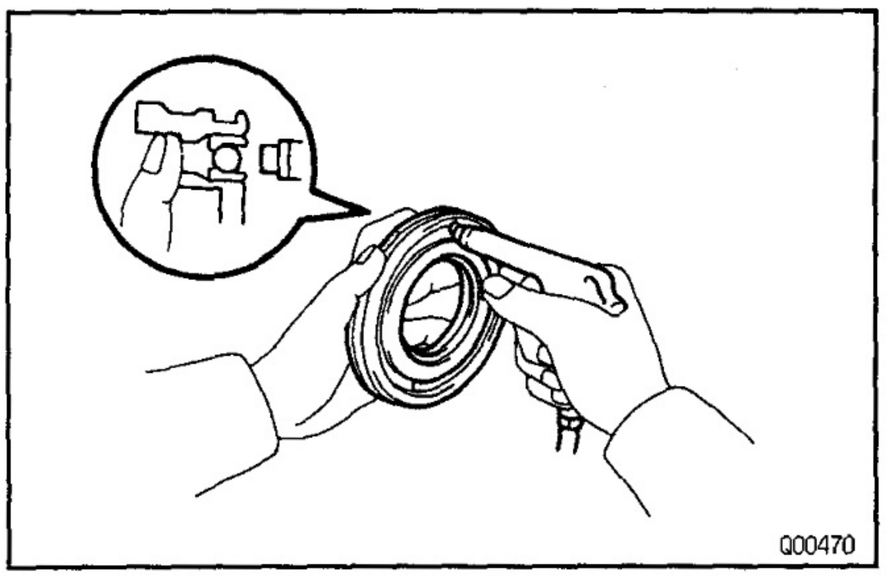
REAR CLUTCH INSPECTION

1. INSPECT DISCS, PLATES 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.

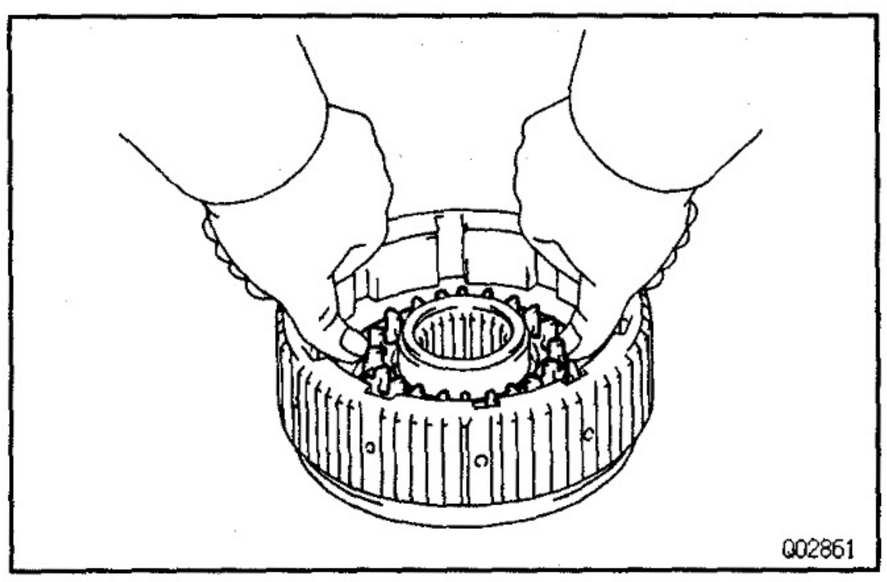


Q00470

2. INSPECT REAR 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.



Q02861

AT08A-01

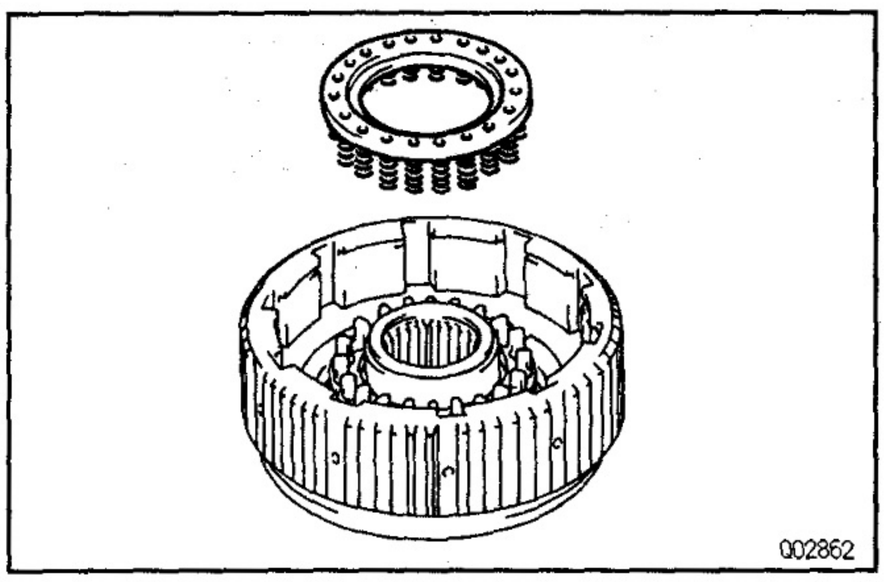
REAR CLUTCH ASSEMBLY

1. INSTALL REAR CLUTCH PISTON

(a) Coat new O—rings with ATF, and install them in the clutch drum.

(b) Push in the clutch piston into the clutch drum with both hands.

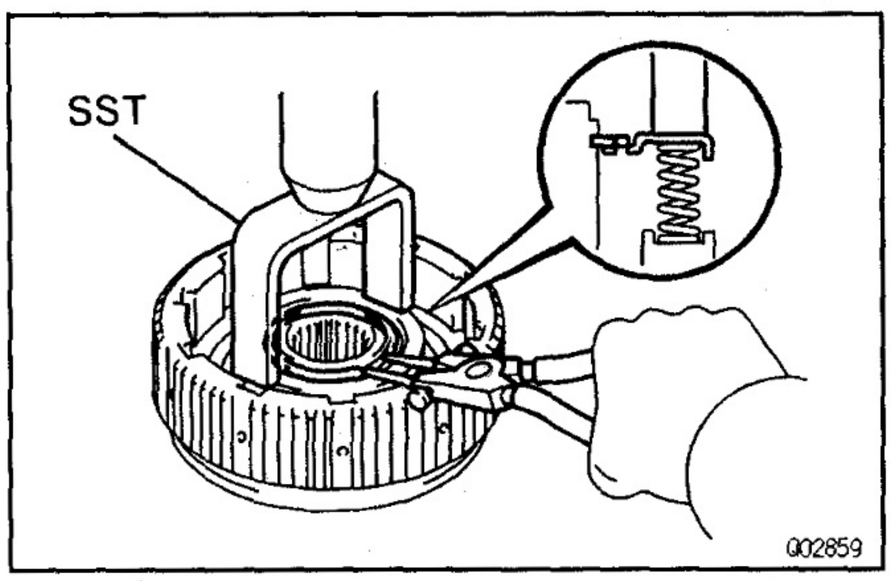
NOTICE: Be careful not to damage the O—rings.



Q02862

2. INSTALL PISTON RETURN SPRINGS

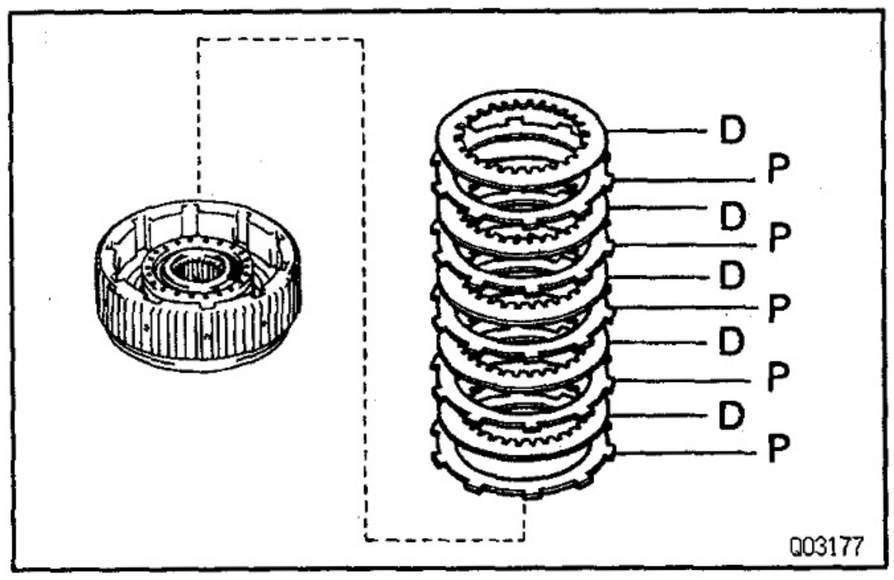
(a) Place the piston return spring.



(b) Place SST on the spring seat, and compress the return spring with a shop press.
SST 09350–36010(09350–06010)

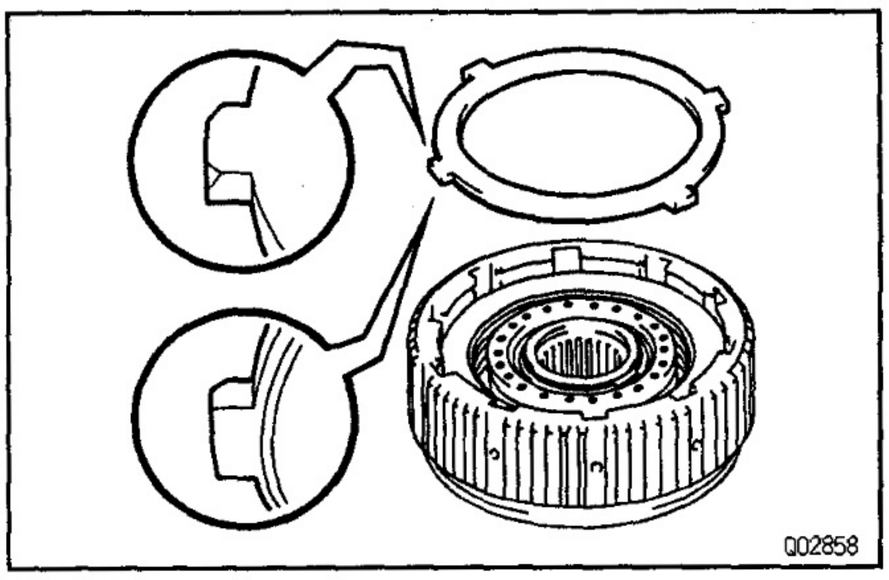
(c) Using snap ring pliers, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the spring retainer claw.

AT

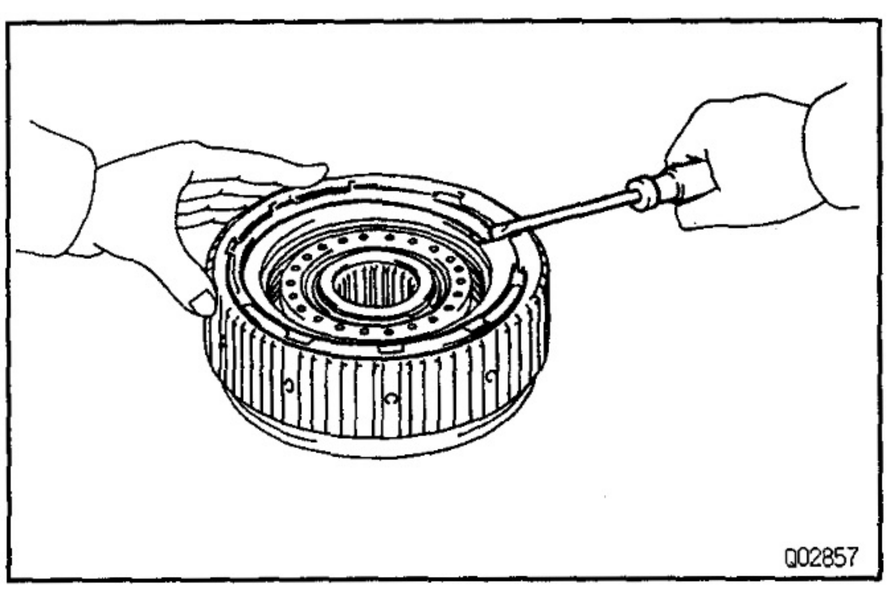


3. INSTALL PLATES, DISCS AND FLANGE

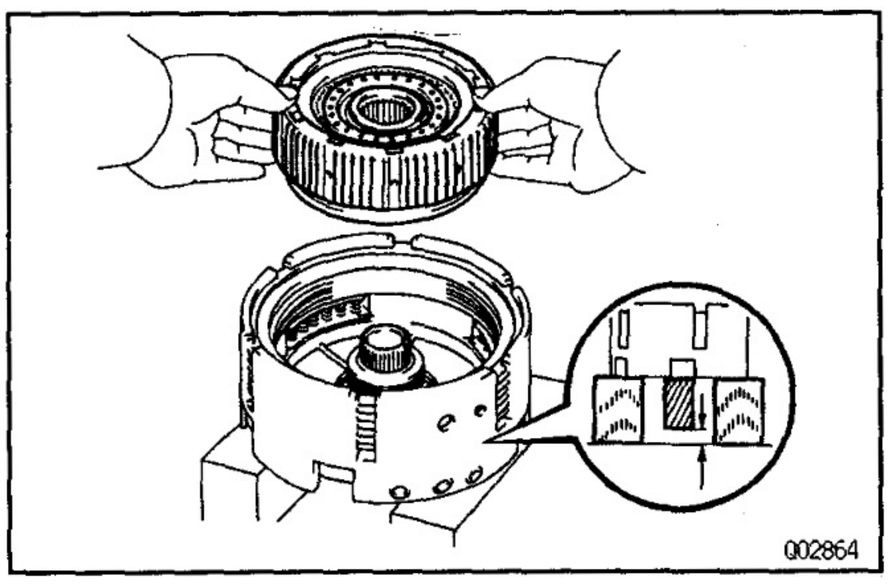
(a) Install the five plates and five discs in order:
P = Plate D = Disc
P–D–P–D–P–D–P–D–P–D



(b) Install the flange, facing the rounded edge upward.
HINT: If the flange is step–edged, install the flange with the step–edge, facing downward.



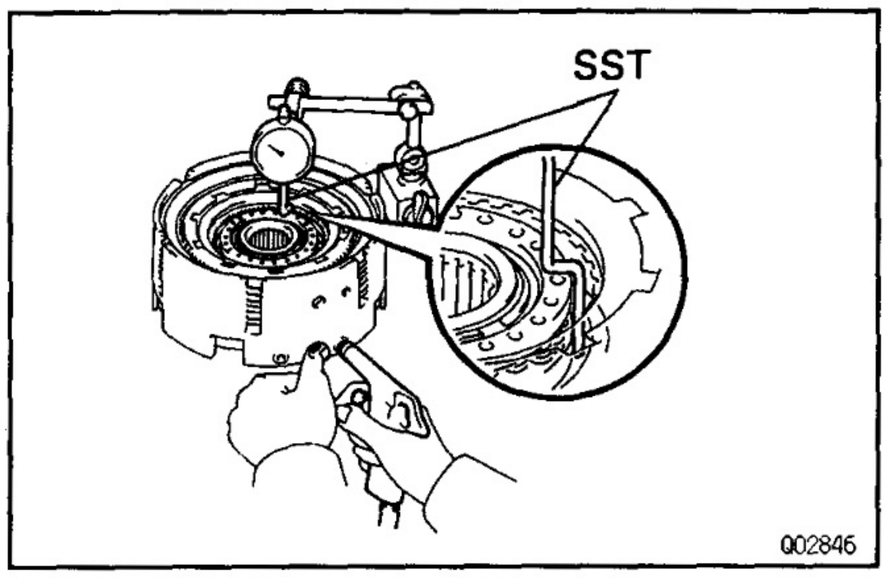
(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring in not aligned with the cutout portion of the rear clutch drum.



4. CHECK PISTON STROKE OF REAR CLUTCH

(a) Place the center support assembly on wooden blocks.
HINT: Provide clearance so that the sun gear does not touch the rear clutch drum.

(b) Place the rear clutch assembly onto the center support assembly.



(c) Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi) as shown.
SST 09350–36010(09350–06110)

Piston stroke:

2.00–2.20 mm (0.0790–0.0866 in.)

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

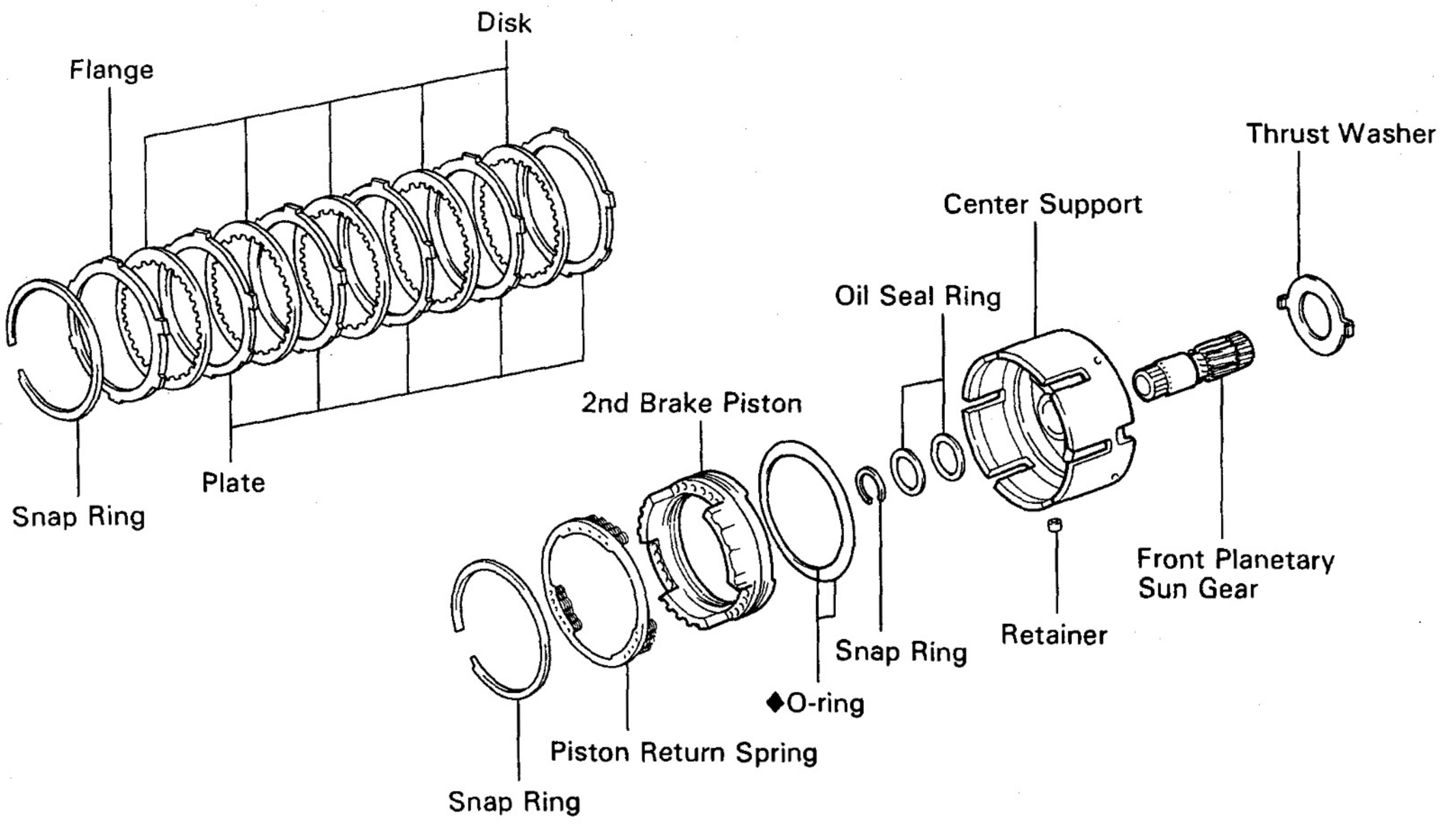
If the piston stroke is not as specified, select another flange.

HINT: there are four different thicknesses for flange.

No.	Thickness mm (in.)	No.	Thickness mm (in.)
None	5.0 (0.197)	2	5.4 (0.213)
1	5.2 (0.205)	3	5.6 (0.220)

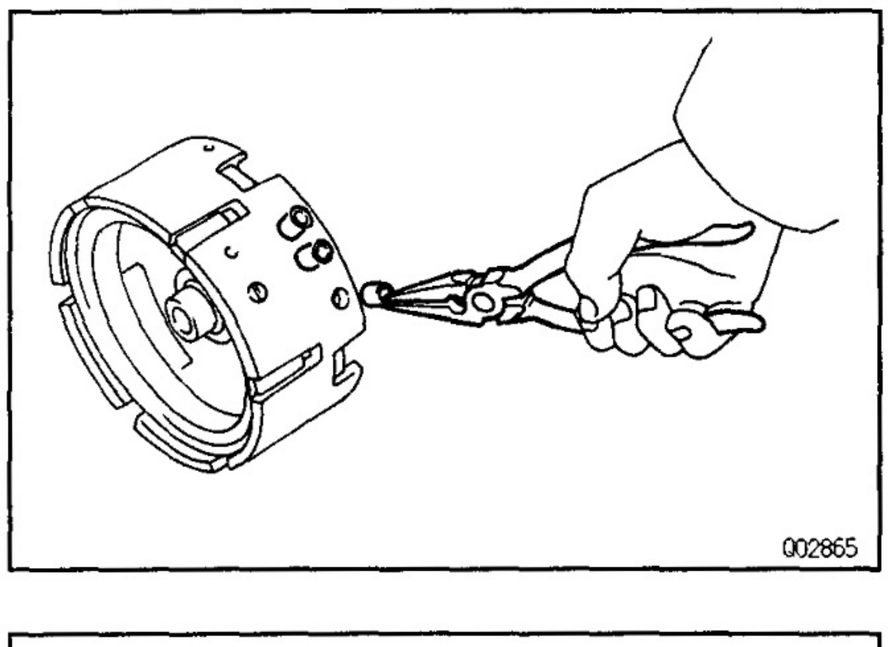
SECOND BRAKE
COMPONENTS

AT095-01



◆ Non-reusable part

003094



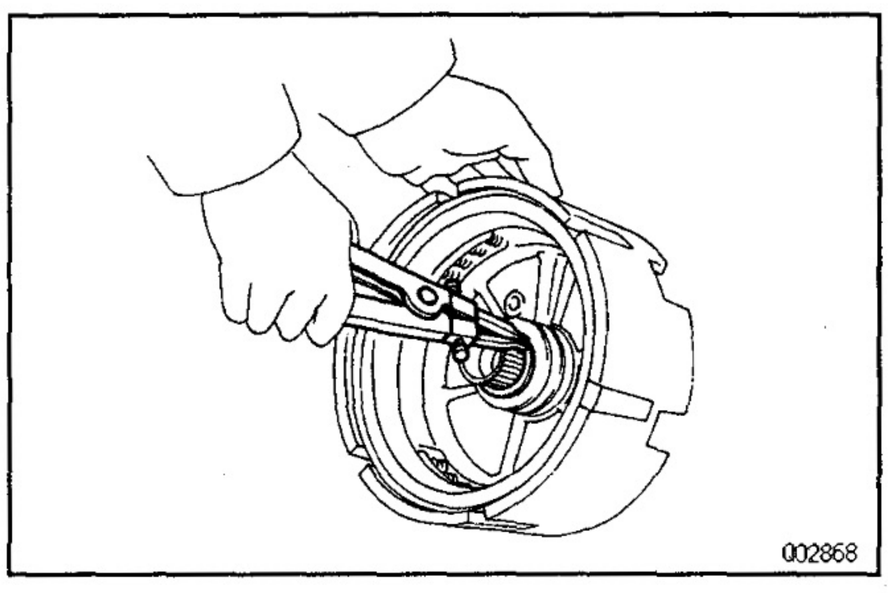
002865

AT08B-01

SECOND BRAKE DISASSEMBLY

1. REMOVE RING RETAINERS

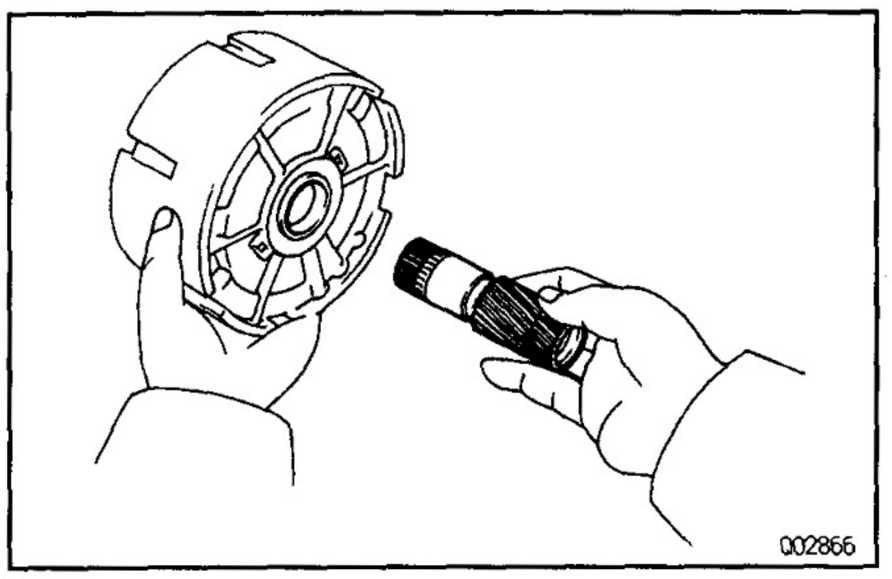
Using needle nose pliers, remove the three ring retainers from the oil holes of the center support.



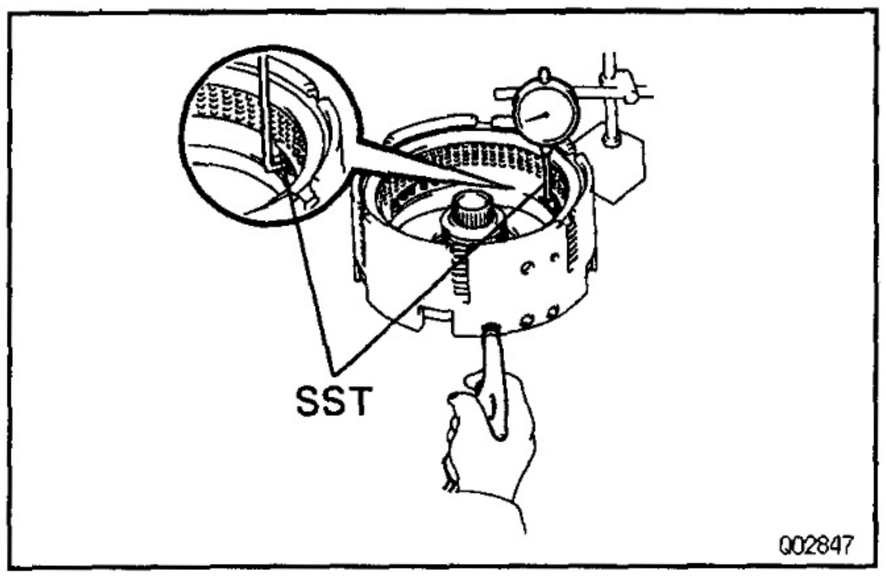
002868

2. REMOVE FRONT PLANETARY SUN GEAR

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



(b) Remove the sun gear.



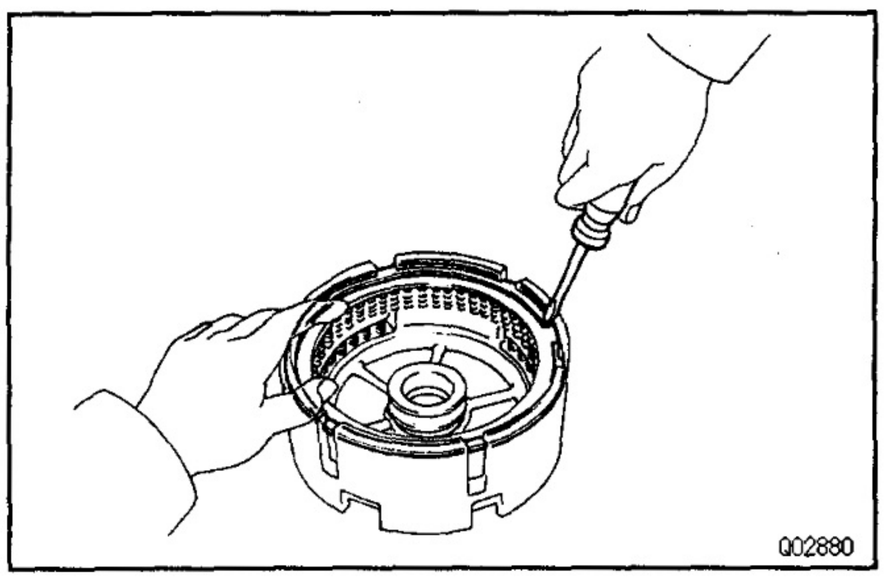
3. CHECK PISTON STROKE OF SECOND BRAKE

Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392 – 785 kPa (4 – 8 kgf/cm², 57 – 114 psi) as shown.
SST 09350 – 36010(09350 – 06120)

Piston stroke:

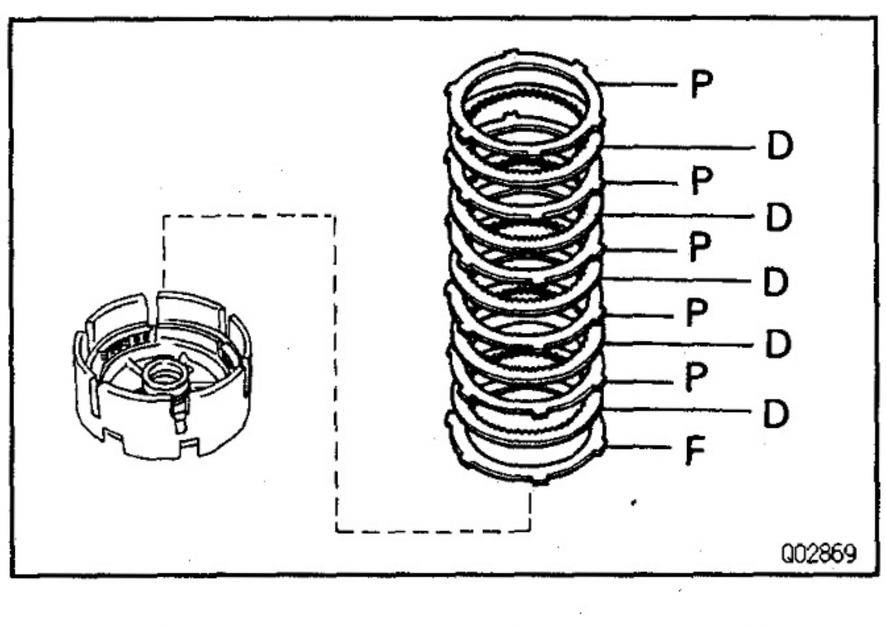
1.86 – 2.06 mm (0.0732 – 0.0811 in.)

If the piston stroke is greater than the specified, inspect the discs.

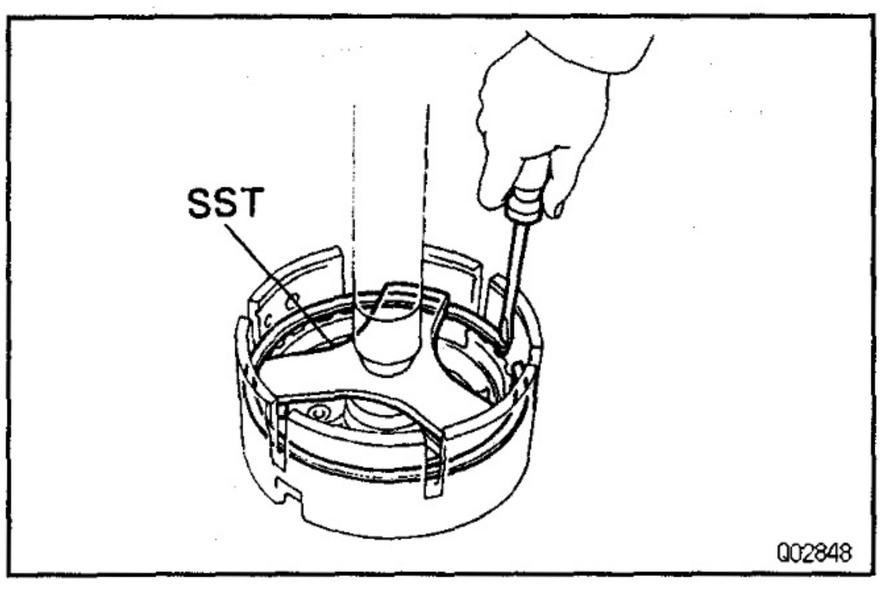


4. REMOVE FLANGE, DISCS AND PLATES

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



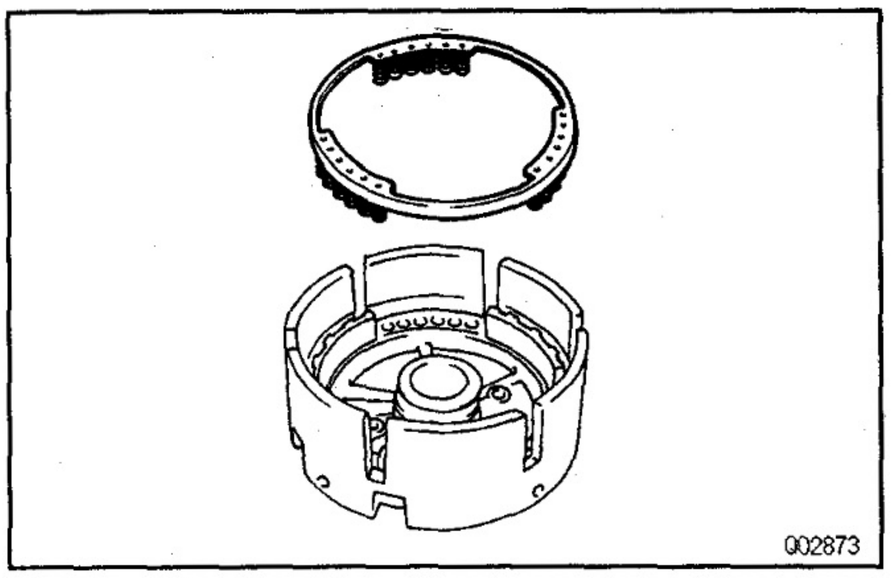
(b) Remove the flange, five discs and five plates.



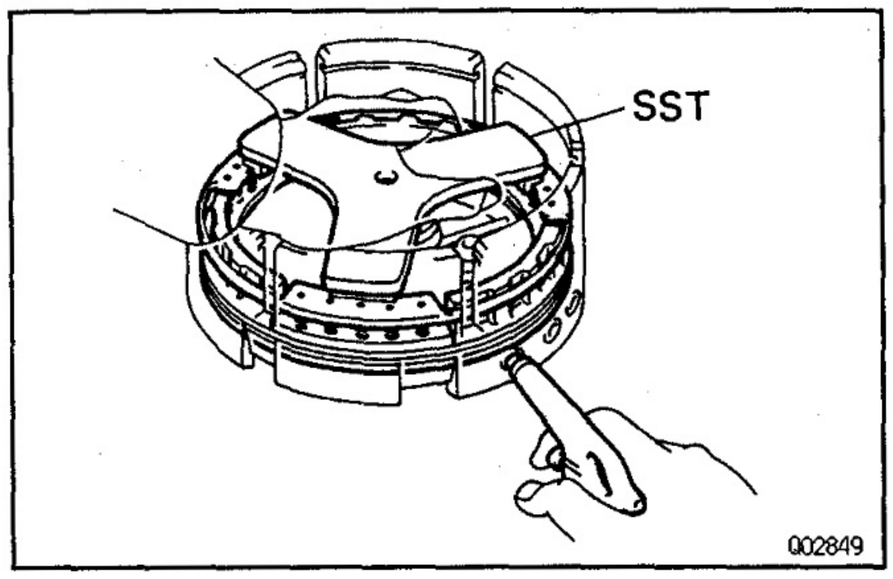
5. REMOVE PISTON RETURN SPRING

(c) Place SST on the spring seat, and compress the return spring with a shop press.
SST 09350 – 36010(09350 – 06020)

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



(c) Remove the piston return spring.

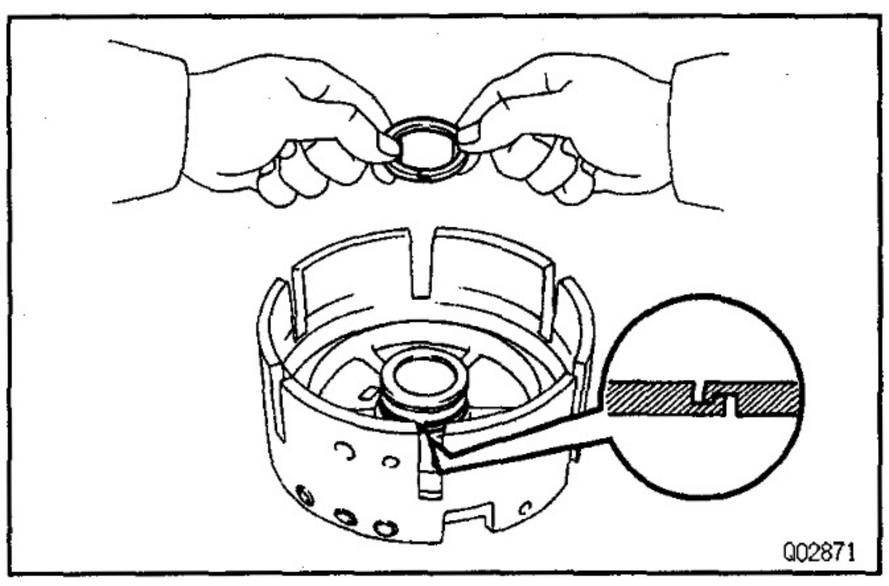


6. REMOVE SECOND BRAKE PISTON

(a) Place the return spring on the brake piston, and then place SST on the return spring.
SST 09350−36010(09350−06020)

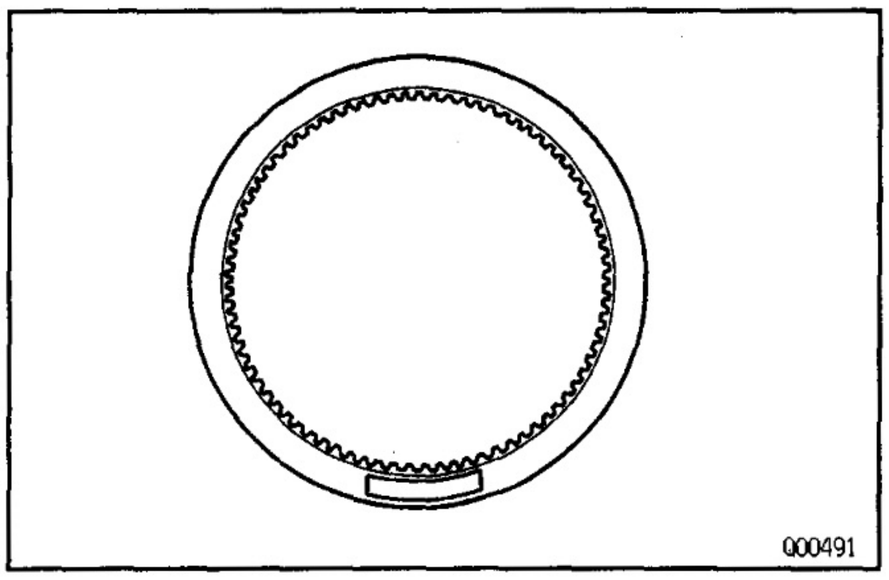
(b) Hold SST so it does not slant, and apply compressed air into the oil hole of the center support to remove the brake piston.
SST 09350−36010(09350−06020)

(c) Remove the two oil seal rings from the center support.



7. REMOVE OIL SEAL RINGS

Remove the two oil seal rings from the center support.



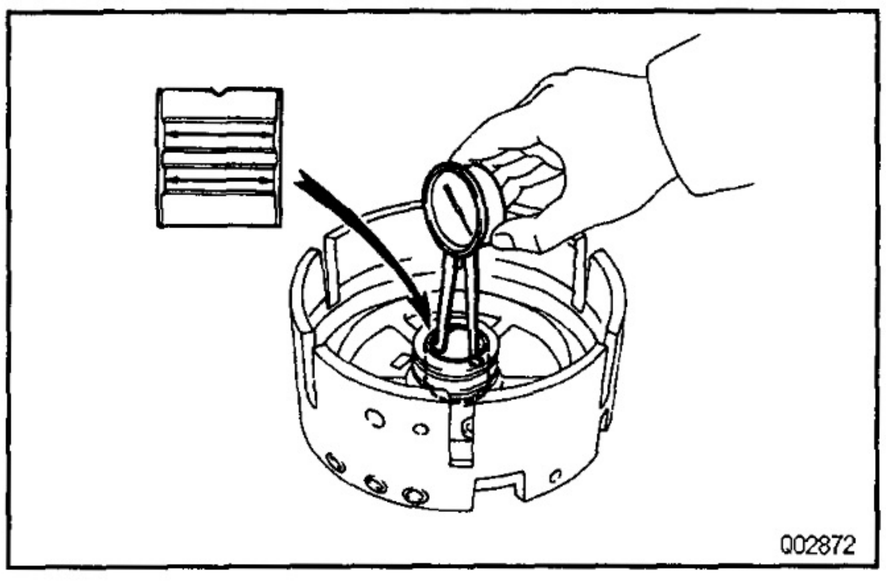
SECOND BRAKE INSPECTION

AT08C−01

1. INSPECT DISCS, PLATES 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.


Q02872

2. INSPECT BUSHING OF CENTER SUPPORT

Using a dial indicator, measure the inside diameter.

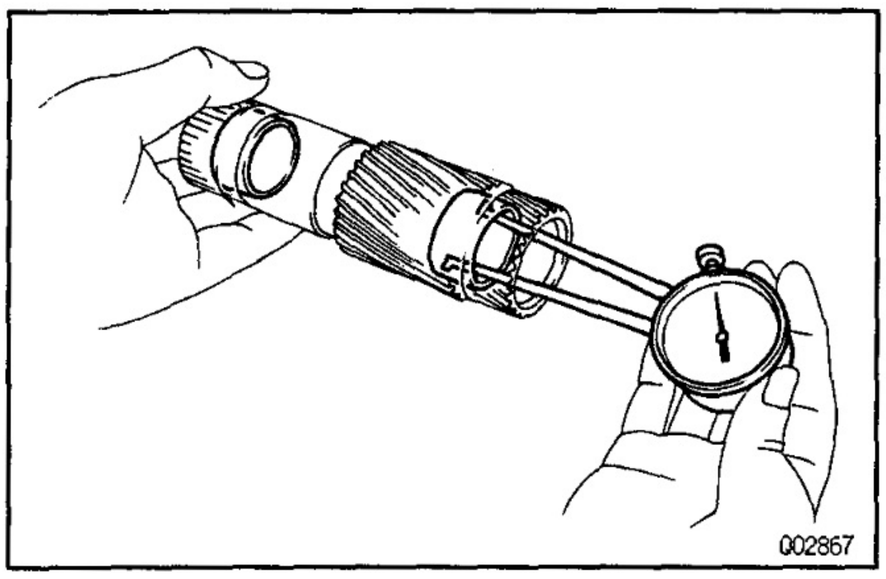
Standard inside diameter:

35.000–35.025 mm (1.3780–1.3789)

Maximum inside diameter:

35.08 mm (1.3811 in.)

If the inside diameter is greater than the maximum, replace the center support.


Q02867

3. INSPECT BUSHINGS OF FRONT PLANETARY SUN GEAR

Using a dial indicator, measure the inside diameter.

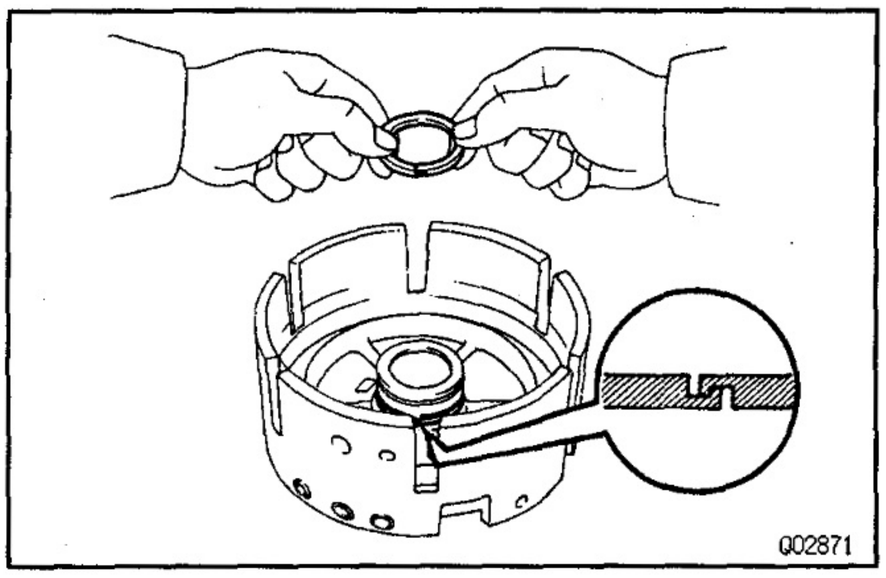
Standard inside diameter:

25.000–25.021 mm (0.9842–0.9851 in.)

Maximum inside diameter:

25.070 mm (0.9870 in.)

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


Q02871

SECOND BRAKE ASSEMBLY

AT08D–01

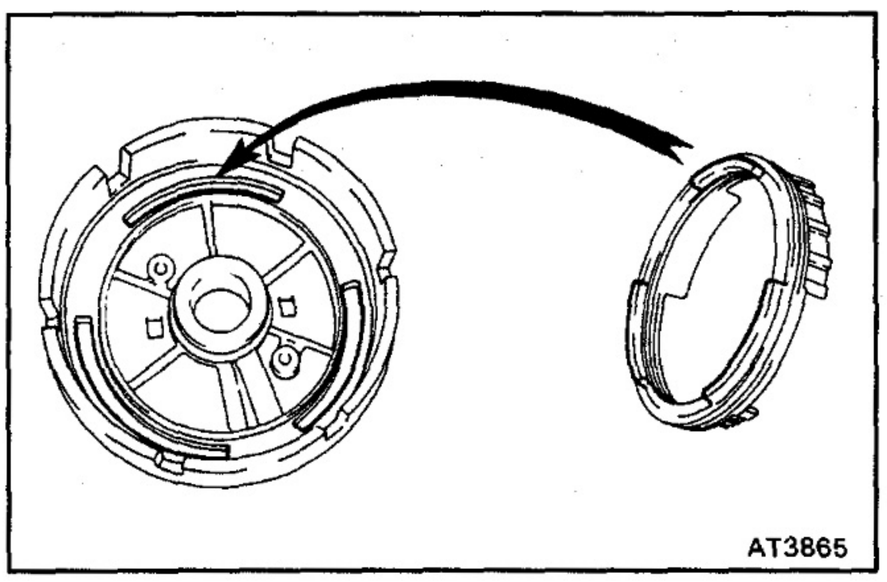
1. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seals, and install then onto the center support.

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

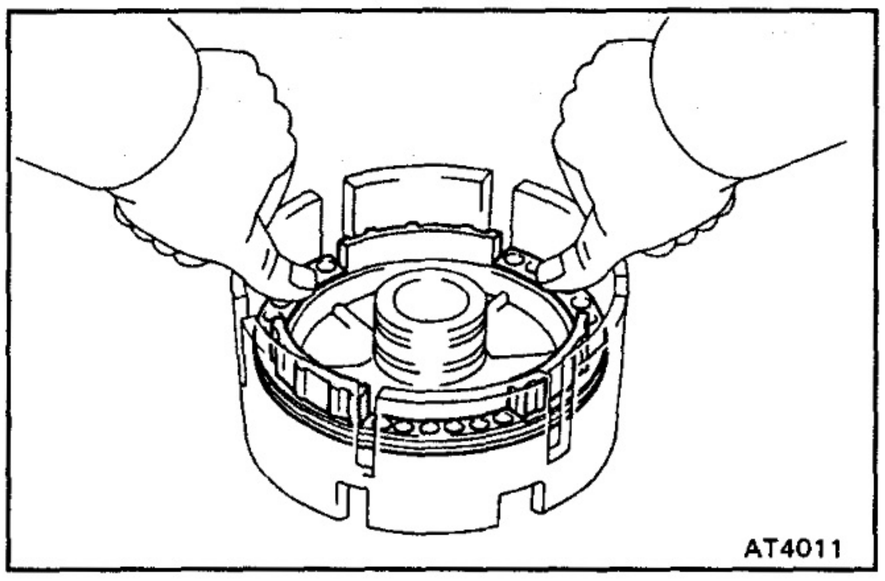
HINT: After installing the oil seal rings, check that they rotate smoothly.


AT3865

2. INSTALL SECOND BRAKE PISTON

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

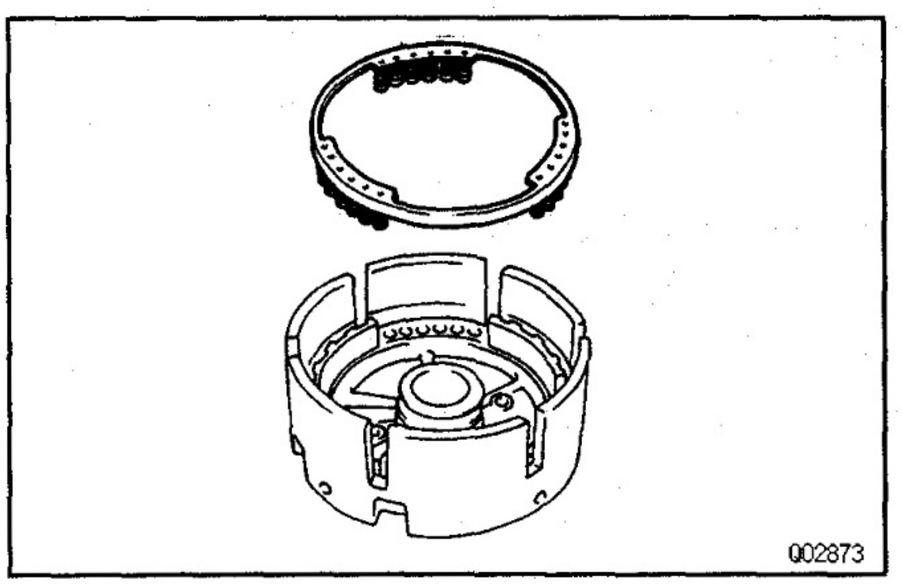
(b) Align the protrusions of the brake piston with the grooves of the center support.


AT4011

(c) Push in the brake piston into the center support with both hands.

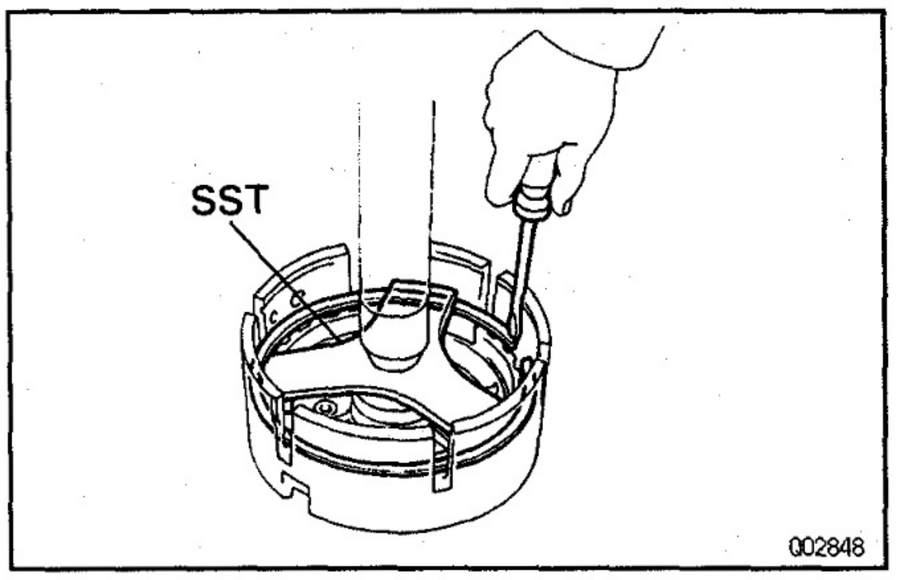
NOTICE: Be careful not to damage the O–rings.

AT



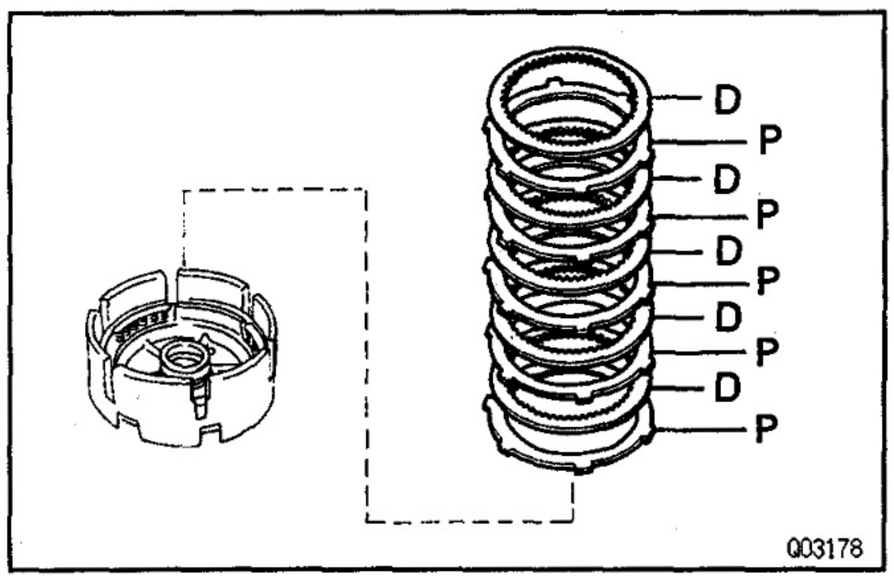
3. INSTALL PISTON RETURN SPRING

(a) Place the return spring on the brake piston.



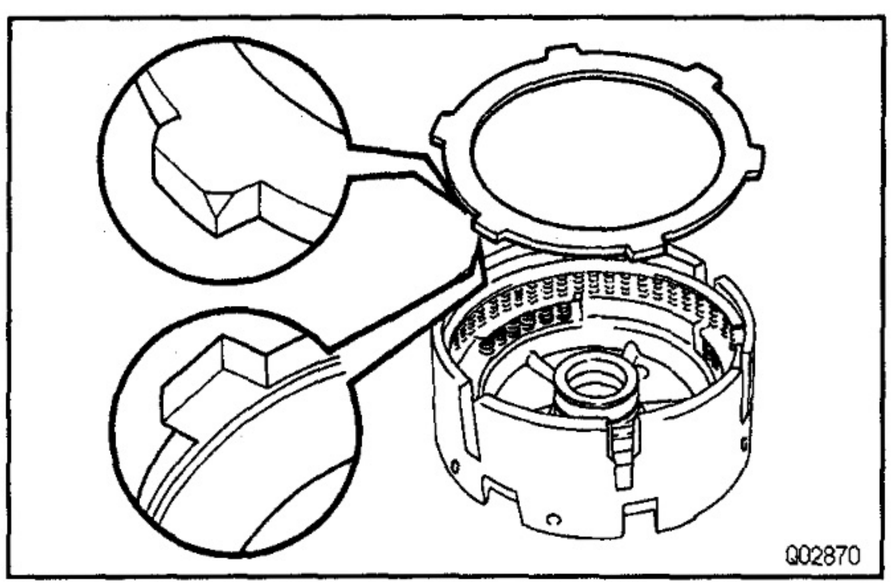
(b) Place SST on the return spring, and compress the return spring with a shop press.
SST 09350−36010(09350−06020)

(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the cutout portion of the center support.

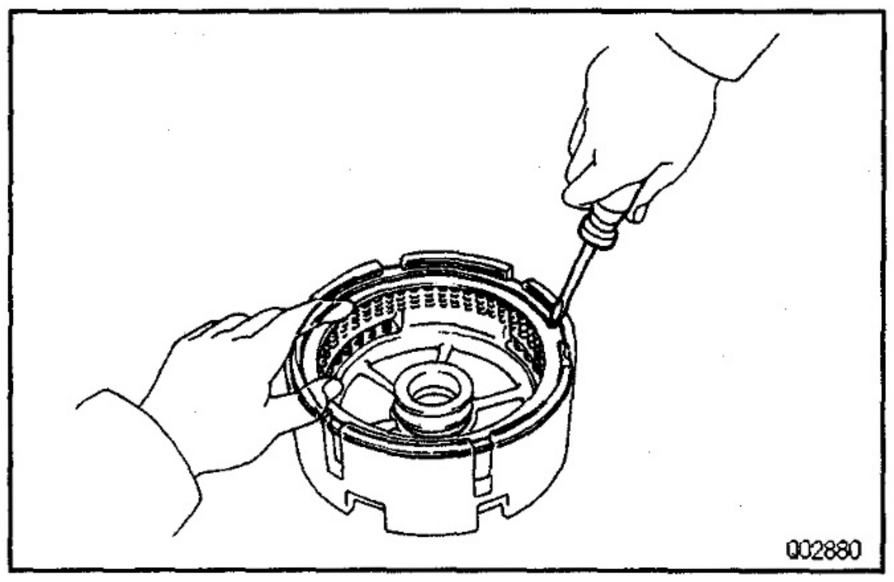


4. INSTALL PLATES, DISCS AND FLANGE

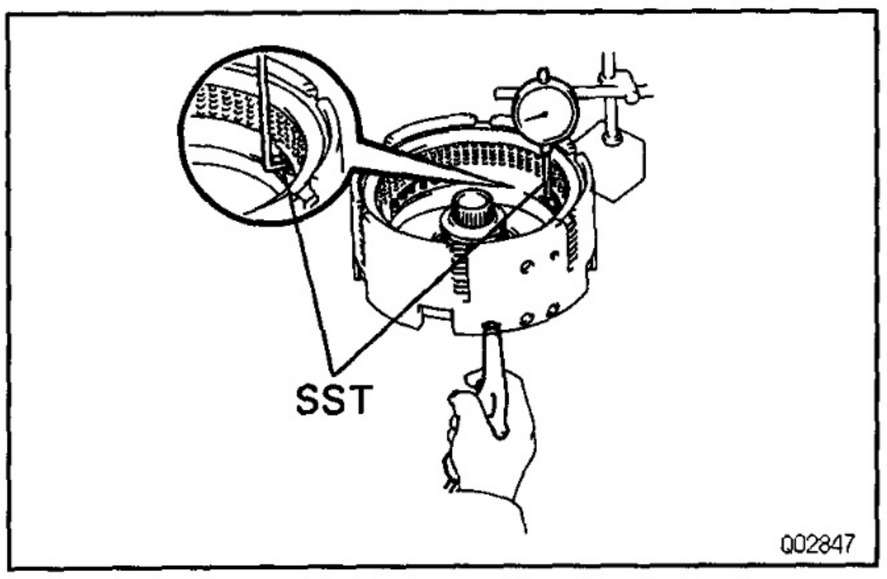
(a) Install the five plates and five discs in order:
P = Plate D = Disc
P−D−P−D−P−D−P−D−P−D



(b) Install the flange, facing the rounded edge upward.
HINT: If the flange is step−edged, install the flange with the step−edged, facing downward.



(c) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned the cutout portion of the center support.



5. CHECK PISTON STROKE OF SECOND BRAKE

Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392–785 kPa (4–8 kgf/cm², 57–114 psi).

