

# GROUP 23B

# AUTOMATIC TRANSMISSION OVERHAUL

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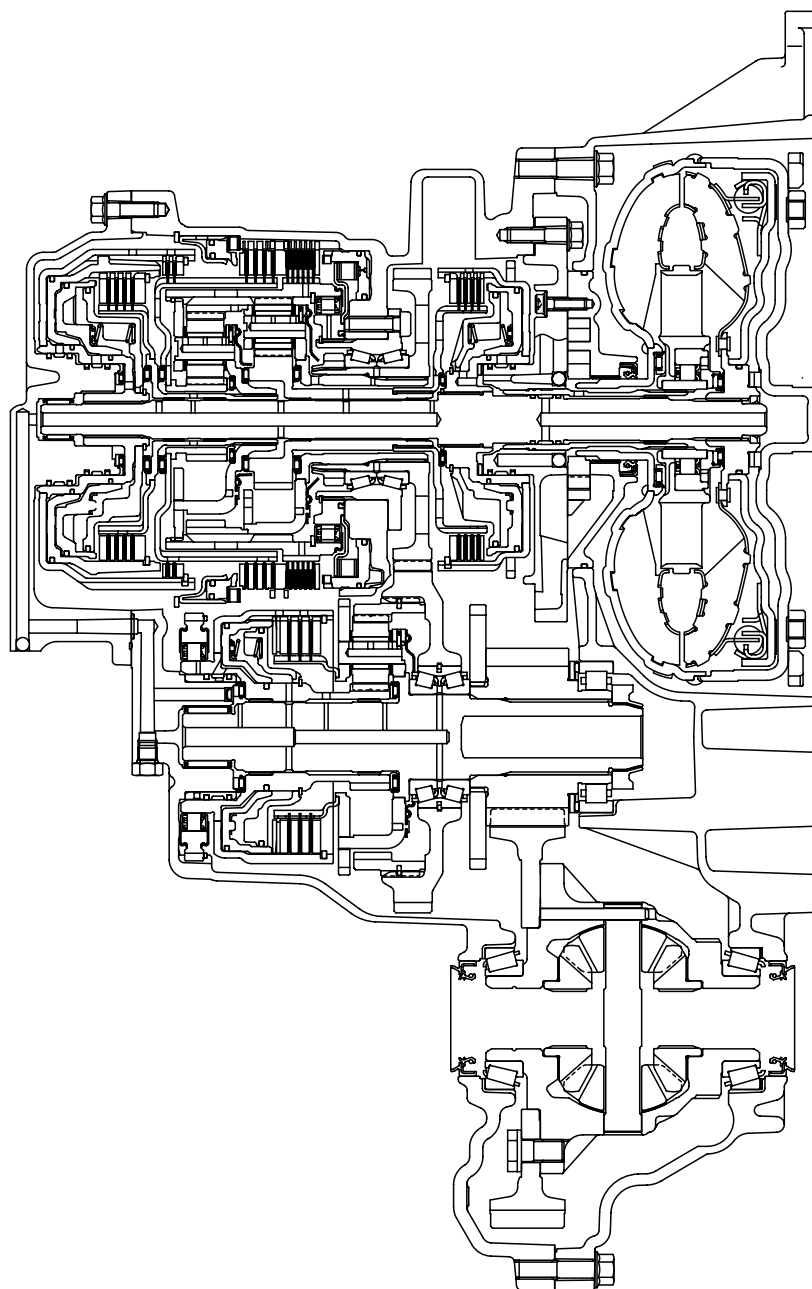
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## GENERAL INFORMATION

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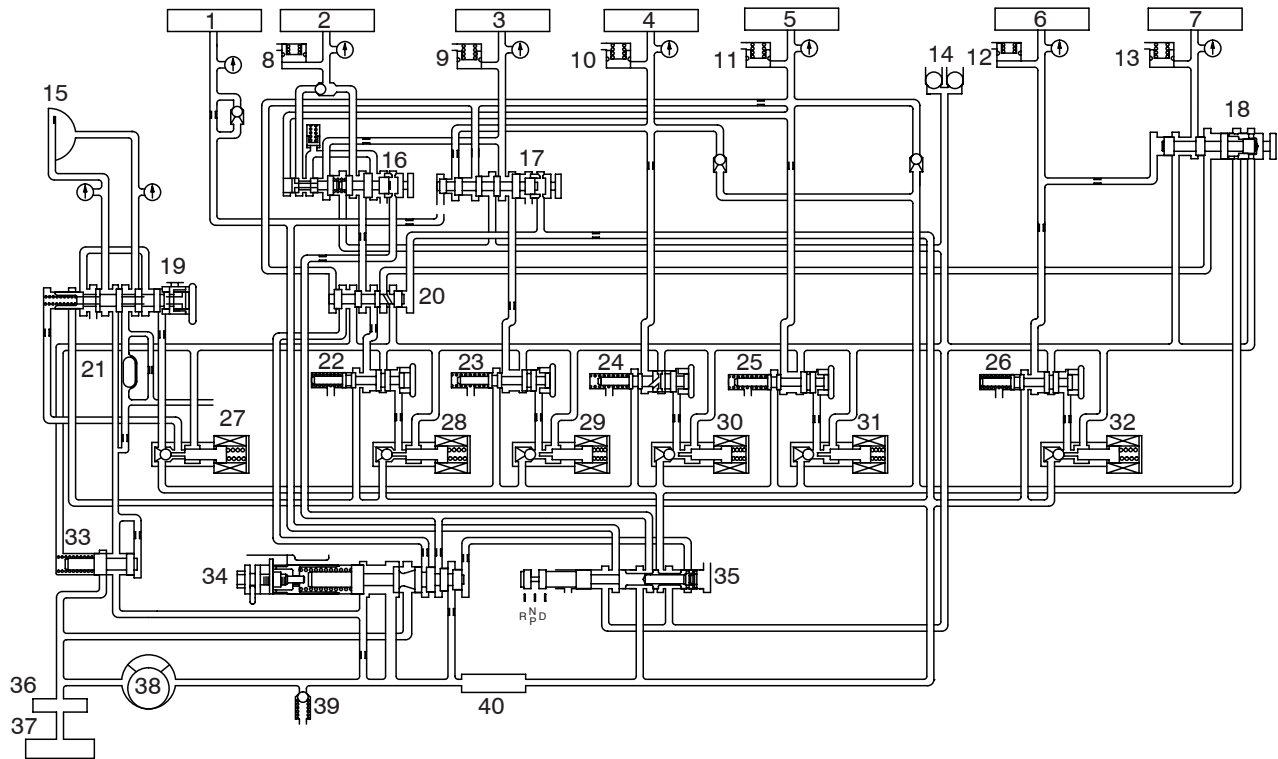
Transmission model	Combined engine	Vehicle model
F5A5A-4-C2Z	6G75-S4-MPI	DL1A

### SECTIONAL VIEW



AK403256

## HYDRAULIC CIRCUIT



AK502955 AB

- |                                 |   |
|---------------------------------|---|
| 1. Reverse clutch               | 21. Cooler                                  |
| 2. Low -reverse brake           | 22. Low-reverse pressure control valve      |
| 3. Second brake                 | 23. Second pressure control valve           |
| 4. Underdrive clutch            | 24. Under drive pressure control valve      |
| 5. Overdrive clutch             | 25. Overdrive pressure control valve        |
| 6. Reduction clutch             | 26. Reduction pressure control valve        |
| 7. Direct clutch                | 27. Dumper clutch control solenoid valve    |
| 8. Low -reverse accumulator     | 28. Low-pressure solenoid valve             |
| 9. Second accumulation          | 29. Second solenoid valve                   |
| 10. Underdrive accumulator      | 30. Under drive solenoid valve              |
| 11. Overdrive accumulator       | 31. Overdrive solenoid valve                |
| 12. Reduction accumulation      | 32. Reduction solenoid valve                |
| 13. Direct clutch               | 33. Torque converter pressure control valve |
| 14. Check ball                  | 34. Regulator valve                         |
| 15. Dumper clutch               | 35. manual valve                            |
| 16. Fail-safe valve A           | 36. Oil filter                              |
| 17. Fail-safe valve B           | 37. Oil pan                                 |
| 18. Fail-safe valve C           | 38. Oil pump                                |
| 19. Dumper clutch control valve | 39. Relief valve                            |
| 20. Switching valve             | 40. Oil strainer                            |



## GENERAL SPECIFICATIONS

M1233000200659

Item		Specification
Transmission model		F5A5A-4-C2Z
Type		Electronically controlled 5-speed full-automatic
Torque converter	Type	3-element with torque converter clutch
	Stall torque ratio	1.71
Gear ratio	1st	3.789
	2nd	2.162
	3rd	1.421
	4th	1.000
	5th	0.686
	Reverse	3.117
Final gear ratio		3.325

## SERVICE SPECIFICATIONS

M1233000300504

Item	Standard value
Brake reaction plate end play mm	0 – 0.16
Second brake end play mm	1.09 – 1.55
Low-reverse brake end play mm	1.65 – 2.11
Underdrive sun gear end play mm	0.25 – 0.45
Input shaft end play mm	0.70 – 1.45
Differential case preload mm	0.045 – 0.105
Underdrive clutch end play mm	1.60 – 1.80
Reverse and overdrive clutch return spring retainer end play mm	0 – 0.09
Reverse clutch end play mm	1.6 – 1.8
Overdrive clutch end play mm	1.5 – 1.7
Direct clutch end play	0.6 – 0.8
Backlash between differential side gear and pinion mm	0.025 – 0.150

## ADJUSTING PLATE, SNAP RING AND SPACERS

M1233023000526

**Thrust washer (For adjustment of input shaft end play)**

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.8	18	2.4	24
2.0	20	2.6	26
2.2	22	2.8	28

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

Thickness mm	Identification colour	Thickness mm	Identification colour
1.6	Brown	2.4	Blue
1.7	None	2.5	Brown
1.8	Blue	2.6	None
1.9	Brown	2.7	Blue
2.0	None	2.8	Brown
2.1	Blue	2.9	None
2.2	Brown	3.0	Blue
2.3	None		

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

Thickness mm	Identification colour	Thickness mm	Identification colour
2.2	None	2.4	Brown
2.3	Blue	2.5	None

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

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.6	F	2.4	B
1.8	E	2.6	A
2.0	D	2.8	0
2.2	C	3.0	1

**Snap ring (For adjustment of reverse clutch end play)**

Thickness mm	Identification colour	Thickness mm	Identification colour
1.6	None	2.3	Blue
1.7	Blue	2.4	Brown
1.8	Brown	2.5	None
1.9	None	2.6	Blue
2.0	Blue	2.7	Brown
2.1	Brown	2.8	None
2.2	None		

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

Thickness mm	Identification colour	Thickness mm	Identification colour
1.48	Brown	1.58	Blue
1.53	None	1.63	Brown

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

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.6	–	2.2	–
1.7	–	2.3	–
1.8	–	2.4	–

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.9	—	2.5	—
2.0	—	2.6	—
2.1	—		

**Spacer (For adjustment of direct clutch end play)**

Thickness mm	Identification colour	Thickness mm	Identification colour
1.9	Brown	2.5	Brown
2.0	None	2.6	None
2.1	Blue	2.7	Blue
2.2	Brown	2.8	Brown
2.3	None	2.9	None
2.4	Blue	3.0	Blue

**Spacer (For adjustment of differential case preload)**

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.65	65	1.01	01
0.68	68	1.04	04
0.71	71	1.07	07
0.74	74	1.10	10
0.77	77	1.13	13
0.80	80	1.16	16
0.83	83	1.19	19
0.86	86	1.22	22
0.89	89	1.25	25
0.92	92	1.28	28
0.95	95	1.31	31
0.98	98	1.34	34

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

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.56 – 0.64	—	0.86 – 0.94	—
0.66 – 0.74	—	0.96 – 1.04	—
0.76 – 0.84	—	0.97 – 1.15	—

## FASTENER TIGHTENING SPECIFICATIONS

M1233023100697

Item		Specification
Transmission	Roll stopper bracket	70 ± 10 N·m
	Control cable support bracket	23 ± 3 N·m
	Eye bolt	24 ± 3 N·m
	Oil cooler feed tube	11 ± 1 N·m
	Input shaft speed sensor	11 ± 1 N·m
	Output shaft speed sensor	11 ± 1 N·m
	Manual control lever	22 ± 3 N·m
	Inhibitor switch	11 ± 1 N·m
	Sealing cap <Type with sealing cap>	5.0 ± 1.0 N·m
	Valve body cover	11 ± 1 N·m
	Manual control shaft detente	6.0 ± 1.0 N·m
	Valve body mounting bolt	11 ± 1 N·m
	Fluid temperature sensor	11 ± 1 N·m
	Torque converter housing	48 ± 6 N·m
	Oil pump	29 ± 2 N·m
	Rear cover	23 ± 3 N·m
	Transfer drive gear	34 ± 2 N·m
	Anchor plug	98 ± 15 N·m
Components	Direct planetary carrier lock nut	170 ± 10 N·m
	Differential drive gear	135 ± 5 N·m
	Solenoid valve support	6.0 ± 1.0 N·m
	Valve body	11 ± 1 N·m
	Plate	6.0 ± 1.0 N·m

## SEALANTS

M1233000500412

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

### FORM-IN-PLACE GASKET (FIPG)

This transmission has several areas where the form-in-place gasket (FIPG) is used for sealing. To ensure that the FIPG fully serves its purpose, it is necessary to observe some precautions when applying it. Bead size, continuity and location are of paramount importance.

Too thin a bead could cause leaks. Too thick a bead, on the other hand, could be squeezed out of location, causing blocking or narrowing of fluid passages. To prevent leaks or blocking of passages, therefore, it is absolutely necessary to apply the FIPG evenly without a break, while observing the correct bead size. FIPG hardens as it reacts with the moisture in the atmospheric air, and it is usually used for sealing metallic flange areas.

**Disassembly**

Parts sealed with a FIPG can be easily removed without need for the use of a special method. In some cases, however, the FIPG in joints may have to be broken by tapping parts with a mallet or similar tool.

**Surface Preparation**

Thoroughly remove all substances deposited on the FIPG application surface, using a gasket scraper. Make sure that the FIPG application surface is flat and smooth. Also make sure that the surface is free from oils, greases and foreign substances. Do not fail to remove old FIPG that may remain in the fastener fitting holes.

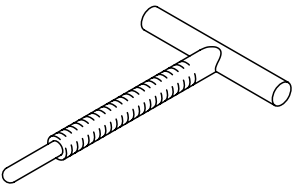
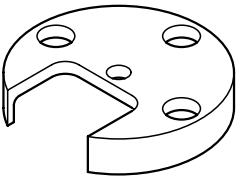
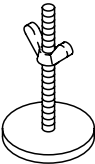
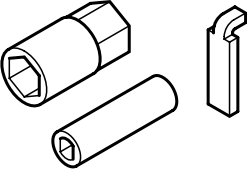
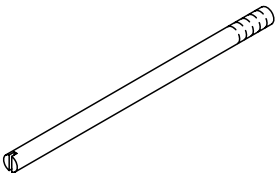
**FIPG Application**

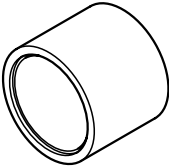
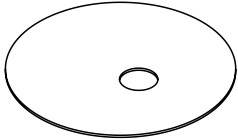
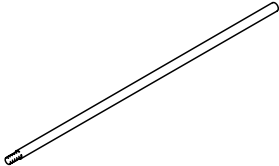
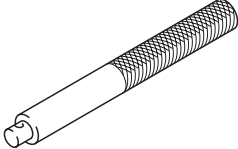
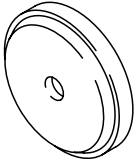
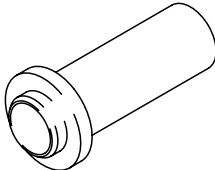
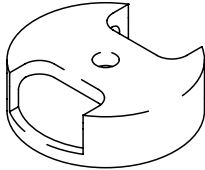
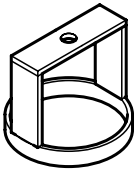
Applied FIPG bead should be of the specified size and free of any break. FIPG can be wiped away unless it has completely hardened. Install the mating parts in position while the FIPG is still wet (in less than 10 minutes after application). Do not allow FIPG to spread beyond the sealing areas during installation. Avoid operating the transmission or letting oils or water come in contact with the sealed area before a time sufficient for FIPG to harden (approximately one hour) has passed.

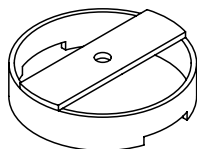
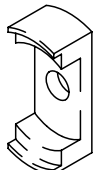
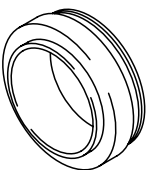
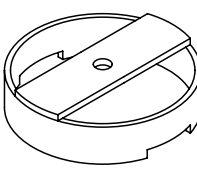
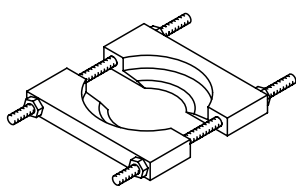
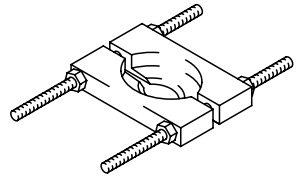
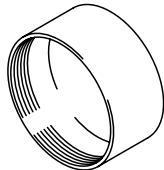
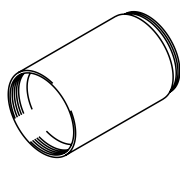
FIPG application method may vary from location to location. Follow the instruction for each particular case described later in this manual.

