Automatic Transmission Workshop Manual SJ6A–EL

FOREWORD

This manual explains the service points for the above-indicated automotive system.
This manual covers all models with the above-indicated automotive system, not any one specific model.
In order to do these procedures safely, quickly, and correctly, you must first read this manual and any other relevant service materials carefully.
All the contents of this manual, including drawings and specifications, are the latest available at the time of printing.
As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers.
This manual should be kept up-to-date.
Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

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There are explanation given only for the sections marked with shadow (▬).

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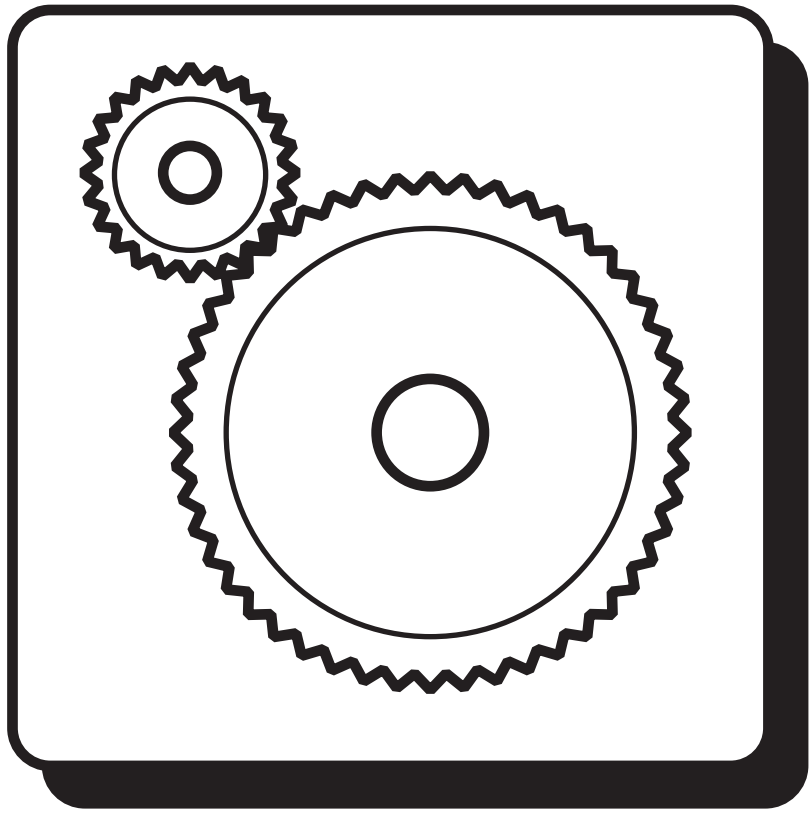
FEATURES



TRANSMISSION/TRANSAXLE

05
SECTION

05-00 OUTLINE

TRANSMISSION/TRANSAXLE SPECIFICATIONS

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Item		Specification
Transmission type		SJ6A-EL
Gear ratio	1GR	3.538
	2GR	2.060
	3GR	1.404
	4GR	1.000
	5GR	0.713
	6GR	0.582
	Reverse	3.168
ATF	Type	JWS3309
	Capacity (Approx. quantity) (L {US qt, lmp qt})	7.4 {7.8, 6.5}
Torque converter stall torque ratio		2.00
Hydraulic system (Number of drive/driven plates)	C1 clutch	4/5
	C2 clutch	5/5
	C3 clutch	4/4
	C4 clutch	4/4
	B1 brake	3/3
	B2 brake	4/3
	B3 brake	3/4
	B4 brake	5/5
Front planetary gear (Number of teeth)	Sun gear	33
	Pinion gear (inner)	19
	Pinion gear (outer)	18
	Ring gear	75
Middle planetary gear (Number of teeth)	Sun gear	26
	Pinion gear	20
	Ring gear	66
Rear planetary gear (Number of teeth)	Sun gear	26
	Pinion gear	20
	Ring gear	66

- Example of automatic transaxle specifications. (MX-5 specifications)

05-13 AUTOMATIC TRANSMISSION

AUTOMATIC TRANSMISSION OUTLINE

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- With the adoption of the line pressure solenoid, TCC control solenoid, solenoid for C3 clutch (shift solenoid F), solenoid for B2 brake (shift solenoid G), and the linear type solenoid, dynamic shift quality has been realized.

AUTOMATIC TRANSMISSION CROSS-SECTIONAL VIEW

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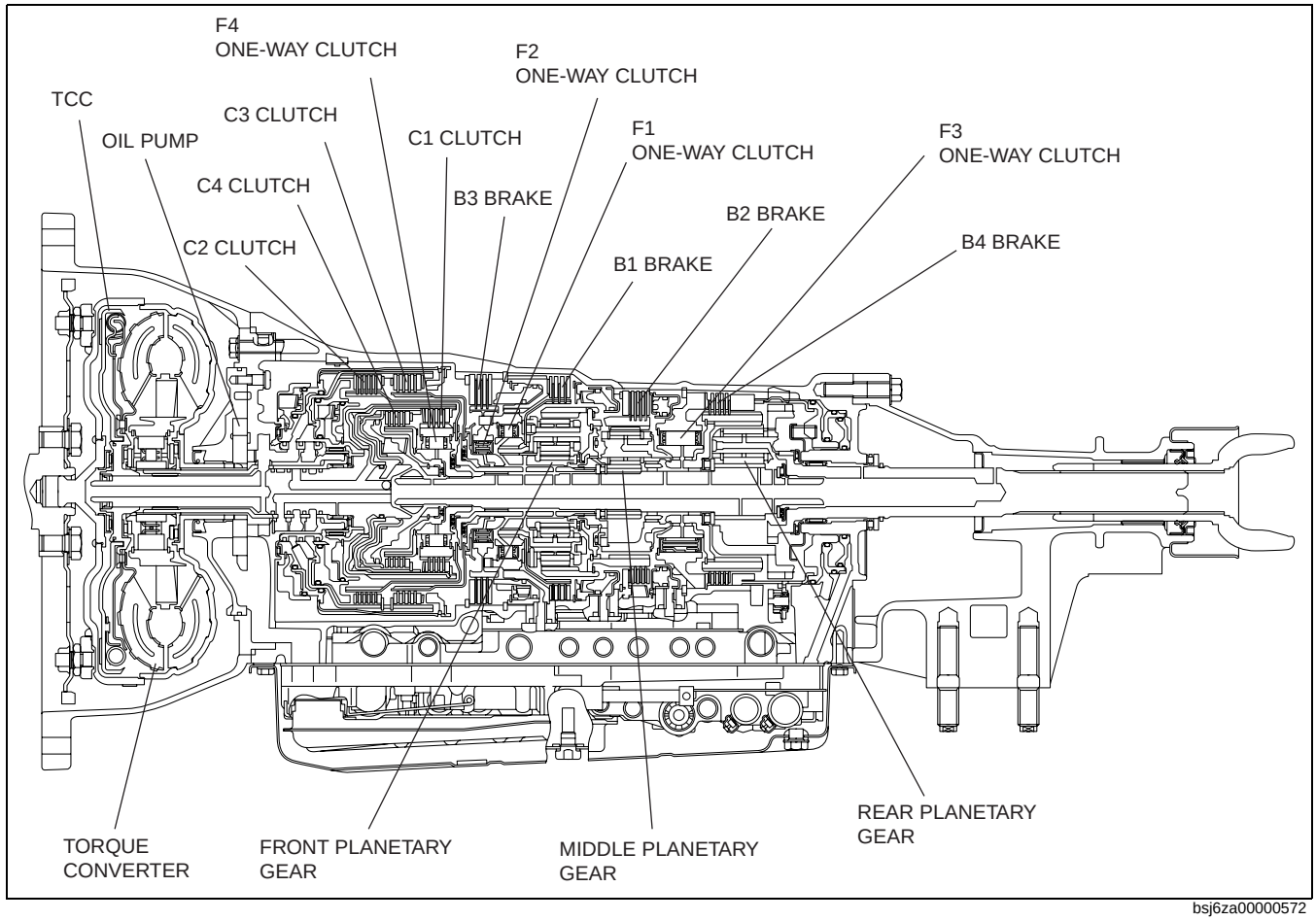

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POWERFLOW STRUCTURE

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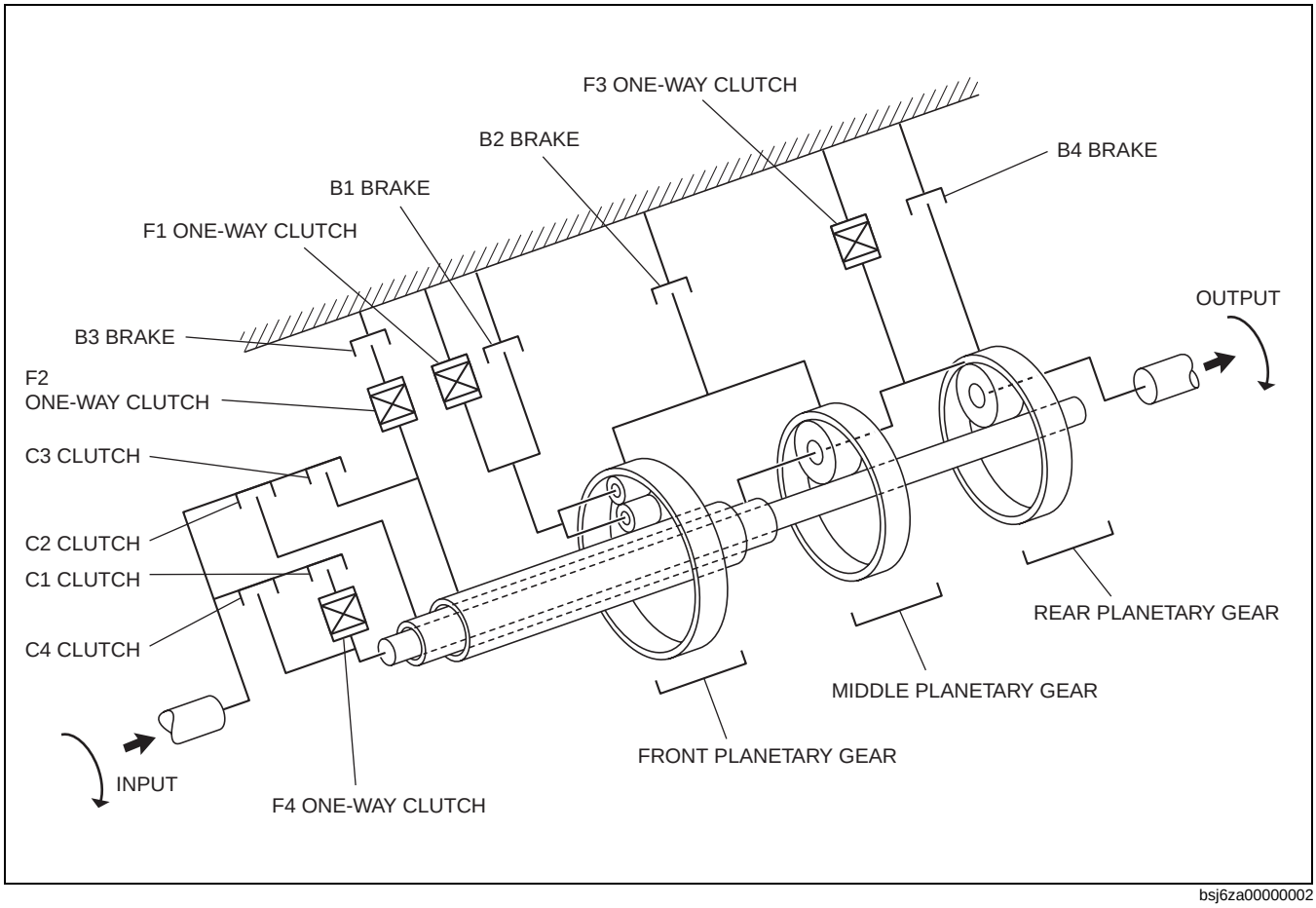
Description of Components



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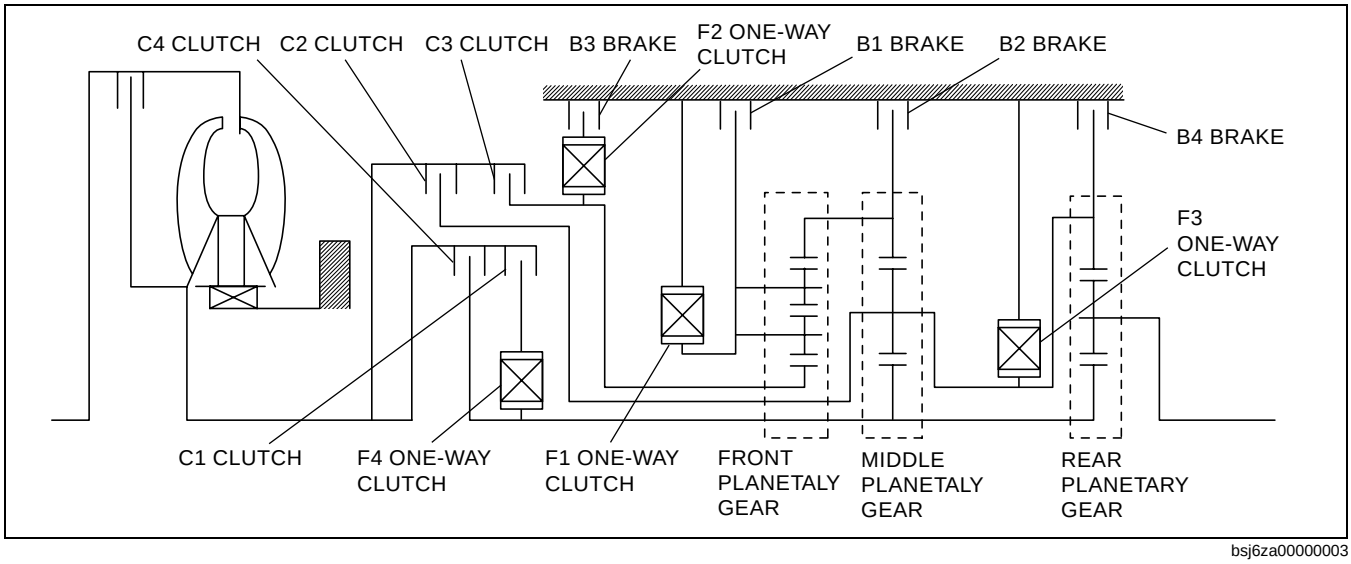

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POWERFLOW OPERATION

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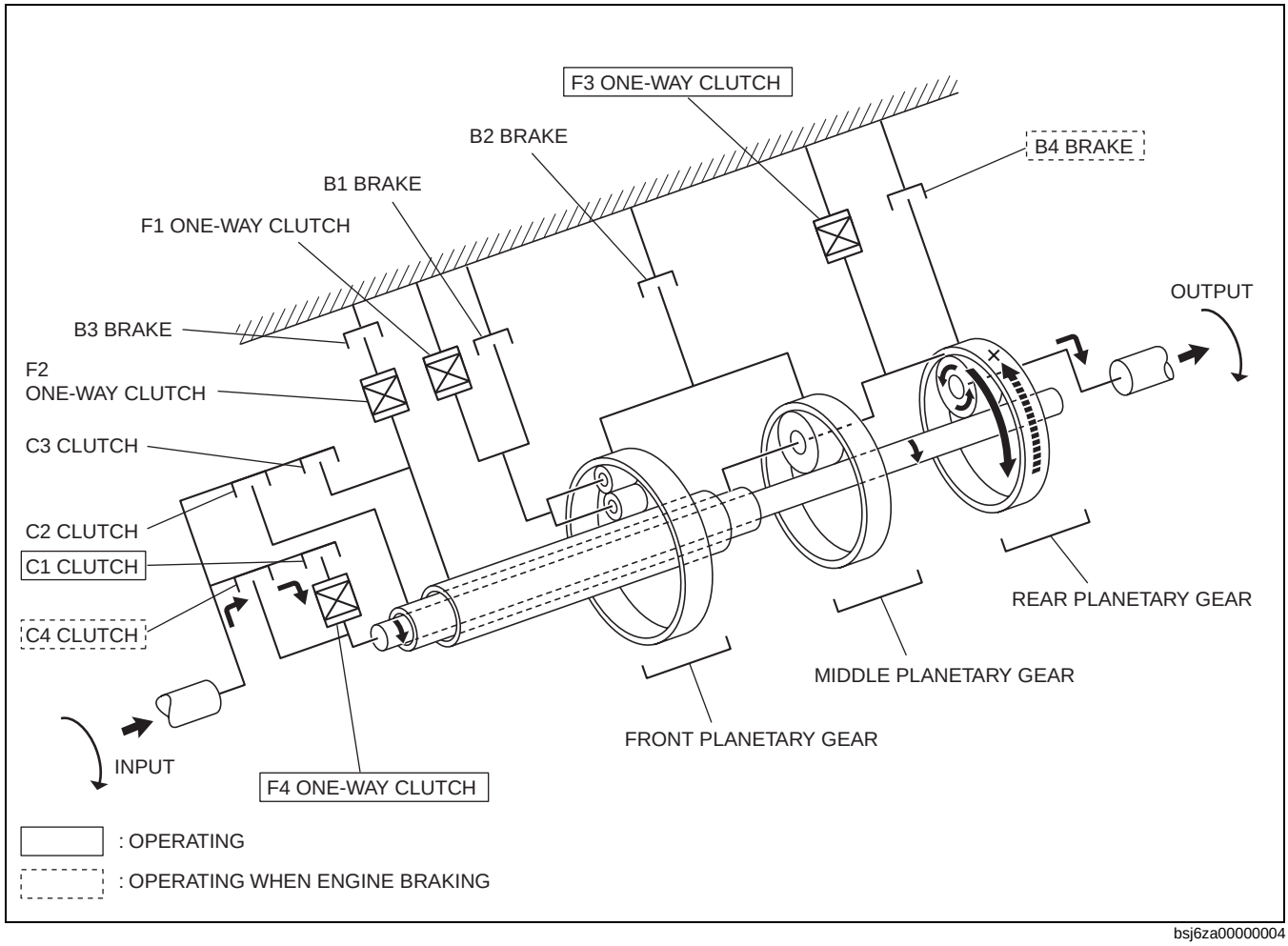
List of operating components

Clutch / Brake	Operation
C1 clutch	• Engages input shaft and intermediate shaft via F4 one-way clutch.
C2 clutch	• Engages input shaft and middle planetary carrier.
C3 clutch	• Engages input shaft and front sun gear.
C4 clutch	• Engages input shaft and intermediate shaft.
B1 brake	• Locks rotation of front planetary carrier.
B2 brake	• Locks rotation of front and middle ring gear.
B3 brake	• Locks F2 one-way clutch outer race.
B4 brake	• Locks rotation of rear ring gear.
F1 one-way clutch	• Locks counterclockwise rotation of front planetary carrier on transmission case.
F2 one-way clutch	• Locks counterclockwise rotation of front sun gear during B3 brake operation.
F3 one-way clutch	• Locks counterclockwise rotation of rear ring gear. • Locks counterclockwise rotation of middle planetary carrier.
F4 one-way clutch	• Locks counterclockwise rotation of intermediate shaft during C1 clutch operation.

1GR



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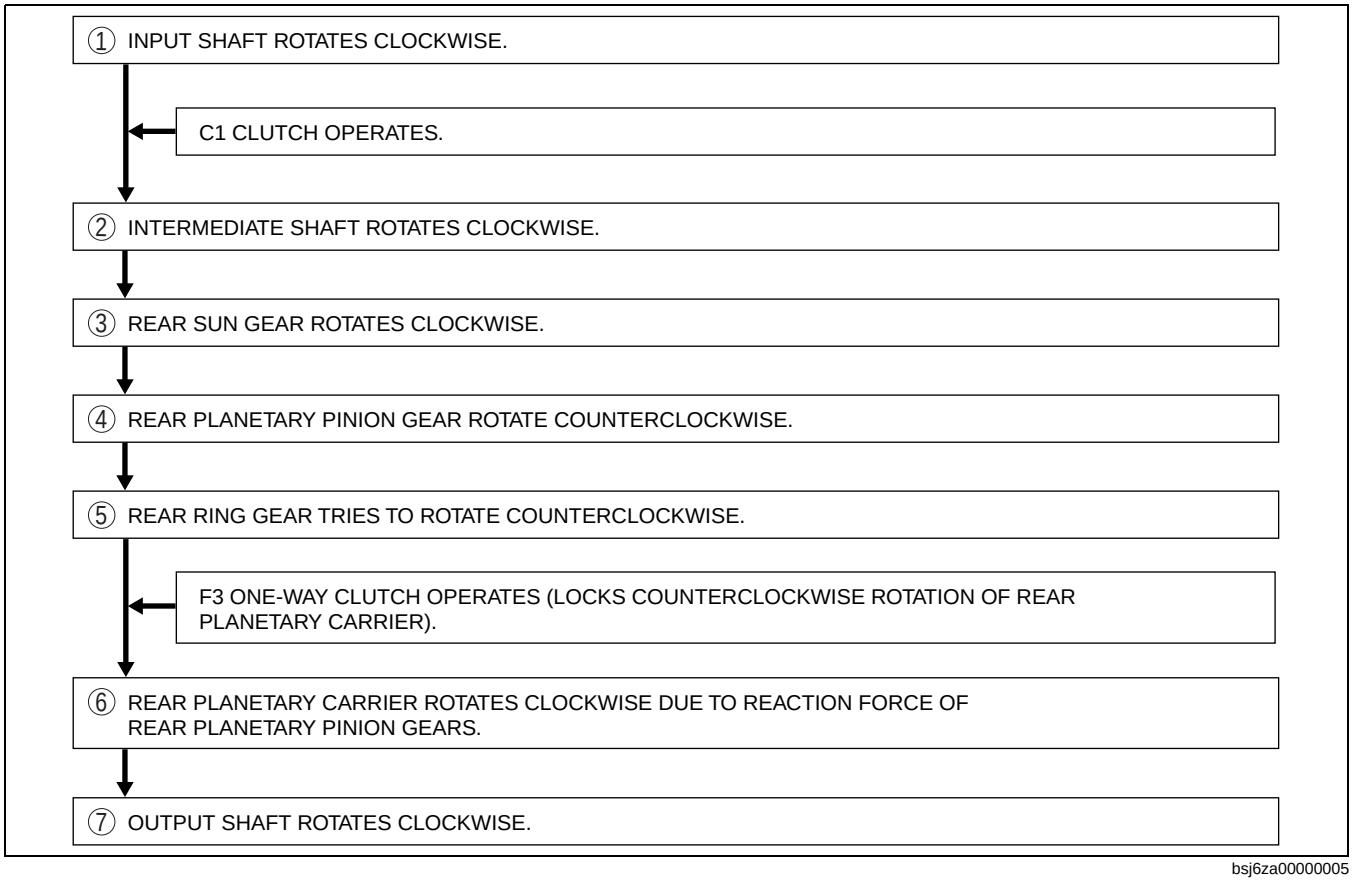

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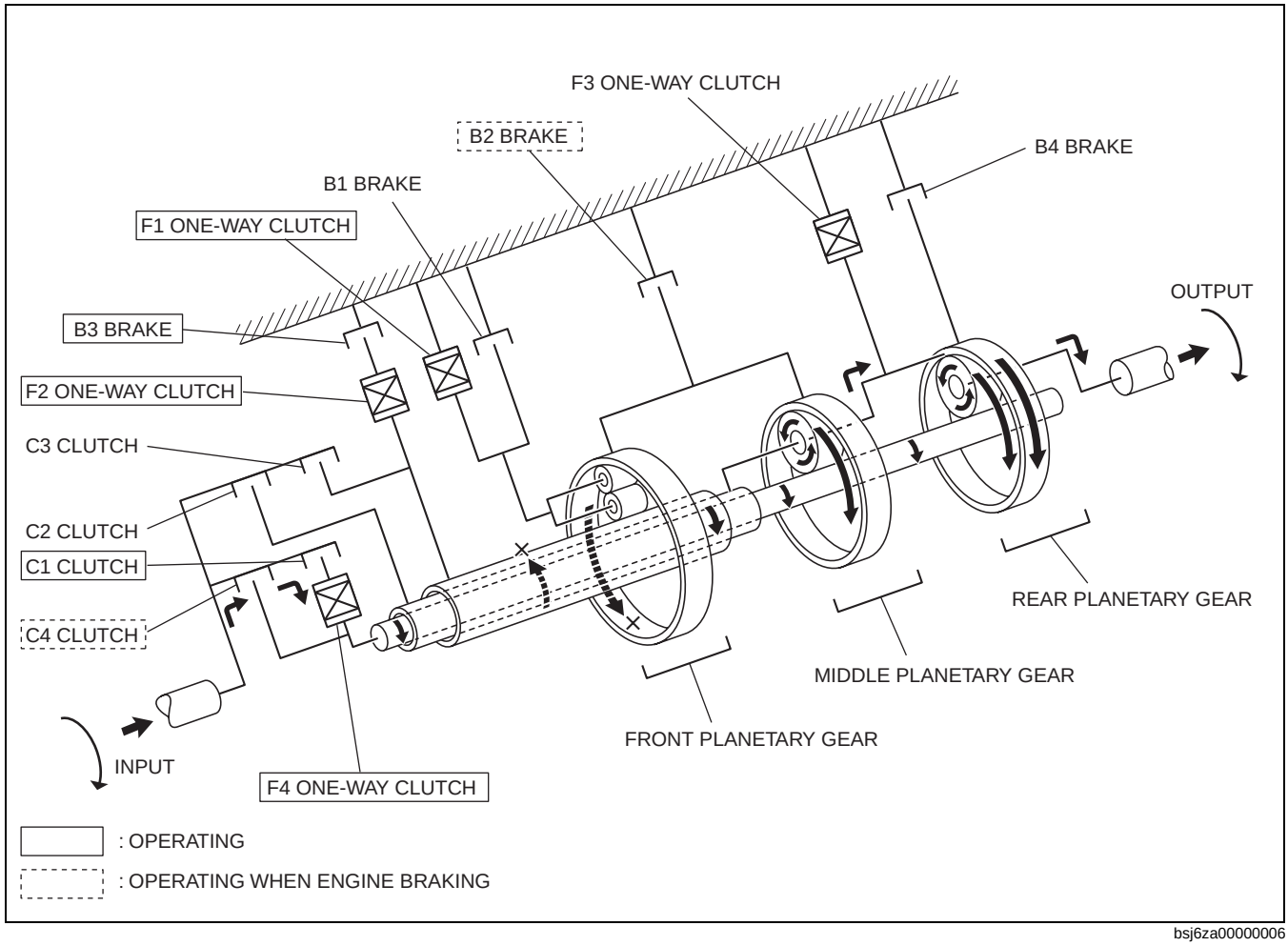
2GR



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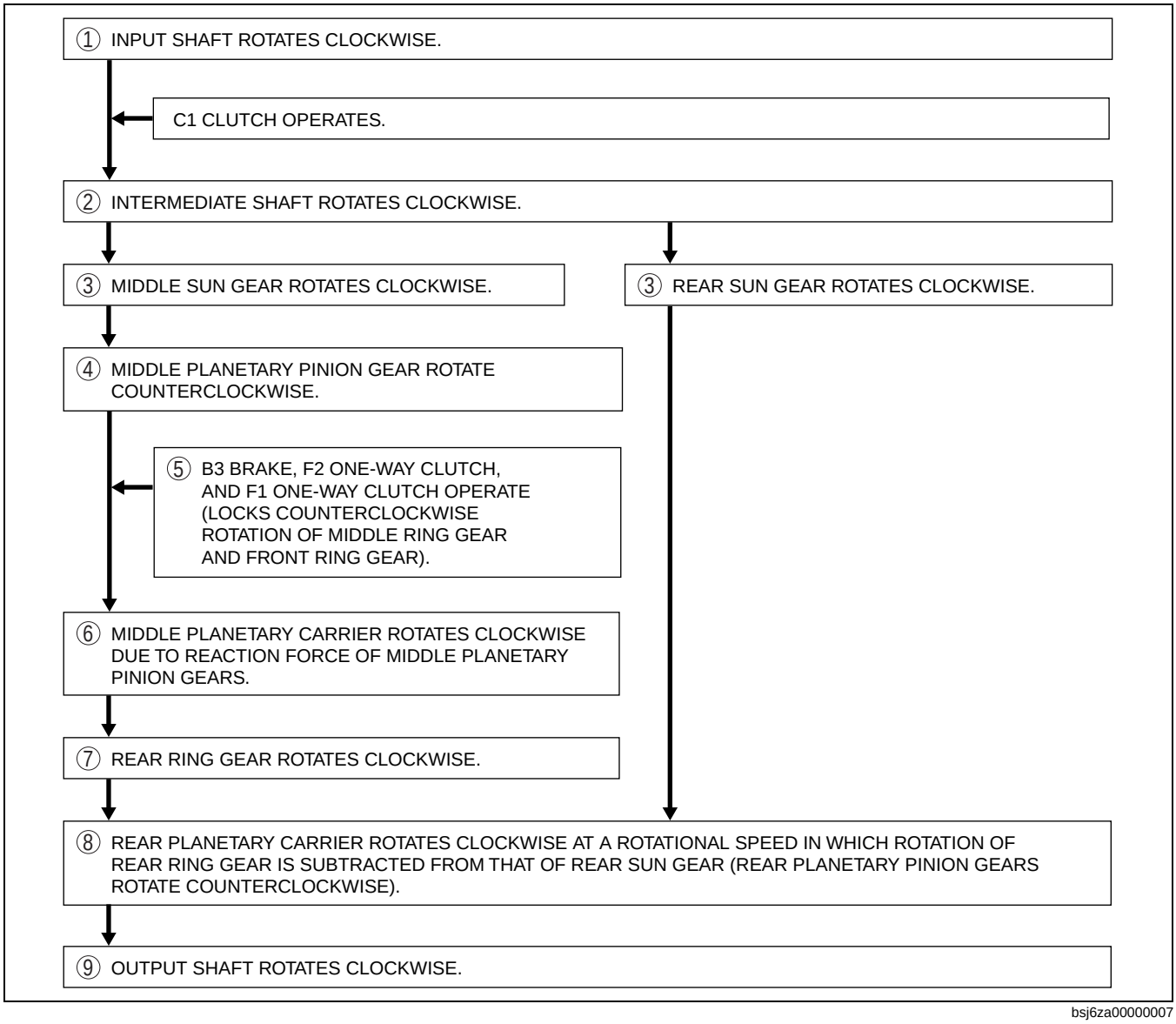

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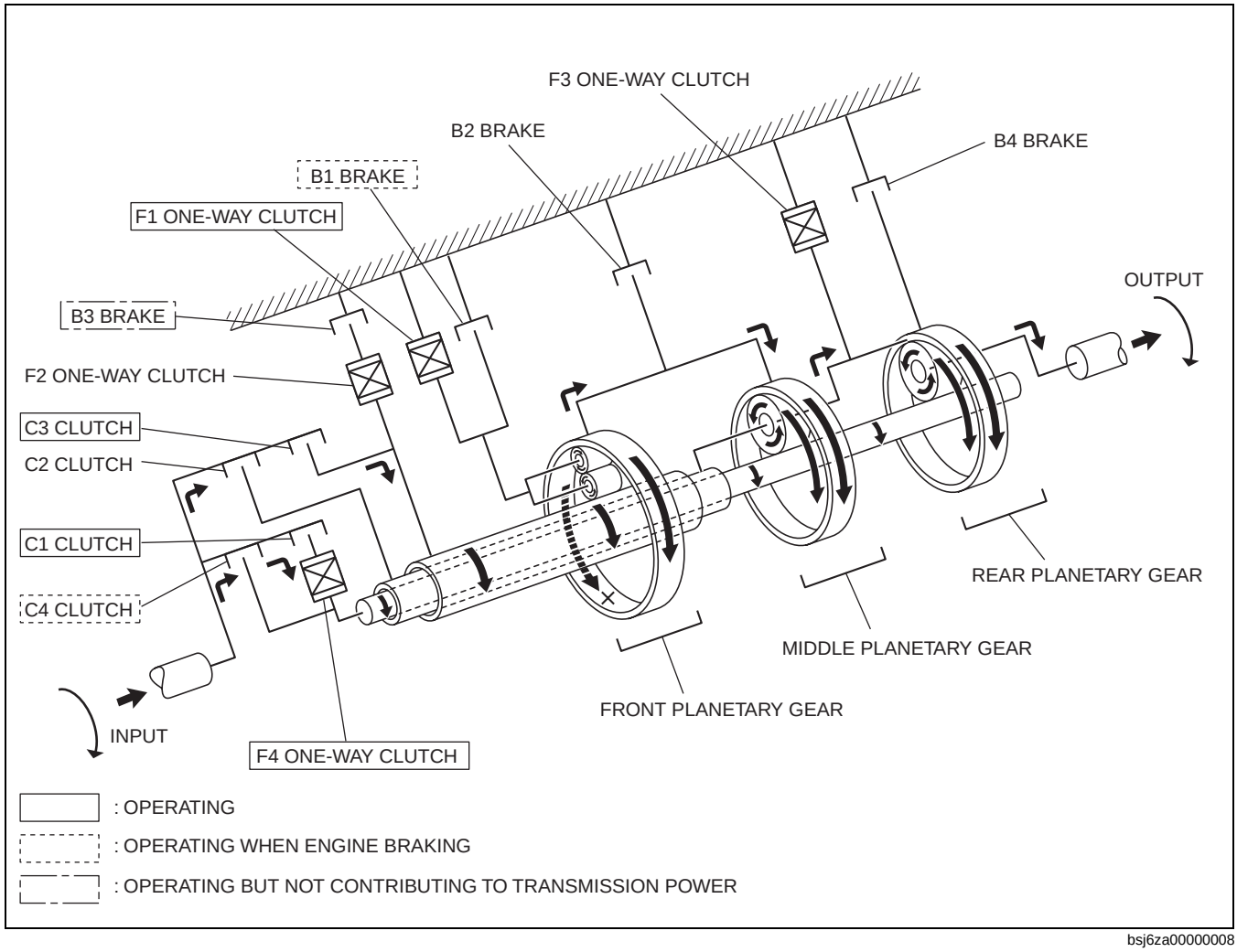
3GR



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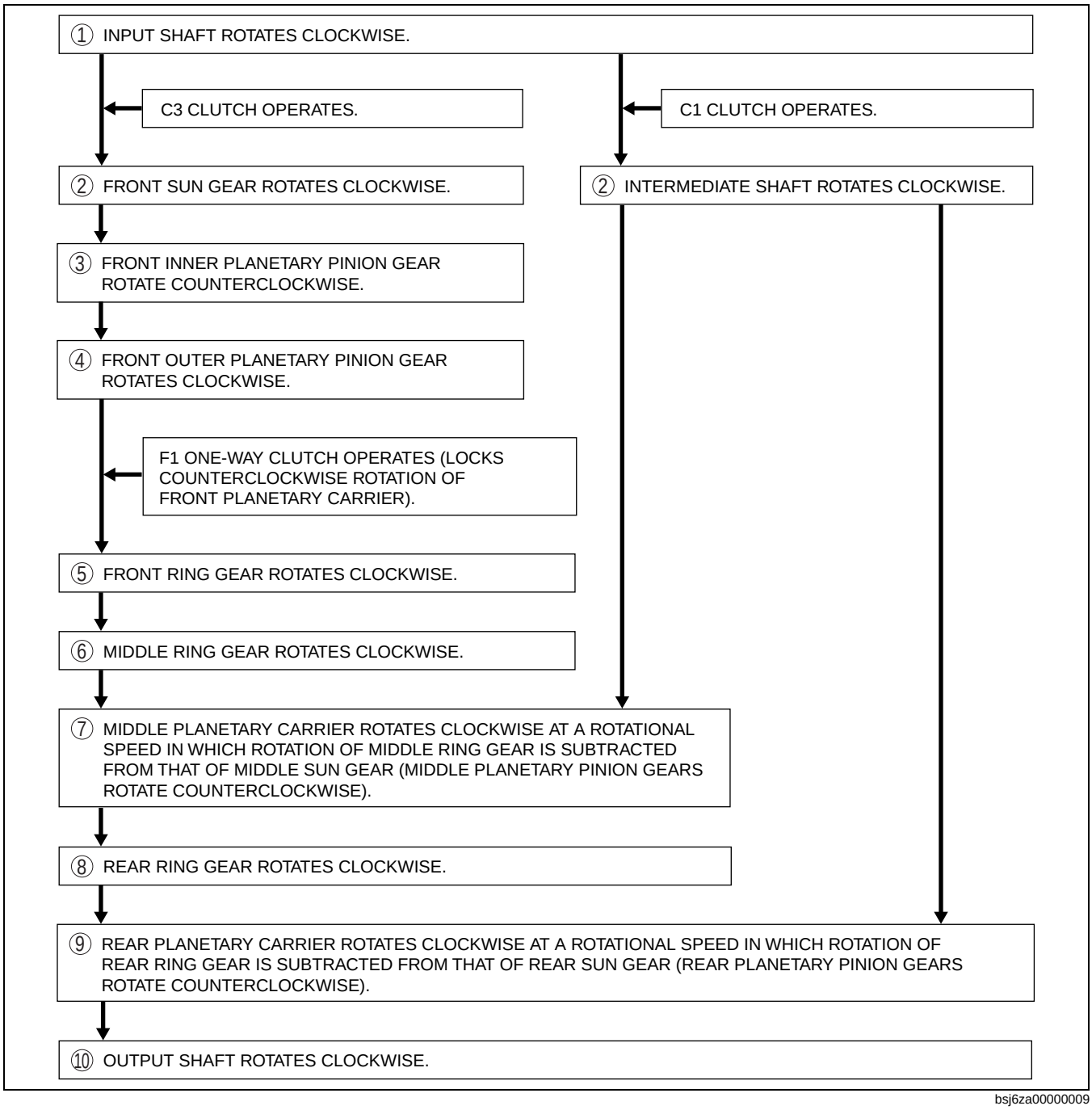

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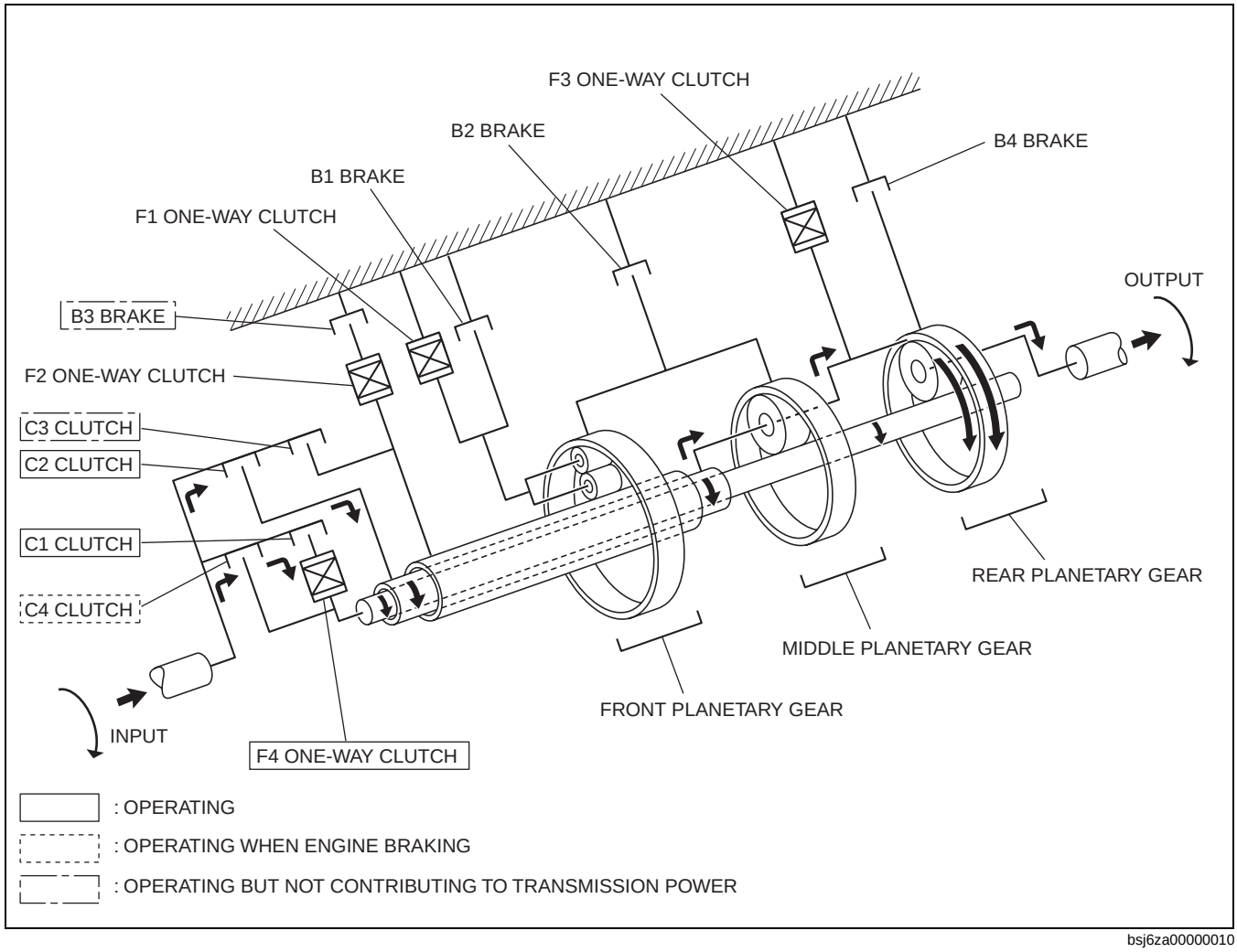
4GR



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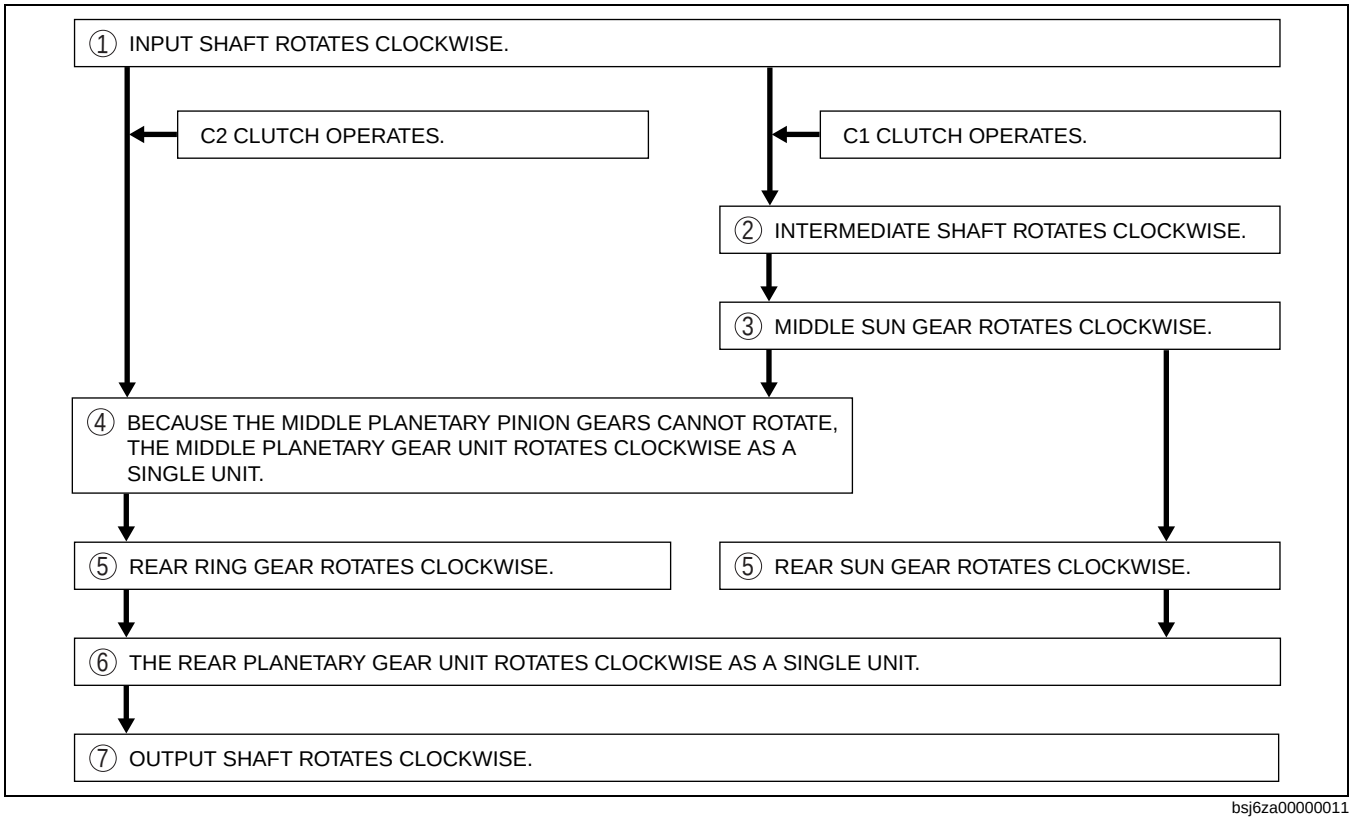

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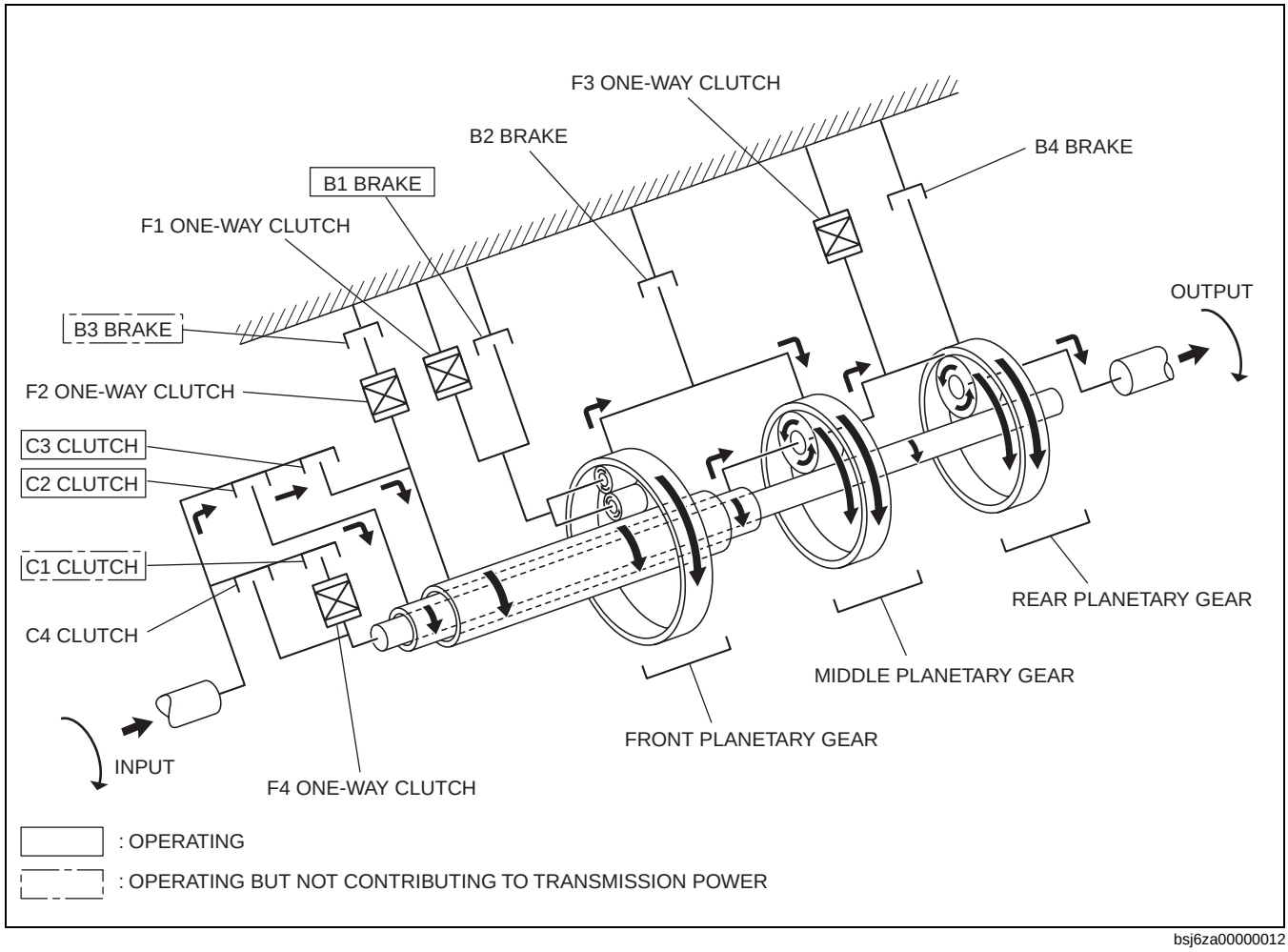
5GR



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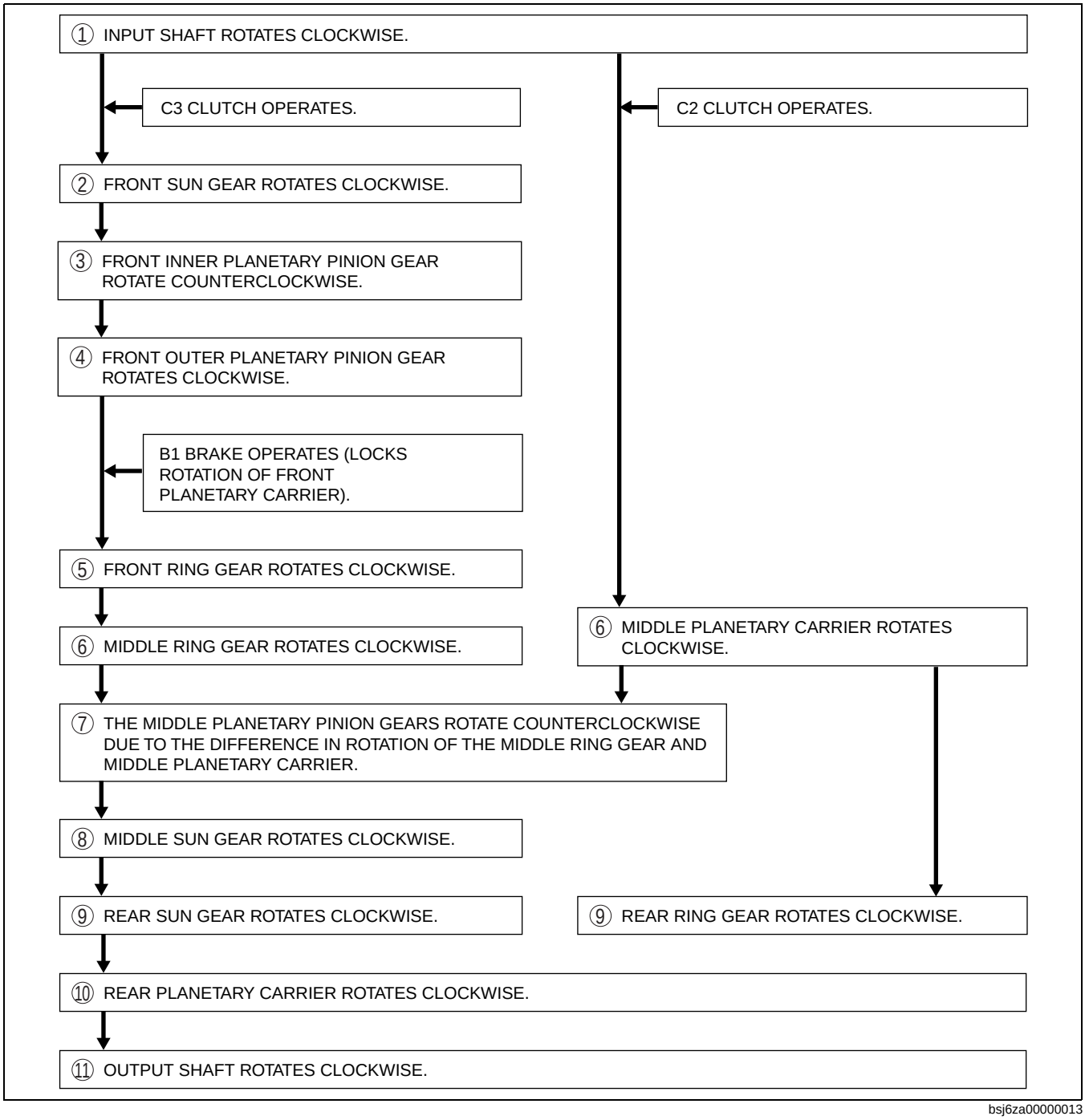

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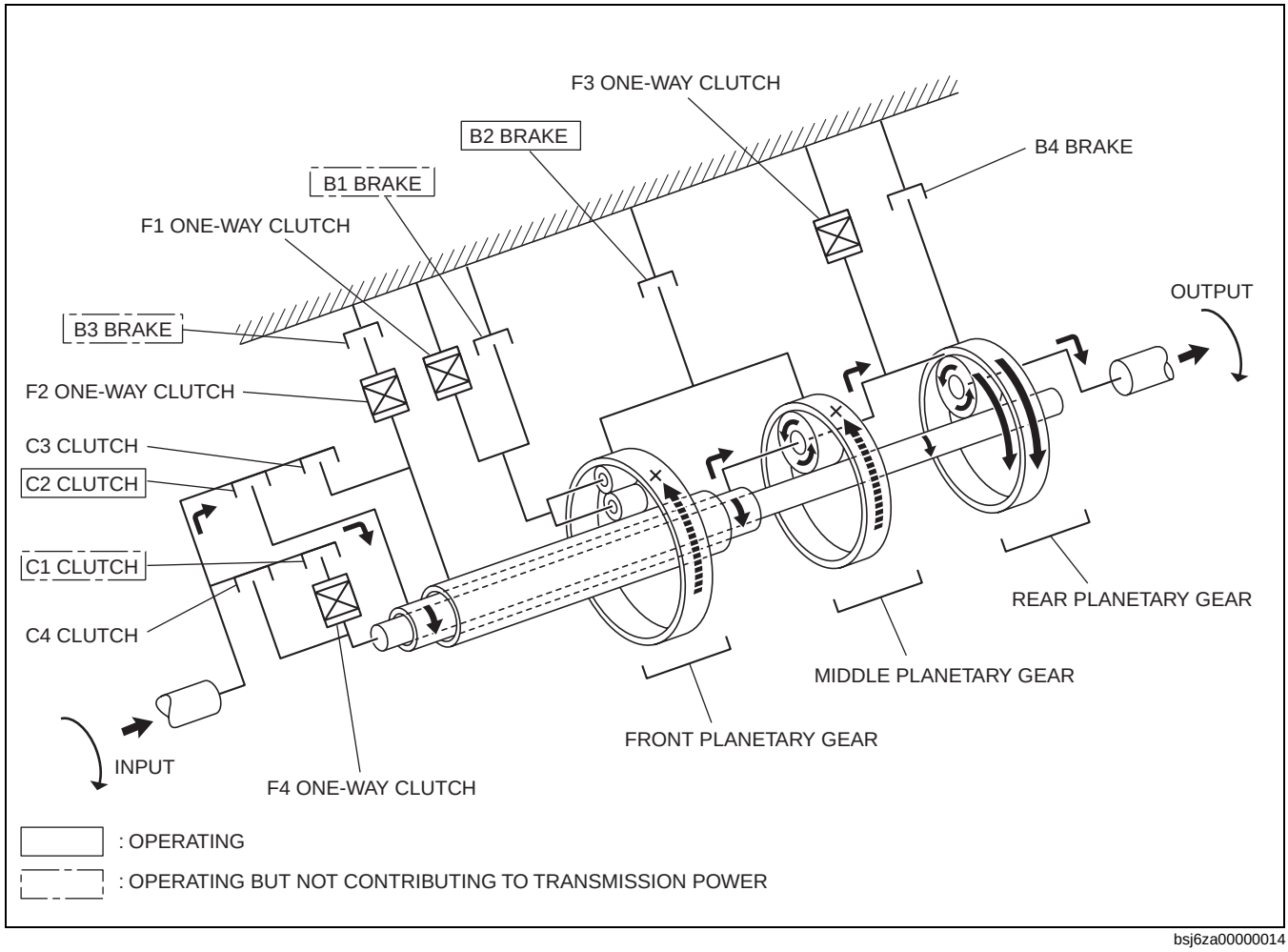
6GR



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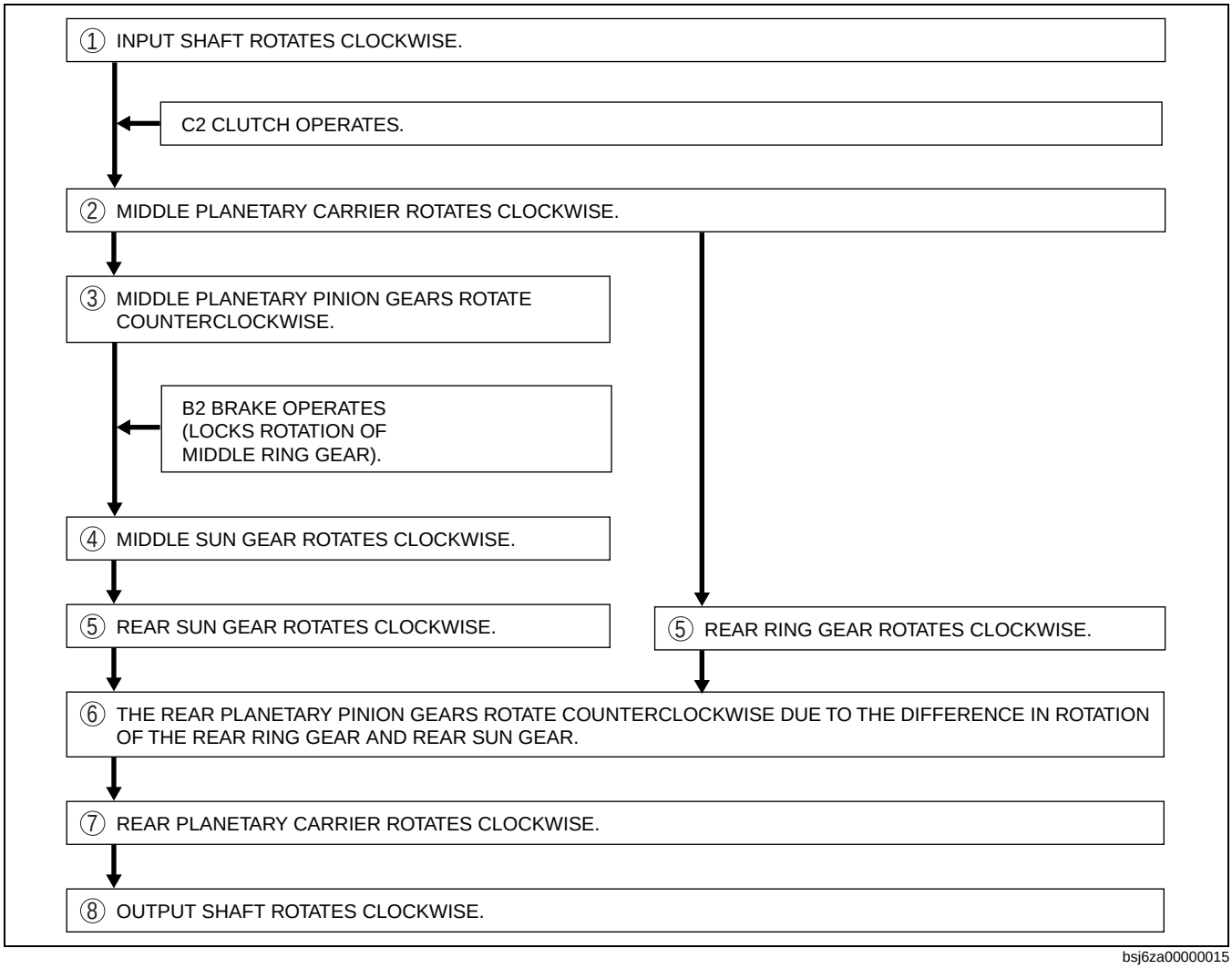

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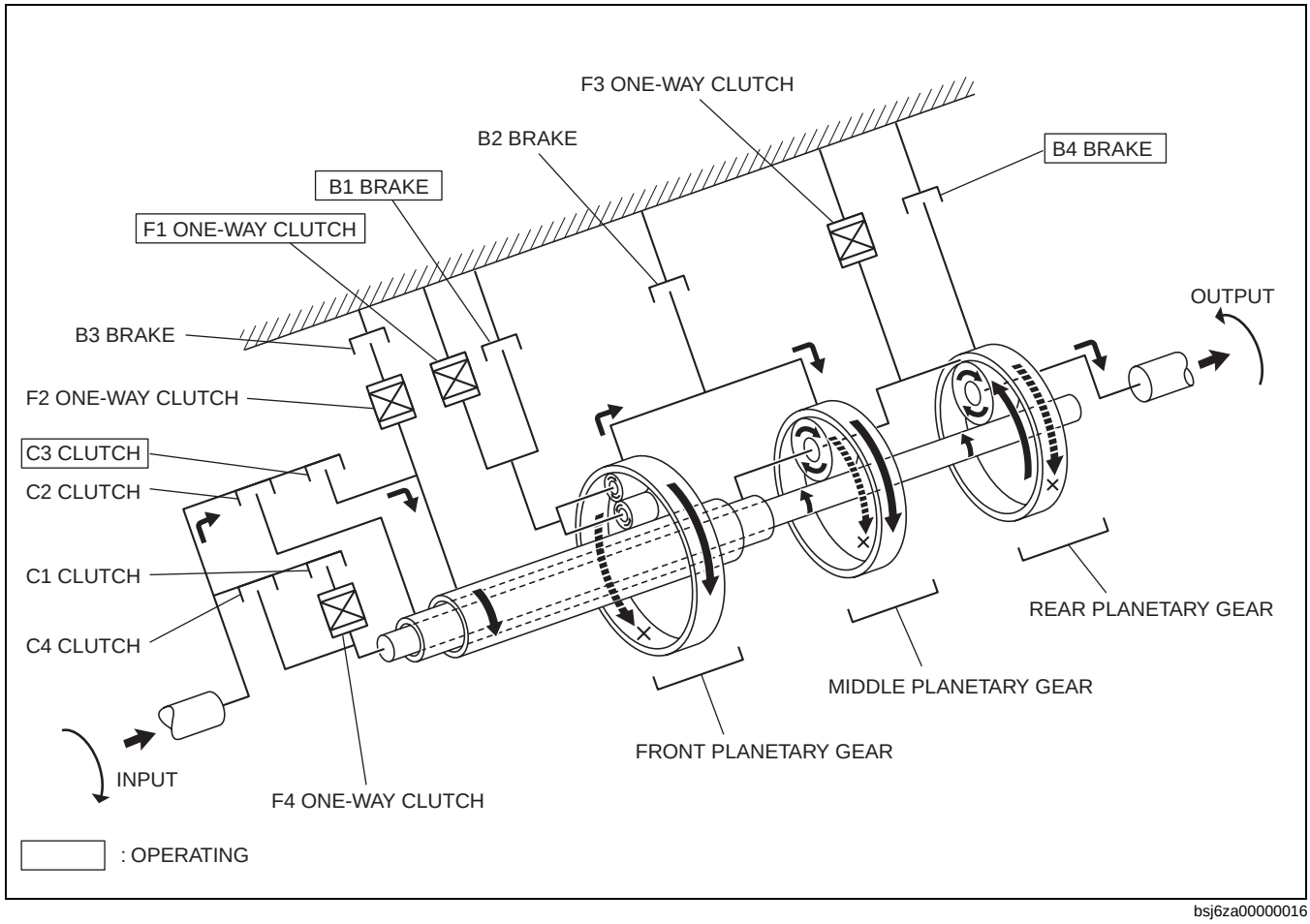
R position



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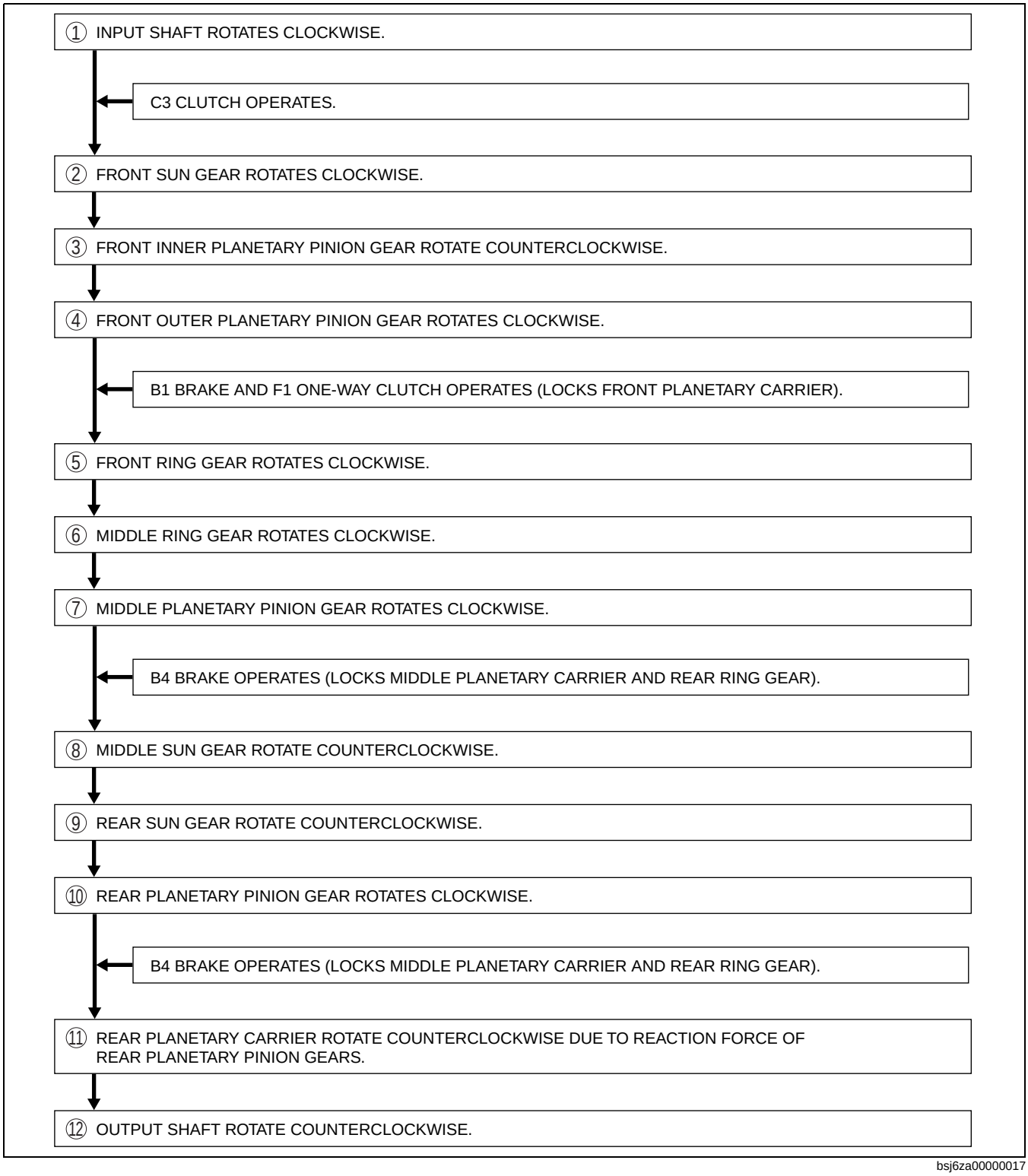

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SERVICE

GENERAL INFORMATION

00
SECTION

00-00 GENERAL INFORMATION

HOW TO USE THIS MANUAL

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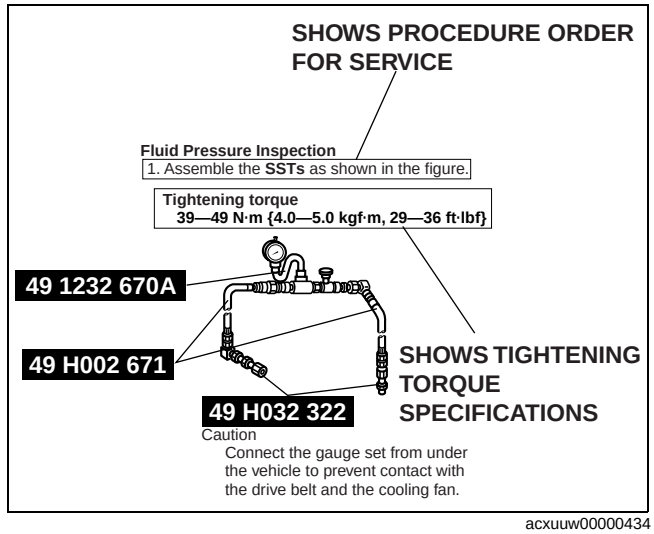
Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  - — Removal/Installation
  - — Disassembly/Assembly
  - — Replacement
  - — Inspection
  - — Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

Service Procedure
Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



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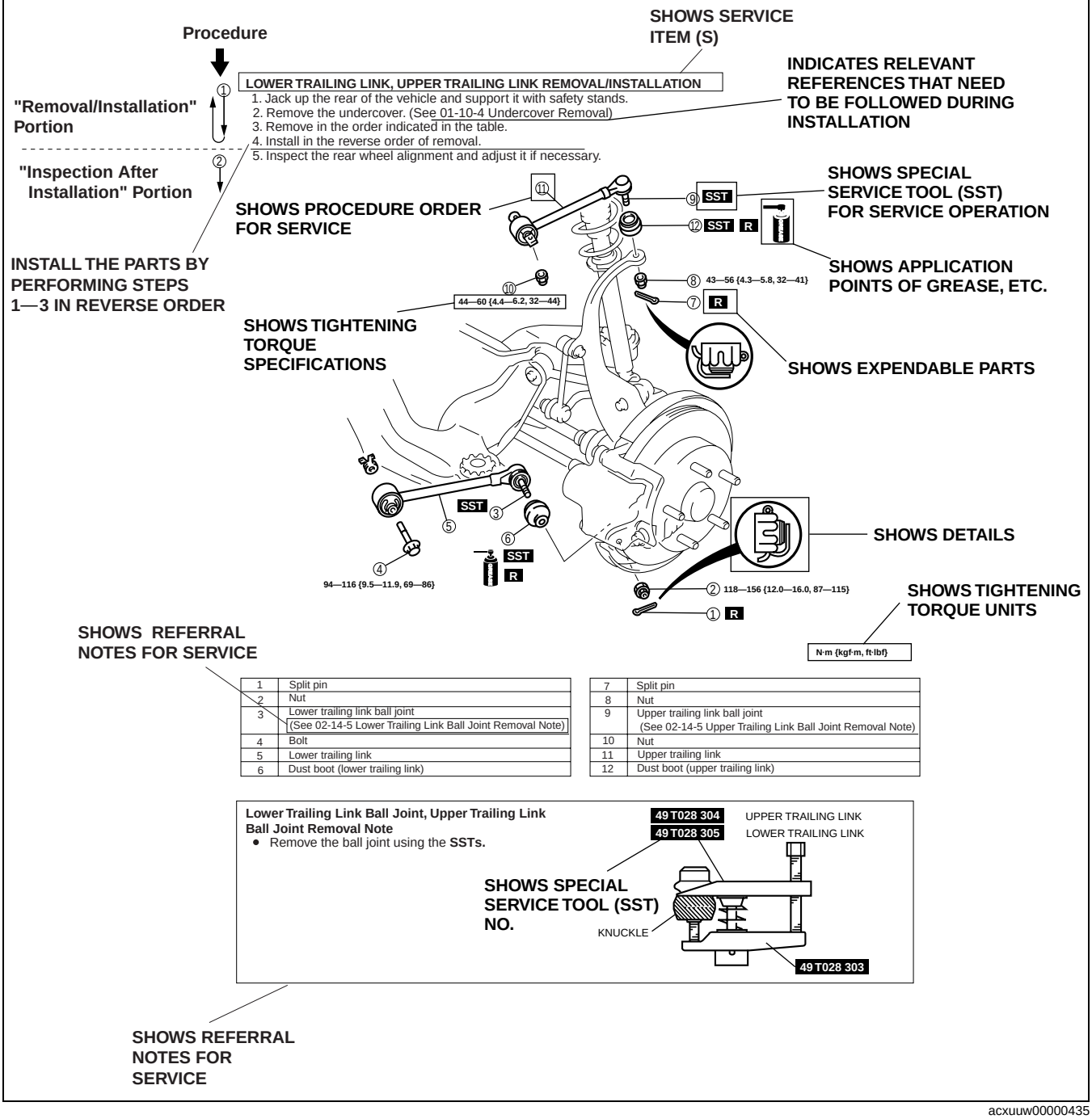
Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.



