2006-08 TRANSMISSION

Automatic Transmission Overhaul - MX-5 Miata & RX-8

05-13 AUTOMATIC TRANSMISSION

AUTOMATIC TRANSMISSION DISASSEMBLY

Precaution

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

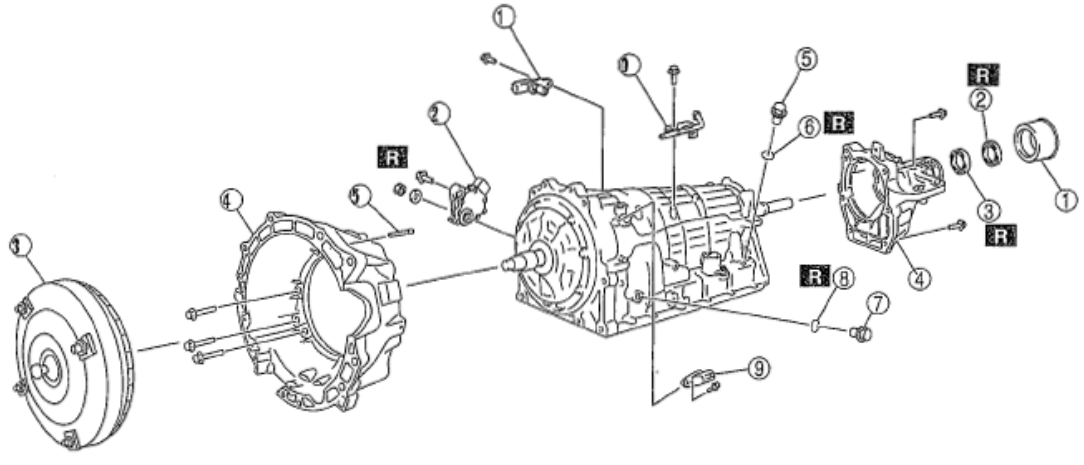
1. Handle electronic parts with care
   - Do not pull the wiring harness forcibly when disconnecting the connector. Unlock the first and pull the connector.
   - When connecting the connector, verify that it is inserted until it is properly locked. (Verify that a click sound is heard.)
   - Do not apply 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

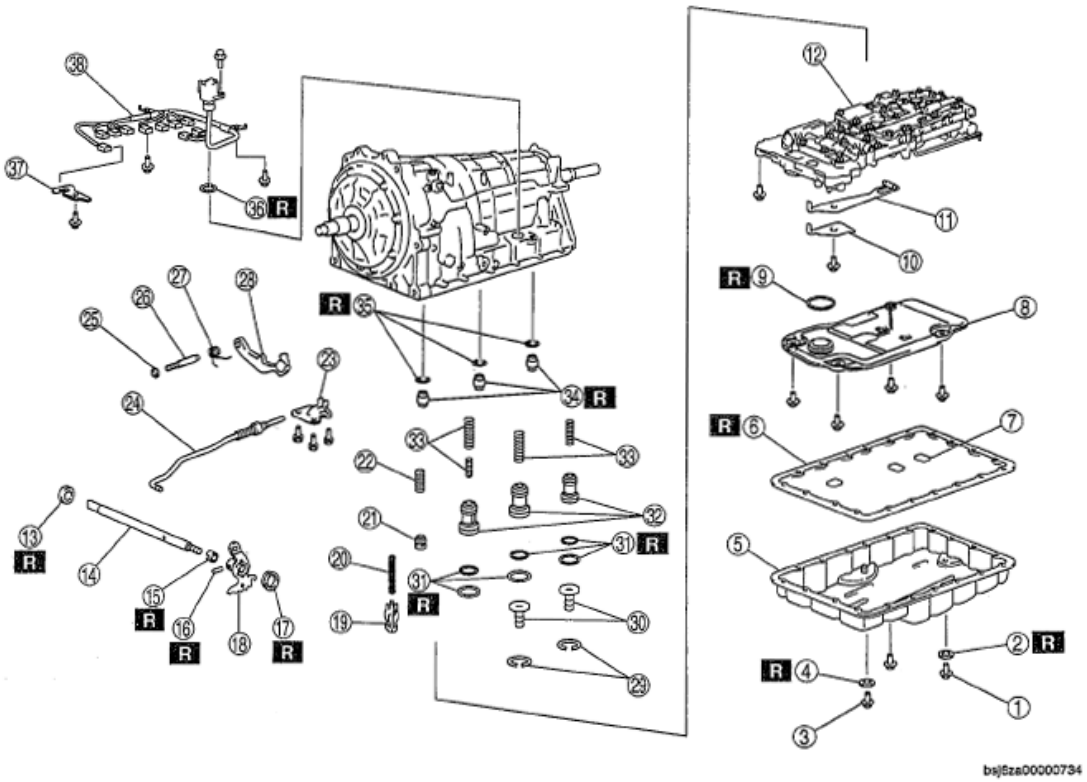
Components



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

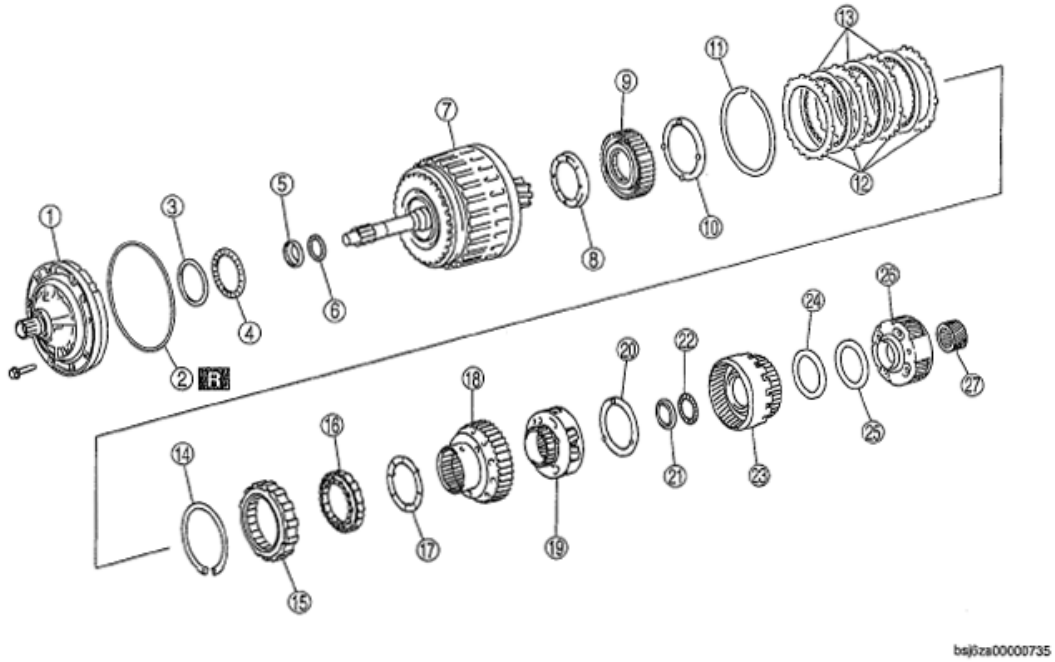
Fig. 1: Disassembled View Of Automatic Transmission Components (1 Of 5)



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

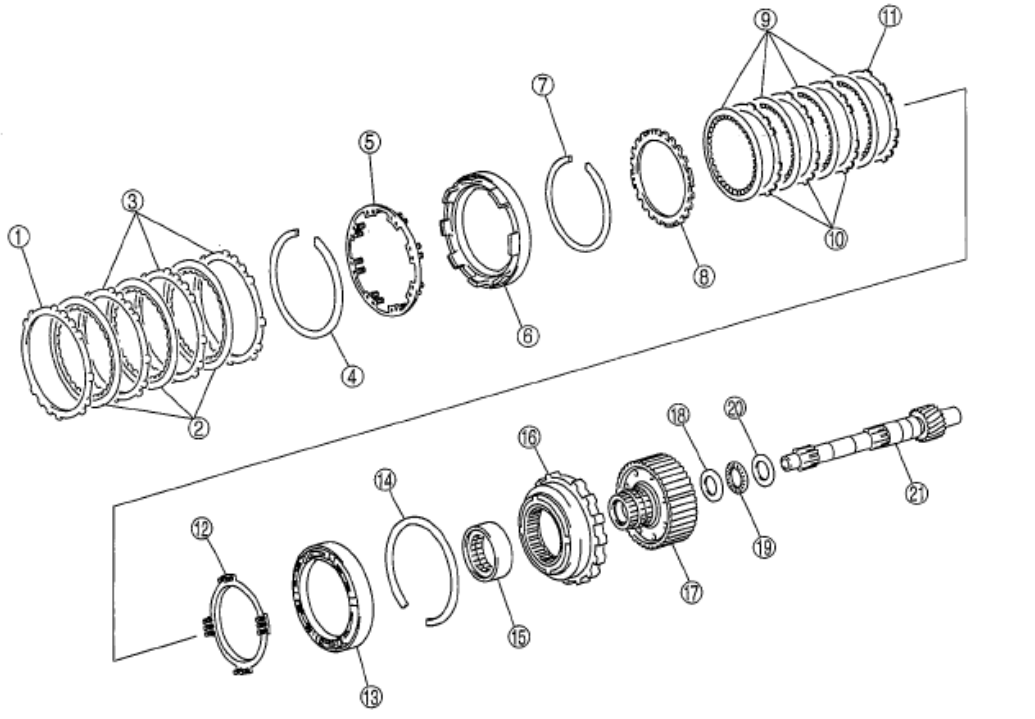
Fig. 2: Disassembled View Of Automatic Transmission Components (2 Of 5)



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

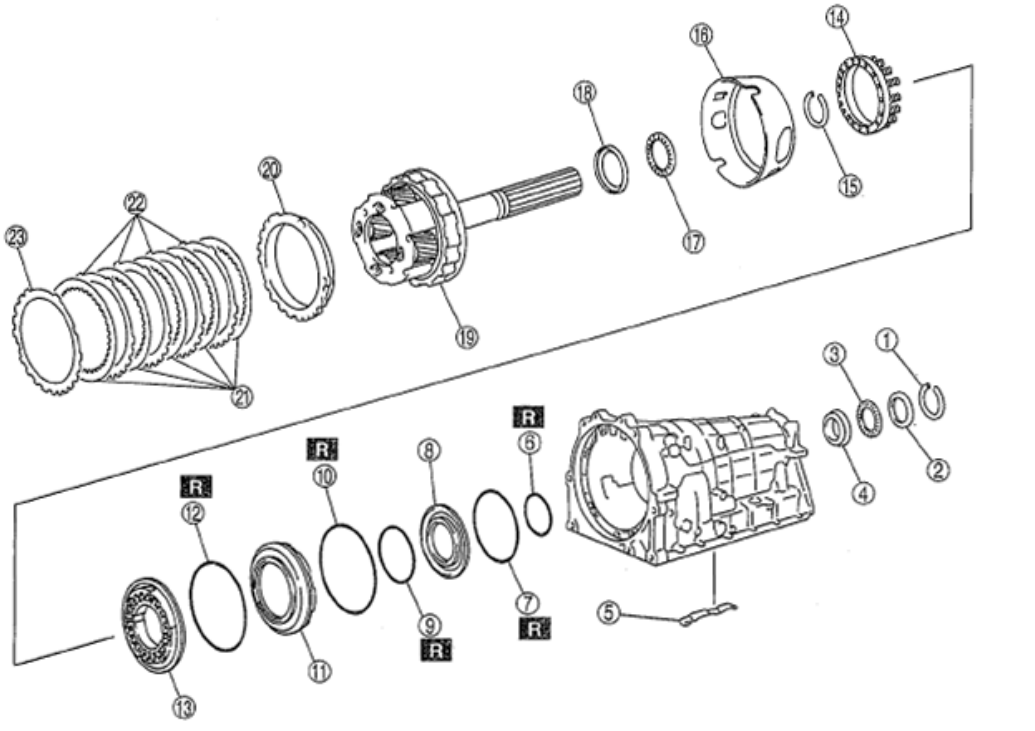
Fig. 3: Disassembled View Of Automatic Transmission Components (3 Of 5)



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

Fig. 4: Disassembled View Of Automatic Transmission Components (4 Of 5)



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

Fig. 5: Disassembled View Of Automatic Transmission Components (5 Of 5)

Disassembly procedure

1. Remove the drain plug and gasket.

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

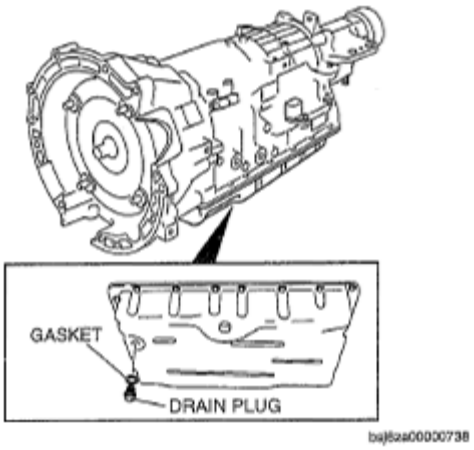


Fig. 6: Identifying Drain Plug And Gasket

2. Remove the torque converter.

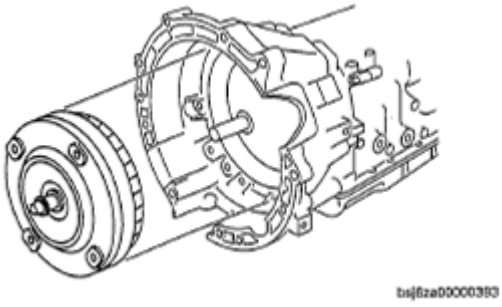


Fig. 7: Identifying Torque Converter

3. Remove the breather hose and breather pipe.

CAUTION:
- **Do not damage the turbine sensor.**

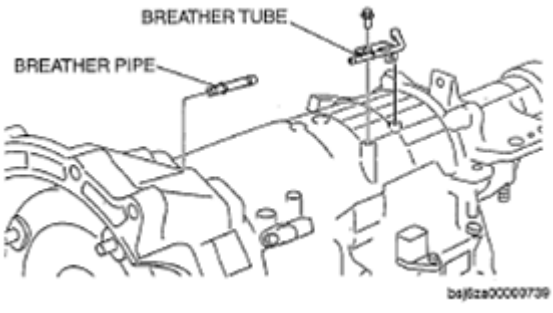


Fig. 8: Identifying Breather Tube And Pipe

4. Remove the turbine sensor.

CAUTION:

- **Do not damage the VSS.**

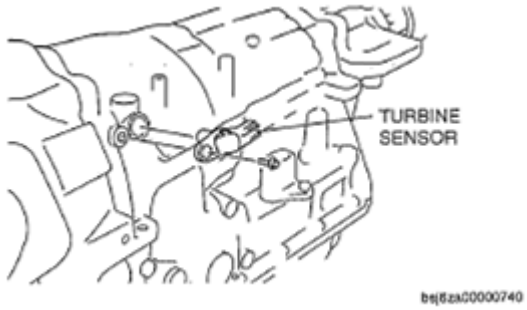


Fig. 9: Identifying Turbine Sensor

5. Remove the VSS.

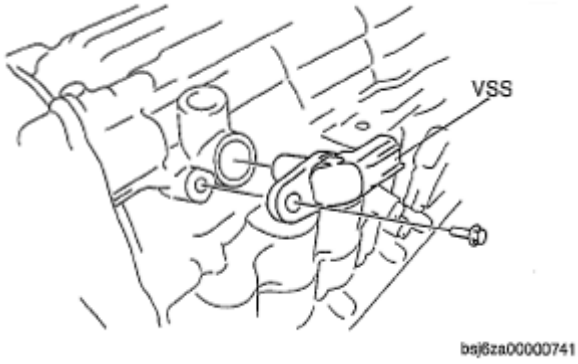


Fig. 10: Identifying VSS

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

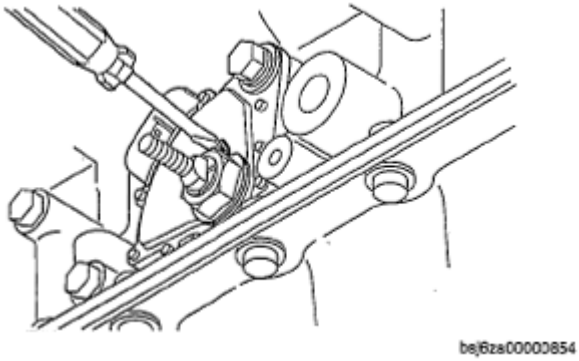


Fig. 11: Lifting Up Lock Washer Using Flathead Screwdriver

7. Remove the nut and lock washer.

CAUTION:
- **Do not damage the TR switch.**

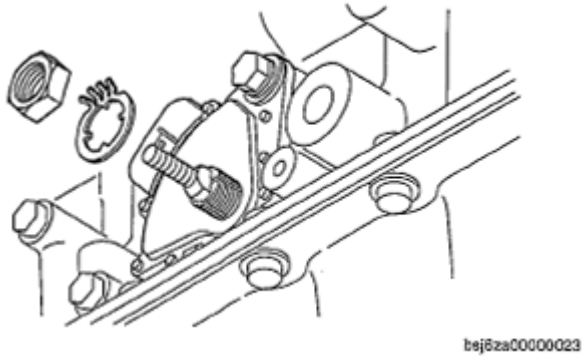


Fig. 12: Identifying Nut And Lock Washer

8. Remove the TR switch.

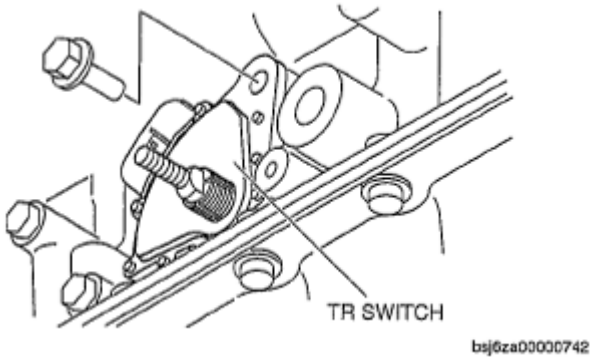


Fig. 13: Identifying TR Switch

9. Remove the bolts as shown in the figure.

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

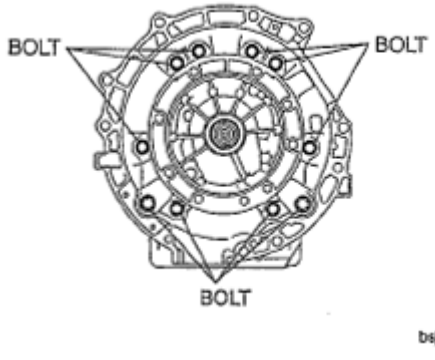


Fig. 14: Identifying Bolts

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.**

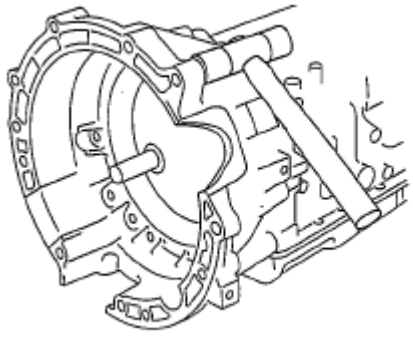


Fig. 15: Tapping Converter Housing Using Plastic Hammer

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

CAUTION:
- **Do not damage the extension housing.**

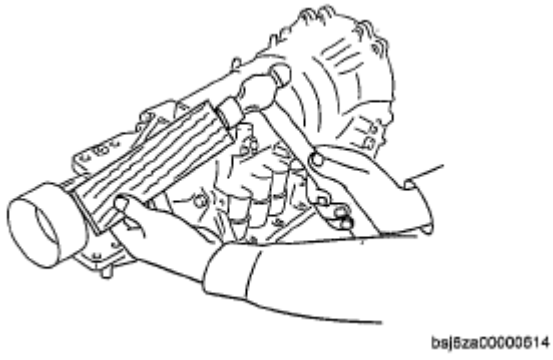


Fig. 16: Tapping Extension Dust Deflector Using Plastic Hammer

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

CAUTION:
- **Do not damage the extension housing.**

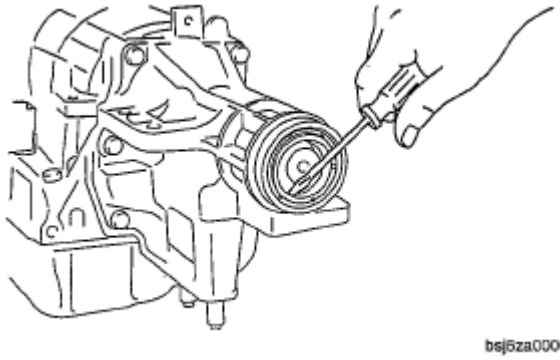


Fig. 17: Removing Extension Housing Shroud Using Flathead Screwdriver

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

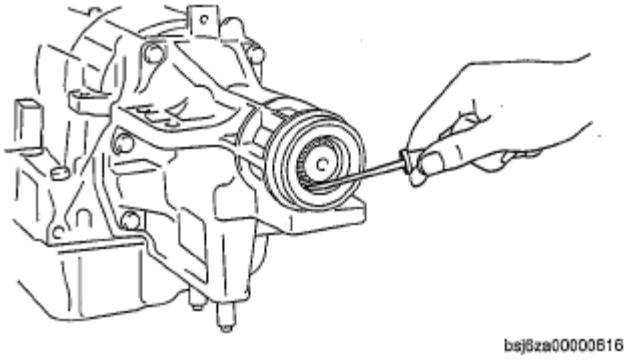


Fig. 18: Removing Oil Seal Using Flathead Screwdriver

14. Remove the bolts as shown in the figure.

CAUTION:

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

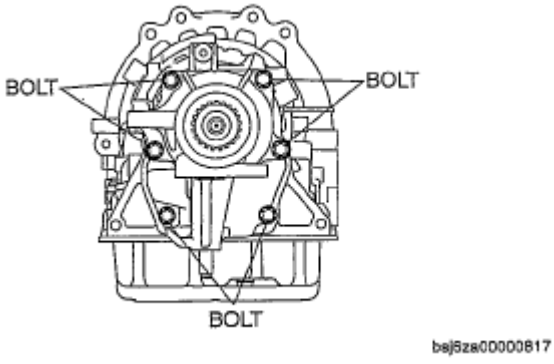


Fig. 19: Identifying Bolts

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

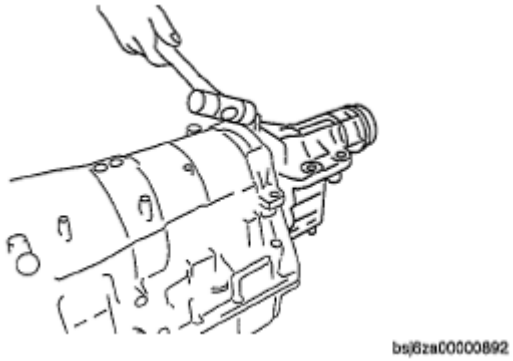


Fig. 20: Tapping Extension Housing Using Plastic Hammer

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.**

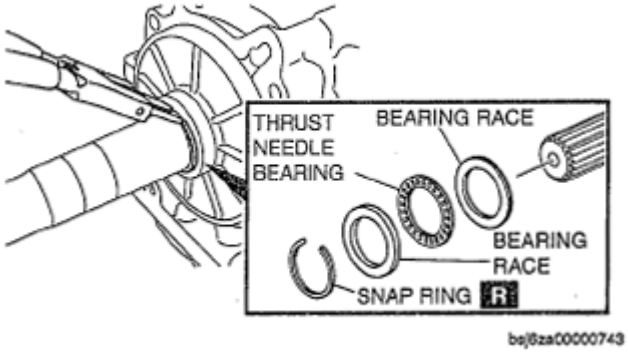


Fig. 21: Removing Snap Ring Using Snap Ring Pliers

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.**

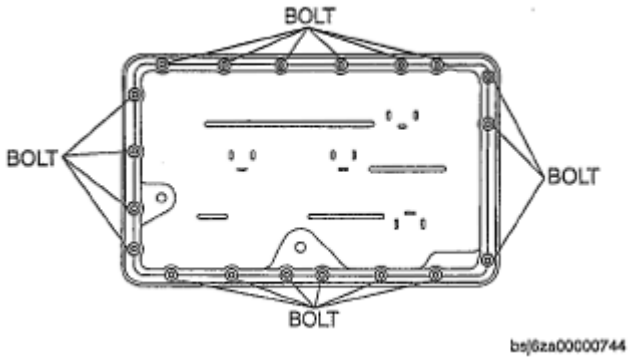


Fig. 22: Identifying Bolts

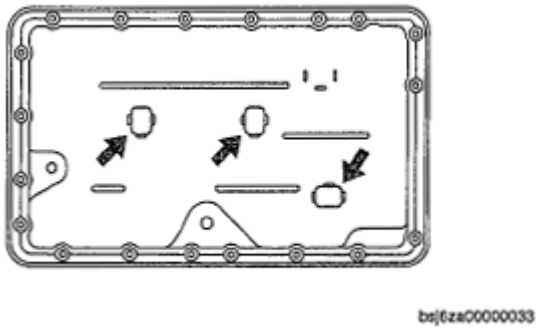


Fig. 23: Locating Magnet In Oil Pan

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

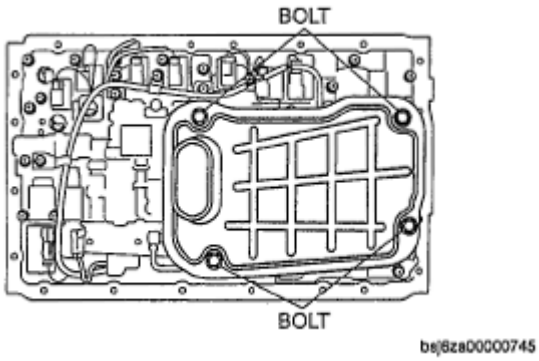


Fig. 24: Identifying Oil Strainer Bolts

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

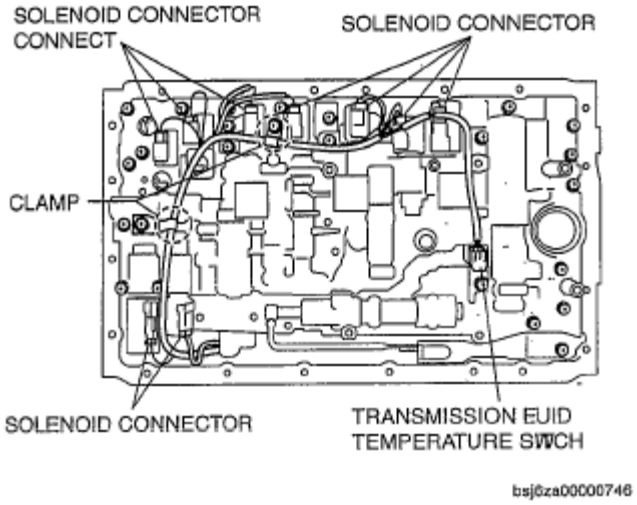


Fig. 25: Identifying Solenoid Connectors

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.

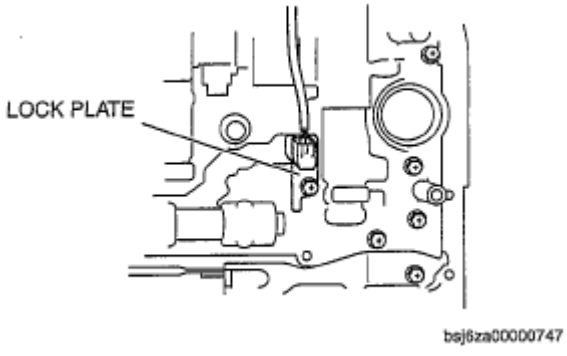


Fig. 26: Identifying Lock Plate

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

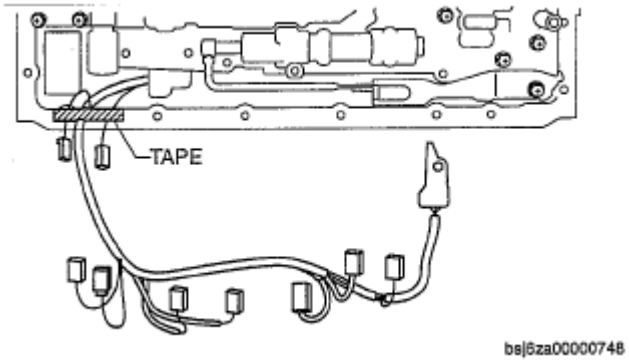


Fig. 27: Identifying Tape

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

CAUTION:
- **Do not drop the control valve body component.**

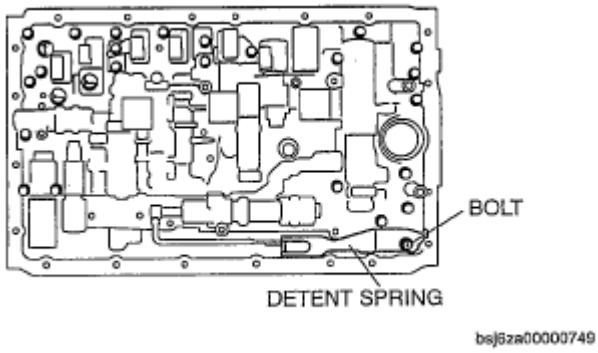


Fig. 28: Identifying Detent Spring And Bolt

27. Remove the bolts from transmission case.

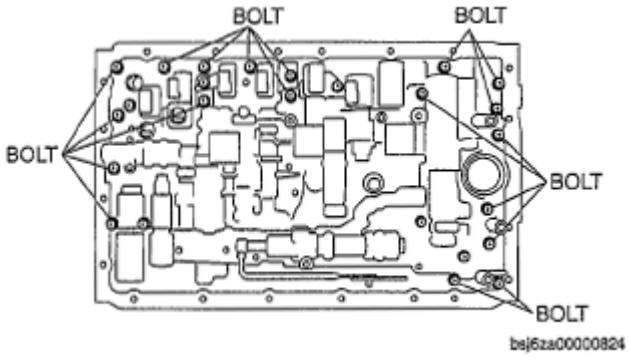


Fig. 29: Identifying Bolts

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

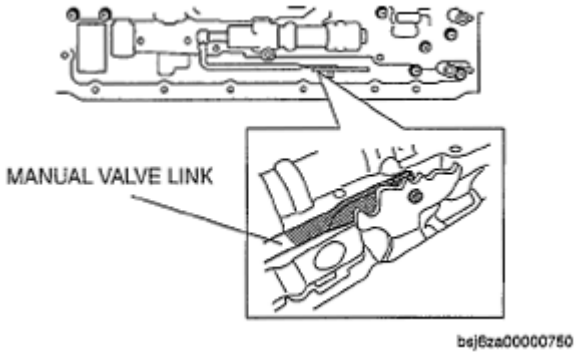


Fig. 30: Identifying Manual Valve Link

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

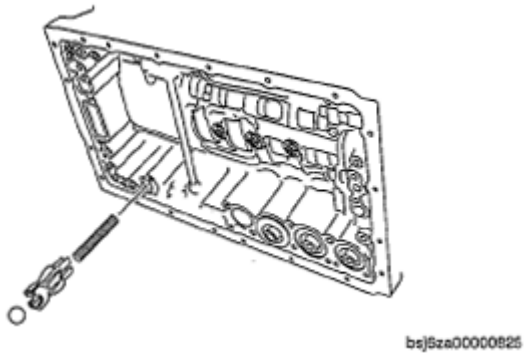


Fig. 31: Identifying Check Valve Subcomponent And Compression Spring

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.**

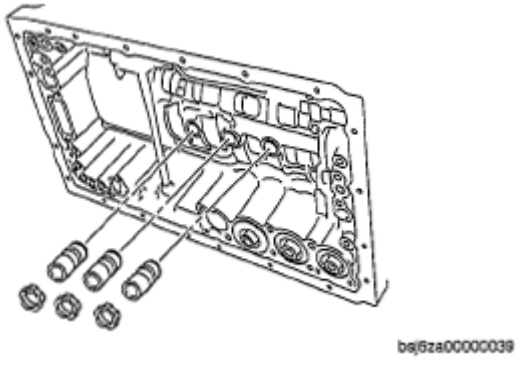


Fig. 32: Identifying Transmission Case And Brake Drum Gasket

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.

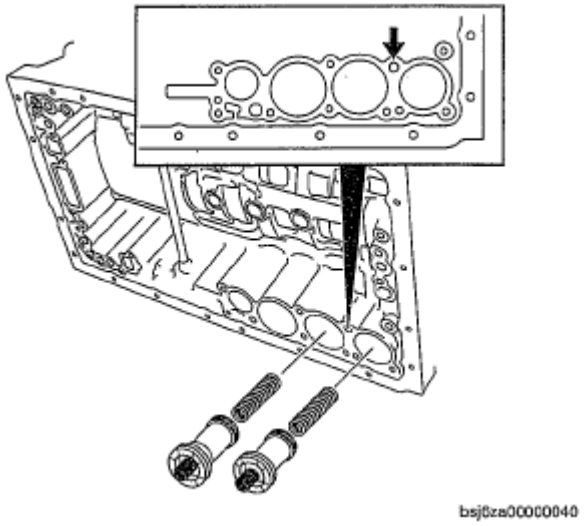


Fig. 33: Locating Oil Passage

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.**

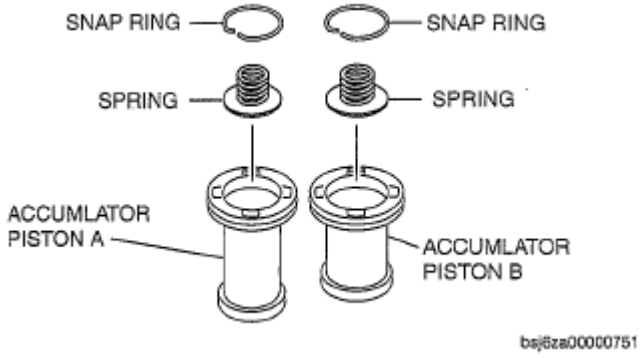


Fig. 34: Identifying Snap Ring On Accumulator Pistons A And B

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.**

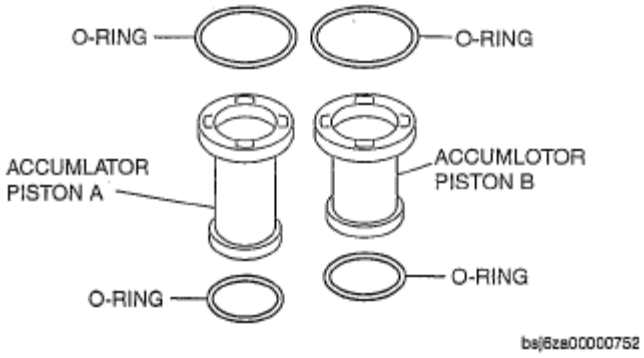


Fig. 35: Identifying O-Ring On Accumulator Piston A And B

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.

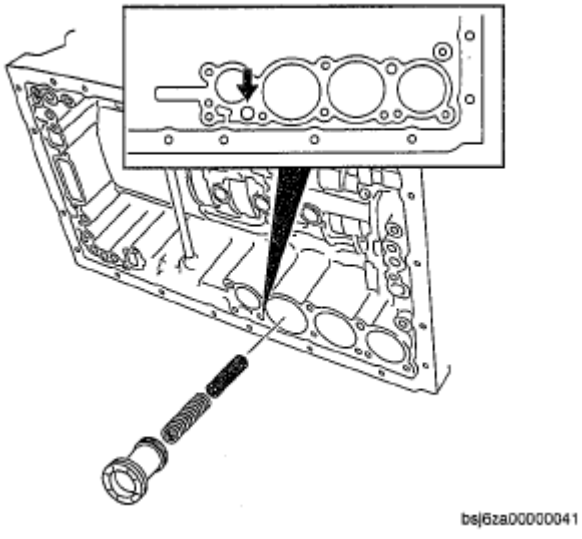


Fig. 36: Locating Oil Passage

38. Remove the bracket.

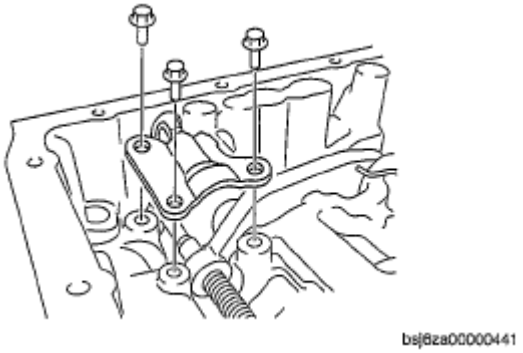


Fig. 37: Identifying Bracket Bolts

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

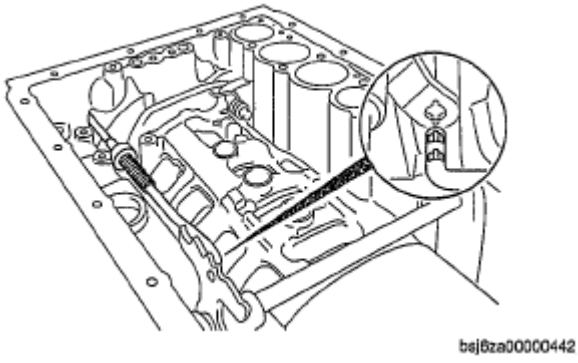


Fig. 38: Identifying Parking Rod On Manual Valve Lever

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.

