GROUP 23B

AUTOMATIC TRANSAXLE OVERHAUL <F4A4B>

CONTENTS

GENERAL DESCRIPTION

M1233000100577

This automatic transaxle is made up of the following main parts.

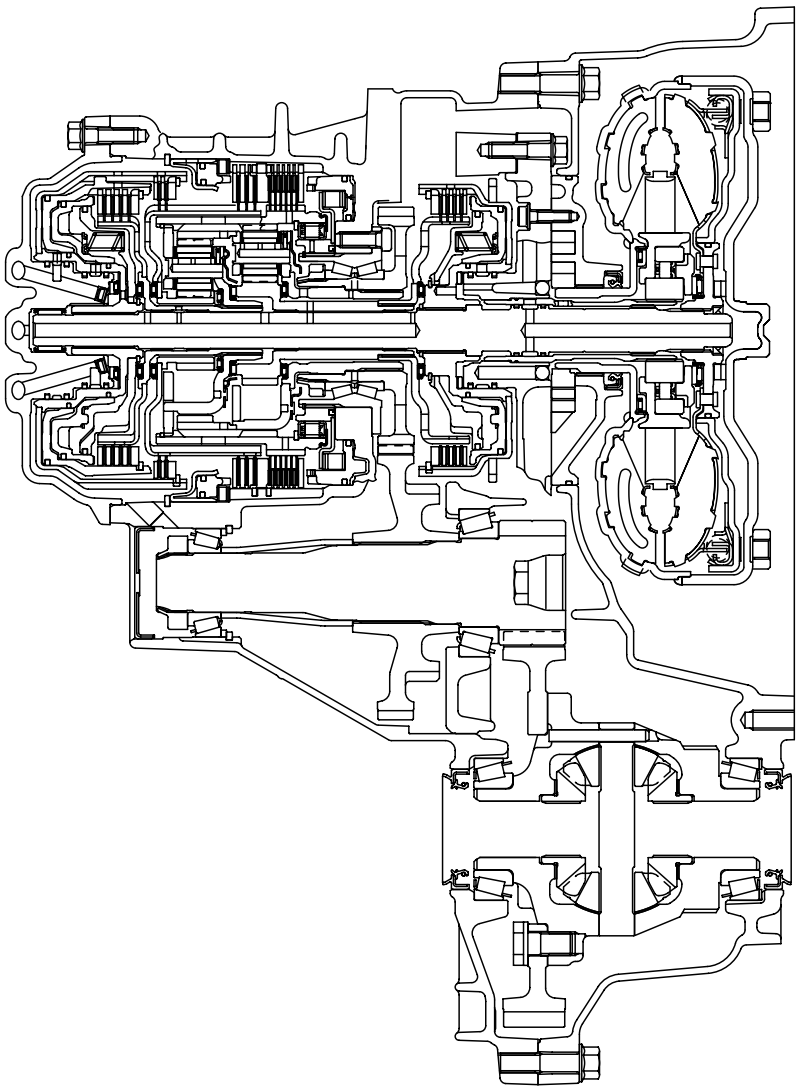
The torque converter employs a 3 element, 1 step, 2 phase lock-up clutch.

The gear train is made up of 3 multi-plate clutches, 2 multi-plate brakes and 2 planetary gears made up of a sun gear, carrier, pinion gear and annulus gear.

The cases consist of a converter housing, transaxle case, rear cover and a valve body cover.

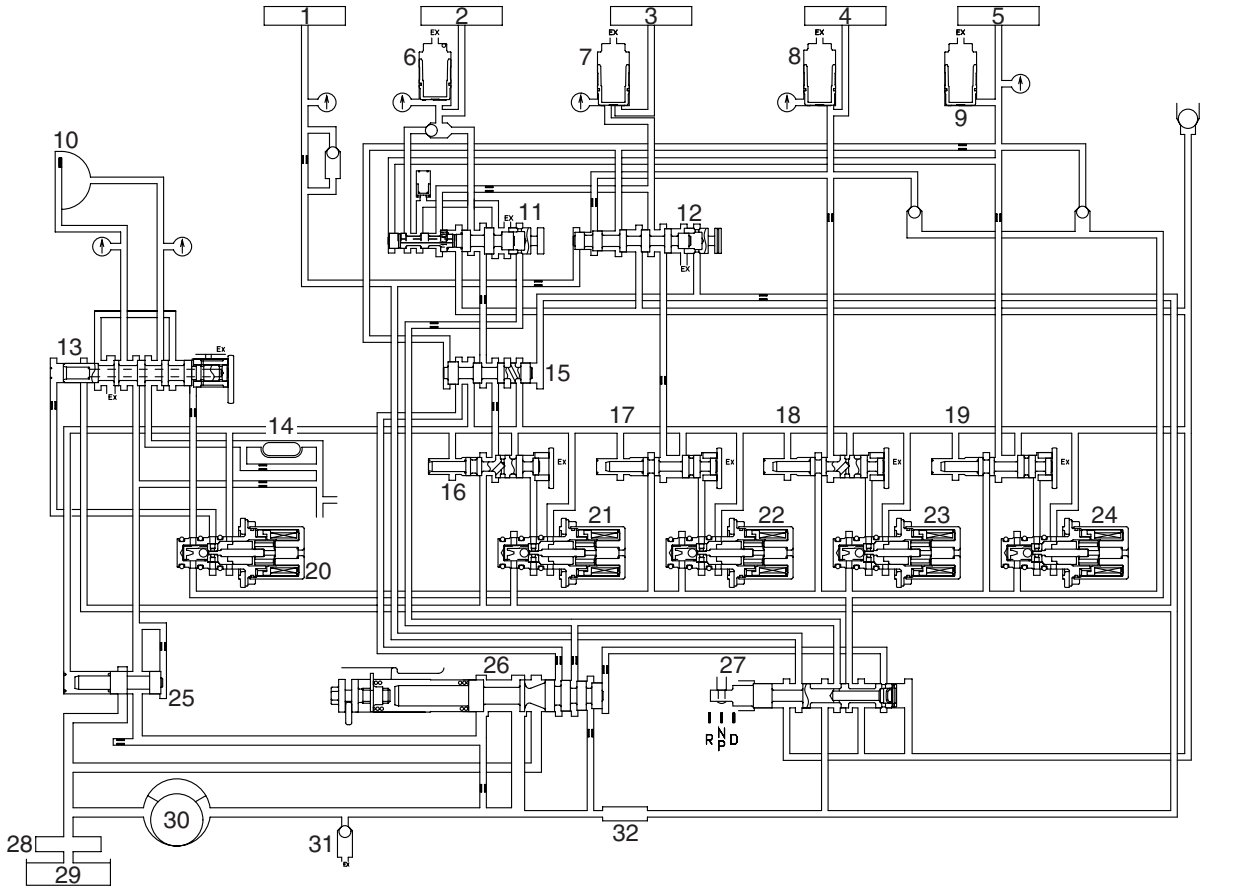
Parts related to oil pressure regulation are the oil pump, which pressurizes the oil; the regulator, which controls the pressure setting; the solenoid valves, which change the oil pressure with electrical signals; the pressure control valve, which controls the oil pressure coming from the solenoid valve that affects each clutch and brake; valves, which retain the oil pressure through the lines; and finally the valve body, which houses all the valves.

SECTIONAL VIEW



AK301596

HYDRAULIC CIRCUIT



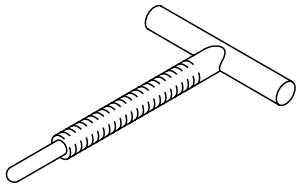
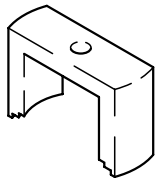
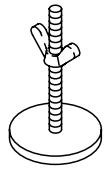
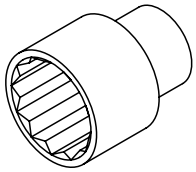
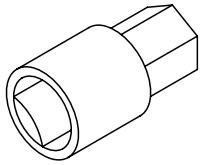
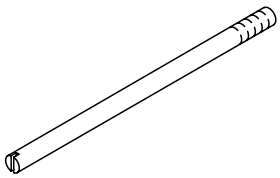
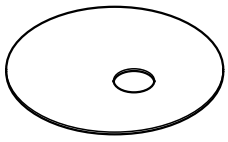
AK202328AC

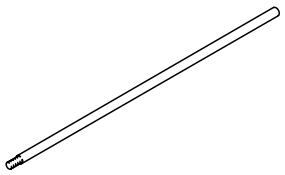
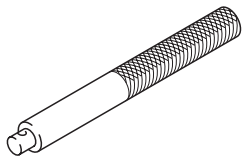
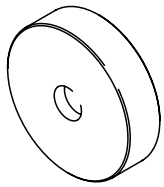
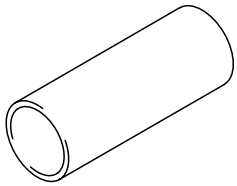
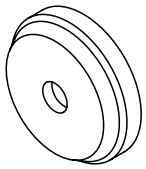
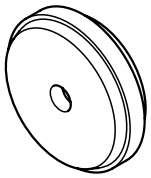
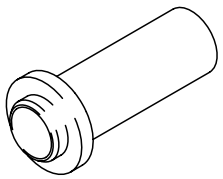
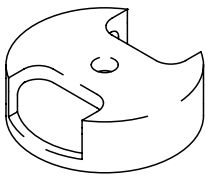
1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. LOW-REVERSE ACCUMULATOR
7. SECOND ACCUMULATOR
8. UNDERDRIVE ACCUMULATOR
9. OVERDRIVE ACCUMULATOR
10. TORQUE CONVERTER CLUTCH
11. FAIL-SAFE VALVE A
12. FAIL-SAFE VALVE B
13. TORQUE CONVERTER CLUTCH CONTROL VALVE
14. COOLER
15. SWITCHING VALVE
16. LOW-REVERSE PRESSURE CONTROL VALVE
17. SECOND PRESSURE CONTROL VALVE
18. UNDERDRIVE PRESSURE CONTROL VALVE
19. OVERDRIVE PRESSURE CONTROL VALVE
20. TORQUE CONVERTER CLUTCH CONTROL SOLENOID VALVE
21. LOW-REVERSE SOLENOID VALVE
22. SECOND SOLENOID VALVE
23. UNDERDRIVE SOLENOID VALVE
24. OVERDRIVE SOLENOID VALVE
25. TORQUE CONVERTER PRESSURE CONTROL VALVE
26. REGULATOR VALVE
27. MANUAL VALVE
28. OIL FILTER
29. OIL PAN
30. OIL PUMP
31. RELIEF VALVE
32. OIL STRAINER

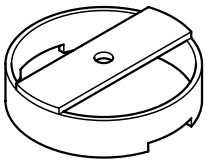
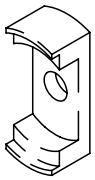
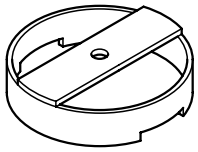
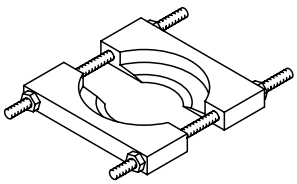
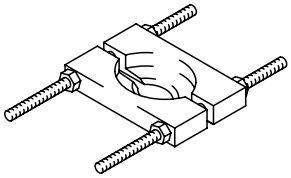
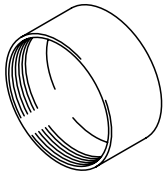
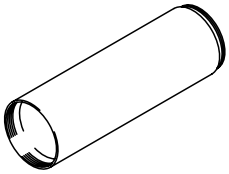
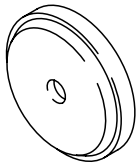
TSB Revision

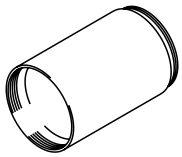
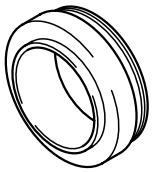
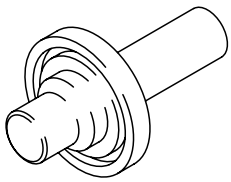
SPECIAL TOOLS

M1233000600497

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MD998333 Oil pump remover	MD998333-01	Removal of oil pump
	MD998903 Spring compressor	MD998903-01	Removal and installation of one-way clutch inner race snap ring
	MD998924 Spring compressor retainer	MD998924-01	Use with spring compressor
	MB991625 Socket (41)	MB991625-01 or General service tool	Removal and installation of output shaft jam nut
	MB990607 Torque wrench socket	MB990607-01	Removal and installation of output shaft jam nut
	MD998412 Guide	MD998412	Installation of oil pump and transfer drive gear
	MB991631 Clearance dummy plate	MB991631-01	Measurement of reaction plate low-reverse brake and second brake end play

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MD998913 Dial gauge extension	MD998913-01	Measurement of low-reverse brake end play
	MB990938 Handle	MB990938-01	• Installation of input shaft rear bearing • Use with installer adapter
	MB990930 Installer adapter	MB990930-01 or General service tool	Installation of output shaft taper roller bearing outer race
	MD998350 Bearing installer	MD998350-01	Installation of output shaft collar and taper roller bearing
	MB990931 Installer adapter	MB990931-01 or General service tool	Installation of cap
	MB990935 Installer adapter	MB990935-01 or General service tool	Installation of differential taper roller bearing outer race
	MD998334 Oil seal installer	MD998334-01	Installation of oil pump oil seal
	MD998907 Spring compressor	MD998907-01	Removal and installation of underdrive clutch snap ring

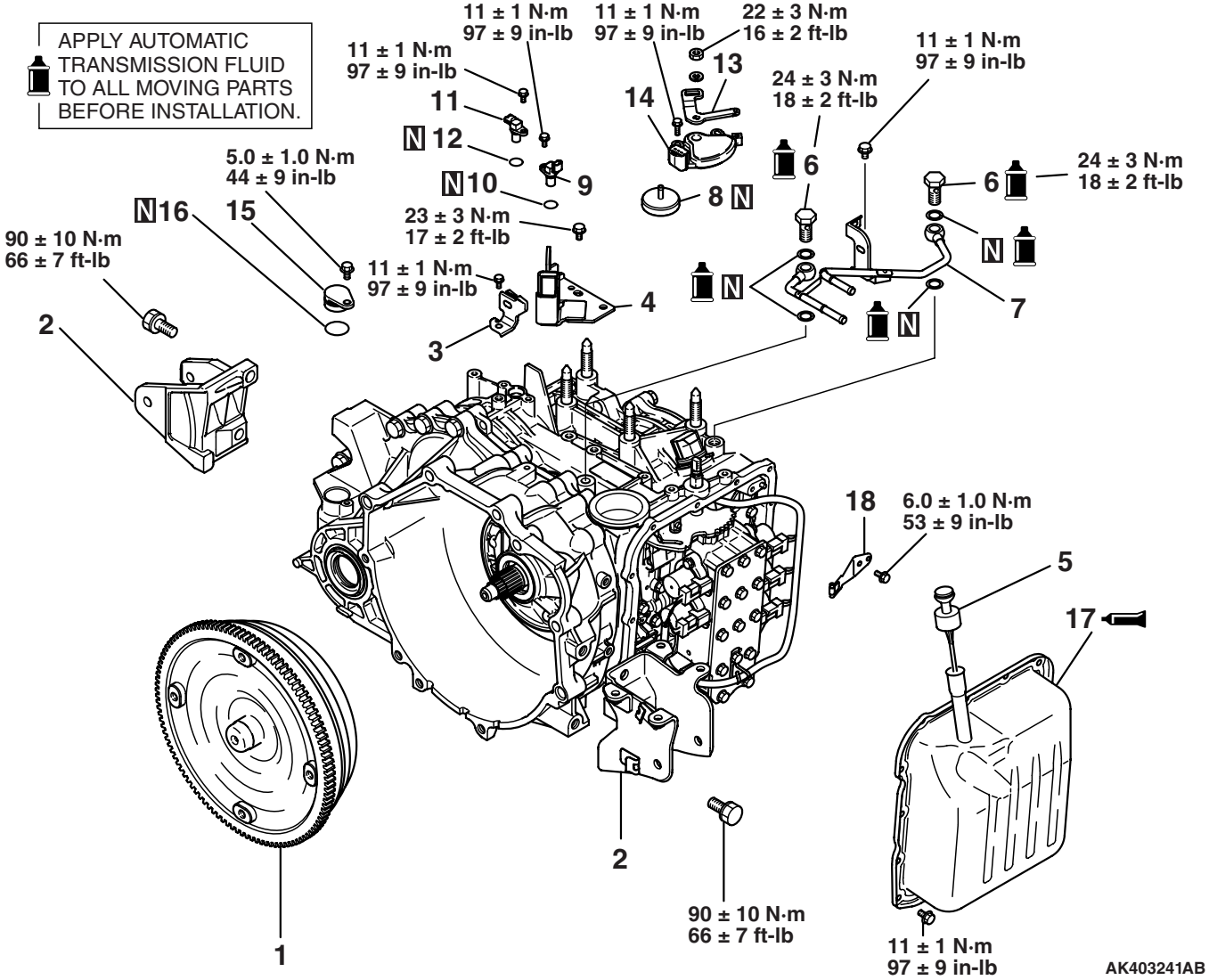
TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MB991628 Spring compressor	MB991628-01	Measurement of underdrive clutch and overdrive clutch end play
	MD999590 Spring compressor	MIT305039	Removal and installation of overdrive clutch snap ring
	MB991790 Spring compressor	MB991790-01	Measurement of reverse clutch end play
	MD998917 Bearing remover	General service tool or MD998348-01	Removal of transfer driven gear
	MD998801 Bearing remover	MD998348-01	Removal of each bearing
	MD998812 Installer cap	General service tool	Use with installer and installer adapter
	MD998814 Installer 200	MIT304180-A	Use with installer cap and installer adapter
	MB990936 Installer adapter	MB990936-01 or General service tool	Installation of output shaft taper roller bearing outer race

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MD998813 Installer 100	General service tool	Use with installer cap and installer adapter
	MD998823 Installer adapter (48)	General service tool	Installation of output shaft taper roller bearing, transfer driven gear, differential taper roller bearing
	MD998800 Oil seal installer	General service tool	Installation of driveshaft oil seal

TRANSAXLE

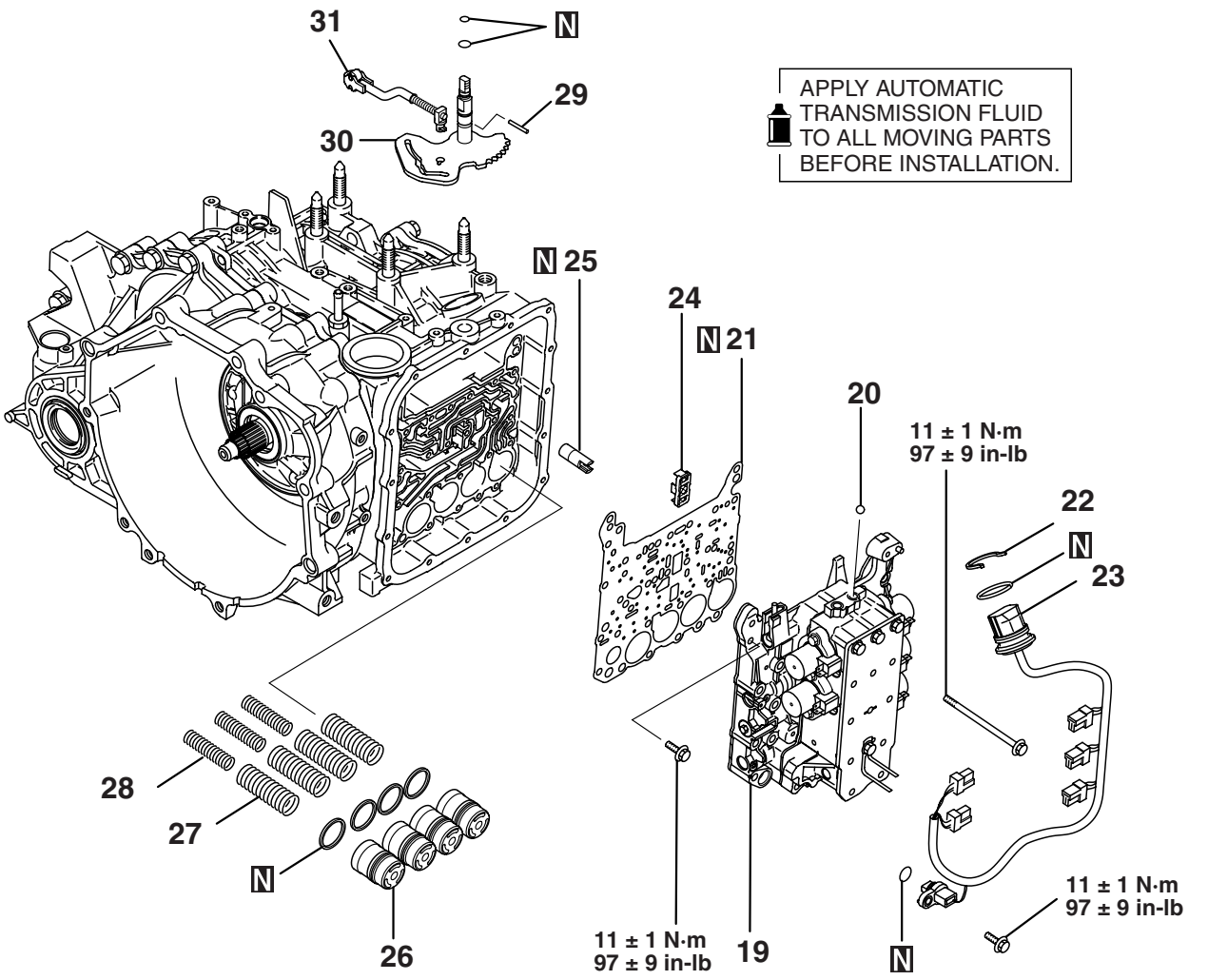
DISASSEMBLY AND ASSEMBLY

M1233001000595



1. TORQUE CONVERTER
2. ROLL STOPPER BRACKET
3. HARNESS BRACKET
4. CONTROL CABLE SUPPORT BRACKET
5. OIL DIPSTICK
6. EYE BOLT
7. OIL COOLER FEED TUBE
8. AIR BREATHER
9. INPUT SHAFT SPEED SENSOR
10. O-RING
11. OUTPUT SHAFT SPEED SENSOR
12. O-RING
13. MANUAL CONTROL LEVER
14. PARK/NEUTRAL POSITION SWITCH
15. SEALING CAP
16. O-RING
17. VALVE BODY COVER
18. MANUAL CONTROL SHAFT DETENT

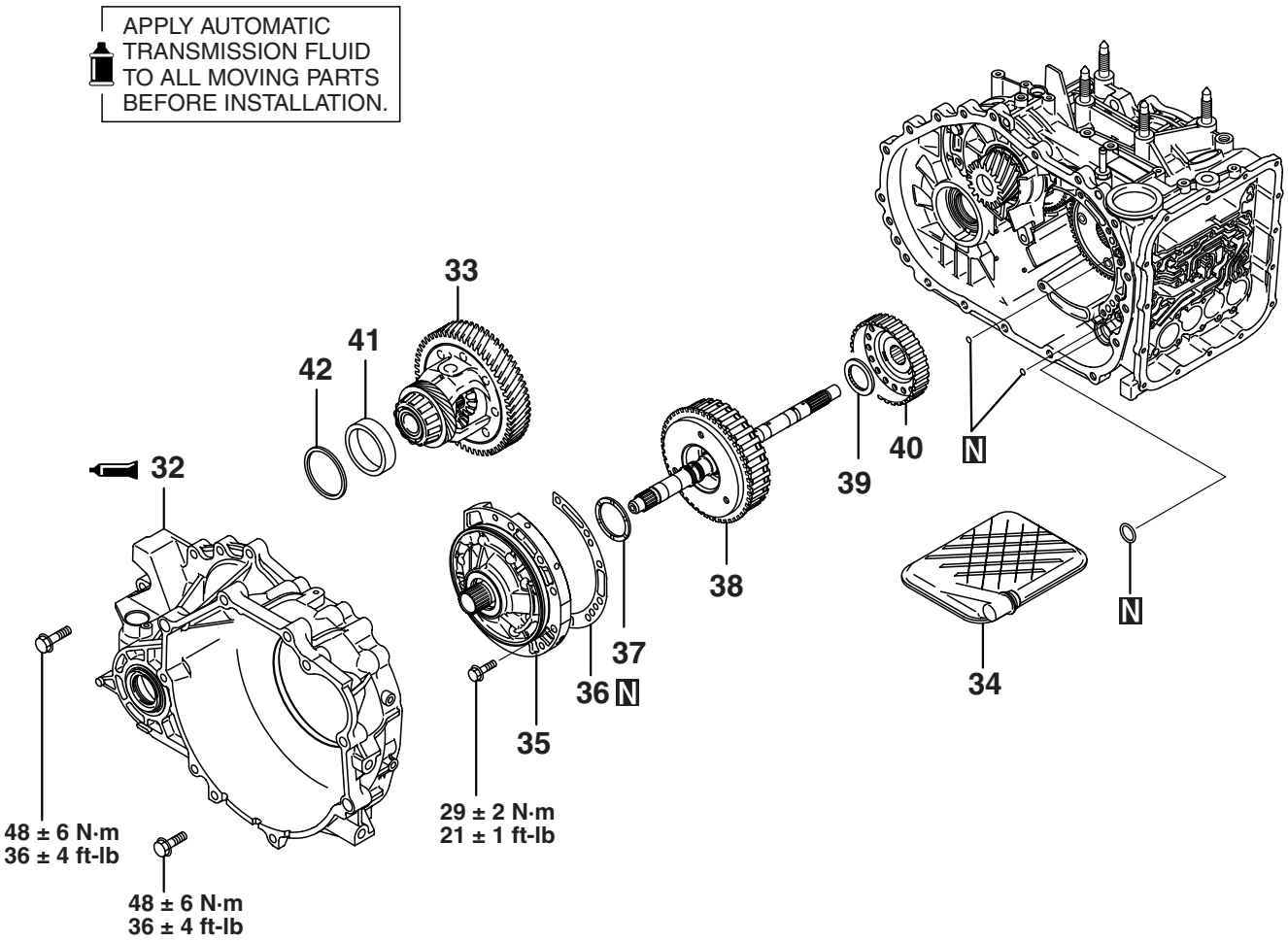
TSB Revision



AK301614AE

19. VALVE BODY
20. STEEL BALL
21. GASKET
23. SNAP RING
23. SOLENOID VALVE HARNESS
24. STRAINER
25. SECOND BRAKE RETAINER OIL SEAL
26. ACCUMULATOR PISTON
27. ACCUMULATOR SPRING
28. ACCUMULATOR SPRING
29. MANUAL CONTROL LEVER SHAFT ROLLER
30. MANUAL CONTROL LEVER SHAFT
31. PARKING PAWL ROD

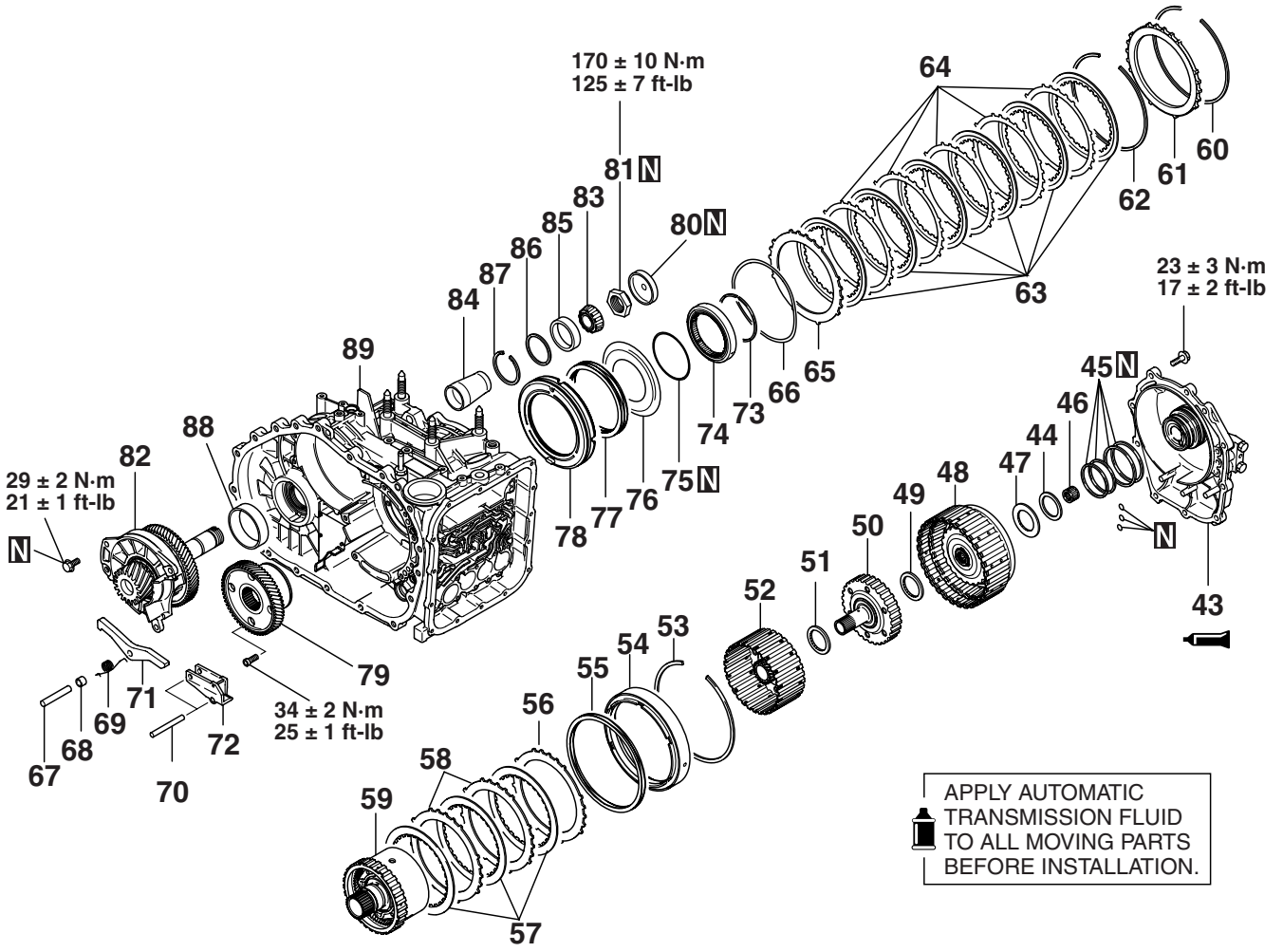
TSB Revision



AK301615AC

32. TORQUE CONVERTER HOUSING
33. DIFFERENTIAL
34. OIL FILTER
35. OIL PUMP
36. GASKET
37 THRUST WASHER NO.1
38. UNDERDRIVE CLUTCH AND INPUT SHAFT
39. THRUST BEARING NO.2
40. UNDERDRIVE CLUTCH HUB
41. OUTER RACE
42. SPACER