SST 09350–36010(09350–06120)

Piston stroke:

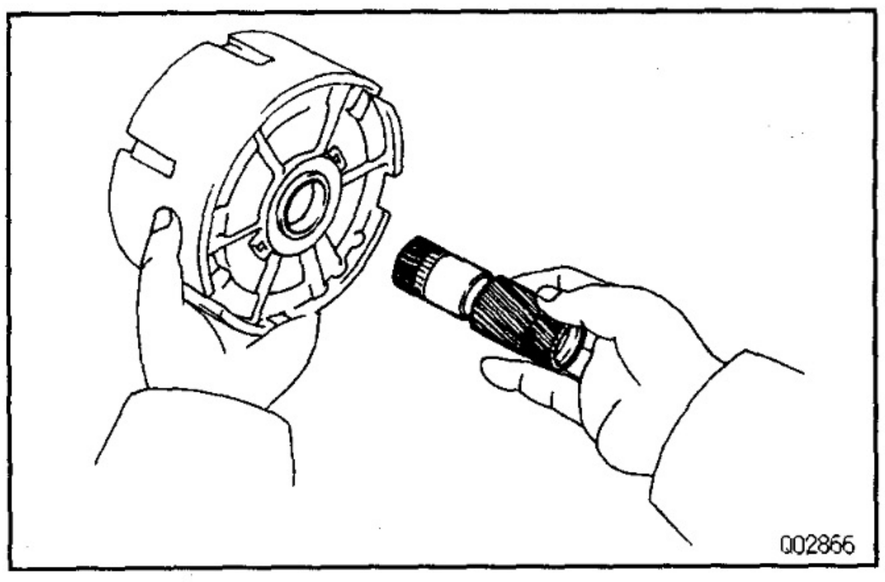
1.86–2.06 mm (0.0732–0.0811 in.)

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

If the piston stroke is not as specified, select another flange.

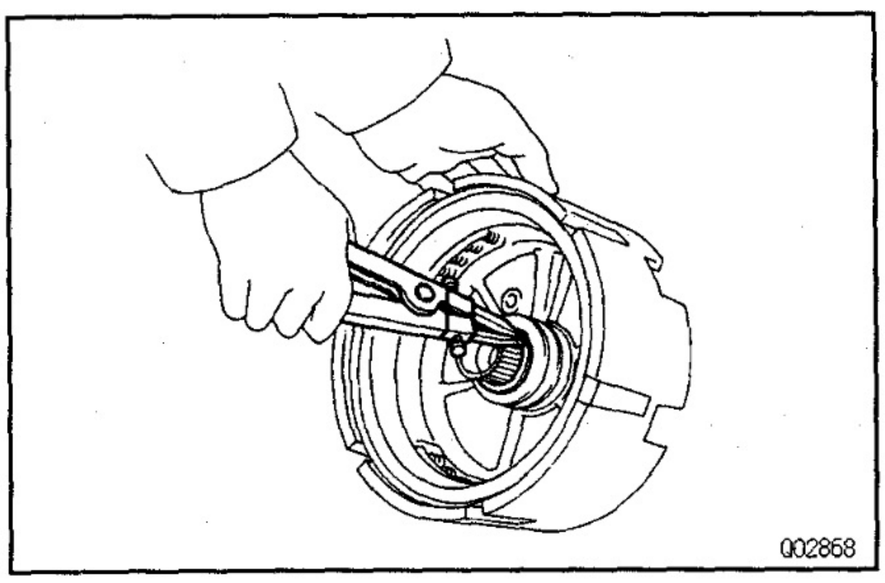
HINT: There are four different thicknesses for flange.

No.	Thickness mm (in.)	No.	Thickness mm (in.)
None	5.0 (0.197)	2	5.4 (0.213)
1	5.2 (0.205)	3	5.6 (0.220)

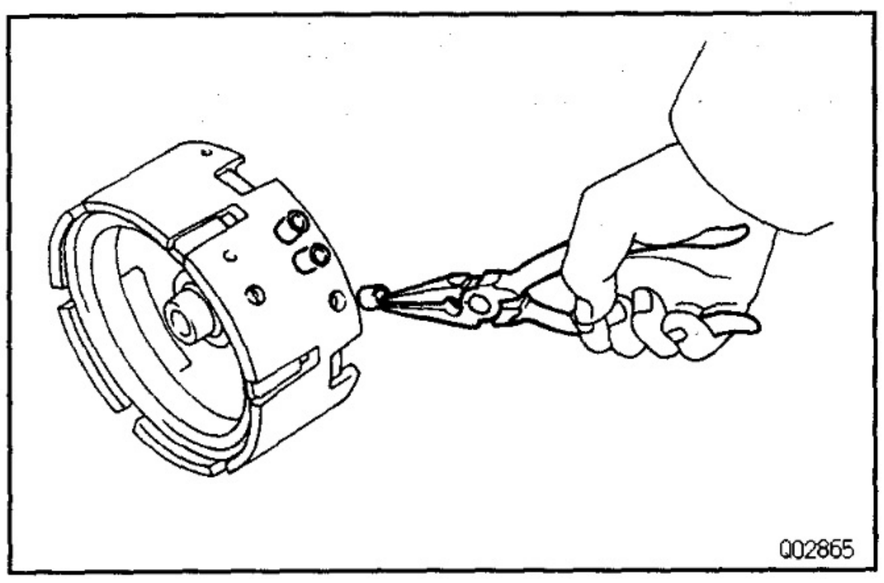


6. INSTALL FRONT PLANETARY SUN GEAR

(a) Install the sun gear.



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



7. INSTALL RING RETAINERS

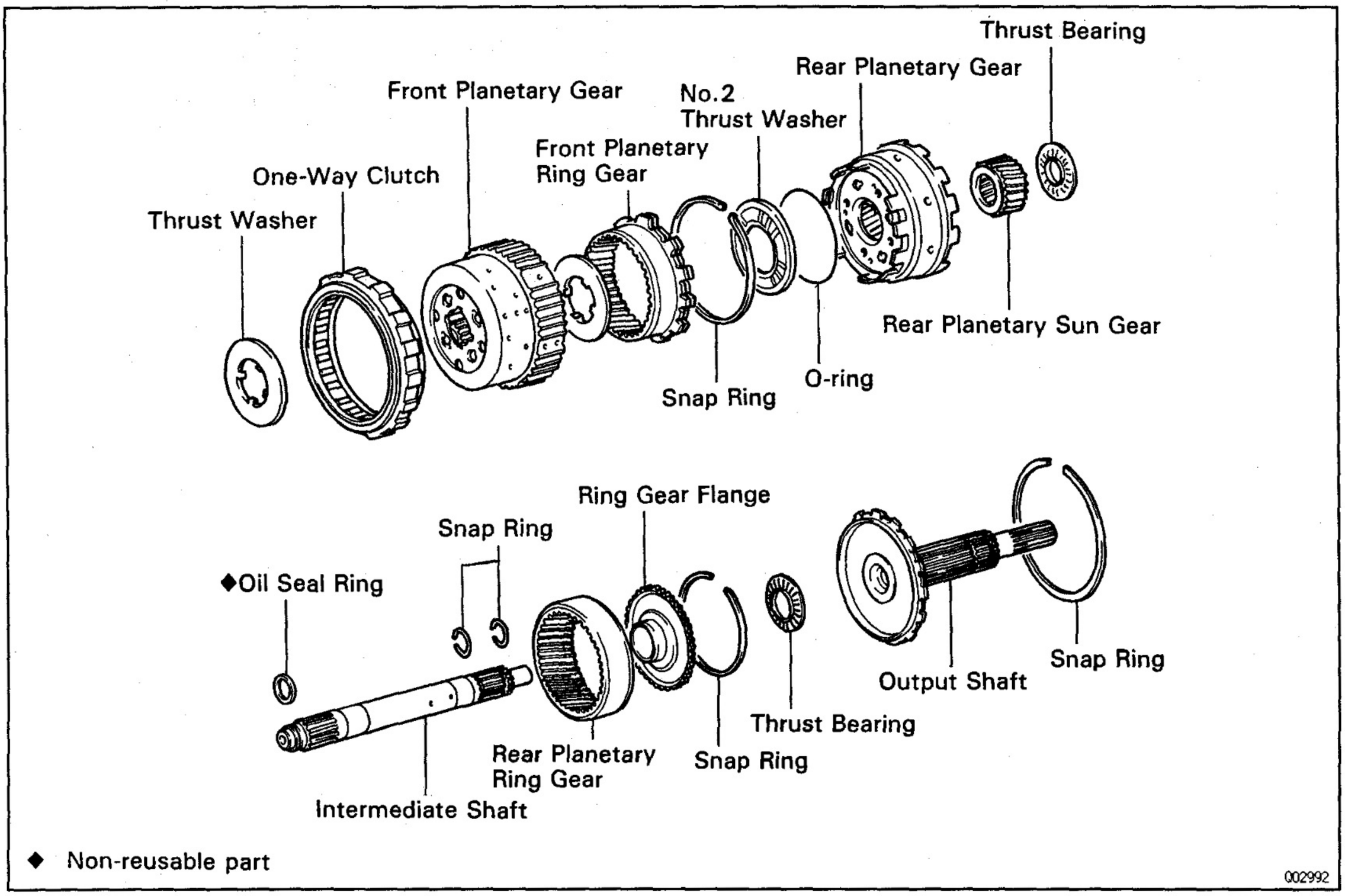
Using needle nose pliers, install the three ring retainers into the oil holes of the center support.

AT

FRONT AND REAR PLANETARY GEAR UNIT

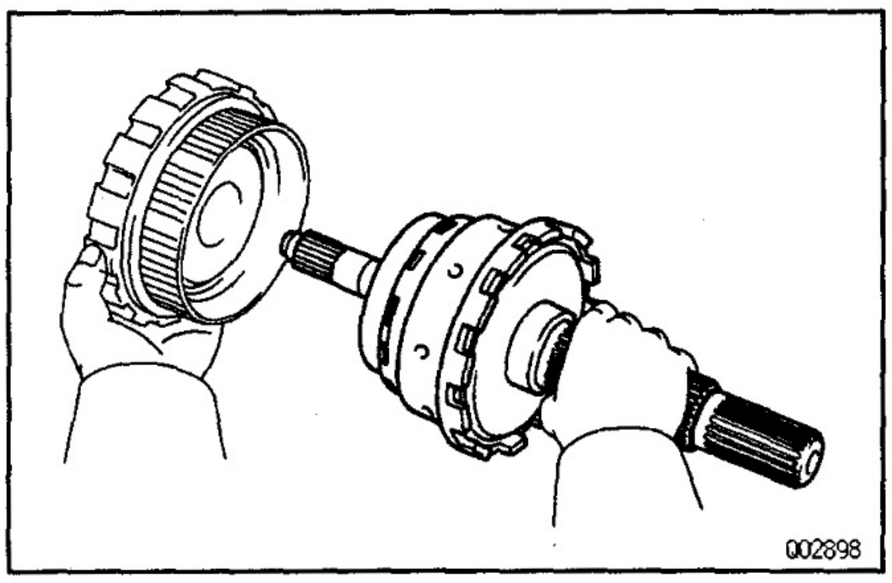
COMPONENTS

AT08E-01



◆ Non-reusable part

002992



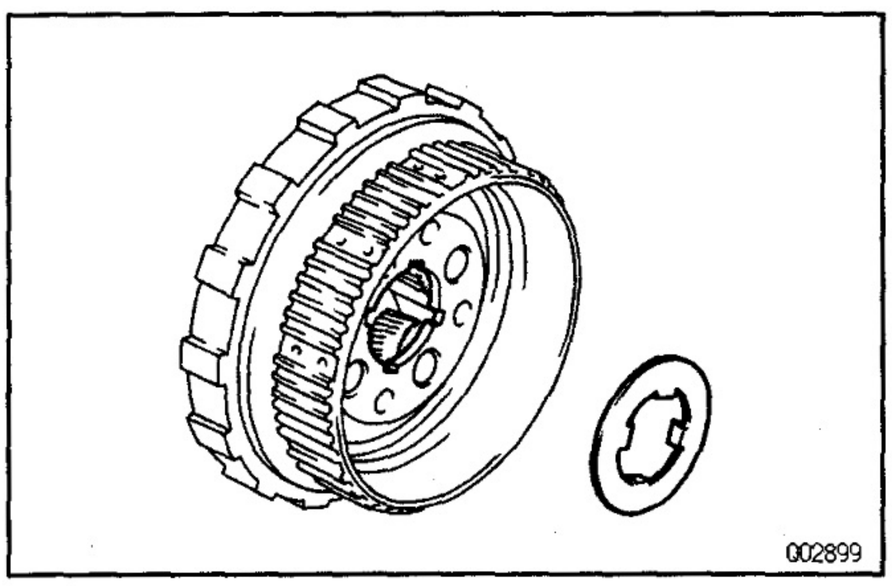
002898

FRONT AND REAR PLANETARY GEAR UNIT DISASSEMBLY

AT08F-01

1. REMOVE REAR PLANETARY GEAR AND OUTPUT SHAFT ASSEMBLY

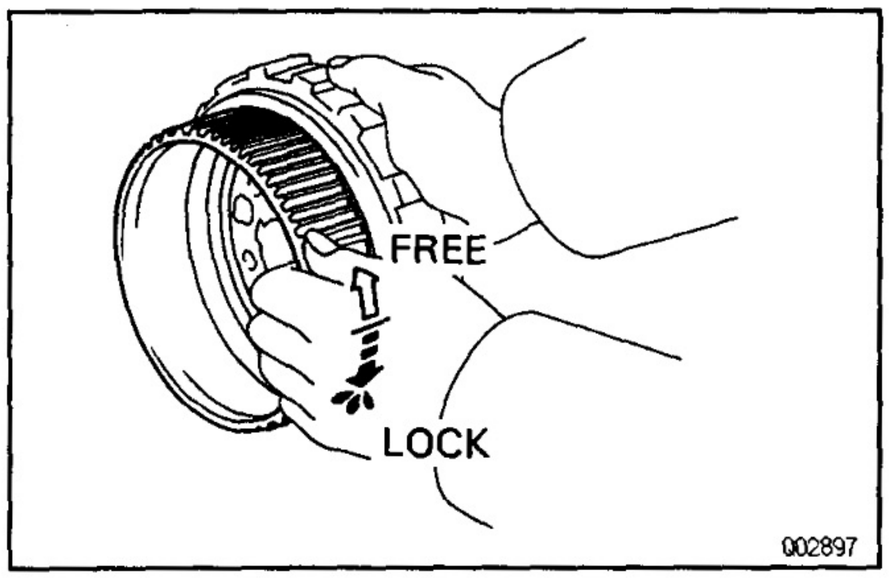
Remove the rear planetary gear and output shaft assembly from the front planetary gear.



002899

2. REMOVE NO.1 REAR THRUST WASHER

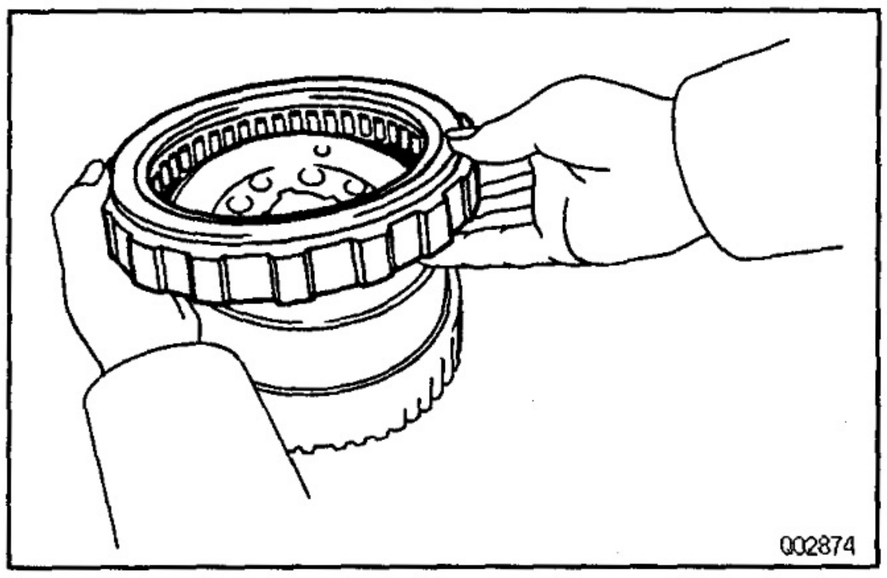
Remove the thrust washer from the rear side of the front planetary gear.



3. CHECK OPERATION OF ONE—WAY CLUTCH

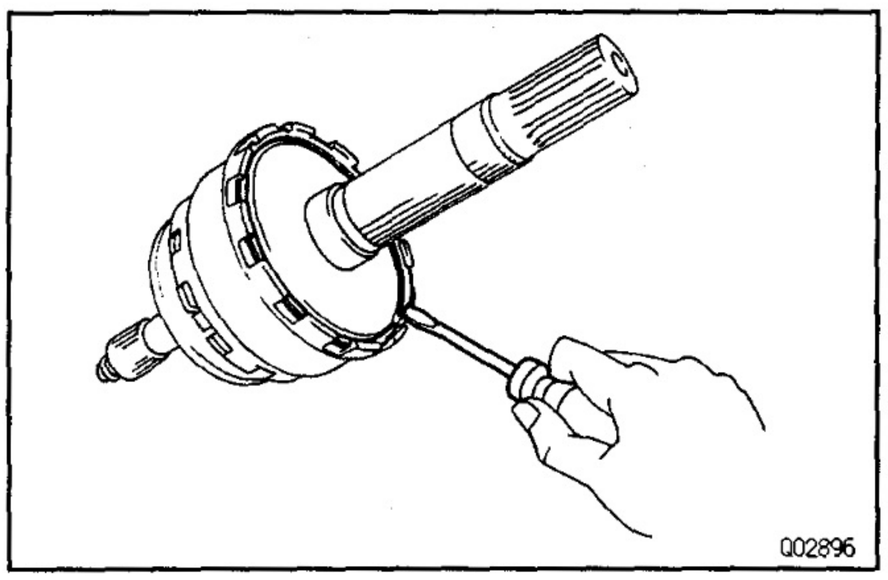
Hold the one—way clutch outer race and turn the front planetary gear. The front planetary gear should turn freely counterclockwise and should lock clockwise.

If operation is not as specified, replace the one—way clutch.



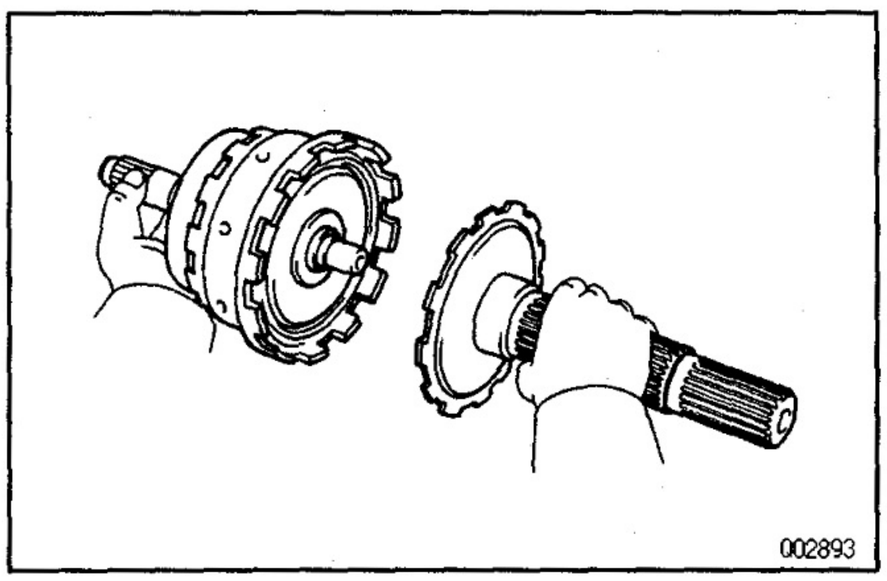
4. REMOVE ONE—WAY CLUTCH

Remove the one—way clutch from the front planetary gear.

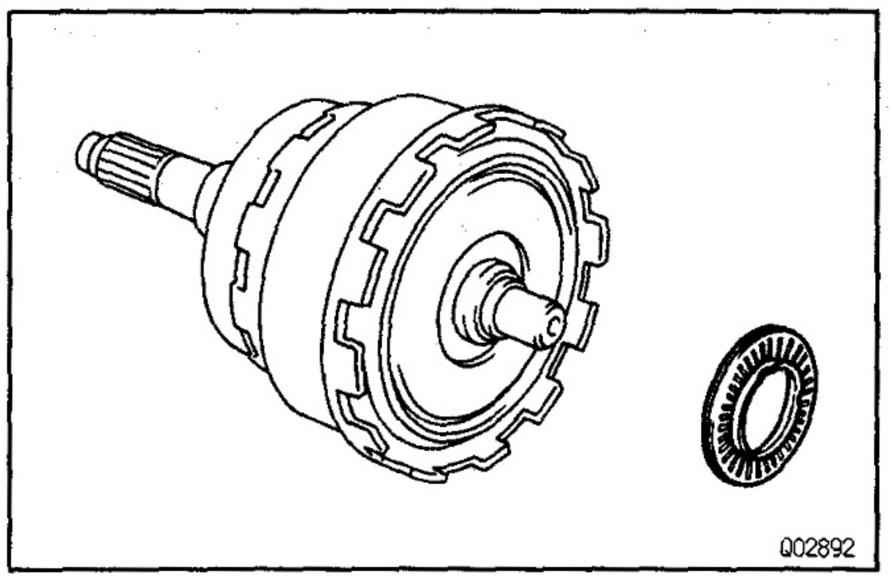


5. REMOVE OUTPUT SHAFT

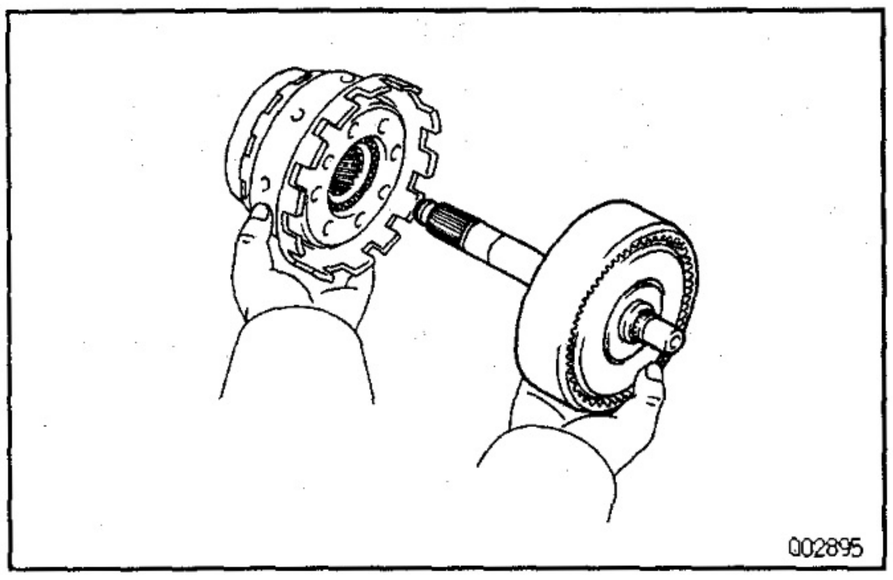
(a) Using a screwdriver, remove the snap ring.



(b) Remove the output shaft from the rear planetary gear.

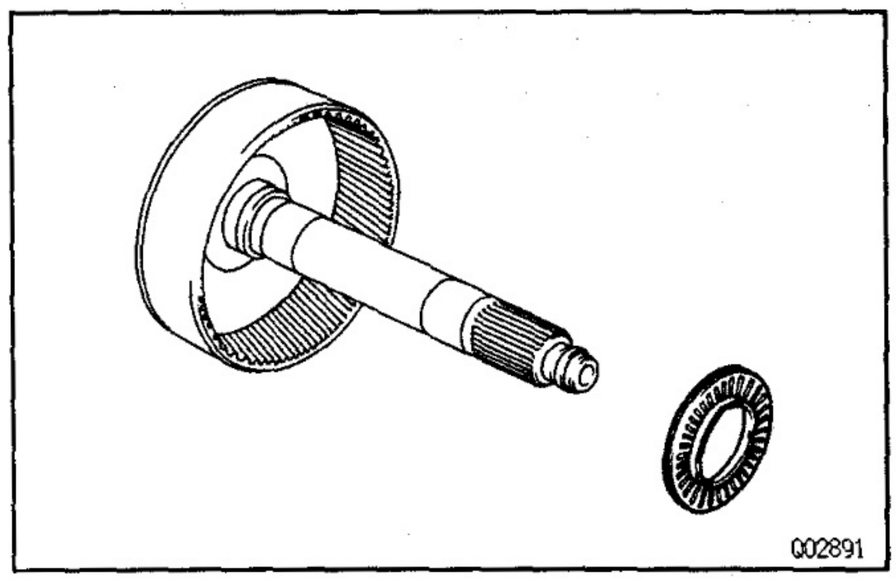


(c) Remove the thrust bearing and race from the rear side of the ring gear flange.

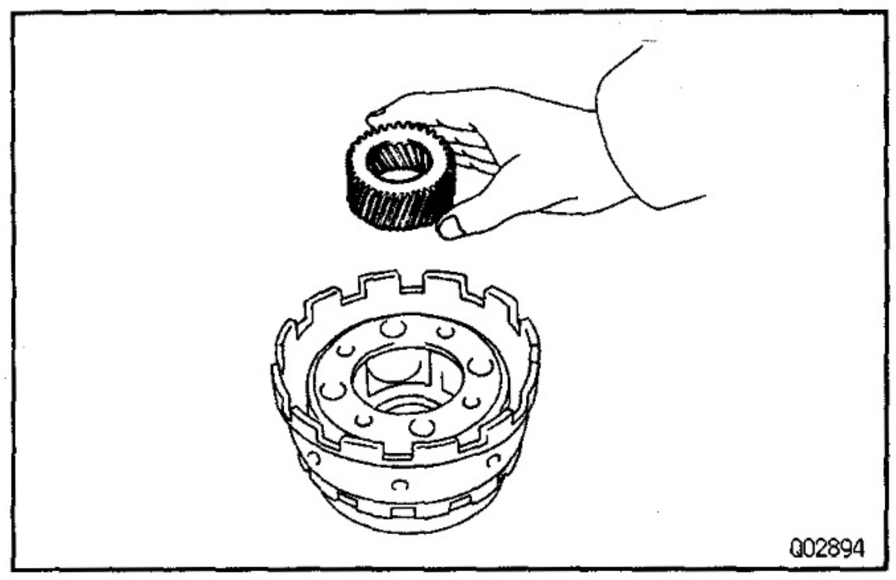


6. REMOVE REAR PLANETARY RING GEAR AND INTERMEDIATE SHAFT ASSEMBLY

(a) Remove the ring gear and intermediate shaft assembly from the rear planetary gear.

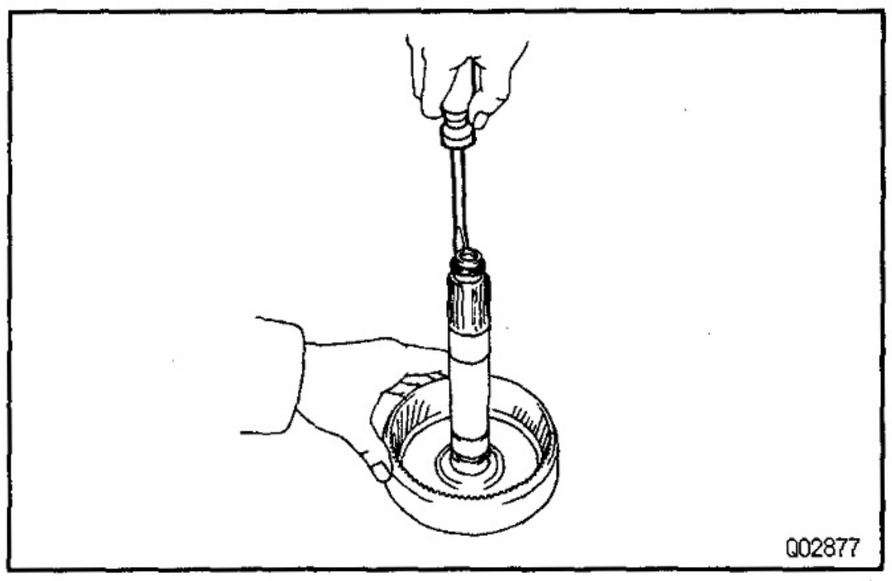


(b) Remove the thrust bearing from the front side of the ring gear flange.



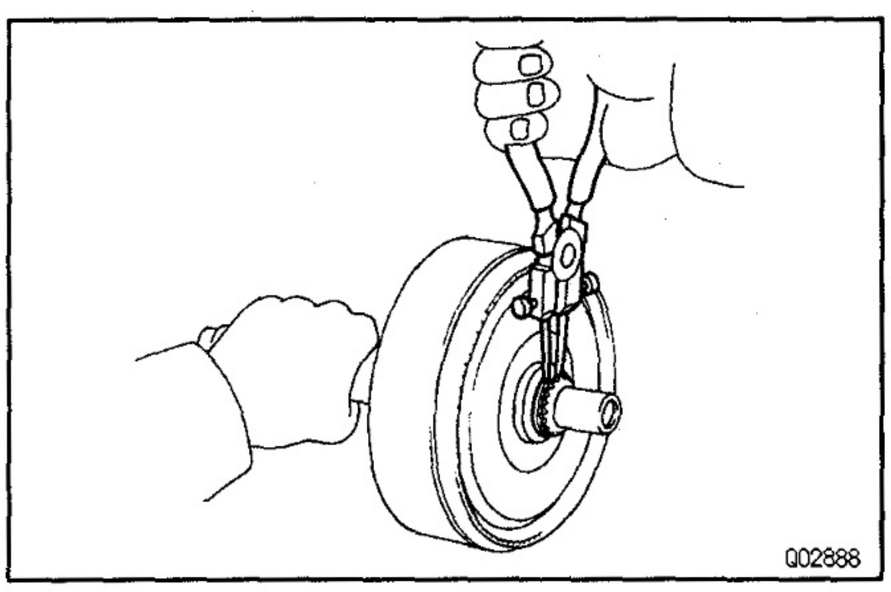
7. REMOVE REAR PLANETARY SUN GEAR

Remove the sun gear from the rear planetary gear.



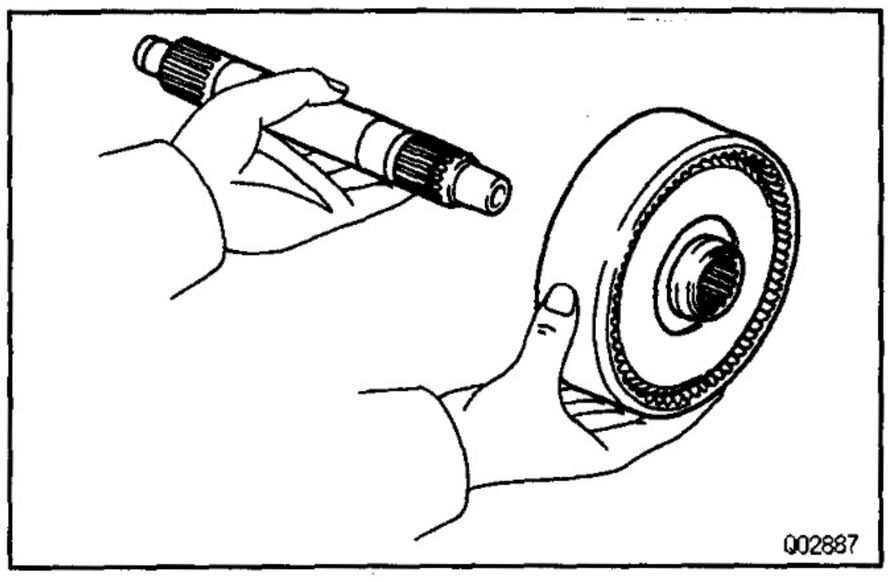
8. REMOVE OIL SEAL RING

Using a small screwdriver, pry out the oil seal ring.

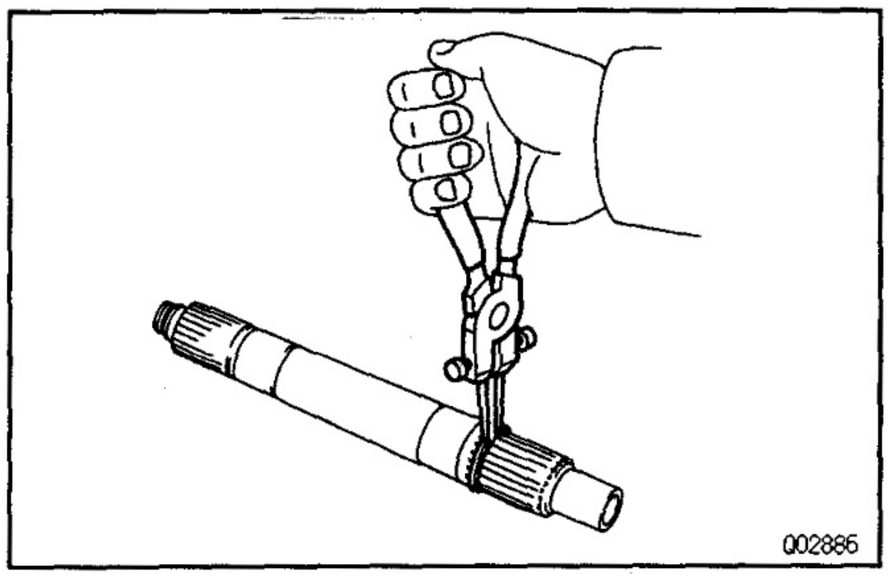


9. REMOVE REAR PLANETARY RING GEAR AND FLANGE ASSEMBLY

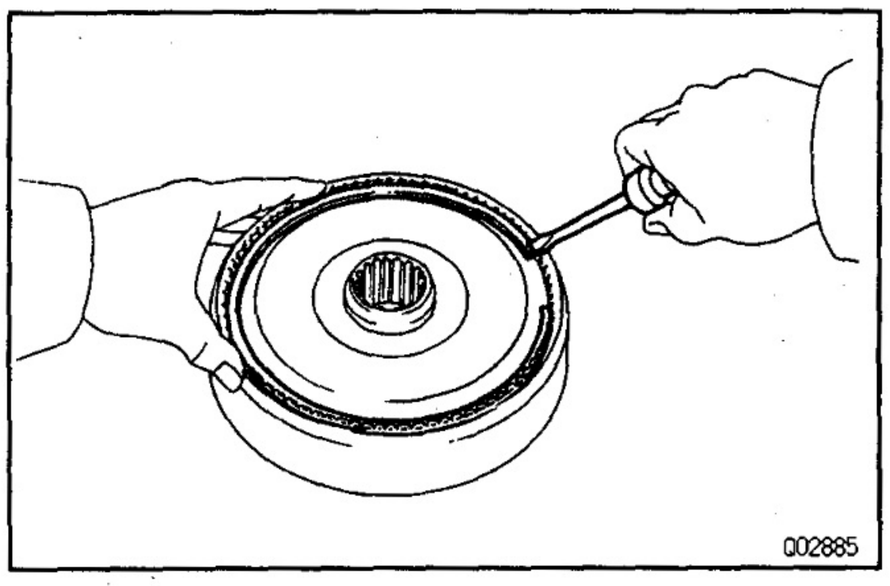
(a) Using snap ring pliers, remove the snap ring from the rear side of the intermediate shaft.



(b) Remove the ring gear and flange assembly from the intermediate shaft.

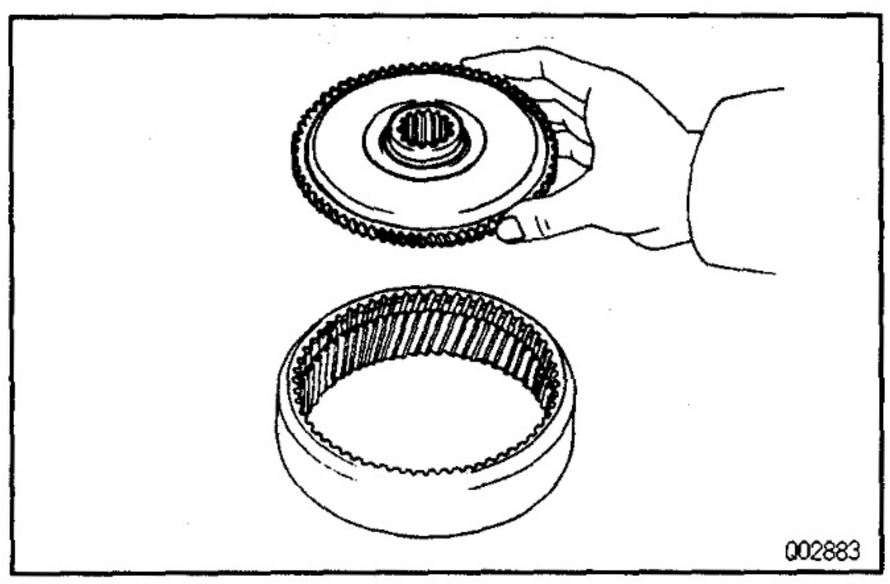


(c) Using snap ring pliers, remove the snap ring from the front side of the intermediate shaft.

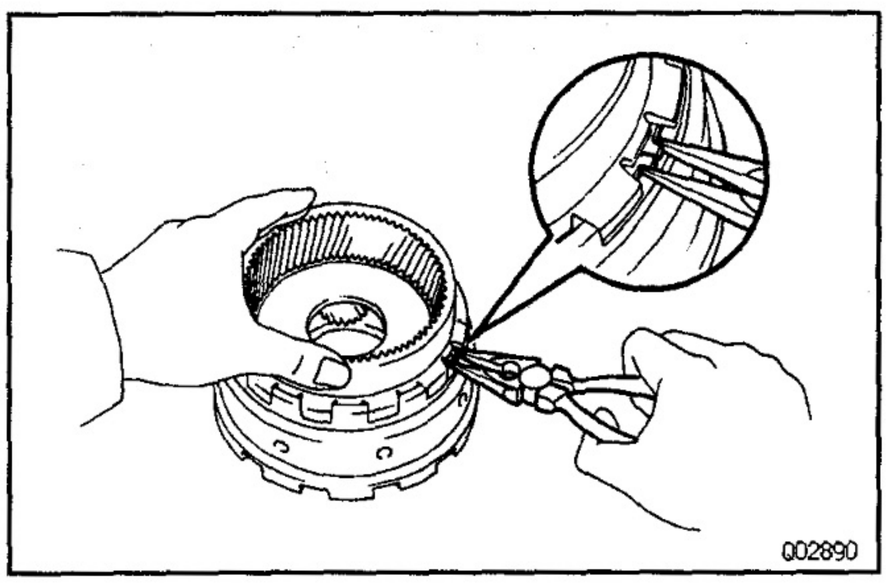


10. REMOVE REAR PLANETARY RING GEAR FLANGE

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

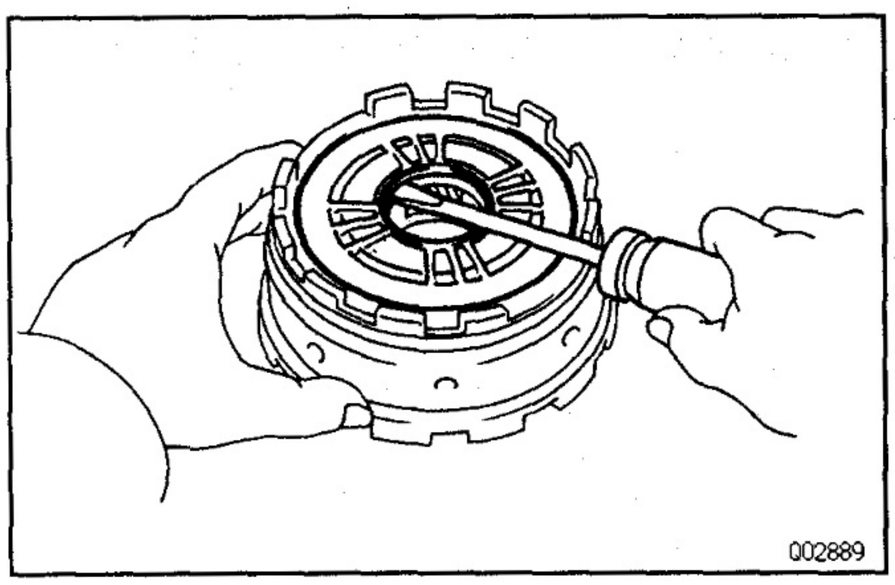


(d) Remove the ring gear flange from the rear planetary ring gear.



11. REMOVE FRONT PLANETARY RING GEAR

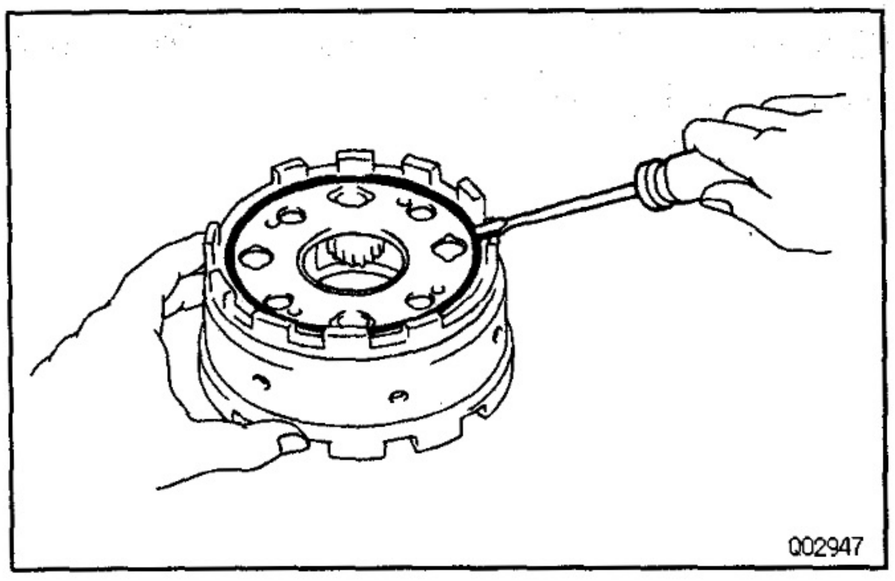
Using needle nose pliers, pry out the ring gear while compressing the snap ring.



12. REMOVE NO.2 THRUST WASHER

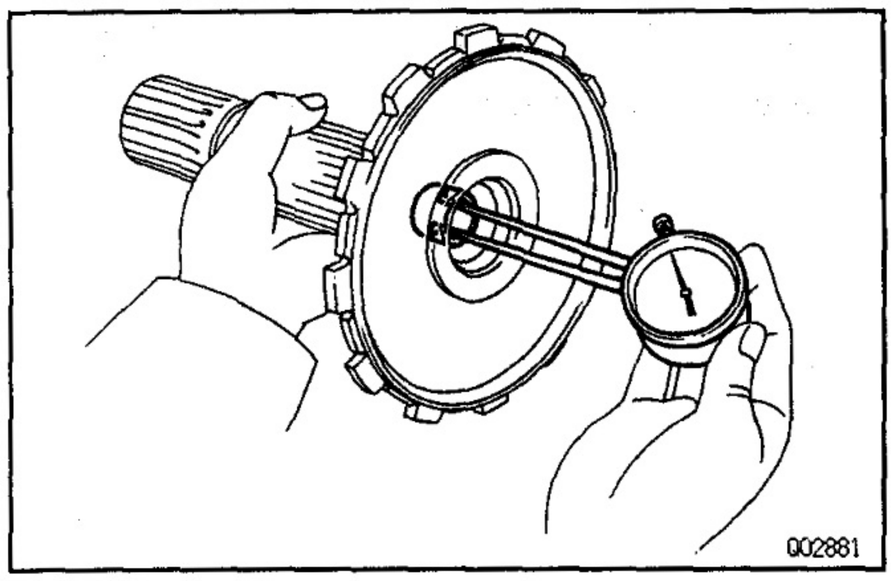
Remove the thrust washer from the rear planetary gear.

NOTICE: Do not damage the No.2 thrust washer.



13. REMOVE O—RING

Using a small screwdriver, remov the o—ring from the rear planetary gear.



FRONT AND REAR PLANETARY GEAR UNIT INSPECTION

AT08G—01

1. INSPECT BUSHING OF OUTPUT SHAFT

Using a dial indicator, measure the inside diameter.

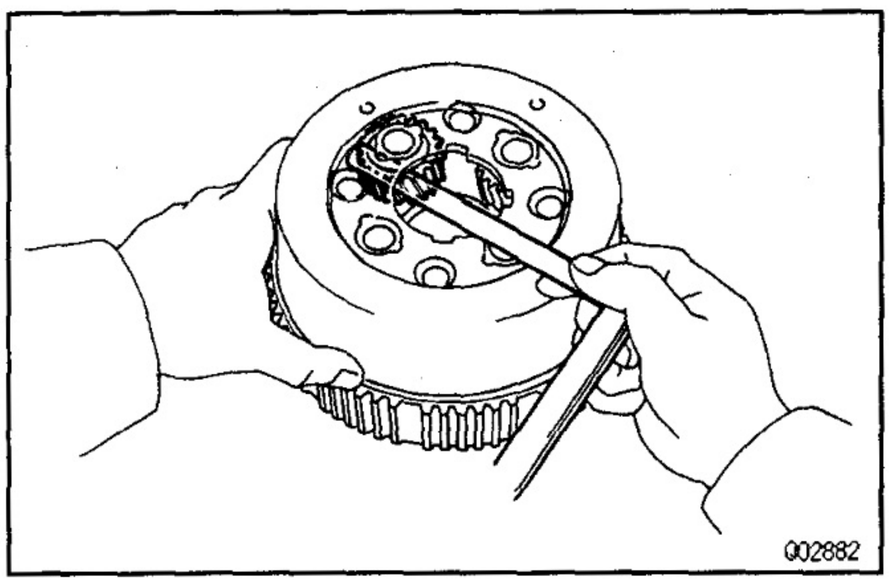
Standard inside diameter:

17.000—17.018 mm (0.6693—0.6700 in.)

Maximum inside diameter:

17.07 mm (0.6720 in.)

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



2. INSPECT PLANETARY PINION GEAR THRUST CLEARANCE

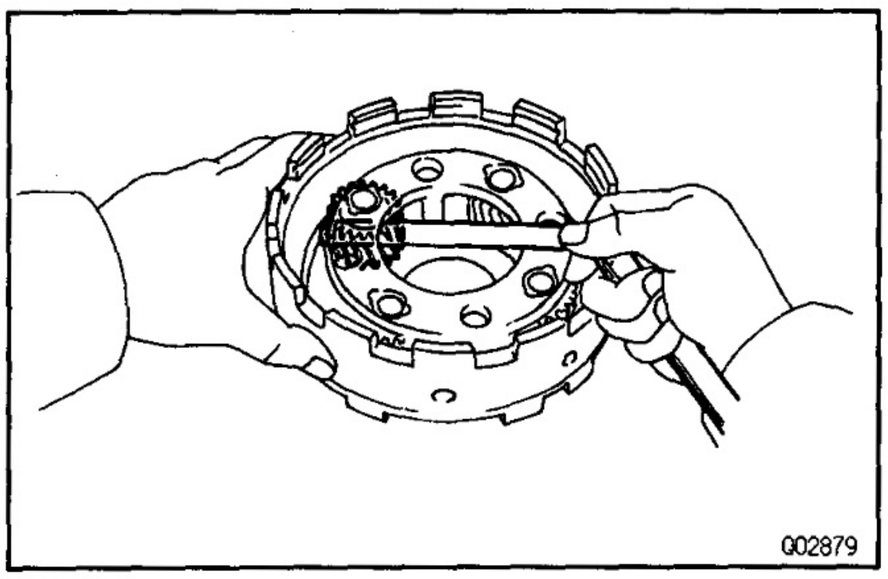
Using a feeler gauge, measure the thrust clearance between the pinions and carrier.

Standard clearance:

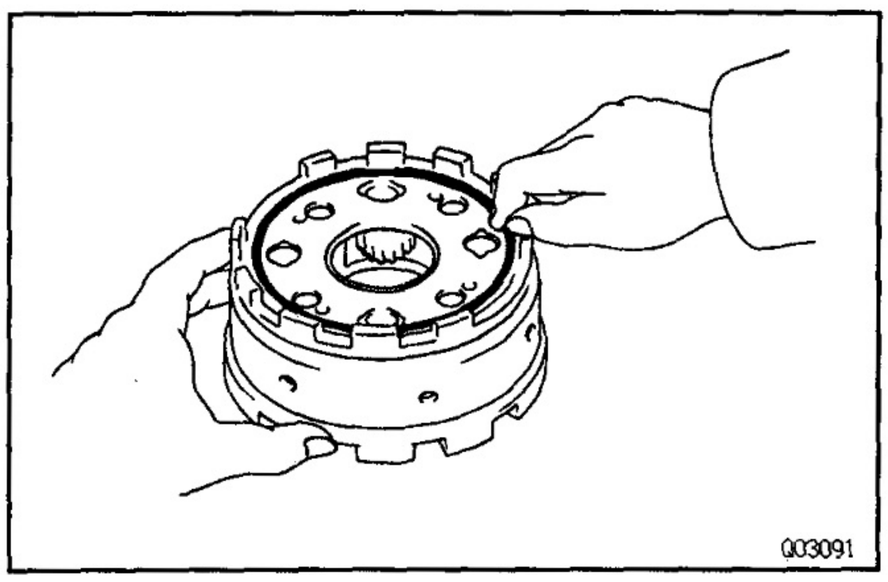
0.20—0.50 mm (0.0079—0.0197 in.)

Maximum clearance:

0.75 mm (0.0295 in.)



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

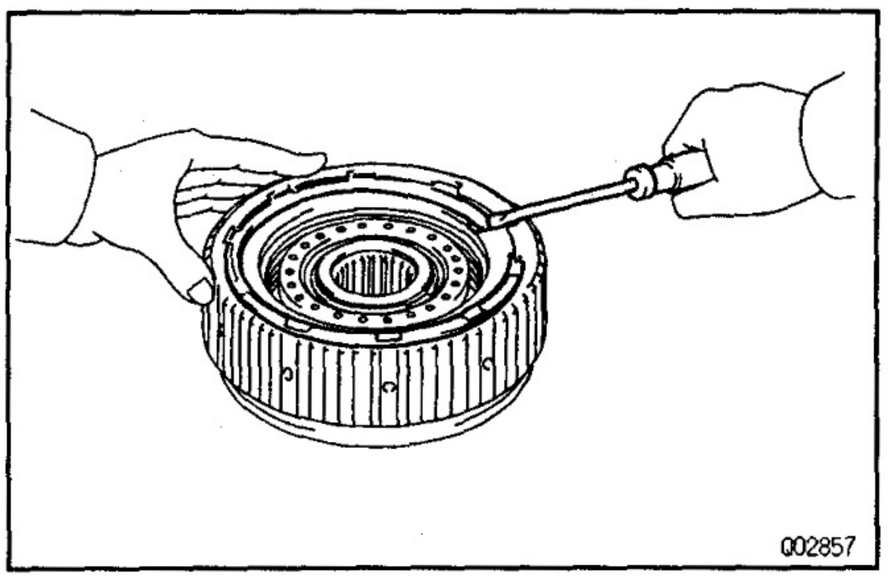


AT06H-01

FRONT AND REAR PLANETARY GEAR UNIT ASSEMBLY

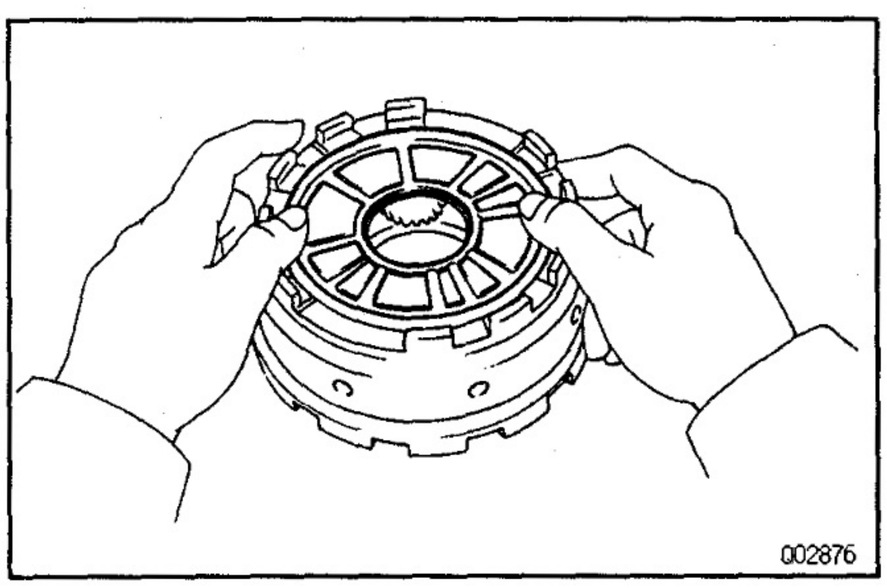
1. INSTALL O-RING

Coat a new O-ring with ATF, and install it to the rear planetary gear.

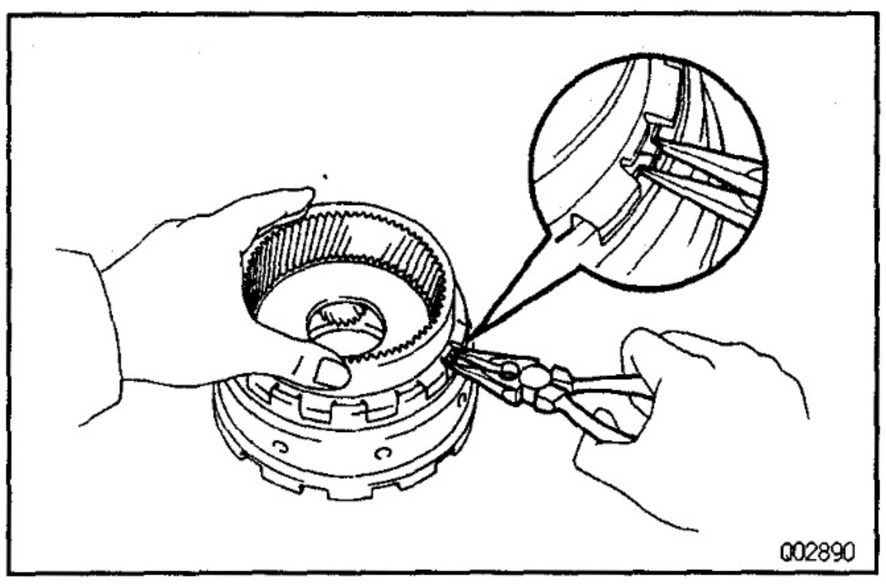


2. INSTALL NO.2 THRUST WASHER

Coat the thrust washer with petroleum jelly, and install it onto the rear planetary gear.



HINT: Securely fit the lips of the thrust washer into the holes of the rear planetary gear.

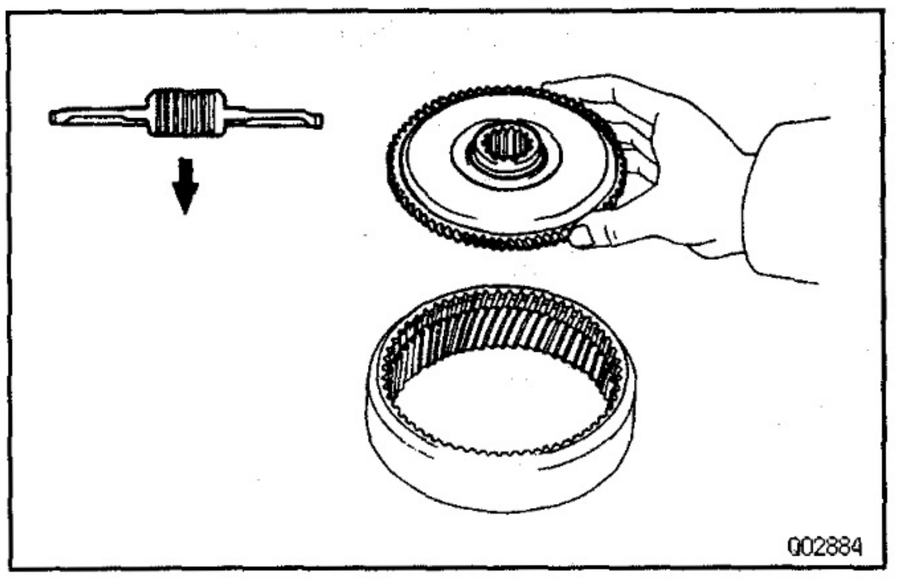


3. INSTALL FRONT PLANETARY RING GEAR

(a) Align the snap ring end with the wide cutout portion of the rear planetary gear.

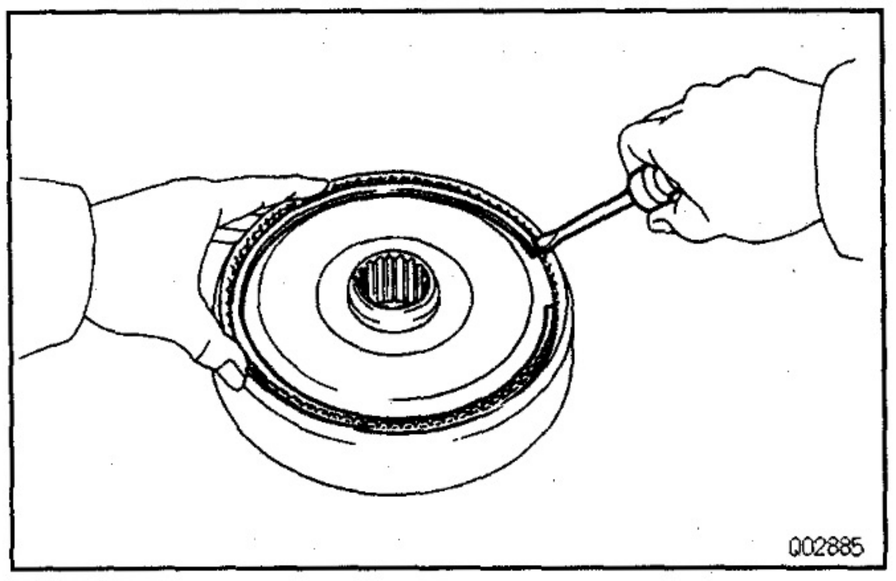
(b) Using needle nose pliers, compress the snap ring and then install the ring gear.

(c) Check that the snap ring is installed into the groove of the rear planetary gear.

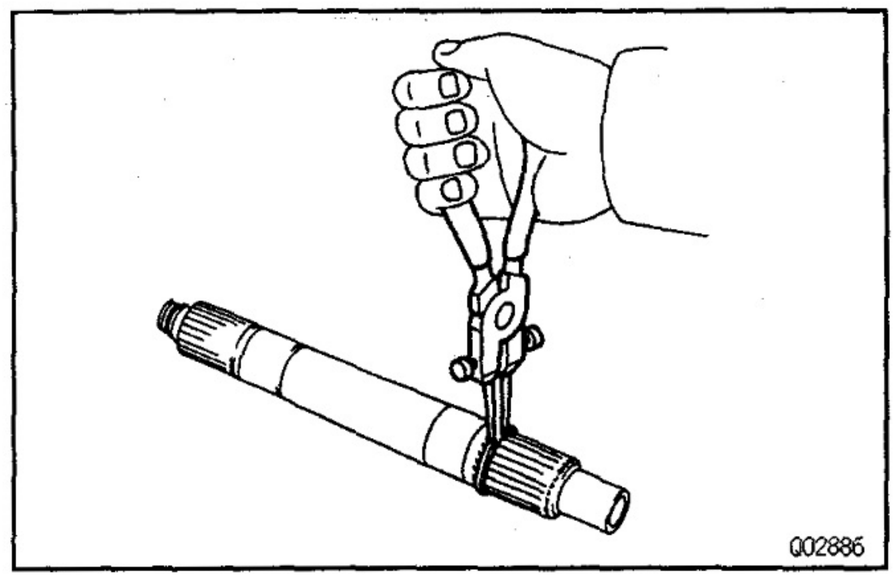


4. INSTALL REAR PLANETARY RING GEAR FLANGE

(a) Install the ring gear flange to the rear planetary ring gear.