1	Split pin
2	Nut
3	Lower trailing link ball joint (See 02-14-5 Lower Trailing Link Ball Joint Removal Note)
4	Bolt
5	Lower trailing link
6	Dust boot (lower trailing link)

7	Split pin
8	Nut
9	Upper trailing link ball joint (See 02-14-5 Upper Trailing Link Ball Joint Removal Note)
10	Nut
11	Upper trailing link
12	Dust boot (upper trailing link)

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Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/ transmission fluid	New appropriate automatic transaxle/ transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
R	Replace part	O-ring, gasket, etc.
SST	Use SST or equivalent	Appropriate tools

Advisory Messages

- You will find several **Warnings, Cautions, Notes, Specifications and Upper and Lower Limits in this manual.**

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

Specification

- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

UNITS

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Electrical current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm^2 (kilogram force per square centimeter)
	psi (pounds per square inch)
Number of revolutions	rpm (revolutions per minute)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit, and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm^2 in the following specifications:

  210—260 kPa {2.1—2.7 kgf/cm^2, 30—38 psi}
  270—310 kPa {2.7—3.2 kgf/cm^2, 39—45 psi}

- The actual converted values for 2.7 kgf/cm^2 are 265 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

FUNDAMENTAL PROCEDURES

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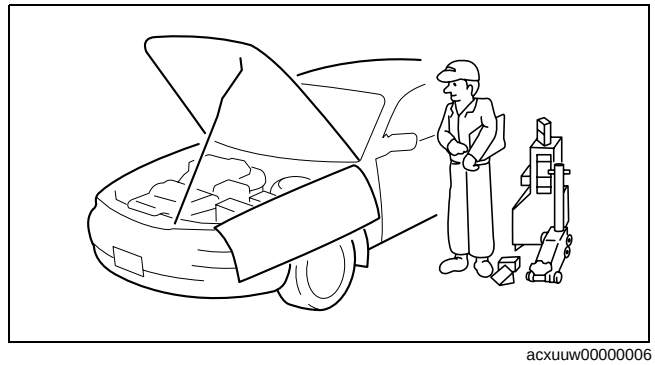
Preparation of Tools and Measuring Equipment

- Be sure that all necessary tools and measuring equipment are available before starting any work.



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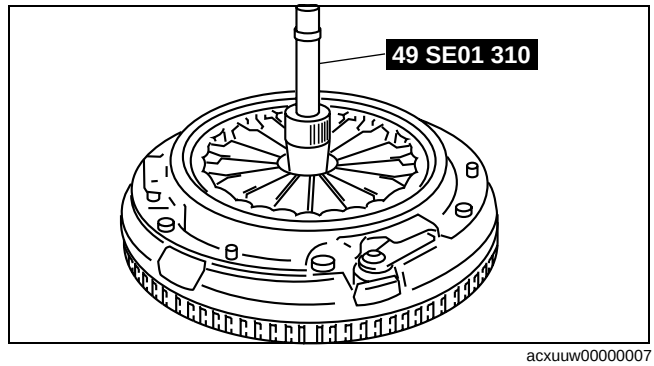
Special Service Tools

- Use special service tools or the equivalent when they are required.



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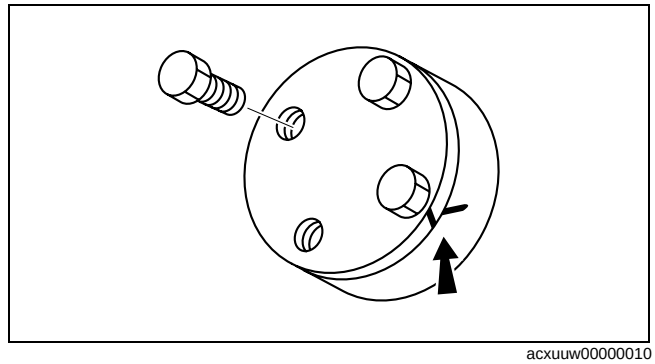
Disassembly

- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance, and identified so that reassembly can be performed easily and efficiently.



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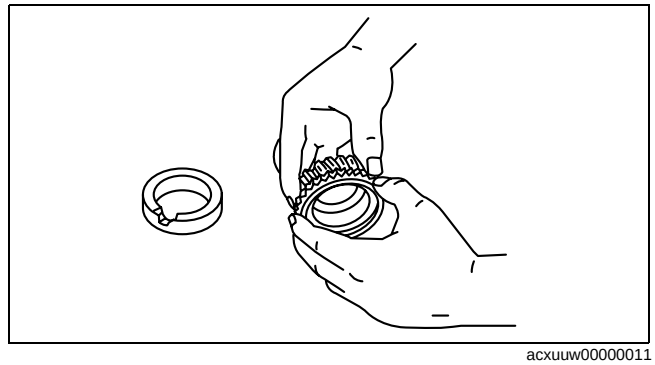
Inspection During Removal, Disassembly

- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



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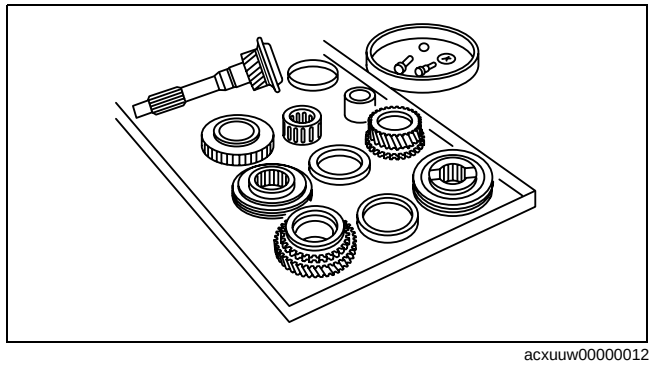
Arrangement of Parts

- All disassembled parts should be carefully arranged for reassembly.
- Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



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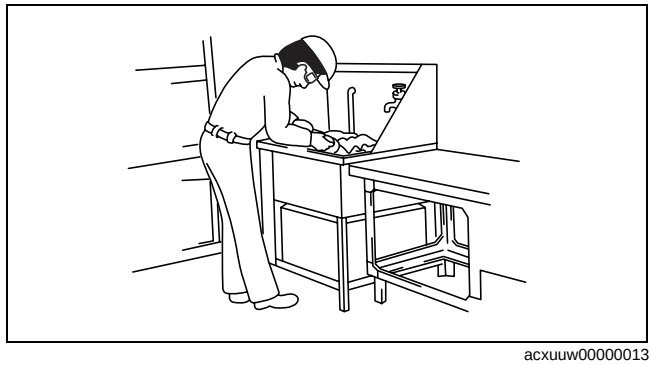
Cleaning of Parts

- All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

Warning

- **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



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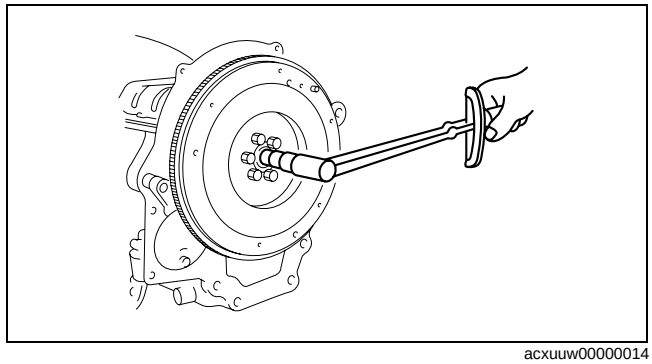
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, these parts should be replaced with new ones:
  - — Oil seals
  - — Gaskets
  - — O-rings
  - — Lock washers
  - — Cotter pins
  - — Nylon nuts



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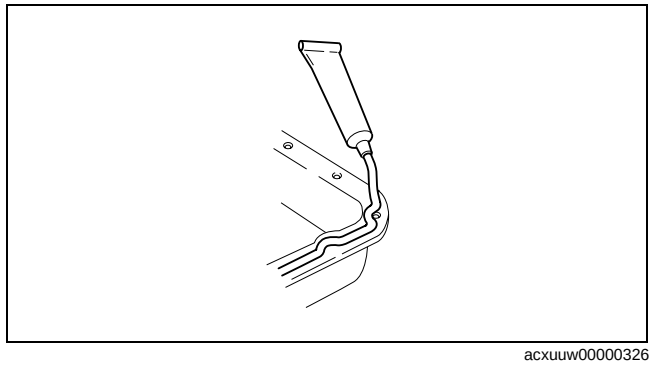
- Depending on location:
  - — Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
  - — Oil should be applied to the moving components of parts.
  - — Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



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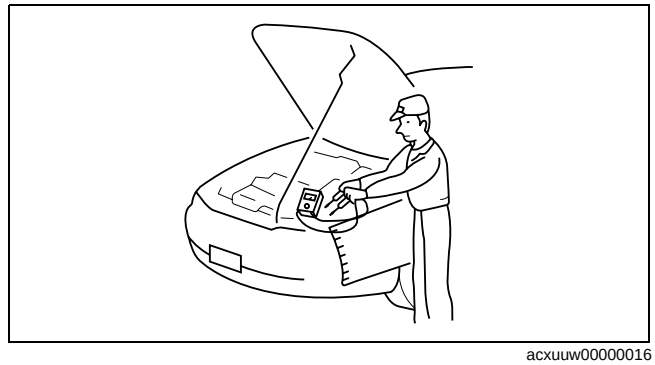
Adjustment

- Use suitable gauges and testers when making adjustments.



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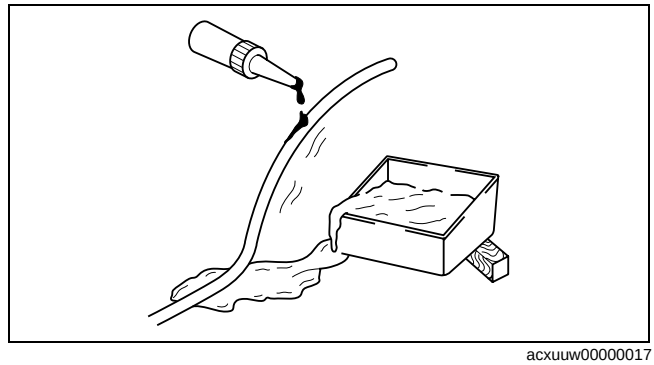
Rubber Parts and Tubing

- Prevent gasoline or oil from getting on rubber parts or tubing.



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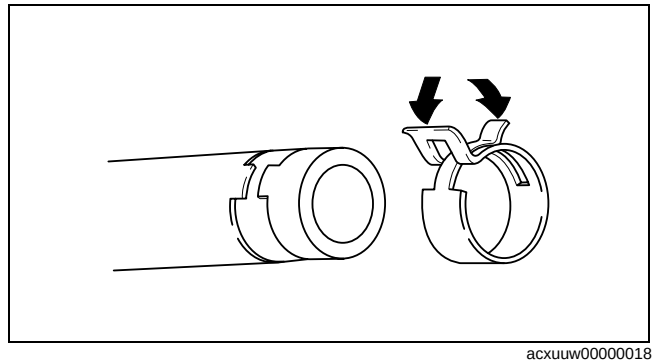
Hose Clamps

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.



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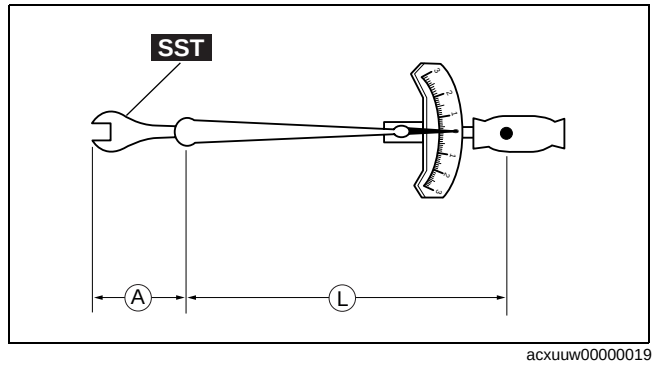
Torque Formulas

- When using a torque wrench-**SST** or equivalent combination, the specified torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]



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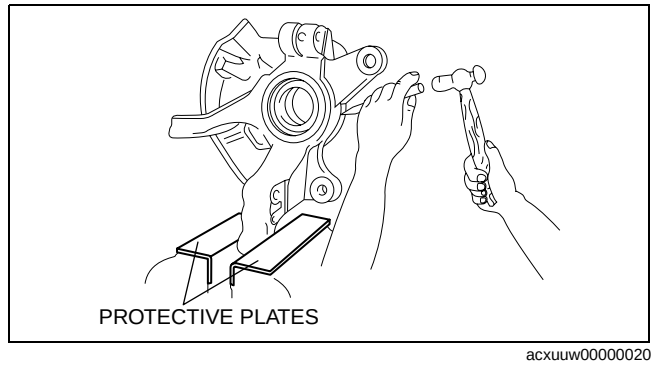
A : The length of the **SST** past the torque wrench drive.
L : The length of the torque wrench.

Vise

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



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ELECTRICAL SYSTEM

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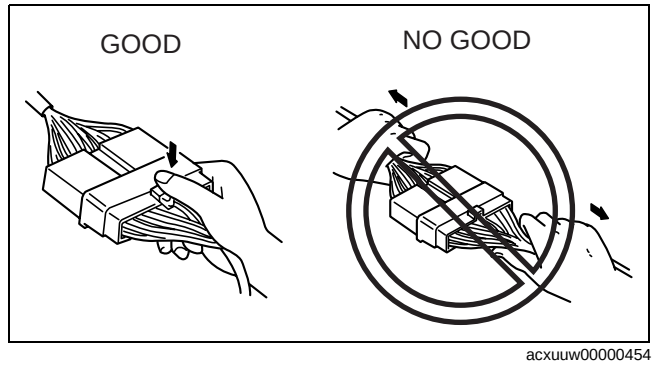
Connectors

Disconnecting connectors

- When disconnecting a connector, grasp the connectors, not the wires.



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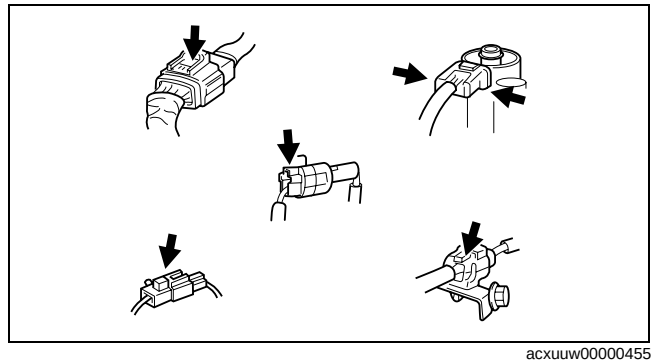
- Connectors can be disconnected by pressing or pulling the lock lever as shown.



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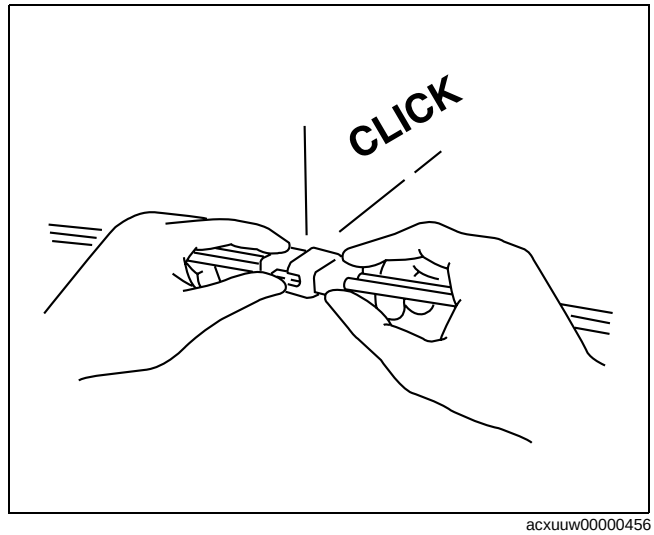
Locking connector

- When locking connectors, listen for a click indicating they are securely locked.



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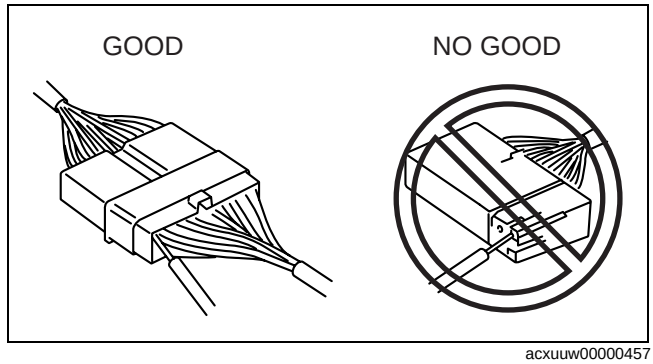
Inspection

Caution
- **To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.**

- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.



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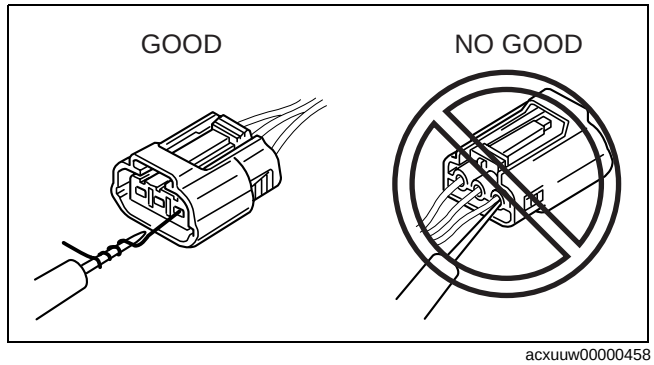
- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.



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SAE STANDARDS

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- In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

SAE Standard		Remark		SAE Standard		Remark
Abbreviation	Name			Abbreviation	Name	
AP	Accelerator Pedal			MAP	Manifold Absolute Pressure	
APP	Accelerator Pedal Position			MAF sensor	Mass Air Flow Sensor	
ACL	Air Cleaner			MFL	Multiport Fuel Injection	
A/C	Air Conditioning			OBD	On-board Diagnostic System	
BARO	Barometric Pressure			OL	Open Loop	
B+	Battery Positive Voltage			OC	Oxidation Catalytic Converter	
CMP sensor	Camshaft Position Sensor			O2S	Oxygen sensor	
CAC	Charge Air Cooler			PNP	Park/Neutral Position	
CLS	Closed Loop System			PSP	Power Steering Pressure	
CTP	Closed Throttle Position			PCM	Powertrain Control Module	#3
CPP	Clutch Pedal Position			PAIR	Pulsed Secondary Air Injection	Pulsed injection
CIS	Continuous Fuel Injection System					
CKP sensor	Crankshaft Position Sensor			AIR	Secondary Air Injection	Injection with air pump
DLC	Data Link Connector					
DTM	Diagnostic Test Mode	#1				
DTC	Diagnostic Test Code(s)			SAPV	Secondary Air Pulse Valve	
DI	Distributor Ignition			SFI	Sequential Multiport Fuel Injection	
DLI	Distributorless Ignition					
EI	Electronic Ignition	#2		3GR	Third Gear	
ECT	Engine Coolant Temperature			TWC	Three Way Catalytic Converter	
EM	Engine Modification			TB	Throttle Body	
EVAP	Evaporative Emission			TP sensor	Throttle Position Sensor	

SAE Standard		Remark		SAE Standard		Remark
Abbreviation	Name			Abbreviation	Name	
EGR	Exhaust Gas Recirculation			TCC	Torque Converter Clutch	
FC	Fan Control			TCM	Transmission (Transaxle) Control Module	
FF	Flexible Fuel					
4GR	Fourth Gear			TR	Transmission (Transaxle) Range	
GEN	Generator			TC	Turbocharger	
GND	Ground			VSS	Vehicle Speed Sensor	
HO2S	Heated Oxygen Sensor	With heater		VR	Voltage Regulator	
				VAF sensor	Volume Air Flow Sensor	
IAC	Idle Air Control			WU-TWC	Warm Up Three Way Catalytic Converter	#4
IAT	Intake Air Temperature					
KS	Knock Sensor			WOP	Wide Open Throttle	
MIL	Malfunction Indicator Lamp					

#1: Diagnostic trouble codes depend on the diagnostic test mode.
#2: Controlled by the PCM
#3: Device that controls engine and powertrain
#4: Directly connected to exhaust manifold

ABBREVIATIONS

id000000801000

ATF	Automatic Transaxle Fluid
LH	Left Hand
RH	Right Hand
SST	Special Service Tool
TFT	Transaxle Fluid Temperature
2WD	2 Wheel Drive

TRANSMISSION/TRANSAXLE

05
SECTION

05-13 AUTOMATIC TRANSMISSION

AUTOMATIC TRANSMISSION DISASSEMBLY

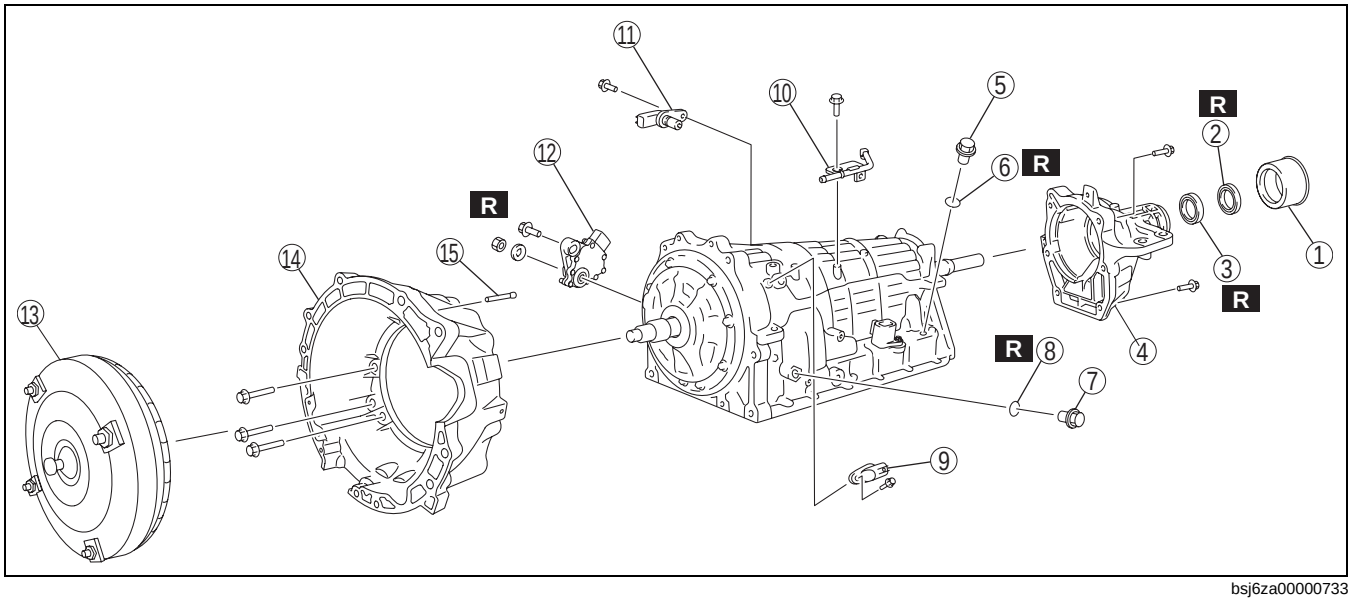
id051300260100

Precaution

The following are precautions that must be followed performing removal/installation.

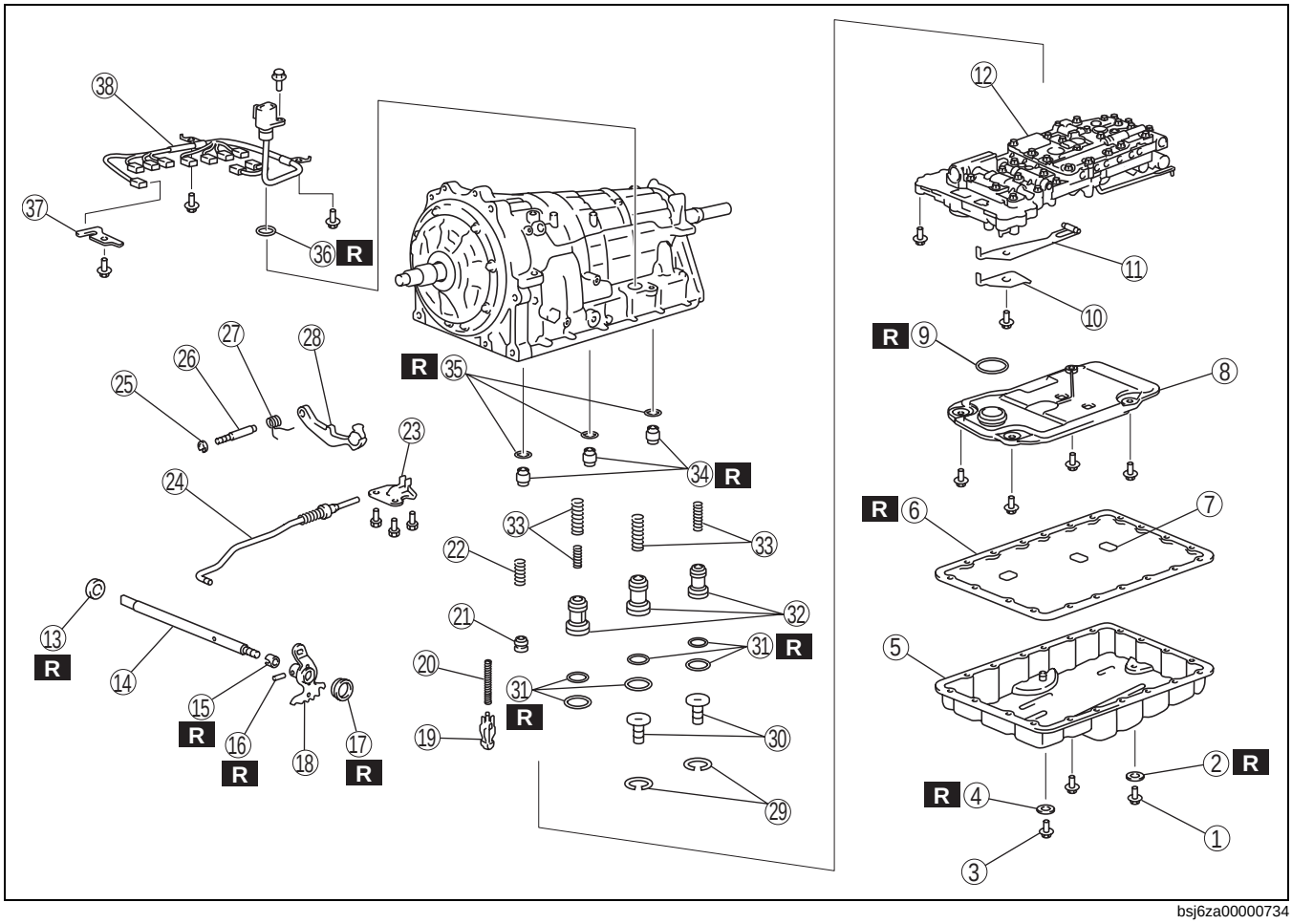
1. Handle electronic parts with care
   - Do not pull the wiring harness forcibly when disconnecting the connector. Unlock the first and pull the connector.
   - When connecting the connector, verify that it is inserted until it is properly locked. (Verify that a click sound is heard.)
   - Do not apply shock to electronic parts. Replace with new parts if they have been dropped or subjected to shock.
2. Prevent foreign matter from penetrating
   - Be sure to remove foreign matter such as dust and sand from the automatic transaxle before removing parts.
   - Protect removed parts from dust with an object such as a vinyl sheet.
   - Do not use cotton work gloves or shop rags as frayed strings might get caught in the unit. Work with bare hands or use vinyl gloves.
3. Prevent scratching
   - Do not pry with a screwdriver forcibly. Slightly tap the case with a plastic hammer when separating component cases at seams.
   - Do not pull the valve forcibly.
   - Be careful not to get the wiring harness caught between parts during installation.
4. Prevent incorrect or insufficient, installation or missing parts
   - Be careful not to install parts incorrectly or lose parts since there are similar types of O-rings, snap rings, bearings and races. Be careful to for straighten parts and check their installation direction.
   - Be careful not to drop small parts such as check balls or lose them during installation.
5. Wash parts and apply oil
   - Wash each part before installing and dry using compressed air, and then apply the specified ATF type JWS3309.
   - Soak discs in ATF type JWS3309 before installing. In particular, soak a new disc for **2 h or more** so that the oil seeps into the lining.
   - If the thrust bearing or race falls during installation, use a small amount of yellow petrolatum grease.
   - Apply ATF type JWS3309 to contact and rotating surfaces.
   - Do not apply oil or drive the vehicle immediately after installing a part applied with sealant. Leave it for **one hour or more**.
   - Do not wash aluminum parts or rubber parts with alkaline chemicals.
   - Do not wash rubber parts with isopropyl alcohol (IPA).
6. ATF care
   - If ATF is spilled on the floor, wipe it off immediately, as it is quite slippery and dangerous.
   - Be sure to use JWS3309 type ATF.

Disassembly
Components



bsj6za00000733

1	Extension dust deflector
2	Extension housing shroud
3	Oil seal
4	Extension housing
5	Filler plug
6	O-ring
7	Drain plug
8	O-ring
9	VSS
10	Breather tube
11	Turbine sensor
12	TR switch
13	Torque converter
14	Converter housing
15	Breather pipe



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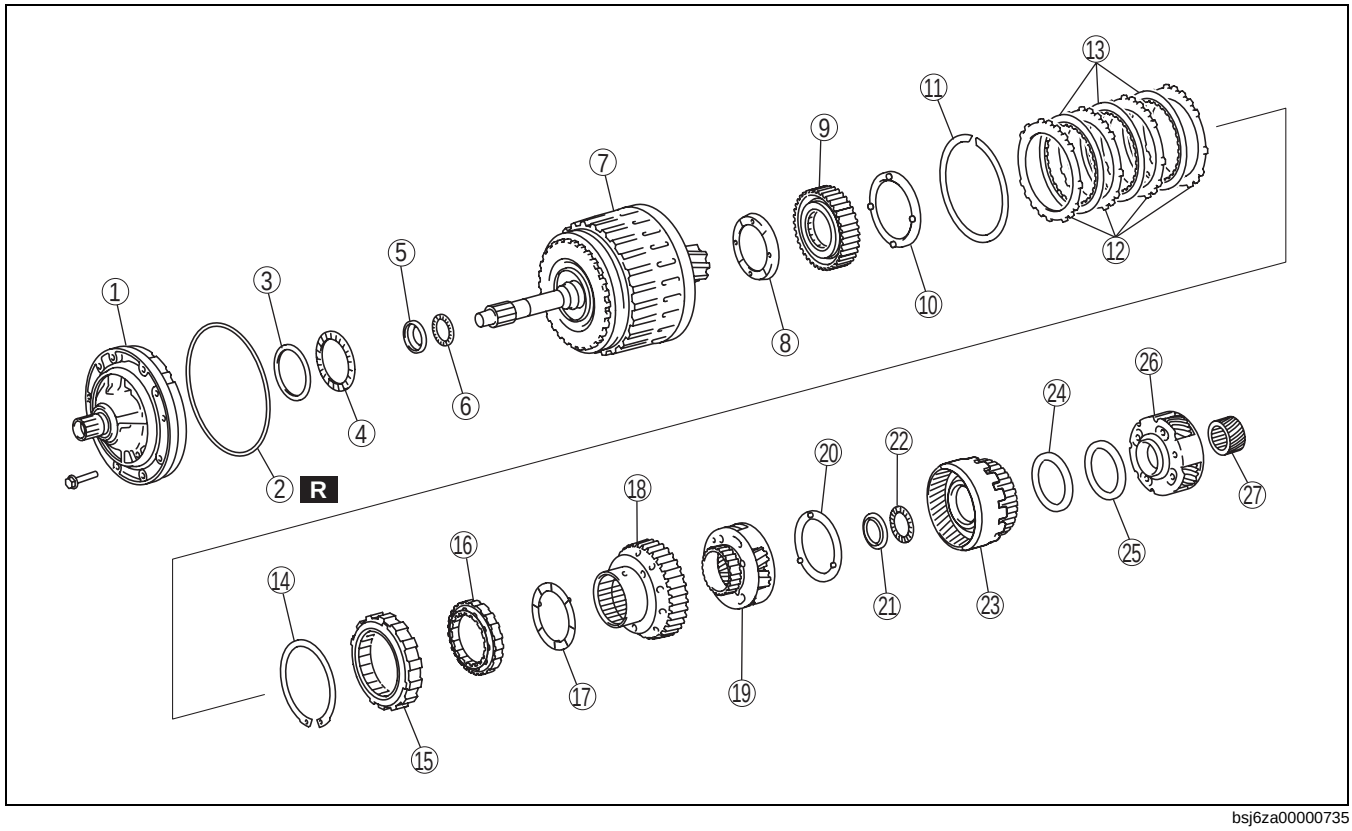
1	Drain plug
2	Gasket
3	Overflow plug
4	Gasket
5	Oil pan
6	Oil pan gasket
7	Magnet
8	Oil strainer
9	O-ring
10	Detent spring cover
11	Detent spring
12	Control valve body
13	Oil seal
14	Manual shaft
15	Manual shaft washer
16	Pin
17	Oil seal
18	Manual valve
19	Check valve
20	Spring
21	Accumulator piston
22	Spring
23	Bracket
24	Parking rod
25	Driven plate
26	Shaft parking pawl
27	Spring
28	Parking pawl
29	Snap ring
30	Spring
31	O-ring
32	Accumulator piston

33	Accumulator spring
34	Gasket
35	Gasket

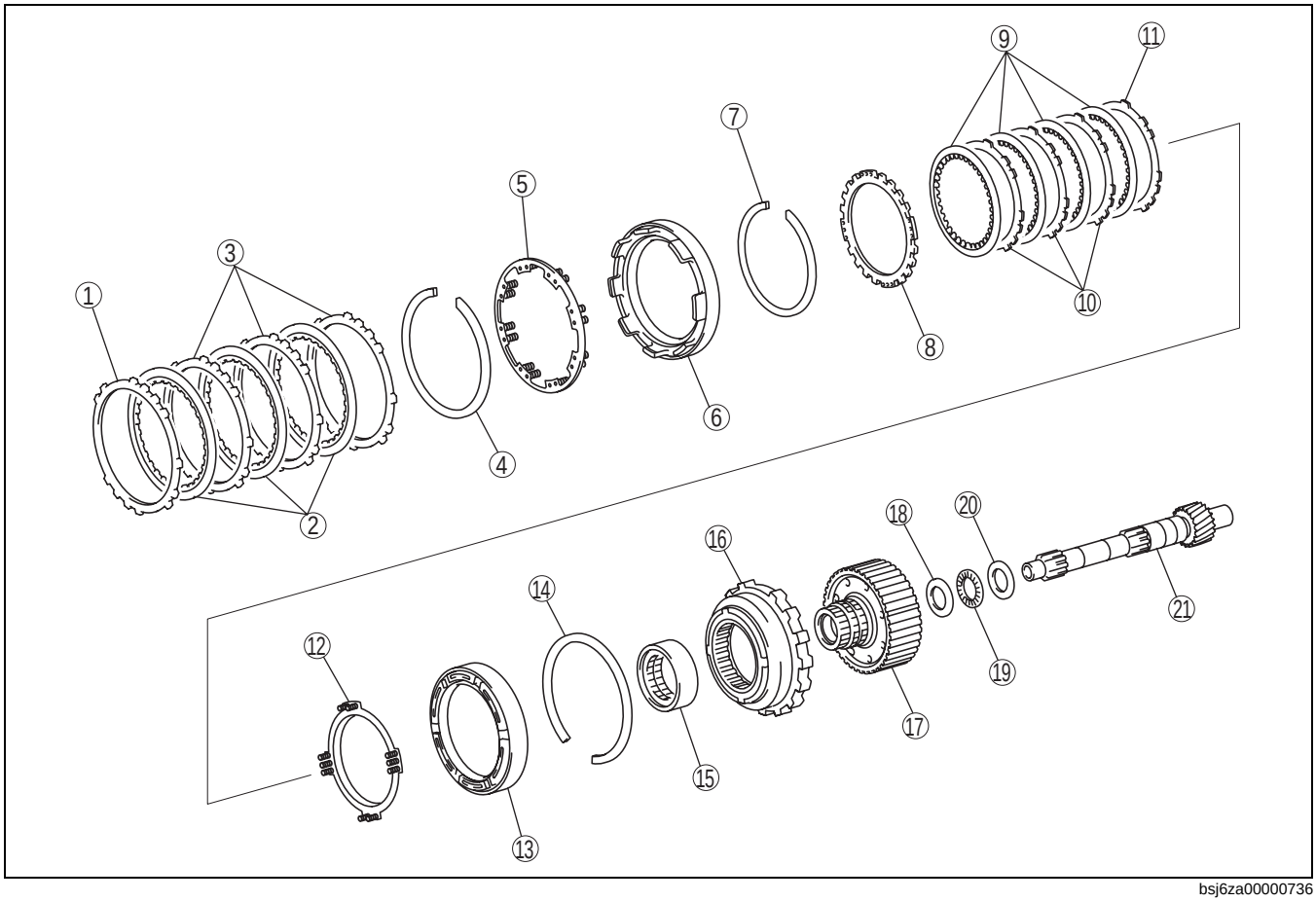
36	O-ring
37	Clip
38	Coupler component



bsj6za00000735

1	Oil pump
2	O-ring
3	Bearing race
4	Thrust needle bearing
5	Bearing race
6	Thrust needle bearing
7	Clutch drum component
8	Thrust washer
9	F2 one-way clutch
10	Thrust washer
11	Snap ring
12	Driven plate
13	Drive plate
14	Snap ring

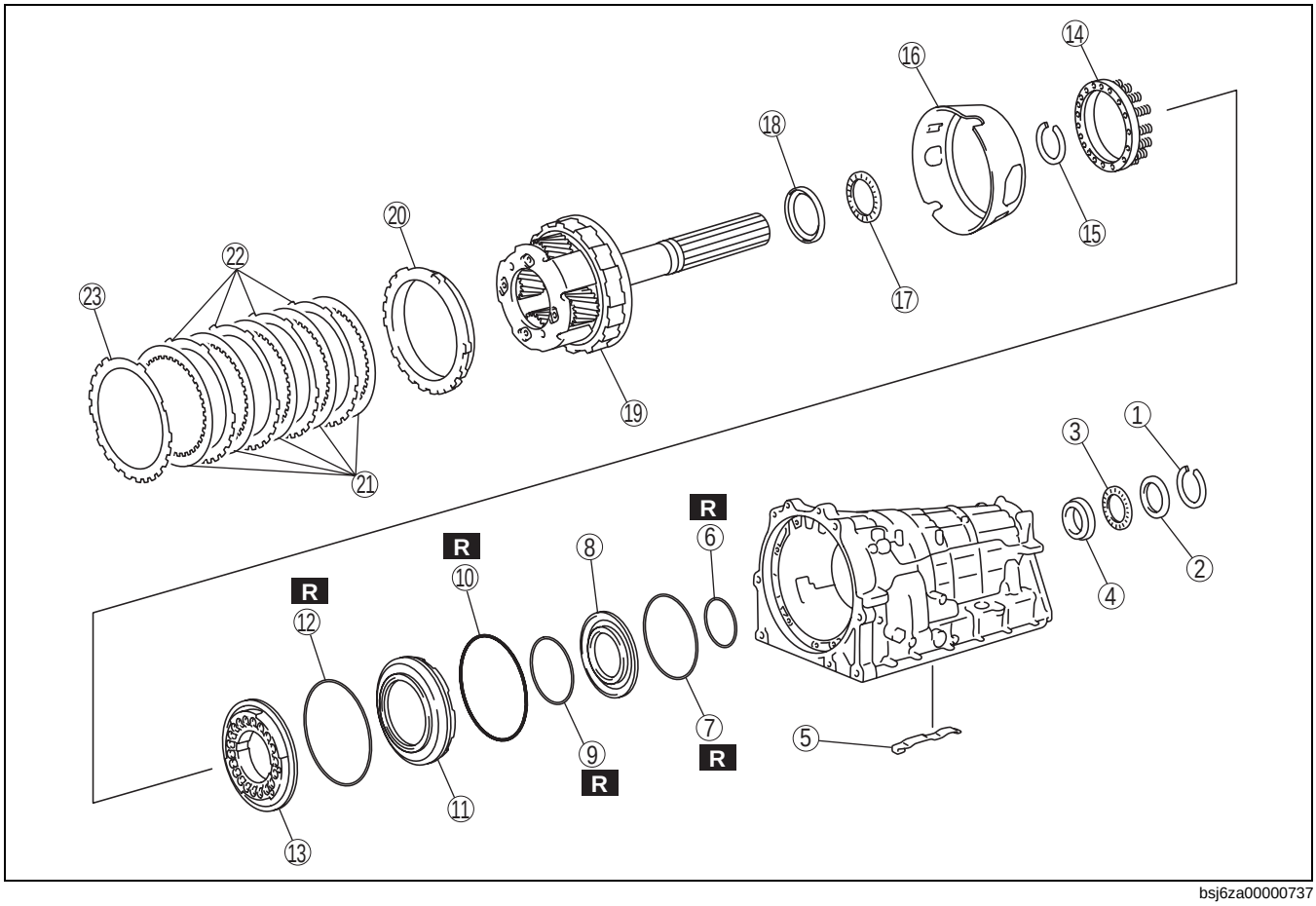
15	B3 brake piston component
16	F1 one-way clutch
17	Thrust washer
18	Bearing race
19	Front planetary gear component
20	Thrust washer
21	Bearing race
22	Thrust needle bearing
23	Front and middle ring gear component
24	Thrust needle bearing
25	Bearing race
26	Front planetary gear component
27	Sun gear



bsj6za00000736

1	Retaining plate
2	Driven plate component
3	Driven plate
4	Snap ring
5	Pinion return spring
6	B1 brake piston component
7	Snap ring
8	Retaining plate
9	Drive plate
10	Driven plate
11	Driven plate

12	Pinion return spring
13	B2 brake piston component
14	Snap ring
15	Inner race
16	F3 one-way clutch
17	Rear ring gear component
18	Bearing race
19	Needle bearing
20	Bearing race
21	Intermediate shaft



bsj6za00000737

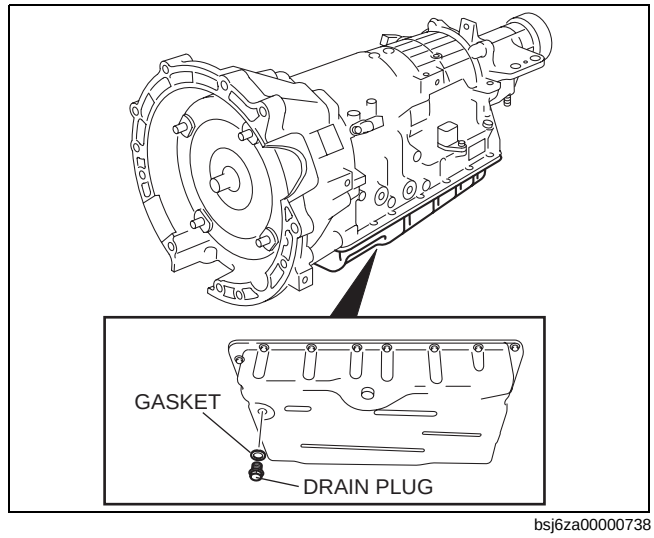
1	Snap ring
2	Bearing race
3	Thrust needle bearing
4	Bearing race
5	Stopper spring
6	O-ring
7	O-ring
8	Inner brake piston
9	O-ring
10	O-ring
11	Sleeve
12	O-ring

13	B4 brake piston
14	Piston return spring
15	Snap ring
16	Brake tube
17	Thrust needle bearing
18	Bearing race
19	Rear planetary gear component
20	O-ring
21	Inner brake piston
22	O-ring
23	O-ring

Disassembly procedure

1. Remove the drain plug and gasket.

Caution
- **Do not damage the oil seal.**
- **Do not drop the torque converter.**



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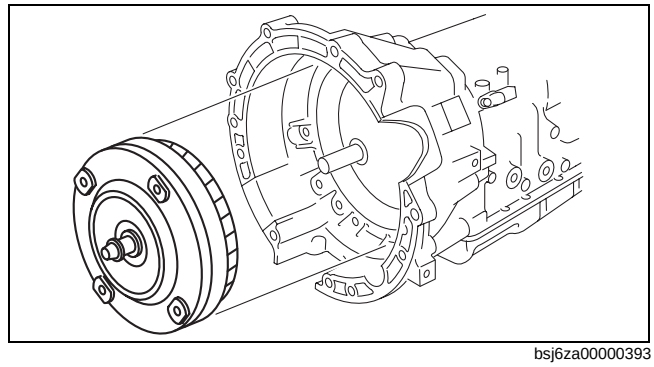
2. Remove the torque converter.



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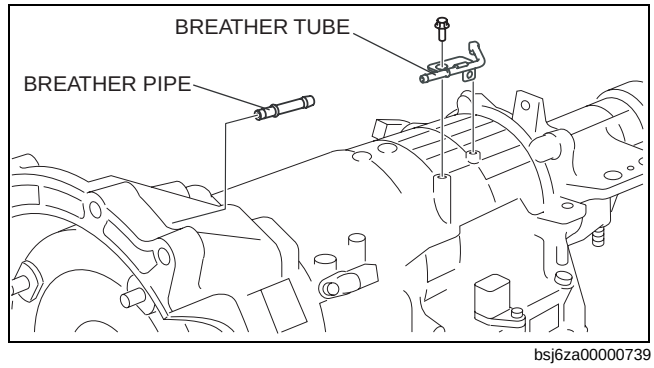
3. Remove the breather hose and breather pipe.

Caution
- **Do not damage the turbine sensor.**



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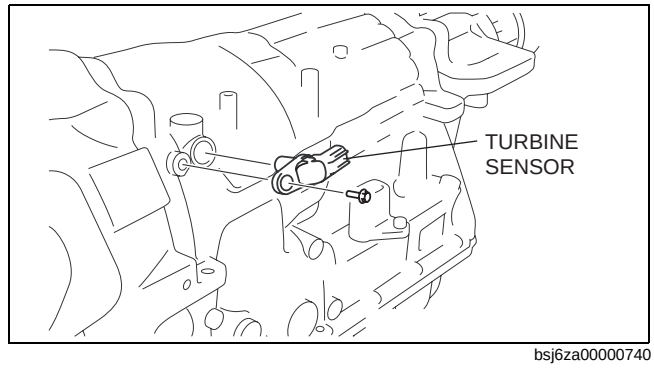
4. Remove the turbine sensor.

Caution
- **Do not damage the VSS.**



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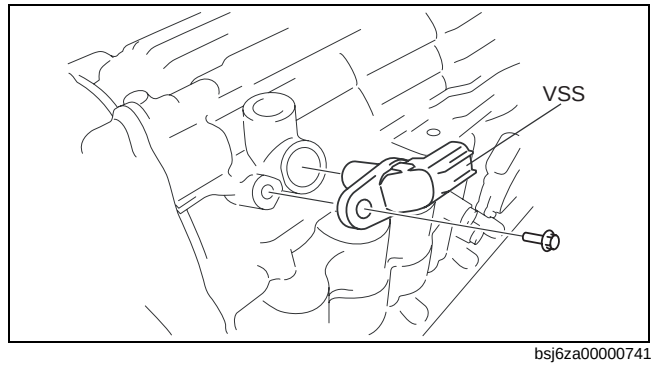
5. Remove the VSS.



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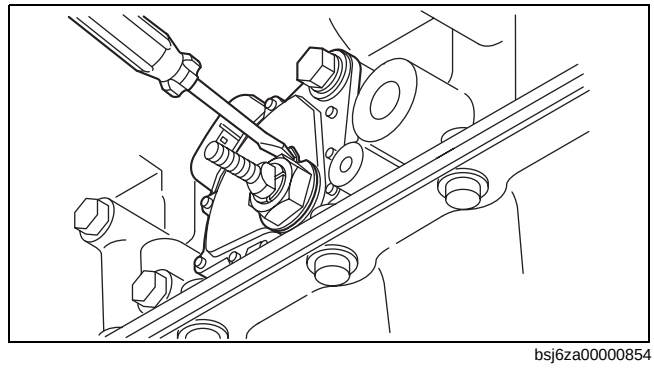
6. Lift up the lock washer using a flathead screwdriver.



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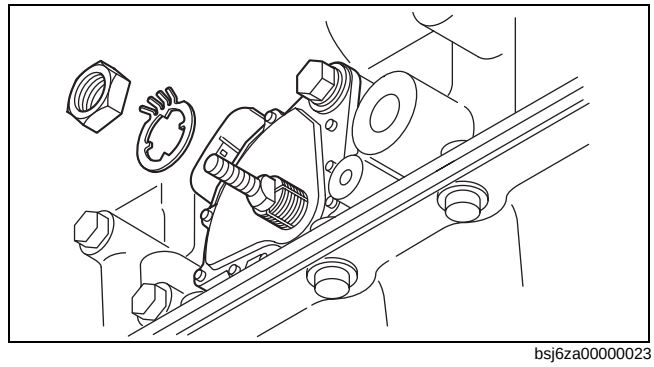
7. Remove the nut and lock washer.

Caution
- **Do not damage the TR switch.**



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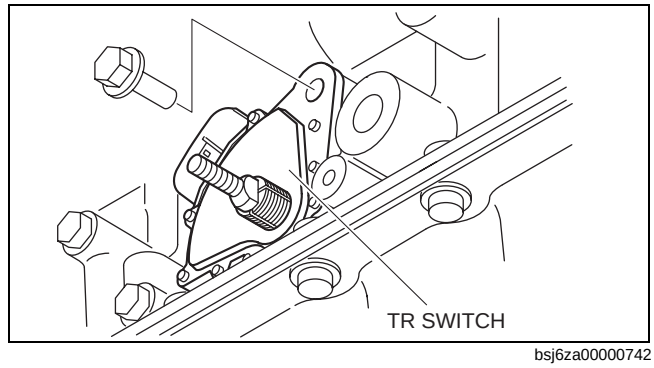
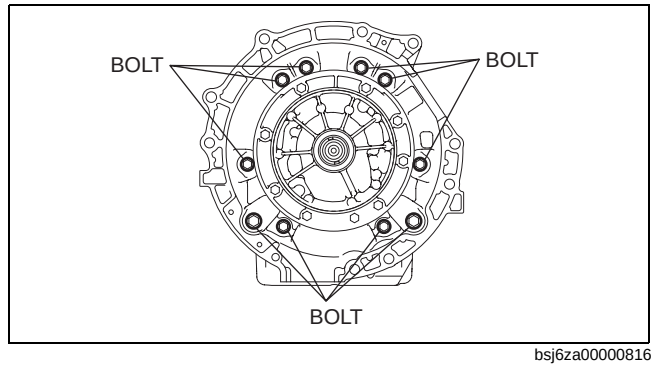
8. Remove the TR switch.



bsj6za00000742

9. Remove the bolts as shown in the figure.

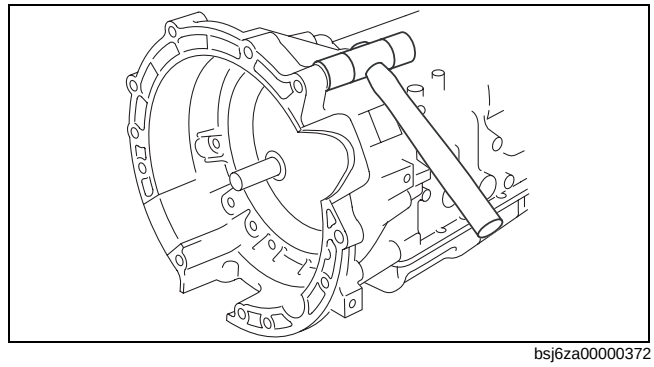
Caution
- **Do not damage the fitting surface of the transmission case and the converter housing.**



bsj6za00000816

10. Using a plastic hammer, tap the converter housing to remove it.

Caution
- **Do not damage the fitting surface of the extension housing and the extension dust deflector.**



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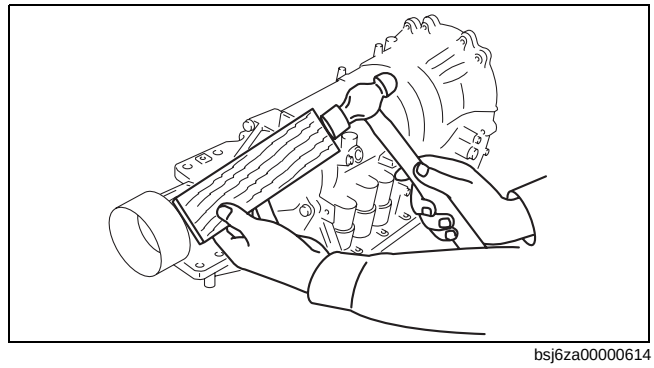
11. Using a plastic hammer and slab of wood, tap the extension dust deflector to remove it.

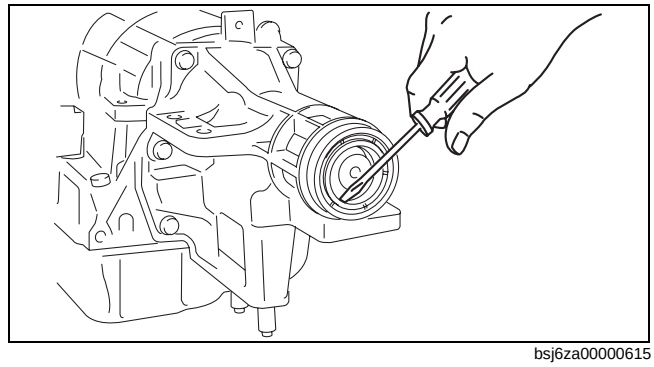
Caution
- **Do not damage the extension housing.**



bsj6za00000614

12. Using a flathead screwdriver, remove the extension housing shroud.

Caution
- **Do not damage the extension housing.**



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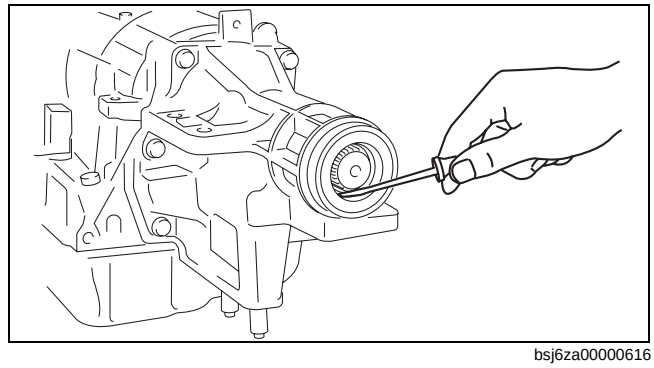
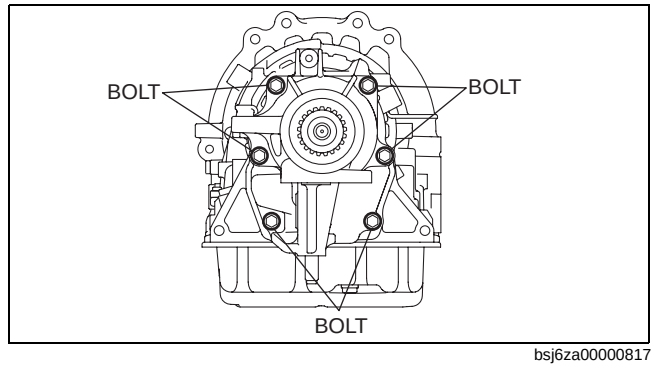
13. Using a flathead screwdriver, remove the oil seal.



bsj6za00000616

14. Remove the bolts as shown in the figure.

Caution
- **Do not damage the fitting surface of the transmission case and the extension housing.**



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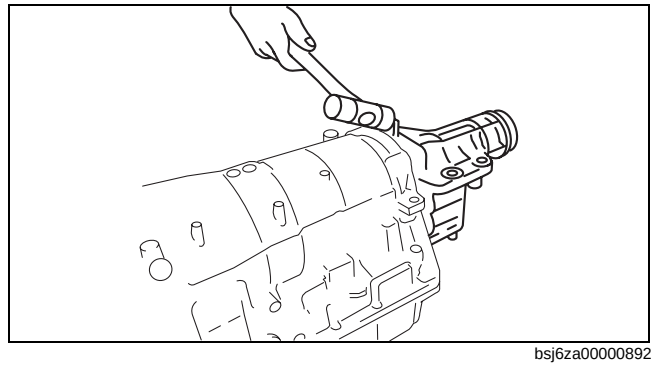
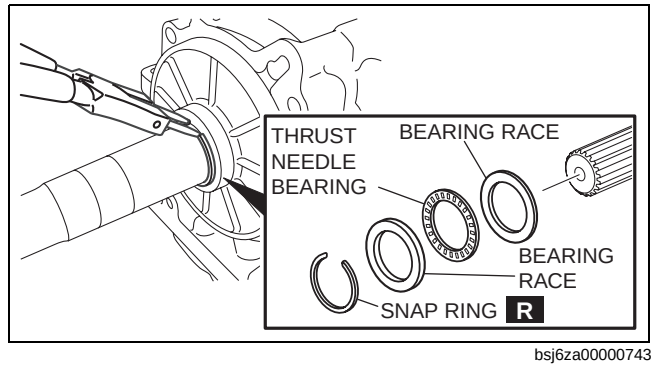
15. Using a plastic hammer, tap the extension housing to remove it.



bsj6za00000892

16. Remove the snap ring using snap ring pliers.

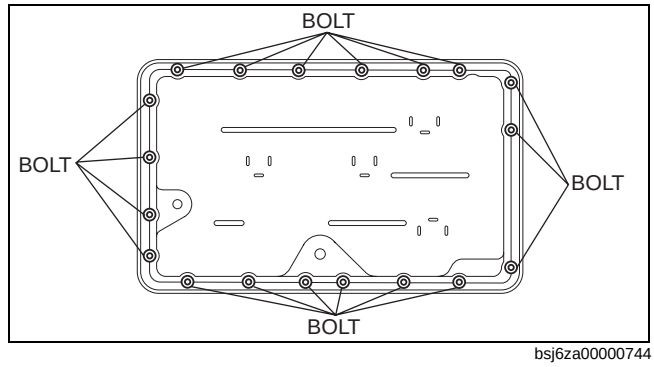
Caution
- **Do not damage the fitting surface of the transmission case and the oil pan.**
- **Do not deform the oil pan.**



bsj6za00000743

17. Remove the bolt as shown in the figure and remove the oil pan and gasket.
18. Remove the magnet from the oil pan.

Note
- Inspect the oil pan for foreign material and determine the worn areas of the transmission. For ferrous metal related areas, check for wear of the bearings, gears, and plates. For brass related metal (non-magnetized), check for bushing wear.



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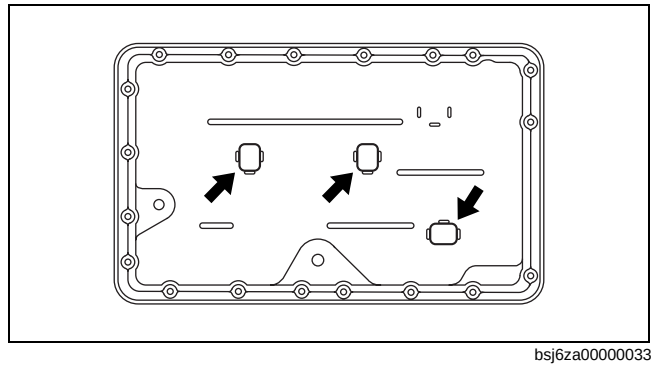
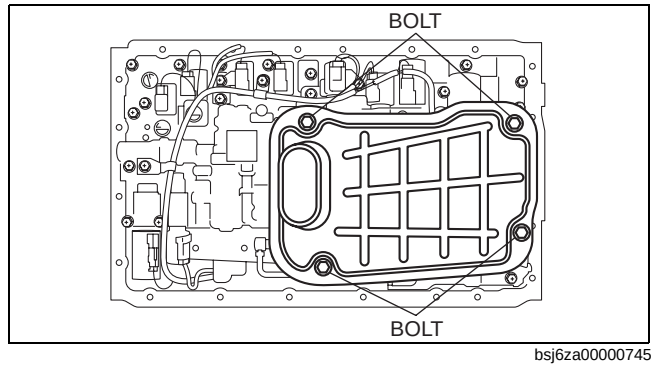


bsj6za00000033

19. Remove the oil strainer from the control valve body component.
20. Remove the O-ring from the oil strainer.



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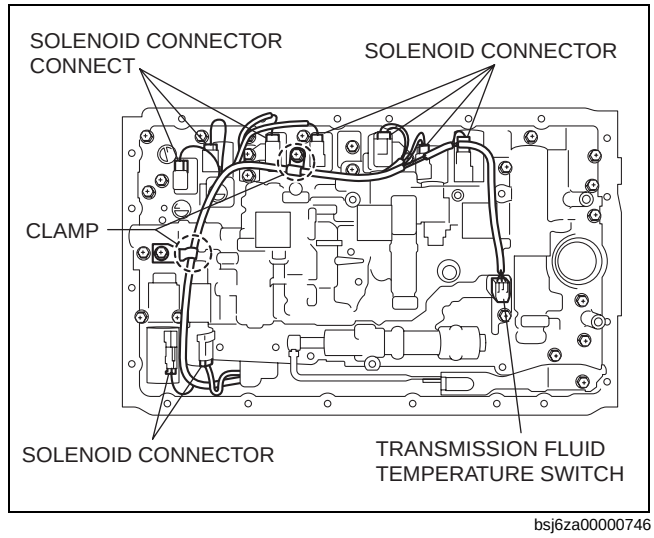
21. Disconnect the solenoid connectors from the solenoids.
22. Disconnect the coupler component from the clamps.

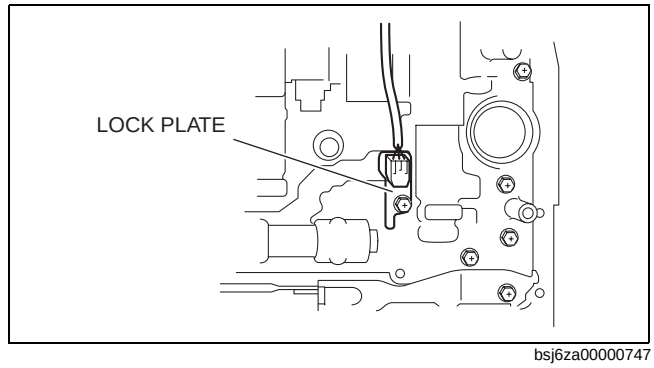


bsj6za00000746

23. Remove the lock plate from the control valve body component.

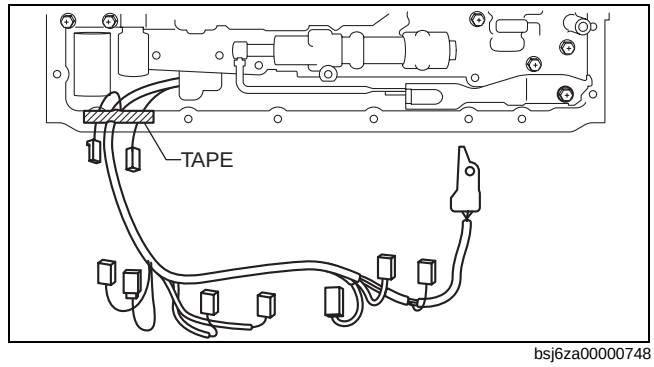
Caution
- **When installing the control valve body, make sure that it does not interfere with the coupler component.**

24. Disconnect the transmission fluid temperature switch from the control valve body component.



bsj6za00000747

25. Fix the coupler component with tape to the transmission case as shown in the figure.



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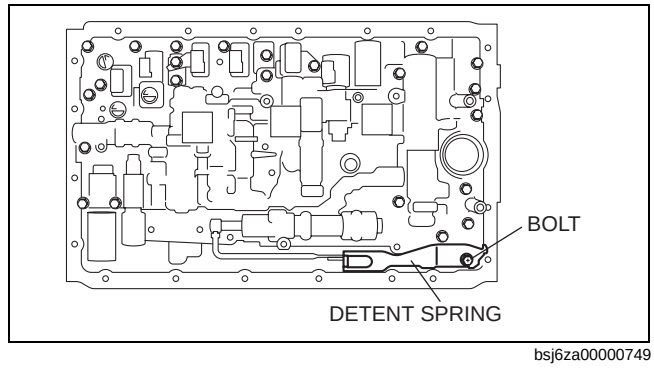
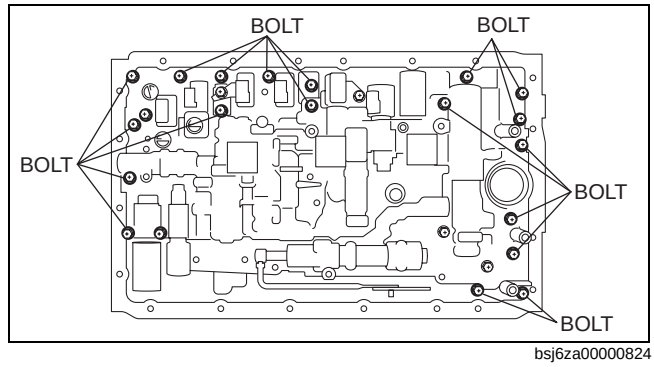
26. Disconnect the detent spring cover and detent spring from the control valve body component.