TSB Revision



AK301616AF

43. REAR COVER
44. THRUST RACE NO.8
45. SEAL RING
46. INPUT SHAFT REAR BEARING
47. THRUST BEARING NO.7
48. REVERSE AND OVERDRIVE CLUTCH
49. THRUST BEARING NO.6
50. OVERDRIVE CLUTCH HUB
51. THRUST BEARING NO.5
52. PLANETARY REVERSE SUN GEAR
53. SNAP RING
54. SECOND BRAKE PISTON
55. RETURN SPRING
56. PRESSURE PLATE
57. SECOND BRAKE DISCS
58. SECOND BRAKE PLATES
59. PLANETARY CARRIER ASSEMBLY
60. SNAP RING
61. REACTION PLATE
62. SNAP RING
63. LOW-REVERSE BRAKE DISCS
64. LOW-REVERSE BRAKE PLATES
65. PRESSURE PLATE
66. WAVE SPRING
67. PARKING PAWL SHAFT
68. SPACER
69. PARKING PAWL SPRING
70. PARKING ROLLER SUPPORT SHAFT
71. PARKING PAWL
72. PARKING ROLLER SUPPORT
73. SNAP RING
74. ONE-WAY CLUTCH INNER RACE
75. O-RING
76. SPRING RETAINER
77. RETURN SPRING
78. LOW-REVERSE BRAKE PISTON
79. TRANSFER DRIVE GEAR
80. CAP
81. JAM NUT
82. OUTPUT SHAFT
83. TAPER ROLLER BEARING
84. COLLAR
85. OUTER RACE
86. SPACER
87. SNAP RING
88. OUTER RACE
89. TRANSAXLE CASE

TSB Revision

Required Special Tools:

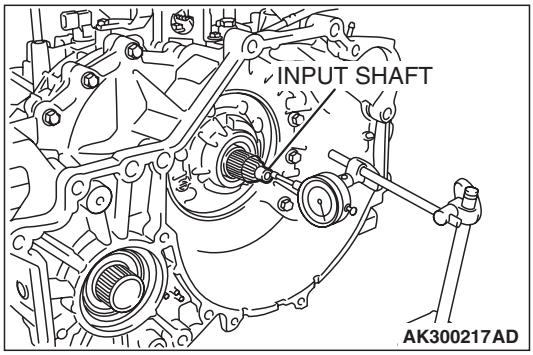
- MB990607: Torque Wrench Socket
- MB990930: Installer Adapter
- MB990931: Installer Adapter
- MB990935: Installer Adapter
- MB990938: Handle
- MB991625: Special Socket (41)
- MB991631: Clearance Dummy Plate
- MD998333: Oil Pump Remover
- MD998350: Bearing Installer
- MD998412: Guide
- MD998903: Spring Compressor
- MD998913: Dial Gauge Extension
- MD998924: Spring Compressor Retainer

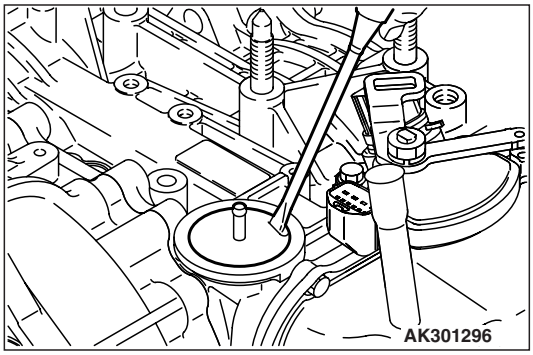
DISASSEMBLY

⚠ CAUTION

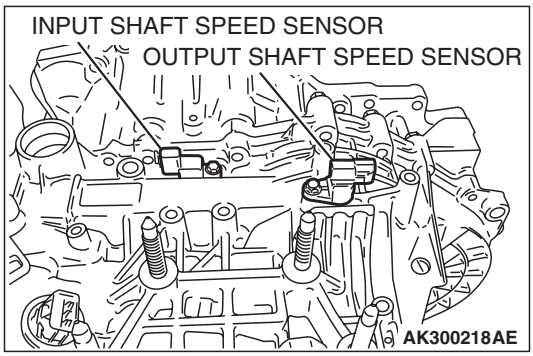
- **Because the automatic transaxle is manufactured from high-precision parts, care must be taken not to scratch or damage these parts during disassembly and assembly.**
- **Work on a rubber mat and keep it clean at all times.**
- **Do not wear any cloth gloves and do not use any shop towels during disassembly. Use only nylon cloth, paper towels or any other lint-free material.**
- **Parts which have been disassembled should all be cleaned. Metal parts can be cleaned with normal detergent, but they should be dried completely using compressed air.**
- **Clutch discs, plastic thrust plates and rubber parts should be cleaned with automatic transmission fluid (ATF).**
- **If the transaxle body has been damaged, disassemble and clean the cooler system.**

1. Remove the torque converter.
2. Use a dial gauge to measure the input shaft end play.
3. Remove each bracket.
4. Remove the dipstick.
5. Remove the eye bolt, gaskets and the oil cooler feed tube.

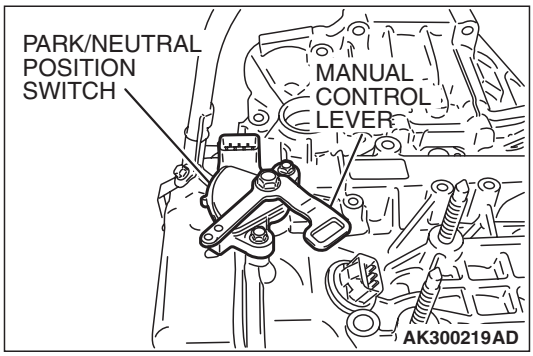




6. Remove the air breather by inserting a screwdriver into the air breather and prying it up.



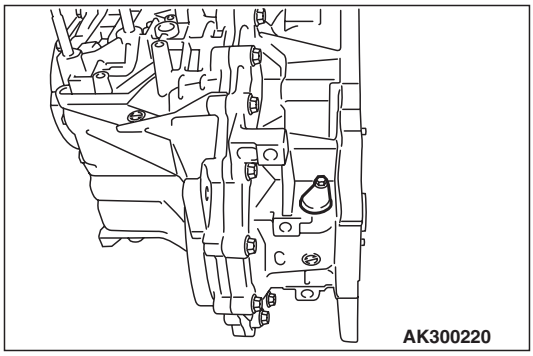
7. Remove the input shaft speed sensor and output shaft speed sensor.



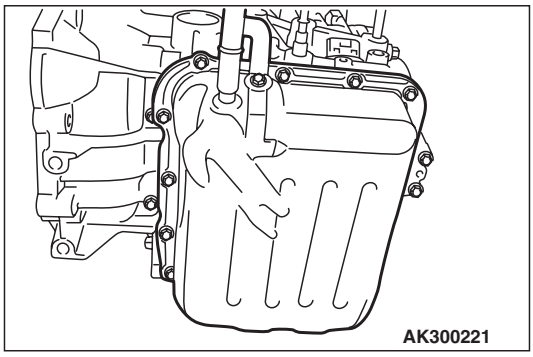
⚠ CAUTION

The manual control lever tightening nut must be removed before removing the valve body. If the valve body is removed before the nut, the park/neutral position switch will be damaged.

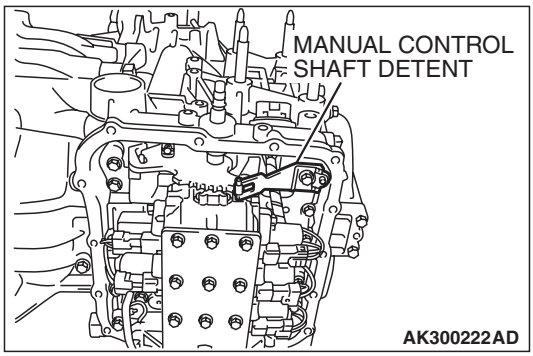
8. Loosen the manual control lever tightening nut, and then remove the manual control lever and the park/neutral position switch.



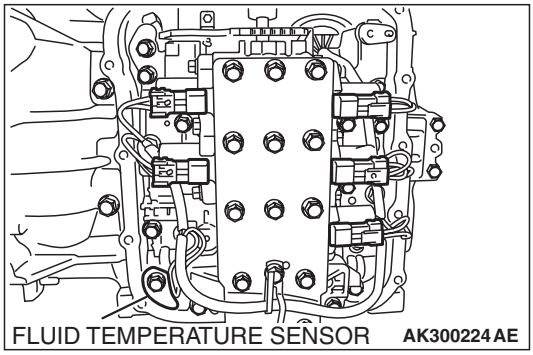
9. Remove the Sealing cap and o-ring.



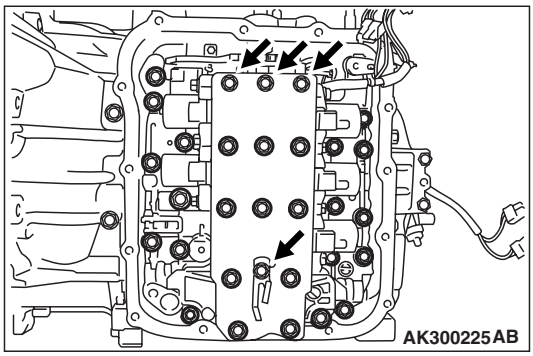
10. Remove the valve body cover.



11.Remove the manual control shaft detent.



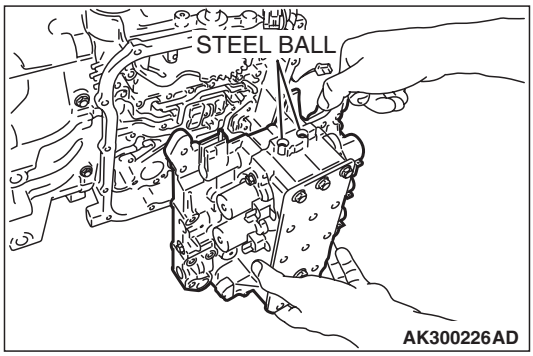
12.Disconnect the solenoid valve harness from the valve body by disconnecting the fluid temperature sensor and all the connectors.



⚠ CAUTION

- **Make sure that the manual control lever and the park/neutral position switch are removed. See step 8.**
- **Do not remove the bolts (four pieces) shown in the illustration.**

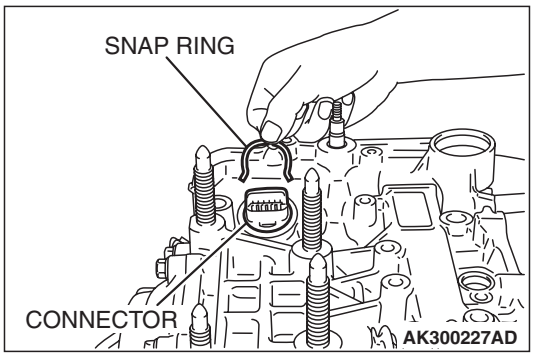
13.Remove the valve body mounting bolts (twenty seven pieces).



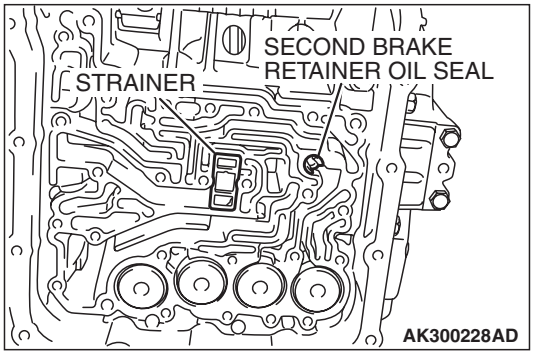
⚠ CAUTION

Do not lose the two steel balls.

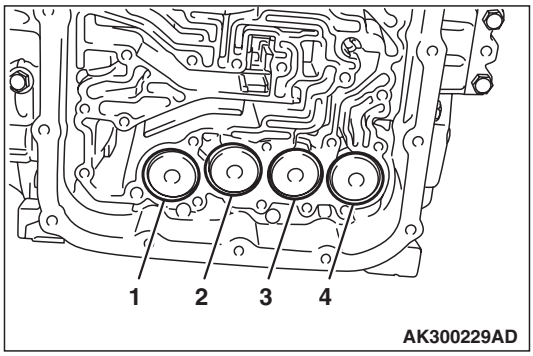
14.Remove the valve body, gasket, and the steel balls (two pieces).



15.Remove the snap ring from the connector. Push the connector into the transaxle case and remove the solenoid valve harness.

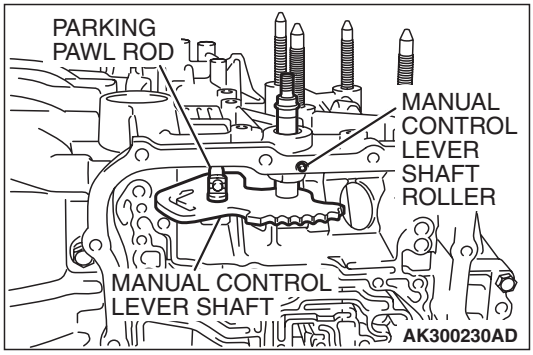


16.Remove the strainer and the second brake retainer oil seal.



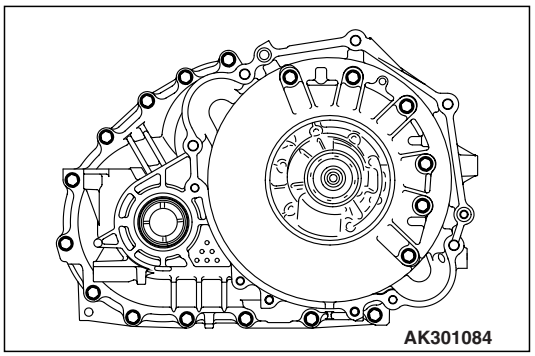
17.Remove each accumulator piston and spring.

NUMBER	NAME
1	For low-reverse brake
2	For underdrive clutch
3	For second brake
4	For overdrive clutch



18.Remove the manual control lever shaft roller.

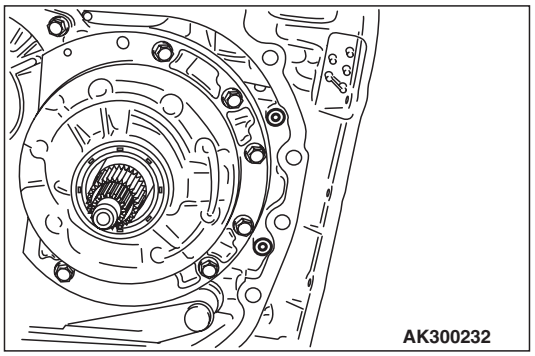
19.Remove the manual control lever shaft and the parking pawl rod.

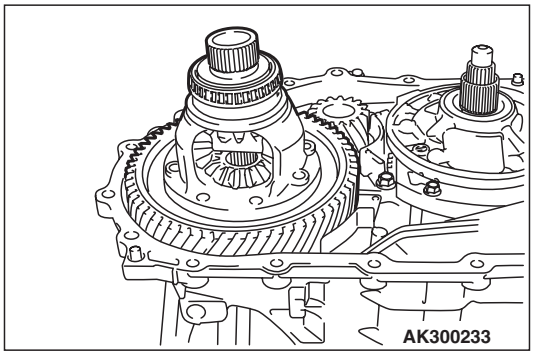

AK301084

20.Remove the torque converter housing mounting bolts (eighteen pieces), and then remove the torque converter housing.

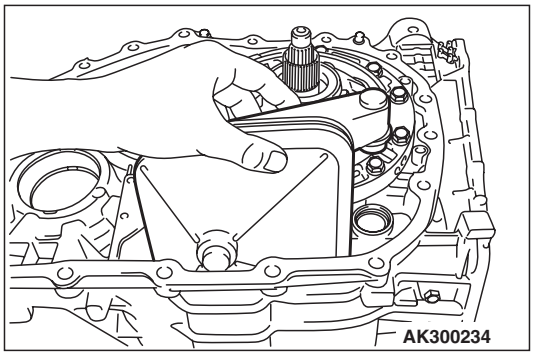
21.Remove the differential bearing outer race and spacer from the torque converter housing.

22.Remove the O-rings (two pieces).

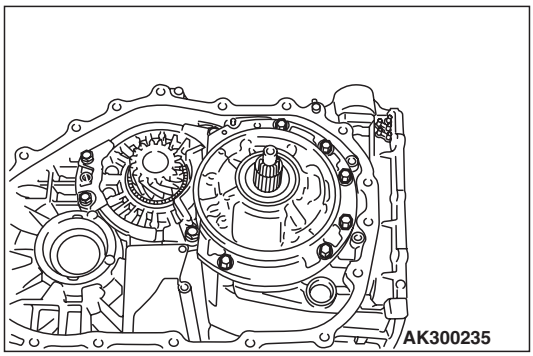

AK300232


AK300233

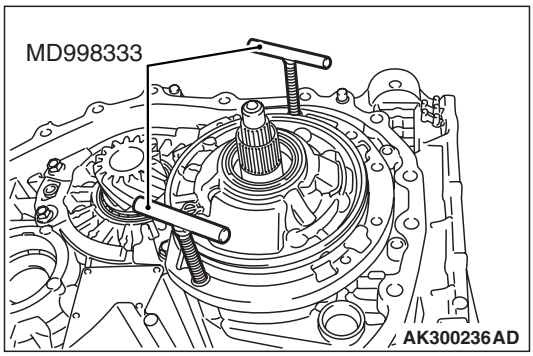
23.Remove the differential.


AK300234

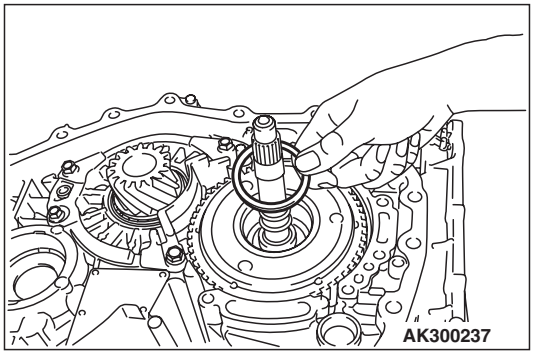
24.Remove the oil filter.



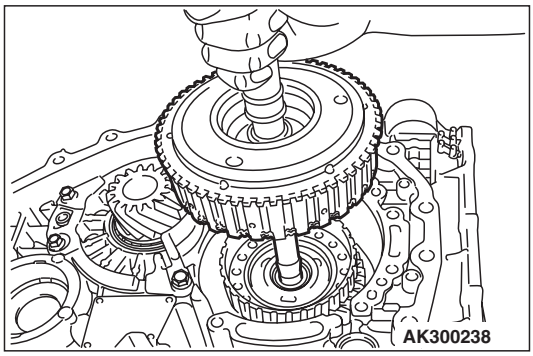
25.Remove the oil pump mounting bolts (six pieces).



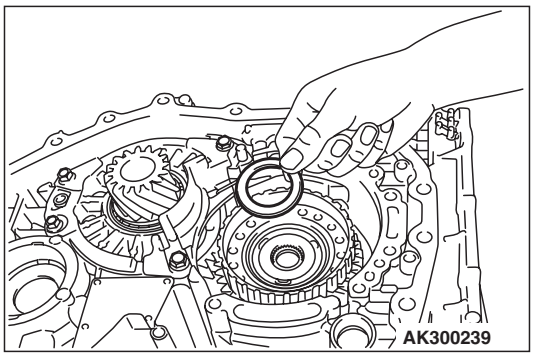
26.Install special tool MD998333 in the position shown in the illustration.
27.Turn special tool MD998333 to remove the oil pump.
28.Remove the oil pump gasket.



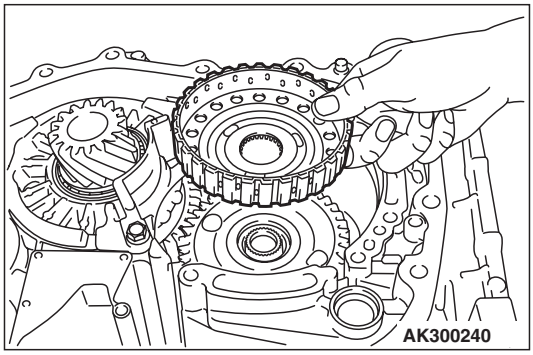
29.Remove thrust washer number 1.



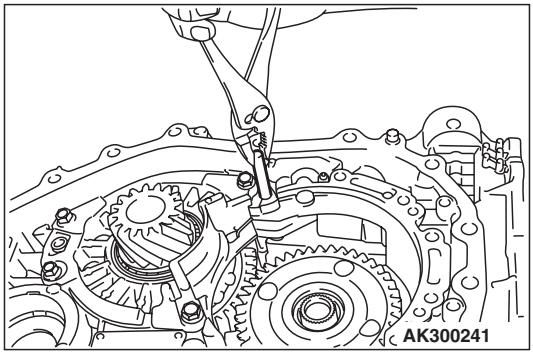
30.Holding the input shaft, remove the underdrive clutch and input shaft.



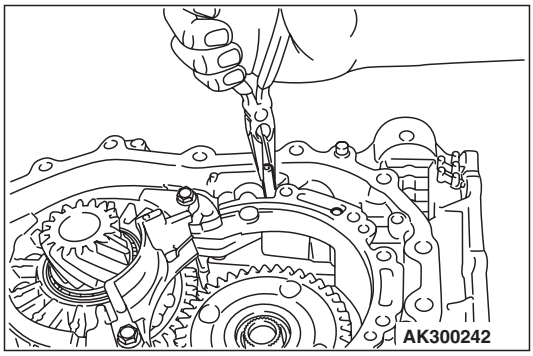
31.Remove thrust bearing number 2.



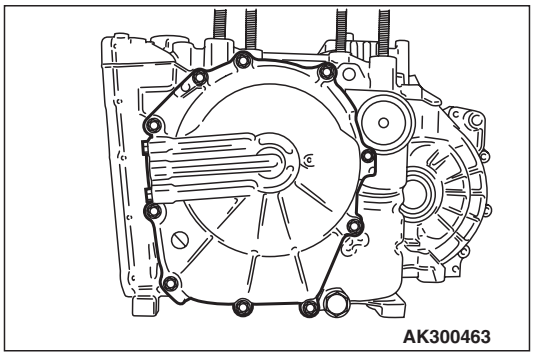
32.Remove the underdrive clutch hub.



33.Remove the parking pawl shaft, and then remove the spacer and spring.

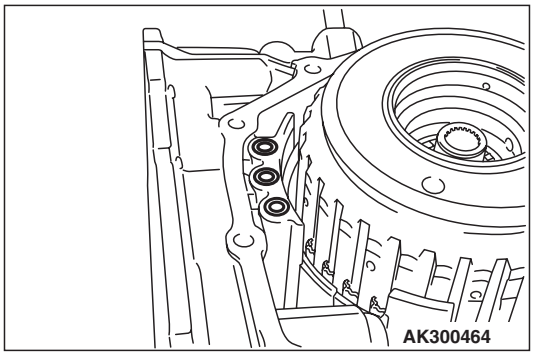


34.Remove the parking roller support shafts (two pieces), and then remove the parking pawl and parking roller support.

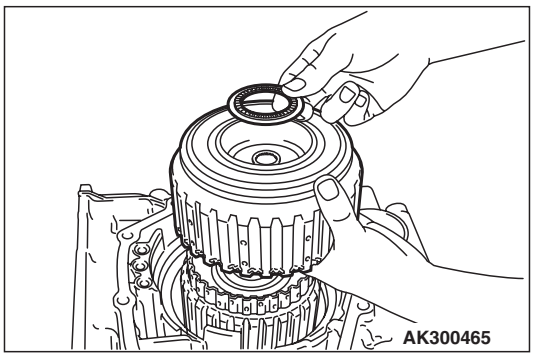


35.Remove the rear cover and input shaft rear bearing.
36.Remove thrust race number 8.
37.Remove the seal rings (four pieces).

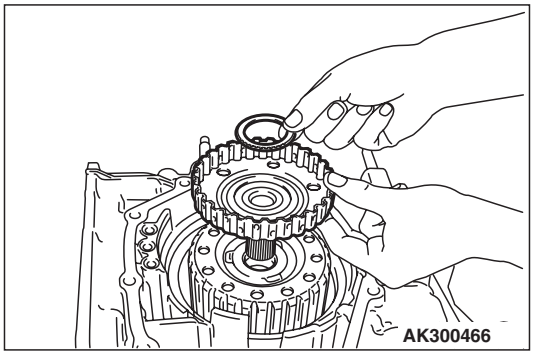
TSB Revision


AK300464

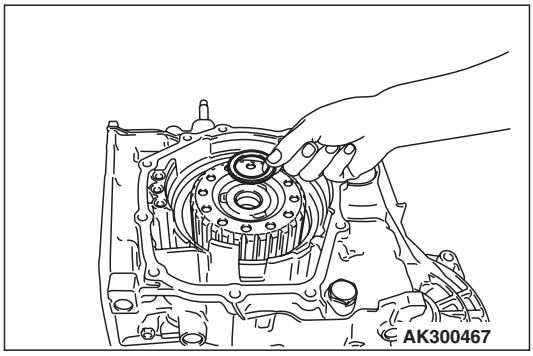
38.Remove the O-rings (three pieces).


AK300465

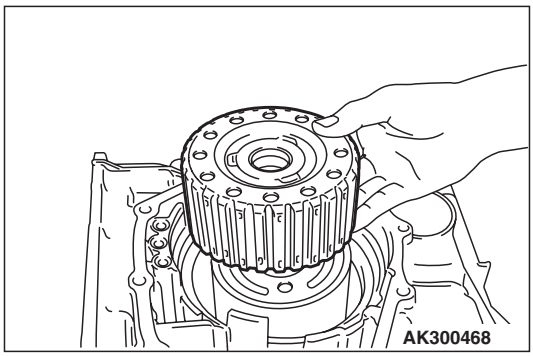
39.Remove the reverse and overdrive clutch and thrust bearing number 7.


AK300466

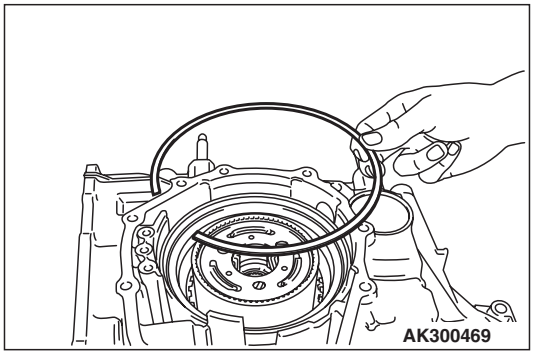
40.Remove overdrive clutch hub and thrust bearing number 6.


AK300467

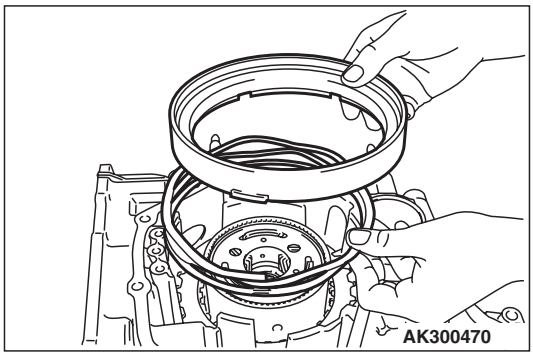
41.Remove thrust bearing number 5.