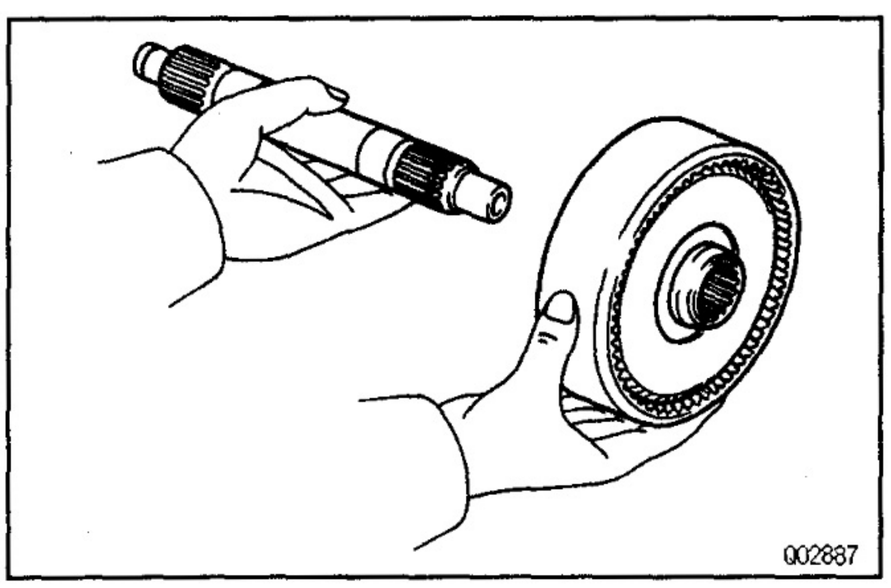


(b) Using a small screwdriver, install the snap ring.

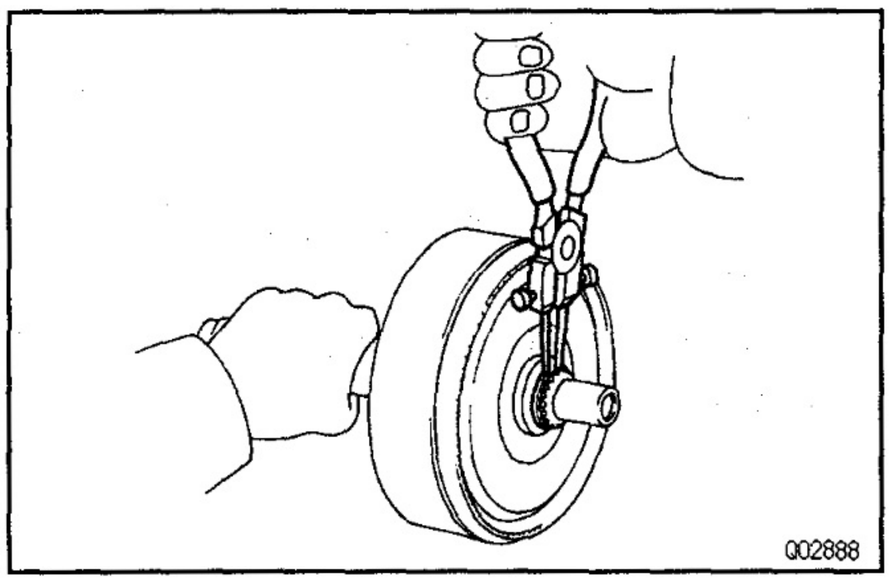


5. INSTALL REAR PLANETARY RING GEAR AND FLANGE ASSEMBLY

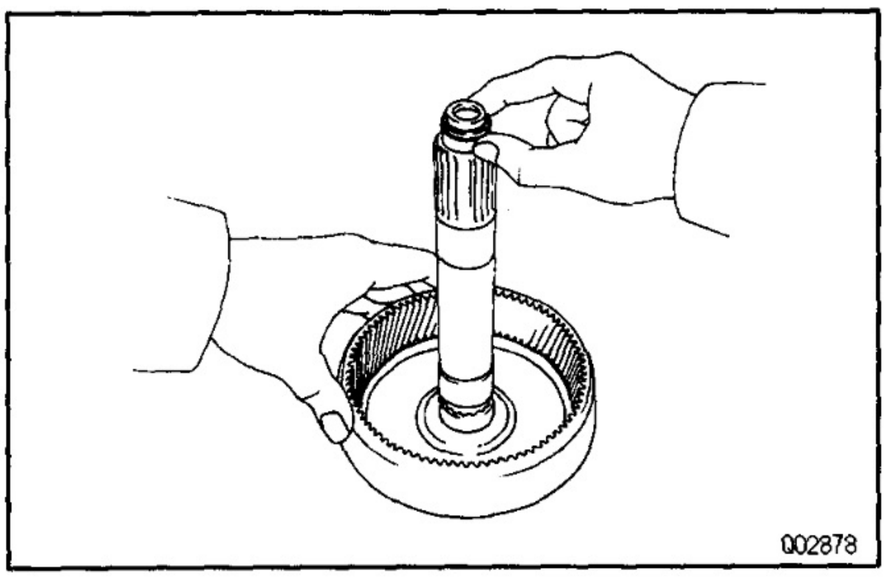
(a) Using snap ring pliers, install the snap ring on the front side of the intermediate shaft.



(b) Install the ring gear and flange assembly.

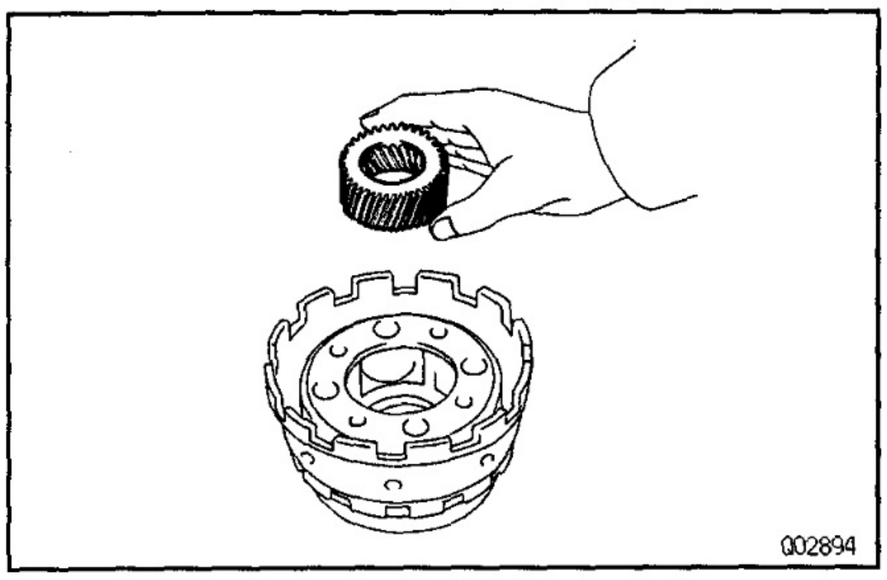


(c) Using snap ring pliers, install the snap ring on the rear side of the intermediate shaft.



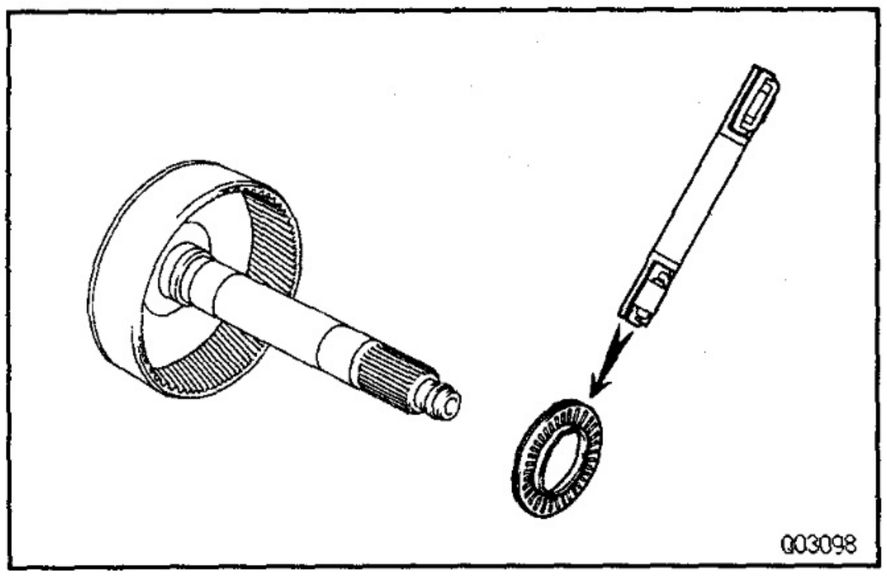
6. INSTALL OIL SEAL RING

Coat a new oil seal ring with ATF, and install it on the intermediate shaft.



7. INSTALL REAR PLANETARY SUN GEAR

Install the sun gear to the rear planetary gear.



8. INSTALL REAR PLANETARY RING GEAR AND INTERMEDIATE SHAFT ASSEMBLY

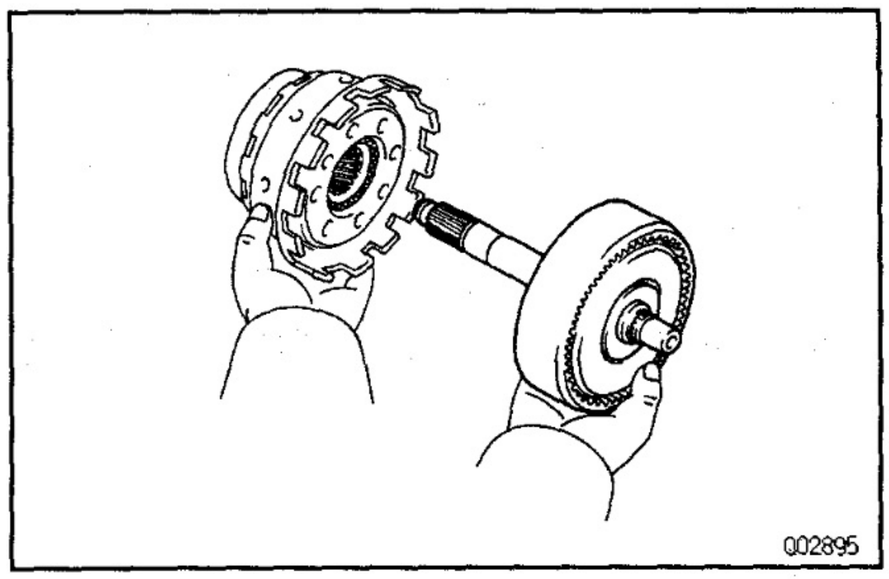
(a) Coat the thrust bearing with petroleum jelly.

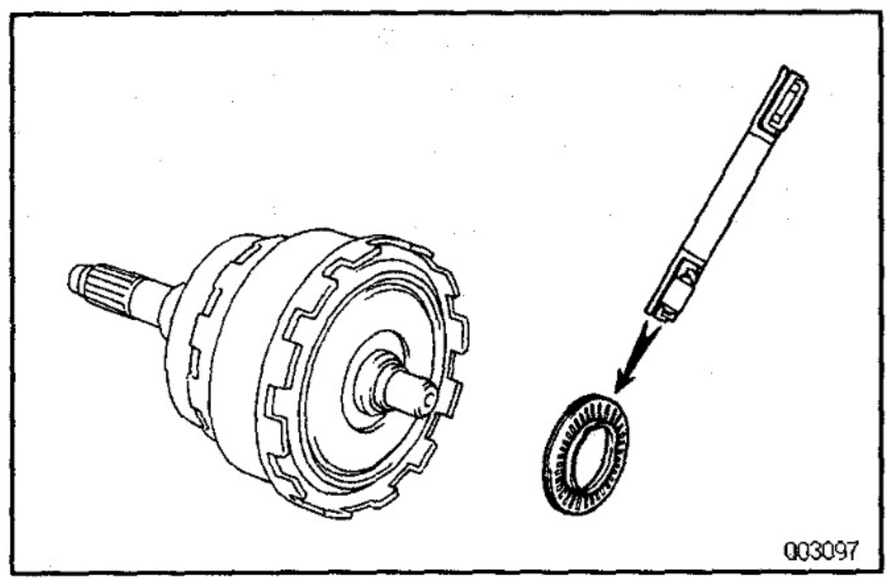
(b) Install the thrust bearing onto the front side of the ring gear flange.

HINT: Race and bearing diameter

Diameter mm (in.)	Inside	Outside
Bearing	32.8 (1.291)	52.0 (2.047)

(c) Install the ring gear and intermediate shaft assembly to the rear planetary gear.





9. INSTALL OUTPUT SHAFT

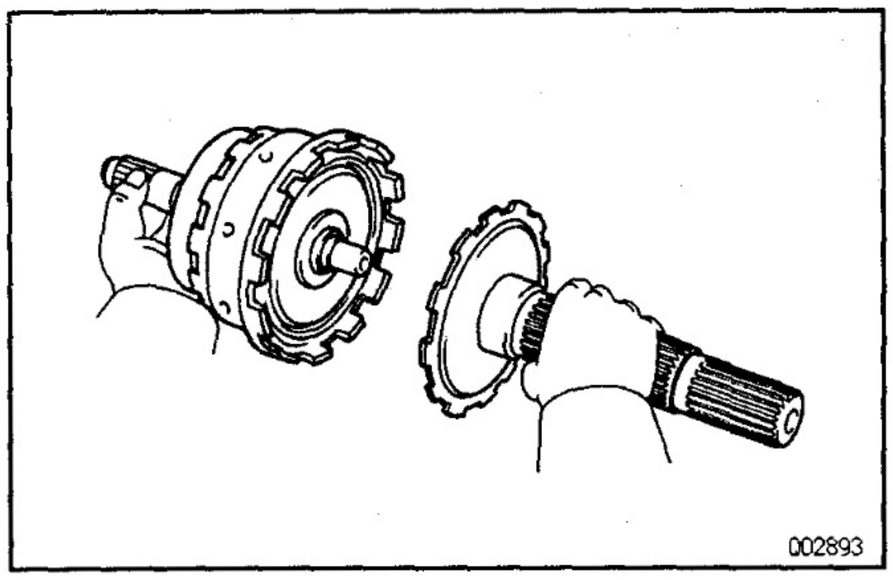
(a) Coat the race and thrust bearing with petroleum jelly.

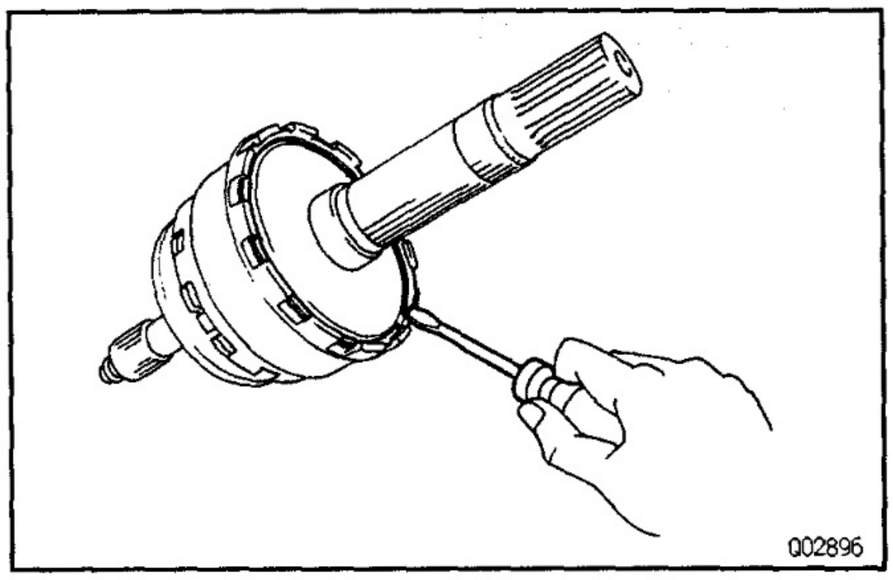
(b) Install the thrust bearing onto the rear side of the ring gear flange.

HINT: Race and bearing diameter

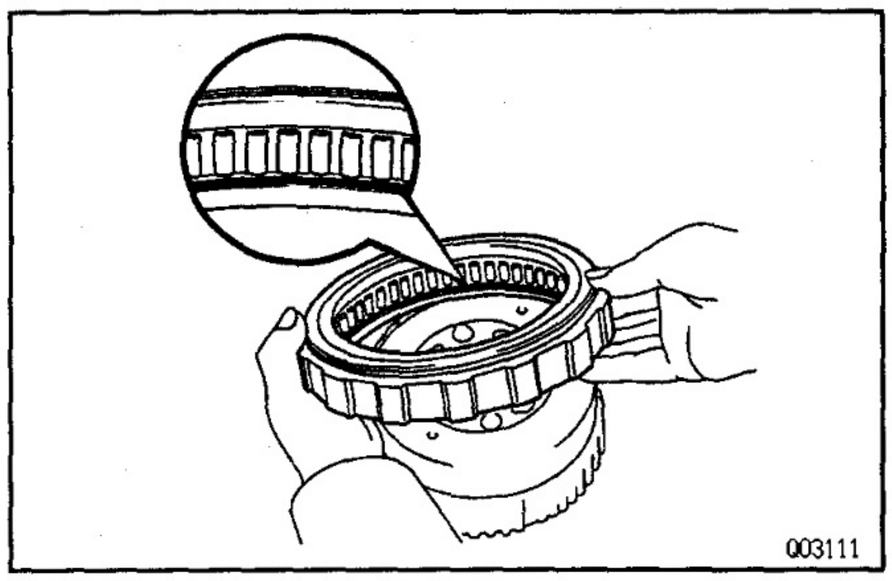
Thickness mm (in.)	Inside	Outside
Bearing	32.8 (1.291)	52.0 (2.047)

(c) Install the output shaft to the rear planetary gear.





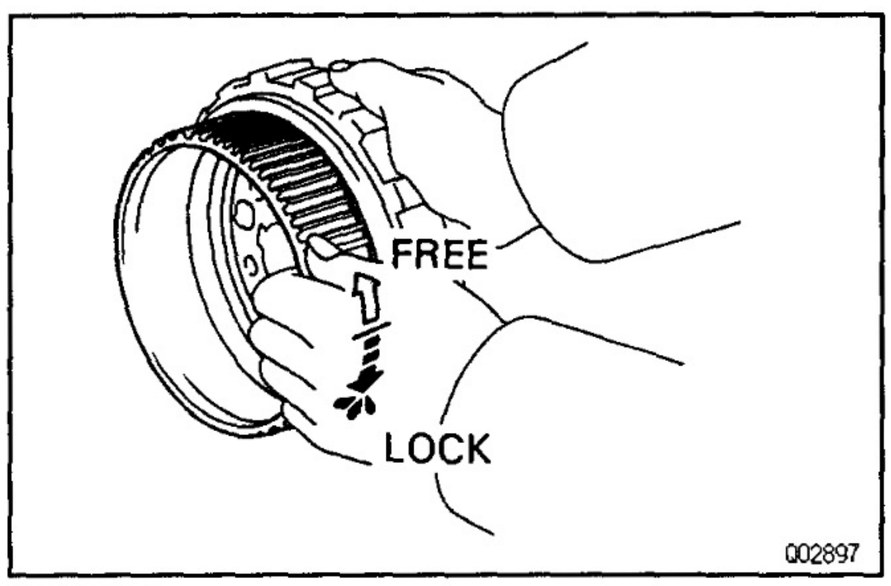
(d) Using a screwdriver, install the snap ring.
HINT: Be sure the end gap of the snap ring is not aligned with the cutout portion of the rear planetary gear.



10. INSTALL ONE—WAY CLUTCH

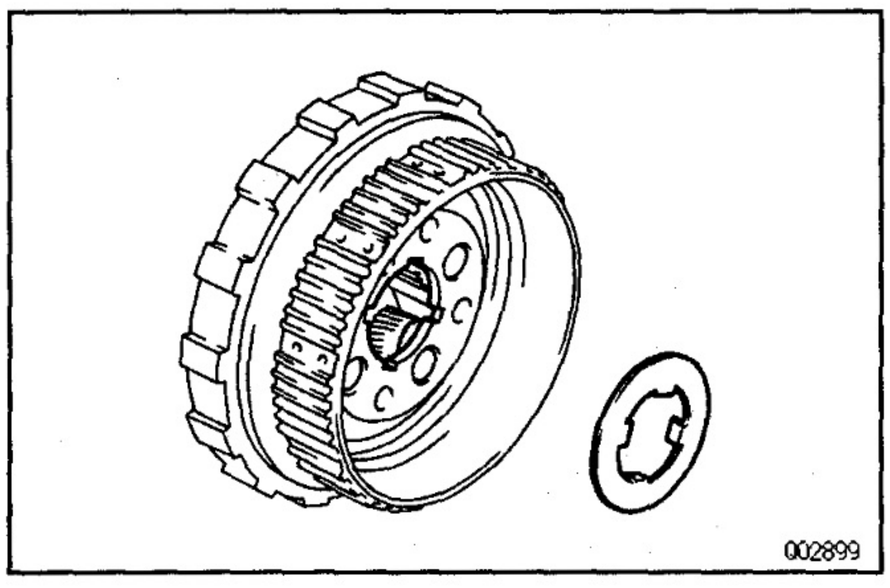
(a) Position the one—way clutch on the front planetary gear, facing the flange side of the one—way clutch downward.

(b) Install the one—way clutch outer race and turn the front planetary gear. The front planetary gear should turn freely counterclockwise and should lock clockwise.
If operation of not as specified, replace the one—way clutch.



11. CHECK OPERATION OF ONE—WAY CLUTCH

Hold the one—way clutch outer race and turn the front planetary gear. The front planetary gear should turn freely counterclockwide and should lock clock wise.
If operation is not as specified, replace the one—way clutch.

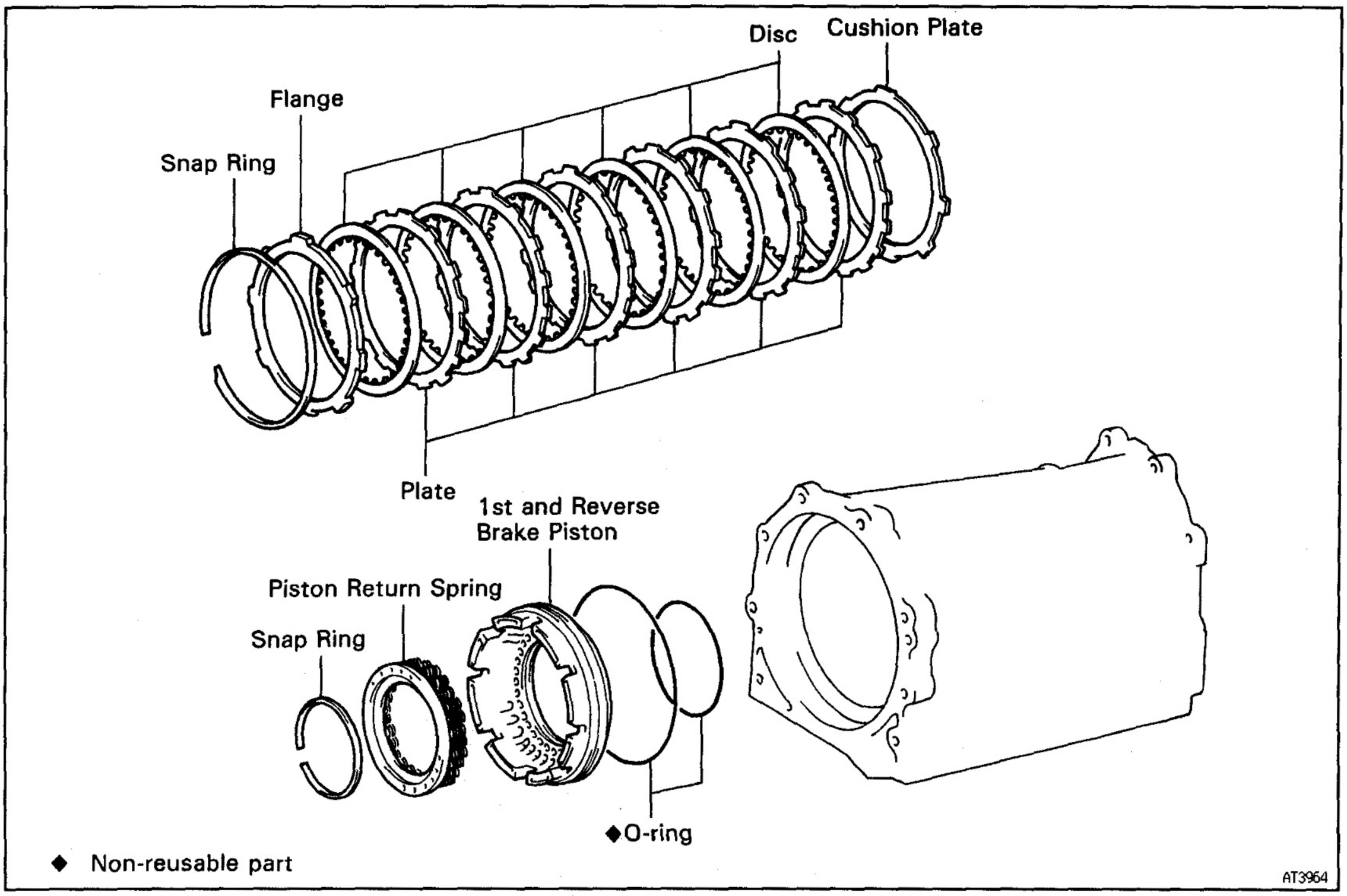


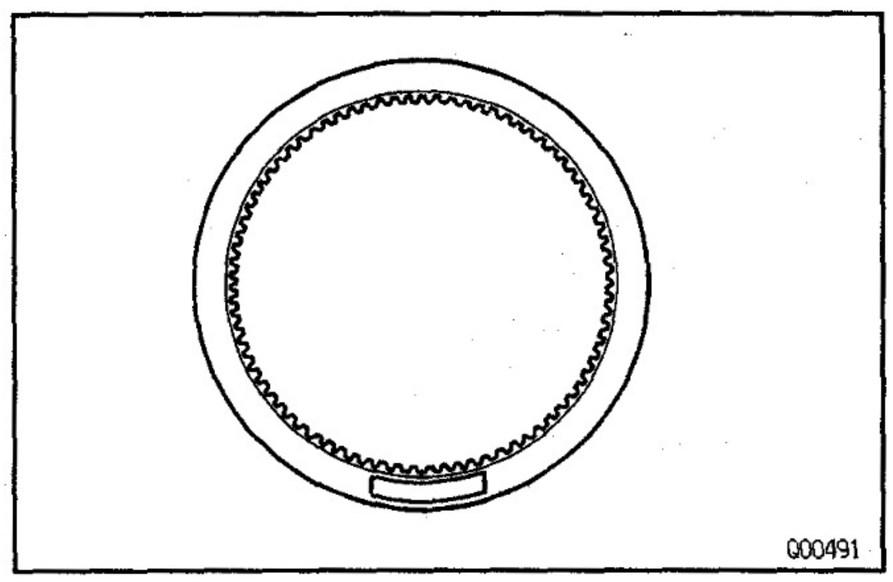
12. INSTALL NO.1 REAR THRUST WASHER

Coat the thrust washer with petroleum jelly, and install it onto the rear side of the front planetary gear. Securely fit the claws of the thrust washer into the grooves of the front planetary gear.

FIRST AND REVERSE BRAKE
COMPONENTS

AT093–01





FIRST AND REVERSE BRAKE INSPECTION

AT08J–01

INSPECT DISCS, PLATES AND CUSHION PLATE

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

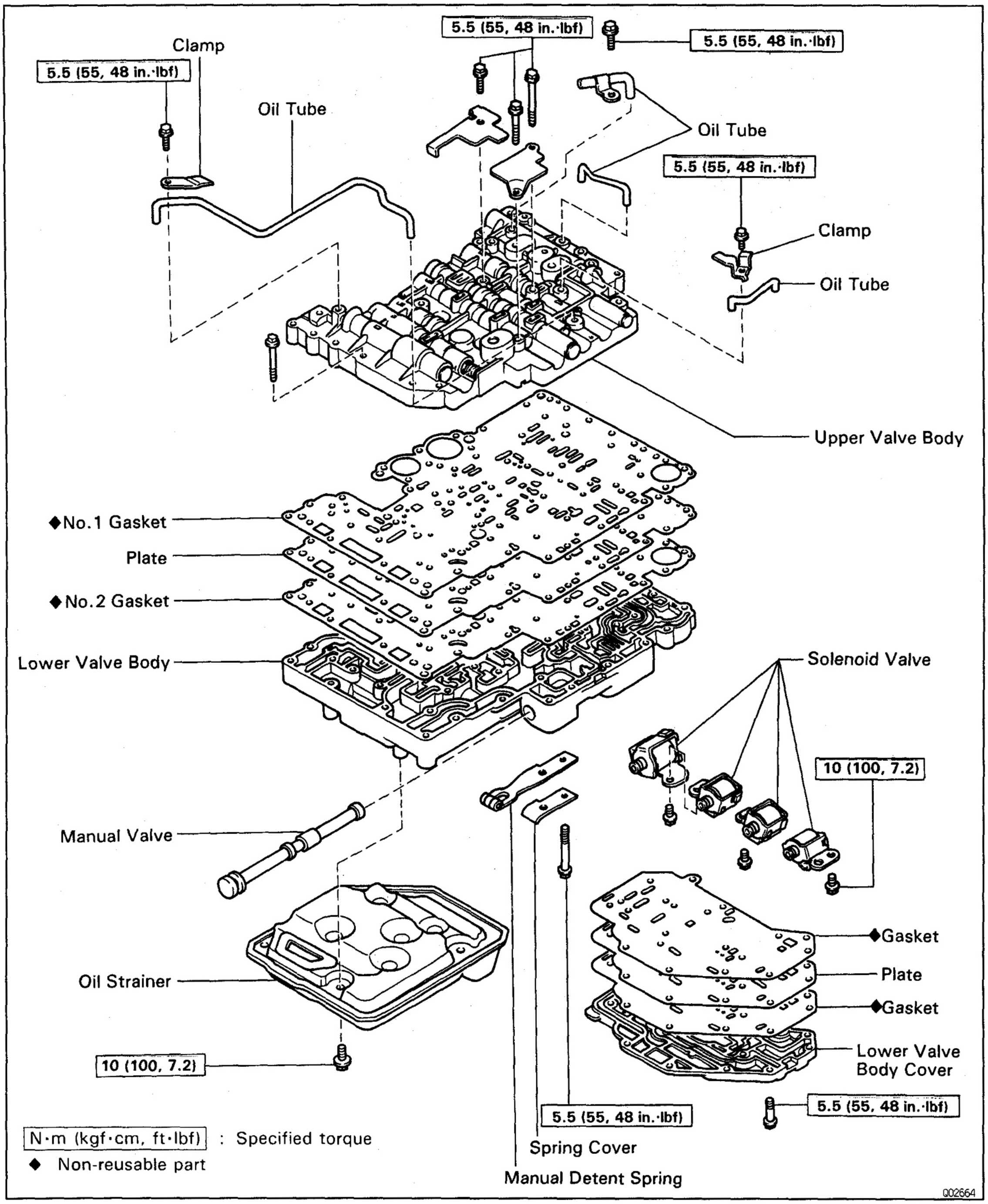
HINT:

- 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.

AT

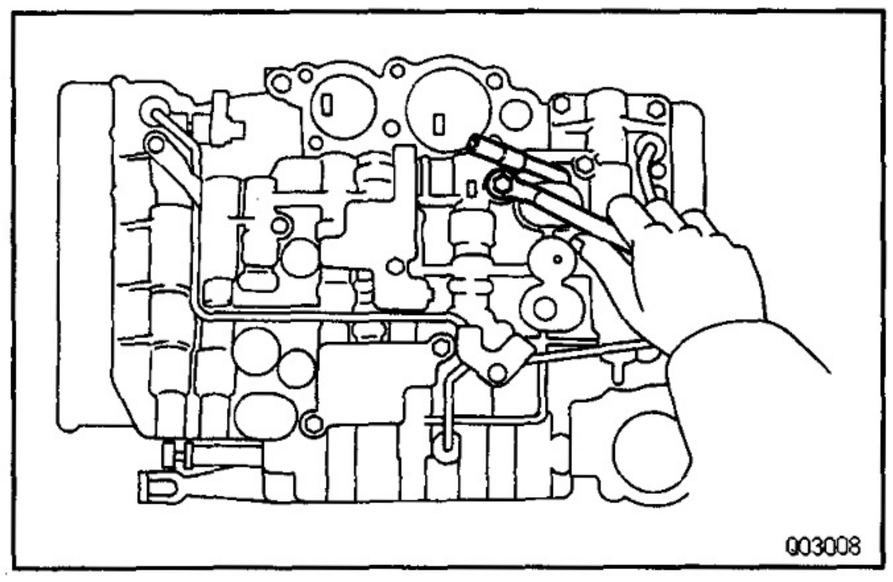
VALVE BODY
COMPONENTS

AT096–01

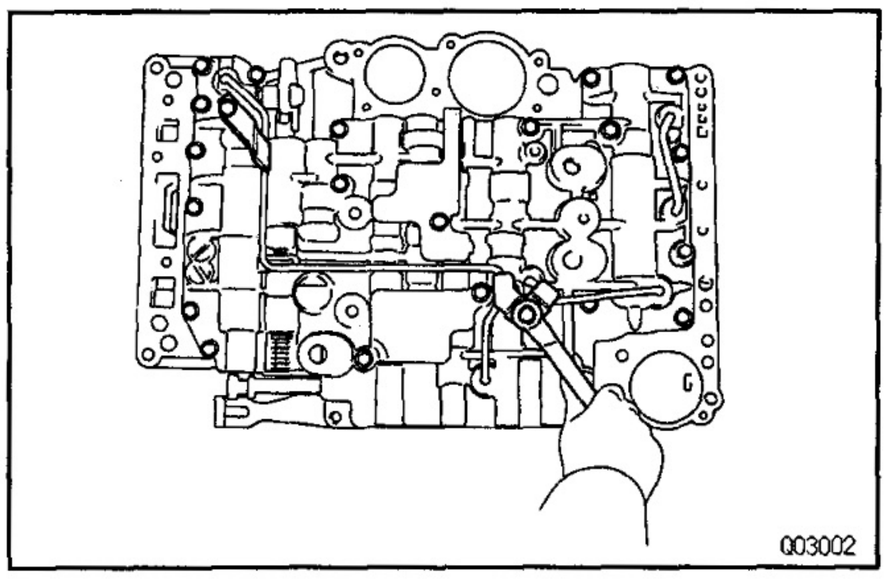


AT08K–01

VALVE BODY DISASSEMBLY

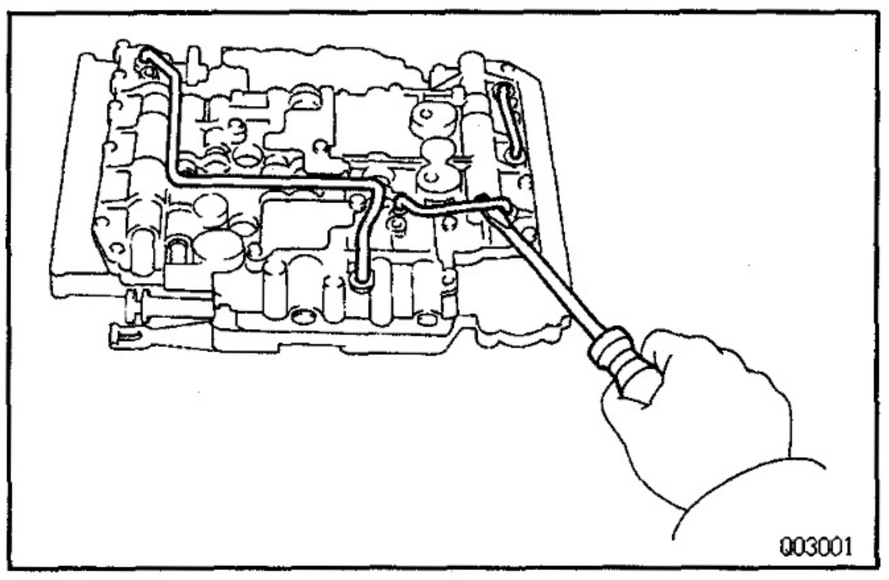


1. REMOVE DRAIN TUBE

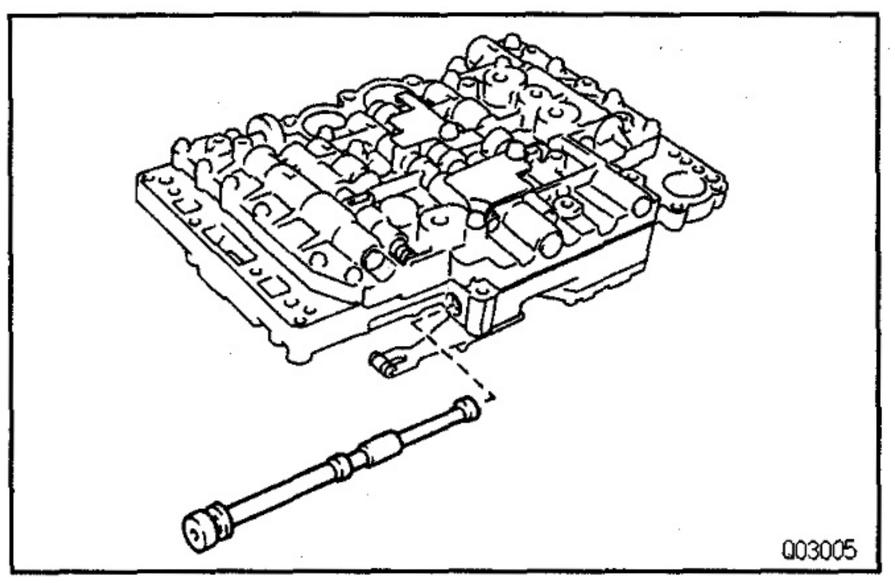


2. REMOVE OIL TUBES

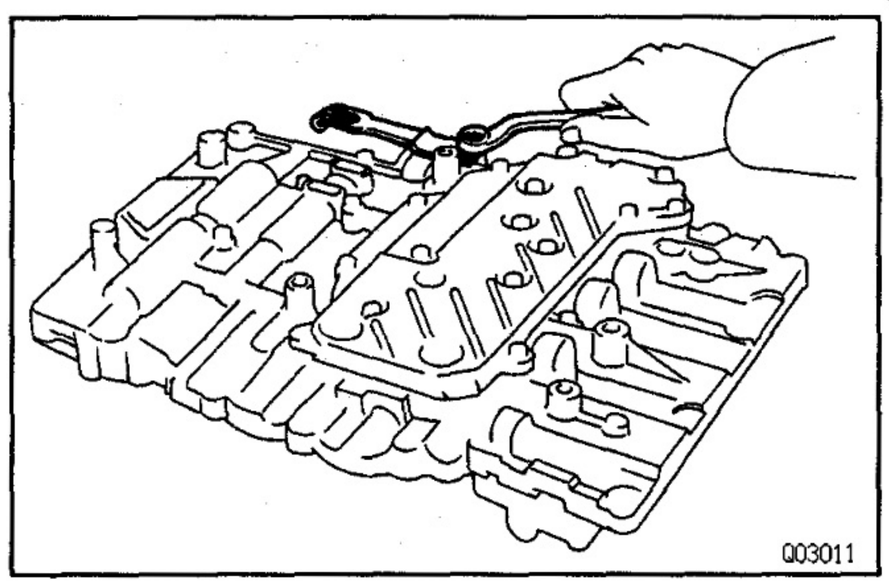
(a) Remove the two tube clamps.



(b) Using a large screwdriver, pry out the three oil tubes.



3. REMOVE MANUAL VALVE

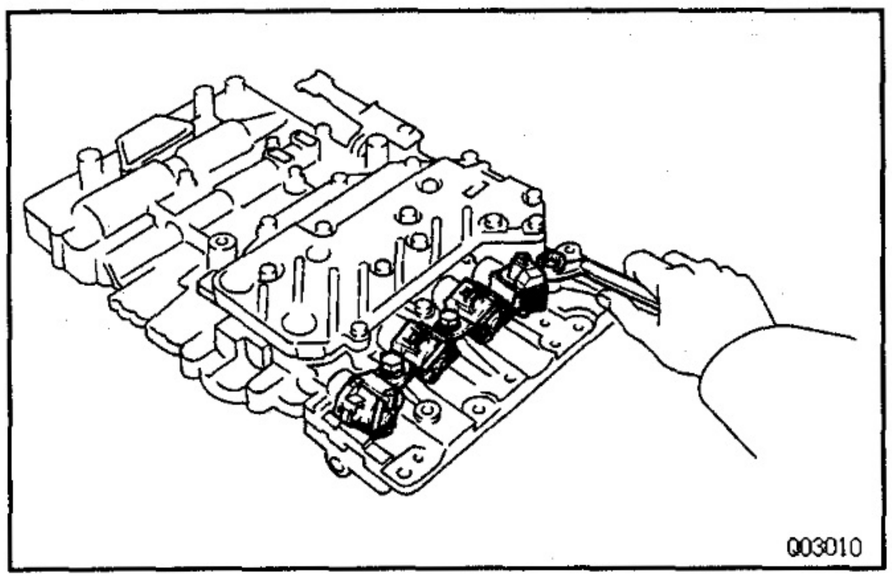


4. REMOVE MANUAL DETENT SPRING

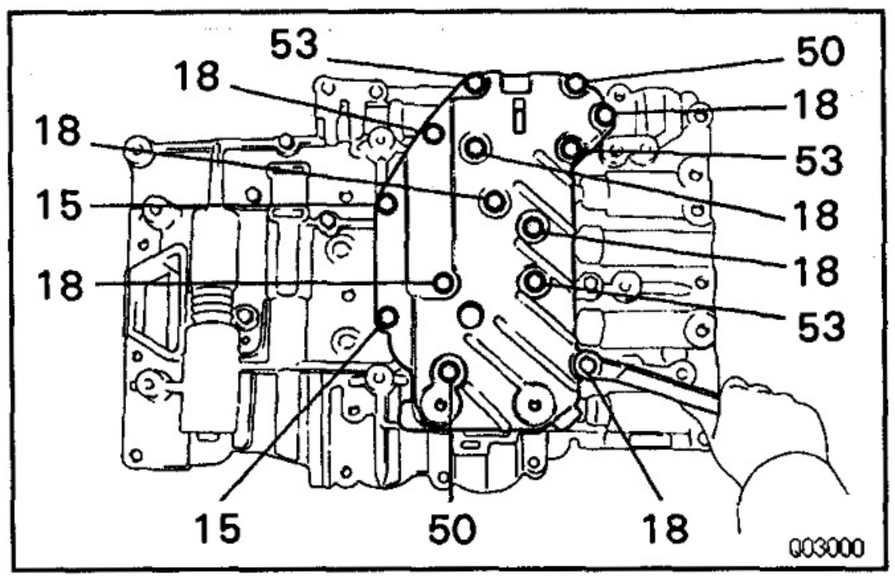
(a) Turn over the valve body assembly.

(b) Remove the bolt, wave washer, spring cover and detent spring.

AT

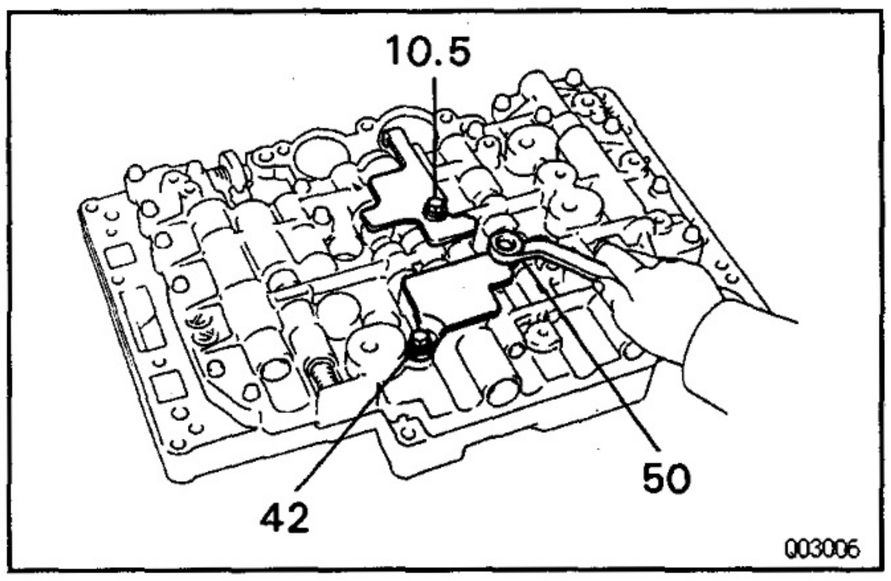


5. REMOVE FOUR SOLENOID VALVES

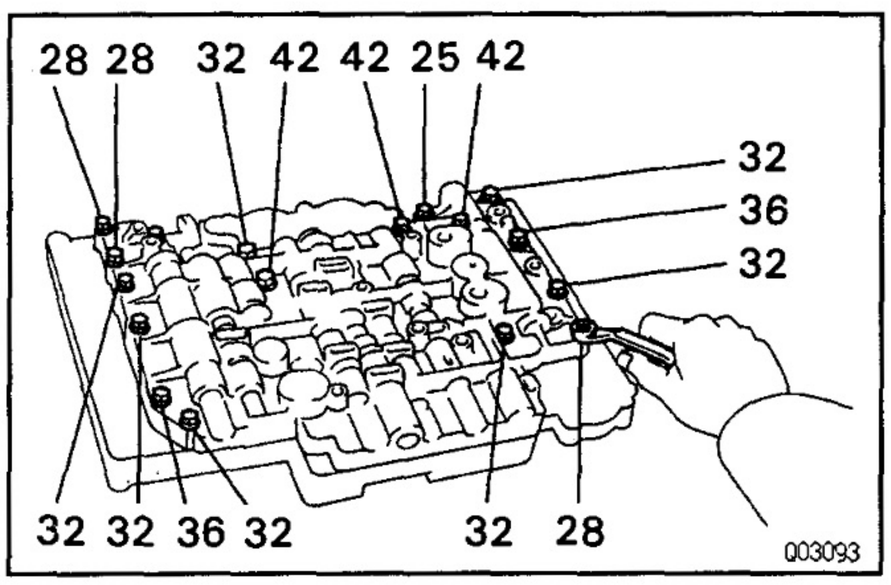


6. REMOVE LOWER VALVE BODY COVER AND PLATE

Remove the sixteen bolts, wave washers, body cover, two gaskets and body plate.

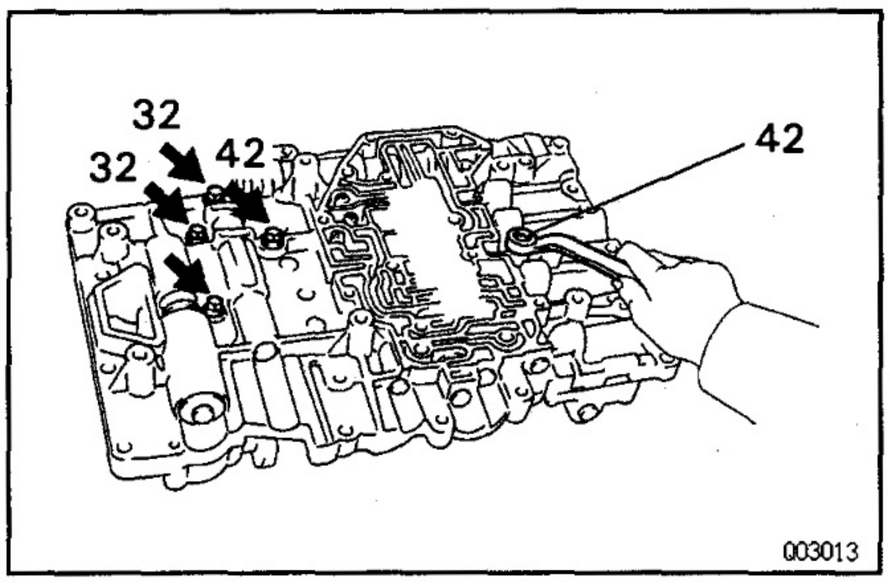


7. REMOVE TWO PLATS



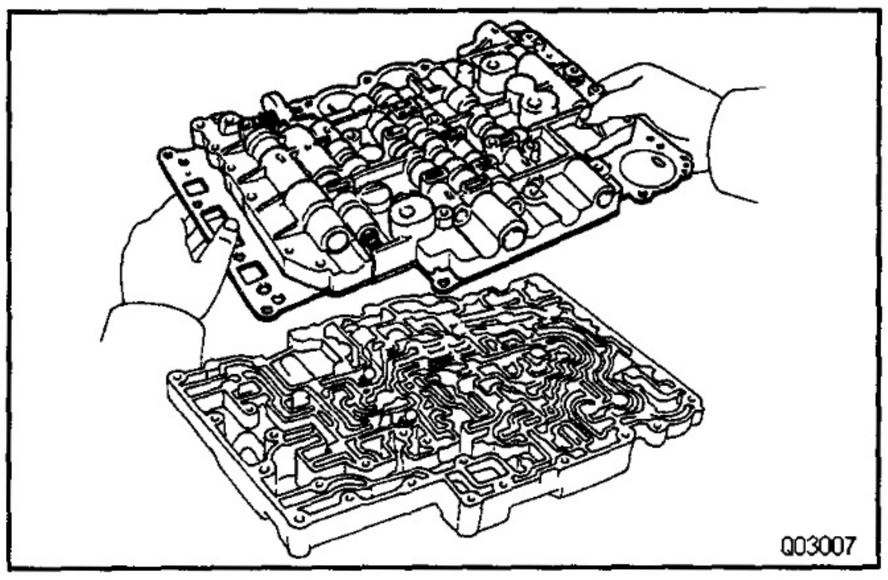
8. SEPARATE UPPER AND LOWER VALVE BODYS

(a) Remove the thrteen bolts from the upper valve body.



(b) Remove the five bolts from the lower valve body.

NOTICE: Be careful that the check balls, springs and check valves do not fall out from the lower valve body.



(c) Remove the lower valve body together with the valve body

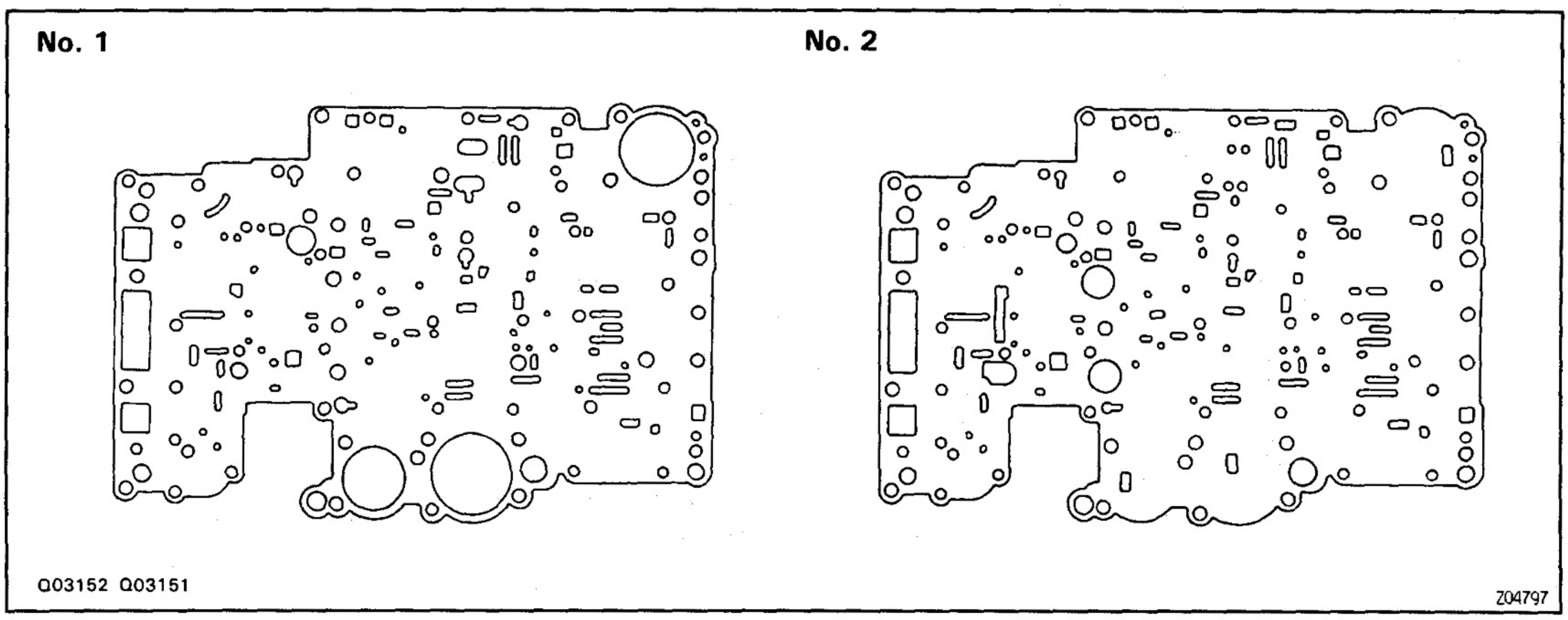
AT

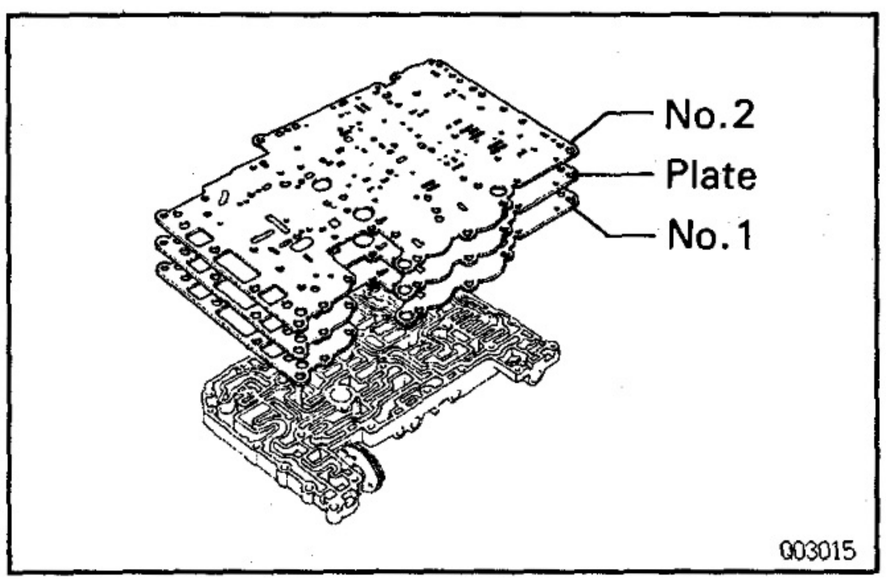
AT099–02

VALVE BODY ASSEMBLY

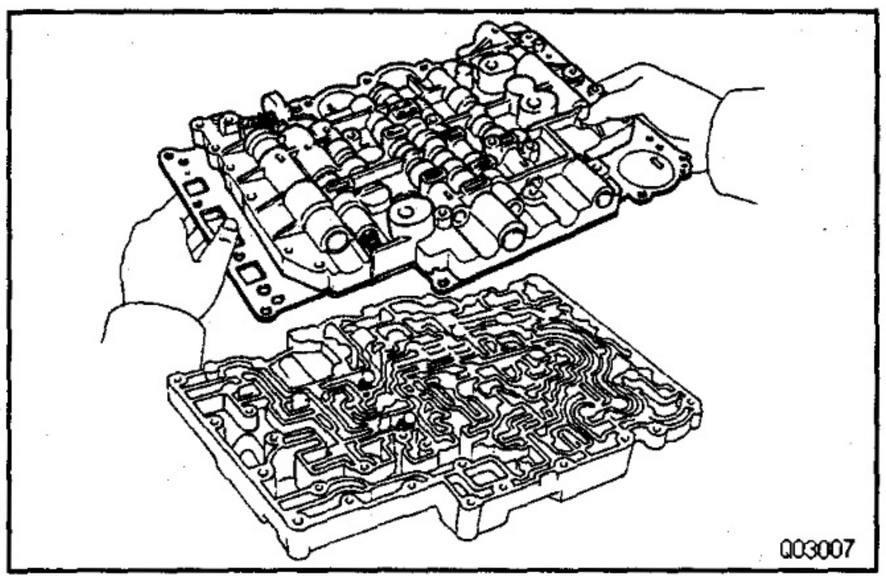
1. INSTALL VALVE BODY PLATE

HINT: Since No.1 and No.2 gaskets look similar, use the illustrations below to differentiate them.





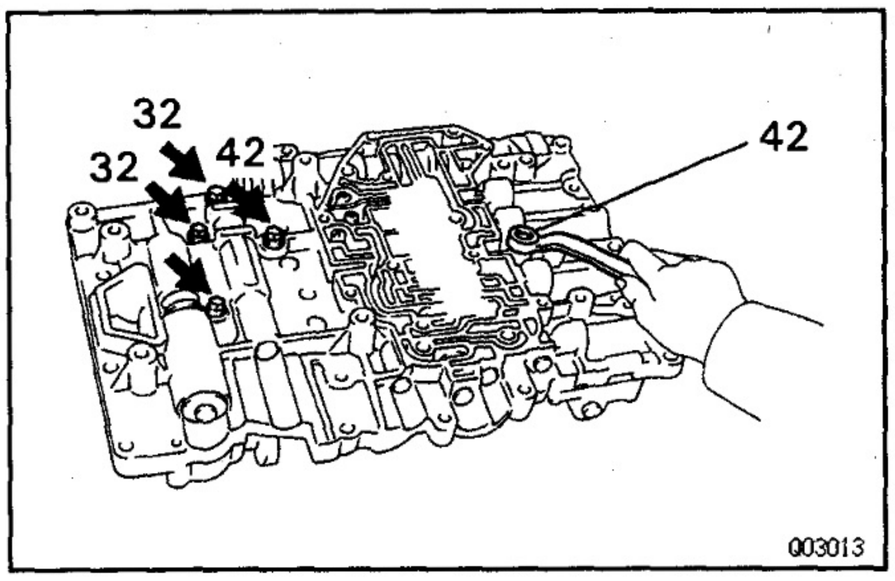
Place a new No.1 gasket, the body plate and a new No.2 gasket on the lower valve body.



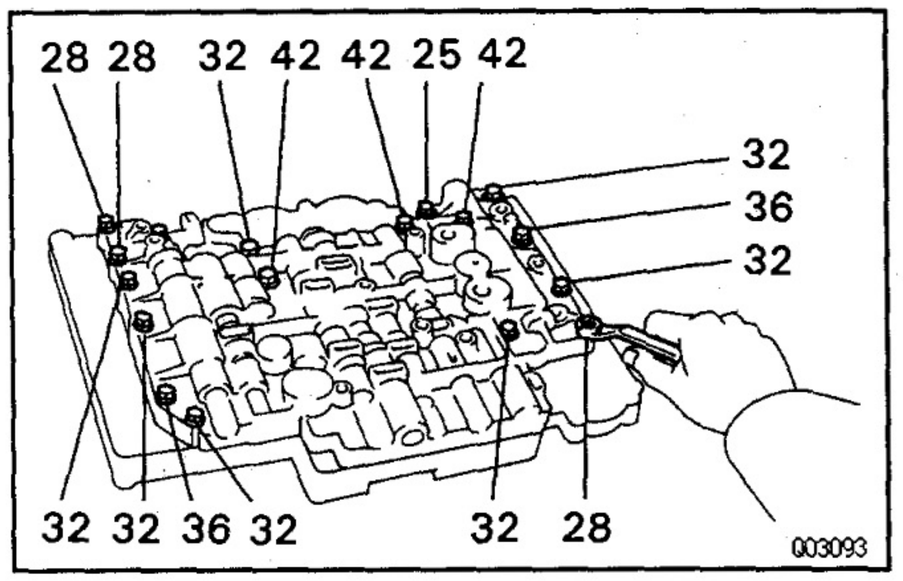
2. INSTALL LOWER VALVE BODY

(a) Turn over the valve body assembly together with the plate and two gaskets.
HINT: Be careful do not fall out the check balls, check valve and the springs.

(b) Place the lower valve body on the upper valve body.