Caution
- **Do not drop the control valve body component.**



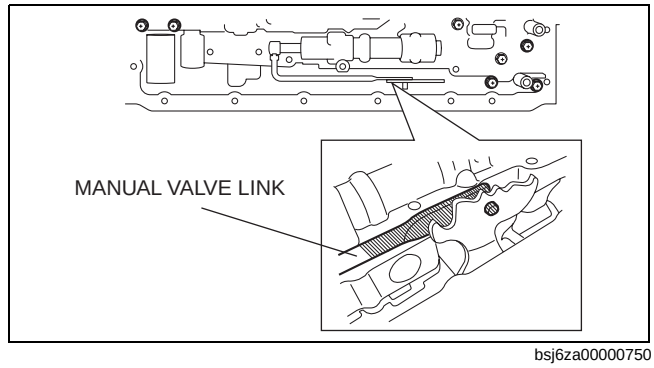
bsj6za00000749

27. Remove the bolts from transmission case.



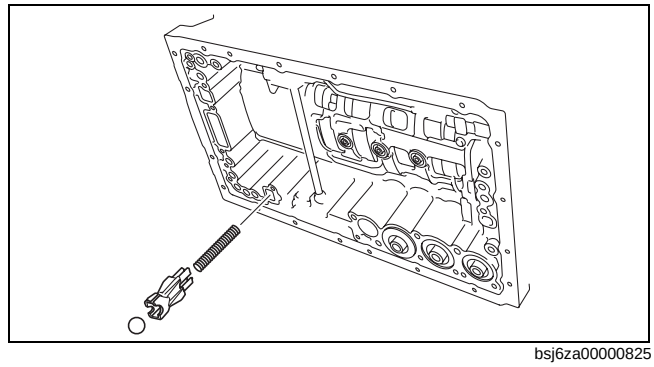
bsj6za00000824

28. Disconnect the manual valve link and remove the control valve body component.



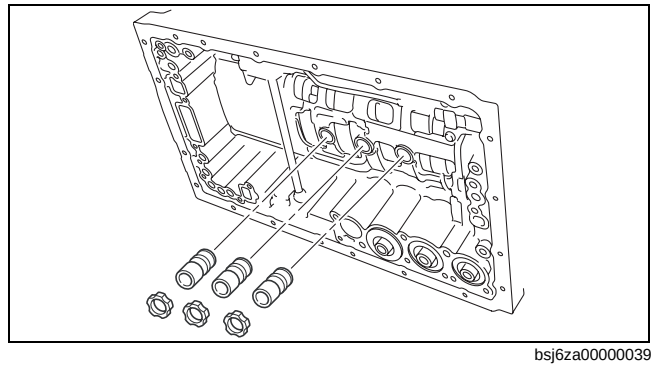
bsj6za00000750

29. Remove the check valve subcomponent and compression spring from transmission case.

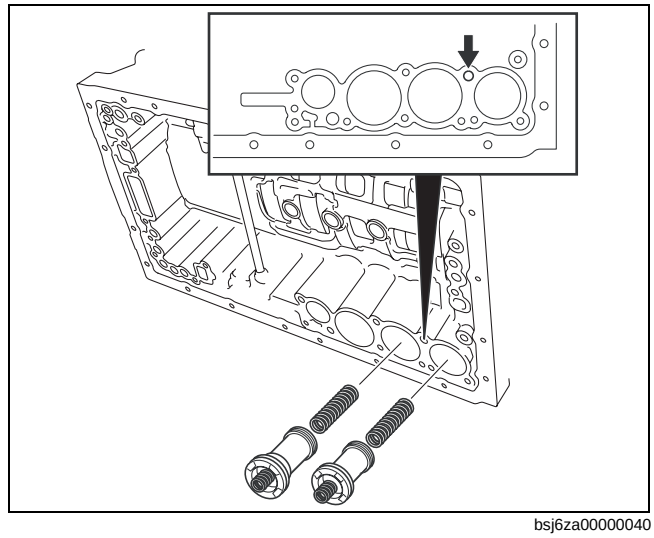

bsj6za00000825

30. Remove the transmission case gasket and brake drum gasket from transmission case.

Caution
- **Be careful of the accumulator pistons A and B as they pop out.**


bsj6za00000039

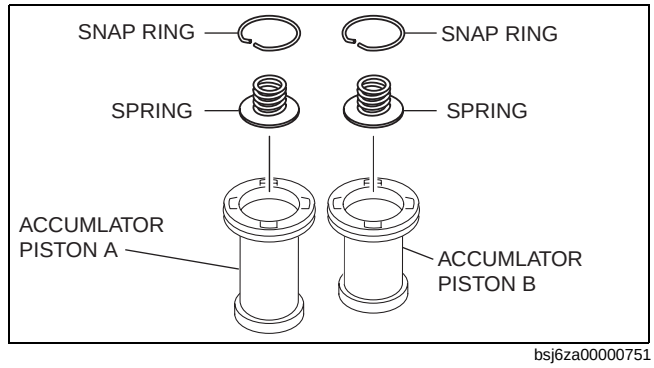
31. Blow compressed air from the oil passage shown in the figure and remove accumulator pistons A and B and the compression spring from the transmission case.



bsj6za00000040

32. Using a flathead screwdriver, remove the snap ring from accumulator pistons A and B.
33. Remove the compression spring from accumulator piston A and B.

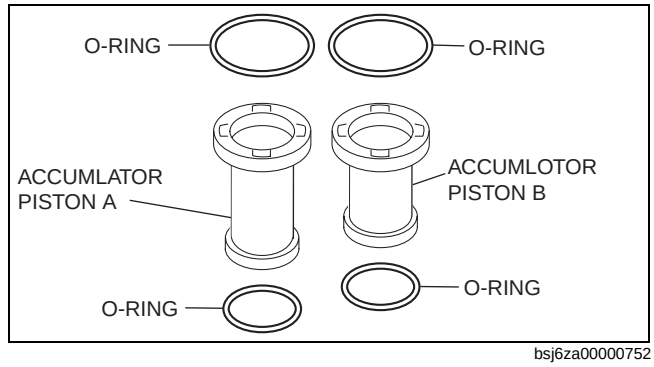
Caution
- **Do not damage the accumulator pistons.**



bsj6za00000751

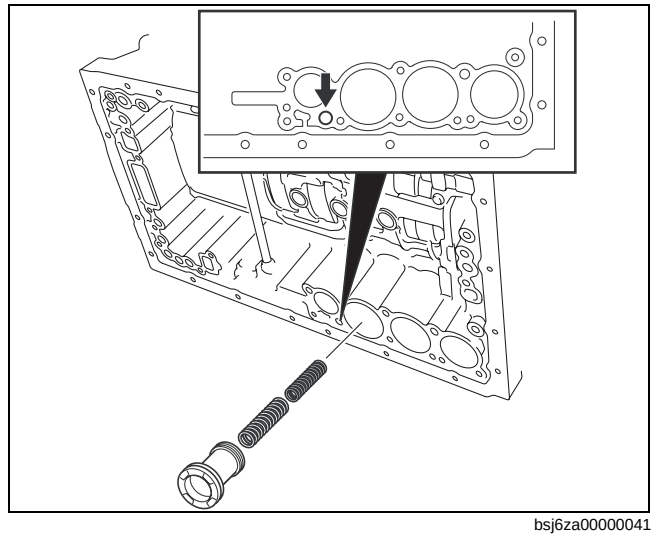
34. Using a flathead screwdriver, remove the O-ring from accumulator piston A and B.

Caution
- **Be careful of the accumulator pistons C as they pop out.**



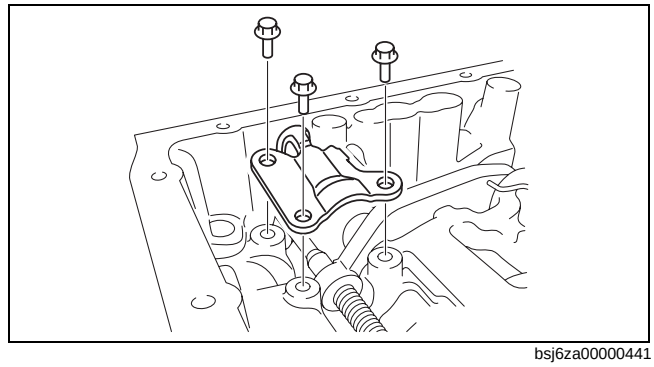
bsj6za00000752

35. Blow compressed air from the oil passage shown in the figure and remove accumulator pistons C and the compression springs from the transmission case.
36. Using a flathead screwdriver, remove the O-ring from accumulator pistons C.
37. Remove the accumulator valve and compression springs from the transmission case.



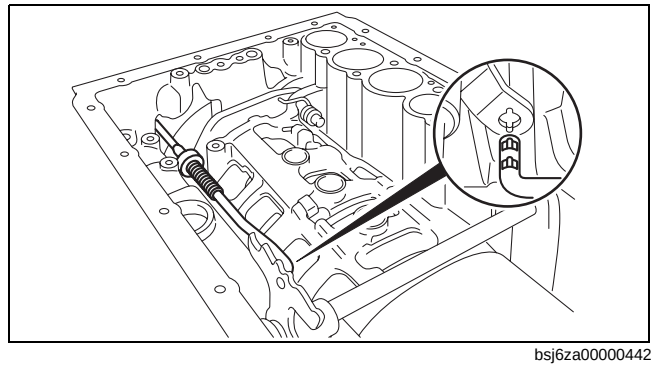
bsj6za00000041

38. Remove the bracket.



bsj6za00000441

39. Remove the parking rod from the manual valve lever.

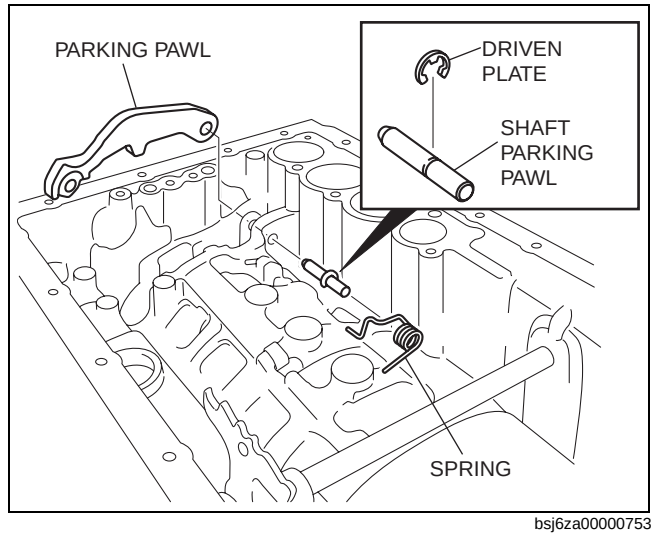


bsj6za00000442

40. Pull out the shaft parking pawl and spring.

Caution
- **Be careful not to apply too much force to the torsion spring.**

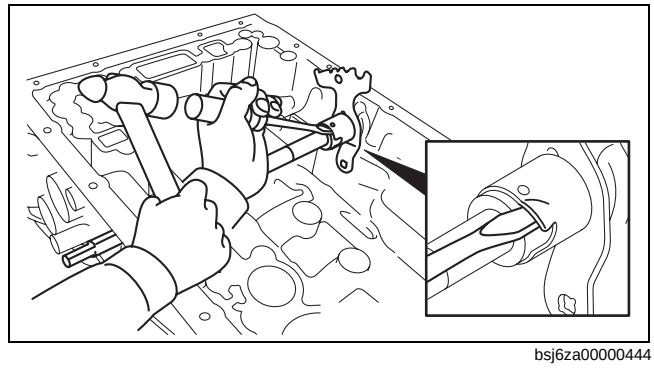
41. Using a flathead screwdriver, remove the driven plate from shaft parking pawl.
42. Remove the parking pawl.



bsj6za00000753

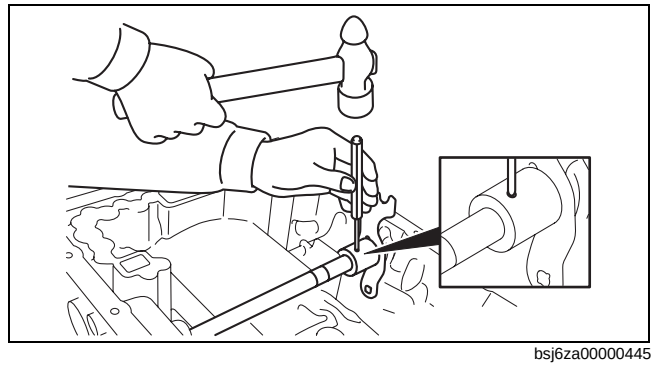
43. Using a flathead screwdriver and hammer, remove the manual shaft washer.

Caution
- **Do not damage the manual valve component.**



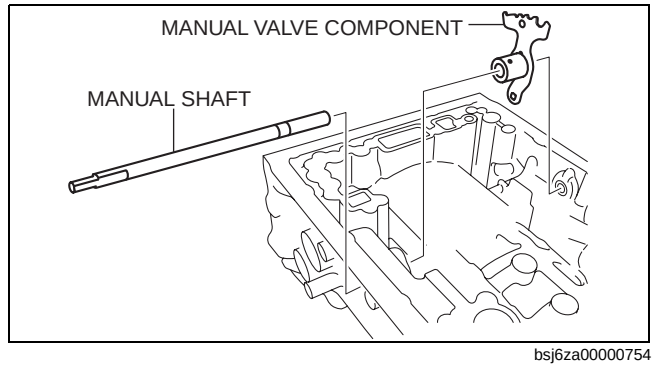
bsj6za00000444

44. Using a hammer and pin punch, remove the pin.



bsj6za00000445

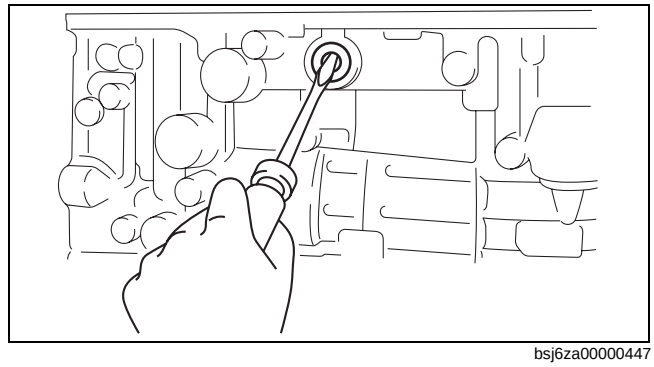
45. Pull out the manual shaft and remove the manual valve component.



bsj6za00000754

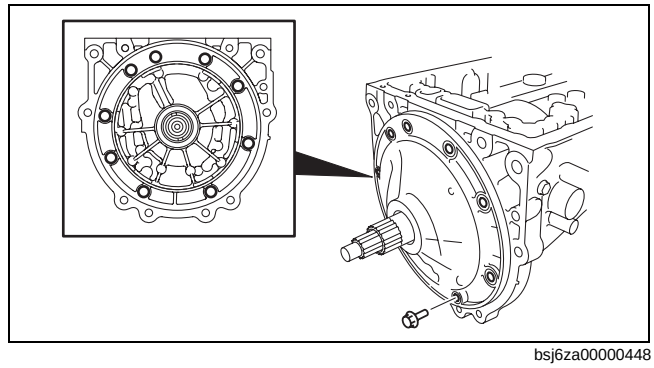
46. Using a flathead screwdriver, remove the oil seal.

Caution
- **Do not damage the transmission case component.**



bsj6za00000447

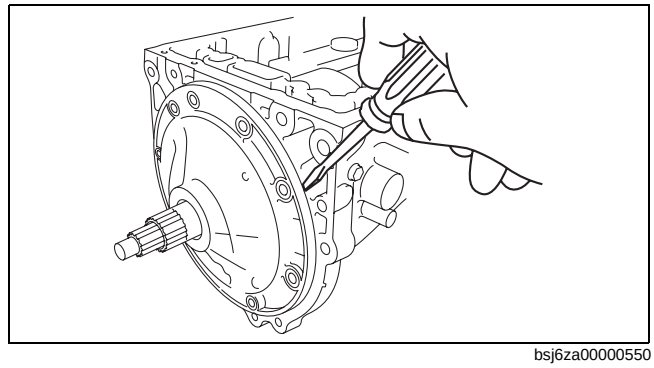
47. Remove the bolts from the oil pump as shown in the figure.



bsj6za00000448

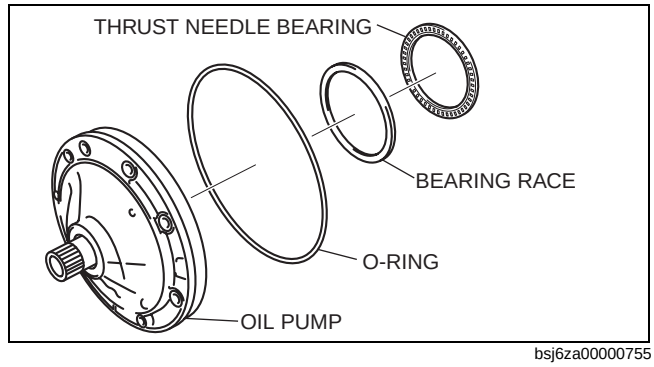
48. Using a flathead screwdriver, remove the oil pump.

Caution
- **Do not damage the oil pump.**



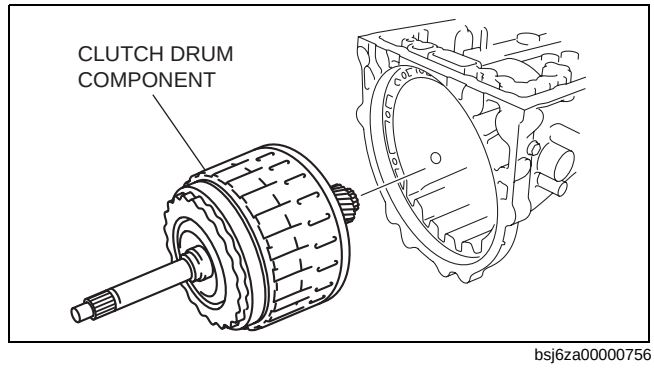
bsj6za00000550

49. Remove the O-ring from the oil pump.
50. Remove the thrust needle bearing and bearing race from oil pump.



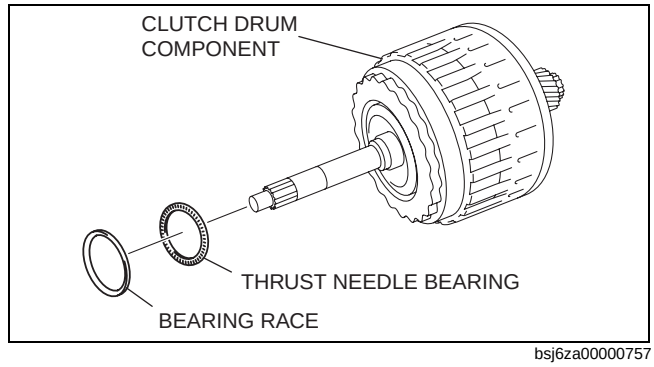
bsj6za00000755

51. Remove the clutch drum component.



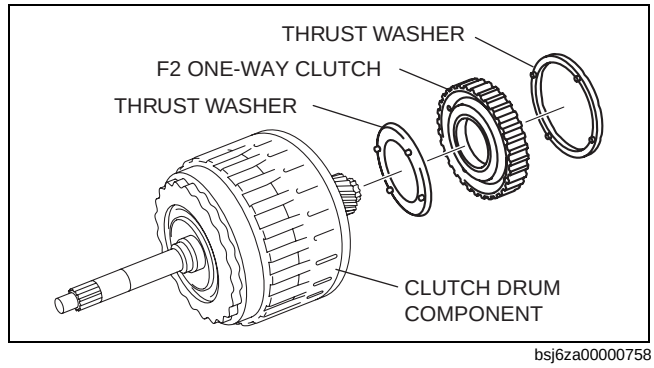
bsj6za00000756

52. Remove the thrust needle bearing and bearing race from the clutch drum component.



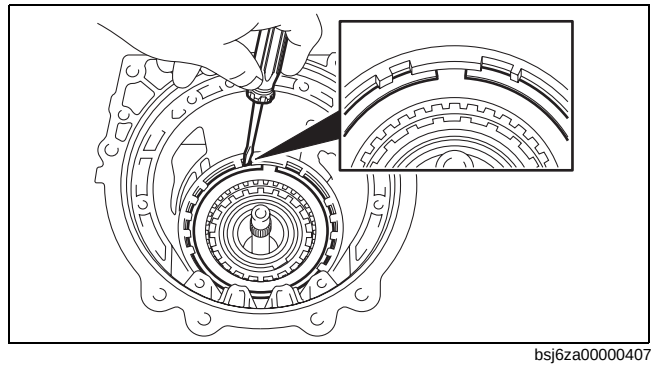
bsj6za00000757

53. Remove the thrust washer and F2 one-way clutch component from the clutch drum component.

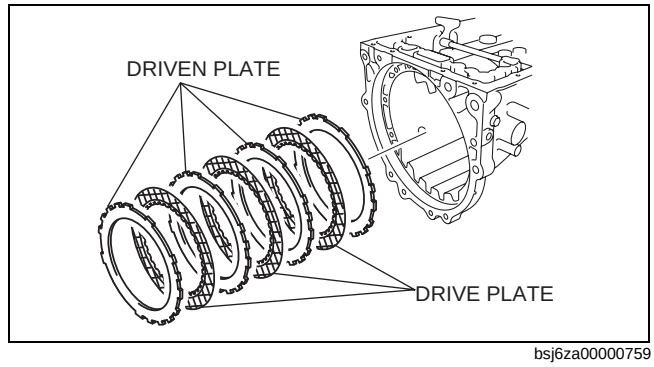


bsj6za00000758

54. Using a flathead screwdriver, remove the snap ring from the transmission case component.


bsj6za00000407

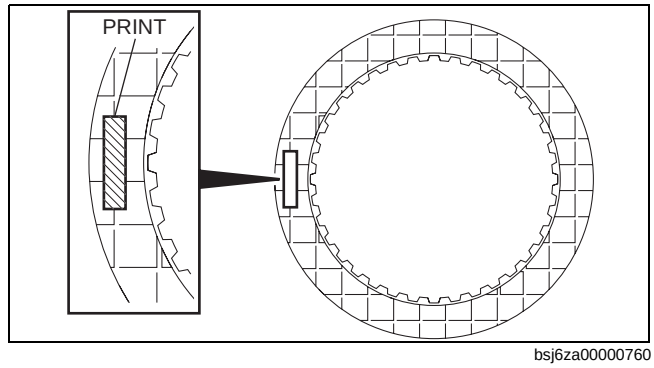
55. Remove the retaining plates, drive and driven plates.



bsj6za00000759

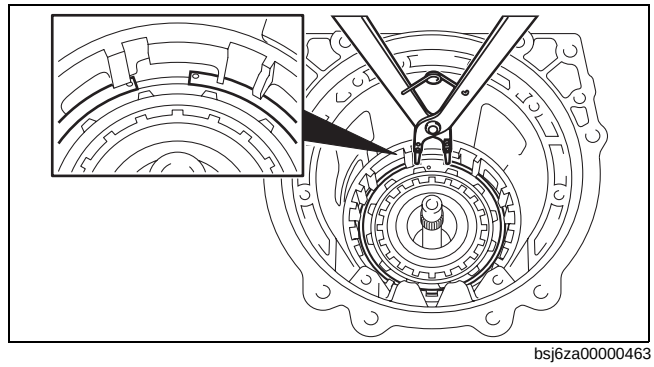
56. Inspect the lining of all drive plates.
    - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace with a new drive plate. When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate. If they are scratched or have changed color, replace with new parts.

    Note
    - Before replacing with new drive plates, soak them at **least 2 h** in ATF.



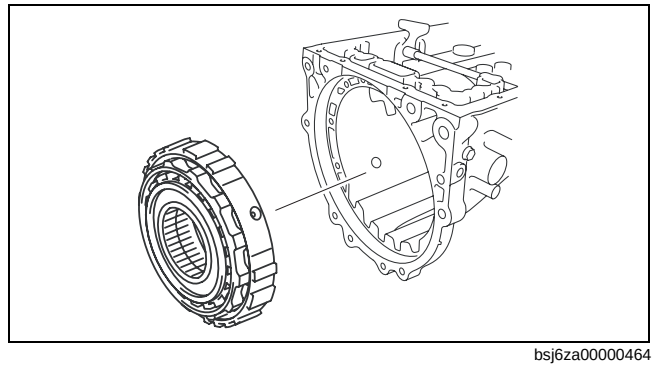
bsj6za00000760

57. Remove the snap ring from transmission case using snap ring pliers.



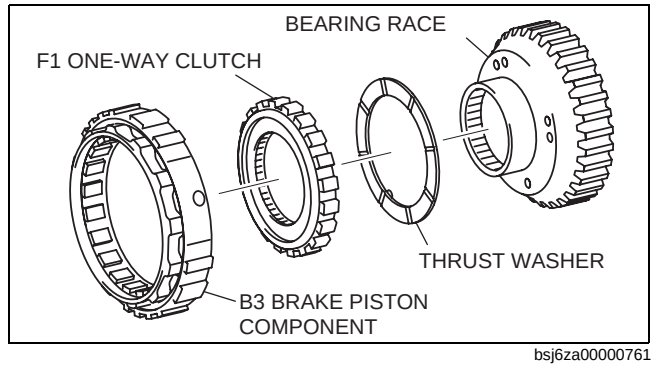
bsj6za00000463

58. Remove the B2 brake piston component and F1 one-way clutch.



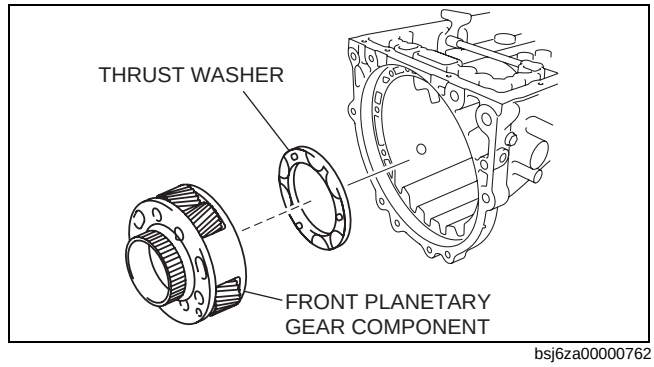
bsj6za00000464

59. Remove the bearing race and thrust washer from the F1 one-way clutch component.
60. Remove the F1 one-way clutch component from the B3 brake piston component.



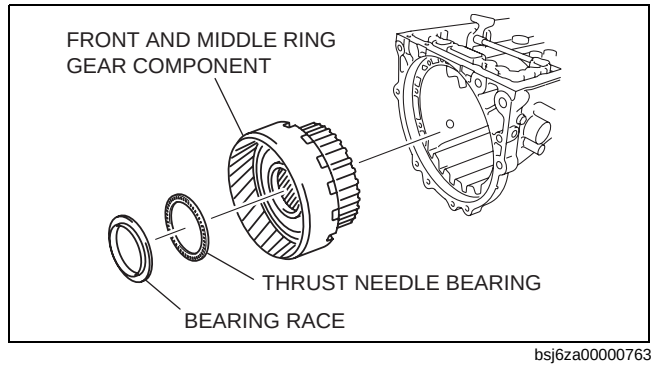
bsj6za00000761

61. Remove the front planetary gear component and thrust washer.



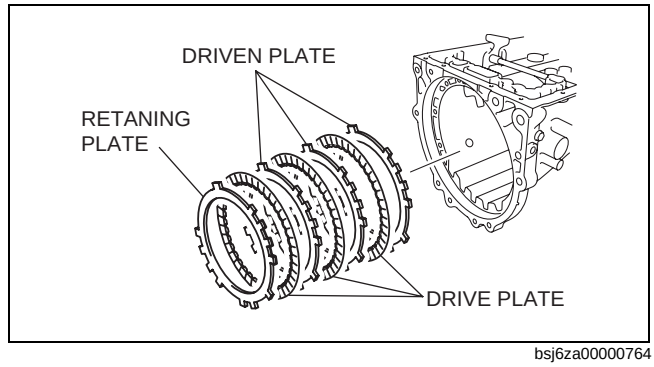
bsj6za00000762

62. Remove the front and middle ring gear component.
63. Remove the bearing race and thrust needle bearing from front and middle ring gear component.



bsj6za00000763

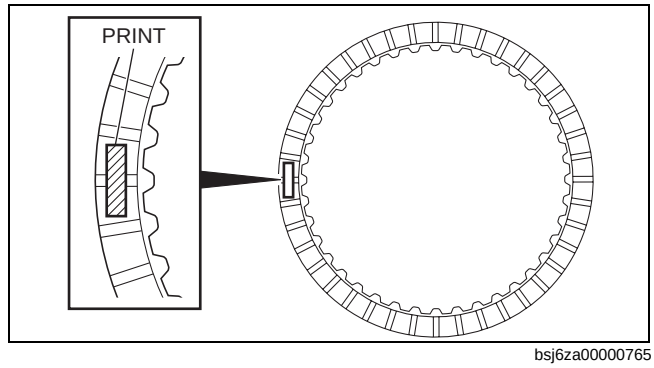
64. Remove the retaining plates, drive and driven plates.



bsj6za00000764

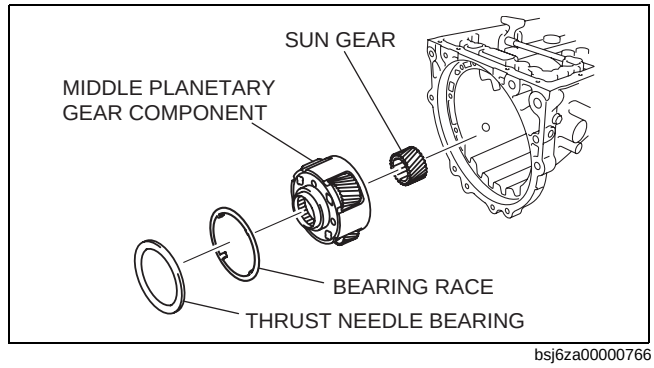
65. Inspect the lining of all drive plates.
    - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace with a new drive plate. When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate. If they are scratched or have changed color, replace with new parts.

    Note
    - Before replacing with new drive plates, soak them at **least 2 h** in ATF.



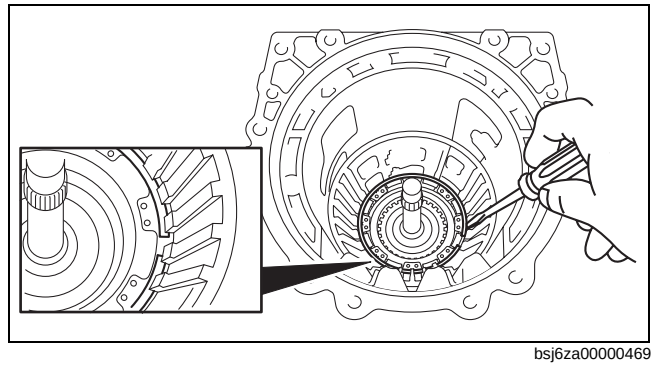
bsj6za00000765

66. Remove the middle planetary gear component and sun gear.
67. Remove the bearing race and thrust needle bearing from middle planetary gear component.



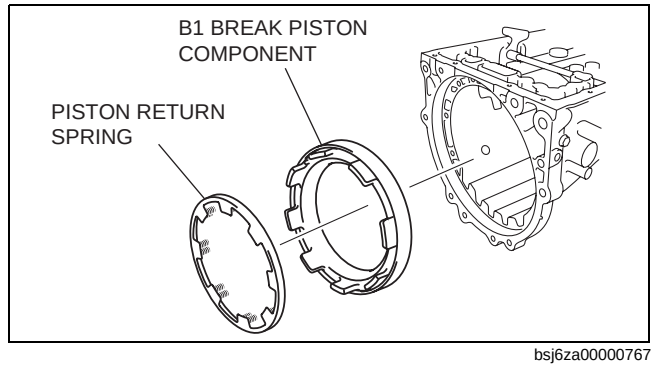
bsj6za00000766

68. Using a flathead screwdriver, remove the snap ring from transmission case component.



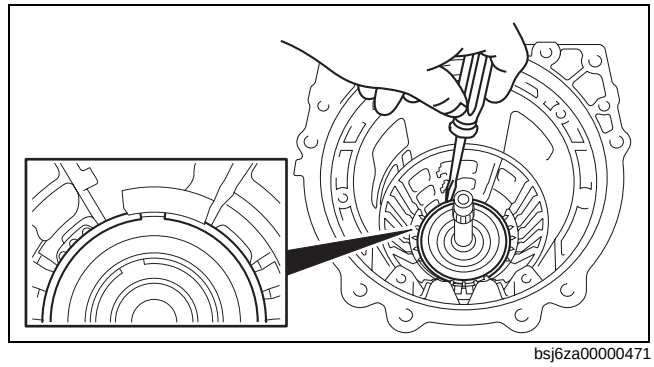
bsj6za00000469

69. Remove the piston return spring and B1brake piston component.



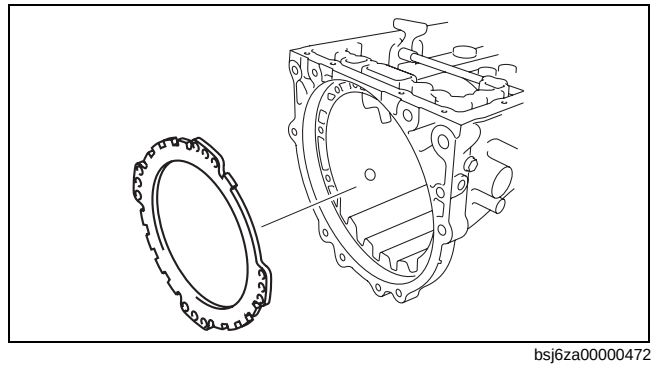
bsj6za00000767

70. Using a flathead screwdriver, remove the snap ring from transmission case.



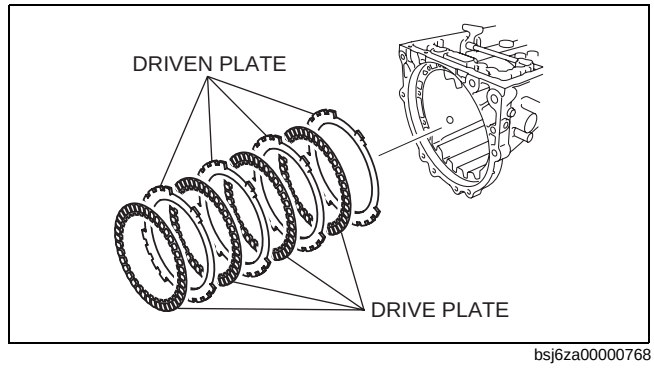
bsj6za00000471

71. Remove the driven plate.



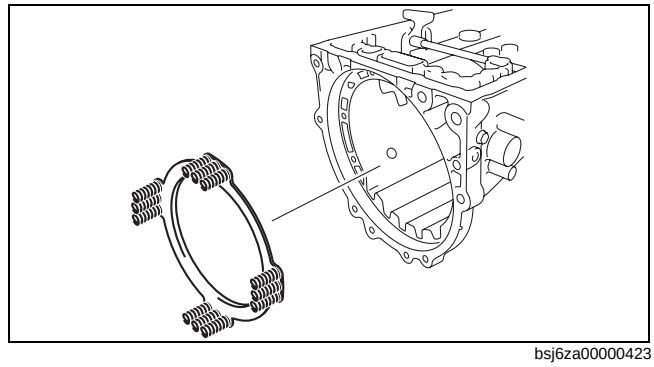
bsj6za00000472

72. Remove the retaining plates, drive and driven plates.



bsj6za00000768

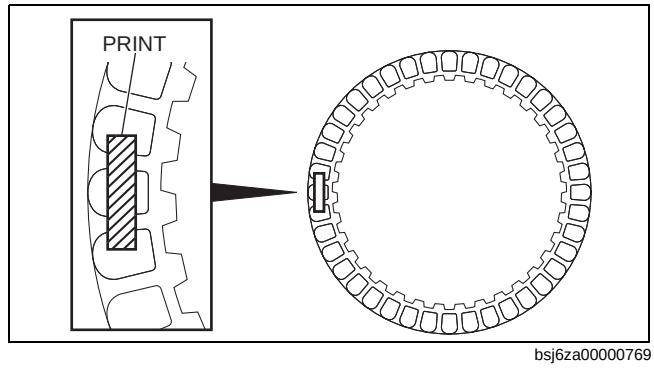
73. Remove the piston return spring.



bsj6za00000423

74. Inspect the lining of all drive plates
    - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace with a new drive plate. When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate. If they are scratched or have changed color, replace with new parts.

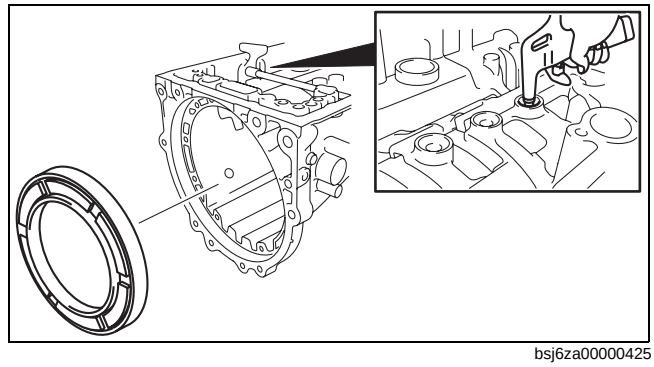
    Note
    - Before replacing with new drive plates, soak them at **least 2 h** in ATF.



bsj6za00000769

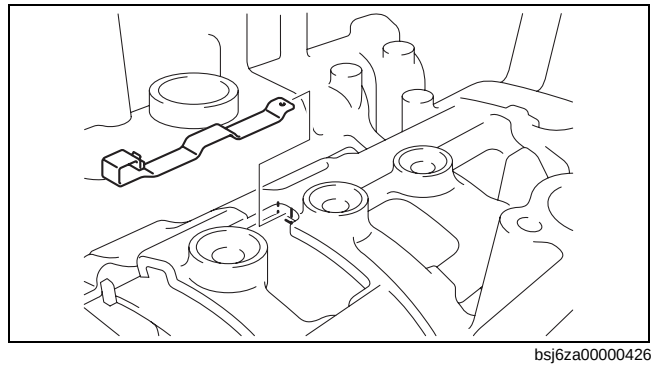
75. Blow compressed air into the oil passage as shown in the figure while pressing the B2 brake piston component by hand and remove the B2 brake piston component from the transmission case.

    Air pressure
    392 kPa {4 kgf/cm^2, 57 psi}



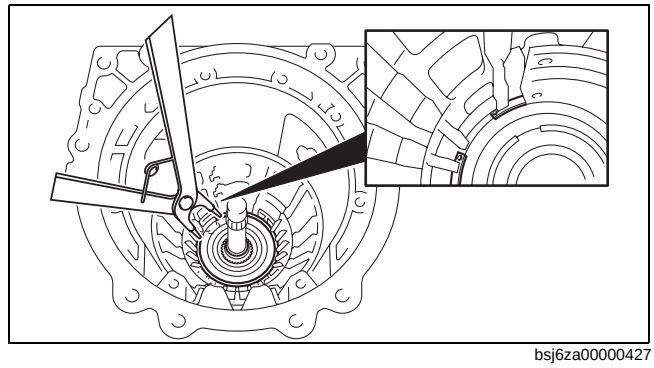
bsj6za00000425

76. Remove the stopper spring from the transmission case.



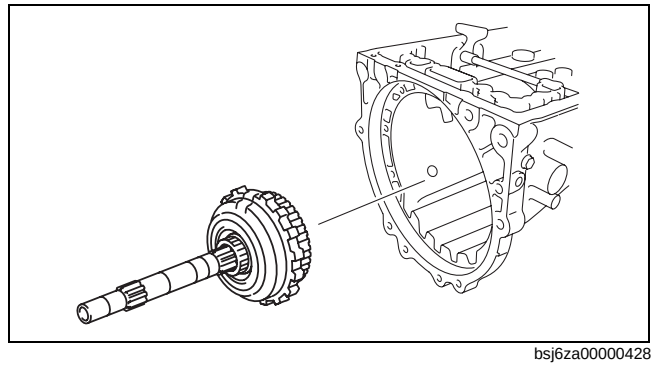
bsj6za00000426

77. Remove the snap ring from the transmission case using snap ring pliers.

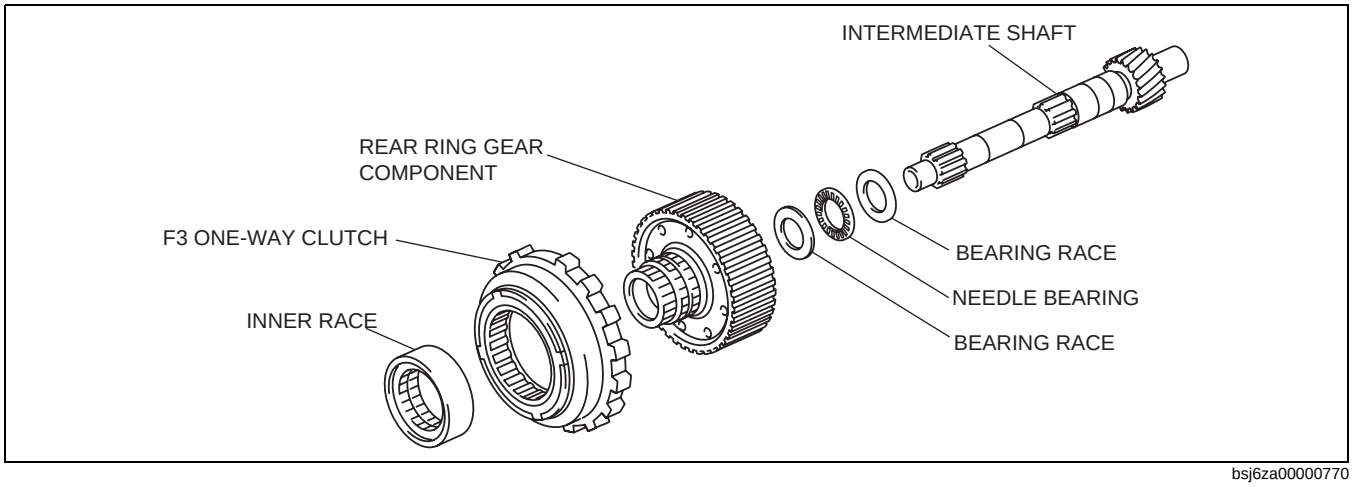


bsj6za00000427

78. Remove the following parts from the transmission case and disassemble in the order indicated below.
    (1) Inner race
    (2) F3 one-way clutch
    (3) Rear ring gear component
    (4) Bearing race
    (5) Needle bearing
    (6) Bearing race
    (7) Intermediate shaft

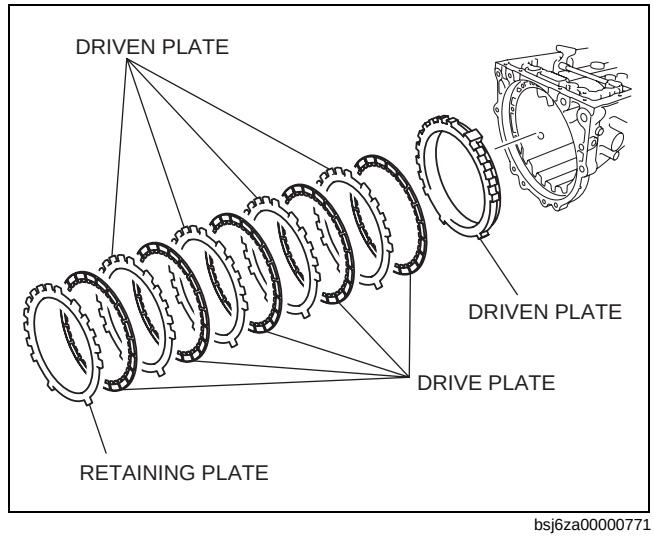


bsj6za00000428



bsj6za00000770

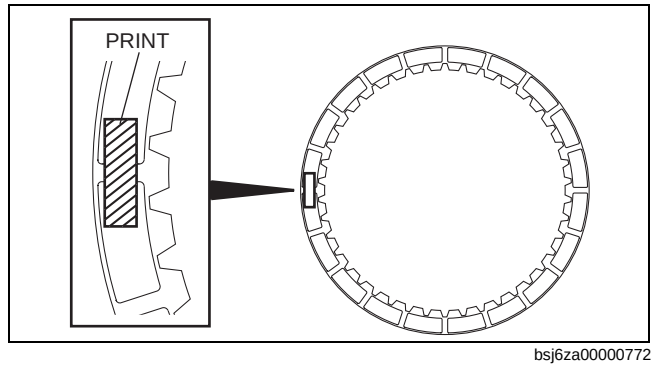
79. Remove the retaining plates, drive and driven plates.



bsj6za00000771

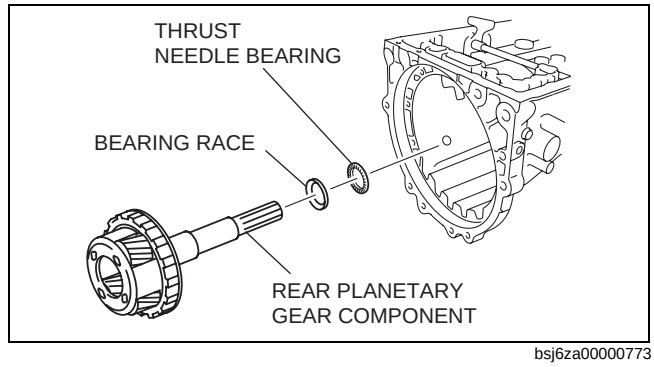
80. Inspect the lining of all drive plates.
    - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate. When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate. If they are scratched or have changed color, replace with new parts.

    Note
    - Before replacing with new drive plates, soak them at **least 2 h** in ATF.



bsj6za00000772

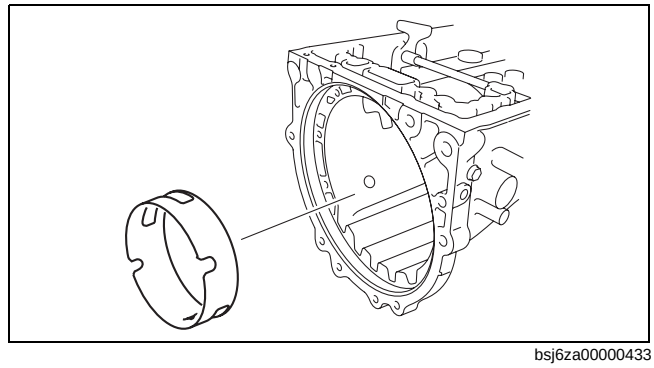
81. Remove the rear planetary gear component and bearing race and thrust needle bearing.



bsj6za00000773

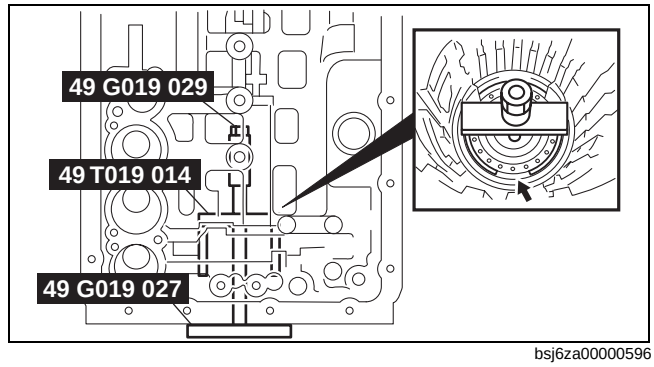
82. Remove the brake tube.

Caution
- **Make sure that the snap ring is not expanded excessively.**



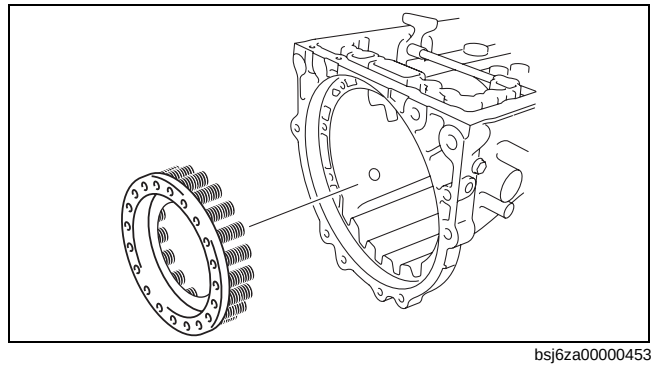
bsj6za00000433

83. Compress the piston return spring using the **SSTs** and remove the snap ring.



bsj6za00000596

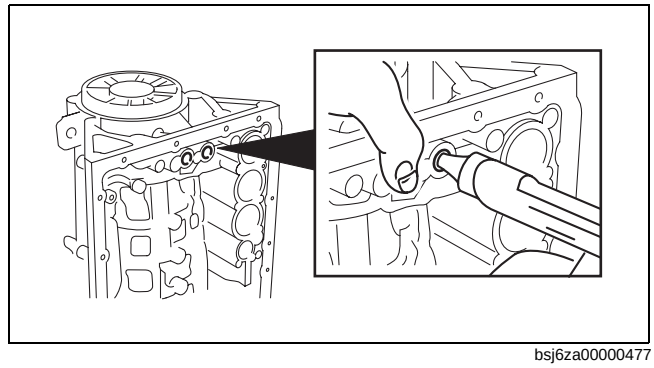
84. Remove the piston return spring.



bsj6za00000453

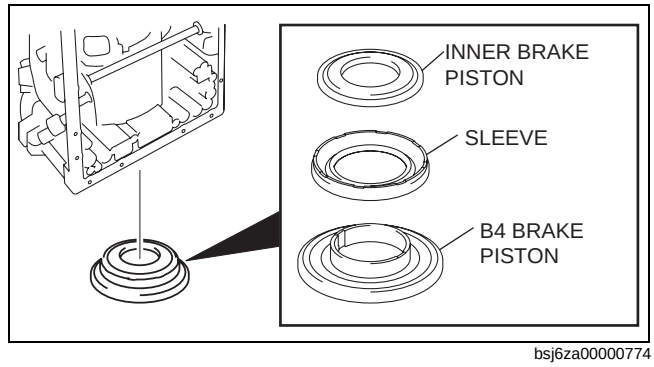
85. Blow compressed air into the oil passage as shown in the figure while pressing the B4 brake piston component by hand and remove the B4 brake piston component from the transmission case.

Air pressure
392 kPa {4 kgf/cm^2, 57 psi}



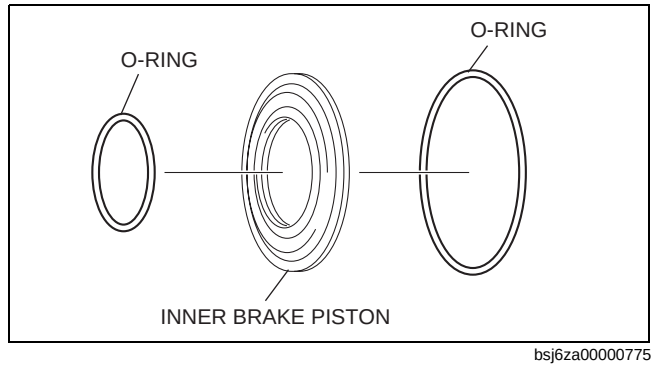
bsj6za00000477

86. Remove the inner brake piston and sleeve and B4 brake piston.



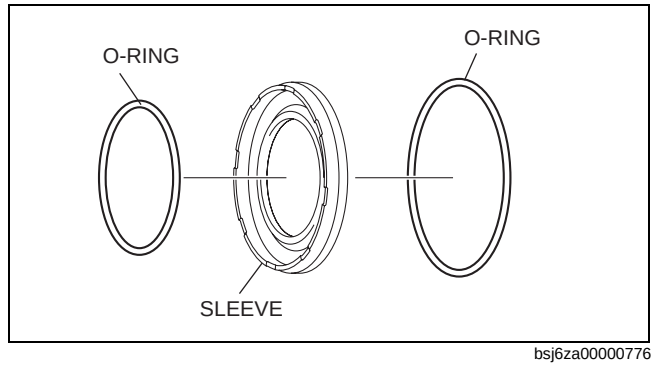
bsj6za00000774

87. Remove the O-ring from the inner brake piston.



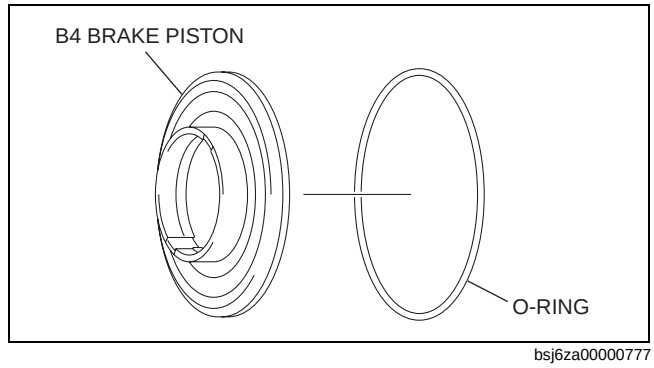
bsj6za00000775

88. Remove the O-ring from sleeve.



bsj6za00000776

89. Remove the O-ring from B4 brake piston.

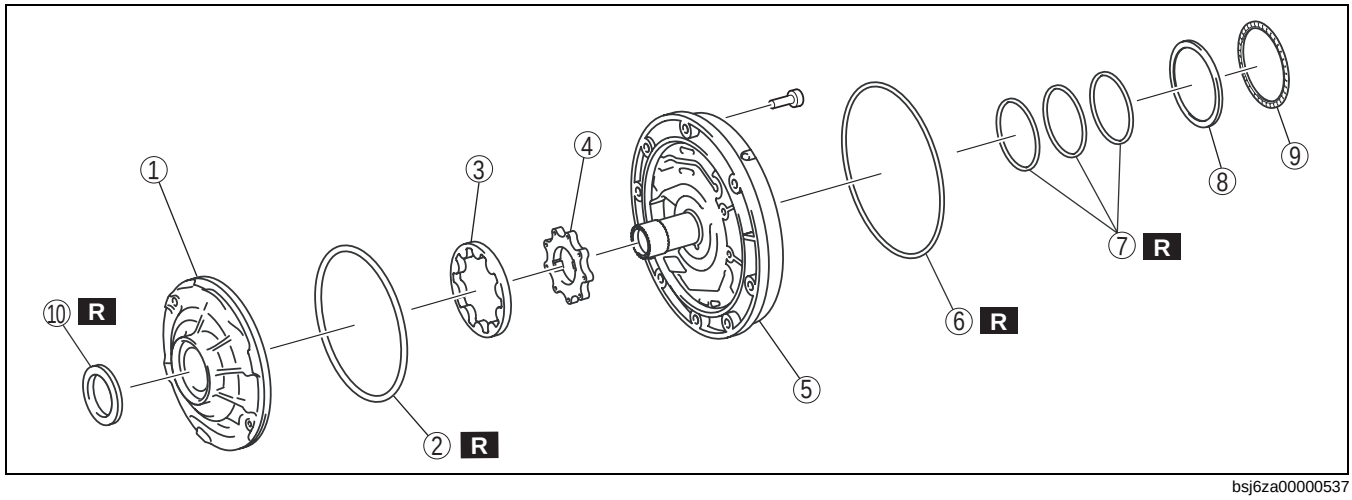


bsj6za00000777

OIL PUMP DISASSEMBLY

id051300260300

Components

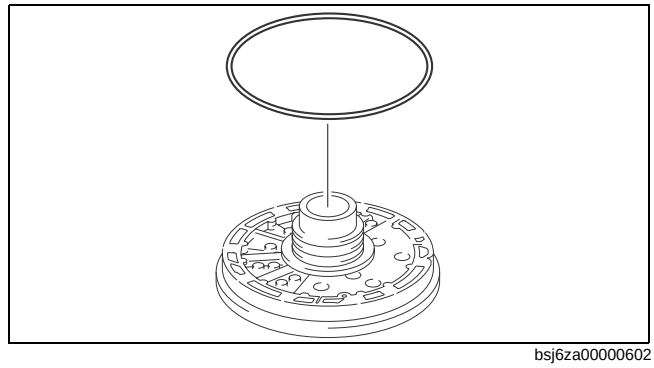


bsj6za00000537

1	Pump housing
2	O-ring
3	Outer oil pump gear
4	Inner oil pump gear
5	Oil pump shaft
6	O-ring
7	Seal ring
8	Bearing race
9	Thrust needle bearing
10	Oil seal

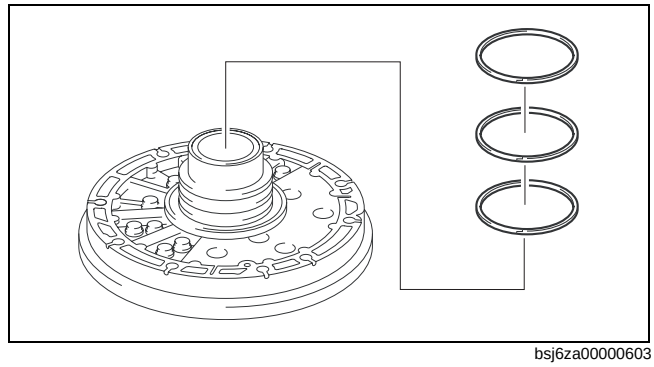
Disassembly

1. Remove the O-ring from the oil pump component.



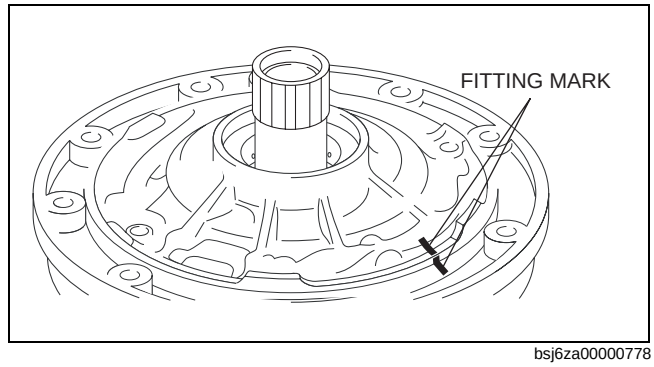
bsj6za00000602

2. Remove the seal ring from the oil pump shaft.



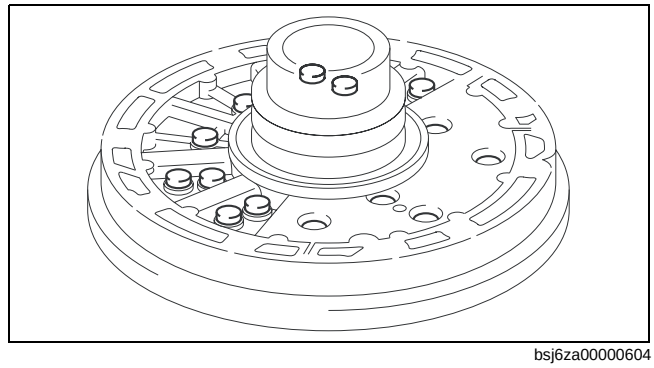
bsj6za00000603

3. Put an installation mark on the pump housing and oil pump shaft.



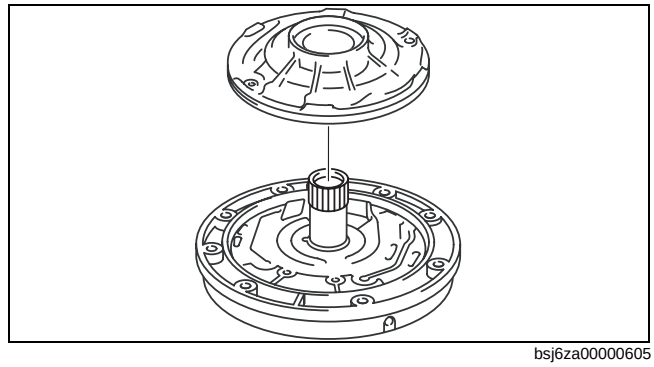
bsj6za00000778

4. Remove the screw from the oil pump.



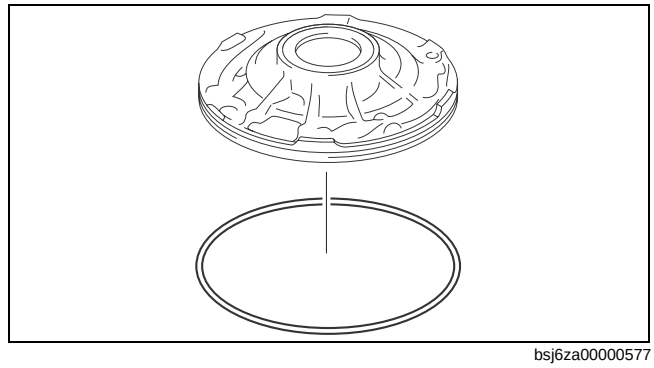
bsj6za00000604

5. Remove the oil pump shaft from the pump housing.



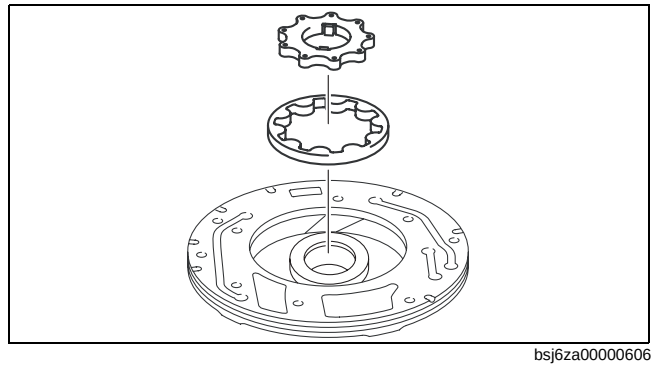
bsj6za00000605

6. Remove the O-ring from the pump housing.



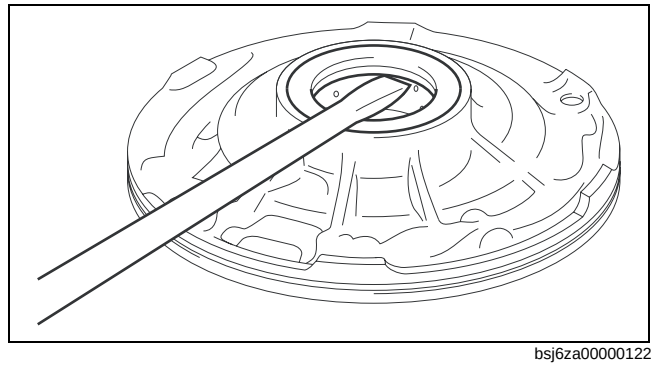
bsj6za00000577

7. Remove the inner oil pump gear and outer oil pump gear from the pump housing.



bsj6za00000606

8. Using a flathead screwdriver, remove the oil seal from the pump housing.



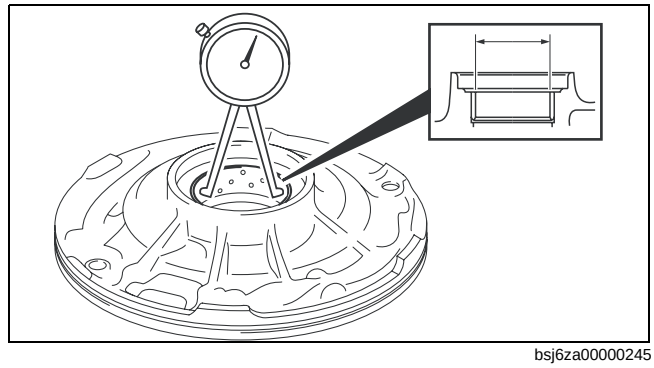
bsj6za00000122

Caution
- **Do not damage the bushing on the pump housing.**

OIL PUMP INSPECTION

id051300260400

1. Using a dial gauge, measure the inner diameter of the pump housing component bushings.

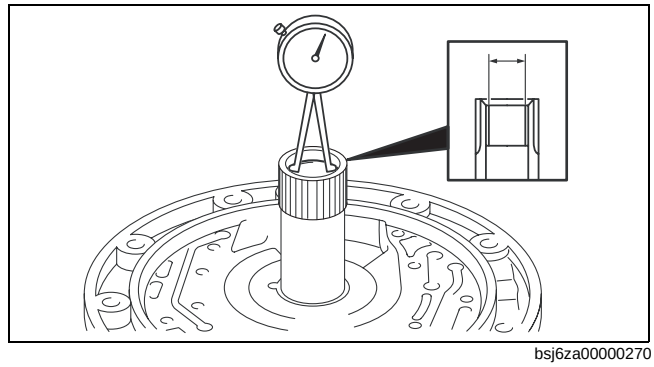


bsj6za00000245

Pump housing bushing inner diameter
38.113—38.138 mm {1.50051—1.50150 in}

Caution
- **Measure at different places and take an average. If it exceeds the specification, replace the pump housing component with a new one.**
- **When the pump housing component is replaced, inspect the contact surface opposed to the torque converter.**
- **If the surface of it is scratched or has changed color, replace the torque converter with a new one.**

2. Using a dial gauge, measure the inner diameter of the oil pump shaft bushings.

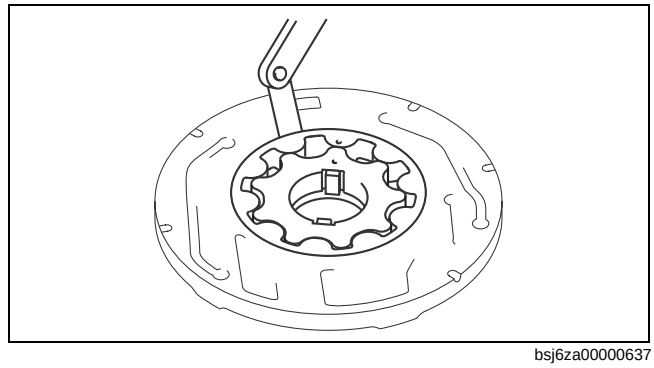


bsj6za00000270

Oil pump shaft bushing inner diameter
21.501—21.527 mm {0.846496—0.847520 in}

Caution
- **Measure at different places and take an average. If it exceeds the specification, replace the oil pump shaft with a new one.**
- **When the oil pump shaft is replaced, inspect the contact surface opposed to the input shaft.**
- **If the surface of it is scratched or has changed color, replace the input shaft with a new one.**

3. Press the gear oil pump towards the outer side of one side of the pump housing. Measure the clearance using a feeler gauge.



bsj6za00000637

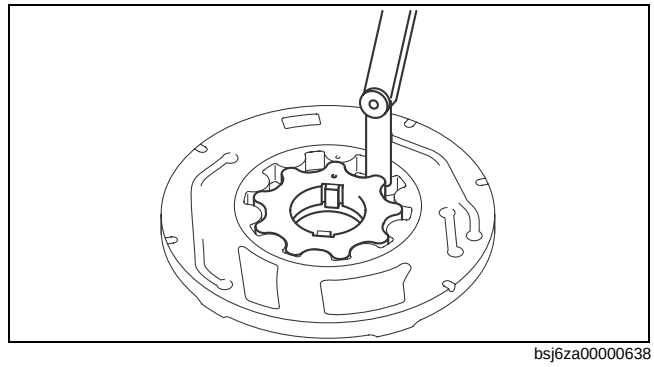
Oil pump gear outer standard clearance
0.10—0.17 mm {0.004—0.006 in}

Caution
- **If it exceeds the specification, replace the pump housing with a new one.**

4. Measure the clearance between the inner and outer oil pump gears using a feeler gauge.

Oil pump gear inner standard clearance
0.07—0.15 mm {0.0028—0.0059 in}

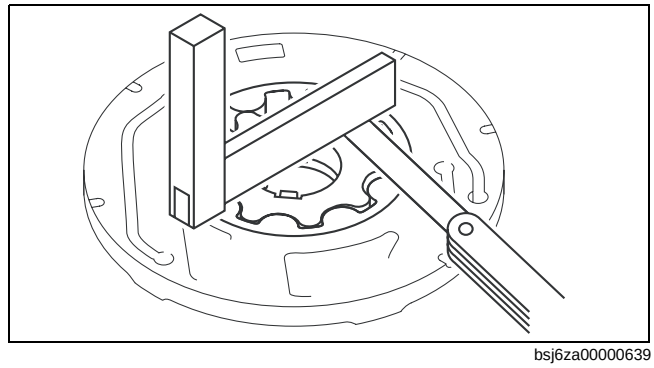
Caution
- **If it exceeds the specification, replace the pump housing with a new one.**



bsj6za00000638

5. Measure the side clearance of both gears using a steel straight edge and feeler gauge.

Oil pump gear side standard clearance
0.02—0.04 mm {0.0008—0.0015 in}



bsj6za00000639

Oil pump gear size (mm {in})

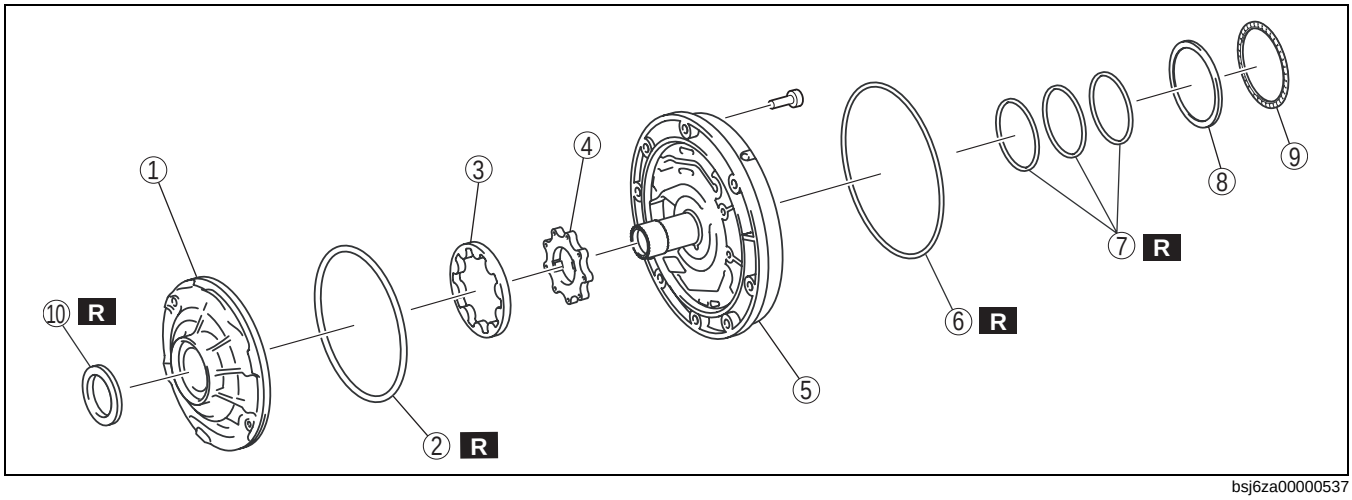
Identification mark	Thickness
0	9.946—9.952
1	9.953—9.959
2	9.960—9.966
3	9.967—9.973
4	9.974—9.980
5	9.981—9.987
6	9.988—9.994

Caution
- **If the measurement exceeds the maximum specification, replace the inner oil pump gear and outer oil pump gear with a new one so that the side clearance is within the maximum specification. If the side clearance still exceeds the maximum specification, replace the oil pump with a new one.**

OIL PUMP ASSEMBLY

id051300260500

Components



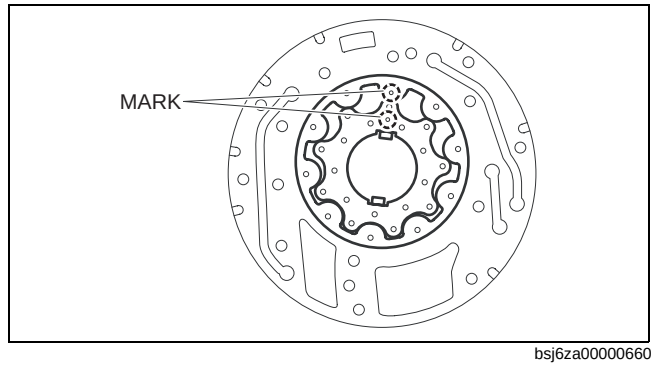
bsj6za00000537

1	Pump housing
2	O-ring
3	Outer oil pump gear
4	Inner oil pump gear
5	Oil pump shaft

6	O-ring
7	Seal ring
8	Bearing race
9	Thrust needle bearing
10	Oil seal

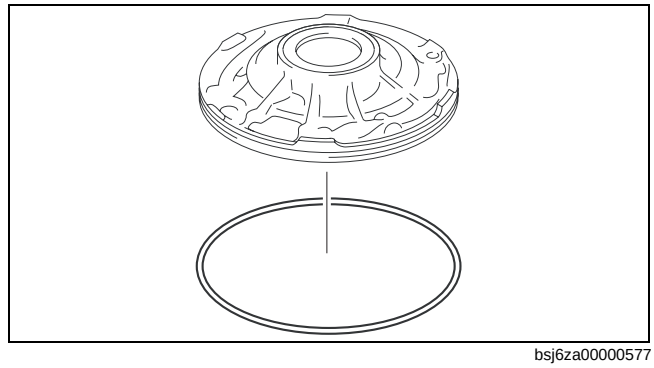
Assembly Procedure

1. Apply ATF to the inner oil pump gear, outer oil pump gear and sliding surface of the pump housing.
2. Install the inner oil pump gear and outer oil pump gear to the pump housing as shown in the figure.
3. Apply ATF to the new O-ring.