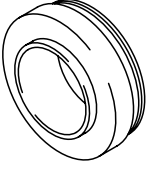
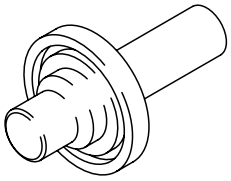
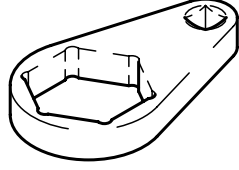
## SPECIAL TOOL(S)

M1233000600572

Tool	Number	Name	Use
	MD998333	Oil pump remover	Removal of oil pump
	MD999577	Spring compressor	Removal and installation of one-way clutch inner race snap ring
	MD998924	Spring compressor retainer	Use with spring compressor
	MB991633	Reduction brake set	Adjustment of reduction brake piston
	MD998412	Guide	Installation of transfer drive gear and oil pump

Tool	Number	Name	Use
	MB991445	Bushing remover and installer base	Installation of differential taper roller bearing outer race
	MB991632	Clearance dummy plate	Measurement of reaction plate low-reverse brake and second brake end play
	MD998913	Dial gauge extension	Measurement of low-reverse brake end play
	MB990938	Handle	<ul style="list-style-type: none"> <li>• Installation of input shaft rear bearing</li> <li>• Use with installer adapter</li> </ul>
	MB990936	Installer adapter	Installation of differential taper roller bearing outer race
	MD998334	Oil seal installer	Installation of oil pump oil seal
	MD998907	Spring compressor	Removal and installation of underdrive clutch snap ring
	MB991630	Spring compressor	Measurement of underdrive clutch and overdrive clutch end play

Tool	Number	Name	Use
	MB991629	Spring compressor	Measurement of underdrive clutch and overdrive clutch end play
	MD999590	Spring compressor	Removal and installation of overdrive clutch snap ring
	MD998824	Installer adapter (50)	Installation of direct clutch snap ring and transfer driven gear
	MB991789	Spring compressor	Measurement of reverse clutch end play
	MD998917	Bearing remover	Removal of transfer driven gear, output gear and parking gear
	MD998801	Bearing remover	Removal of each bearing
	MD998812	Installer cap	Use with installer and installer adapter
	MD998813	Installer 100	Use with installer cap and installer adapter

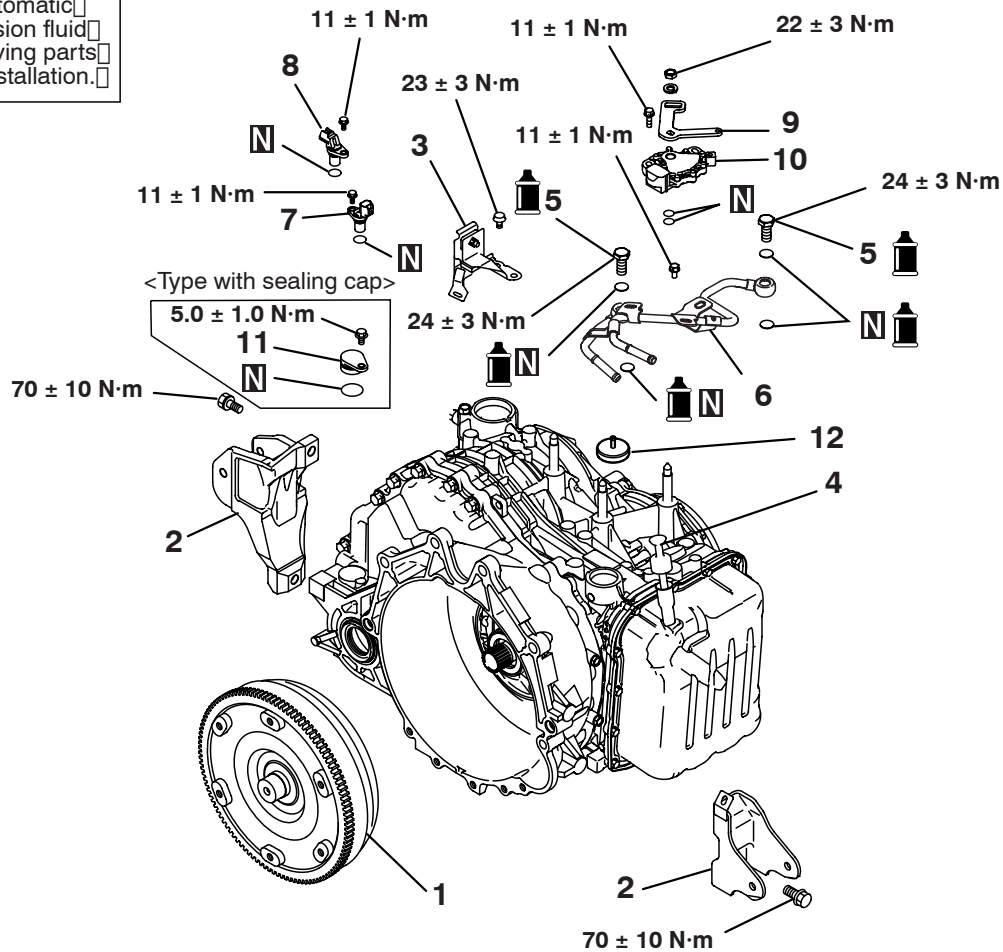
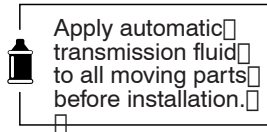
Tool	Number	Name	Use
	MD998820	Installer adapter (42)	Installation of differential taper roller bearing
	MD998800	Oil seal installer	Installation of drive shaft oil seal
	MD998834	Special spanner	Removal and installation of direct planetary carrier lock nut



# TRANSMISSION

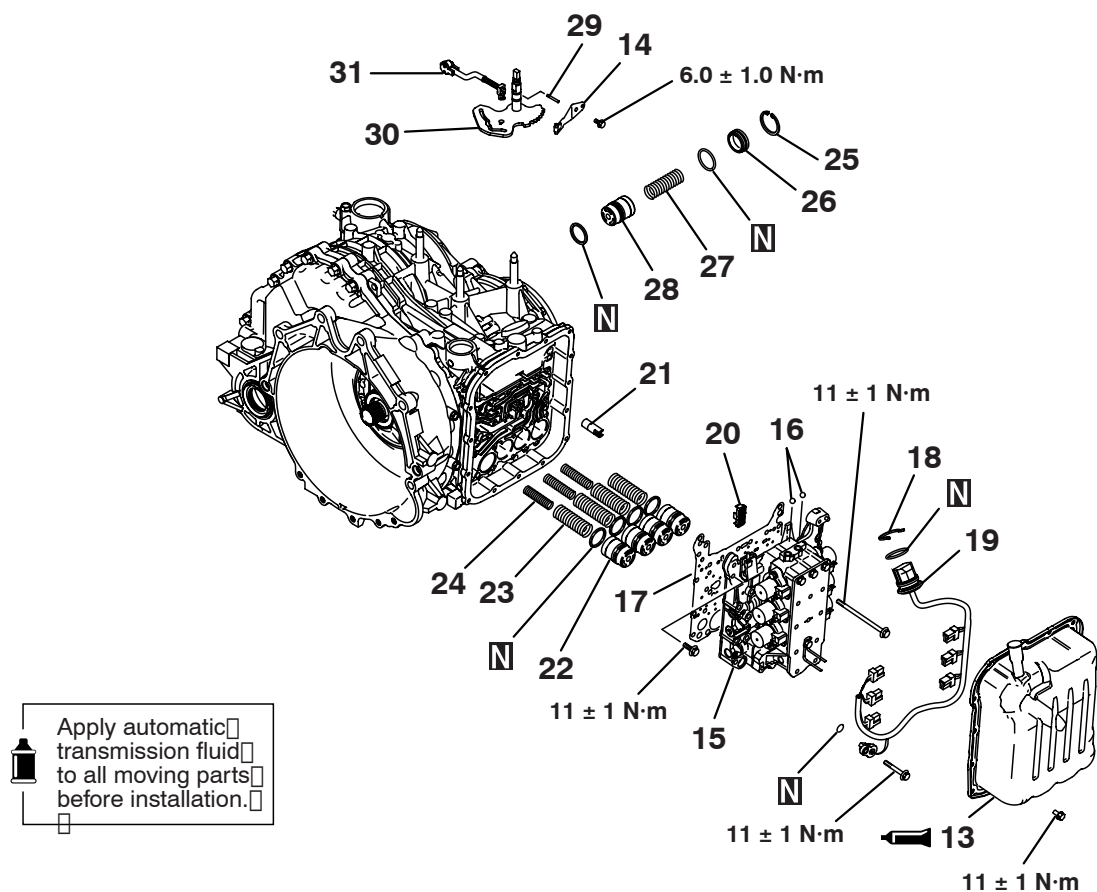
## DISASSEMBLY AND REASSEMBLY

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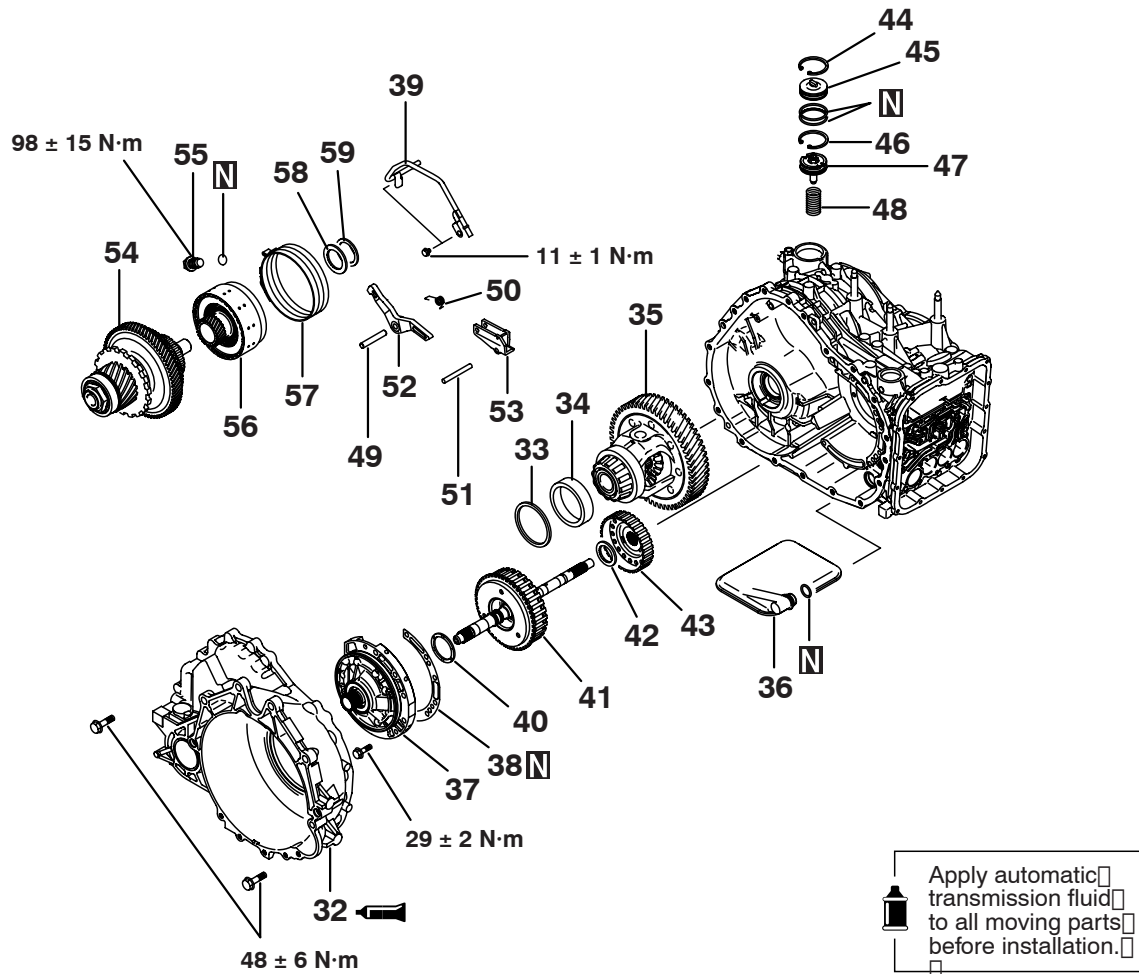
- |                                  |   |
|----------------------------------|---|
| 1. Torque converter              | 7. Input shaft speed sensor             |
| 2. Roll stopper bracket          | 8. Output shaft speed sensor            |
| 3. Control cable support bracket | 9. Manual control lever                 |
| 4. Oil level gauge               | 10. Inhibitor switch                    |
| 5. Eye bolt                      | 11. Sealing cap <Type with sealing cap> |
| 6. Oil cooler feed tube          | 12. Air breather                        |



- 13. Valve body cover
- 14. Manual control shaft detent
- 15. Valve body
- 16. Steel ball
- 17. Gasket
- 18. Snap ring
- 19. Solenoid valve harness
- 20. Strainer
- 21. Solenoid brake retainer oil seal
- 22. Accumulator piston

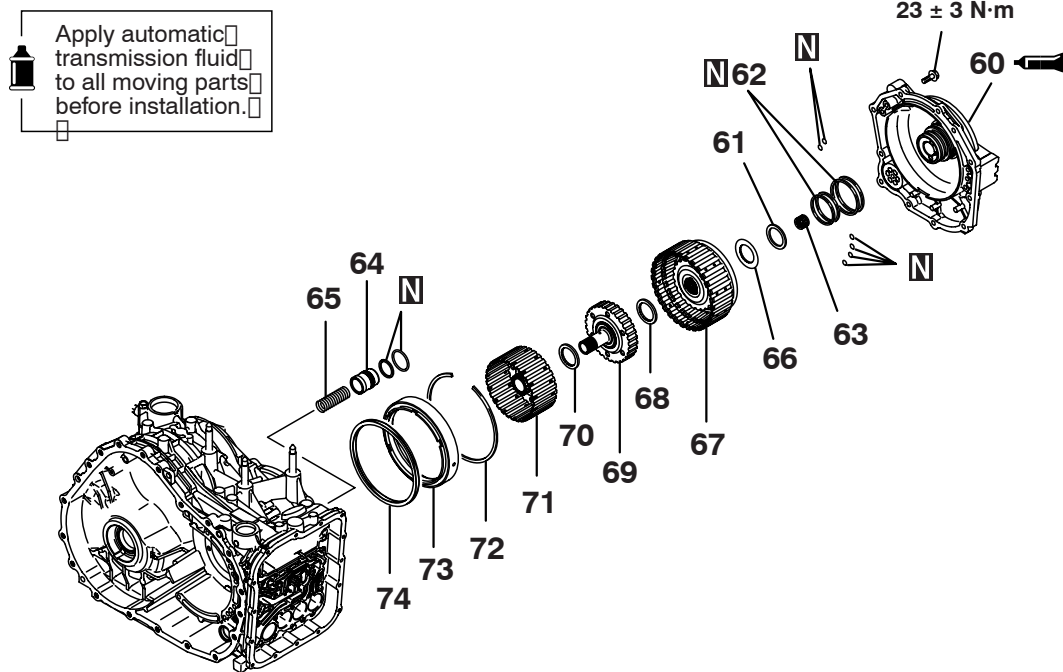
- 23. Accumulator spring
- 24. Accumulator spring
- 25. Snap ring
- 26. Accumulator cover
- 27. Accumulator spring
- 28. Accumulator piston
- 29. Manual control lever shaft roller
- 30. Manual control lever shaft
- 31. Parking pawl rod

AK403264AC



AK502957AB

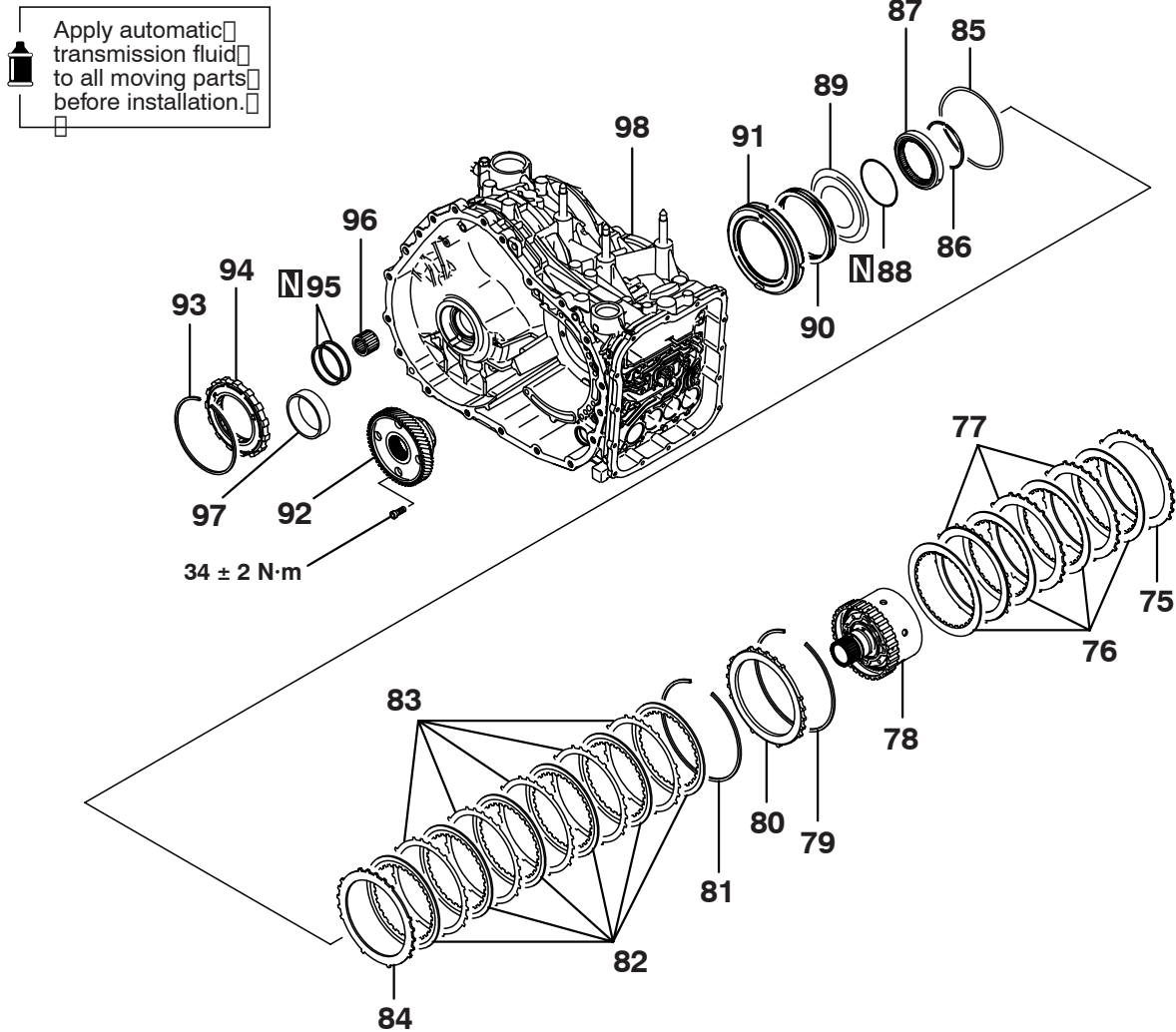
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|---------------------------------------|---------------------------------------|
| 32. Torque converter housing          | 46. Snap ring                         |
| 33. Spacer                            | 47. Reduction brake piston            |
| 34. Outer race                        | 48. Reduction brake spring            |
| 35. Differential                      | 49. Parking pawl shaft                |
| 36. Oil filter                        | 50. Parking pawl spring               |
| 37. Oil pump                          | 51. Parking roller support shaft      |
| 38. Gasket                            | 52. Parking pawl                      |
| 39. Pipe                              | 53. Parking roller support            |
| 40. Thrust washer # 1                 | 54. Direct planetary carrier assembly |
| 41. Underdrive clutch and input shaft | 55. Anchor plug                       |
| 42. Thrust bearing #2                 | 56. Direct clutch                     |
| 43. Underdrive clutch hub             | 57. Reduction brake band              |
| 44. Snap ring                         | 58. Thrust bearing #11                |
| 45. Reduction brake piston cover      | 59. Thrust race #12                   |