AK300468

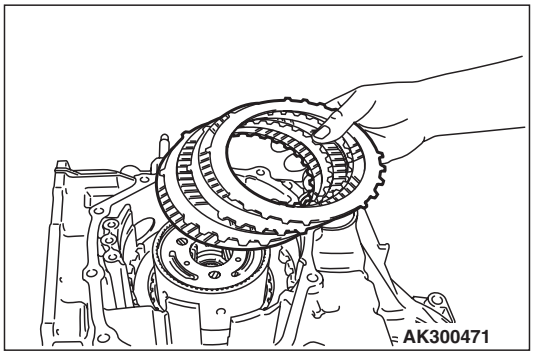
42.Remove the planetary reverse sun gear.


AK300469

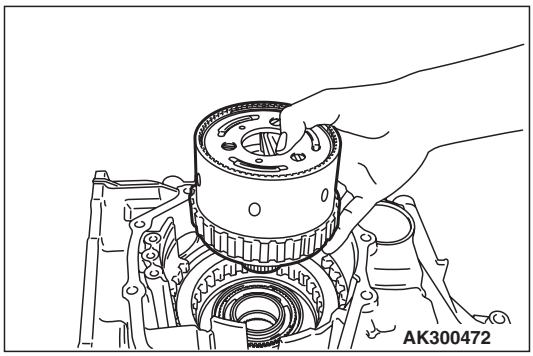
43.Remove the snap ring.


AK300470

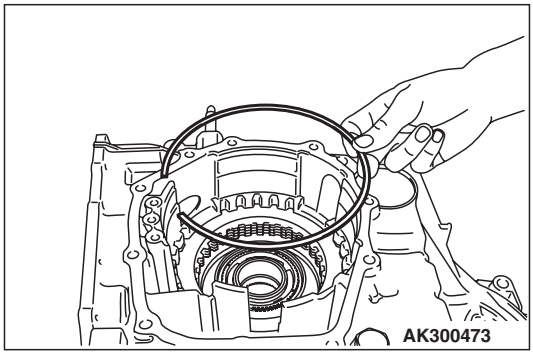
44.Remove the second brake piston and the return spring.


AK300471

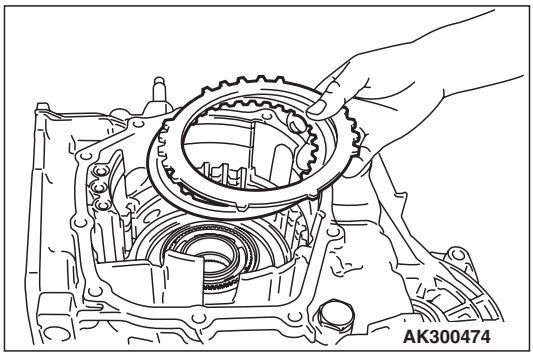
45.Remove the brake plates (two pieces), brake discs (three pieces) and pressure plate.



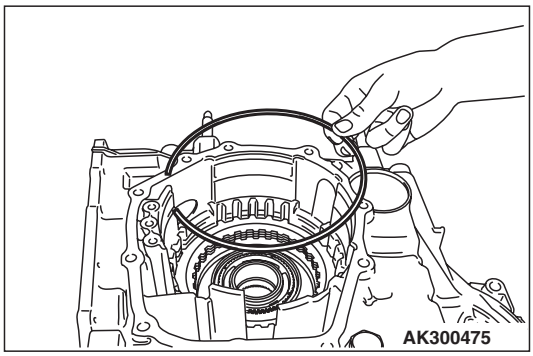
46.Remove the planetary carrier assembly.



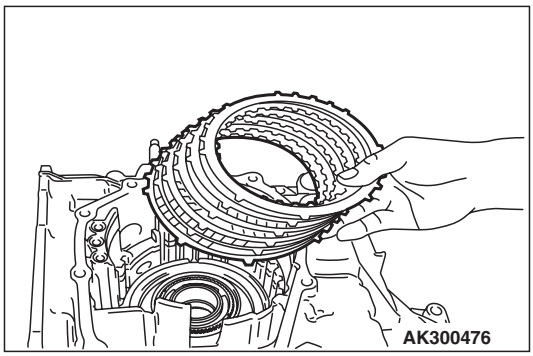
47.Remove the snap ring.



48.Remove the reaction plate and the brake disc.

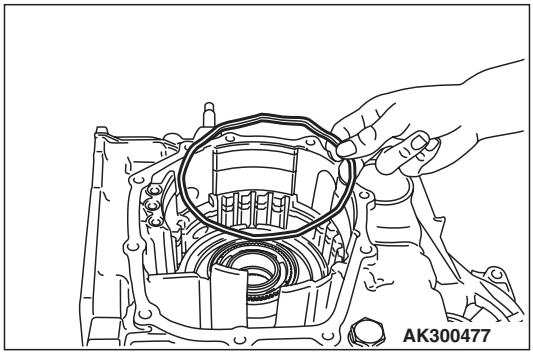


49.Remove the snap ring.

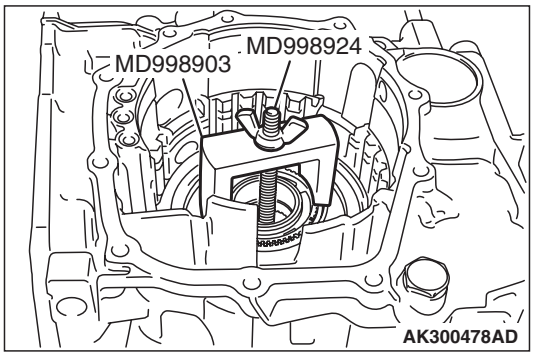


50.Remove the brake plates (five pieces), brake discs (six pieces) and pressure plate.

*NOTE: *Includes the brake discs removed in step 48.*



51.Remove the wave spring.



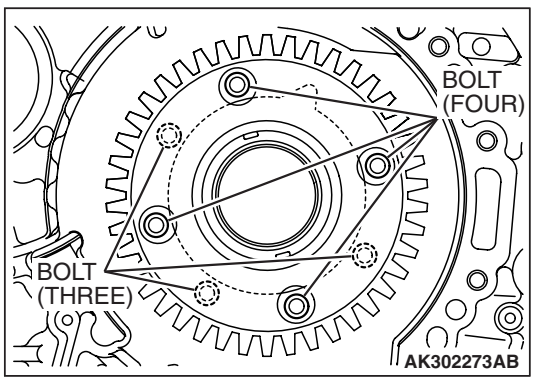
52.Remove the one-way clutch inner race and low-reverse brake piston as follows:

(1) Using special tools MD998903 and MD998924, compress the one-way clutch inner race.

(2) Remove the snap ring.

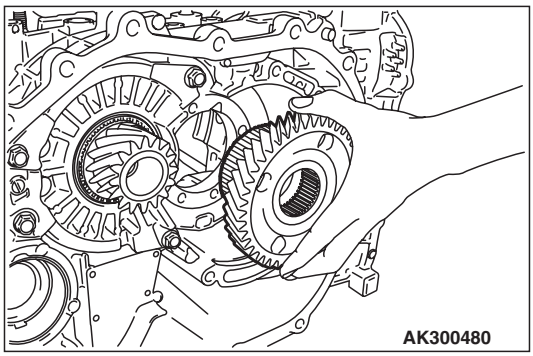
(3) Remove the special tools.

(4) Remove the one-way clutch inner race, O-ring, spring retainer, return spring and low-reverse brake piston.

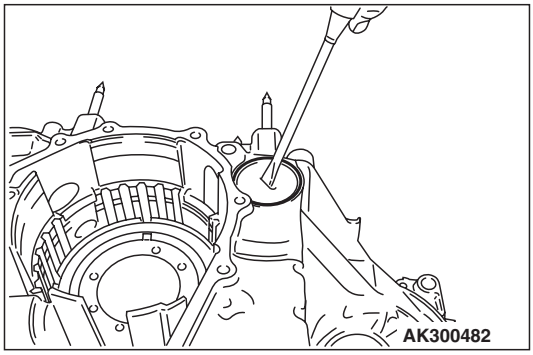


53.Remove the transfer drive gear bearing mounting bolts (three or four pieces).

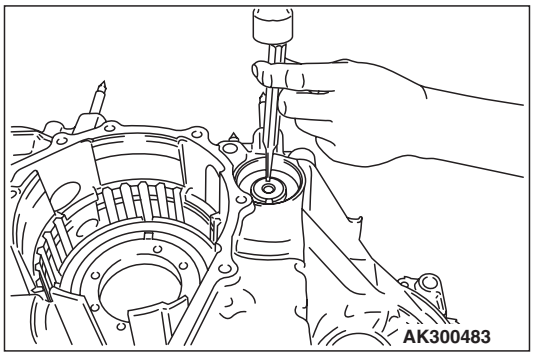
Then, turn the gear 1/8 turn (45 degrees) and remove the remaining bolts.



54.Remove the transfer drive gear.



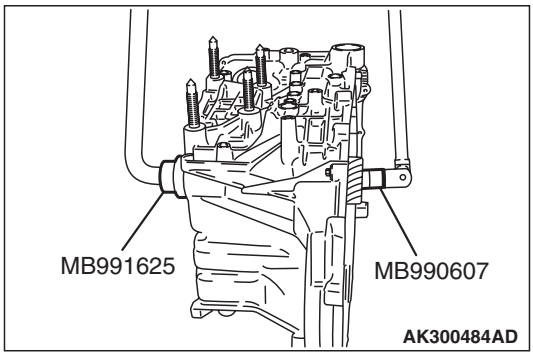
55.Remove the cap by inserting a screwdriver into the center of the cap and prying it up.



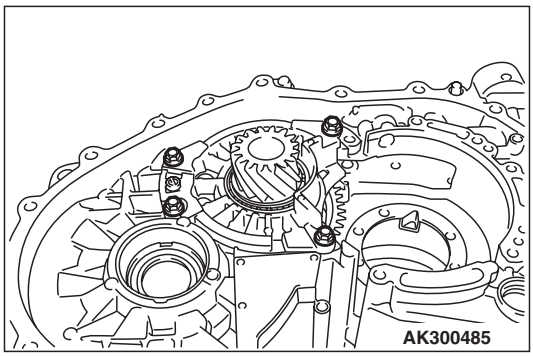
56.Using a chisel, straighten the staked portions from the output shaft jam nut.

⚠ CAUTION

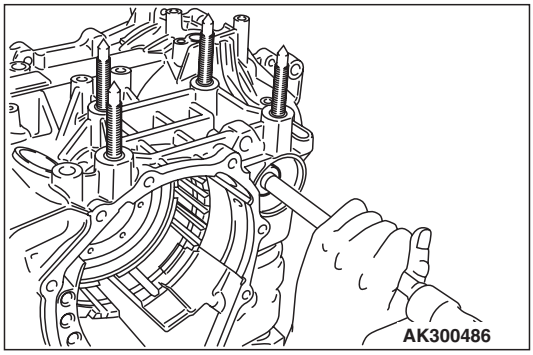
The jam nut is reverse threaded.



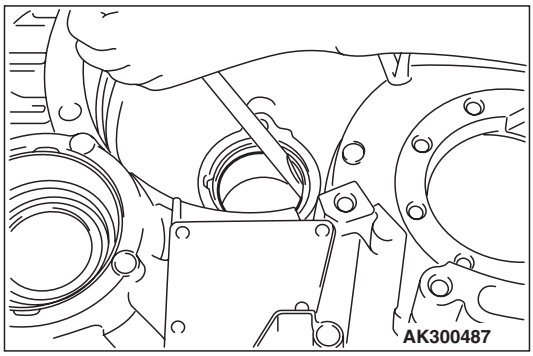
57.Use special tools MB991625 and MB990607 to remove the output shaft jam nut.



58.Remove the bearing retainer mounting bolts.



59.Tap on the rear end of the output shaft to remove the output shaft, taper roller bearing and collar.



60.Tap out the outer race and the spacer.

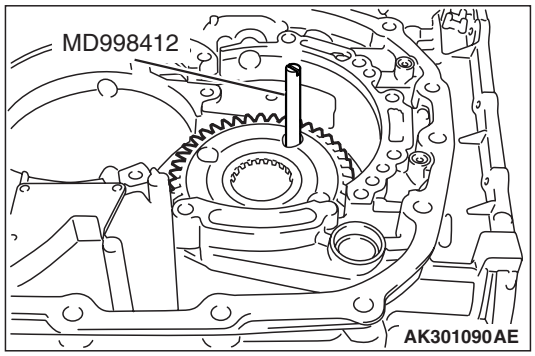
61.Remove the snap ring.

62.Remove the differential bearing outer race from the transaxle case.

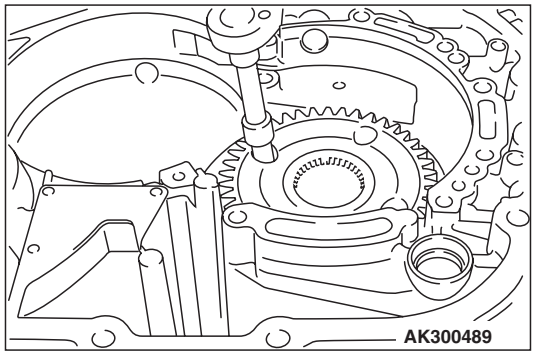
ASSEMBLY

⚠ CAUTION

- **Do not reuse the gasket, O-ring, oil seal. Always replace with a new one when assembling.**
- **Do not use grease. Use petroleum jelly (i.e. Vaseline).**
- **Apply ATF to friction components, rotating parts, and sliding parts before installation. Immerse new clutch discs or brake discs in ATF for at least two hours before assembling them.**
- **When replacing a bushing, replace the assembly which it belongs to.**
- **Do not use cloth gloves or shop towels during assembly. Use nylon cloth or other lint-free material.**

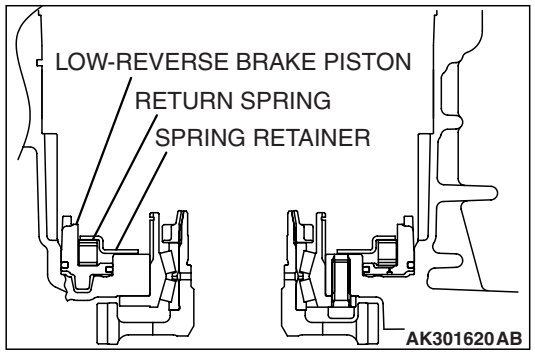


1. Install special tool MD998412 in the installation screw hole of the transfer drive gear bearing located in the transaxle case. Using this as a guide, install the transfer drive gear bearing and gear in the transaxle case.

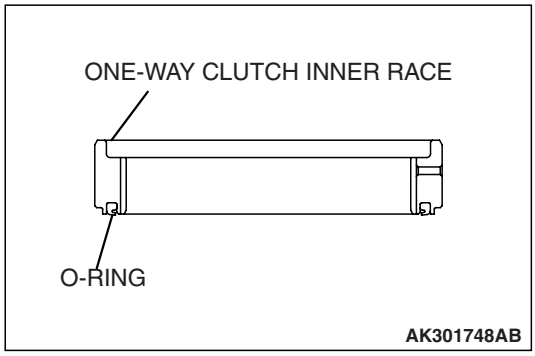


2. Tighten the mounting bolts (seven pieces) of the transfer drive gear bearing to the specified torque.

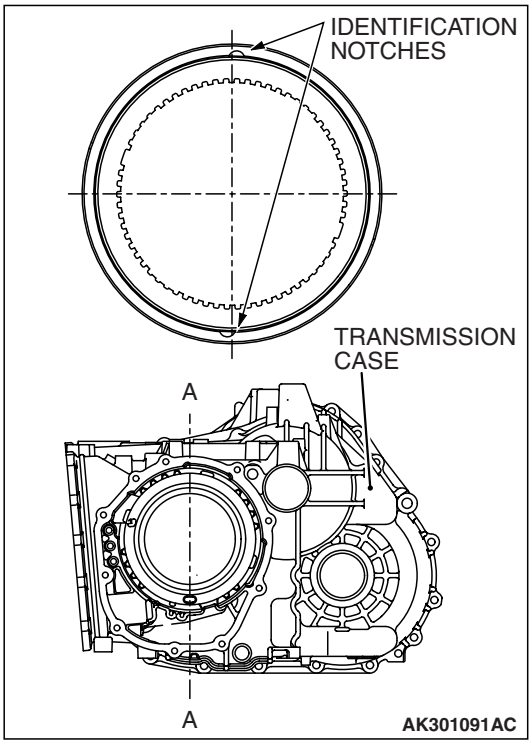
   Tightening torque:
   34 ±2 N· m (25 ±1 ft-lb)



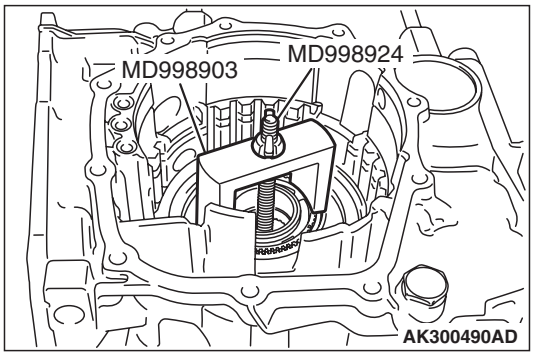
3. Install the low-reverse brake piston, return spring, and spring retainer into the transaxle case.



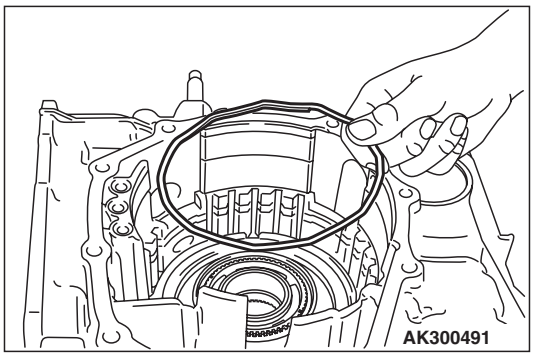
4. Install a new O-ring into the groove of one-way clutch inner race.



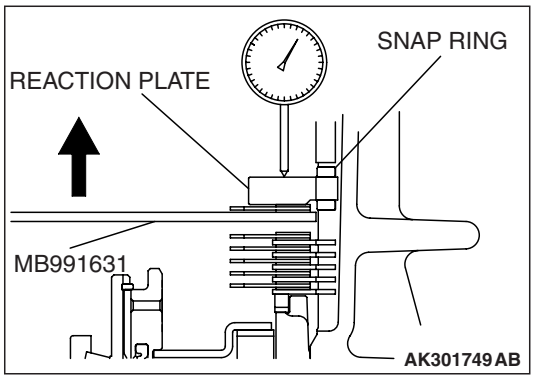
5. Check the placement of the identification notches in the one-way clutch inner race. Install the one-way clutch inner race to the transfer drive gear bearing so that the notches fall along the A –A line.



6. Put the snap ring on the inner race.
7. Set special tools MD998903 and MD998924 as shown, and then compress the one-way clutch inner race and install the snap ring.



8. Install the wave spring onto the low-reverse brake piston.

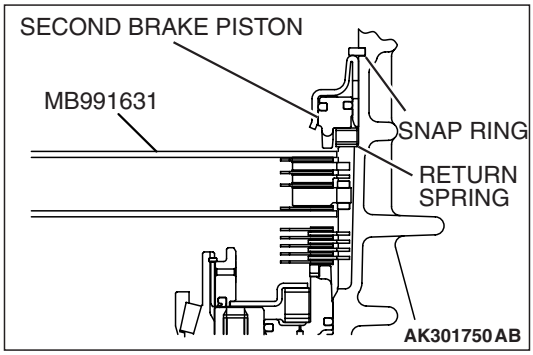


9. Install the brake discs (six pieces), brake plates (five pieces) and snap ring as shown in the illustration.

   NOTE: Do not install the pressure plate at this time.

10. Install special tool MB991631 on the brake disc.
11. Install the reaction plate and the used snap ring.
12. Move special tool MB991631 to measure the end play of reaction plate. Then replace the snap ring installed in step 11 to adjust the end play to standard value.

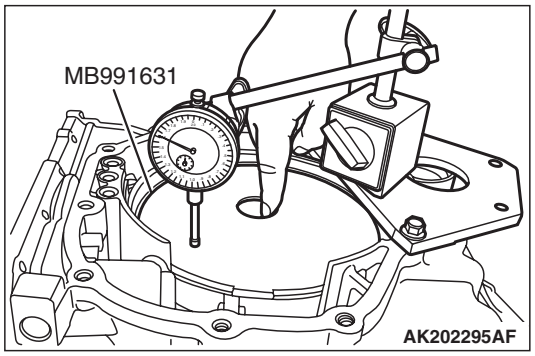
    Standard value: 0 –0.16 mm (0 –0.0063 inch)

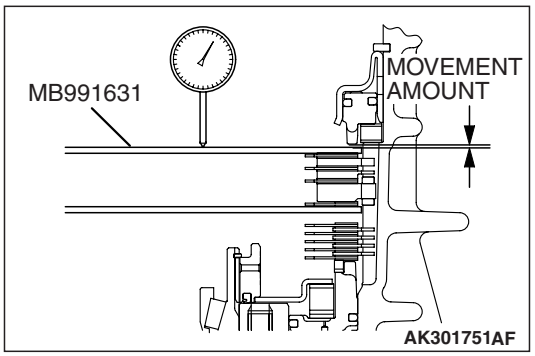


13. Install the brake discs (three pieces) and brake plates (two pieces) as shown in the illustration.

    NOTE: Do not install the pressure plate at this time.

14. Place special tool MB991631 on top of the brake disc in place of the pressure plate.
15. Install the return spring, second brake piston and snap ring.





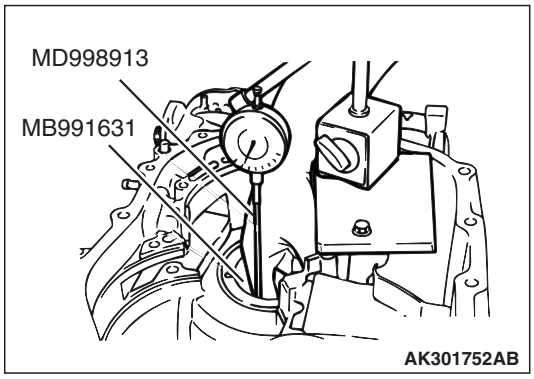
16.Move special tool MB991631 and measure its movement.

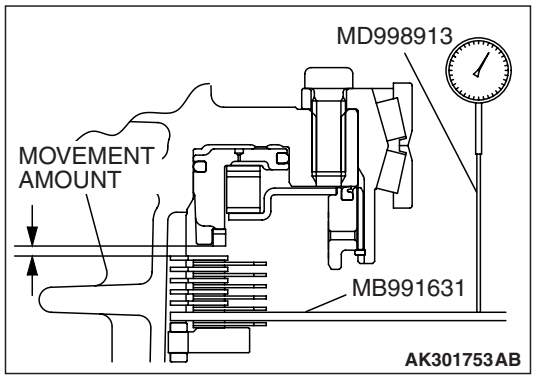
Standard value of end play (Reference):
0.79 –1.25 mm (0.0311 –0.0492 inch)

17.Select a pressure plate whose thickness corresponds to the measured amount of movement from the following table.

PRESSURE PLATE FOR SECOND BRAKE

MOVEMENT AMOUNT mm (in)	THICKNESS mm (in)	ID SYMBOL
0.6 –0.8 (0.024 –0.031)	1.6 (0.063)	L
0.8 –1.0 (0.031 –0.039)	1.8 (0.071)	1
1.0 –1.2 (0.039 –0.047)	2.0 (0.079)	0
1.2 –1.4 (0.047 –0.055)	2.2 (0.087)	2
1.4 –1.6 (0.055 –0.063)	2.4 (0.094)	4
1.6 –1.8 (0.063 –0.071)	2.6 (0.102)	6





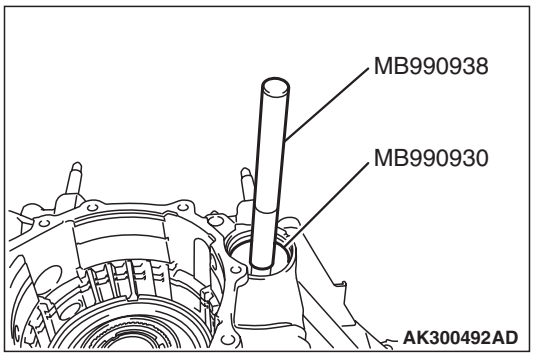
18. Turn the transaxle over so that the installation surface of the torque converter housing is facing up.
    Install special tool MD998913 in a dial gauge, and then move special tool MB991631 and measure its movement.
    Standard value of end play (Reference):
    1.65 –2.11 mm (0.0649 –0.0831 inch)
19. Select a pressure plate whose thickness corresponds to the measured amount of movement from the table below.

PRESSURE PLATE FOR LOW-REVERSE BRAKE

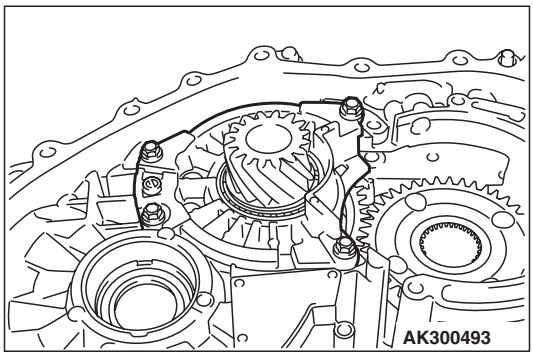
MOVEMENT AMOUNT mm (in)	THICKNESS mm (in)	ID SYMBOL
1.3 –1.5 (0.051 –0.059)	1.6 (0.063)	L
1.5 –1.7 (0.059 –0.067)	1.8 (0.071)	1
1.7 –1.9 (0.067 –0.075)	2.0 (0.079)	0
1.9 –2.1 (0.075 –0.083)	2.2 (0.087)	2
2.1 –2.3 (0.083 –0.091)	2.4 (0.094)	4
2.3 –2.5 (0.091 –0.098)	2.6 (0.102)	6
2.5 –2.7 (0.098 –0.106)	2.8 (0.110)	8
2.7 –2.9 (0.106 –0.114)	3.0 (0.118)	D

⚠ CAUTION
If necessary, take the measurements in steps 9 to 18 after replacing the pressure plate, brake plate and brake disc.

20. Remove all parts and special tools that were installed to take the measurements in steps 9 to 18. Remove and separate the pressure plate and snap ring chosen in steps 12, 16 and 18.
21. Install the snap ring into the groove of transaxle case output shaft bore.



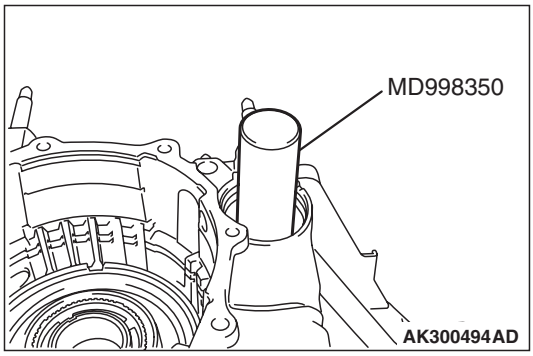
22.Use special tools MB990930 and MB990938 to tap the output shaft bearing outer race in the transaxle case.



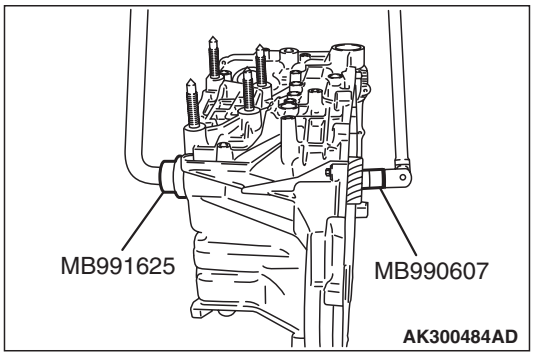
⚠ CAUTION
Do not reuse the bolt, as it has had sealant applied.

23.Tighten the mounting bolts of the output shaft bearing retainer to the specified torque.

Tightening torque:
29 ±2 N· m (21 ±1 ft-lb)



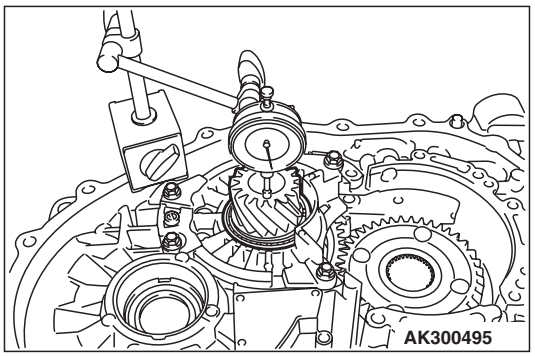
24.Use special tool MD998350 to install the collar and taper roller bearing on the output shaft.



25.Apply ATF to a new jam nut, and use special tools MB990607 and MB991625 to tighten the jam nut to the specified torque. Then turn back one turn, and tighten to the specified torque again.

Tightening torque: 170 ±10 N· m (125 ±7 ft-lb)

NOTE: The jam nut is reverse threaded.