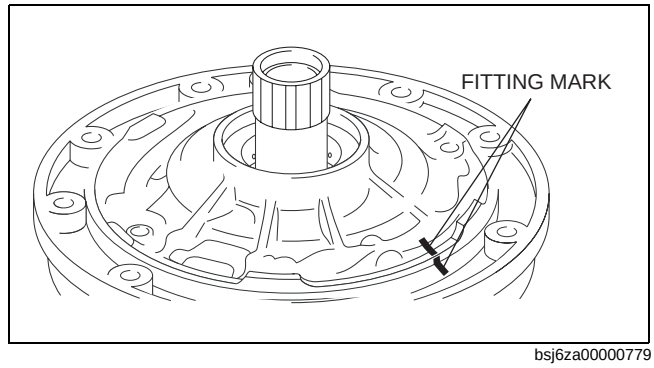


bsj6za00000660

4. Install the O-ring to the pump housing.


bsj6za00000577

5. Align the oil pump shaft with the mark on the pump housing, and install it.



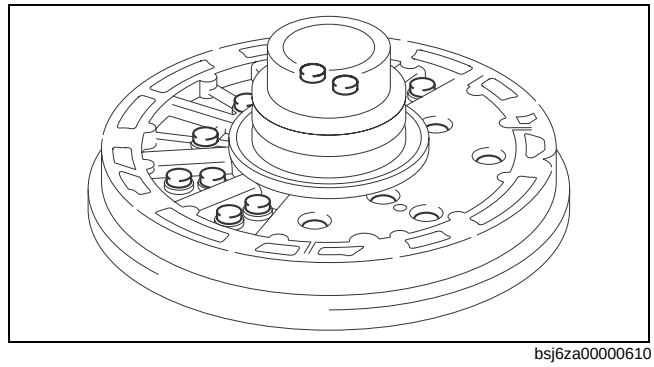
bsj6za00000779

6. Align the oil pump shaft with bolt hole on the pump housing, and temporarily tighten.
7. Tighten the bolts.

   Tightening torque
   9.8—11.8 N·m {100.0—120.3 kgf·cm, 86.8—104.4 in·lbf}

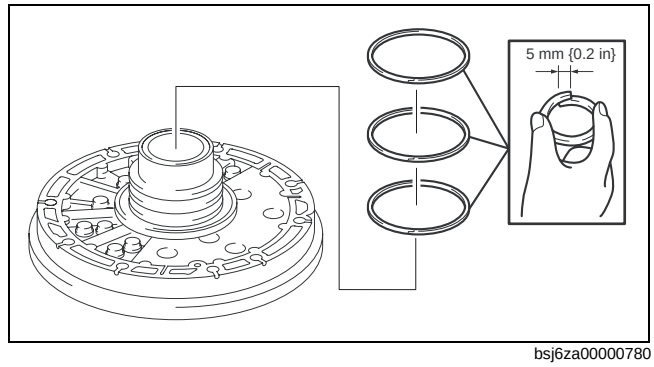
8. Apply ATF to the sliding surface of the new seal ring and oil pump.

   Caution
   - **Do not expand the seal ring too much.**
   - **Be careful not to shorten the seal rings too much, when installing the seal rings.**


bsj6za00000610

9. Compress the seal rings as shown in the figure, then install the seal rings to the oil pump shaft.

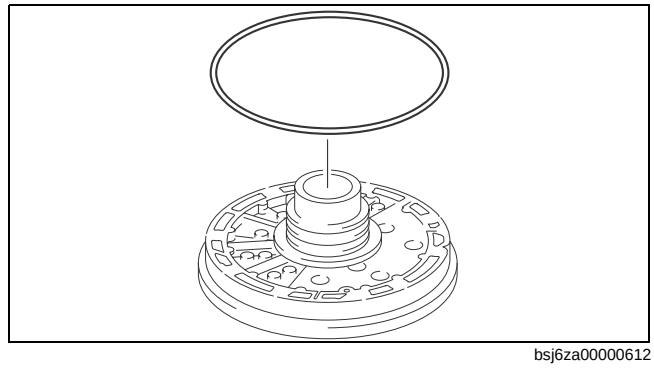
Note
- Verify that oil seal rings rotate smoothly after installing them.



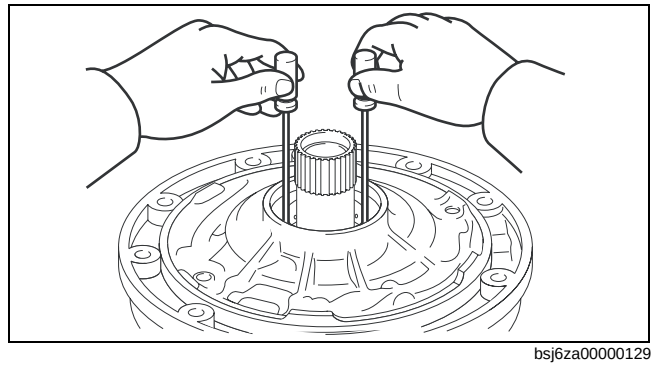
bsj6za00000780

10. Apply ATF to the new O-rings.

11. Install the O-rings to the oil pump component.


bsj6za00000612

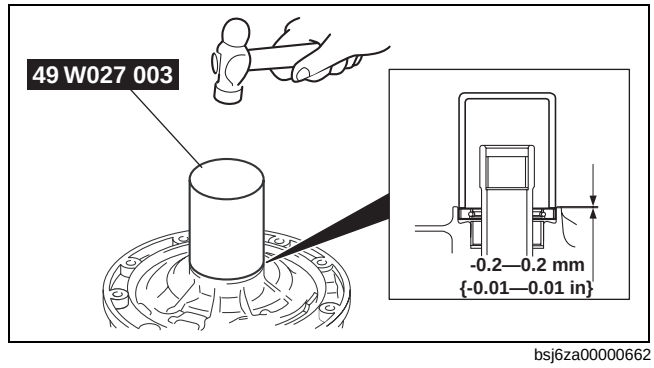
12. Turn the drive gear with flathead screwdrivers and verify it rotates smoothly.


bsj6za00000129

13. Using a hammer, install the new oil seal to the pump housing.

Caution
- **Do not damage the oil seal.**

14. Apply grease to the oil seal lip.

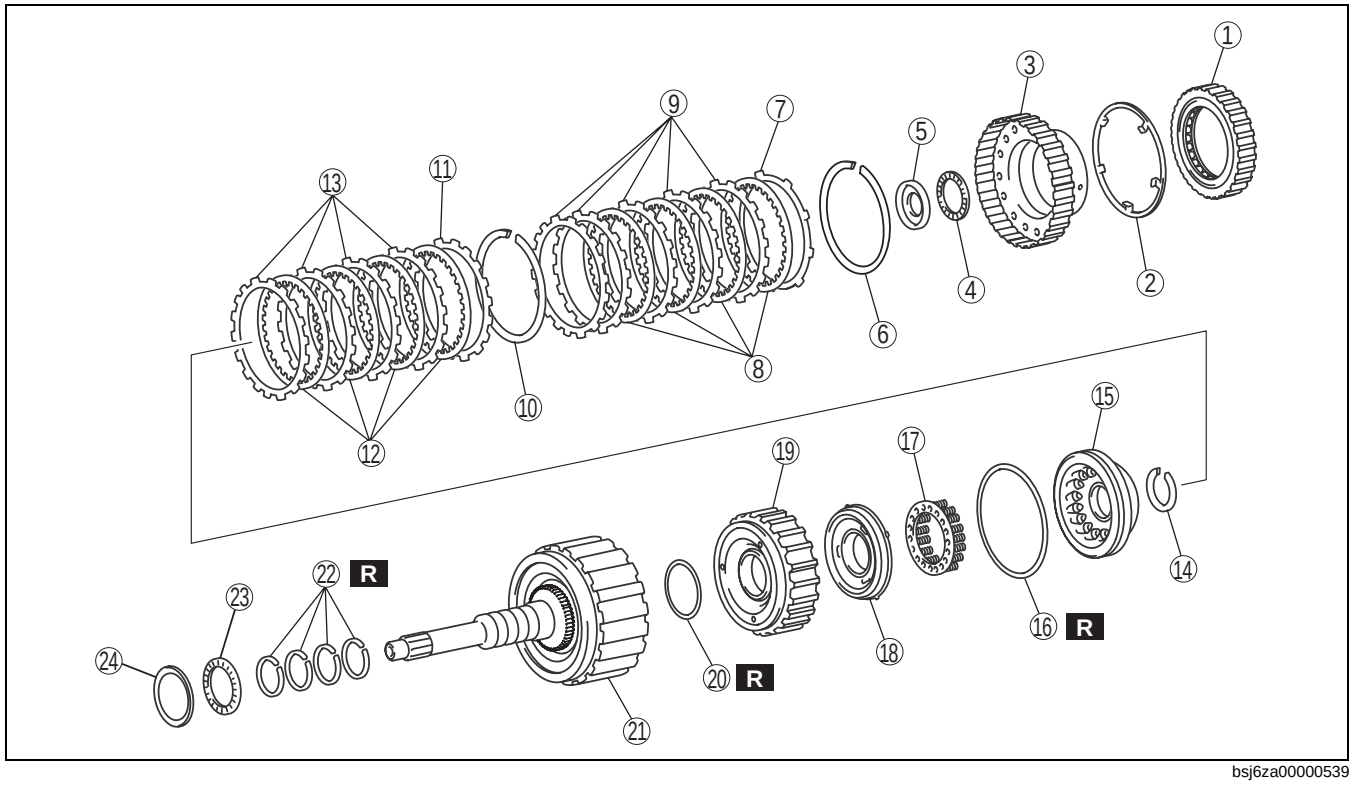


bsj6za00000662

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH COMPONENT DISASSEMBLY

id051300260600

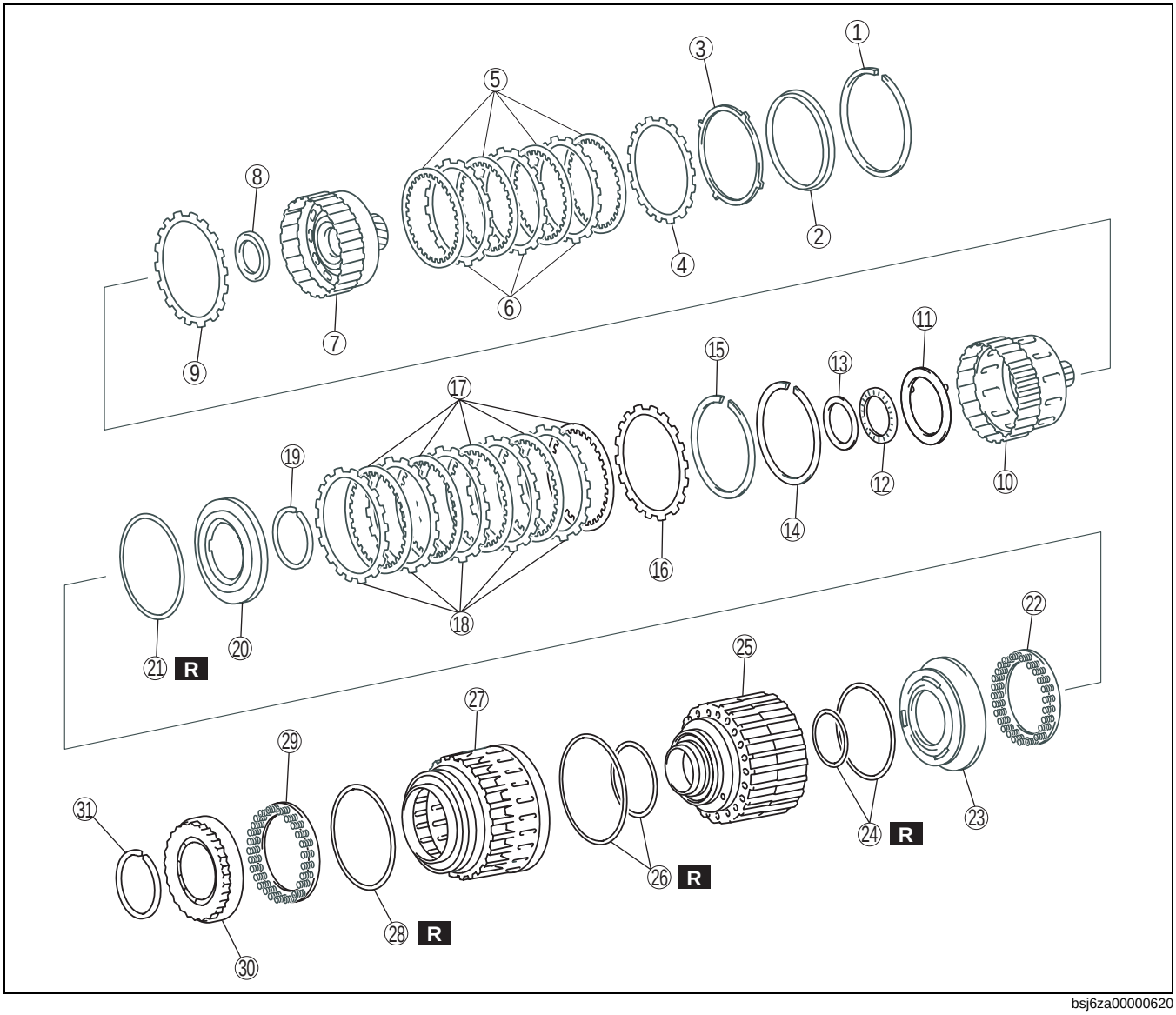
Components



bsj6za00000539

1	F4 one-way clutch
2	Thrust washer
3	Clutch hub
5	Bearing race
6	Snap ring
7	Retaining plate
8	Drive plate
9	Driven plate
10	Snap ring
11	Retaining plate
12	Drive plates component
13	Driven plate

14	Snap ring
15	C1 clutch seal plate
16	D-ring
17	Piston return spring
18	C4 clutch piston
19	C1 clutch piston
20	O-ring
21	Input shaft component
22	Seal ring
23	Bearing race
24	Snap ring



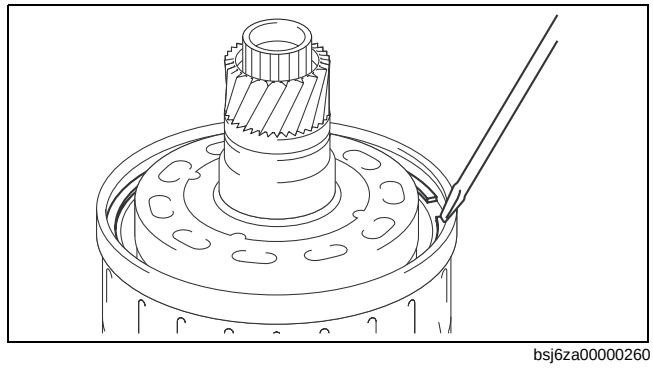
bsj6za00000620

1	Snap ring
2	Sleeve
3	Driven plate
4	Retaining plate
5	Drive plate
6	Driven plate
7	Clutch hub component
8	Thrust needle bearing
9	Retaining plate
10	Clutch hub
11	Thrust washer
12	Thrust bearing
13	Bearing race
14	Snap ring
15	Snap ring
16	Retaining plate

17	Drive plate
18	Driven plate
19	Snap ring
20	C2 clutch seal plate
21	O-ring
22	C2 clutch piston return spring
23	C2 clutch piston
24	O-ring
25	C2, C3 clutch drum
26	O-ring
27	C3 clutch piston component
28	O-ring
29	Piston return spring
30	C3 clutch seal plate
31	Snap ring

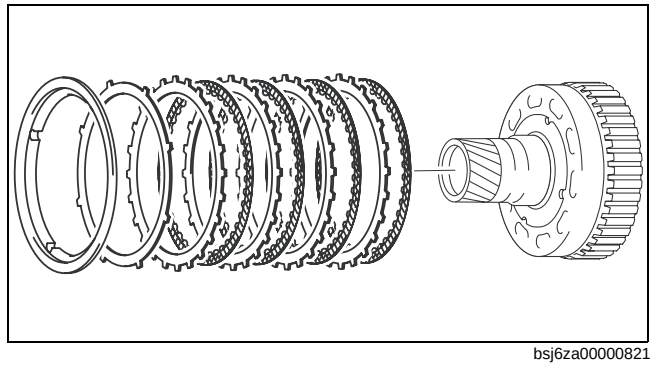
Disassembly Procedure

1. Using a flathead screwdriver, remove the snap ring from the C3 clutch piston component.
2. Remove the clutch hub component from the C3 clutch piston component.



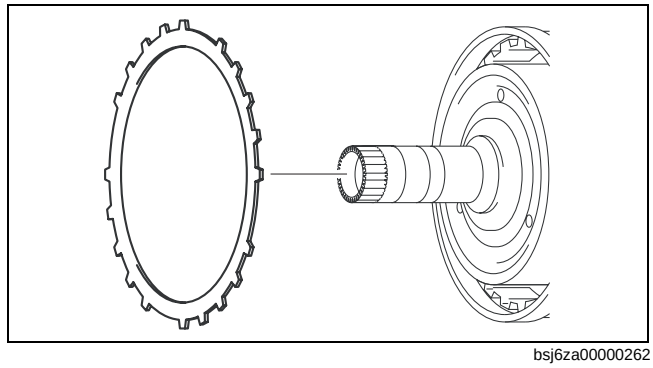
bsj6za00000260

3. Remove the retaining plate and the drive plate and the driven plate from the clutch hub component.



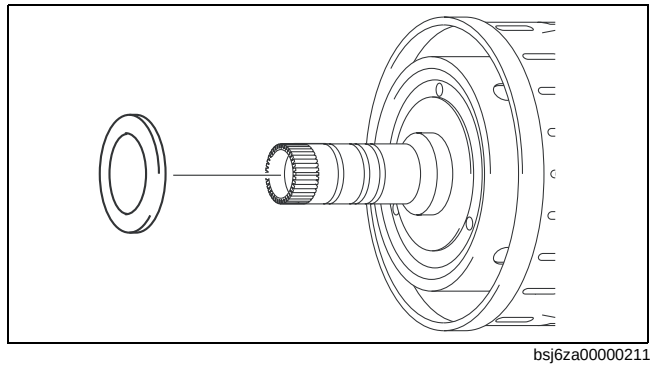
bsj6za00000821

4. Remove the retaining plate from the C3 clutch piston component.



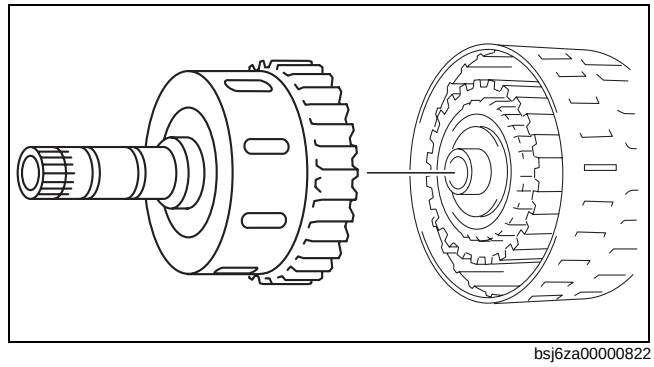
bsj6za00000262

5. Remove the thrust needle bearing from the clutch hub.



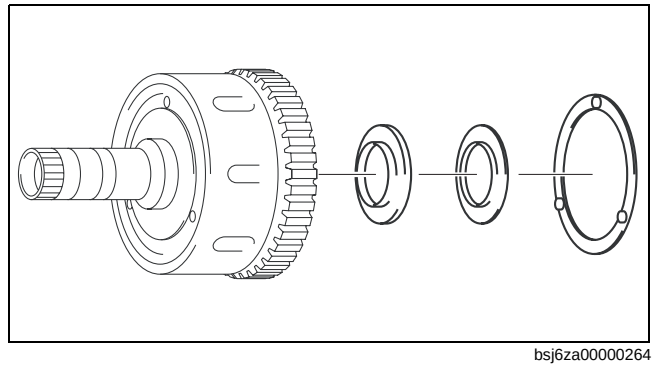
bsj6za00000211

6. Remove the clutch hub from the C3 clutch piston component.



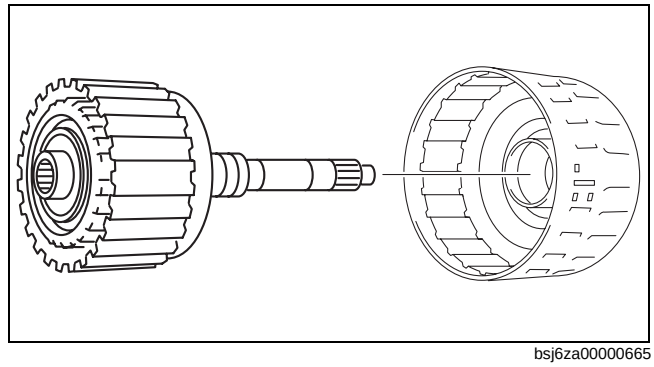
bsj6za00000822

7. Remove the thrust bearing, the bearing race and the thrust washer from clutch hub.



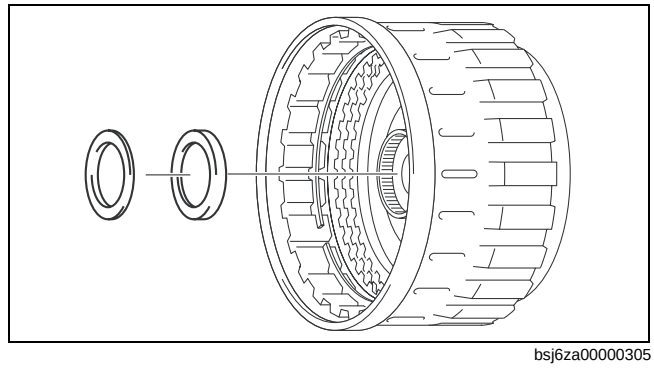
bsj6za00000264

8. Remove the C1, C4 clutch component from the C2, C3 clutch drum.



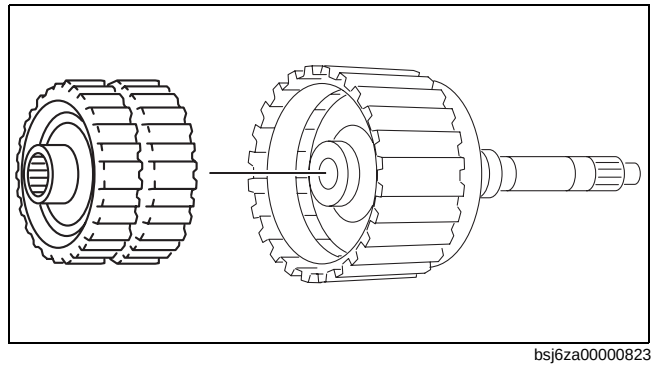
bsj6za00000665

9. Remove the bearing race from the C3 clutch piston component.



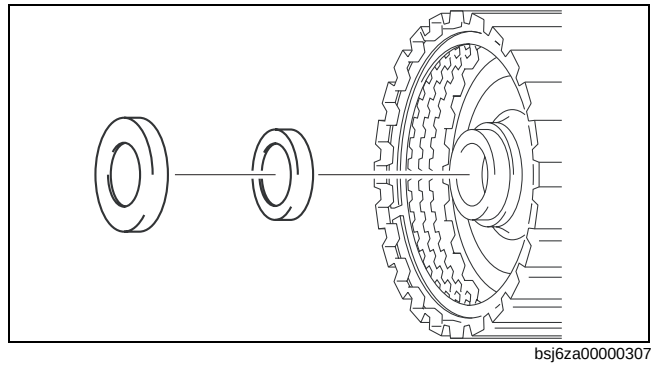
bsj6za00000305

10. Remove the clutch hub and F4 one-way clutch from the C1, C4 clutch component.



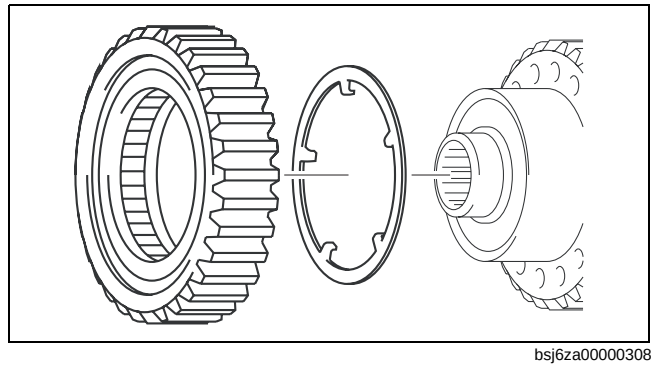
bsj6za00000823

11. Remove the bearing race from the C1, C4 clutch component.



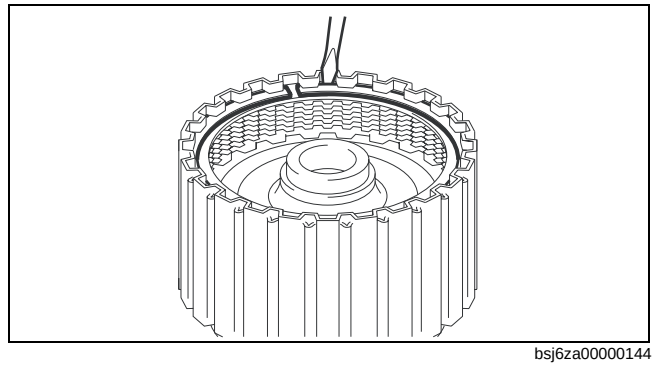
bsj6za00000307

12. Remove the F4 one-way clutch from the clutch hub.



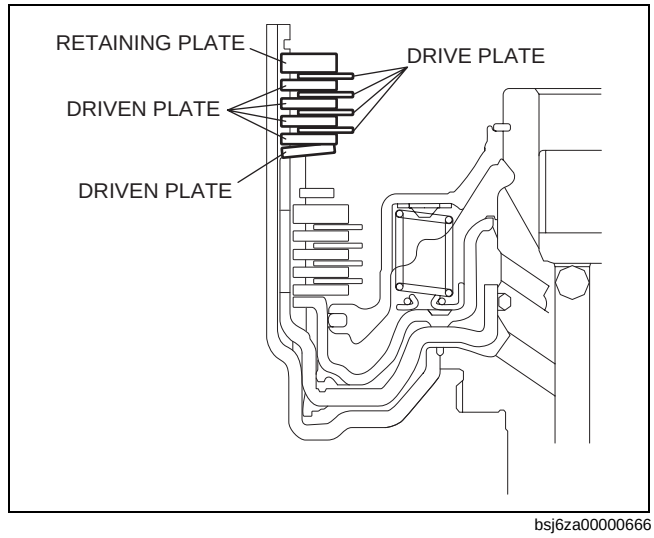
bsj6za00000308

13. Using a flathead screwdriver, remove the snap ring from the input shaft component.



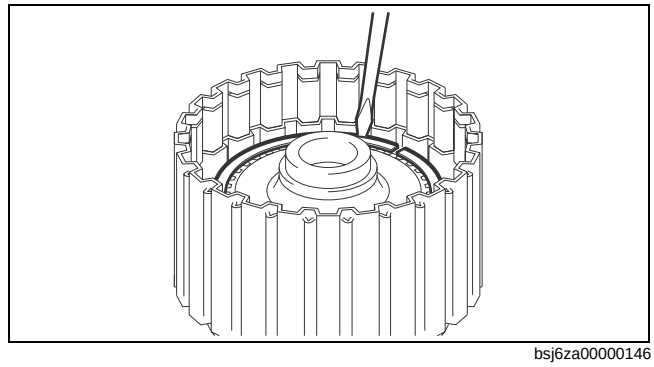
bsj6za00000144

14. Remove the retaining plate (C1) and the drive plate (C1) and the driven plate (C1) from the input shaft component.



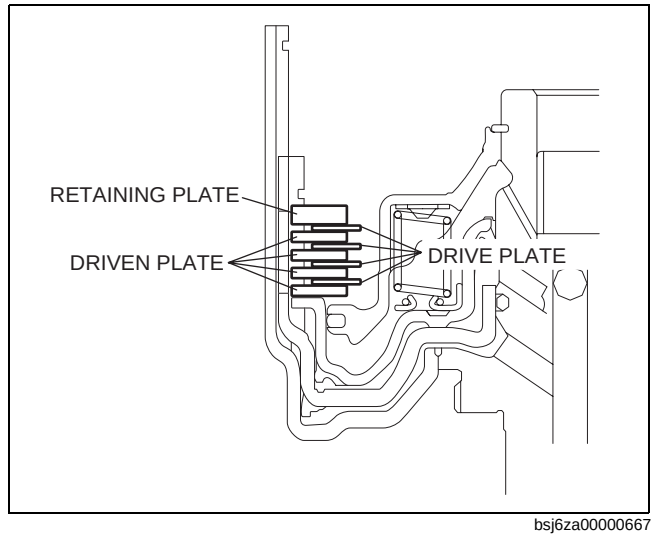
bsj6za00000666

15. Using a flathead screwdriver, remove the snap ring from the input shaft component.



bsj6za00000146

16. Remove the retaining plate (C4) and the drive plate (C4) and the driven plate (C4) from the input shaft component.

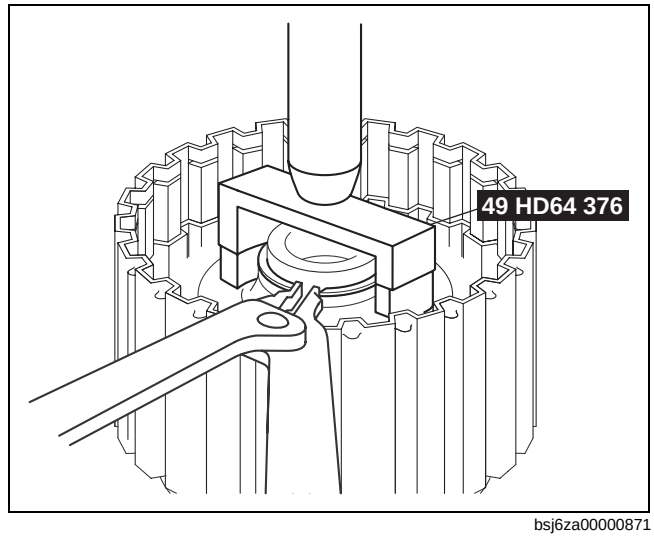


bsj6za00000667

17. Place the **SST** on the seal plate and compress the piston return spring with a press.

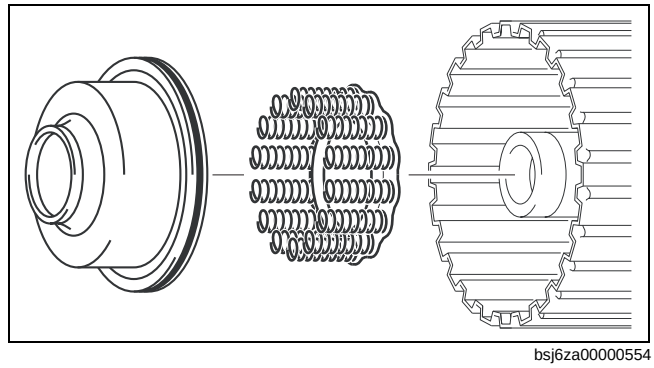
Caution
- **Be careful not to expand the snap ring too much.**

18. Remove the snap ring using snap ring pliers.



bsj6za00000871

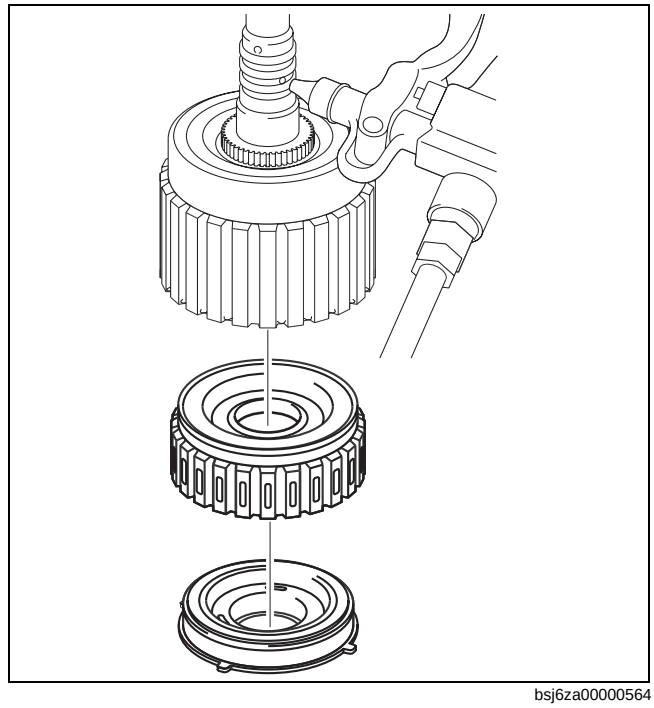
19. Remove the C4 clutch seal plate and the piston return spring from the input shaft component.



bsj6za00000554

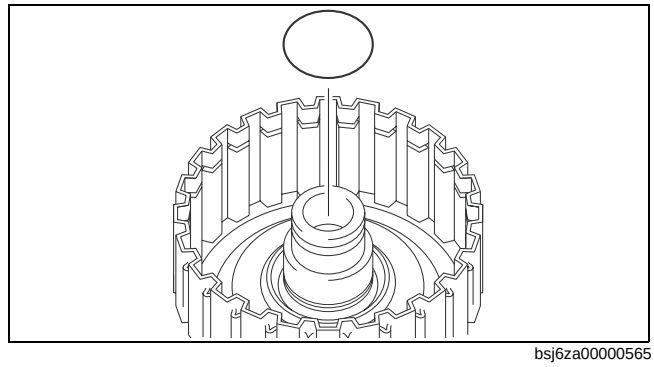
20. Apply compressed air into the oil passage as shown in the figure and remove the C4 clutch piston and C1 clutch piston from the input shaft component.

    Air pressure
    392 kPa (4.02 kgf/cm^2, 57 psi)

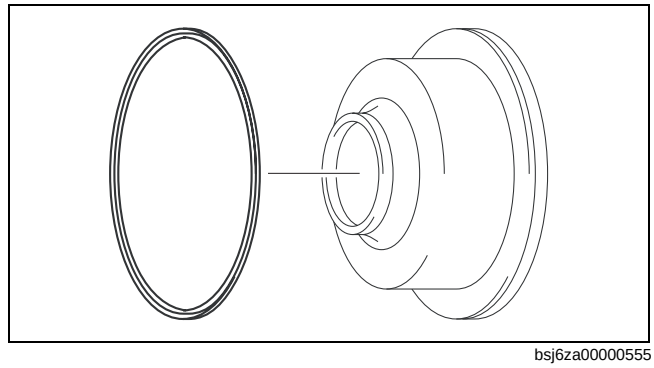

bsj6za00000564

21. When applying compressed air, shut the oil passages of the input shaft component.

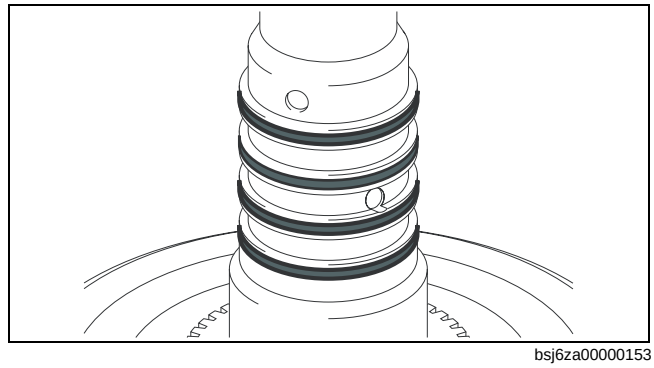
22. Remove the O-ring from the input shaft component.


bsj6za00000565

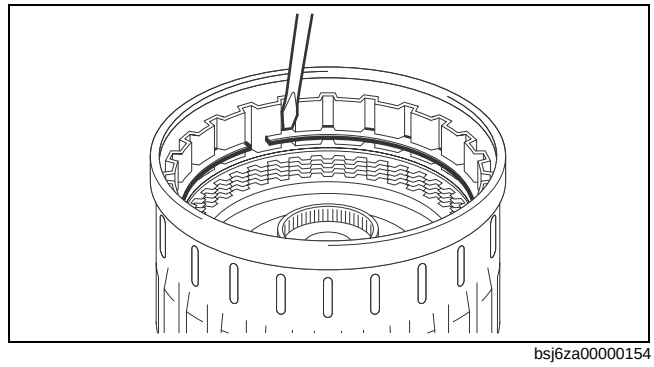
23. Remove the D-ring from the C1 clutch seal plate.


bsj6za00000555

24. Remove the seal ring from the input shaft component.

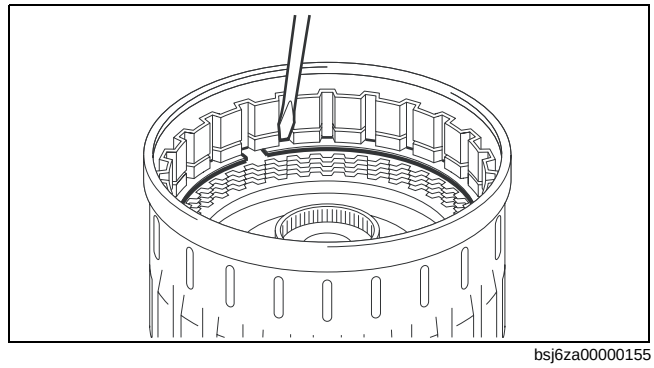

bsj6za00000153

25. Using a flathead screwdriver, remove the snap ring (C3) from the C2, C3 clutch drum.



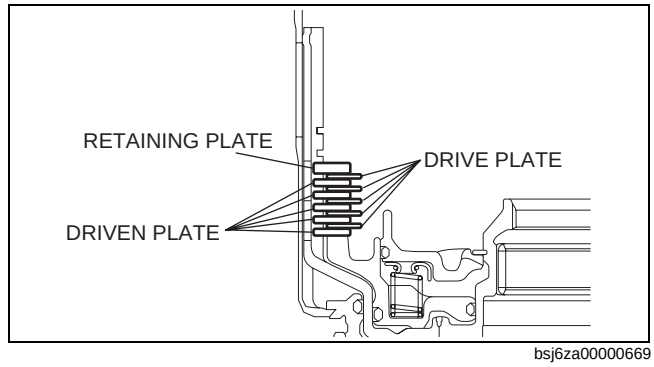
bsj6za00000154

26. Using a flathead screwdriver, remove the snap ring (C2) from the C2, C3 clutch drum.



bsj6za00000155

27. Remove the retaining plate (C2) and the drive plate (C2) and the driven plate (C2) from the input shaft component.

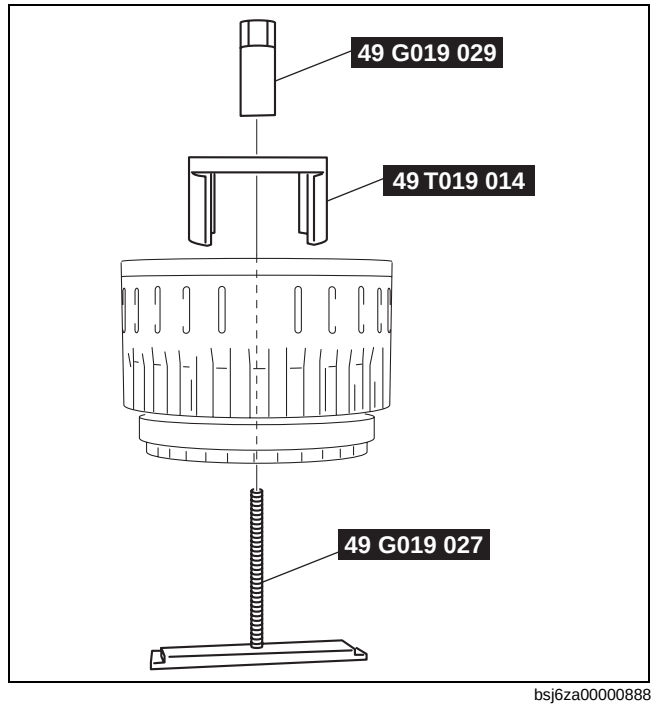


bsj6za00000669

28. Install the **SST** as shown in the figure, and compress the C2 clutch piston return spring.

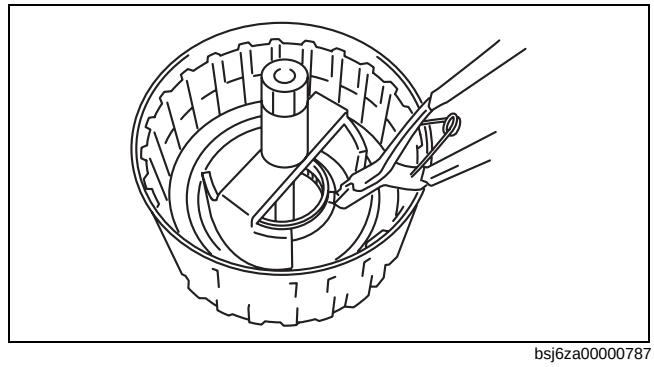
Caution

- **Be careful not to expand the snap ring too much.**



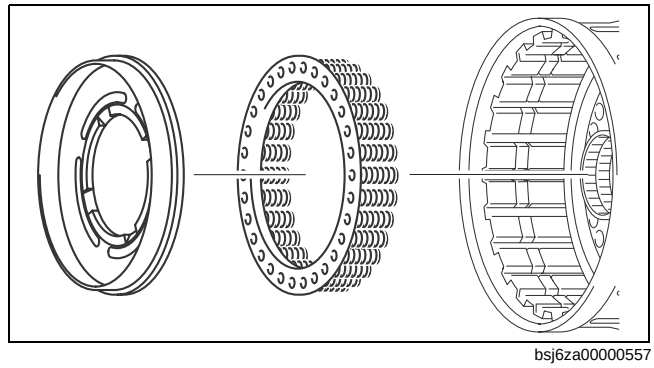
bsj6za00000888

29. Remove the snap ring using snap ring pliers.



bsj6za00000787

30. Remove the seal plate and the C2 clutch piston return spring from the C3 clutch drum.



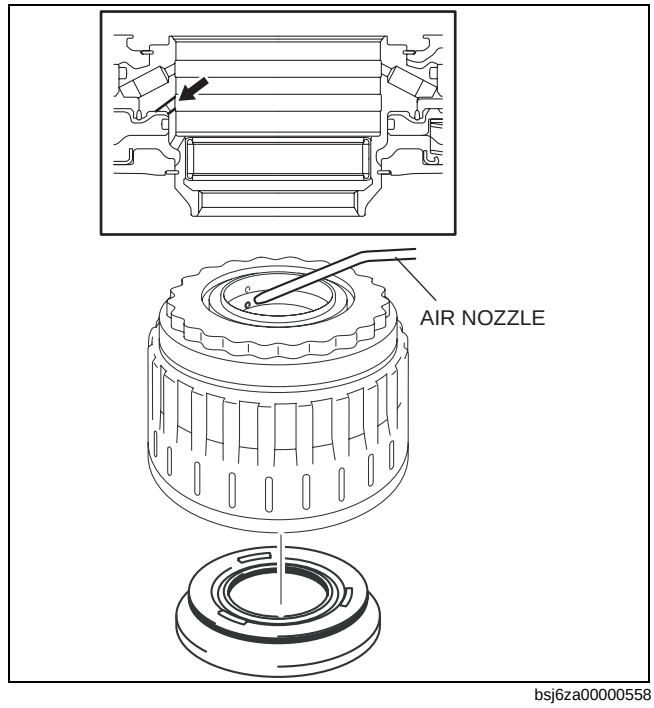
bsj6za00000557

31. Apply compressed air into the oil passage as shown in the figure and remove the C2 clutch piston and C3 clutch piston from the input shaft component.

    Air pressure

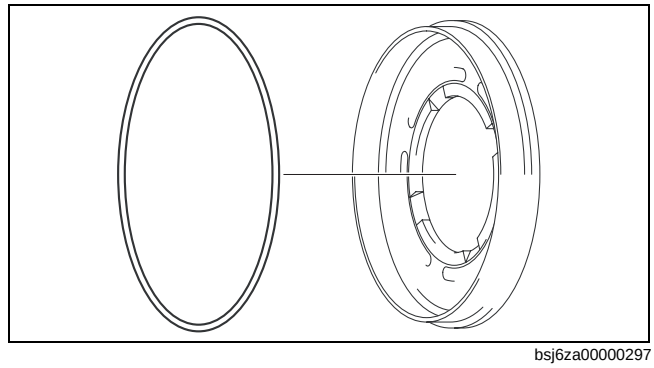
    392 kPa (4.02 kgf/cm^2, 57 psi)

32. When applying compressed air, shut the oil passage of the input shaft component.



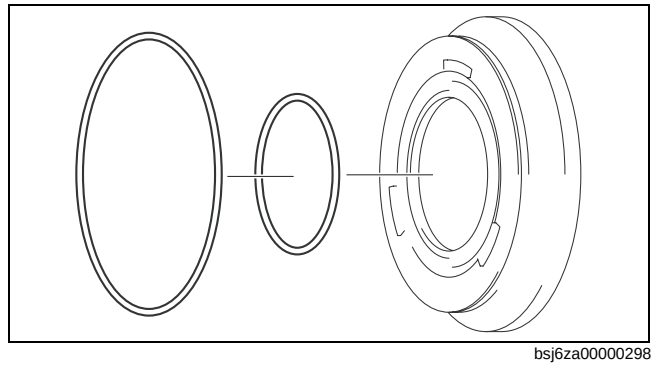
bsj6za00000558

33. Remove the O-ring from the C2 clutch seal plate.



bsj6za00000297

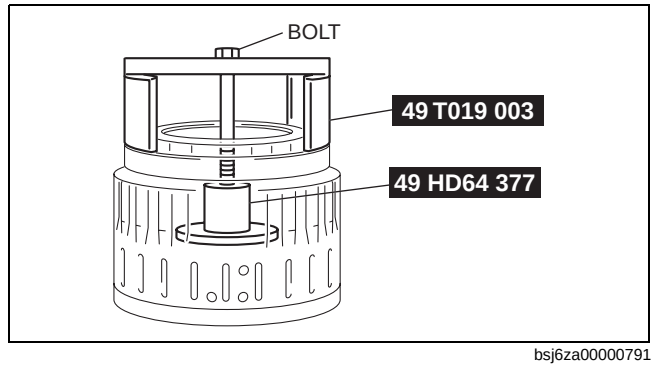
34. Remove the O-ring from the C2 clutch piston.



bsj6za00000298

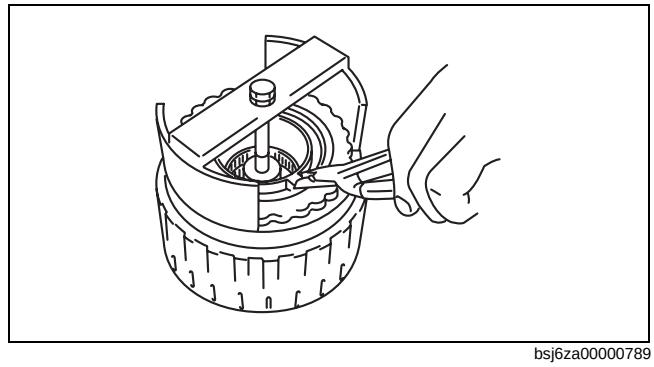
35. Install the **SST** using a **M10-1.25** bolt with a length of **100 mm** as shown in the figure to compress the piston return spring.

Caution
- **Be careful not to expand the snap ring too much.**



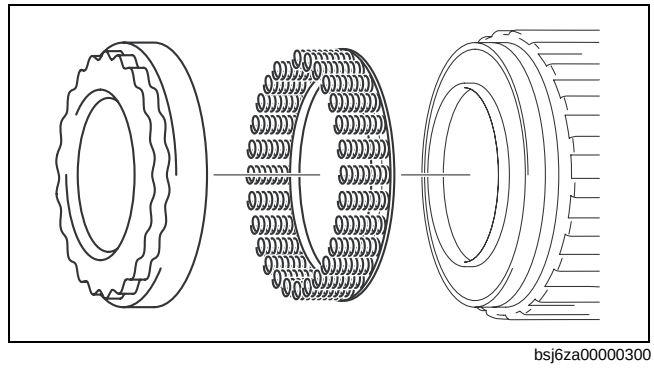
bsj6za00000791

36. Remove the snap ring using snap ring pliers.



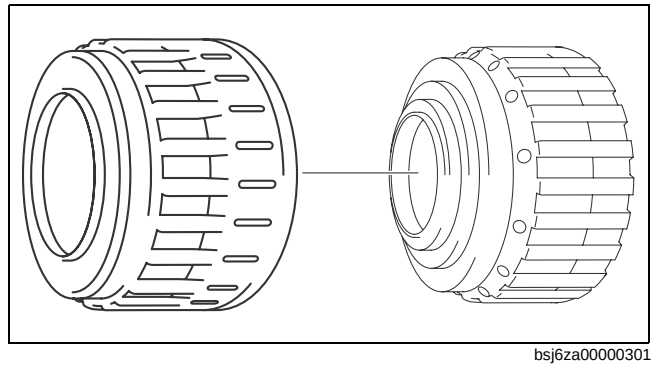
bsj6za00000789

37. Remove the seal plate piston return spring from the C3 clutch piston component.



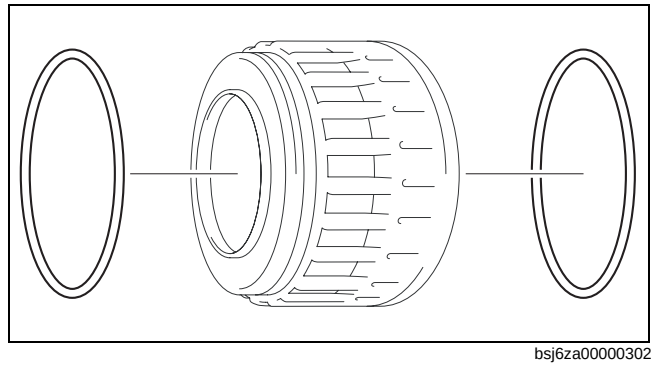
bsj6za00000300

38. Remove the C2, C3 clutch drum C3 clutch piston component.



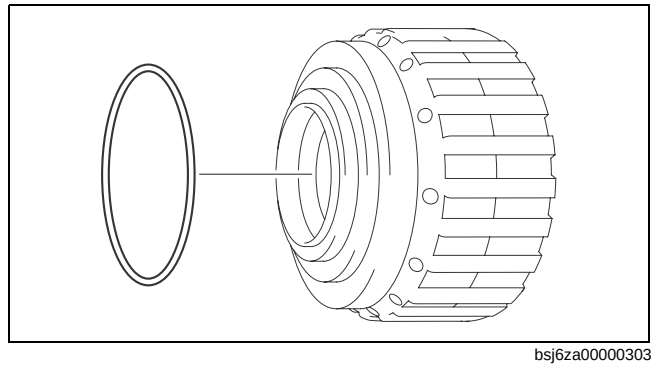
bsj6za00000301

39. Remove the O-ring from the C3 clutch piston component.



bsj6za00000302

40. Remove the O-ring from the C2, C3 clutch drum.



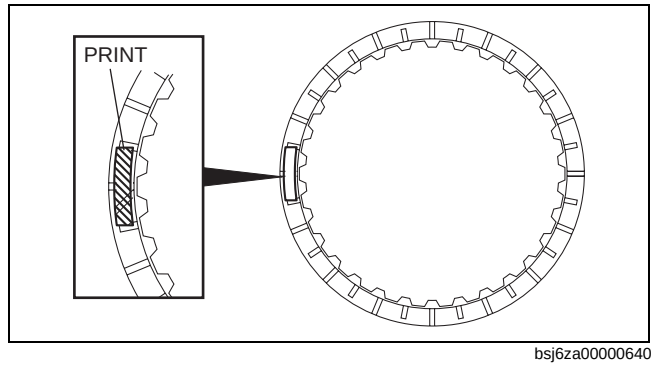
bsj6za00000303

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH INSPECTION

id051300260700

1. Inspect the lining of all drive plates. (C1)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

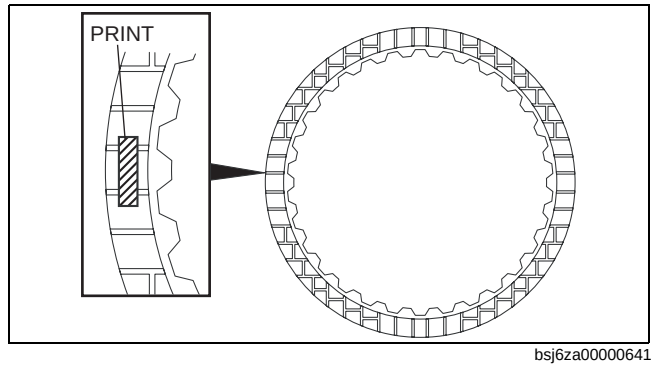
   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.



bsj6za00000640

2. Inspect the lining of all drive plates. (C4)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.

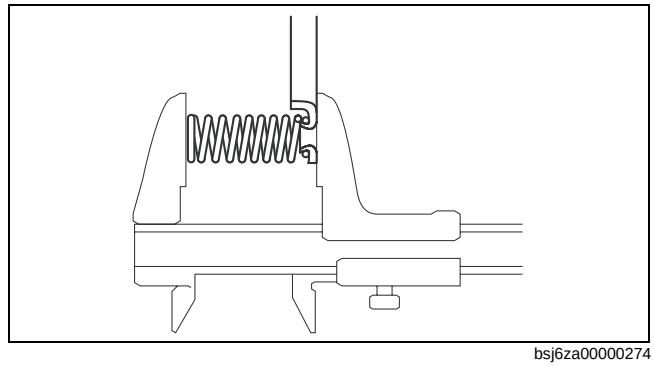


bsj6za00000641

3. Using vernier calipers, measure the free length of the piston return spring.

   C1, C4 clutch return spring free length
   Standard: 26.29 mm {1.04 in}

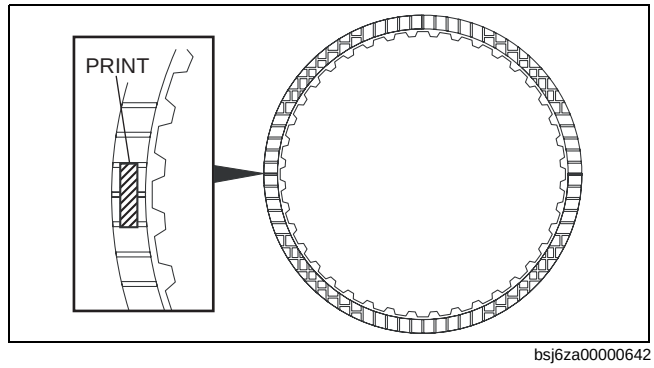
   - If it less than the specification, replace the piston return spring with a new one.



bsj6za00000274

4. Inspect the lining of all drive plates. (C2)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

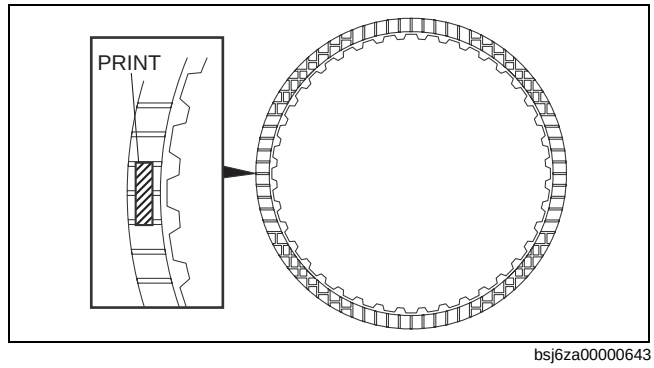
   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.



bsj6za00000642

5. Inspect the lining of all drive plates. (C3)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.

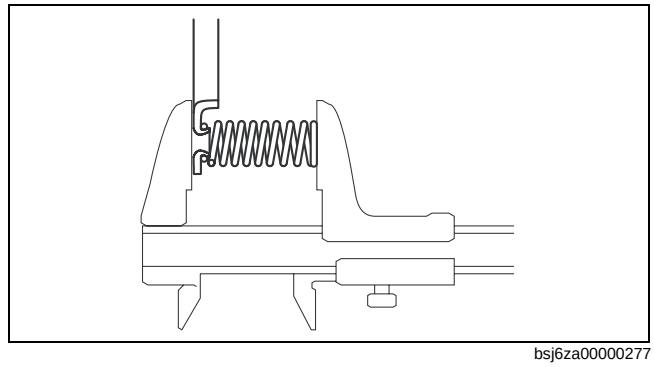


bsj6za00000643

6. Using vernier calipers, measure the free length of the piston return spring.

   C2 clutch return spring free length
   Standard: 20.02 mm {0.79 in}

   - If it less than the specification, replace the piston return spring with a new one.

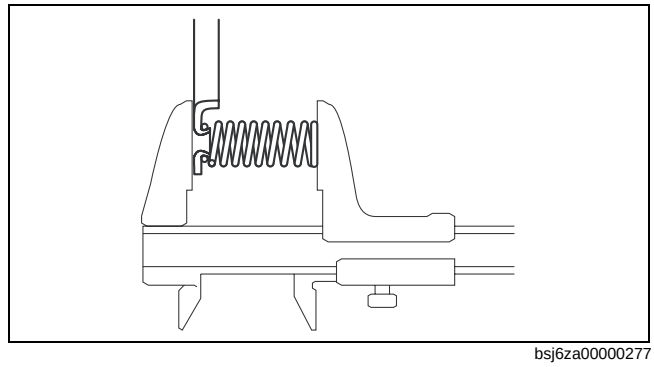


bsj6za00000277

7. Using vernier calipers, measure the free length of the piston return spring.

   C3 clutch return spring free length
   Standard: 21.03 mm {0.83 in}

   - If it less than the specification, replace the piston return spring with a new one.

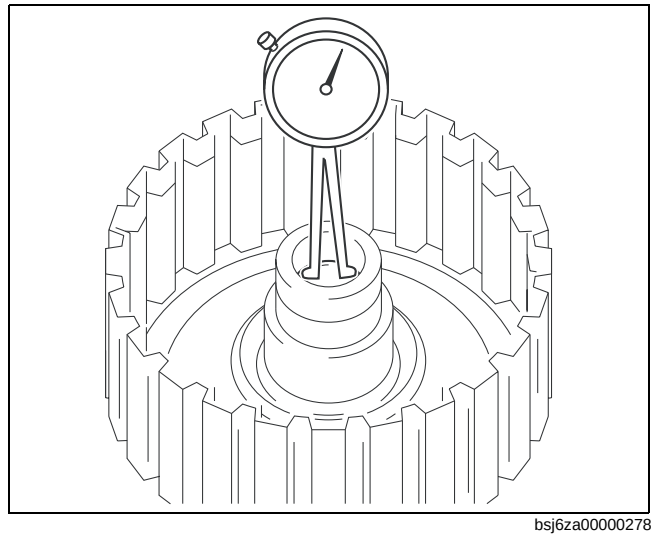


bsj6za00000277

8. Using a dial gauge, measure the inner diameter of the input shaft component bushings.

   Input shaft component bushing inner diameter
   18.000—18.025 mm {0.7087—0.7096 in}

   Caution
   - **Measure at different places and take an average. If it exceeds the specification, replace the input shaft component with a new one.**
   - **When the input shaft component is replaced, inspect the contact surface opposed to the intermediate shaft.**
   - **If the surface of it is scratched or has changed color, replace the intermediate shaft with a new one.**

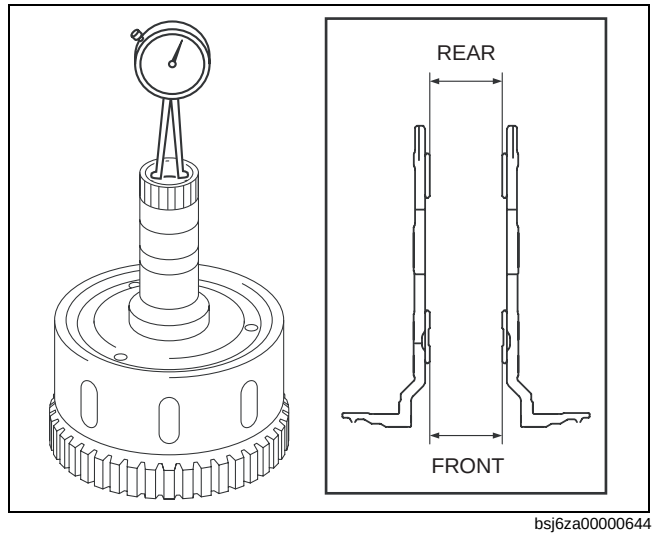


bsj6za00000278

9. Using a dial gauge, measure the inner diameter of the clutch hub bushings.

   Clutch hub bushing inner diameter
   Front side: 23.037—23.062 mm {0.90697—0.90795 in}
   Rear side: 23.037—23.062 mm {0.90697—0.90795 in}

   Caution
   - **Measure at different places and take an average. If it exceeds the specification, replace the clutch hub with a new one.**
   - **When the clutch hub is replaced, inspect the contact surface opposed to the input shaft component.**
   - **If the surface of it is scratched or has changed color, replace the input shaft component with a new one.**

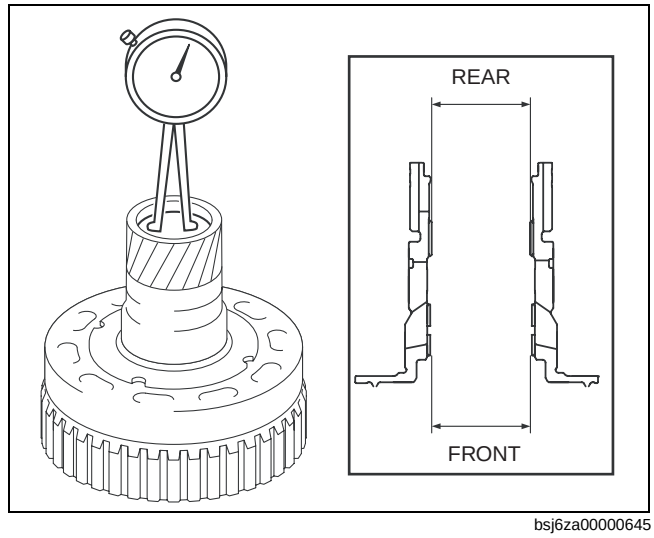


bsj6za00000644

10. Using a dial gauge, measure the inner diameter of the clutch hub component bushings.

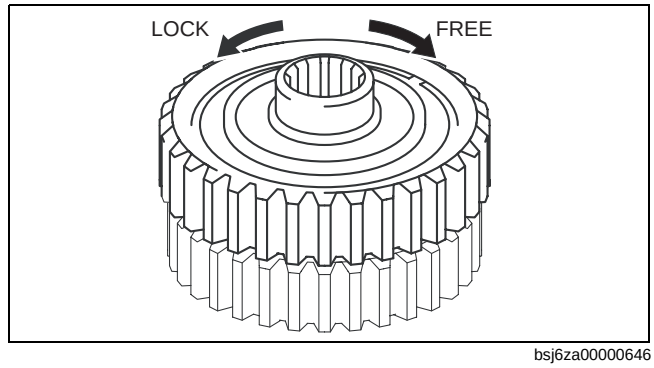
    Clutch hub component bushing inner diameter
    Front side: 33.312—33.337 mm {1.31150—1.31248 in}
    Rear side: 33.312—33.337 mm {1.31150—1.31248 in}

    Caution
    - **Measure at different places and take an average. If it exceeds the specification, replace the clutch hub component with a new one.**
    - **When the clutch hub component is replaced, inspect the contact surface opposed to the clutch hub.**
    - **If the surface of it is scratched or has changed color, replace the clutch hub with a new one.**



bsj6za00000645

11. Verify that the F4 one-way clutch rotates when the clutch hub is secured and rotated clockwise, and that it does not rotate when the clutch hub is rotated counterclockwise.