- 60. Rear cover
- 61. Thrust race #8
- 62. Seal ring
- 63. Input shaft rear bearing
- 64. Accumulator piston
- 65. Accumulator spring
- 66. Thrust bearing #7
- 67. Reverse and overdrive clutch

- 68. Thrust bearing #6
- 69. Overdrive clutch hub
- 70. Thrust bearing #5
- 71. Planetary reverse sun gear
- 72. Snap ring
- 73. Second brake piston
- 74. Return spring

AK403289AC



- 75. Pressure plate
- 76. Second brake disc
- 77. Second brake plate
- 78. Planetary carrier assembly
- 79. Snap ring
- 80. Reaction plate
- 81. Snap ring
- 82. Low-reverse brake disc
- 83. Low-reverse brake plate
- 84. Pressure plate
- 85. Wave spring
- 86. Snap ring

- 87. One-way clutch inner race
- 88. O-ring
- 89. Spring retainer
- 90. Return spring
- 91. Low-reverse brake piston
- 92. Transfer drive gear
- 93. Snap ring
- 94. One-way clutch
- 95. Seal ring
- 96. Needle bearing
- 97. Outer race
- 98. Transmission case

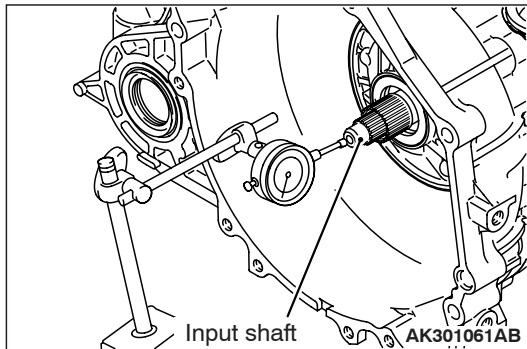
AK403290AC

## DISASSEMBLY

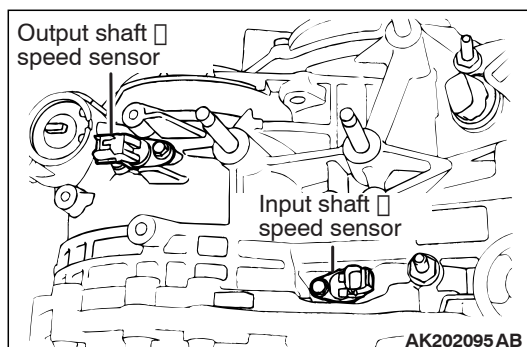
### ⚠ CAUTION

- The automatic transmission includes many high-precision parts. Handle these parts extremely carefully not to scratch or damage them during disassembly and reassembly.
- Work bench should be covered with a rubber mat and keep it clean at all times.
- Do not wear any cloth gloves and do not use any rags during disassembly. Use only nylon cloth or paper towels if necessary.
- All removed parts must be washed clean. Metal parts may be washed in an ordinary solvent, but they should be dried completely using compressed air.
- Clutch discs, plastic thrust plates and rubber parts should be washed in automatic transmission fluid (ATF) and keep them free of dirt after washing.
- If the transmission has been found damaged and repaired, also disassemble and clean the ATF cooler system.

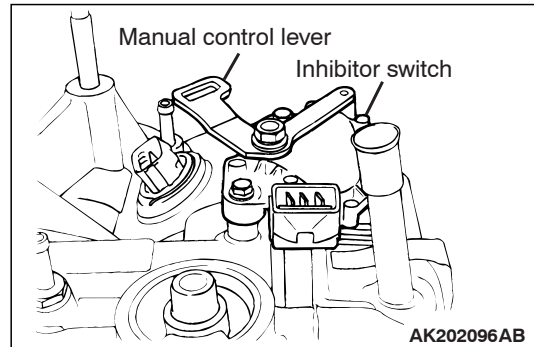
1. Remove the torque converter.



2. Use a dial gauge to measure the input shaft end play.
3. Remove control cable support bracket.
4. Remove the oil level gauge.
5. Remove the eye bolt, gaskets and the oil cooler feed tube.



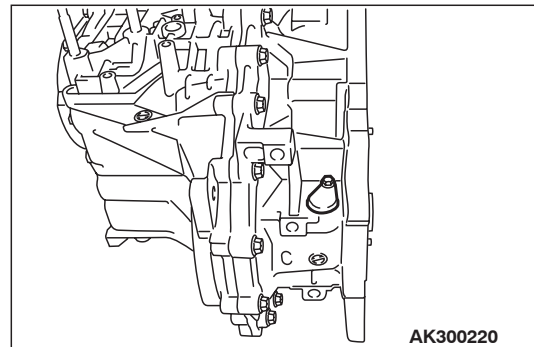
6. Remove the input shaft speed sensor and output shaft speed sensor.



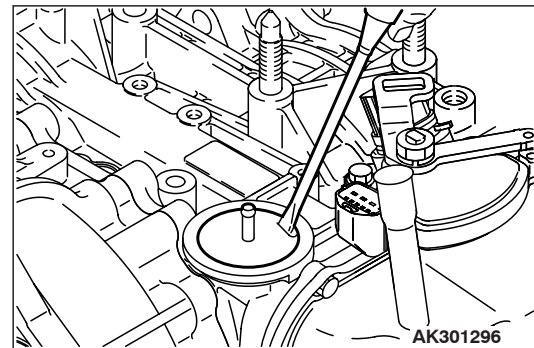
### ⚠ CAUTION

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

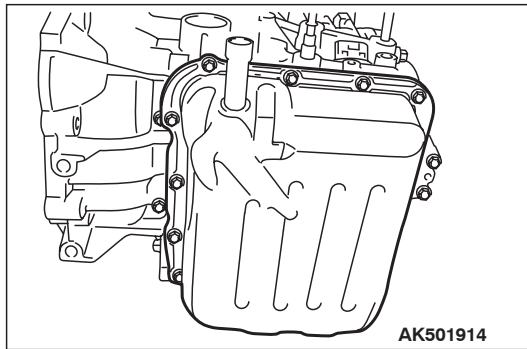
7. Loosen the manual control lever tightening nut, and then remove the manual control lever and the inhibitor switch.



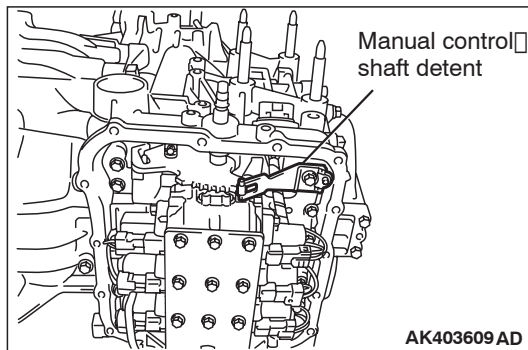
8. Remove the sealing cap and O-ring. <Type with sealing cap>



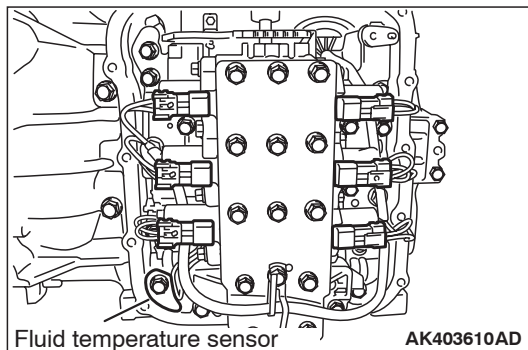
9. Remove the air breather by inserting a screwdriver into the air breather and prying it up.



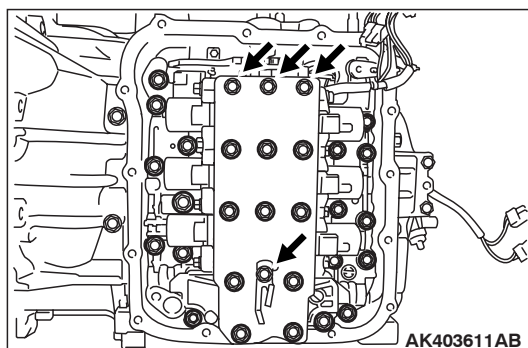
10. Remove the valve body cover.



11. Remove the manual control shaft detent.



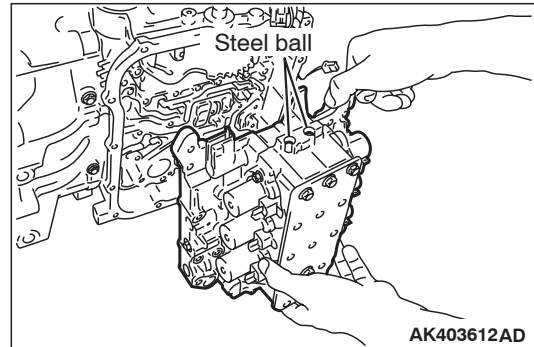
12. Disconnect the solenoid valve harness from the valve body by disconnecting the fluid temperature sensor and all the connectors.



**⚠ CAUTION**

- Make sure that the manual control lever and the inhibitor switch are removed. See step 7.
- Do not remove the bolts (four pieces) shown in the illustration.

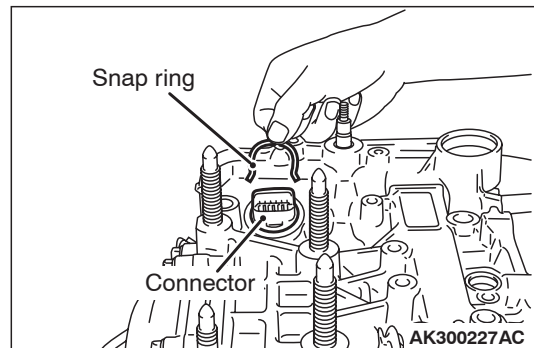
13. Remove the valve body mounting bolts (twenty seven pieces).



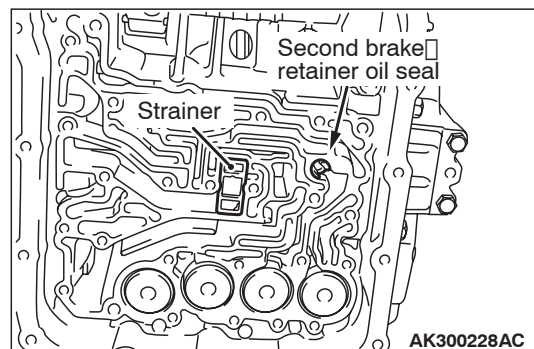
**⚠ CAUTION**

**Do not lose the two steel balls.**

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

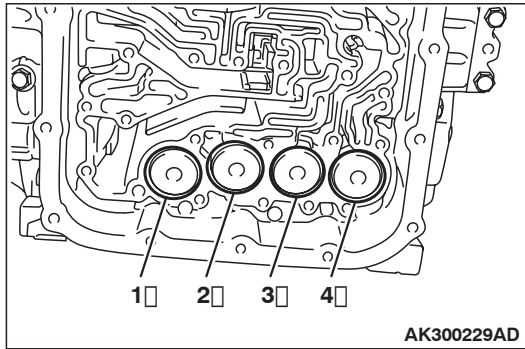


15. Remove the snap ring from the connector. Push the connector into the transmission case and remove the solenoid valve harness.



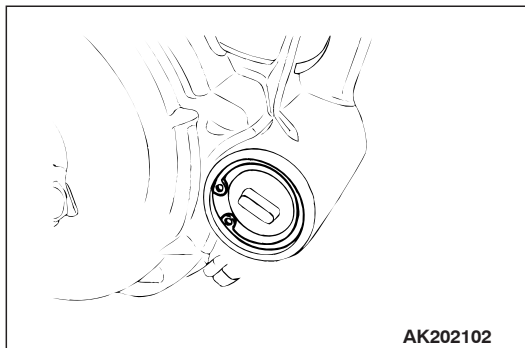
16. Remove the strainer and the second brake retainer oil seal.



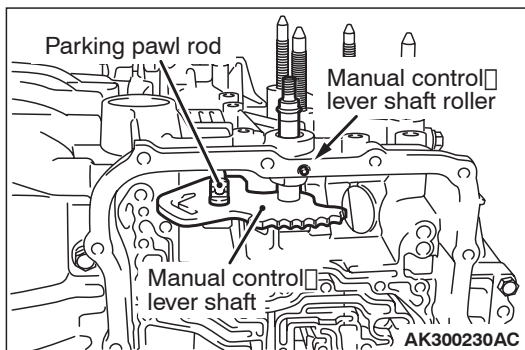


17. Remove each accumulator piston and spring.

Number	Name
1	For low-reverse brake
2	For underdrive clutch
3	For second brake
4	For overdrive clutch

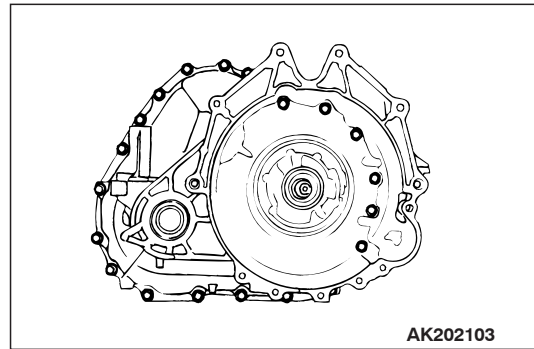


18. Remove the reduction brake accumulator cover after removing the snap ring, then remove the spring and piston.

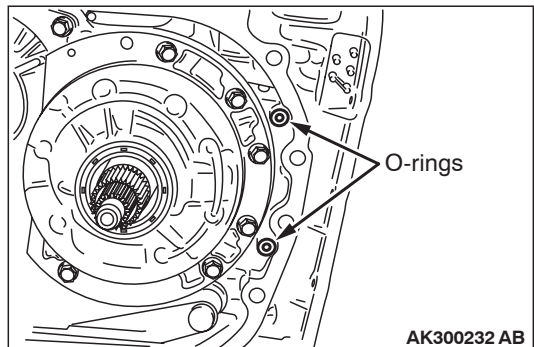


19. Remove the manual control lever shaft roller.

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

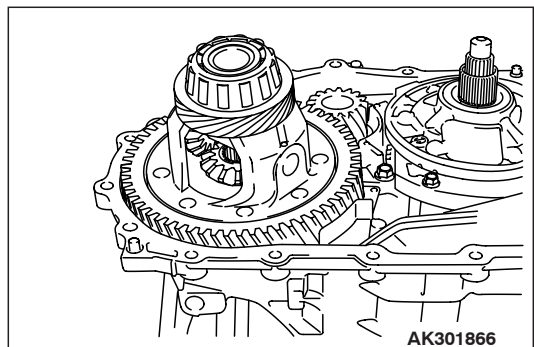


21. Remove the torque converter housing mounting bolts (twenty pieces), and then remove the torque converter housing.

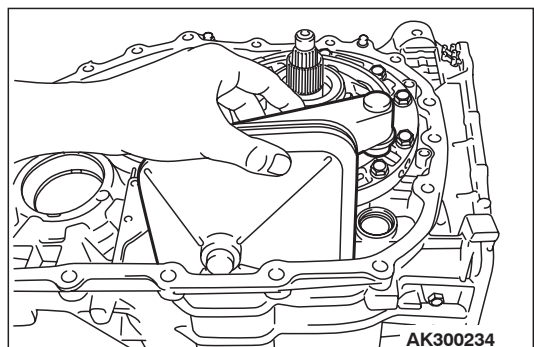


22. Remove the O-rings (two pieces).

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

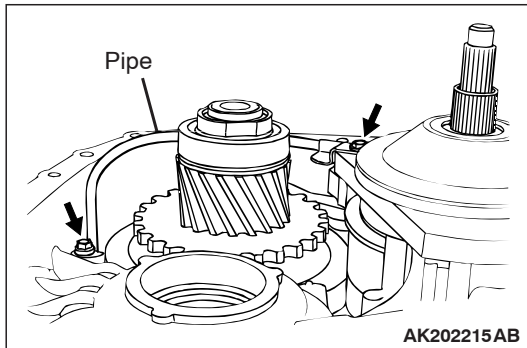


24. Remove the differential.

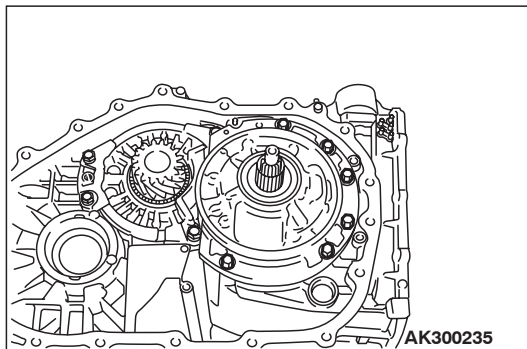




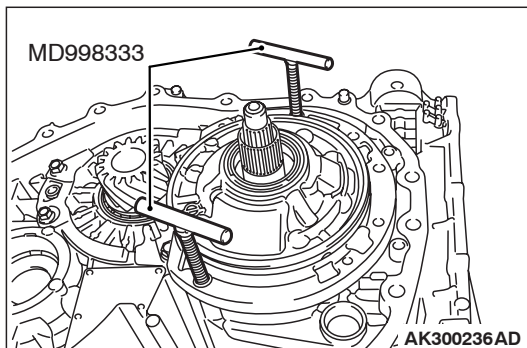
25.Remove the oil filter.