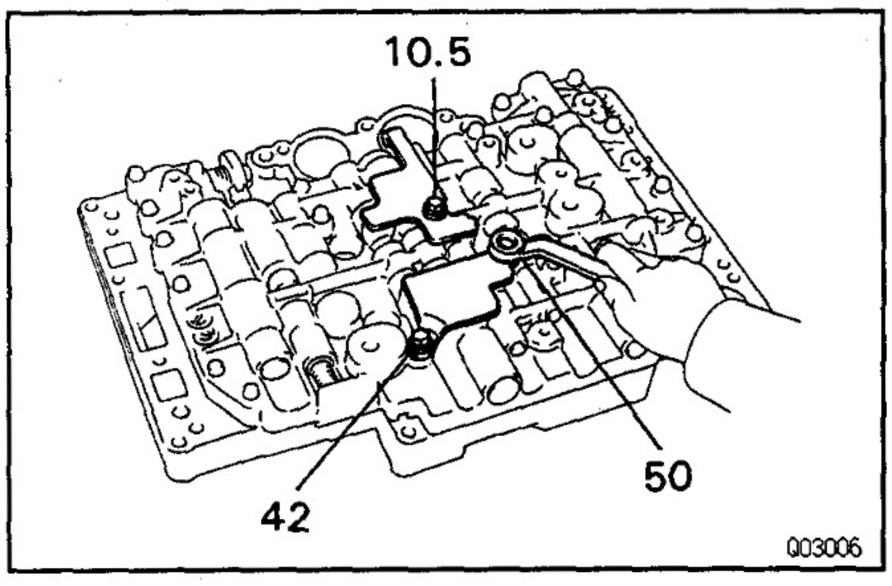


(b) Temporarily install the five bolts.
HINT: Each bolt length mm (in.) is indicated in the figure.
Bolt length:
32 mm (1.26 in.)
42 mm (1.65 in.)



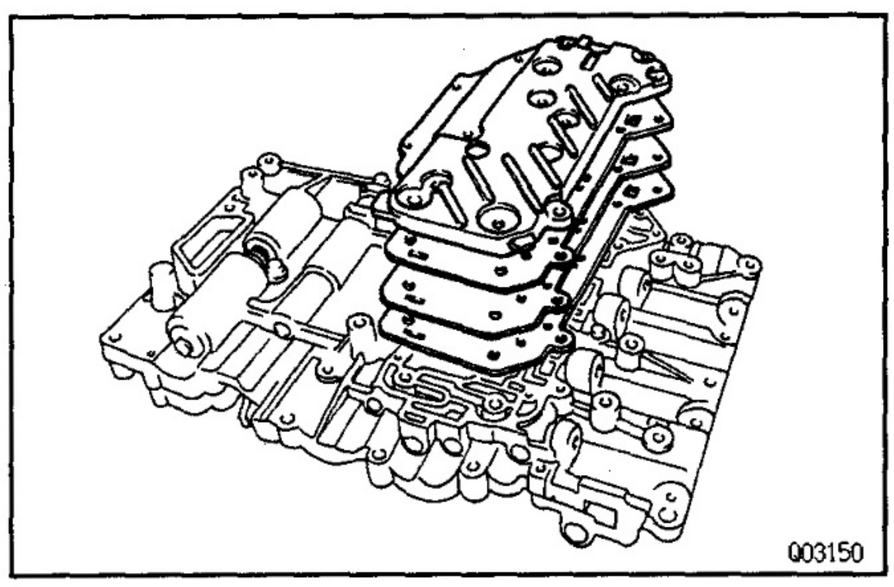
3. INSTALL UPPER VALVE BODY INSTALLATION BOLTS

(a) Turn over the valve body assembly.
(b) Temporarily install the twenty bolts.
HINT: Each bolt length mm (in.) is indicated in the figure.
Bolt length:
25 mm (0.98 in.)
28 mm (1.10 in.)
32 mm (1.26 in.)
36 mm (1.42 in.)
42 mm (1.65 in.)



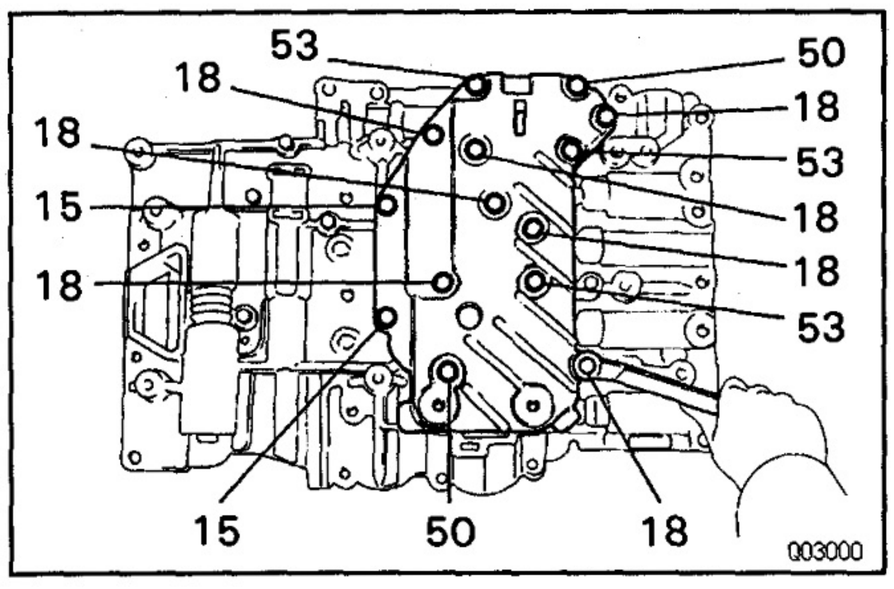
4. INSTALL TWO PLATES

HINT: Each bolt length mm (in.) is indicated in the figure.
Bolt length:
10.5 mm (0.413 in.)
42 mm (1.657 in.)
50 mm (1.97 in.)



5. INSTALL LOWER VALVE BODY PLATE AND COVER

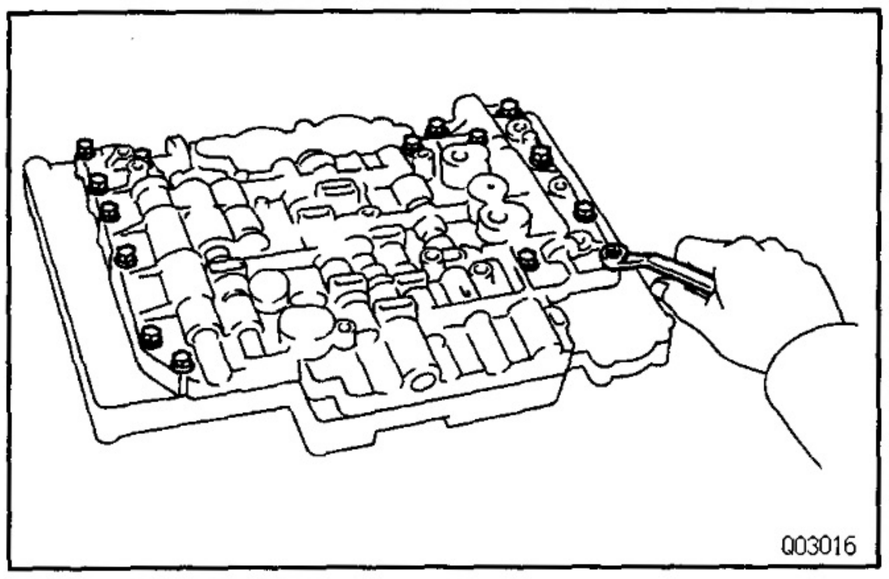
(a) Place a new No.3 gasket, the body plate and a new No.4 gasket on the lower valve body.



(b) Install the body cover with the two wave washers and fourteen bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
HINT: Each bolt length mm (in.) is indicated in the figure.

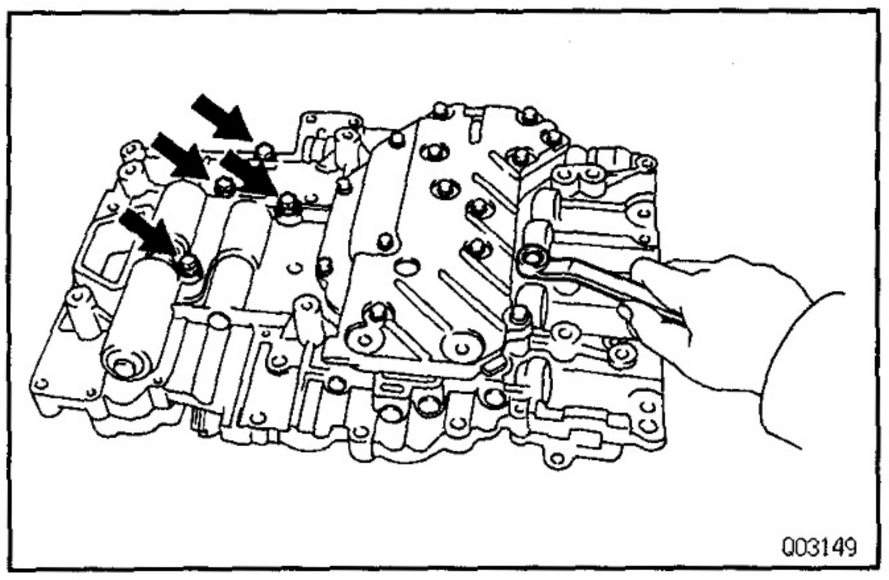
Bolt length:

15 mm (0.59 in.)
18 mm (0.71 in.)
50 mm (1.97 in.)
53 mm (2.09 in.)

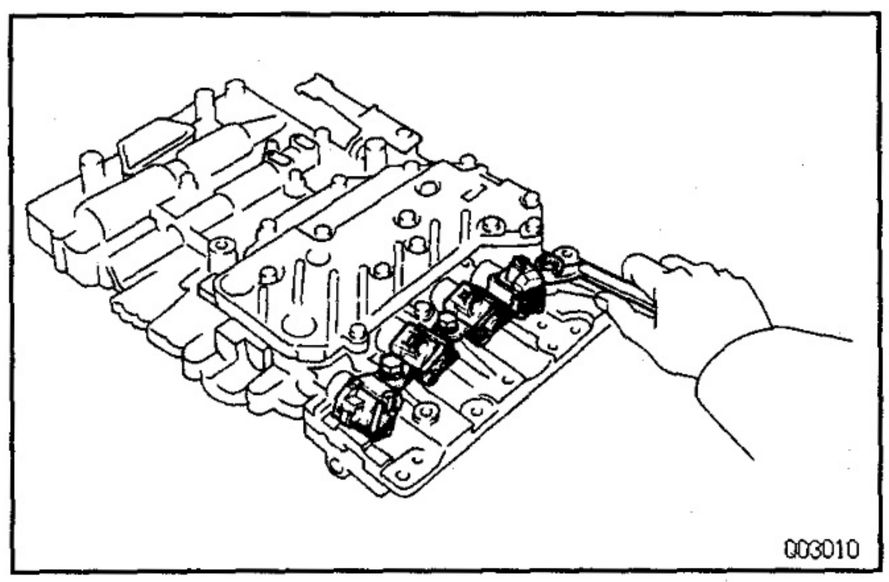


6. TIGHTEN BOLTS OF UPPER AND LOWER VALVE BODIES

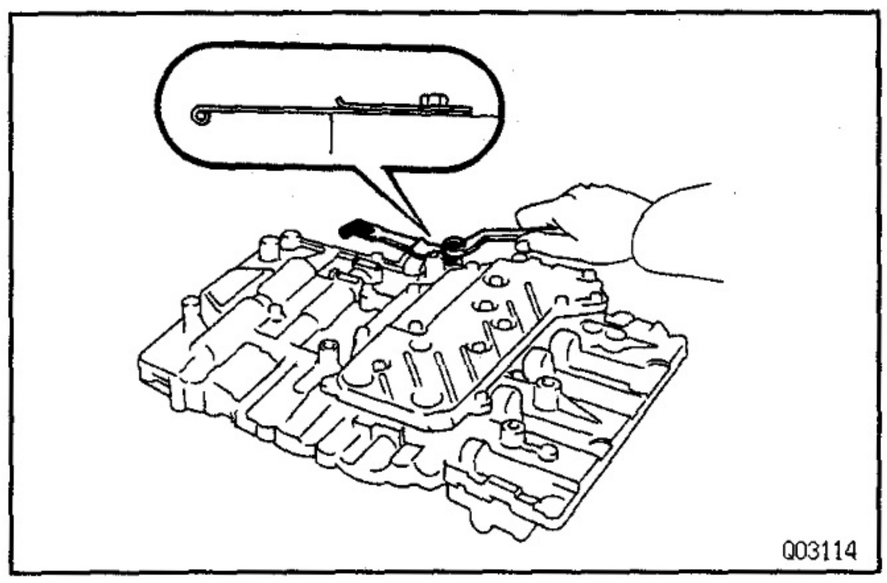
(a) (Upper Side)
Tighten the seven bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



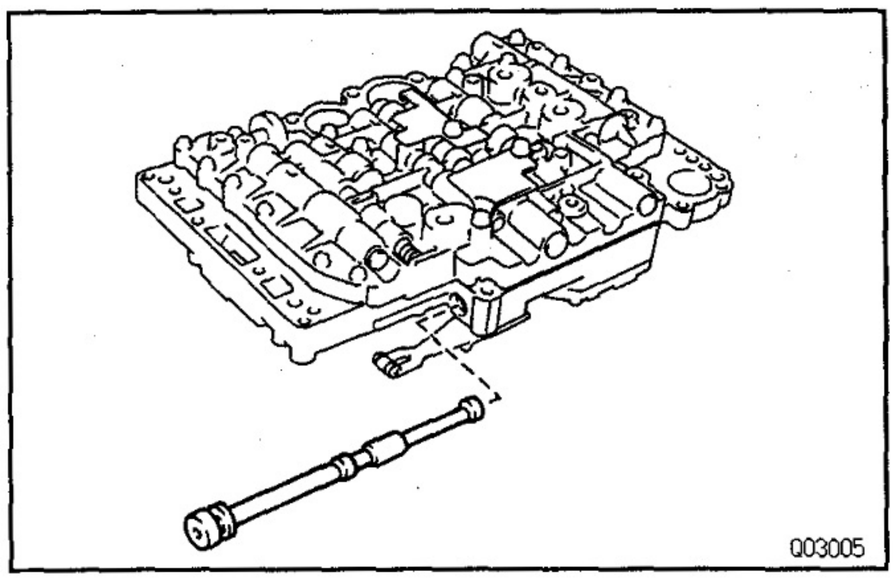
(b) (Lower Side)
Tighten the nine bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



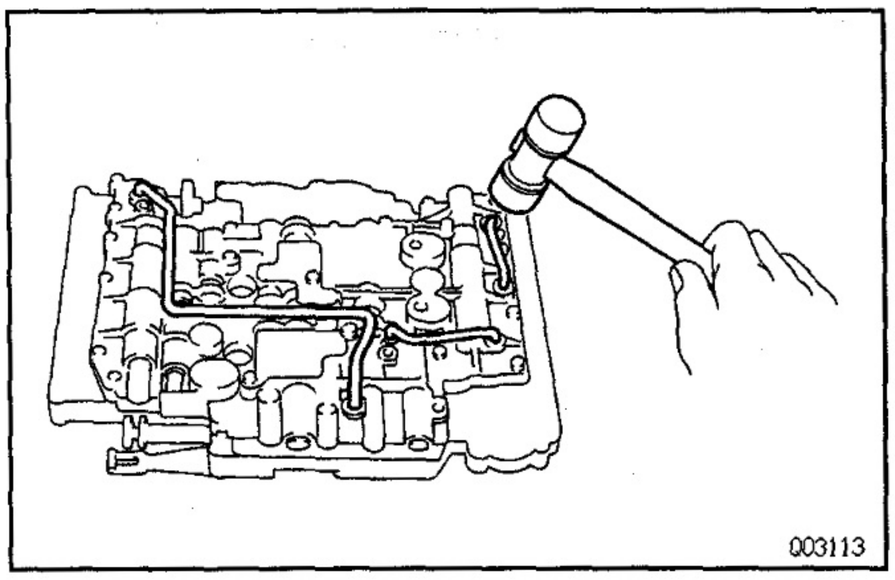
7. INSTALL FOUR SOLENOID VALVES
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



8. INSTALL MANUAL DETENT SPRING
Install the detent spring and cover with the wave washer and bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
HINT: Use the bolt which is 43 mm (1.69 in) in length.

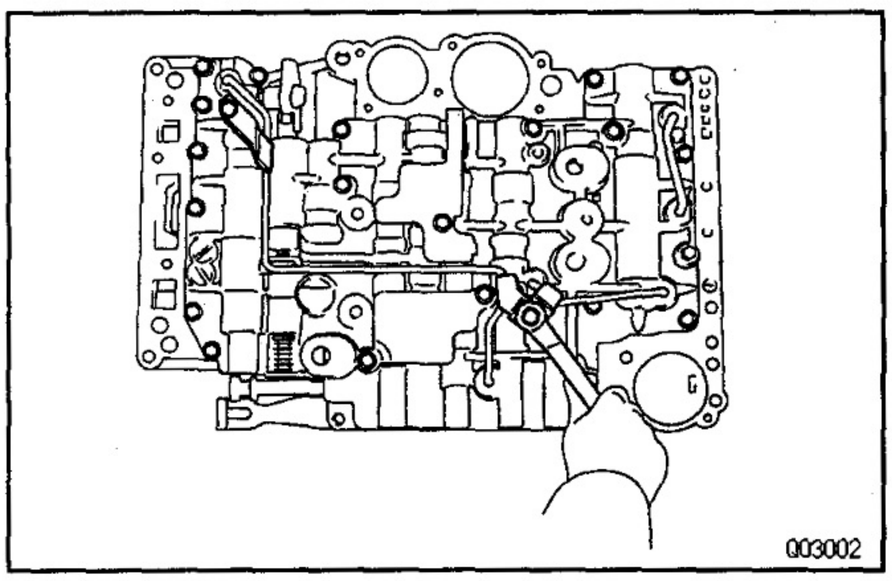


9. INSTALL MANUAL VALVE

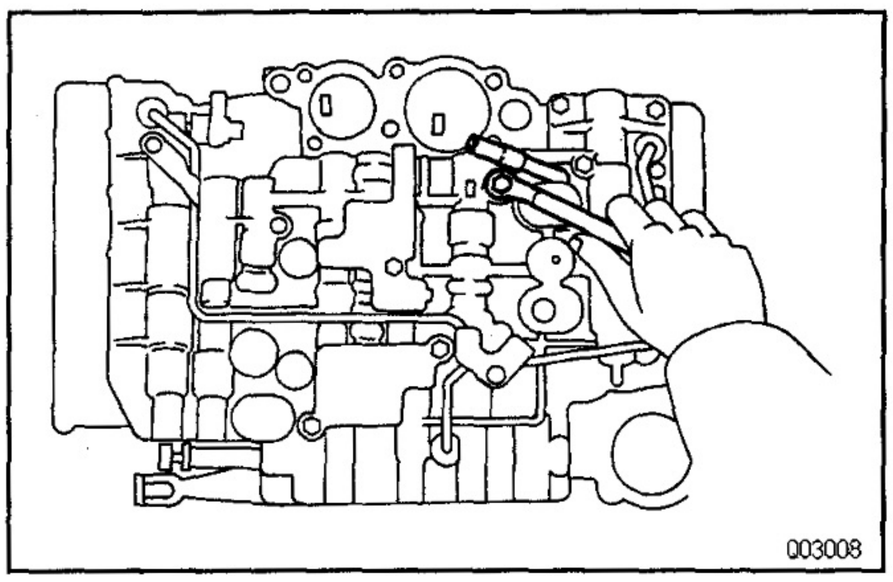


10. INSTALL OIL TUBES

(a) Using a plastic–faced hammer, tap in the oil tubes.
NOTICE: Be careful not to bend or damage the tubes.



(b) Install the tube clamps with the two wave washers and bolts.
HINT: Use the bolt which is 10.5 mm (0.41 in.) in length.

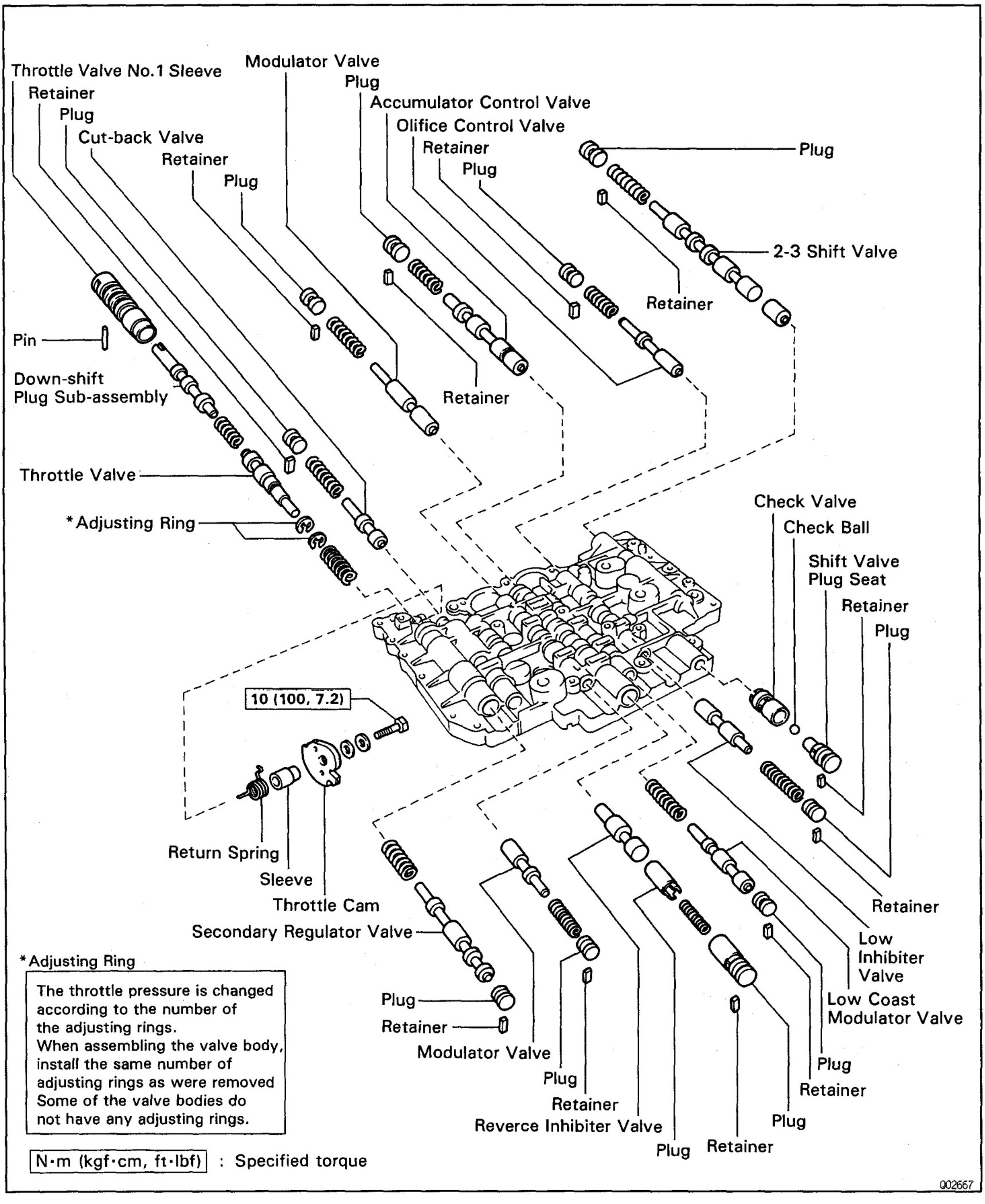


11. INSTALL DRAIN TUBE

Install the drain tube.
HINT: Use the bolt which is 10.5 mm (0.41 in.) in length.

UPPER VALVE BODY
CONPONENTS

AT06L–01



*Adjusting Ring

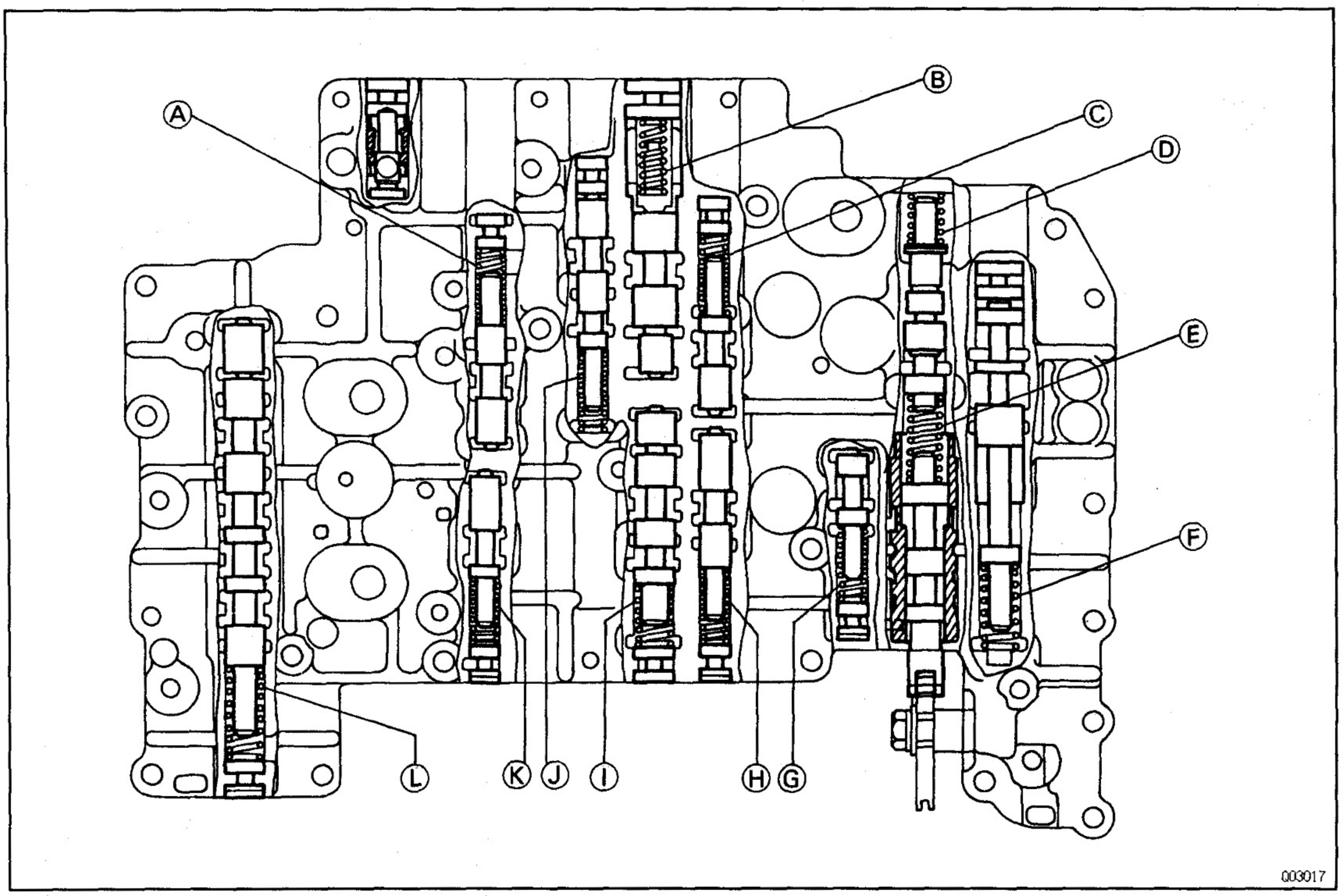
The throttle pressure is changed according to the number of the adjusting rings.
When assembling the valve body, install the same number of adjusting rings as were removed
Some of the valve bodies do not have any adjusting rings.

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

Q02667

AT06M—01

VALVE BODY SPRINGS SPECIFICATIONS

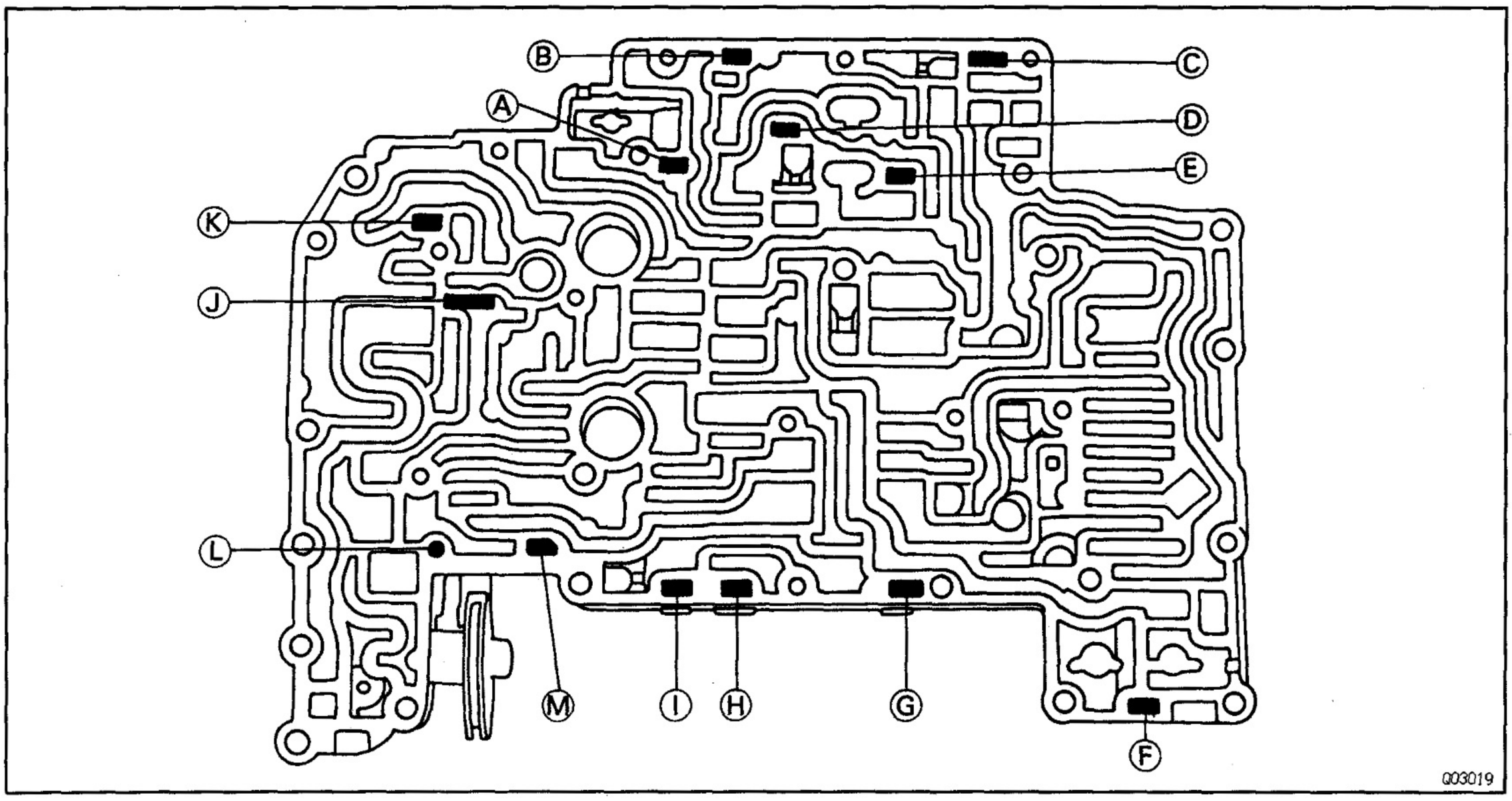


Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓐ	2—3 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓑ	Reverse Inhibiter Valve (Light Blue)	29.3 x 7.9 (1.154 x 0.311)	20.0
Ⓒ	Modulator Valve (Brown)	31.8 x 7.6 (1.252 x 0.299)	17.0
Ⓓ	Throttle Valve (White)	25.3 x 9.2 (0.996 x 0.362)	9.5
Ⓔ	Throttle Valve (Blue)	26.85 x 8.97 (1.057 x 0.353)	10.5
Ⓕ	Secondary Regulator Valve (None)	46.0 x 16.7 (1.811 x 0.657)	15.0
Ⓖ	Cut—back Valve (Purple)	30.44.0 x 7.3 (1.198 x 0.287)	16.0
Ⓗ	Lock—up Signal Valve (Purple)	30.44 x 7.3 (1.198 x 0.287)	16.0
Ⓘ	Accumulator Control Valve (Green)	27.4 x 10.3 (1.079 x 0.406)	10.5
Ⓙ	Low Coast Modulator Valve (Red)	31.8 x 7.3 (1.252 x 0.287)	16.0
Ⓚ	Orifice Control Valve (Yellow)	38.97 x 8.6 (1.534 x 0.339)	18.0
Ⓛ	Low Inhibiter Valve (Purple)	30.44 x 7.3 (1.198x0.287)	16.0

AT08N-01

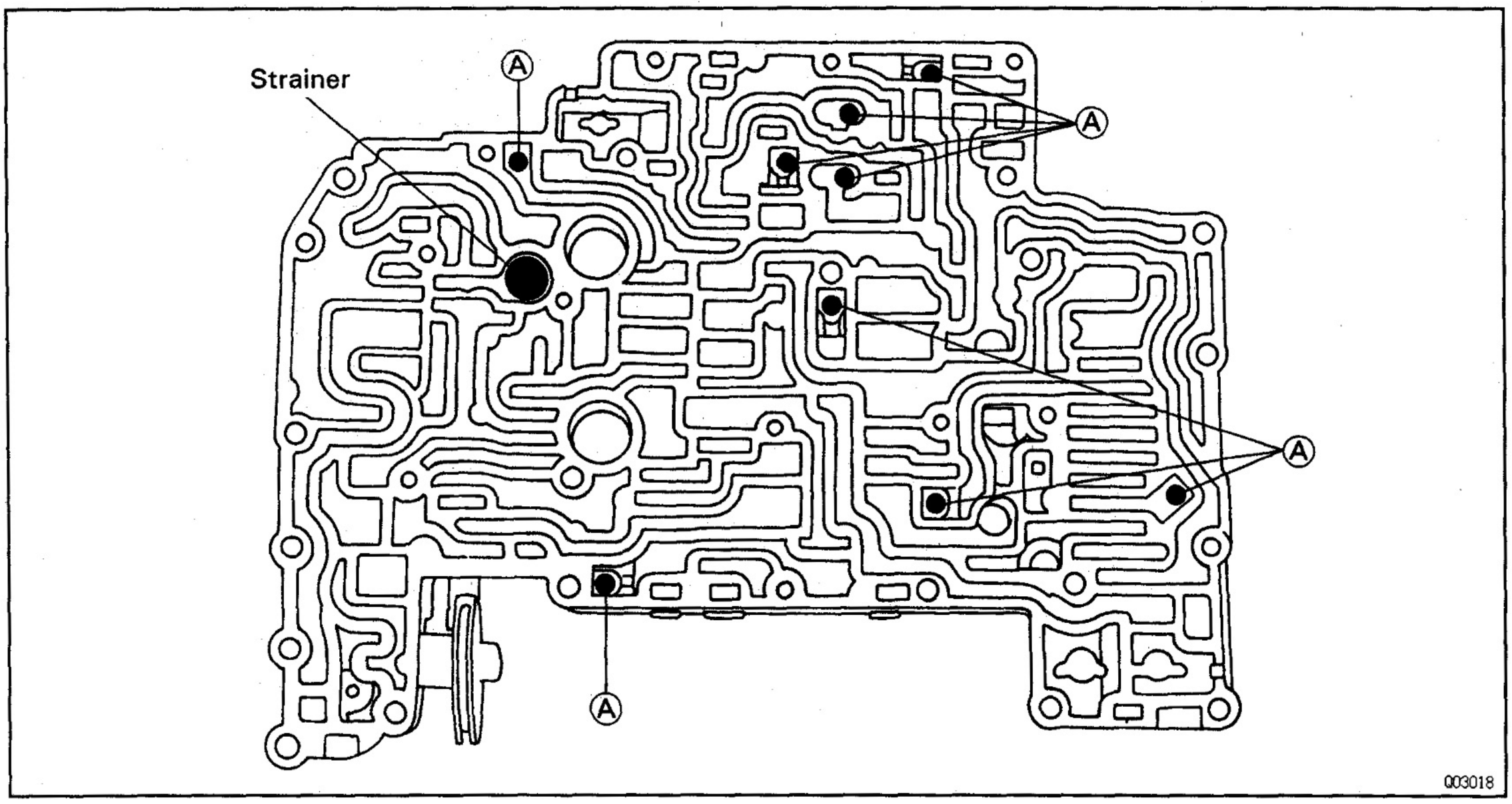
RETAINER, PINS AND CHECK BALLS LOCATION

1. RETAINERS AND PINS



Mark	Name	Length x Width x Thickness or diameter mm (in.)
Ⓐ	Retainer for Modulator Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓑ	Retainer for Reverce Inhibiter Valve Sleeve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓒ	Retainer for Check Valve Sleeve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓓ	Retainer for Low Coast Modulator Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓔ	Retainer for Low Inhibiter Valve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓕ	Retainer for 2—3 Shift Valve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓖ	Retainer for Olifice Contrtol Valve plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓗ	Retainer for Accumulator Control Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓘ	Retainer for Lock—up Signal Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓙ	Stopper for Throttle Valve	—
Ⓚ	Retainer for Secondary Regulator Valve Plug	18.0 x 5.0 x 3.2 (0.709 x 0.197 x 0.126)
Ⓛ	Pin for Throttle Valve Sleeve	23.8 x 3.0 (0.937 x 0.118)
Ⓜ	Retainer for Cut—back Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)

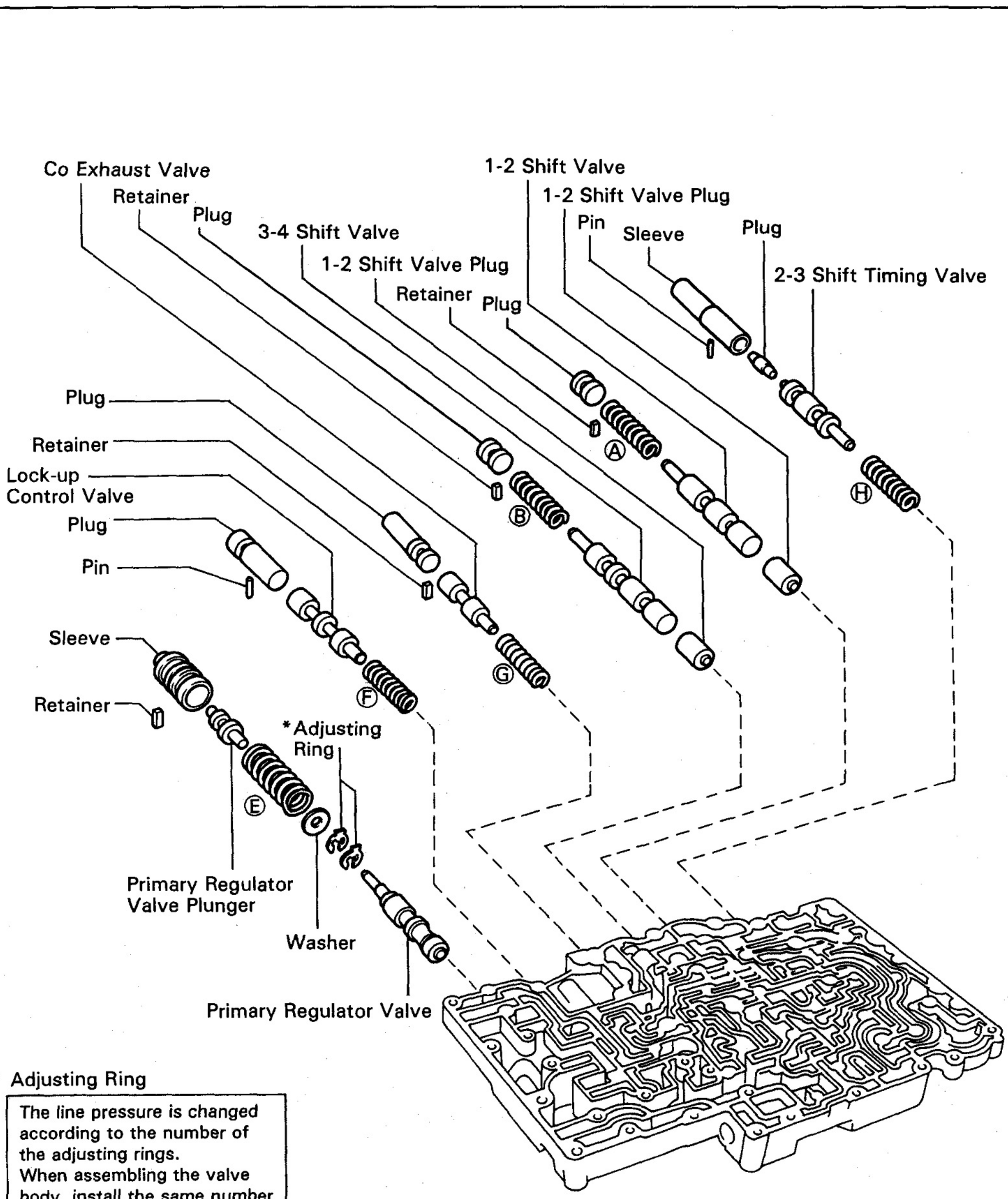
2. CHECK BALLS



Mark	Name	Diameter mm (in.)
Ⓐ	Check Ball	6.4 (0.252)

LOWER VALVE BODY
COMPONENTS

AT08P–01



* Adjusting Ring

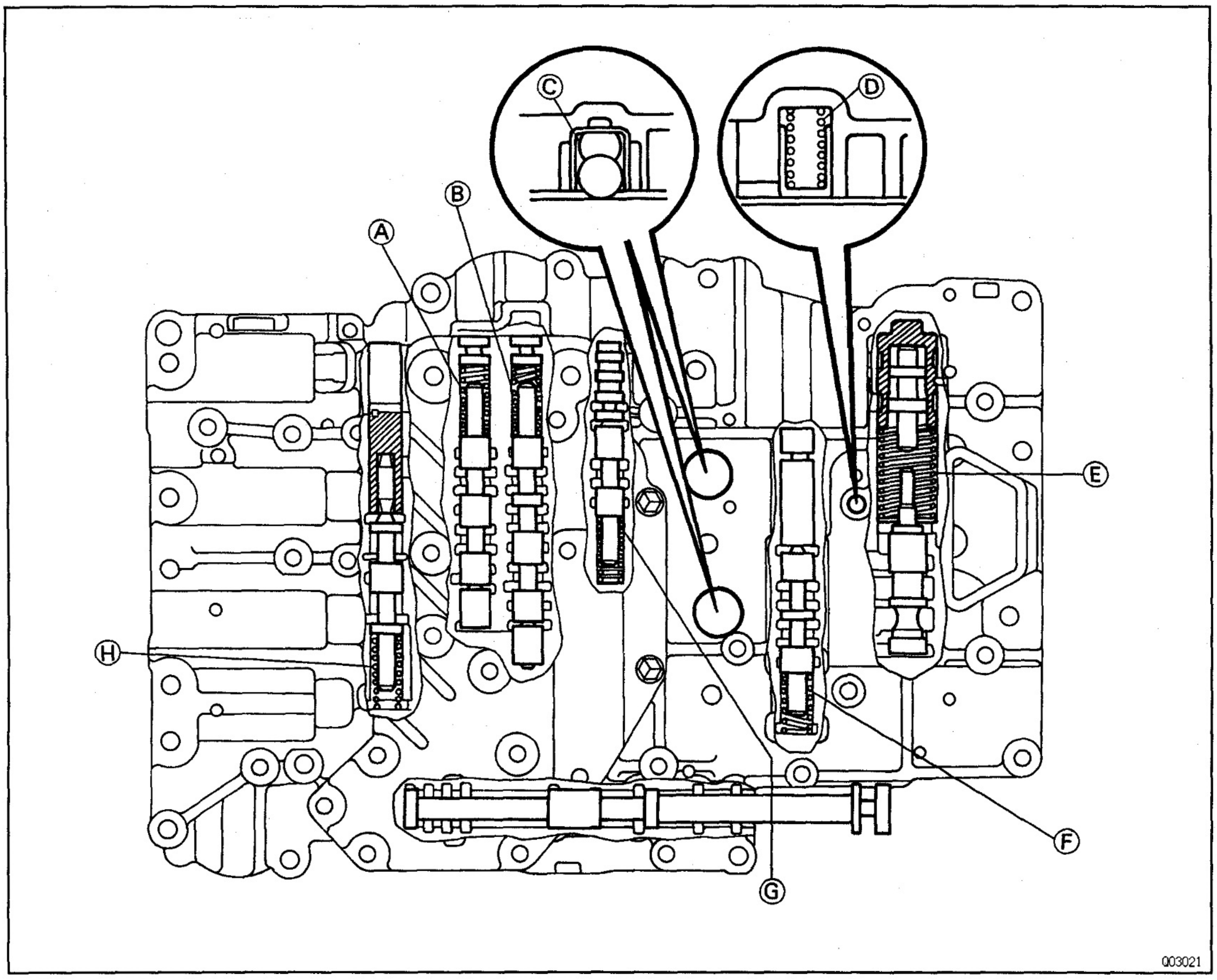
The line pressure is changed according to the number of the adjusting rings.
When assembling the valve body, install the same number of adjusting rings as were removed.
Some of the valve bodies do not have any adjusting rings.

003020

AT0SQ-01

VALVE BODY SPRINGS SPECIFICATIONS

AT



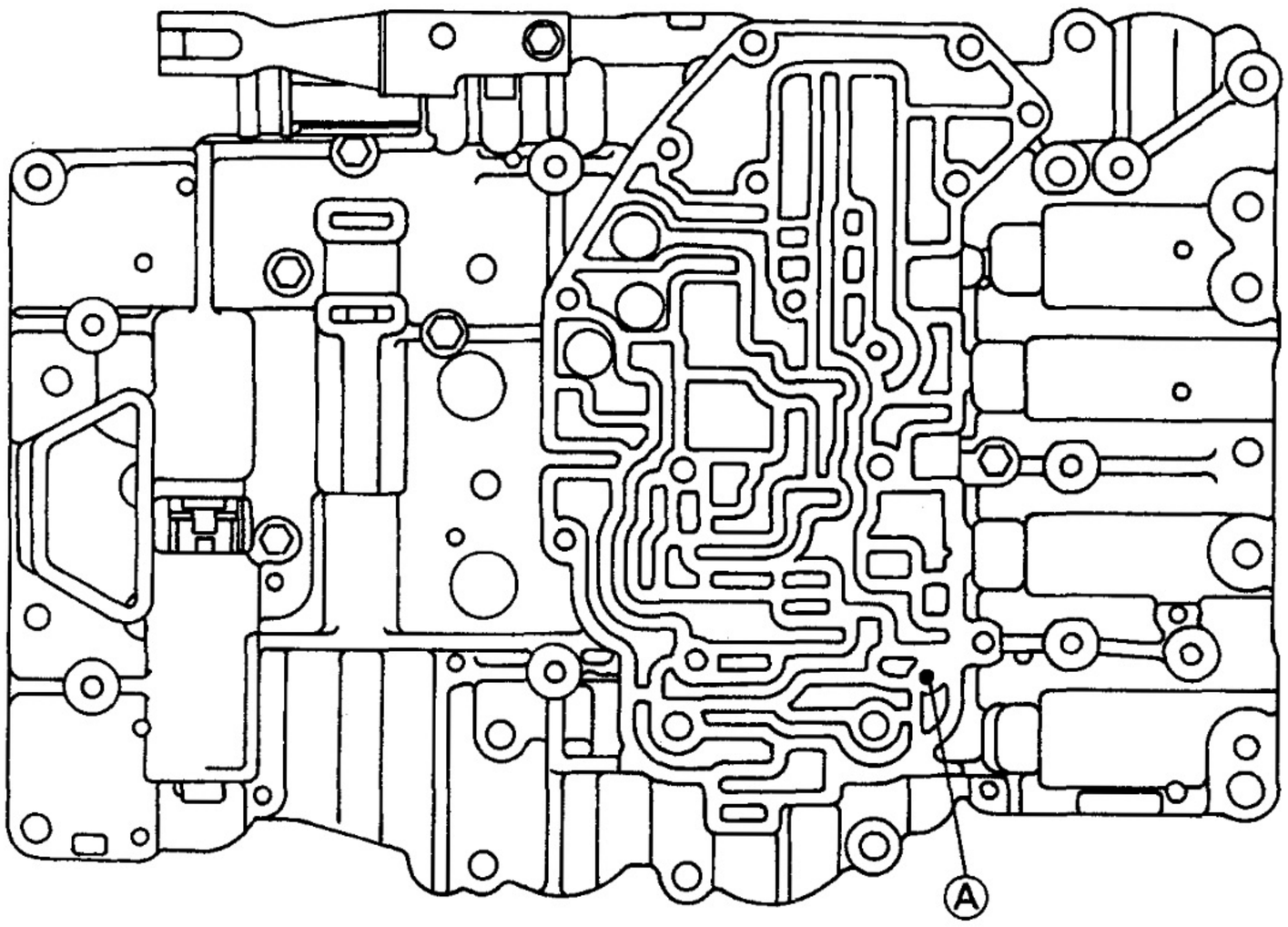
Q03021

Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓐ	1—2 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓑ	3—4 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓒ	Check Ball (None)	14.0 x 9.8 (0.551 x 0.386)	6.0
Ⓓ	Pressure Reliefe Valve(White)	24.0 x 8.2 (0.945 x 0.323)	12.0
Ⓔ	Primary Regulator Valve (Red)	58.2 x 20.9 (2.291 x 0.823)	11.0
Ⓕ	Lock—up Control Valve(White)	26.95 x 9.8 (1.061 x 0.386)	13.0
Ⓖ	C_0 Exhaust Valve (Yellow)	33.3 x 8.2 (1.311 x 0.323)	14.0
Ⓗ	2—3 Timing Valve(Yellow)	38.79 x 8.6 (1.534 x 0.339)	18.0

AT08R-01

PARTS LOCATIONS

1. RETAINERS AND PINS
LOWER SIDE

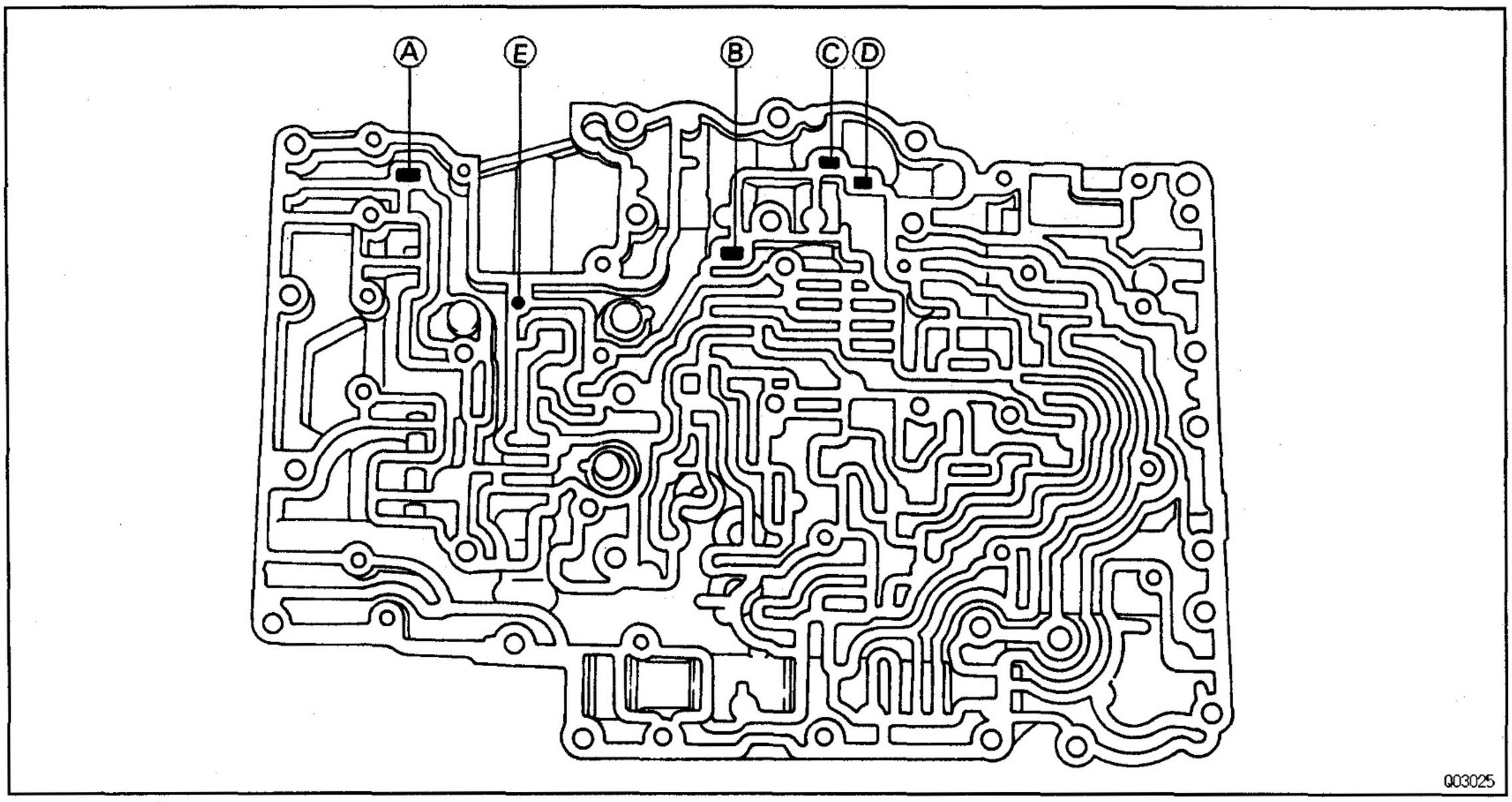


Q03022

Mark	Name(Color)	Length x Diameter mm (in.)	Total No.of Coils
Ⓐ	Pin for 2 — 3 Timing Valve Sleeve (Yellow)	36.8 x 8.6 (1.449 x 0.339)	15.5

AT

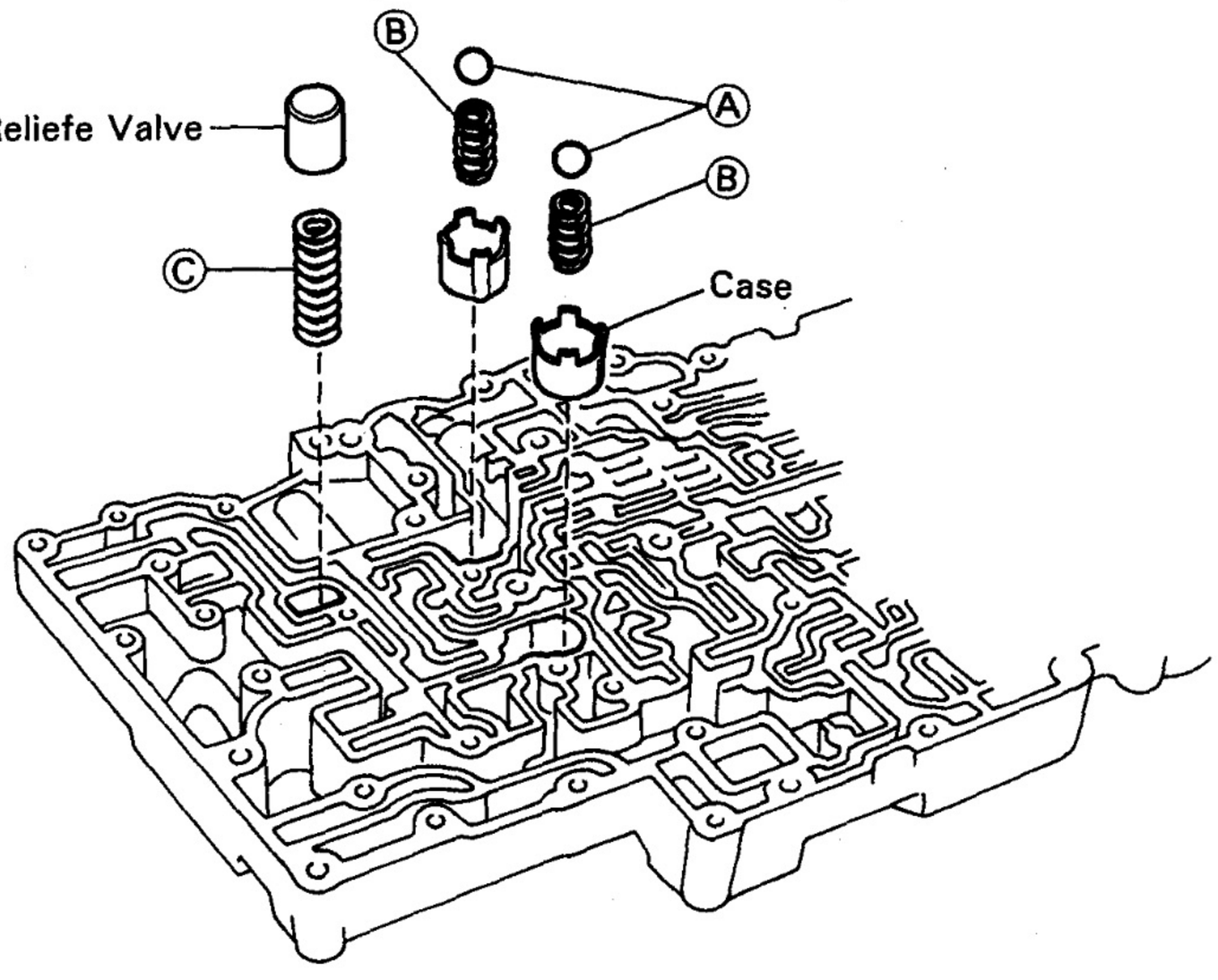
UPPER SIDE



Mark	Name	Length x Width x Thickness mm(in.)
Ⓐ	Retainer for Primary Regulator Valve Plunger Sleeve	18.0 x 5.0 x 3.2 (0.709 x 0.197 x 0.126)
Ⓑ	Retainer for C_0 Exhaust Valve	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)
Ⓒ	Retainer for 3—4 Shift Valve Plug	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)
Ⓓ	Retainer for 1—2 Shift Valve Plug	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)

Mark	Name	Length x Diameter mm(in.)
Ⓔ	Pin for Lock—up control Valve Plug	23.8 x 2.5(0.937 x 0.098)

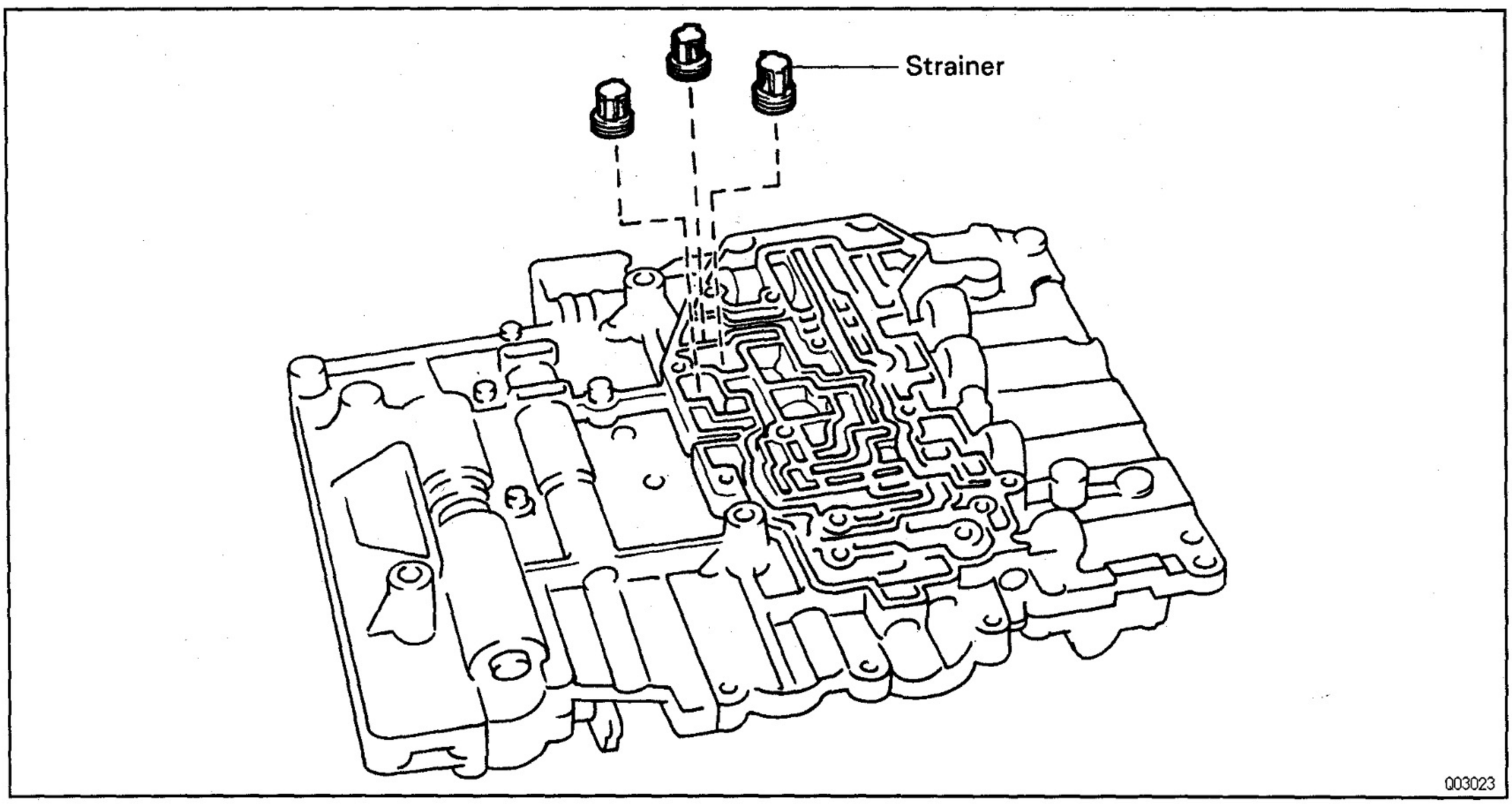
2. CHECK VALVE, BALL AND SPRINGS



Mark	Name	Diameter mm (in.)
Ⓐ	Check Ball	8.7 (0.343)