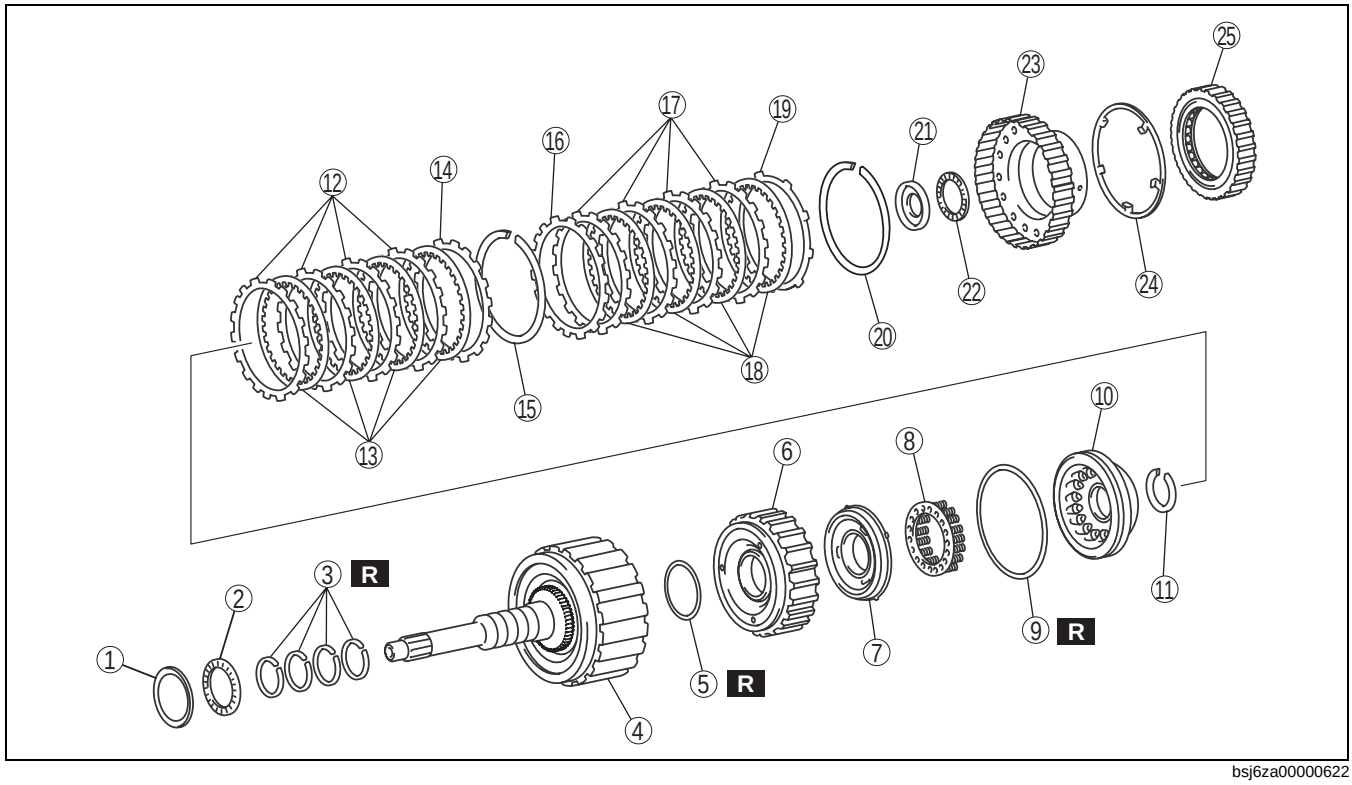


bsj6za00000646

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH COMPONENT ASSEMBLY

id051300260800

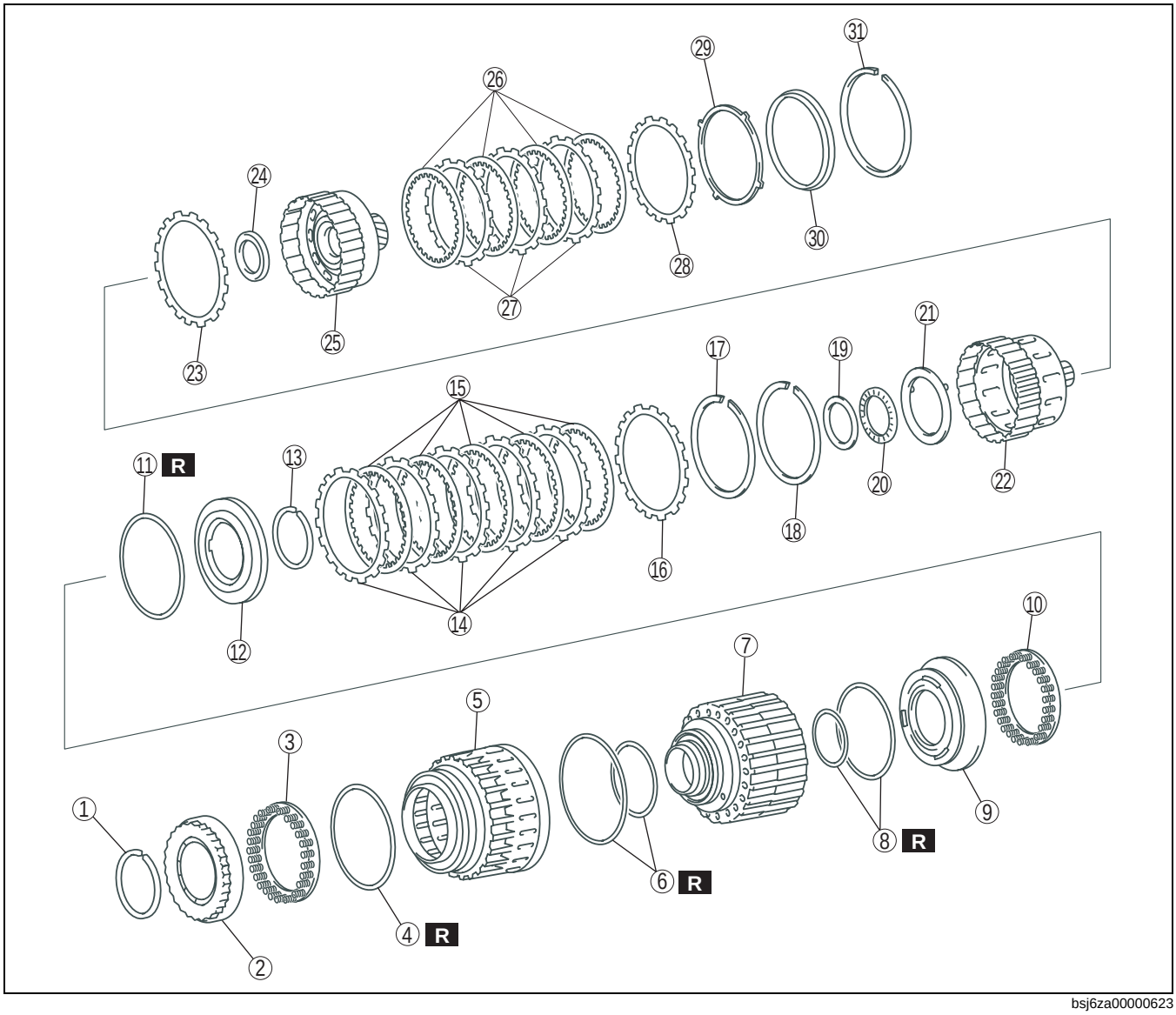
Components



bsj6za00000622

1	Bearing race
2	Thrust needle spring
3	Seal ring
4	Input shaft component
5	O-ring
6	C1 clutch position
7	C4 clutch position
8	Piston return spring
9	O-ring
10	C1 clutch seal plate
11	Snap ring
12	Driven plate
13	Drive plate

14	Retaining plate
15	Snap ring
16	Driven plate
17	Driven plate
18	Drive plate
19	Retaining plate
20	Snap ring
21	Bearing race
22	Thrust needle bearing
23	Clutch hub
24	Thrust washer
25	F4 one-way clutch



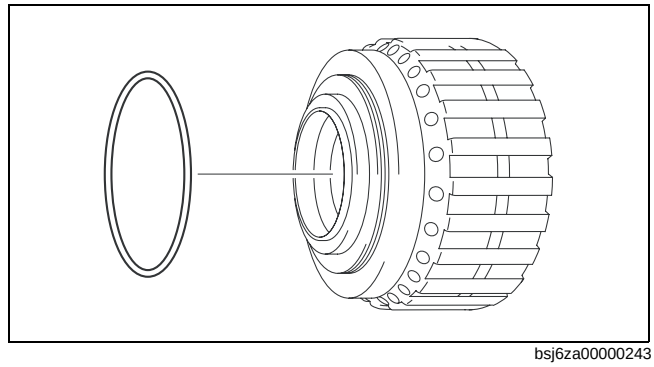
bsj6za00000623

1	Snap ring
2	C3 clutch seal plate
3	Piston return spring
4	O-ring
5	C3 clutch piston component
6	O-ring
7	C2, C3 clutch drum
8	O-ring
9	C2 clutch piston
10	C2 clutch piston return spring
11	O-ring
12	C2 clutch seal plate
13	Snap ring
14	Driven plate
15	Drive plate
16	Retaining plate

17	Snap ring
18	Snap ring
19	Bearing race
20	Thrust bearing
21	Thrust washer
22	Clutch hub
23	Retaining plate
24	Thrust needle bearing
25	Clutch hub component
26	Drive plate
27	Driven plate
28	Retaining plate
29	Driven plate
30	Sleeve
31	Snap ring

Assembly Procedure

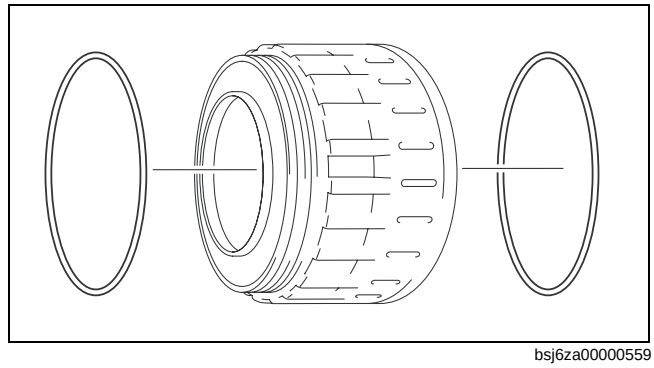
1. Apply ATF to the new O-rings.
2. Install the O-rings to the C2, C3 clutch drum.
3. Apply ATF to the new O-rings.



bsj6za00000243

4. Install the O-rings to the C3 clutch piston component.
5. Apply ATF to the C2, C3 clutch drum and the C3 clutch piston component.

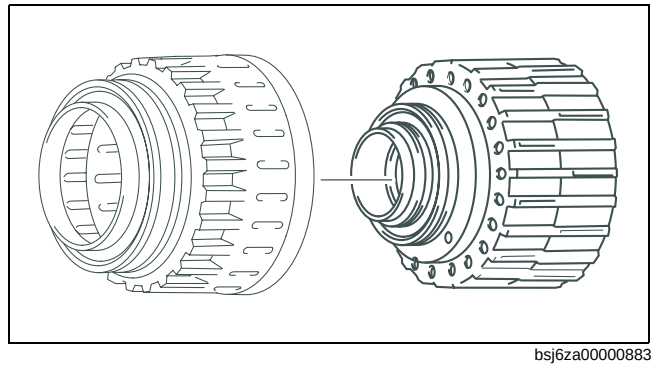
Caution
- **Do not damage the O-ring.**



bsj6za00000559

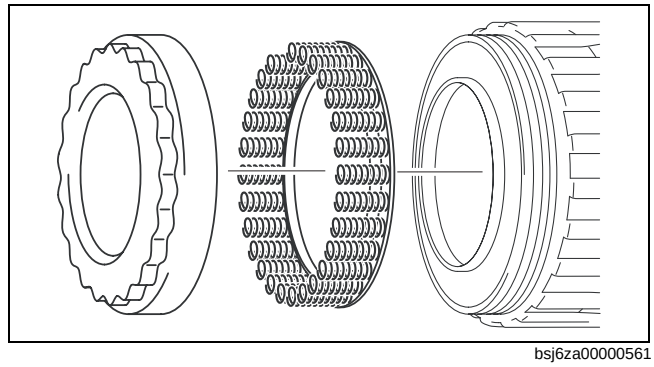
6. Install the C2, C3 clutch drum to the C3 clutch piston component.
7. Apply ATF to the seal plate and the piston return spring.

Caution
- **Do not damage the O-ring.**



bsj6za00000883

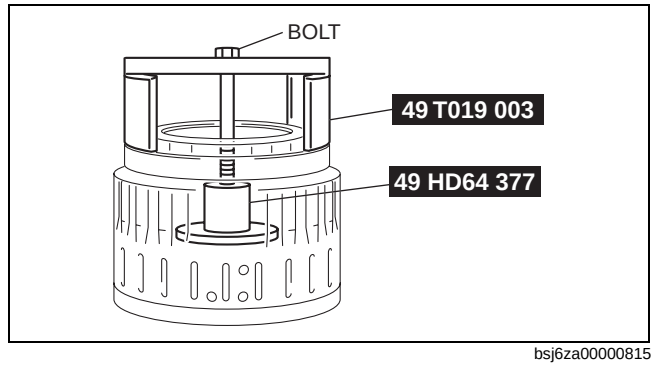
8. Install the seal plate and the piston return spring to the C3 clutch hub component.



bsj6za00000561

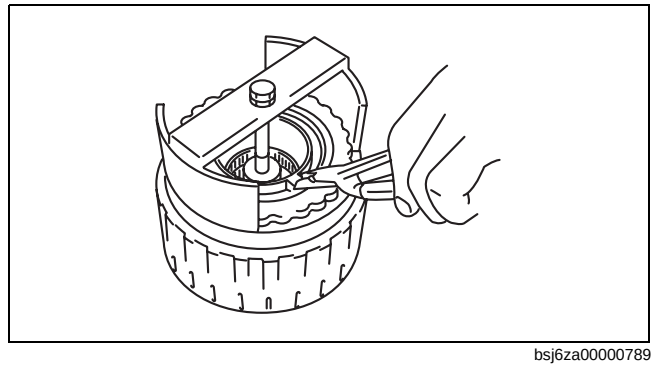
9. Install the **SST** using a **M10-1.25** bolt with a length of **100 mm** as shown in the figure to compress the piston return spring.

Caution
- **Do not expand the snap ring too much.**



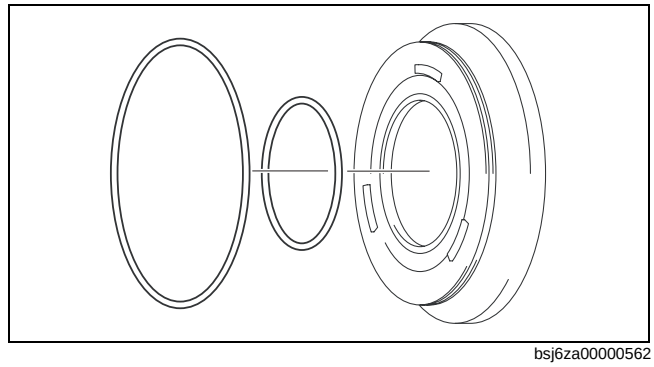
bsj6za00000815

10. Remove the snap ring using snap ring pliers.
11. Apply ATF to the new O-rings.



bsj6za00000789

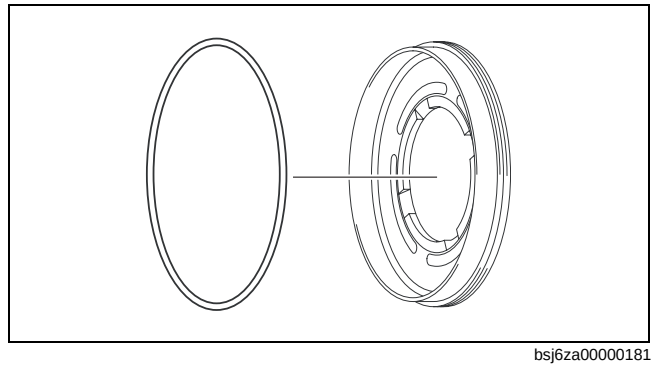
12. Install the O-rings to the C2 clutch piston.
13. Apply ATF to the new O-rings.



bsj6za00000562

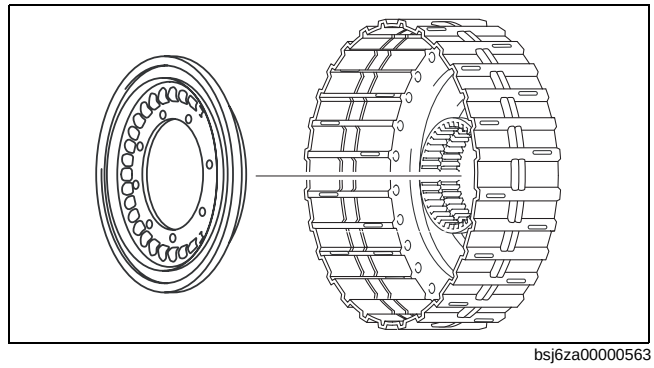
14. Install the O-rings to the C2 clutch seal plate.
15. Apply ATF to the C2 clutch piston and the C2, C3 clutch drum.

Caution
- **Do not damage the O-ring.**



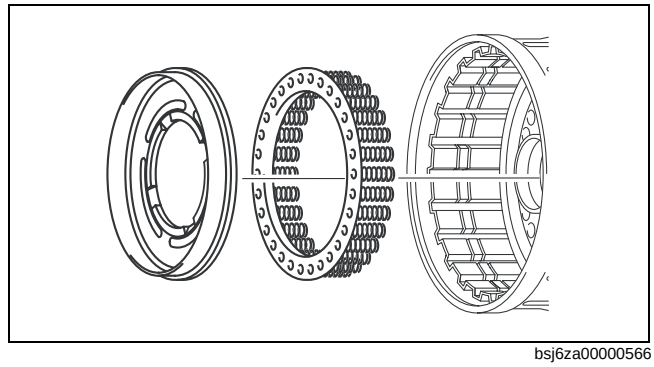
bsj6za00000181

16. Install the C2 clutch piston and the C2, C3 clutch drum.
17. Apply ATF to the C2 clutch seal plate and the C2, C3 clutch drum.



bsj6za00000563

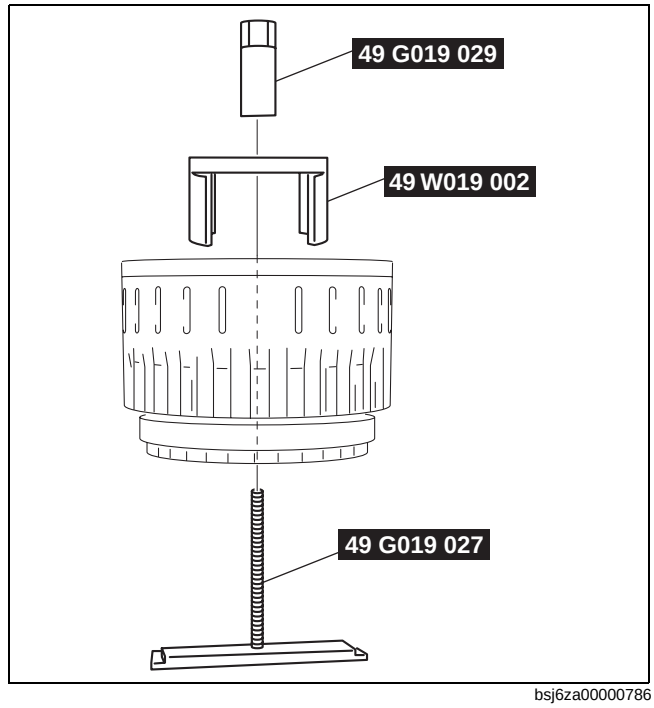
18. Install the C2 clutch seal plate and the C2 clutch piston return spring to the C2, C3 clutch drum.



bsj6za00000566

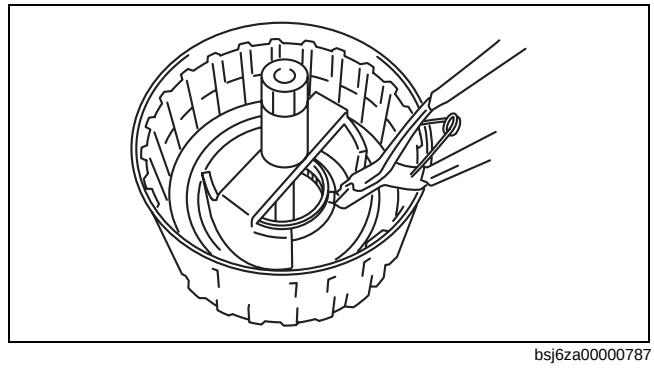
19. Install the **SST** as shown in the figure, and compress the C2 clutch piston return spring.

Caution
- **Do not expand the snap ring too much.**



bsj6za00000786

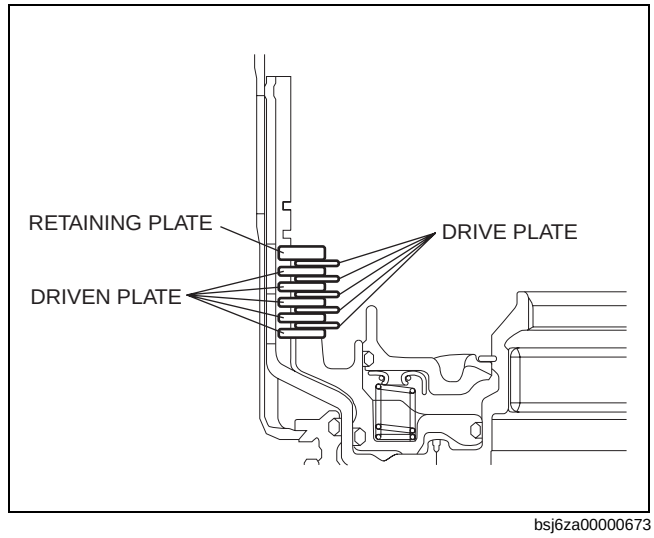
20. Install the snap ring using snap ring pliers.
21. Apply ATF to the driven plate (C2) and the drive plate (C2) and the retaining plate (C2).



bsj6za00000787

22. Install the driven plate (C2), the drive plate (C2), the retaining plate (C2) to the C2, C3 clutch drum.

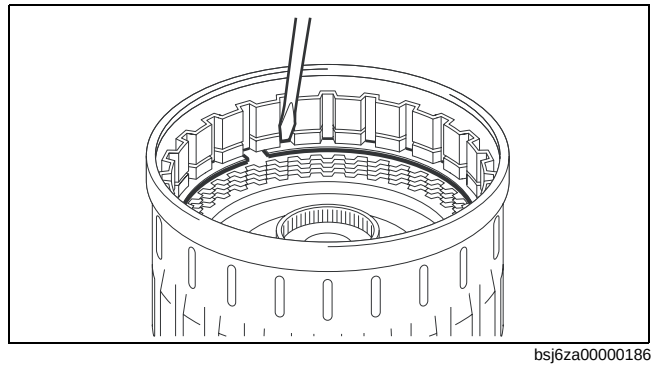
Caution
- **Inspect the number of drive and driven plates.**



bsj6za00000673

23. Using a flathead screwdriver, install the snap ring (C2) to the C2, C3 clutch drum.

Caution
- **When installing the snap ring, set the end gap of the snap ring as shown in the figure.**



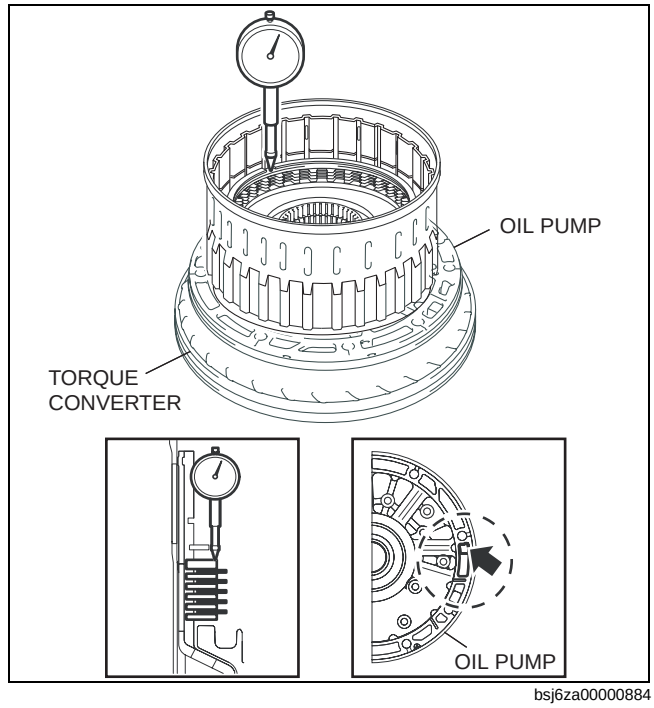
bsj6za00000186

24. Measure the retaining plate travel distance at both ends across the diameter using a dial gauge while blowing compressed air into the oil passage as shown in the figure, and calculate the average value. Verify that the piston moves smoothly.

Air pressure
200 kPa (2 kgf/cm2, 28 psi)

Identification mark	Thickness (mm {in})
0	2.95—3.05 {0.016—0.120}
1	3.05—3.15 {0.120—0.124}
2	3.15—3.25 {0.124—0.128}
3	3.25—3.35 {0.128—0.132}
4	3.35—3.45 {0.132—0.136}
5	3.45—3.55 {0.136—0.140}
6	3.55—3.65 {0.140—0.144}
7	3.65—3.75 {0.144—0.148}
8	3.75—3.85 {0.148—0.152}

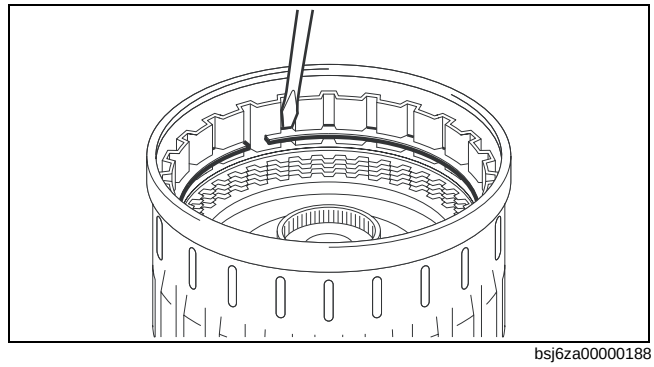
Caution
- **If the C2 clutch pack clearance exceeds the maximum specification, select another retaining plate.**



bsj6za00000884

25. Using a flathead screwdriver, install the snap ring (C3) to the C2, C3 clutch drum.

Caution
- **When installing the snap ring, set the end gap of the snap ring as shown in the figure.**

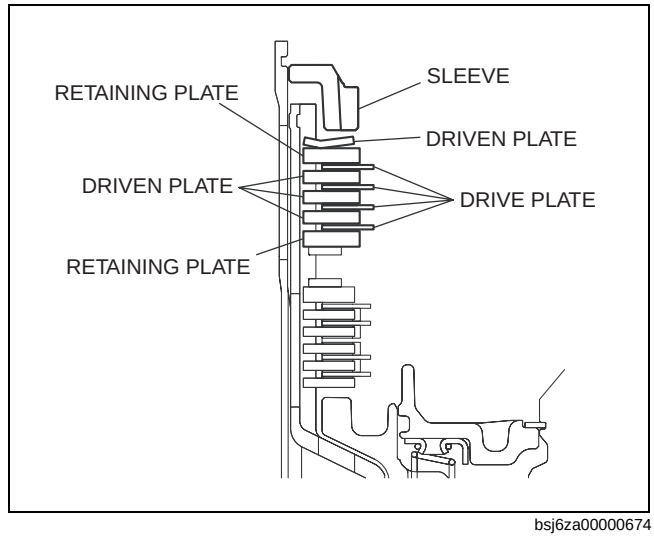

bsj6za00000188

26. Apply ATF to the retaining plate (C3), the driven plate (C3), the drive plate (C3).

Caution
- **Inspect the number of drive and driven plates.**

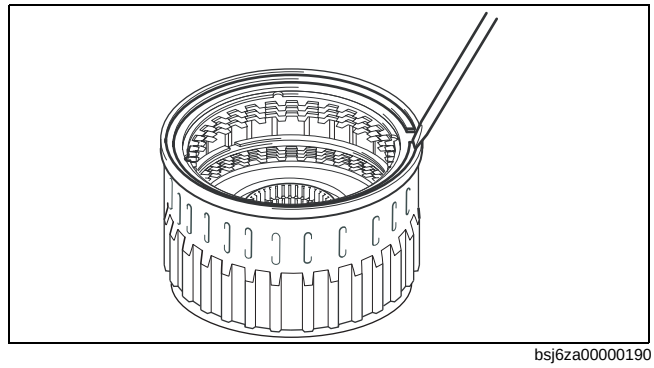
27. Install the retaining plate (C3) and the driven plate (C3) and the drive plate (C3) and the sleeve to the C2, C3 clutch drum.

Caution
- **When installing the snap ring, set the end gap of the snap ring as shown in the figure.**

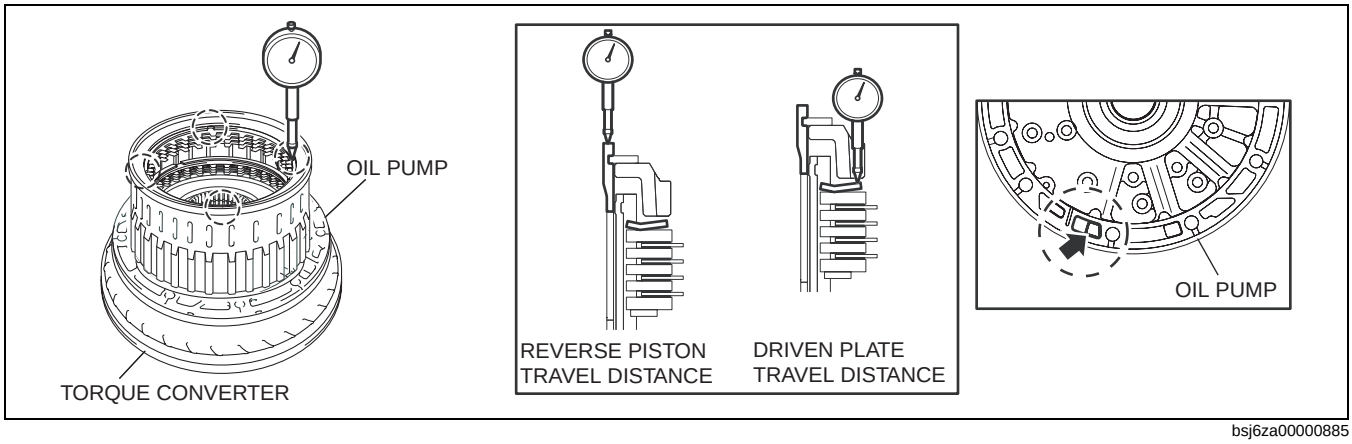


bsj6za00000674

28. Using a flathead screwdriver, install the snap ring (C3) to the C2, C3 clutch drum.


bsj6za00000190

29. Measure the driven plate travel distance of the reverse piston travel distance and driven plate at the both ends across the diameter using a dial gauge while blowing compressed air into the oil passage as shown in the figure, and calculate the average value. Verify that the piston moves smoothly.



bsj6za00000885

Air pressure
200 kPa (2 kgf/cm2, 28 psi)

Standard travel distance A
1.62—2.68 mm {0.06—0.10 in}

Standard travel distance B
1.22—1.67 mm {0.05—0.06 in}

Standard gap
0.40—0.70 mm {0.01—0.03 in}

Identification mark	Thickness (mm {in})
0	2.35—2.45 {0.093—0.096}
1	2.45—2.55 {0.096—0.100}
2	2.55—2.65 {0.100—0.104}
3	2.65—2.75 {0.104—0.108}
4	2.75—2.85 {0.108—0.112}
5	2.85—2.95 {0.112—0.116}
6	2.95—3.05 {0.116—0.120}
7	3.05—3.15 {0.120—0.124}
8	3.15—3.25 {0.124—0.128}
9	3.25—3.35 {0.128—0.132}
A	3.35—3.45 {0.132—0.136}
B	3.45—3.55 {0.136—0.140}

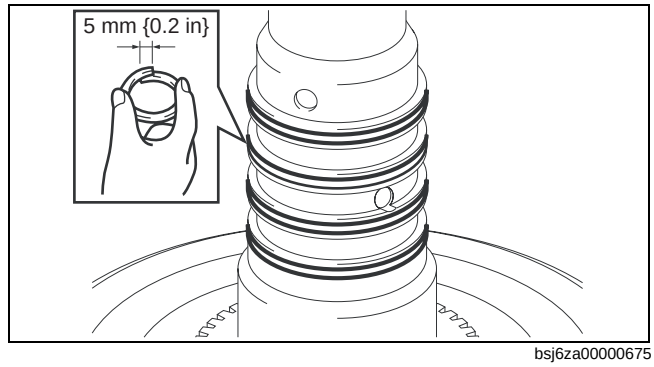
Caution
- **If the C3 clutch pack clearance exceeds the maximum specification, select another retaining plate.**

30. Apply ATF to the sliding surface of the new seal ring input shaft.

Caution
- **Do not expand the seal ring too much.**
- **Be careful not to shorten the seal rings too much, when installing them.**

31. Compress the seal rings as shown in the figure and install them to the input shaft component.

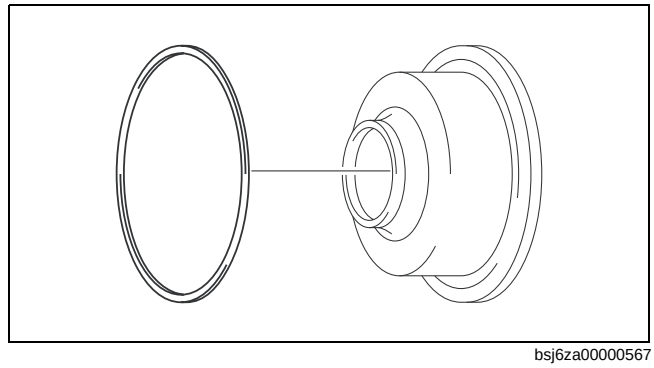
Note
- Verify that oil seal rings rotate smoothly after installing them.



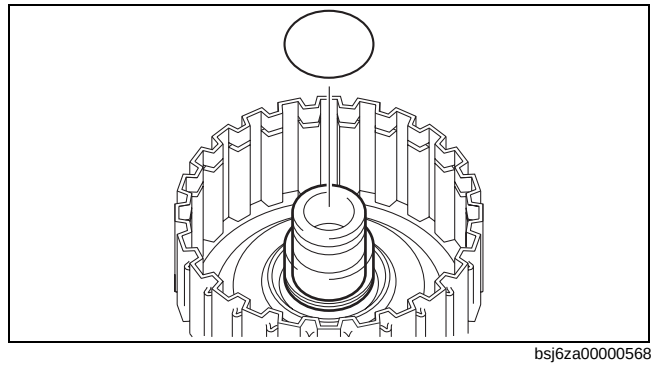
bsj6za00000675

32. Apply ATF to the new D-ring.

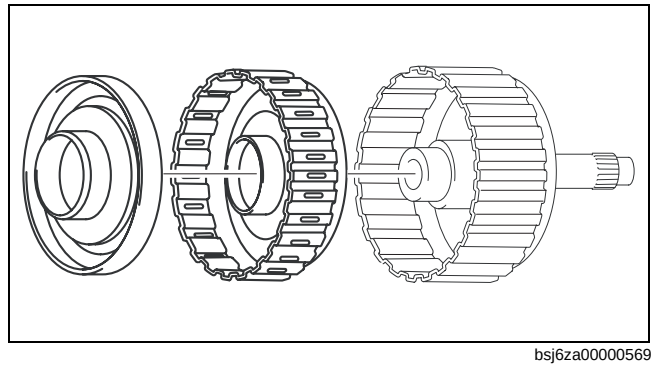
33. Install the D-ring to the C4 clutch seal plate.
34. Apply ATF to the new O-ring.


bsj6za00000567

35. Install the O-ring to the input shaft component.
36. Apply ATF to the C1 clutch piston and the C4 clutch piston to the input shaft component.


bsj6za00000568

37. Install the C1 clutch piston and the C4 clutch piston to the input shaft component.
38. Apply ATF to the C1 clutch seal plate and the input shaft component.

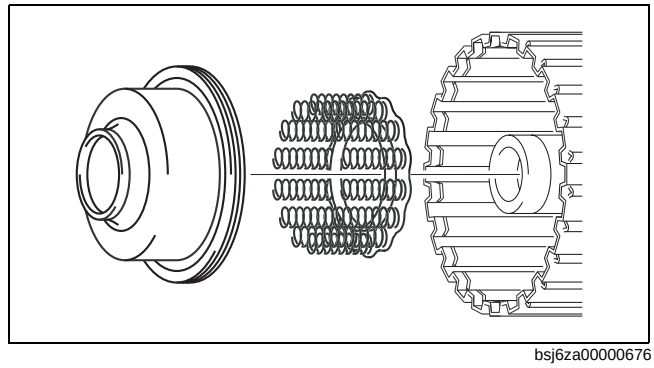

bsj6za00000569

39. Install the C1 clutch seal plate and the piston return spring to the input shaft component.

Caution
- **Do not damage the D-ring.**

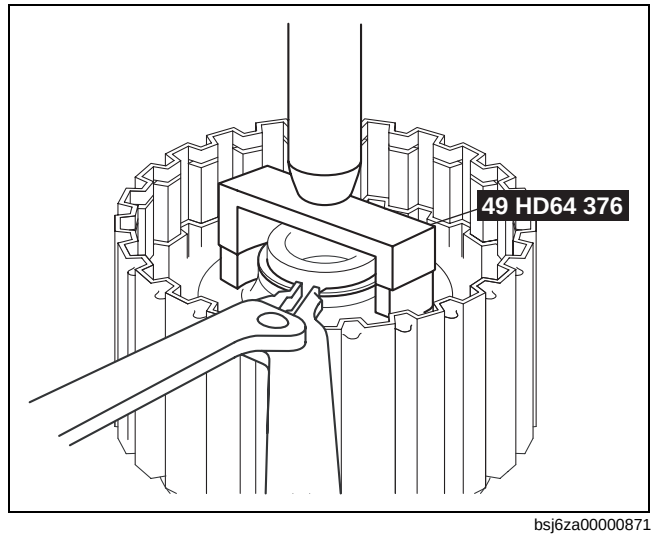
40. Place the **SST** on the C1 clutch seal plate and compress the piston return spring with a press.

Caution
- **Do not expand the snap ring too much.**


bsj6za00000676

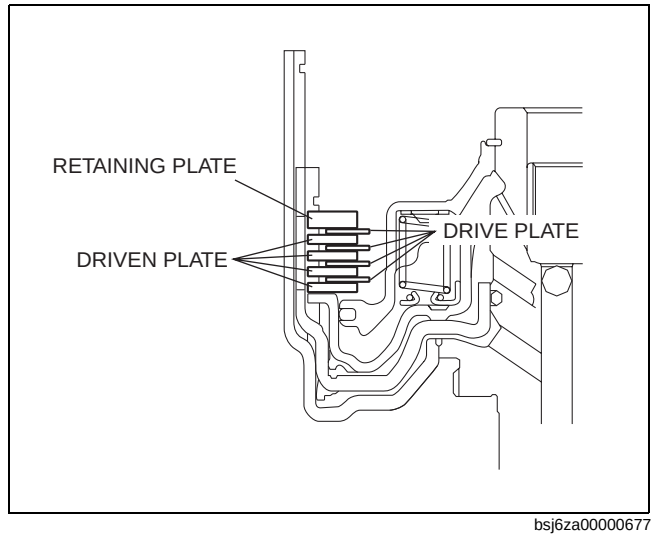
41. Install the snap ring using snap ring pliers.
42. Apply ATF to the retaining plate (C4), the driven plate (C4), the drive plate (C4).

Caution
- **Inspect the number of drive and driven plates.**



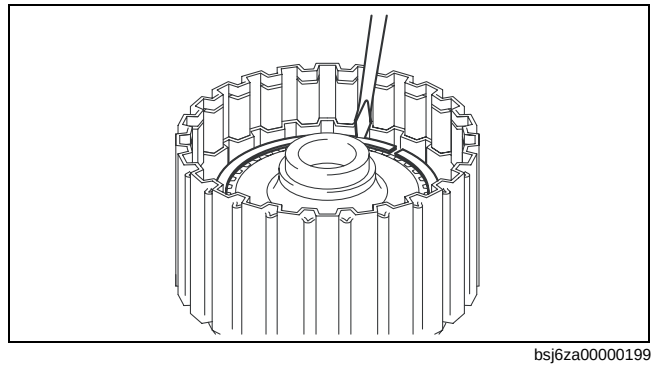
bsj6za00000871

43. Install the retaining plate (C4), the driven plate (C4), the drive plate (C4) to the input shaft component.



bsj6za00000677

44. Using a flathead screwdriver, install the snap ring to the input shaft component.

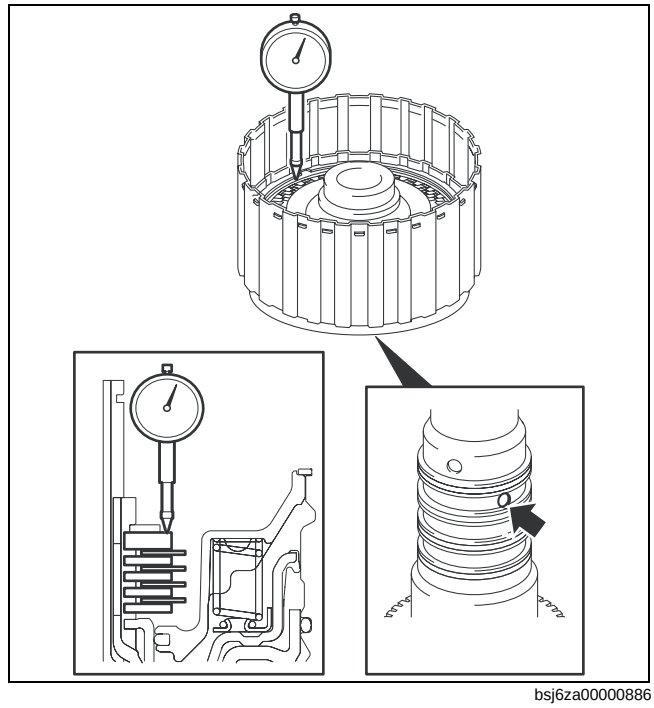


bsj6za00000199

45. Measure the retaining plate travel distance at both ends across the diameter using a dial gauge while blowing compressed air into the oil passage as shown in the figure, and calculate the average value. Verify that the piston moves smoothly.

Air pressure
200 kPa (2 kgf/cm2, 28 psi)

Standard travel distance
0.02—1.01 mm {0.0008—0.0397 in}
Standard gap
0.4—0.7 mm {0.0158—0.0275 in}



bsj6za00000886

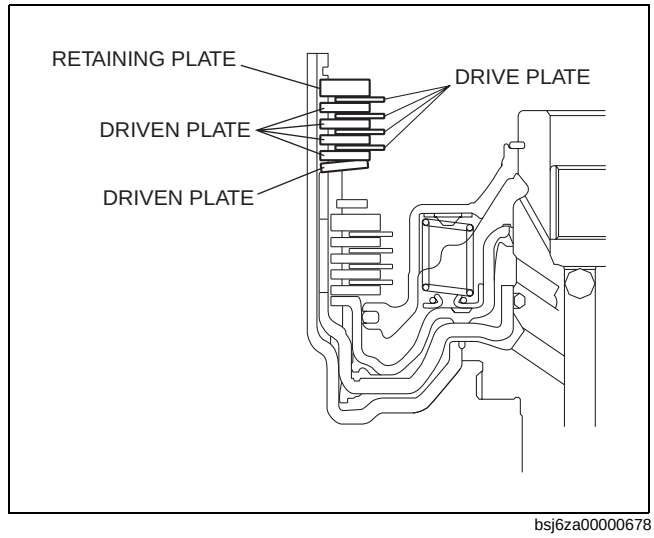
Identification mark	Thickness (mm {in})
0	2.95—3.05 {0.116—0.120}
1	3.05—3.15 {0.120—0.124}
2	3.15—3.25 {0.124—0.128}
3	3.25—3.35 {0.128—0.132}
4	3.35—3.45 {0.132—0.136}
5	3.45—3.55 {0.136—0.140}
6	3.55—3.65 {0.140—0.144}
7	3.65—3.75 {0.144—0.148}
8	3.75—3.85 {0.148—0.152}
9	3.85—3.95 {0.152—0.156}

Caution
- **If the C4 clutch pack clearance exceedy the maximum specification, select another retaining plate.**

46. Apply ATF to the retaining plate (C1), the driven plate (C1), the drive plate (C1).

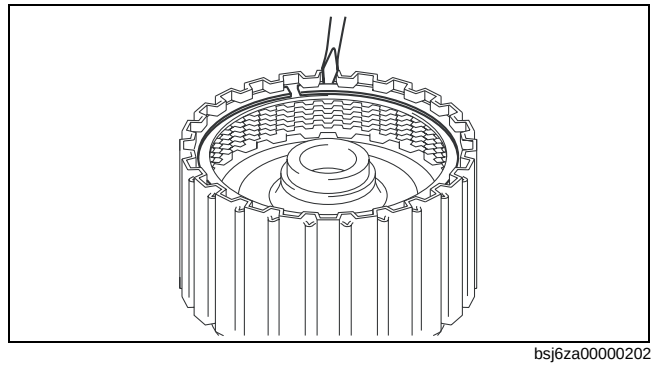
Caution
- **Inspect the number of drive and driven plates.**

47. Install the retaining plate (C1), the driven plate (C1), the drive plate (C1) to the input shaft component.



bsj6za00000678

48. Using a flathead screwdriver, install the snap ring to the input shaft component.



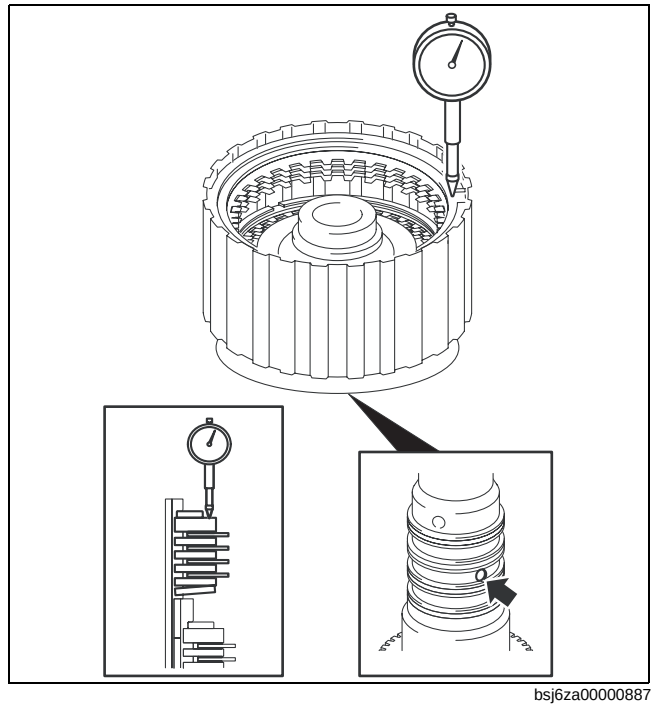
bsj6za00000202

49. Measure the retaining plate travel distance at both ends across the diameter using a dial gauge while blowing compressed air into the oil passage as shown in the figure, and calculate the average value. Verify that the piston moves smoothly.

    Air pressure
    200 kPa (2 kgf/cm2, 28 psi)

    Standard travel distance
    0.14—0.17 mm {0.0056—0.0066 in}
    Standard gap
    0.56—0.86 mm {0.0221—0.0338 in}

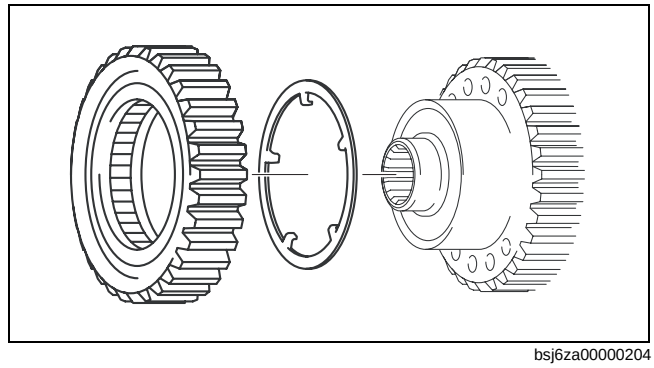
    Caution
    - **If the C1 clutch pack clearance exceedy the maximum specification, select another retaining plate.**



bsj6za00000887

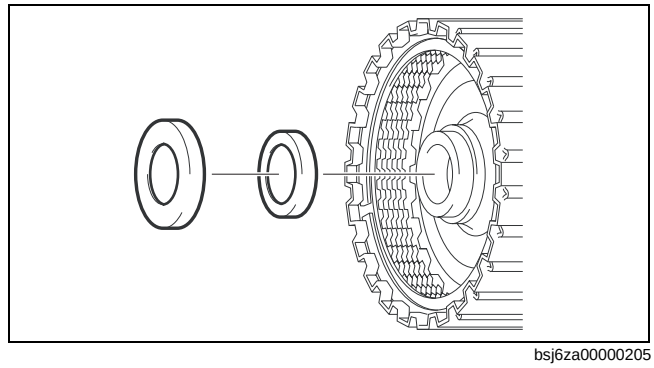
50. Apply ATF to the F4 one-way clutch and the thrust washer.

51. Install the F4 one-way clutch to the clutch hub.
52. Apply ATF to the bearing race.



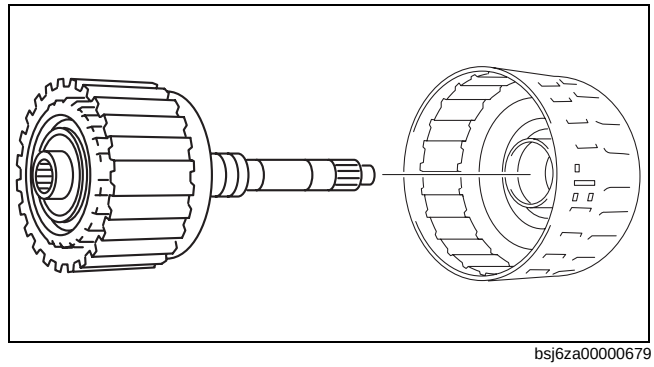
bsj6za00000204

53. Install the bearing race to the C1, C4 clutch component.



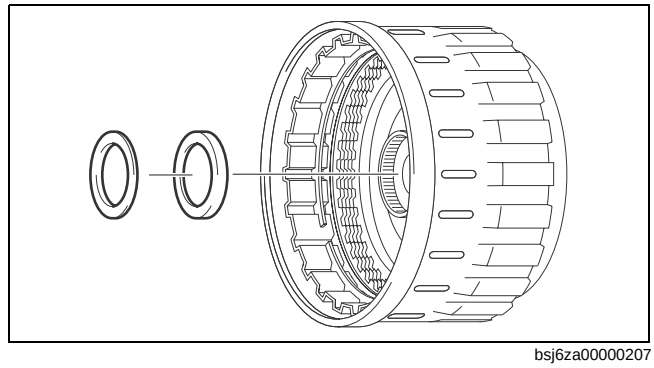
bsj6za00000205

54. Install the clutch hub to the C1, C4 clutch component.
55. Apply ATF to the bearing race.



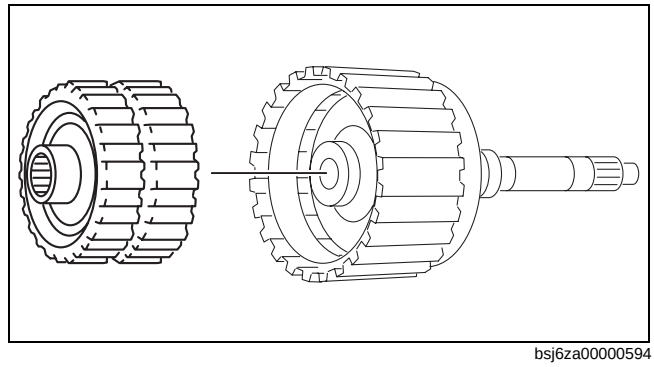
bsj6za00000679

56. Install the bearing race to the C3 clutch piston component.



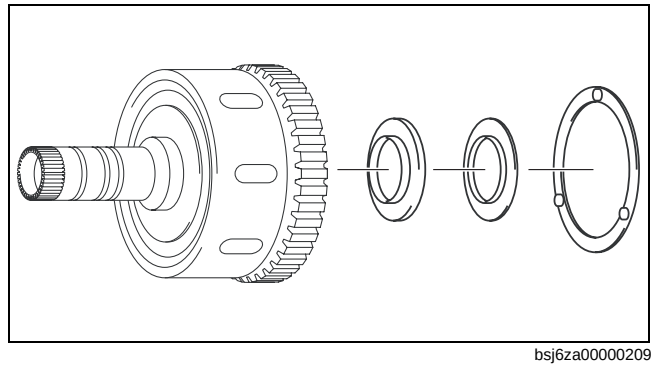
bsj6za00000207

57. Install the C1, C4 clutch component to the C2, C3 clutch drum.
58. Apply ATF to the thrust bearing, the bearing race and the thrust washer.



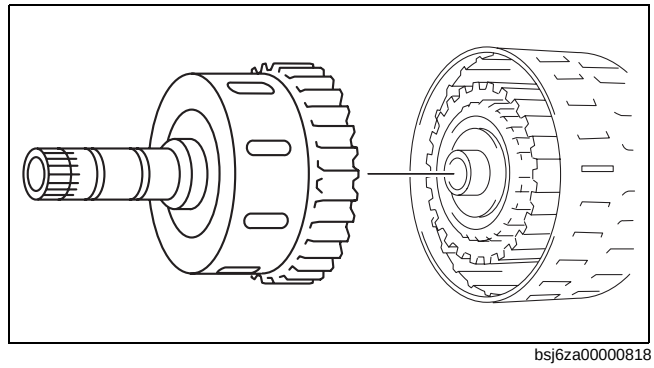
bsj6za00000594

59. Install the thrust bearing, bearing race and thrust washer.



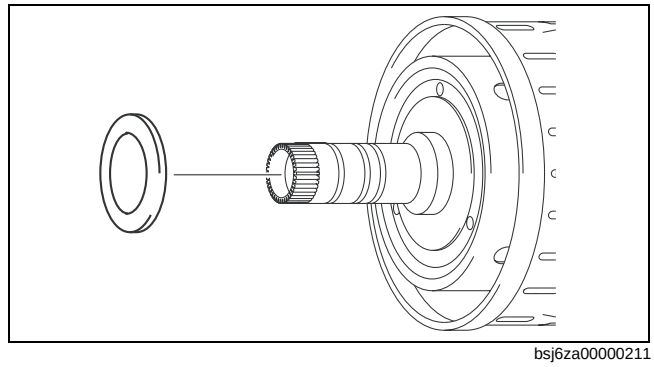
bsj6za00000209

60. Install the clutch hub to the C3 clutch piston component.
61. Apply ATF to the thrust needle spring.



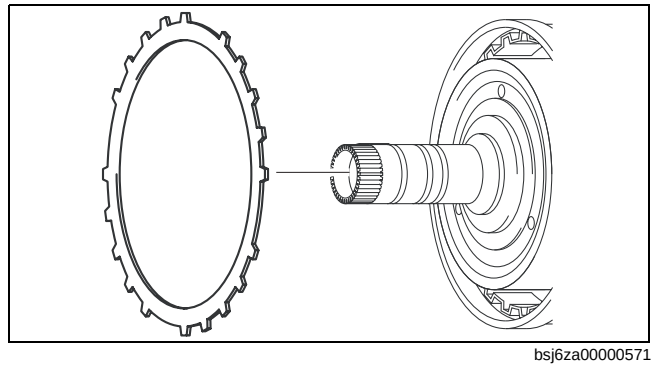
bsj6za00000818

62. Install the thrust needle spring to the clutch hub.
63. Apply ATF to the retaining plate.



bsj6za00000211

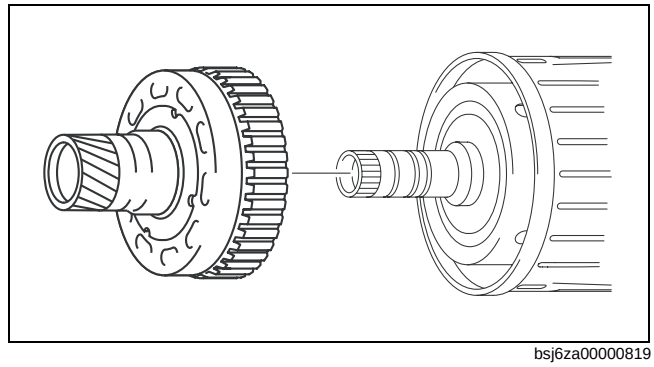
64. Install the retaining plate to the C3 clutch piston component.



bsj6za00000571

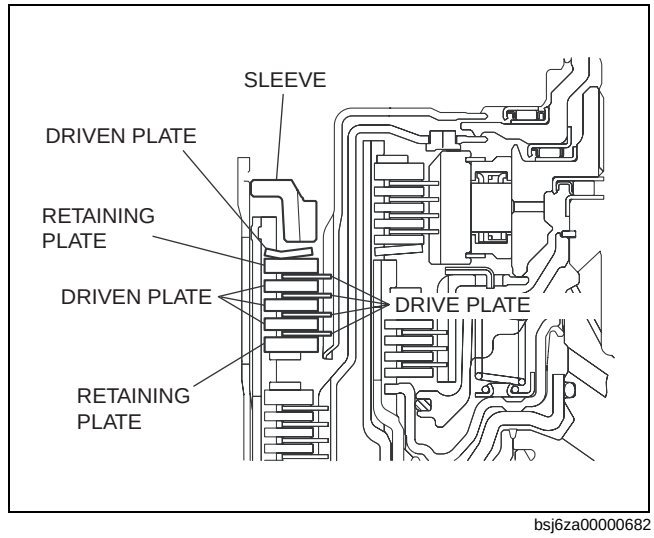
65. Install the clutch hub component to the C3 clutch piston component.
66. Apply ATF to the retaining plate, the drive plate, the driven plate.

Caution
- **Inspect the number of drive and driven plates.**



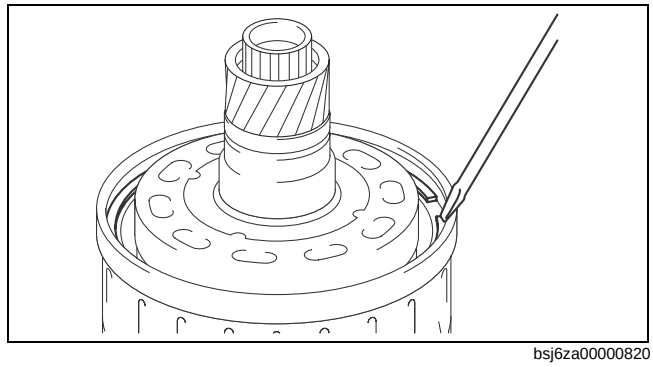
bsj6za00000819

67. Install the retaining plate (C3), the drive plate (C3), and the driven plate (C3) to the clutch hub component.



bsj6za00000682

68. Using a flathead screwdriver, install the snap ring to the C3 clutch piston component.

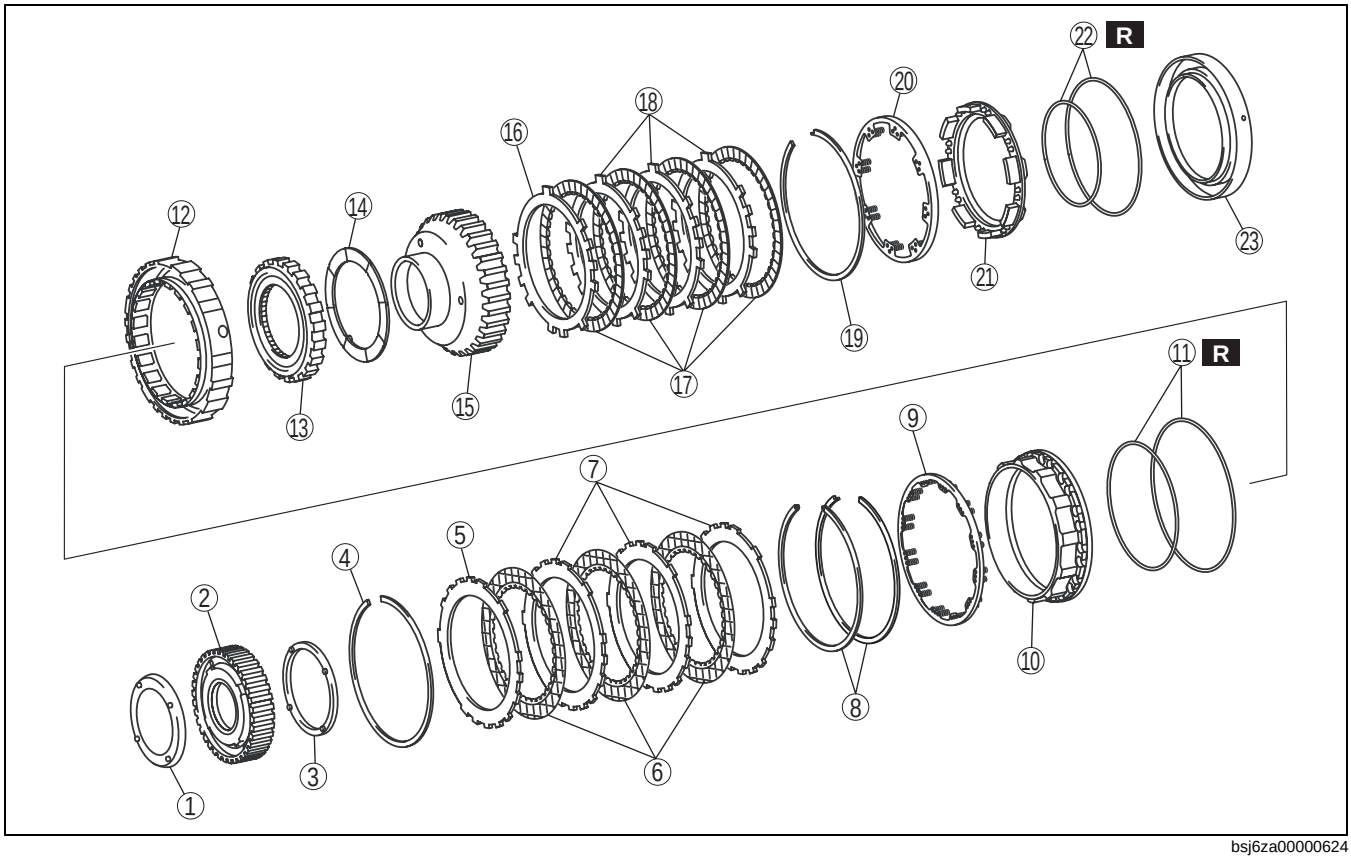


bsj6za00000820

B1, B3 BRAKE AND F1, F2 ONE-WAY CLUTCH COMPONENT DISASSEMBLY

id051300260900

Components



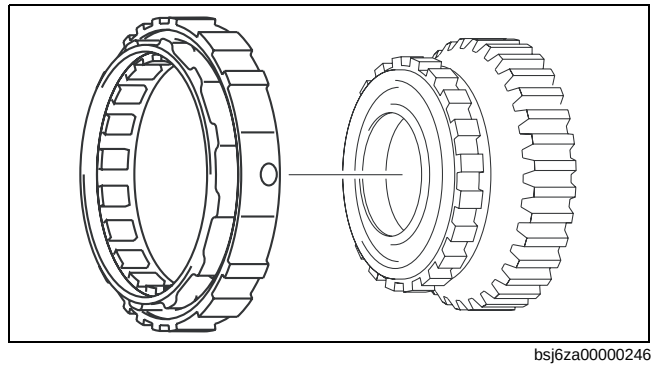
bsj6za00000624

1	Thrust washer
2	F2 one-way clutch
3	Thrust washer
4	Snap ring
5	Driven plate
6	Drive plate
7	Driven plate
8	Snap ring
9	Piston return spring
10	B3 brake piston
11	O-ring
12	B3 brake cylinder

13	F1 one-way clutch
14	Thrust washer
15	Bearing race
16	Retaining plate
17	Drive plate
18	Driven plate
19	Snap ring
20	Spring return
21	B1 brake piston
22	O-ring
23	B1 brake cylinder

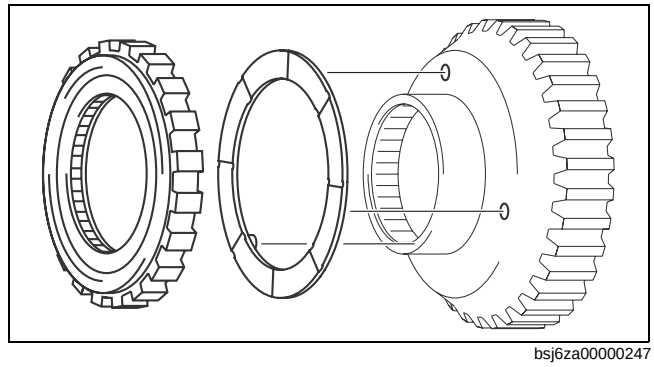
Disassembly Procedure

1. Remove the B3 brake cylinder from the F1 one-way clutch.



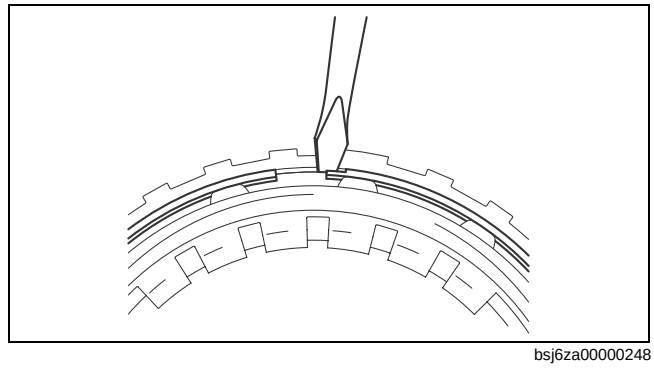
bsj6za00000246

2. Remove the F1 one-way clutch and the thrust washer from the bearing race.



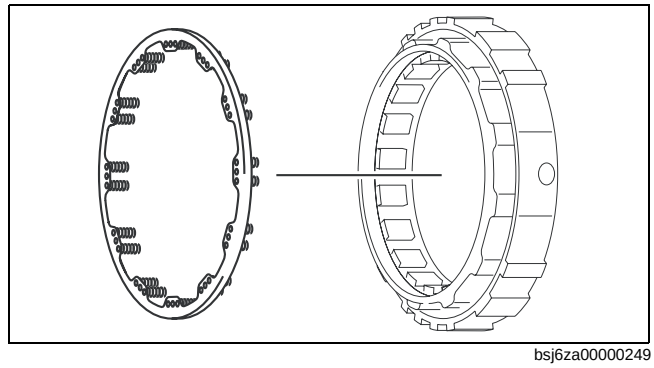
bsj6za00000247

3. Using a flathead screwdriver, remove the snap ring from the B3 brake cylinder.



bsj6za00000248

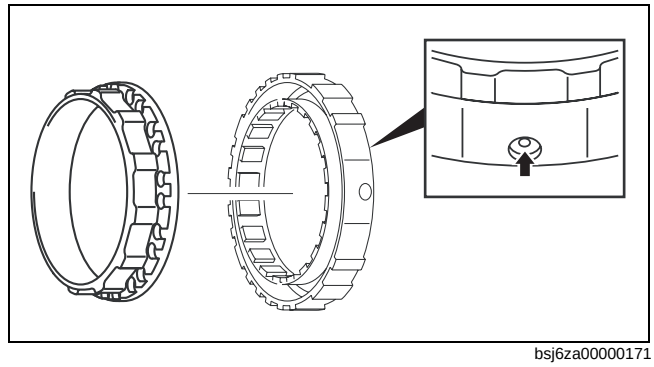
4. Remove the piston return spring from the B3 brake piston.



bsj6za00000249

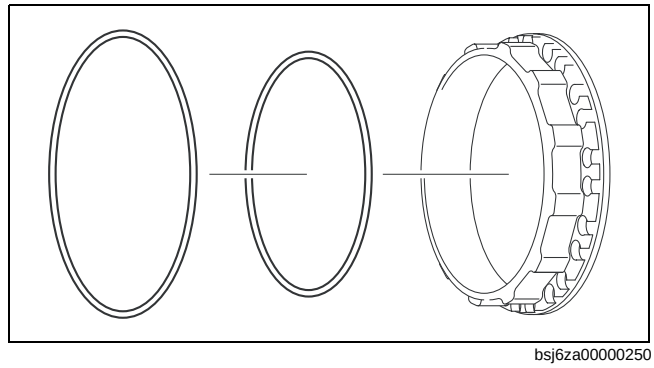
5. While pushing the B3 brake piston, apply compressed air into the oil passage as shown in the figure and remove the B3 brake piston from the B3 brake cylinder.