26. Move the output shaft to measure the end play and record the measurement value.

    Standard value of output shaft end play (reference): 0.01 –0.09 mm

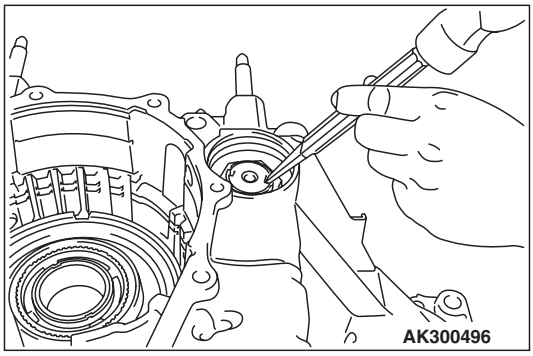
27. Remove the parts that were installed in steps 22 to 25.
28. Select a spacer whose thickness corresponds to the measured amount of movement from the following table.

SPACER FOR OUTPUT SHAFT

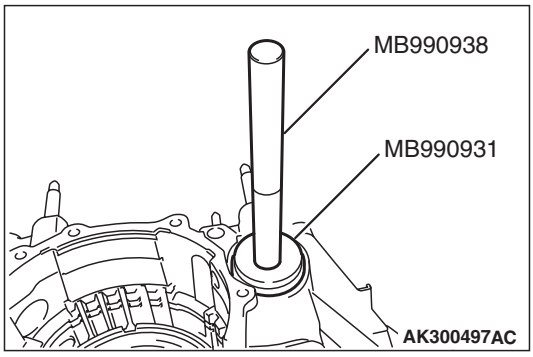
MOVEMENT AMOUNT mm (in)	THICKNESS mm (in)	ID SYMBOL
1.81 –1.85 (0.0713 – 0.0728)	1.88 (0.0740)	88
1.85 –1.89 (0.0728 – 0.0744)	1.92 (0.0756)	92
1.89 –1.93 (0.0744 – 0.0760)	1.96 (0.0772)	96
1.93 –1.97 (0.0760 – 0.0776)	2.00 (0.0787)	00
1.97 –2.01 (0.0776 – 0.0791)	2.04 (0.0803)	04
2.01 –2.05 (0.0791 – 0.0807)	2.08 (0.0819)	08
2.05 –2.09 (0.0807 – 0.0823)	2.12 (0.0835)	12
2.09 –2.13 (0.0823 – 0.0839)	2.16 (0.0850)	16
2.13 –2.17 (0.0839 – 0.0854)	2.20 (0.0866)	20
2.17 –2.21 (0.0854 – 0.0870)	2.24 (0.0882)	24
2.21 –2.25 (0.0870 – 0.0886)	2.28 (0.0898)	28
2.25 –2.29 (0.0886 – 0.0902)	2.32 (0.0913)	32
2.29 –2.33 (0.0902 – 0.0917)	2.36 (0.0929)	36
2.33 –2.37 (0.0917 – 0.0933)	2.40 (0.0945)	40
2.37 –2.41 (0.0933 – 0.0949)	2.44 (0.0961)	44
2.41 –2.45 (0.0949 – 0.0965)	2.48 (0.0976)	48
2.45 –2.49 (0.0965 – 0.0980)	2.52 (0.0992)	52

MOVEMENT AMOUNT mm (in)	THICKNESS mm (in)	ID SYMBOL
2.49 –2.53 (0.0980 – 0.0996)	2.56 (0.1008)	56
2.53 –2.57 (0.0996 – 0.1012)	2.60 (0.1024)	60
2.57 –2.61 (0.1012 – 0.1028)	2.64 (0.1039)	64
2.61 –2.65 (0.1028 – 0.1043)	2.68 (0.1055)	68
2.65 –2.69 (0.1043 – 0.1059)	2.72 (0.1071)	72
2.69 –2.73 (0.1059 – 0.1075)	2.76 (0.1087)	76

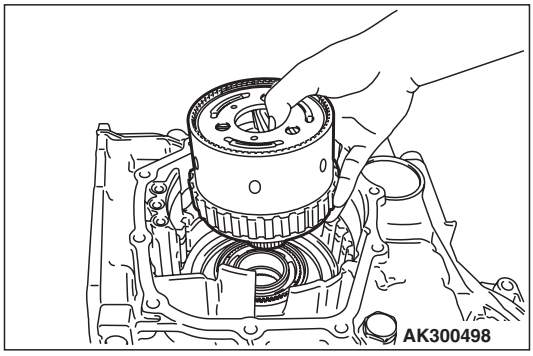
29. Repeat steps 22 to 25 again, installing each part and using the appropriate adjustment spacer determined in step 28.
30. Stake the jam nut with a punch (two places).

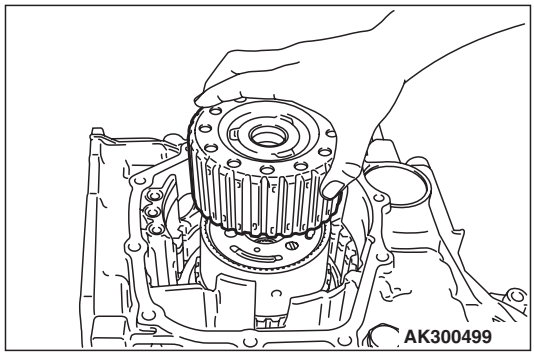


31. Use special tools MB990931 and MB990938 to install the cap as shown in the illustration.

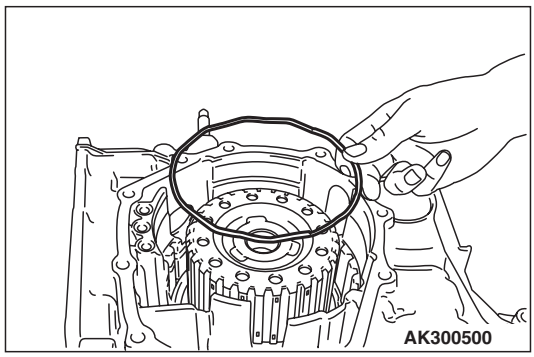


32. Install the planetary carrier assembly.

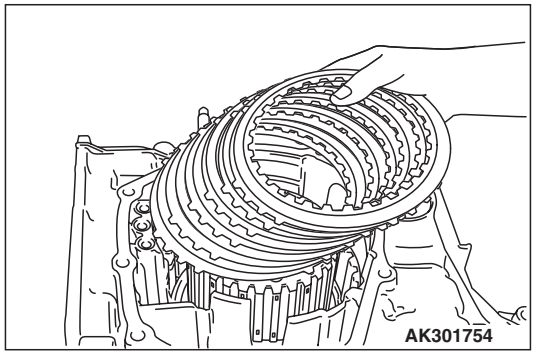




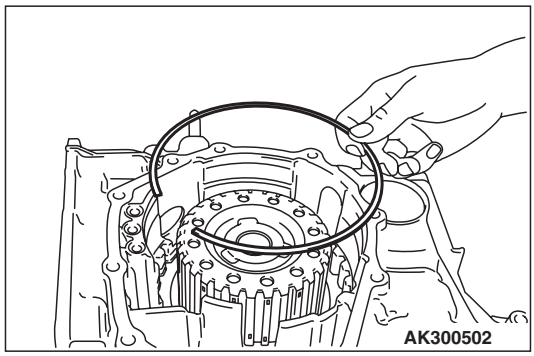
33.Install the planetary reverse sun gear.



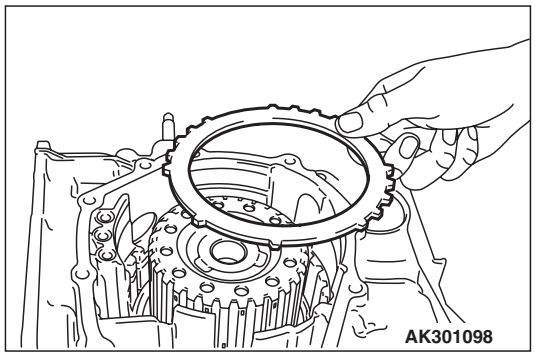
34.Install the wave spring on the low-reverse brake piston.



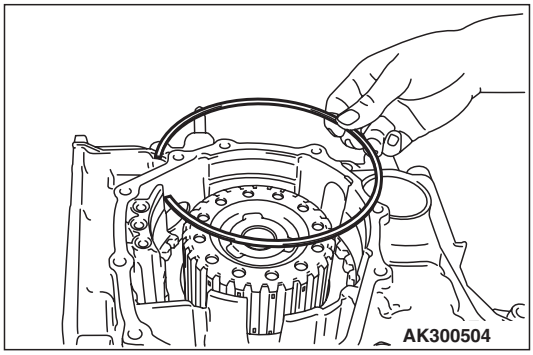
35.Install the pressure plate that was selected in step 19. Next, install brake discs (six pieces) and brake plates (five pieces), one on top of the other.



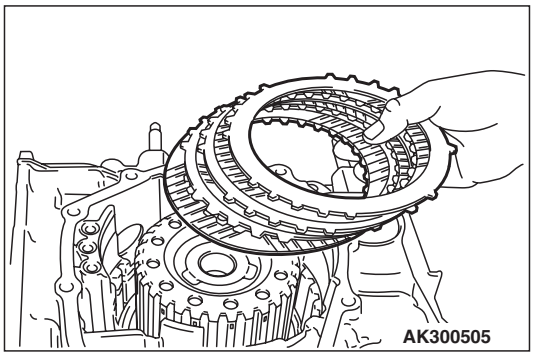
36.Install the snap ring.



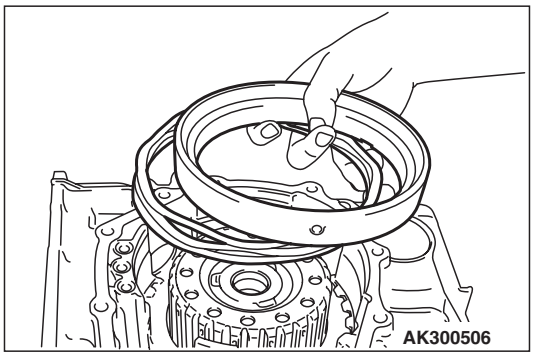
37.Install the reaction plate.



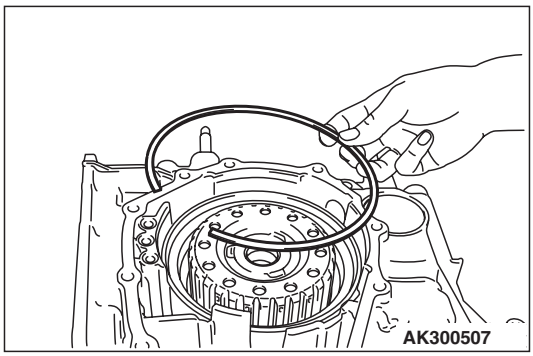
38.Install the snap ring that was selected in step 12.



39.Install brake discs (three pieces) and brake plates (two pieces), one on top of the other. Next, install the pressure plate that was selected in step 17.

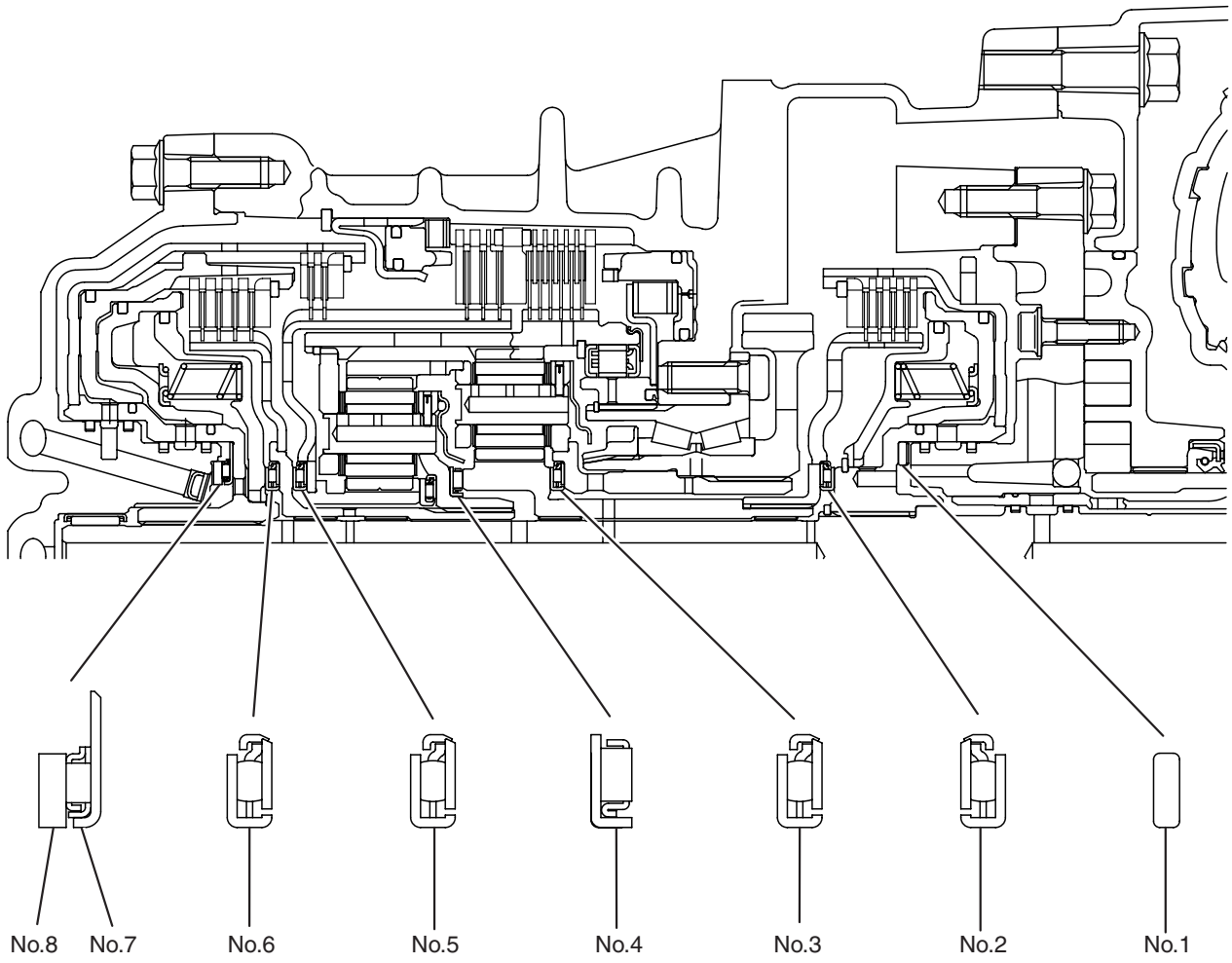


40.Install the return spring and second brake piston.



41.Install the snap ring.

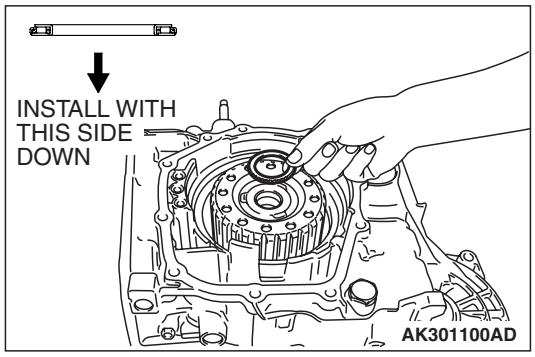
IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS



AK301755 AB

SYMBOL	OD mm (in)	ID mm (in)	THICKNESS mm (in)	SYMBOL	OD mm (in)	ID mm (in)	THICKNESS mm (in)
No. 1	59 (2.32)	47 (1.85)	1.8 (0.071)	No. 8	48.9 (1.925)	37 (1.46)	1.6 (0.063)
	59 (2.32)	47 (1.85)	2.0 (0.079)		48.9 (1.925)	37 (1.46)	1.7 (0.067)
	59 (2.32)	47 (1.85)	2.2 (0.087)		48.9 (1.925)	37 (1.46)	1.8 (0.071)
	59 (2.32)	47 (1.85)	2.4 (0.094)		48.9 (1.925)	37 (1.46)	1.9 (0.075)
	59 (2.32)	47 (1.85)	2.6 (0.102)		48.9 (1.925)	37 (1.46)	2.0 (0.079)
	59 (2.32)	47 (1.85)	2.8 (0.110)		48.9 (1.925)	37 (1.46)	2.1 (0.083)
No. 2	49 (1.93)	34 (1.34)	3.6 (0.142)		48.9 (1.925)	37 (1.46)	2.2 (0.087)
No. 3	49 (1.93)	34 (1.34)	3.6 (0.142)		48.9 (1.925)	37 (1.46)	2.3 (0.091)
No. 4	46 (1.81)	31 (1.22)	3.3 (0.130)		48.9 (1.925)	37 (1.46)	2.4 (0.094)
No. 5	49 (1.93)	34 (1.34)	3.6 (0.142)		48.9 (1.925)	37 (1.46)	2.5 (0.098)
No. 6	49 (1.93)	34 (1.34)	3.6 (0.142)		48.9 (1.925)	37 (1.46)	2.6 (0.102)
No. 7	59 (2.32)	37 (1.46)	2.8 (0.110)				

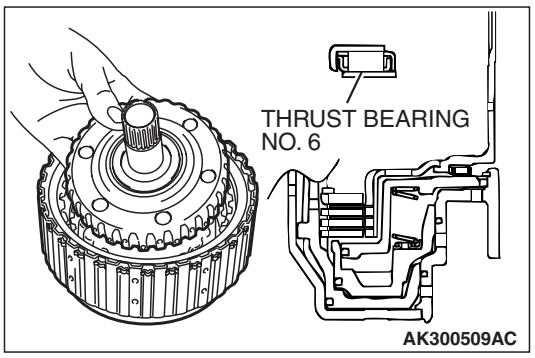
TSB Revision



⚠ CAUTION

Be sure to install the thrust bearing in the correct direction as shown.

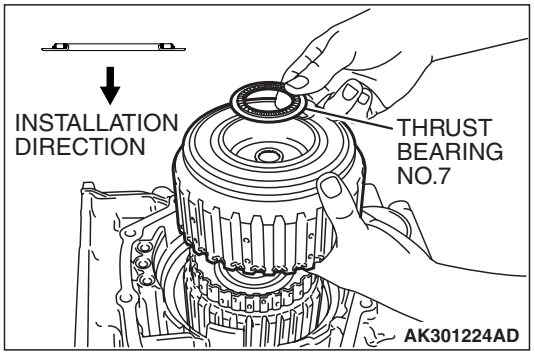
42.Check the installation direction of the thrust bearing number 5, and install it on the hub of the planetary reverse sun gear.



⚠ CAUTION

Use care to install the thrust bearing in the proper direction.

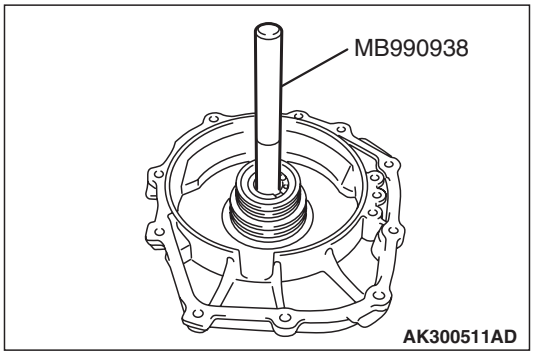
43.Attach thrust bearing number 6 to the inside of the overdrive clutch hub using petroleum jelly (Vaseline). Then install the assembly in the reverse and overdrive clutch.



⚠ CAUTION

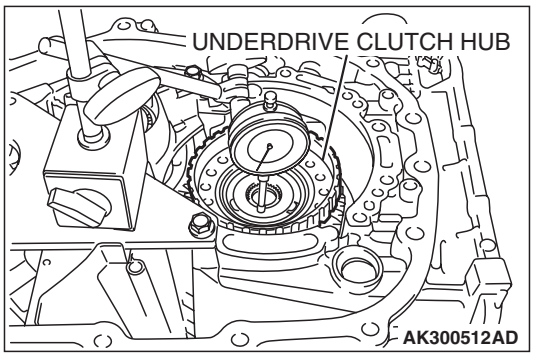
Be sure to install the thrust bearing in the correct direction as shown.

44.Check the installation direction of thrust bearing number 7, and install it on the reverse clutch retainer.



45.Use special tool MB990938 to tap the input shaft rear bearing in the rear cover.

46.Install the seal rings (four pieces) in the grooves of the rear cover.



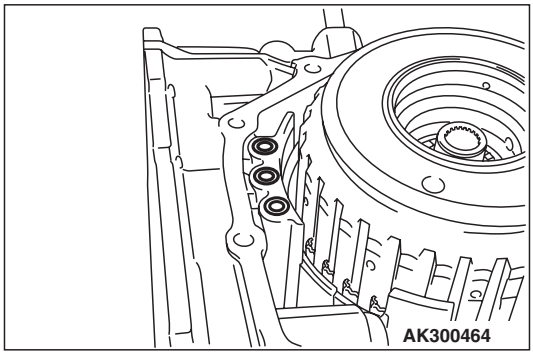
47.Measure the end play of the under drive sun gear by the following procedures:
(1) Install the thinnest thrust race number 8 [thickness 1.6 mm (0.063 inch); part number MD707267] on thrust bearing number 7.
(2) Install the rear cover on the transaxle case and tighten the bolts to the specified torque.

Tightening torque: 23 ±3 N· m (17 ±2 ft-lb)

(3) Turn over the transaxle case so that the installation surface of the torque converter housing is facing up.
(4) Install the underdrive clutch hub on the underdrive sun gear.
(5) Measure end play of the underdrive sun gear and record the measurement value.

Standard value (Reference):
0.25 –0.45 mm (0.0098 –0.0177 inch)

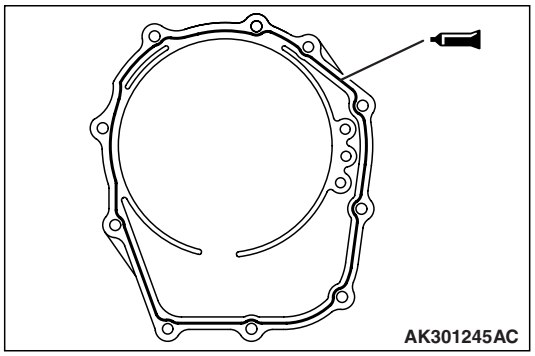
(6) After taking the measurement in steps (5), take out the installed parts in steps (1) through (4).



48.Install the O-rings (three pieces).

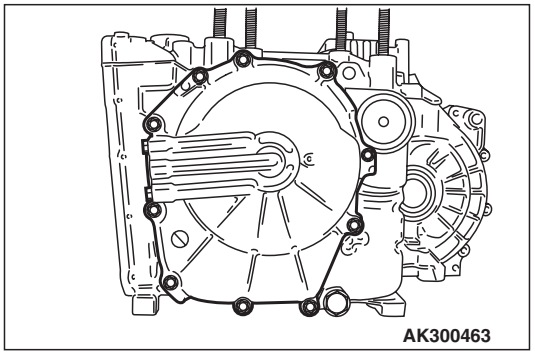
49.Select a thrust race number 8 whose thickness corresponds to the measured values taken in step 47 from the table below. Install it on thrust bearing number 7.

MEASUREMENT VALUE mm (in)	THICKNESS mm (in)
0.3 –0.4 (0.012 –0.016)	1.6 (0.063)
0.4 –0.5 (0.016 –0.020)	1.7 (0.067)
0.5 –0.6 (0.020 –0.024)	1.8 (0.071)
0.6 –0.7 (0.024 –0.028)	1.9 (0.075)
0.7 –0.8 (0.028 –0.031)	2.0 (0.079)
0.8 –0.9 (0.031 –0.035)	2.1 (0.083)
0.9 –1.0 (0.035 –0.039)	2.2 (0.087)
1.0 –1.1 (0.039 –0.043)	2.3 (0.091)
1.1 –1.2 (0.043 –0.047)	2.4 (0.094)
1.2 –1.3 (0.047 –0.051)	2.5 (0.098)
1.3 –1.4 (0.051 –0.055)	2.6 (0.102)


AK301245AC

50.Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD974421 or equivalent) to the illustrated position of the rear cover.

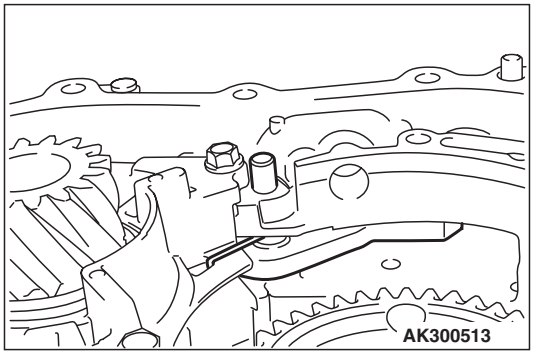
NOTE: Be sure to install the case quickly while the sealant is wet (within 15 minutes). Leaks will occur if the rear cover is installed after the sealant dries.


AK300463

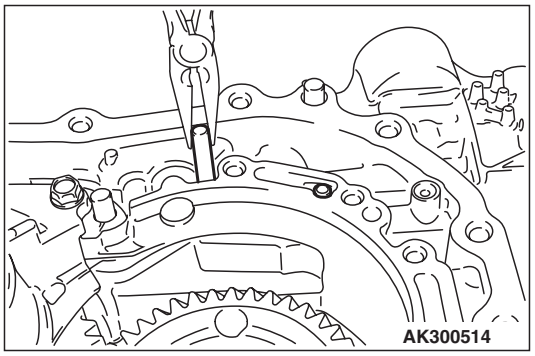
51.Install the rear cover, and tighten its mounting bolts to the specified torque.

Tightening torque: 23 ±3 N· m (17 ±2 ft-lb)

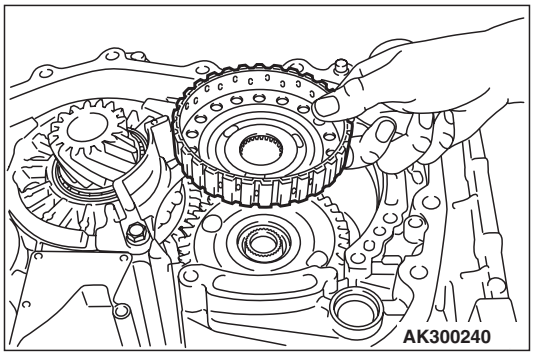
NOTE: After installation, keep the sealed area away from ATF for approximately one hour.


AK300513

52.Install the parking pawl, spacer, and spring. Then insert the parking pawl shaft.


AK300514

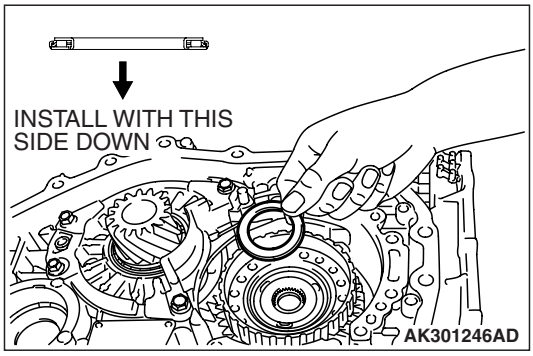
53.Install the parking roller support, and then insert the parking roller support shafts (two pieces).


AK300240

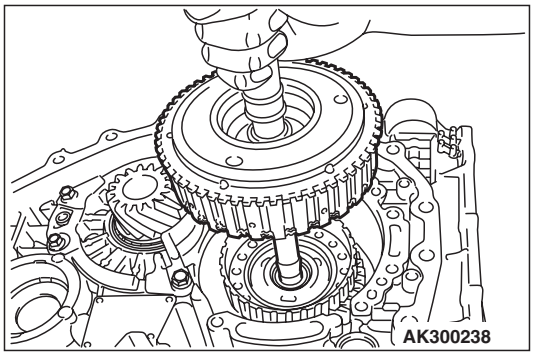
54.Install the underdrive clutch hub to the underdrive sun gear.

⚠ CAUTION

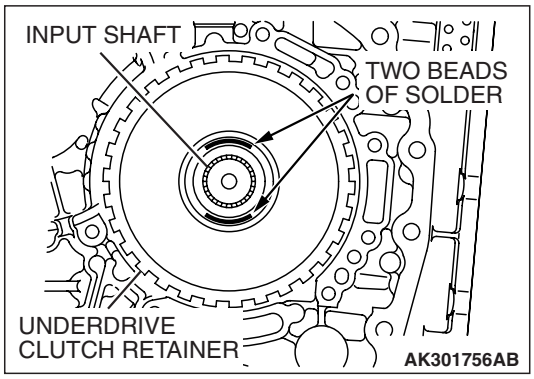
Be sure to install the thrust bearing in the correct direction as shown.