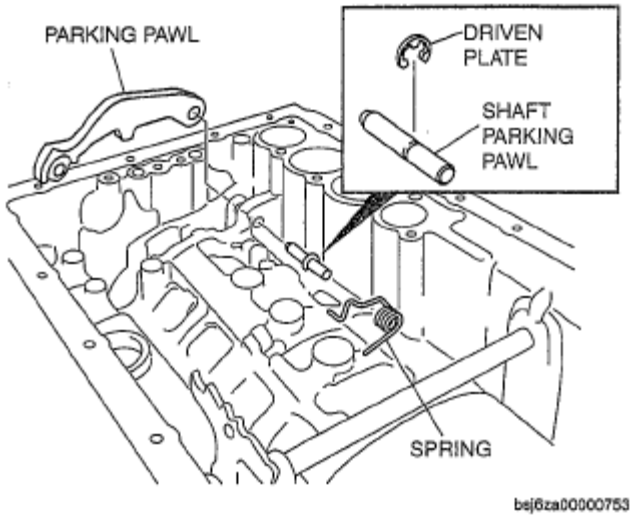


Fig. 39: Identifying Shaft Parking Pawl And Spring

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

CAUTION:
- **Do not damage the manual valve component.**

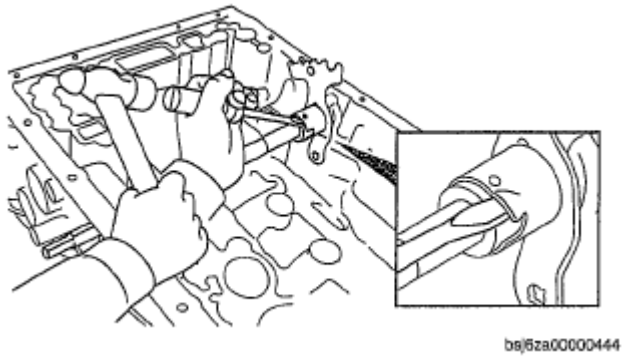


Fig. 40: Removing Manual Shaft Washer Using Flathead Screwdriver And Hammer

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

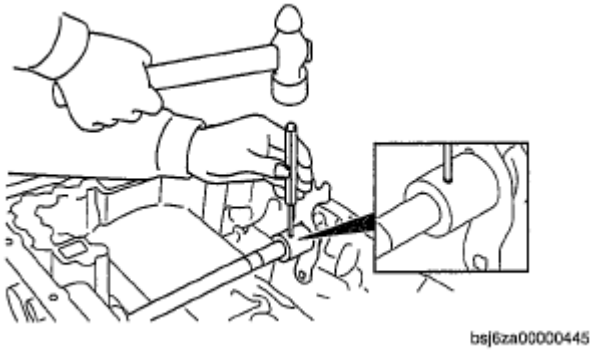


Fig. 41: Removing Pin Using Hammer And Pin Punch

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

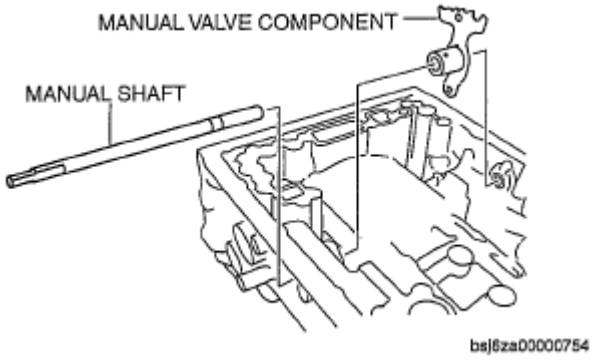


Fig. 42: Identifying Manual Shaft And Manual Valve Component

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

CAUTION:
- **Do not damage the transmission case component.**

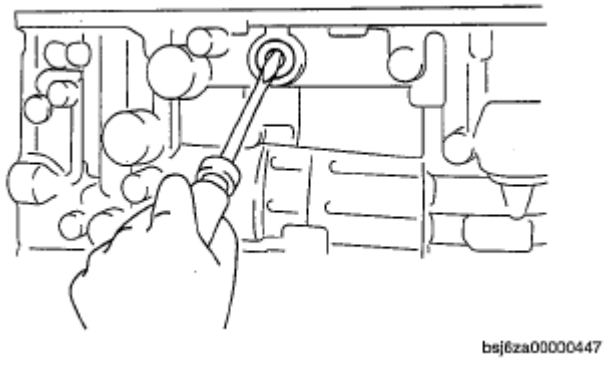


Fig. 43: Removing Oil Seal Using Flathead Screwdriver

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

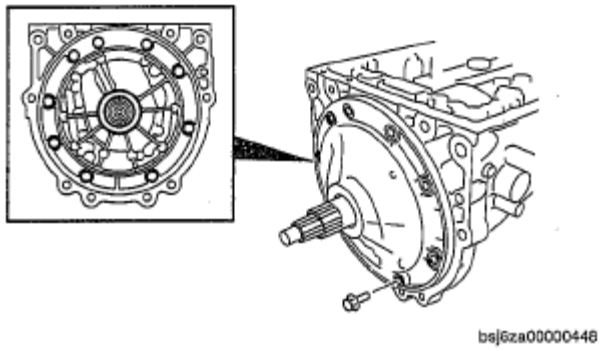


Fig. 44: Identifying Bolts On Oil Pump

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

CAUTION:
- **Do not damage the oil pump.**

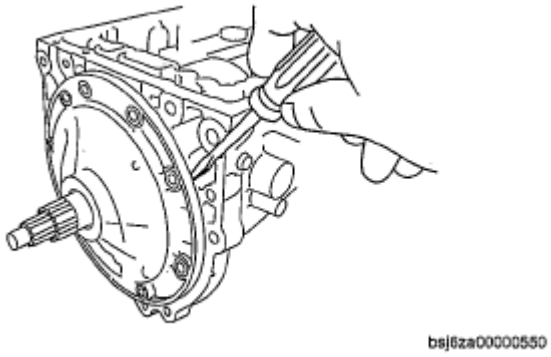


Fig. 45: Removing Oil Pump Using Flathead Screwdriver

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

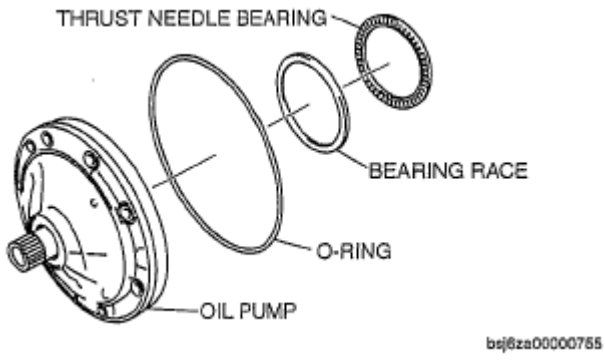


Fig. 46: Identifying O-Ring, Thrust Needle Bearing And Bearing Race On Oil Pump

51. Remove the clutch drum component.

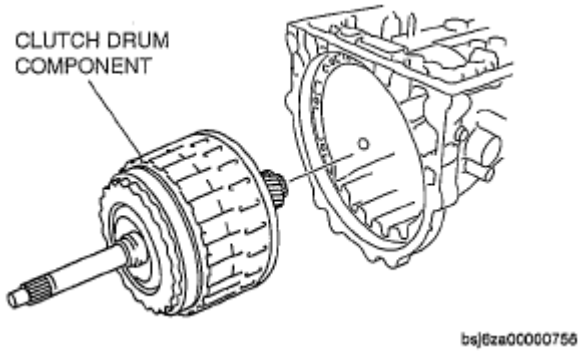


Fig. 47: Identifying Clutch Drum Component

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

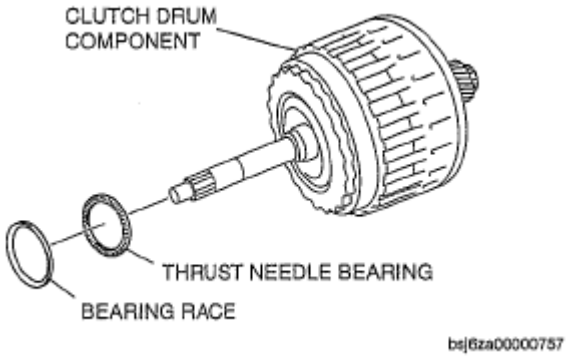


Fig. 48: Identifying Thrust Needle Bearing And Bearing Race

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

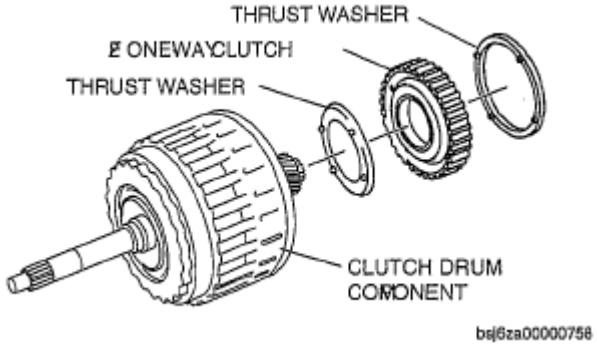


Fig. 49: Identifying Thrust Washer And F2 One-Way Clutch Component On Clutch Drum Component

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

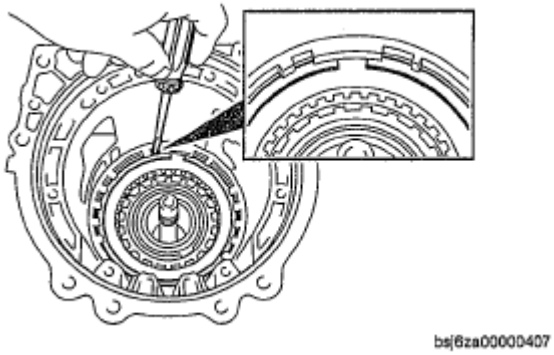


Fig. 50: Removing Snap Ring From Transmission Case Using Flathead Screwdriver

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

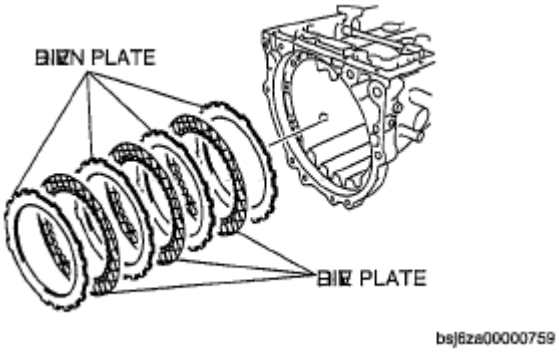


Fig. 51: Identifying Drive And Driven Plates

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.**

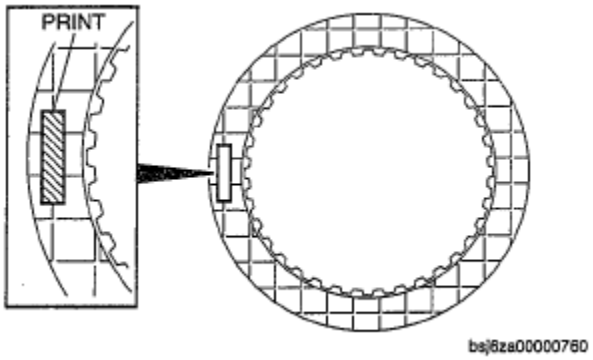


Fig. 52: Identifying Print Mark Location

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

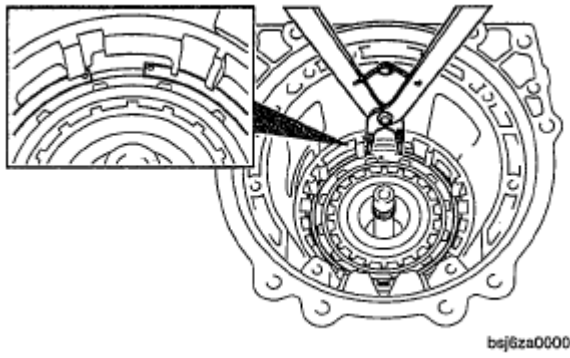


Fig. 53: Removing Snap Ring From Transmission Case Using Snap Ring Pliers

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

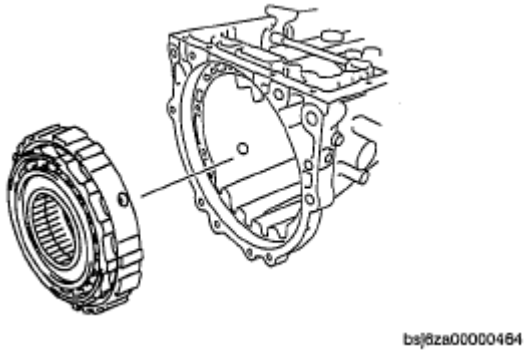


Fig. 54: Identifying B2 Brake Piston Component

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.

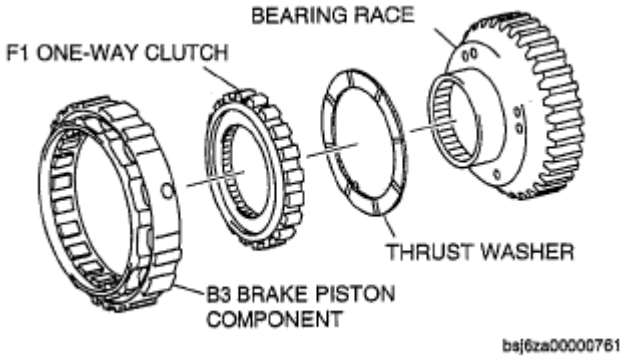


Fig. 55: Identifying F1 One-Way Clutch, B3 Brake Piston Component, Bearing Race And Thrust Washer

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

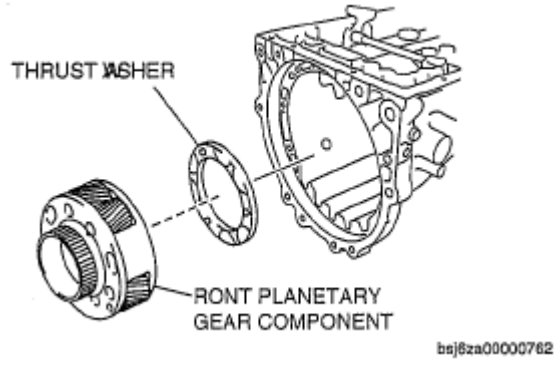


Fig. 56: Identifying Planetary Gear Component And Thrust Washer

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.

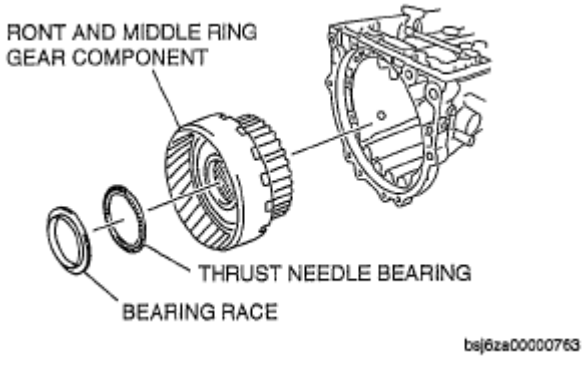


Fig. 57: Identifying Front And Middle Ring Gear Component, Thrust Needle Bearing And Bearing Race

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

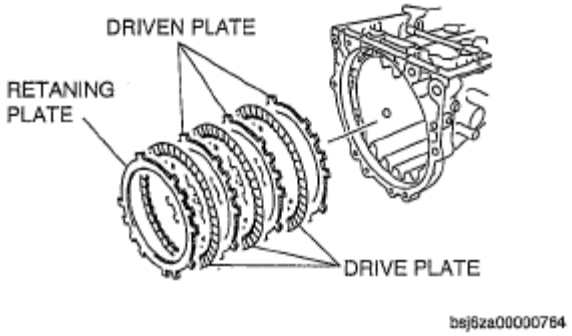


Fig. 58: Identifying Retaining Plates, Drive And Driven Plates

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.**

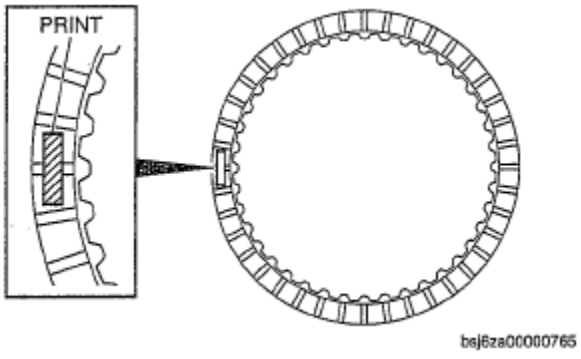


Fig. 59: Identifying Print Mark Location

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

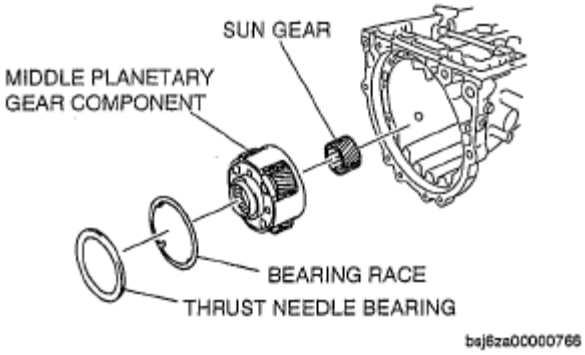


Fig. 60: Identifying Middle Planetary Gear Component And Sun Gear

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

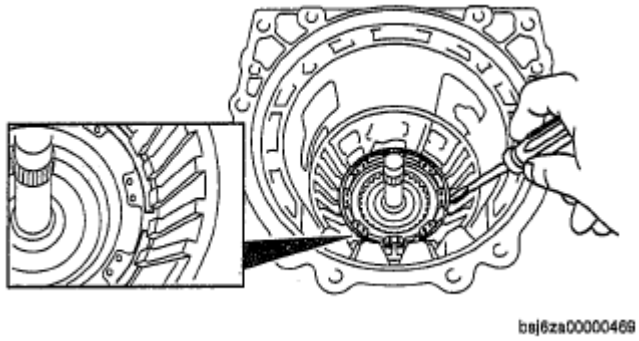


Fig. 61: Removing Snap Ring Using Flathead Screwdriver

69. Remove the piston return spring and B1 brake piston component.

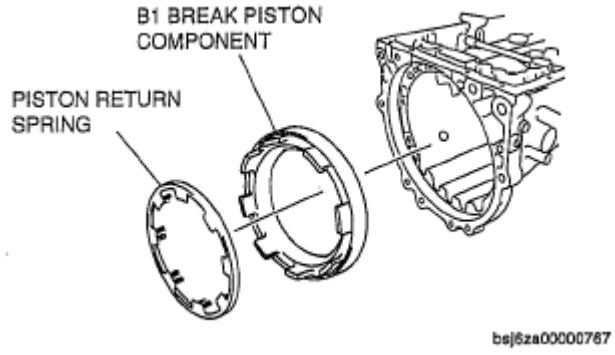


Fig. 62: Identifying Piston Return Spring And B1 Brake Piston Component

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

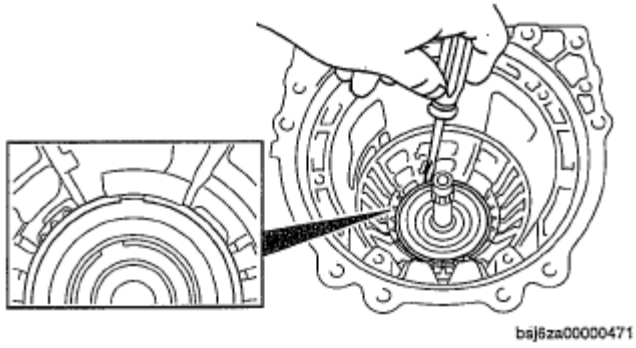


Fig. 63: Removing Snap Ring Using Flathead Screwdriver

71. Remove the driven plate.

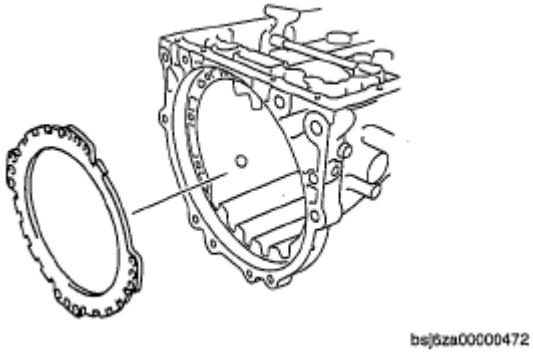


Fig. 64: Identifying Driven Plate

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

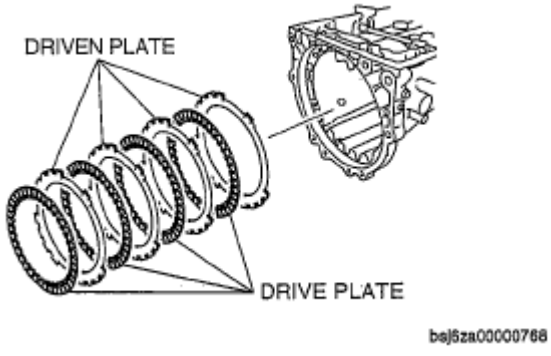


Fig. 65: Identifying Drive And Driven Plates

73. Remove the piston return spring.

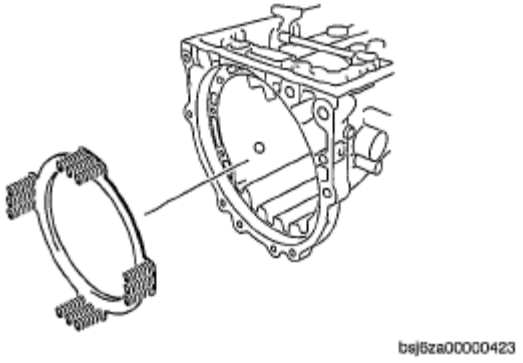


Fig. 66: Identifying Piston Return Spring

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.**

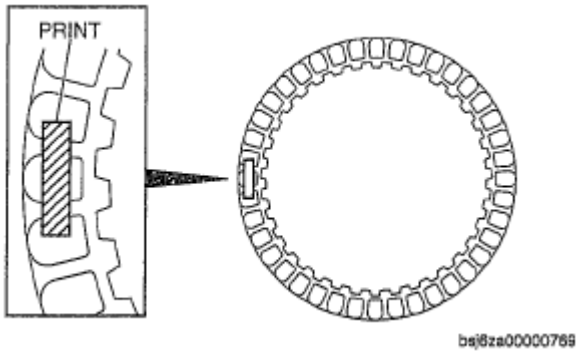


Fig. 67: Identifying Print Mark Location

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}

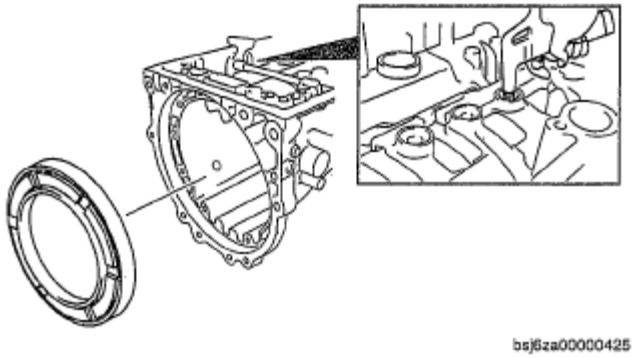


Fig. 68: Identifying Oil Passage Location

76. Remove the stopper spring from the transmission case.

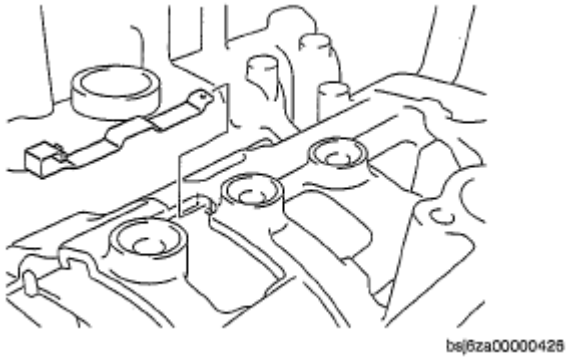


Fig. 69: Identifying Stopper Spring On Transmission Case

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

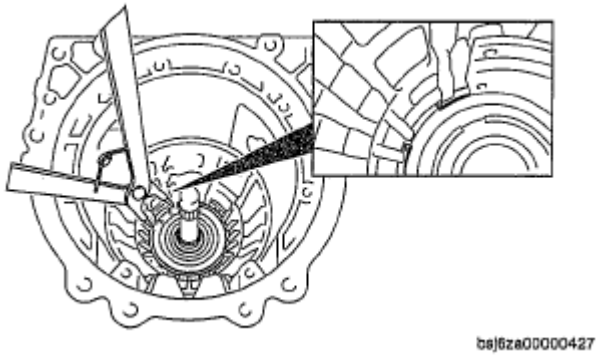


Fig. 70: Removing Snap Ring From Transmission Case Using Snap Ring Pliers

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

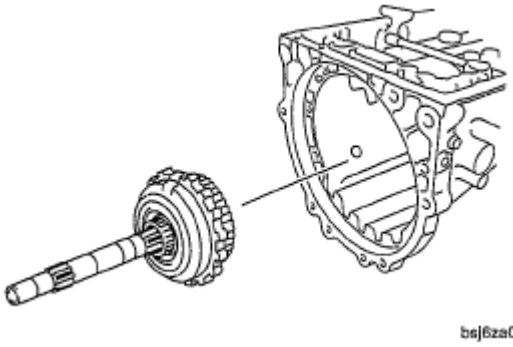


Fig. 71: Identifying Intermediate Shaft Components

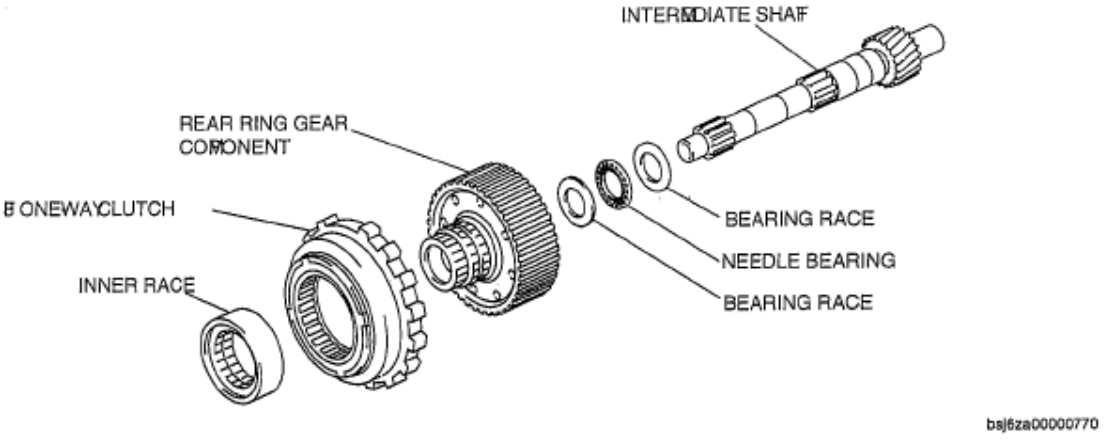


Fig. 72: Disassembled View Of Transmission Case Components

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

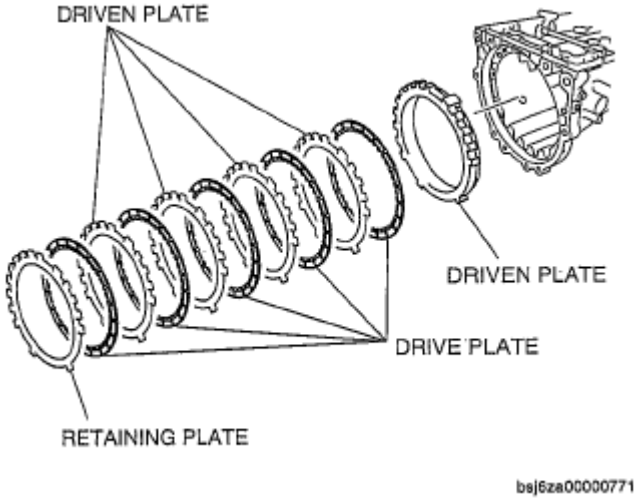


Fig. 73: Identifying Retaining Plates, Drive And Driven Plates

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.**

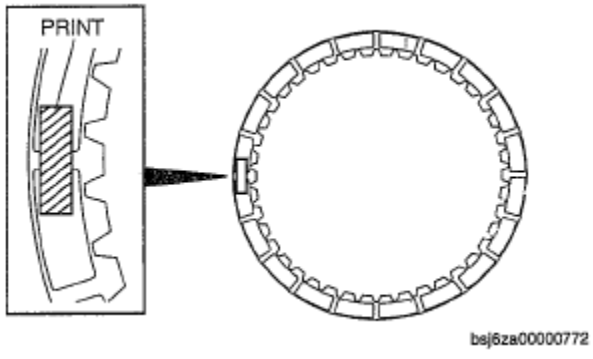


Fig. 74: Identifying Print Mark Location

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

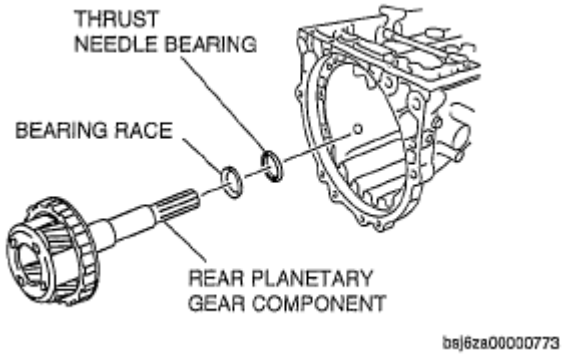


Fig. 75: Identifying Rear Planetary Gear Component, Bearing Race And Thrust Needle Bearing

82. Remove the brake tube.

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

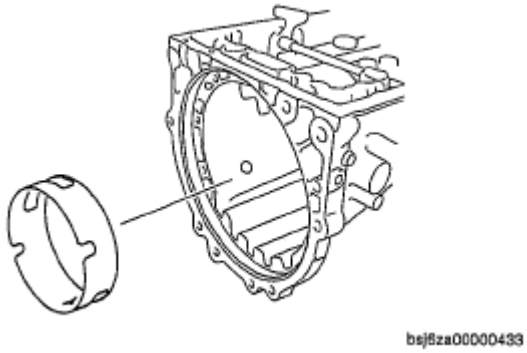


Fig. 76: Identifying Brake Tube

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

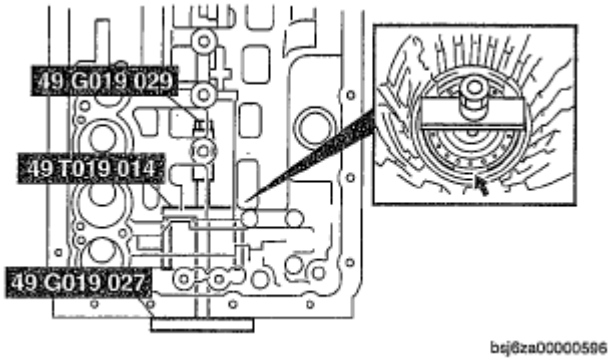


Fig. 77: Identifying SSTs For Compressing Piston Return Spring

84. Remove the piston return spring.

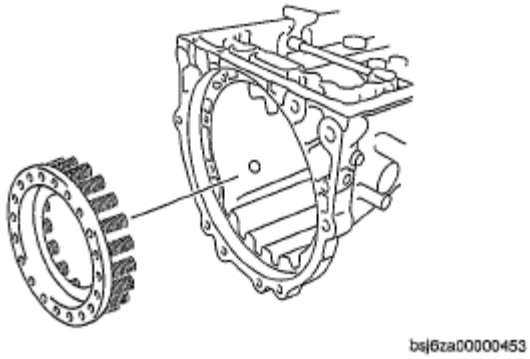


Fig. 78: Identifying Piston Return Spring

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}

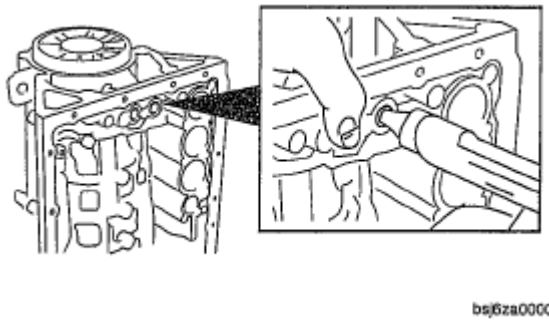


Fig. 79: Blowing Compressed Air Into Oil Passage

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

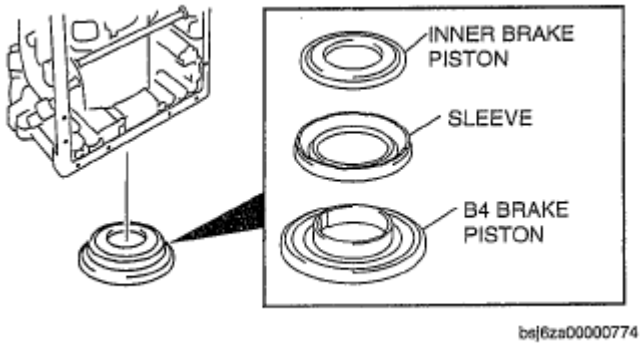


Fig. 80: Identifying Inner Brake Piston And Sleeve And B4 Brake Piston

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

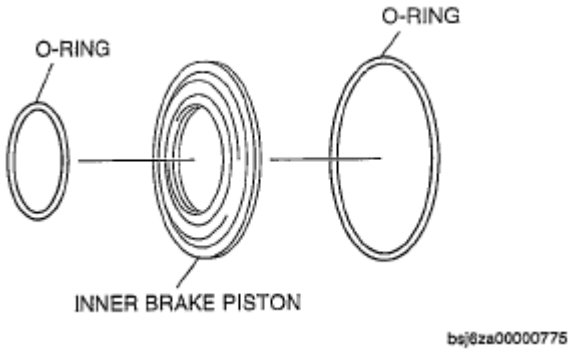


Fig. 81: Identifying O-Ring On Inner Brake Piston

88. Remove the O-ring from sleeve.

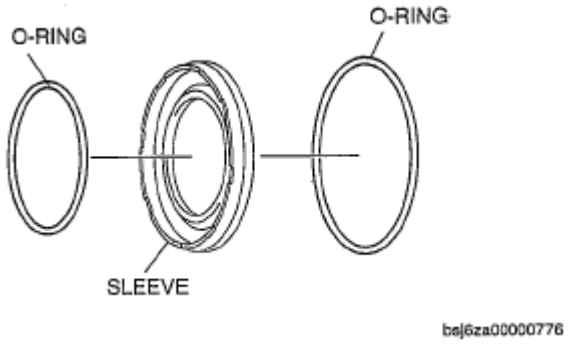


Fig. 82: Identifying O-Ring On Sleeve

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

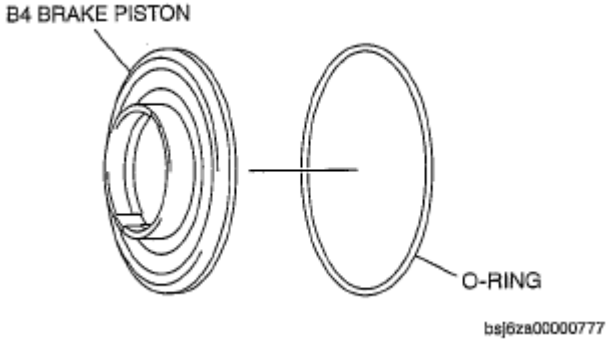
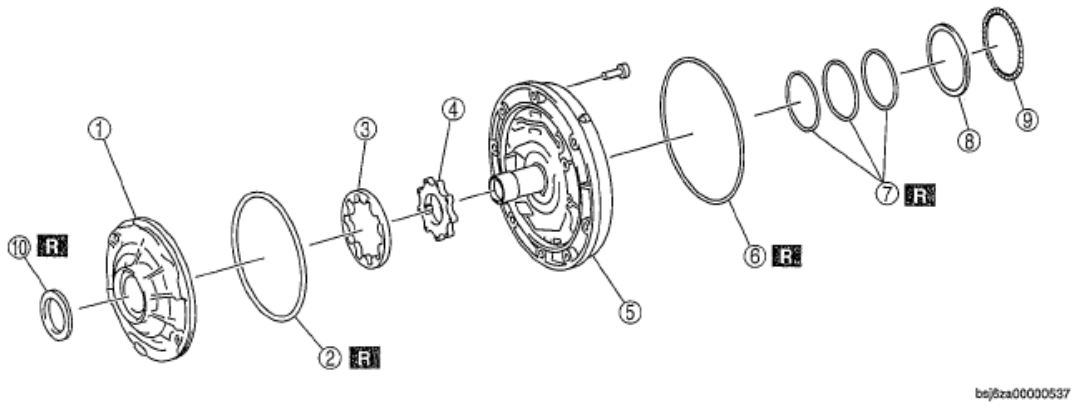


Fig. 83: Identifying O-Ring On B4 Brake Piston

OIL PUMP DISASSEMBLY

Components



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

Fig. 84: Disassembled View Of Oil Pump Components

Disassembly

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

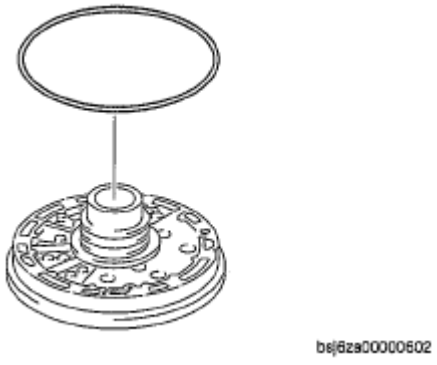


Fig. 85: Identifying O-Ring On Oil Pump

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

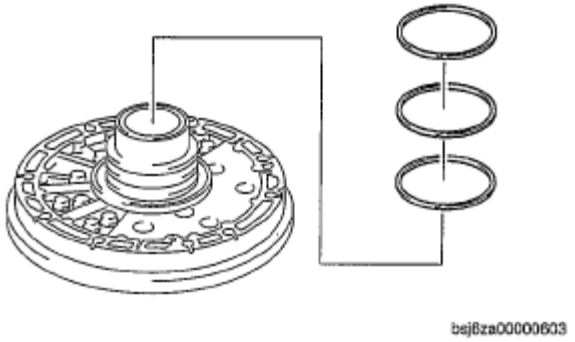


Fig. 86: Identifying Seal Ring

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

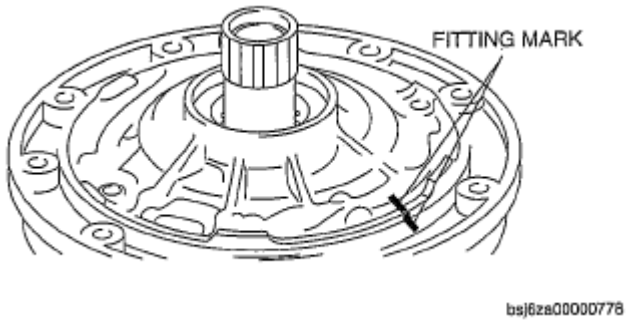


Fig. 87: Identifying Fitting Mark On Pump Housing

4. Remove the screw from the oil pump.

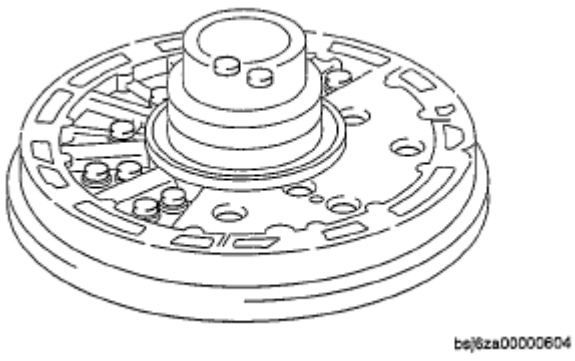


Fig. 88: Identifying Screw On Oil Pump

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

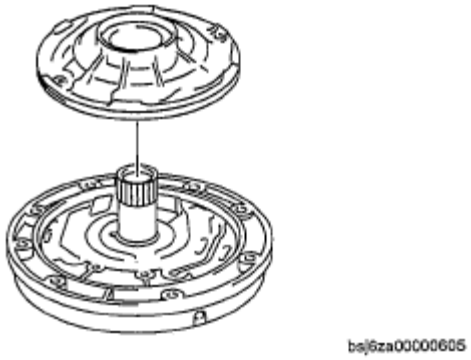


Fig. 89: Identifying Oil Pump Shaft

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

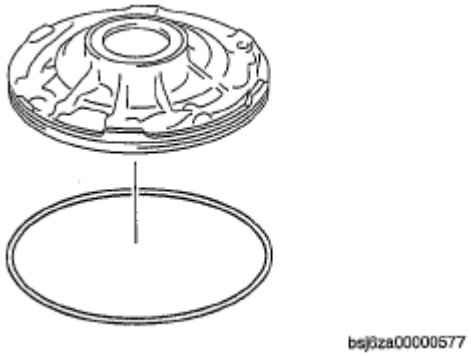


Fig. 90: Identifying O-Ring On Pump Housing

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

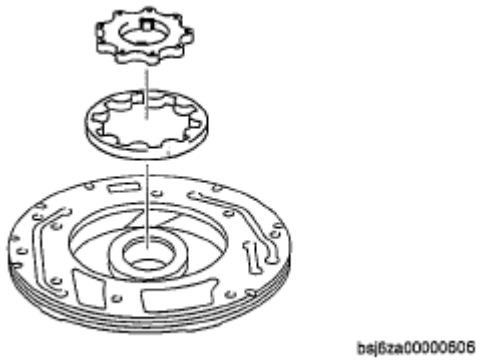


Fig. 91: Identifying Inner And Outer Oil Pump Gear

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

CAUTION:
- **Do not damage the bushing on the pump housing.**

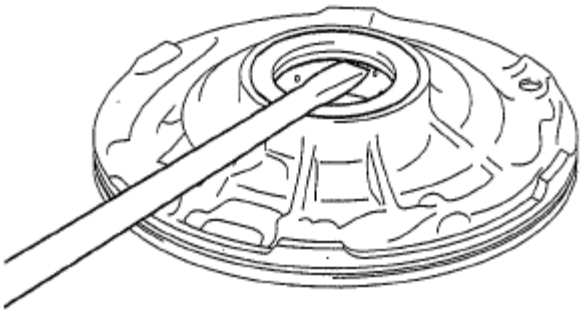


Fig. 92: Removing Oil Seal From Pump Housing Using Flathead Screwdriver

OIL PUMP INSPECTION

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

   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.**

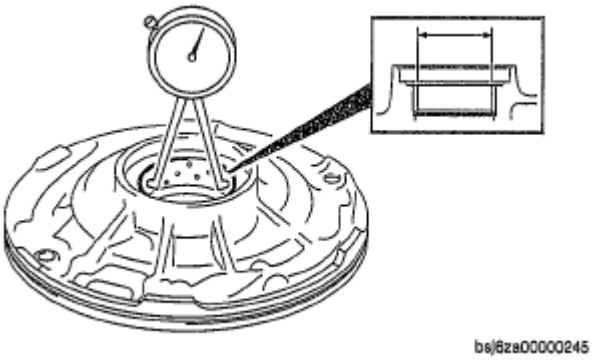


Fig. 93: Measuring Inner Diameter Of Pump Housing Component Bushings Using Dial Gauge

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

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.**

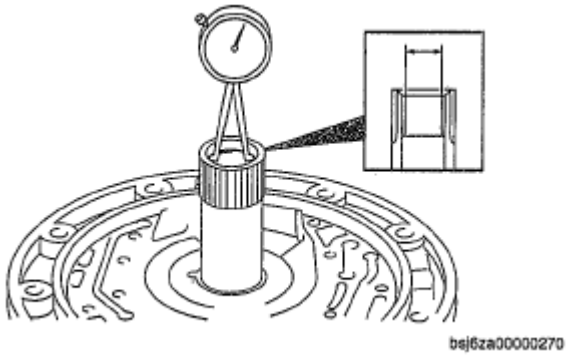


Fig. 94: Measuring Inner Diameter Of Oil Pump Shaft Bushings Using Dial Gauge

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

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.**

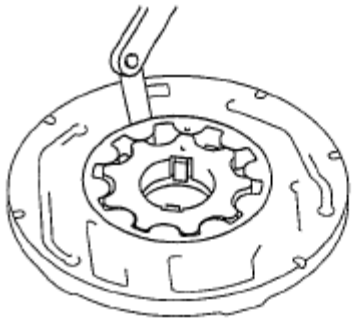


Fig. 95: Measuring Oil Pump Gear Outer Clearance Using Feeler Gauge

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.**

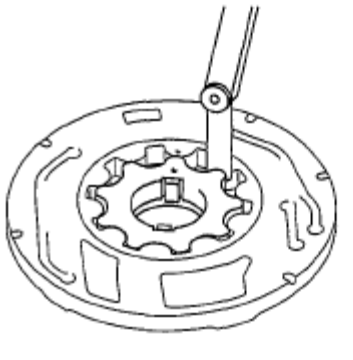


Fig. 96: Measuring Oil Pump Gear Inner Clearance

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}

   Oil pump gear size (mm {in})

OIL PUMP GEAR SIZE REFERENCE

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

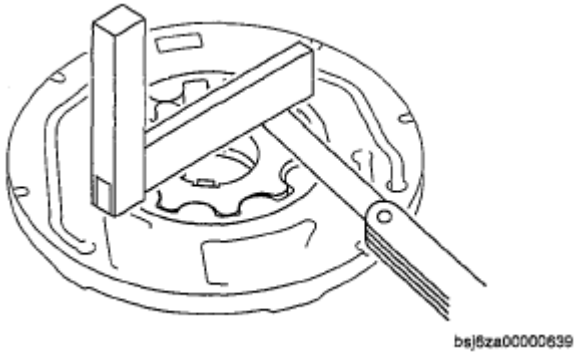


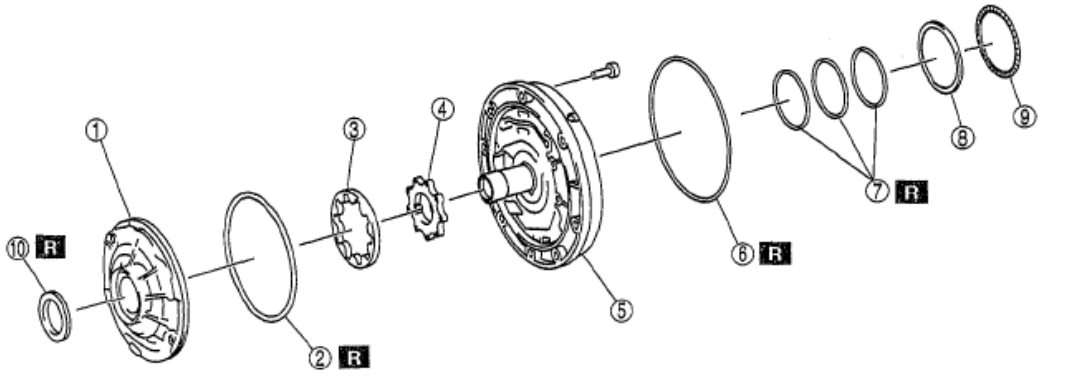
Fig. 97: Measuring Side Clearance Of Both Gears Using Steel Straight Edge And Feeler Gauge

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

Components



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

Fig. 98: Exploded View Of Oil Pump Assembly

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.