26.Remove the pipe clamp bolts (two places).



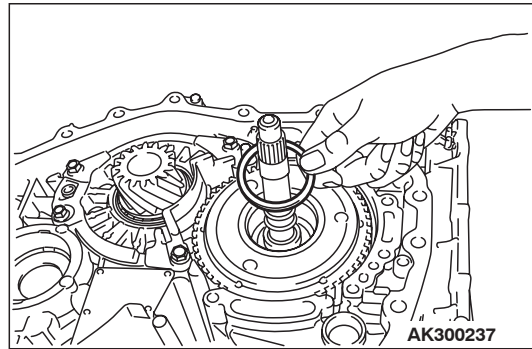
27.Remove the oil pump mounting bolts (six pieces).



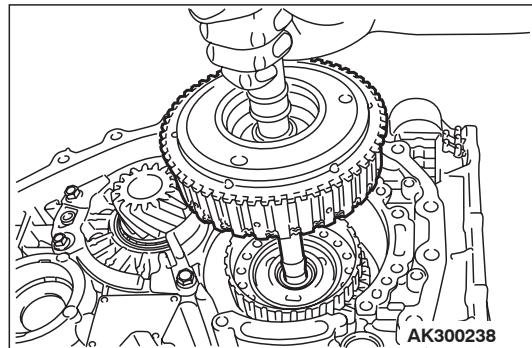
28.Place special tool Oil pump remover (MD998333) as shown in the drawing.

29.Turn special tool Oil pump remover (MD998333) to remove the oil pump.

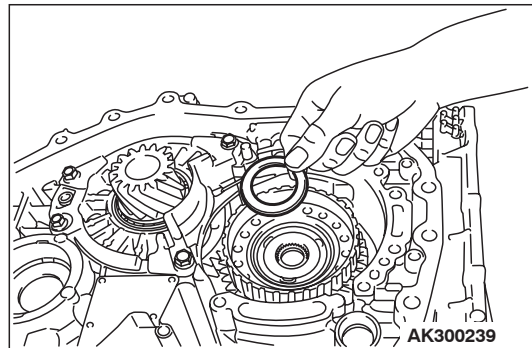
30.Remove the oil pump gasket.



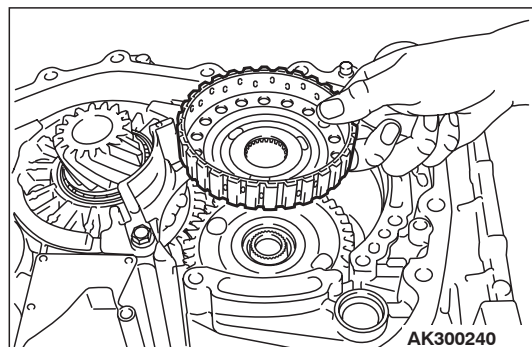
31.Remove thrust washer #1.



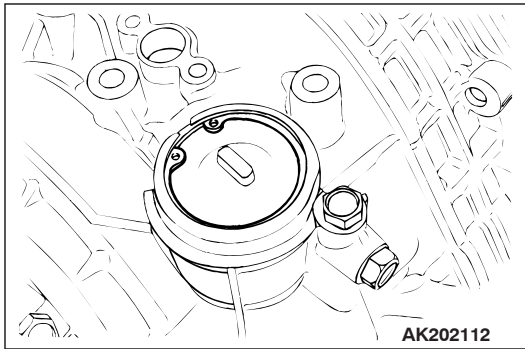
32.Holding the input shaft, remove the underdrive clutch and input shaft.



33.Remove thrust bearing #2.

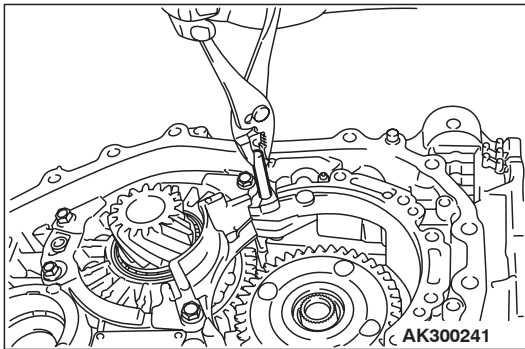


34.Remove the underdrive clutch hub.

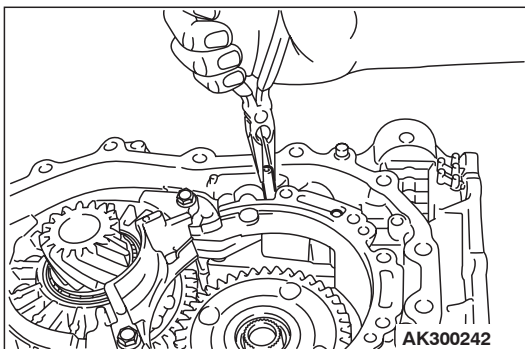


35. Remove the reduction brake piston cover after removing the snap ring.

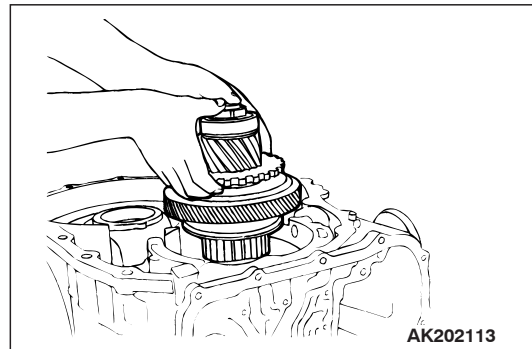
36. Remove the reduction brake piston and spring after removing the snap ring.



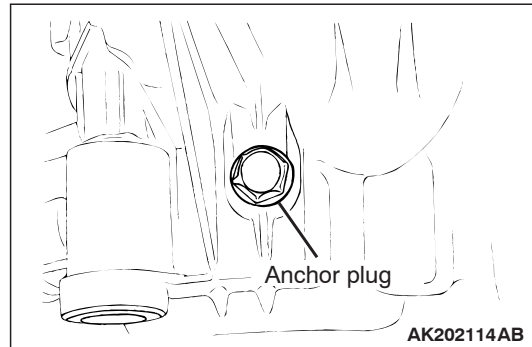
37. Remove the parking pawl shaft, and then remove the spacer and spring.



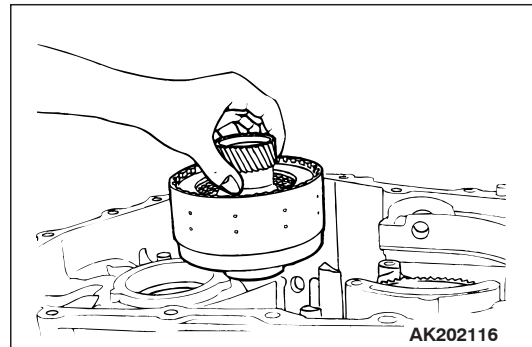
38. Remove the parking roller support shafts (two pieces), and then remove the parking pawl and parking roller support.



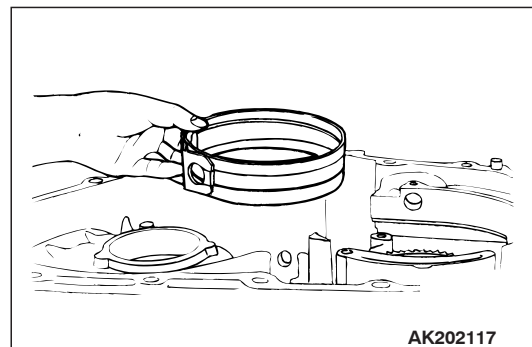
39. Remove the direct planetary carrier assembly.



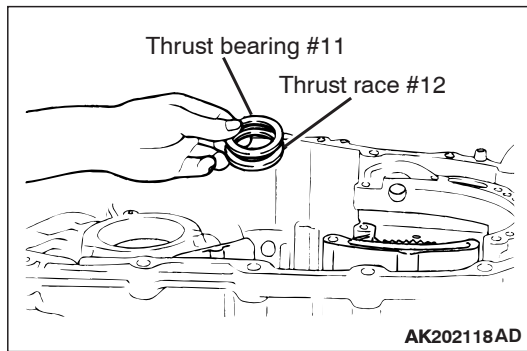
40. Remove the anchor plug and O-ring.



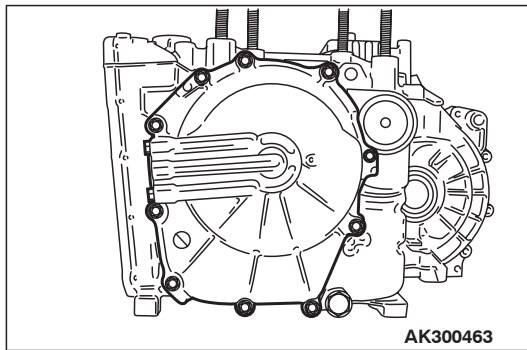
41. Remove the direct clutch.



42. Remove the reduction brake band.



43. Remove the thrust bearing #11 and thrust race #12.

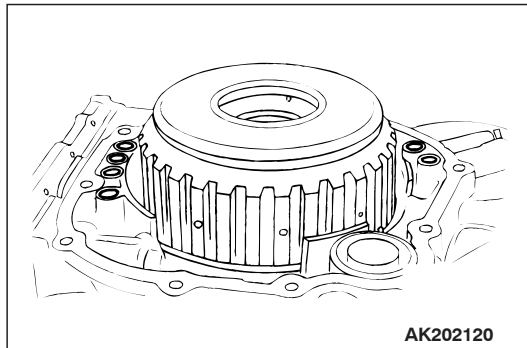


44. Remove the rear cover.

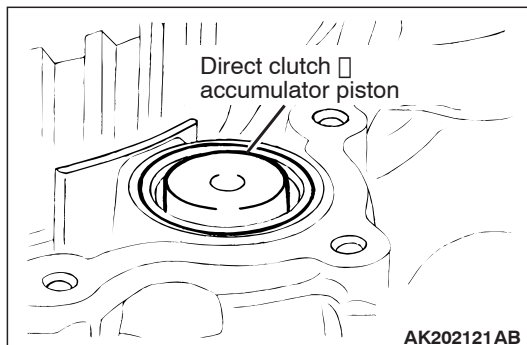
45. Remove the thrust race #8.

46. Remove the seal rings (four pieces).

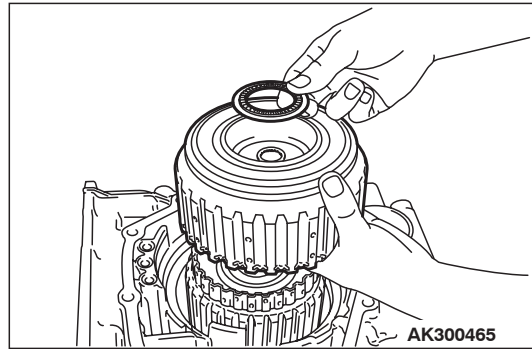
47. Remove the input shaft rear bearing.



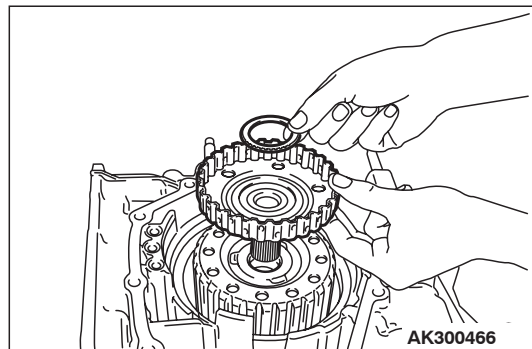
48. Remove the O-rings (six pieces).



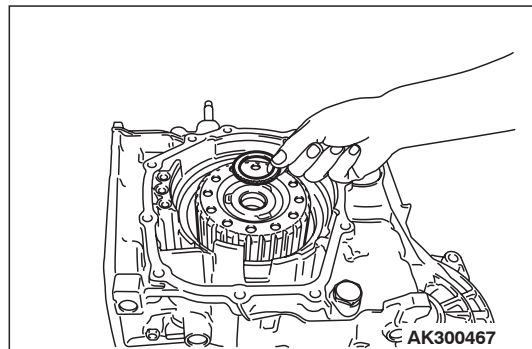
49. Remove the direct clutch accumulator piston and spring after removing the O-ring.



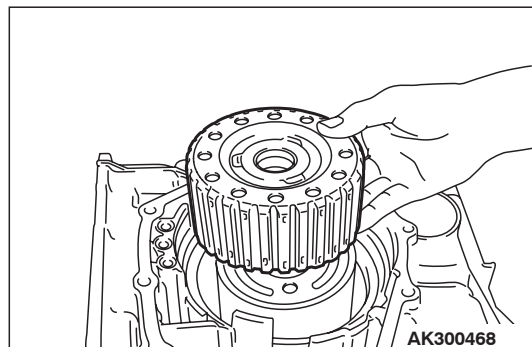
50. Remove the reverse and overdrive clutch and thrust bearing #7.



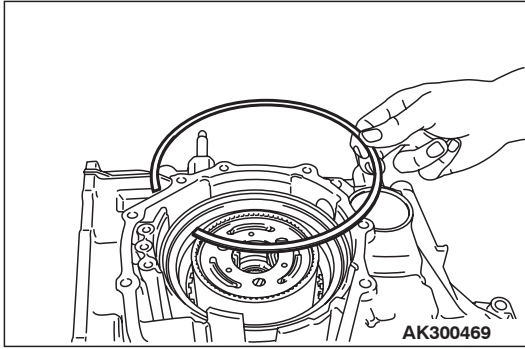
51. Remove overdrive clutch hub and thrust bearing #6.



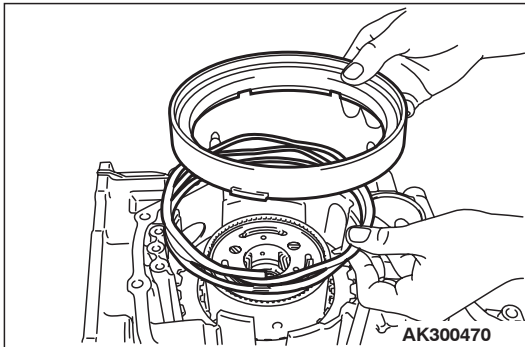
52. Remove thrust bearing #5.



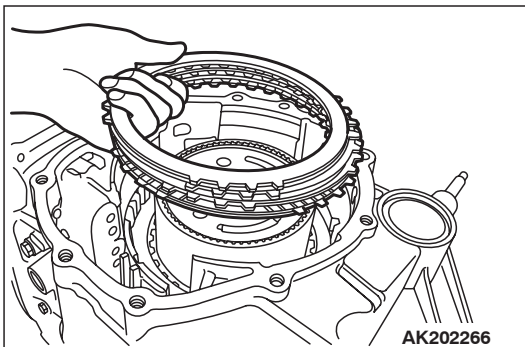
53. Remove the planetary reverse sun gear.



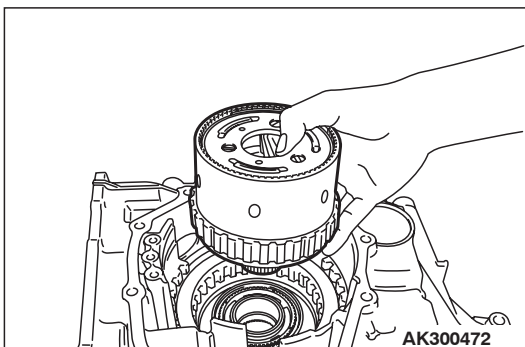
54.Remove the snap ring.



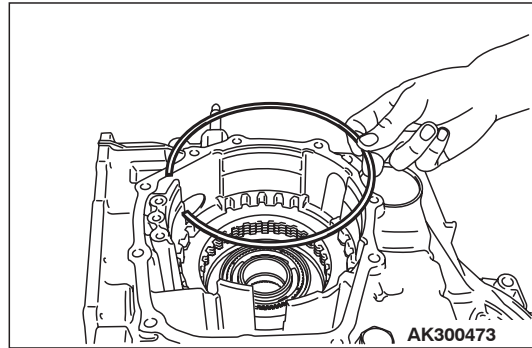
55.Remove the second brake piston and the return spring.



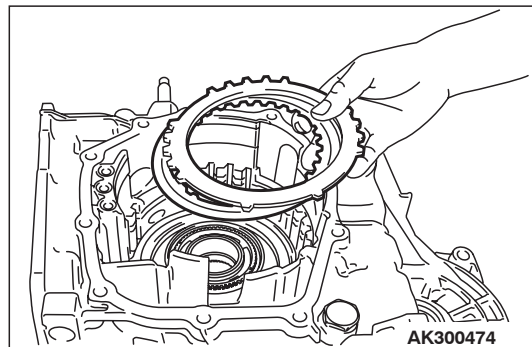
56.Remove the pressure plate, second brake discs (four pieces) and second brake plates (three pieces).