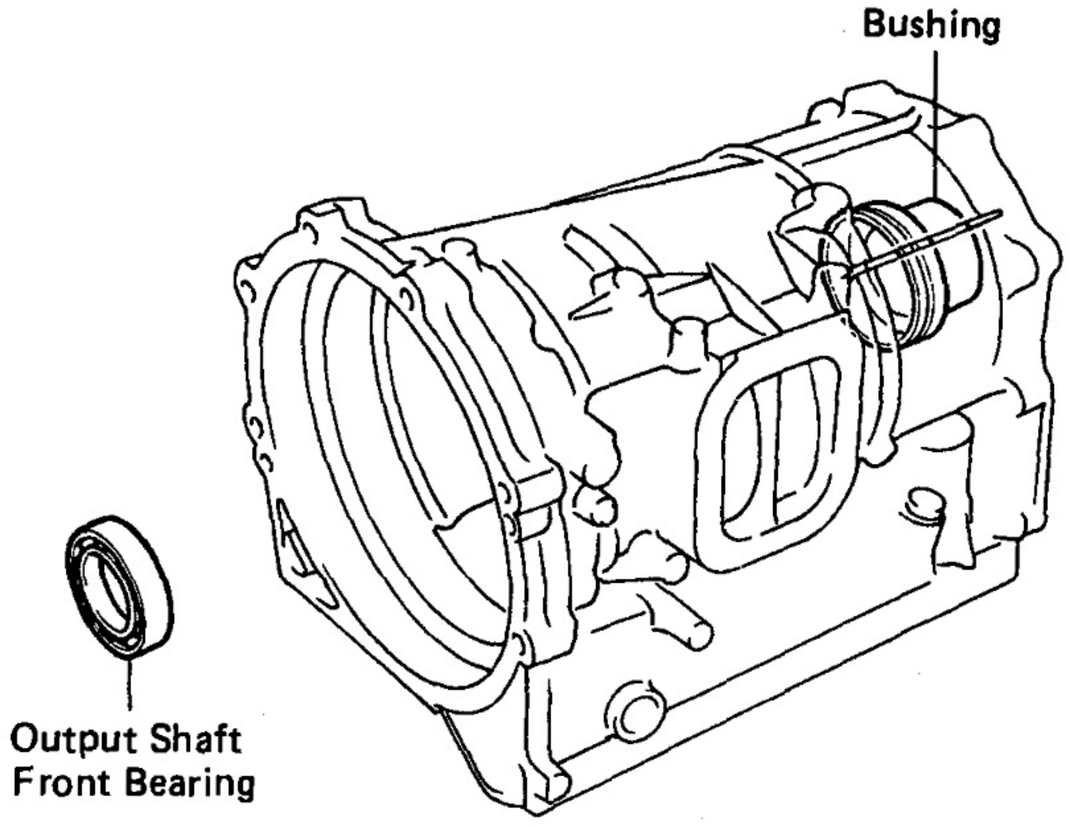
Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓑ	Check Ball (None)	14 x 9.8 (0.551 x 0.386	6.0
Ⓒ	Pressure Relief Valve	24.0 x 8.2 (0.945 x 0.323)	12.0

3. STRAINERS

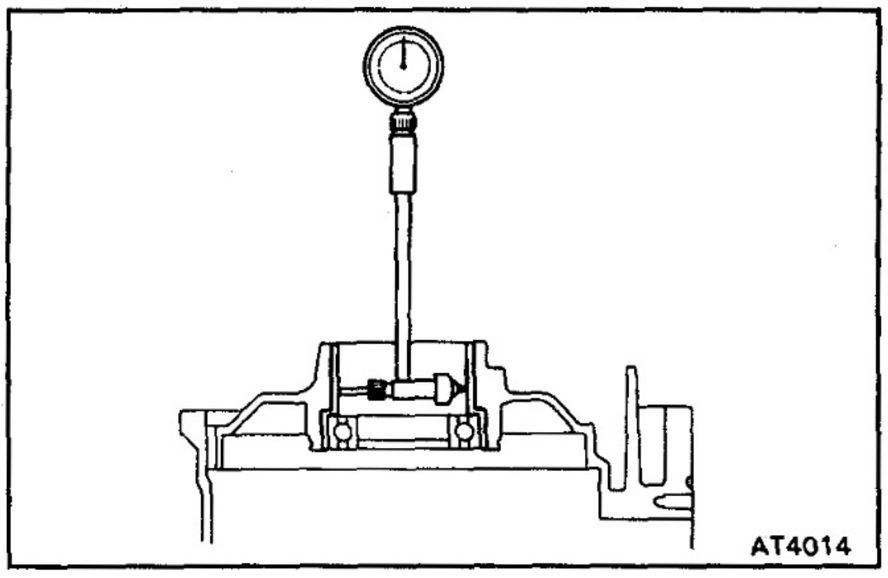


TRANSMISSION CASE
COMPONENTS

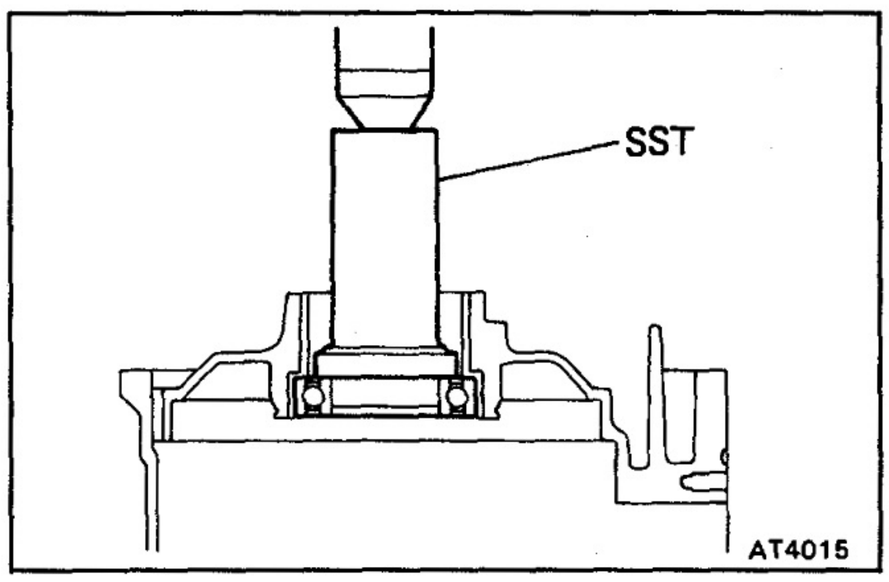
AT08S–01



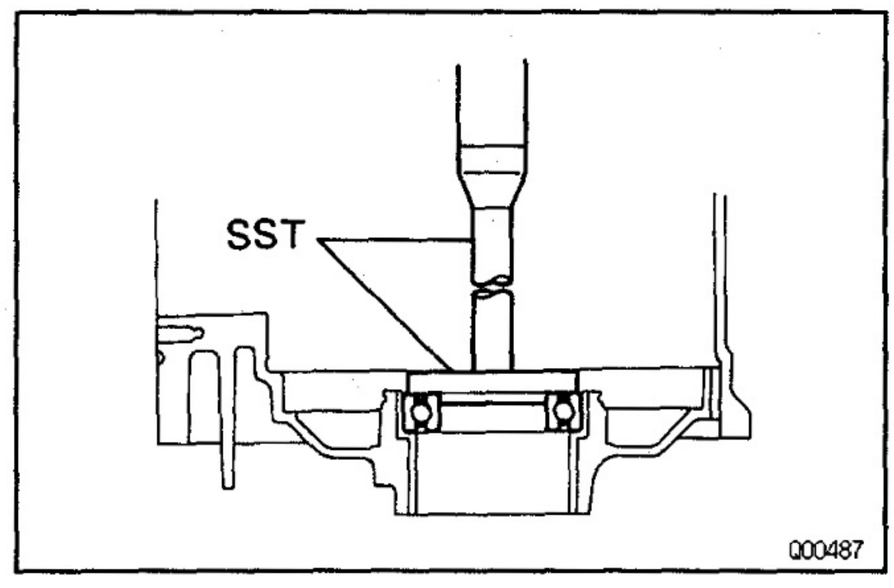
AT3882



AT4014



AT4015



Q00487

TRANSMISSION CASE INSPECTION

AT06T–01

1. INSPECT BUSHING OF TRANSMISSION CASE

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

Standard inside diameter:

64.000–64.050 mm (2.5197–2.5216 in.)

Maximum inside diameter:

64.10 mm (2.5236 in.)

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

2. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

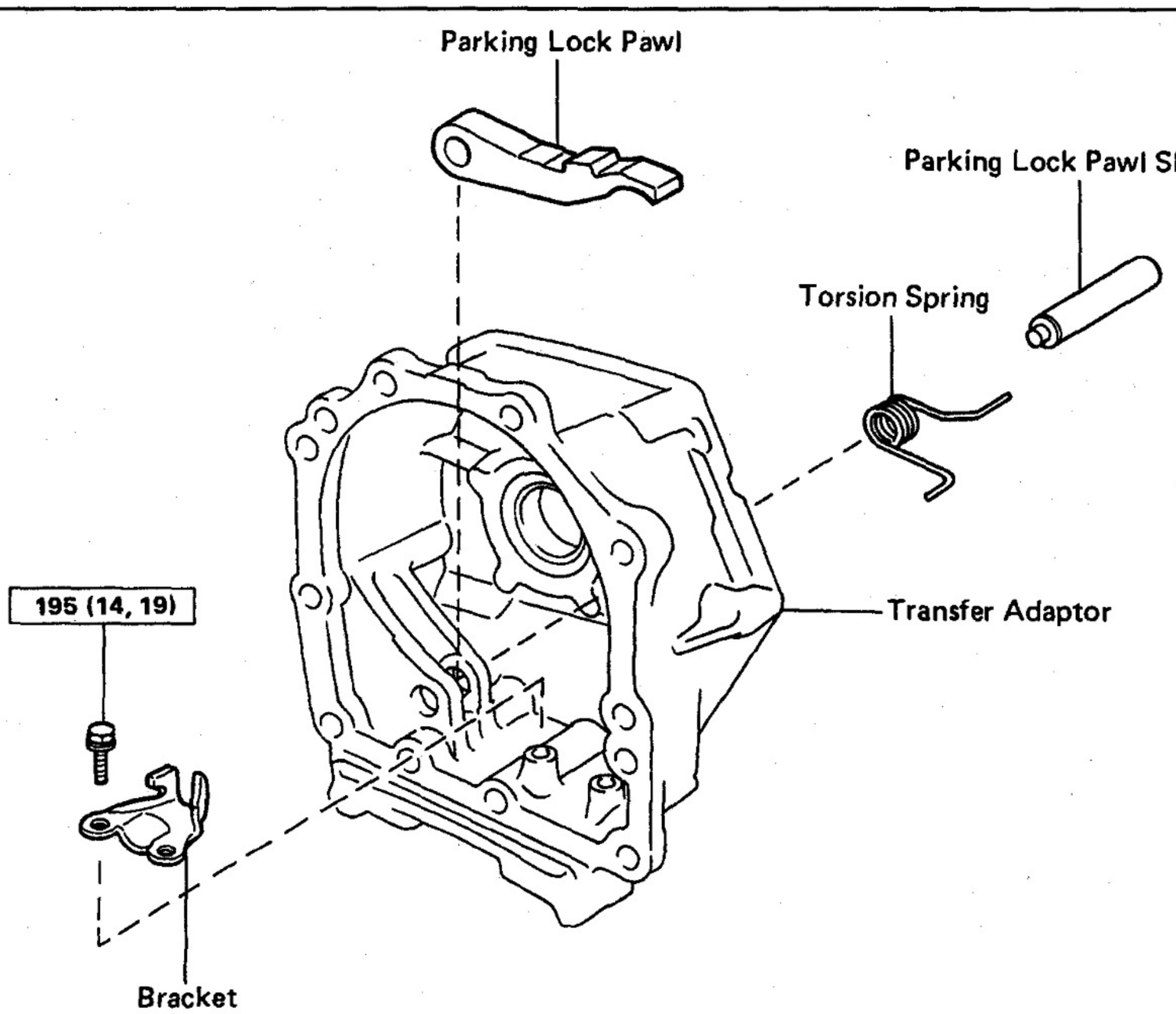
(a) Using SST and a press, press out the bearing.
SST 09350–36010(09350–06060)

(b) Using SST and a press, press in a new bearing.
SST 09350–36010(09350–06050,09350–06060)

(c) Check that the bearing rotates smoothly.

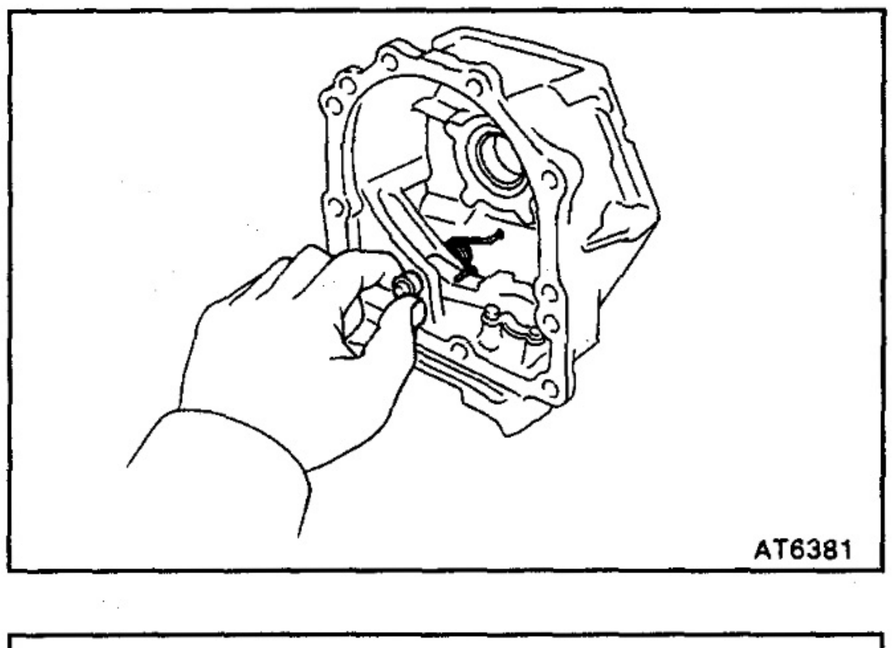
PARKING LOCK PAWL
COMPONENTS

AT08U–01

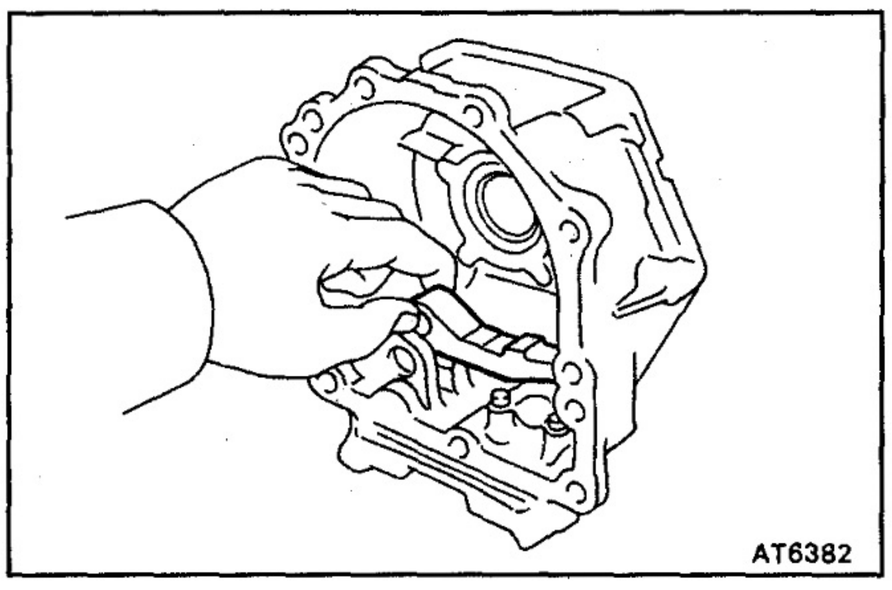


kg-cm (ft-lb, N·m) : Specified torque

AT6380



AT6381



AT6382

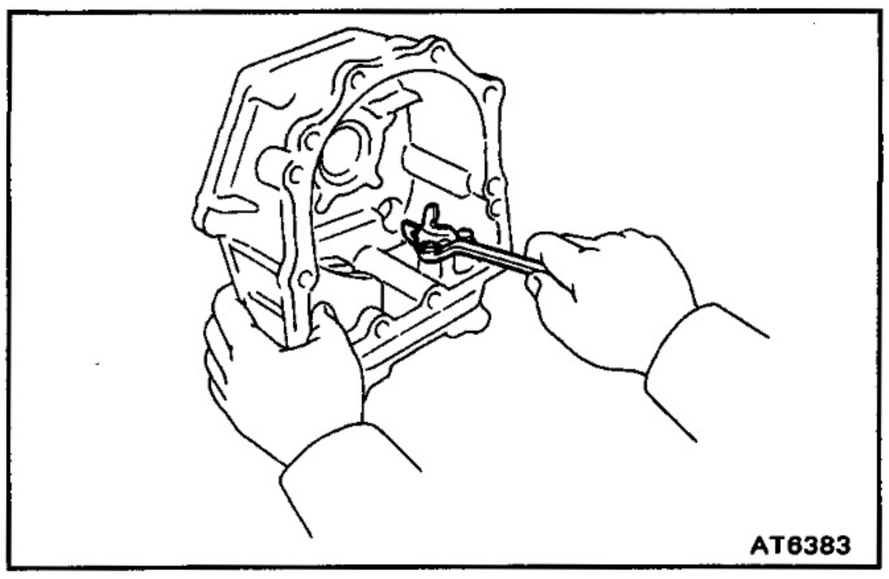
PARKING LOCK PAWL DISASSEMBLY

AT08V–01

1. REMOVE PARKING LOCK PAWL SHAFT

Remove the pawl shaft and snap ring.

2. REMOVE PARKING LOCK PAWL

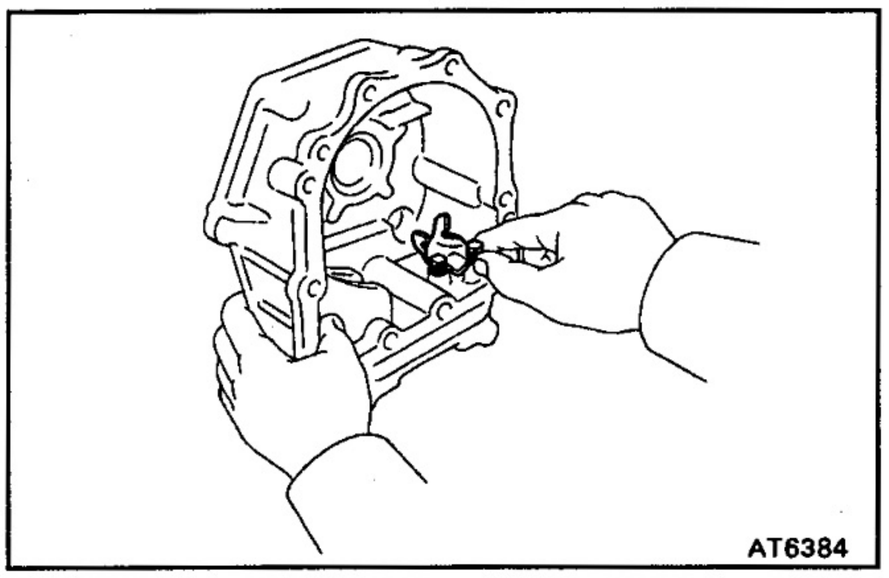


3. REMOVE PARKING LOCK PAWL BRACKET

Remove the two bolts and pawl bracket.

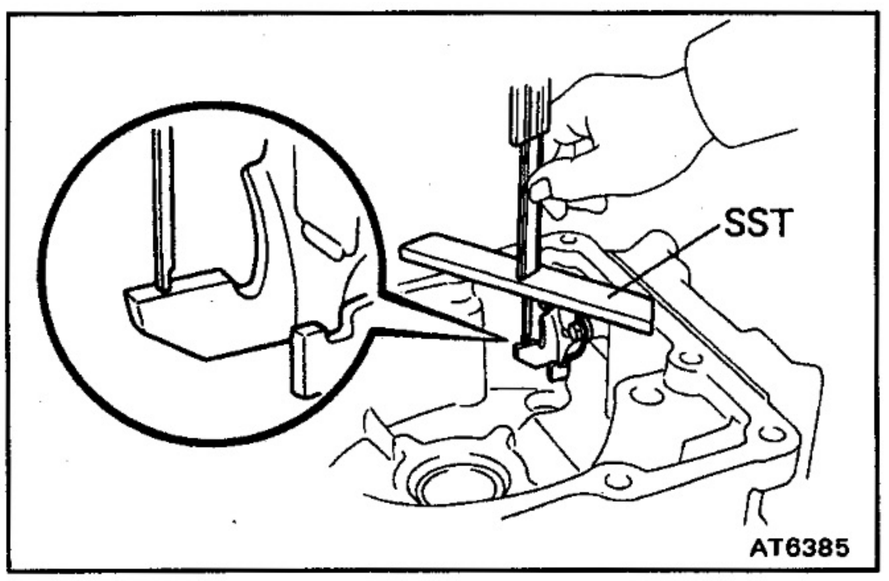
PARKING LOCK PAWL ASSEMBLY

AT06W-01



1. INSTALL PARKING LOCK PAWL BRACKET

(a) Temporarily install the pawl bracket with the two bolts.



(b) Using SST and calipers, set the pawl bracket so that so the distance between the transfer adaptor surface and the top of the bracket tab is specified distance.

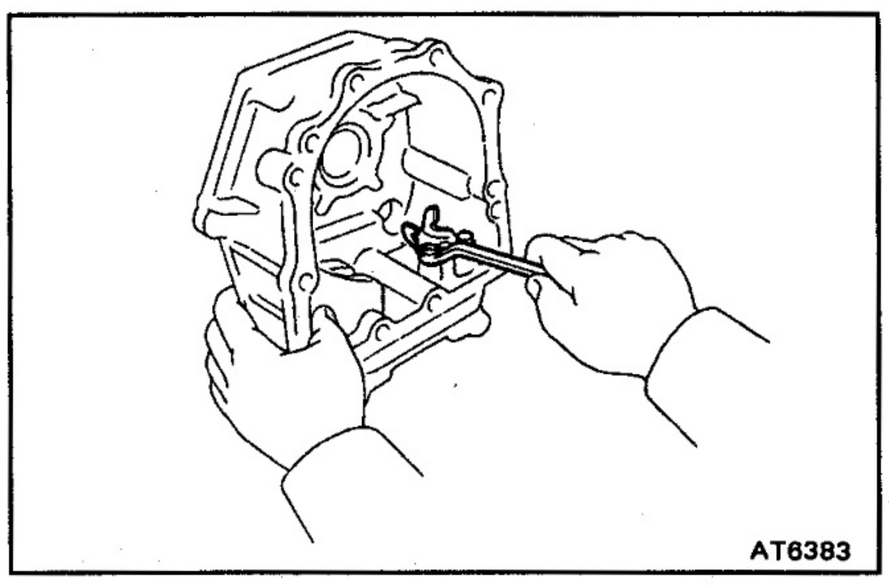
Standard distance:

Total distance – SST thickness

Standard distance:

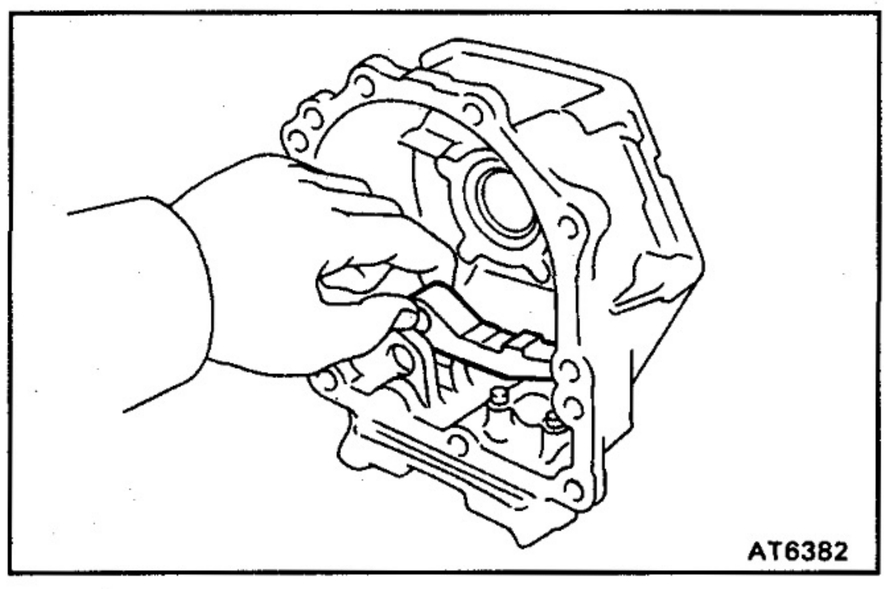
47.5–47.6 mm (1.870–1.874 in.)

SST 09350–36010(09350–06091)

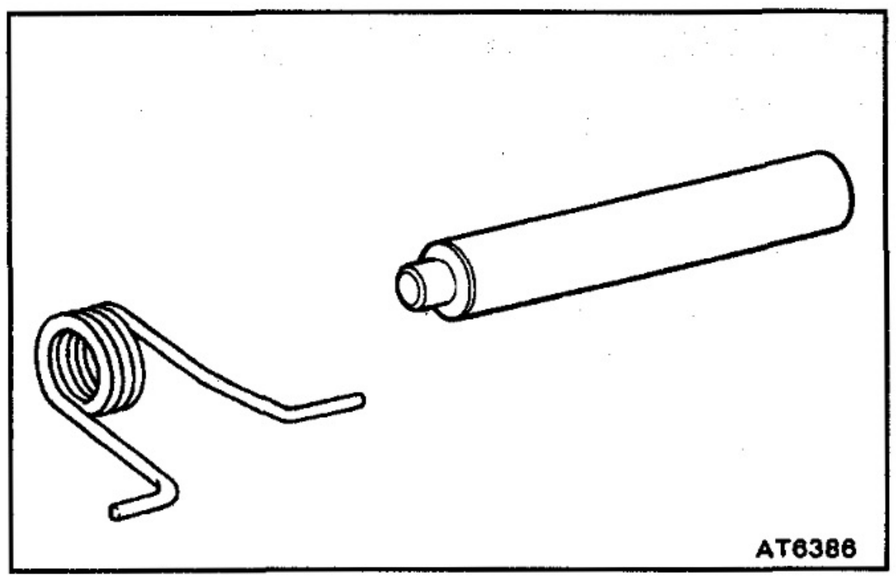


(c) Tighten the bolts.

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

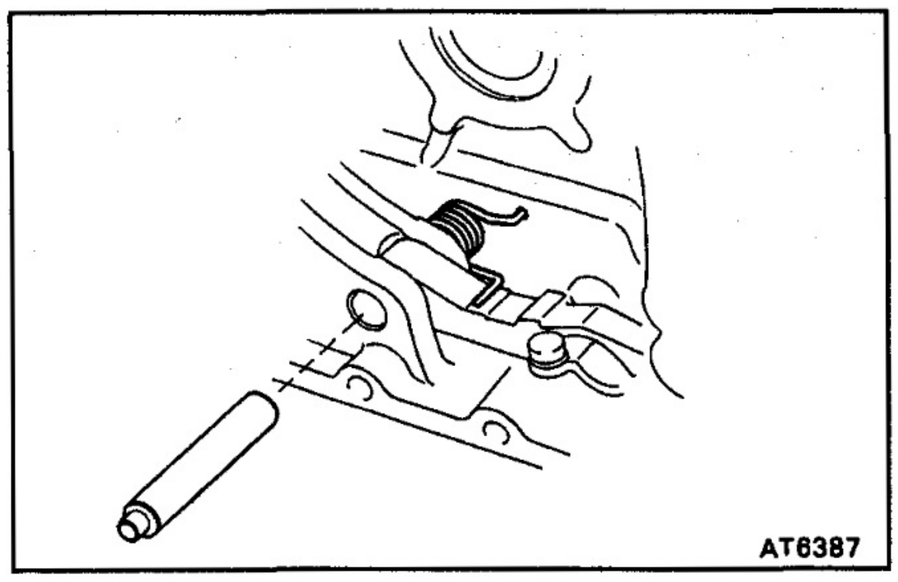


2. INSTALL PARKING LOCK PAWL

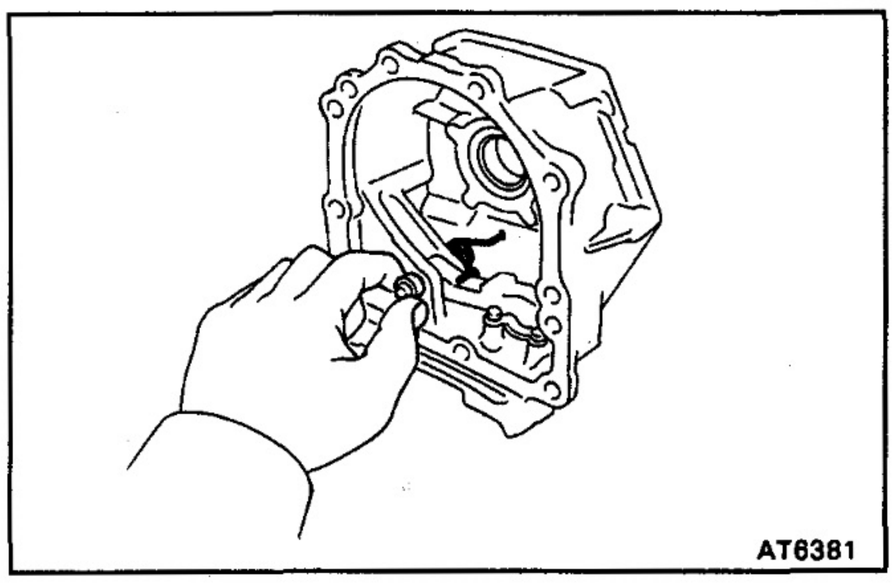


3. INSTALL PARKING LOCK PAWL SHAFT

(a) Install the spring.



(b) Install the spring end to the hole of the transfer adaptor, and install the pawl shaft.



(c) Hold the pawl shaft, hook another spring end to the pawl with a screwdriver.

(d) Make sure the pawl moves smoothly.

COMPONENT PARTS INSTALLATION

AT08X-01

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

GENERAL INSTALLATION NOTES

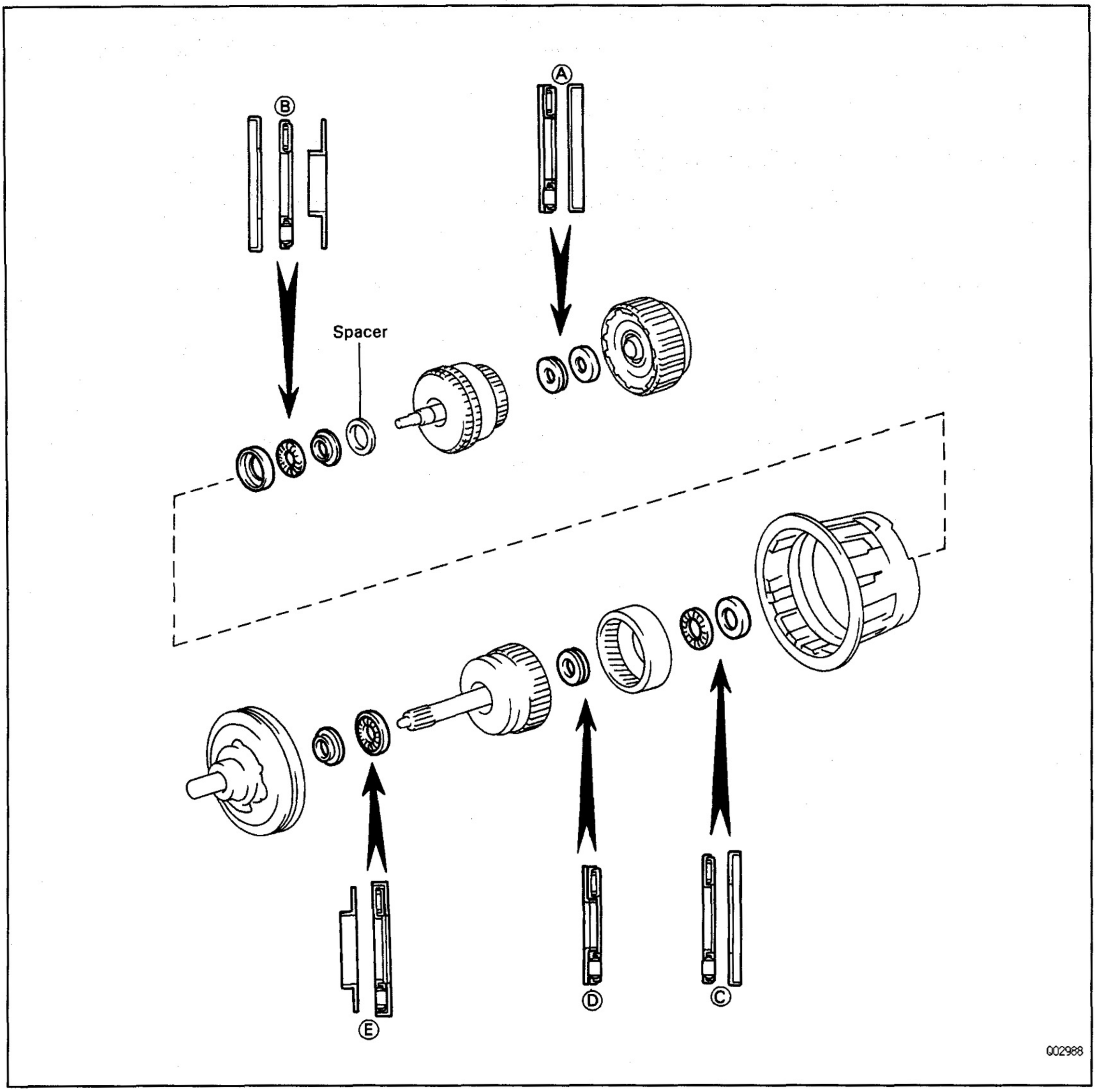
AT08Y-01

AT

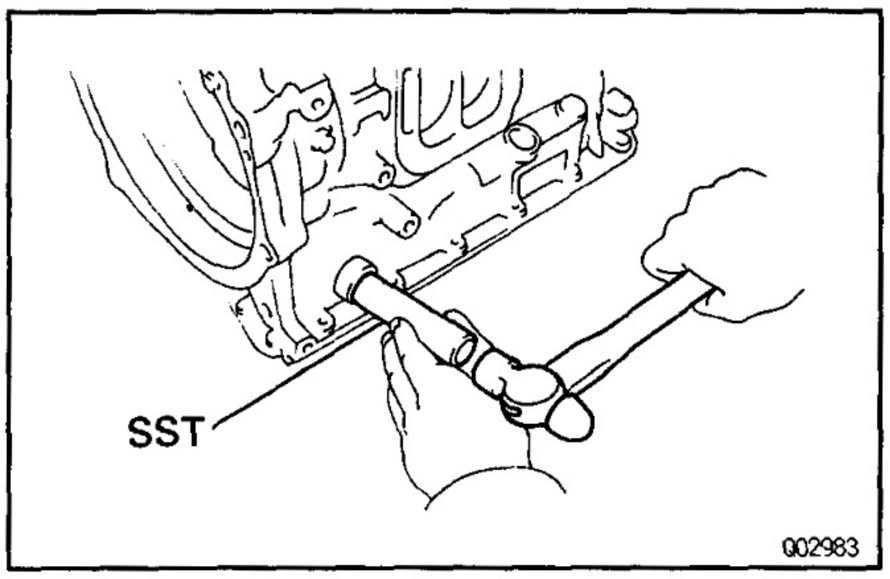
1. The automatic transmission is composed of highly precision—finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage of affect performance.
2. Before assembling new clutch discs, soak them in automatic transmission fluid for at least fifteen 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 places.
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.

AT08Z-01

BEARINGS AND RACES LOCATION



Mark	Thrust Bearing Diameter Inside/Outside mm (in.)	Front Race Diameter Inside/Outside mm (in.)	Rear Race Diameter Inside/Outside mm (in.)
Ⓐ	32.8 / 52.0 (1.291 / 2.047)	–	37.0 / 52.0 (1.457 / 2.047)
Ⓑ	32.8 / 52.0 (1.291 / 2.047)	37.0 / 52.0 (1.457 / 2.047)	32.8 / 50.4 (1.291 / 1.984)
Ⓒ	34.7 / 52.0 (1.366 / 2.047)	–	37.0 / 52.0 (1.457 / 2.047)
Ⓓ	23.2 / 42.0 (0.913 / 1.654)	–	–
Ⓔ	28.5 / 48.0 (1.122 / 1.819)	27.1 / 43.0 (1.067 / 1.693) 27.9 / 43.0 (1.098 / 1.693) 28.3 / 43.0 (1.114 / 1.693)	–



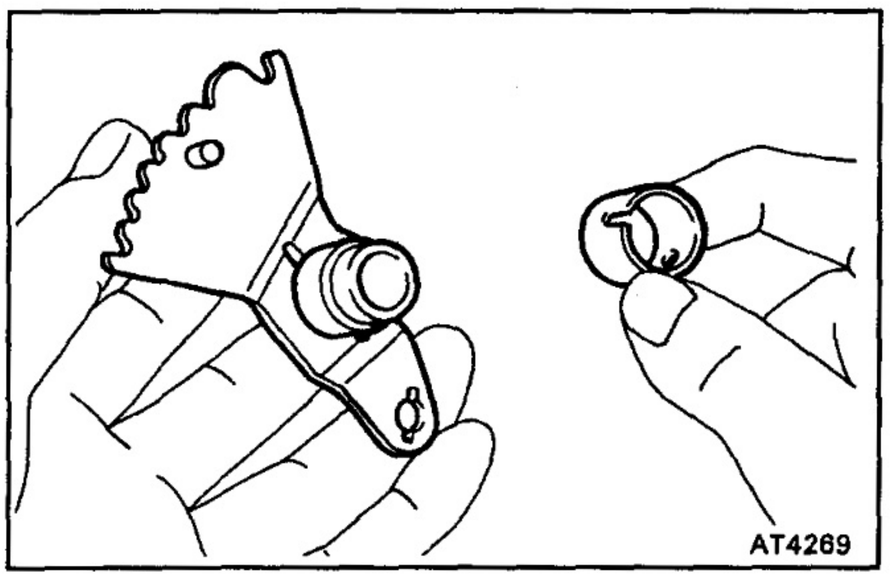
BASIC SUBASSEMBLY REASSEMBLY

AT090-01

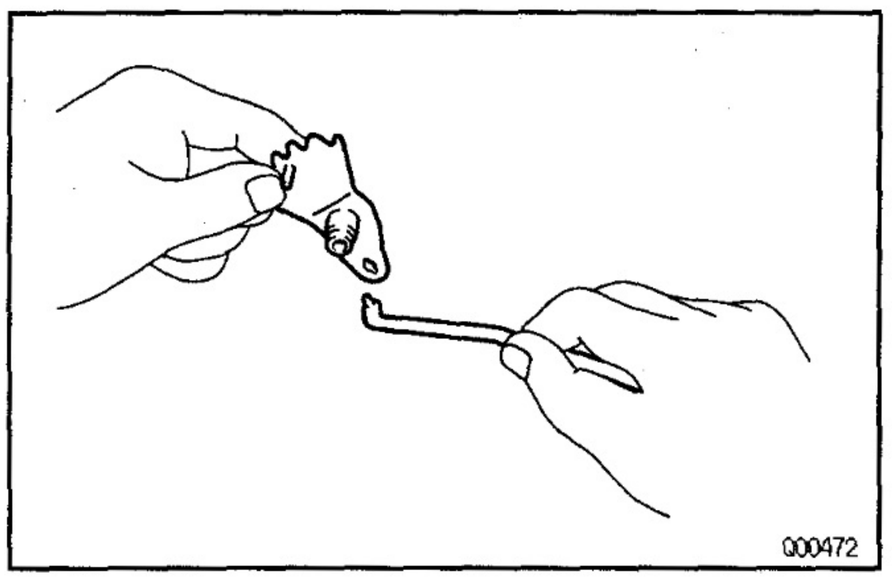
1. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEALS

(a) Using SST, tap in new two oil seals.
SST 09350−36010(09350−06150)

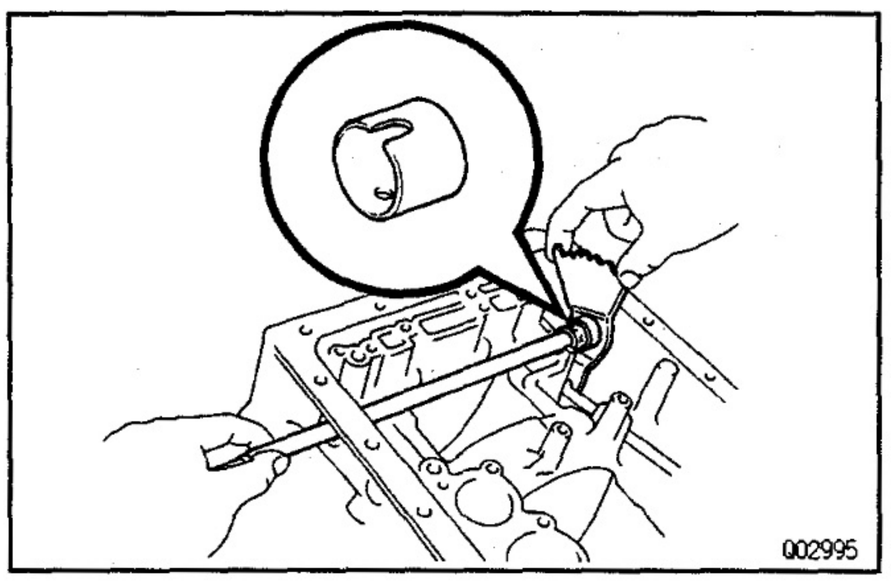
(b) Apply MP grease to the oil seal lip.



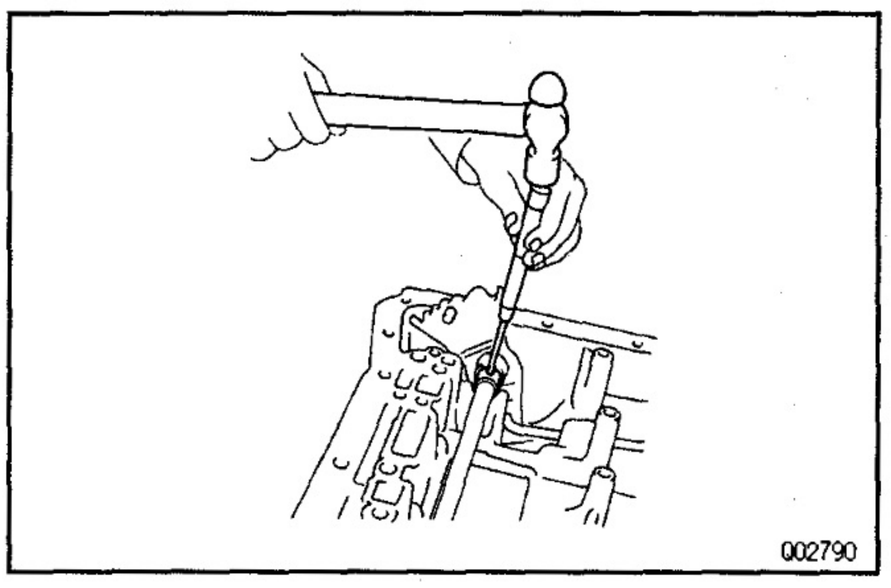
(b) Assemble a new spacer to the manual valve lever.



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

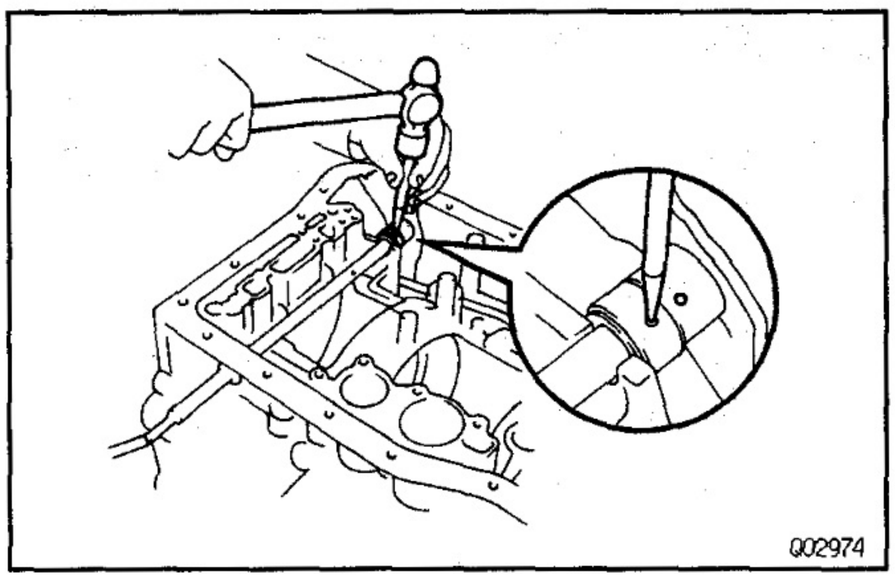


(e) Install the manual valve lever shaft to the transmission case through the manual valve lever.

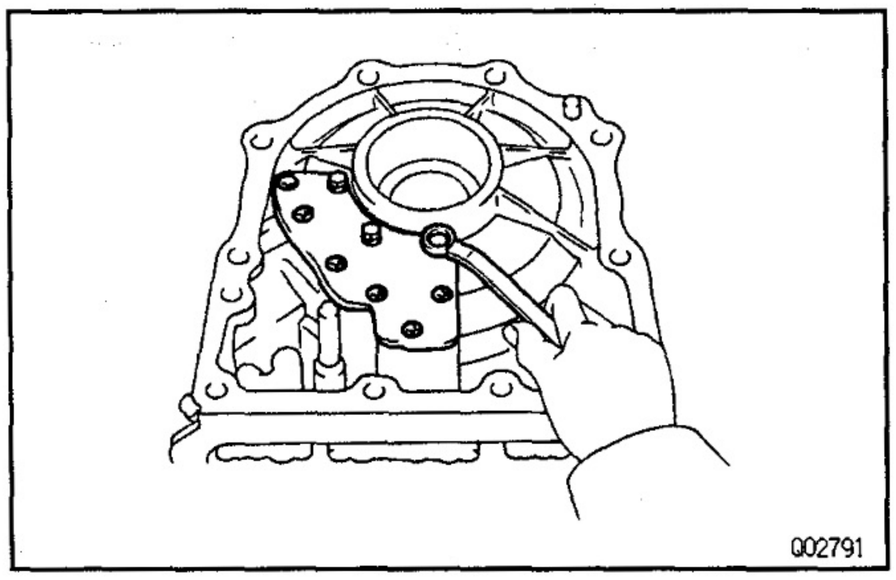


(f) Using a hammer, tap in the pin with the slot at a right angle to the shaft.

AT



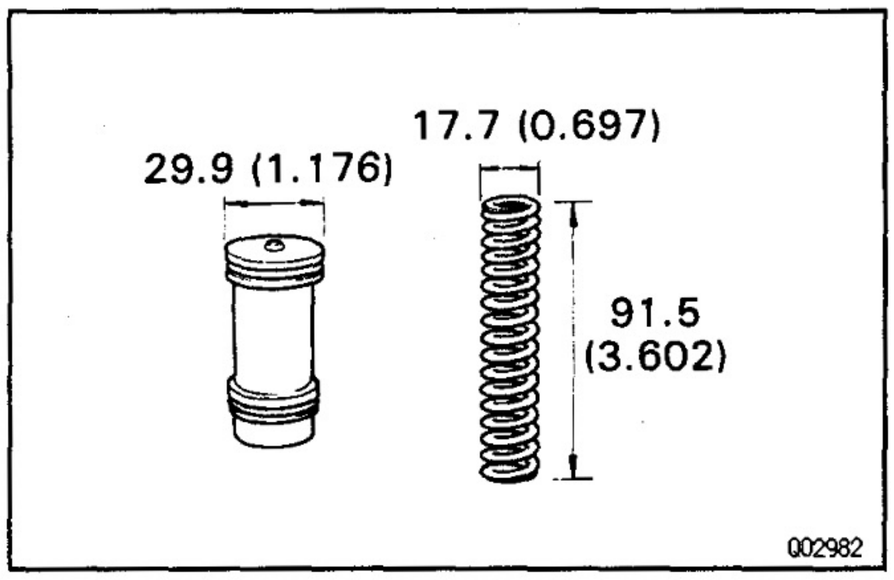
(g) Match the spacer hole to the lever calking hollow and calk the spacer to the lever.
(h) Make sure the manual valve lever shaft turns smoothly.



2. INSTALL TRANSMISSION REAR COVER

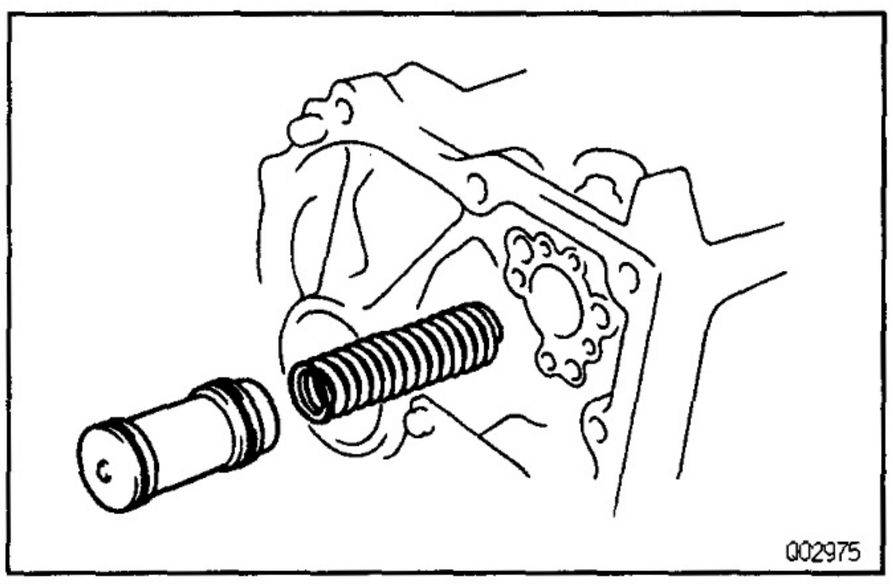
Install a new gasket and rear cover with the three bolts and six screws.

Torque:7.8 N·m (80 kgf·cm, 69 in.·lbf)

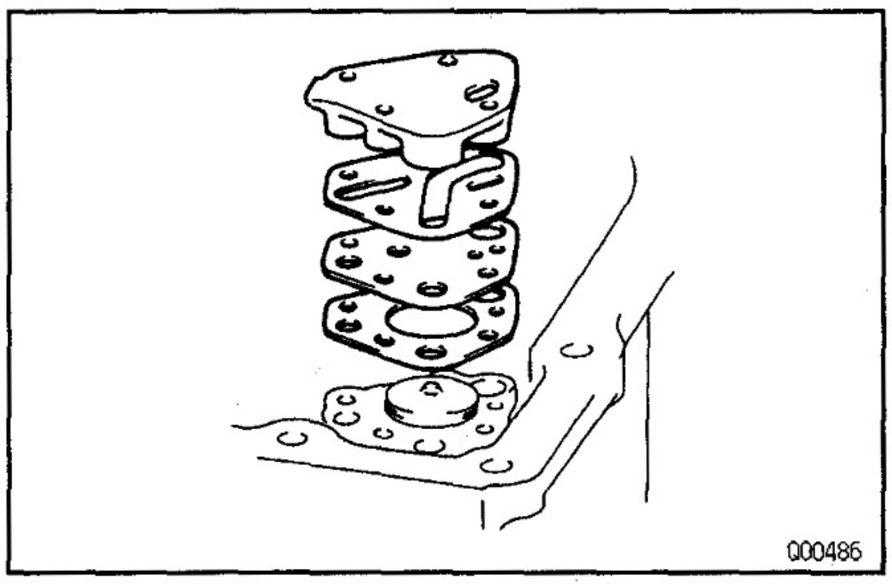


3. INSTALL C_1 ACCUMULATOR PISTON AND SPRING

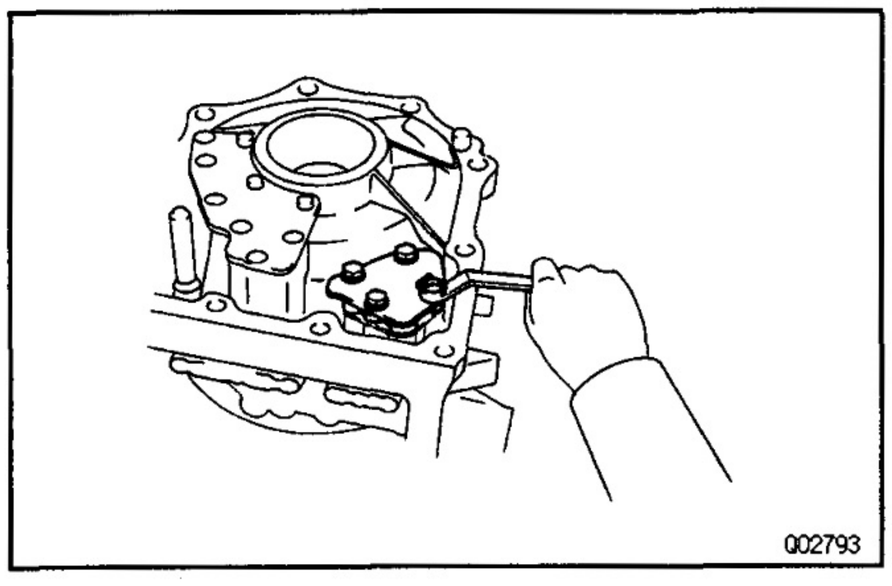
(a) coat new two O—rings with ATF, and install them to the piston.



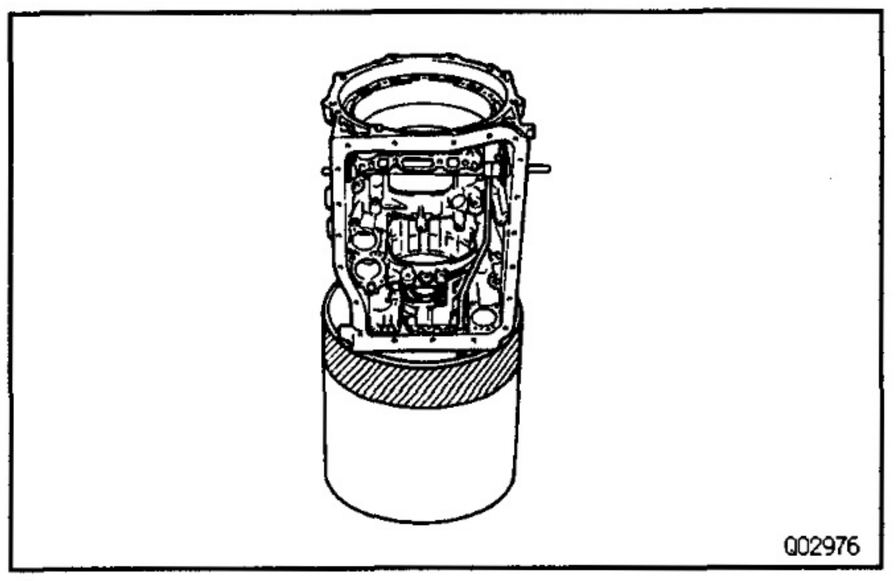
(b) Install the spring and accumulator piston into the bore of the transmission case.
HINT: Piston, spring diameters and spring free length are shown in the figure.



(c) Place the following parts on the transmission case.
(1) New gasket
(2) Plate
(3) New gasket
(4) Front clutch accumulator cover

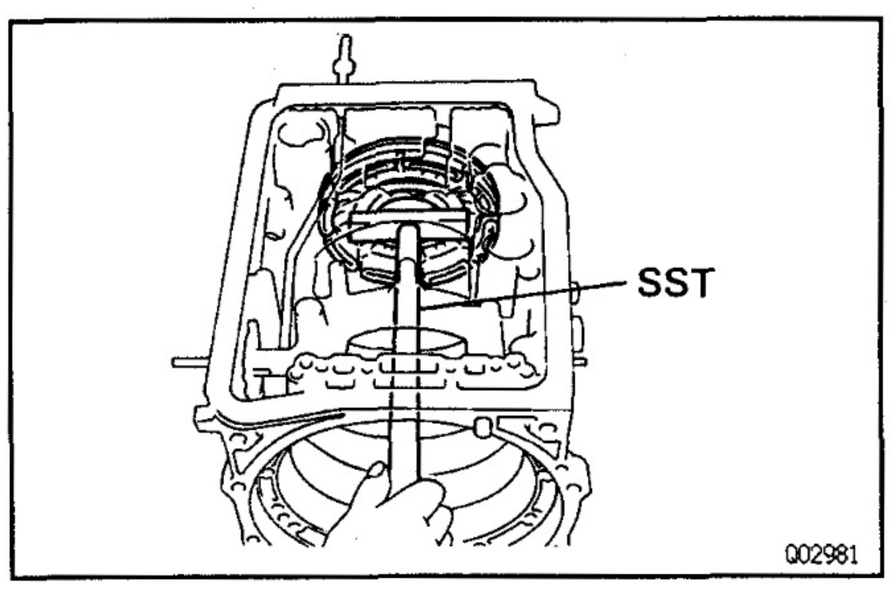


(d) Install the four bolts.
Torque:7.8 N·m (80 kgf·cm, 69 in.·lbf)



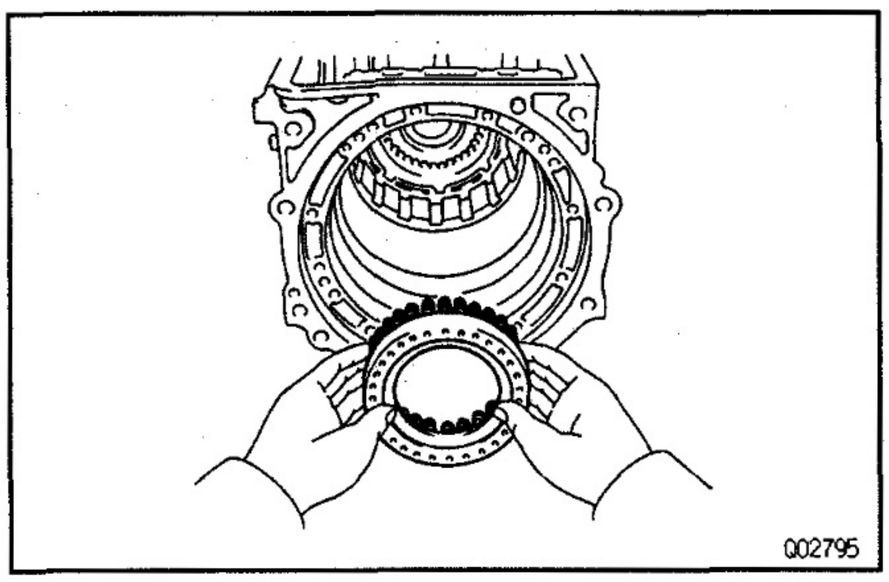
4. INSTALL FIRST AND REVERSE BRAKE PISTON

(a) Place the transmission case on a cylinder.
NOTICE: Be careful not to damage the transmission case.
Tape the top of the cylinder.