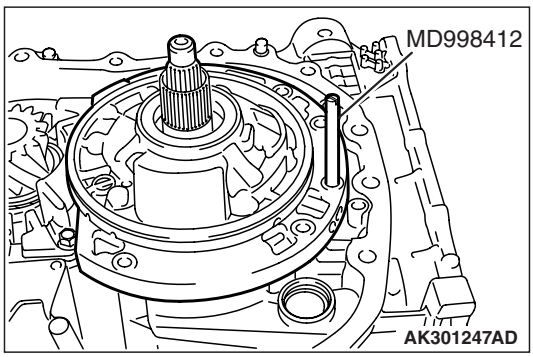
55.Check the installation direction of thrust bearing number 2, and install it on the underdrive clutch hub.



56.Hold the input shaft, and install the underdrive clutch.



57.Place two beads of solder [each 10 mm (0.39 inch) in length, 3.5 mm (0.14 inch) in diameter] on the underdrive clutch retainer as shown in the illustration.



58.Install special tool MD998412 as shown.

59.Install the oil pump to the transaxle case.

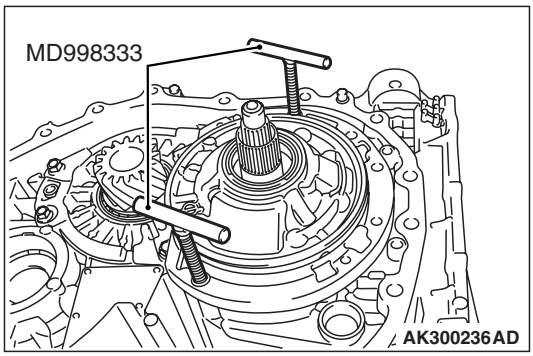
NOTE: Do not install the oil pump gasket at this time.

60.Tighten the six oil pump mounting bolts to the specified torque.

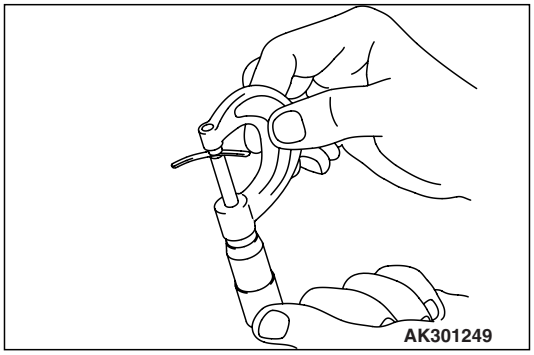
Tightening torque: 29 ±2 N· m (21 ±1 ft-lb)

61.Remove the oil pump mounting bolts.

TSB Revision



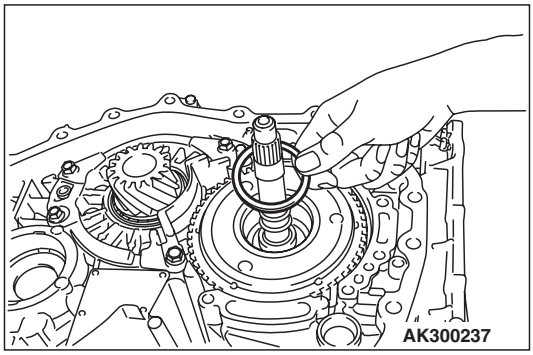
62.Using special tools MD998333, remove the oil pump and the crushed solders.



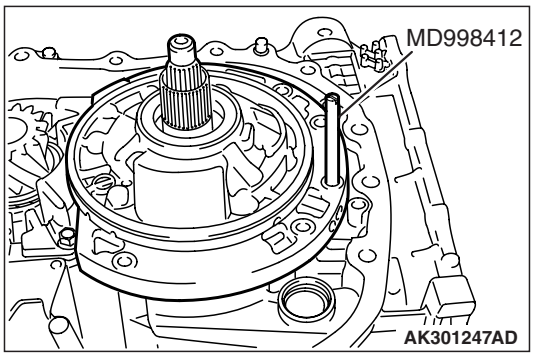
63.Use a micrometer to measure the thickness of the crushed solder beads and record the measured value.

64.Select a thrust washer number 1 whose thickness corresponds to the measured value from table below.

MEASUREMENT VALUE mm (in)	THICKNESS mm (in)	ID SYMBOL
2.25 –2.45 (0.089 –0.096)	1.8 (0.071)	18
2.45 –2.65 (0.096 –0.104)	2.0 (0.079)	20
2.65 –2.85 (0.104 –0.112)	2.2 (0.087)	22
2.85 –3.05 (0.112 –0.120)	2.4 (0.094)	24
3.05 –3.25 (0.120 –0.128)	2.6 (0.102)	26
3.25 –3.45 (0.128 –0.136)	2.8 (0.110)	28

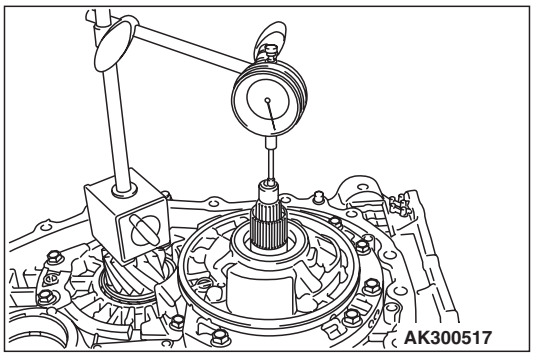


65.Install thrust washer number 1 that was selected in step 64 on the underdrive clutch retainer.



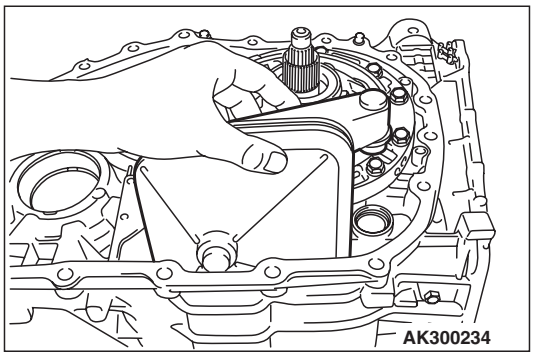
66.Install special tool MD998412 as shown.
67.Install the new oil pump gasket on the transaxle case.
68.Install the oil pump and tighten the six mounting bolts to the specified torque.

Tightening torque: 29 ±2 N· m (21 ±1 ft-lb)

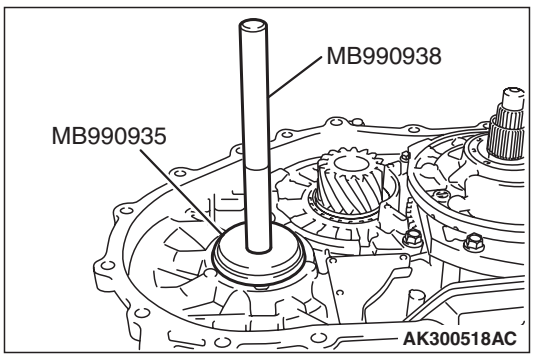


69.Make sure that the input shaft end play meets the standard value.

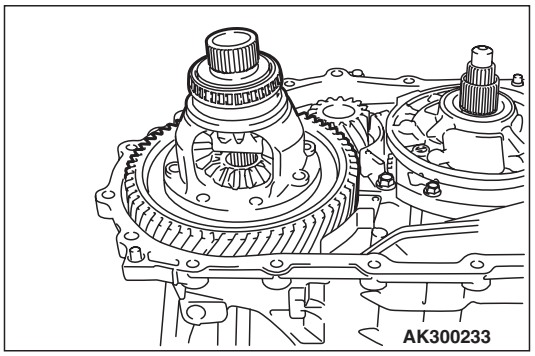
Standard value : 0.70 –1.45 mm (0.028 –0.057 inch)



70.Install the oil filter.



71.Use special tools MB990935 and MB990938 to tap the differential bearing outer race in the transaxle case.



72.Install the differential.

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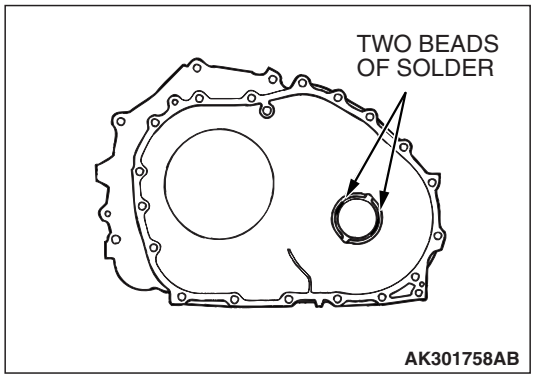
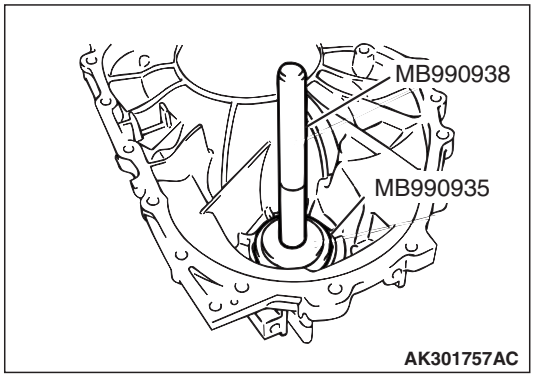
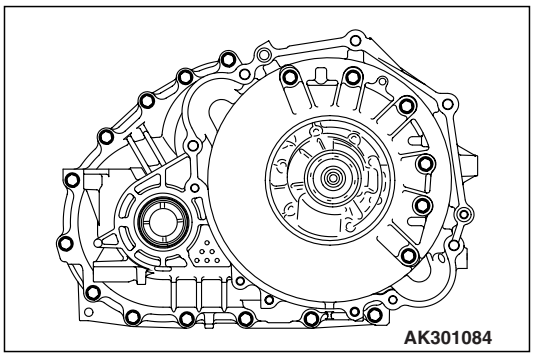


73.Place two beads of solder [each 10 mm (0.39 inch) in length, 3 mm (0.12 inch) in diameter] on the torque converter housing as shown in the illustration.



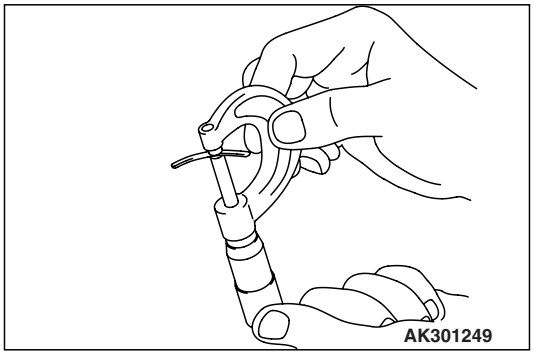
74.Use special tools MB990935 and MB990938 to press the differential bearing outer race into the torque converter housing.



75.Install the torque converter housing to the transaxle case without applying sealant. Tighten its mounting bolts to the specified torque.

Tightening torque: 48 ±6 N·m (36 ±4 ft-lb)

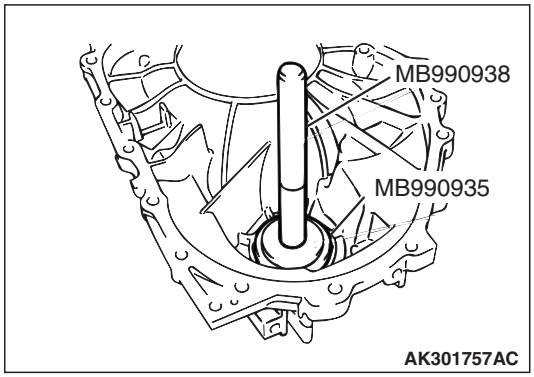
76.Loosen all the bolts, and remove the torque converter housing. Then remove the outer race and the crushed solders.



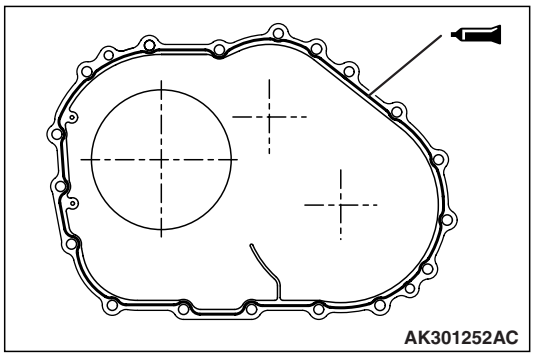
77.Use a micrometer to measure the thickness of the crushed solder beads and record the measured value. Add 0.045 to 0.105 mm (0.0018 to 0.0041 inch)* to the measured value and select a spacer with the corresponding thickness. Adjustment spacer sizes are all listed on P.23B-74. Select the most suitable one from among those listed.

*NOTE: * is the thickness for the differential case preload.*

78.Install the spacer selected in step 77 to the torque converter housing.



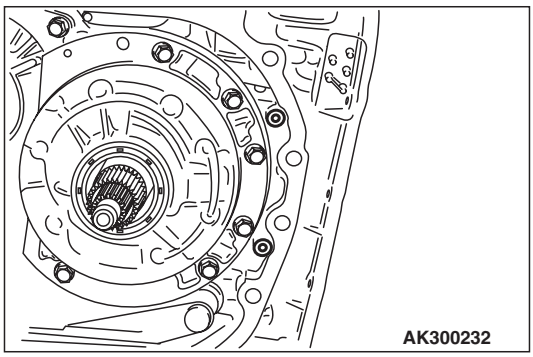
79.Use special tools MB990935 and MB990938 to press the outer race into housing.



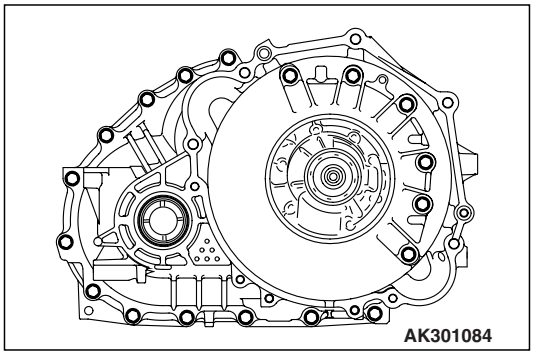
80.Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD974421 or equivalent) to the torque converter housing in the area shown.

NOTE: Be sure to install the case quickly while the sealant is wet (with 15 minutes). Leaks will occur if the rear cover is installed after the sealant dries.

NOTE: After installation, keep the sealed area away from ATF for approximately one hour.



81.Install the O-rings (two pieces).

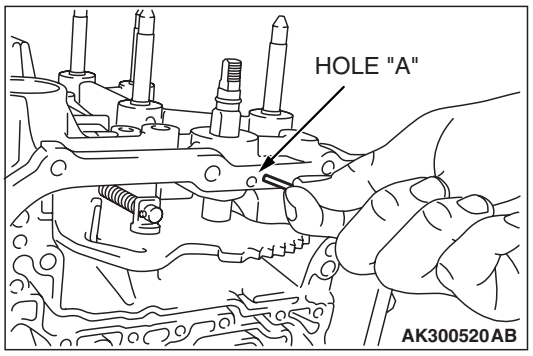


82.Install the torque converter housing and then tighten its mounting bolts (eighteen pieces) to the specified torque.

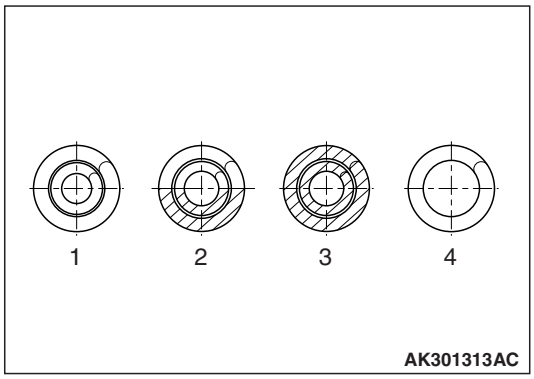
Tightening torque: 48 ±6 N· m (36 ±4 ft-lb)

83.Insert the O-rings (two pieces) into the grooves of the manual control lever shaft.

84.Install the manual control lever shaft and parking pawl rod.

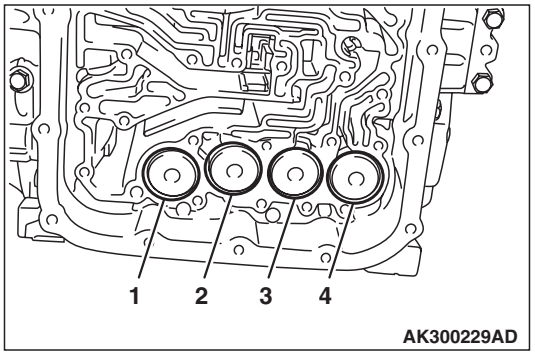


85.Align hole "A" with the groove in the manual control lever shaft. Insert the manual control lever shaft roller into hole "A."



86.Insert the new seal rings in the grooves of the accumulator pistons.

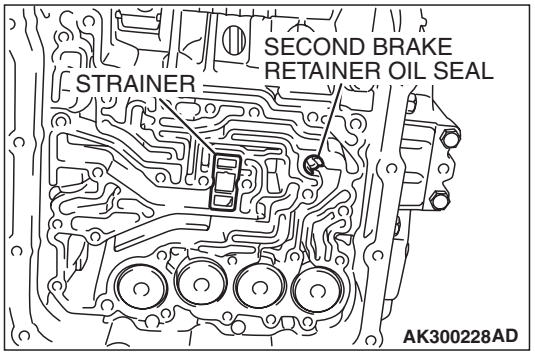
NOTE: The piston and seal ring are common parts.



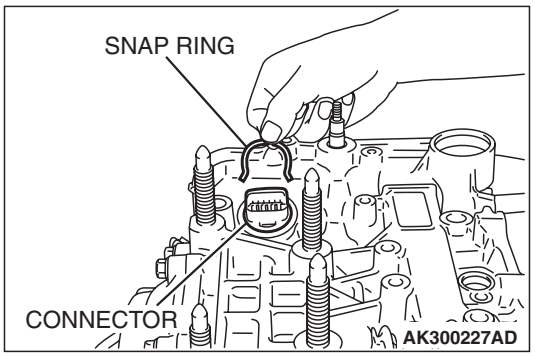
87.Identify the accumulator spring and insert it and the accumulator piston into each hole of the transaxle case.

NOTE: Accumulator springs are identified as shown in the illustration.

NO.	NAME	IDENTIFICATION "BLUEING"
1	For low-reverse brake	None
2	For underdrive clutch	Half
3	For second brake	Whole surface
4	For overdrive clutch	None

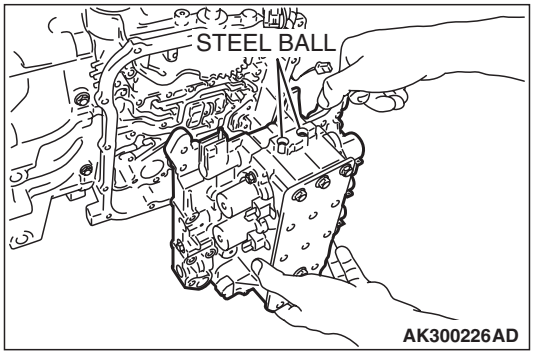


88.Install the strainer and second brake retainer oil seal.



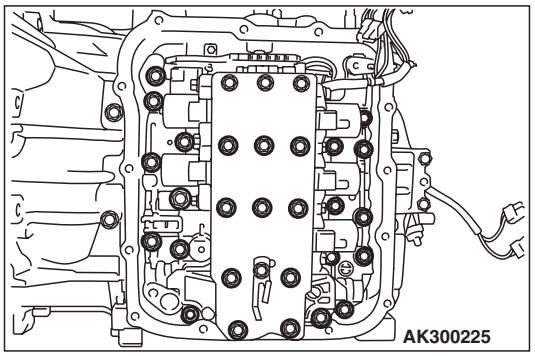
89.Insert a new O-ring to the groove of the solenoid valve harness connector.

90.Insert the solenoid valve harness connector into the hole from the inside of the transaxle case so it is oriented as shown in the illustration. Then secure the snap ring to the connector groove.



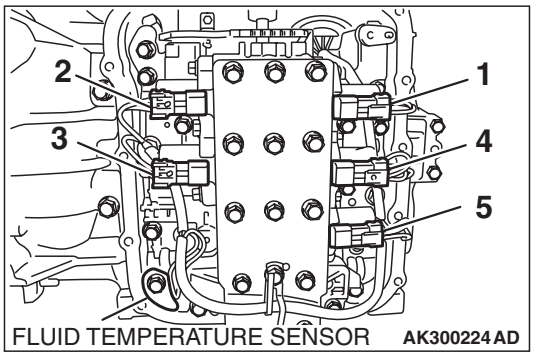
91.Install the steel balls into each of the two holes in the top face of the valve body (outside valve body).

92.Install the valve body and gasket to the transaxle case. Make sure that the manual valve's pin is in the groove in the detent plate of the manual control lever.



93.Install the valve body mounting bolts (twenty seven pieces), and tighten to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)



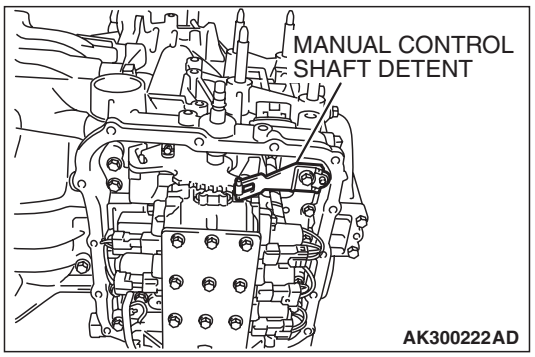
94.Attach the solenoid valve harness to valve body by connecting the all the connectors.

NO.	PARTS TO BE CONNECTED	SOLENOID VALVE HARNESS	
		CABLE COLOR	CONNECTOR HOUSING COLOR
1	Underdrive solenoid valve	White, red, red	Black
2	Overdrive solenoid valve	Orange, red	Black
3	Low-reverse solenoid valve	Brown, yellow	Milky white
4	Second solenoid valve	Blue, red, red	Milky white
5	Torque converter clutch control solenoid valve	Blue, yellow, yellow	Black

TSB Revision

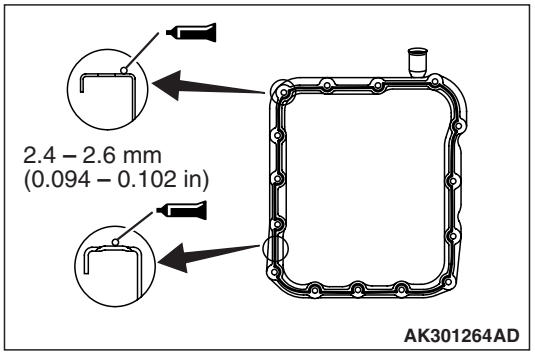
95.Install the fluid temperature sensor to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)



96.Install the manual control shaft detent and tighten the bolt to the specified torque.

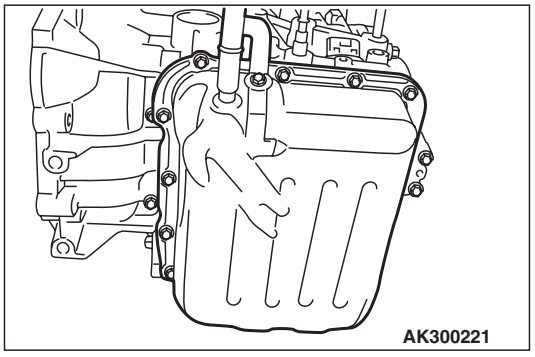
Tightening torque: 6.0 ±1.0 N· m (53 ±9 in-lb)



97.Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD974421 or equivalent) to the valve body cover in the area shown.

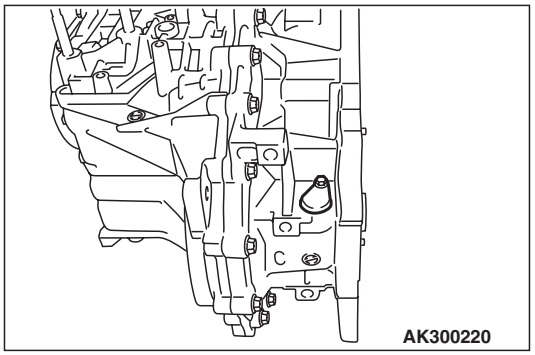
NOTE: Be sure to install the case quickly while the sealant is wet (with 15 minutes) or leaks will occur if the rear cover is installed after the sealant dries.

NOTE: After installation, keep the sealed area away from ATF for approximately one hour.



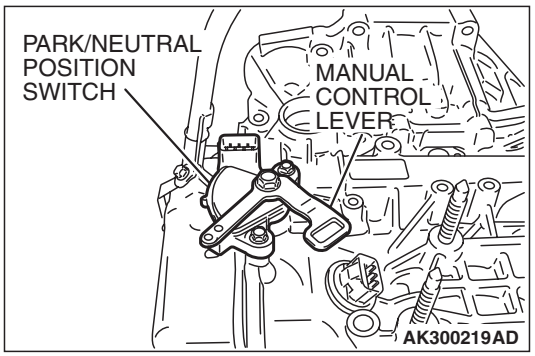
98.Install the valve body cover, and then tighten its mounting bolts to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)



99.Install the Sealing cap and tighten the bolt to the specified torque.

Tightening torque: 5.0 ±1.0 N· m (44 ±9 in-lb)

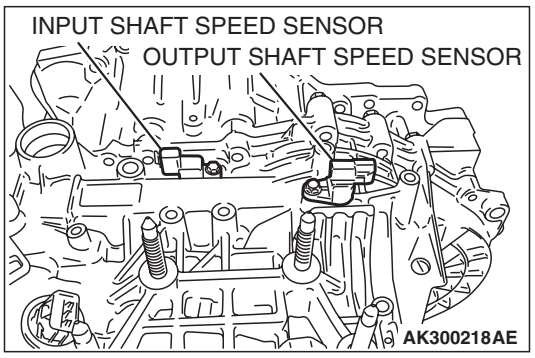


100.Install the park/neutral position switch and tighten the bolt to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)

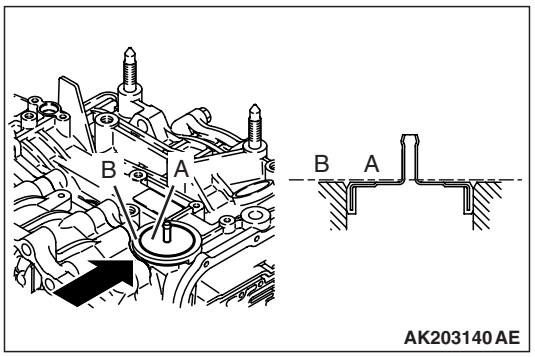
101.Install the manual control lever and tighten the nut to the specified torque.

Tightening torque: 22 ±3 N· m (16 ±2 ft-lb)



102.Install the input shaft speed sensor and output shaft speed sensor and tighten the bolt to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)



103.Press Face "A" of the air breather to be on the same plane as the Face "B" of the transaxle case as shown in the illustration.

104.Apply ATF on the both sides of the new gasket and threads of the eyebolts, and then tighten to the specified torque.

Tightening torque: 24 ±3 N· m (18 ±2 ft-lb)

105.Tighten the oil cooler feed pipe clamp bolt to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)

106.Install the oil dipstick.

107.Install the cable support brackets to the specified torque.

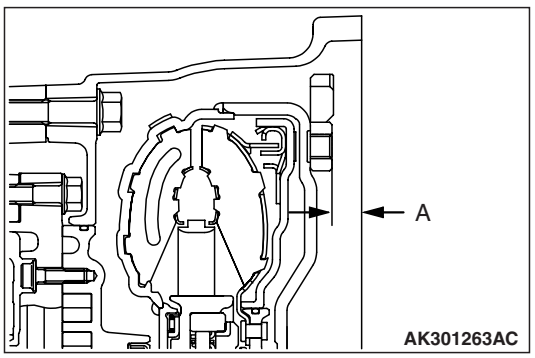
Tightening torque: 23 ±3 N· m (17 ±2 ft-lb)

108.Install the harness bracket to the specified torque.

Tightening torque: 11 ±1 N· m (97 ±9 in-lb)

109.Install the roll stopper brackets.

Tightening torque: 90 ±10 N· m (66 ±7 ft-lb)



⚠ CAUTION

Apply ATF to the oil pump drive hub before installing the torque converter. Be careful not to damage the oil seal lip when installing the torque converter.

110.Install the torque converter, and align it with the oil pump so that the shown dimension "A" meets the reference value.