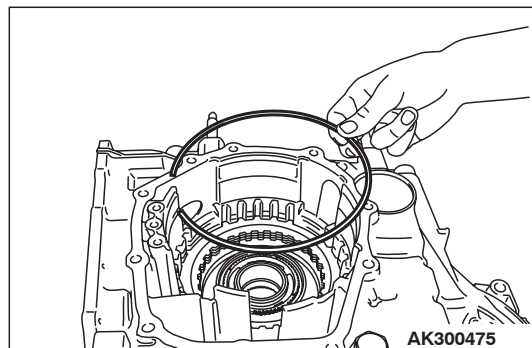
57.Remove the planetary carrier assembly.



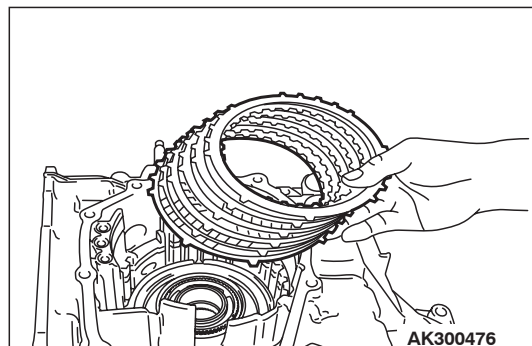
58.Remove the snap ring.



59.Remove the reaction plate and the brake disc.



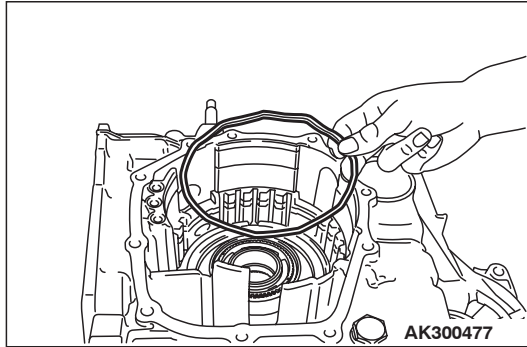
60.Remove the snap ring.



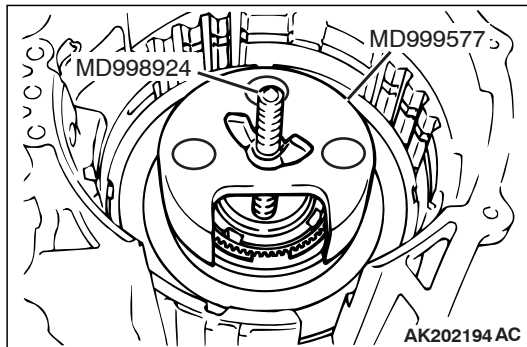
61.Remove the brake plates (five pieces), brake discs (six pieces) and pressure plate.



*NOTE: \*Includes the brake discs removed in step 57.*

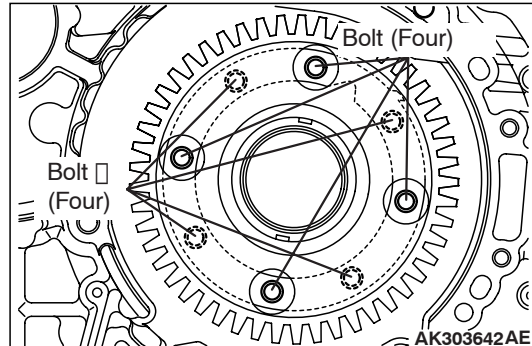
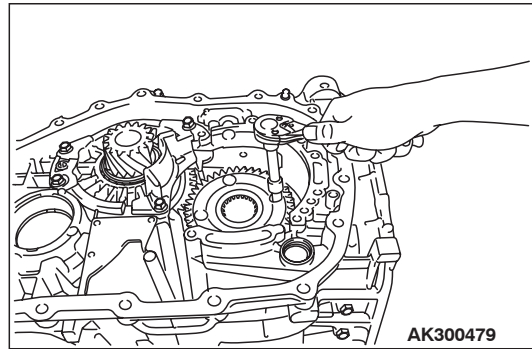


62. Remove the wave spring.

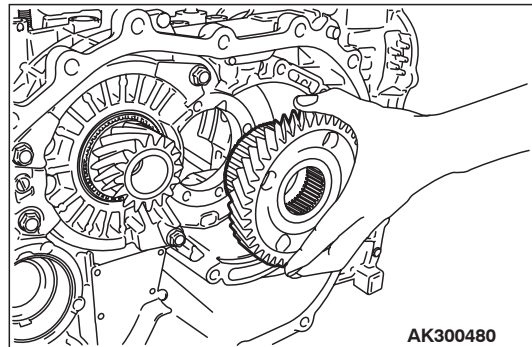


63. Remove the one-way clutch inner race and low-reverse brake piston as follows:

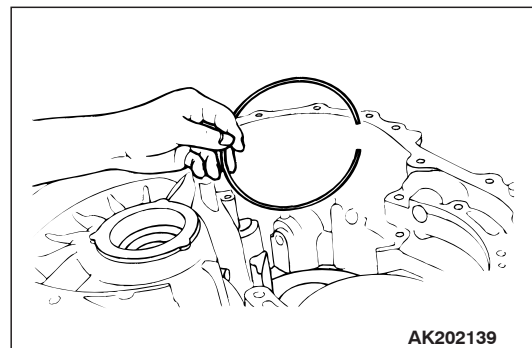
- (1) Using special tools to compress the one-way clutch inner race.
- Spring compressor (MD999577)
- Spring compressor retainer (MD998924)
- (2) Remove the snap ring.
- (3) Remove the special tools.
- (4) Remove the one-way clutch inner race, O-ring, spring retainer, return spring and low-reverse brake piston.



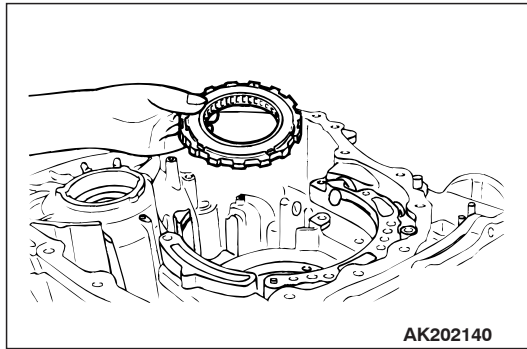
64. Remove the transfer drive gear bearing mounting bolts (four pieces).  
Then, turn the gear 1/8 turn and remove the remaining bolts (four pieces).



65. Remove the transfer drive gear.



66. Remove the snap ring.

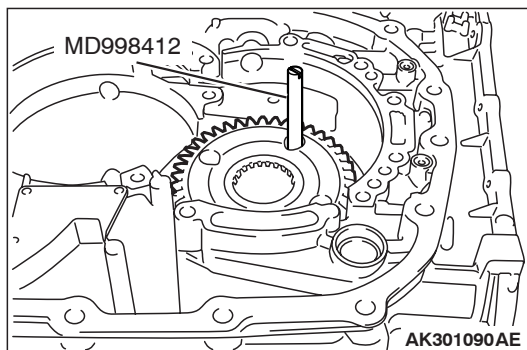


67. Remove the one-way clutch.
68. Remove the seal rings (two pieces).
69. Remove the needle bearing.
70. Remove the differential bearing outer race from the transmission case.

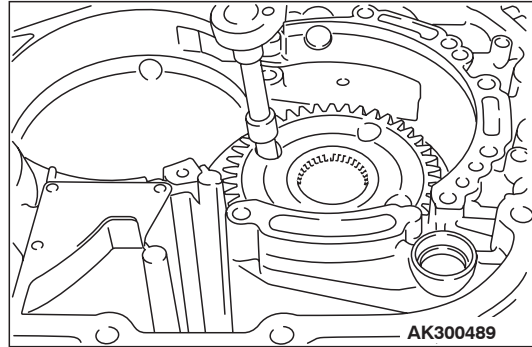
## REASSEMBLY

### **CAUTION**

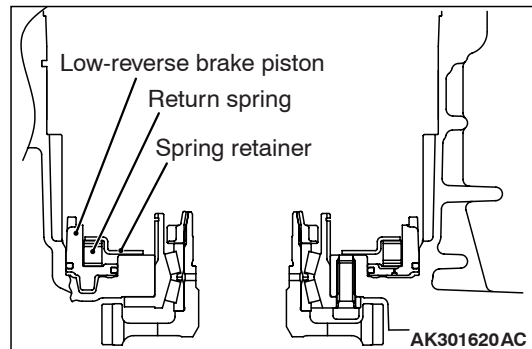
- Never reuse any gasket, O-ring, and oil seal. Always replace them with new ones.
- Never use any product other than blue petroleum jelly or white Vaseline to lubricate or hold parts during assembly.
- Apply ATF to friction elements, rotating parts, and sliding parts before installation. Soak new clutch discs or brake discs in ATF for at least two hours before installing them.
- Never apply sealant or adhesive to gaskets.
- When a bushing requires replacement, replace the assembly of which the bushing forms a part.
- Never use any cloth gloves or any rags during reassembly. Use only nylon cloth or paper towels if necessary.
- Change also the ATF in the cooler circuit.



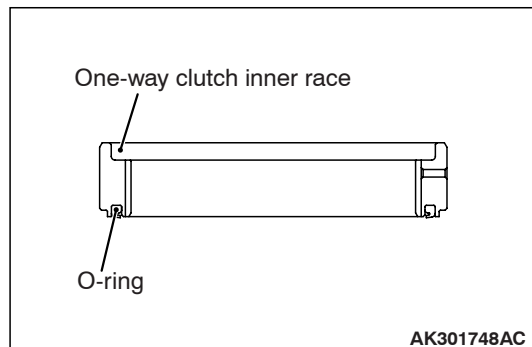
1. Install special tool Guide (MD998412) in the installation screw hole of the transfer drive gear bearing located in the transmission case. Using this as a guide, install the transfer drive gear bearing and gear in the transmission case.



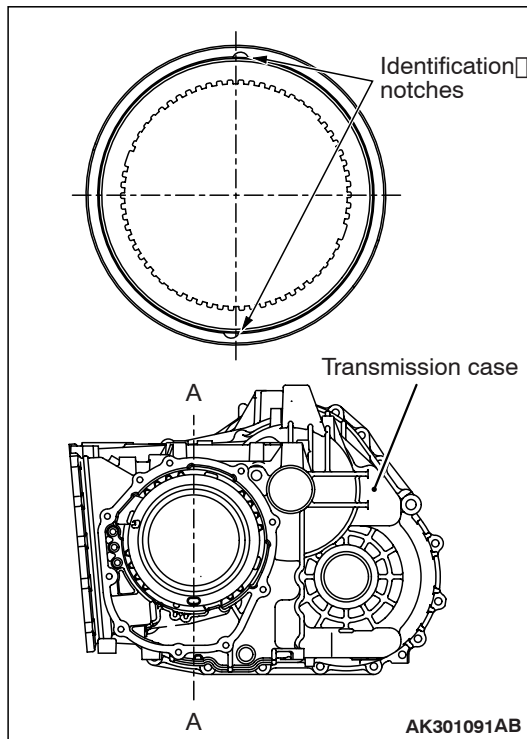
2. Tighten the mounting bolts (eight pieces) of the transfer drive gear bearing to the specified torque of  $34 \pm 2$  N·m.



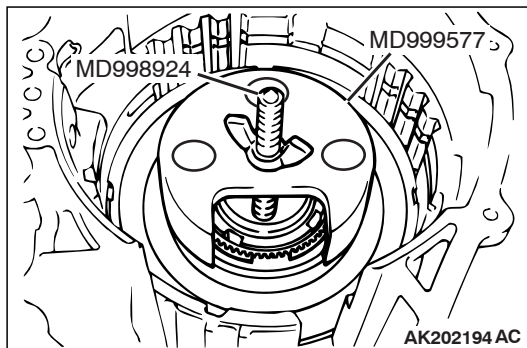
3. Install the low-reverse brake piston, return spring, and spring retainer into the transmission case.



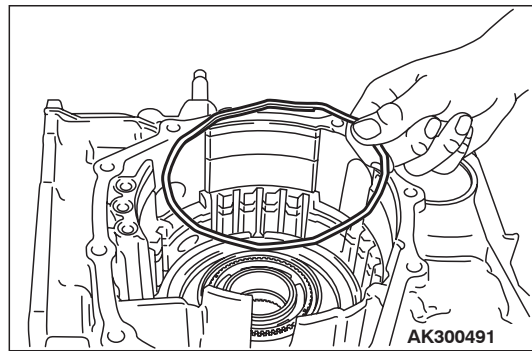
4. Fit a new O-ring into the groove of one-way clutch inner race.



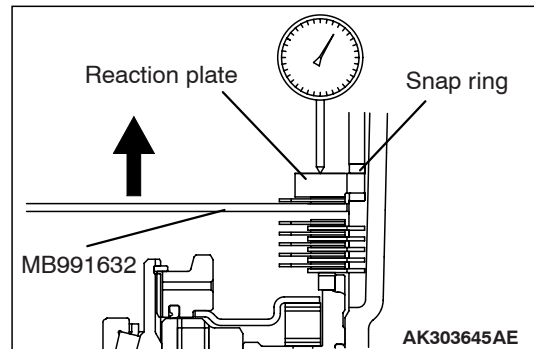
5. Check the placement of the identification notches in the one-way clutch inner race. Install the one-way clutch inner race to the transfer drive gear bearing so that the notches fall along the A – A line.



6. Put the snap ring on the inner race.  
7. Set special tools as shown, and then compress the one-way clutch inner race and install the snap ring.
- Spring compressor (MD999577)
  - Spring compressor retainer (MD998924)



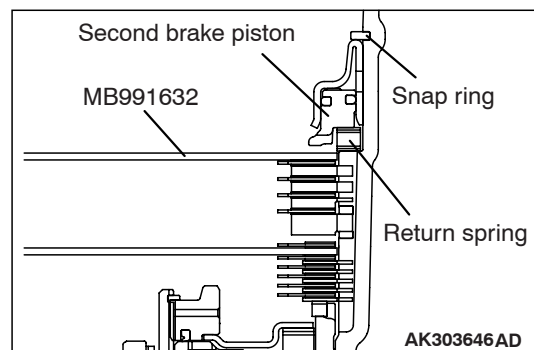
8. Install the wave spring onto the low-reverse brake piston.



9. Install the brake discs (six pieces), brake plates (five pieces) and snap ring as shown in the figure.  
*NOTE: Do not install the pressure plate at this time.*

10. Install special tool Clearance dummy plate (MB991632) on the brake disc.  
11. Install the reaction plate and the used snap ring.  
12. Move special tool Clearance dummy plate (MB991632) 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.

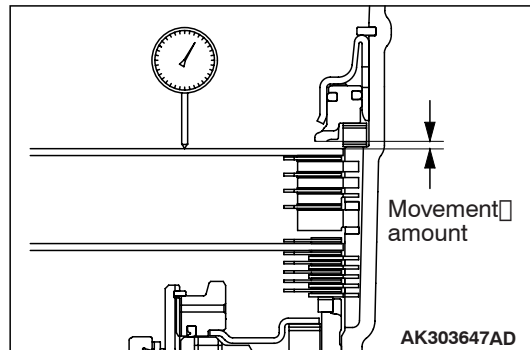
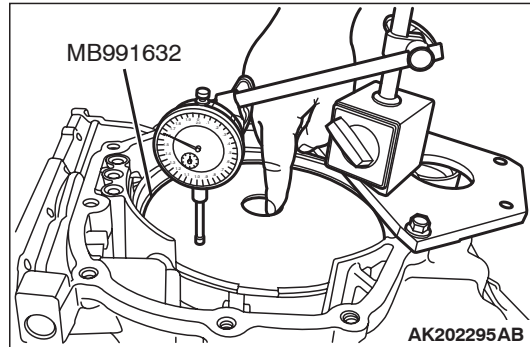
**Standard value: 0 – 0.16 mm**



13. Install the brake discs (four pieces) and brake plates (three pieces) as shown in the figure.

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

14. Place special tool Clearance dummy plate (MB991632) on top of the brake disc in place of the pressure plate.
15. Install the return spring, second brake piston and snap ring.

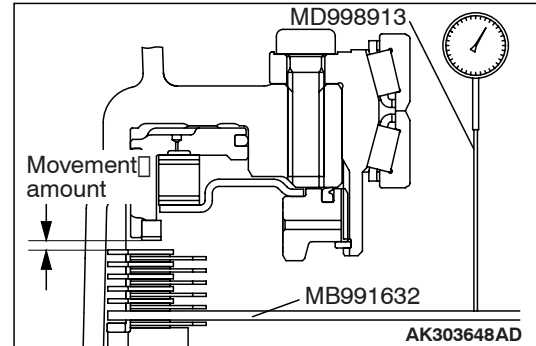
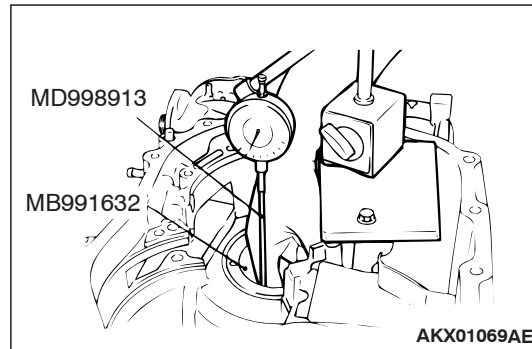


16. Move special tool Clearance dummy plate (MB991632) and measure its movement.
- Standard value of end play (Reference):**  
**1.09 – 1.55 mm**

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

**Available pressure plates**

Amount of movement mm	Thickness mm	Identification symbol
1.1 – 1.3	1.8	E
1.3 – 1.5	2.0	D
1.5 – 1.7	2.2	C
1.7 – 1.9	2.4	B
1.9 – 2.1	2.6	A
2.1 – 2.3	2.8	0



18. Turn the transmission over so that the installation surface of the torque converter housing is facing up.

Install special tool Dial gauge extension (MD998913) in a dial gauge, and then move special tool Clearance dummy plate (MB991632) and measure its movement.