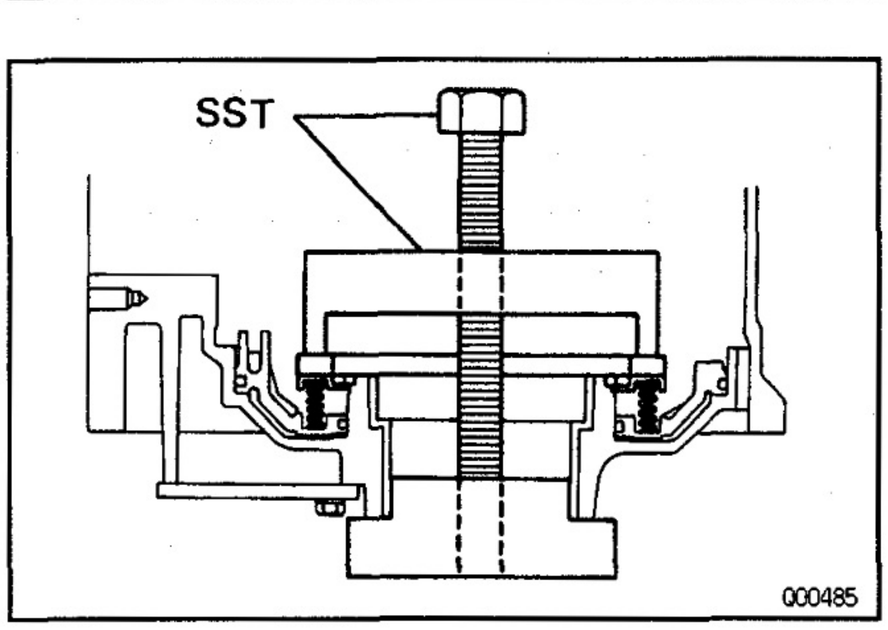


(b) Coat new two O—rings with ATF, and install them to the brake piston.

(c) Using SST, pushing the brake piston.
SST 09350—36010(09350—06035,09350—06050)

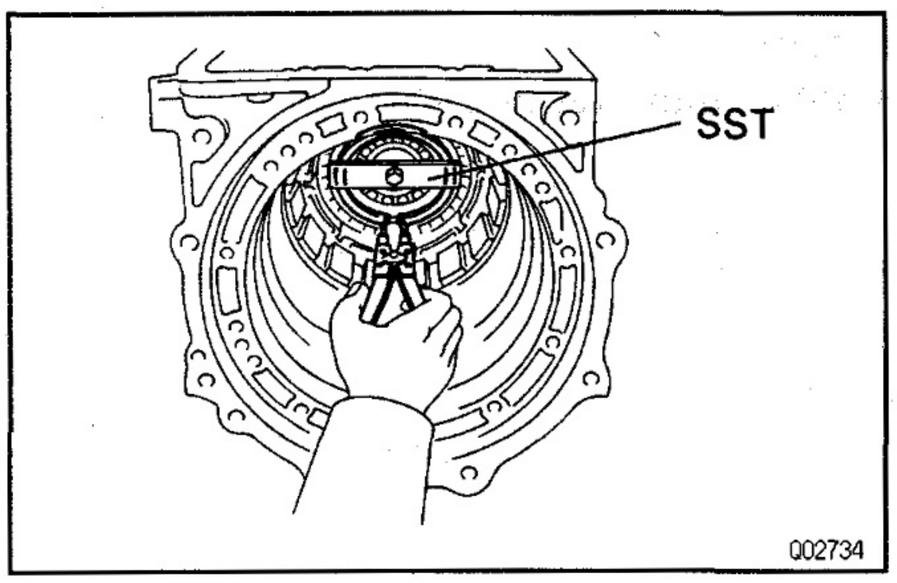


(d) Place the return spring on the brake piston.

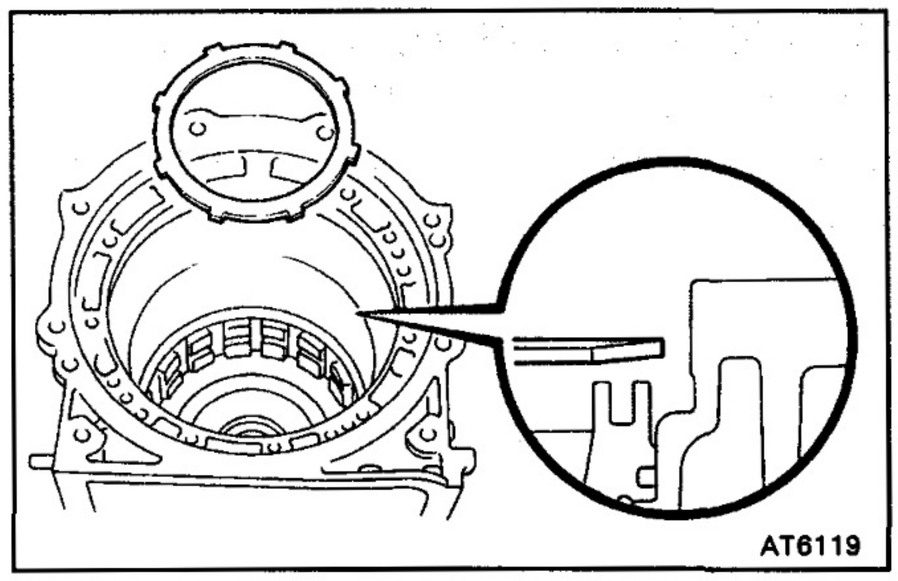


(e) Using SST, compress the return spring.
SST 09350—36010(09350—06030)

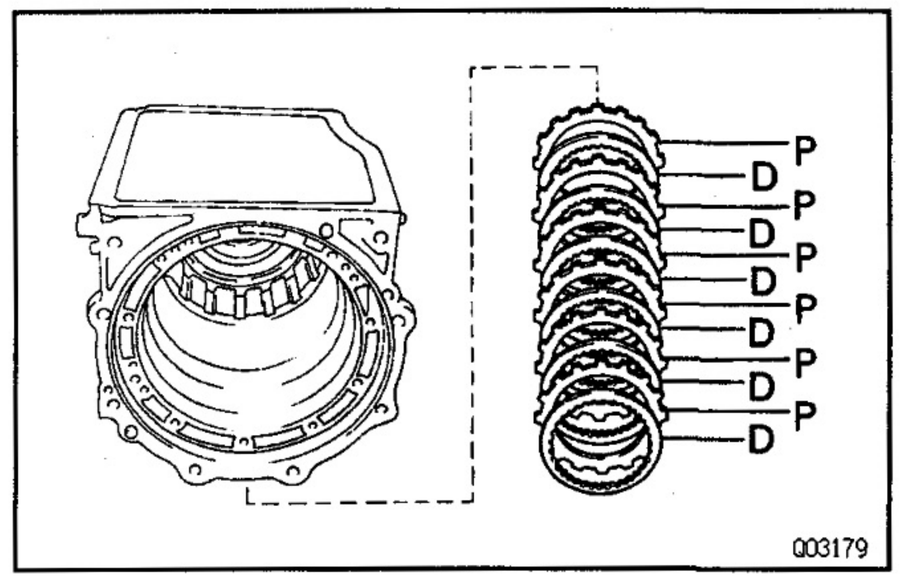
AT



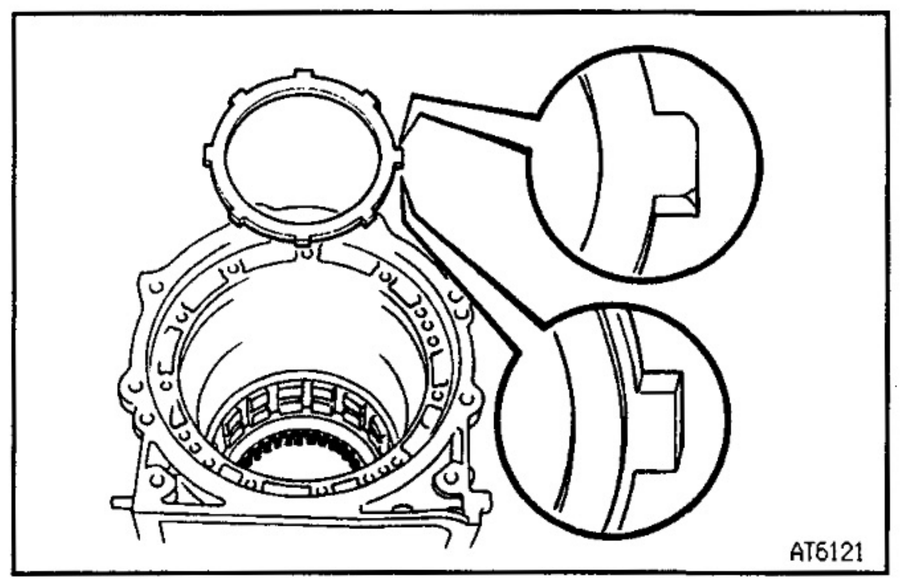
(f) Using snap ring plieres, install the snap ring.



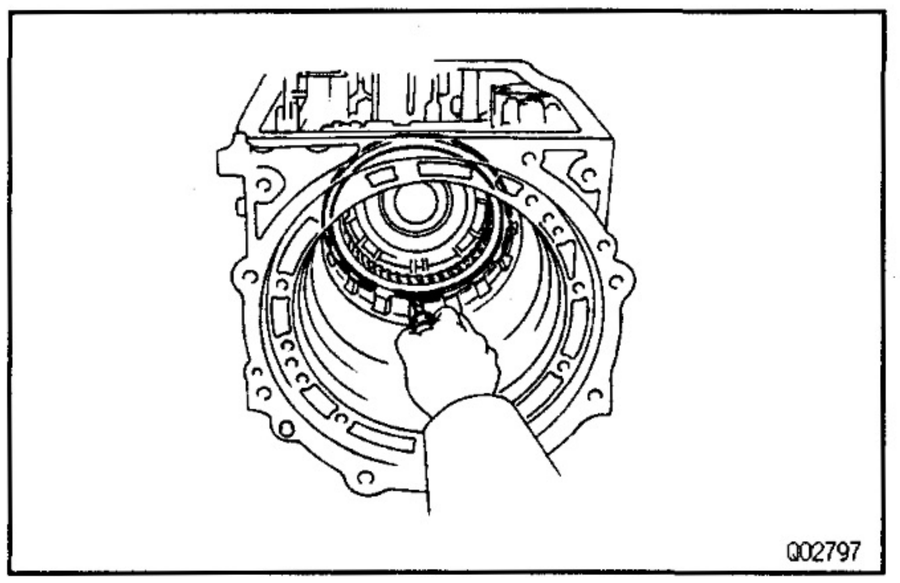
(g) Install the cushion plate, facing the rounded edge inward.



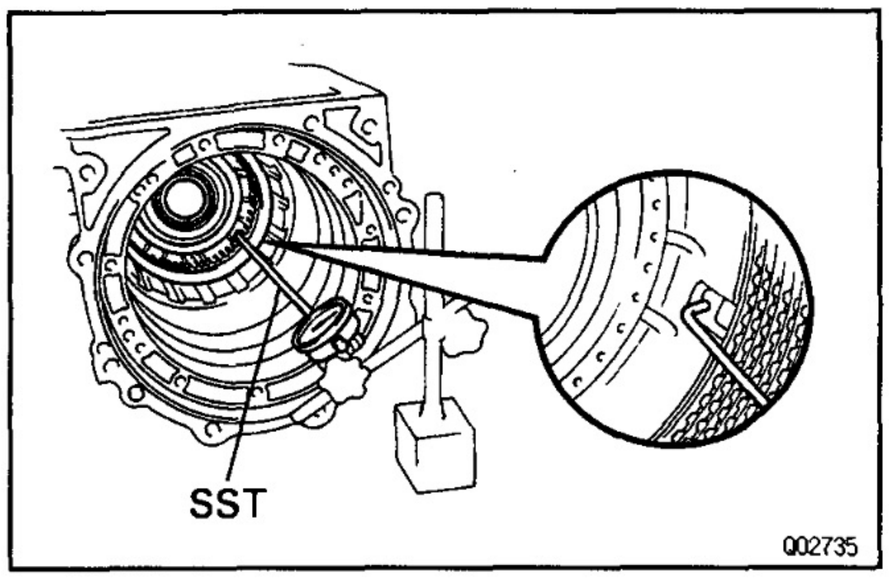
(h) Install the six plates and six discs in order:
P = Plate D = Disc
P–D–P–D–P–D–P–D–P–D–P–D



(i) Install the flange, facing the rounded edge outward.
HINT: If the flange is step–edged, install the flange with the step–edge, facing inward.



(j) Install the snap ring.
HINT: Be sure the end of the snap ring is not aligned with the cutout portion of the transmission case.



5. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

Using SST and a dial indicator, measure the piston stroke by applying and releasing the compressed air 392 — 785 kPa (4 — 8 kgf — cm², 57 — 114 psi) as shown.

SST 09350—36010(09350—06120,09350—06130)

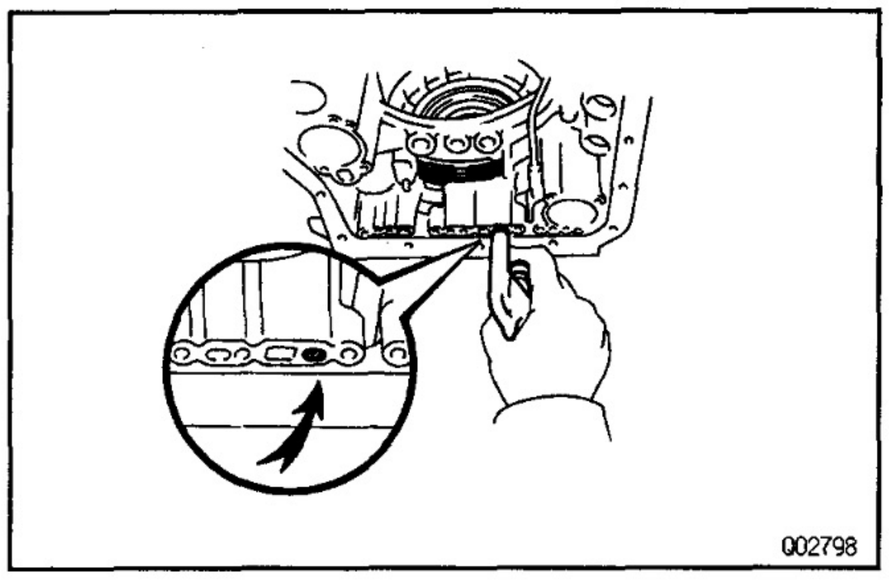
Piston stroke:

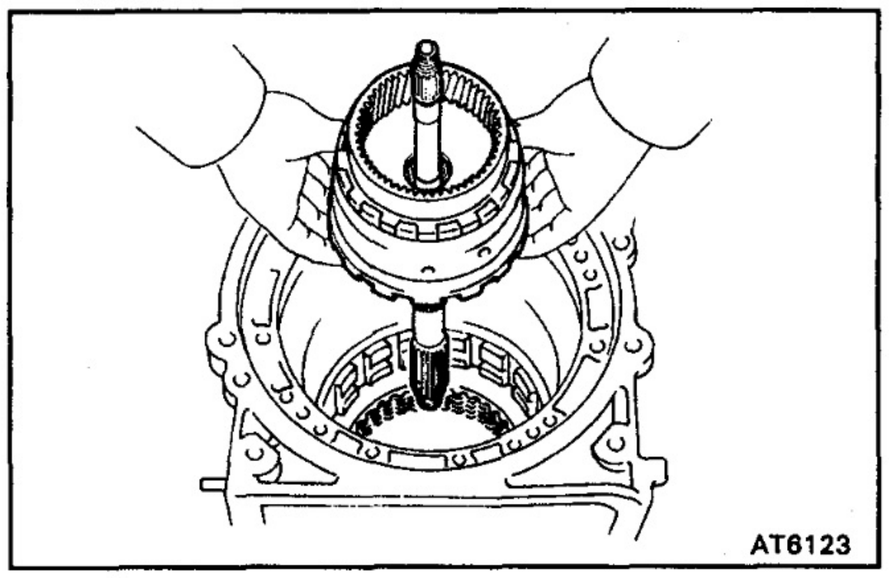
3.3—3.8 mm (0.130—0.150 in.)

If the piston stroke is not as specified, select another flange.

HINT: there are three different thicknesses for flange.

No.	Thickness mm (in.)
None	6.65 (0.2618)
1	7.05 (0.2776)
2	7.45 (0.2933)

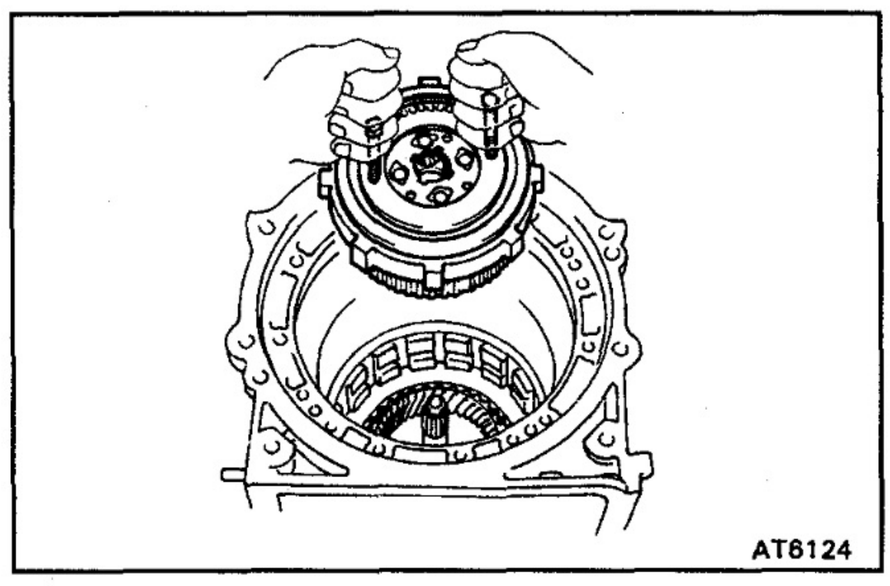




6. INSTALL PLANETARY GEARS, ONE — WAY CLUTCH AND OUTPUT SHAFT ASSEMBLY

(a) Place the transmission case on a cylinder.

(b) Install the rear planetary carrier and output shaft assembly to the transmission case.



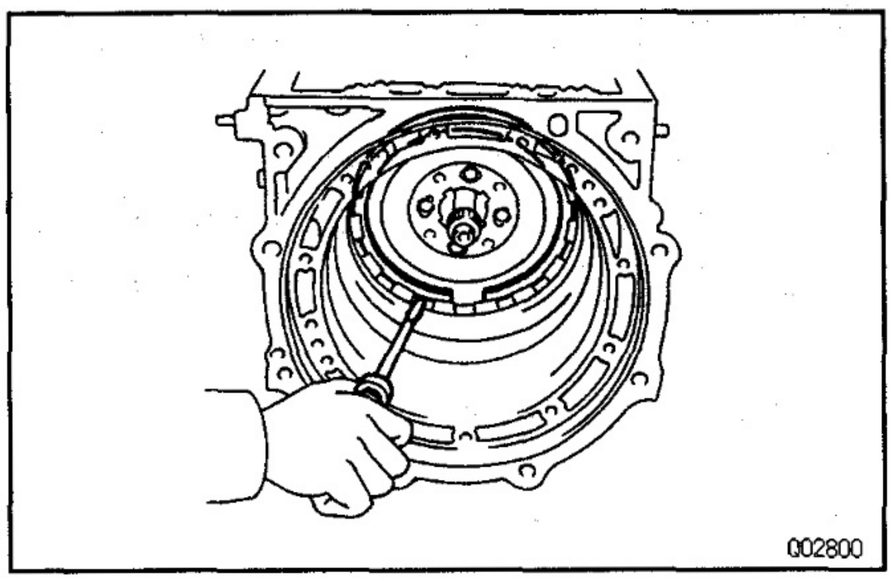
(c) Temporarily install two bolts to the front planetary carrier.
HINT: Use two 6 mm (1 mm pitch) bolts. Do not screw over 5 revolutions.

(d) Align the spline of the one—way clutch with the spline groove of the transmission case.

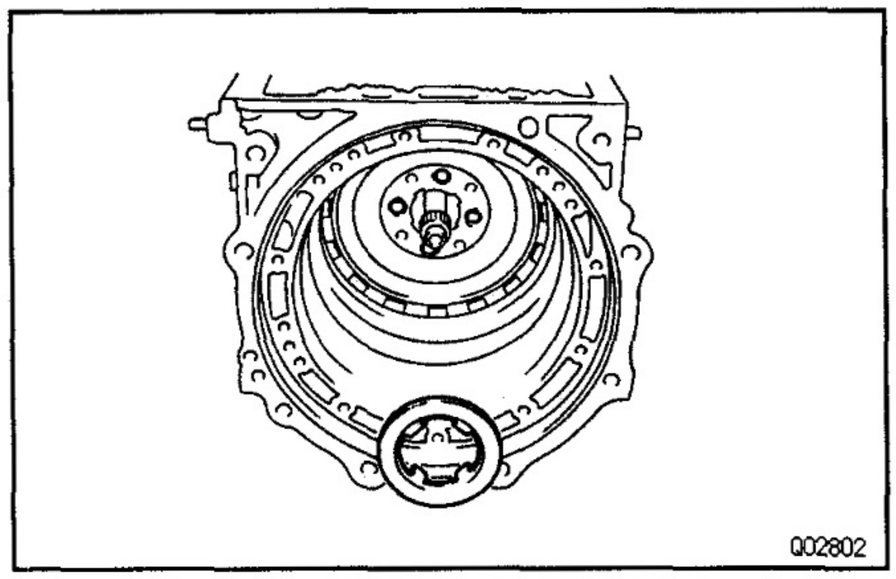
(e) Install the front planetary carrier and one—way clutch assembly into the transmission case.
HINT:
- Mesh the spline of the front planetary carrier with the flukes of the discs by rotating and pushing the front planetary carrier clockwise.
- If the front planetary carrier will not rotate clockwise, check the installation of the one—way clutch.

(f) Remove the two bolts from the front planetary carrier.

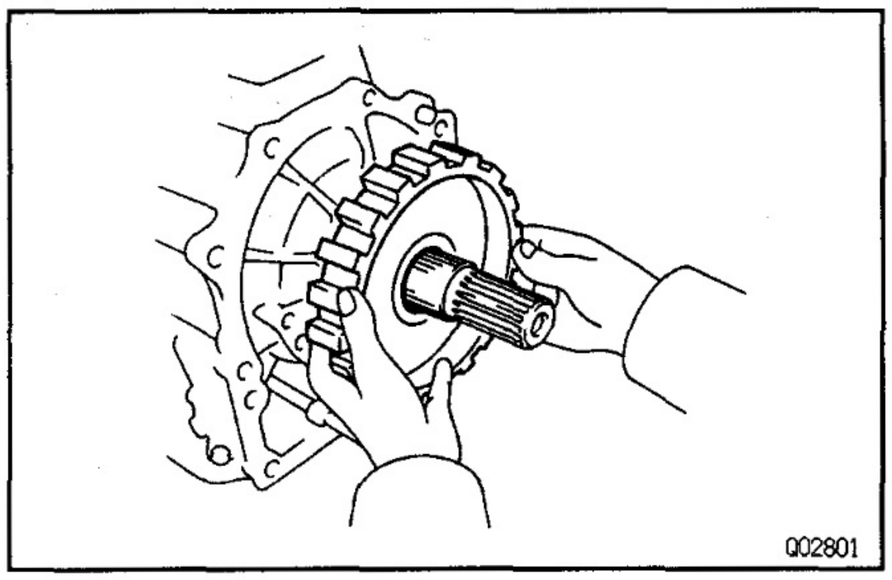
AT



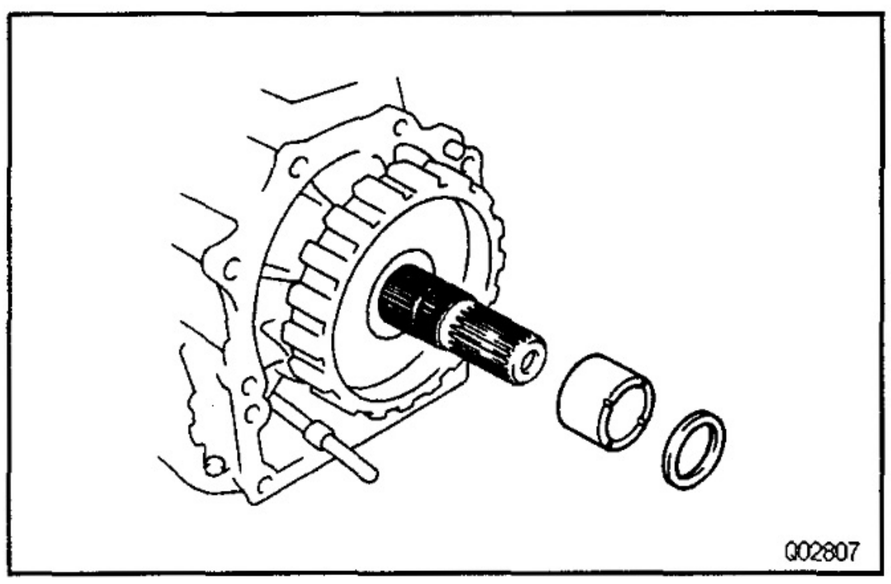
(g) Using a screwdriver, install the snap ring.
HINT: Be sure the end of the snap ring is not aligned with the cutout portion of the transmission case.



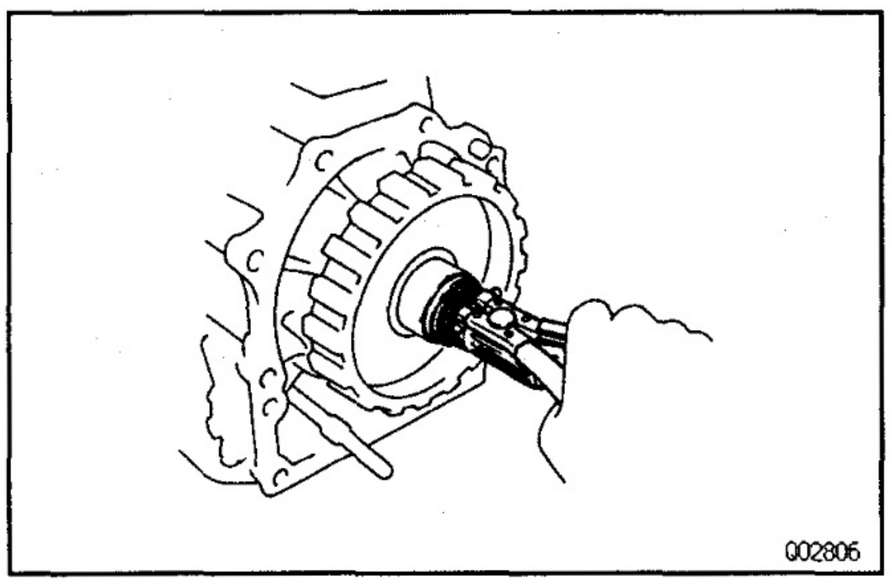
(h) Coat the thrust washer with petroleum jelly, and install it onto the front planetary carrier.
HINT: Securely fit the claws of the thrust washer into the grooves of the front planetary gear.



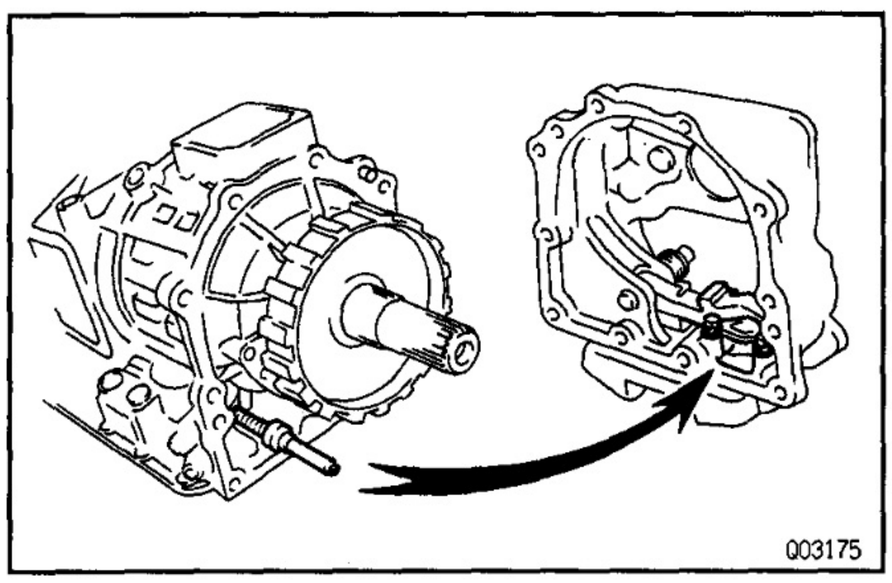
7. INSTALL SPEED SENSOR ROTOR
Install the speed sensor rotor onto the output shaft.



8. INSTALL OUTPUT SHAFT SPACERS
(a) Install the two output shaft spacers.



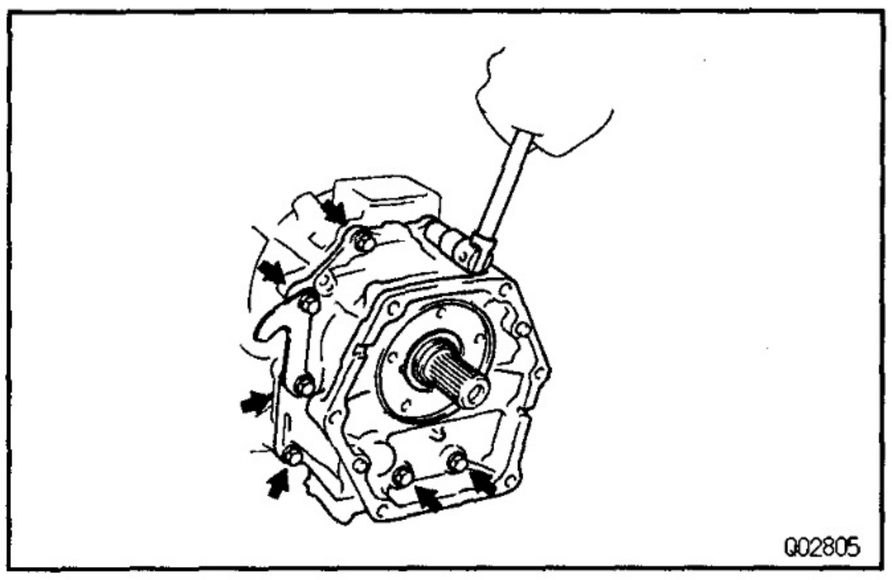
(b) Using snap ring pliers, install the snap ring.



9. INSTALL TRANSFER ADAPTOR AND OUTPUT SHAFT REAR BEARING

(a) Place a new gasket on the transmission case.

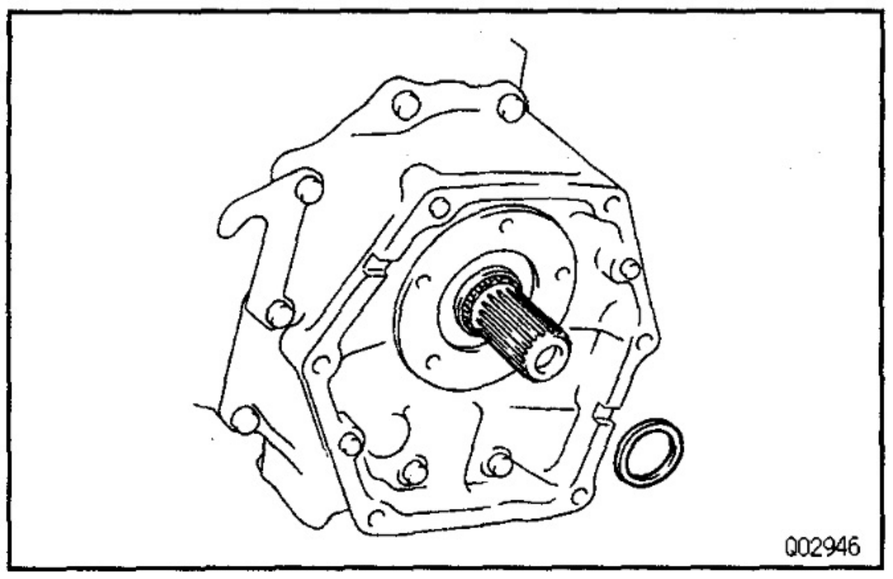
(b) Install the parking lock rod between the parking lock pawl and bracket, and attach the transfer adaptor on the transmission case.

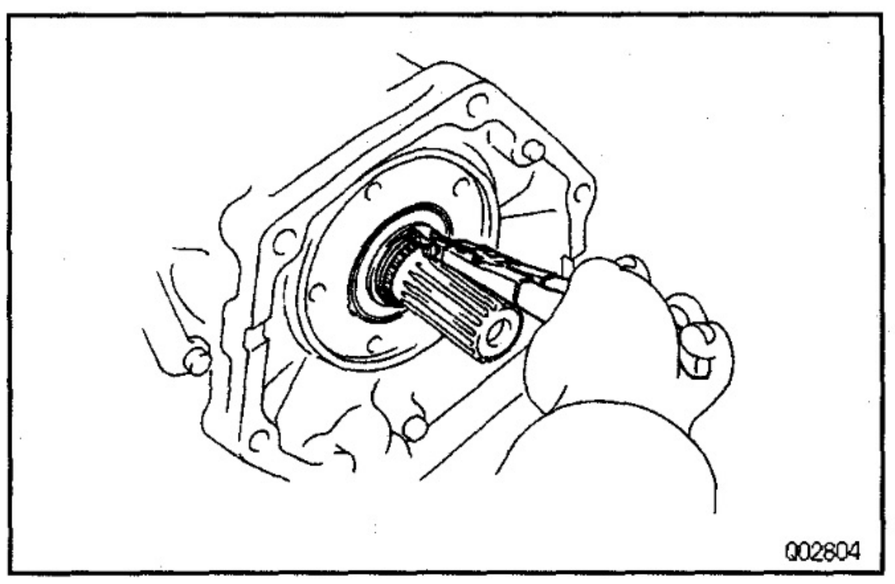


(c) Install the transfer adaptor with ten bolts.
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

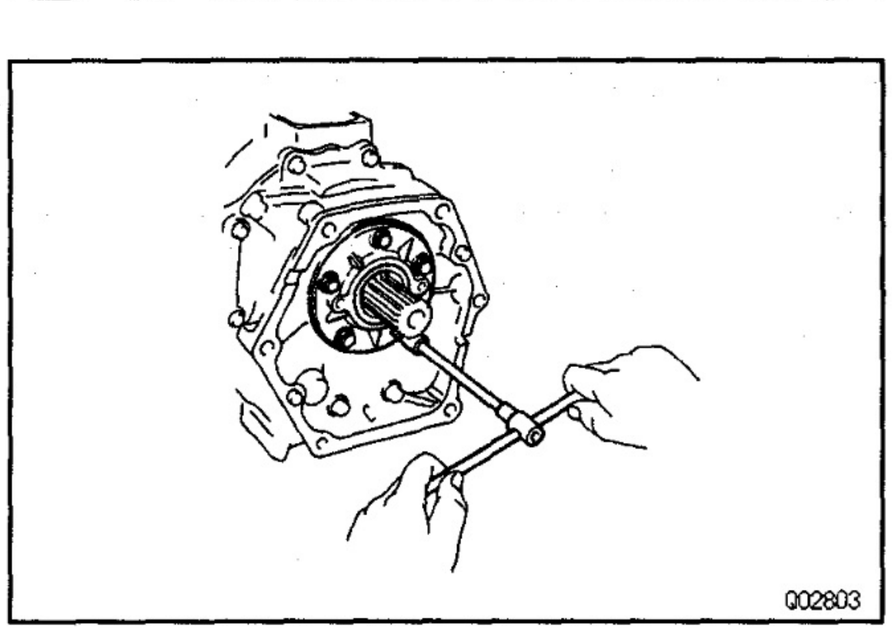
10. INSTALL OUTPUT SHAFT SPACER

(a) Install the spacer onto the output shaft.





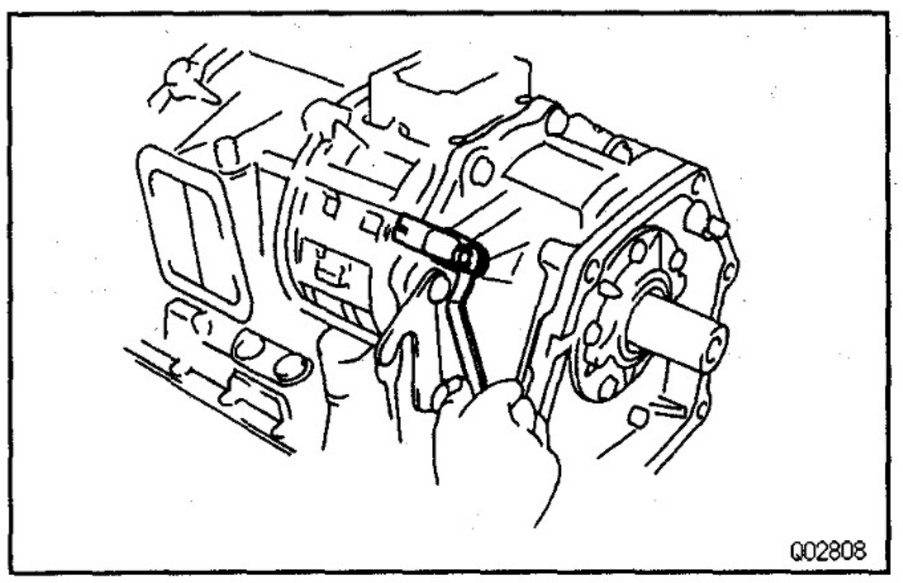
(b) Using snap ring pliers, install the snap ring.



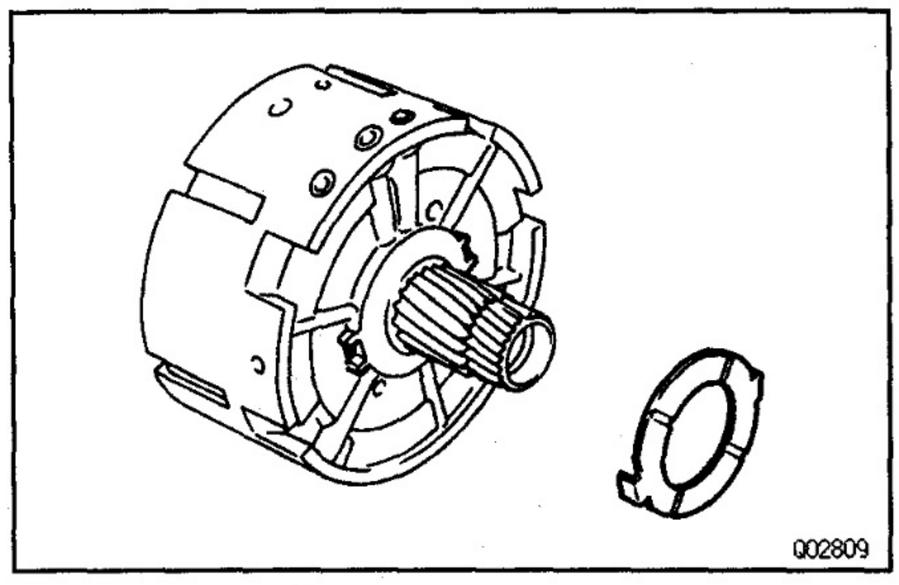
11. INSTALL OUTPUT SHAFT REAR BEARING RETAINER

Install the output shaft rear bearing with five bolts.

AT

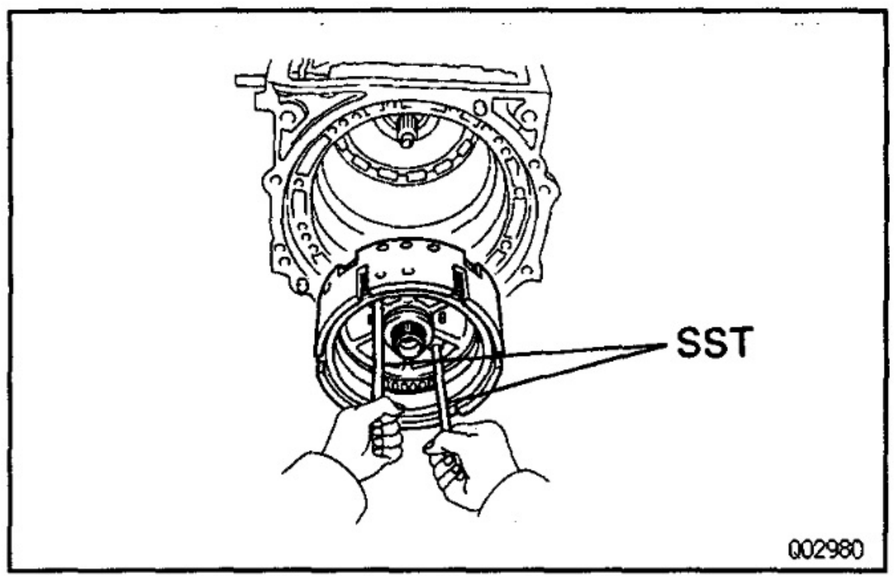


12. INSTALL SPEED SENSOR



13. TEMPORARILY INSTALL CENTER SUPPORT ASSEMBLY

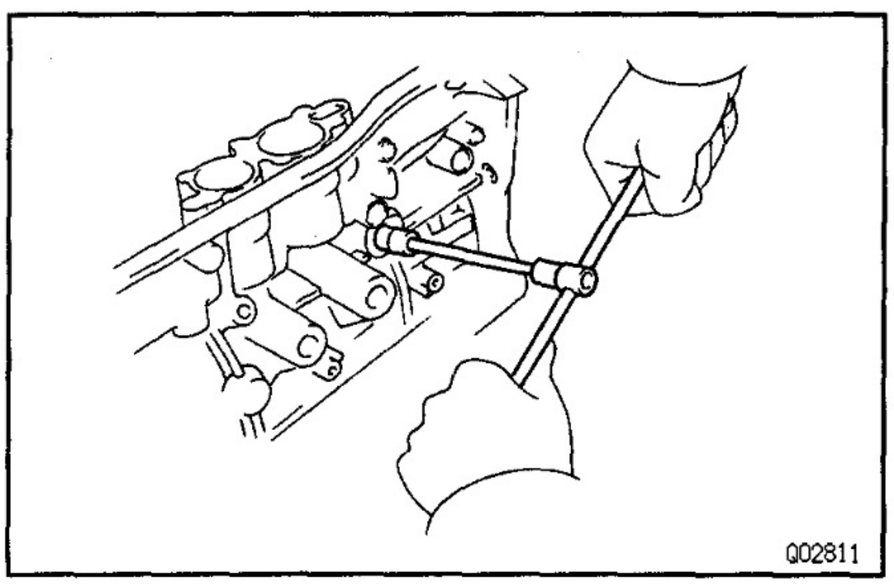
(a) Coat the thrust washer with petroleum jelly, and install it onto the rear side of the center support.
HINT: Securely fit the claws of the thrust washer into the grooves of the center support.



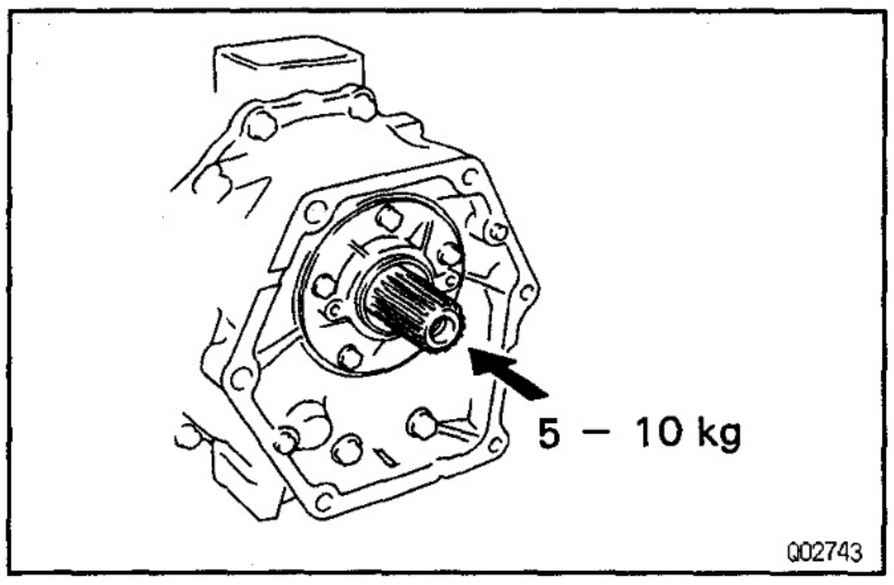
(b) Install SST (two bolts) to the center support.
SST 09350−36010(09350−06140)

(c) Align the oil holes and bolt holes of the center support and transmission case.

(d) Install the center support assembly into the transmission case.

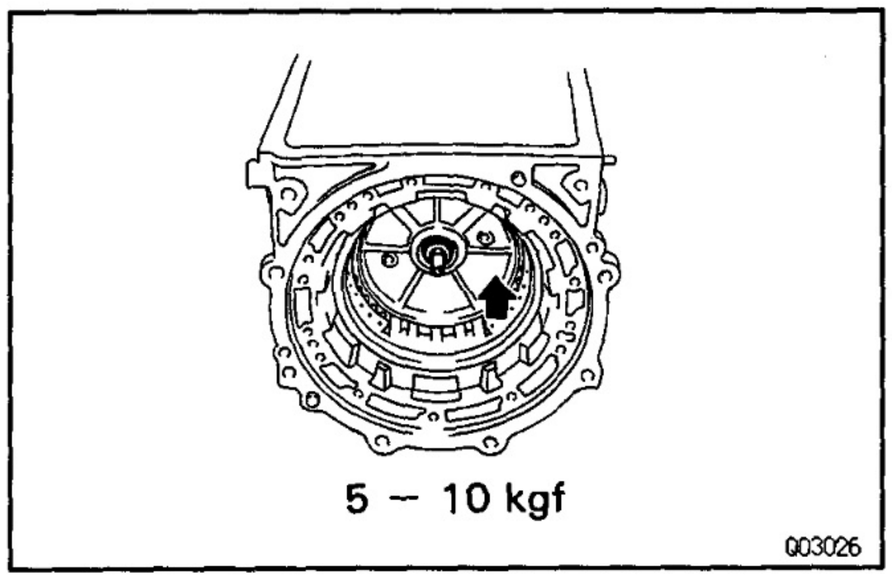


(e) Install the three center support bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

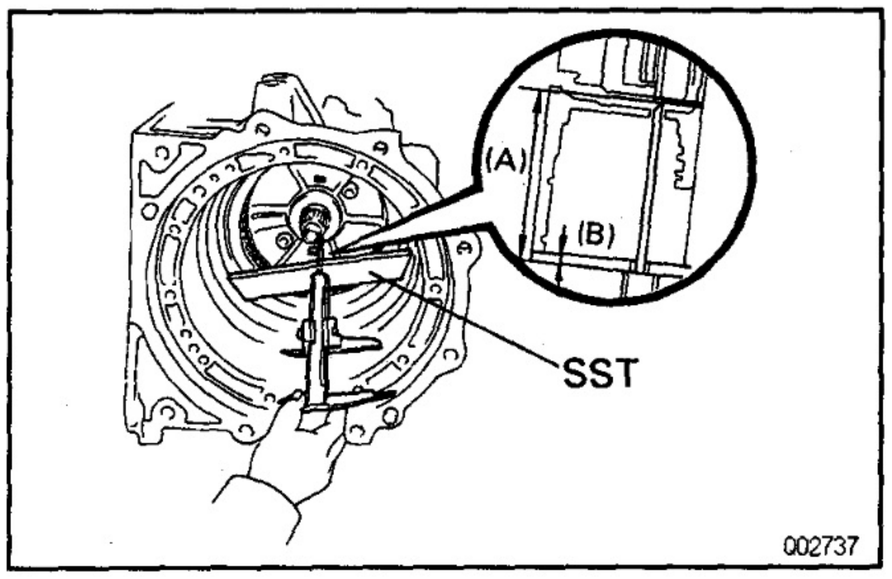


14. ADJUST THRUST CLEARANCE OF CENTER SUPPORT

(a) Push the transmission output shaft toward the front of the transmission by applying a force of 49−89 N (5 −10 kgf, 11.0−22.0 lbf), then pull with the same amount of force.



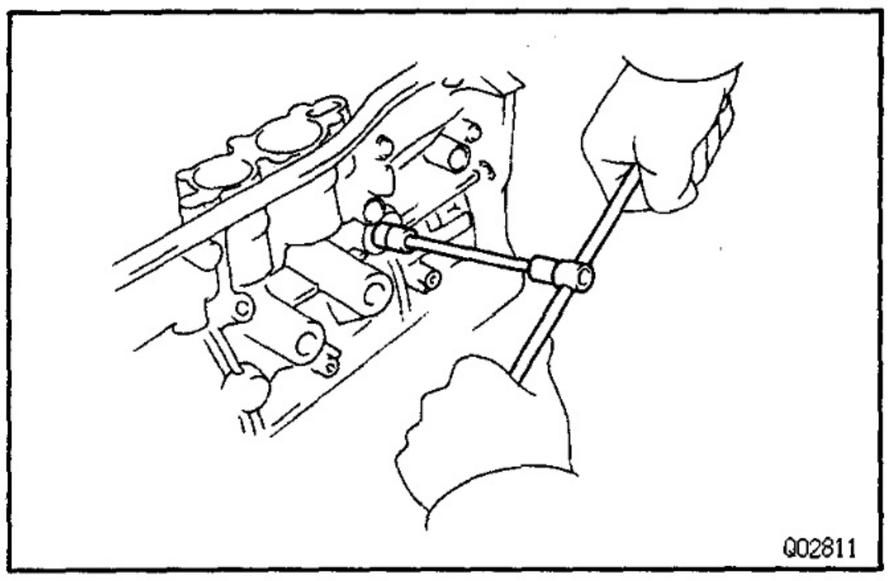
(b) Push the center support toward the rear of the transmission by applying a force of 49–89 N (5–10 kgf, 11.0–22.0 lbf), then pull with the same amount of force.



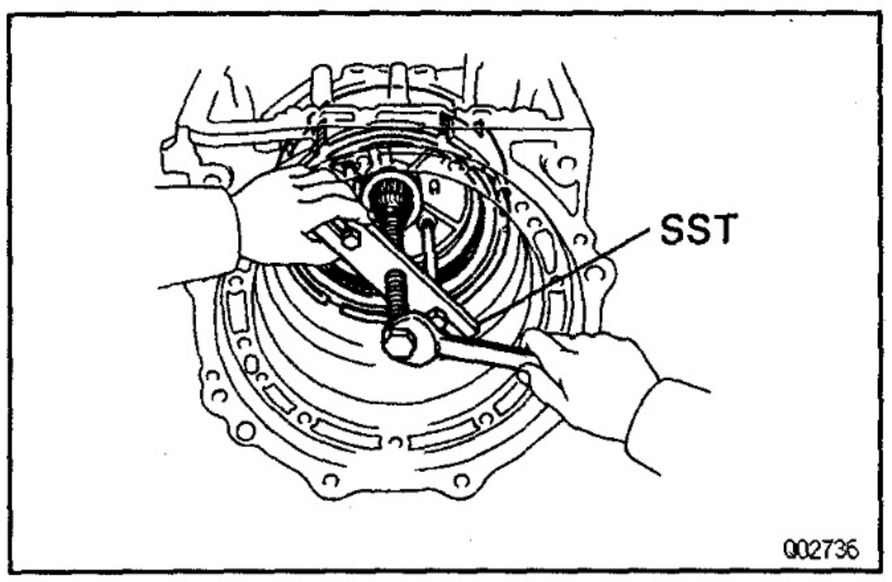
(c) Place SST on the center support.
SST 09350–36010(09350–06090)

(d) Using calipers, measure distance (A) between the tops of SST and the thrust washer on the front planetary gear.

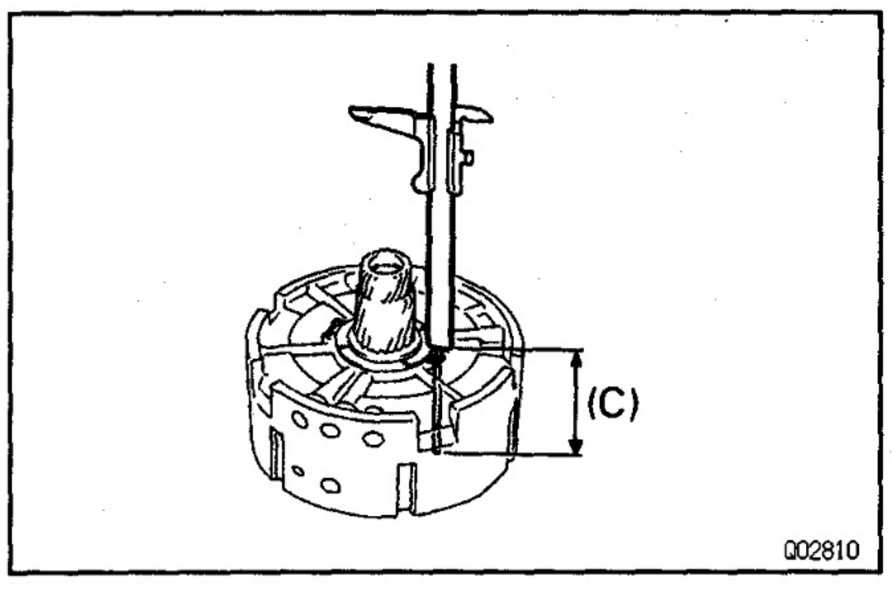
(e) Using calipers, measure thickness (B) of SST.



(f) Remove the three center support set bolts.



(g) Using SST, remove the center support assembly from the transmission case.
SST 09350–36010(09350–06140)



(h) Turn over the center support together with the thrust washer, and place it on a flat surface.

(i) Inserting calipers into the thrust washer hole, measure the distance (C) between it and the flat surface.

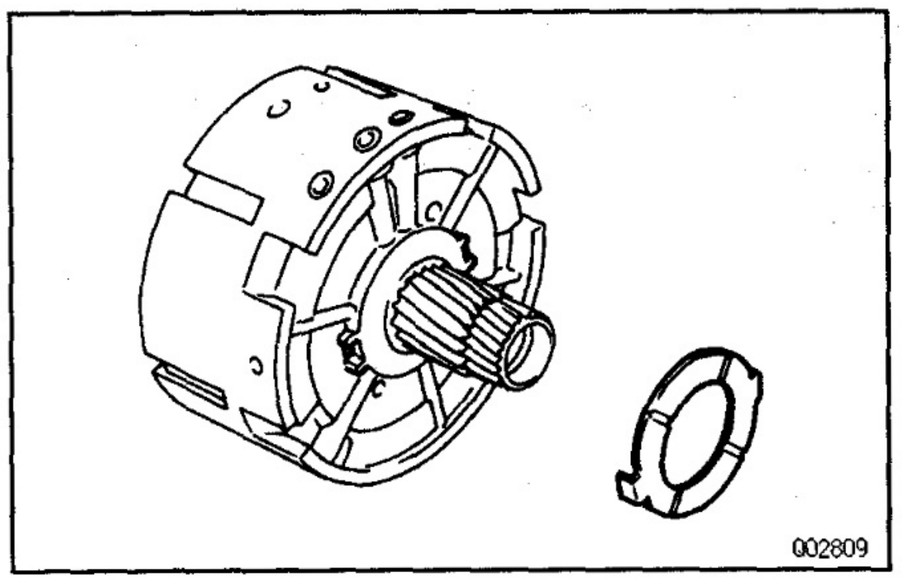
Center support thrust clearance:

A – (B + C)

Standard thrust clearance:

0.30–0.70 mm (0.0118–0.0276 in.)

AT



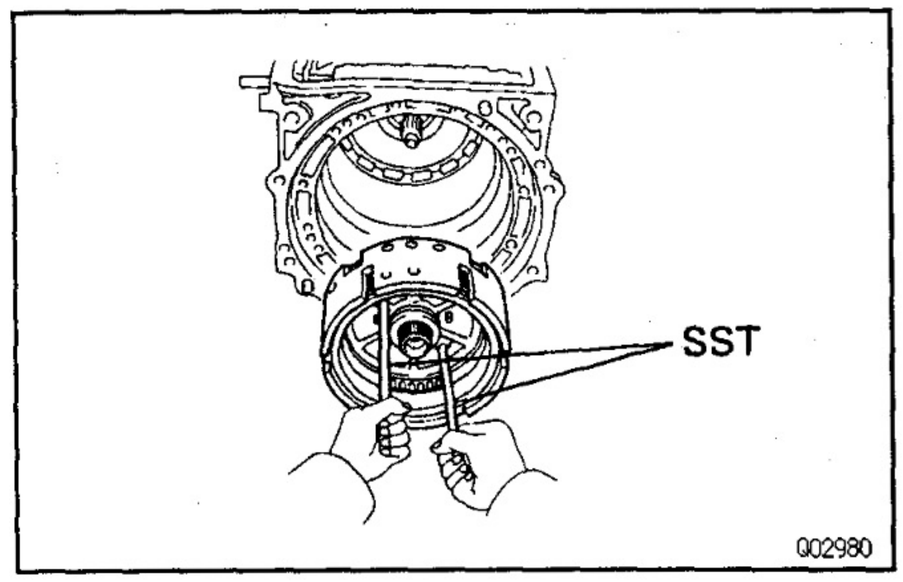
Maximum thrust clearance:

0.90 mm (0.0354 in.)

If the thrust clearance is greater than the maximum, select and install a thrust washer.

HINT: there are four different thicknesses for thrust washer.

Thickness mm (in.)	Thickness mm (in.)
1.8 (0.071)	2.4 (0.094)
2.1 (0.083)	2.6 (0.102)



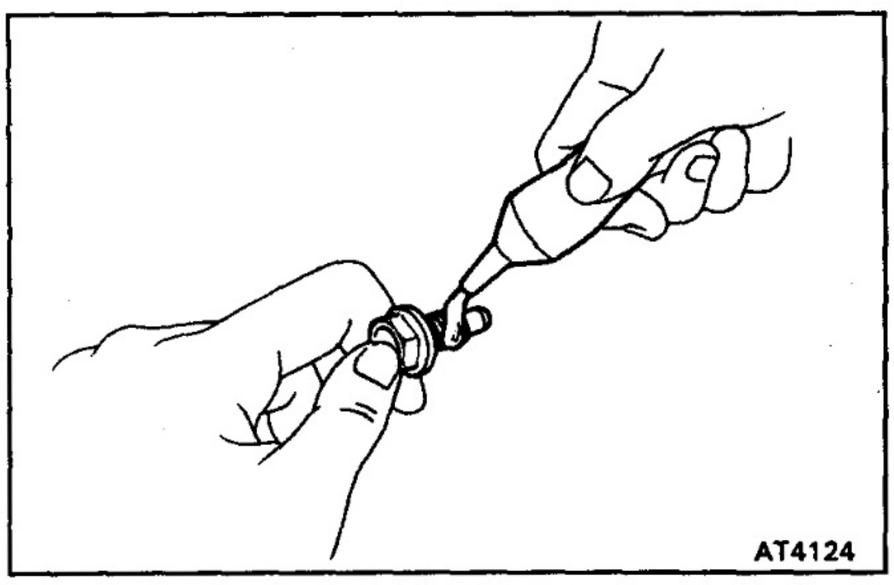
15. INSTALL CENTER SUPPORT ASSEMBLY

(a) Coat new three O–rings with ATF and install them to the oil holes of the center support.