   Air pressure
   392 kPa (4.0 kgf/cm^2, 57 psi)



bsj6za00000171

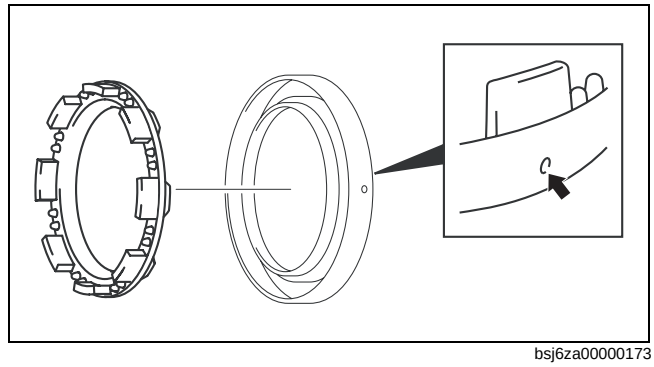
6. Remove the O-ring from the B3 brake piston.



bsj6za00000250

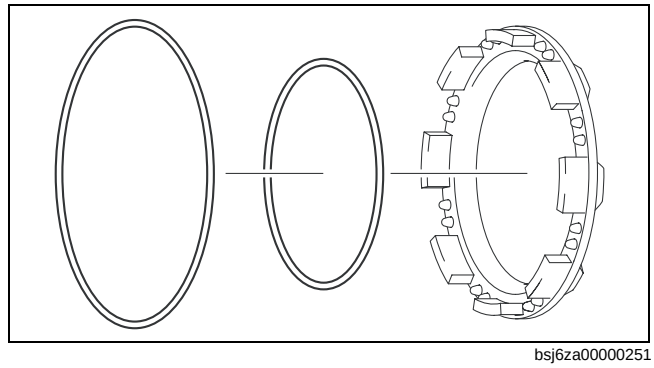
7. While pushing the B1 brake piston, apply compressed airinto the oil passage as shown in the figure and remove the B1 brake piston from the B1 brake cylinder.

   Air pressure
   392 kPa (4.0 kgf/cm^2, 57 psi)



bsj6za00000173

8. Remove the O-ring from the B1 brake piston.



bsj6za00000251

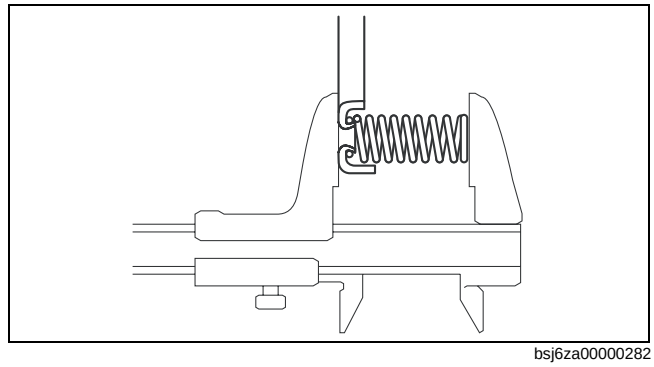
B1, B3 BRAKE AND F1, F2 ONE-WAY CLUTCH INSPECTION

id051300261000

1. Using vernier calipers, measure the free length of the piston return spring.

   B3 brake return spring free length
   Standard: 15.72 mm {0.62 in}

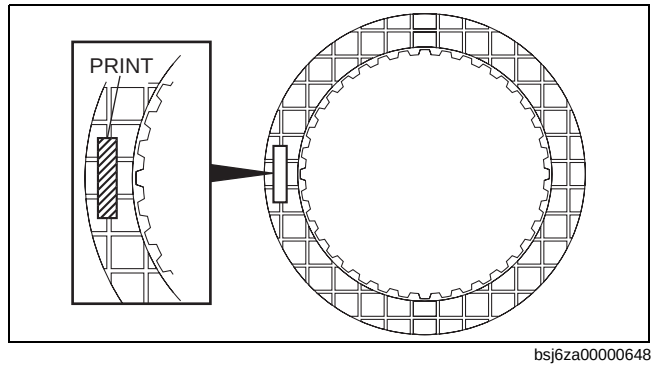
   - If it less than the specification, replace the piston return spring with a new one.



bsj6za00000282

2. Inspect the lining of all drive plates. (B3)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.

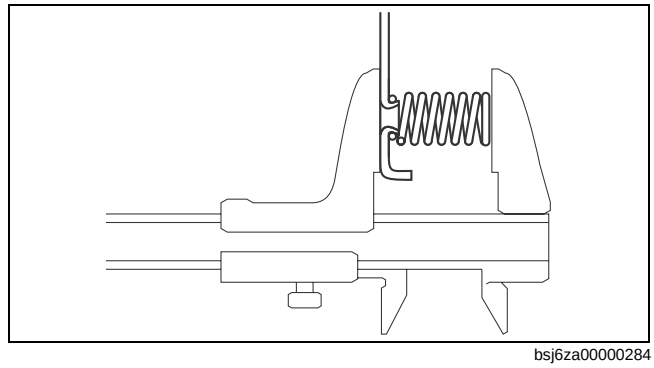


bsj6za00000648

3. Using vernier calipers, measure the free length of the piston return spring.

   B1 brake return spring free length
   Standard: 17.05 mm {0.67 in}

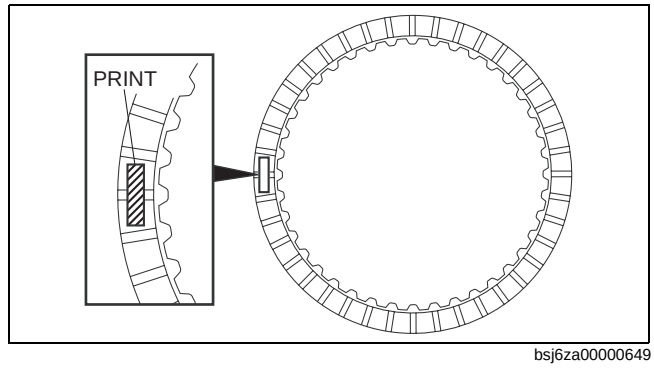
   - If it less than the specification, replace the piston return spring with a new one.



bsj6za00000284

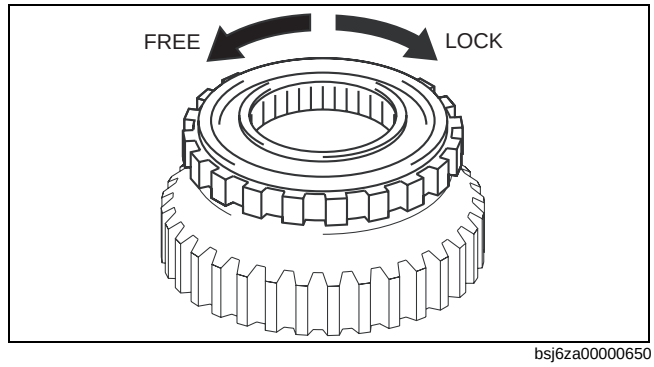
4. Inspect the lining of all drive plates. (B1)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.



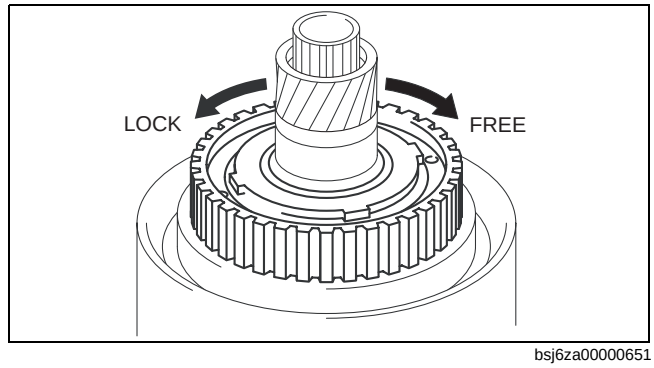
bsj6za00000649

5. Verify that the F1 one-way clutch rotates when the bearing race is secured and rotated clockwise, and that it does not rotate when the bearing race is rotated counterclockwise.



bsj6za00000650

6. Verify that the F2 one-way clutch rotates when the clutch hub is secured and rotated clockwise, and that it does not rotate when the clutch hub is rotated counterclockwise.

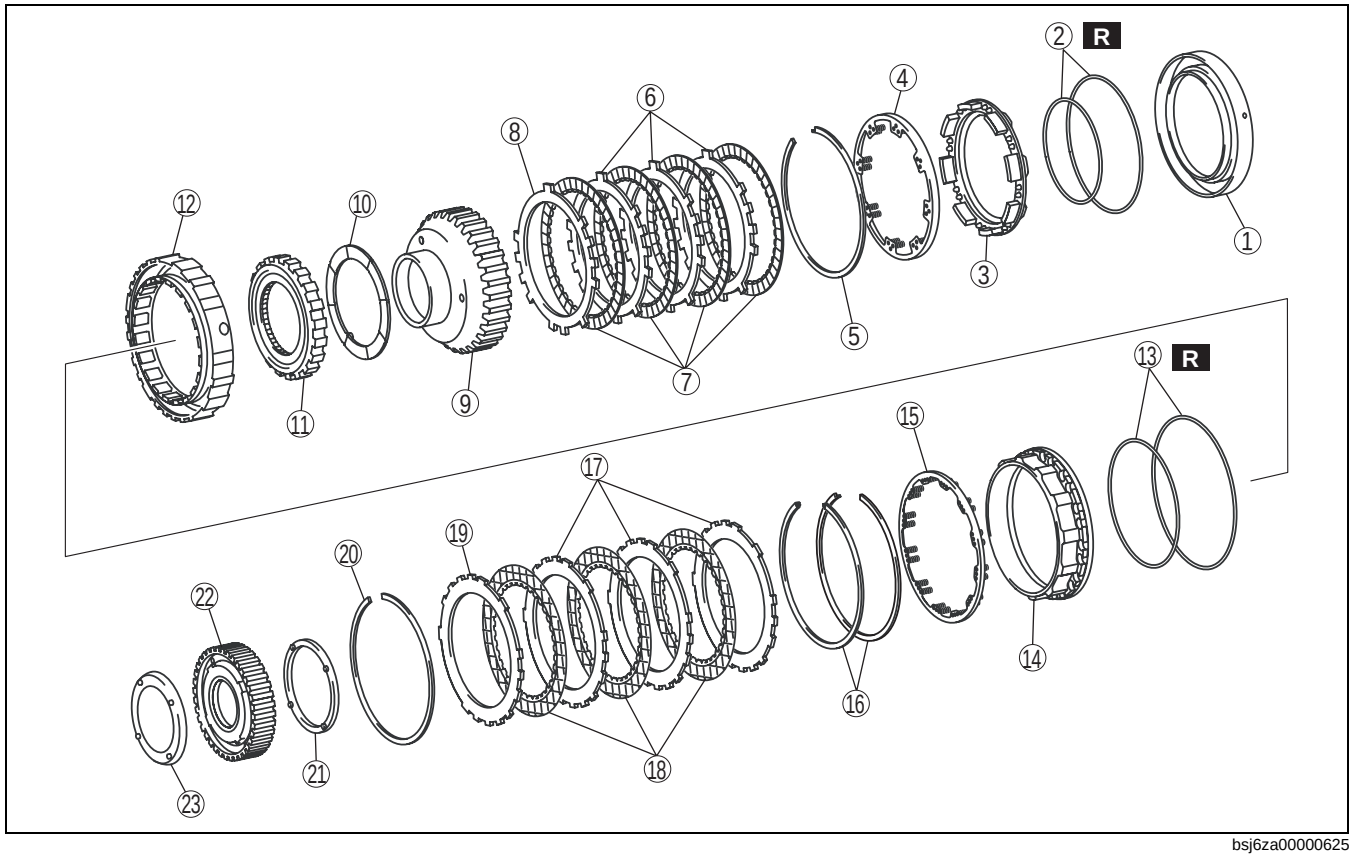


bsj6za00000651

B1, B3 BRAKE AND F1, F2 ONE-WAY CLUTCH COMPONENT ASSEMBLY

id051300261100

Components



bsj6za00000625

1	B1 brake cylinder
2	O-ring
3	B1 brake piston
4	Spring return
5	Snap ring

6	Driven plate
7	Drive plate
8	Retaining plate
9	Bearing race
10	Thrust washer

11	F1 one-way clutch
12	B3 brake cylinder
13	O-ring
14	B3 brake cylinder
15	Piston return spring
16	Snap ring
17	Driven plate

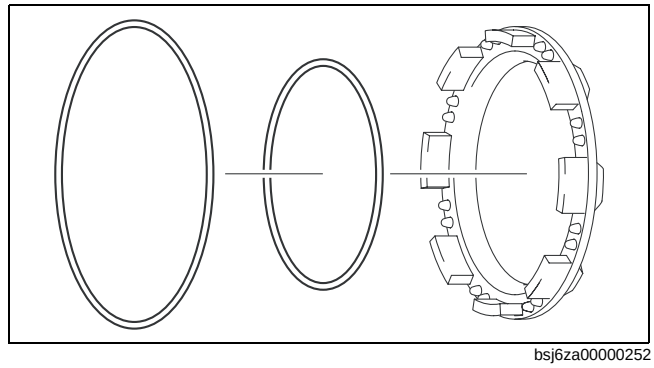
18	Drive plate
19	Driven plate
20	Snap ring
21	Thrust washer
22	F2 one-way clutch
23	Thrust washer

Assembly Procedure

1. Apply ATF to the new O-rings.
2. Install the O-rings to the B1 brake piston.
3. Apply ATF to the B1 brake piston and the B1 brake cylinder.

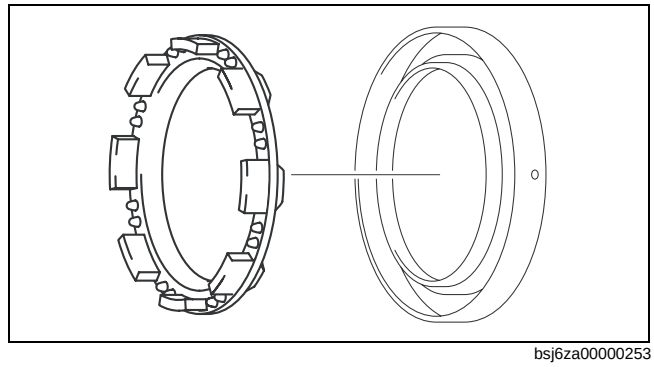
Caution

- **Do not damage the O-ring.**



bsj6za00000252

4. Install the B1 brake piston to the B1 brake cylinder.
5. Apply ATF to the new O-rings.

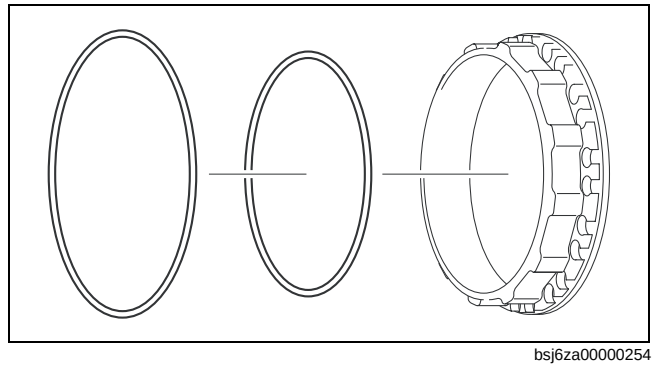


bsj6za00000253

6. Install the O-rings to the B3 brake piston.
7. Apply ATF to the B3 brake cylinder to the B3 brake piston.

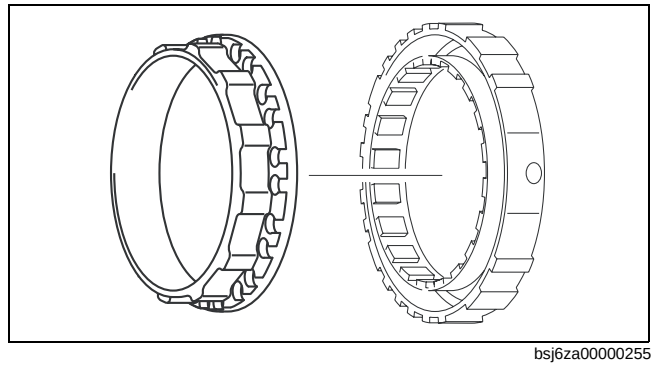
Caution

- **Do not damage the O-ring.**



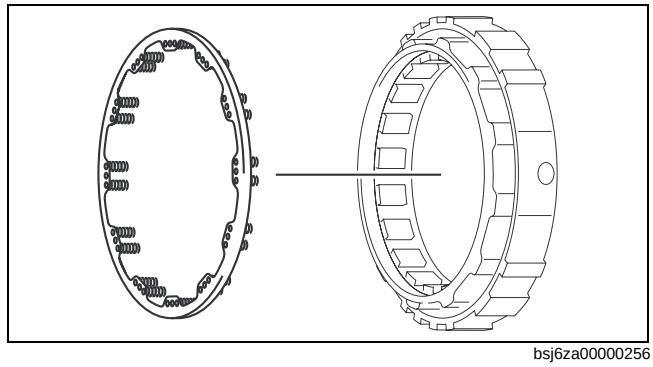
bsj6za00000254

8. Install the B3 brake piston to the B3 brake cylinder.



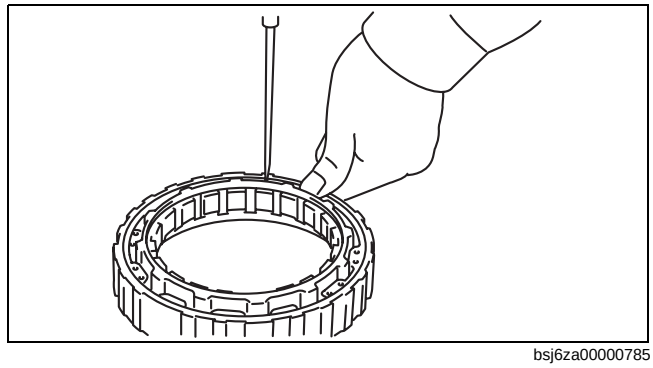
bsj6za00000255

9. Install the piston return spring to the B3 brake piston.



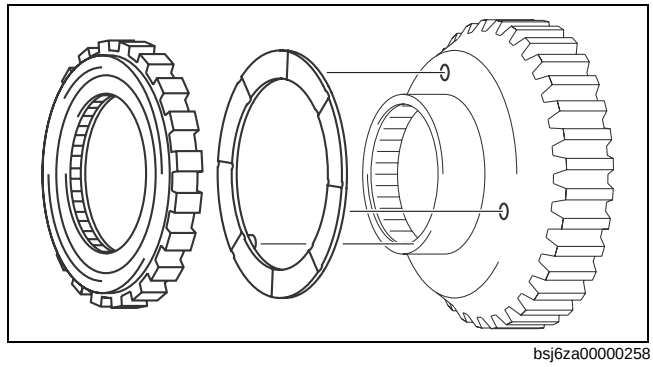
bsj6za00000256

10. While holding the snap ring with a finger, install it to the brake cylinder using a flathead screwdriver.
11. Apply ATF to the thrust washer.
12. Install the bearing race to the thrust washer.



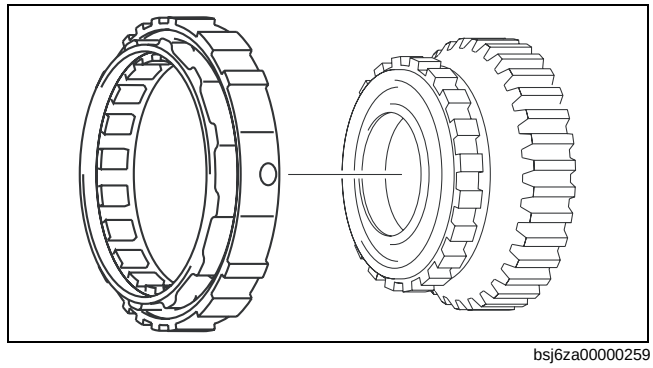
bsj6za00000785

13. Install the F1 one-way clutch to the bearing race.



bsj6za00000258

14. Install the B3 brake cylinder to the F1 one-way clutch.

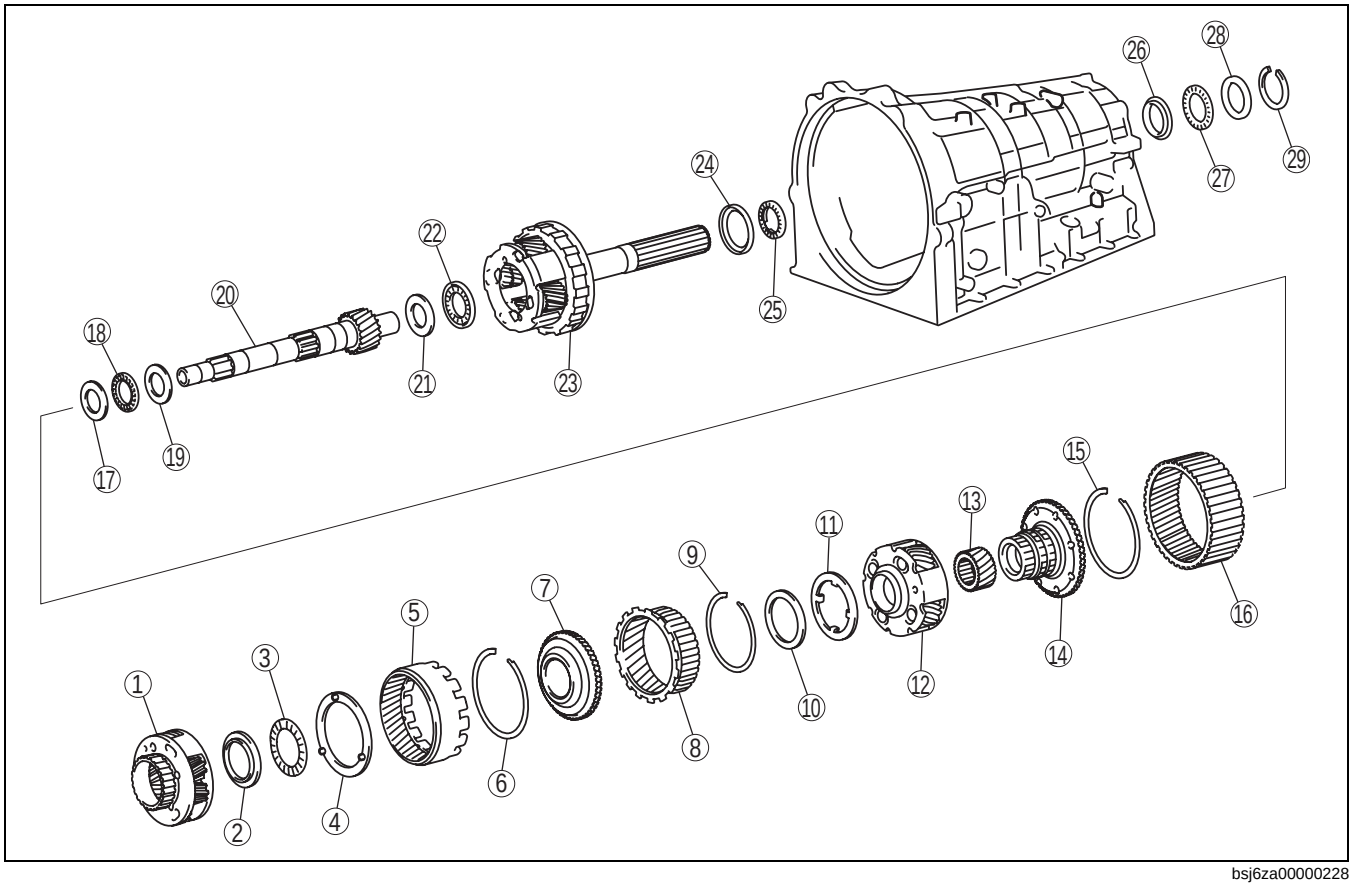


bsj6za00000259

PLANETARY GEAR COMPONENT DISASSEMBLY

id051300261200

Components



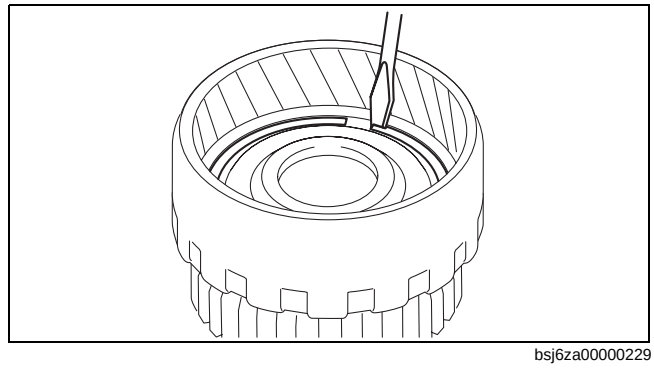
bsj6za00000228

1	Front planetary gear component
2	Bearing race
3	Thrust needle bearing
4	Thrust washer
5	Front planetary ring gear
6	Snap ring
7	Front planetary ring gear flange
8	Middle planetary ring gear
9	Snap ring
10	Thrust needle bearing
11	Bearing race
12	Middle planetary gear component
13	Sun gear
14	Middle planetary ring gear flange
15	Snap ring

16	Rear planetary ring gear
17	Bearing race
18	Needle bearing
19	Bearing race
20	Intermediate shaft
21	Bearing race
22	Thrust needle bearing
23	Rear planetary ring gear
24	Bearing race
25	Thrust needle bearing
26	Bearing race
27	Thrust needle bearing
28	Bearing race
29	Snap ring

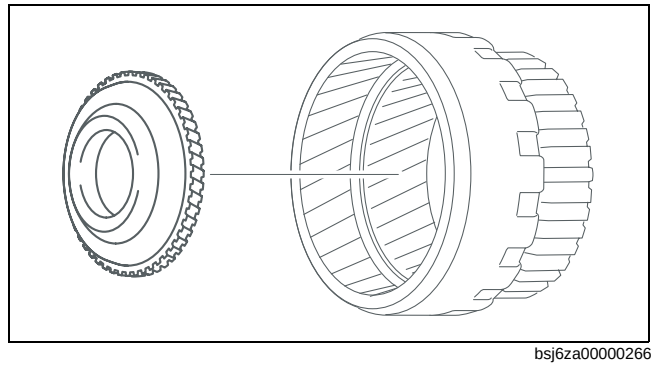
Disassembly Procedure

1. Using a flathead screwdriver, remove the snap ring from the middle planetary ring gear.



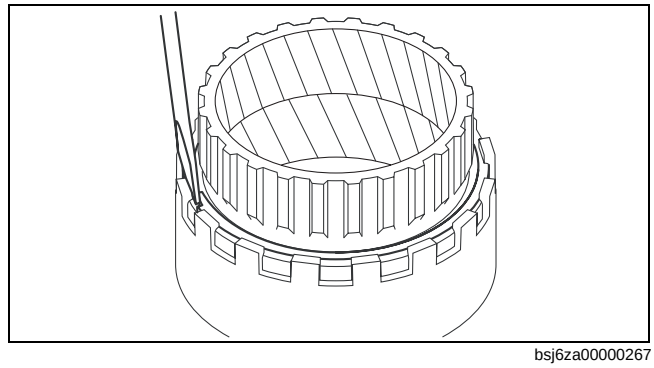
bsj6za00000229

2. Remove the front planetary ring gear flange from the middle planetary ring gear.



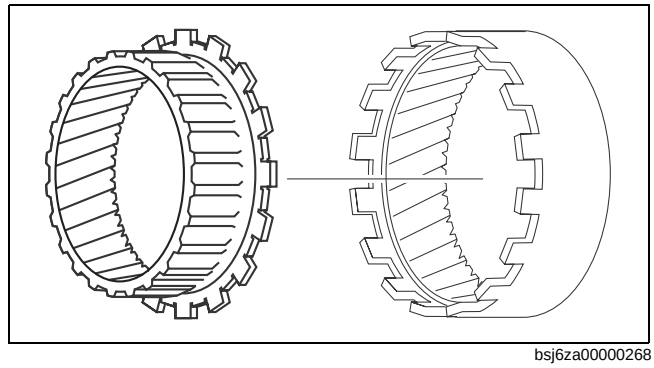
bsj6za00000266

3. Using a flathead screwdriver, remove the snap ring from the middle planetary ring gear.



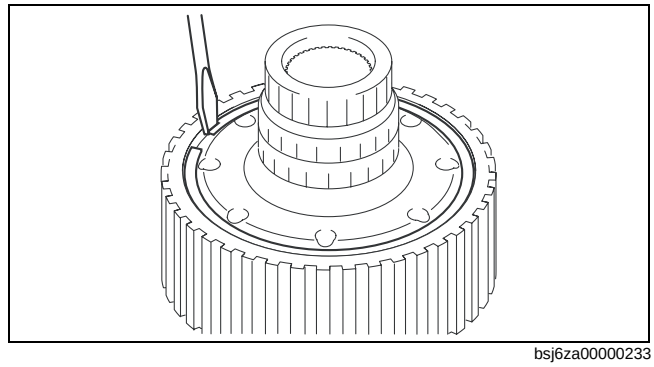
bsj6za00000267

4. Remove the front planetary ring gear from the middle planetary ring gear.



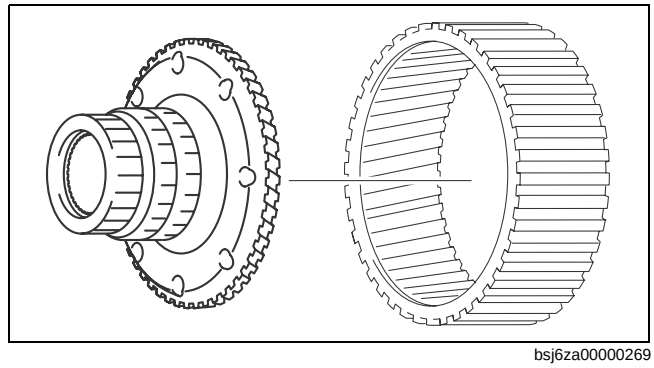
bsj6za00000268

5. Using a flathead screwdriver, remove the snap ring from the rear planetary ring gear.



bsj6za00000233

6. Remove the rear planetary ring gear flange from the rear planetary ring gear.



bsj6za00000269

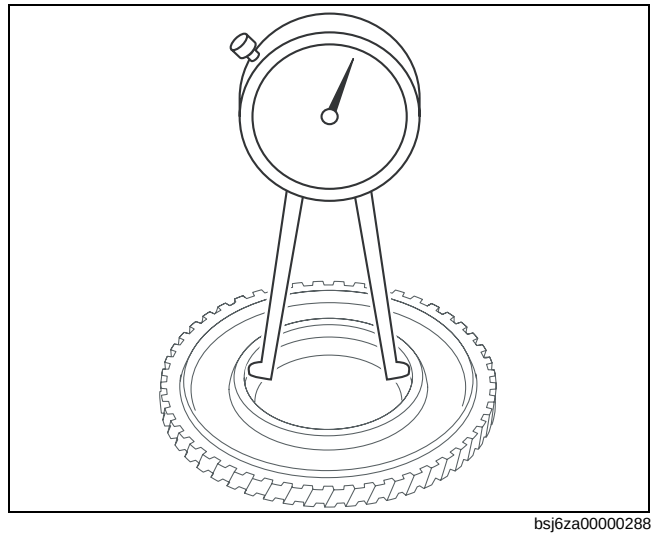
PLANETARY GEAR COMPONENT INSPECTION

id051300261300

1. Using a dial gauge, measure the inner diameter of the front planetary ring gear flange bushings.

   Front planetary ring gear bushing inner diameter
   46.038—46.063 mm {1.81252—1.81350 in}

   Caution
   - **Measure at different places and take an average. If it exceeds the specification, replace the front planetary ring gear flange with a new one.**
   - **When the front planetary ring gear flange is replaced, inspect the contact surface opposed to the middle planetary gear component.**
   - **If the surface of it is scratched or has changed color, replace the middle planetary gear component with a new one.**

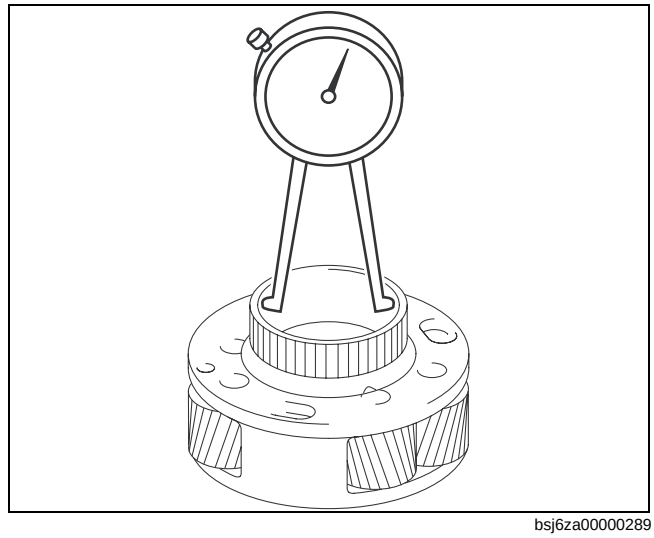


bsj6za00000288

2. Using a dial gauge, measure the inner diameter of the front planetary gear component bushings.

Front planetary gear component bushing inner diameter
48.755—48.780 mm {1.91949—1.92047 in}

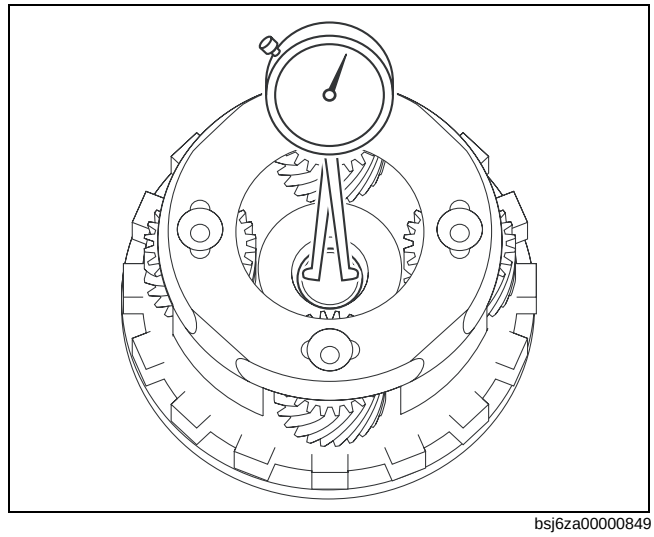
Caution
- **Measure at different places and take an average. If it exceeds the specification, replace the front planetary gear component with a new one.**
- **When the front planetary gear component is replaced, inspect the contact surface opposed to the clutch hub.**
- **If the surface of it is scratched or has changed color, replace the clutch hub with a new one.**


bsj6za00000289

3. Using a dial gauge, measure the inner diameter of the rear planetary gear component bushings.

Rear planetary gear component bushing inner diameter
18.000—18.025 mm {0.7087—0.7096 in}

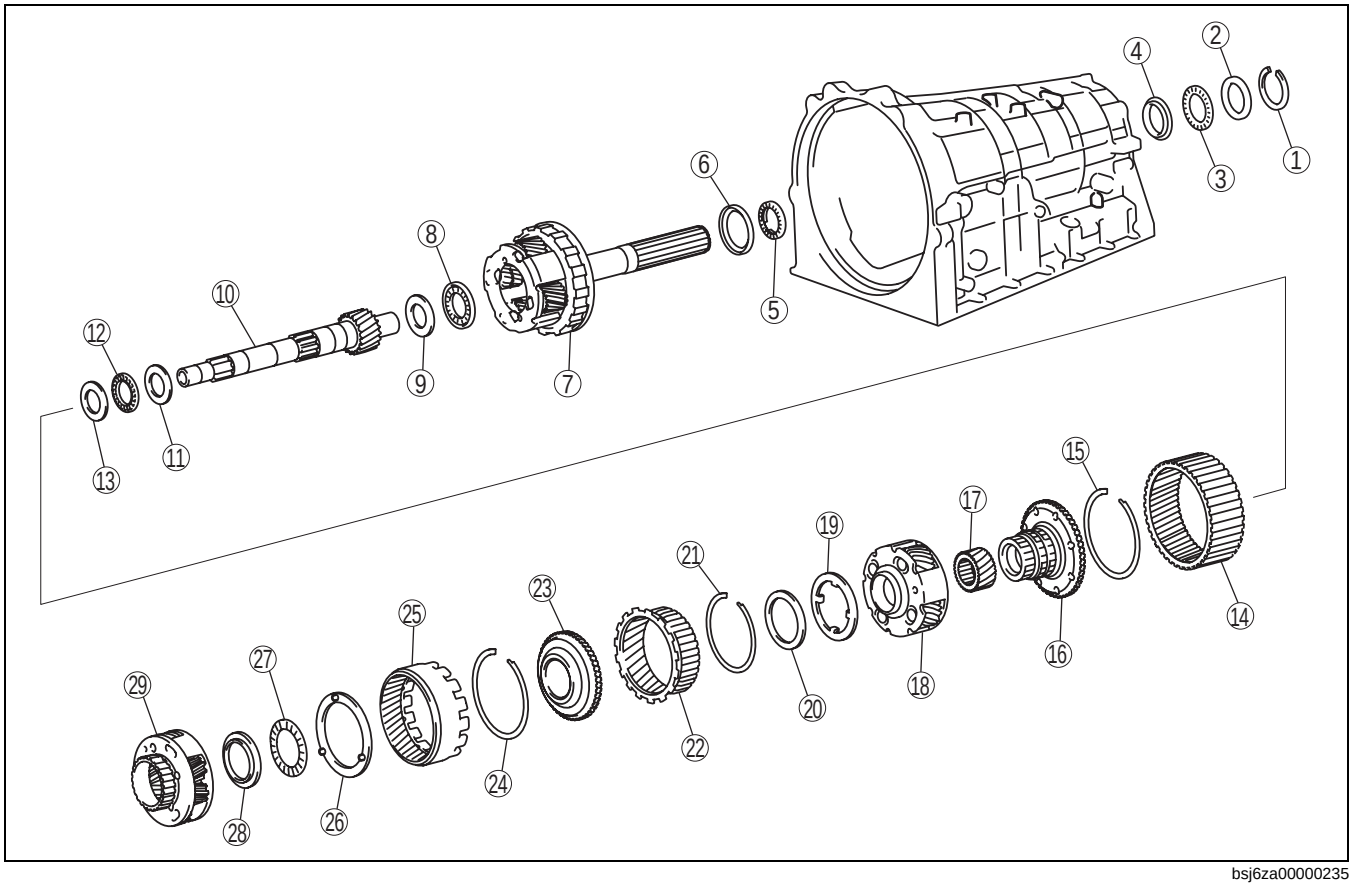
Caution
- **Measure at different places and take an average. If it exceeds the specification, replace the rear planetary gear component with a new one.**
- **When the rear planetary gear component is replaced, inspect the contact surface opposed to the intermediate shaft.**
- **If the surface of it is scratched or has changed color, replace the intermediate shaft with a new one.**


bsj6za00000849

PLANETARY GEAR COMPONENT ASSEMBLY

id051300261400

Components



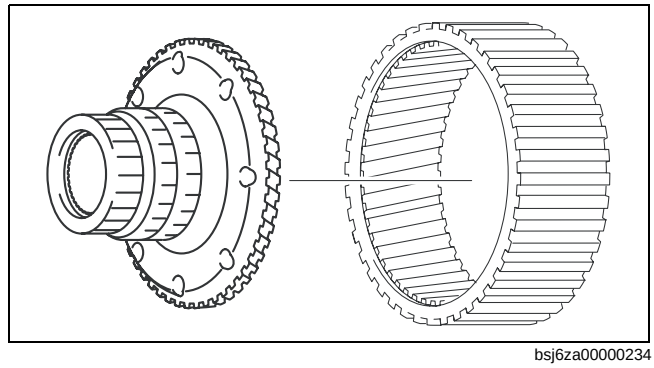
bsj6za00000235

1	Snap ring
2	Bearing race
3	Thrust needle bearing
4	Bearing race
5	Thrust needle bearing
6	Bearing race
7	Rear planetary gear component
8	Thrust needle bearing
9	Bearing race
10	Intermediate shaft
11	Bearing race
12	Needle bearing
13	Bearing race
14	Rear planetary ring gear flange
15	Snap ring

16	Middle planetary ring gear flange
17	Sun gear
18	Middle planetary gear component
19	Bearing race
20	Thrust needle bearing
21	Snap ring
22	Middle planetary ring gear
23	Middle planetary ring gear flange
24	Snap ring
25	Front planetary gear component
26	Thrust washer
27	Thrust needle bearing
28	Bearing race
29	Front planetary gear component

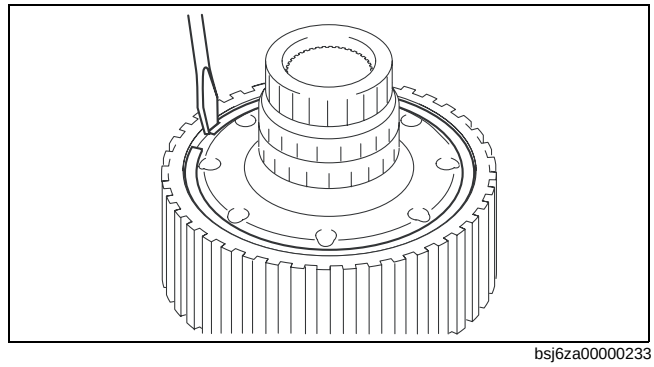
Assembly Procedure

1. Install the rear planetary gear flange to the rear planetary ring gear.



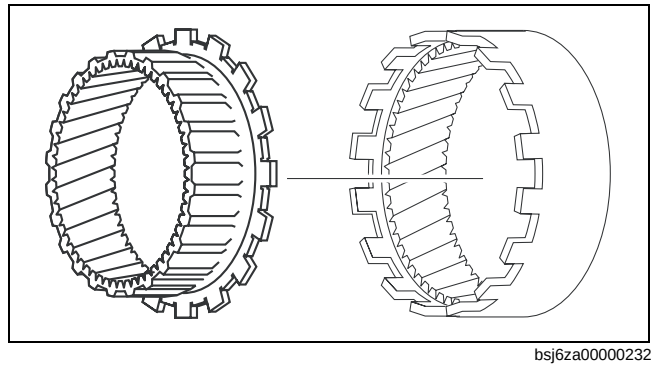
bsj6za00000234

2. Using a flathead screwdriver, install the snap ring to the rear planetary ring gear.



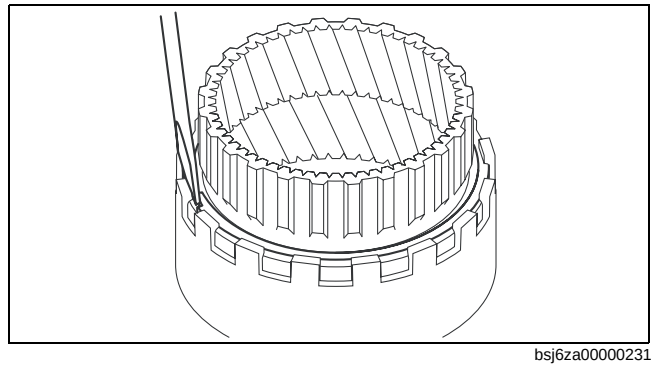
bsj6za00000233

3. Install the front planetary ring gear to the middle planetary ring gear.



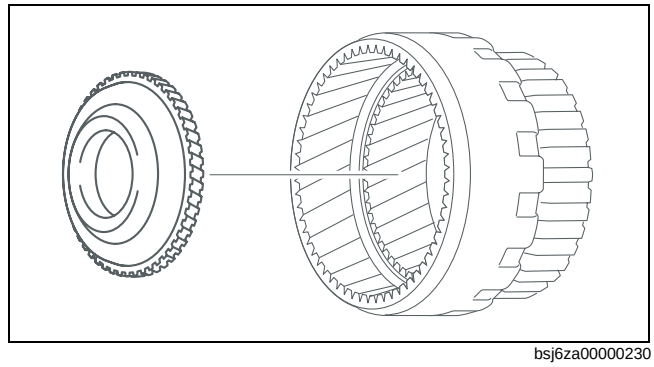
bsj6za00000232

4. Using a flathead screwdriver, install the snap ring to the middle planetary ring gear.



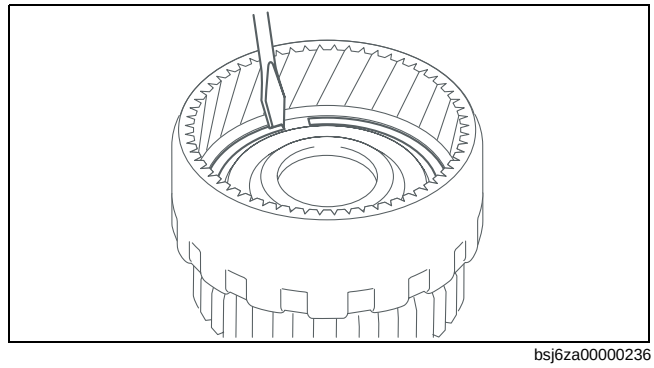
bsj6za00000231

5. Install the middle planetary ring gear flange to the middle planetary ring gear.



bsj6za00000230

6. Using a flathead screwdriver, install the snap ring to the middle planetary ring gear.

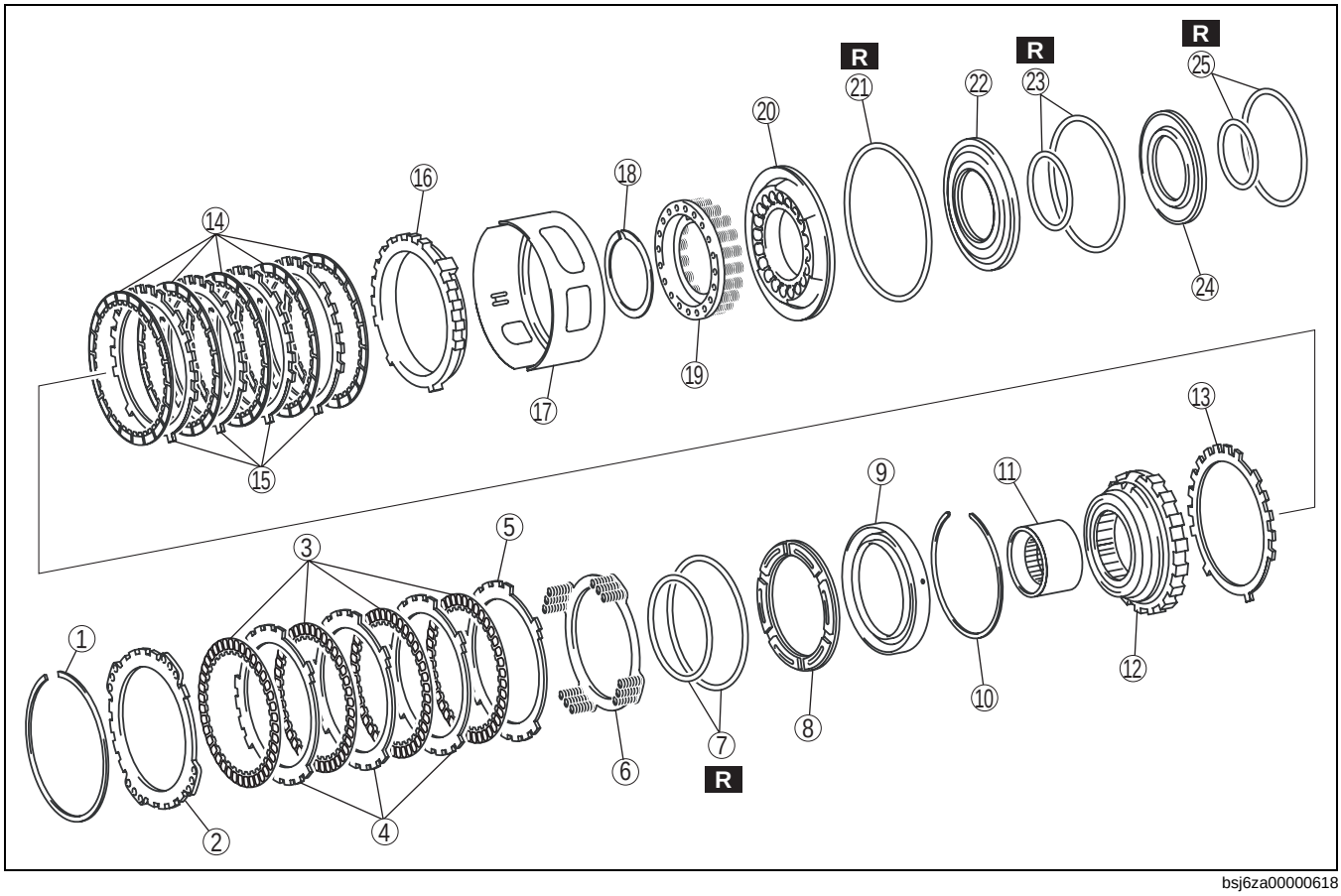


bsj6za00000236

B2, B4 BRAKE AND F3 ONE-WAY CLUTCH COMPONENT DISASSEMBLY

id051300261500

Components



bsj6za00000618

1	Snap ring
2	Retaining plate
3	Drive plate
4	Driven plate
5	Driven plate
6	Piston return spring
7	O-ring
8	B2 brake piston
9	B2 brake cylinder
10	Snap ring
11	Inner race
12	F3 one-way clutch
13	Retaining plate

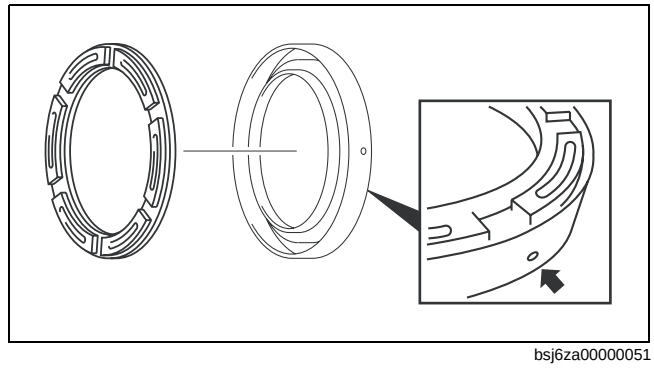
14	Drive plate
15	Driven plate
16	Driven plate
17	Brake tube
18	Snap ring
19	Piston return spring
20	B4 brake piston
21	O-ring
22	Sleeve
23	O-ring
24	B4 brake piston
25	O-ring

Disassembly Procedure

1. Blow compressed air into the oil passage as shown in the figure while pressing the B2 brake piston and brake cylinder by hand and remove the B2 brake piston.

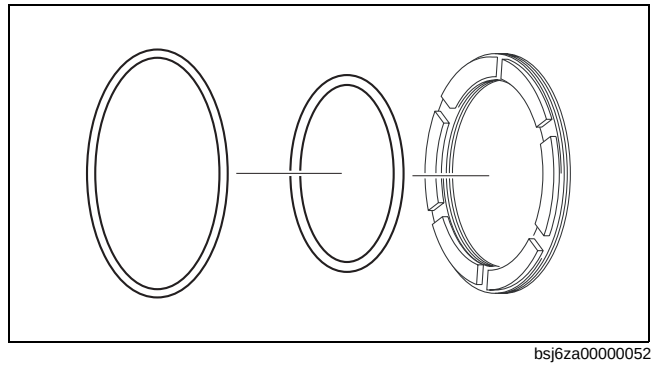
   Air pressure

   392 kPa (4.0 kgf/cm^2, 57 psi)



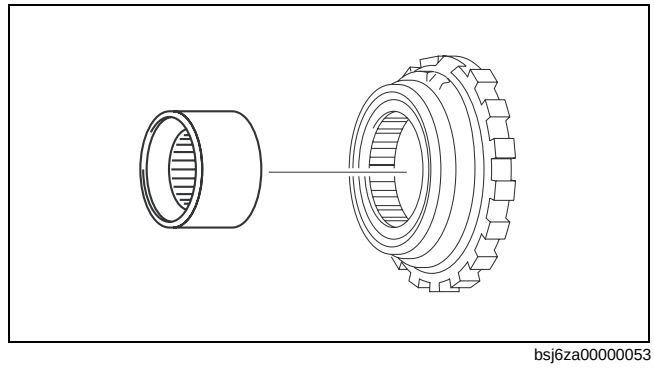
bsj6za00000051

2. Remove the O-ring from the B2 brake piston.



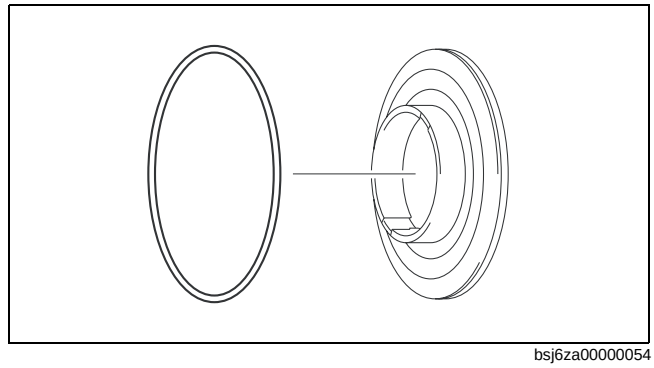
bsj6za00000052

3. Remove the inner race from the F3 one-way clutch component.



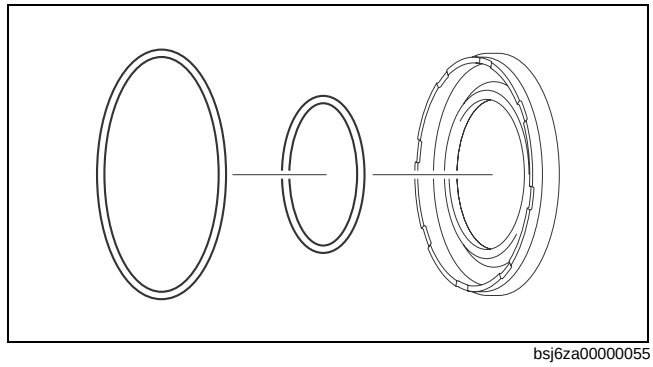
bsj6za00000053

4. Remove the O-ring from the B4 brake piston.



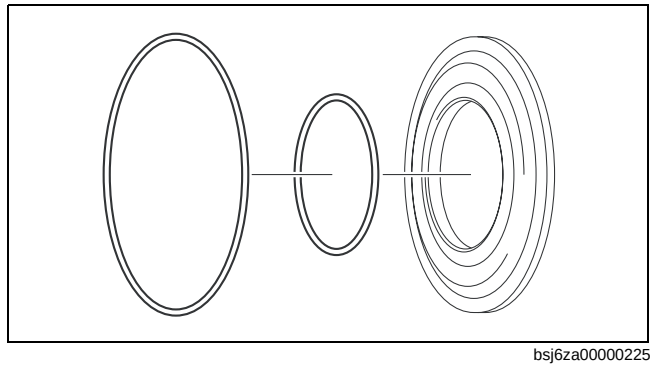
bsj6za00000054

5. Remove the O-ring from the sleeve.



bsj6za00000055

6. Remove the O-ring from the inner brake piston.



bsj6za00000225

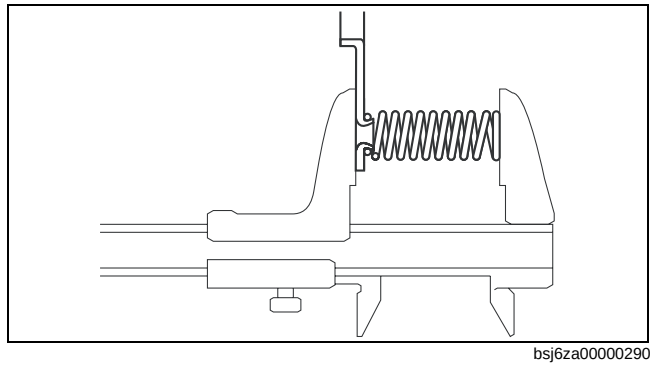
B2, B4 BRAKE AND F3 ONE-WAY CLUTCH INSPECTION

id051300261600

1. Using vernier calipers, measure the free length of the piston return spring.

   B2 brake return spring free length
   Standard: 22.66 mm {0.89 in}

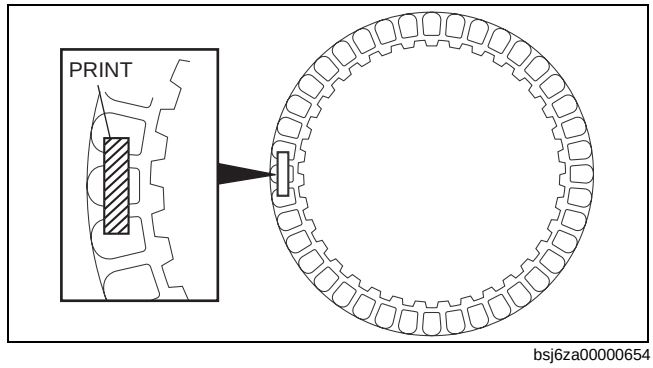
   - If it less than the specification, replace the piston return spring with a new one.



bsj6za00000290

2. Inspect the lining of all drive plates. (B2)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.

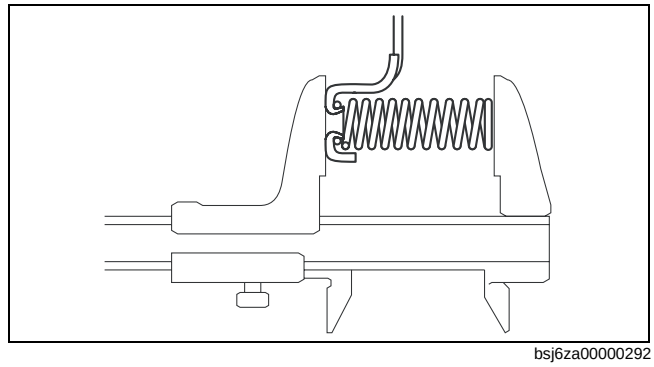


bsj6za00000654

3. Using vernier calipers, measure the free length of the piston return spring.

   B4 brake return spring free length
   Standard: 13.84 mm {0.54 in}

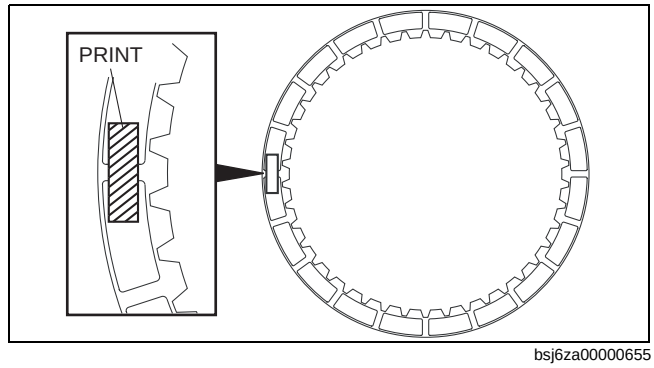
   - If it less than the specification, replace the piston return spring with a new one.



bsj6za00000292

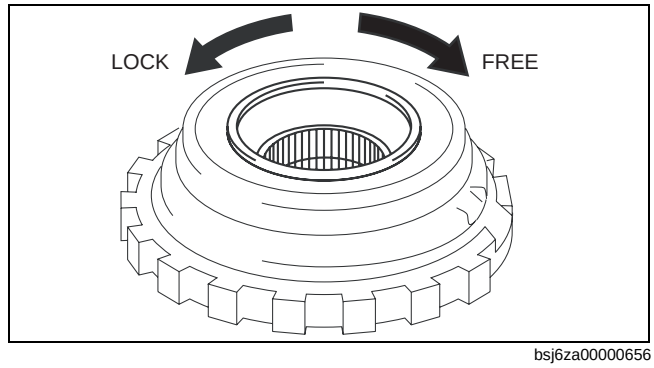
4. Inspect the lining of all drive plates. (B4)
   - If the lining is flaking or has changed color, or if it is worn or the print mark is wearing away, replace it with a new drive plate.
   - When replacing, inspect the contact surfaces between the retaining plate, driven plate and drive plate.
   - If they are scratched or have changed color, replace with new parts.

   Note
   - Before replacing with new drive plates, soak them at least **2 h** in ATF.



bsj6za00000655

5. Verify that the inner race rotates when the F3 one-way clutch is secured and rotated clockwise, and that it does not rotate when the F3 one-way clutch is rotated counterclockwise.

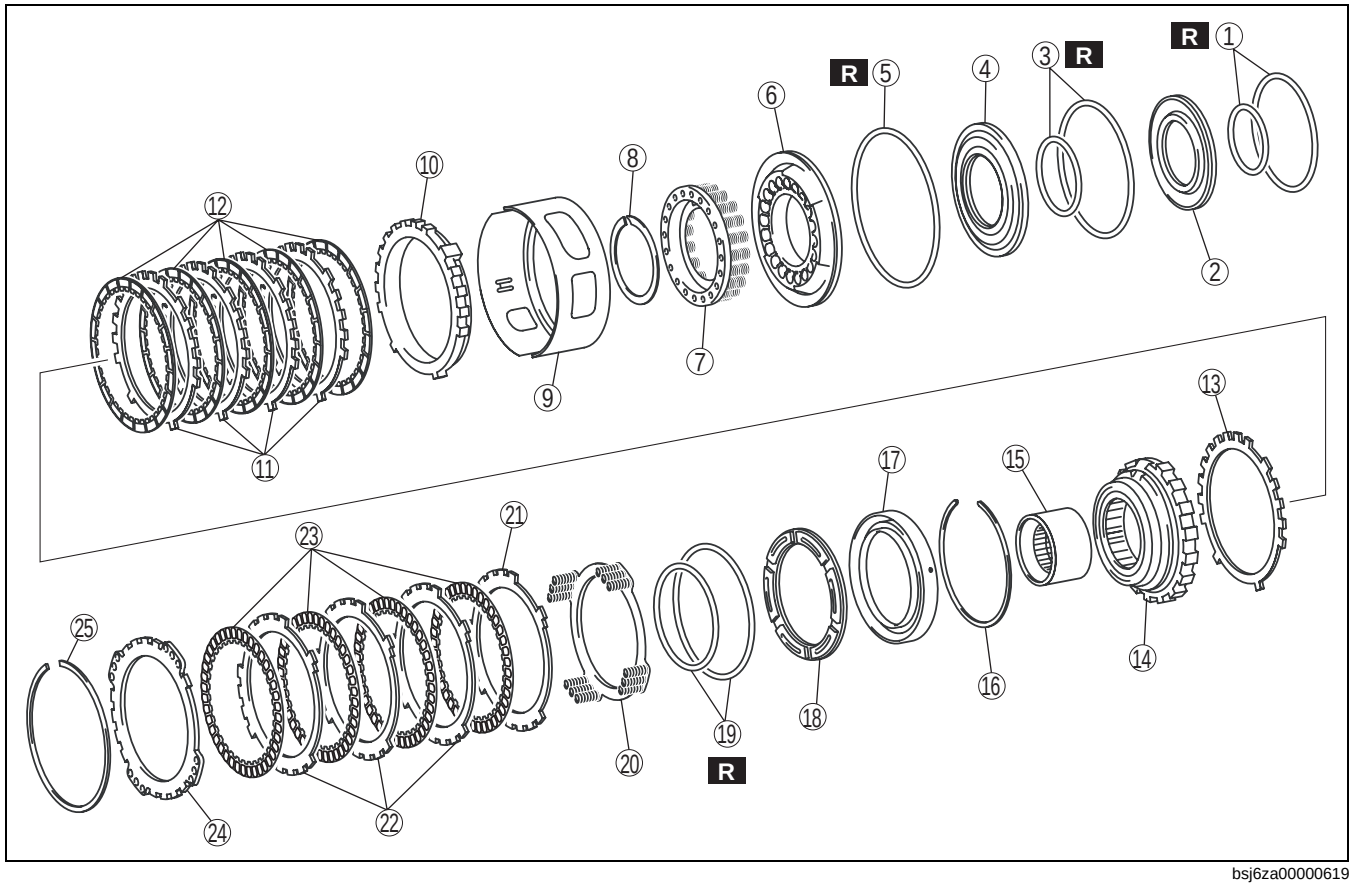


bsj6za00000656

B2, B4 BRAKE AND F3 ONE-WAY CLUTCH COMPONENT ASSEMBLY

id051300261700

Components



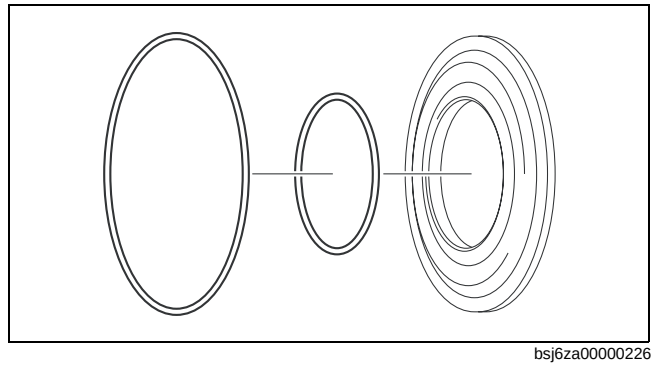
bsj6za00000619

1	O-ring
2	Inner brake piston
3	O-ring
4	Sleeve
5	O-ring
6	B4 brake piston
7	Piston return spring
8	Snap ring
9	Brake tube
10	Driven plate
11	Drive plate
12	Driven plate
13	Retaining plate

14	F3 one-way clutch
15	Inner race
16	Snap ring
17	B2 brake cylinder
18	B2 brake piston
19	O-ring
20	Piston return spring
21	Driven plate
22	Drive plate
23	Driven plate
24	Retaining plate
25	Snap ring

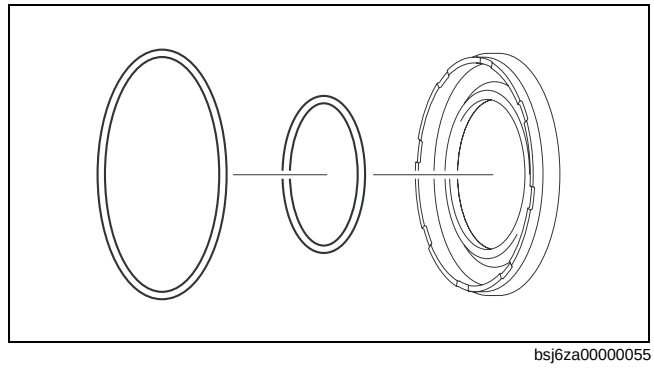
Assembly Procedure

1. Apply ATF to the new O-rings.
2. Install the O-rings to the B4 brake piston.
3. Apply ATF to the new O-rings.



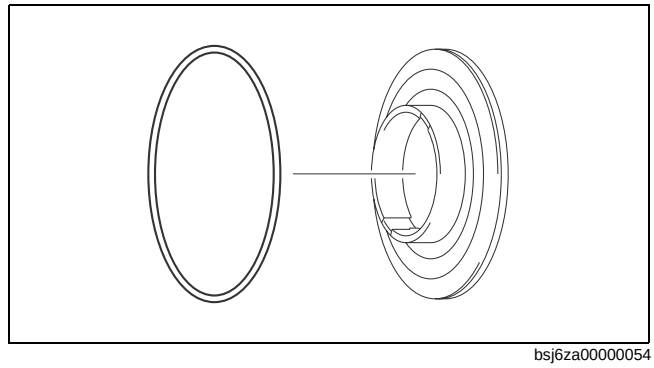
bsj6za00000226

4. Install the O-rings to the sleeve.
5. Apply ATF to the new O-ring.



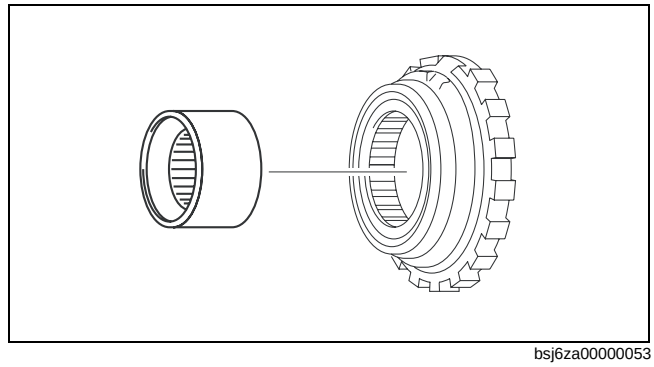
bsj6za00000055

6. Install the O-rings to the B4 brake piston.
7. Apply ATF to the inner race and the F3 one-way clutch component.



bsj6za00000054

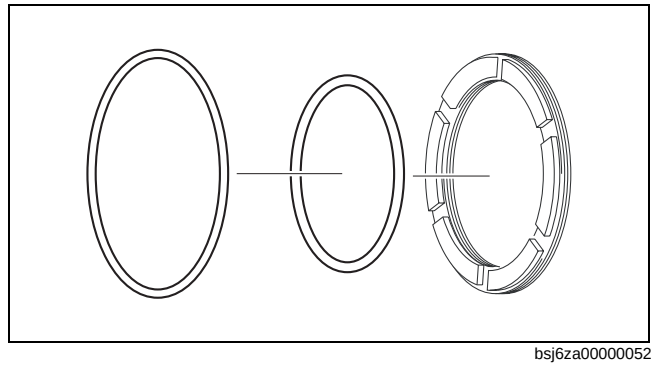
8. Install the inner race to the F3 one-way clutch component.
9. Apply ATF to the new O-ring.



bsj6za00000053

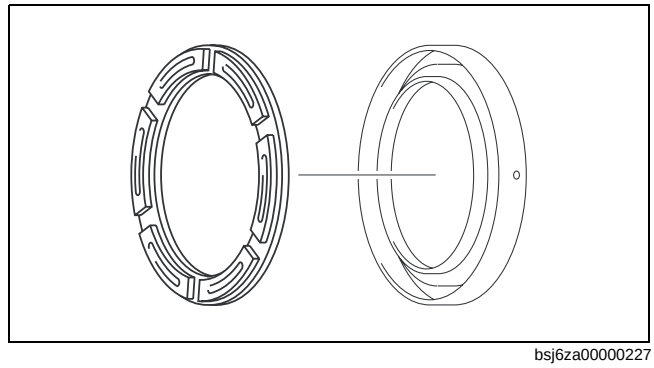
10. Install the O-ring to the B2 brake piston.
11. Apply ATF to the brake cylinder and the B2 brake piston.