**Standard value of end play (Reference):**  
**1.65 – 2.11 mm**

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

**Available pressure plates**

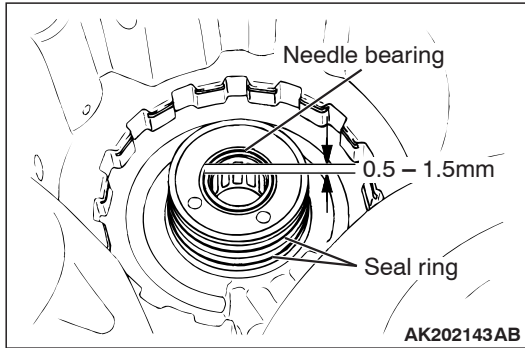
Amount of movement mm	Thickness mm	Identification symbol
1.0 – 1.2	1.6	F
1.2 – 1.4	1.8	E
1.4 – 1.6	2.0	D
1.6 – 1.8	2.2	C
1.8 – 2.0	2.4	B
2.0 – 2.2	2.6	A
2.2 – 2.4	2.8	0
2.4 – 2.6	3.0	1



**⚠ CAUTION**

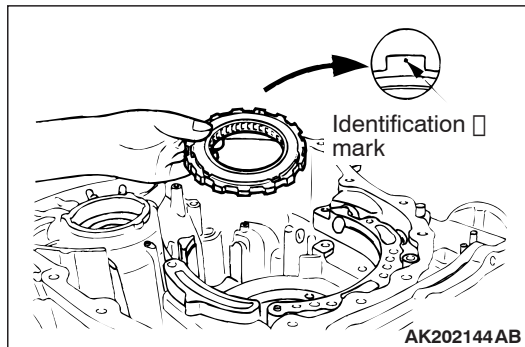
If necessary, take the measurements in steps 9 to 18 after replacing the pressure plate, brake plate and brake disc.

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.

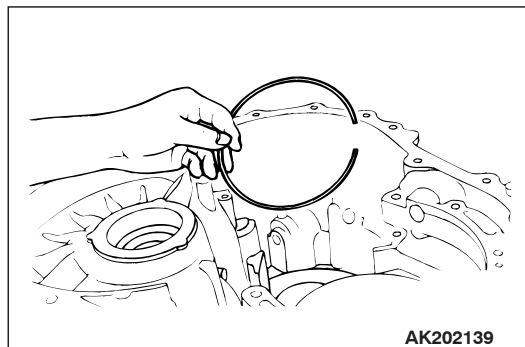


21. Install the needle bearing as shown in the illustration.

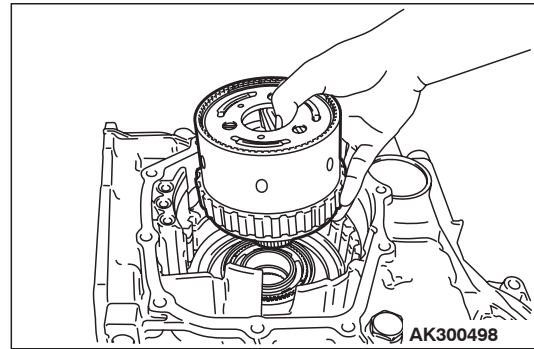
22. Install the two seal rings.



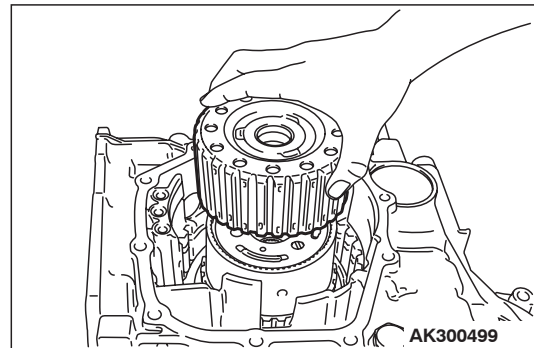
23. Install the snap ring into the groove of transmission case output shaft bore.



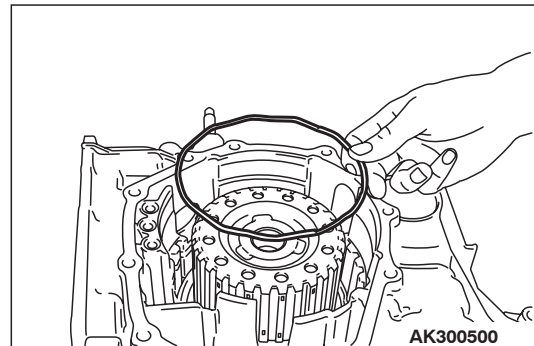
24. Install the snap ring.



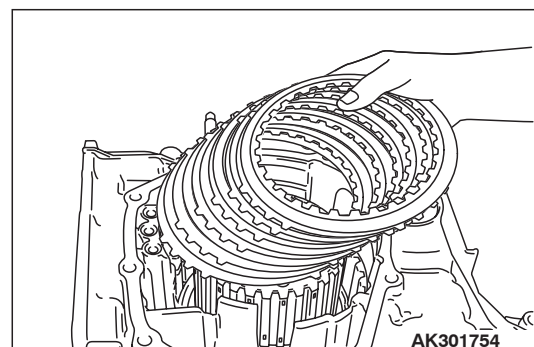
25. Install the planetary carrier assembly.



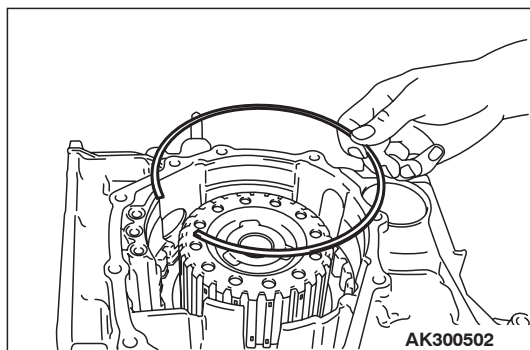
26. Install the planetary reverse sun gear.



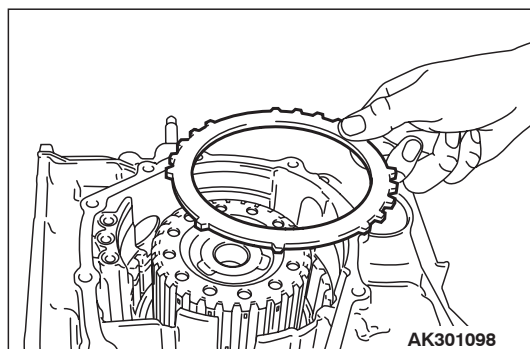
27. Install the wave spring on the low-reverse brake piston.



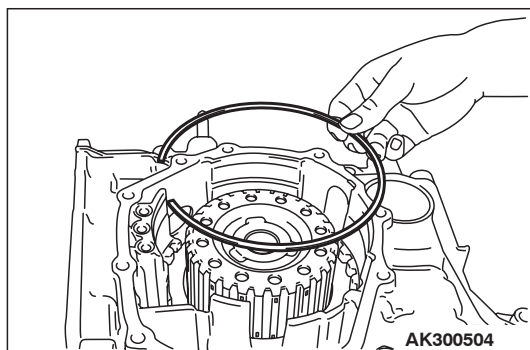
28. Install the pressure plate that was selected in step 19. Next, install brake discs (six pieces) and brake plates (five pieces), one on top of the other.



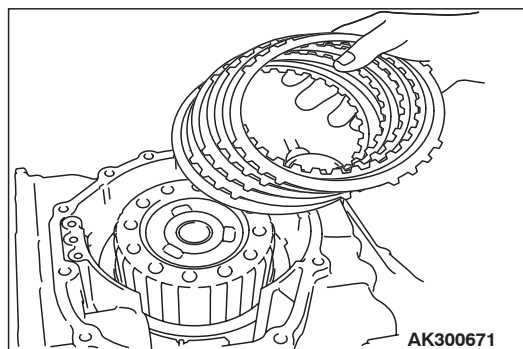
29. Install the snap ring.



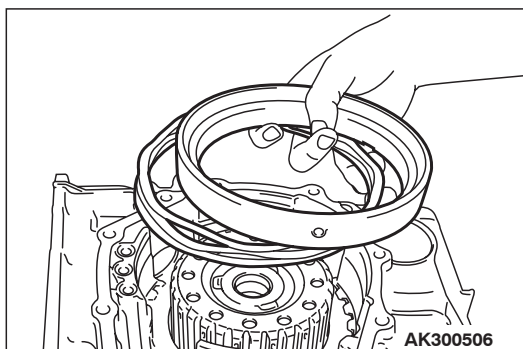
30. Install the reaction plate.



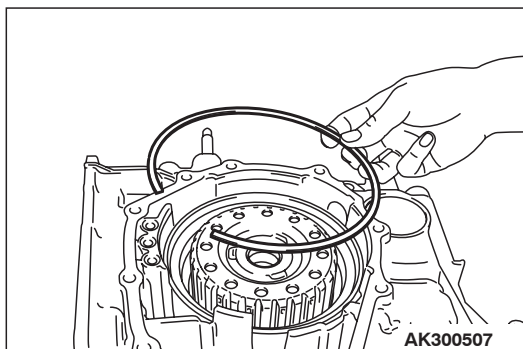
31. Install the snap ring that was selected in step 12.



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

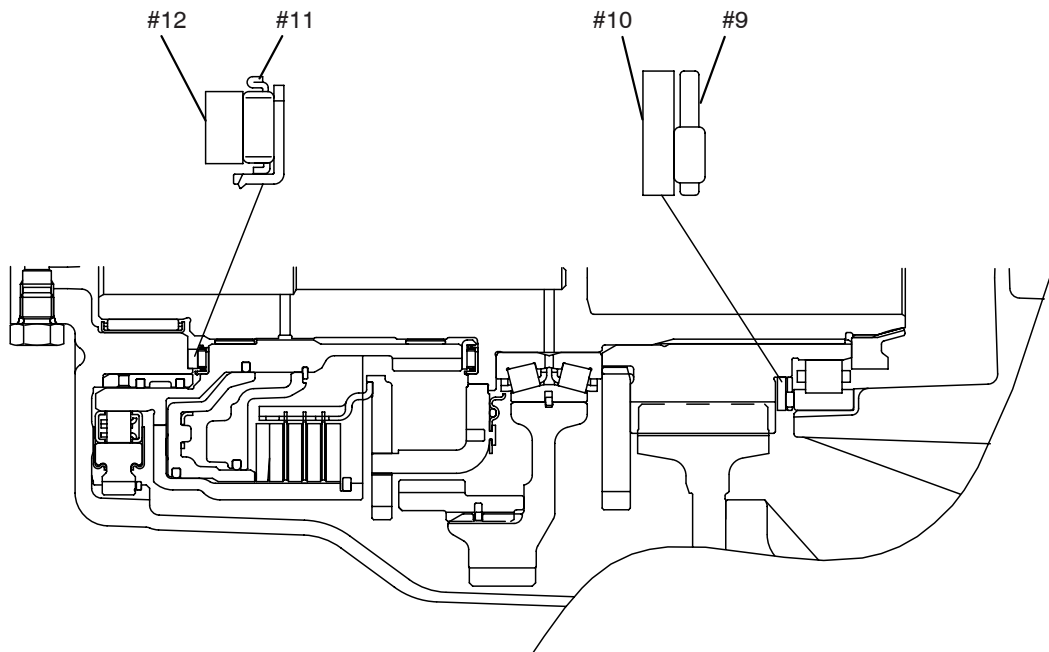
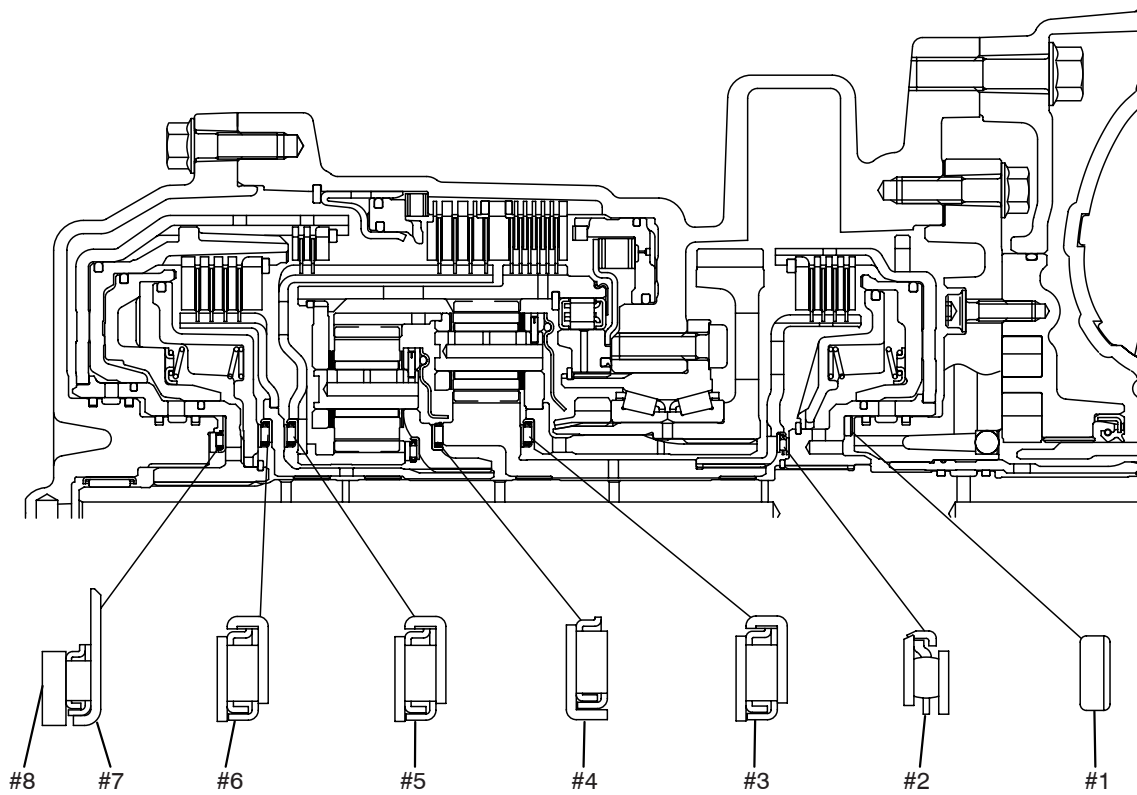


33. Install the return spring and second brake piston.

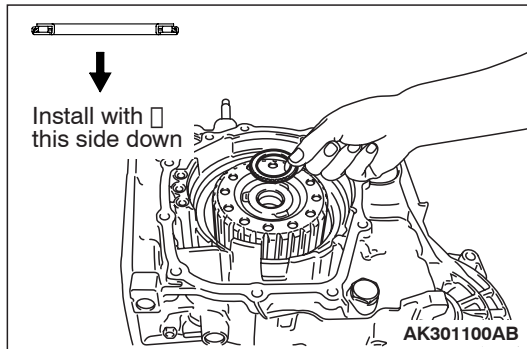


34. Install the snap ring.

IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS



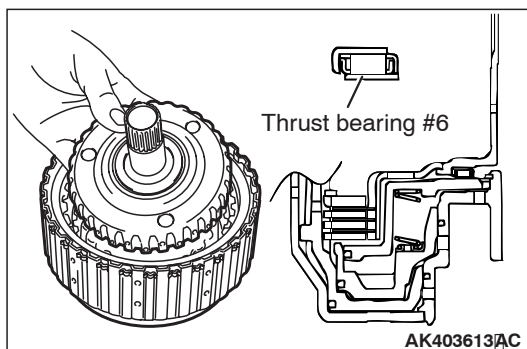
Symbol	O.D. mm	I.D. mm	Thickness mm	Symbol	O.D. mm	I.D. mm	Thickness mm
# 1	59	47	1.8	# 8	48.9	37	1.8
	59	47	2.0		48.9	37	1.9
	59	47	2.2		48.9	37	2.0
	59	47	2.4		48.9	37	2.1
	59	47	2.6		48.9	37	2.2
	59	47	2.8		48.9	37	2.3
# 2	49	34	3.6		48.9	37	2.4
# 3	57	38.5	4.1		48.9	37	2.5
# 4	55.4	38.5	3.3		48.9	37	2.6
# 5	57	38.5	4.1	# 9	80	60	2.5
# 6	57	38.5	4.1	# 10	80	60	2.5
# 7	59	37	2.8	# 11	55.4	38.5	3.3
# 8	48.9	37	1.6	# 12	54.6	43	3.0
	48.9	37	1.7				



**⚠ CAUTION**

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

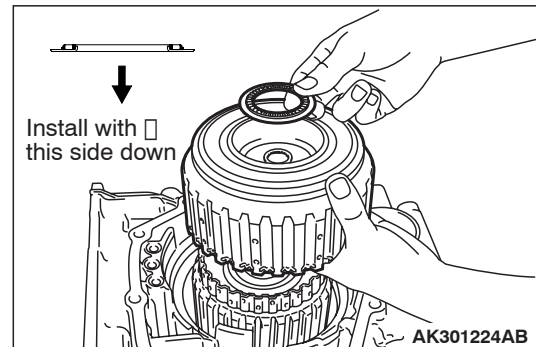
35. Check the installation direction of the thrust bearing #5, and install it on the hub of the planetary reverse sun gear.