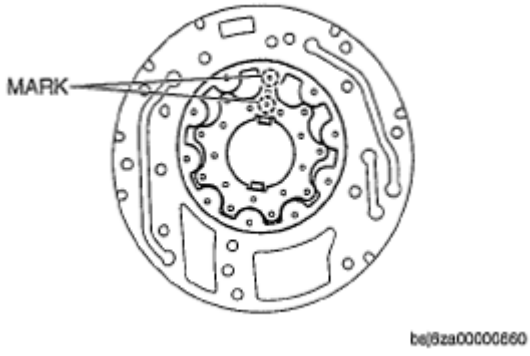


Fig. 99: Identifying Alignment Marks On Oil Pump Gear

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

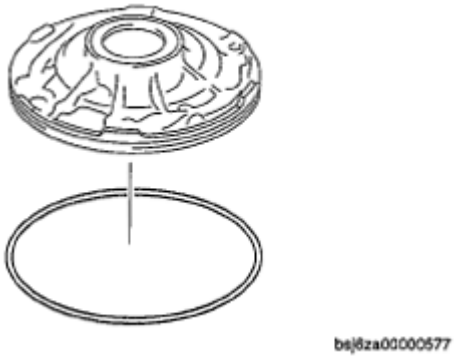


Fig. 100: Identifying O-Ring On Pump Housing

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

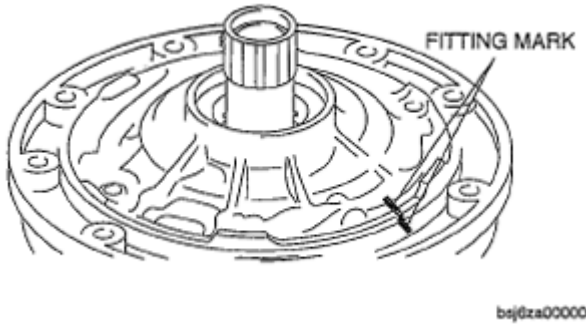


Fig. 101: Identifying Fitting Mark On Pump Housing

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.

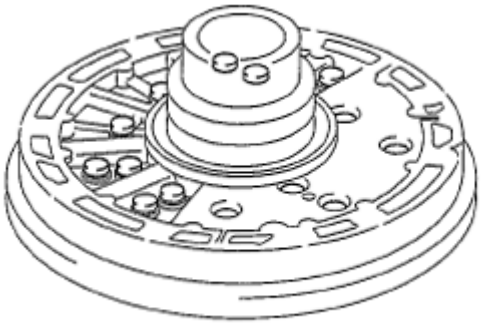


Fig. 102: Identifying Bolts

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

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.**

10. Apply ATF to the new O-rings.

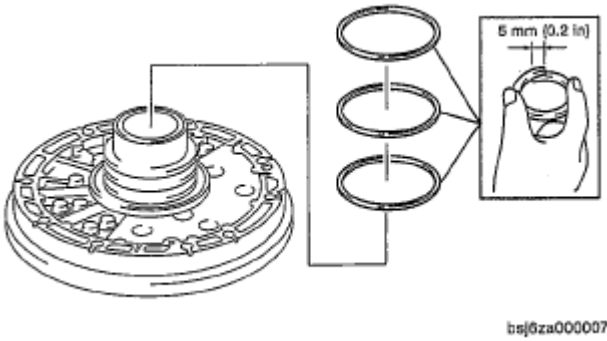


Fig. 103: Identifying Seal Rings

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

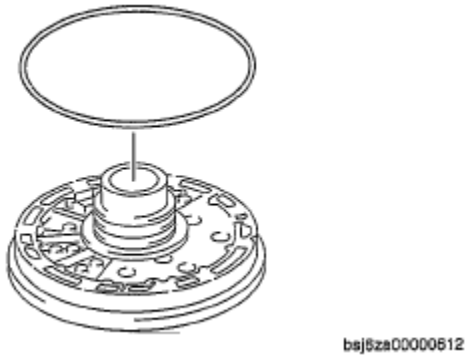


Fig. 104: Identifying O-Rings

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

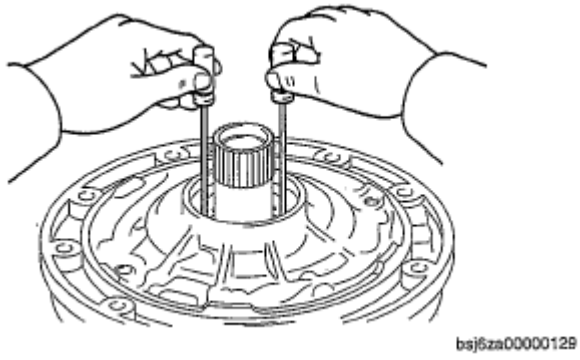


Fig. 105: Turning Drive Gear Using Flathead Screwdrivers

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.

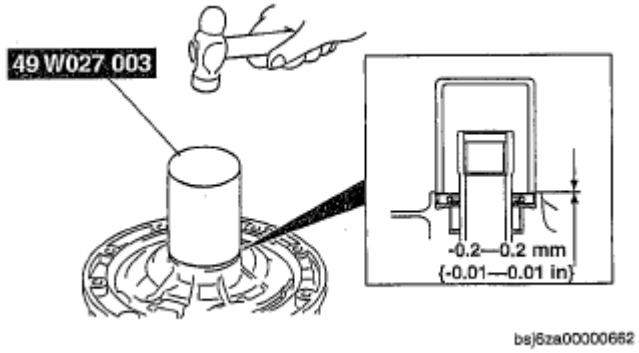
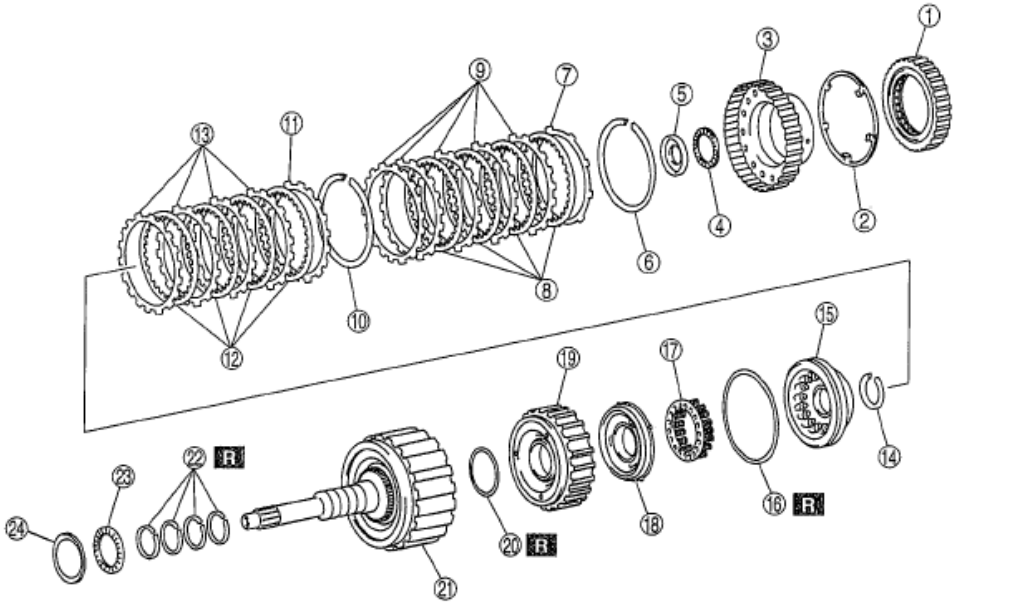


Fig. 106: Installing Oil Seal To Pump Housing Using Hammer

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH COMPONENT DISASSEMBLY

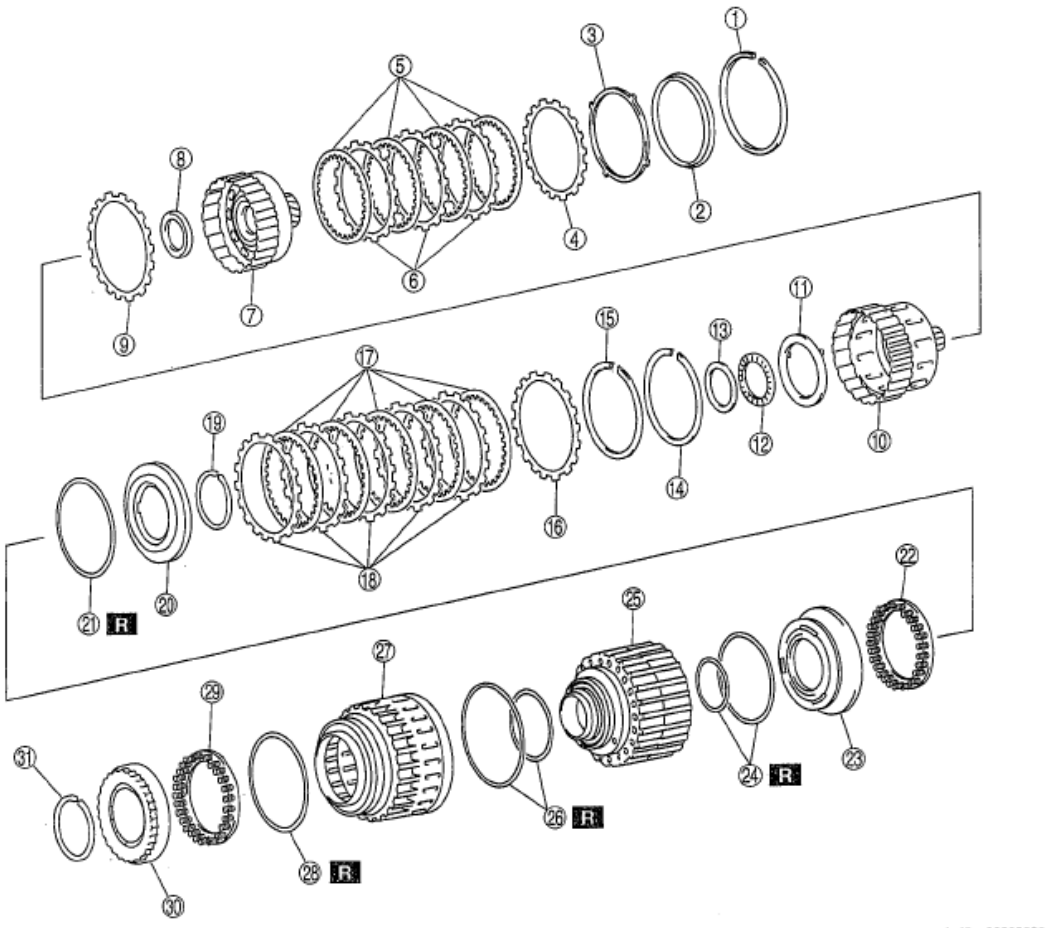
Components



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

Fig. 107: Clutch Drum Component And F4 One-Way Clutch Component Disassembled View (1 Of 2)



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

Fig. 108: Clutch Drum Component And F4 One-Way Clutch Component Disassembled View (2 Of 2)

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.

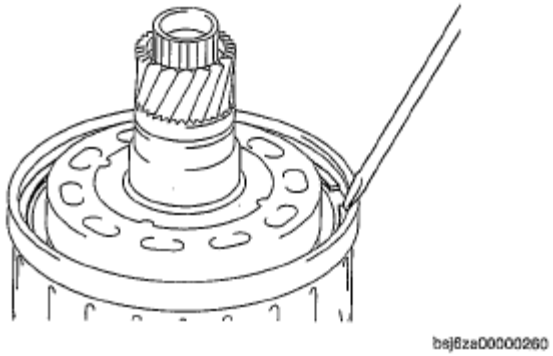


Fig. 109: Removing Snap Ring From C3 Clutch Piston Component Using Screwdriver

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

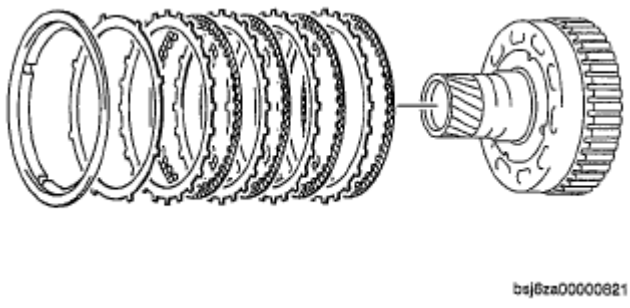


Fig. 110: Identifying Retaining Plate, Drive Plate And Driven Plate

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

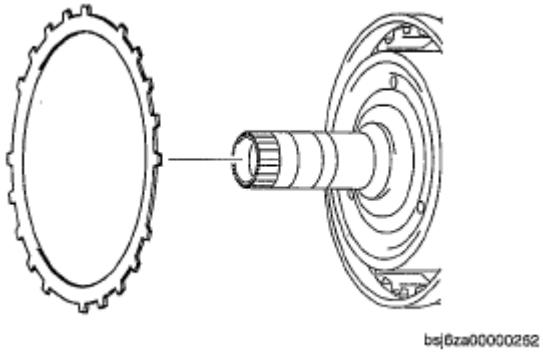


Fig. 111: Identifying Retaining Plate On C3 Clutch Piston Component

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

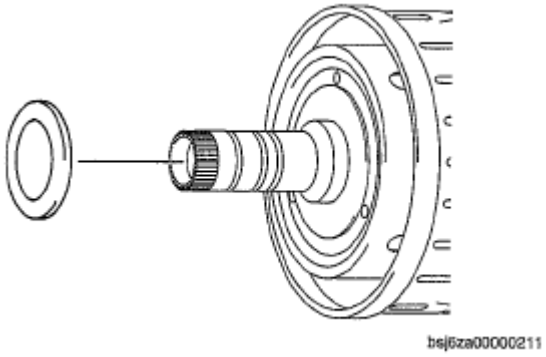


Fig. 112: Identifying Thrust Needle Bearing On Clutch Hub

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

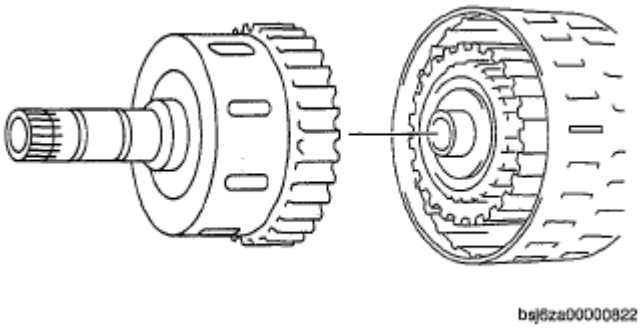


Fig. 113: Identifying Clutch Hub

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

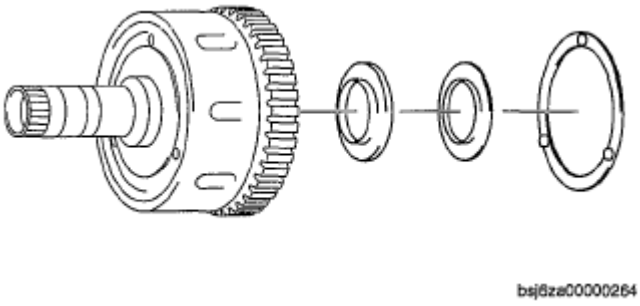


Fig. 114: Identifying Thrust Bearing, Bearing Race And Thrust Washer

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

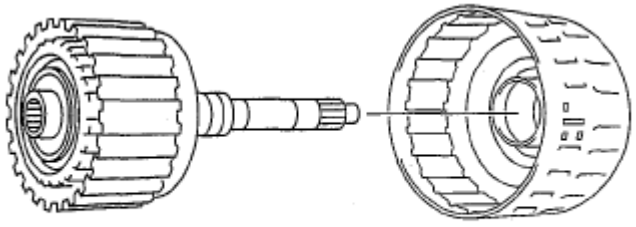


Fig. 115: Identifying Clutch Component

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

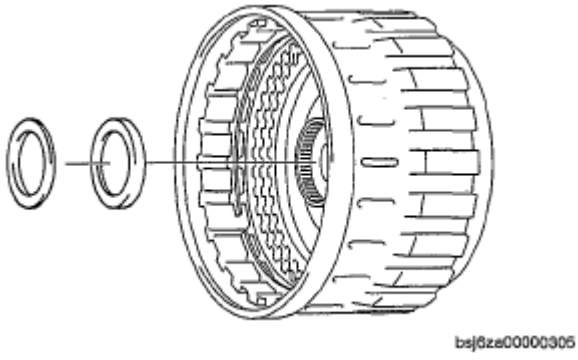


Fig. 116: Identifying Bearing Race

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

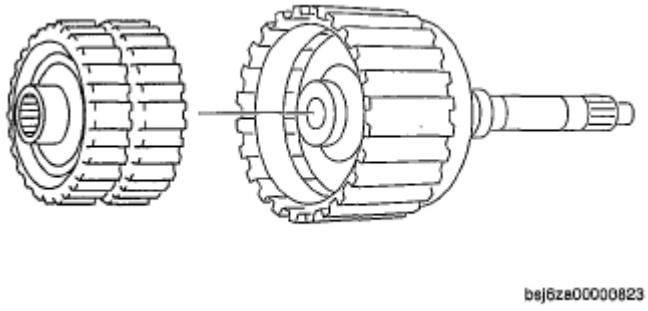


Fig. 117: Identifying Clutch Hub And F4 One-Way Clutch

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

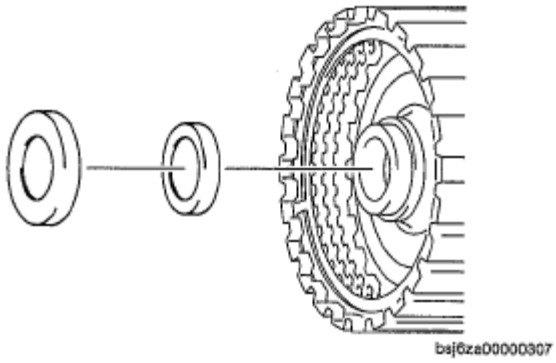


Fig. 118: Identifying Bearing Race

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

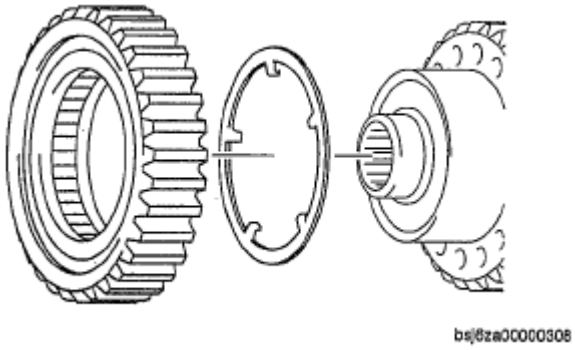


Fig. 119: Identifying F4 One-Way Clutch

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

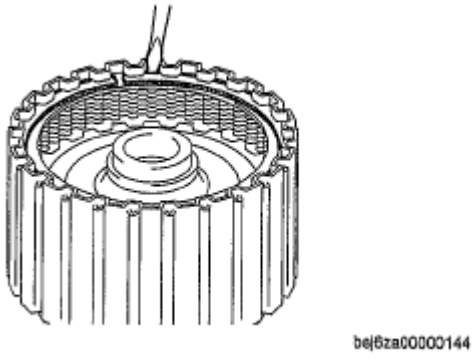


Fig. 120: Removing Snap Ring From Input Shaft Component Using Flathead Screwdriver

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

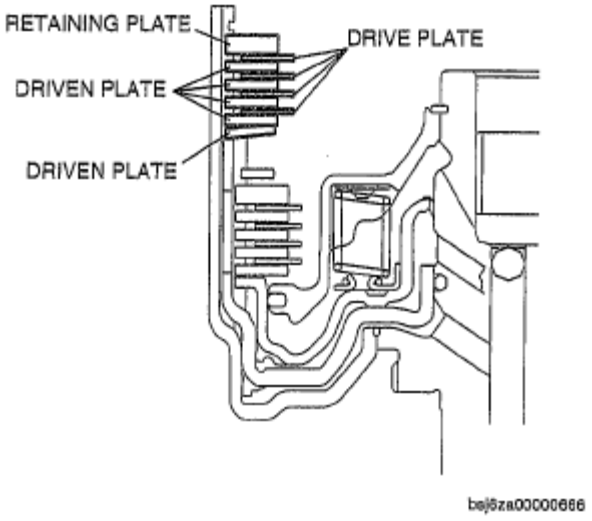


Fig. 121: Identifying Retaining Plate, Drive And Driven Plate

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

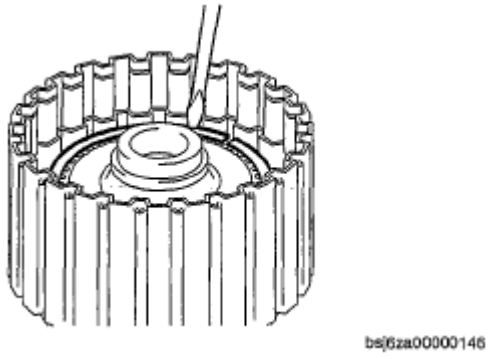


Fig. 122: Removing Snap Ring From Input Shaft Component Using Flathead Screwdriver

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

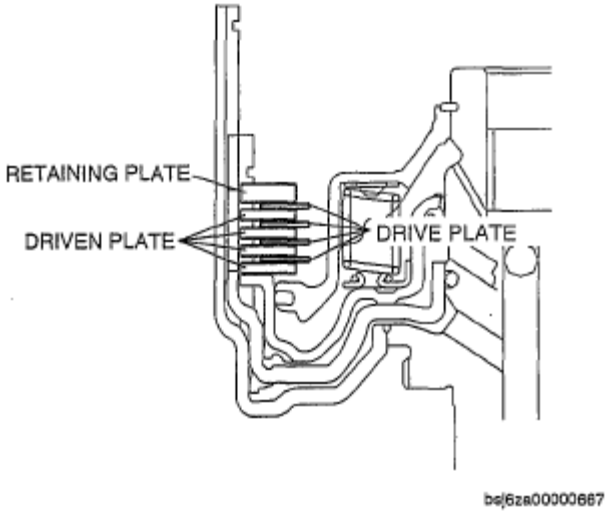


Fig. 123: Identifying Retaining Plate, Drive And Driven Plate

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.

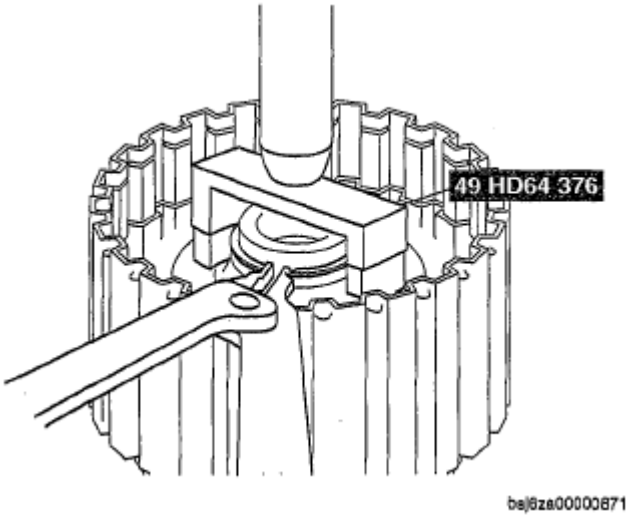


Fig. 124: Removing/Installing Snap Ring Using Snap Ring Pliers

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

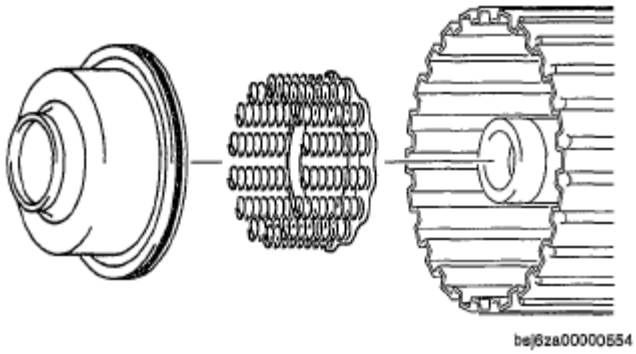


Fig. 125: Identifying C4 Clutch Seal Plate And Piston Return Spring

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)

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

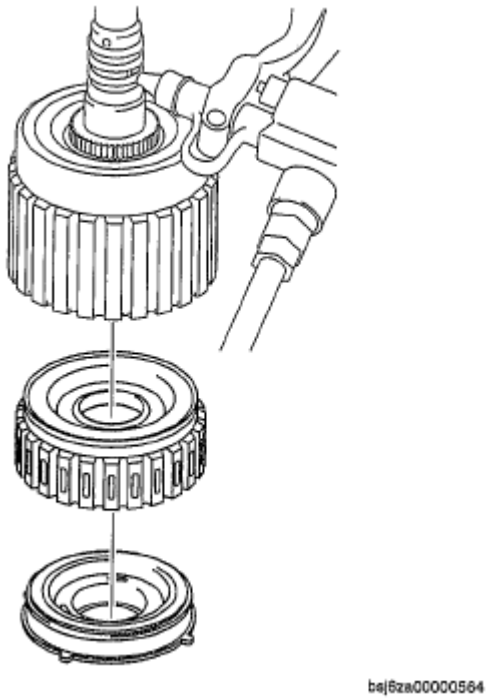


Fig. 126: Applying Compressed Air Into Oil Passage

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

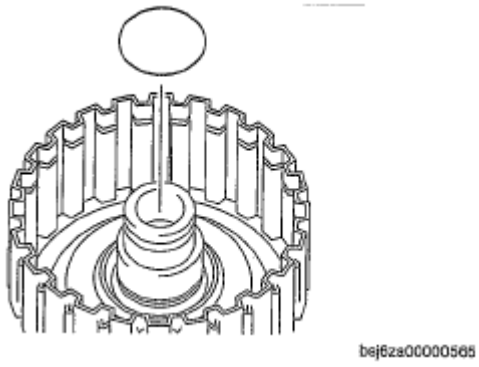


Fig. 127: Identifying O-Ring On Input Shaft Component

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

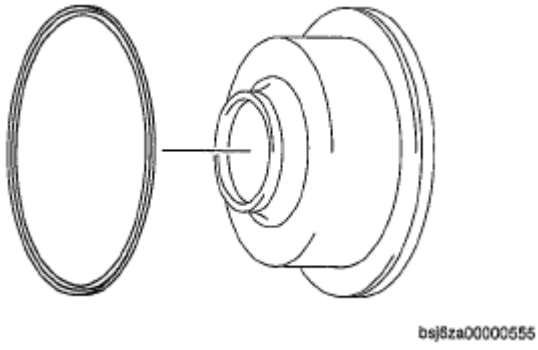


Fig. 128: Identifying D-Ring On C1 Clutch Seal Plate

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

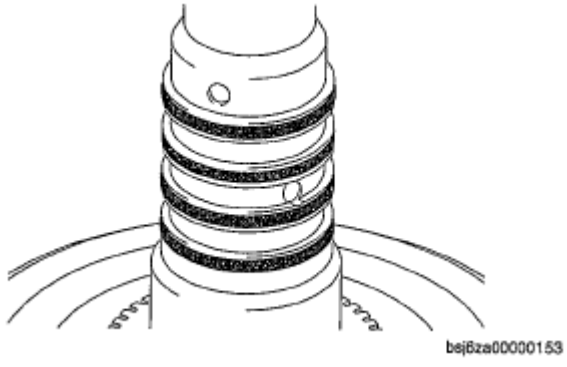


Fig. 129: Identifying Seal Ring On Input Shaft Component

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

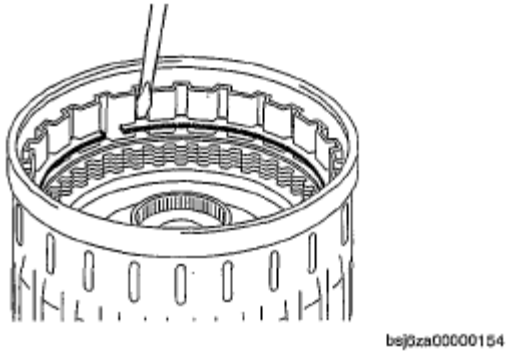


Fig. 130: Removing Snap Ring (C3) From C2, C3 Clutch Drum

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

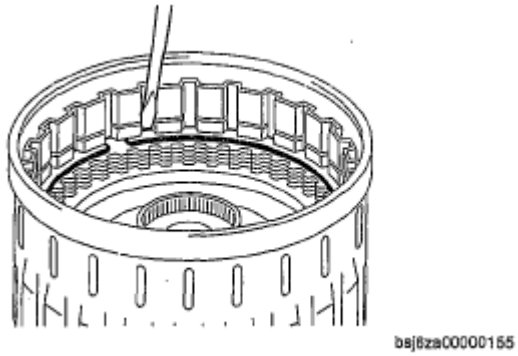


Fig. 131: Removing Snap Ring (C2) From C2, C3 Clutch Drum

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

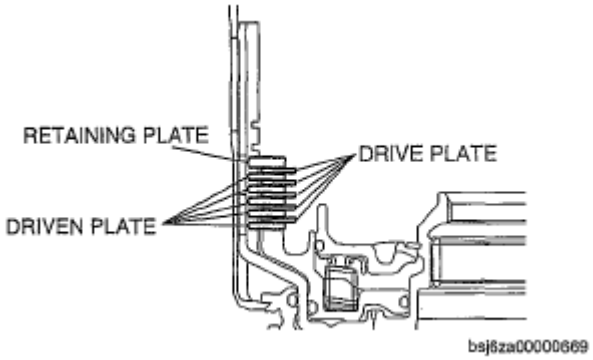


Fig. 132: Identifying Retaining Plate, Drive And Driven Plate

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.**

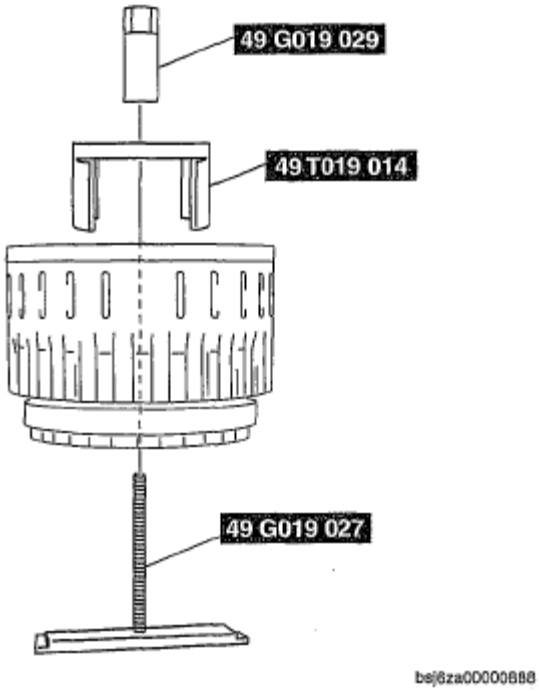


Fig. 133: Identifying SST

29. Remove the snap ring using snap ring pliers.

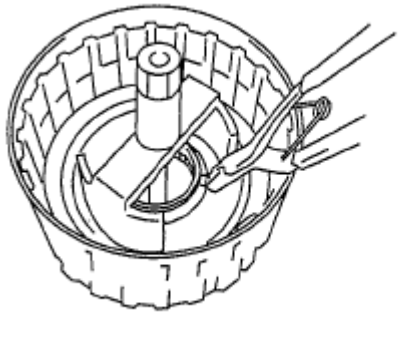


Fig. 134: Removing/Installing Snap Ring Using Snap Ring Pliers

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

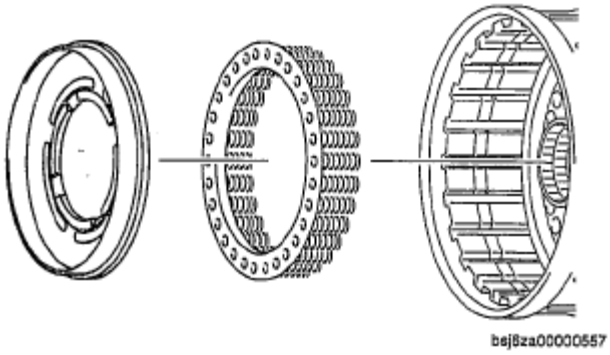


Fig. 135: Identifying Seal Plate And C2 Clutch Piston Return Spring

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.

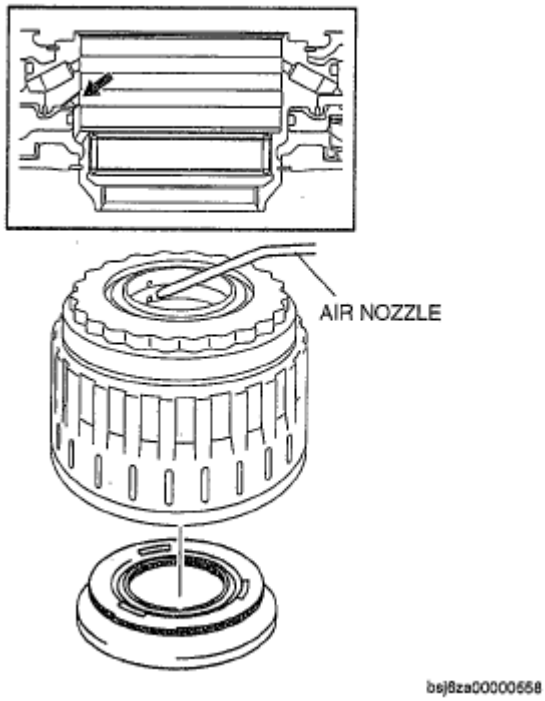


Fig. 136: Identifying Oil Passage For Applying Compressed Air

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

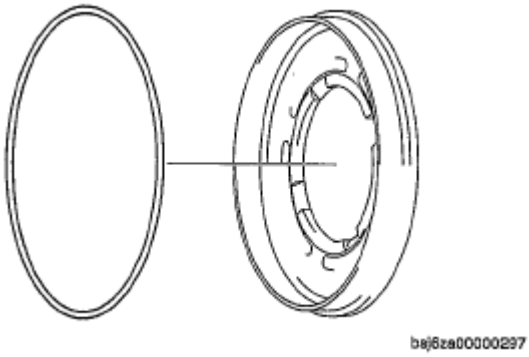


Fig. 137: Identifying O-Ring On C2 Clutch Seal Plate

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

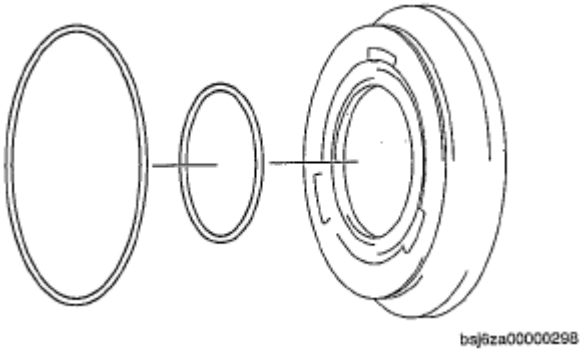


Fig. 138: Identifying O-Ring On C2 Clutch Piston

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.**

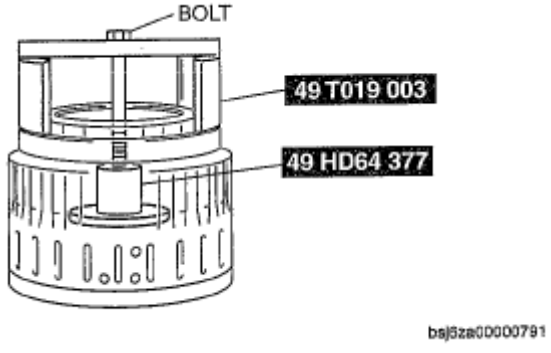


Fig. 139: Identifying SST

36. Remove the snap ring using snap ring pliers.

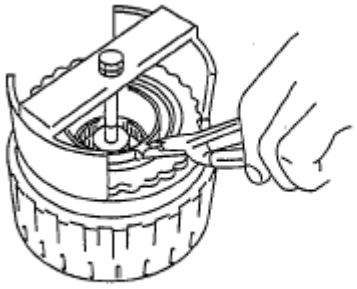


Fig. 140: Removing Snap Ring Using Snap Ring Pliers

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

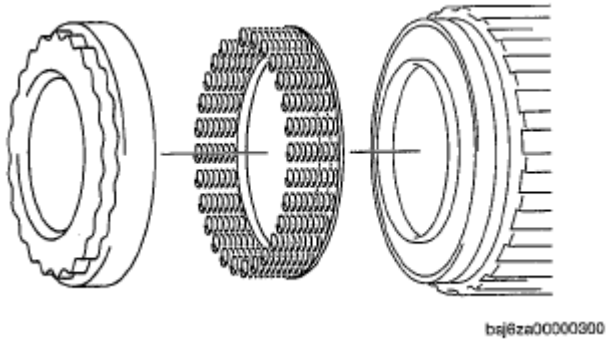


Fig. 141: Identifying Seal Plate Piston Return Spring On C3 Clutch Piston Component

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

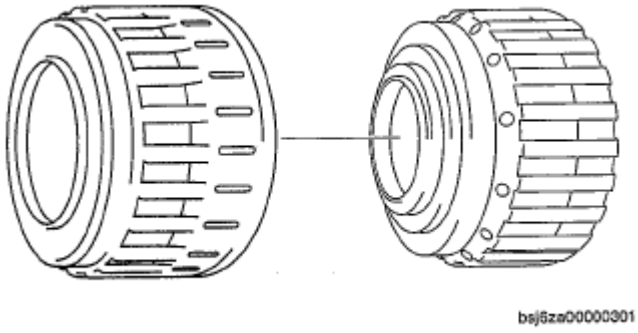


Fig. 142: Identifying C2, C3 Clutch Drum And C3 Clutch Piston Component

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

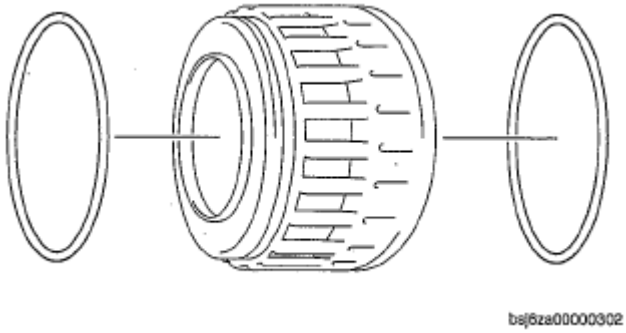


Fig. 143: Identifying O-Ring On C3 Clutch Piston Component

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

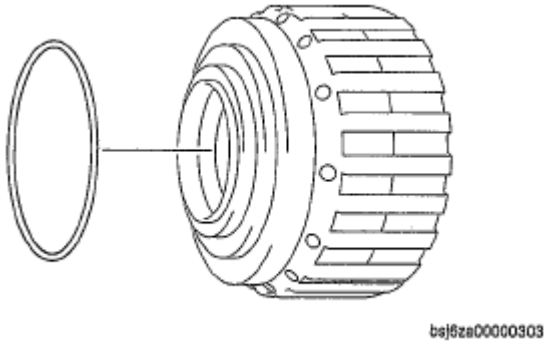


Fig. 144: Identifying O-Ring On C2, C3 Clutch Drum

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH INSPECTION

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.**

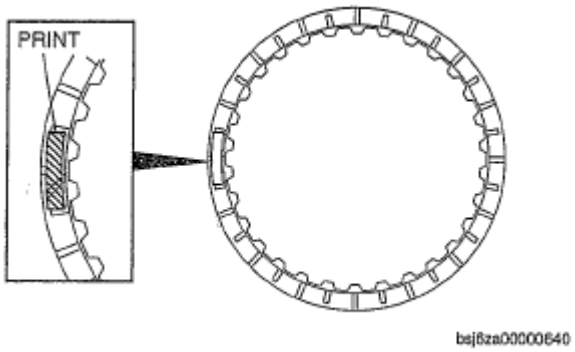


Fig. 145: Identifying Print Mark On Drive Plates (C1)

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.**

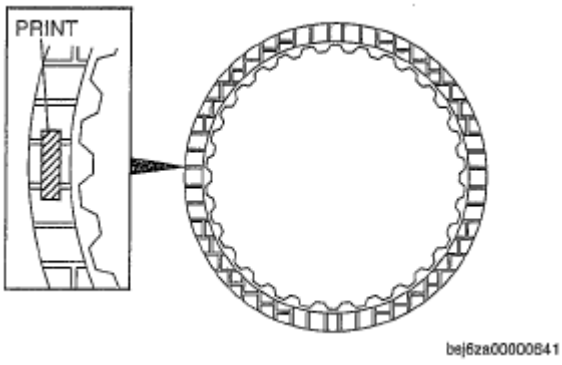


Fig. 146: Identifying Print Mark On Drive Plates (C4)

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.