Caution
- **Do not damage the O-ring.**



bsj6za00000052

12. Install the B2 brake piston to the brake cylinder.

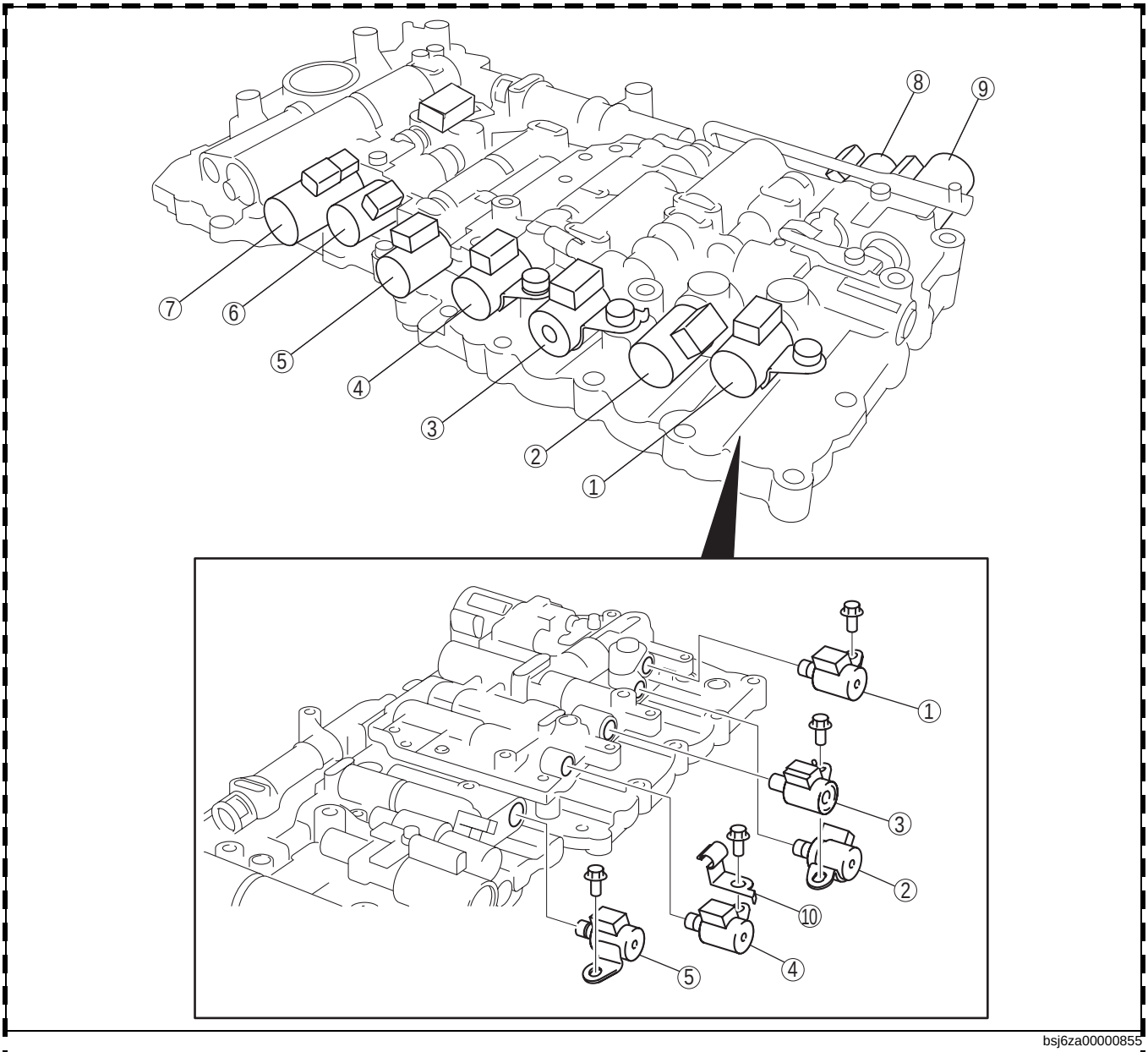


bsj6za00000227

CONTROL VALVE BODY DISASSEMBLY/ASSEMBLY

id051300261800

Components



bsj6za00000855

1	Shift solenoid C
2	Shift solenoid B
3	Shift solenoid D
4	Shift solenoid A
5	Shift solenoid E

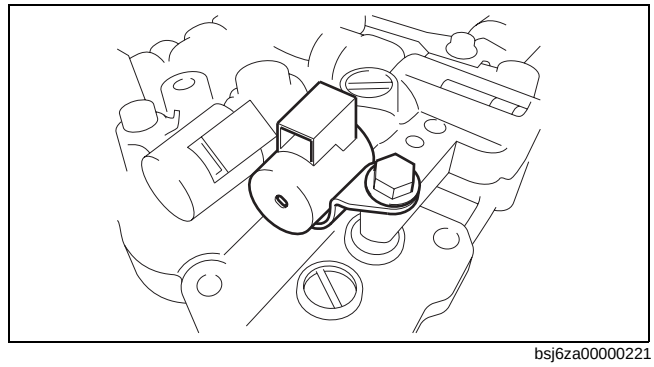
6	Shift solenoid F
7	Pressure control solenoid
8	Shift solenoid G
9	TCC control solenoid
10	Harness clip

Disassembly Procedure

Caution
- **Do not damage the solenoid.**

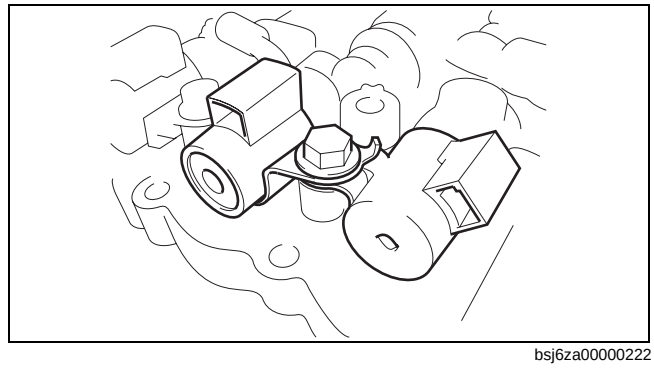
1. Remove the shift solenoid C from the control valve body.

Caution
- **Do not damage the solenoid.**


bsj6za00000221

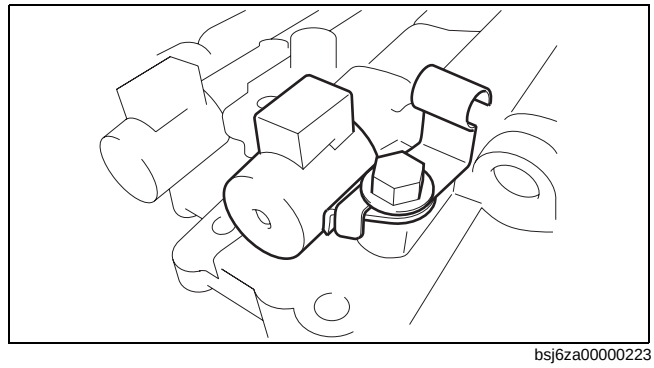
2. Remove the shift solenoid B shift solenoid D from the control valve body.
3. Remove the bolt and the wiring harness clip.

Caution
- **Do not damage the solenoid.**

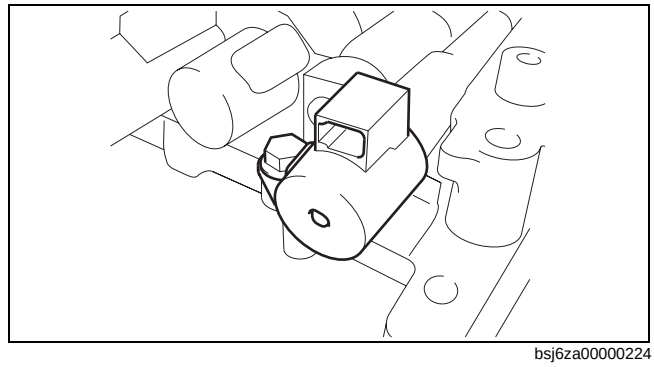

bsj6za00000222

4. Remove the shift solenoid A from the control valve body.

Caution
- **Do not damage the solenoid.**


bsj6za00000223

5. Remove the shift solenoid E from the control valve body.

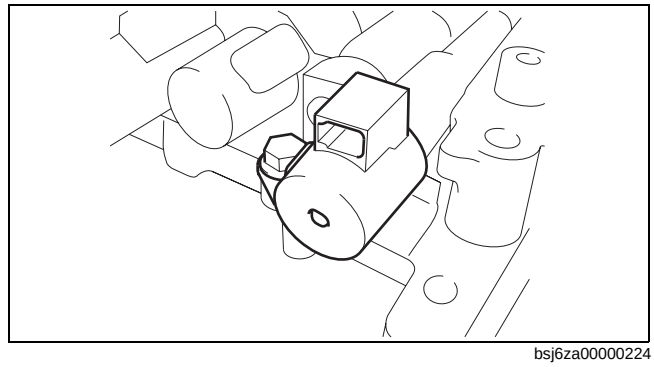

bsj6za00000224

Assembly Procedure

Caution
- **Do not damage the solenoid.**

1. Install the shift solenoid E to the control valve body.

   Tightening torque
   8.0—12.0 N·m {81.6—122.3 kgf·cm, 70.9—106.1 in·lbf}


bsj6za00000224

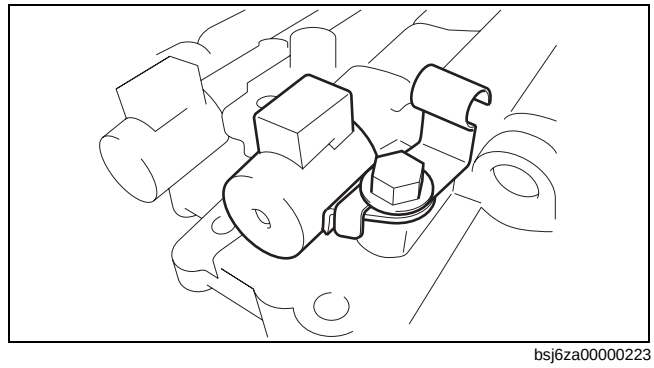
2. Install the bolt and the wiring harness clip.

   Caution
   - **Do not damage the solenoid.**

3. Install the shift solenoid A to the control valve body.

   Tightening torque
   8.0—12.0 N·m {81.6—122.3 kgf·cm, 70.9—106.1 in·lbf}

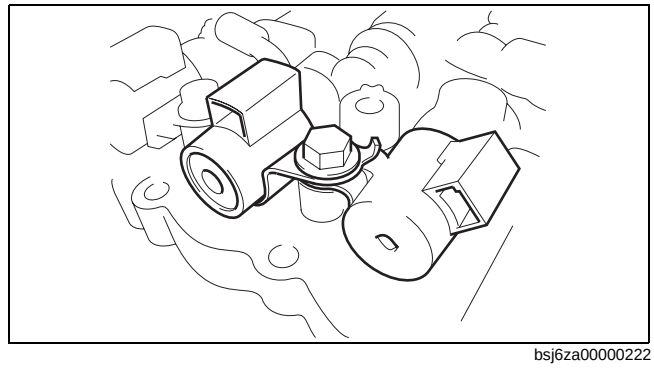
   Caution
   - **Do not damage the solenoid.**


bsj6za00000223

4. Install the shift solenoid B and the shift solenoid D to the control valve body.

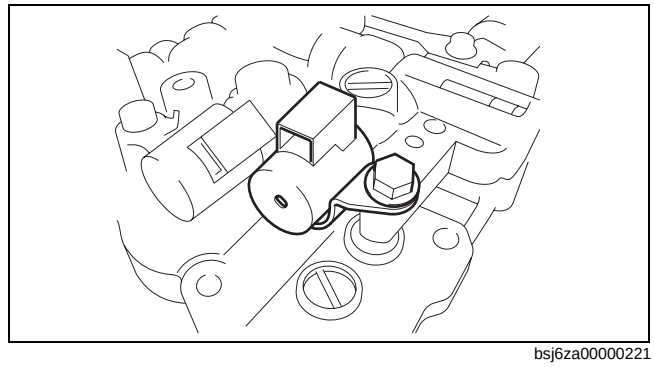
   Tightening torque
   8.0—12.0 N·m {81.6—122.3 kgf·cm, 70.9—106.1 in·lbf}

   Caution
   - **Do not damage the solenoid.**


bsj6za00000222

5. Install the shift solenoid C to the control valve body.

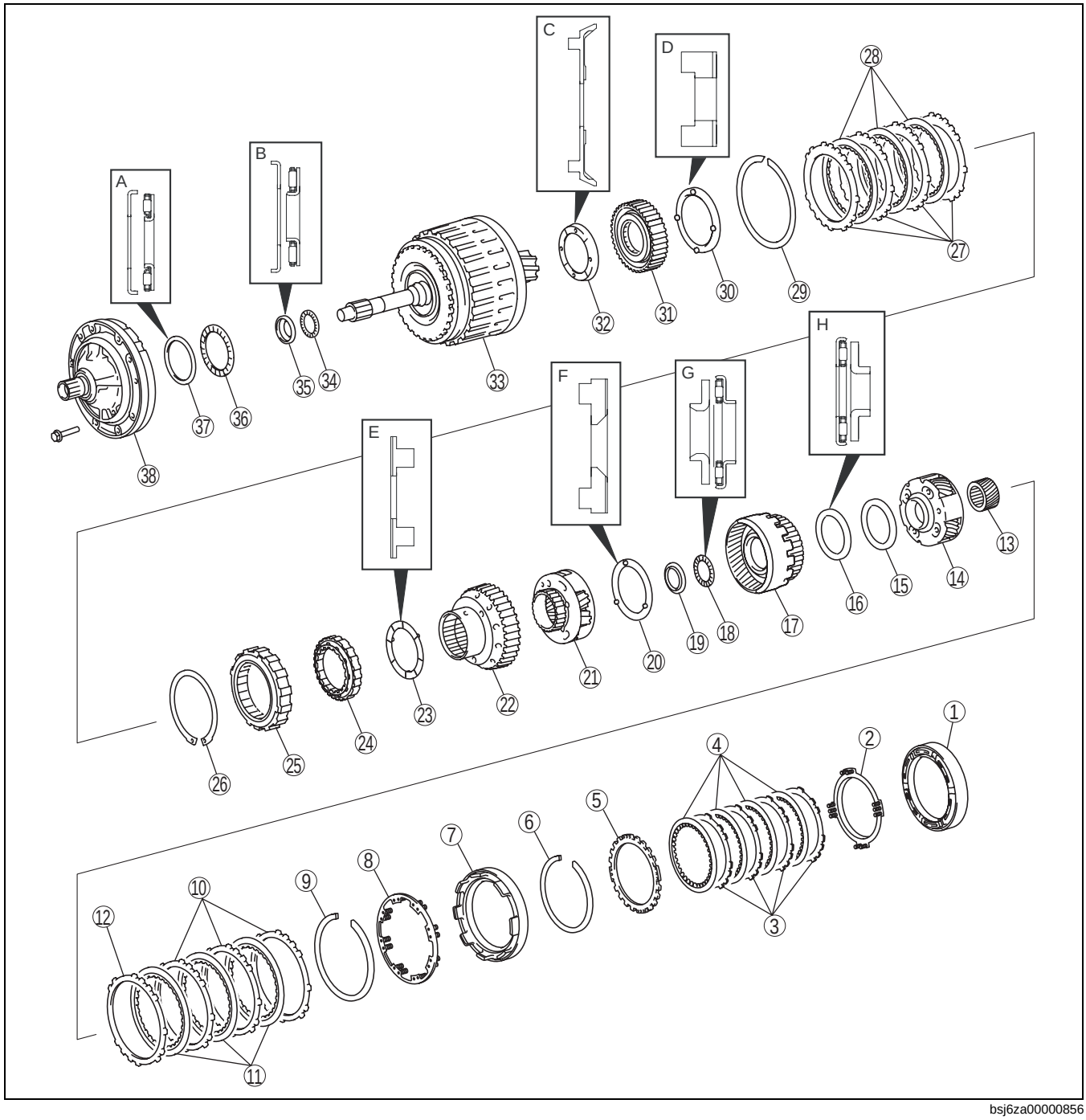
   Tightening torque
   8.0—12.0 N·m {81.6—122.3 kgf·cm, 70.9—106.1 in·lbf}


bsj6za00000221

AUTOMATIC TRANSMISSION ASSEMBLY

id051300261900

Assembly
Bearing and race locations



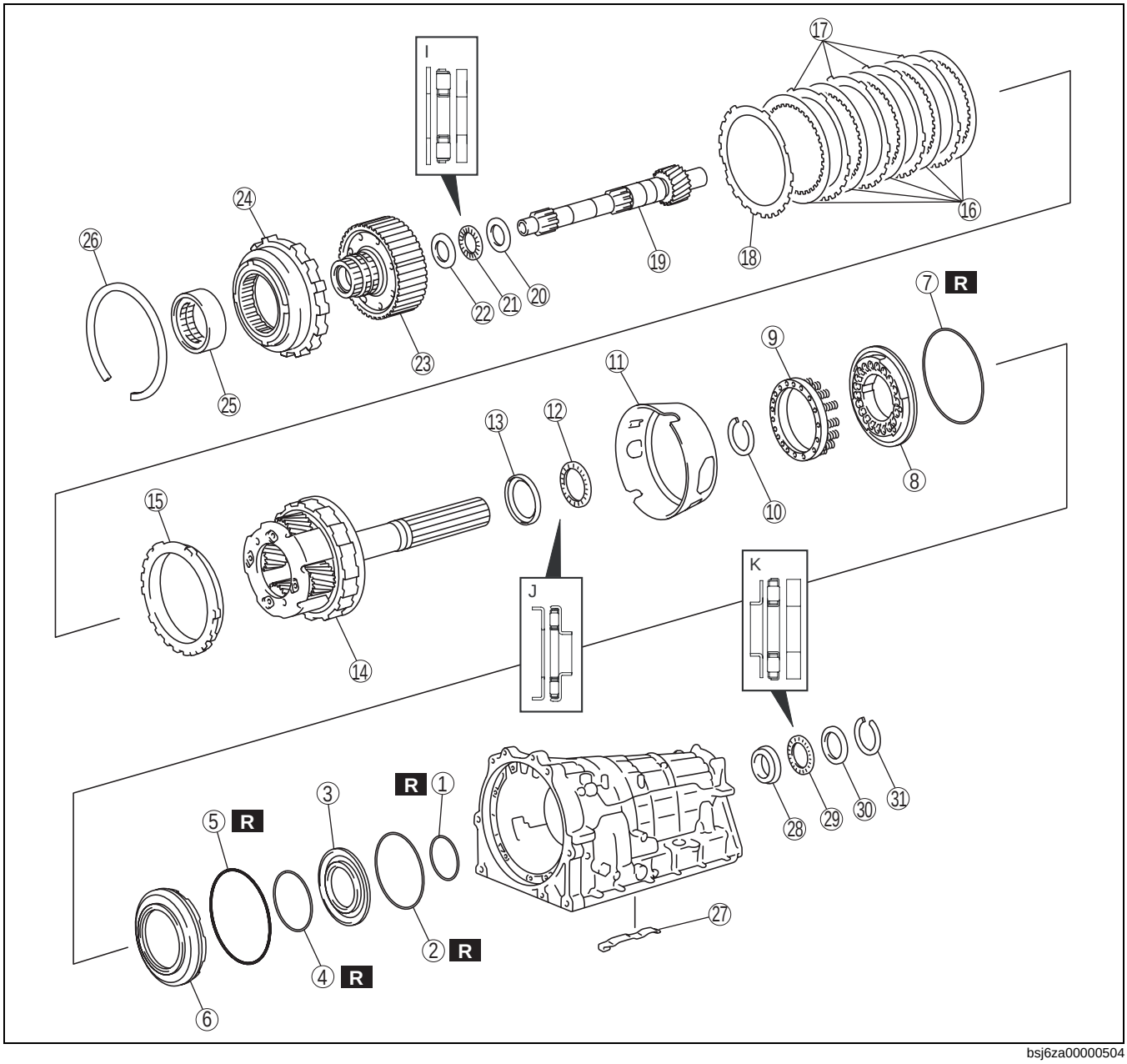
bsj6za00000856

1	B2 brake piston component
2	Piston return spring
3	Driven plate
4	Drive plate
5	Driven plate
6	Snap ring
7	B1 brake piston component
8	Piston return spring
9	Snap ring
10	Driven plate
11	Drive plate

12	Retaining plate
13	Sun gear
14	Middle planetary gear component
15	Bearing race
16	Thrust needle bearing
17	Front and middle ring gear component
18	Thrust needle bearing
19	Bearing race
20	Thrust washer
21	Front planetary gear component
22	Bearing race

23	Thrust washer
24	F1 one-way clutch
25	B3 brake piston component
26	Snap ring
27	Driven plate
28	Drive plate
29	Snap ring
30	Thrust washer

31	F2 one-way clutch
32	Thrust washer
33	Clutch drum component
34	Thrust needle bearing
35	Bearing race
36	Thrust needle bearing
37	Bearing race
38	Oil pump



bsj6za00000504

1	O-ring
2	O-ring
3	Inner brake piston
4	O-ring
5	O-ring
6	Sleeve
7	O-ring

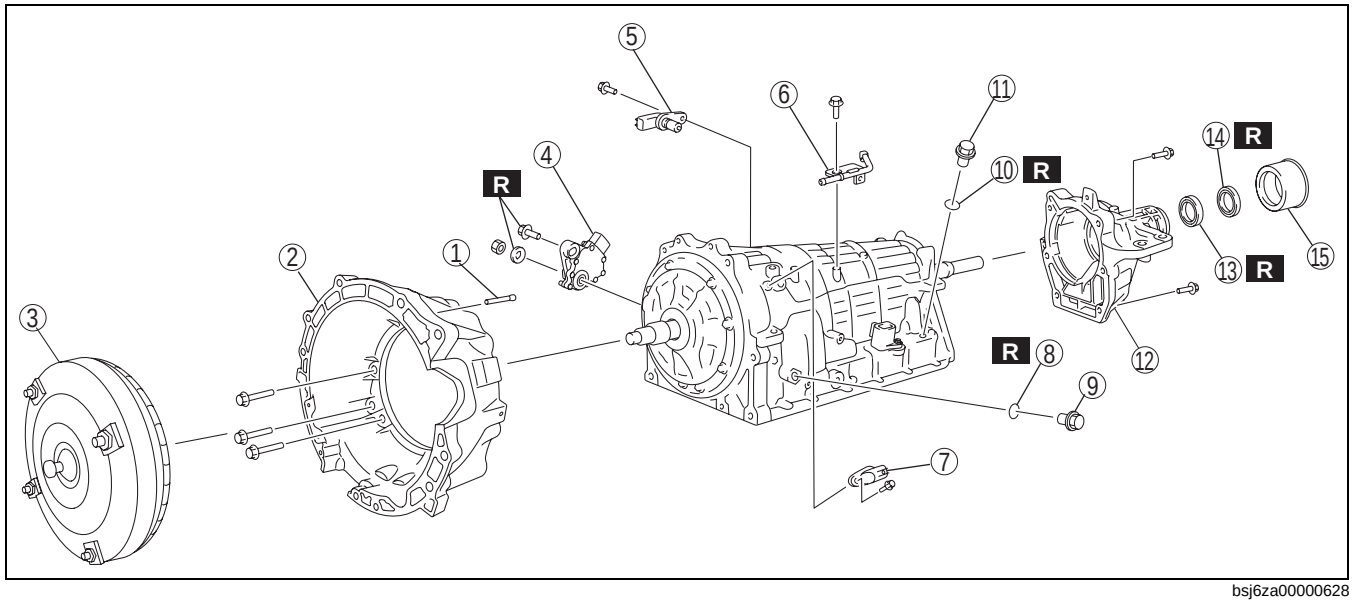
8	B4 brake piston
9	Piston return spring
10	Snap ring
11	Brake tube
12	Thrust needle bearing
13	Bearing race
14	Rear planetary gear component

15	Driven plate
16	Drive plate
17	Driven plate
18	Retaining plate
19	Intermediate shaft
20	Bearing race
21	Needle bearing
22	Bearing race
23	Rear ring gear component

24	F3 one-way clutch
25	Inner race
26	Snap ring
27	Stopper spring
28	Bearing race
29	Thrust needle bearing
30	Bearing race
31	Snap ring

		A	B	C	D	E	F	G	H	I	J	K
Bearing race (Front) (mm)	Outer diameter	87.74 {3.45}	35.6 {1.40}	92.6 {3.65}	102.7 {4.04}	96.7 {3.81}	83.6 {3.29}	50.8 {1.20}	-	44.9 {1.77}	56.7 {2.23}	51.2 {2.02}
	Inner diameter	74.2 {2.92}	20.00 {0.79}	63.8 {2.51}	89.3 {3.52}	76.3 {3.00}	60.0 {2.36}	34.9 {1.37}	-	29.6 {1.06}	43.3 {1.70}	37.0 {1.46}
Bearing (mm)	Outer diameter	85.6 {3.37}	41.0 {1.61}	-	-	-	-	53.1 {2.09}	73.5 {2.89}	43.85 {1.73}	58.0 {2.28}	52.5 {2.07}
	Inner diameter	71.9 {2.83}	20.0 {0.79}	-	-	-	-	38.6 {1.52}	58.5 {2.30}	27.8 {1.09}	40.6 {1.60}	36.1 {1.42}
Bearing race (Rear) (mm)	Outer diameter	-	-	-	-	-	-	-	71.2 {2.80}	43.7 {1.72}	-	51.0 {2.01}
	Inner diameter	-	-	-	-	-	-	-	54.8 {2.16}	27.8 {1.09}	-	36.1 {1.42}

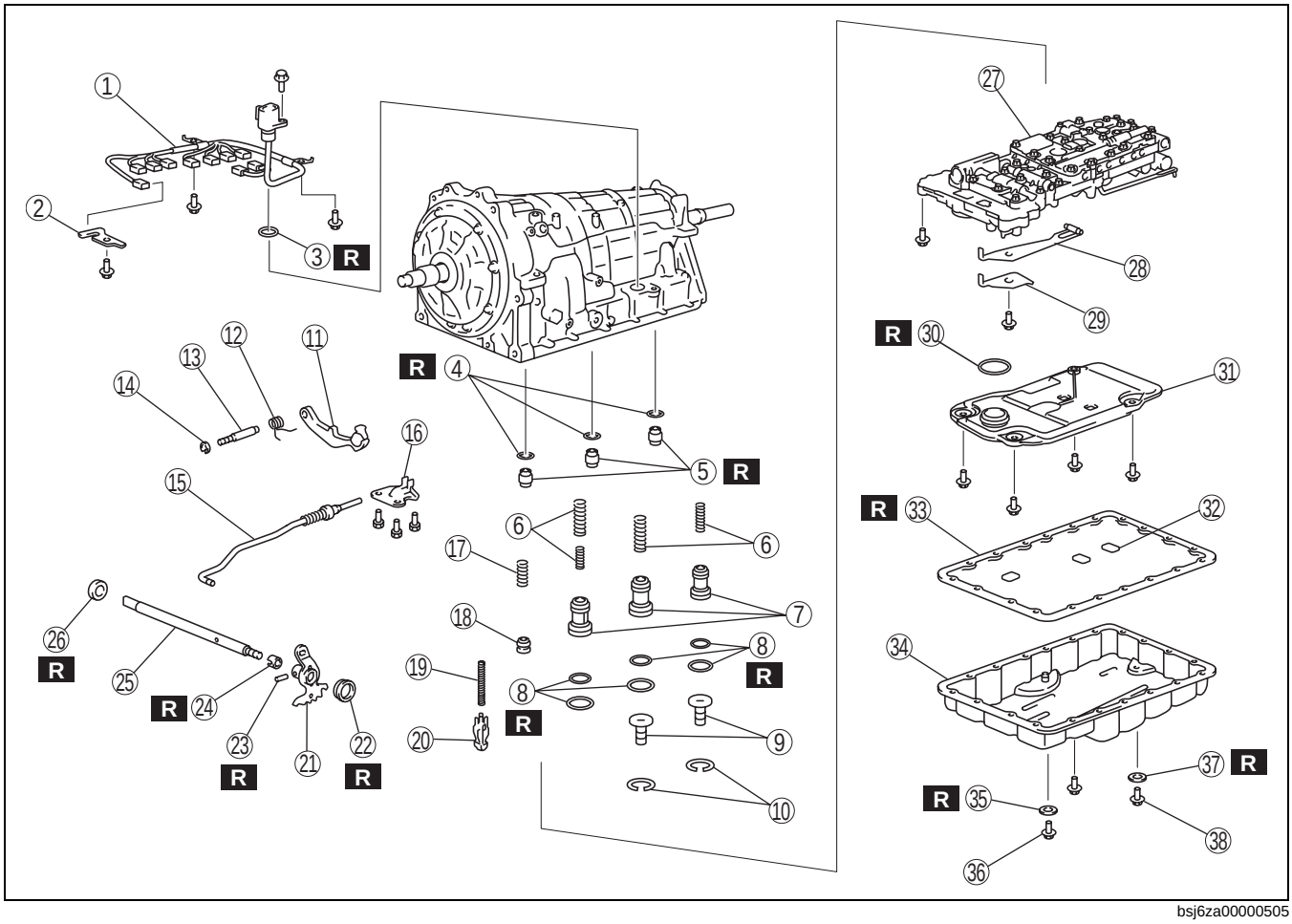
Components



bsj6za00000628

1	Breather pipe
2	Converter housing
3	Torque converter
4	TR switch
5	Turbine sensor
6	Breather tube
7	VSS
8	O-ring

9	Check valve
10	O-ring
11	Filler plug
12	Extension housing
13	Oil seal
14	Extension housing shroud
15	Extension dust deflector



bsj6za00000505

1	Coupler component
2	Clip
3	O-ring
4	Gasket
5	Gasket
6	Accumulator spring
7	Accumulator piston
8	O-ring
9	Spring
10	Snap ring
11	Parking pawl
12	Spring
13	Parking pawl shaft
14	Driven plate
15	Parking rod
16	Bracket
17	Spring
18	Accumulator valve
19	Spring

20	Check valve
21	Manual valve
22	Oil seal
23	Pin
24	Manual shaft washer
25	Manual shaft
26	Oil seal
27	Control valve body
28	Detent spring
29	Detent spring cover
30	O-ring
31	Oil strainer
32	Magnet
33	Oil pan gasket
34	Oil pan
35	Gasket
36	Overflow plug
37	Gasket
38	Drain plug

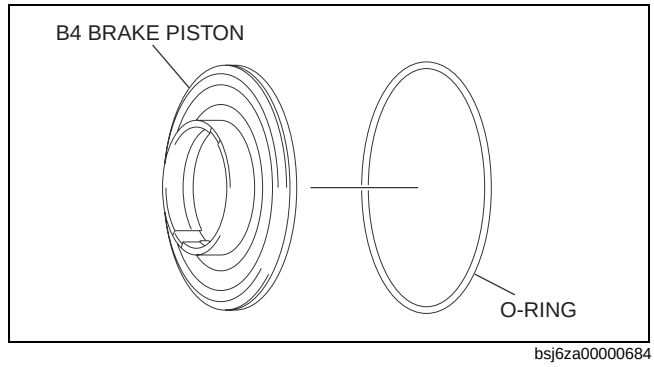
Disassembly Procedure

1. Apply ATF to the new O-ring.

Caution
- **Do not damage the O-ring and B4 brake piston.**

2. Install the O-ring to the B4 brake piston.
3. Apply ATF to the new O-rings.

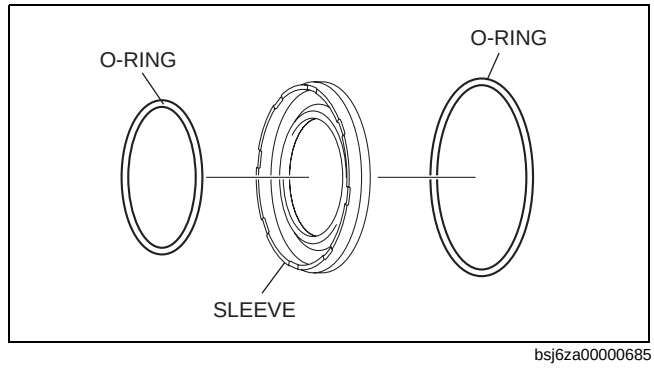
Caution
- **Do not damage the O-ring and sleeve.**



bsj6za00000684

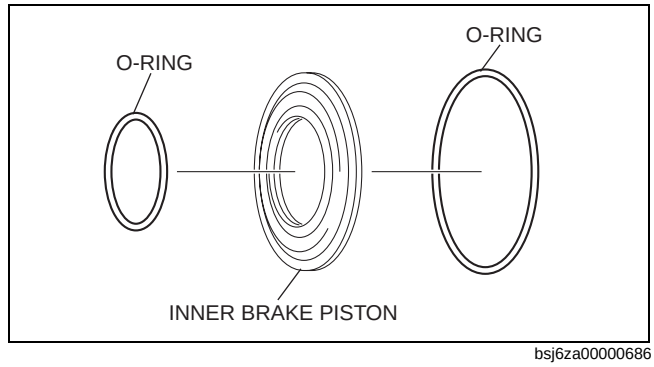
4. Install the O-ring to the sleeve.
5. Apply ATF to the new O-rings

Caution
- **Do not damage the O-ring and inner brake piston.**



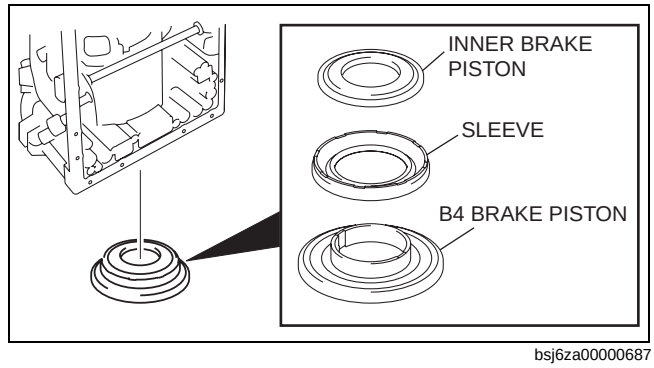
bsj6za00000685

6. Install the O-ring to the inner brake piston.
7. Apply ATF to the sliding surface of the transmission case.



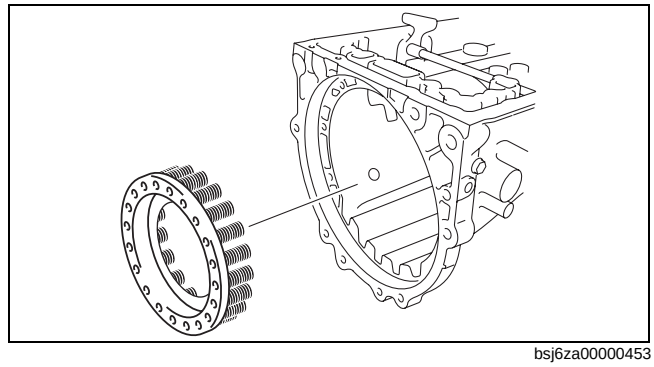
bsj6za00000686

8. Install the inner brake piston, sleeve and B4 brake piston to the transmission case.



bsj6za00000687

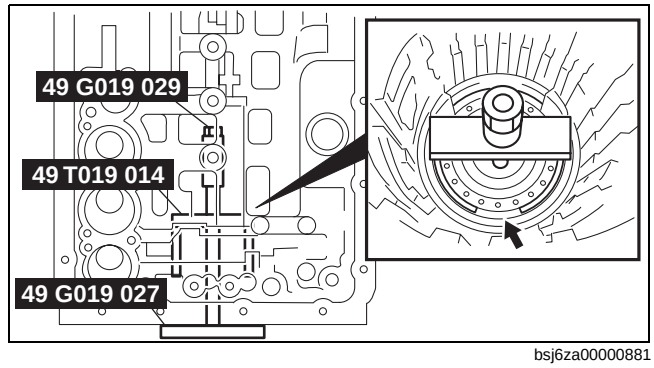
9. Install the piston return spring.



bsj6za00000453

10. Using the **SST**, compress the piston return spring and install the snap ring into the groove.

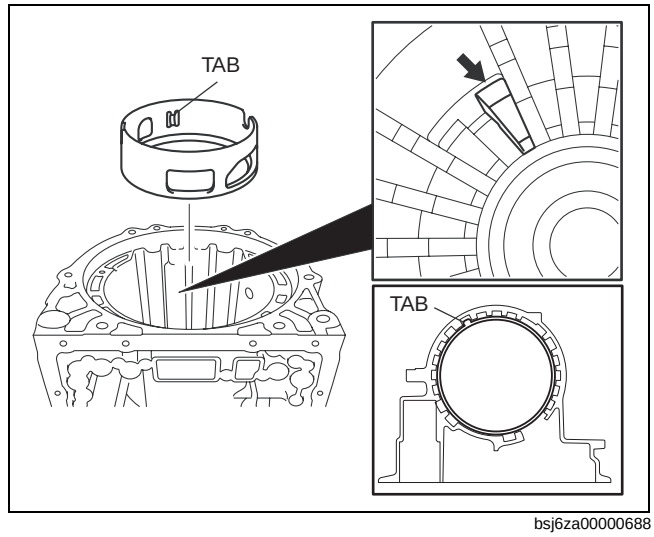
Caution
- **Do not expand the snap ring too much.**



bsj6za00000881

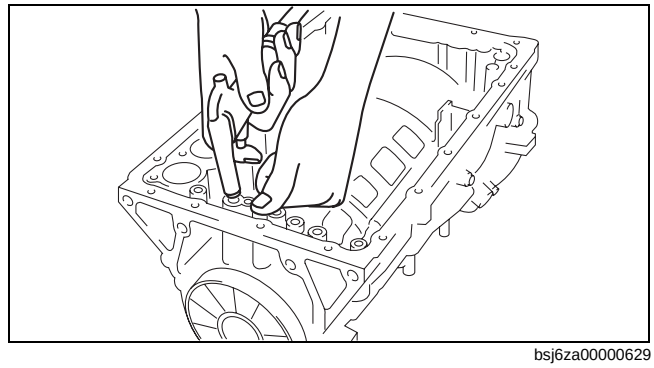
11. Install the brake tube to the transmission case as shown in the figure.

Caution
- **Align the tabs of the brake tube with the position shown in the figure.**



bsj6za00000688

12. Verify that B4 brake piston moves smoothly when the compressed air atomization equipment lever is pulled/released while blowing compressed air into the transmission case.

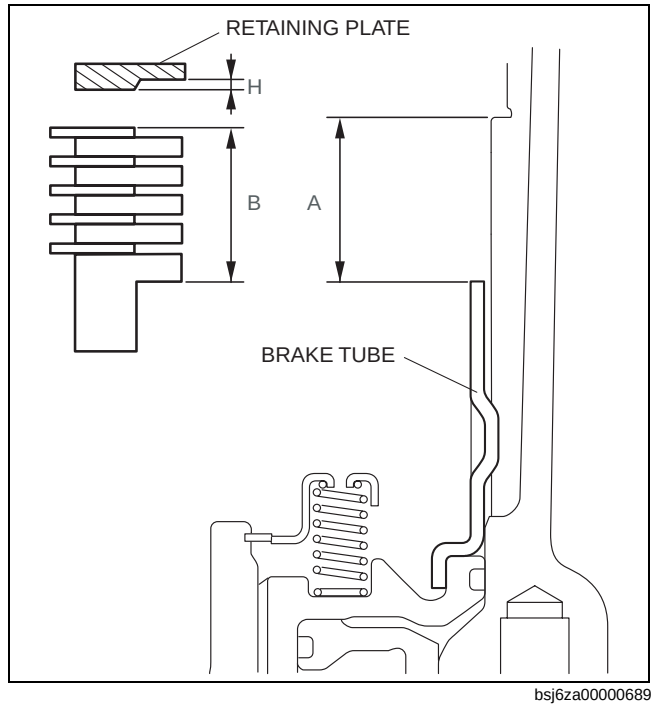


bsj6za00000629

13. Measure the level difference (length A) between the brake tube upper surface and the retaining plate contact surface at the both ends across the B4 brake piston diameter using a vernier caliper, and calculate the average value.

    Note
    - Install the B4 brake piston to the transmission case securely.

    Dimension A
    23.32—24.18 mm {0.92—0.95 in}



bsj6za00000689

14. Measure the thickness of all the driven plates and drive plate components (5), and driven plates (4) at the both ends across the diameter using a vernier caliper, and calculate the average value.

    Dimension B
    21.92—22.72 mm {0.87—0.89 in}

15. Calculate the pack clearance using the following formula.

    Dimension A-Dimension B-0.18 mm {0.007 in}-Thickness H

16. If the pack clearance exceeds the maximum specification, select the retaining plate with a clearance that is the maximum specification and install it.

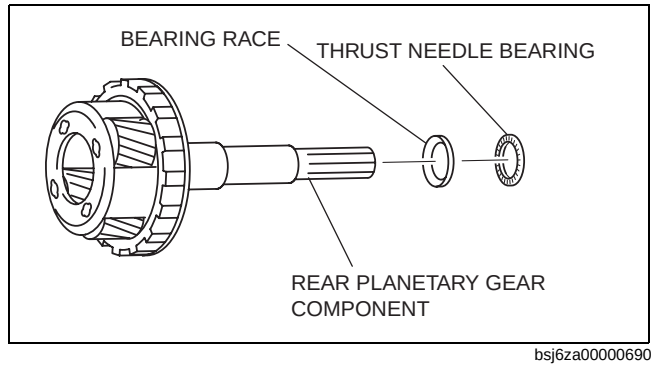
    Pack clearance
    0.5—0.8 mm {0.02—0.03 in}

    Note
    - There are 8 types of retaining plates for the pack clearance adjustment. Select the one with the most suitable thickness.

Retaining plate thickness H (mm {in})

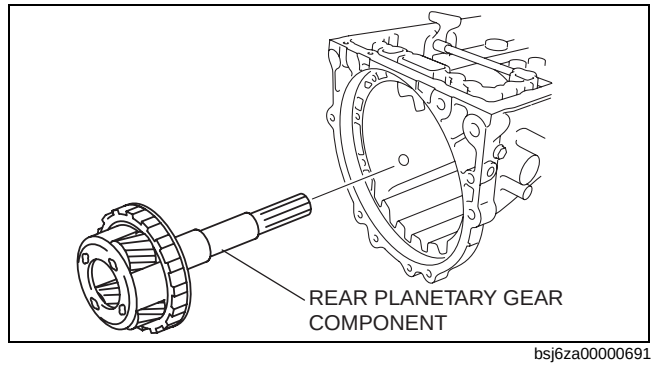
Identification mark	Thickness (mm {in})
0	0
2	0.15—0.25 {0.006—0.010}
4	0.35—0.45 {0.014—0.0177}
6	0.55—0.65 {0.022—0.026}
8	0.75—0.85 {0.030—0.033}
10	0.95—1.05 {0.037—0.041}
12	1.15—1.25 {0.045—0.049}
14	1.35—1.45 {0.054—0.057}

17. Apply ATF to the bearing race, thrust needle bearing and install to the rear planetary gear component.



bsj6za00000690

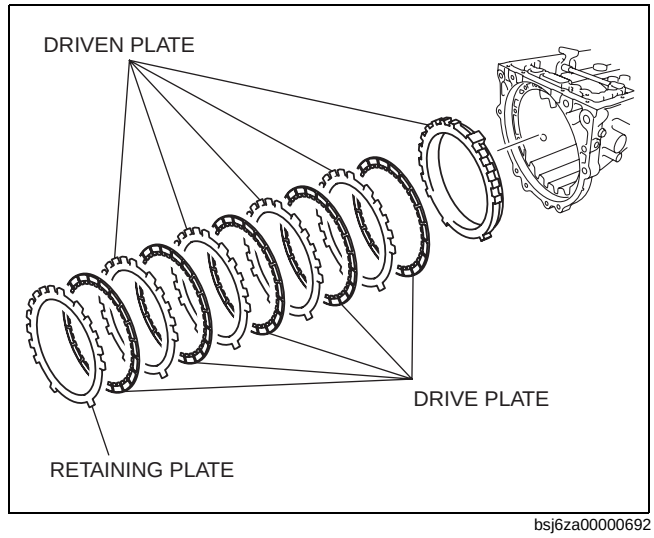
18. Install the rear planetary gear component to the transmission case.



bsj6za00000691

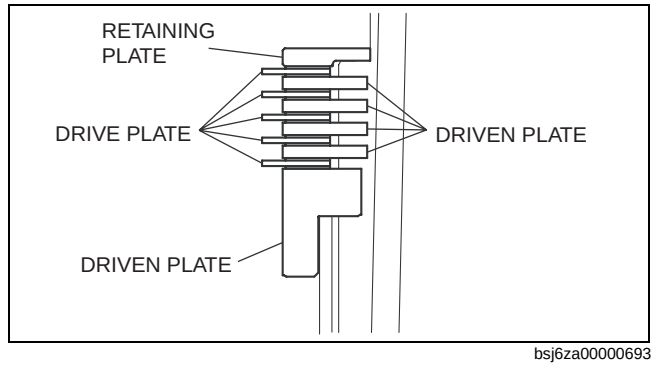
19. Install the retaining plates, drive plates and driven plates to the transmission case as shown in the figure.

Caution
- **Inspect the number and order of the retaining plate, drive and driven plates.**



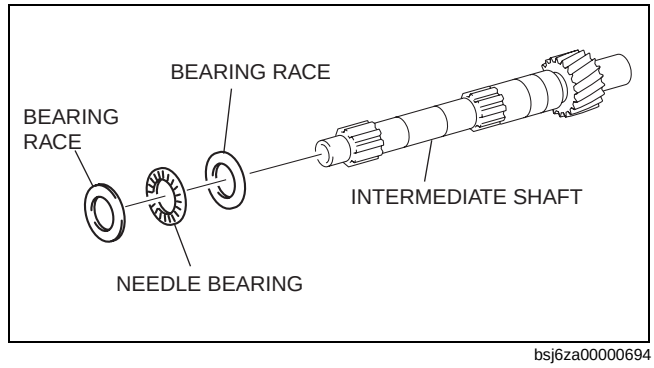
bsj6za00000692

20. Install the retaining plate, drive plates and driven plates in the order indicated in the figure.



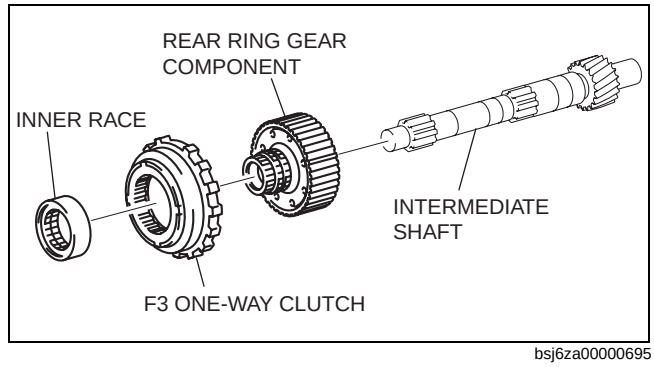
bsj6za00000693

21. Apply ATF to the bearing race, needle bearing race and install to the intermediate shaft.



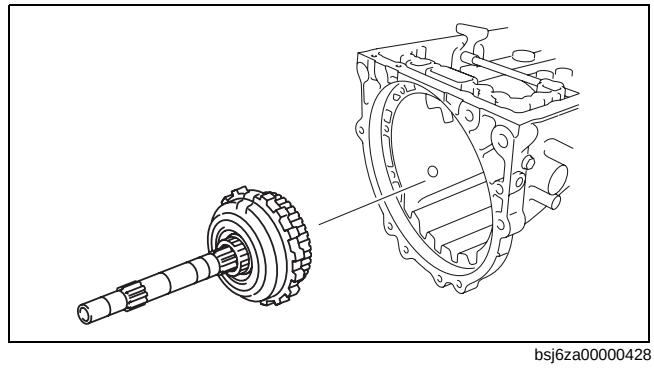
bsj6za00000694

22. Install the rear ring gear component, F3 one-way clutch and inner race to the intermediate shaft.



bsj6za00000695

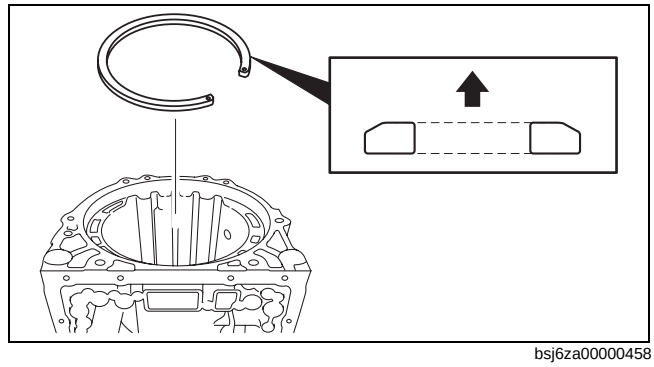
23. Install the intermediate shaft component to the transmission case.



bsj6za00000428

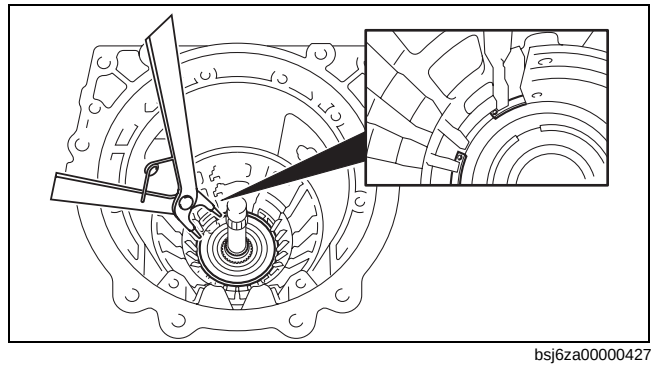
24. Verify that the snap ring is correctly positioned.

Caution
- **If the snap ring is not installed in the correct direction, the automatic transmission may not operate normally.**



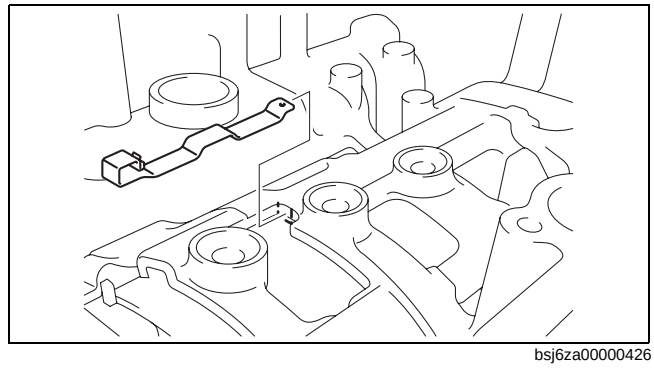
bsj6za00000458

25. Install snap ring to the transmission case using snap ring pliers.



bsj6za00000427

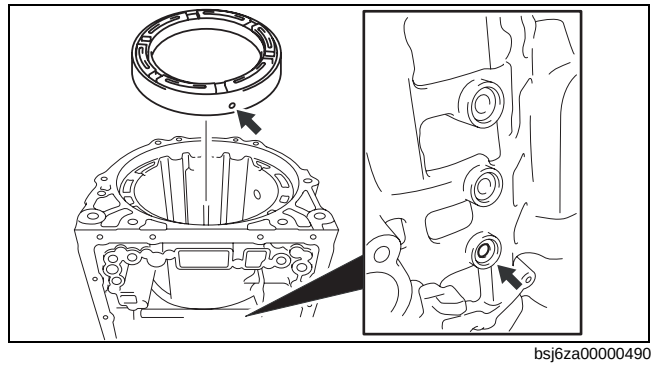
26. Install the stopper spring to the transmission case.



bsj6za00000426

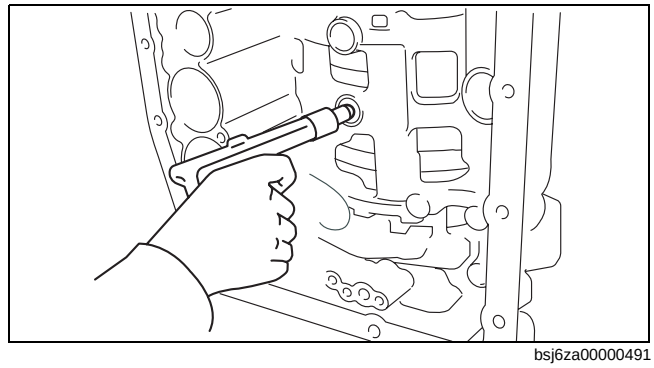
27. Install the brake piston and brake cylinder to the transmission case.

    Caution
    - **Align the opening of the snap ring with the position shown in the figure.**



bsj6za00000490

28. Verify that B2 brake piston moves smoothly when the compressed air atomization equipment lever is pulled/released while blowing compressed air into the transmission case.



bsj6za00000491

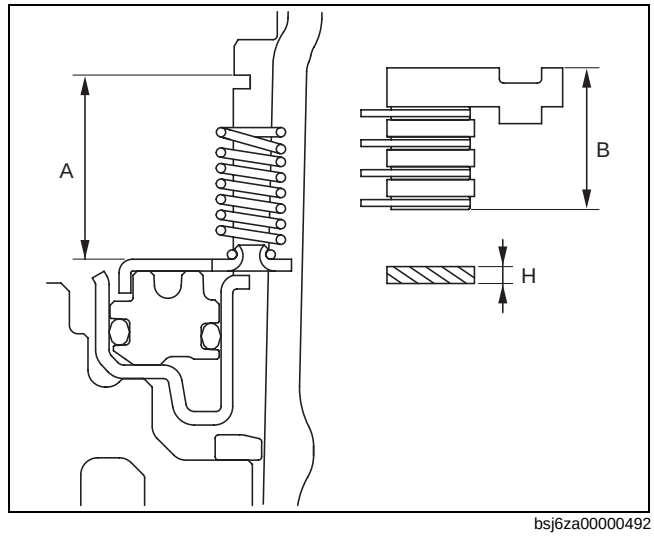
29. Measure the level difference (length A) between the brake piston upper surface and the snap ring contact surface at the both ends across the brake piston diameter using a vernier caliper, and calculate the average value.

    Note
    - Install the B2 brake piston to the transmission case securely.

    Dimension A
    21.19—21.90 mm {0.84—0.86 in}

30. Measure the thickness of all the driven plates and drive plate components (4), and driven plates (3) at the both ends across the diameter using a vernier caliper, and calculate the average value.

    Dimension B
    16.52—17.15 mm {0.65—0.67 in}



bsj6za00000492

31. Calculate the pack clearance using the following formula.

    Dimension A-Dimension B-1.6 mm {0.063 in}-Thickness H

32. If the pack clearance exceeds the maximum specification, select the retaining plate with a clearance that is the maximum specification and install it.

Pack clearance
0.6—0.9 mm {0.024—0.035 in}

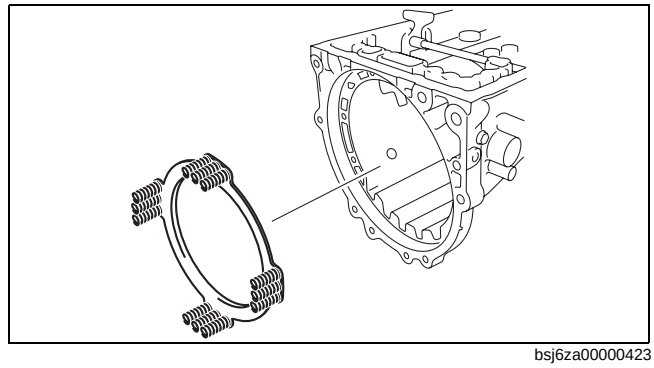
Note
- There are 8 types of retaining plates for the pack clearance adjustment. Select the one with the most suitable thickness.

Retaining plate thickness H (mm {in})

Identification mark	Thickness (mm {in})
0	1.95—2.05 {0.077—0.081}
1	2.05—2.15 {0.081—0.085}
2	2.15—2.25 {0.085—0.089}
3	2.25—2.35 {0.089—0.093}
4	2.35—2.45 {0.093—0.096}
5	2.45—2.55 {0.096—0.100}
6	2.55—2.65 {0.100—0.104}
7	2.65—2.75 {0.104—0.108}

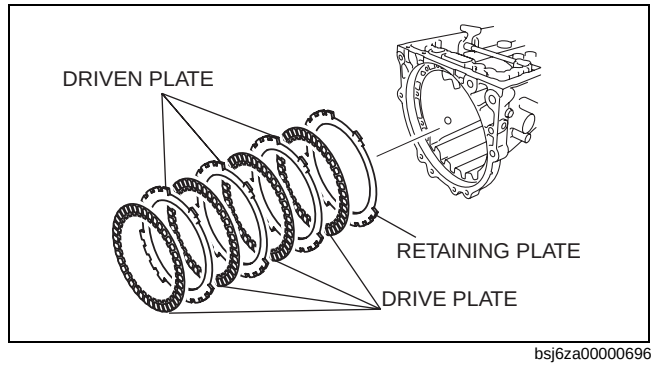
33. Install the return spring to the transmission case.

Caution
- **Inspect the number and order of the retaining plate, drive and driven plates.**



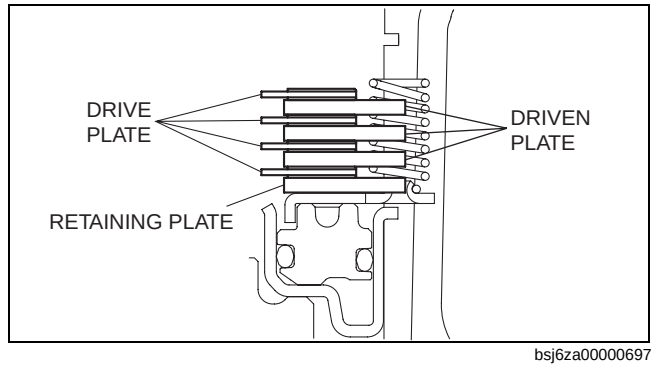
bsj6za00000423

34. Install the retaining plate, drive plate and driven plates to the transmission case as shown in the figure.



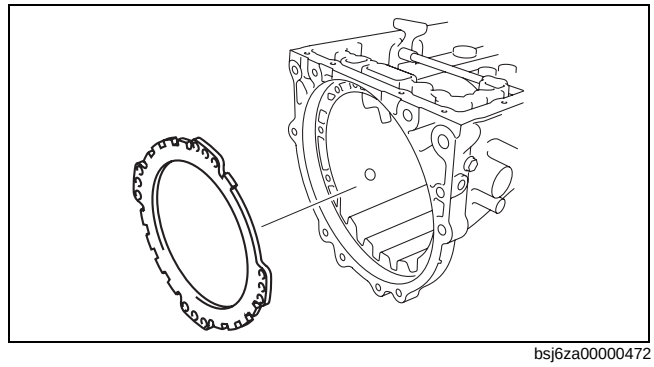
bsj6za00000696

35. Install the retaining plate, drive plate component, and driven plates in the order indicated in the figure.



bsj6za00000697

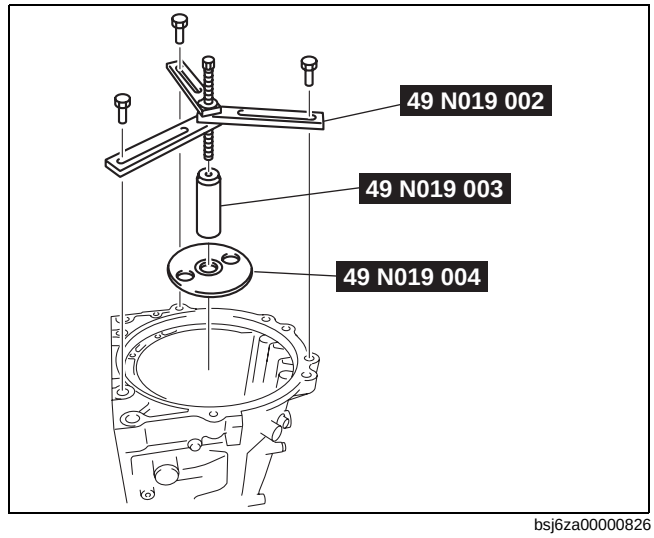
36. Install the retaining plate to the transmission case.



bsj6za00000472

37. Install the **SST** as shown in the figure, and compress the piston return spring.

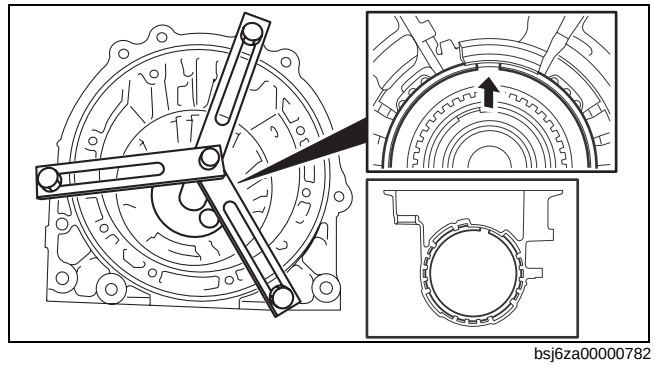
Caution
- **Align the opening of the snap ring with the position shown in the figure.**



bsj6za00000826

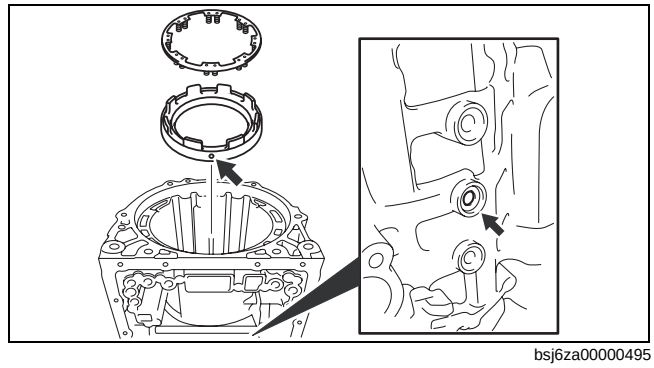
38. Using a flathead screwdriver, install the snap ring into the groove.

Caution
- **Align the hole of the brake piston and brake cylinder with the position shown in the figure.**



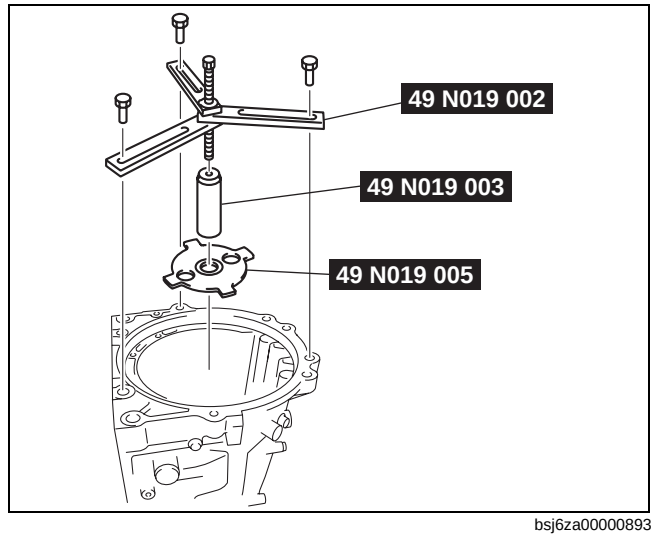
bsj6za00000782

39. Install the B1 brake piston component and return spring to the transmission case as shown in the figure.



bsj6za00000495

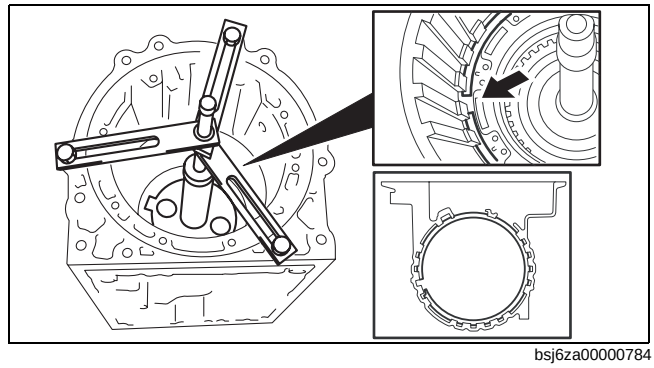
40. Install the **SST** as shown in the figure, and compress the piston return spring.



bsj6za00000893

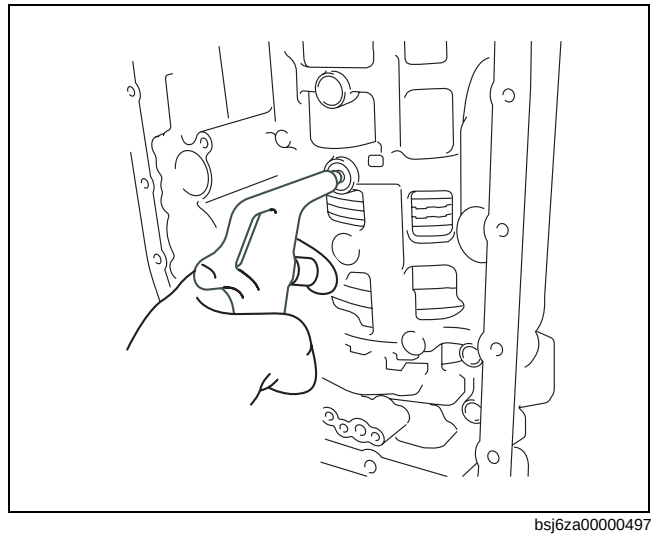
41. Using a flathead screwdriver, install the snap ring to the transmission case.

Caution
- **Align the opening of the snap ring with the position shown in the figure.**



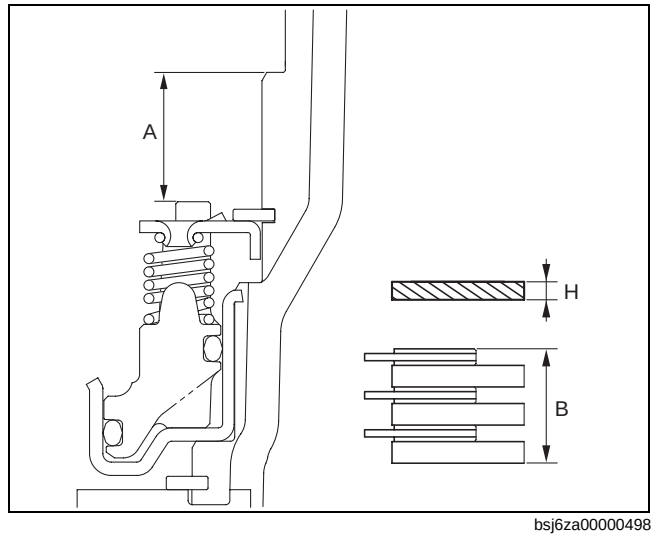
bsj6za00000784

42. Verify that B1 brake piston moves smoothly when the compressed air atomization equipment lever is pulled/released while blowing compressed air into the transmission case.



bsj6za00000497

43. Measure the level difference (length A) between the B1 brake piston upper surface and retaining plate contact surface at the both ends across the B1 brake piston diameter using a vernier caliper, and calculate the average value.



bsj6za00000498

Note
- Install the B1 brake piston component to the transmission case securely.