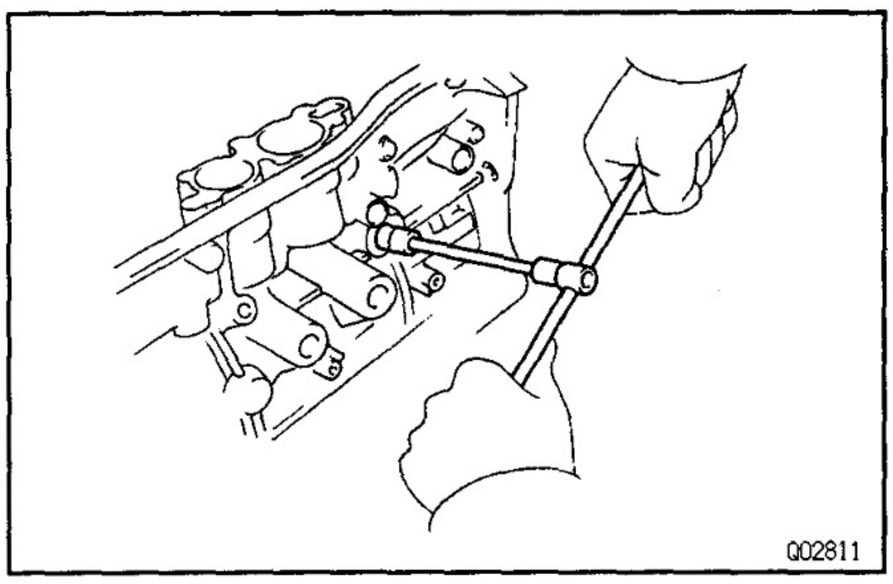
(b) Install SST (two bolts) to the center support.
SST 09350–36010(09350–06140)

(c) Align the oil holes and bolt hole of the center support and transmission case.

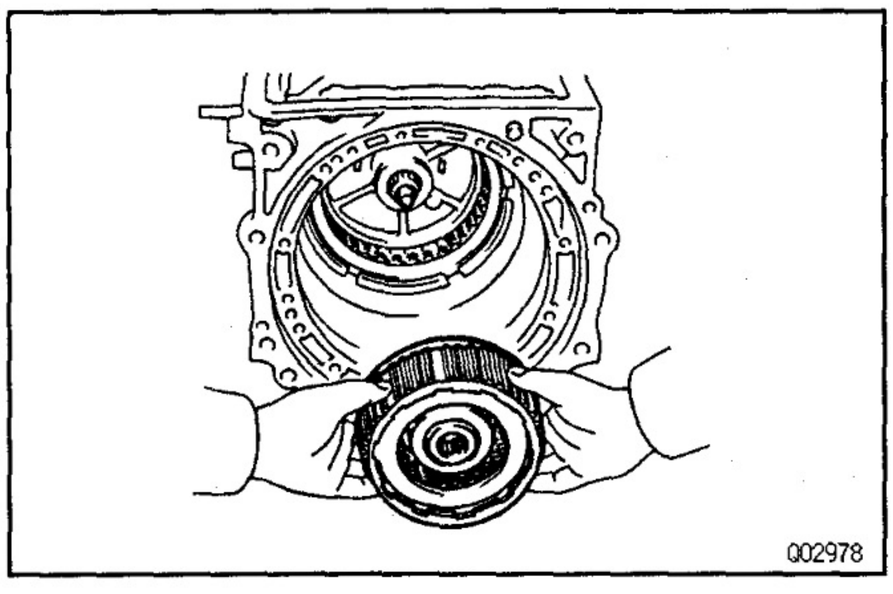
(d) Install the center support assembly into the transmission case.



(e) Apply sealant to the threads of the center support set bolts.
Sealant: Part No. 08833–00080, THREE BOND 1344, LOCTITE 240 or equivalent



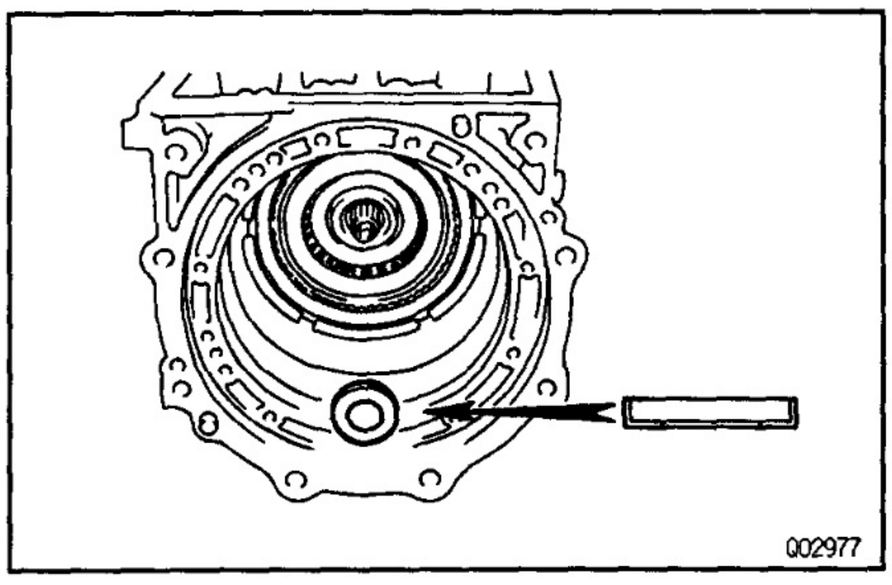
(f) Install the three center support set bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



16. INSTALL REAR CLUTCH ASSEMBLY

Install the rear clutch assembly into the transmission case.

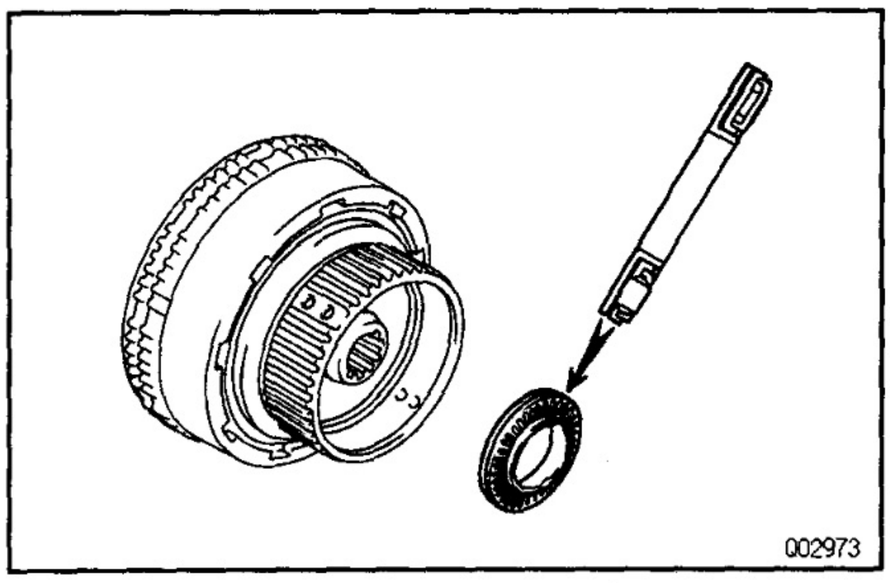
HINT: Mesh the spline of the rear clutch drum with the flukes of the discs by rotating and pushing the rear clutch drum clockwise or counterclockwise.



17. INSTALL FRONT CLUTCH ASSEMBLY

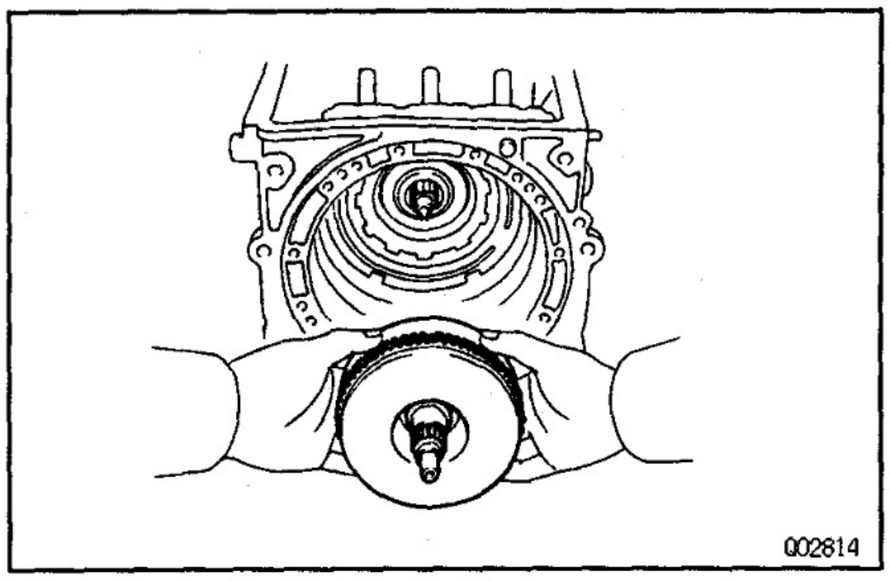
(a) Coat the race with petroleum jelly, and install it onto the rear clutch drum.
HINT: Race diameter

Diameter mm (in.)	Inside	Outside
Race	37.0 (1.457)	52.0 (2.047)

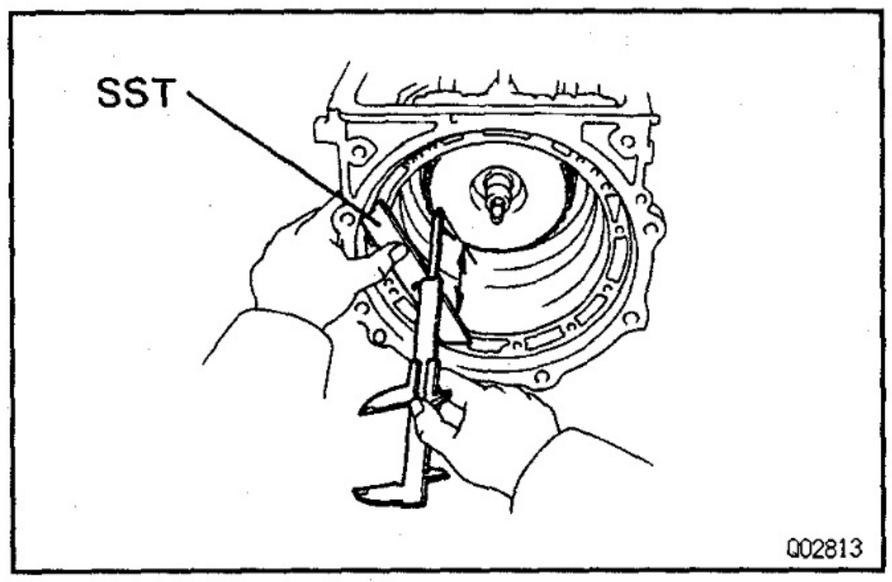


(b) Coat the bearing with petroleum jelly, and install them onto the front clutch hub.
HINT: Bearing and race diameters

diameter mm (in.)	Inside	
Bearing	32.8 (1.291)	52.0 (2.047)



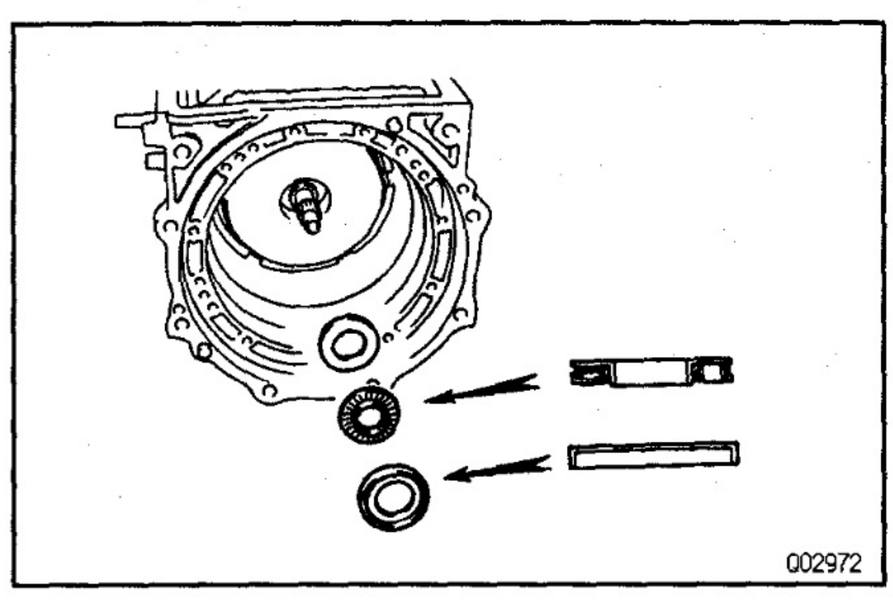
(c) Install the front clutch assembly into the transmission case.
HINT: Mesh the spline of the front clutch hub with the flukes of the discs by rotating and pushing the front clutch drum clockwise or counterclockwise.



18. CHECK CORRECT INSTALLATION OF FRONT CLUTCH ASSEMBLY

(a) Place SST on the installation surface of the oil pump.
SST 09350–36010(09350–06090)

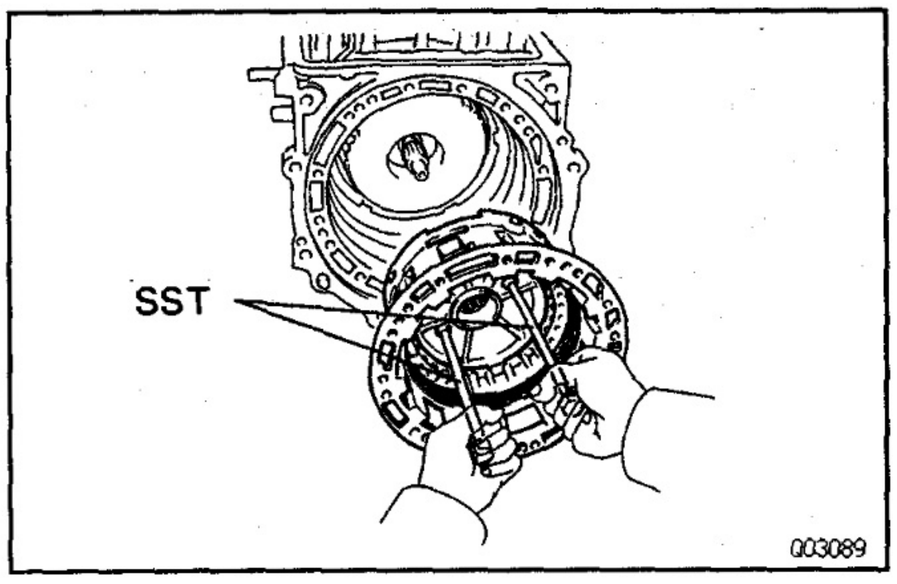
(b) Using calipers, measure the distance between the tops of SST and the clutch drum.
If the distance corresponds to that during disassembly, the front clutch assembly is installed correctly.



19. TEMPORARILY INSTALL OVERDRIVE CASE ASSEMBLY

(a) Remove the oil seal ring from the input shaft

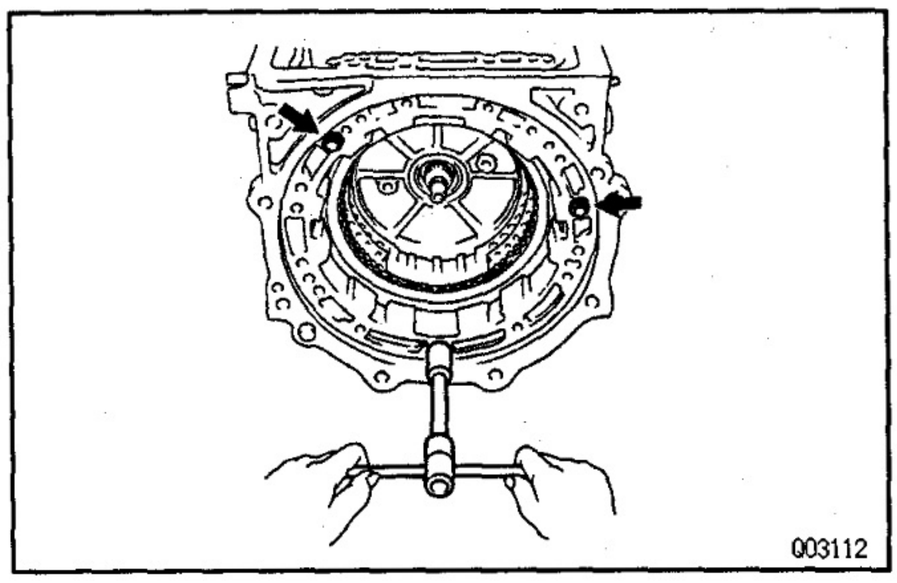
(b) Coat the race and bearing with petroleum jelly, and install the spacer and them onto the front clutch drum.
HINT: Bearing and race diameter



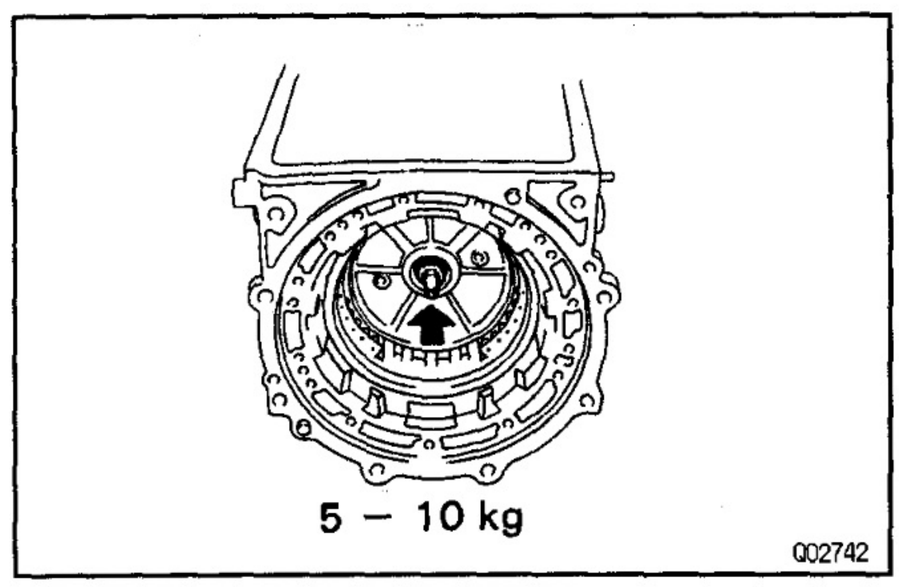
diameter mm (in.)	Inside	Outside
Bearing	32.8 (1.291)	52.0 (2.047)
Race (Front)	37.0 (1.457)	52.0 (2.047)
Race (Rear)	32.8 (1.291)	50.4 (1.984)

(c) Install SST (two bolts) to the O/D case.
SST 09350–36010(09350–06140)

(d) Align the oil holes and bolt holes of the O/D case and transmission case.

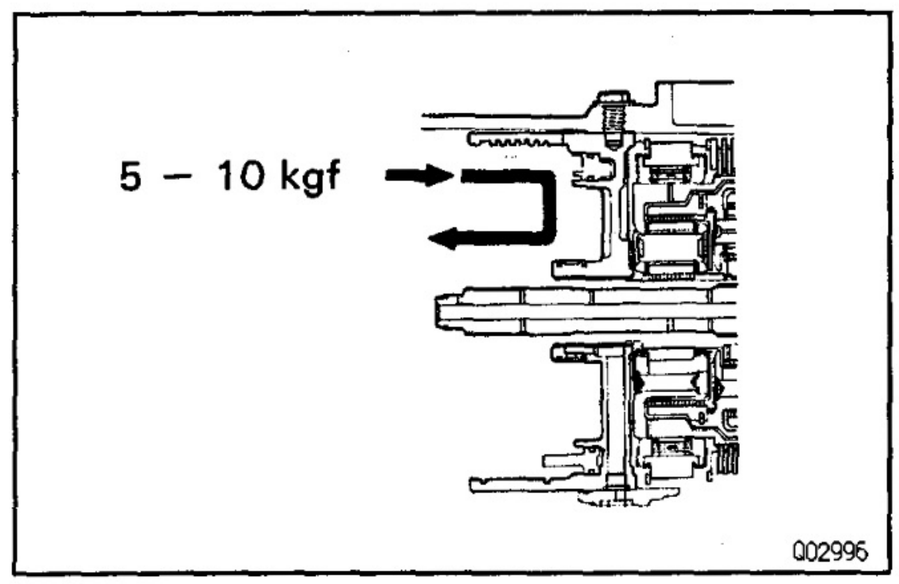


(e) Temporarily install the three bolts
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

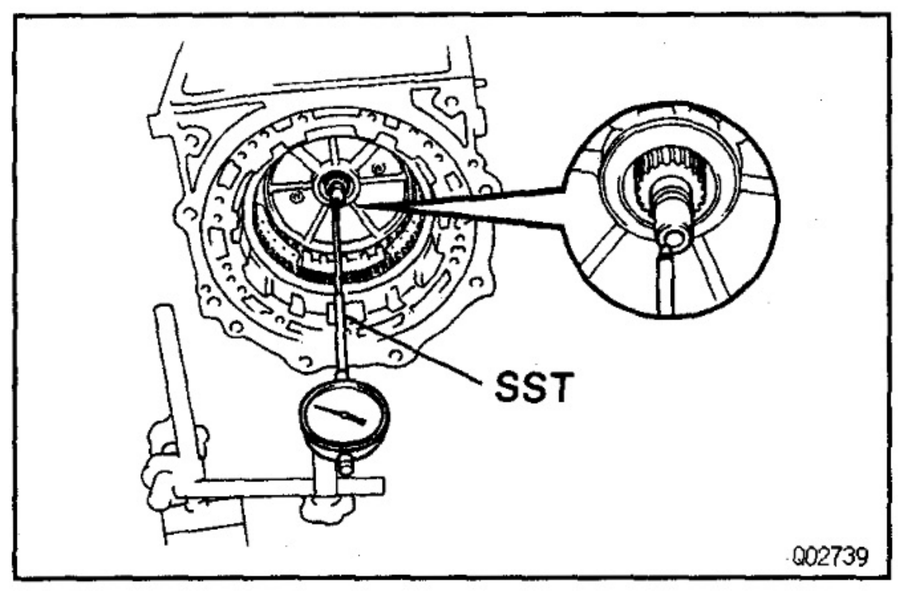


20. ADJUST THRUST CLEARANCE OF INPUT SHAFT (FRONT CLUTCH DRUM)

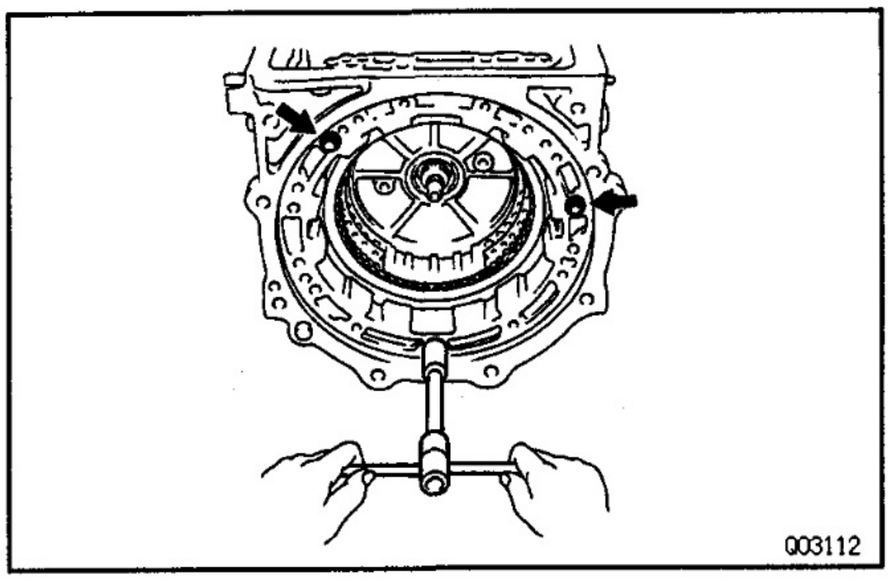
(a) Push the transmission output shaft toward the front of the transmission by applying a force of 49–98 N (5–10 kgf, 11.0–22.0 lbf).



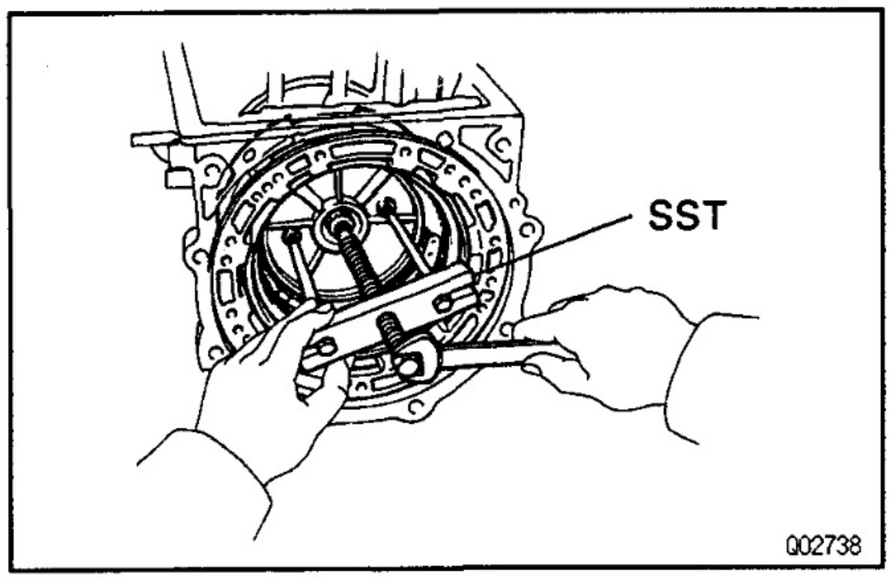
(b) Push the O/D case toward the rear of the transmission by applying a force of 49–98 N (5–10 kgf, 11.0–22.0 lbf).



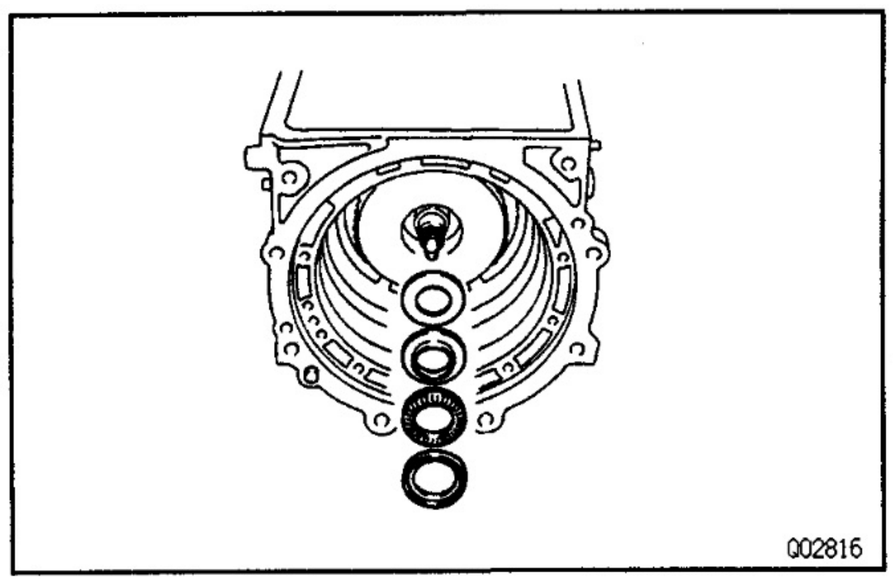
(c) Using SST and a dial indicator, measure the thrust clearance of the input shaft.
SST 09350–36010(093520–06130)
Standard thrust clearance:
0.30–0.70 mm (0.0118–0.0276 in.)
Maximum thrust clearance:
0.70 mm (0.0276 in.)
If the thrust clearance is greater than the maximum, adjust with a spacer.



(d) Remove the set bolts.



(e) Using SST, remove the O/D case assembly.
SST 09350—36010(09350—06140)



(f) Remove the thrust bearing, two races, and spacer from the front clutch drum or O/D case.

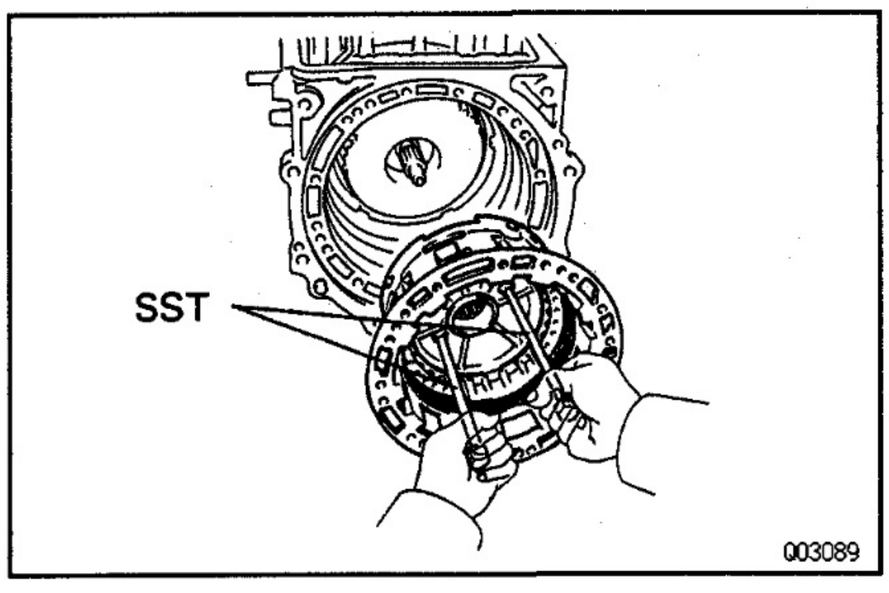
(g) Select a spacer.

Thicness mm (in.)	Thickness mm (in.)
0.9 (0.035)	1.8 (0.071)
1.2 (0.047)	2.1 (0.083)
1.5 (0.059)	

HINT: There are five different thicknesses for spacer.

(h) Install the spacer, two races and bearing onto the front clutch drum.

(i) Reinstall the oil seal ring to the input shaft.



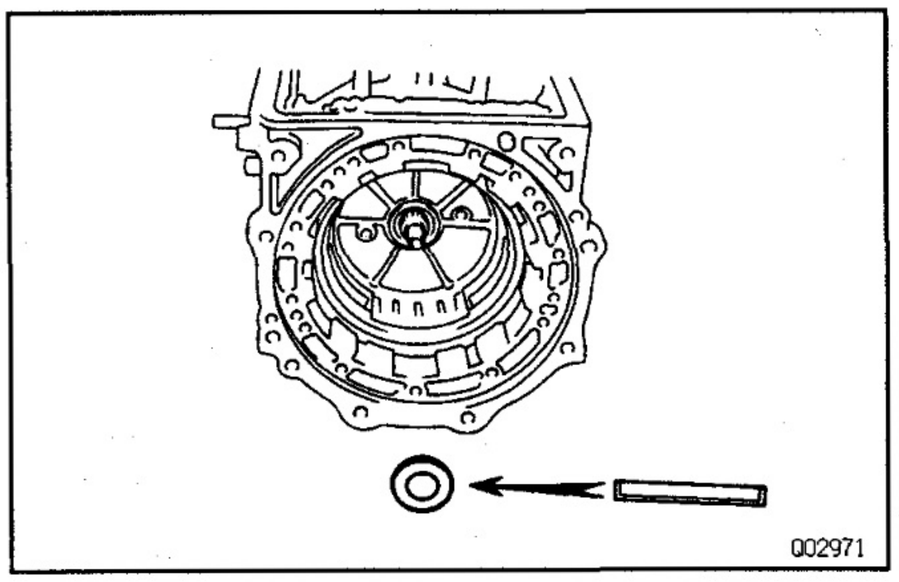
AT091—02

21. INSTALL OVERDRIVE CASE ASSEMBLY

(a) Coat new three O—ring with ATF, and install them to the oil holes of the O/D case.

(b) Install SST (two bolts) to the O/D case.
SST 09350—36010(09350—06140)

(c) Align the oil holes and bolt holes of the O/D case and transmission case.

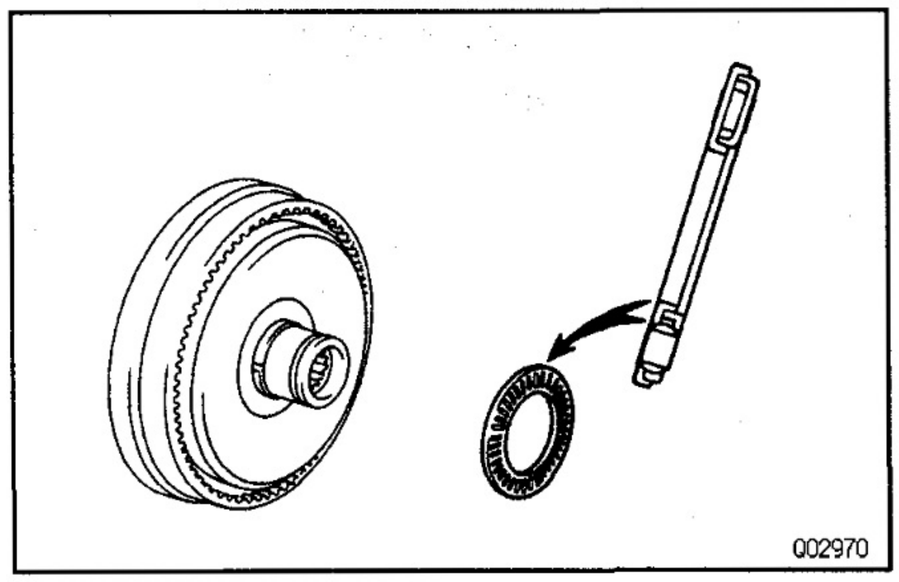


22. INSTALL OVERDRIVE RING GEAR ASSEMBLY

(a) Coat the race with petroleum jelly, and install it onto the O/D case.

HINT: Race diameter

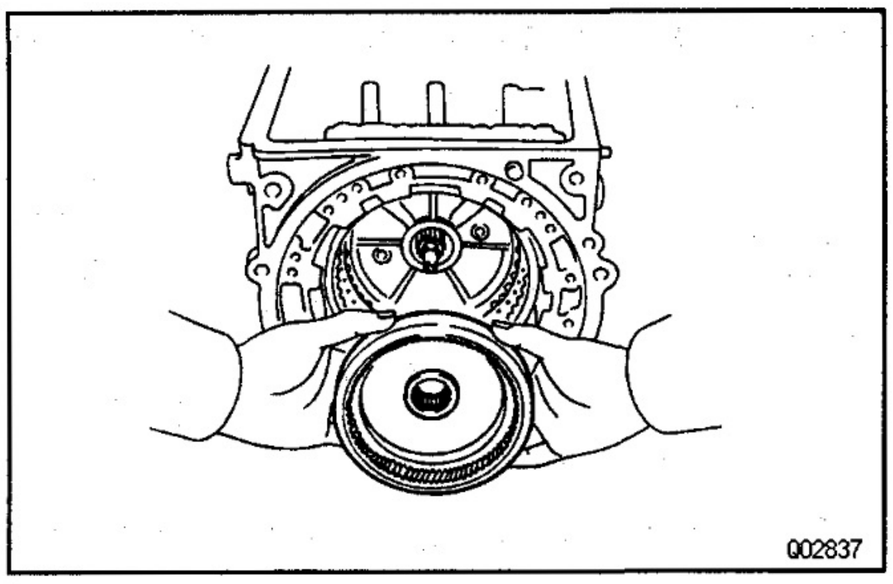
Diameter mm (in.)	Inside	Outside
Race	37.0 (1.457)	52.0 (2.047)



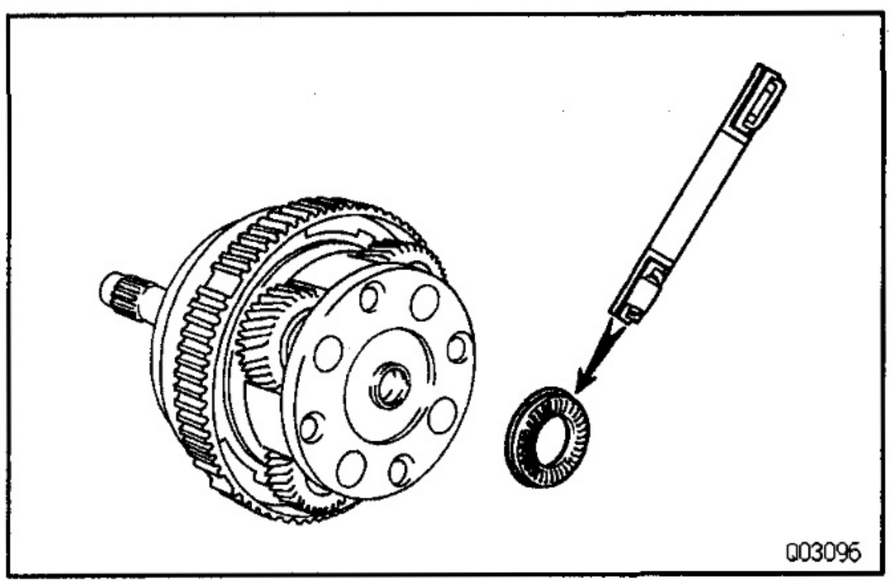
(b) Coat the bearing with petroleum jelly, and install it onto the ring gear flange.

HINT: Bearing diameter

Diameter mm (in.)	Inside	Outside
Race	34.7 (1.366)	52.0 (2.047)



(c) Install the ring gear assembly into the O/D case.

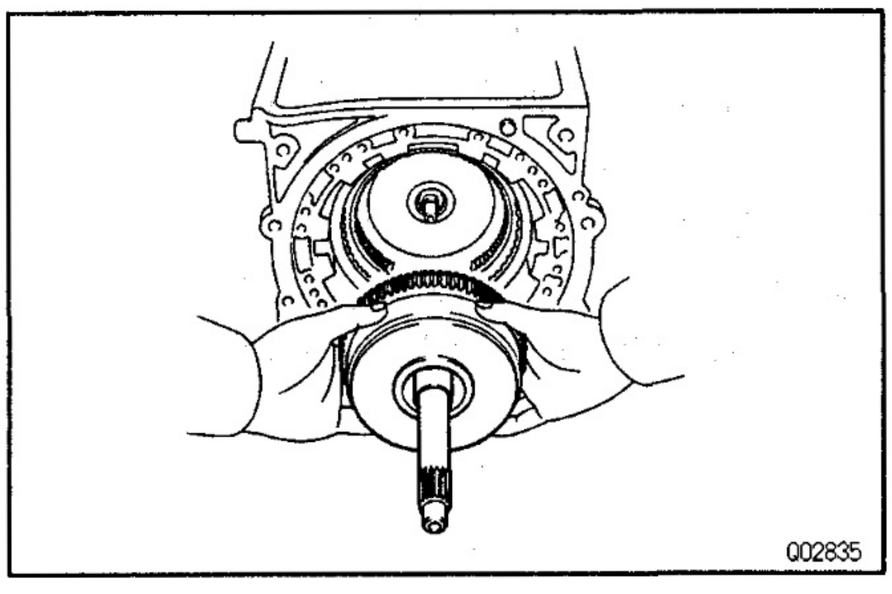


23. INSTALL OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND ONE—WAY CLUTCH ASSEMBLY

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

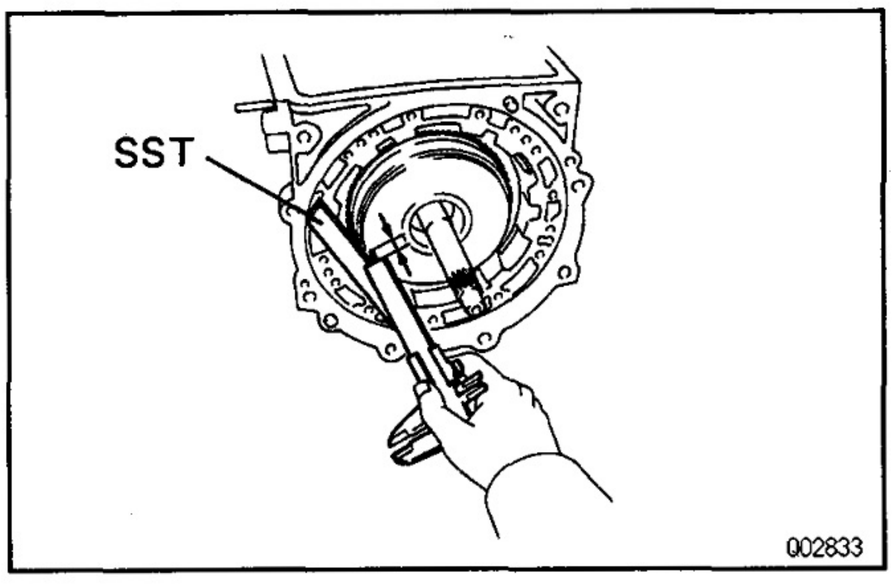
HINT: Bearing and race diameters

Diameter mm (in.)	Inside	Outside
Bearing	23.2 (0.913)	42.0 (1.654)



(b) Install the planetary gear, direct clutch and one—way clutch assembly into transmission case.

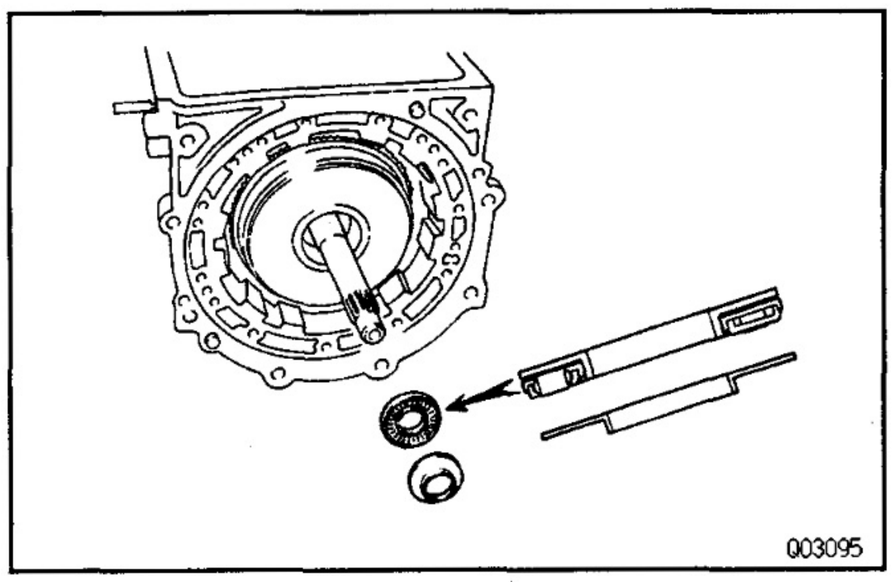
HINT: Mesh the spline of the O/D direct clutch drum with the flukes of the discs by rotating and pushing the O/D direct clutch drum clockwise or counterclockwise.



24. CHECK CORRECT INSTALLATION OF OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND ONE—WAY CLUTCH ASSEMBLY

(a) Place SST on the installation surface of the oil pump.
SST 09350—36010(09350—06090)

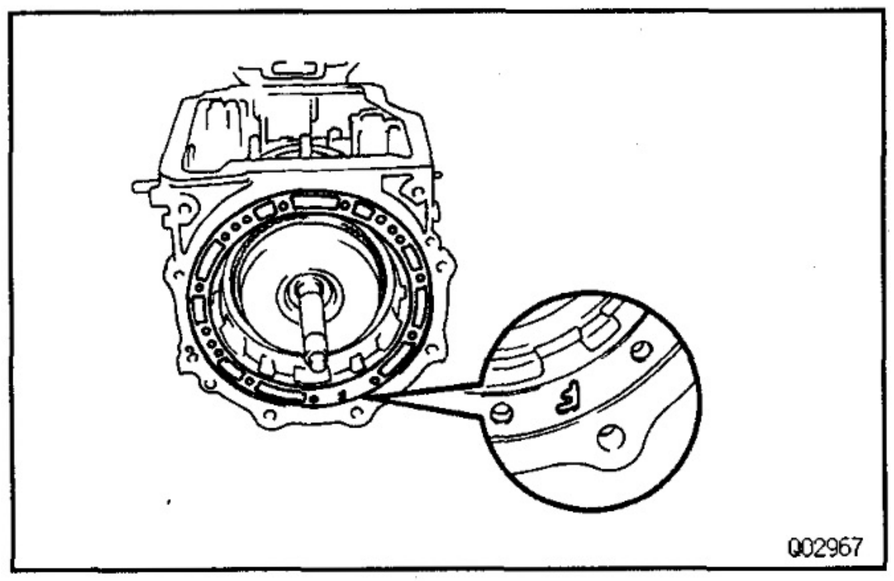
(b) Using calipers, measure the distance between the tops of SST and the clutch drum.
If the distance corresponds to that during disassembly, the O/D planetary gear, O/D direct clutch and one—way clutch assembly is installed correctly.



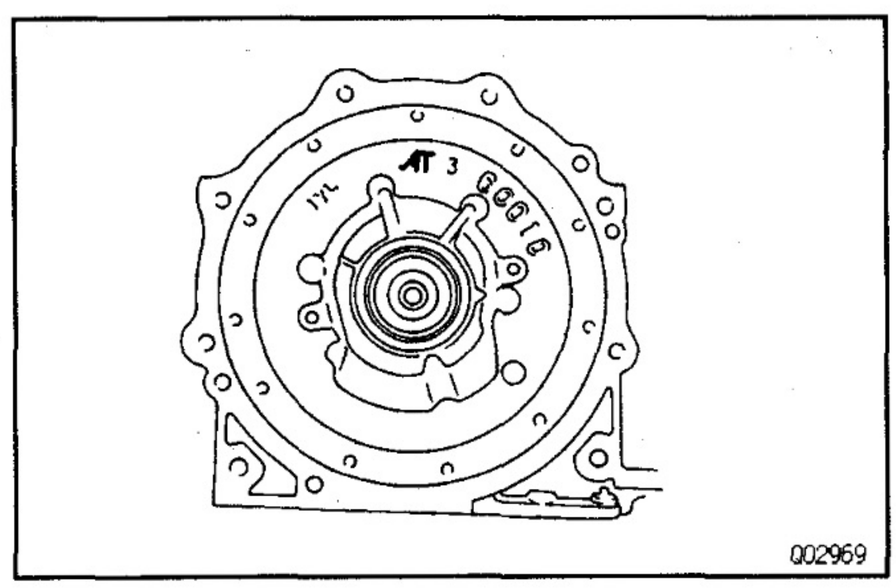
25. TEMPORARILY INSTALL OIL PUMP

(a) Coat the race and bearing with petroleum jelly, and install them onto the clutch drum.
HINT: Bearing and race diameters

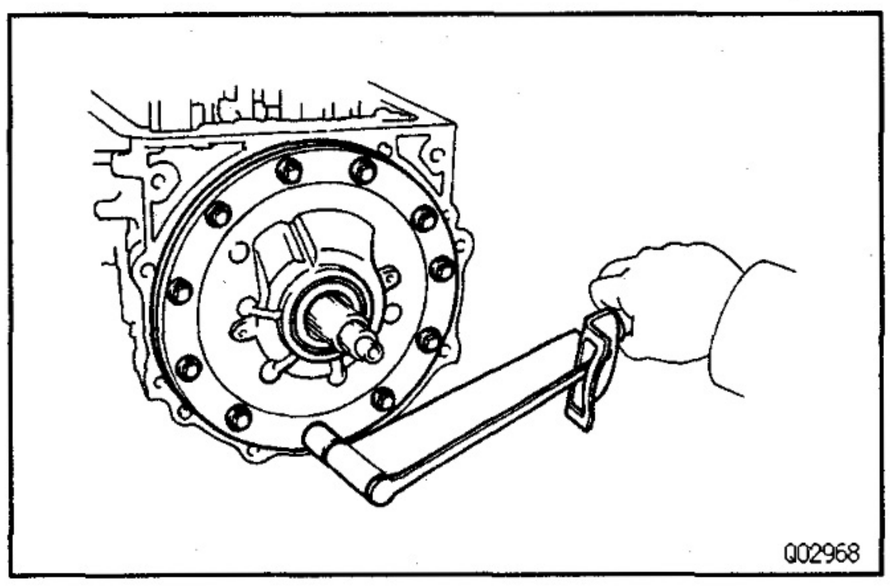
Diameter mm (in.)	Inside	Outside
Bearing	28.5 (1.122)	48.0 (1.890)
Race	27.1 (1.067) 27.9 (1.098) 28.3 (1.114)	43.0 (1.693)
Race (Rear)	28.5 (1.122)	48.0 (1.890)



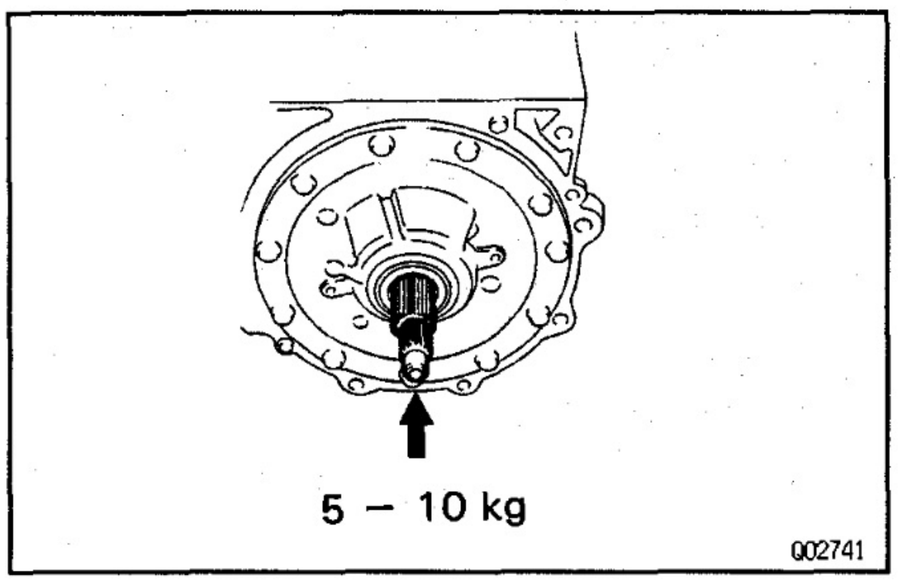
(b) Place the gasket on the transmission case.



(c) Align the bolt holes of the pump body and transmission case, and install it.

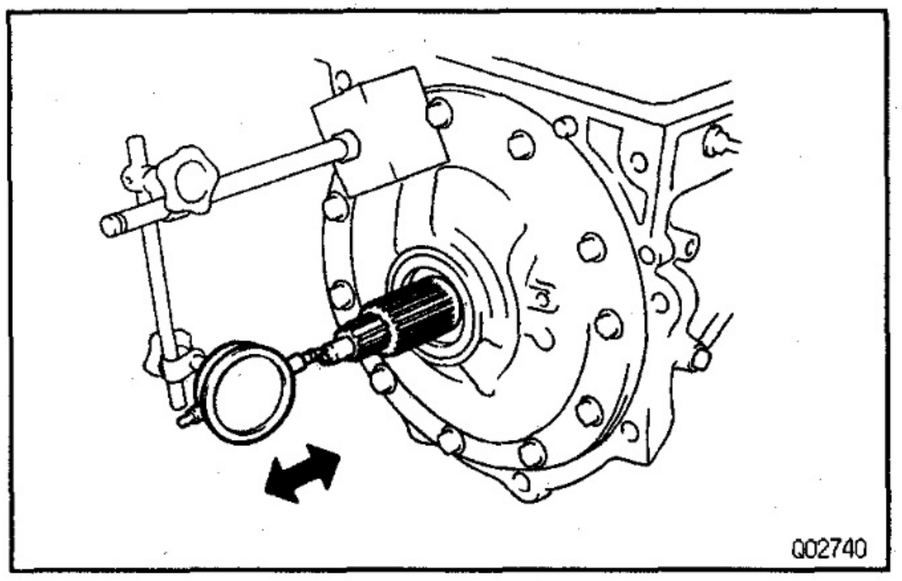


(d) Install and tighten the eleven bolts.
Torque: 21 N·m (210 kgf·cm, 16 ft·lbf)



26. ADJUST THRUST CLEARANCE OF OVERDRIVE INPUT SHAFT (OVERDRIVE PLANETARY GEAR)

(a) Push the O/D input shaft toward the rear of the transmission by a force of 49–98 N (5–10 kgf, 11.0–22.0 lbf).



(b) Using a dial indicator, measure the thrust clearance of the input shaft.

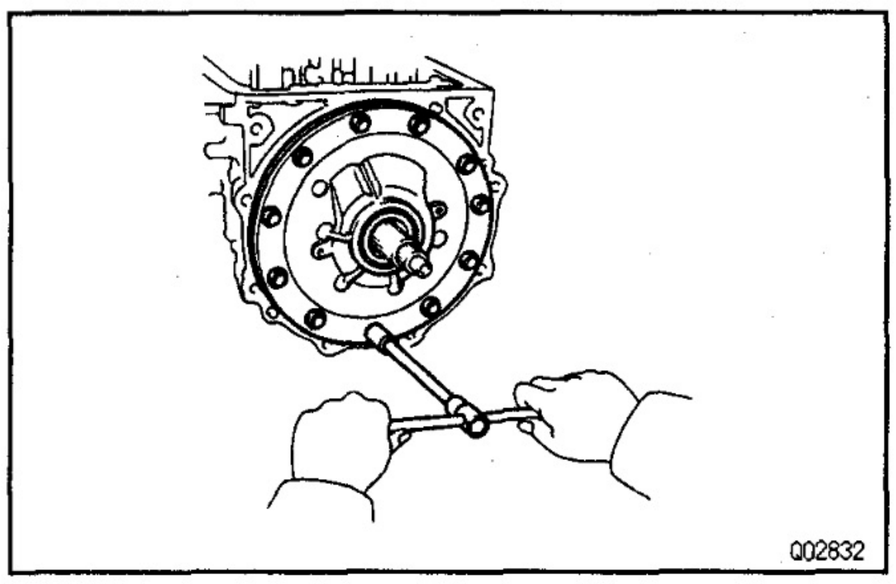
Standard thrust clearance:

0.40–0.90 mm (0.0157–0.0354 in.)

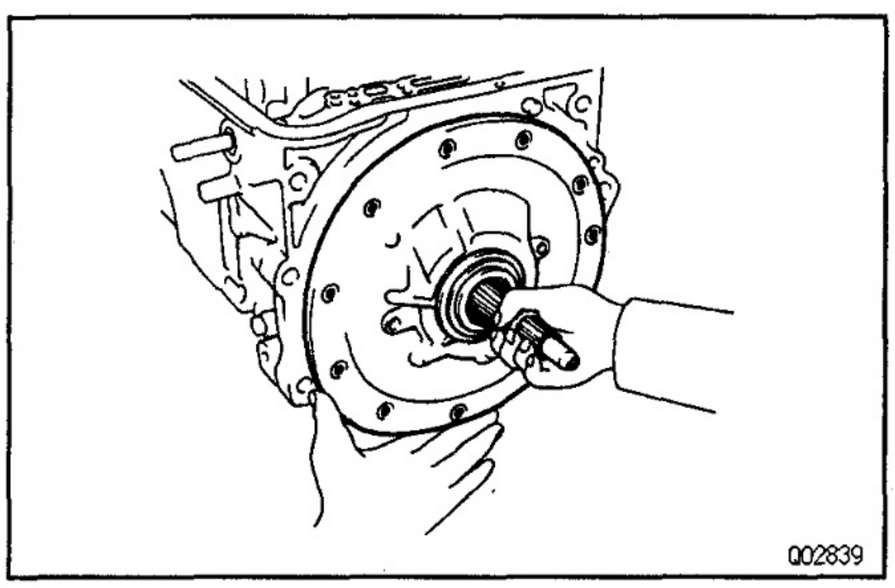
Maximum thrust clearance:

0.90 mm (0.0354 in.)

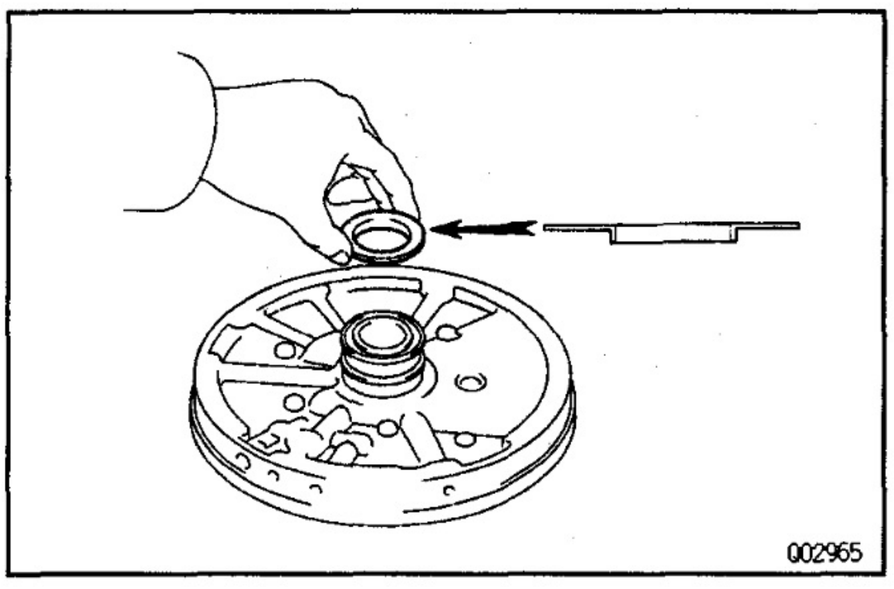
If the thrust clearance is greater than the maximum, adjust with a race.



(c) Remove the eleven oil pump set bolts.



(d) Remove the oil pump and gasket.



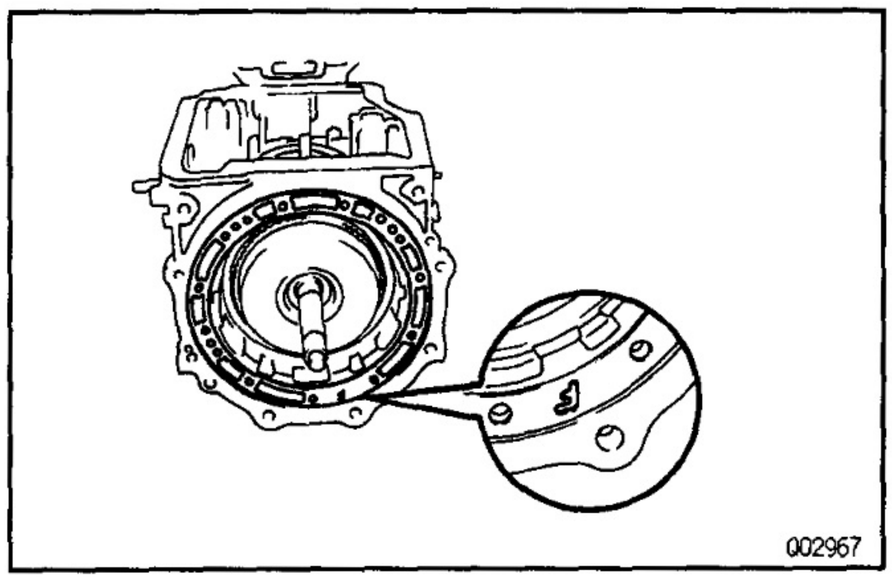
(e) Remove the race from the oil pump cover.

(f) Select a race.

HINT: there are three different thicknesses for race.

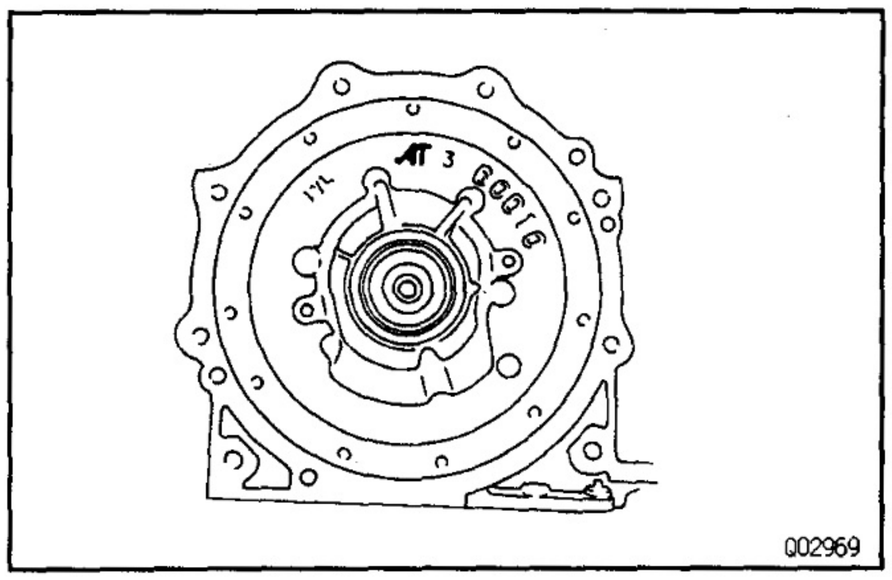
Thickness mm (in.)	Thickness mm (in.)
0.8 (0.031)	1.4 (0.055)
1.0 (0.039)	

(g) Coat the race with petroleum jelly, and install the oil pump cover.