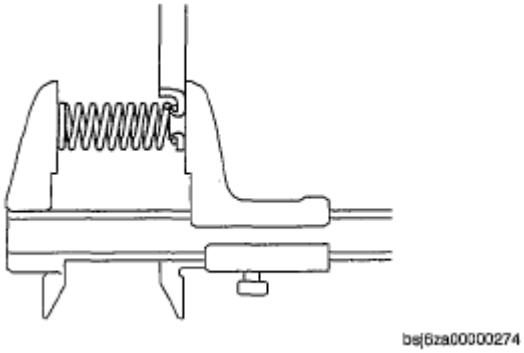


Fig. 147: Measuring Free Length Of Piston Return Spring

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.**

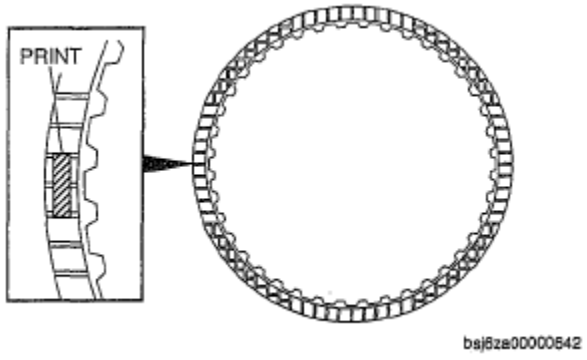


Fig. 148: Identifying Print Mark On Drive Plates (C2)

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.

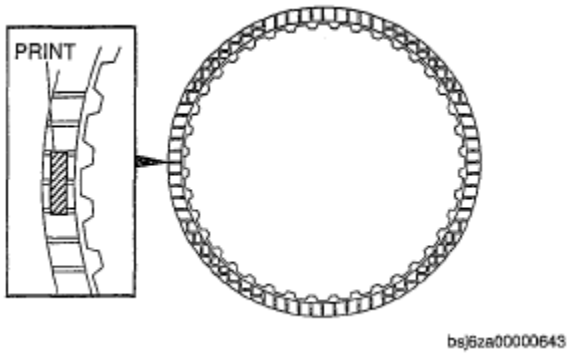


Fig. 149: Identifying Print Mark On Drive Plates (C3)

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.

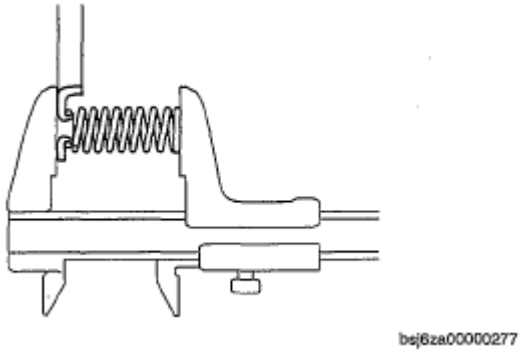


Fig. 150: Measuring Free Length Of Piston Return Spring

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.

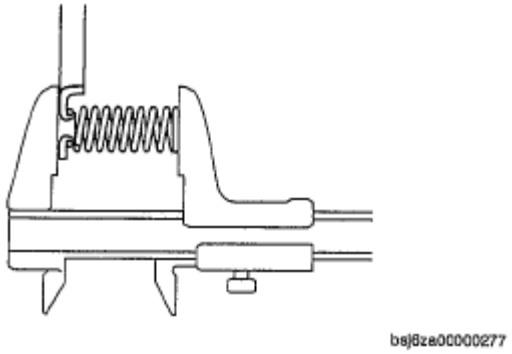


Fig. 151: Measuring Free Length Of Piston Return Spring

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.**

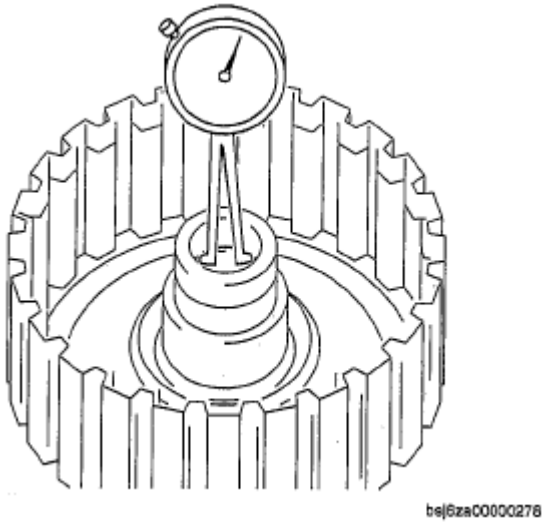


Fig. 152: Measuring Inner Diameter Of Input Shaft Component Bushings Using Dial Gauge

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.**

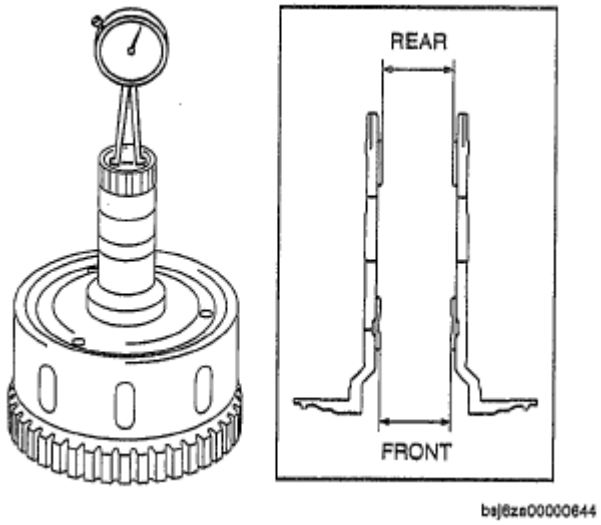


Fig. 153: Measuring Inner Diameter Of Clutch Hub Bushings Using Dial Gauge

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.**

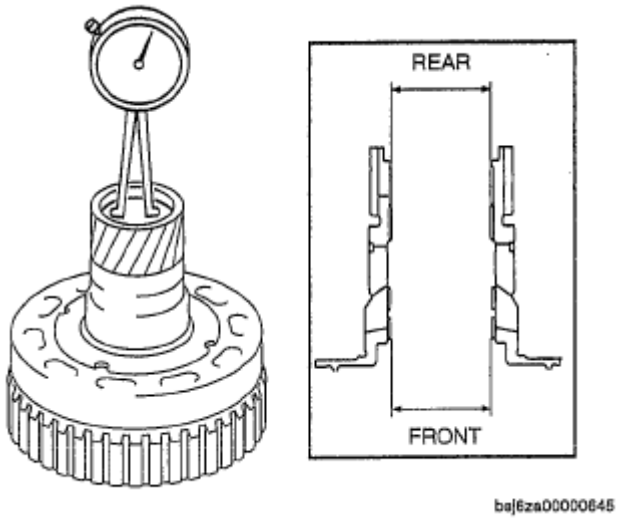


Fig. 154: Measuring Inner Diameter Of Clutch Hub Component Bushings Using Dial Gauge

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.

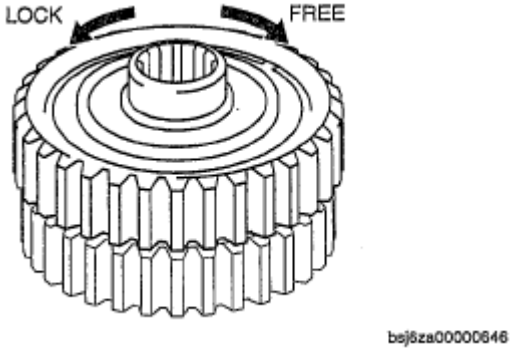
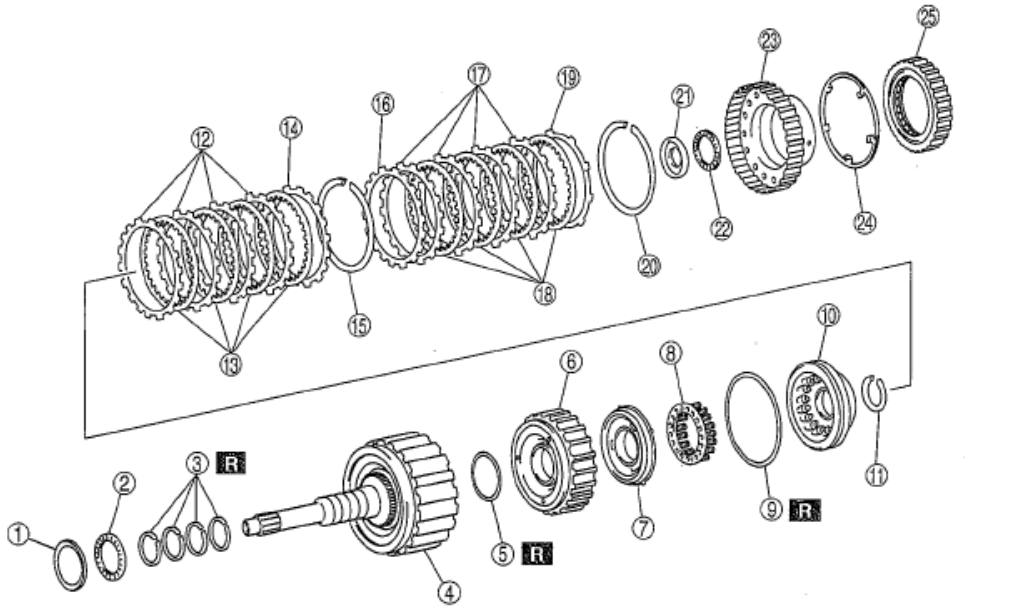


Fig. 155: Identifying F4 One-Way Clutch Rotation Positions

CLUTCH DRUM COMPONENT AND F4 ONE-WAY CLUTCH COMPONENT ASSEMBLY

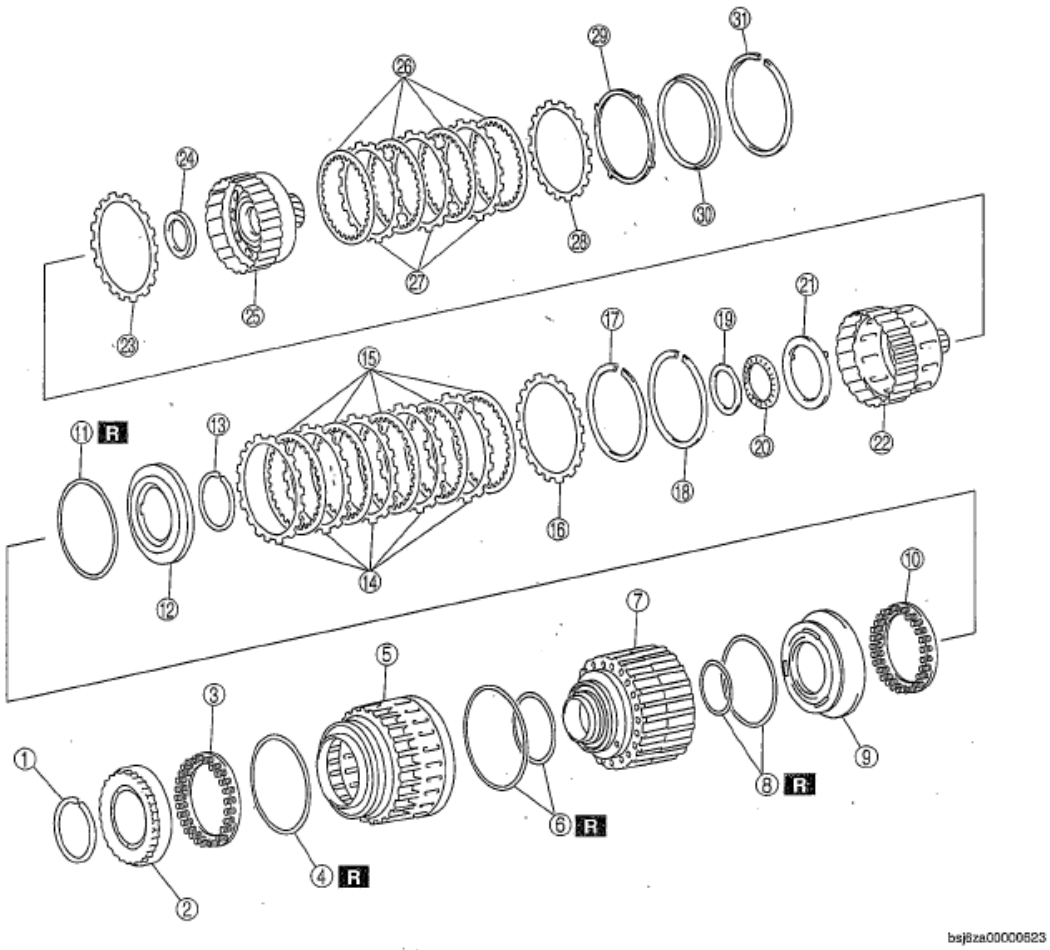
Components



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

Fig. 156: Exploded View Of Clutch Drum Component And F4 One-Way Clutch Component (1 Of 2)



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

Fig. 157: Exploded View Of Clutch Drum Component And F4 One-Way Clutch Component (2 Of 2)

Assembly Procedure

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

3. Apply ATF to the new O-rings.

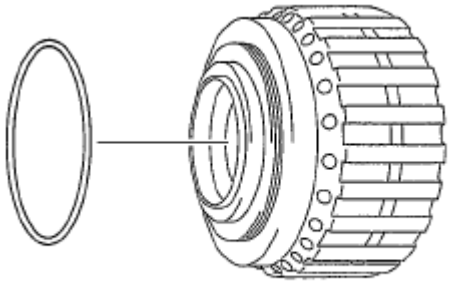


Fig. 158: Identifying O-Ring On C2, C3 Clutch Drum

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.**

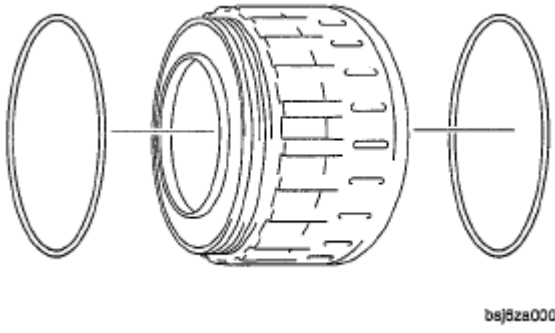


Fig. 159: Identifying O-Rings On C3 Clutch Piston Component

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.**

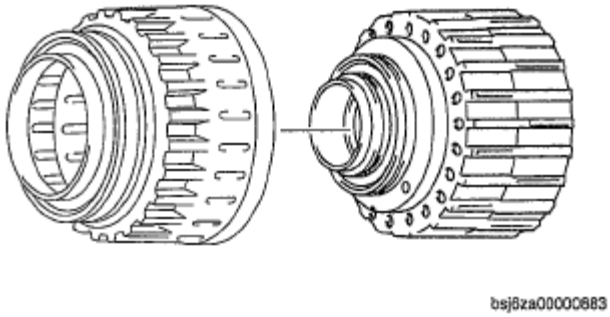


Fig. 160: Identifying C2, C3 Clutch Drum

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

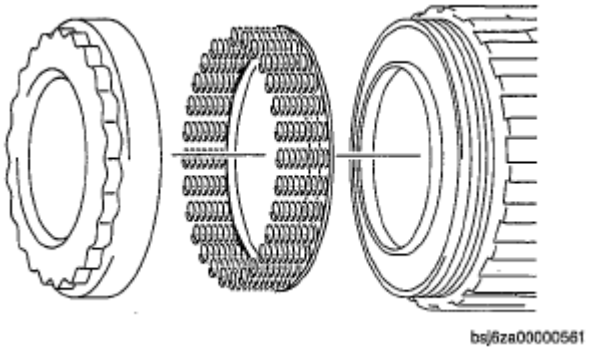


Fig. 161: Identifying Seal Plate And Piston Return Spring

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.**

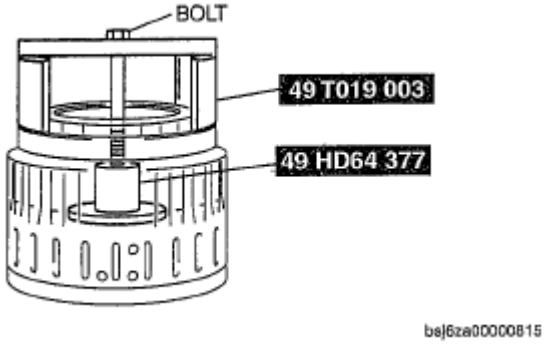


Fig. 162: Identifying SST

10. Remove the snap ring using snap ring pliers.

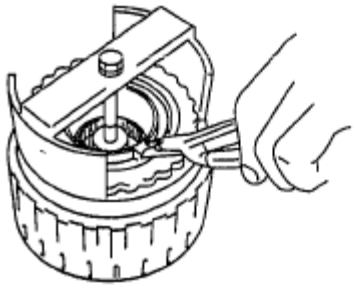


Fig. 163: Removing Snap Ring Using Snap Ring Pliers

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

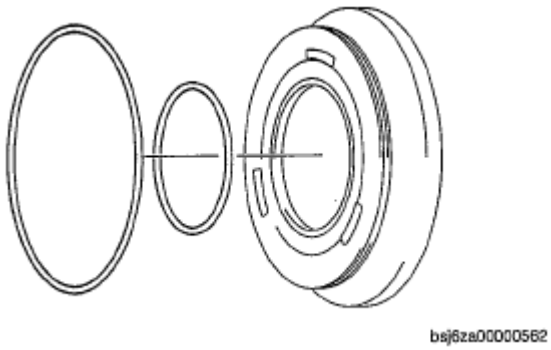


Fig. 164: Identifying O-Rings On C2 Clutch Piston

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.**

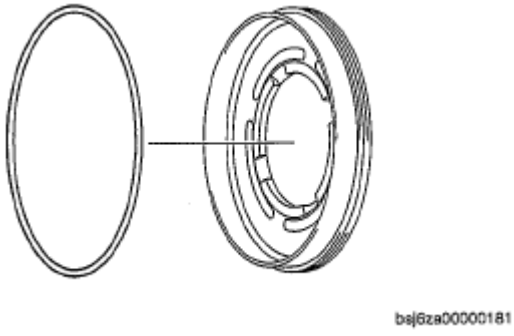


Fig. 165: Identifying O-Rings On C2 Clutch Seal Plate

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.

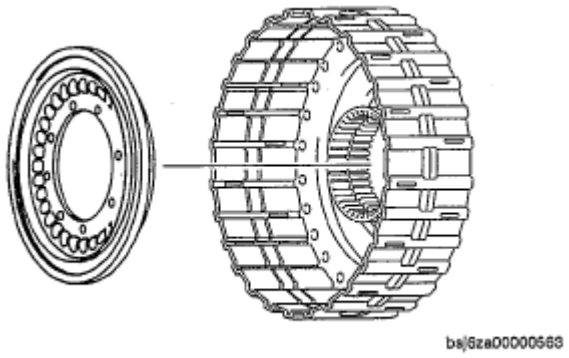


Fig. 166: Identifying C2 Clutch Seal Plate

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

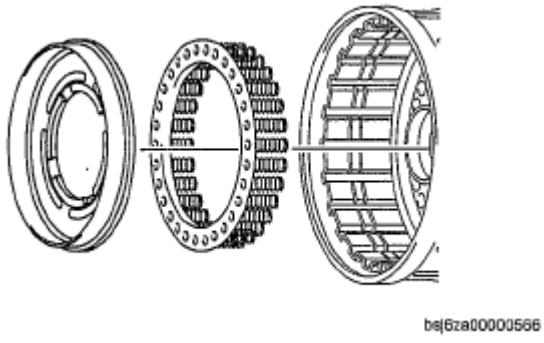


Fig. 167: Identifying C2 Clutch Seal Plate And C2 Clutch Piston Return Spring

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.**

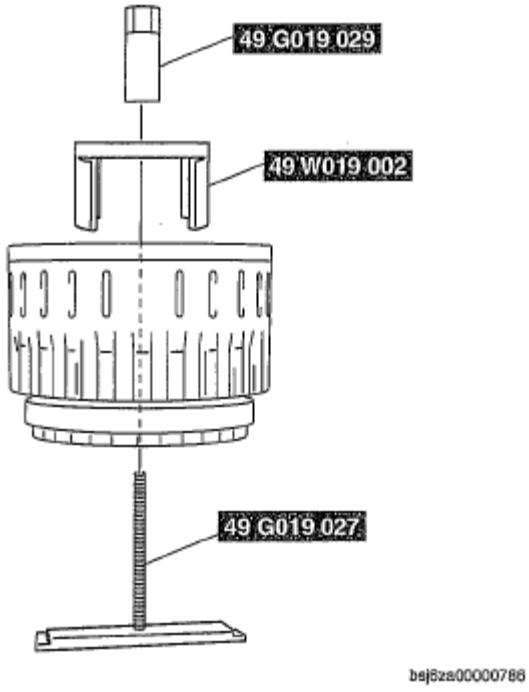


Fig. 168: Identifying SST

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).

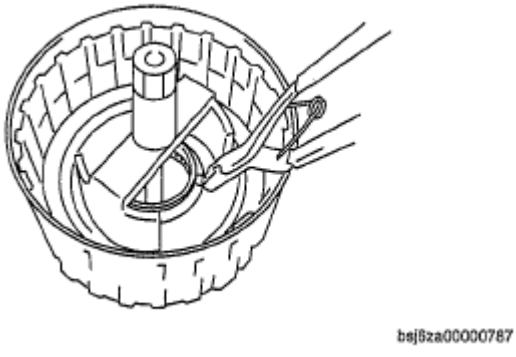


Fig. 169: Removing/Installing Snap Ring Using Snap Ring Pliers

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.**

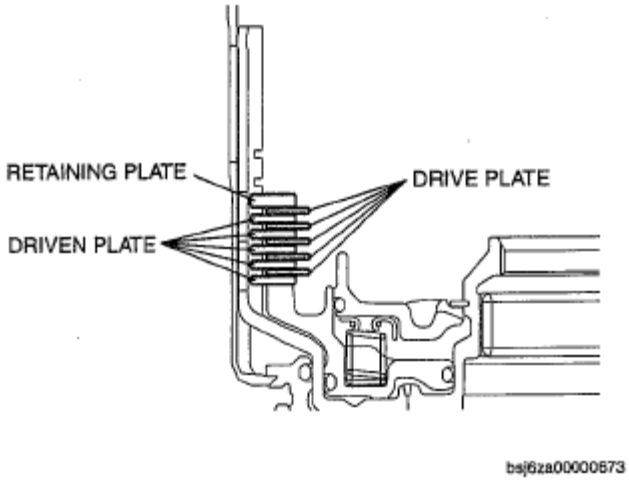


Fig. 170: Identifying Driven, Drive Plate And Retaining Plate

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.**

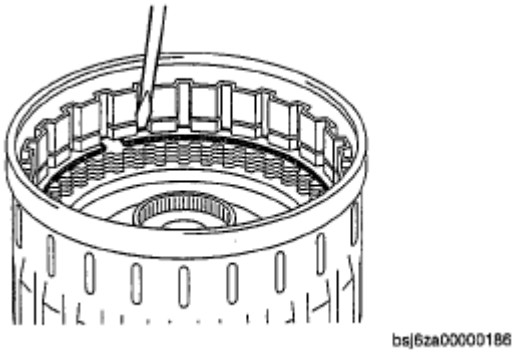


Fig. 171: Installing Snap Ring Using Flathead Screwdriver

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/cm^2 , 28 psi)

THICKNESS REFERENCE

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}

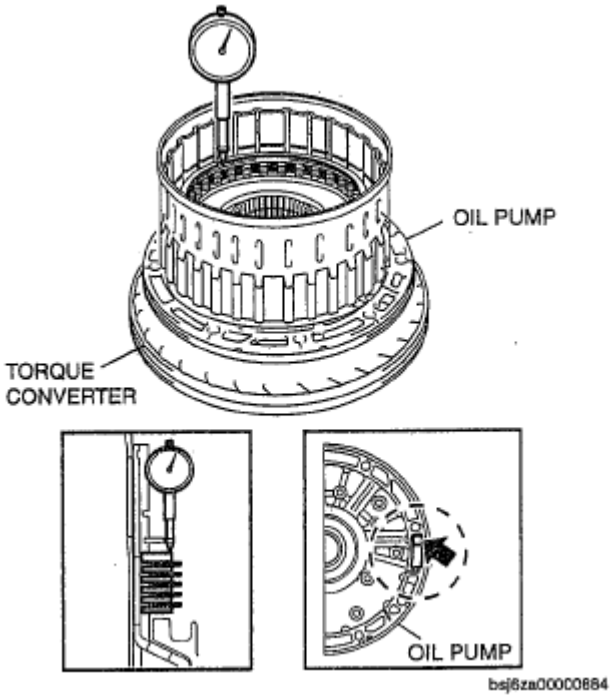


Fig. 172: Measuring Retaining Plate Travel Distance At Both Ends Across Diameter Using Dial Gauge

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

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.**

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

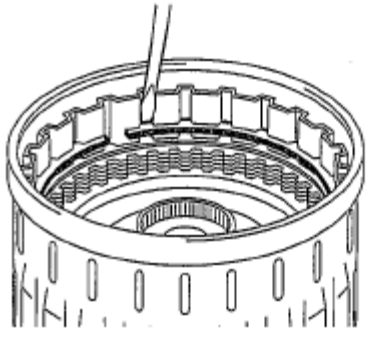


Fig. 173: Installing Snap Ring Using Flathead Screwdriver

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.**

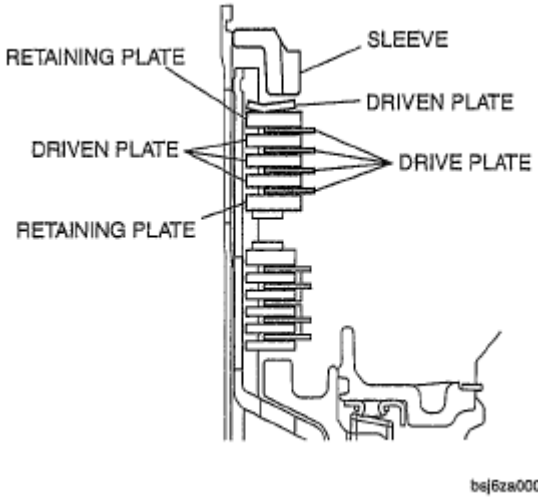


Fig. 174: Identifying Retaining Plate, Driven Plate, Drive Plate And Sleeve

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

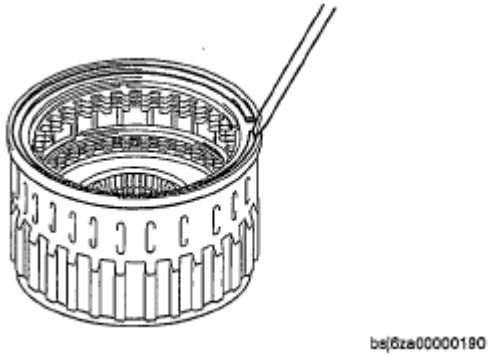


Fig. 175: Installing Snap Ring Using Flathead Screwdriver

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.

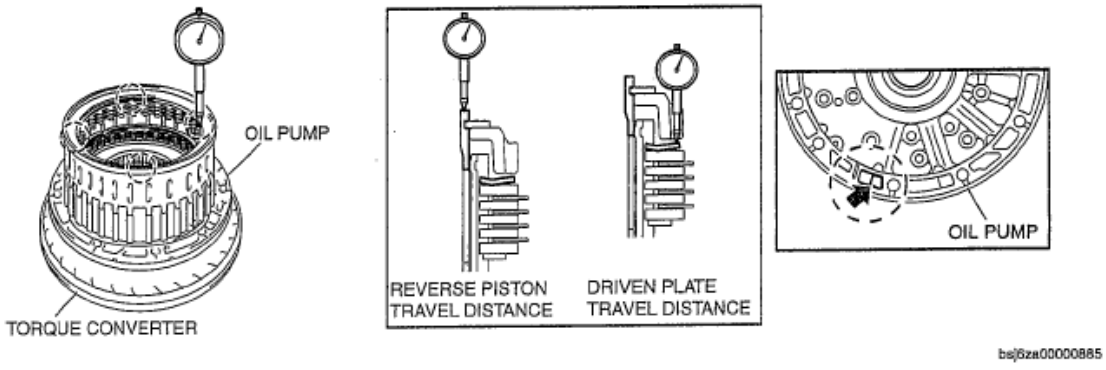


Fig. 176: Measuring Driven Plate Travel Distance Using Dial Gauge

Air pressure

200 kPa (2 kgf/cm^2 , 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}

THICKNESS REFERENCE

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.**

32. Apply ATF to the new D-ring.

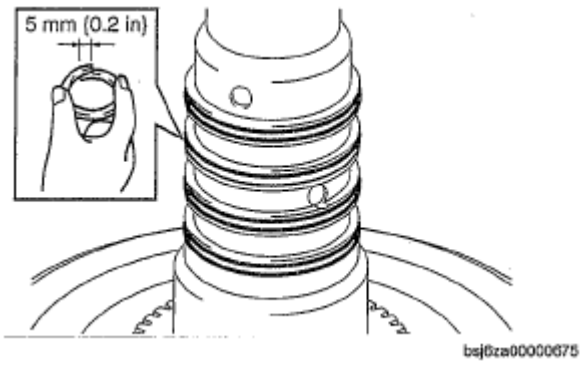


Fig. 177: Compressing Seal Rings

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

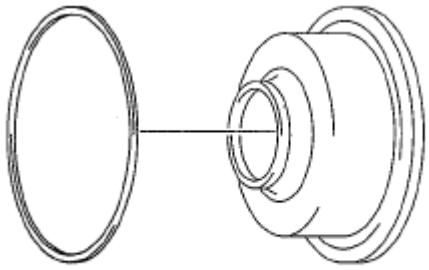


Fig. 178: Identifying D-Ring On C4 Clutch Seal Plate

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.

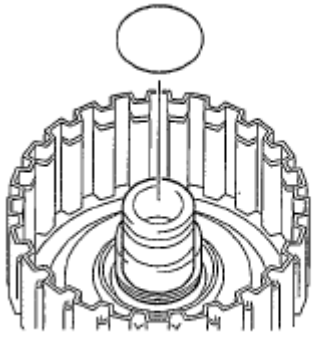


Fig. 179: Identifying O-Ring On Input Shaft Component

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.

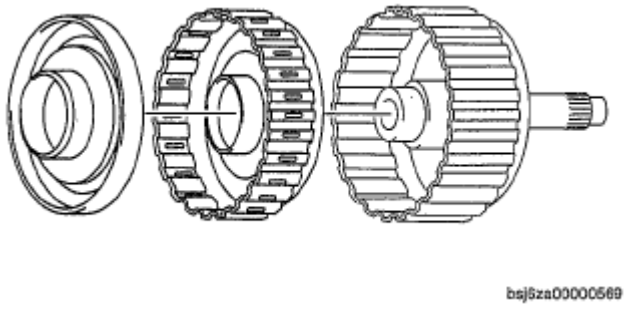


Fig. 180: Identifying C1 Clutch Piston And C4 Clutch Piston

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.**

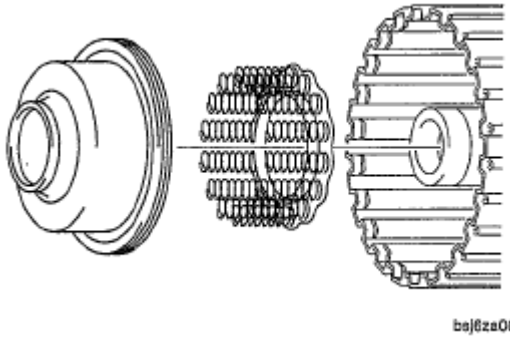


Fig. 181: Identifying C1 Clutch Seal Plate And Piston Return Spring

41. Install the snap ring using snap ring pliers.

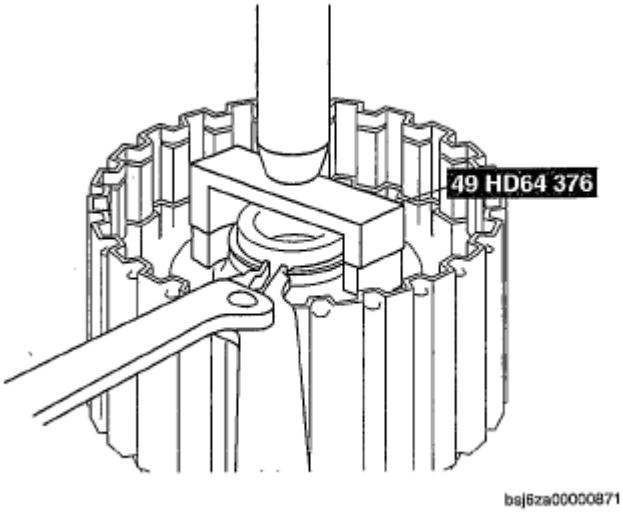


Fig. 182: Removing/Installing Snap Ring Using Snap Ring Pliers

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.**

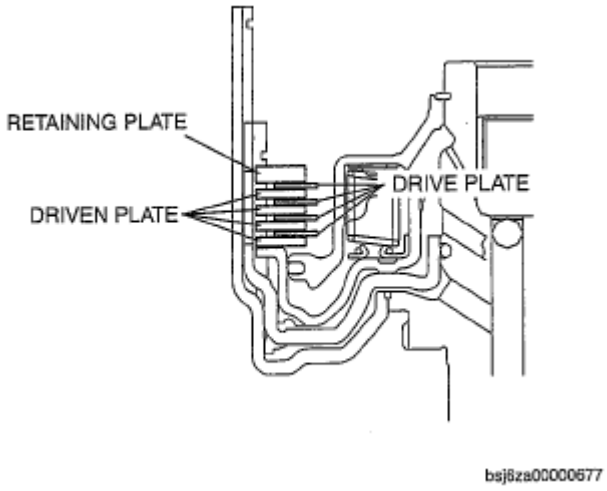


Fig. 183: Identifying Retaining Plate, Driven And Drive Plate

43. Install the retaining plate (C4), the driven plate (C4), the drive plate (C4) to the input shaft component.
44. Using a flathead screwdriver, install the snap ring to the input shaft component.

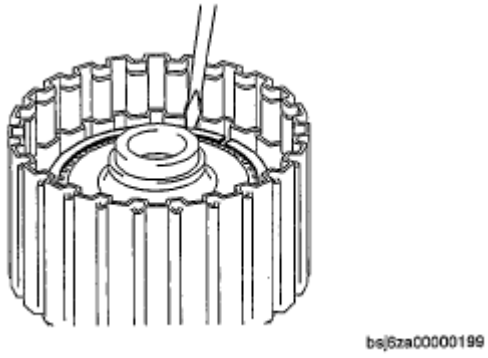


Fig. 184: Installing Snap Ring To Input Shaft Component Using Flathead Screwdriver

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/cm^2 , 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}

THICKNESS REFERENCE

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}

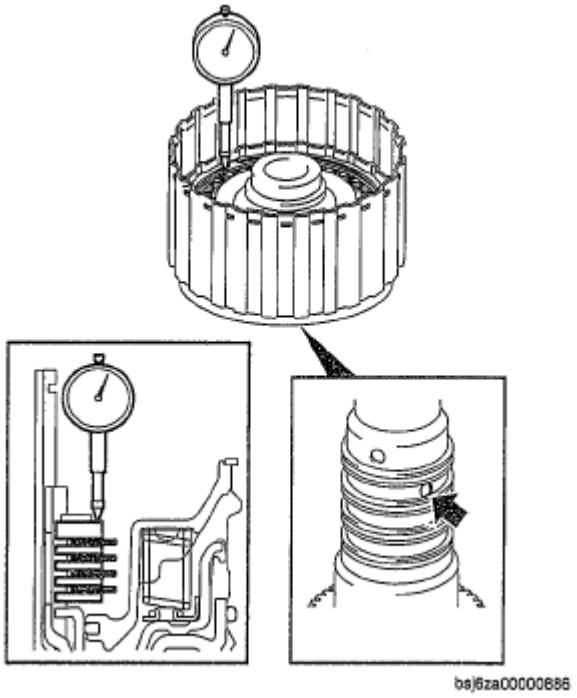


Fig. 185: Measuring Retaining Plate Travel Distance At Both Ends Across Diameter Using Dial Gauge

CAUTION:
- **If the C4 clutch pack clearance exceed 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.