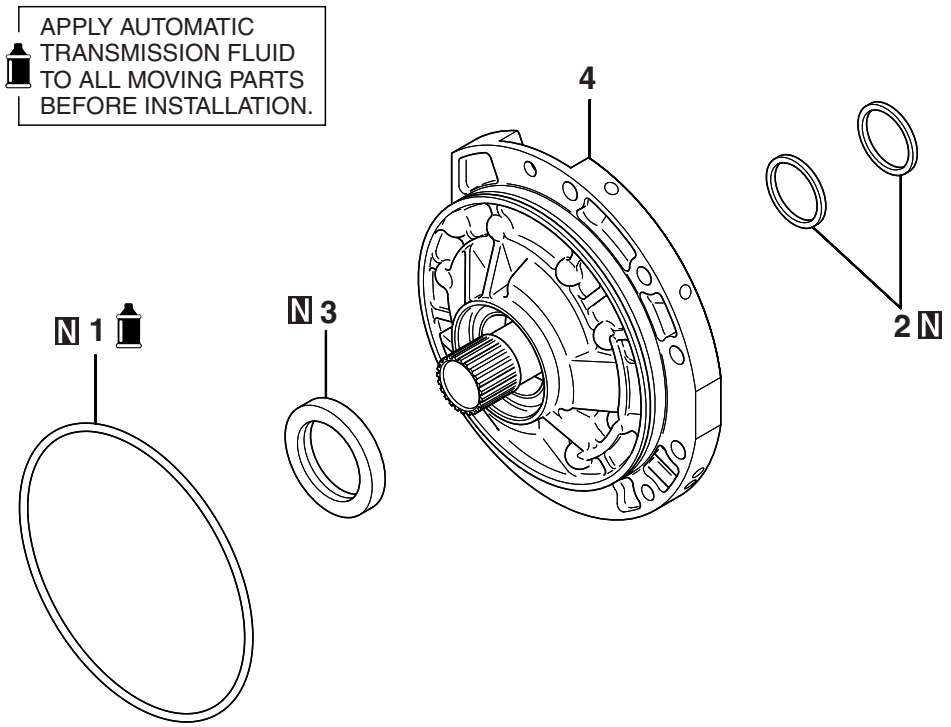
Reference value:
Approximately 12.2 mm (0.48 inch)

TSB Revision

OIL PUMP

DISASSEMBLY AND ASSEMBLY

M1233001300198



AK301599 AB

DISASSEMBLY STEPS

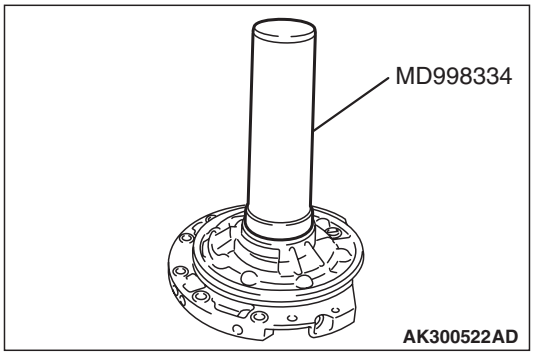
>>**B**<< 1. O-RING
2. SEAL RING

DISASSEMBLY STEPS

>>**A**<< 3. OIL SEAL
4. OIL PUMP ASSEMBLY

Required Special Tool:

- MD998334: Oil Seal Installer



ASSEMBLY SERVICE POINTS

>>A<< OIL SEAL INSTALLATION

1. Apply a small amount of ATF to the oil seal lip.
2. Use special tool MD998334 to tap the oil seal in the oil pump body.

>>B<< O-RING INSTALLATION

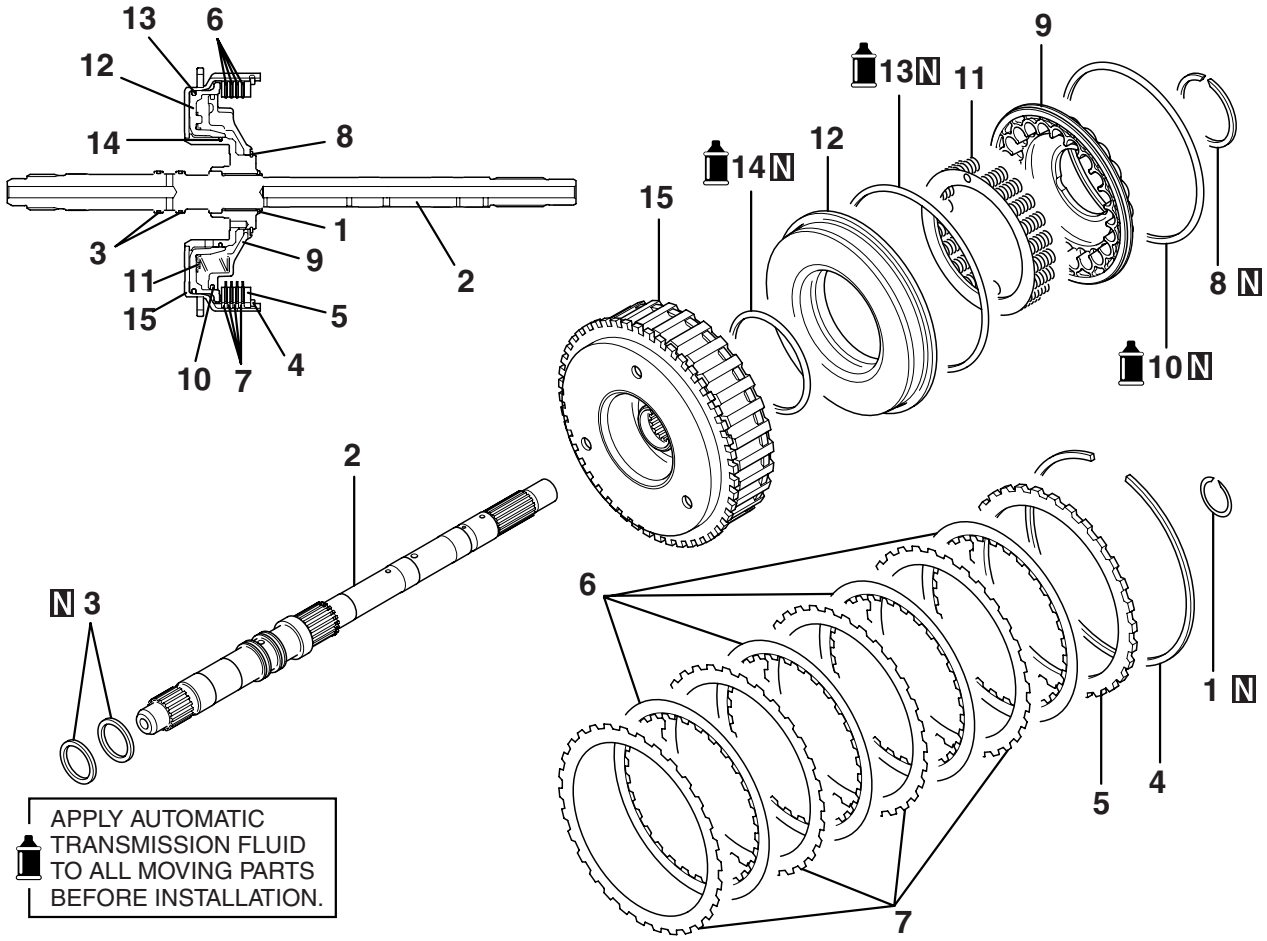
Install a new O-ring to the outer groove of the oil pump, and apply ATF or petroleum jelly (Vaseline) to the O-ring.

TSB Revision

UNDERDRIVE CLUTCH AND INPUT SHAFT

DISASSEMBLY AND ASSEMBLY

M1233024500160



AK301600 AB

		DISASSEMBLY STEPS
	1.	SNAP RING
	2.	INPUT SHAFT
	3.	SEAL RING
>>**D**<<	4.	SNAP RING
>>**C**<<	5.	CLUTCH REACTION PLATE
>>**C**<<	6.	CLUTCH DISC
>>**C**<<	7.	CLUTCH PLATE
<<**A**>> >>**B**<<	8.	SNAP RING

		DISASSEMBLY STEPS
	9.	SPRING RETAINER
>>**A**<<	10.	D-RING
	11.	RETURN SPRING
	12.	UNDERDRIVE CLUTCH PISTON
>>**A**<<	13.	D-RING
>>**A**<<	14.	D-RING
	15.	UNDERDRIVE CLUTCH RETAINER

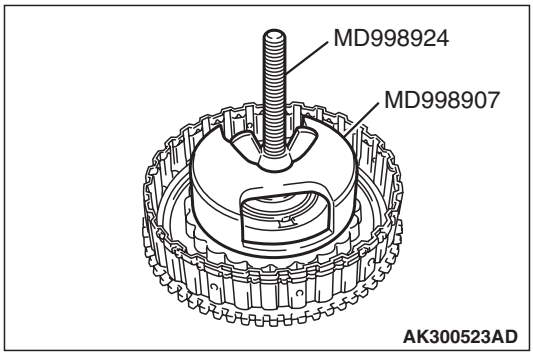
Required Special Tools:

- MB991628: Spring Compressor
- MD998907: Spring Compressor
- MD998924: Spring Compressor Retainer

TSB Revision

DISASSEMBLY SERVICE POINT

<<A>> SNAP RING REMOVAL



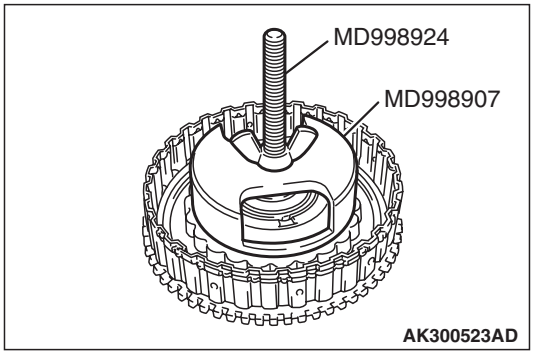
1. Set special tools MD998907 and MD998924 as shown in the illustration.
2. Compress the return spring and remove the snap ring.

ASSEMBLY SERVICE POINTS

>>A<< D-RING INSTALLATION

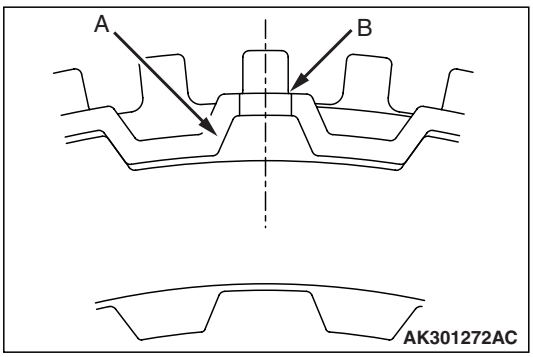
1. Install a D-ring in the groove in the underdrive clutch retainer and piston, and in the groove in the outside of the spring retainer. Be careful not to twist or damage the D-rings.
2. Apply ATF or petroleum jelly (Vaseline) to the D-rings.

>>B<< SNAP RING INSTALLATION



1. Place the snap ring on top of the spring retainer, and then set special tool MD998907 and MD998924 as shown in the illustration.
2. Compress the return spring and install the snap ring.

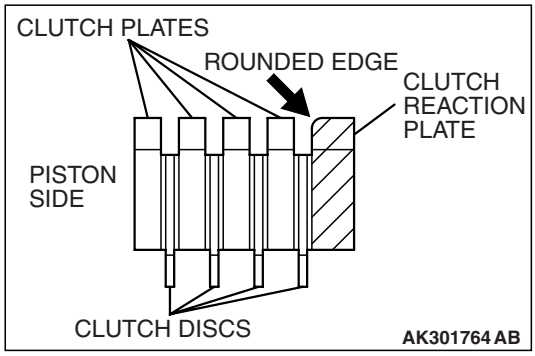
>>C<< CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION



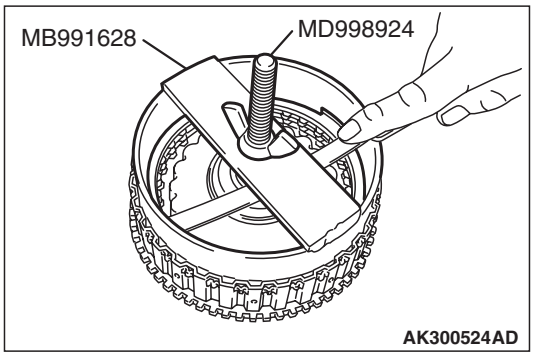
⚠ CAUTION

Immerse the clutch disc in ATF before assembling it. If the clutch disc is new, soak it in ATF for at least two hours.

1. Assemble the four clutch plates and four clutch discs one on top of the other inside the underdrive clutch retainer. All four clutch plates should be assembled so that the places with no teeth (marked "A") are aligned with the holes in the retainer (marked "B").



2. Install the clutch reaction plate in the direction shown. Install it the same as the clutch plates, so that the areas with no teeth (marked "A") are aligned with the retainer (marked "B").



>>D<< SNAP RING INSTALLATION

1. Install the snap ring into the groove of clutch retainer.
2. Set special tools MB991628 and MD998924 as shown in the illustration, and then compress the clutch element.
3. Check that the clearance between the snap ring and the clutch reaction plate is within the standard value. If not within the standard value, select a snap ring so that it is.

Standard value: 1.6 –1.8 mm (0.0630 –0.0709 inch)

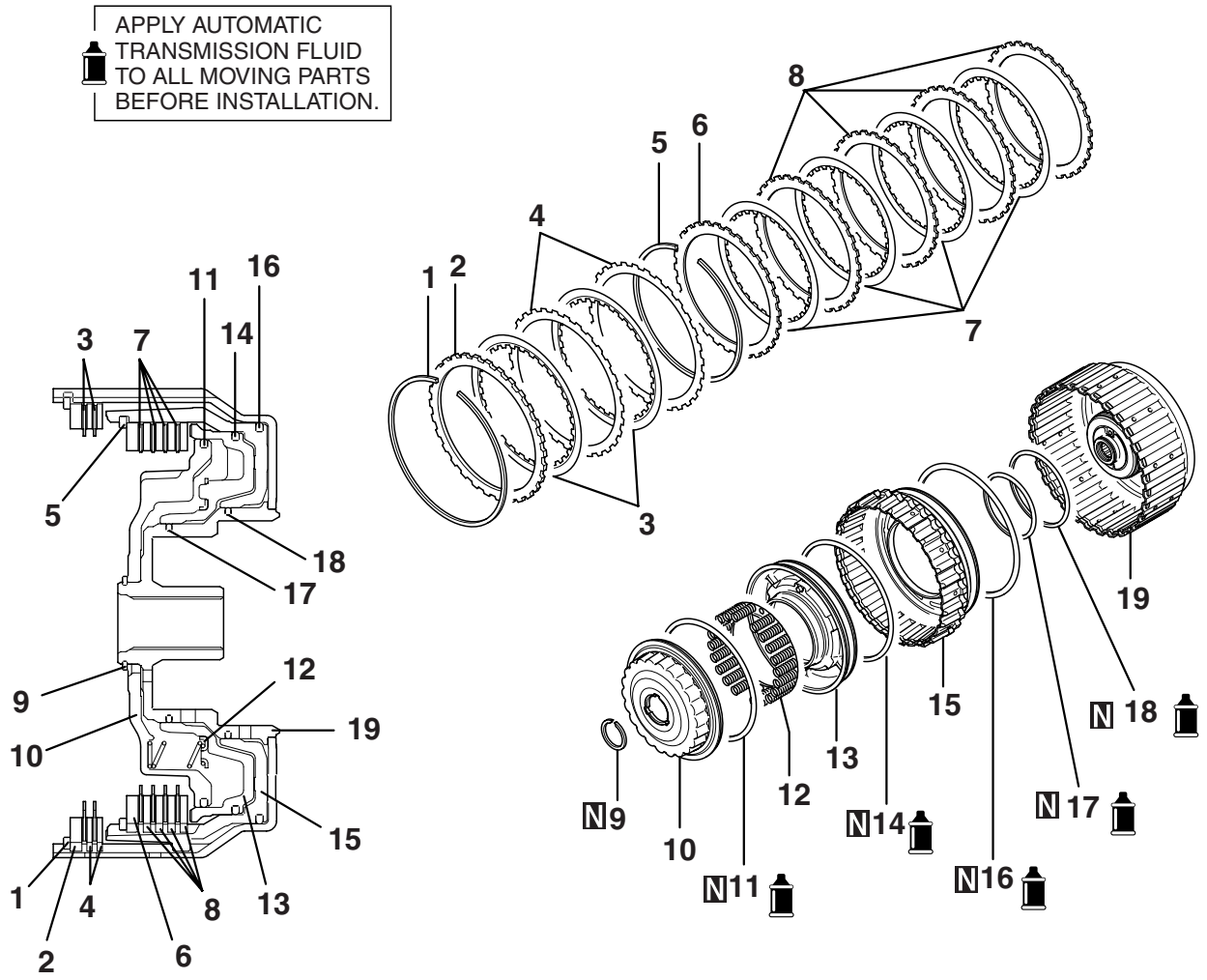
REVERSE AND OVERDRIVE CLUTCH

DISASSEMBLY AND ASSEMBLY

M1233024800105

NUMBER OF CLUTCH DISCS AND PLATES

	CLUTCH DISC	CLUTCH PLATE	CLUTCH REACTION PLATE
Over drive clutch	4	4	1
Reverse clutch	2	2	1



DISASSEMBLY STEPS

- >>G<< 1. SNAP RING
- >>F<< 2. CLUTCH REACTION PLATE
- >>F<< 3. CLUTCH DISC
- >>F<< 4. CLUTCH PLATE
- >>E<< 5. SNAP RING
- >>D<< 6. CLUTCH REACTION PLATE
- >>D<< 7. CLUTCH DISC
- >>D<< 8. CLUTCH PLATE
- <<A>> >>C<< 9. SNAP RING
- 10. SPRING RETAINER

DISASSEMBLY STEPS

- >>A<< 11. D-RING
- 12. RETURN SPRING
- 13. OVERDRIVE CLUTCH PISTON
- >>A<< 14. D-RING
- >>B<< 15. REVERSE CLUTCH PISTON
- >>A<< 16. D-RING
- >>A<< 17. D-RING
- >>A<< 18. D-RING
- 19. REVERSE CLUTCH RETAINER

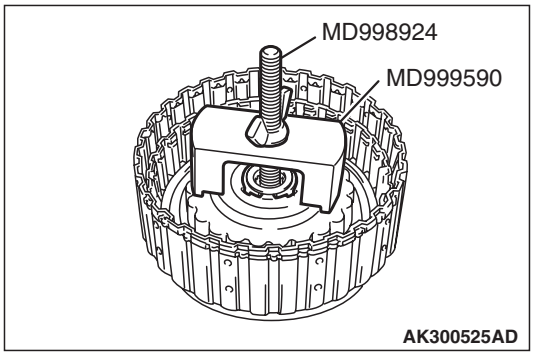
TSB Revision

Required Special Tools:

- MB991628: Spring Compressor
- MB991790: Spring Compressor
- MD998924: Spring Compressor Retainer
- MD999590: Spring Compressor

DISASSEMBLY SERVICE POINT

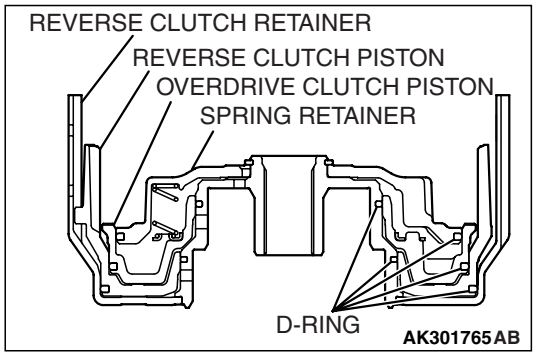
<<A>> SNAP RING REMOVAL



1. Set special tools MD999590 and MD998924 as shown in the illustration.
2. Compress the return spring and remove the snap ring.

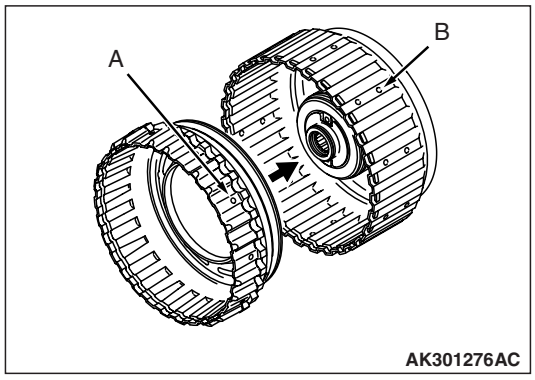
ASSEMBLY SERVICE POINTS

>>A<< D-RING INSTALLATION



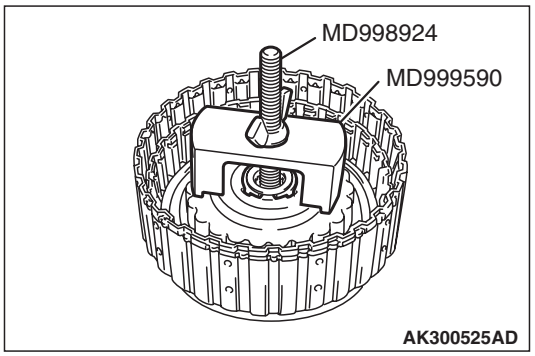
1. Install D-rings in the grooves on the reverse clutch retainer, piston, overdrive clutch piston and spring retainer. Be careful not to twist or damage the D-rings.
2. Apply ATF or petroleum jelly (Vaseline) to D-rings.

>>B<< REVERSE CLUTCH PISTON INSTALLATION

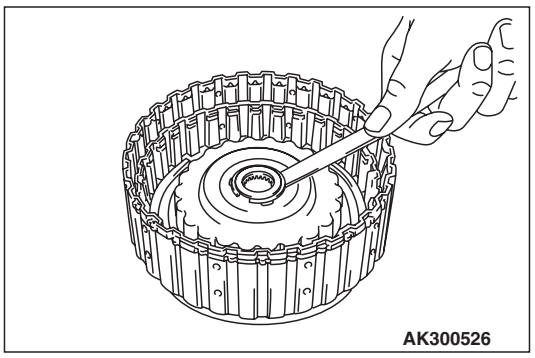


Align the outer circumference holes ("A" and "B") of the reverse clutch piston and the reverse clutch retainer to assemble them.

>>C<< SNAP RING INSTALLATION



1. Set special tools MD999590 and MD998924 as shown in the illustration.
2. Tighten the nut on the special tool to press down on the spring retainer and reverse clutch retainer, and then install the snap ring.



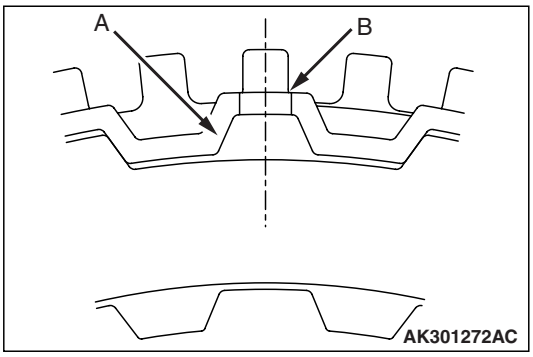
3. Check that the clearance between the snap ring and the return spring retainer is within the standard value. If not within the standard value, select a snap ring so that it is.

   Standard value: 0 –0.09 mm (0 –0.0035 inch)

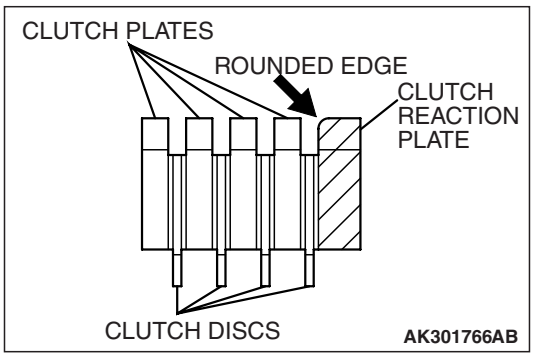
>>D<< PRESSURE PLATE/CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION

⚠ CAUTION

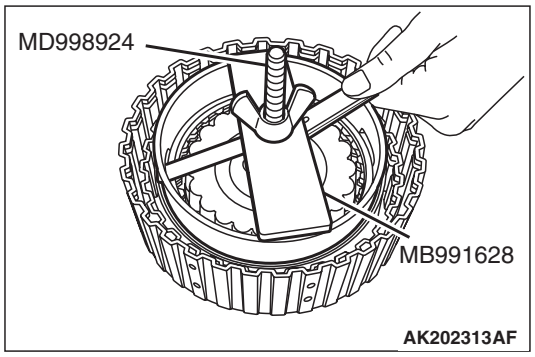
Immerse the clutch disc in ATF before assembling it. If the clutch disc is new, soak it in ATF for more than two hours.



1. Assemble the clutch discs (four pieces) and clutch plates (four pieces), one on top of the other, inside the reverse clutch piston. Assemble both clutch plates so that the places with no teeth (marked "A") are aligned with the holes in the retainer (marked "B").



2. Install the clutch reaction plate in the direction shown.



>>E<< SNAP RING INSTALLATION

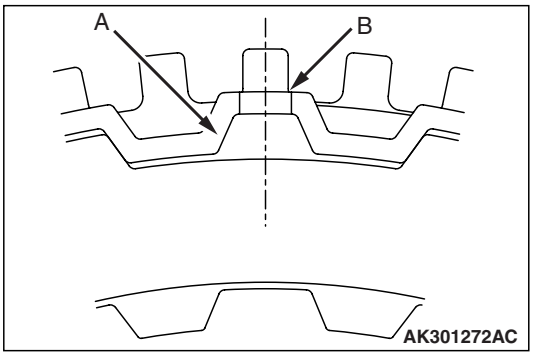
1. Install the snap ring into the groove in the reverse clutch piston.
2. Set special tools MB991628 and MD998924 as shown in the illustration, and compress the clutch element.
3. Check that the clearance between the snap ring and the clutch reaction plate is within the standard value. If not within the standard value, select a snap ring so that it is.

Standard value: 1.6 –1.8 mm (0.0630 –0.0709 inch)

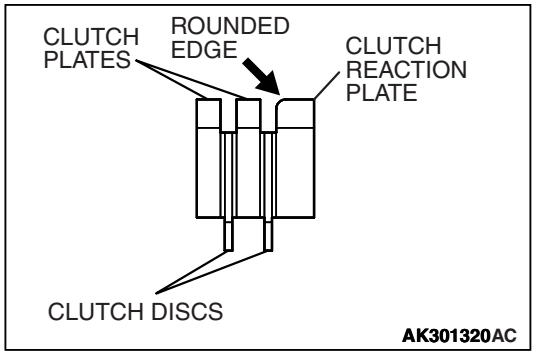
>>F<< CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION

⚠ CAUTION

Immerse the clutch disc in ATF before assembling it. If the clutch disc is new, soak it in ATF for at least two hours.

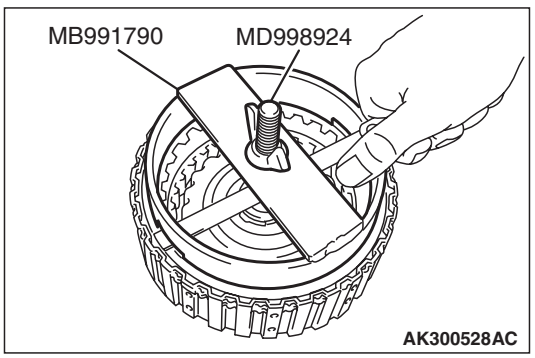


1. Assemble two clutch discs and two clutch plates, one on top of the other, inside the reverse clutch retainer. Assemble both clutch plates so that the places with no teeth (marked "A") are aligned with the holes in the retainer (marked "B").



2. Install the clutch reaction plate in the direction shown. Install it the same as the clutch plate, so that the places with no teeth (marked "A") are aligned with the holes in the retainer (marked "B").

>>G<< SNAP RING INSTALLATION



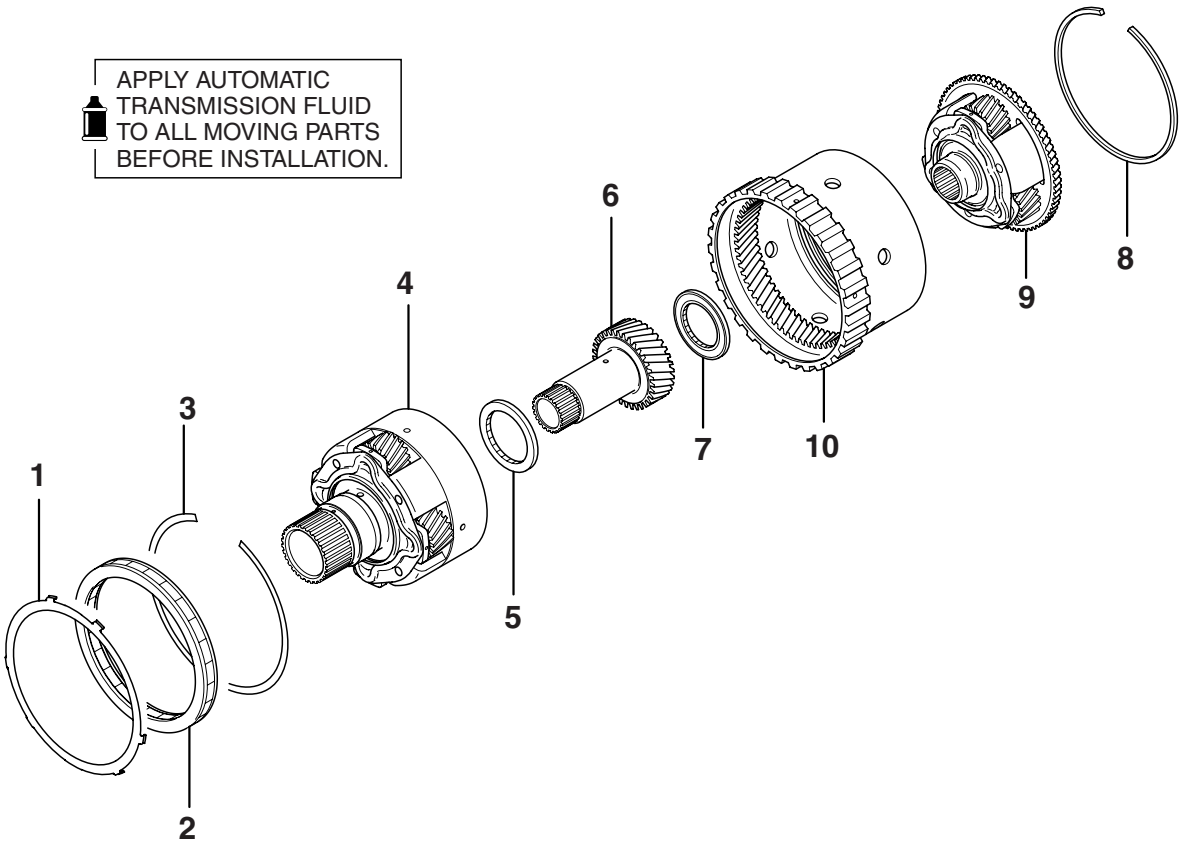
1. Install the snap ring into the groove of reverse clutch retainer.
2. Set special tools MB991790 and MD998924 as shown in the illustration, and compress the clutch element.
3. Check that the clearance between the snap ring and the clutch reaction plate is within the standard value. If not within the standard value, select a snap ring so that it is.