Dimension A
15.27—15.92 mm {0.61—0.62 in}

44. Measure the thickness of all the driven plates and drive plate components (3), and driven plates (3) at the both ends across the diameter using a vernier caliper, and calculate the average value.

Dimension B
12.52—12.92 mm {0.493—0.508 in}

45. Calculate the pack clearance using the following formula.

Dimension A-Dimension B-Thickness H

46. If the pack clearance exceeds the maximum specification, select the retaining plate with a clearance that is the maximum specification and install it.

Pack clearance
0.42—0.72 mm {0.017—0.028 in}

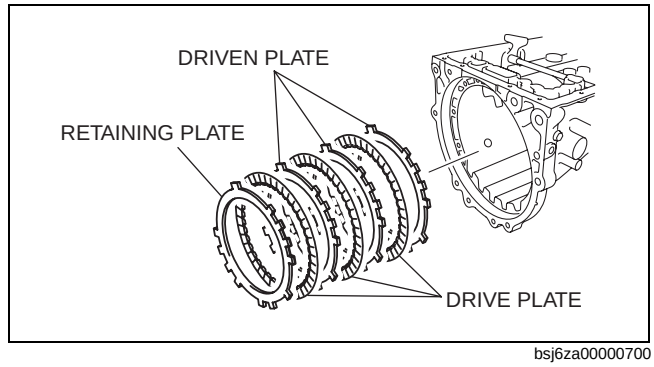
Note
- There are four types of retaining plates for the pack clearance adjustment. Select the one with the most suitable thickness.

Retaining plate thickness H (mm {in})

Identification mark	Thickness (mm {in})
0	1.95—2.05 {0.077—0.081}
1	2.15—2.25 {0.085—0.089}
2	2.35—2.45 {0.093—0.096}
3	2.55—2.65 {0.100—0.104}

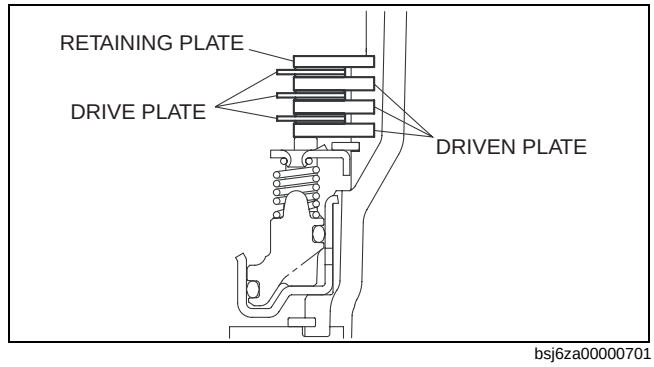
Caution
- **Inspect the number and order of the retaining plate, drive and driven plates.**

47. Install the drive plate, driven plates and retaining plate to the transmission component as shown in the figure.



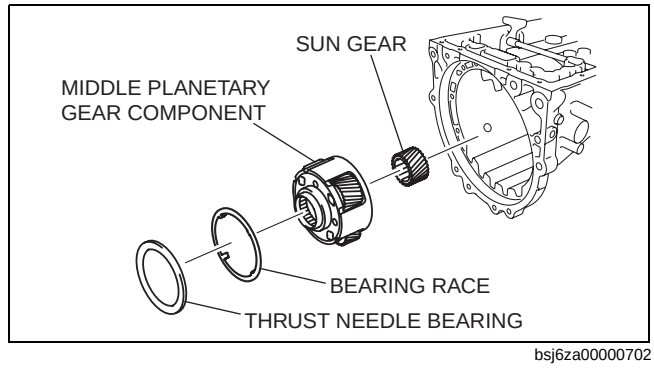
bsj6za00000700

48. Install the driven plates, drive plate, and the retaining plate in the order indicated in the figure.
49. Install the bearing race and thrust needle bearing to the middle planetary gear component.



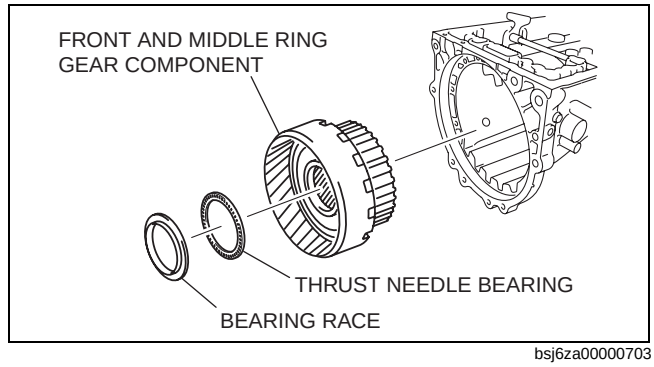
bsj6za00000701

50. Install the middle planetary gear component and sun gear.
51. Apply ATF to the bearing race and thrust needle bearing.
52. Install the bearing race and thrust needle bearing to the middle planetary gear component.



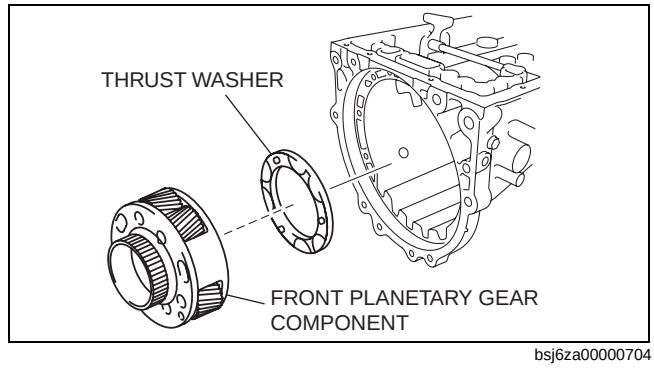
bsj6za00000702

53. Install the front and middle planetary gear ring component.
54. Apply ATF to the thrust washer.



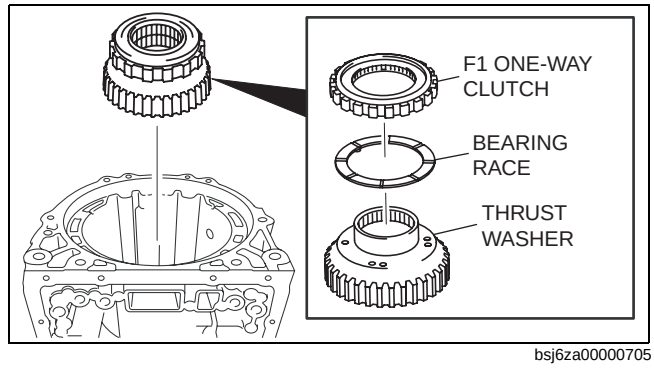
bsj6za00000703

55. Install the thrust washer to the front planetary gear component.
56. Apply ATF to the thrust washer and install it to the bearing race.



bsj6za00000704

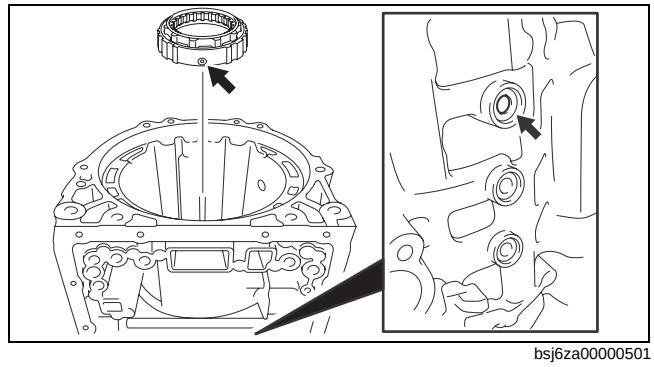
57. Install the F1 one-way clutch component to the bearing race.



bsj6za00000705

58. Install the brake piston to the transmission case as shown in the figure.

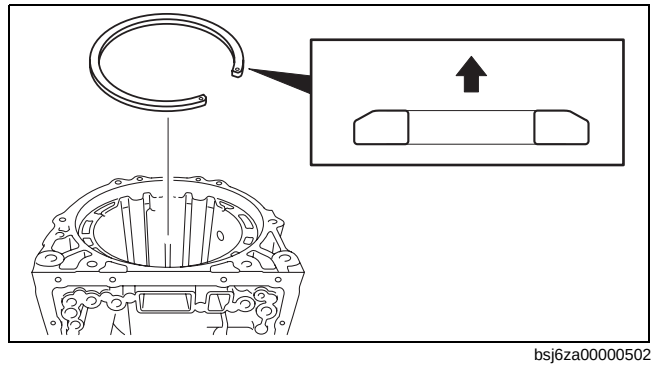
Caution
- **Align the hole of the brake piston with the position shown in the figure**



bsj6za00000501

59. Verify that the snap ring is correctly positioned.

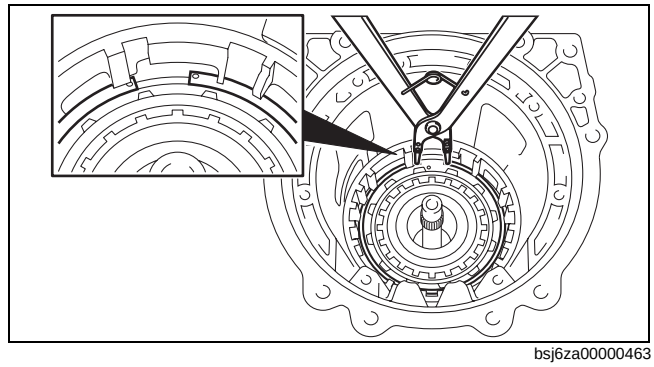
Caution
- **If the snap ring is not installed in the correct direction, the automatic transmission may not operate normally.**



bsj6za00000502

60. Using snap ring pliers, install snap ring into the groove.

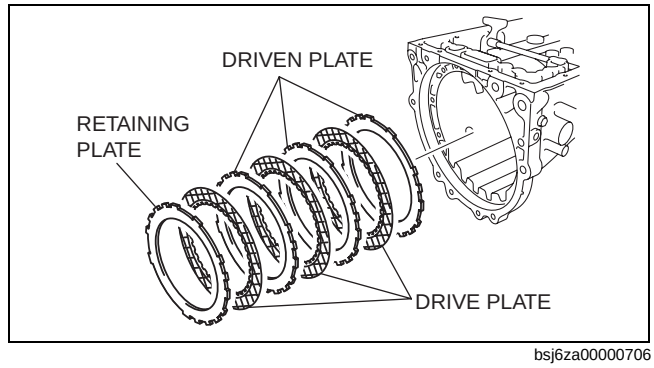
Note
- Align the opening of the snap ring with the position shown in the figure.



bsj6za00000463

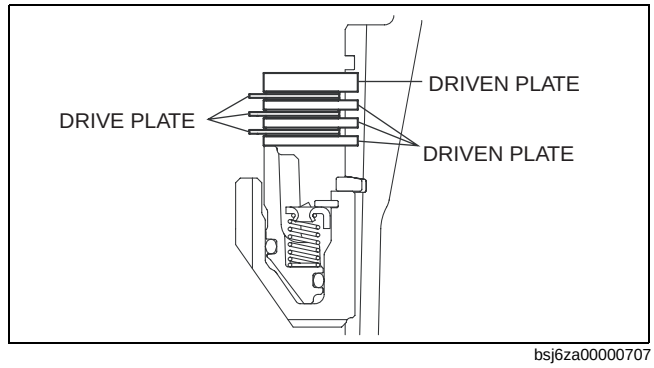
61. Install the drive plate and driven plate as shown in the figure.

Note
- Inspect the number and order of the retaining plate, drive and driven plates.



bsj6za00000706

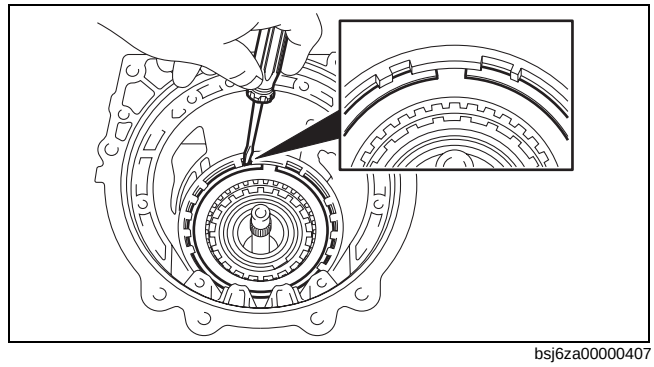
62. Install the driven plates, drive plate and the retaining plate in the order indicated in the figure.



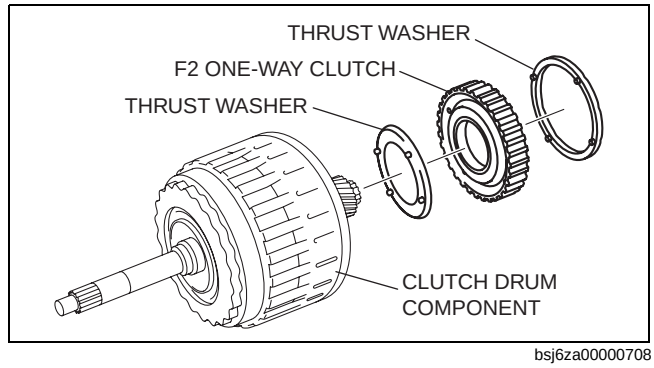
bsj6za00000707

63. Using a flathead screwdriver, install the snap ring into the groove.

Caution
- **Align the opening of the snap ring with the position shown in the figure.**

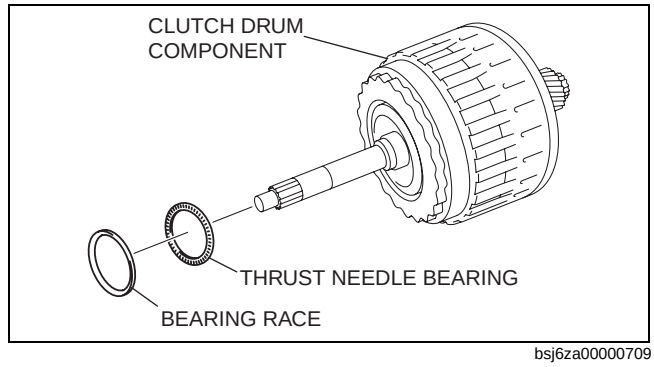

bsj6za00000407

64. Apply ATF to the thrust washer and install it to the F2 one-way clutch component.
65. Install the F2 one-way clutch component to the clutch drum component.
66. Apply ATF to the bearing race and thrust needle bearing.



bsj6za00000708

67. Install the bearing race and thrust needle bearing to the clutch drum component and the F2 one-way clutch component.

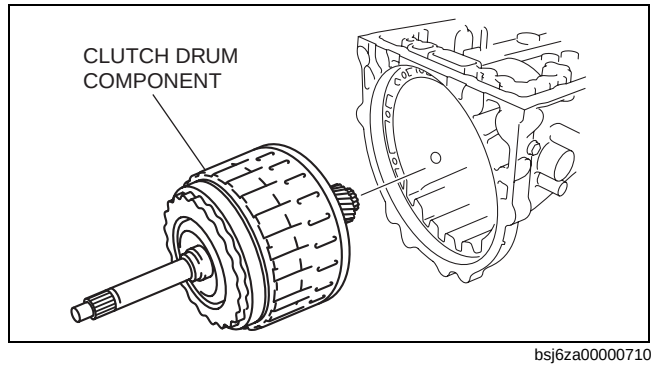


bsj6za00000709

68. Install the clutch drum component and F2 one-way clutch component.

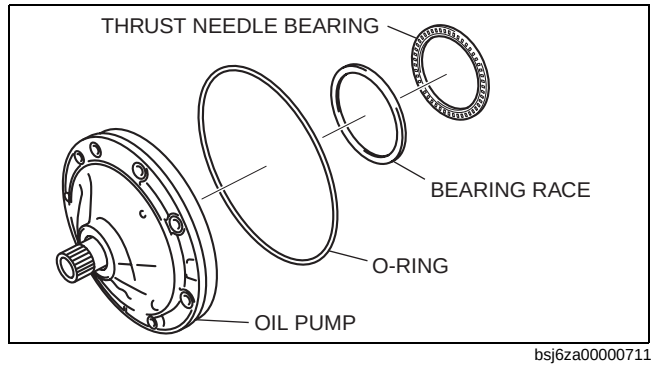
Caution
- **Do not drop the clutch drum component and the F2 one-way clutch component.**

69. Apply ATF to the new O-ring.
70. Install the O-ring to the oil pump component.



bsj6za00000710

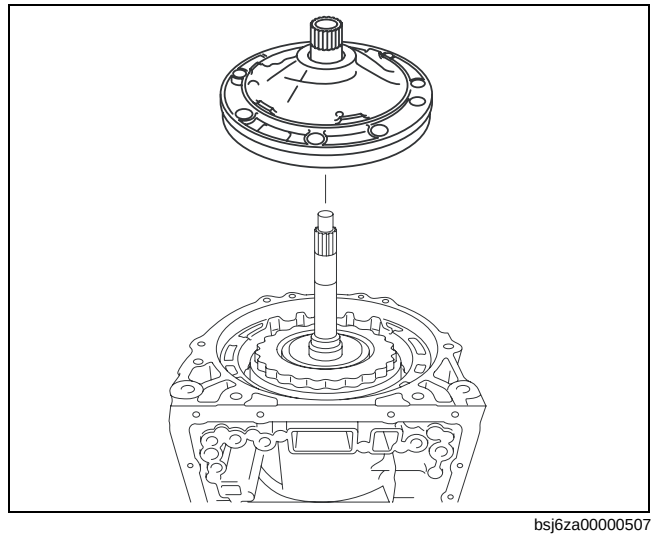
71. Apply ATF to the thrust needle bearing, bearing race and install it to the oil pump component.



bsj6za00000711

72. Install the oil pump as shown in the figure.

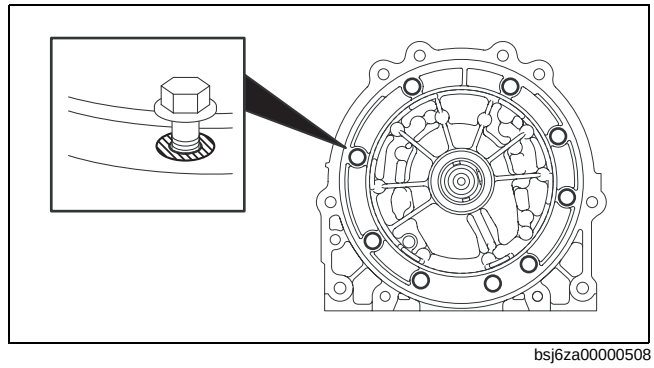
Caution
- **Do not drop the oil pump.**



bsj6za00000507

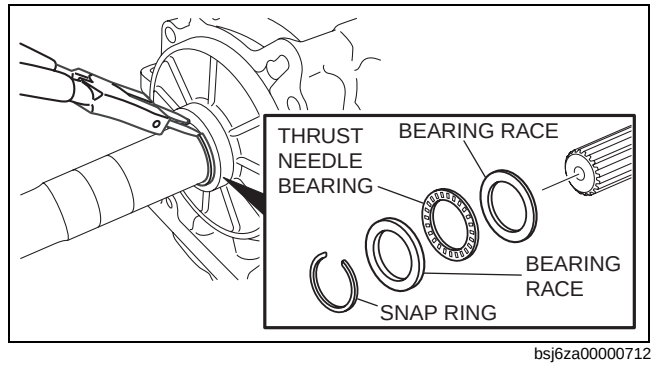
73. Install the bolt as shown in the figure.

Tightening torque
17.6—24.5 N·m {1.8—2.4 kgf·m, 13.0—18.0 ft·lbf}



bsj6za00000508

74. Apply ATF to the thrust needle bearing and the bearing race.
75. Install the thrust needle bearing and bearing race to the front planetary gear component.
76. Install snap ring using snap ring pliers.

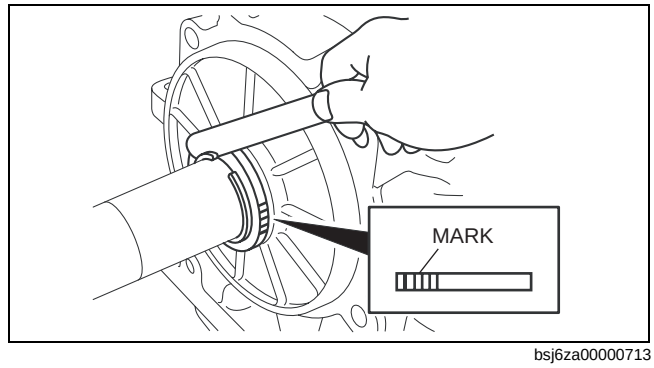


bsj6za00000712

77. Measure the clearance between snap ring and bearing race using a thickness gauge.

Standard
0.02—0.12 mm {0.0008—0.0047 in}

- If not within the specification, select an appropriate bearing race.



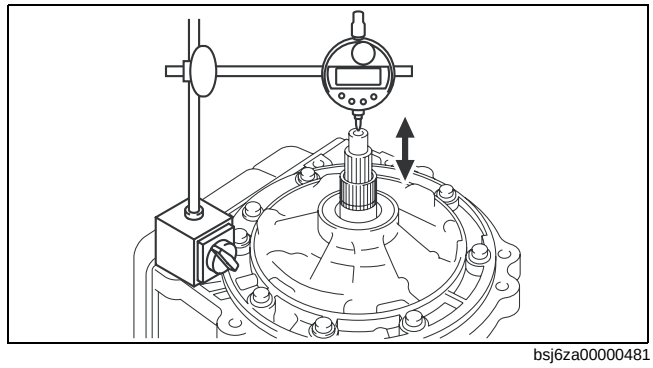
bsj6za00000713

Retaining plate size

Identification mark	Thickness (mm {in})
	3.80 {0.150}
	3.85 {0.152}
	3.90 {0.154}
	3.95 {0.156}
	4.00 {0.157}
	4.05 {0.159}
	4.10 {0.161}
	4.15 {0.163}
	4.20 {0.165}
	4.25 {0.167}
	4.30 {0.169}
	4.35 {0.171}

78. Verify that the input shaft turns smoothly.
79. Using a dial indicator, measure the input shaft end play.

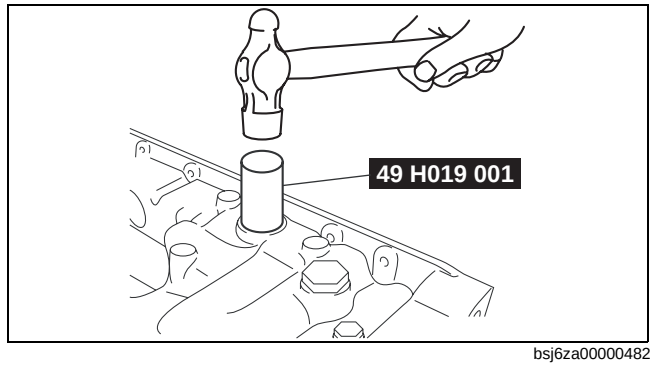
    Input shaft end play
    0.35—1.05 mm {0.014—0.041 in}



bsj6za00000481

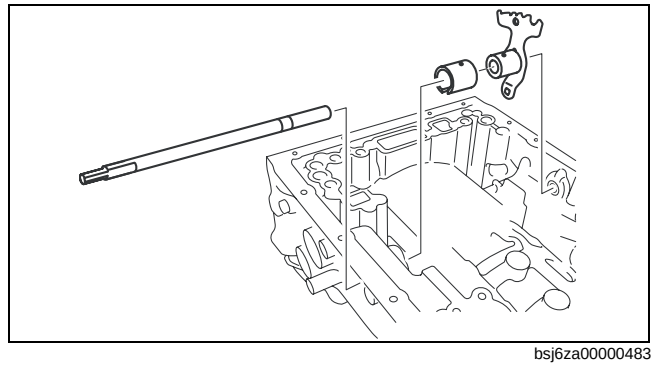
80. Using the **SST** and a hammer, install a new oil seal.

    Caution
    - **Do not damage the transmission case.**



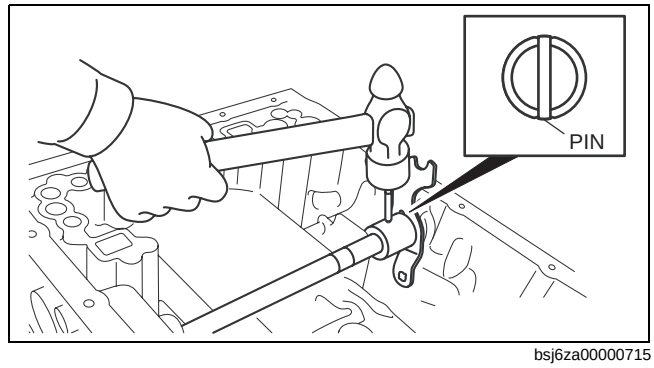
bsj6za00000482

81. Install a new manual shaft washer to the manual valve.
82. Insert the manual shaft into the transmission case and assemble it to the manual valve.



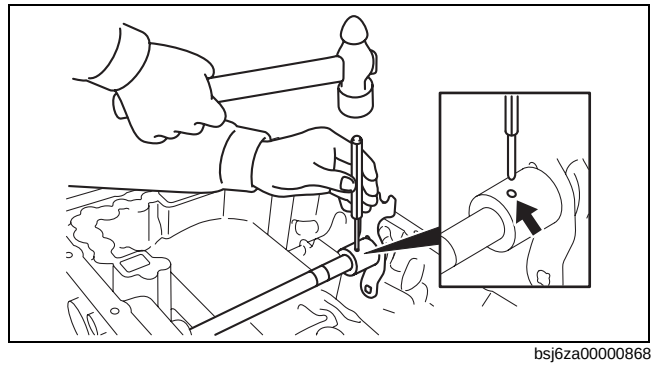
bsj6za00000483

83. Tap in a new pin using a hammer.



bsj6za00000715

84. Align the manual shaft groove with the spacer hole and crimp them using a punch.
85. Verify that the manual shaft turns smoothly.

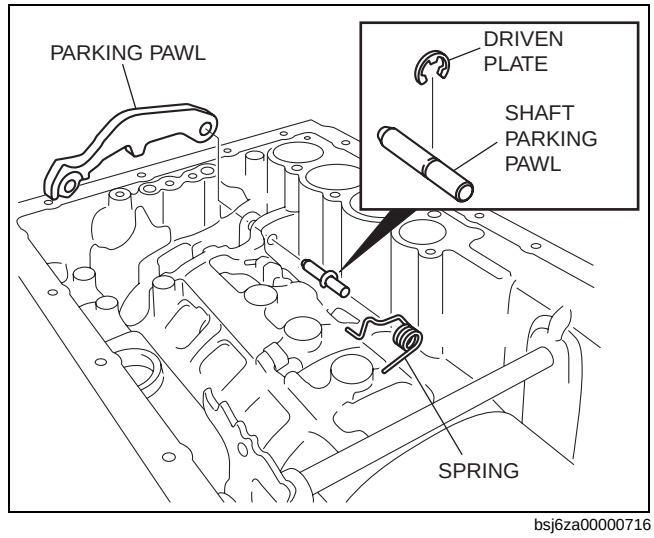


bsj6za00000868

86. Install the parking pawl.
87. Install the driven plate to the parking pawl shaft.
88. Install the parking pawl shaft, spring.

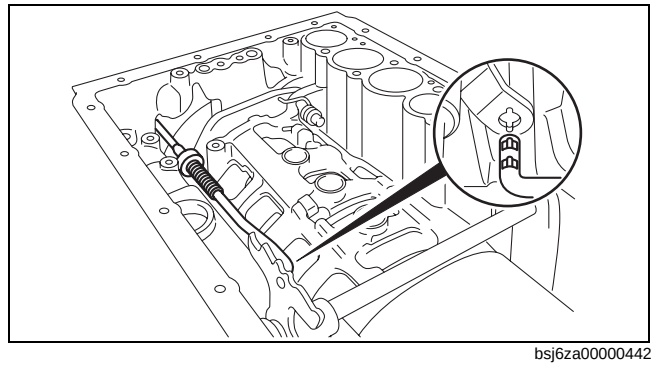
Caution

- **Be careful not to apply too much force to the spring.**



bsj6za00000716

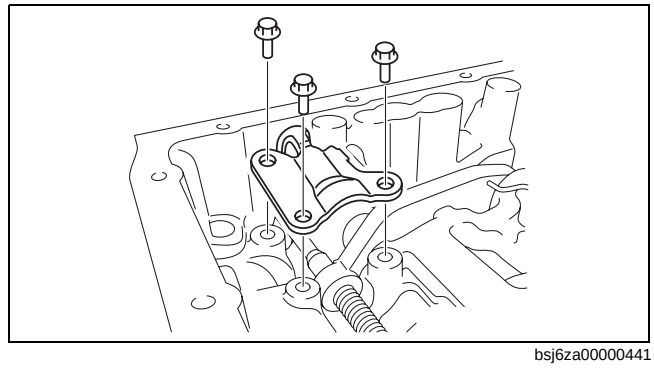
89. Connect the parking rod to the manual valve.



bsj6za00000442

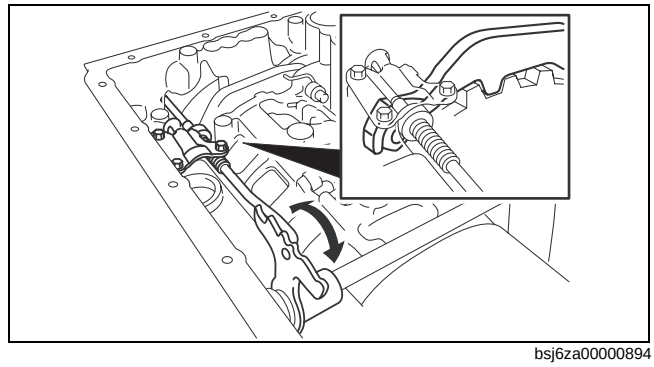
90. Install the bracket.

Tightening torque
5.9—8.8 N·m {60.2—89.7 kgf·cm, 52.3—77.8 in·lbf}



bsj6za00000441

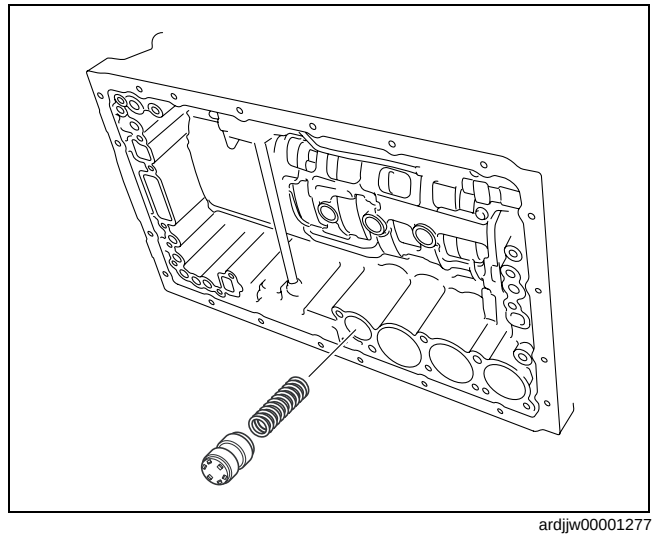
91. Set the manual valve to the P position and verify that the parking pawl shaft is properly engaged with the front planetary gear component.



bsj6za00000894

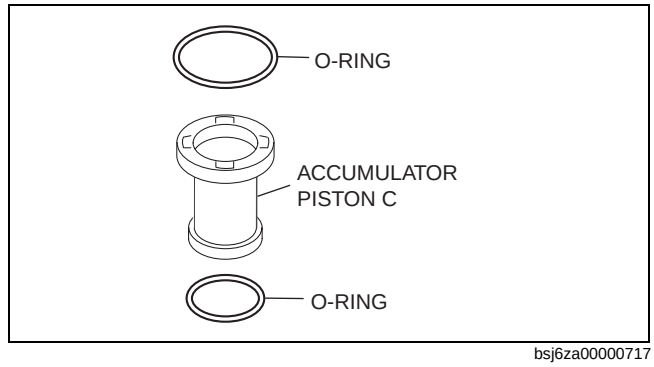
92. Install the accumulator valve and compression spring to the transmission case.

Caution
- **Do not damage the O-ring and accumulator piston.**



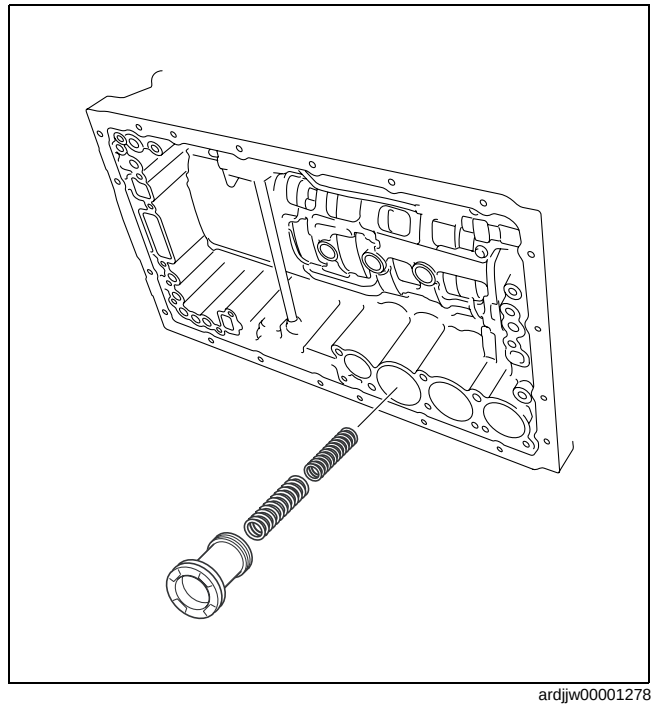
ardjjw00001277

93. Apply ATF to the new O-ring and install the accumulator pistons C.



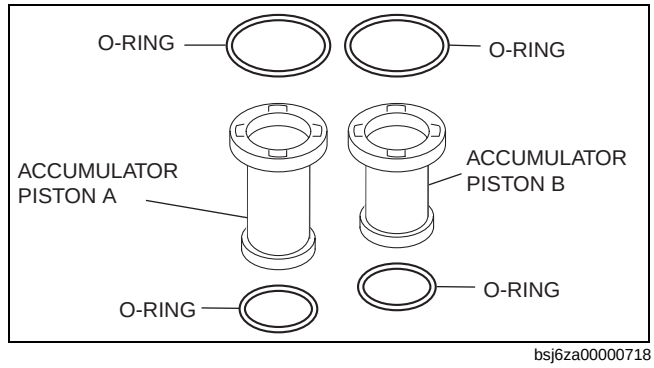
bsj6za00000717

94. Install the accumulator piston C, compression spring to the transmission case.



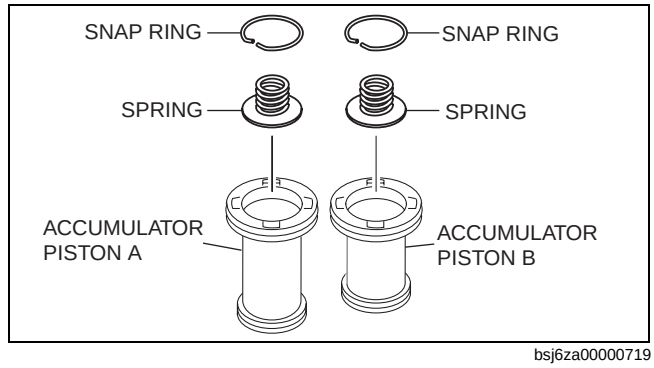
ardjjw00001278

95. Apply ATF to the new O-ring and install the accumulator pistons A, B.



bsj6za00000718

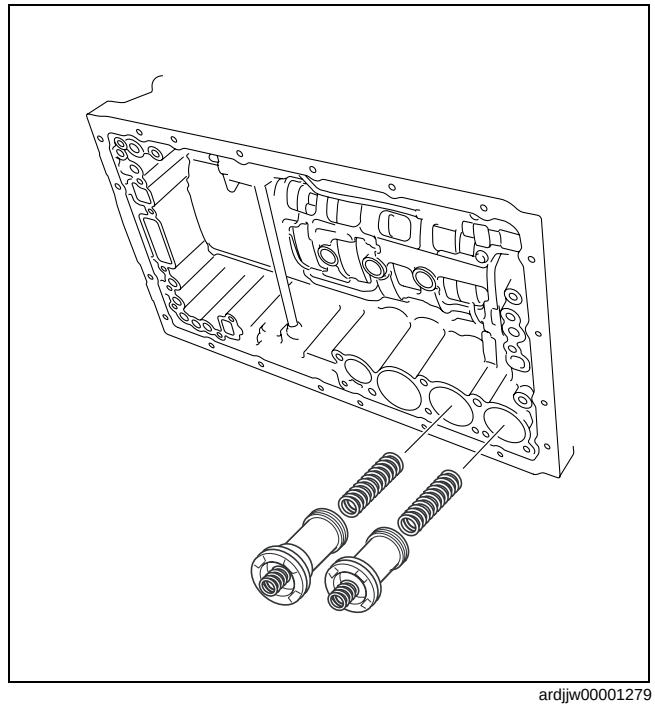
96. Using a flathead screwdriver, install the compression spring, snap ring to the accumulator pistons A, B.



bsj6za00000719

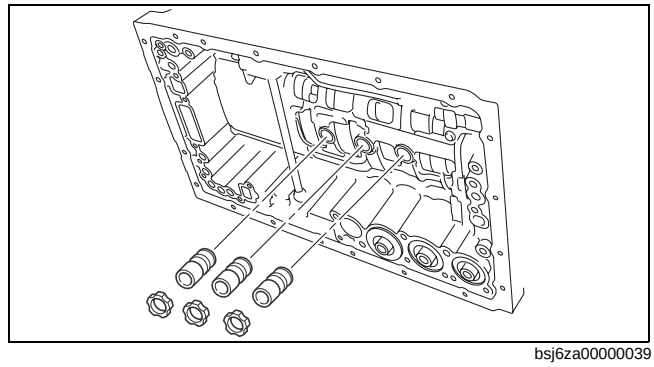
97. Install the accumulator pistons A, B and the compression spring to the transmission case.

Caution
- **Do not damage gasket.**



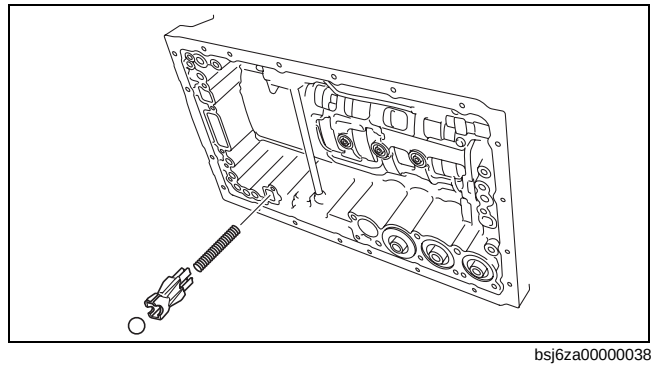
ardjjw00001279

98. Apply ATF to the new transmission case gasket, new brake drum gasket and install the transmission case.



bsj6za00000039

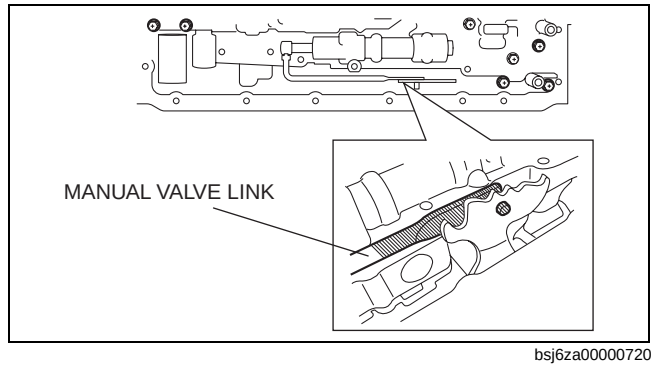
99. Install the check valve subcomponent and compression spring to the transmission case.



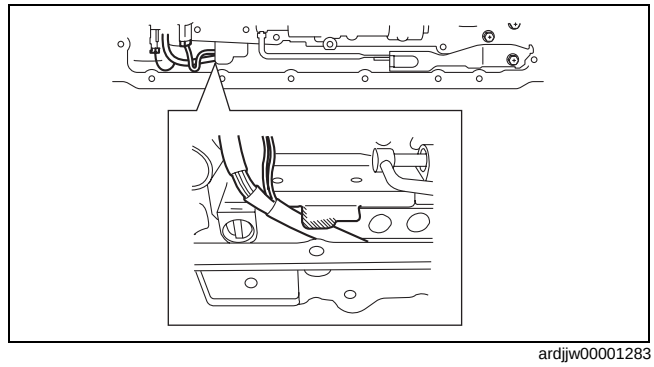
bsj6za00000038

100. Connect the manual valve link, and install the control valve body component.

Caution
- **When installing the control valve body component, route the wiring harness correctly to the separate plate depression inside the control valve body component shown in the figure.**



bsj6za00000720

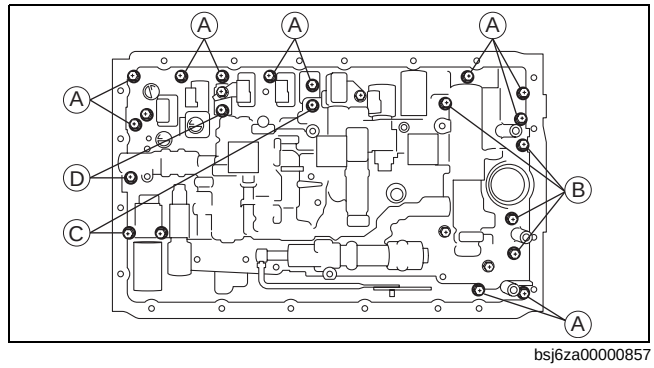


ardjjw00001283

101.Temporarily tighten the bolts to the transmission case as shown in the figure.

Bolt length (measured from below the head)
A: 25 mm {0.98 in}
B: 36 mm {1.42 in}
C: 45 mm {1.77 in}
D: 50 mm {1.97 in}

Note
- Aligning the bolt holes, temporarily tighten the bolts by hand.
- Tighten the bolts from the inner side.



bsj6za00000857

102.Tighten the bolts.

Tightening torque
10.0—12.0 N·m {102—122 kgf·cm, 89—105 in·lbf}

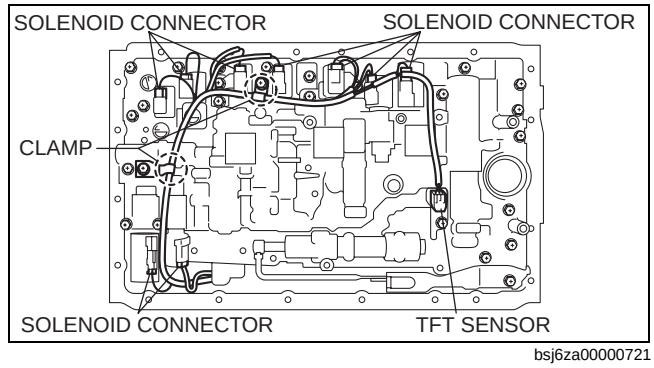
103.Install the detent spring cover and detent spring to the control valve body component.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

104.Install the TFT sensor, lock plate to control valve body component.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

105.Clamp the coupler component.
106.Connect the solenoid connector to the solenoid.
107.Apply ATF to the new O-ring and install the oil strainer.

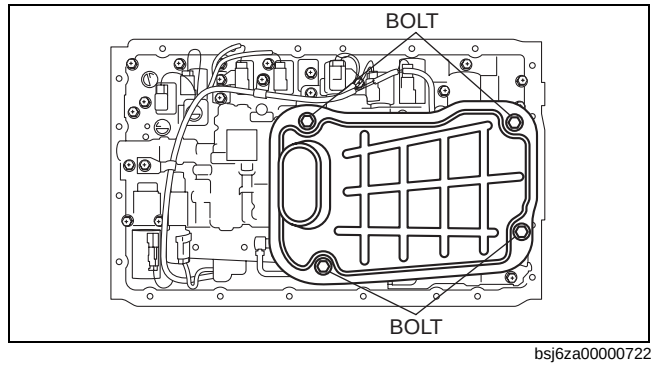


bsj6za00000721

108.Install the oil strainer to the control valve body component.

Tightening torque
8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

Caution
- **Make sure that lint or dirt does not penetrate the transmission.**



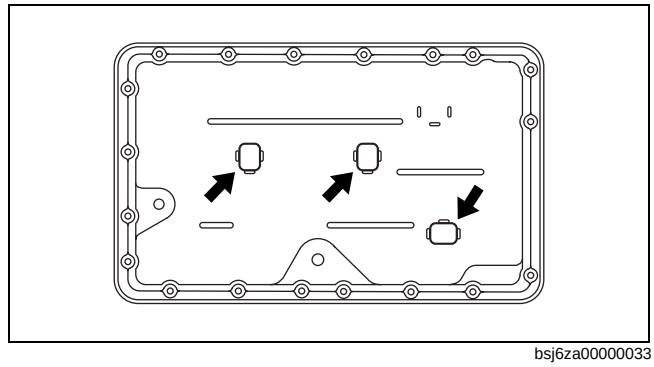
bsj6za00000722

109.Clean the contact surface of the oil pan and transmission case.

Note
- Wash the magnets before installing them.

110.Install the magnet to the oil pan.

Caution
- **Do not damage the contact surface of the oil pan and transmission case.**
- **Do not deform the oil pan.**

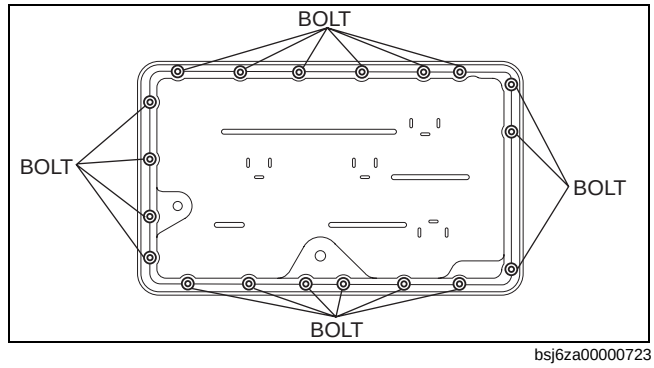

bsj6za00000033

111.Install the new oil pan gasket and oil pan to the transmission case.

Caution
- **Because the oil pan gasket is made of cork, the oil pan gasket may be damaged if it is tightened with excessive force.**

112.Install the bolts to the transmission case.

Tightening torque
3.9—4.9 N·m {39.8—49.9 kgf·cm, 34.6—43.3 in·lbf}



bsj6za00000723

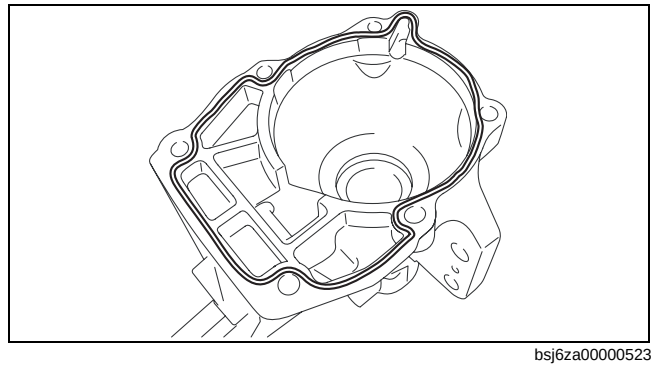
113. Remove the silicone sealant and be careful not to spill any oil on the contact surface of the transmission case and extension housing.
114.Clean the contact surface of the transmission case and the extension housing, and the bolt holes.

Note
- Completely remove sealant and oil with isoproply alcohol (IPA) or similar.

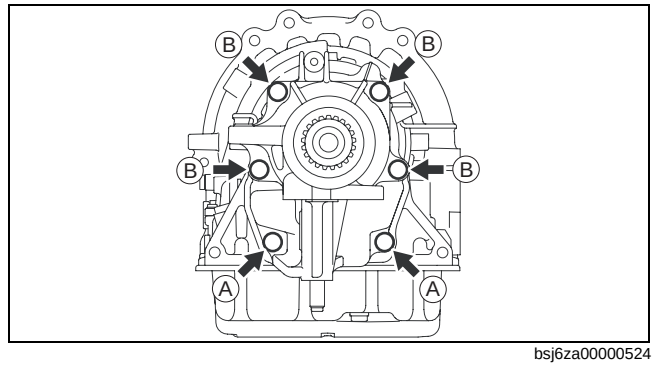
115.Apply sealant to the extension housing as shown in the figure.

Note
- Spread sealant over the contact surface.

116.Install the extension housing and transmission case.


bsj6za00000523

117.Temporarily tighten the bolts by hand as shown in the figure.



bsj6za00000524

Bolt number	Bolt size	Length (measured from below the head) (mm {in}}
A	M10 -1.5	35 {1.38}
B	M10-1.5	45 {1.77}

Note
- Do not apply sealant to the transmission case.
- The characters shown in the figure indicate the bolt type.

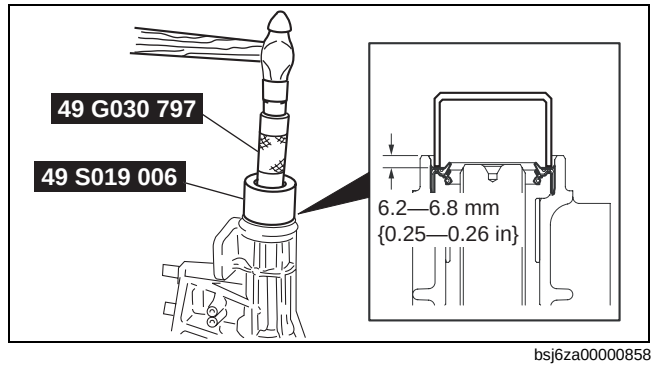
118.Tighten the bolts.

Tightening torque
26.5—41.2 N·m {2.71—4.20 kgf·m, 19.6—30.3 ft·lbf}

119..Assemble a new oil seal to the extension housing in the position shown in the figure using the **SST** and a hammer.

Caution
- **Do not damage the oil seal.**
- **Do not damage the extension housing.**

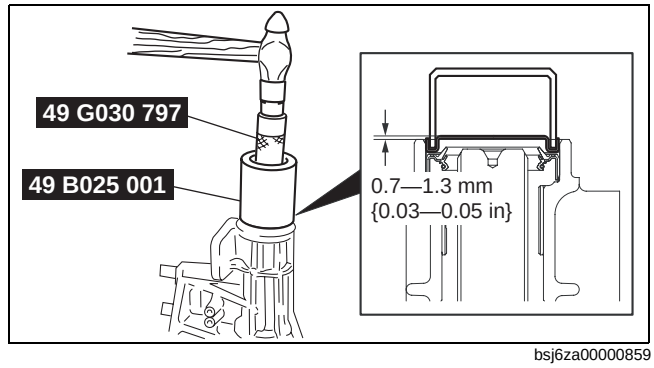
120.Apply grease to the oil seal lip.



bsj6za00000858

121.Using the **SST** and a hammer, install the new extension housing shroud to the extension housing as shown in the figure.

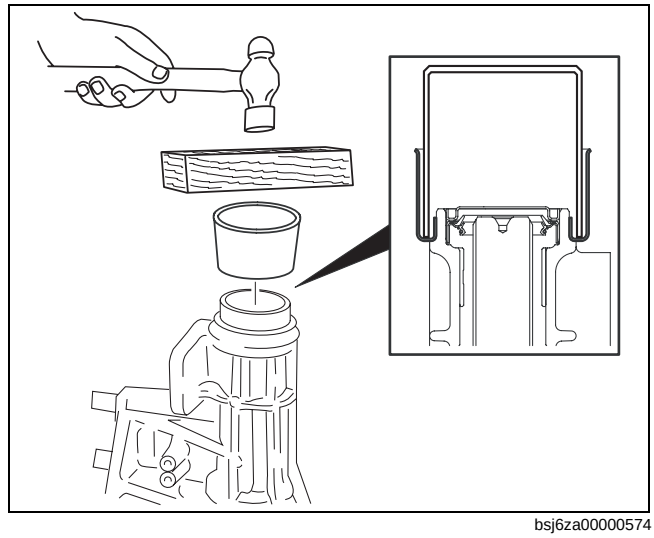
Caution
- **Do not damage the oil seal.**
- **Do not damage the extension housing.**
- **Do not damage the extension housing shroud.**



bsj6za00000859

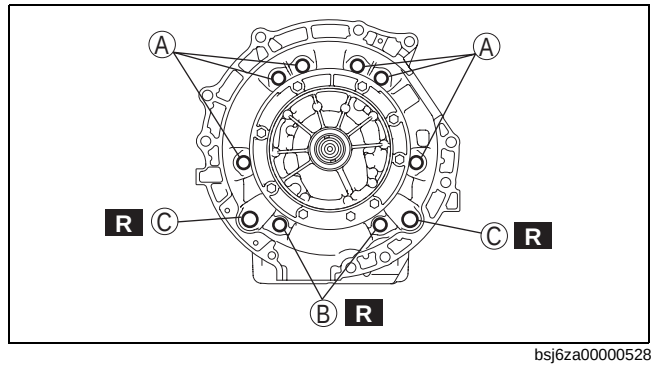
122.Using a hammer and slab of wood, install the new extension dust deflector to the extension housing as shown in the figure.

Caution
- **Do not damage extension housing.**
- **Do not damage extension dust deflector.**



bsj6za00000574

123.Temporarily tighten the bolts A and new bolts B, C by hand as shown in the figure.



bsj6za00000528

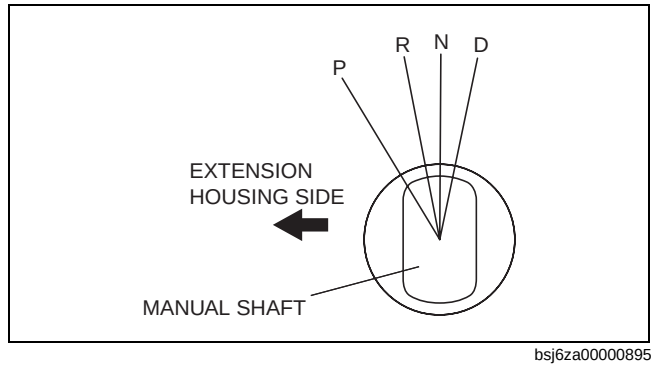
Bolt number	Bolt size	Length (measured from below the head) (mm {in})
A	M10 -1.5	35 {1.38}
B	M10-1.5	35 {1.38}
C	M10-1.75	38 {1.50}

124.Tighten the bolts.

Tightening torque
A, B: 26.5—41.2 N·m {2.71—4.20 kgf·m, 19.6—30.3 ft·lbf}
C: 47.0—66.6 N·m {4.80—6.79 kgf·m, 34.7—49.1 ft·lbf}

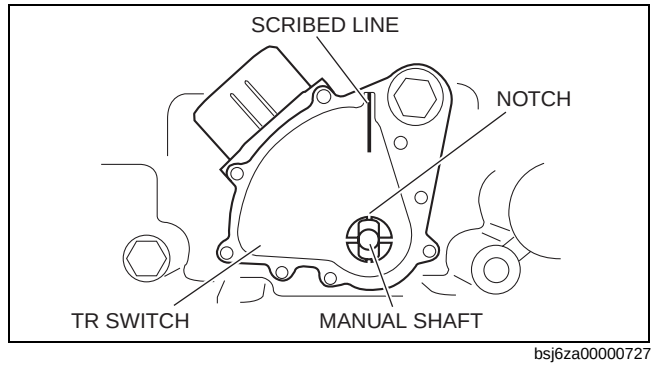
125.Turn the manual shaft fully to the extension housing side and turn it back two steps so that the N position is selected.
126.Install the TR switch and temporarily tighten the new TR switch installation bolt.

Caution
- **If the TR switch is not adjusted correctly, adjust it correctly, otherwise the AT may not operate normally.**



bsj6za00000895

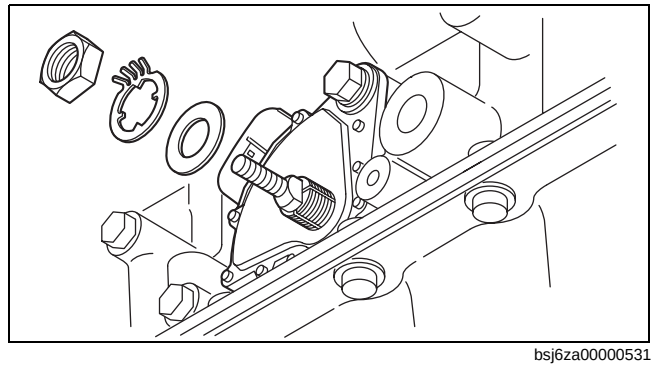
127.Verify that the scribed line on the TR switch and the manual shaft notch are aligned.



bsj6za00000727

128.Install the washer, lock washer and nut.

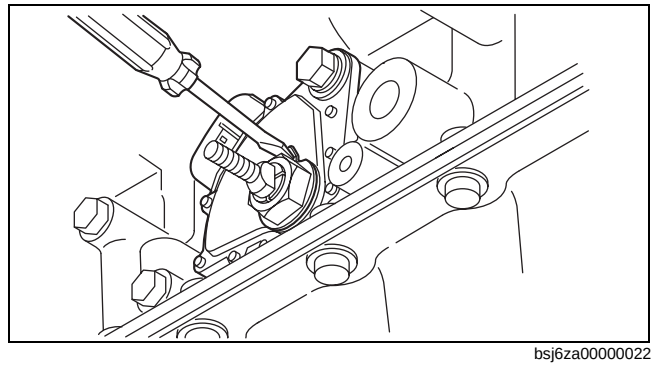
Tightening torque
5.9—7.8 N·m {61—79 kgf·cm, 53—69 in·lbf}



bsj6za00000531

129.Using a flathead screwdriver, bend the tab of lock washer.
130.Tighten the TR switch installation bolt.

Tightening torque
9.8—15.7 N·m {1.0—1.6 kgf·m, 7.3—11.6 ft·lbf}

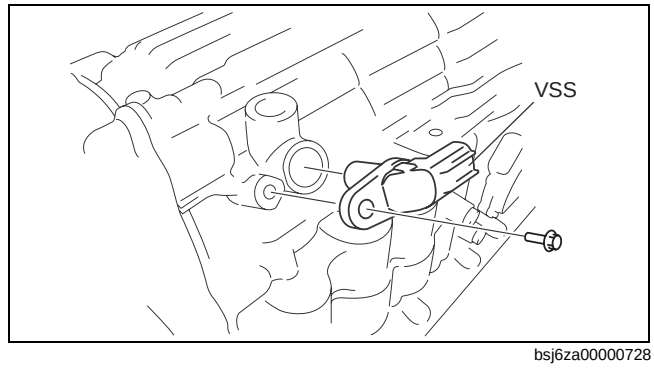


bsj6za00000022

131.Install the VSS.

Tightening torque
3.9—6.9 N·m {40—70 kgf·cm, 35—61 in·lbf}

Caution
- **Do not damage the VSS.**

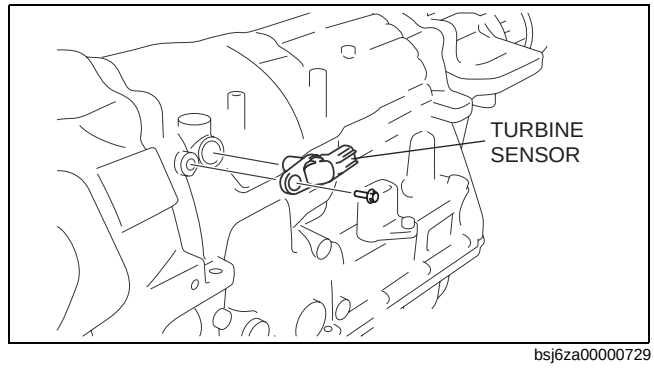


bsj6za00000728

132.Install the turbine sensor.

Tightening torque
3.9—6.9 N·m {40—70 kgf·cm, 35—61 in·lbf}

Caution
- **Do not damage the turbine sensor.**

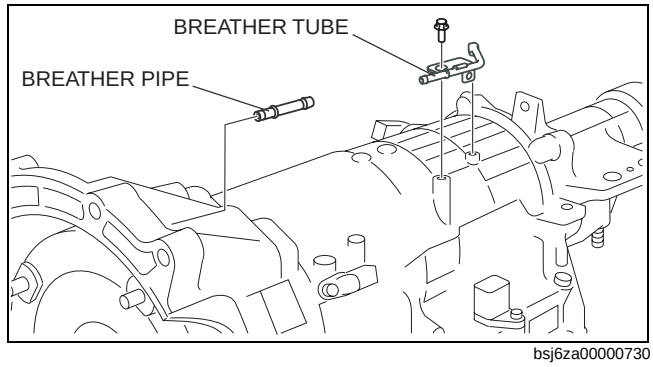


bsj6za00000729

133.Install the breather tube.

Tightening torque
3.9—6.9 N·m {40—70 kgf·cm, 35—61 in·lbf}

Caution
- **Do not damage the breather tube.**

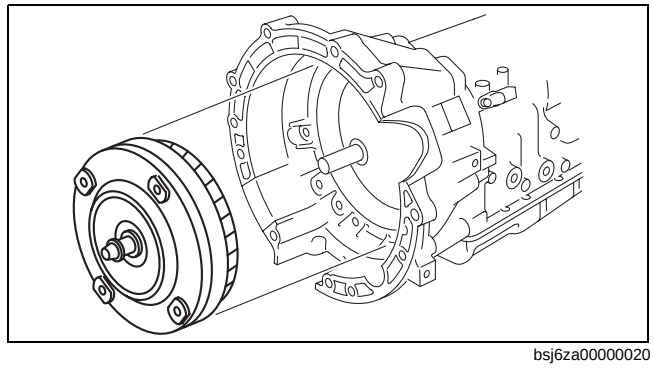


bsj6za00000730

134.Install the breather pipe.

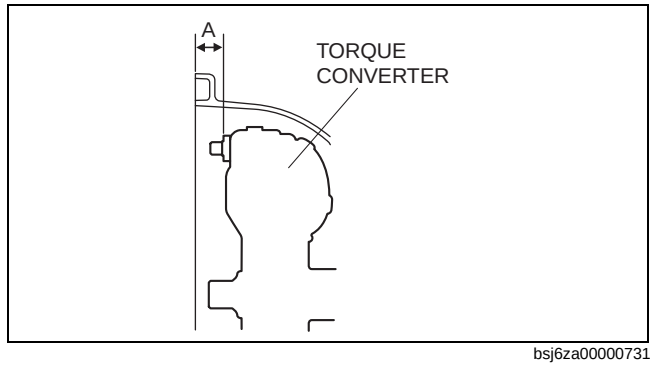
135.Using a flathead screwdriver, position the drive gear on the oil pump component in the center. Then install the torque converter component to the transmission.

Caution
- **Do not damage the oil seal.**
- **Do not drop the torque converter.**


bsj6za00000020

136.To ensure that the torque converter is installed accurately, measure distance A between the end of the torque converter and the end of the converter housing.

Distance A (between the end of the torque converter and the end of the converter housing)
26.2 mm {1.0 in}



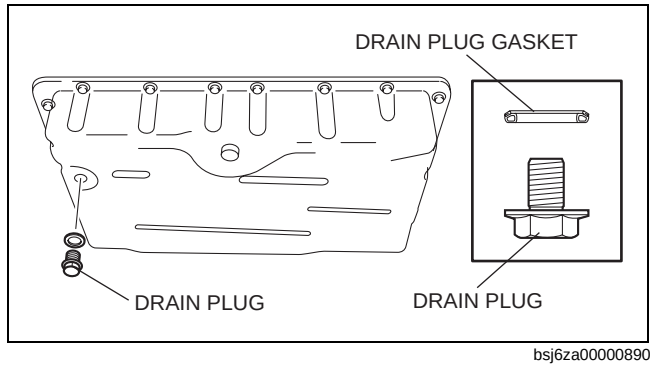
bsj6za00000731

137.Clean the drain plug.

Caution
- **Install the drain plug being careful of the drain plug gasket direction.**

138.Install the new drain plug gasket and drain plug to the oil pan.

Tightening torque
17.5—22.5 N·m {1.8—2.2 kgf·m, 13.0—16.5 ft·lbf}



bsj6za00000890

05-50 TECHNICAL DATA

TRANSMISSION TECHNICAL DATA

id055000800200

Item	Specification
Pump housing bushing inner diameter	38.113—38.138 mm {1.50051—1.50150 in}
Oil pump shaft bushing inner diameter	21.501—21.527 mm {0.846496—0.847520 in}
Oil pump gear outer standard clearance	0.10—0.17 mm {0.004—0.006 in}
Oil pump gear inner standard clearance	0.07—0.15 mm {0.0028—0.0059 in}
Oil pump gear side standard clearance	0.02—0.04 mm {0.0008—0.0015 in}
C1, C4 clutch return spring free length	Standard: 26.29 mm {1.04 in}
C2 clutch return spring free length	Standard: 20.02 mm {0.79 in}
C3 clutch return spring free length	Standard: 21.03 mm {0.83 in}
Input shaft component bushing inner diameter	18.000—18.025 mm {0.7087—0.7096 in}
Clutch hub bushing inner diameter	Front side: 23.037—23.062 mm {0.90697—0.90795 in} Rear side: 23.037—23.062 mm {0.90697—0.90795 in}
Clutch hub component bushing inner diameter	Front side: 33.312—33.337 mm {1.31150—1.31248 in} Rear side: 33.312—33.337 mm {1.31150—1.31248 in}
B3 brake return spring free length	Standard: 15.72 mm {0.62 in}
B1 brake return spring free length	Standard: 17.05 mm {0.67 in}
Front planetary ring gear bushing inner diameter	46.038—46.063 mm {1.81252—1.81350 in}
Front planetary gear component bushing inner diameter	48.755—48.780 mm {1.91949—1.92047 in}
Rear planetary gear component bushing inner diameter	18.000—18.025 mm {0.7087—0.7096 in}
B2 brake return spring free length	Standard: 22.66 mm {0.89 in}
B4 brake return spring free length	Standard: 13.84 mm {0.54 in}
Input shaft end play	0.35—1.05 mm {0.014—0.041 in}
Distance A (between the end of the torque converter and the end of the converter housing)	26.2 mm {1.0 in}

05-60 SERVICE TOOLS

TRANSMISSION SST

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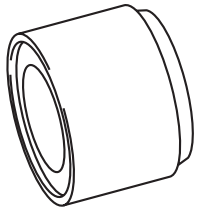
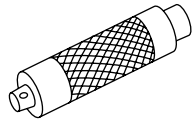
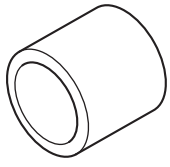
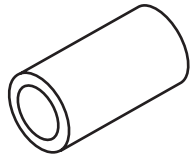
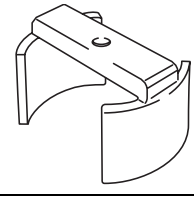
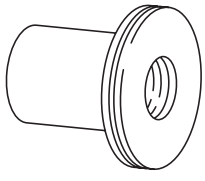
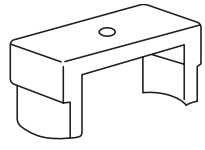
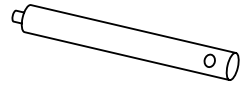
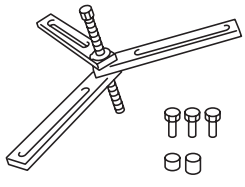
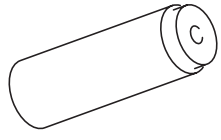
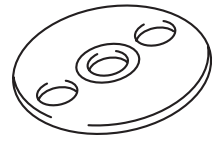
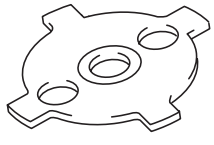
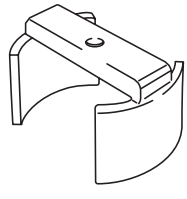
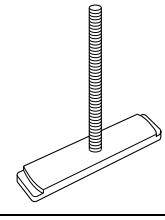
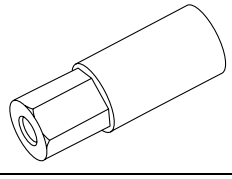
49 S019 006 Oil seal installer 	49 G030 797 Handle 	49 B025 001 Body 
49 W027 003 Support block 	49 H019 001 Attachment 	49 T019 003 Body 
49 HD64 377 Attachment 	49 HD64 376 Body 	49 G033 102 Handle 
49 N019 002 Compressor 	49 N019 003 Extension 	49 N019 004 Attachment 
49 N019 005 Attachment 	49 T019 014 Body 	49 G019 027 Attachment 
49 G019 029 Nut 	—	—