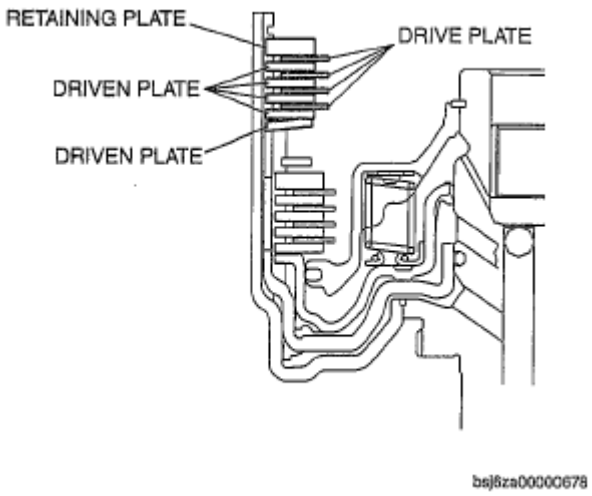


Fig. 186: Identifying Retaining Plate, Driven Plate And Drive Plate

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

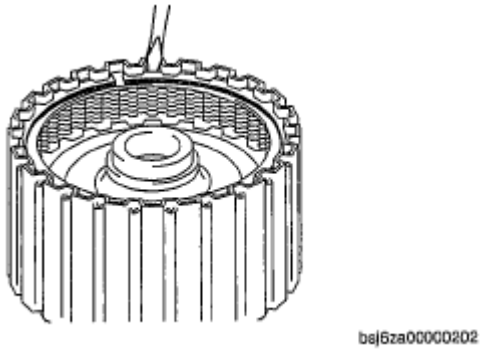


Fig. 187: Installing Snap Ring Using Flathead Screwdriver

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/cm^2 , 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 exceed the maximum specification, select another retaining plate.**

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

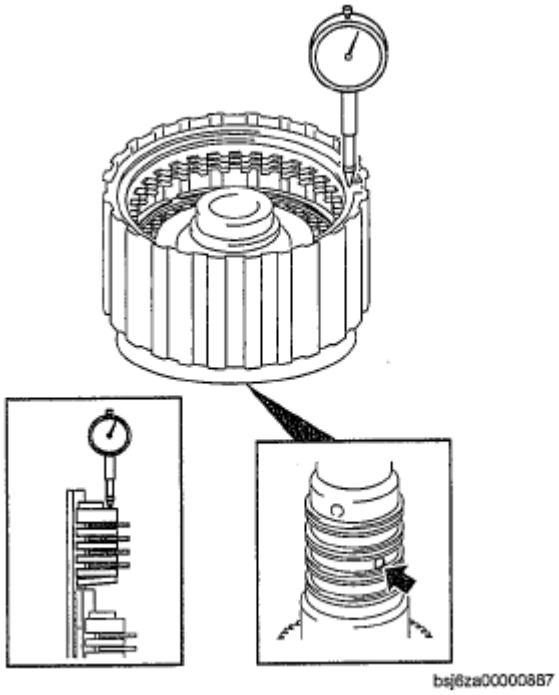


Fig. 188: Measuring Retaining Plate Travel Distance At Both Ends Across Diameter Using Dial Gauge

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

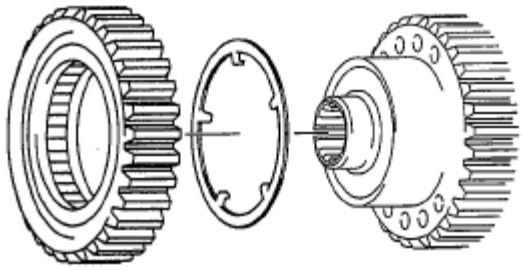


Fig. 189: Identifying F4 One-Way Clutch And Thrust Washer

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

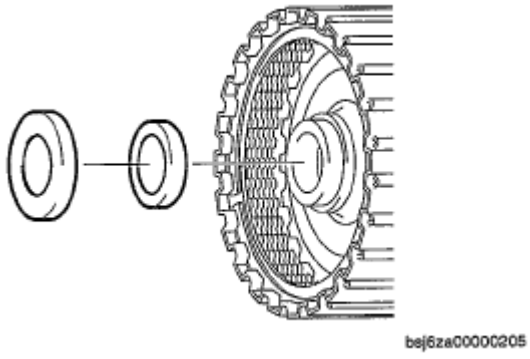


Fig. 190: Identifying Bearing Races

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

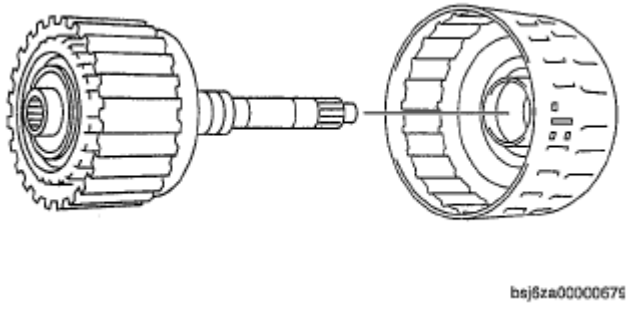


Fig. 191: Identifying Clutch Hub

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

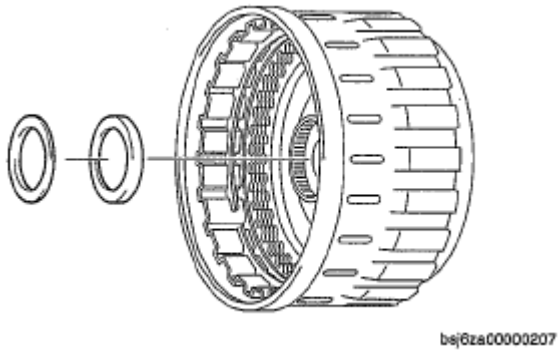


Fig. 192: Identifying Bearing Race On C3 Clutch Piston Component

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.

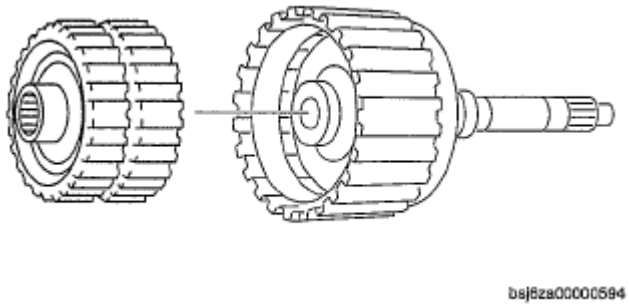


Fig. 193: Identifying C1, C4 Clutch Component

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

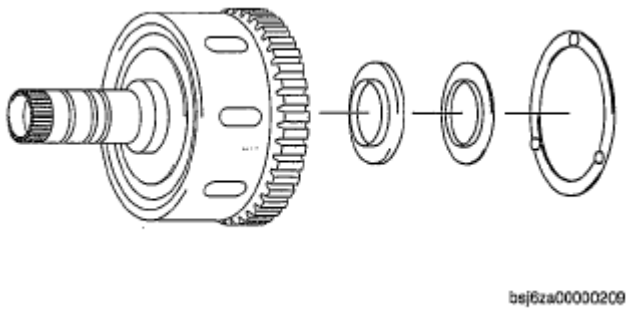


Fig. 194: Identifying Thrust Bearing, Bearing Race And Thrust Washer

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

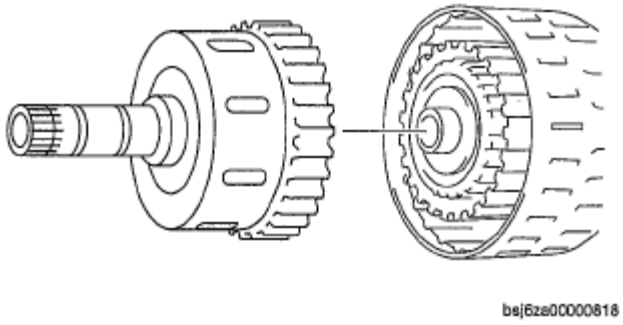


Fig. 195: Identifying Clutch Hub On C3 Clutch Piston Component

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

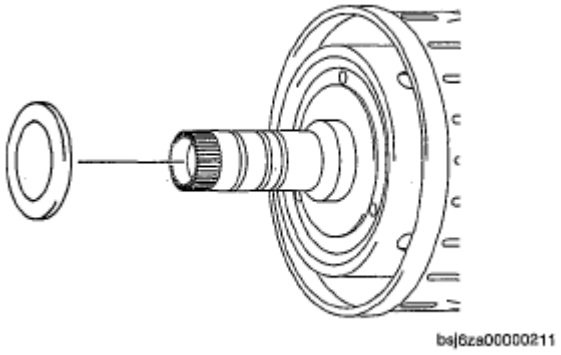


Fig. 196: Identifying Thrust Needle Bearing On Clutch Hub

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

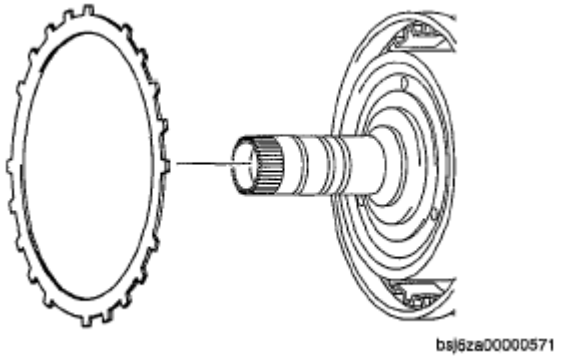
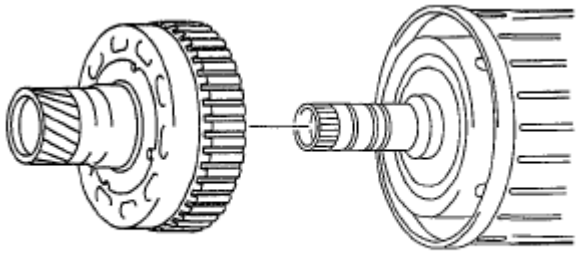


Fig. 197: Identifying Retaining Plate On C3 Clutch Piston Component

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:

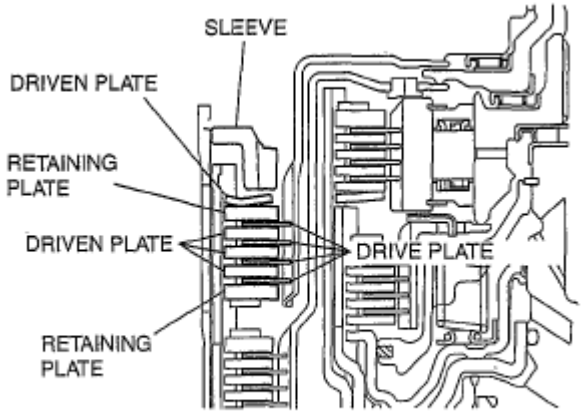
- **Inspect the number of drive and driven plates.**



bsj6za00000819

Fig. 198: Identifying Clutch Hub Component

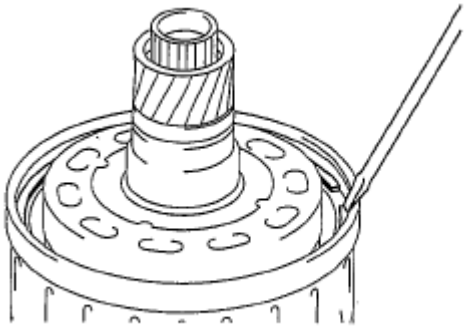
67. Install the retaining plate (C3), the drive plate (C3), and the driven plate (C3) to the clutch hub component.



bsj6za0C000682

Fig. 199: Identifying Retaining Plate, Drive Plate And Driven Plate

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

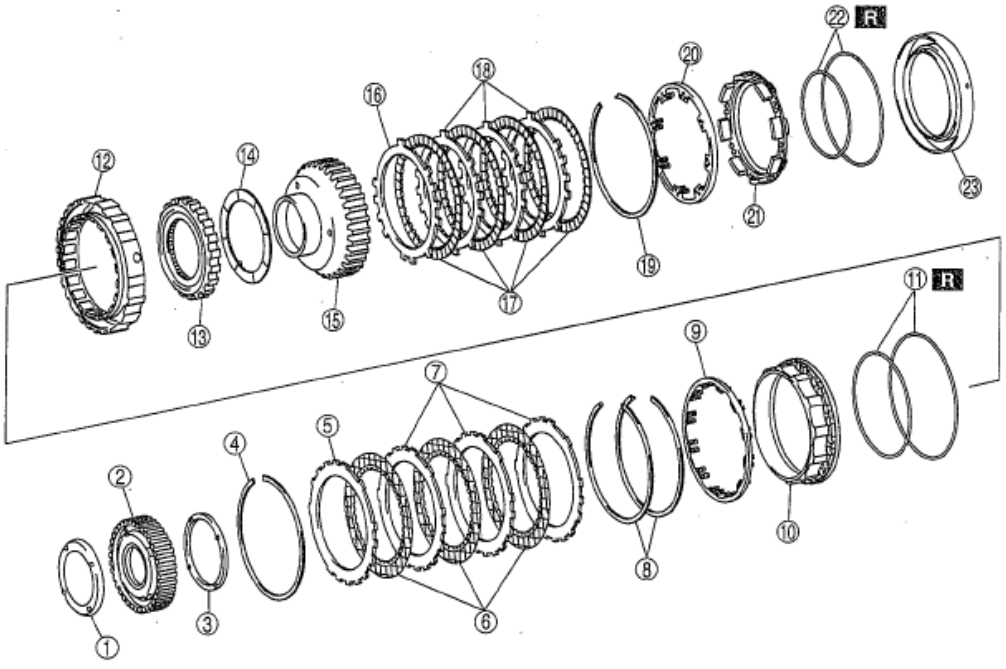


bsj6za00000820

Fig. 200: Installing Snap Ring To C3 Clutch Piston Component Using Flathead Screwdriver

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

Components



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

Fig. 201: B1, B3 Brake And F1, F2 One-Way Clutch Component Disassembled View

Disassembly Procedure

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

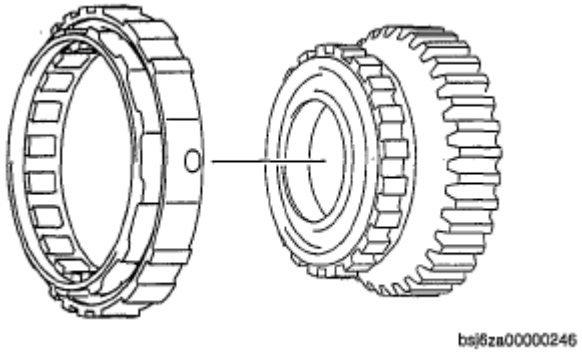


Fig. 202: Identifying B3 Brake Cylinder

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

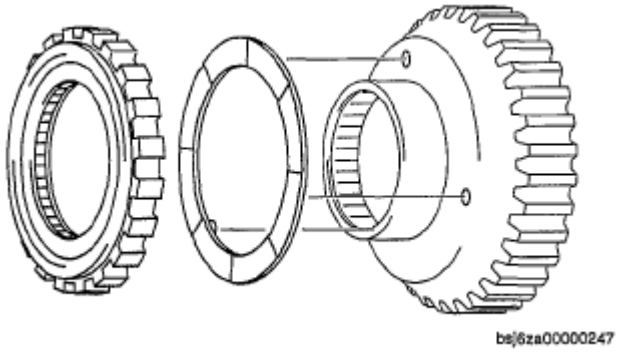


Fig. 203: Identifying F1 One-Way Clutch And Thrust Washer

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

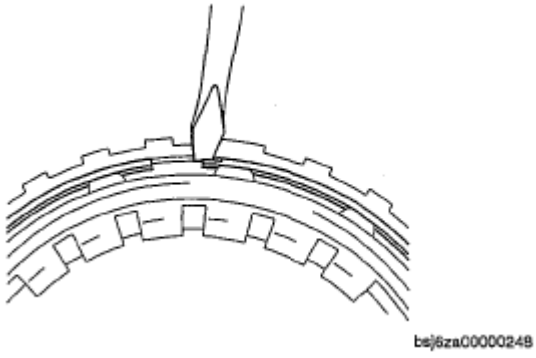


Fig. 204: Removing Snap Ring From B3 Brake Cylinder Using Flathead Screwdriver

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

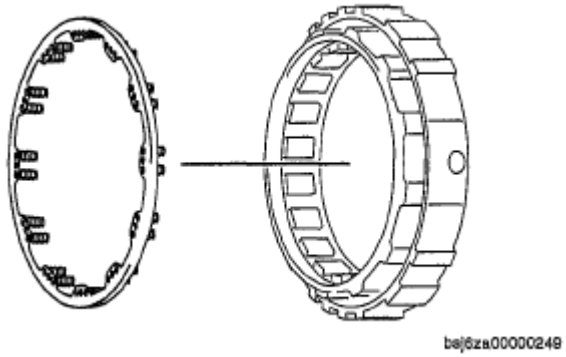


Fig. 205: Identifying Piston Return Spring

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)

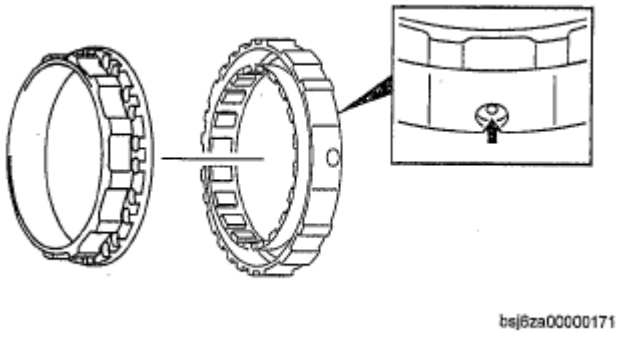


Fig. 206: Locating Oil Passage

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

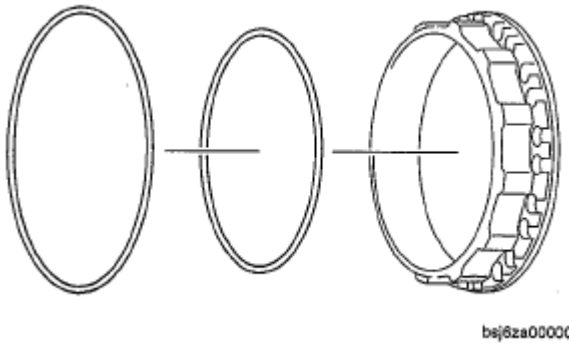


Fig. 207: Identifying O-Ring On B3 Brake Piston

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)

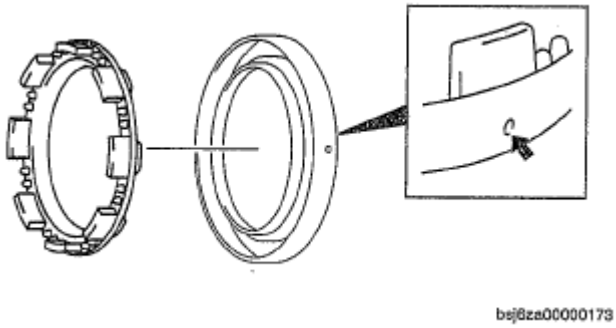


Fig. 208: Locating Oil Passage

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

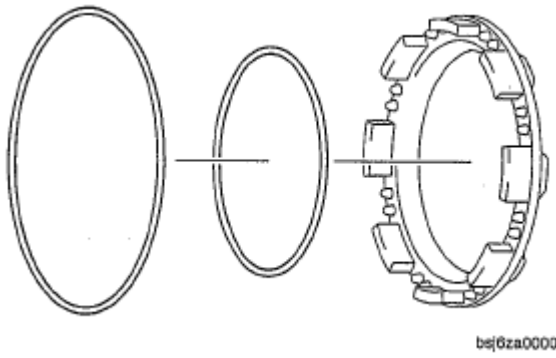


Fig. 209: Identifying O-Ring On B1 Brake Piston

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

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.

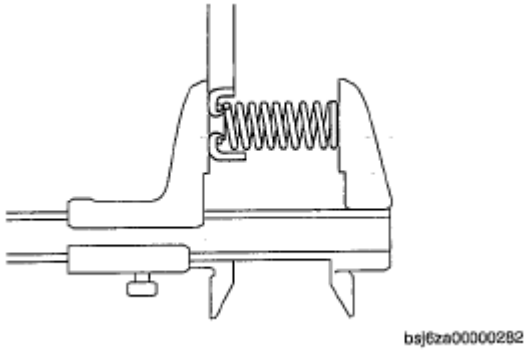


Fig. 210: Measuring Free Length Of Piston Return Spring Using Vernier Caliper

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.

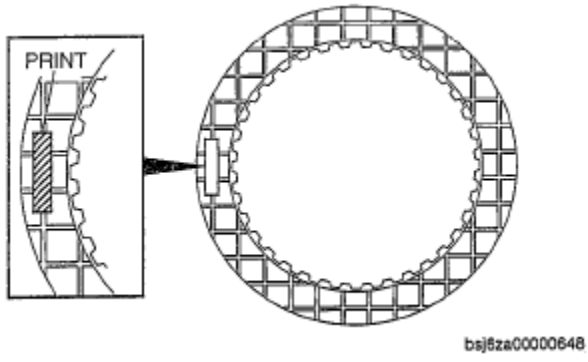


Fig. 211: Identifying Print Mark Location

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

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.

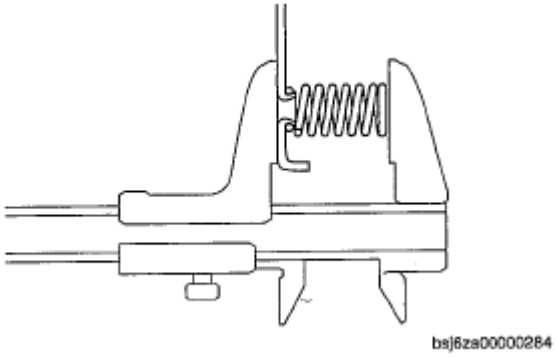


Fig. 212: Measuring Free Length Of Piston Return Spring

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.

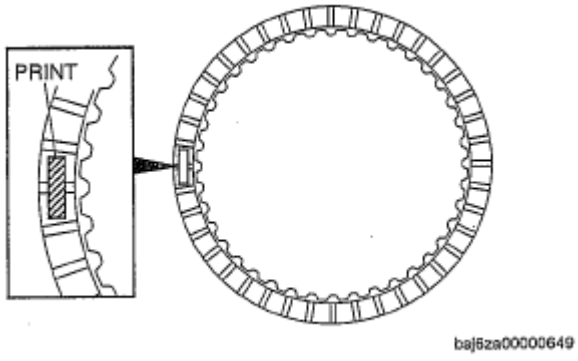


Fig. 213: Identifying Print Mark Location

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

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.

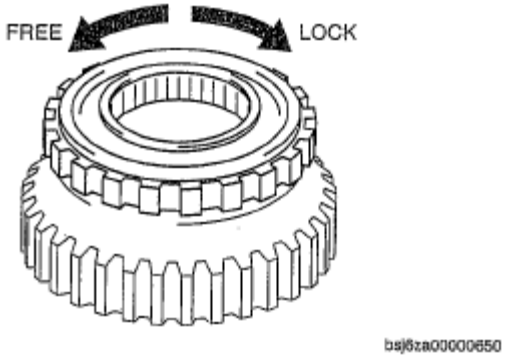


Fig. 214: Identifying F1 One-Way Clutch Rotation Positions

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.

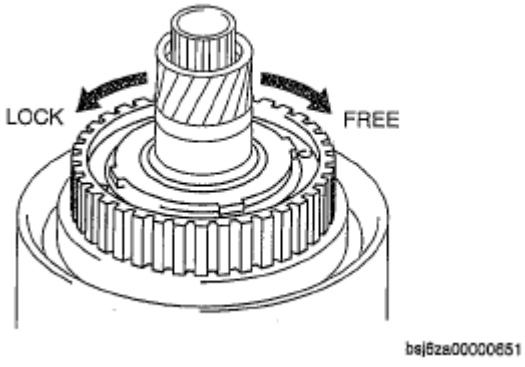
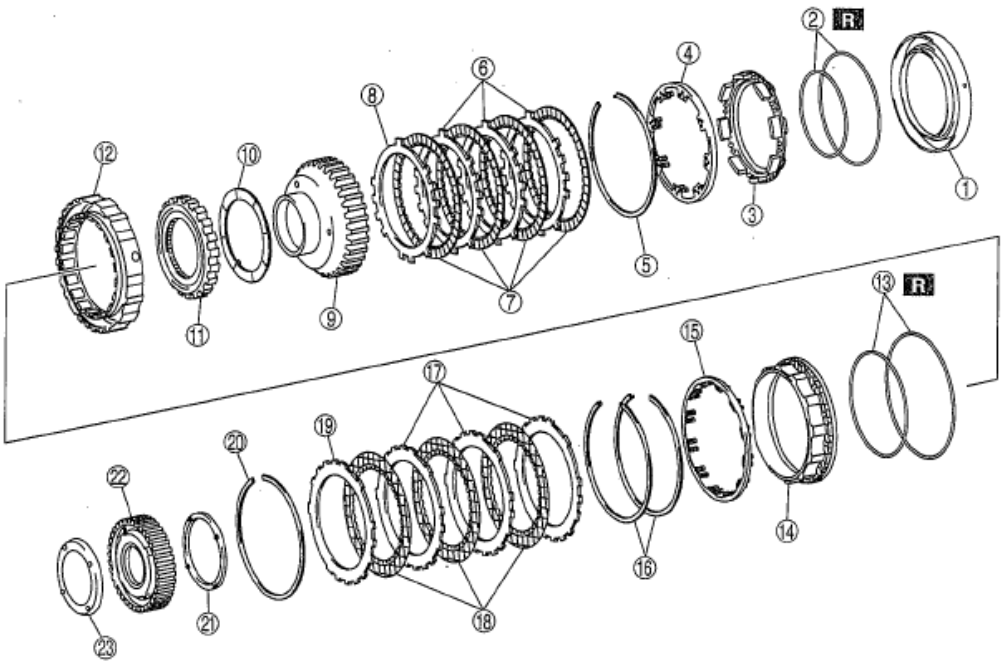


Fig. 215: Identifying F2 One-Way Clutch Rotation Positions

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

Components



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

Fig. 216: Exploded View Of B1, B3 Brake And F1, F2 One-Way Clutch Component

Assembly Procedure

1. Apply ATF to the new O-ring.
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.**

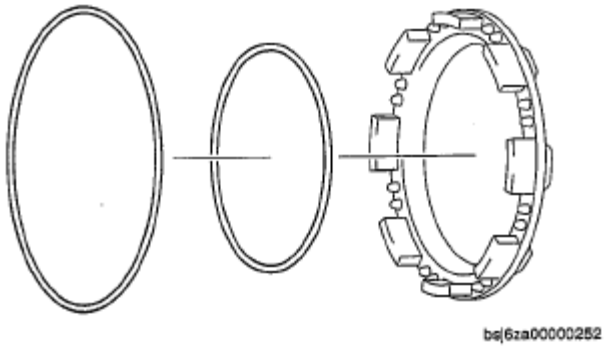


Fig. 217: Identifying O-Rings On B1 Brake Piston

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

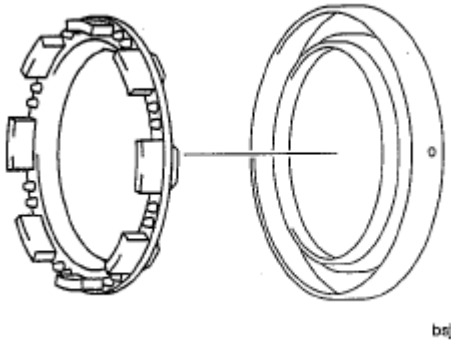


Fig. 218: Identifying B1 Brake Piston On B1 Brake Cylinder

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.**

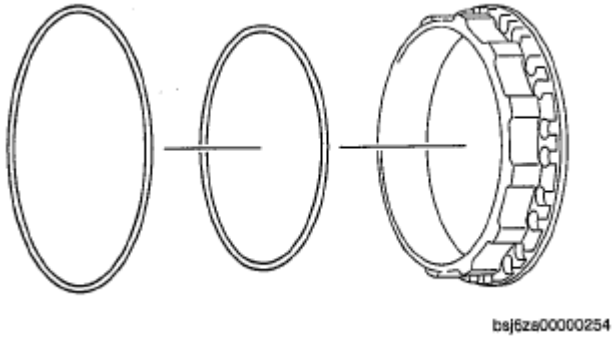


Fig. 219: Identifying O-Rings On B3 Brake Piston

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

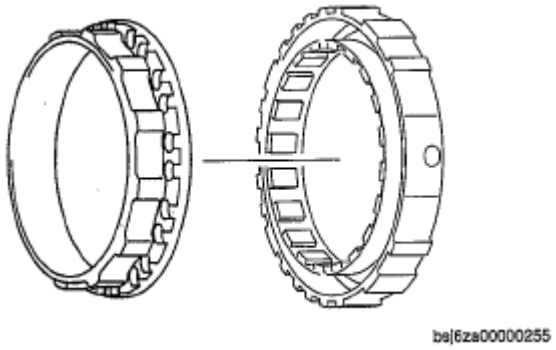


Fig. 220: Identifying B3 Brake Piston On B3 Brake Cylinder

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

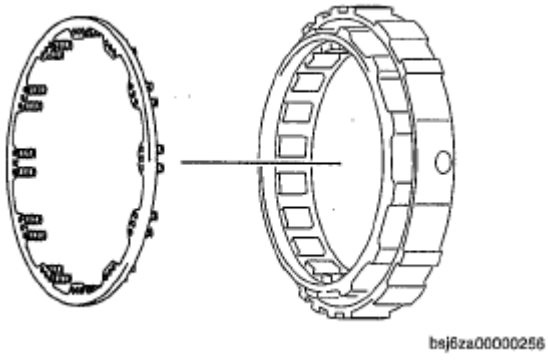


Fig. 221: Identifying Piston Return Spring

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.

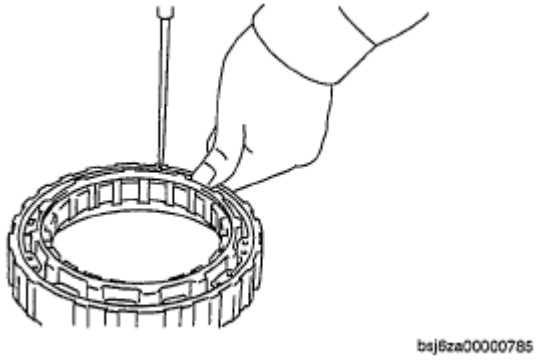


Fig. 222: Installing Brake Cylinder Using Flathead Screwdriver

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

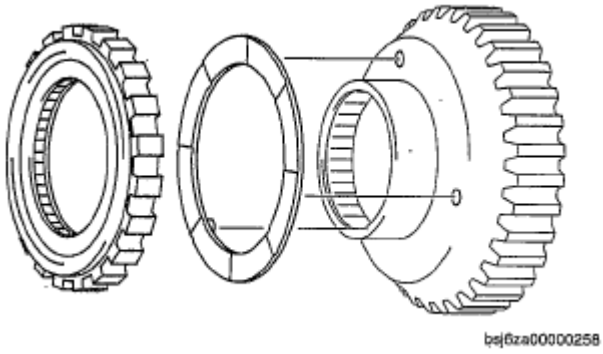


Fig. 223: Identifying F1 One-Way Clutch

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

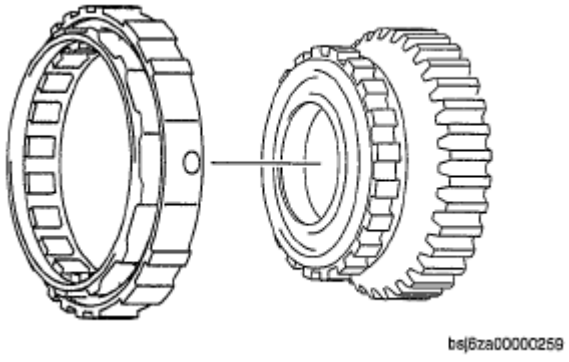
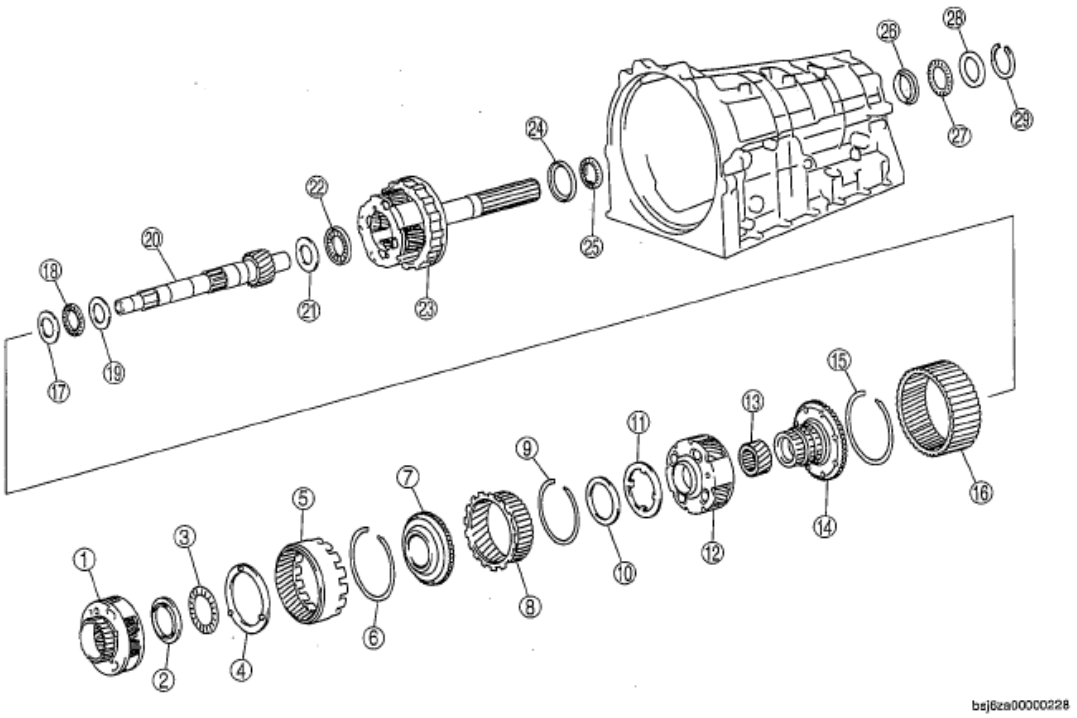


Fig. 224: Identifying B3 Brake Cylinder

PLANETARY GEAR COMPONENT DISASSEMBLY

Components



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

Fig. 225: Planetary Gear Component Disassembled View

Disassembly Procedure

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

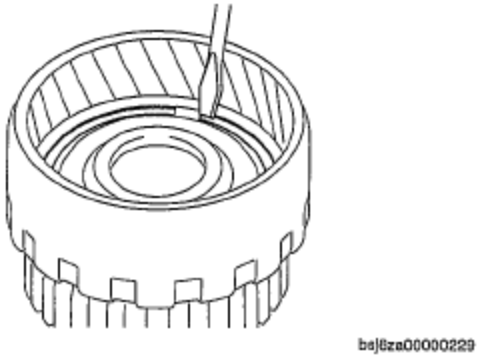


Fig. 226: Removing Snap Ring From Middle Planetary Ring Gear Using Flathead Screwdriver

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

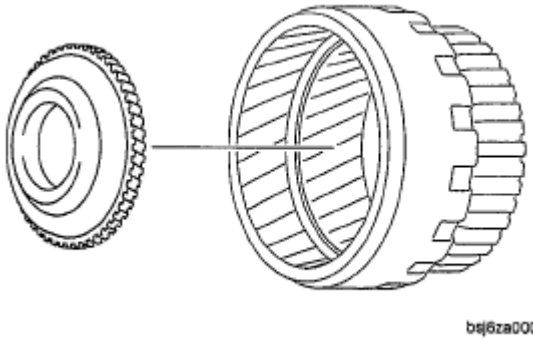


Fig. 227: Identifying Front Planetary Ring Gear Flange

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

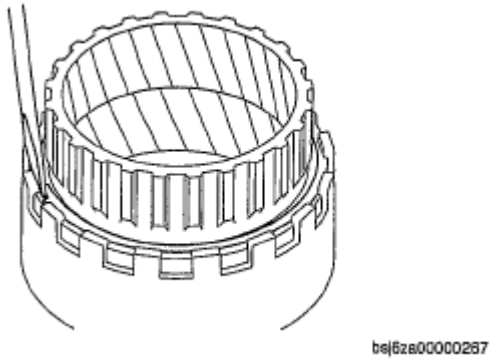


Fig. 228: Removing Snap Ring From Middle Planetary Ring Gear

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

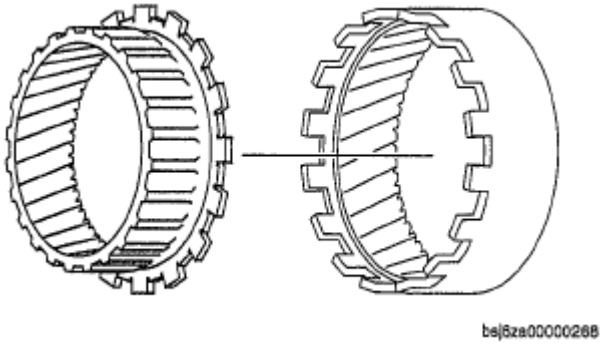


Fig. 229: Identifying Front Planetary Ring Gear

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

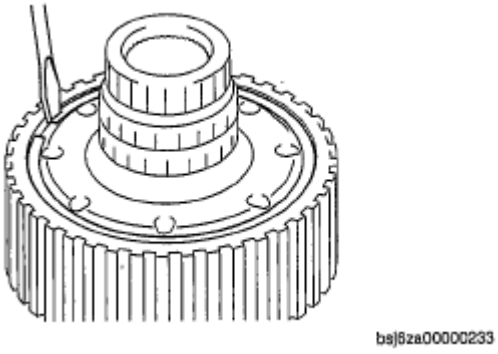


Fig. 230: Removing Snap Ring From Rear Planetary Ring Gear Using Flathead Screwdriver

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

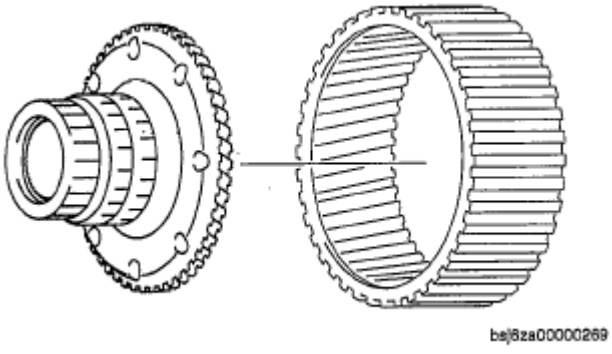


Fig. 231: Identifying Rear Planetary Ring Gear Flange

PLANETARY GEAR COMPONENT INSPECTION

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.**

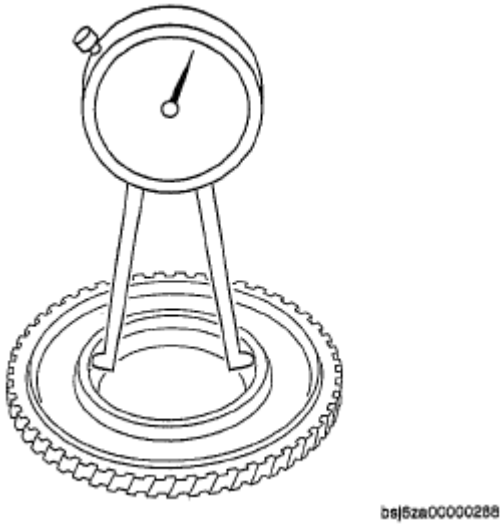


Fig. 232: Measuring Inner Diameter Of Front Planetary Ring Gear Flange Bushings

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.**

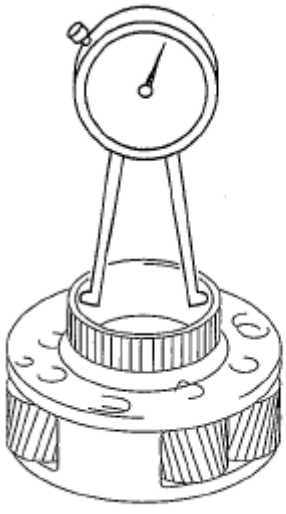


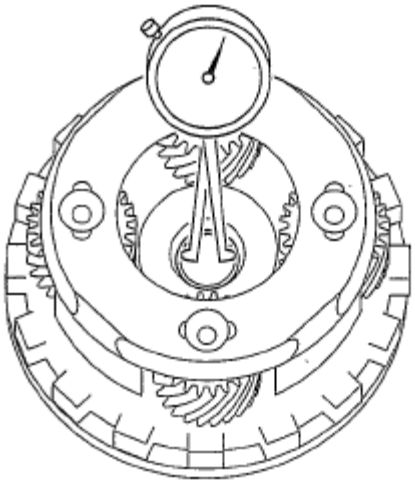
Fig. 233: Measuring Inner Diameter Of Front Planetary Gear Component Bushings