Standard value: 1.5 –1.7 mm (0.0591 –0.0669 inch)

PLANETARY GEAR

DISASSEMBLY AND ASSEMBLY

M1233002500162



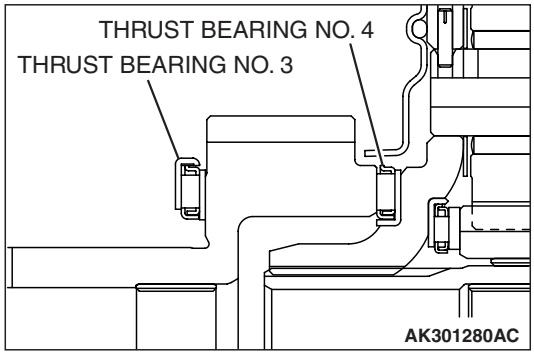
AK301602AB

	DISASSEMBLY STEPS
	1. STOPPER PLATE
>>B<<	2. ONE-WAY CLUTCH
	3. SNAP RING
	4. OUTPUT PLANETARY CARRIER
>>A<<	5. THRUST BEARING NUMBER 3
	6. UNDERDRIVE SUN GEAR
>>A<<	7. THRUST BEARING NUMBER 4
	8. SNAP RING
	9. OVERDRIVE PLANETARY CARRIER
	10. OVERDRIVE ANNULUS GEAR

TSB Revision

ASSEMBLY SERVICE POINTS

>>A<< THRUST BEARING NUMBER 3 AND THRUST BEARING NUMBER 4 INSTALLATION

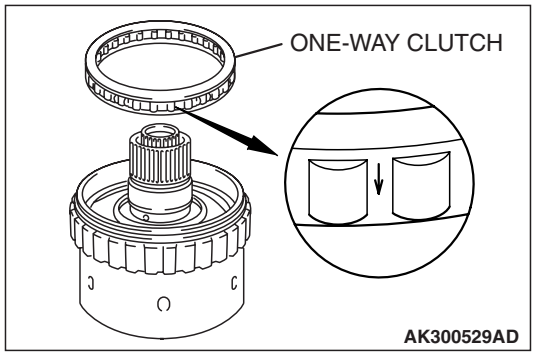


⚠ CAUTION

Use care to install the thrust bearings in the correct direction.

Check the installation direction of thrust bearings number 3 and 4, and install them as shown.

>>B<< ONE-WAY CLUTCH INSTALLATION

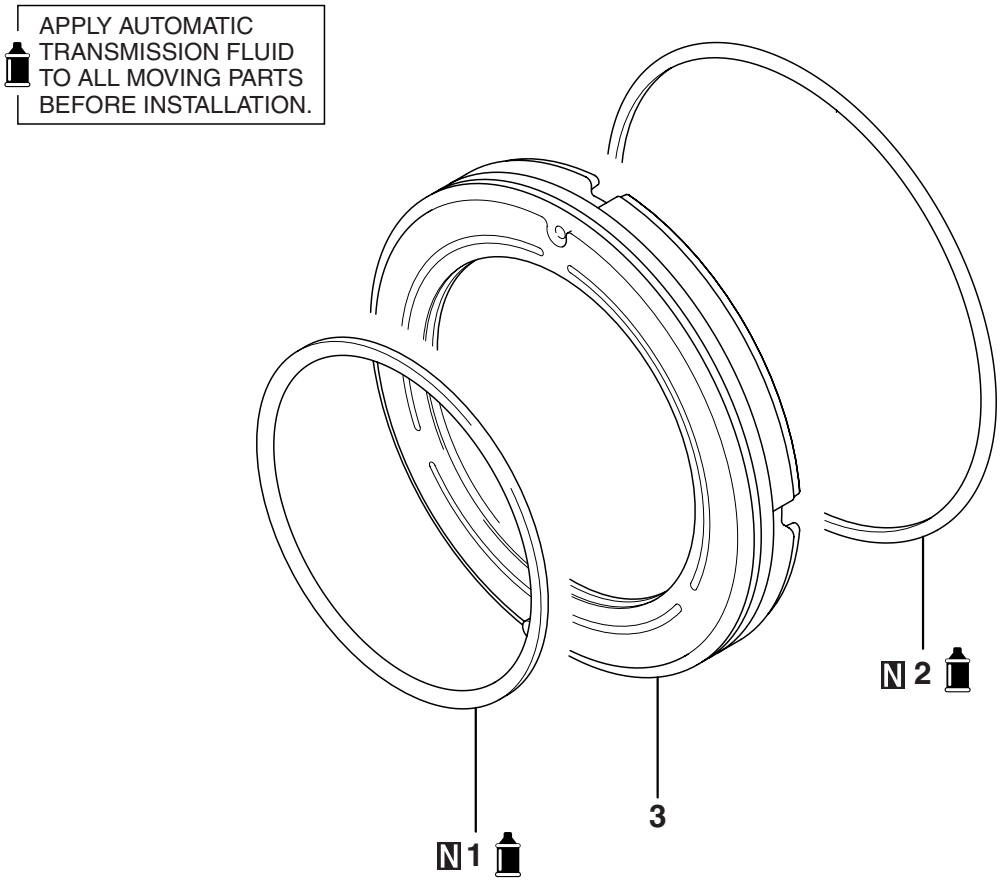


Insert the one-way clutch into the overdrive annulus gear so that the arrow points towards the output planetary carrier.

LOW-REVERSE BRAKE

DISASSEMBLY AND ASSEMBLY

M1233003700181



AK301603AB

DISASSEMBLY STEPS

>>**A**<< 1. D-RING

DISASSEMBLY STEPS

>>**A**<< 2. D-RING
3. LOW-REVERSE BRAKE PISTON

ASSEMBLY SERVICE POINT

>>A<< D-RING INSTALLATION

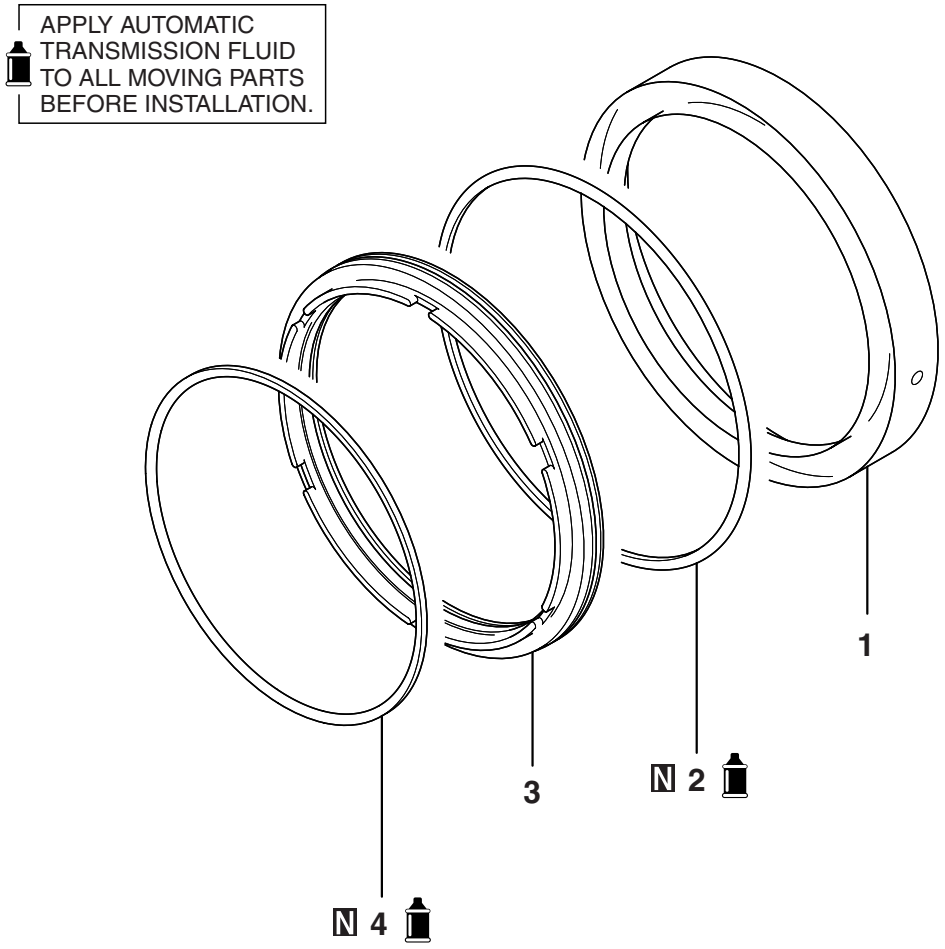
Apply ATF or petroleum jelly (Vaseline) to the D-ring, and install carefully.

TSB Revision

SECOND BRAKE

DISASSEMBLY AND ASSEMBLY

M1233025400111



AK301604 AB

DISASSEMBLY STEPS

1. SECOND BRAKE RETAINER
>>**A**<< 2. D-RING
3. SECOND BRAKE PISTON
>>**A**<< 4. D-RING

ASSEMBLY SERVICE POINT

>>A<< D-RING INSTALLATION

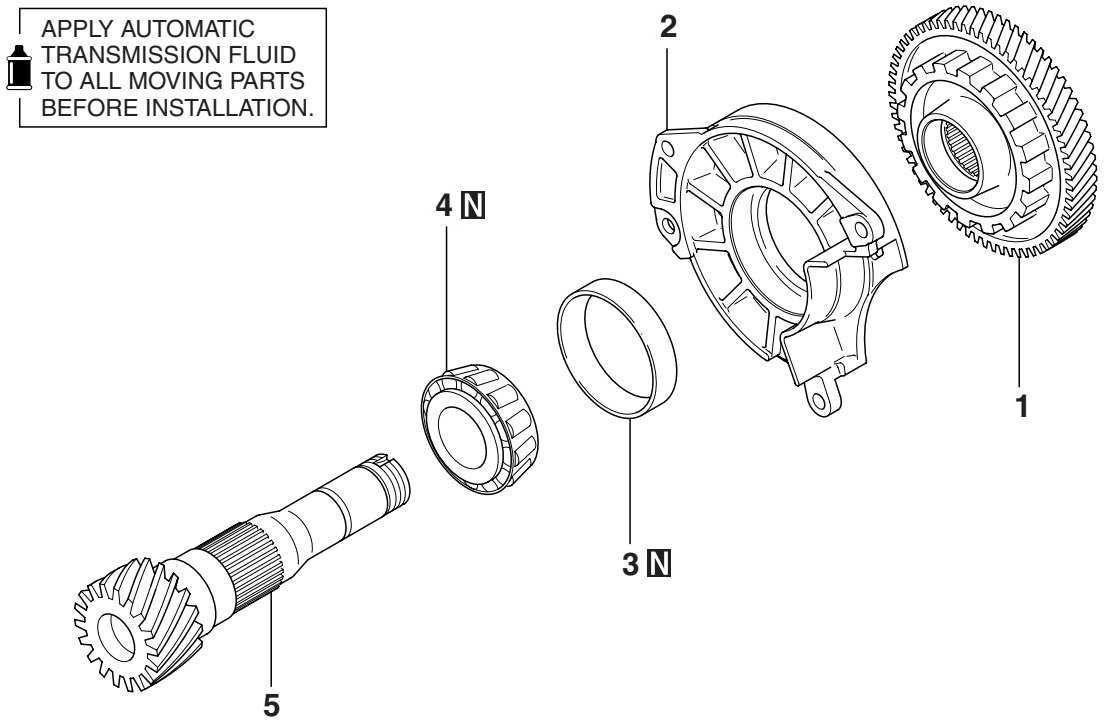
Apply ATF or petroleum jelly (Vaseline) to the D-ring, and install carefully.

TSB Revision

OUTPUT SHAFT

DISASSEMBLY AND ASSEMBLY

M1233025700145



AK301605 AB

DISASSEMBLY STEPS

<<**A**>> >>**C**<< 1. TRANSFER DRIVEN GEAR
2. BEARING RETAINER
>>**B**<< 3. OUTER RACE
<<**B**>> >>**A**<< 4. TAPER ROLLER BEARING
5. OUTPUT SHAFT

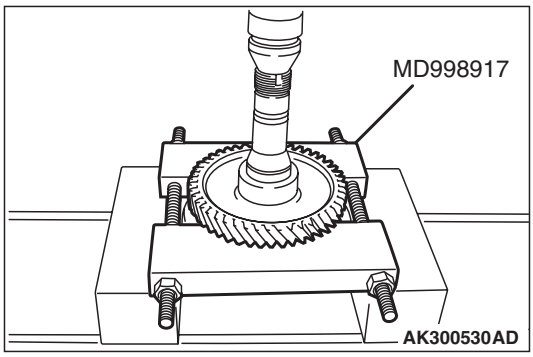
Required Special Tools:

- MB990936: Installer Adapter
- MB990938: Handle
- MD998801: Bearing Remover
- MD998812: Installer Cap
- MD998813: Installer 100
- MD998814: Installer 200
- MD998823: Installer Adapter (48)
- MD998917: Bearing Remover

TSB Revision

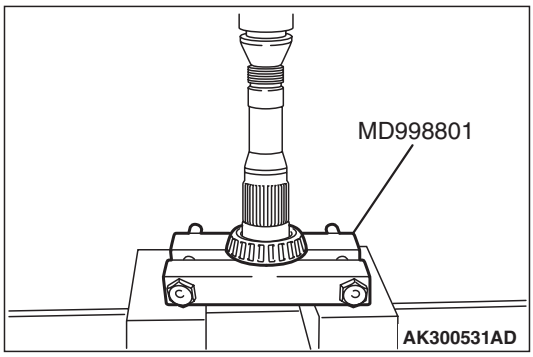
DISASSEMBLY SERVICE POINTS

<<A>> TRANSFER DRIVEN GEAR REMOVAL



1. Support the transfer driven gear with general service tool or special tool MD998917, and then set them on the press.
2. Push down on the output shaft with the press to remove the transfer driven gear.

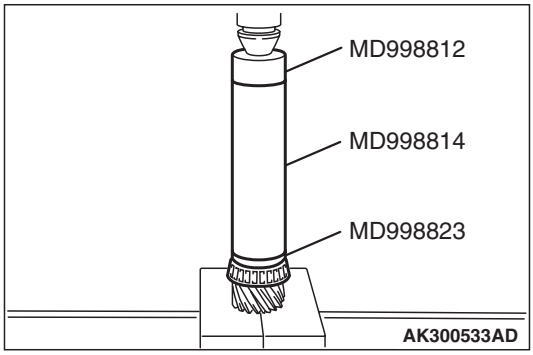
<<B>> TAPER ROLLER BEARING REMOVAL



1. Support the taper roller bearing with the special tool MD998801, and then set them on the press.
2. Push down on the output shaft with the press to remove the taper roller bearing.

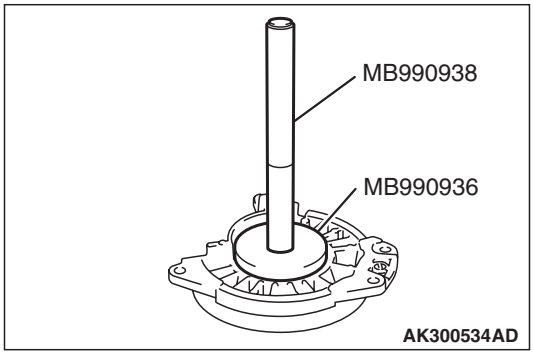
ASSEMBLY SERVICE POINTS

>>A<< TAPER ROLLER BEARING INSTALLATION

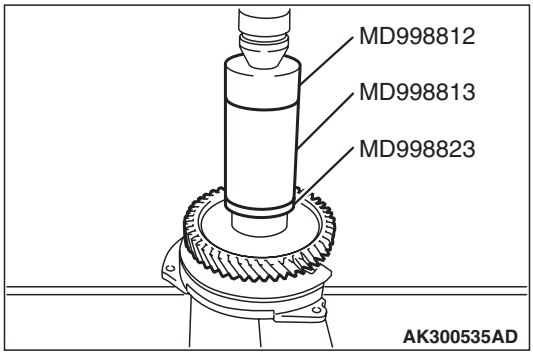


1. Set the output shaft on the press support stand.
2. Using special tools MD998823, MD998812 and MD998814, press in the taper roller bearing.

>>B<< OUTER RACE INSTALLATION



Use the special tools MB990936 and MB990938 to tap the outer race in the bearing retainer.



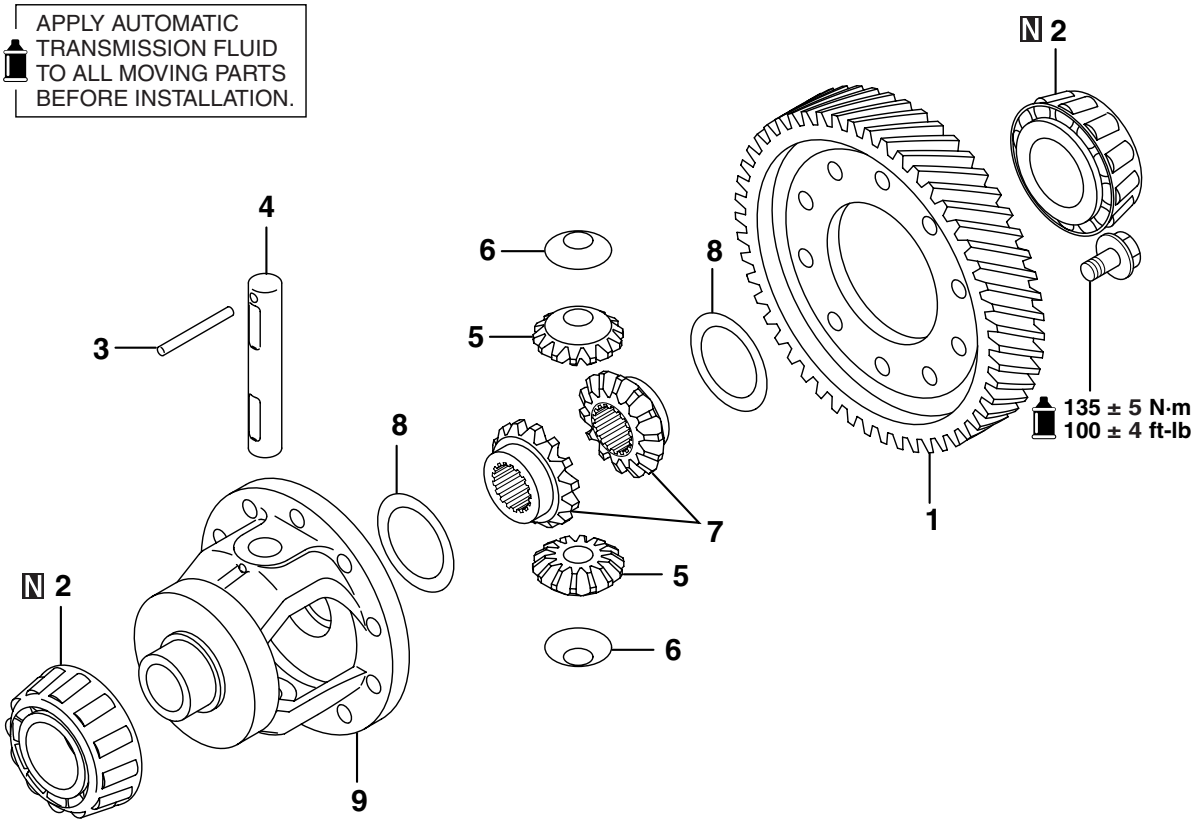
>>C<< TRANSFER DRIVEN GEAR INSTALLATION

1. Set the output shaft on the press support stand.
2. Using special tools MD998823, MD998812 and MD998813, press in the transfer driven gear.

DIFFERENTIAL

DISASSEMBLY AND ASSEMBLY

M1233003100350



AK301606AB

			DISASSEMBLY STEPS
	>>D<<	1.	DIFFERENTIAL DRIVE GEAR
<<A>>	>>C<<	2.	TAPER ROLLER BEARINGS
	>>B<<	3.	LOCK PIN
	>>A<<	4.	PINION SHAFT
	>>A<<	5.	PINIONS
	>>A<<	6.	WASHERS
	>>A<<	7.	SIDE GEARS
	>>A<<	8.	SPACERS
		9.	DIFFERENTIAL CASE

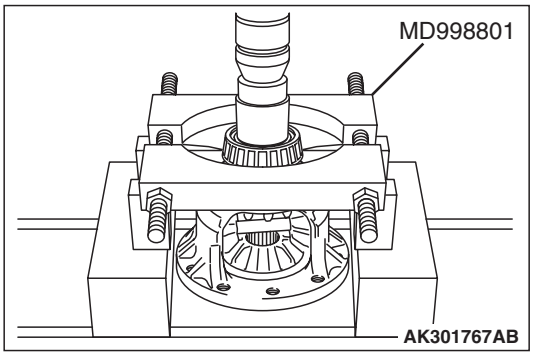
TSB Revision

Required Special Tools:

- MD998801: Bearing Remover
- MD998812: Installer Cap
- MD998823: Installer Adapter (48)

DISASSEMBLY SERVICE POINT

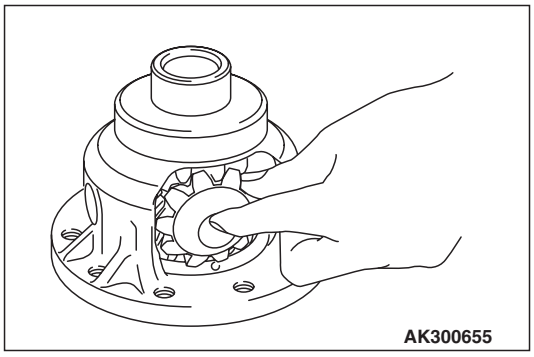
<<A>> TAPER ROLLER BEARING REMOVAL



1. Support the taper roller bearing with special tool MD998801, and then set them on the press.
2. Push down on the differential case with the press to remove the bearing.

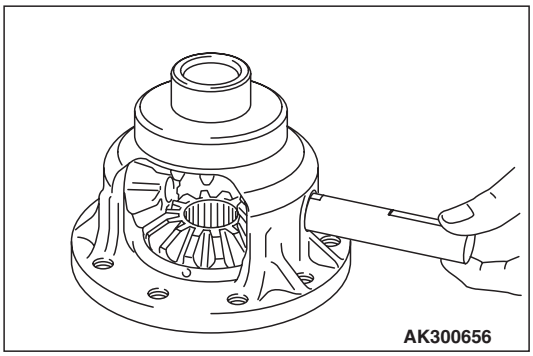
ASSEMBLY SERVICE POINTS

>>A<< SPACER, SIDE GEAR, WASHER, PINION AND PINION SHAFT INSTALLATION

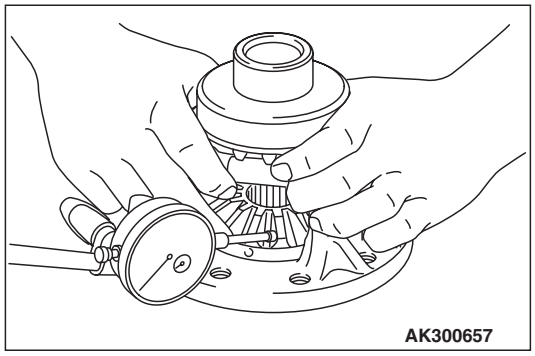


1. Mount a spacer on the back surface of the side gear, and then install the side gear in the differential case.

   NOTE: When a new side gear is to be installed, use a medium thickness spacer [0.93 to 1.00 mm (0.0366 to 0.0395 inch)].
2. Set the washer on the back of each pinion, and put both pinions simultaneously in mesh with the side gears. While rotating them, install them into position.



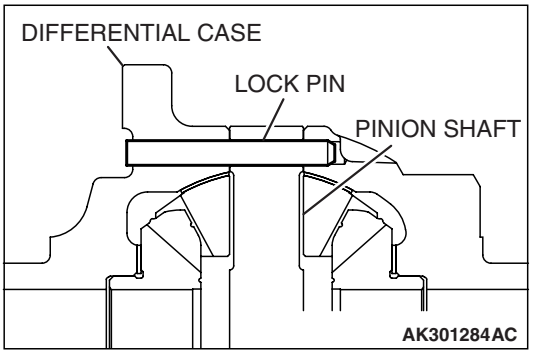
3. Insert the pinion shaft.


AK300657

4. Measure the backlash between the side gear and pinion.
   Standard value:
   0.025 –0.150 mm (0.0010 –0.0059 inch)
5. If the backlash is out of the standard value, select a spacer and re-measure the backlash.
   NOTE: Adjust until the backlash on both sides are equal.

>>B<<LOCK PIN INSTALLATION

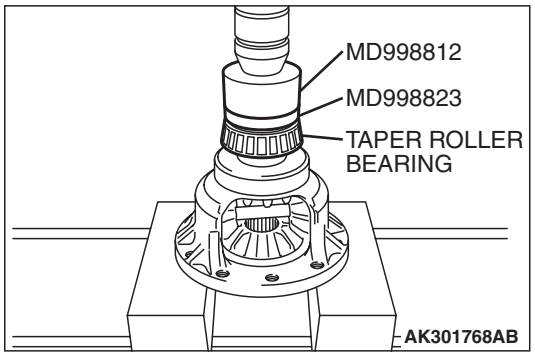
Install the lock pin so that it will be oriented in the direction shown.



AK301284AC

>>C<< TAPER ROLLER BEARING INSTALLATION

Using special tools MD998812 and MD998823, press in the taper roller bearing.

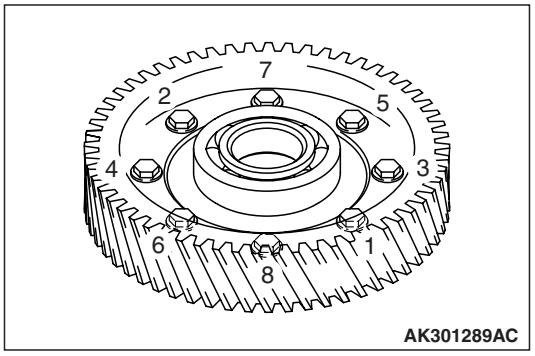


AK301768AB

>>D<< DIFFERENTIAL DRIVE GEAR INSTALLATION

Apply ATF to the bolt, and then tighten the bolts to the specified torque in the sequence shown.