**⚠ CAUTION**

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

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

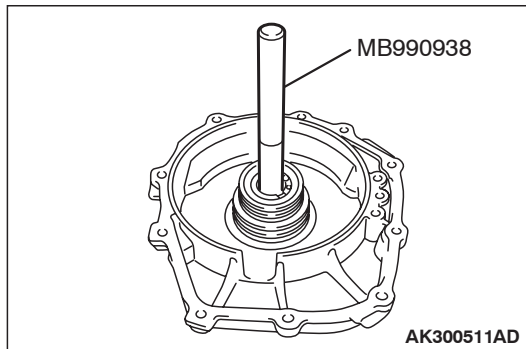


37. Install the reverse and overdrive clutch.

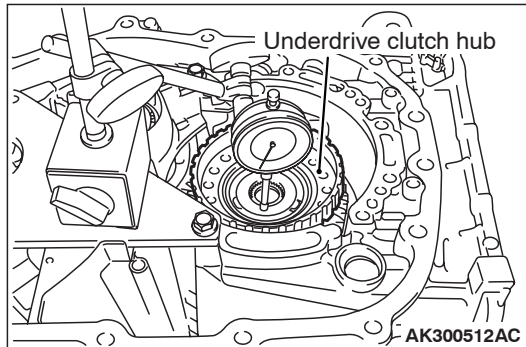
**⚠ CAUTION**

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

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



39. Use special tool Handle (MB990938) to tap the input shaft rear bearing in the rear cover.
40. Install the seal rings (four pieces) in the grooves of the rear cover.

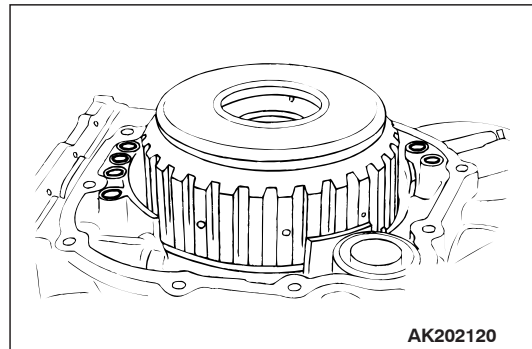


41. Measure the end play of the under drive sun gear by the following procedures:
- (1) Install the thinnest thrust race #8 (thickness 1.6 mm) on thrust bearing #7.
  - (2) Install the rear cover on the transmission case and tighten the bolts to the specified torque of  $23 \pm 3$  N·m.
  - (3) Turn over the transmission case so that the installation surface of the torque converter housing is facing up.
  - (4) Install the under drive clutch hub on the under drive sun gear.
  - (5) Measure end play of the underdrive sun gear and record the measurement value.

**Standard value (Reference):**

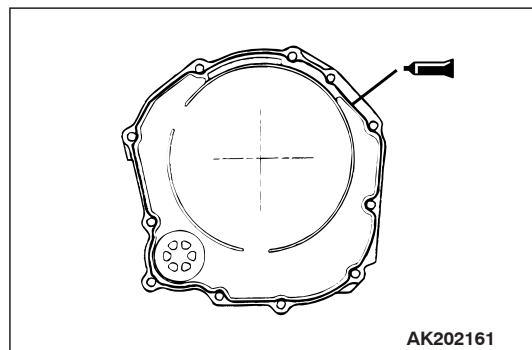
**0.25 – 0.45 mm**

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



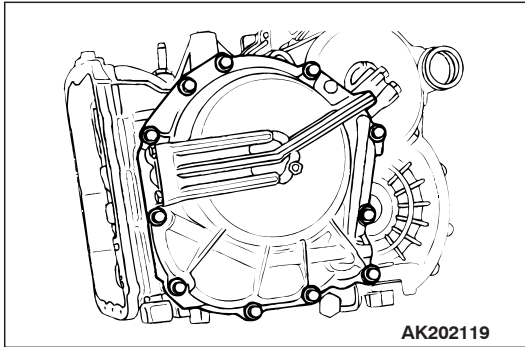
42. Install the O-rings (six pieces).
43. Select a thrust race #8 whose thickness corresponds to the measured values taken in step 40 from the table below. Install it on thrust bearing #7.

Measurement mm	Thickness mm
0.3 – 0.4	1.6
0.4 – 0.5	1.7
0.5 – 0.6	1.8
0.6 – 0.7	1.9
0.7 – 0.8	2.0
0.8 – 0.9	2.1
0.9 – 1.0	2.2
1.0 – 1.1	2.3
1.1 – 1.2	2.4
1.2 – 1.3	2.5
1.3 – 1.4	2.6



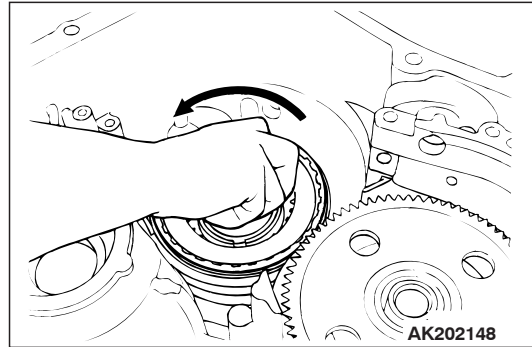
44. Apply a 2 mm diameter bead of from-in-place gasket (FIGP) to the illustrated position of the rear cover.

**Specified sealant: Mitsubishi genuine sealant Part No. MD974421 or equivalent**



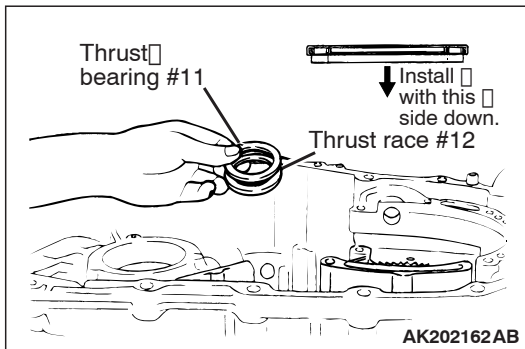
45. Install the rear cover, and tighten its mounting bolts to the specified torque of  $23 \pm 3$  N·m.

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



48. Make sure that the direct clutch can be rotated only in the direction indicated in the illustration.

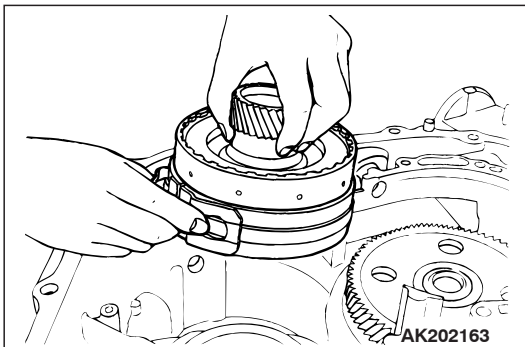
*NOTE: If the clutch can be rotated in the other direction, remove and reinstall it correctly.*



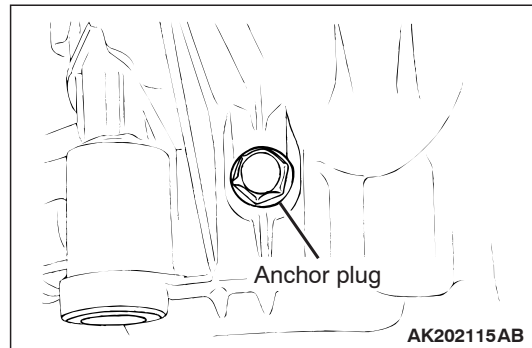
**⚠ CAUTION**

**Install the thrust bearing with the indicated side facing down.**

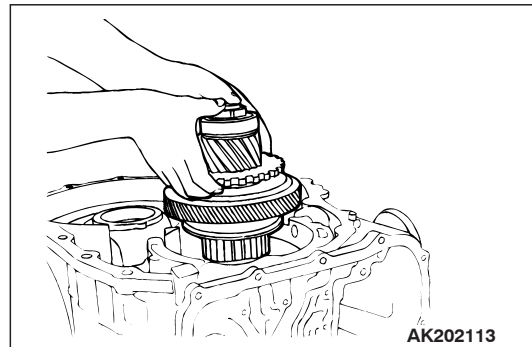
46. Install the thrust race #12 and thrust bearing #11.



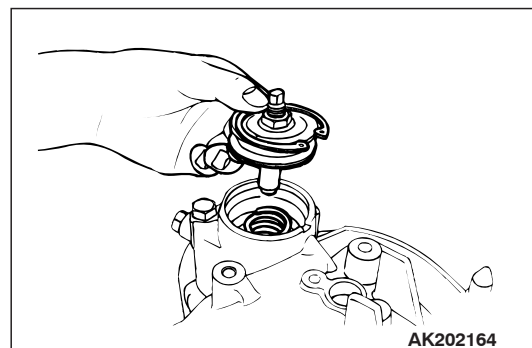
47. Finger-tighten the anchor plug and a new O-ring, then install the reduction brake band and direct clutch simultaneously.



49. Tighten the anchor plug to the specified torque of  $98 \pm 15$  N·m.

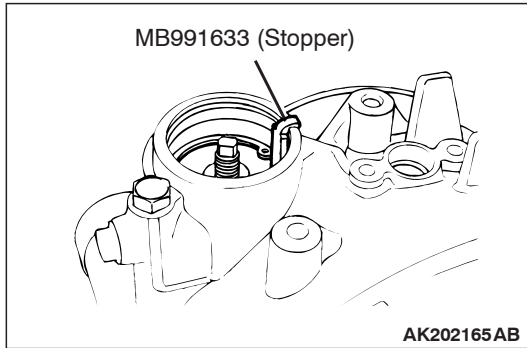


50. Install the direct planetary carrier assembly.



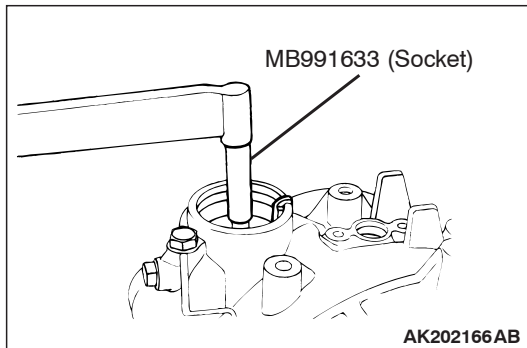


51. Install the reduction brake spring and piston in position in the transmission case, then install the snap ring.

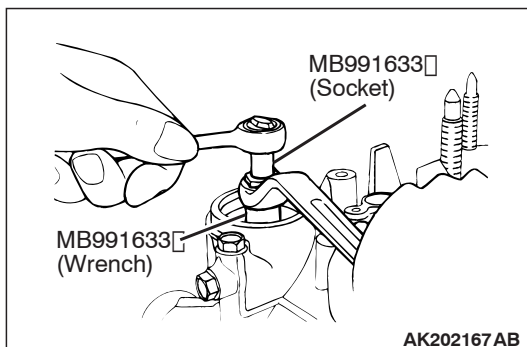


52. Adjust the reduction brake piston using the following procedure:

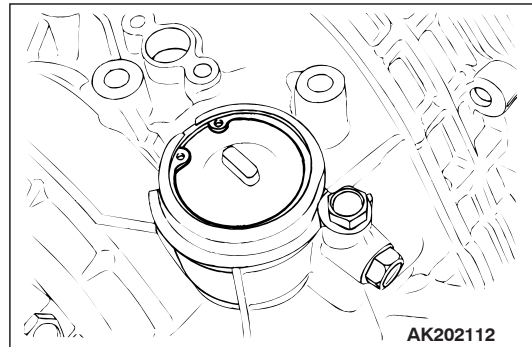
- (1) Remove the nut from the reduction brake piston.
- (2) Install the stopper of the special tool Reduction brake set (MB991633) to hold the reduction brake piston against rotation.



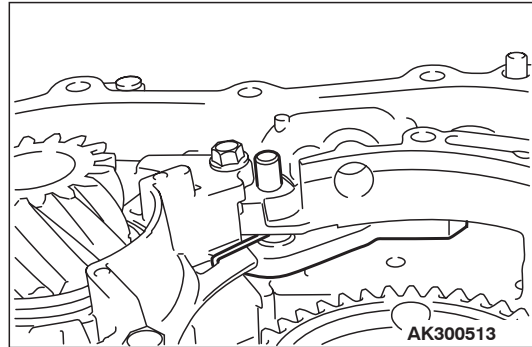
- (3) Using a torque wrench fitted with the socket of the special tool Reduction brake set (MB991633), tighten the adjusting rod to 10 N·m, then loosen it. Repeat this operation twice. Tighten the adjusting rod to 5 N·m, then turn it back 5-1/2 to 5-3/4 turns.



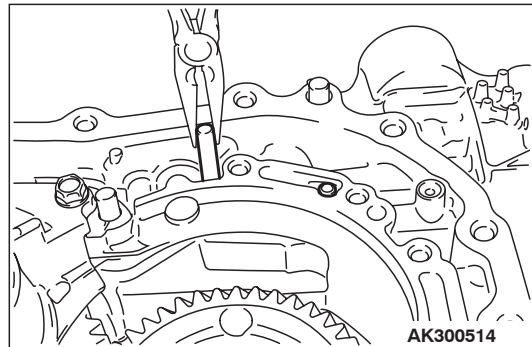
- (4) Install the nut on the adjusting rod and tighten the nut to  $19 \pm 3$  N·m using the wrench of the special tool.



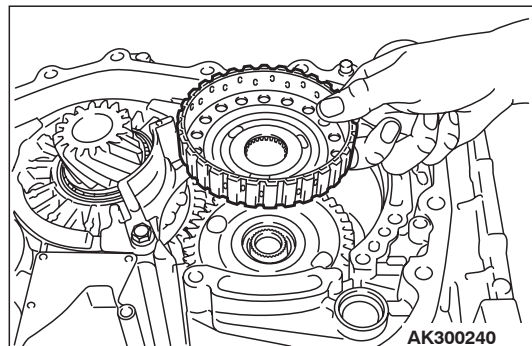
53. Install the reduction brake piston cover and snap ring.



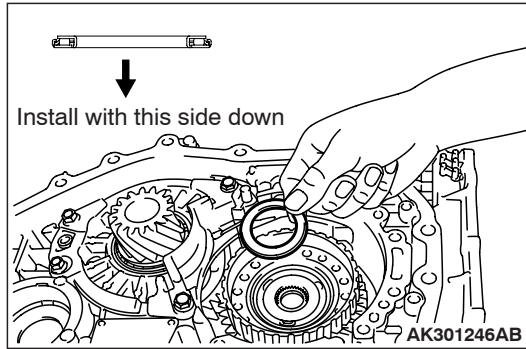
54. Install the parking pawl, spacer, and spring. Then insert the parking pawl shaft.



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



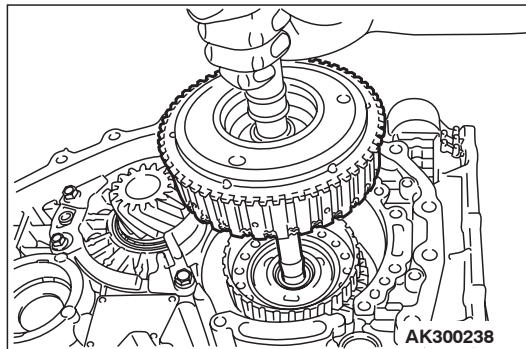
56. Install the underdrive clutch hub to the underdrive sun gear.



**⚠ CAUTION**

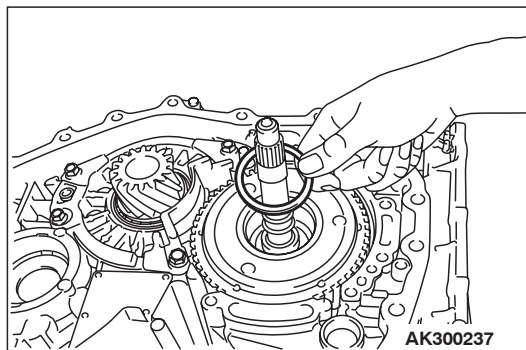
**Be sure to install the thrust bearing in the correct direction as shown.**

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

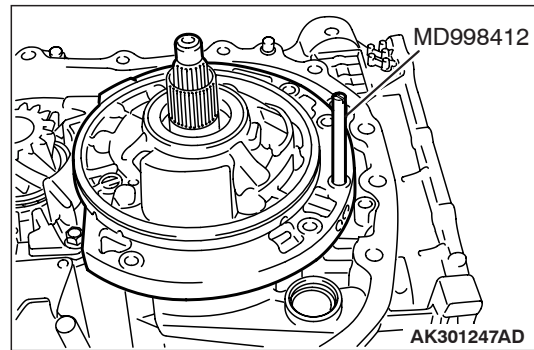


58. Hold the input shaft, and install the underdrive clutch.

59. Adjustment of input shaft end play and select the thrust washer #1. (Refer to adjustment of transmission - thrust washer selection for adjustment of input shaft end play [P.23B-41](#))



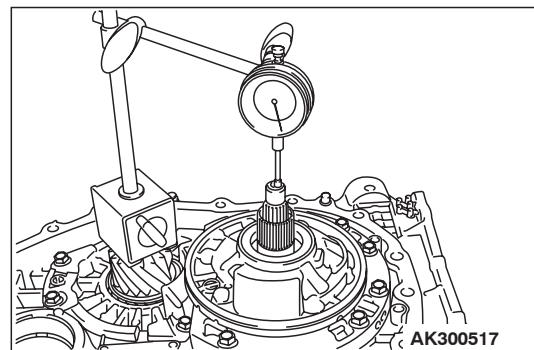
60. Install thrust washer #1 that was selected in step 59 on the underdrive clutch retainer.



**⚠ CAUTION**

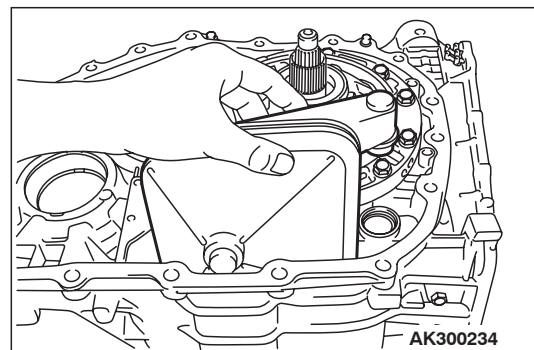
**Never use a gasket that has been tightened.**

61. Use the special tool Guide (MD998412) to install a new oil pump gasket and the oil pump.  
62. Tighten the oil pump mounting bolts to the specified torque of  $29 \pm 2$  N·m.