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 front 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.**

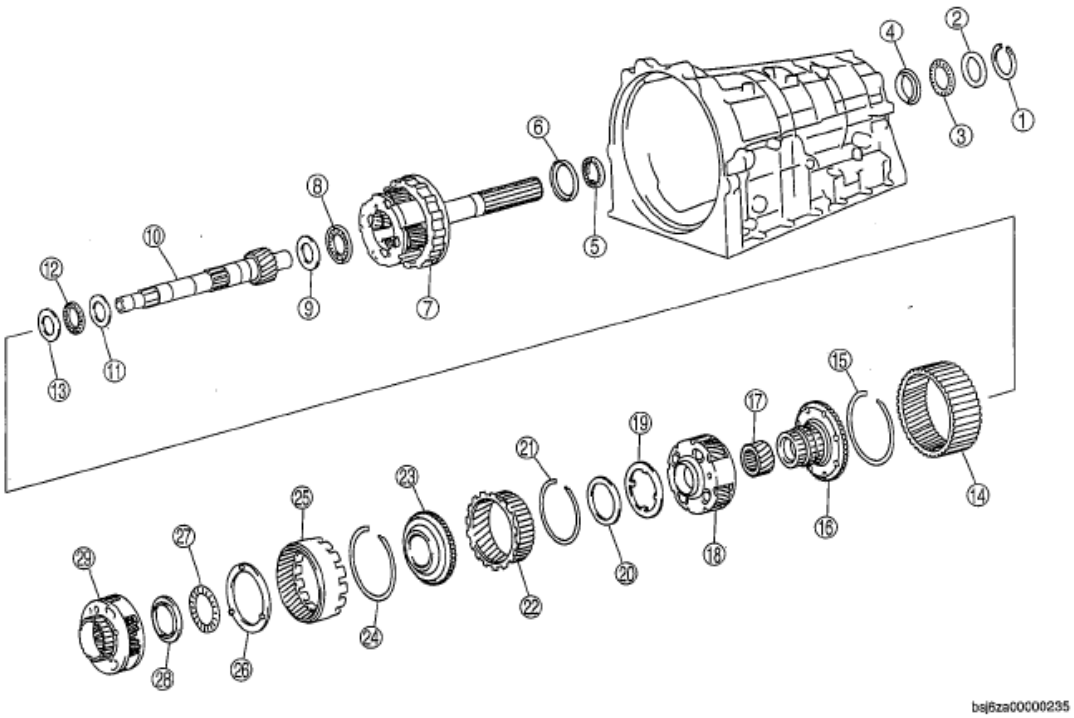


bsj8za00000849

Fig. 234: Measuring Inner Diameter Of Rear Planetary Gear Component Bushings

PLANETARY GEAR COMPONENT ASSEMBLY

Components



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

Fig. 235: Exploded View Of Planetary Gear Components

Assembly Procedure

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

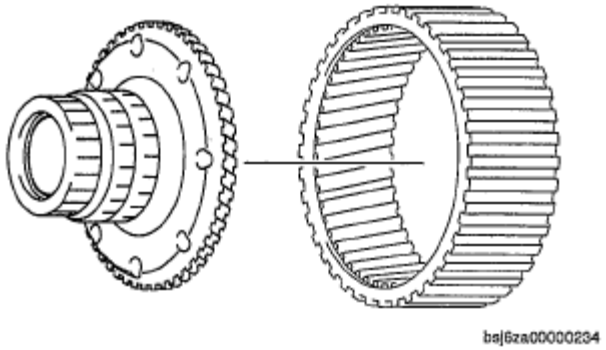


Fig. 236: Identifying Rear Planetary Gear Flange

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

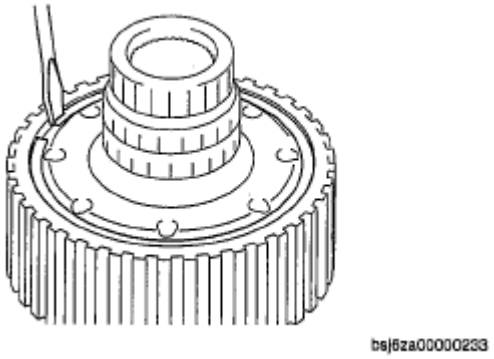


Fig. 237: Installing Snap Ring To Rear Planetary Ring Gear

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

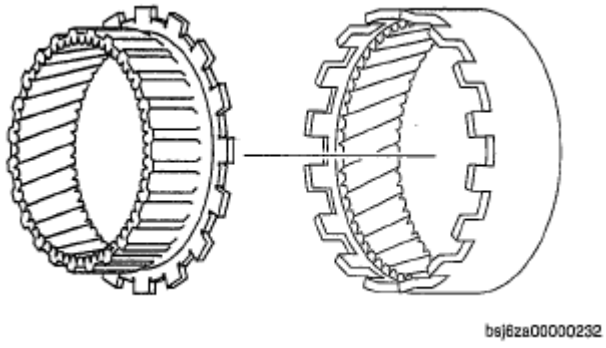


Fig. 238: Identifying Front Planetary Ring Gear

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

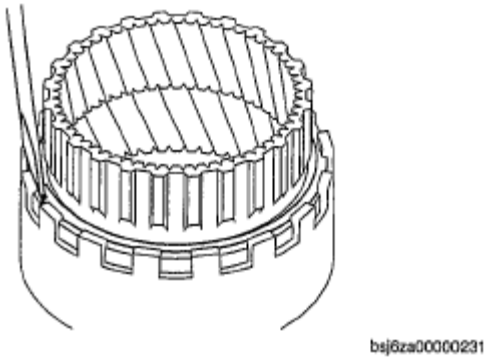


Fig. 239: Installing Snap Ring To Middle Planetary Ring Gear

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

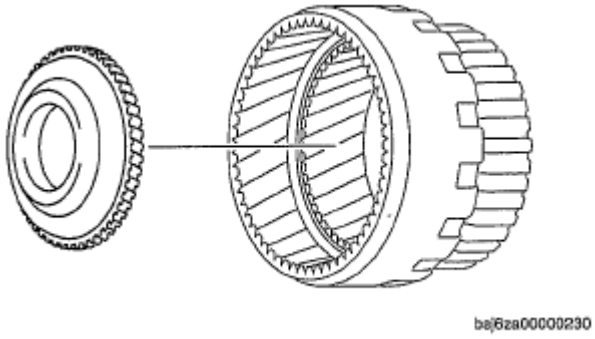


Fig. 240: Identifying Middle Planetary Ring Gear Flange

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

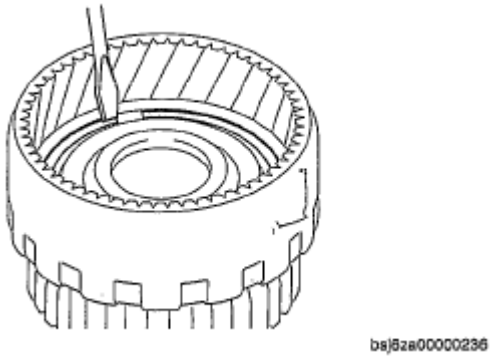
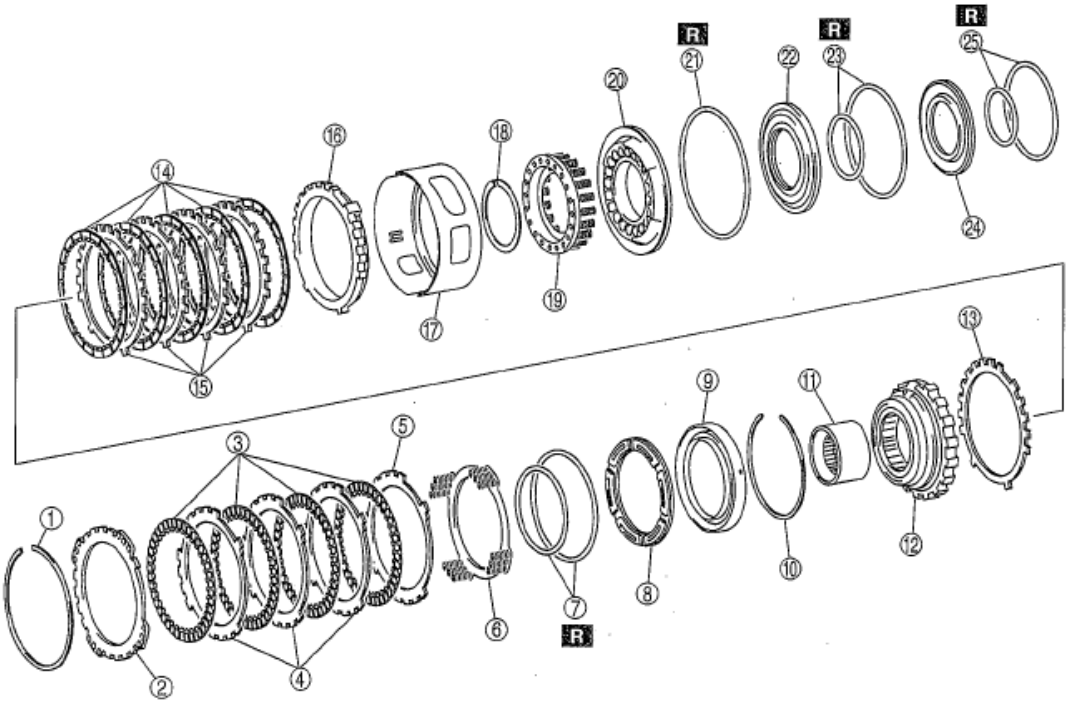


Fig. 241: Installing Snap Ring To Middle Planetary Ring Gear

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

Components



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

Fig. 242: B2, B4 Brake And F3 One-Way Clutch Component Disassembled View

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)

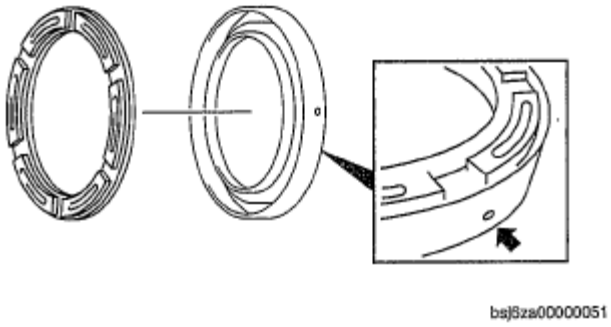


Fig. 243: Locating Oil Passage

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

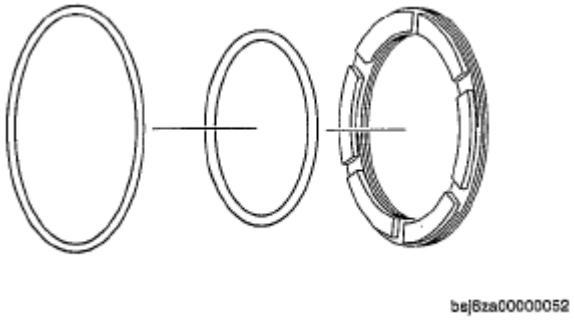


Fig. 244: Identifying O-Ring On B2 Brake Piston

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

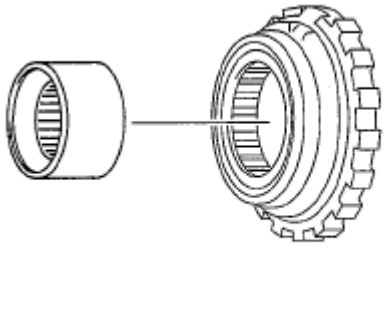


Fig. 245: Identifying Inner Race On F3 One-Way Clutch Component

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

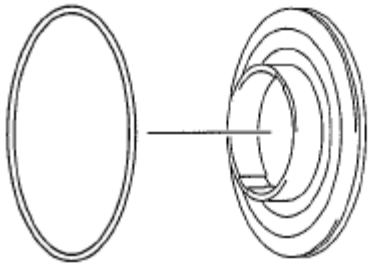


Fig. 246: Identifying O-Ring On B4 Brake Piston

5. Remove the O-ring from the sleeve.

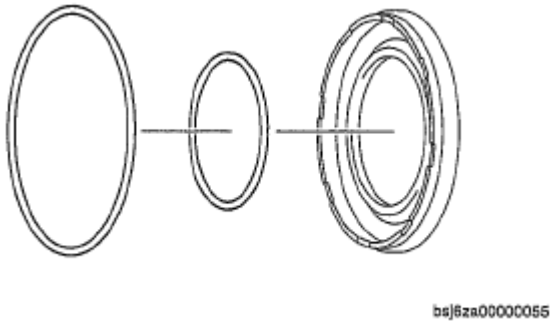


Fig. 247: Identifying O-Ring On Sleeve

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

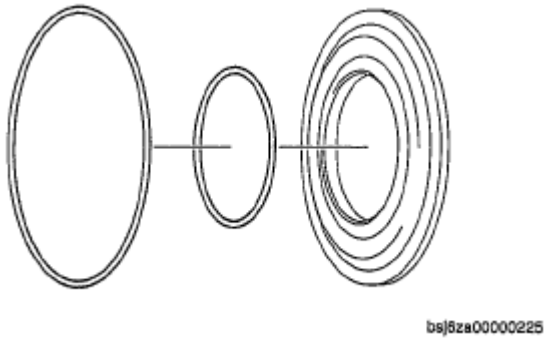


Fig. 248: Identifying O-Ring On Inner Brake Piston

B2, B4 BRAKE AND F3 ONE-WAY CLUTCH INSPECTION

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.

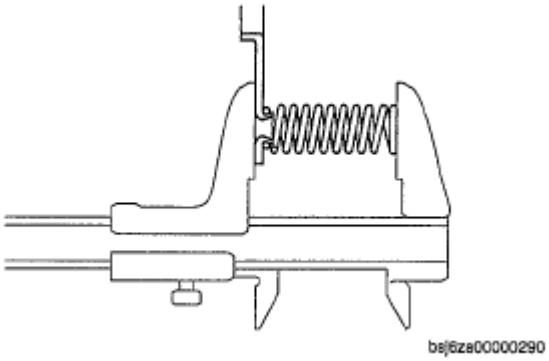


Fig. 249: Measuring Free Length Of Piston Return Spring

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.

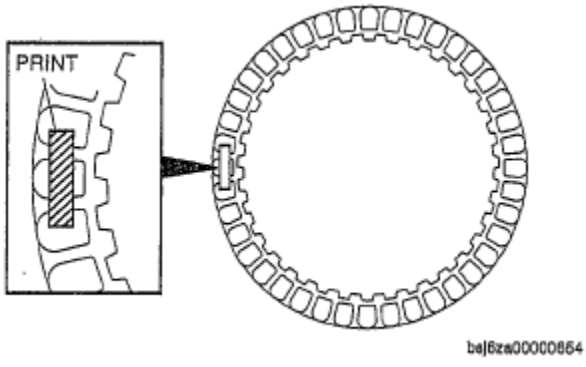


Fig. 250: Identifying Print Mark Location

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

3. Using vernier callpers, 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.

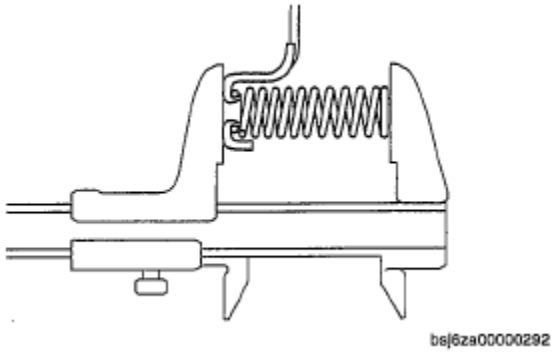


Fig. 251: Measuring Free Length Of Piston Return Spring

4. 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.

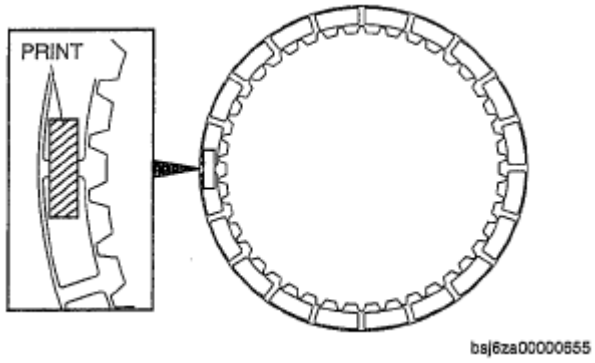


Fig. 252: Identifying Print Mark Location

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

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.

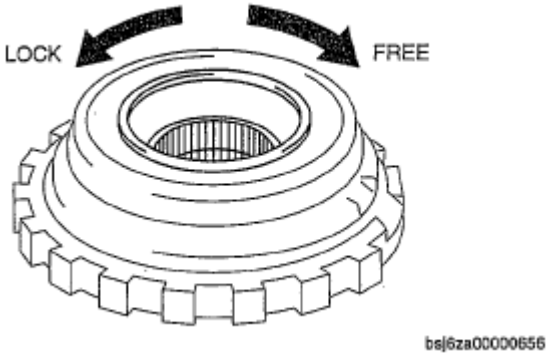
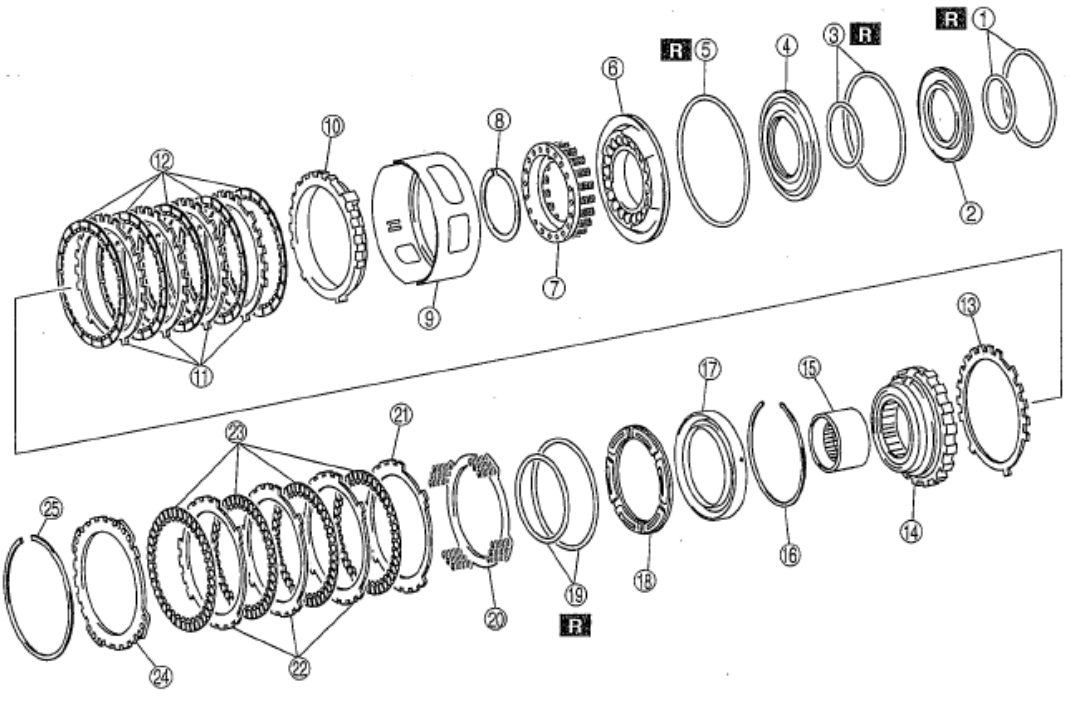


Fig. 253: F3 One-Way Clutch Rotation Position

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

Components



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

Fig. 254: Exploded View Of B2, B4 Brake And F3 One-Way Clutch Components

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.

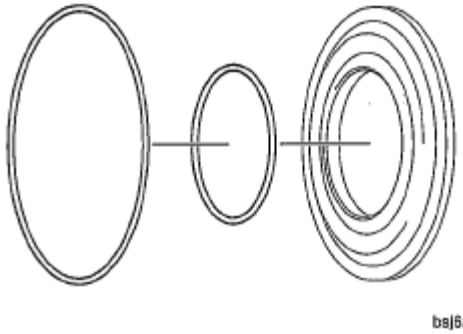


Fig. 255: Identifying O-Rings On B4 Brake Piston

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

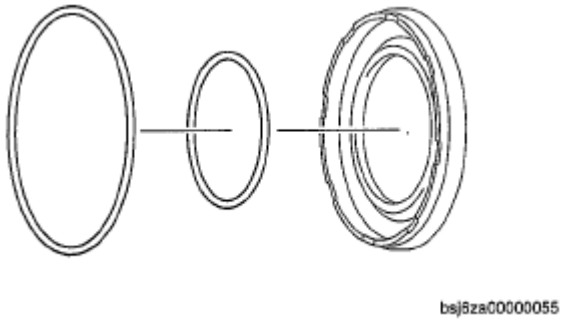


Fig. 256: Identifying O-Ring On Sleeve

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

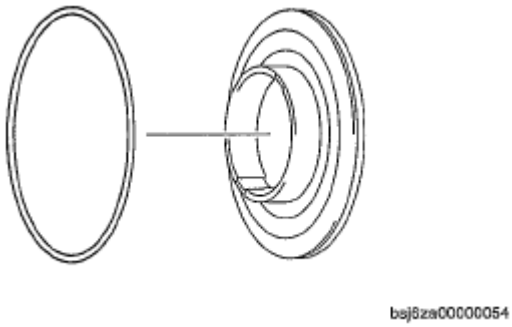


Fig. 257: Identifying O-Ring On B4 Brake Piston

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

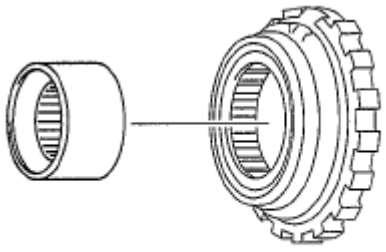


Fig. 258: Identifying Inner Race On F3 One-Way Clutch Component

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.**

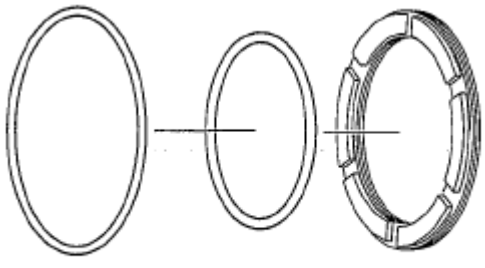


Fig. 259: Identifying O-Ring On B2 Brake Piston

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

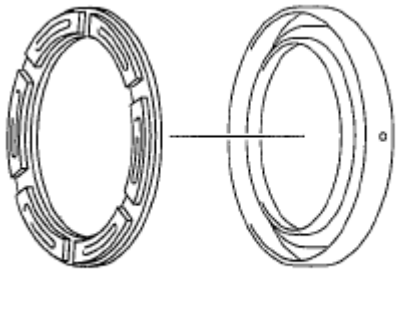
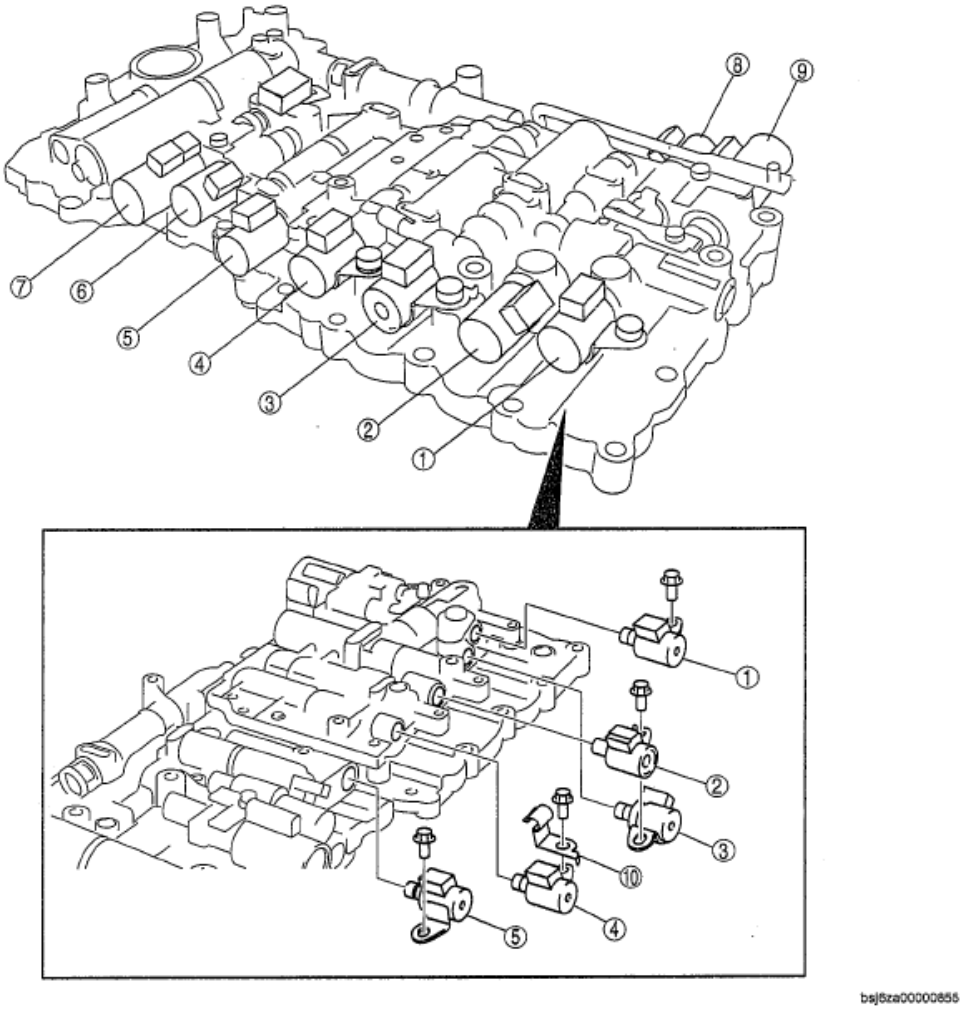


Fig. 260: Identifying B2 Brake Piston On Brake Cylinder

CONTROL VALVE BODY DISASSEMBLY/ASSEMBLY

Components



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

Fig. 261: Exploded View Of Control Valve Body

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.**

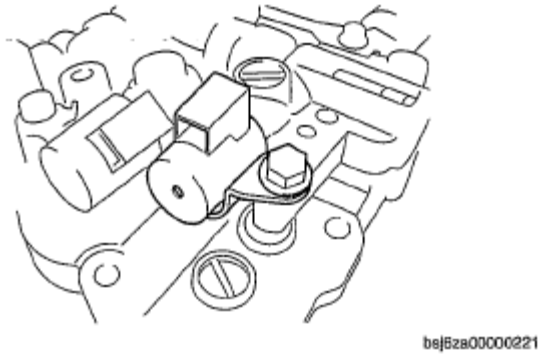


Fig. 262: Identifying Shift Solenoid C

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.**

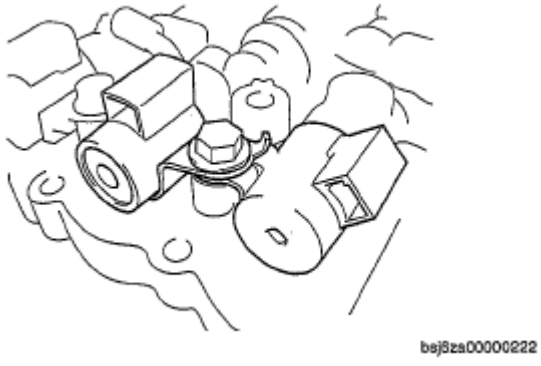


Fig. 263: Identifying Shift Solenoid B

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

CAUTION:
- **Do not damage the solenoid.**

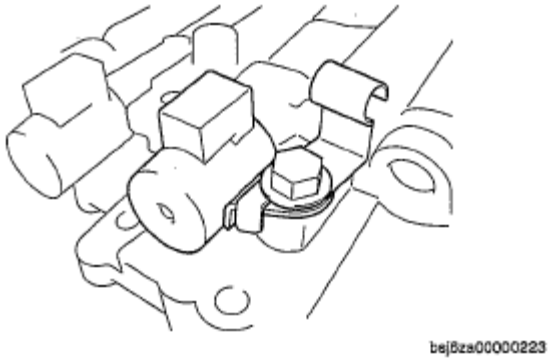


Fig. 264: Identifying Shift Solenoid A

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

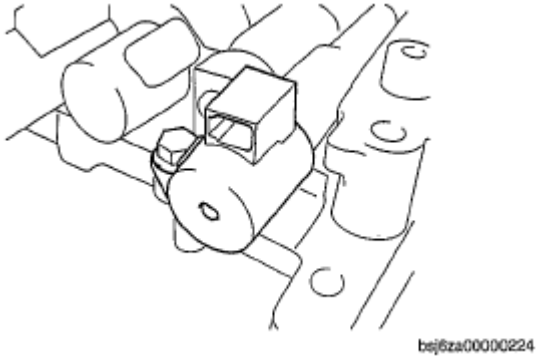


Fig. 265: Identifying Shift Solenoid E

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}

2. Install the bolt and the wiring harness clip.

CAUTION:
- **Do not damage the solenoid.**

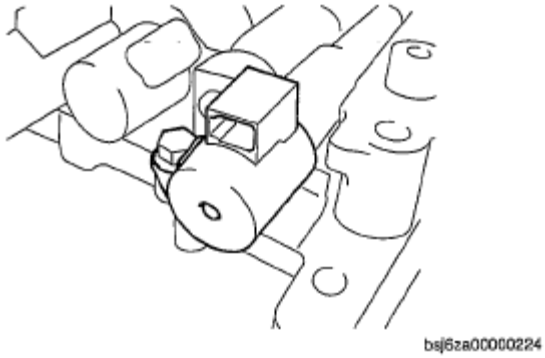


Fig. 266: Identifying Shift Solenoid E

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.**

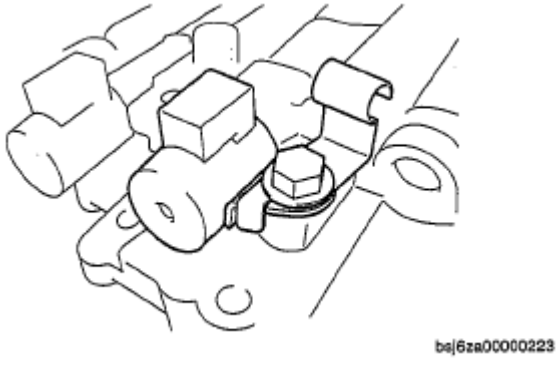


Fig. 267: Identifying Shift Solenoid A

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.**

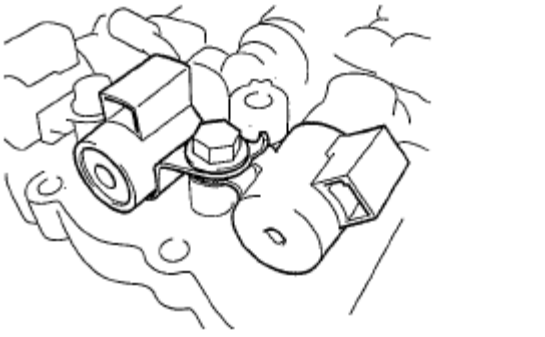


Fig. 268: Identifying Shift Solenoid B

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}

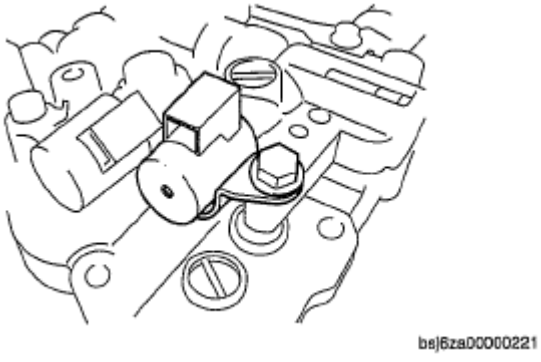
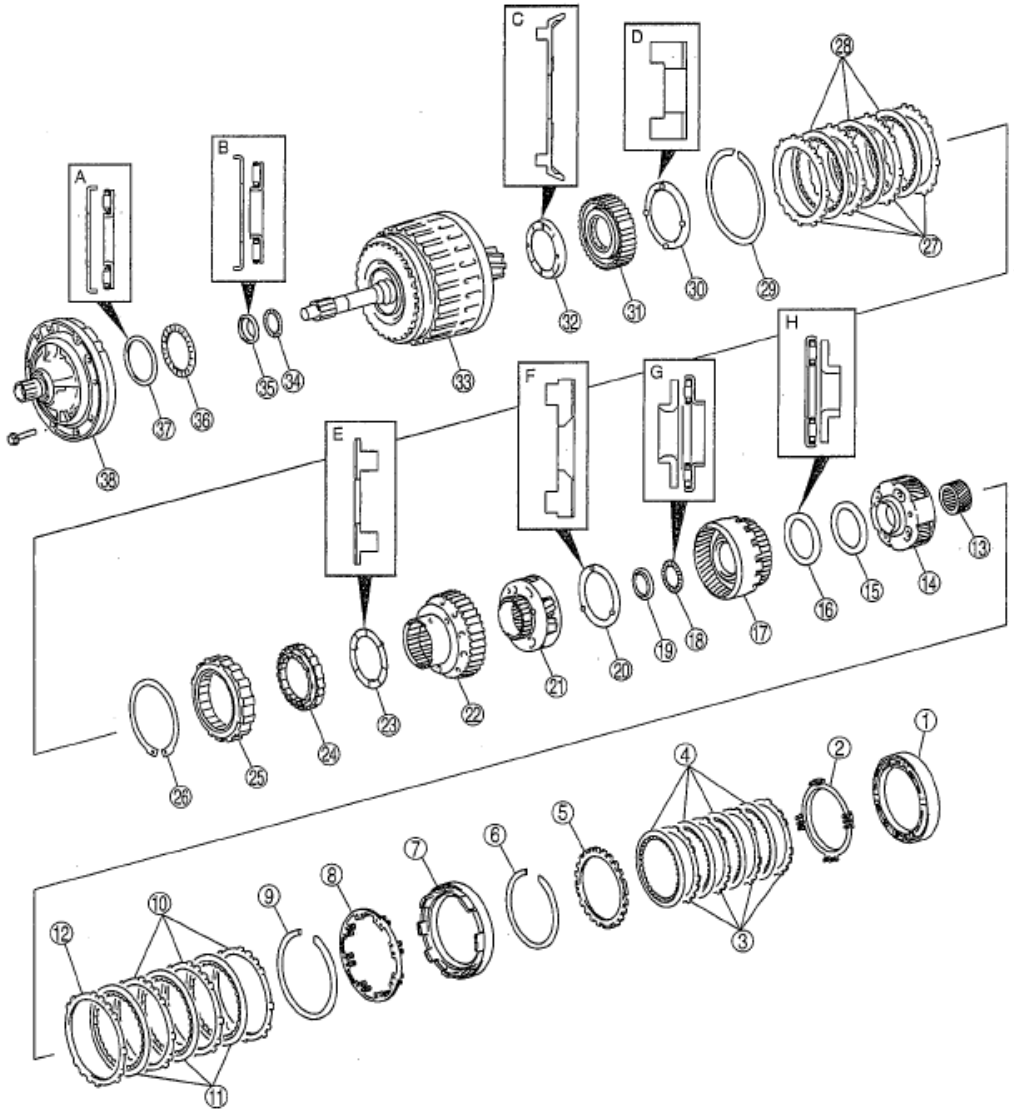


Fig. 269: Identifying Shift Solenoid C

AUTOMATIC TRANSMISSION ASSEMBLY

Assembly

Bearing and race locations

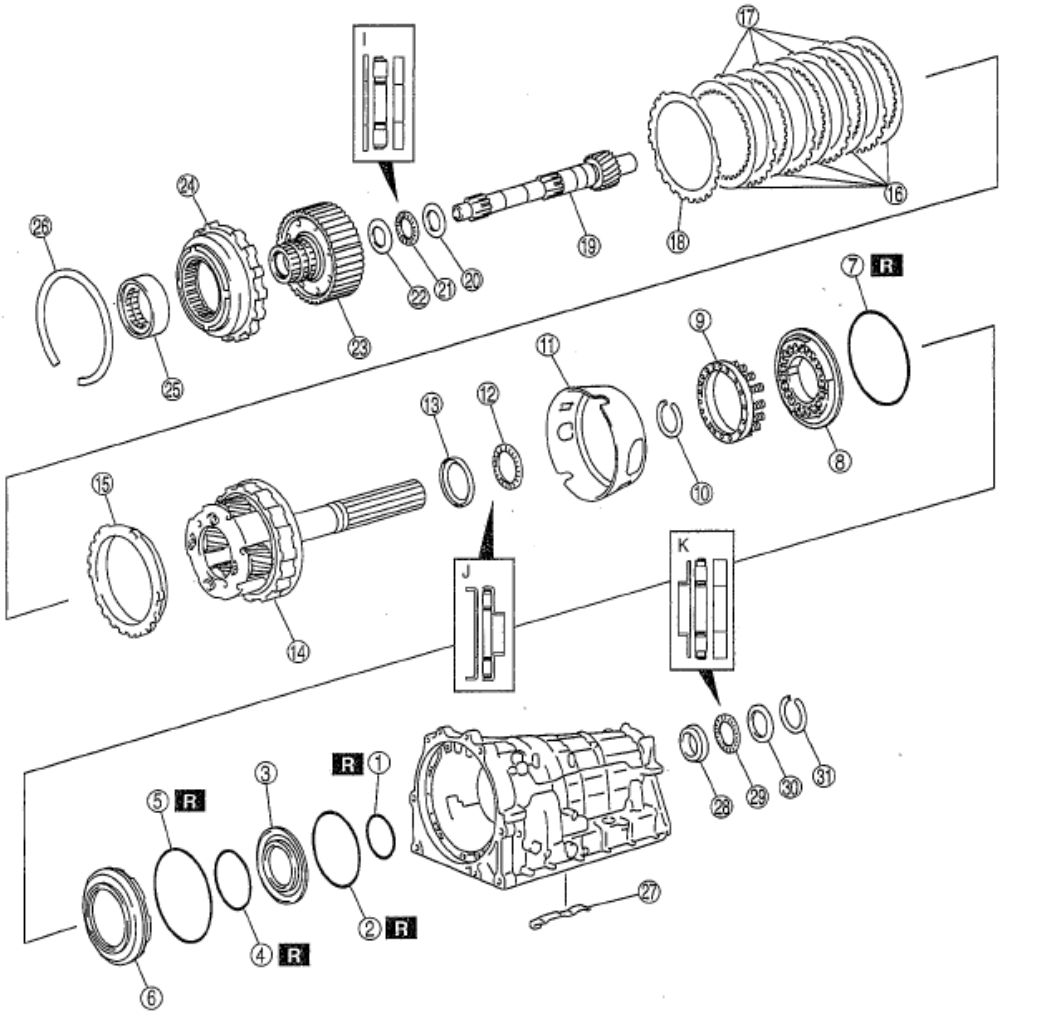


bsj6za00000856

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

Fig. 270: Exploded View Of Automatic Transmission Assembly With Bearing And Race Locations (1 Of 2)