Tightening torque: 135 ±5 N· m (100 ±4 ft-lb)

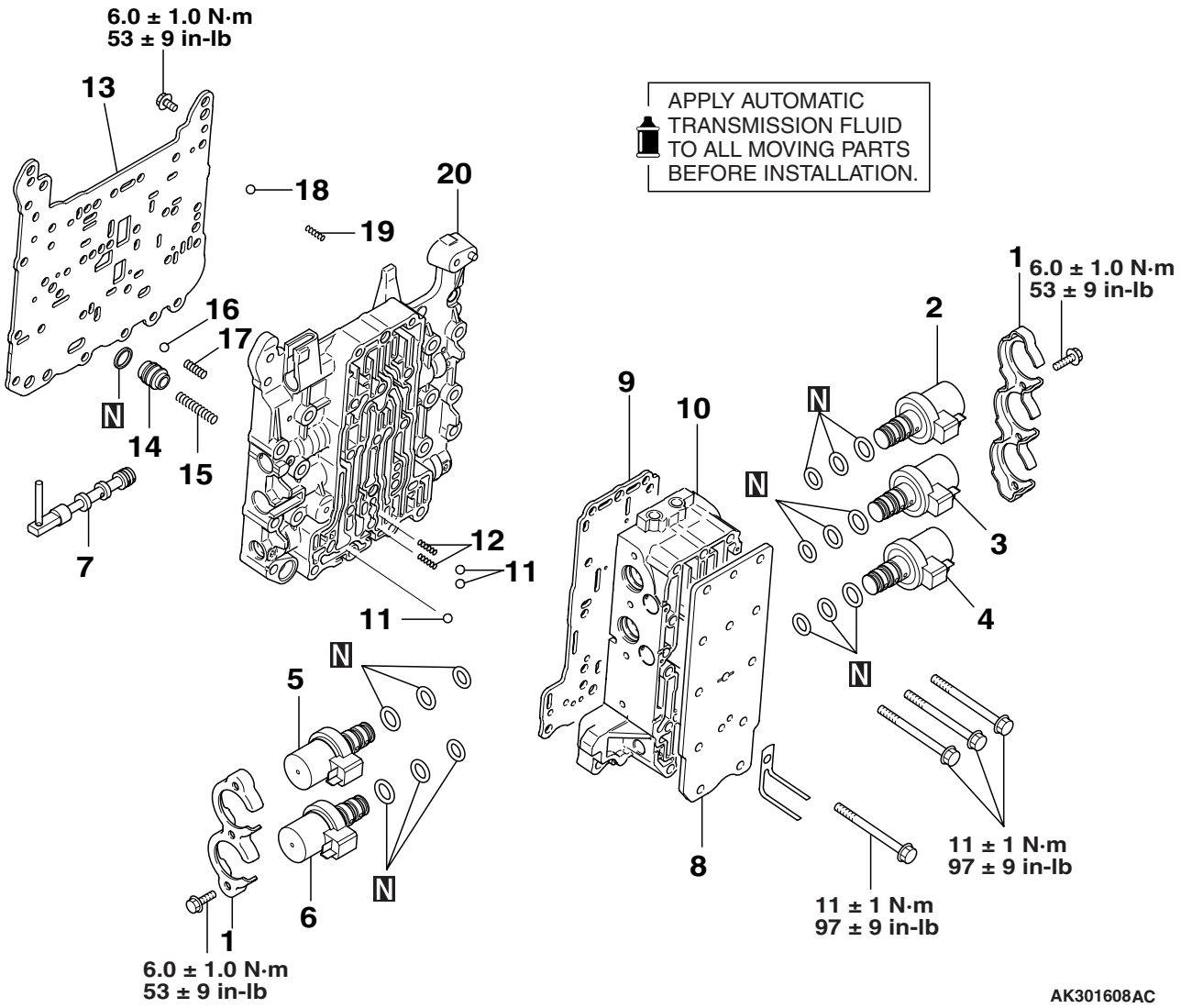


AK301289AC

VALVE BODY

DISASSEMBLY AND ASSEMBLY

M1233005500310



			DISASSEMBLY STEPS
		1.	SOLENOID VALVE SUPPORT
<<**A**>>	>>**C**<<	2.	UNDERDRIVE SOLENOID VALVE
<<**A**>>	>>**C**<<	3.	SECOND SOLENOID VALVE
<<**A**>>	>>**C**<<	4.	TORQUE CONVERTER CLUTCH CONTROL SOLENOID VALVE
<<**A**>>	>>**C**<<	5.	OVERDRIVE SOLENOID VALVE
<<**A**>>	>>**C**<<	6.	LOW-REVERSE SOLENOID VALVE
		7.	MANUAL VALVE
		8.	COVER
		9.	PLATE
		10.	OUTSIDE VALVE BODY ASSEMBLY

		DISASSEMBLY STEPS
>>**B**<<	11.	STEEL BALL (ORIFICE CHECK BALL)
>>**B**<<	12.	SPRING
	13.	PLATE
>>**A**<<	14.	DAMPING VALVE
>>**A**<<	15.	DAMPING VALVE SPRING
>>**A**<<	16.	STEEL BALL (LINE RELIEF)
>>**A**<<	17.	SPRING
>>**A**<<	18.	STEEL BALL (ORIFICE CHECK BALL)
>>**A**<<	19.	SPRING
	20.	INSIDE VALVE BODY ASSEMBLY

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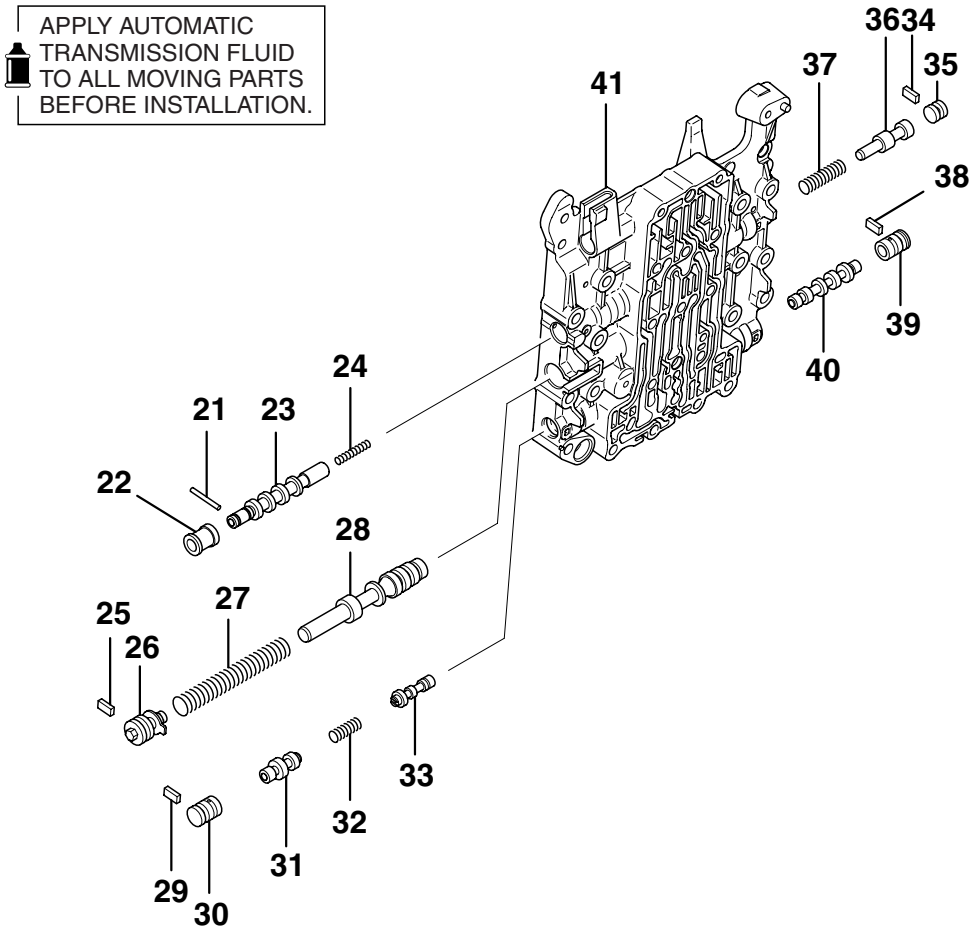


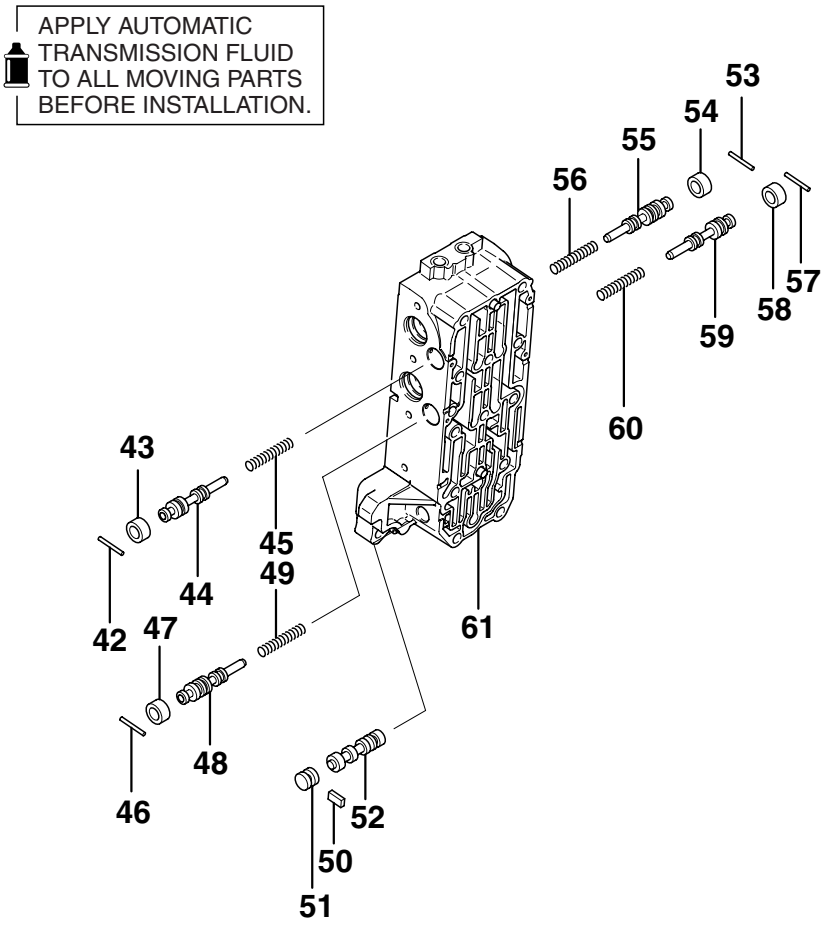
AK301609AB

DISASSEMBLY STEPS

21. ROLLER
22. TORQUE CONVERTER CLUTCH CONTROL VALVE SLEEVE
23. TORQUE CONVERTER CLUTCH CONTROL VALVE
24. TORQUE CONVERTER CLUTCH CONTROL VALVE SPRING
25. PLATE
26. SCREW
27. REGULATOR VALVE SPRING
28. REGULATOR VALVE
29. PLATE
30. FAIL-SAFE VALVE A SLEEVE

DISASSEMBLY STEPS

31. FAIL-SAFE VALVE A2
32. FAIL-SAFE VALVE A SPRING
33. FAIL-SAFE VALVE A1
34. PLATE
35. PLUG
36. TORQUE CONVERTER VALVE
37. TORQUE CONVERTER VALVE SPRING
38. PLATE
39. FAIL-SAFE VALVE B SLEEVE
40. FAIL-SAFE VALVE B
41. INSIDE VALVE BODY



AK301610 AB

DISASSEMBLY STEPS

42. ROLLER
43. OVERDRIVE PRESSURE CONTROL VALVE SLEEVE
44. OVERDRIVE PRESSURE CONTROL VALVE
45. OVERDRIVE PRESSURE CONTROL VALVE SPRING
46. ROLLER
47. LOW-REVERSE PRESSURE CONTROL VALVE SLEEVE
48. LOW-REVERSE PRESSURE CONTROL VALVE
49. LOW-REVERSE PRESSURE CONTROL VALVE SPRING
50. PLATE
51. PLUG

DISASSEMBLY STEPS

52. SWITCHING VALVE
53. ROLLER
54. UNDERDRIVE PRESSURE CONTROL VALVE SLEEVE
55. UNDERDRIVE PRESSURE CONTROL VALVE
56. UNDERDRIVE PRESSURE CONTROL VALVE SPRING
57. ROLLER
58. SECOND PRESSURE CONTROL VALVE SLEEVE
59. SECOND PRESSURE CONTROL VALVE
60. SECOND PRESSURE CONTROL VALVE SPRING
61. OUTSIDE VALVE BODY

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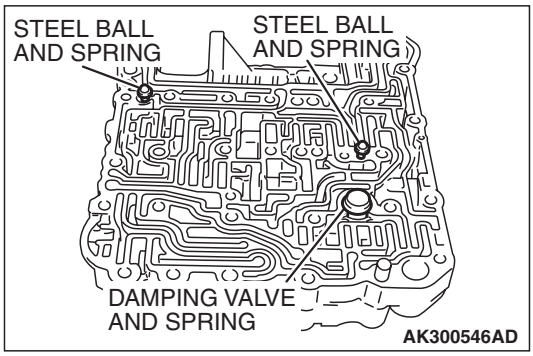
DISASSEMBLY SERVICE POINT

<<A>> SOLENOID VALVES REMOVAL

Mark the solenoid valves with white paint to make assembly easier.

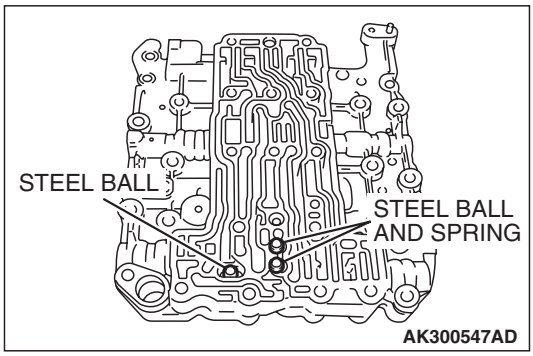
ASSEMBLY SERVICE POINTS

>>A<< SPRING, STEEL BALL, DAMPING VALVE AND DAMPING VALVE SPRING INSTALLATION



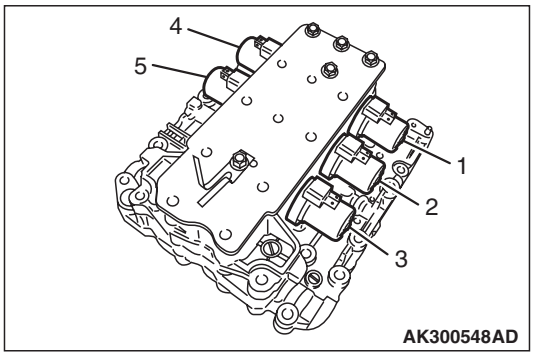
1. Install the steel balls (two pieces) and springs (two pieces) to the inside valve body as shown.
2. Install the damping valve and spring to the inside valve body as shown.

>>B<< SPRING AND STEEL BALL INSTALLATION



Install the steel balls (three pieces) and springs (two pieces) to the inside valve body as shown.

>>C<< SOLENOID VALVES INSTALLATION



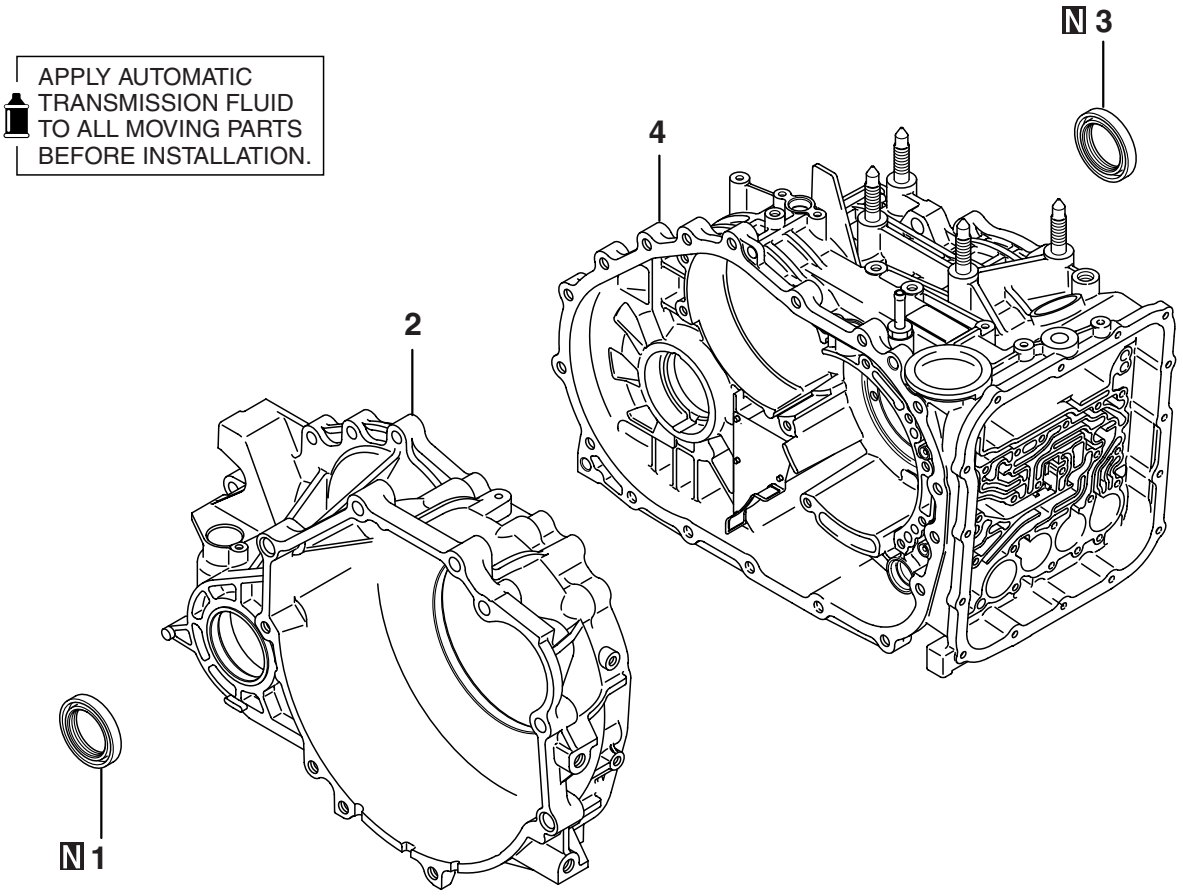
1. Apply ATF or petroleum jelly (Vaseline) to the O-ring and install carefully.
2. Install the solenoid valves by referring to the marks applied during disassembly.

NO.	NAME
1	Underdrive solenoid valve
2	Second solenoid valve
3	Torque converter clutch control solenoid valve
4	Overdrive solenoid valve
5	Low-reverse solenoid valve

DRIVE SHAFT OIL SEAL

DISASSEMBLY AND ASSEMBLY

M1233004300153



AK301611 AB

DISASSEMBLY STEPS

>>**A**<< 1. OIL SEAL
2. TORQUE CONVERTER HOUSING

DISASSEMBLY STEPS

>>**B**<< 3. OIL SEAL
4. TRANSAXLE CASE

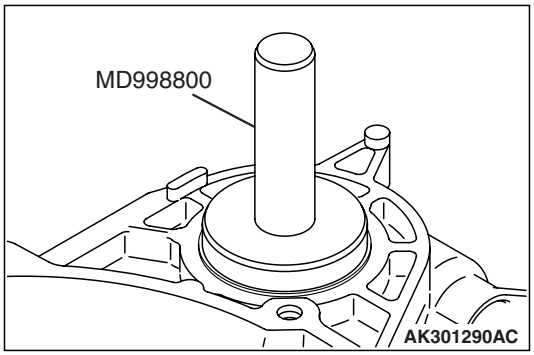
Required Special Tool:

- MD998800: Oil Seal Installer

TSB Revision

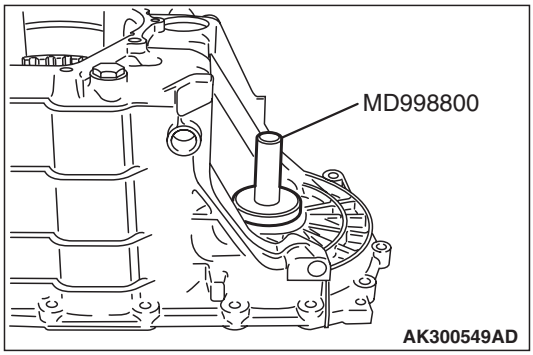
ASSEMBLY SERVICE POINTS

>>A<< OIL SEAL INSTALLATION



Use special tool MD998800 to tap the oil seal into the torque converter housing.

>>B<< OIL SEAL INSTALLATION



Use special tool MD998800 to tap the oil seal in the transaxle case.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1233023100567

ITEM		SPECIFICATION
Transaxle	Roll stopper bracket	90 ±10 N· m (66 ±7 ft-lb)
	Control cable bracket	23 ±3 N· m (17 ±2 ft-lb)
	Harness bracket	11 ±1 N· m (97 ±9 in-lb)
	Eye bolt	24 ±3 N· m (18 ±2 ft-lb)
	Oil cooler feed tube	11 ±1 N· m (97 ±9 in-lb)
	Input shaft speed sensor	11 ±1 N· m (97 ±9 in-lb)
	Output shaft speed sensor	11 ±1 N· m (97 ±9 in-lb)
	Manual control lever	22 ±3 N· m (16 ±2 ft-lb)
	Park/neutral position switch (PNP switch)	11 ±1 N· m (97 ±9 in-lb)
	Sealing cap	5.0 ±1.0 N· m (44 ±9 in-lb)
	Valve body cover	11 ±1 N· m (97 ±9 in-lb)
	Manual control shaft detente	6.0 ±1.0 N· m (53 ±9 in-lb)
	Valve body mounting bolt	11 ±1 N· m (97 ±9 in-lb)
	Fluid temperature sensor	11 ±1 N· m (97 ±9 in-lb)
	Torque converter housing	48 ±6 N· m (36 ±4 ft-lb)
	Oil pump	29 ±2 N· m (21 ±1 ft-lb)
	Rear cover	23 ±3 N· m (17 ±2 ft-lb)
	Transfer drive gear	34 ±2 N· m (25 ±1 ft-lb)
	Output shaft jam nut	170 ±10 N· m (125 ±7 ft-lb)
	Output shaft bearing retainer	29 ±2 N· m (21 ±1 ft-lb)
Components	Differential drive gear	135 ±5 N· m (100 ±4 ft-lb)
	Solenoid valve support	6.0 ±1.0 N· m (53 ±9 in-lb)
	Valve body	11 ±1 N· m (97 ±9 in-lb)
	Plate	6.0 ±1.0 N· m (53 ±9 in-lb)

GENERAL SPECIFICATIONS

M1233000200585

ITEM		SPECIFICATION
Model		F4A4B
Type		Electronically controlled 4-speed full-automatic
Torque converter	Type	3-element with torque converter clutch
	Stall torque ratio	1.93
Gear ratio	1st	2.842
	2nd	1.573
	3rd	1.000
	4th	0.688
	Reverse	2.214
Final gear ratio		4.212

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SERVICE SPECIFICATIONS

M1233000300270

ITEM	STANDARD VALUE
Output shaft preload mm (in)	0.01 – 0.09 (0.0004 – 0.0035)
Brake reaction plate end play mm (in)	0 – 0.16 (0 – 0.0063)
Low-reverse brake end play mm (in)	1.65 – 2.11 (0.0649 – 0.0831)
Second brake end play mm (in)	0.79 – 1.25 (0.0311 – 0.0492)
Underdrive sun gear end play mm (in)	0.25 – 0.45 (0.0098 – 0.0177)
Input shaft end play mm (in)	0.70 – 1.45 (0.028 – 0.057)
Differential case preload mm (in)	0.045 – 0.105 (0.0018 – 0.0041)
Underdrive clutch end play mm (in)	1.6 – 1.8 (0.0630 – 0.0709)
Reverse and overdrive clutch return spring retainer end play mm (in)	0 – 0.09 (0 – 0.0035)
Overdrive clutch end play mm (in)	1.6 – 1.8 (0.0630 – 0.0709)
Reverse clutch end play mm (in)	1.5 – 1.7 (0.0591 – 0.0669)
Backlash between differential side gear and pinion mm (in)	0.025 – 0.150 (0.0010 – 0.0059)

VALVE BODY SPRING IDENTIFICATION TABLE

M1233022900128

SPRING	WIRE DIAMETER mm (in)	OUTSIDE DIAMETER mm (in)	FREE LENGTH mm (in)	NUMBER OF LOOPS
Regulator valve spring	1.8 (0.071)	15.7 (0.618)	86.7 (3.413)	24
Underdrive pressure control valve spring	0.7 (0.028)	7.6 (0.299)	37.7 (1.484)	25
Overdrive pressure control valve spring	0.7 (0.028)	7.6 (0.299)	37.7 (1.484)	25
Low-reverse pressure control valve spring	0.7 (0.028)	7.6 (0.299)	37.7 (1.484)	25
Second pressure control valve spring	0.7 (0.028)	7.6 (0.299)	37.7 (1.484)	25
Torque converter spring	1.6 (0.063)	11.2 (0.441)	34.4 (1.354)	12.5
Torque converter clutch control valve spring	0.7 (0.028)	5.9 (0.232)	28.1 (1.106)	19
Fail-safe valve spring	0.7 (0.028)	8.9 (0.350)	21.9 (0.862)	9.5
Damping valve spring	1.0 (0.039)	7.7 (0.303)	35.8 (1.409)	17
Line relief valve spring	1.0 (0.039)	7.0 (0.276)	17.3 (0.681)	10
Orifice check ball spring	0.5 (0.020)	4.5 (0.177)	17.2 (0.677)	15

ADJUSTING PLATE, SNAP RING AND SPACERS

M1233023000429

Thrust washer (For adjustment of input shaft end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.8 (0.071)	18	2.4 (0.094)	24
2.0 (0.079)	20	2.6 (0.102)	26
2.2 (0.087)	22	2.8 (0.110)	28

Snap ring (For adjustment of underdrive clutch and overdrive clutch end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.6 (0.063)	None	2.4 (0.094)	Brown
1.7 (0.067)	Blue	2.5 (0.098)	None
1.8 (0.071)	Brown	2.6 (0.102)	Blue
1.9 (0.075)	None	2.7 (0.106)	Brown
2.0 (0.079)	Blue	2.8 (0.110)	None
2.1 (0.083)	Brown	2.9 (0.114)	Blue
2.2 (0.087)	None	3.0 (0.118)	Brown
2.3 (0.091)	Blue		

Snap ring (For adjustment of low-reverse brake and second brake reaction plates end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
2.2 (0.087)	Blue	2.4 (0.094)	None
2.3 (0.091)	Brown	2.5 (0.098)	Blue

Pressure plate (For adjustment of low-reverse brake and second brake end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.6 (0.063)	L	2.4 (0.094)	4
1.8 (0.071)	1	2.6 (0.102)	6
2.0 (0.079)	0	2.8 (0.110)	8
2.2 (0.087)	2	3.0 (0.118)	D

Snap ring (For adjustment of reverse clutch end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.6 (0.063)	None	2.3 (0.091)	Blue
1.7 (0.067)	Blue	2.4 (0.094)	Brown
1.8 (0.071)	Brown	2.5 (0.098)	None
1.9 (0.075)	None	2.6 (0.102)	Blue
2.0 (0.079)	Blue	2.7 (0.106)	Brown
2.1 (0.083)	Brown	2.8 (0.110)	None
2.2 (0.087)	None		

Snap ring (For adjustment of reverse clutch and overdrive clutch spring retainer end plays)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.48 (0.0583)	Brown	1.58 (0.0622)	Blue
1.53 (0.0602)	None	1.63 (0.0642)	Brown

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Thrust race (For adjustment of underdrive sun gear end play)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.6 (0.063)	–	2.2 (0.087)	–
1.7 (0.067)	–	2.3 (0.091)	–
1.8 (0.071)	–	2.4 (0.094)	–
1.9 (0.075)	–	2.5 (0.098)	–
2.0 (0.079)	–	2.6 (0.102)	–
2.1 (0.083)	–		

Spacer (For adjustment of output shaft preload)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
1.88 (0.0740)	88	2.36 (0.0929)	36
1.92 (0.0756)	92	2.40 (0.0945)	40
1.96 (0.0772)	96	2.44 (0.0961)	44
2.00 (0.0787)	00	2.48 (0.0976)	48
2.04 (0.0803)	04	2.52 (0.0992)	52
2.08 (0.0819)	08	2.56 (0.1008)	56
2.12 (0.0835)	12	2.60 (0.1024)	60
2.16 (0.0850)	16	2.64 (0.1039)	64
2.20 (0.0866)	20	2.68 (0.1055)	68
2.24 (0.0882)	24	2.72 (0.1071)	72
2.28 (0.0898)	28	2.76 (0.1087)	76
2.32 (0.0913)	32		

Spacer (For adjustment of differential case preload)

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
0.71 (0.0280)	71	1.07 (0.0421)	07
0.74 (0.0291)	74	1.10 (0.0433)	J
0.77 (0.0303)	77	1.13 (0.0445)	D
0.80 (0.0315)	80	1.16 (0.0457)	K
0.83 (0.0327)	83	1.19 (0.0469)	L
0.86 (0.0339)	86	1.22 (0.0480)	G
0.89 (0.0350)	89	1.25 (0.0492)	M
0.92 (0.0362)	92	1.28 (0.0504)	N
0.95 (0.0374)	95	1.31 (0.0516)	E
0.98 (0.0386)	98	1.34 (0.0528)	O
1.01 (0.0398)	01	1.37 (0.0539)	P
1.04 (0.0409)	04		

Spacer (For adjustment of backlash between differential side gear and pinion

THICKNESS mm (in)	IDENTIFICATION SYMBOL	THICKNESS mm (in)	IDENTIFICATION SYMBOL
0.75 –0.82 (0.0295 –0.0323)	–	1.01 –1.08 (0.0398 –0.0425)	–
0.83 –0.92 (0.0327 –0.0362)	–	1.09 –1.16 (0.0429 –0.0457)	–
0.93 –1.00 (0.0366 –0.0394)	–		

SEALANTS

M1233000500229

ITEM	SPECIFIED SEALANT
Rear cover	Mitsubishi genuine sealant Part No. MD974421 or equivalent
Torque converter housing	Mitsubishi genuine sealant Part No. MD974421 or equivalent
Valve body cover	Mitsubishi genuine sealant Part No. MD974421 or equivalent