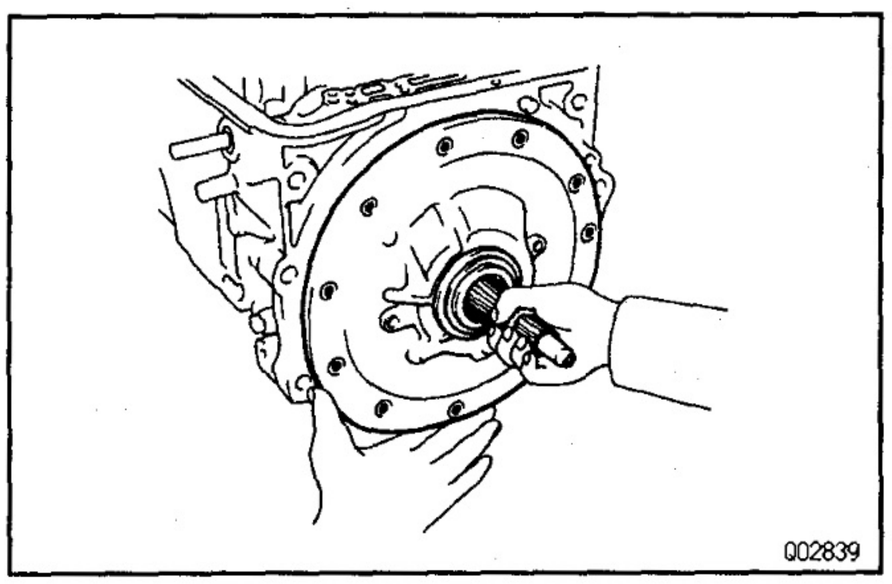


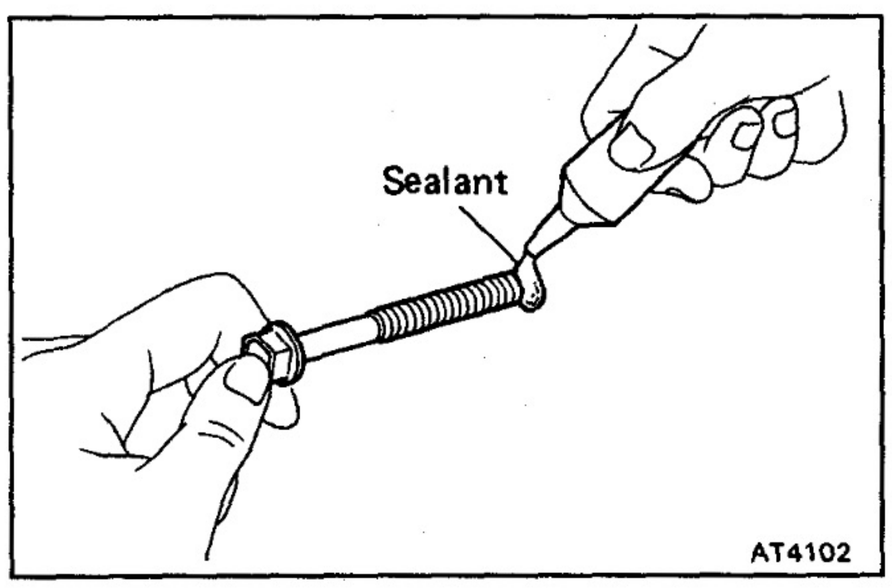
27. INSTALL OIL PUMP

(a) Place a new gasket on the transmission case.

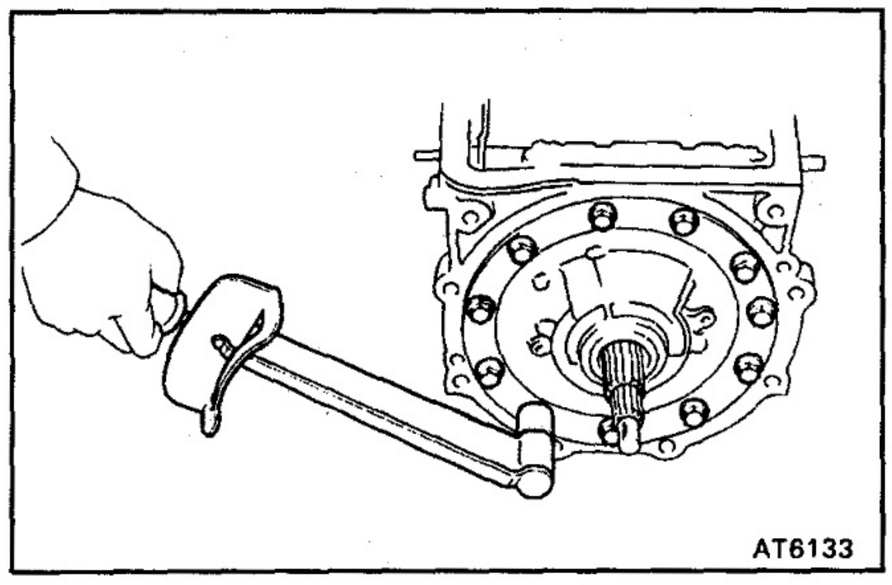


(b) Align the bolt holes of the pump body and transmission case.

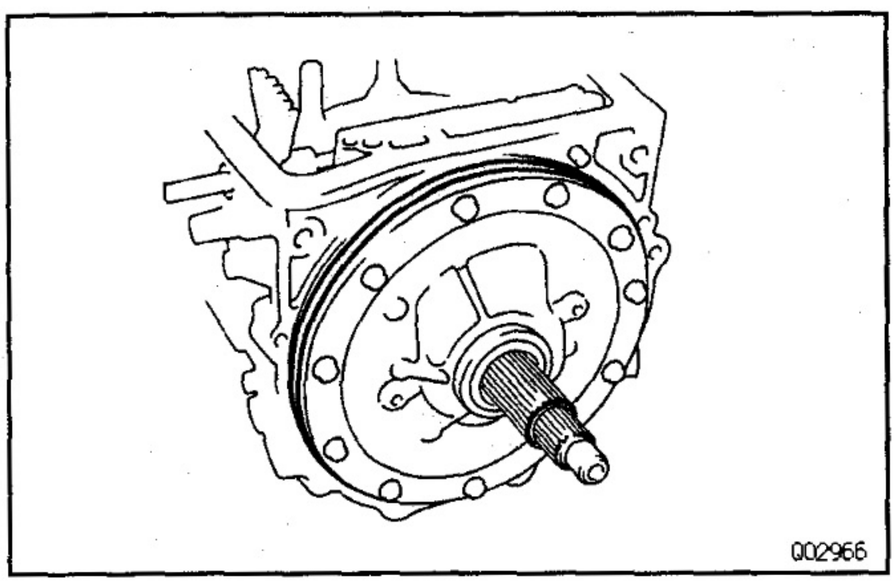




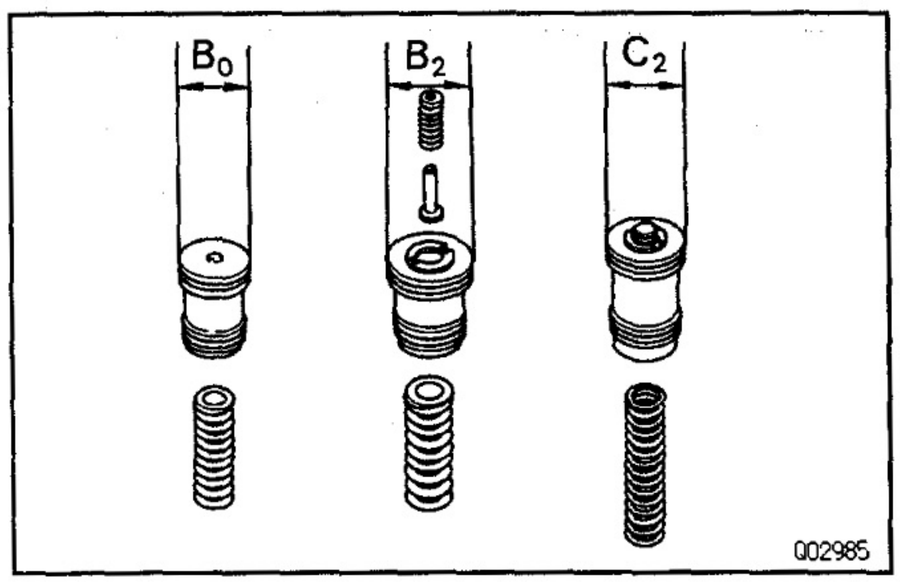
(c) Apply sealant to the threads of the oil pump set bolts.
Sealant: Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent.



(d) Install and tighten the eleven bolts.
Torque: 21 N·m (210 kgf·cm, 16 ft·lbf)



(e) Coat two new O–rings with ATF, and install them to the oil pump body.



28. INSTALL C_2, B_0, B_2 ACCUMULATOR SPRINGS AND PISTONS

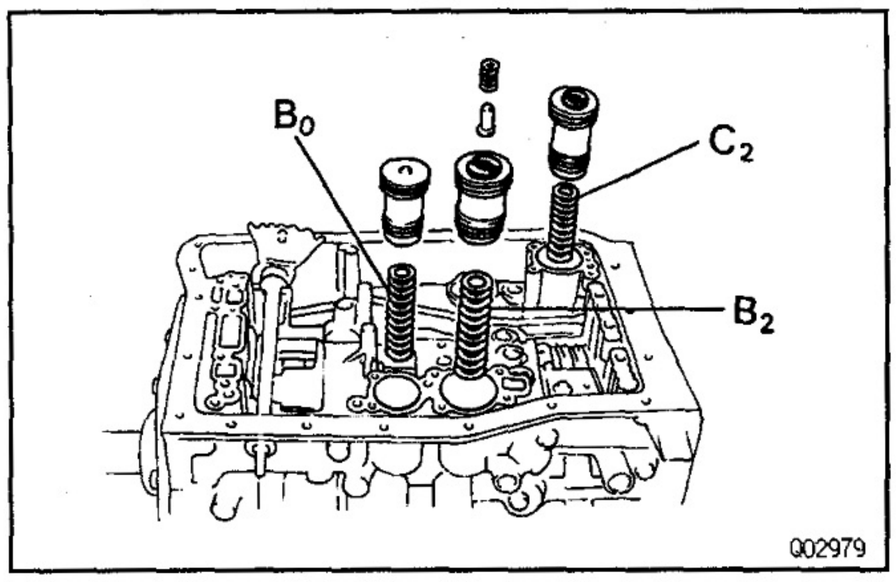
(a) Coat new O–rings with ATF, and install them to the pistons.

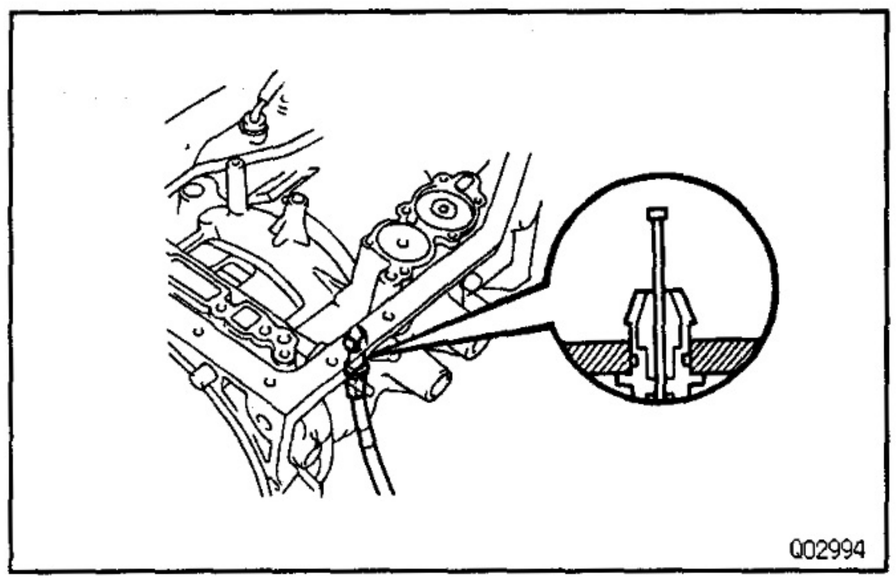
(b) Install the three springs and accumulator pistons into the bore of the transmission case as shown.
HINT: Piston diameter

	Piston Diameter mm (in.)
B_0	35.9 (1.413)
B_2	43.9 (1.728)
C_2	39.9 (1.571)

HINT: Spring diameter and free length

Spring (Color) mm (in.)	Free Length	Diameter
B_0 (Light Green)	63.1 (2.484)	20.7 (0.815)
B_2 (Blue)	65.0 (2.559)	25.1 (0.988)
C_2 (Green)	83.5 (3.287)	21.7 (0.854)

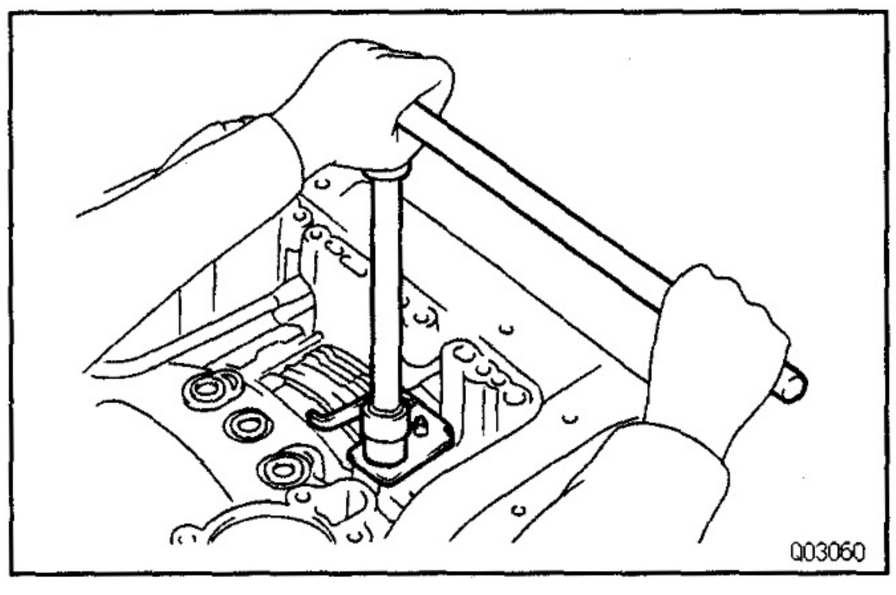




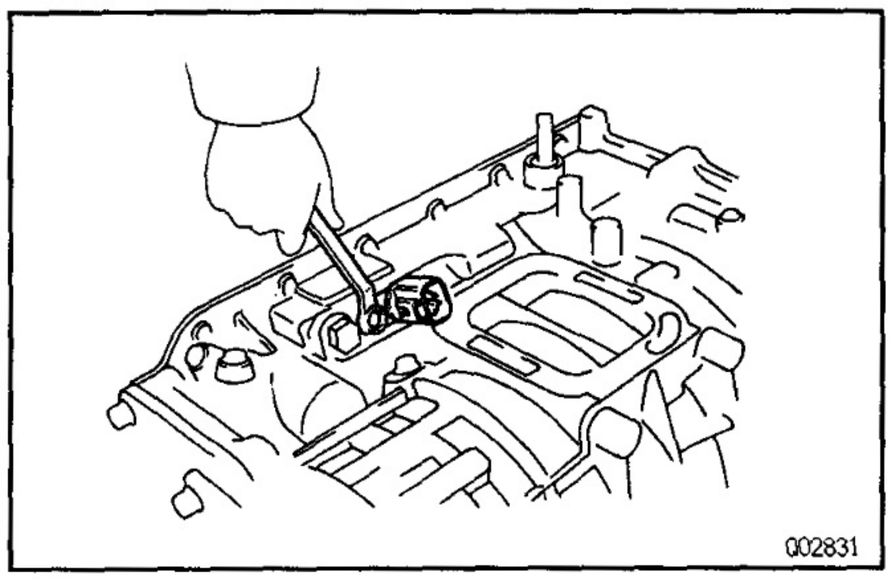
29. INSTALL THROTTLE CABLE

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

(b) Install the cable to the transmission case.



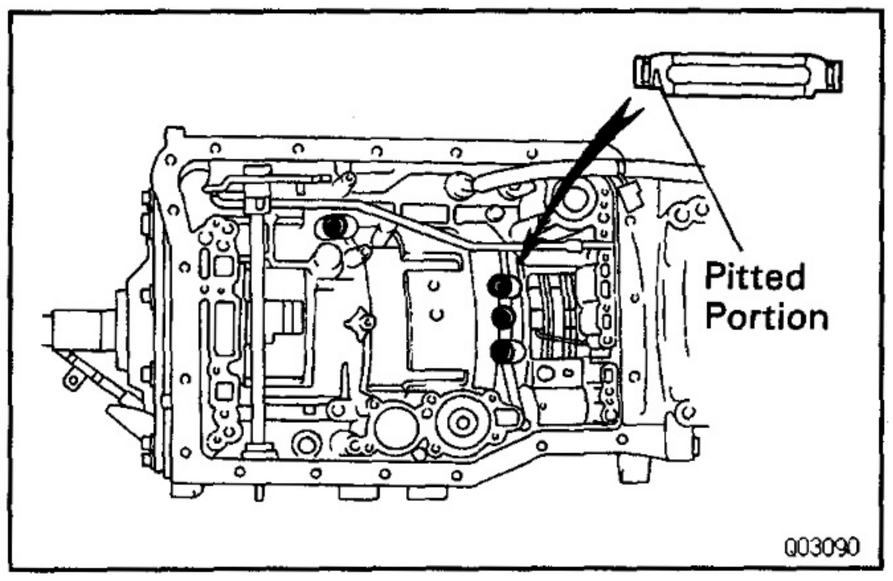
30. INSTALL FIRST AND REVERSE BRAKE GUIDE



31. INSTALL SOLENOID WIRING

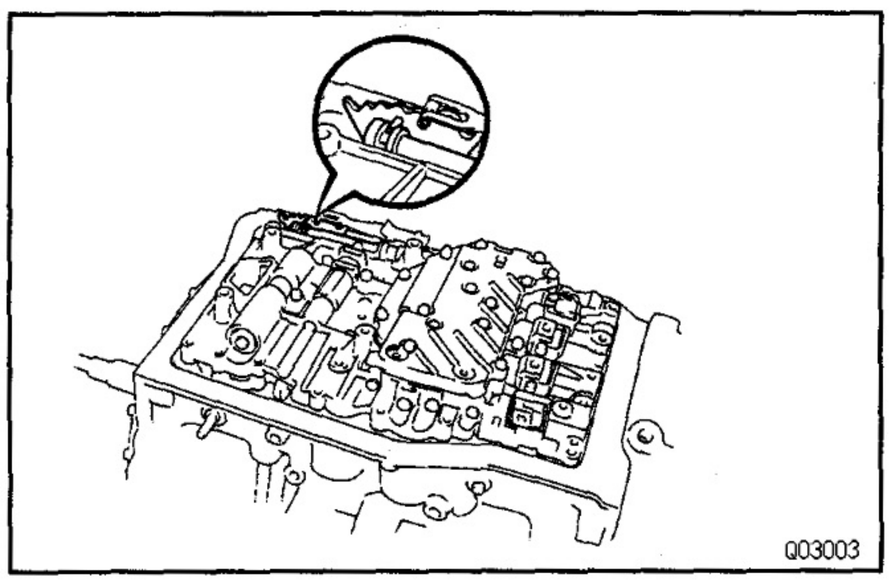
(a) Coat a new O–ring with ATF, and install it to the wiring.

(b) Install the solenoid wiring to the transmission case.



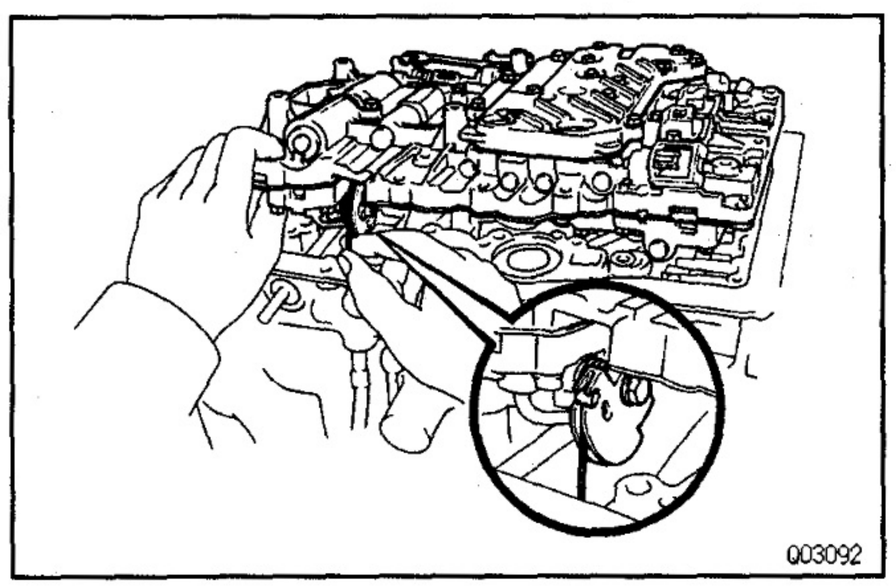
32. INSTALL CENTER SUPPORT APPLY GASKET

Install new four gaskets, facing the pitted side toward the transmission case.

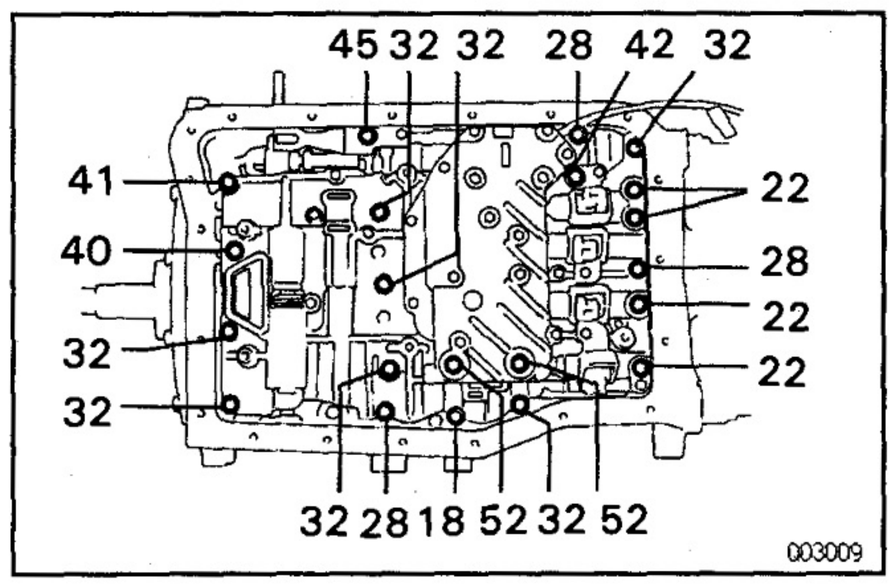


33. INSTALL VALVE BODY

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



(b) Connect the throttle cable to the cam.



(c) Install the bolts.

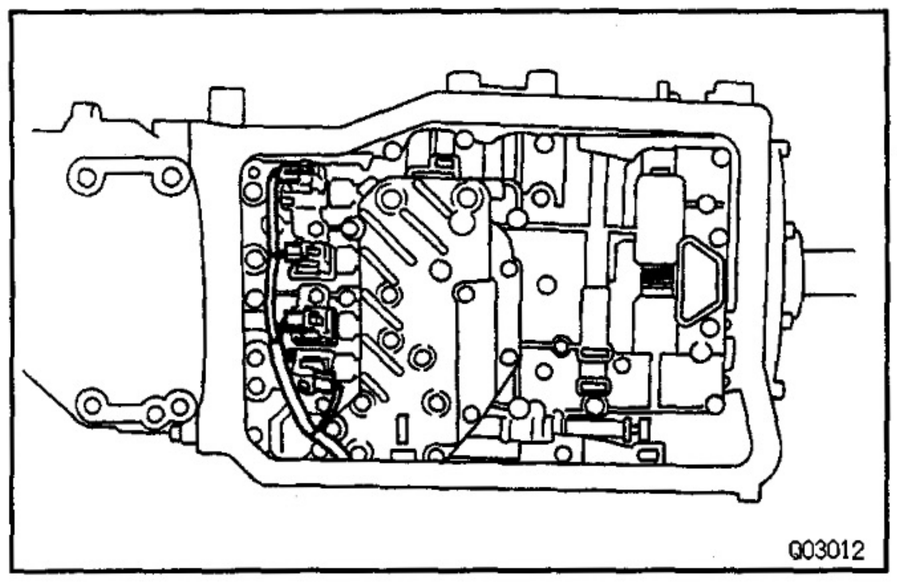
HINT: each bolt length is indicated below.

Bolt length:

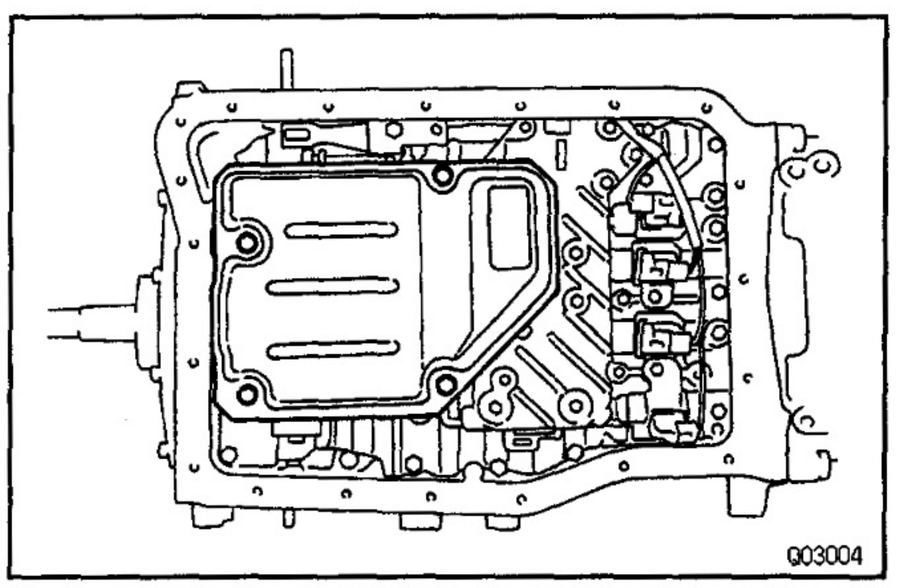
18 mm (0.71 in.)
22 mm (0.87 in.)
28 mm (1.10 in.)
32 mm (1.26 in.)
40 mm (1.57 in.)
41 mm (1.61 in.)
42 mm (1.65 in.)
45 mm (1.77 in.)
52 mm (2.04 in.)

(d) Check that the manual valve lever contacts the center of the roller at the tip of the detent spring.

(e) Tighten the bolts.
Torque: 10 N·m (100 kgf·cm, 7 in.·lbf)

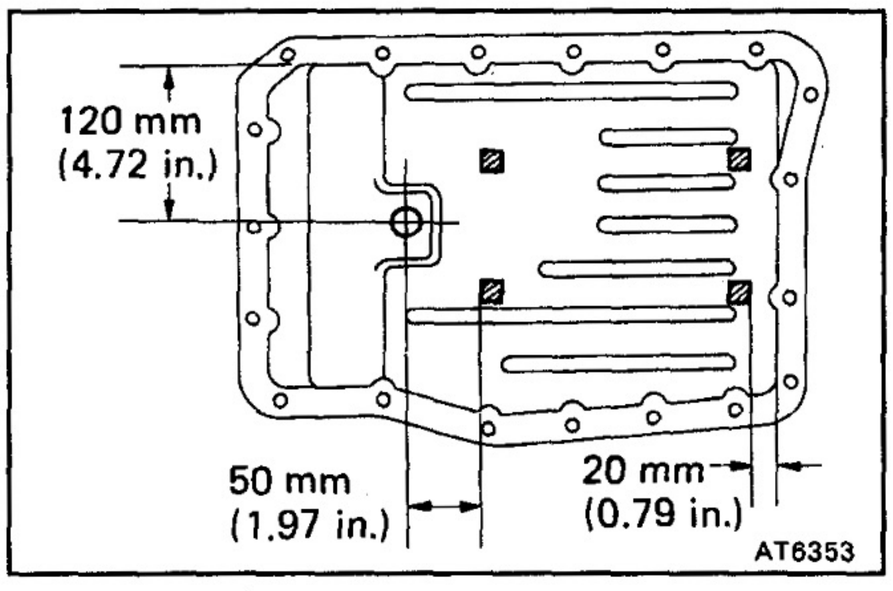

Q03012

34. CONNECT FOUR SOLENOID CONNECTORS


Q03004

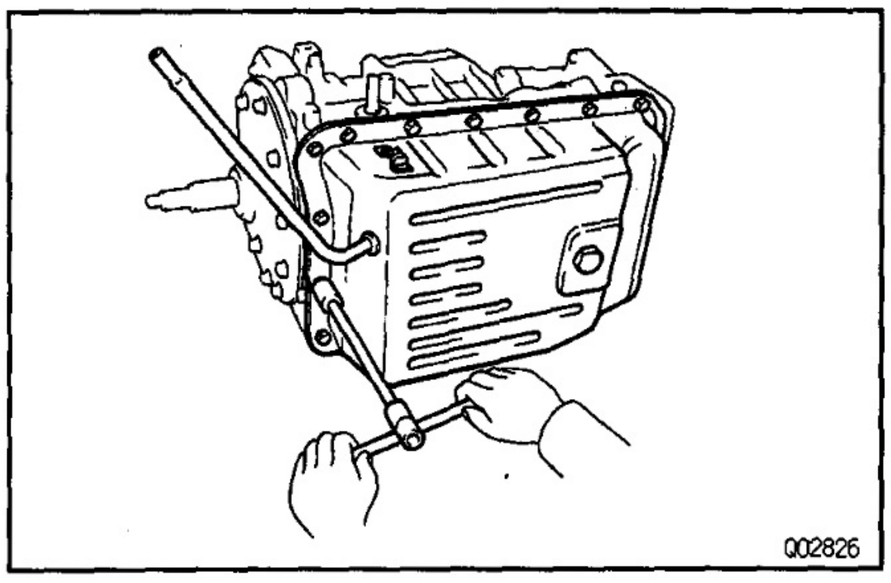
35. INSTALL OIL STRAINER

Install a new gasket and the oil strainer with the seven wave washers (for 8 mm head bolts) and ten bolts.
Torque: 10 N·m (100 kgf·cm, 77 ft·lbf)
Each bolt length is indicated below.



36. INSTALL MAGNETS IN PAN

Install the two magnets in the oil pan as shown in the figure.

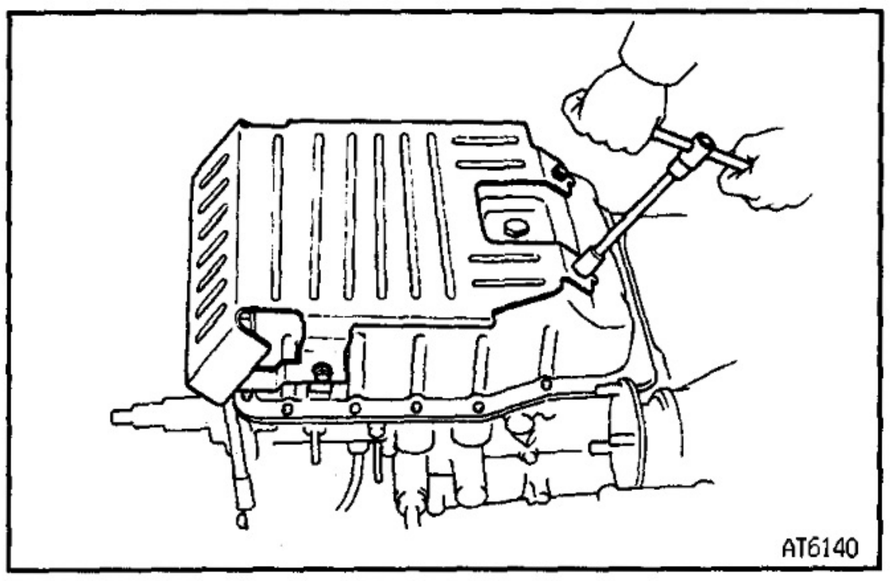


37. INSTALL OIL PAN

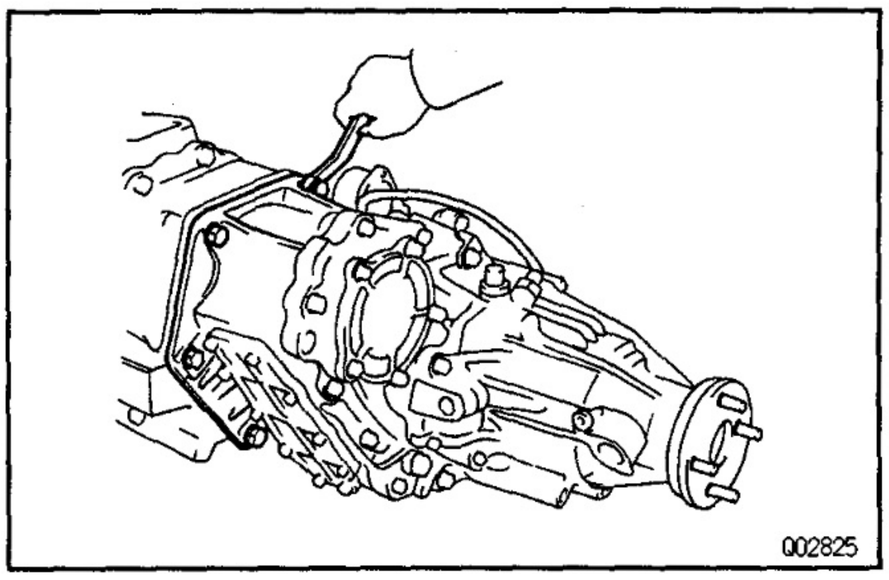
(a) Remove any packing material and be careful not to drop oil on the contacting surface of the transmission case and oil pan.

(b) Apply seal packing to the oil pan.
Seal packing: Part No. 08826 – 00090, THREE BOND 1281B or equivalent

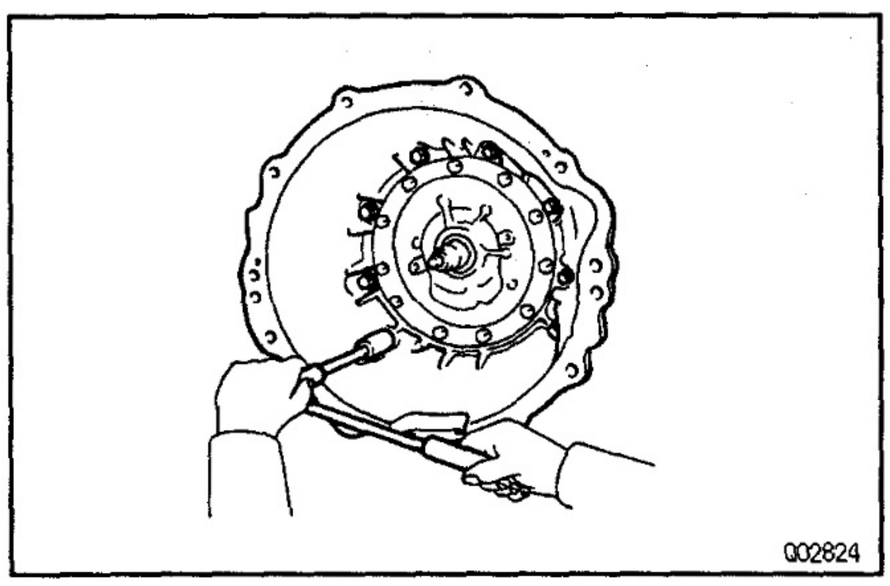
(c) Install and torque the twenty bolts.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)



38. INSTALL OIL PAN PROTECTOR
Install the protector with the four bolts.



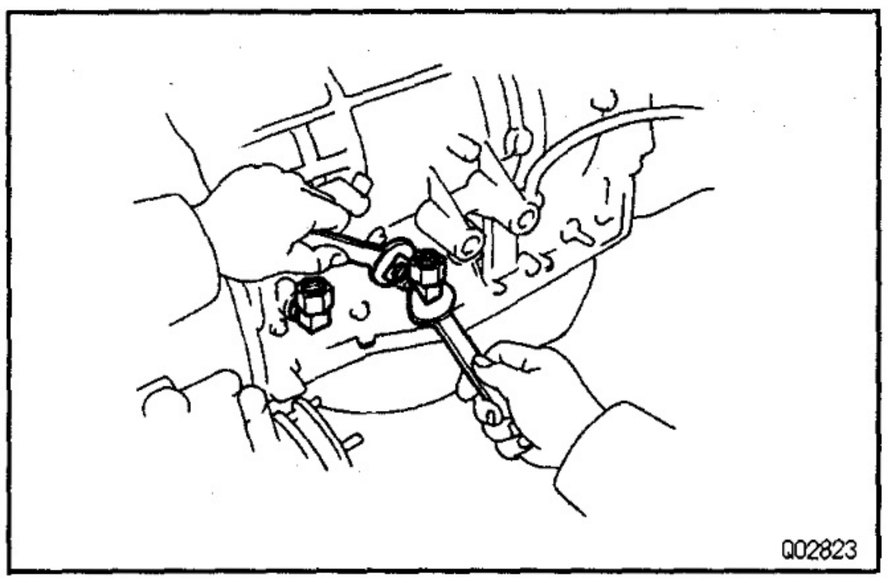
39. INSTALL TRANSFER ASSEMBLY
Install the transfer assembly with six bolts.



40. INSTALL TRANSMISSION HOUSING

(a) Install the transmission housing with the eight bolts.
NOTICE: Be careful do not dammage the two O–rings around the oil pump body when installing the transmission housing.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

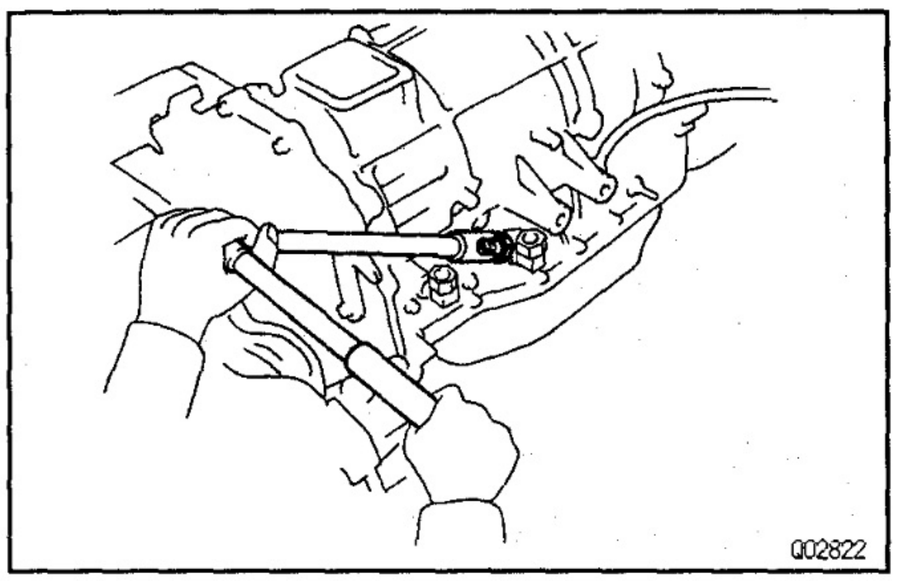
(b) Install the throttle cable to the transmission case with the bolt.



41. INSTALL TWO TRANSMISSION OIL COOLER UNIONS

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

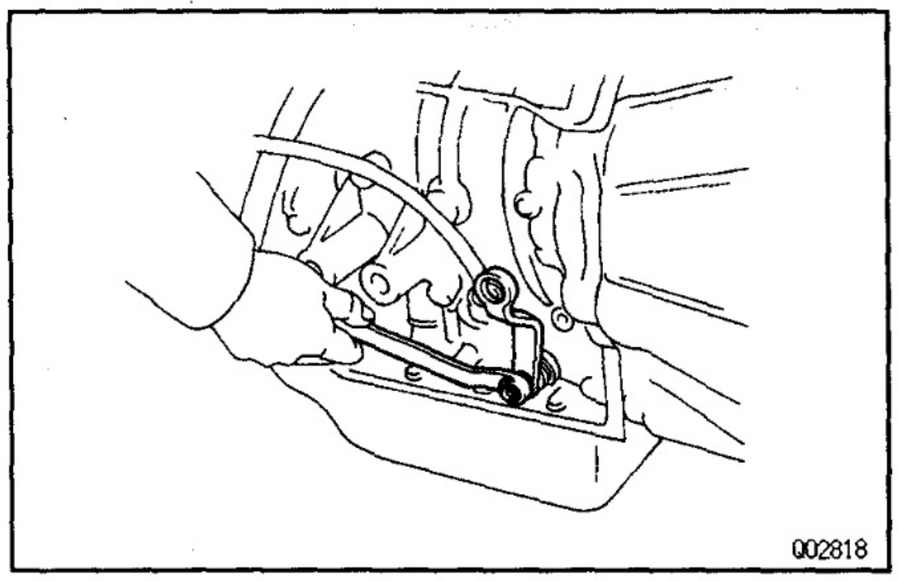
(b) Install the two unions.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



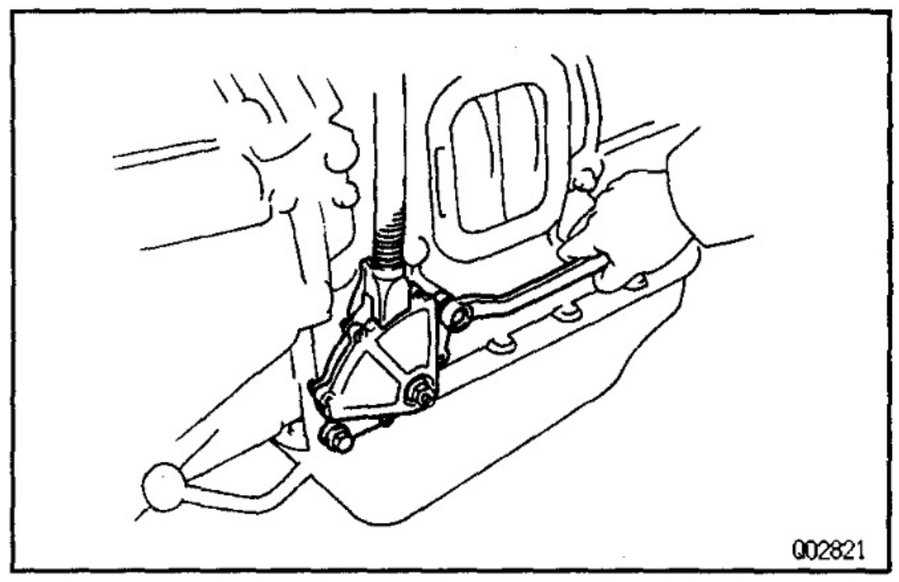
42. INSTALL A/T FLUID TEMPERATURE SENSOR

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

(b) Install the sensor to the front union.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

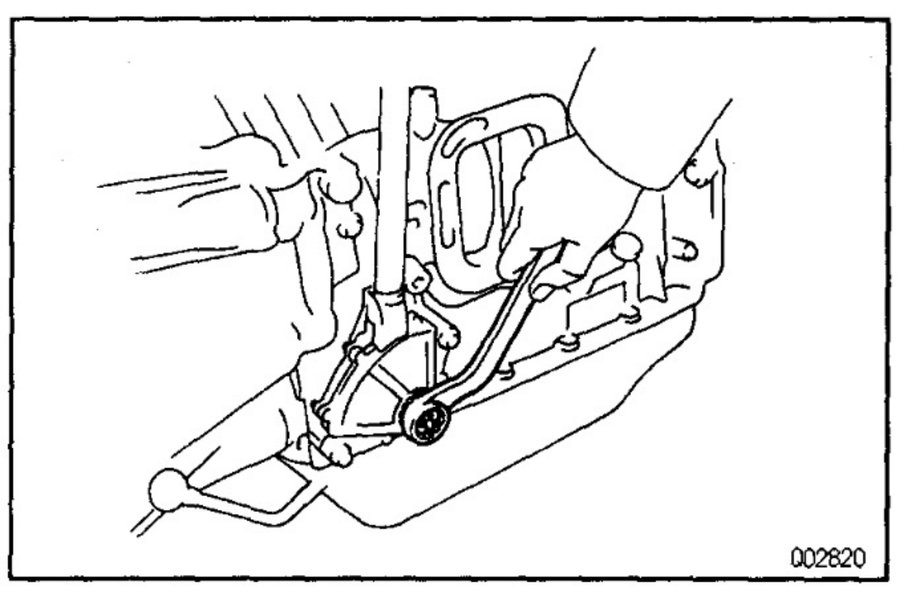


43. INSTALL CONTROL SHAFT LEVER
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

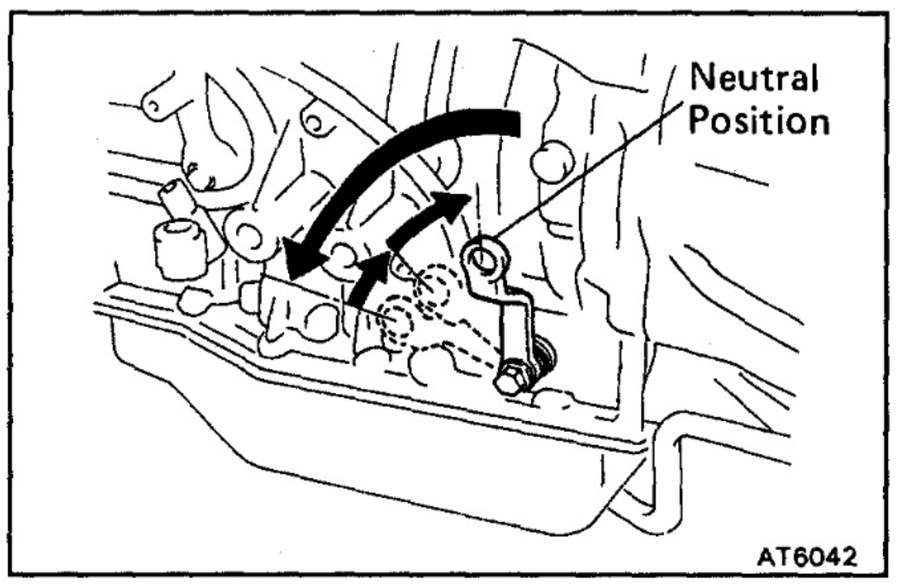


44. INSTALL NEUTRAL START SWITCH

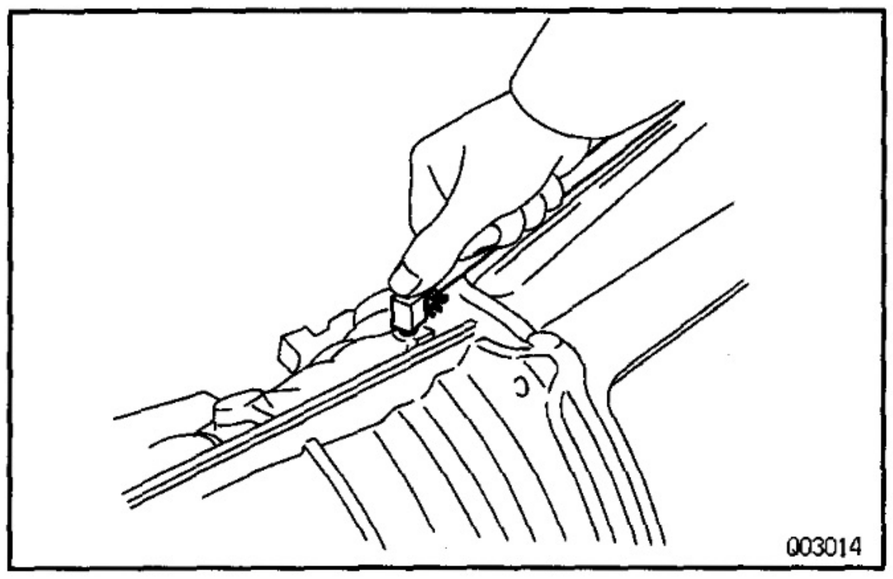
(a) Temporarily install the neutral start switch with the two bolts.



(b) Install the grommet, anew lock washer and the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)



(c) Fully turn the control shaft lever back and return two notches. It is now neutral position.



45. INSTALL BREATHER PLUG AND HOSE

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

(b) Install the breather plug and hose.

SERVICE SPECIFICATIONS

SERVICE DATA

AT097-01

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	0.14—0.24 mm	0.0055—0.0094 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.
	Drive and driven gear thickness		18.435—18.450 mm	0.7258—0.7246 in.
			18.451—18.486 mm	0.7264—0.7278 in.
	Pump body bushing inside diameter	STD	42.050—42.075 mm	1.6555—1.6565 in.
		Limit	42.13 mm	1.6587 in.
	Pump cover bushing inside diameter			
	Front	STD	24.000—24.021 mm	0.9449—0.9457 in.
		Limit	24.070 mm	1.9476 in.
	Rear	STD	26.500—26.521 mm	1.0433—1.0441 in.
		Limit	26.57 mm	1.0461 in.
O/D Planetary Gear and O/D Direct Clutch	O/D input shaft thrust clearance			
	(O/D planetary gear)	STD	0.40—0.90 mm	0.0157—0.0354 in.
		Limit	0.90 mm	0.0345 in.
	O/D input shaft thrust bearing race thickness		0.8 mm	0.031 in.
			1.0 mm	0.039 in.
			1.4 mm	0.055 in.
	Piston stroke		1.80—2.00 mm	0.0709—0.0787 in.
	O/D direct clutch drum bushing inside diameter	STD	26.500—26.521 mm	1.0433—1.0441 in.
		Limit	26.57 mm	1.0461 in.
	O/D planetary gear bushing inside diameter	STD	12.000—12.018 mm	0.4724—0.4731 in.
		Limit	12.07 mm	0.4752 in.
	Planetary pinion gear thrust clearance	STD	0.20—0.59 mm	0.0079—0.0232 in.
		Limit	0.80 mm	0.315 in.
O/D Brake	Piston stroke		1.25—1.85 mm	0.0492—0.0728 in.
	O/D case bushing inside diameter	STD	33.100—33.500 mm	1.3031—1.3189 in.
		Limit	33.20 mm	1.3071 in.
Front Clutch	Input shaft thrust clearance			
	(forward clutch hub)	STD	0.30—0.70 mm	0.0118—0.0276 in.
		Limit	0.70 mm	0.0276 in.
	Input shaft spacer thickness		0.9 mm	0.035 in.
			1.2 mm	0.047 in.
			1.5 mm	0.059 in.
			1.8 mm	0.071 in.
			2.1 mm	0.083 in.
	Piston stroke		3.93—4.23 mm	0.1547—0.1665 in.
	Front clutch plate thickness		1.8 mm	0.071 mm
			2.0 mm	0.079 in.
			2.2 mm	0.087 in.
			2.4 mm	0.094 in.

Rear Clutch	Piston stroke		2.00—2.20 mm	0.0790—0.0866 in.
	Rear clutch flange thickness		5.0 mm	0.197 in.
			5.2 mm	0.205 in.
			5.4 mm	0.213 in.
			5.6 mm	0.220 in.
Second Brake	Center support thrust clearance	STD	0.30—0.70 mm	0.0118—0.0276 in.
		Limit	0.90 mm	0.0354 in.
	Center support thrust washer thickness		1.8 mm	0.071 in.
			2.1 mm	0.083 in.
			2.4 mm	0.094 in.
			2.6 mm	0.102 in.
	Piston stroke		1.86—2.06 mm	0.0732—0.0811 in.
	Center support bushing inside diameter	STD	35.000—35.025 mm	1.3780—1.3789 in.
		Limit	35.08 mm	1.3811 in.
	Front planetary sum gear bushing inside diameter	STD	25.000—25.021 mm	0.9842—0.9851 in.
		Limit	25.07 mm	0.9851 in.
	Second brake flange thickness		5.0 mm	0.197 in.
			5.2 mm	0.205 in.
			5.4 mm	0.213 in.
			5.6 mm	0.220 in.
Planetary Gears and Output Shaft	Output shaft bushing inside diameter	STD	17.000—17.018 mm	0.6693—0.6700 in.
		Limit	17.07 mm	0.6720 in.
	Planetary pinion gearthrust clearance	STD	0.20—0.50 mm	0.0079—0.0197 in.
		Limit	0.75 mm	0.0295 in.
1st and Reverse Brake	Piston stroke		3.3—3.8 mm	0.130—0.150 in.
	1st and raverse brake flange thickness		6.65 mm	0.2618 in.
			7.05 mm	0.2776 in.
			7.45 mm	0.2933 in.
Transmission Case	Bushing inside diameter	STD	64.000—64.050 mm	2.5197—2.5216 in.
		Limit	64.10 mm	2.5236 in.
Parking Lock Paul	Parking lock paul braket distance		47.5—47.6 mm	1.870—1.874 in.

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UPPER VALVE BODY

Spring Specifications

Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓐ	2—3 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓑ	Reverse Inhibiter Valve (Light Blue)	29.3 x 7.9 (1.154 x 0.311)	20.0
Ⓒ	Modulator Valve (Brown)	31.8 x 7.6 (1.252 x 0.299)	17.0
Ⓓ	Throttle Valve (White)	25.3 x 9.2 (0.996 x 0.362)	9.5
Ⓔ	Throttle Valve (Blue)	26.85 x 8.97 (1.057 x 0.353)	10.5
Ⓕ	Secondary Regulator Valve (None)	46.0 x 16.7 (1.811 x 0.657)	15.0
Ⓖ	Cut—back Valve (Purple)	30.44.0 x 7.3 (1.198 x 0.287)	16.0
Ⓗ	Lock—up Signal Valve (Purple)	30.44 x 7.3 (1.198 x 0.287)	16.0
Ⓘ	Accumulator Control Valve (Green)	27.4 x 10.3 (1.079 x 0.406)	10.5
Ⓙ	Low Coast Modulator Valve (Red)	31.8 x 7.3 (1.252 x 0.287)	16.0
Ⓚ	Orifice Control Valve (Yellow)	38.97 x 8.6 (1.534 x 0.339)	18.0
Ⓛ	Low Inhibiter Valve (Purple)	30.44 x 7.3 (1.198x0.287)	16.0

Retainers and Pins Specifications

Mark	Name	Length x Width x Thickness or diameter mm (in.)
Ⓐ	Retainer for Modulator Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓑ	Retainer for Reverce Inhibiter Valve Sleeve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓒ	Retainer for Check Valve Sleeve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓓ	Retainer for Low Coast Modulator Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓔ	Retainer for Low Inhibiter Valve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓕ	Retainer for 2—3 Shift Valve Plug	13.5 x 5.0 x 3.2 (0.531 x 0.197 x 0.126)
Ⓖ	Retainer for Olifice Contrtol Valve plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓗ	Retainer for Accumulator Control Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓘ	Retainer for Lock—up Signal Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)
Ⓙ	Stopper for Throttle Valve	—
Ⓚ	Retainer for Secondary Regulator Valve Plug	18.0 x 5.0 x 3.2 (0.709 x 0.197 x 0.126)
Ⓛ	Pin for Throttle Valve Sleeve	23.8 x 3.0 (0.937 x 0.118)
Ⓜ	Retainer for Cut—back Valve Plug	16.0 x 5.0 x 3.2 (0.630 x 0.197 x 0.126)

Check Balls Specifications

Mark	Name	Diameter mm (in.)
Ⓐ	Check Ball	6.4 (0.252)

LOWER VALVE BODY

Springs Specifications

Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓐ	1—2 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓑ	3—4 Shift Valve (Orange)	37.23 x 8.7 (1.466 x 0.343)	18.0
Ⓒ	Check Ball (None)	14.0 x 9.8 (0.551 x 0.386)	6.0
Ⓓ	Pressure Reliefe Valve(White)	24.0 x 8.2 (0.945 x 0.323)	12.0
Ⓔ	Primary Regulator Valve (Red)	58.2 x 20.9 (2.291 x 0.823)	11.0
Ⓕ	Lock—up Control Valve(White)	26.95 x 9.8 (1.061 x 0.386)	13.0
Ⓖ	C_0 Exhaust Valve (Yellow)	33.3 x 8.2 (1.311 x 0.323)	14.0
Ⓗ	2—3 Timing Valve(Yellow)	38.79 x 8.6 (1.534 x 0.339)	18.0

Retainers and Pins Specifications

Mark	Name	Length x Diameter mm (in.)
Ⓐ	Pin for 2–3 Timing Valve Sleeve	23.8 x 2.5 (0.927 x 0.098)

Mark	Name	Length x Width x Thickness mm(in.)
Ⓐ	Retainer for Primary Regulator Valve Plunger Sleeve	18.0 x 5.0 x 3.2 (0.709 x 0.197 x 0.126)
Ⓑ	Retainer for C_0 Exhaust Valve	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)
Ⓒ	Retainer for 3–4 Shift Valve Plug	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)
Ⓓ	Retainer for 1–2 Shift Valve Plug	12.0 x 5.0 x 3.2 (0.472 x 0.197 x 0.126)

Mark	Name	Length x Diameter mm(in.)
Ⓔ	Pin for Lock–up control Valve Plug	23.8 x 2.5(0.937 x 0.098)

Check Valve, Ball and Springs Specifications

Mark	Name	Diameter mm (in.)
Ⓐ	Check Ball	8.7 (0.343)

Mark	Name (Color)	Free length x Outer Diameter mm (in.)	Total No. of coils
Ⓑ	Check Ball (None)	14 x 9.8 (0.551 x 0.386	6.0
Ⓒ	Pressure Relief Valve	24.0 x 8.2 (0.945 x 0.323)	12.0

ACCUMULATOR

	Piston Diameter mm (in.)	Spring Free length x Outer Diameter mm (in.)	Spring Color
B_0	35.9 (1.413)	63.1 x 20.7 (2.484 x 0.815)	Light Green
B_2	43.9 (1.728)	65.0 x 25.1 (2.559 x 0.988)	Blue
C_1	29.9 (1.413)	91.5 x 17.7 (3.602 x 0.697)	Green
C_2	39.9 (1.571)	83.5 x 21.7 (3.287 x 0.854)	Light Green

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TORQUE SPECIFICATIONS

Part tightened		N·m	kgf·cm	ft·lbf
Oil pump cover x oil pump body	10mm head bolt	8.8	90	78 in.·lbf
	12 mm head bolt	21	210	15
Lower balve body cover x Lower valve body		5.4	55	48 in.·lbf
Upper valve body x Lower valve body		5.4	55	48 in.·lbf
Manual detent spring x Lower valve body		5.4	55	48 in.·lbf
Parking lock pawl x Transfer adoptor		19	195	14
Transmission rear cover x Transmission case		7.8	80	69 in.·lbf
C_1 accumulator cover x Transmission case		7.8	80	69 in.·lbf
Transfer Adoptor x Transmission case		37	380	27
Center support set bolt		25	250	18
Torque converter x Drive plate		28	290	21
Oil pan x Transmission case		6.9	70	61 in.·lbf
Transmission housing x Transmission case		64	650	47
Fluid Temp. sensor Transmission case		34	350	25
Oil cooler union x Transmission case		29	300	22
Park/neutral position switch x Transmission case		13	130	9
Park/neutral position switch x Manual valve shaft		6.9	70	61 in.·lbf
Control shaft x Transmission case		13	130	9
Oil pump x Transmission case		25	250	18
Valve body x Transmission case		10	100	87in.·lbf
Oil strainer x Valve body		10	100	87in.·lbf

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