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

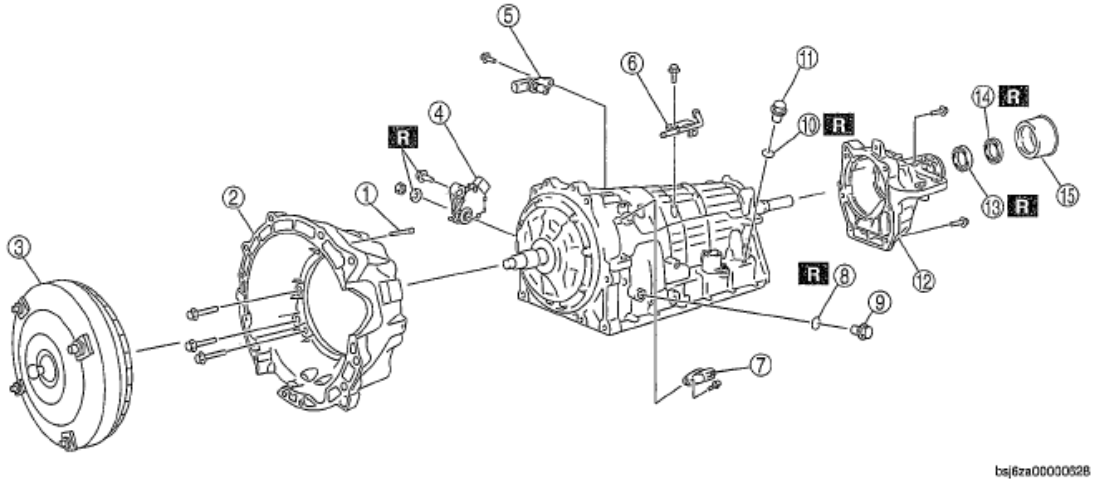
15	Driven plate
16	Drive plate
17	Driven plate
18	Retaining plate
19	Intermediate shaft
20	Bearing race
21	Needle bearing
22	Bearing race
23	Rear ring gear component
24	F3 one-way clutch
25	Inner race
26	Snap ring
27	Stopper spring
28	Bearing race
29	Thrust needle bearing
30	Bearing race
31	Snap ring

Fig. 271: Exploded View Of Automatic Transmission Assembly With Bearing And Race Locations (2 Of 2)

BEARING REFERENCE

		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}

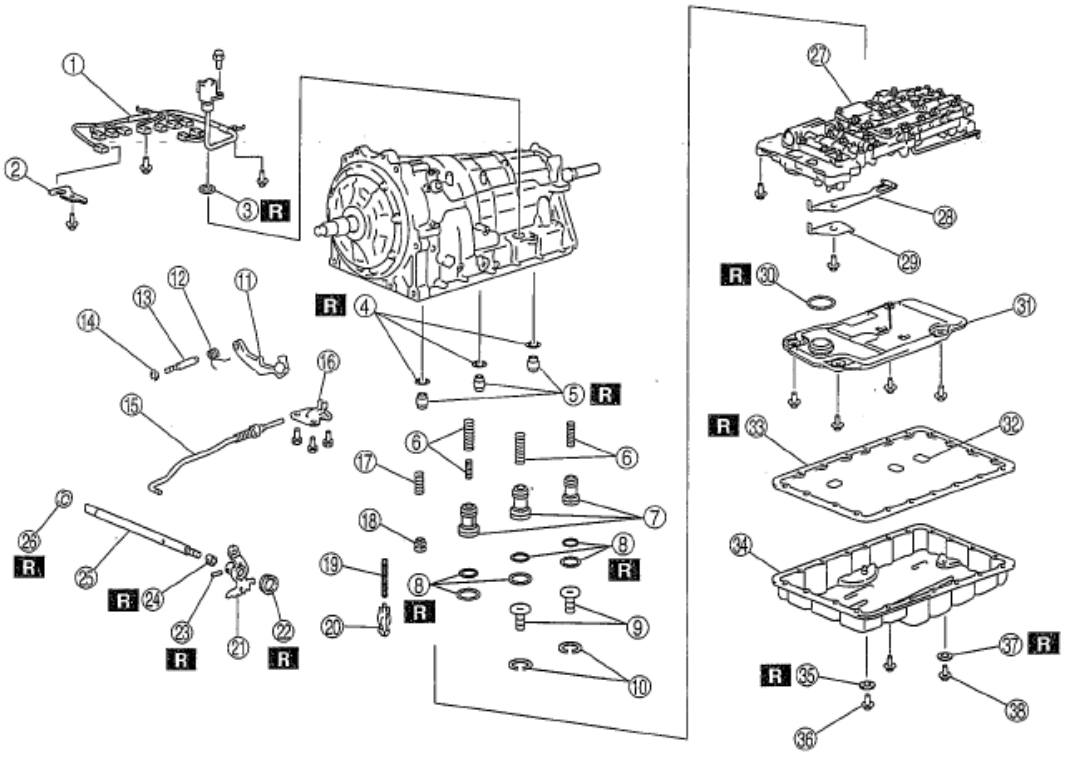
Components



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

Fig. 272: Exploded View Of Automatic Transmission Components (1 Of 2)



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

Fig. 273: Exploded View Of Automatic Transmission Components (2 Of 2)

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.**

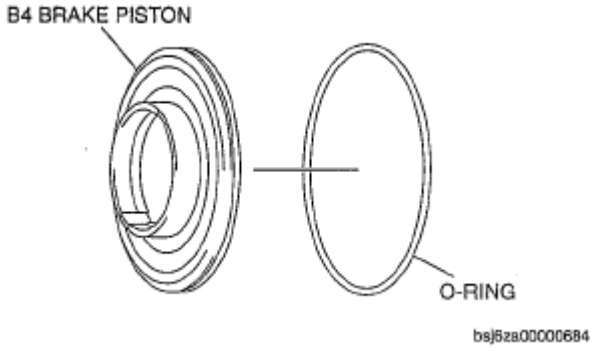


Fig. 274: Identifying O-Ring And B4 Brake Piston

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.**

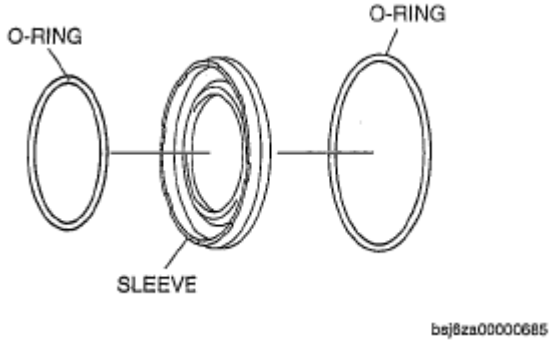


Fig. 275: Identifying O-Ring And Sleeve

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

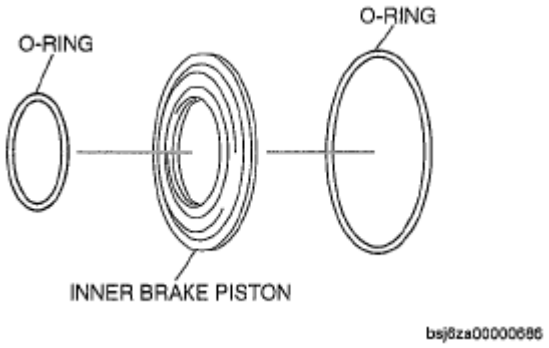


Fig. 276: Identifying O-Ring And Inner Brake Piston

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

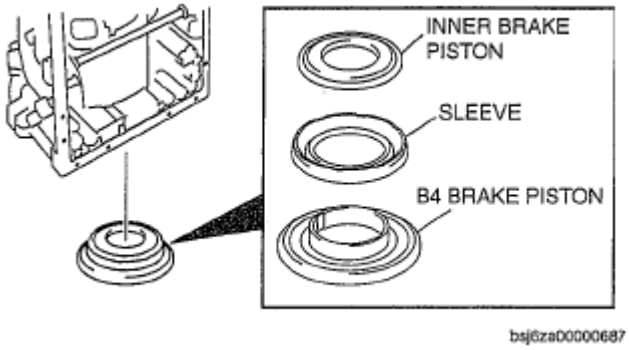


Fig. 277: Identifying Inner Brake Piston, Sleeve And B4 Brake Piston

9. Install the piston return spring.

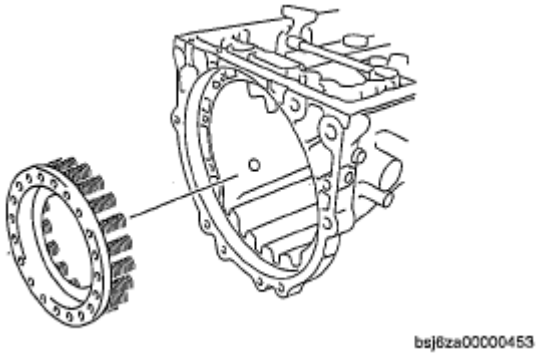


Fig. 278: Identifying Piston Return Spring

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.**

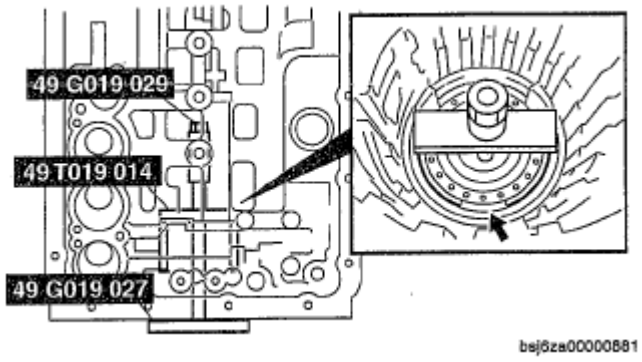


Fig. 279: Identifying SST For Compressing Piston Return Spring

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.**

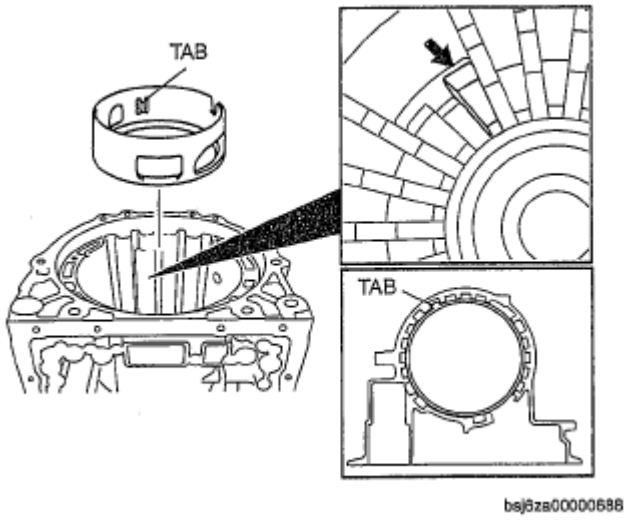


Fig. 280: Identifying Tabs Of Brake Tube

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.

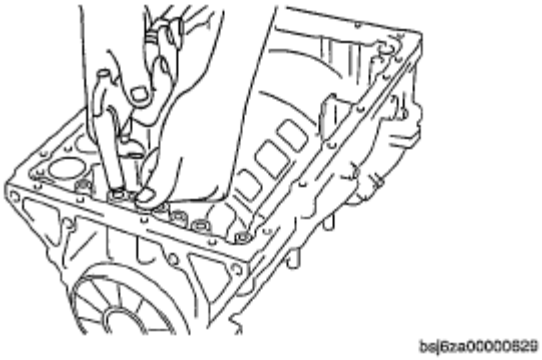


Fig. 281: Blowing Compressed Air Into Transmission Case

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}

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

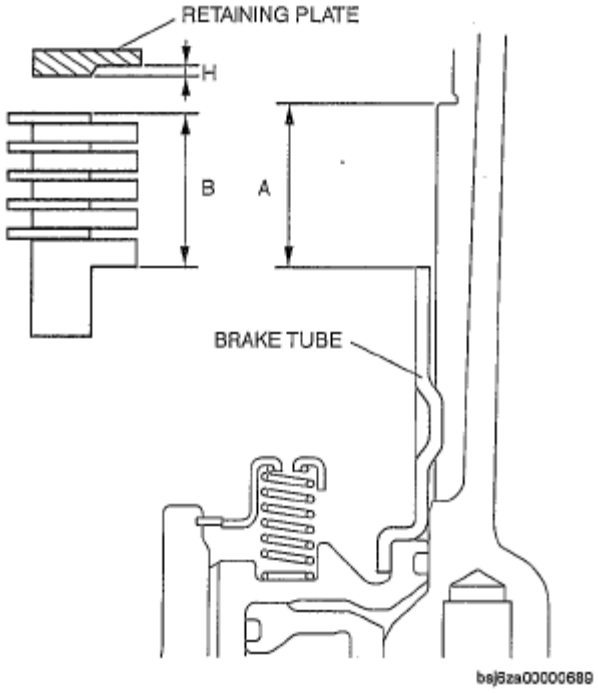


Fig. 282: Identifying Dimension A And B

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})

RETAINING PLATE THICKNESS

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.

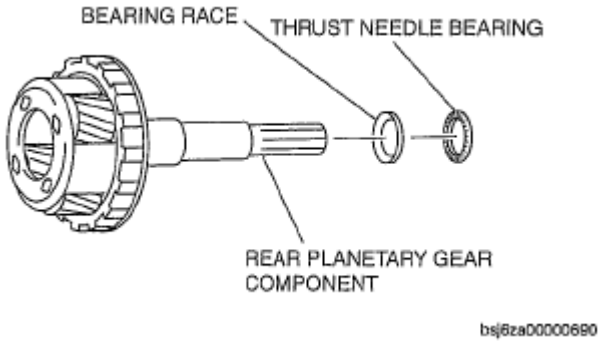


Fig. 283: Identifying Bearing Race, Thrust Needle Bearing And Rear Planetary Gear Component

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

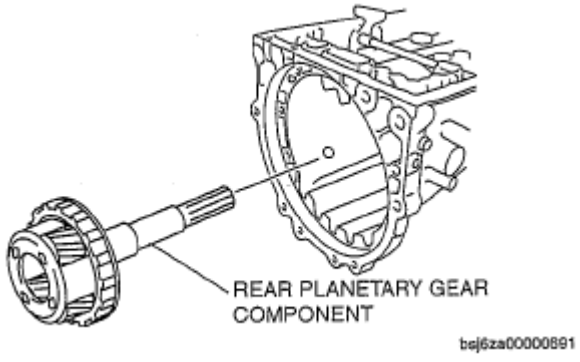


Fig. 284: Identifying Rear Planetary Gear Components

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.**

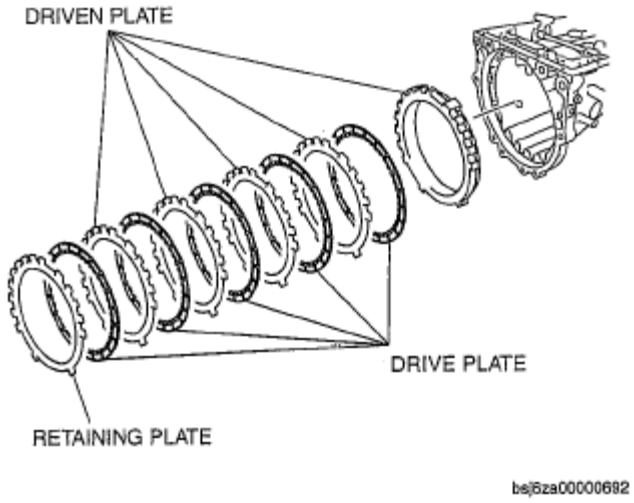


Fig. 285: Identifying Retaining Plates, Drive And Driven Plates

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

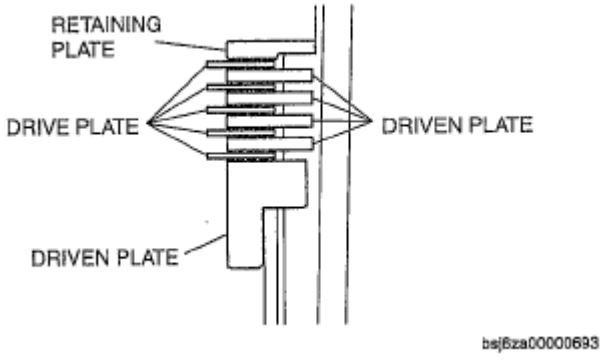


Fig. 286: Identifying Retaining Plate, Drive Plates And Driven Plates

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

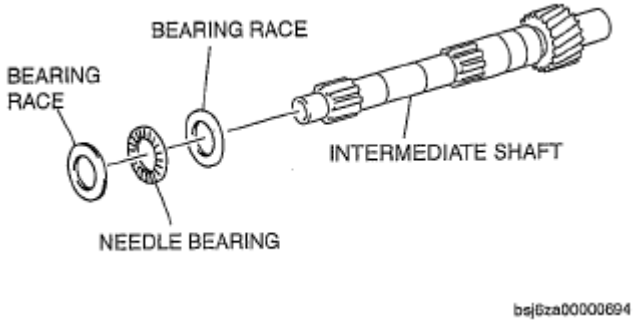


Fig. 287: Identifying Bearing Race And Needle Bearing Race

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

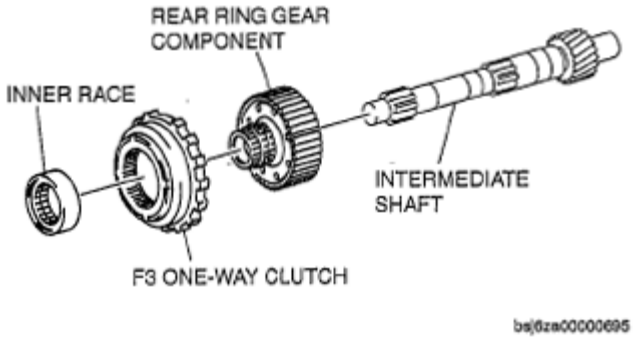


Fig. 288: Identifying Rear Ring Gear Component, F3 One-Way Clutch And Inner Race

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

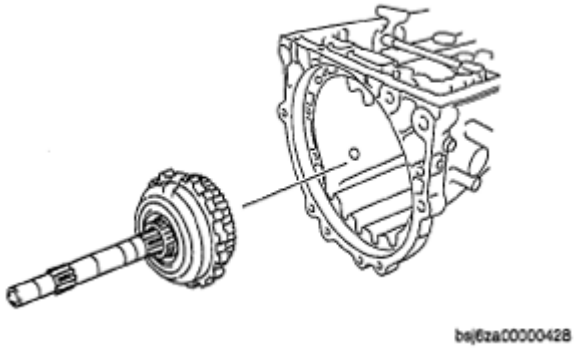


Fig. 289: Identifying Intermediate Shaft Component

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.**

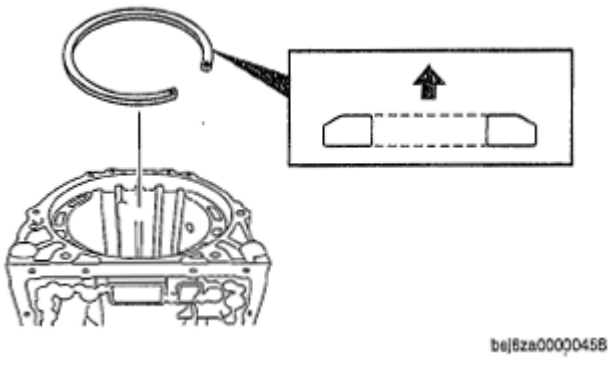


Fig. 290: Identifying Snap Ring Position

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

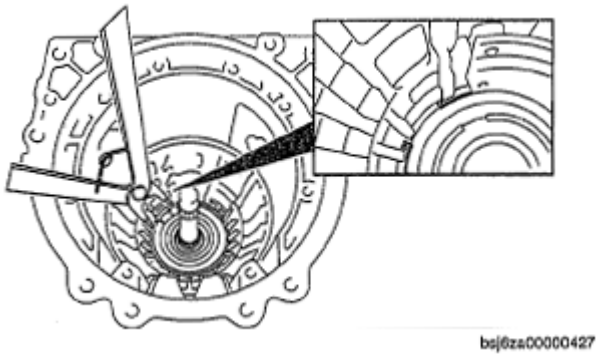


Fig. 291: Installing Snap Ring To Transmission Case Using Snap Ring Pliers

26. Install the stopper spring to the transmission case.

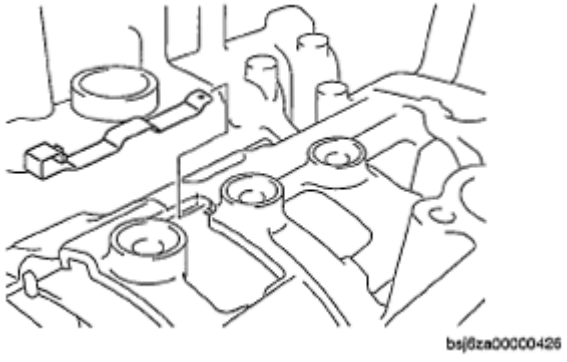


Fig. 292: Identifying Stopper Spring On Transmission Case

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.**

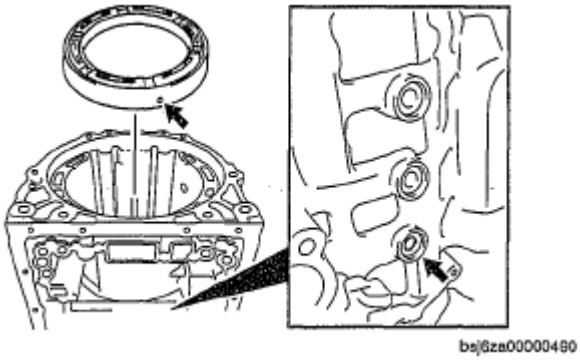


Fig. 293: Positions For Aligning Opening Of Snap Ring

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.

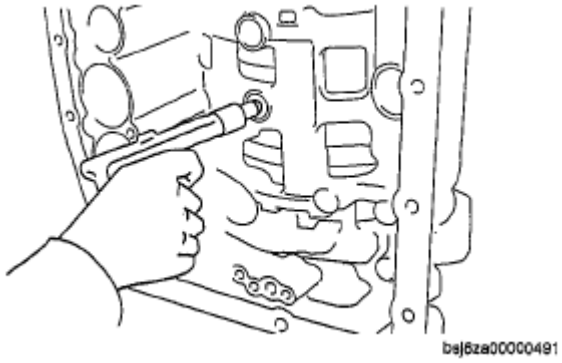


Fig. 294: Blowing Compressed Air Into Transmission Case

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}

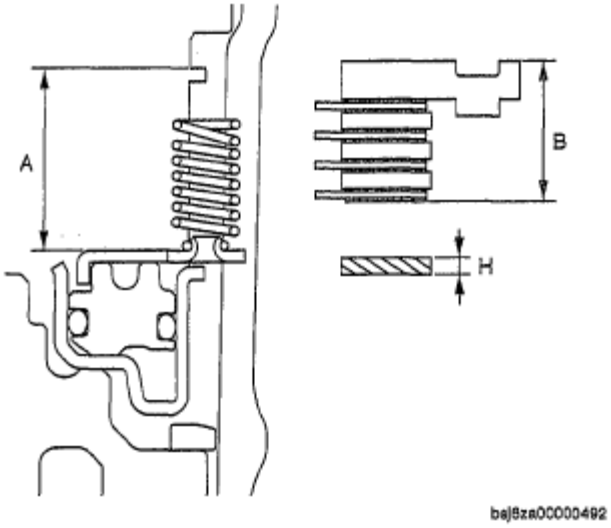


Fig. 295: Identifying Dimension A, B And H

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})

    RETAINING PLATE THICKNESS

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.**

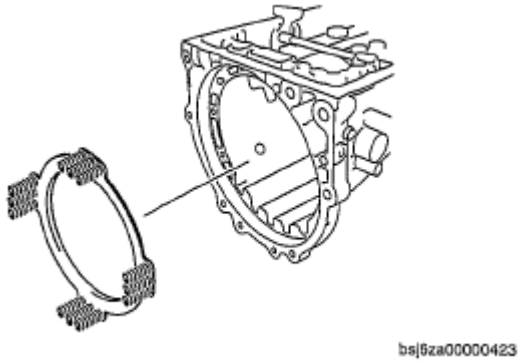


Fig. 296: Identifying Piston Return Spring

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

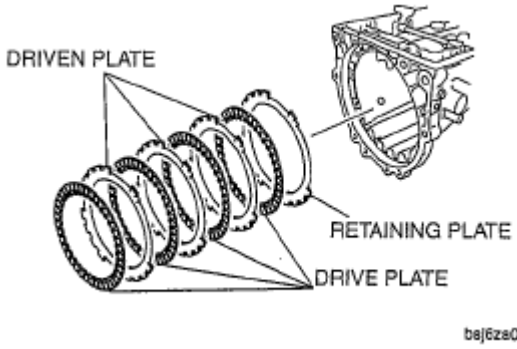


Fig. 297: Identifying Retaining Plate, Drive Plate And Driven Plates

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

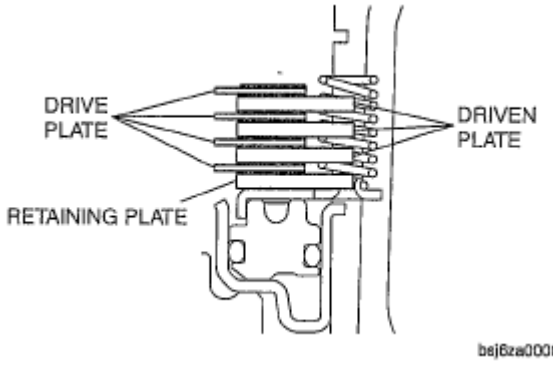


Fig. 298: Identifying Retaining Plate, Drive Plate Component And Driven Plates

36. Install the retaining plate to the transmission case.

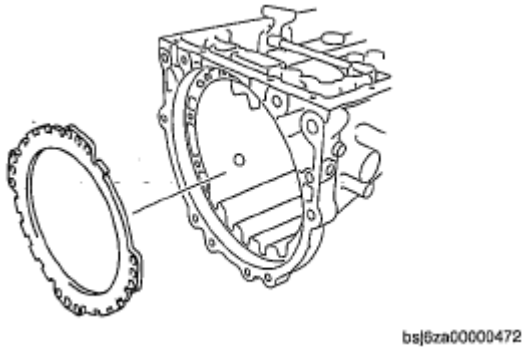


Fig. 299: Identifying Retaining Plate

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.**

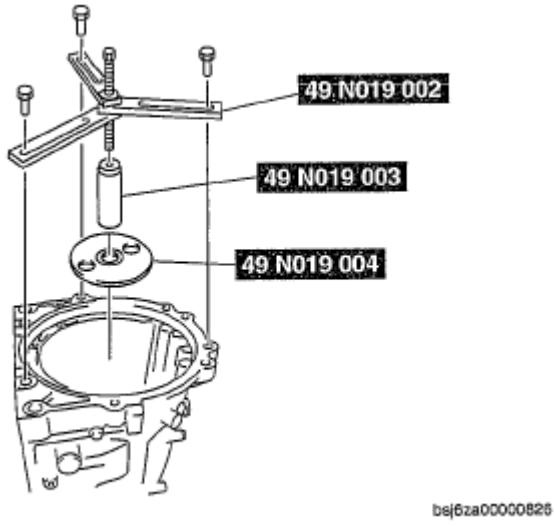


Fig. 300: Identifying SST

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.**

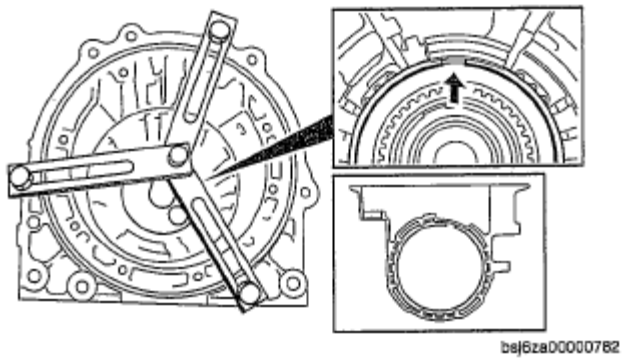


Fig. 301: Position For Installing Snap Ring

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

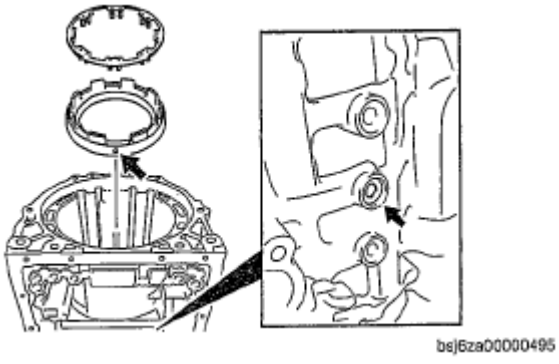


Fig. 302: Positions For Installing B1 Brake Piston Component And Return Spring

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

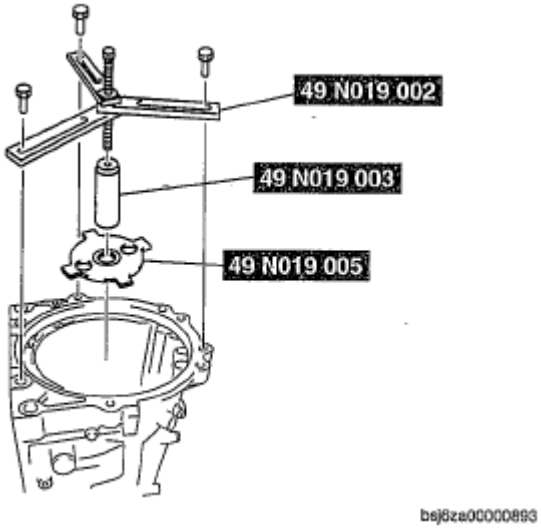


Fig. 303: Identifying SST

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.**

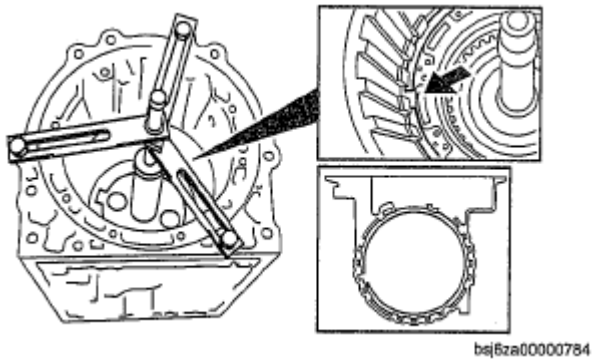


Fig. 304: Position For Installing Snap Ring

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.

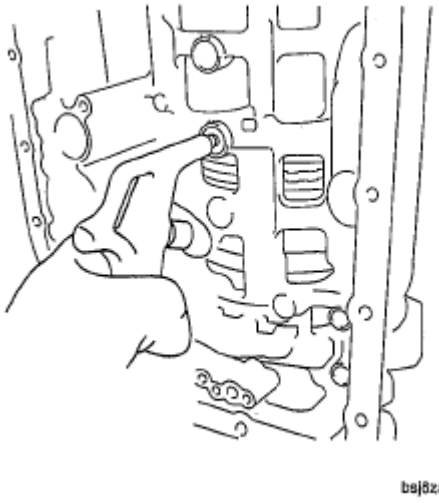


Fig. 305: Blowing Compressed Air Into Transmission Case

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.

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}

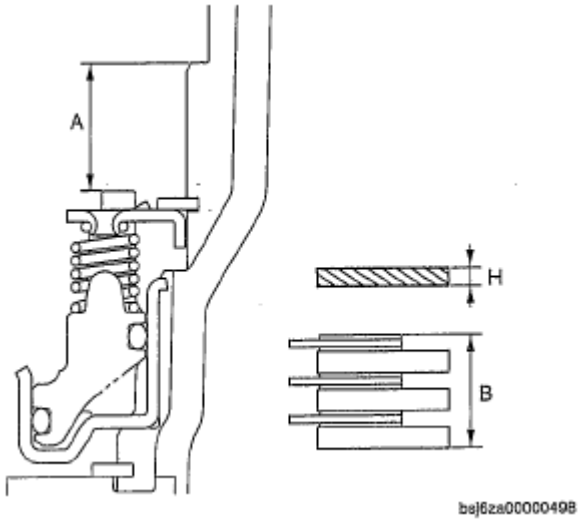


Fig. 306: Identifying Dimension A, B And H

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})

RETAINING PLATE THICKNESS

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.

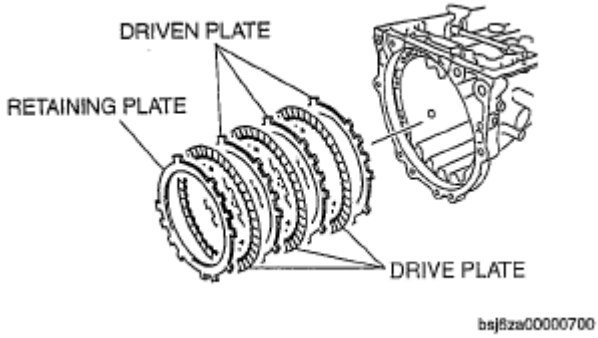


Fig. 307: Identifying Drive Plate, Driven Plates And Retaining Plate

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.

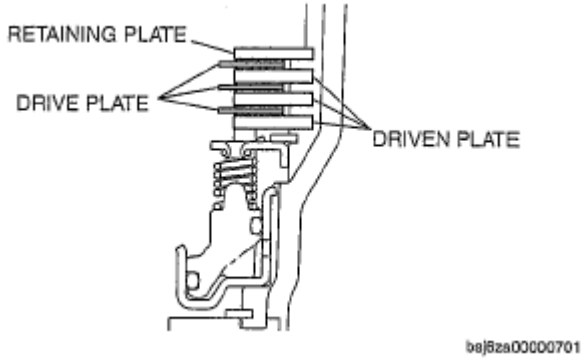


Fig. 308: Identifying Driven Plates, Drive Plate And Retaining Plate

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.

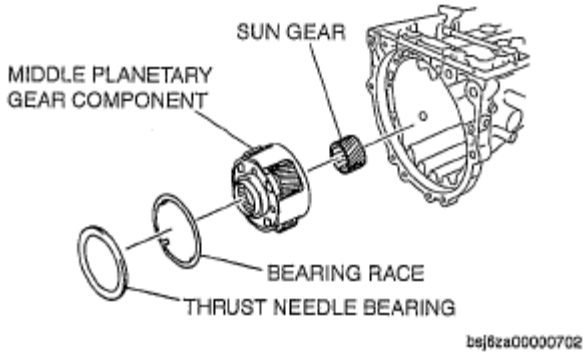


Fig. 309: Identifying Middle Planetary Gear Component And Sun Gear

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

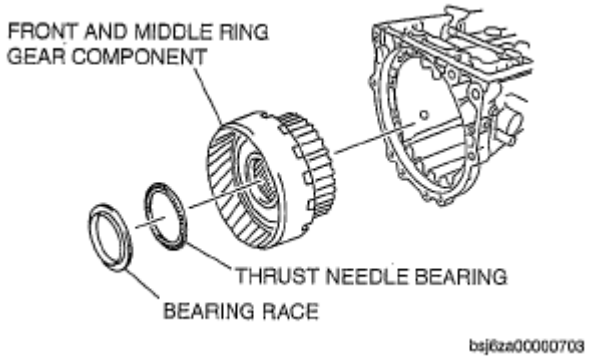


Fig. 310: Identifying Front And Middle Planetary Gear Ring Component And Thrust Needle Bearing

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.

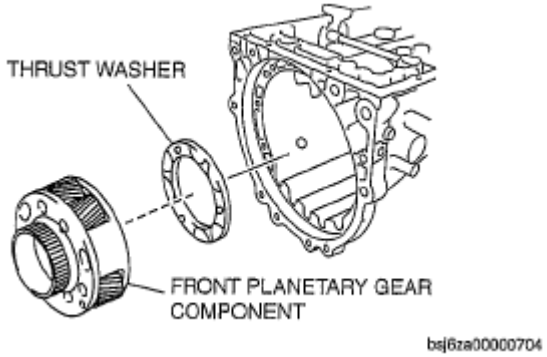


Fig. 311: Identifying Thrust Washer And Front Planetary Gear Component

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

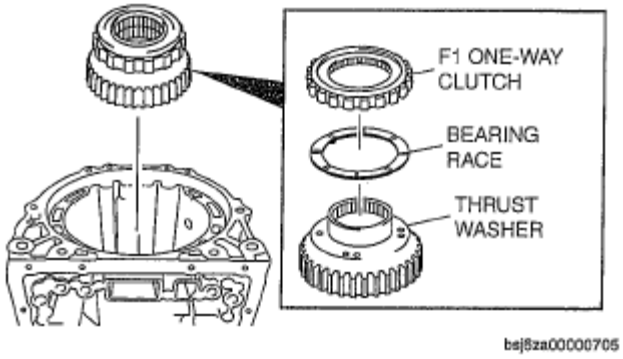


Fig. 312: Identifying F1 One-Way Clutch Component

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**

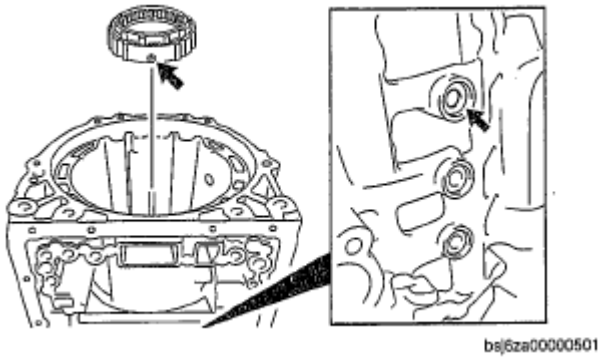


Fig. 313: Position For Aligning Hole Of Brake Piston

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.**

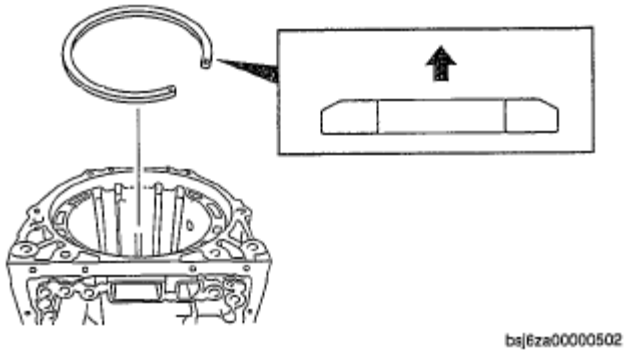


Fig. 314: Position For Installing Snap Ring

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.**

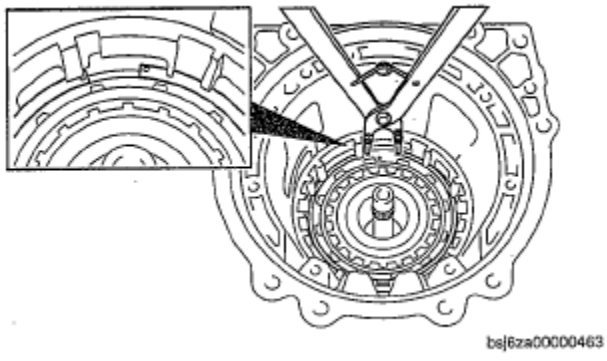


Fig. 315: Installing Snap Ring Using Snap Ring Pliers

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.**

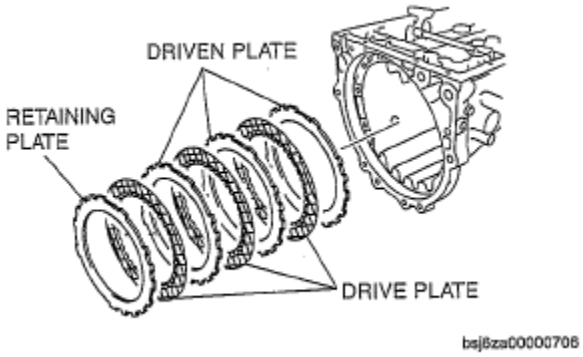


Fig. 316: Identifying Retaining Plate, Drive And Driven Plates

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

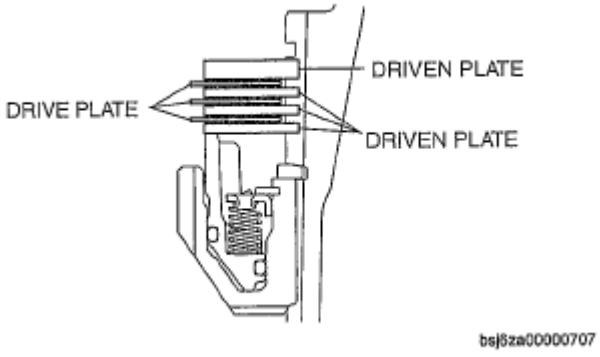


Fig. 317: Identifying Driven Plates, Drive Plate And Retaining Plate

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.**

64. Apply ATF to the thrust washer and install it to the F2 one-way clutch component.

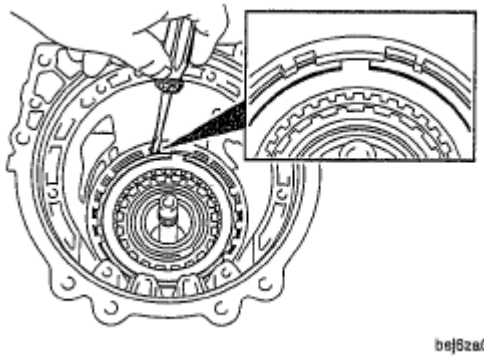


Fig. 318: Installing Snap Ring Using Flathead Screwdriver

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

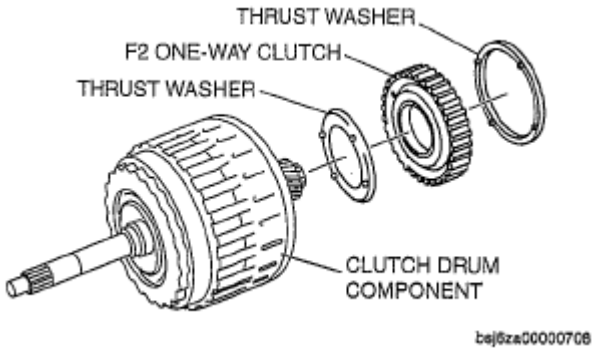


Fig. 319: Identifying F2 One-Way Clutch Component To Clutch Drum Component

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

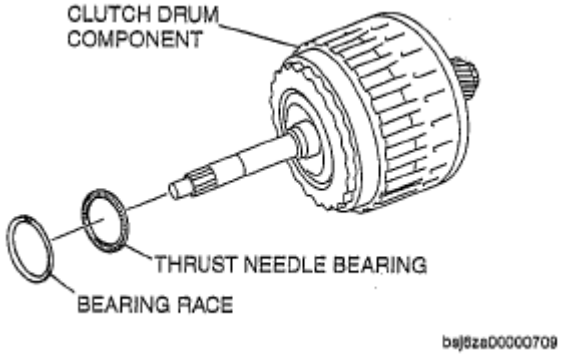


Fig. 320: Identifying Bearing Race, Thrust Needle Bearing And Clutch Drum Component

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.

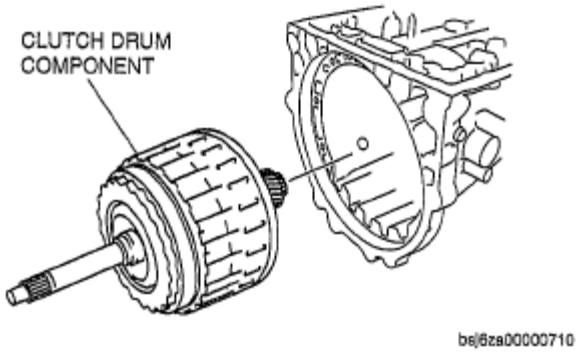


Fig. 321: Identifying Clutch Drum Component

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

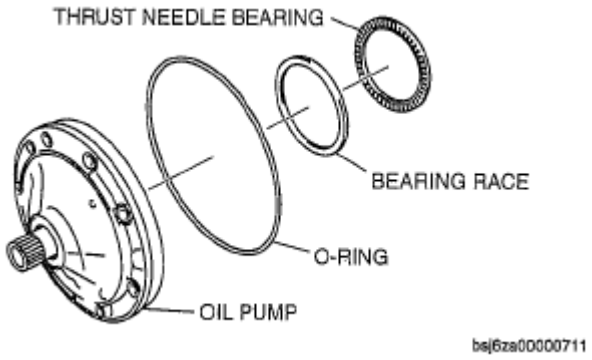


Fig. 322: Identifying Thrust Needle Bearing, Bearing Race And O-Ring

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

CAUTION:
- **Do not drop the oil pump.**

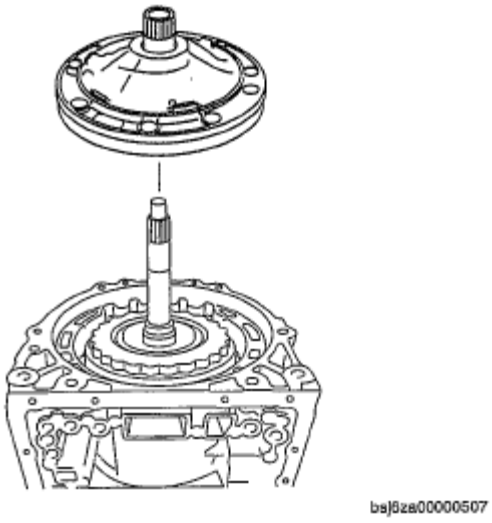


Fig. 323: Identifying Oil Pump

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.lb}

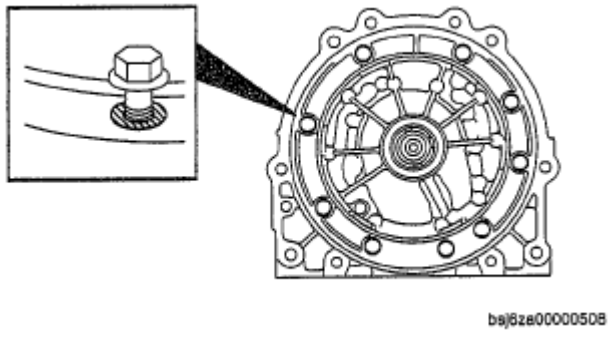


Fig. 324: Identifying Bolt

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.

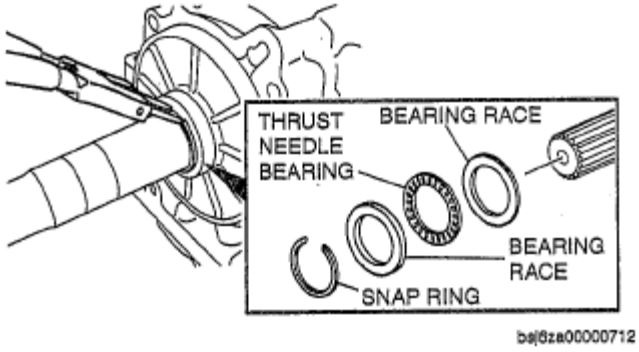


Fig. 325: Installing Thrust Needle Bearing And Bearing Race

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.

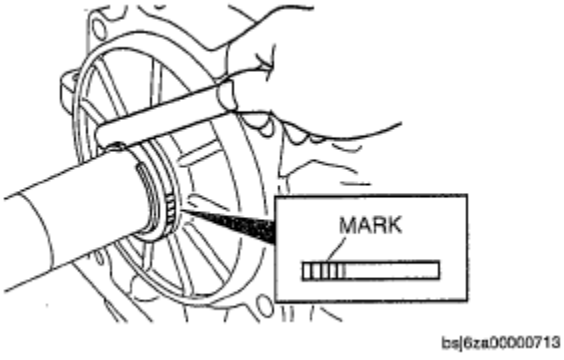


Fig. 326: Measuring Clearance Between Snap Ring And Bearing Race Using Thickness Gauge

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}

Fig. 327: Retaining Plate Size Reference Chart

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}

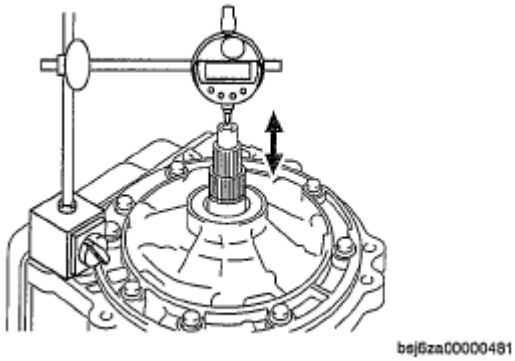


Fig. 328: Measuring Input Shaft End Play Using Dial Indicator

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

CAUTION:
- **Do not damage the transmission case.**

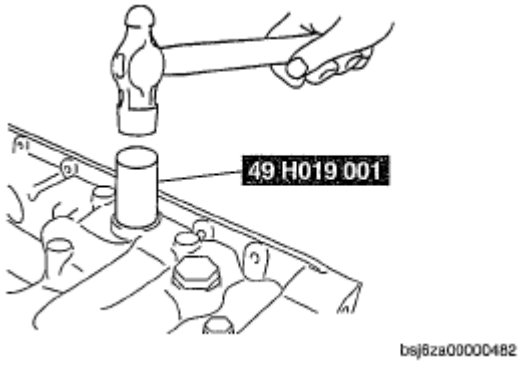


Fig. 329: Installing Oil Seal Using SST And Hammer

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.

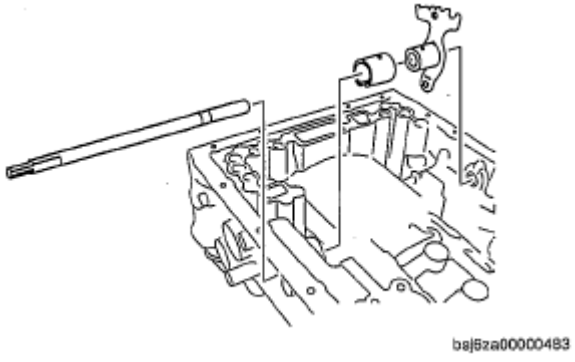


Fig. 330: Identifying Manual Shaft Washer And Manual Valve

83. Tap in a new pin using a hammer.

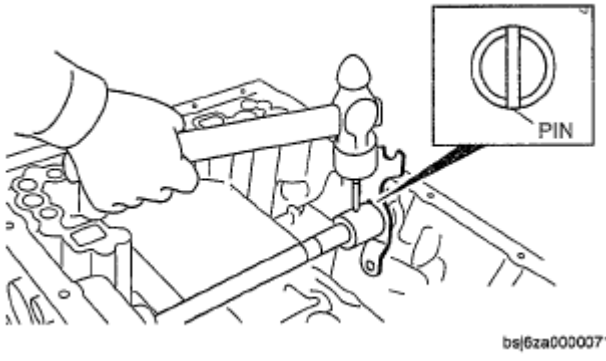


Fig. 331: Tapping Pin Using Hammer

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

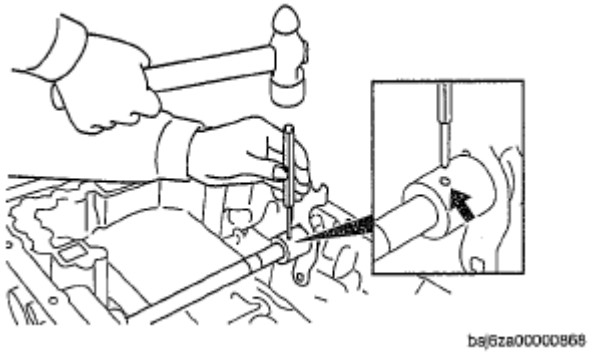


Fig. 332: Locating Spacer Hole

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.**

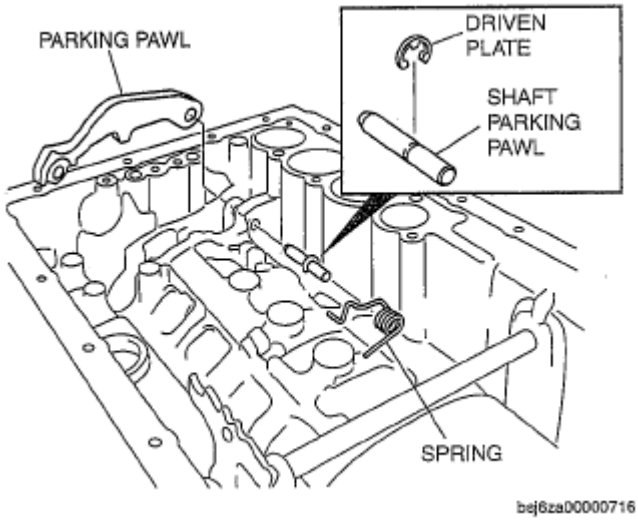


Fig. 333: Identifying Driven Plate, Parking Pawl Shaft And Parking Pawl

89. Connect the parking rod to the manual valve.

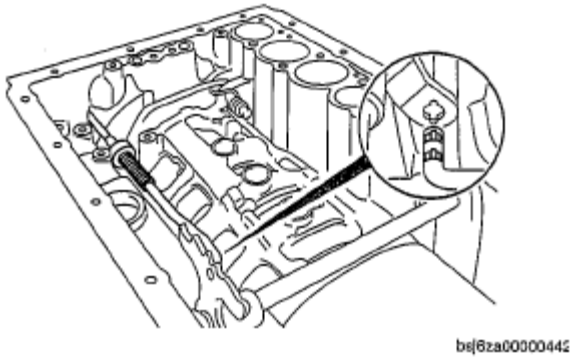


Fig. 334: Identifying Parking Rod On Manual Valve Lever

90. Install the bracket.

Tightening torque

5.9-8.8 N.m {60.2-89.7 kgf.cm, 52.3-77.8 in.lbf}

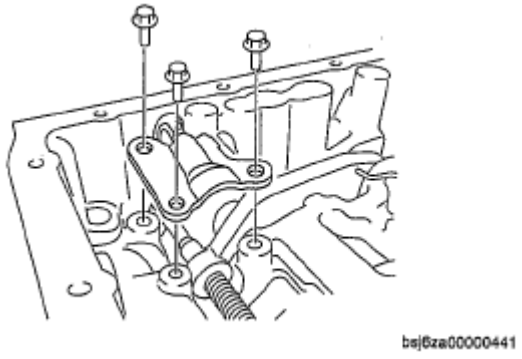


Fig. 335: Identifying Bracket Bolts

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.

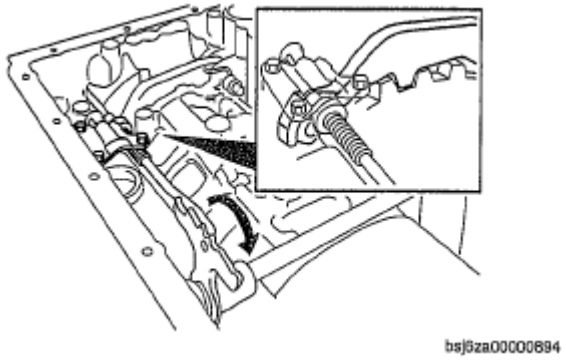


Fig. 336: Engaging Parking Pawl Shaft

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

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

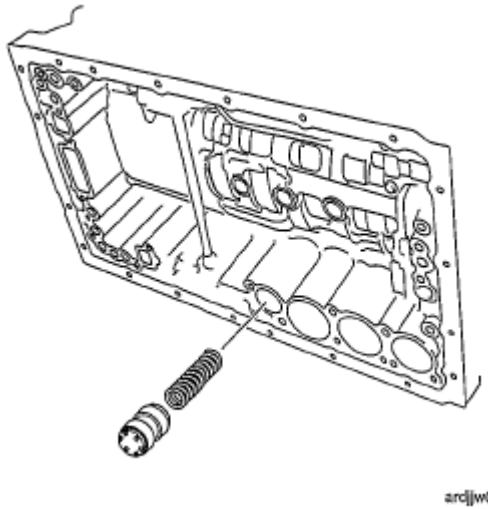


Fig. 337: Identifying Accumulator Valve And Compression Spring

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

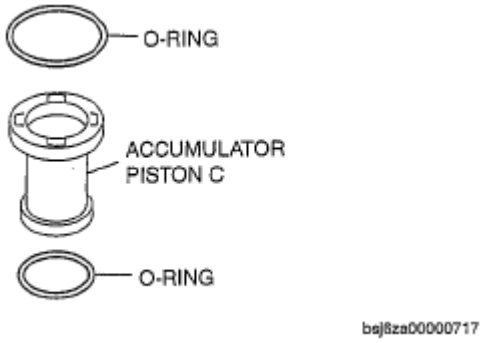


Fig. 338: Identifying O-Ring And Accumulator Pistons C

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

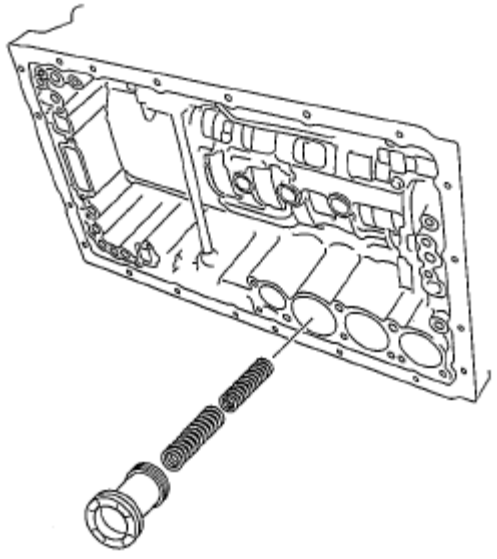


Fig. 339: Identifying Accumulator Piston C And Compression Spring

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

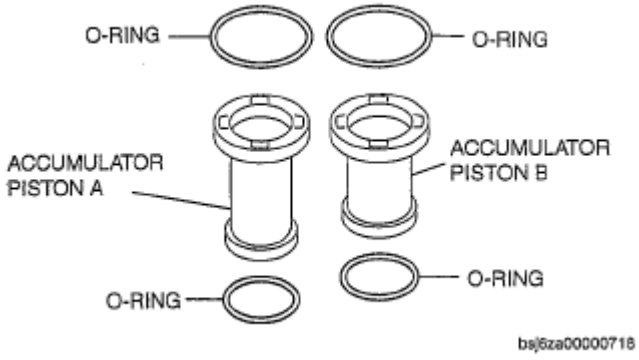


Fig. 340: Identifying O-Ring On Accumulator Pistons A, B

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

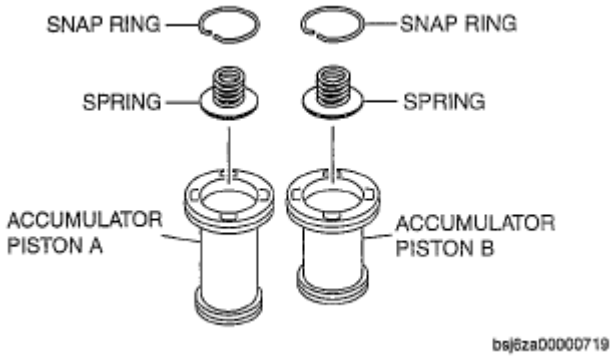


Fig. 341: Identifying Snap Ring On Accumulator Pistons A, B

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

CAUTION:
- **Do not damage gasket.**

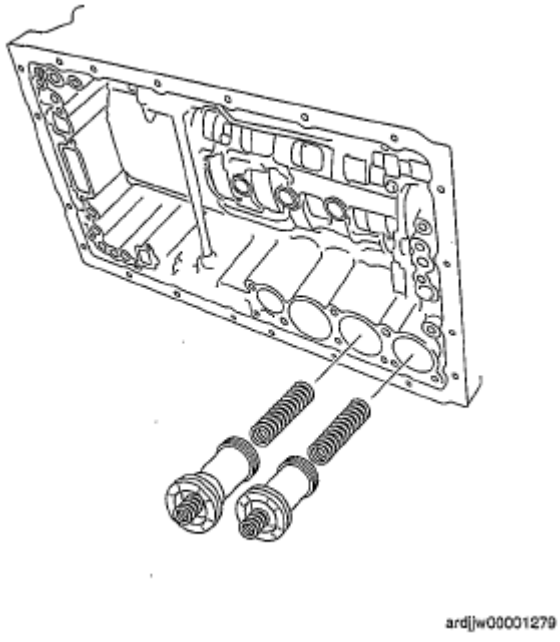


Fig. 342: Identifying Accumulator Pistons A, B And Compression Spring

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

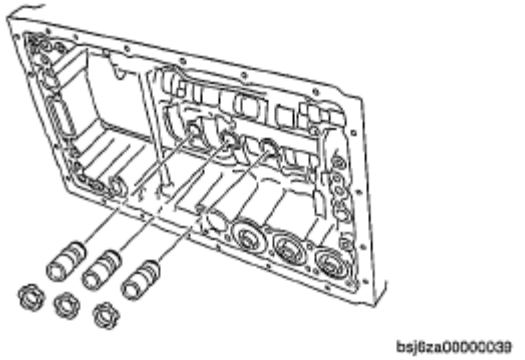


Fig. 343: Identifying Transmission Case And Brake Drum Gasket

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

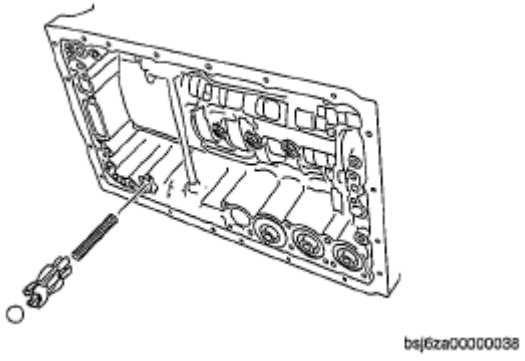


Fig. 344: Identifying Check Valve Subcomponent And Compression Spring

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.**

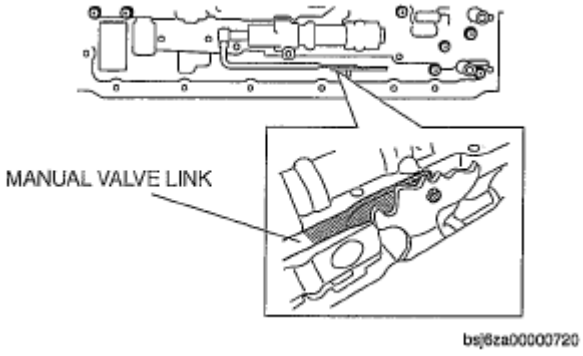


Fig. 345: Identifying Manual Valve Link

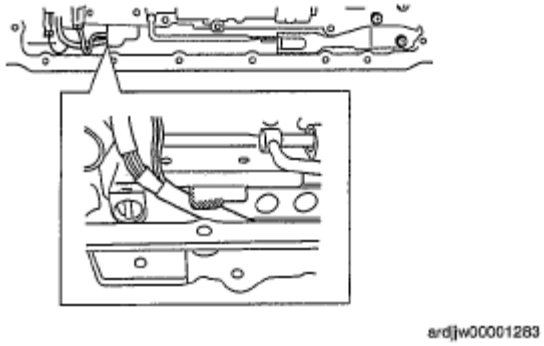


Fig. 346: Position For Installing Control Valve Body Component

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.**

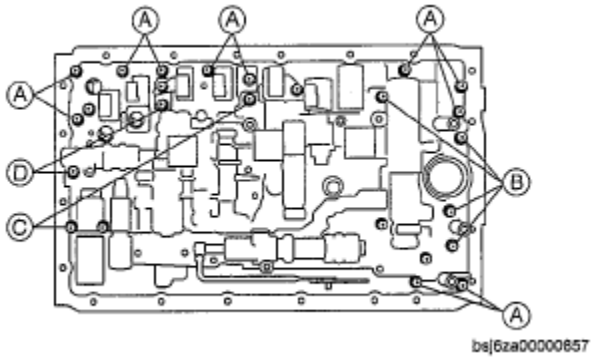


Fig. 347: Identifying Transmission Case Bolts

- **Tighten the bolts from the inner side.**

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.

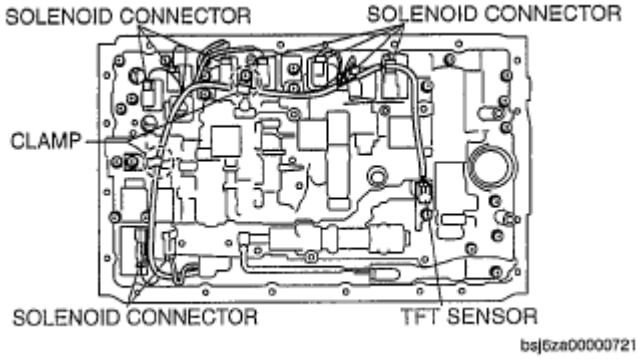


Fig. 348: Identifying Solenoid Connector

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.**

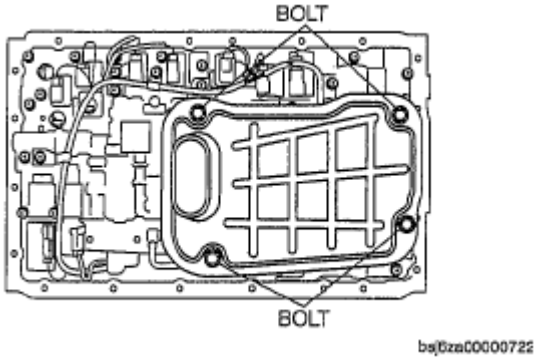


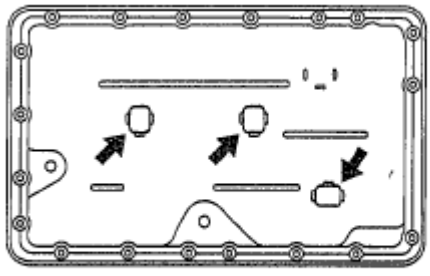
Fig. 349: Identifying Bolts On Control Valve Body

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.**



be|8za00000033

Fig. 350: Locating Magnet On Oil Pan

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}

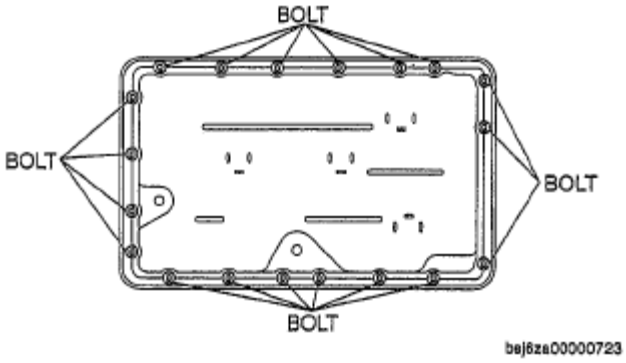


Fig. 351: Identifying Transmission Case Bolts

113. Remove the silicons 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.

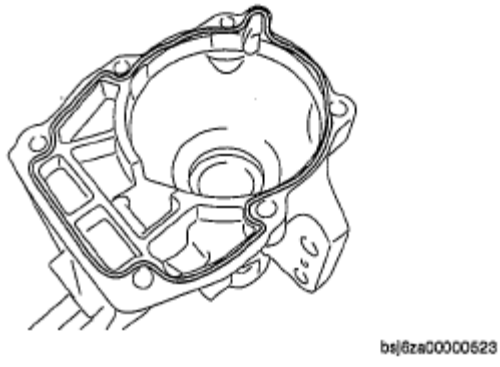
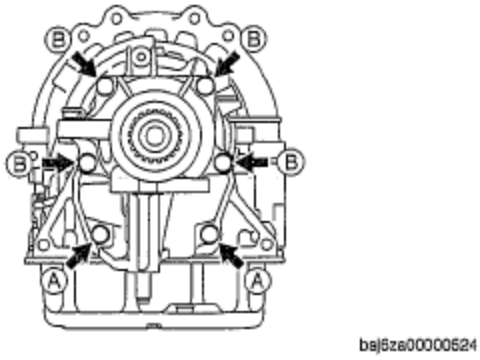


Fig. 352: Identifying Sealant Application Area On Extension Housing

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



baj6za00000624

Fig. 353: Locating Bolts On Transmission Case

TRANSMISSION CASE BOLTS REFERENCE

Bolt number	Bolt size	Length (measured from below the head) (mm {in})
A	M10-1.5	35 {1.38}
B	M 10-1.5	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.

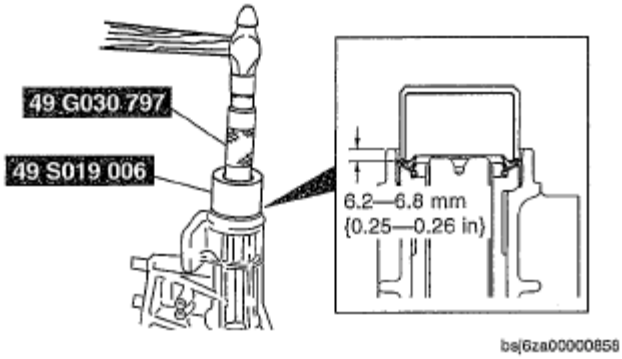


Fig. 354: Position For Installing Oil Seal To Extension Housing

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.**

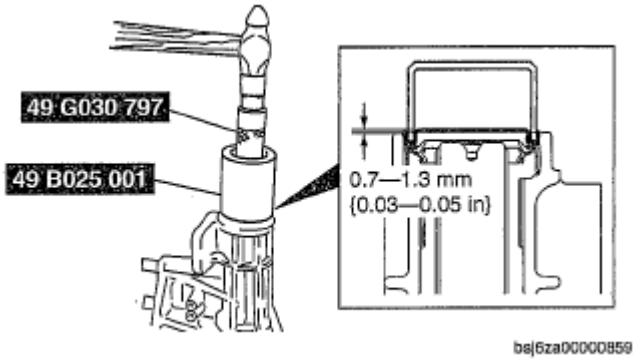


Fig. 355: Position For Installing Extension Housing Shroud To Extension Housing

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.**

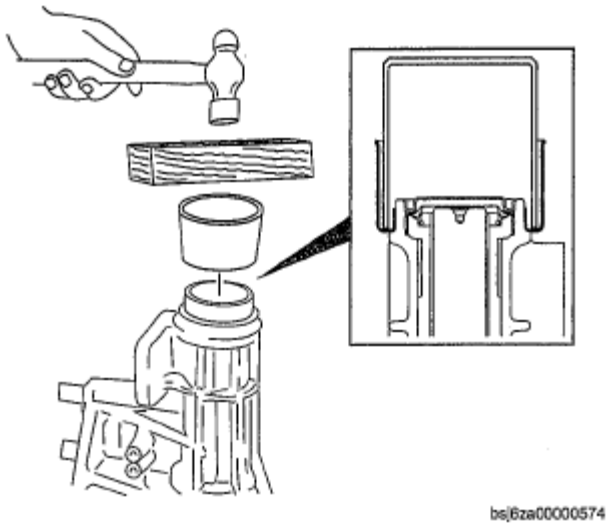


Fig. 356: Position For Installing Extension Dust Deflector

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

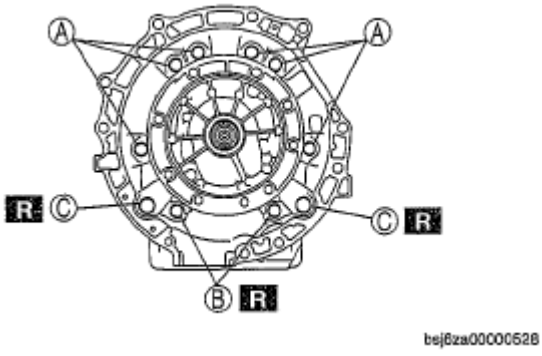


Fig. 357: Identifying Bolts

BOLTS REFERENCE CHART

Bolt number	Bolt size	Length (measured from below the head) (mm {in})
A	M10-1.5	35 {1.38}
B	M 10-1.5	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.**

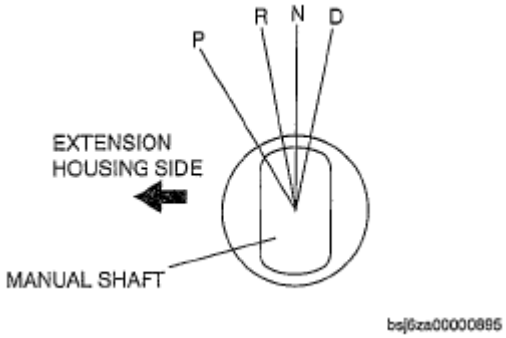


Fig. 358: Identifying TR Switch Positions

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

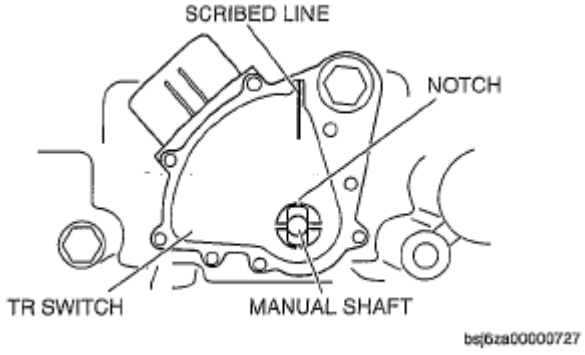


Fig. 359: Identifying TR Switch And Manual Shaft Notch Align Position

128. Install the washer, lock washer and nut.

Tightening torque

5.9-7.8 N.m {61-79 kgf.cm, 53-69 in.lbf}

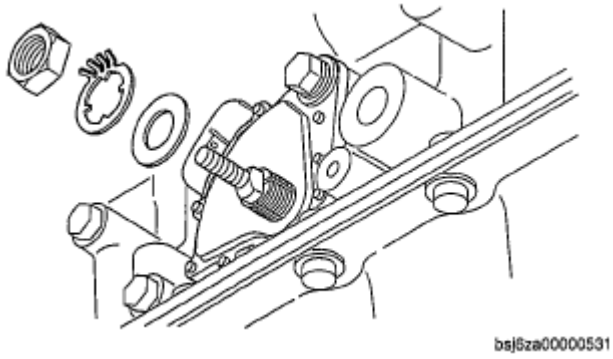


Fig. 360: Identifying Washer, Lock Washer And Nut

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}

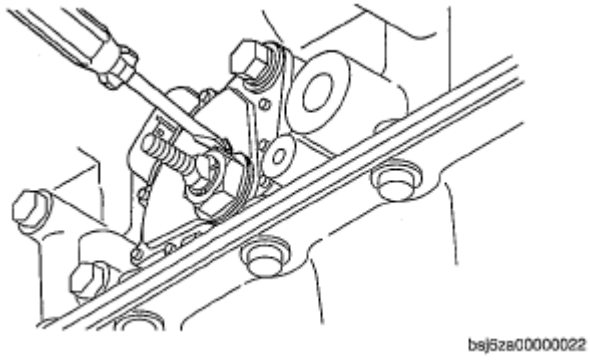


Fig. 361: Bending Tab Of Lock Washer Using Flathead Screwdriver

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.**

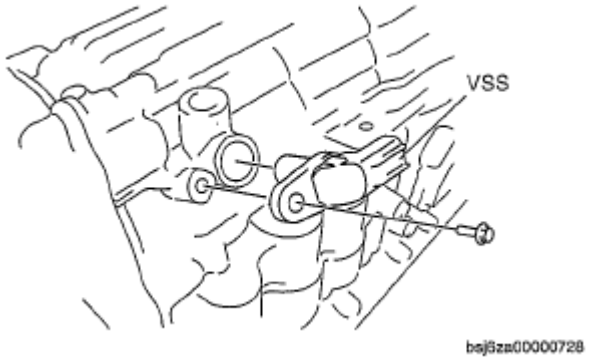


Fig. 362: Identifying VSS

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.**

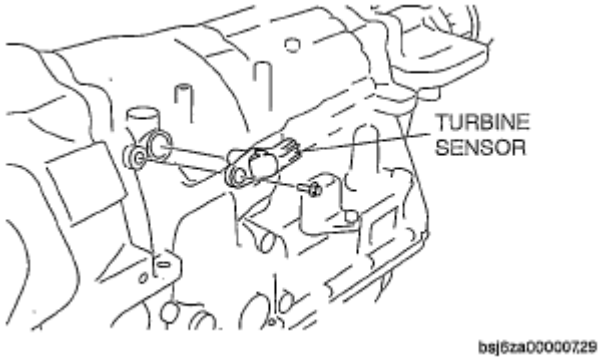


Fig. 363: Identifying Turbine Sensor

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.**

134. Install the breather pipe.

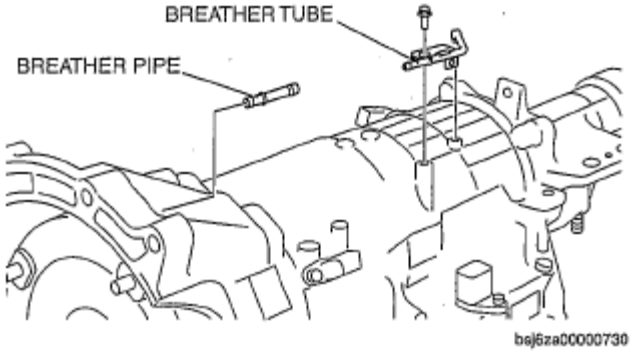


Fig. 364: Identifying Breather Tube And Pipe

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.**

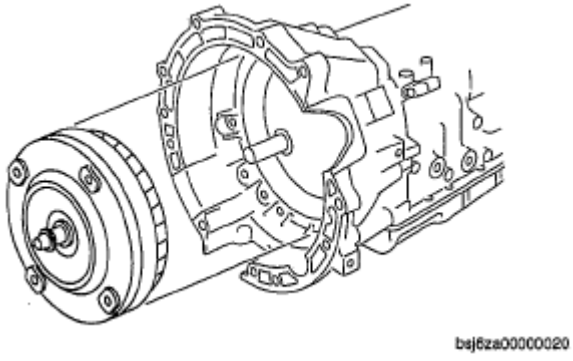


Fig. 365: Identifying Torque Converter

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}

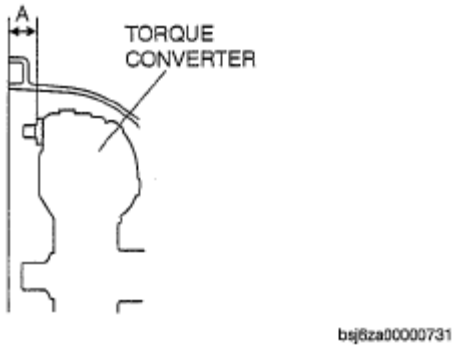


Fig. 366: Identifying Distance A

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}

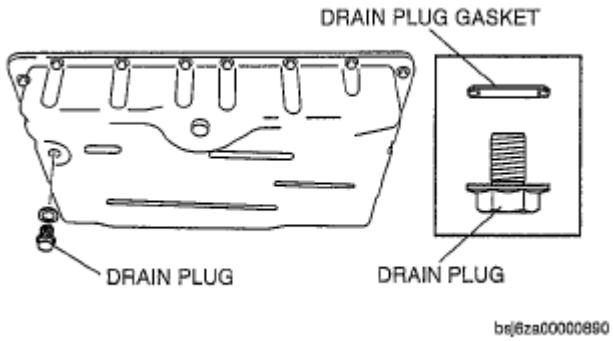


Fig. 367: Identifying Oil Pan Drain Plug Gasket And Drain Plug

05-50 TECHNICAL DATA

TRANSMISSION TECHNICAL DATA

TRANSMISSION TECHNICAL DATA

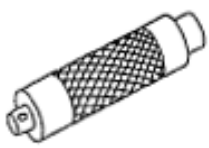
Item	Specification
Pump housing bushing inner diameter	38.113-38.138 mm {1.50051-1.50150 in}
Oil pump shaft bushing inner diameter	21.501-21.527 mm {0.846496-0.847520

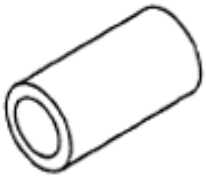
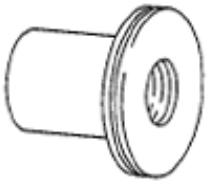
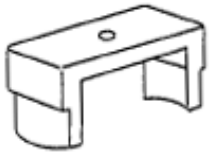
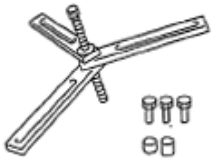
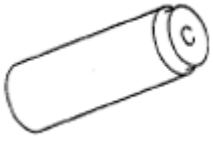
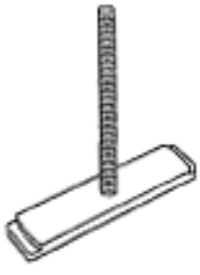
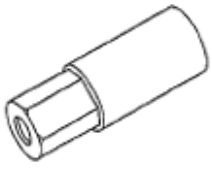
	in}
Oil pump gear outer standard clearance	0.10-0.17 mm {0.004-0.006 in}
Oil pump gear inner standard clearance	0.07-0.15 mm {0.0028-0.0059 in}
Oil pump gear side standard clearance	0.02-0.04 mm {0.0008-0.0015 in}
C1, C4 clutch return spring free length	Standard: 26.29 mm {1.04 in}
C2 clutch return spring 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

TRANSMISSION SST

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 	-	-