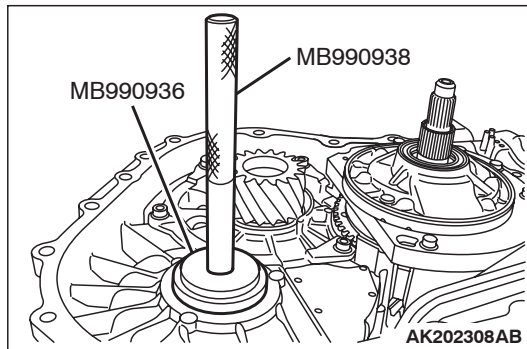
63. Measure the end play of the input shaft. Make sure that the end play of the input shaft is within the standard value range with the thrust washer #1 in place.

**Standard value: 0.70 – 1.45 mm**



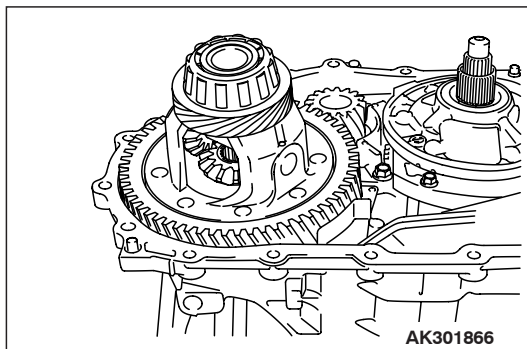
64. Install the oil filter.





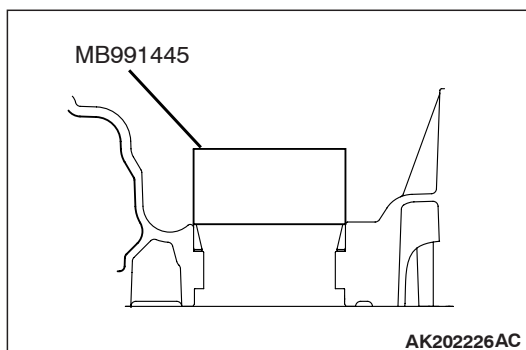
65. Use the special tools to drive the differential bearing outer race into the transmission case.

- Installer adapter (MB990936)
- Handle (MB990938)

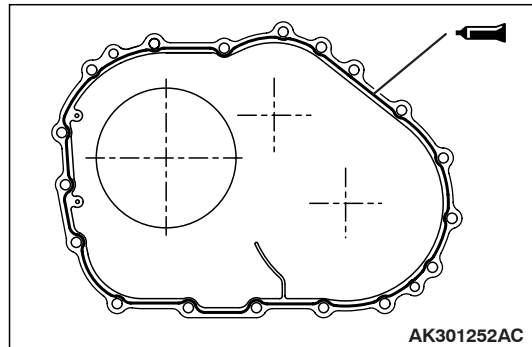


66. Install the differential.

67. Adjustment of differential case preload and select the spacer. (Refer to adjustment of transmission - spacer selection for adjustment of differential case preload [P.23B-41](#))

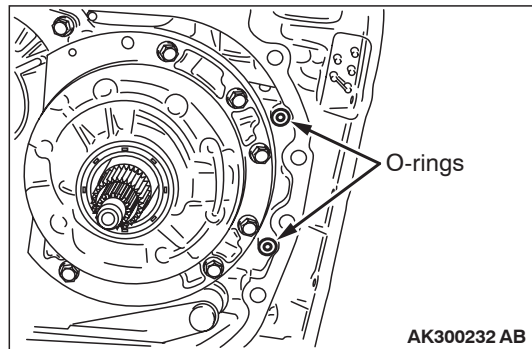


68. Use special tools Bushing remover and installer base (MB991445) to press the differential bearing outer race into the torque converter housing.

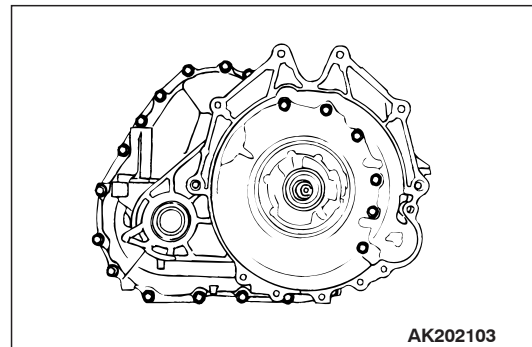


69. Apply an approx. 2 mm diameter bead of from-in-place gasket (FIGP) to the torque converter housing in the area shown.

**Specified sealant: Mitsubishi genuine sealant Part No. MD974421 or equivalent**



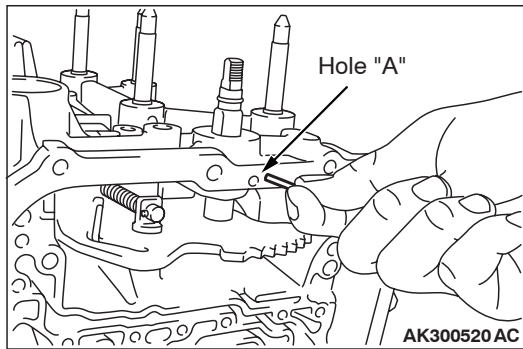
70. Install the O-rings (two pieces).



71. Install the converter housing and tighten the mounting bolts to the specified torque of  $48 \pm 6$  N·m.

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

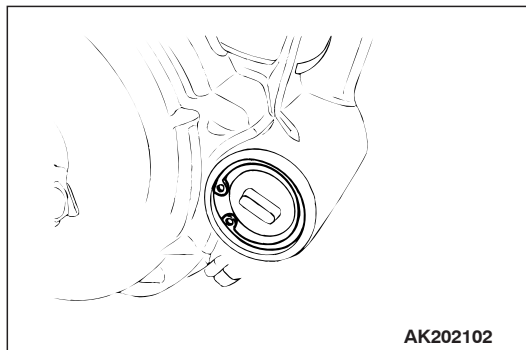
73. Install the manual control lever shaft and parking pawl rod.



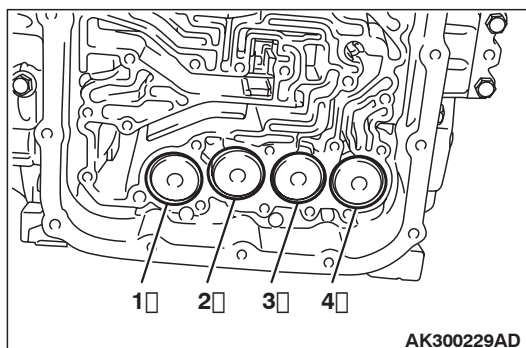
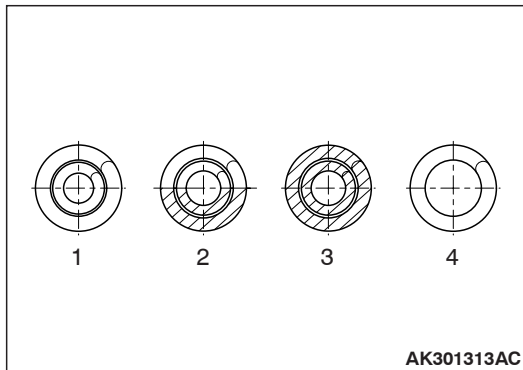
74.Align hole "A" with the groove in the manual control lever shaft. Insert the manual control lever shaft roller into hole "A."

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

*NOTE: The piston and seal ring are common parts.*



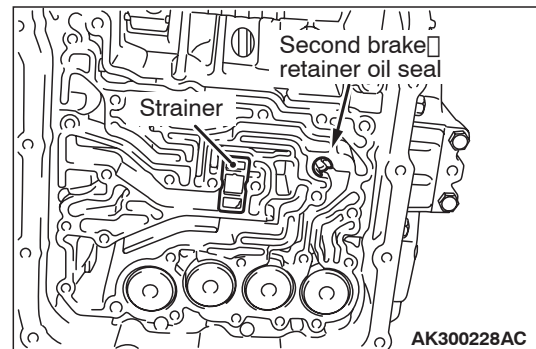
76.Install the piston and spring of the reduction brake accumulator, then install the accumulator cover.



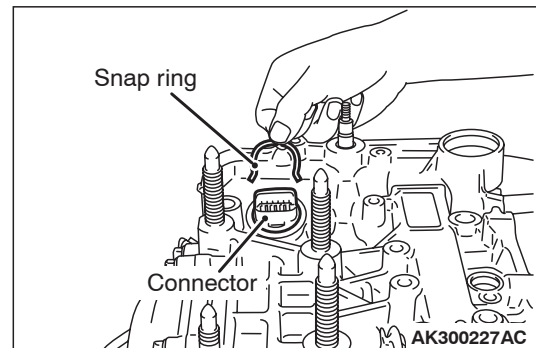
77.Identify the accumulator spring and insert it and the accumulator piston into each hole of the transmission case.

*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

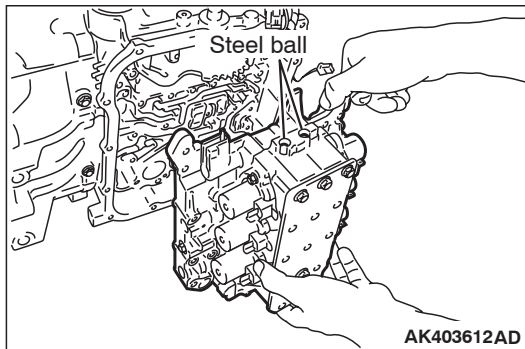


78.Install the strainer and second brake retainer oil seal.

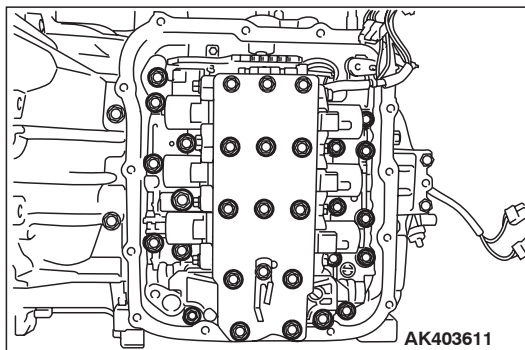


79.Insert a new O-ring to the groove of the solenoid valve harness connector.

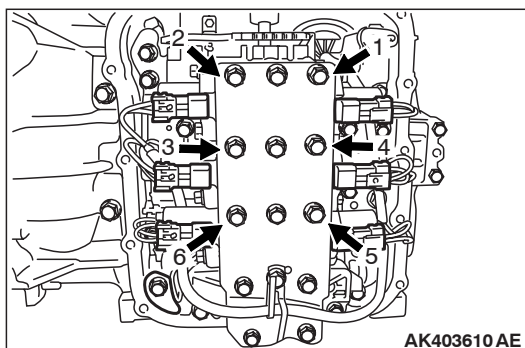
80.Insert the solenoid valve harness connector into the hole from the inside of the transmission case so it is oriented as shown in the illustration. Then secure the snap ring to the connector groove.



81. Install the steel balls into each of the two holes in the top face of the valve body (outside valve body).
82. Install the valve body and gasket to the transmission case.  
Make sure that the manual valve's pin is in the groove in the detent plate of the manual control lever.

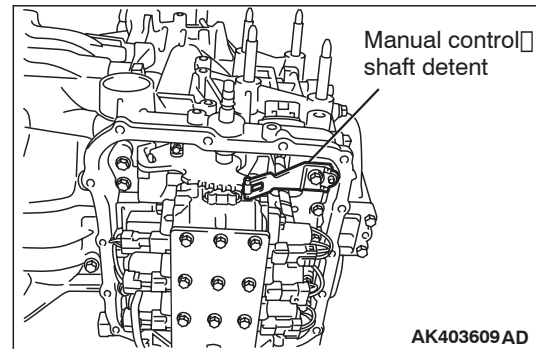


83. Install the valve body mounting bolts (twenty seven pieces), and tighten to the specified torque of  $11 \pm 1$  N·m.

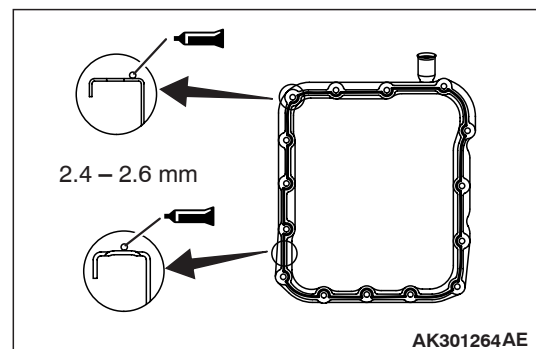


84. Attach the solenoid valve harness to the valve body by connecting all the connectors.
85. Install the fluid temperature sensor to the specified torque of  $11 \pm 1$  N·m.

No.	Solenoid valve	Cable colour	Connector housing colour
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	Damper clutch control solenoid valve	Blue, yellow, yellow	Black
6	Reduction solenoid valve	Green, yellow, yellow	Black

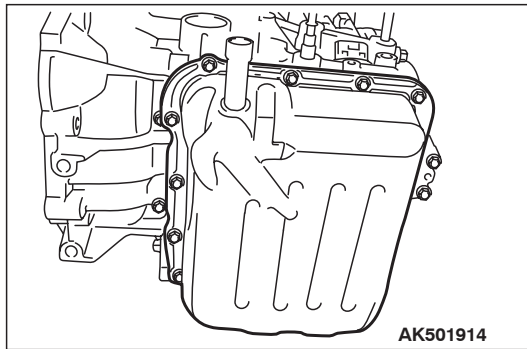


86. Install the manual control shaft detent and tighten the bolt to the specified torque of  $6.0 \pm 1.0$  N·m.

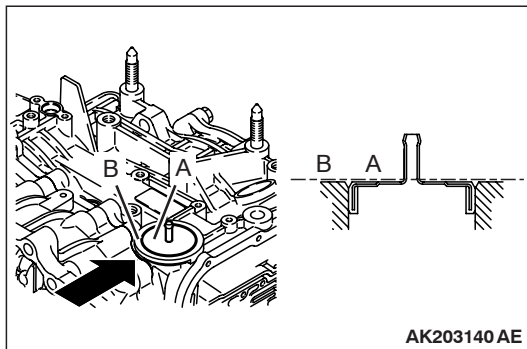


87. Apply an approx. 2 mm diameter bead of from-in-place gasket (FIGP) to the valve body cover in the area shown.

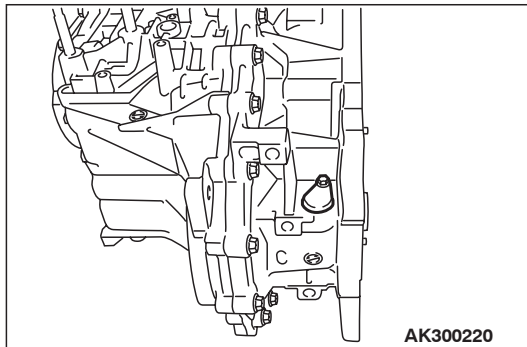
**Specified sealant: Mitsubishi genuine sealant Part No. MD974421 or equivalent**



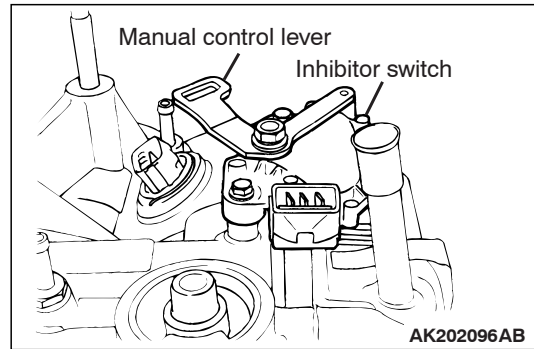
88. Install the valve body cover, and then tighten its mounting bolts to the specified torque of  $11 \pm 1$  N·m.



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

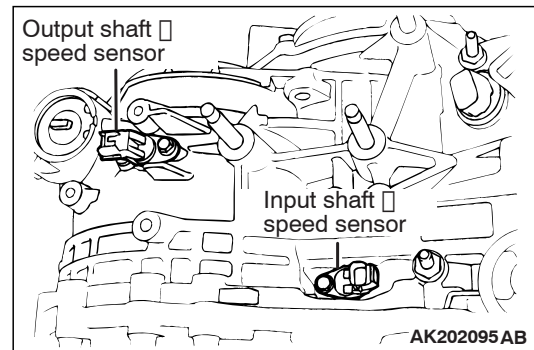


90. Install the sealing cap and tighten the bolt to the specified torque of  $5.0 \pm 1.0$  N·m. <Type with sealing cap>



91. Install the inhibitor switch and tighten the bolt to the specified torque of  $11 \pm 1$  N·m.

92. Install the manual control lever and tighten the nut to the specified torque of  $22 \pm 3$  N·m.



93. Install the input shaft speed sensor and output shaft speed sensor and tighten the bolt to the specified torque of  $11 \pm 1$  N·m.

94. Apply ATF on the both sides of the new gasket and threads of the eyebolts, and then tighten to the specified torque of  $24 \pm 3$  N·m.

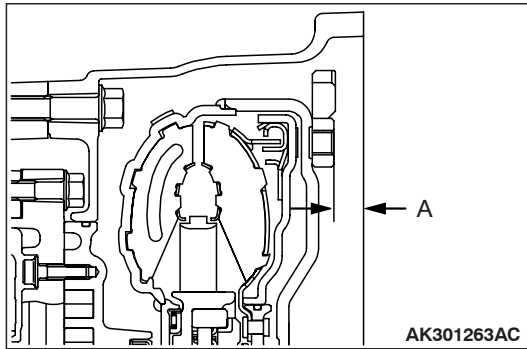
95. Tighten the oil cooler feed pipe clamp bolt to the specified torque of  $11 \pm 1$  N·m.

96. Install the oil dipstick.

97. Install the control cable support brackets to the specified torque of  $23 \pm 3$  N·m.

98. Install the harness bracket to the specified torque of  $11 \pm 1$  N·m.

99. Install the roll stopper brackets to the specified torque of  $70 \pm 10$  N·m.



**⚠ 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.

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

Reference value: Approximately 9.4 mm

**ADJUSTMENT OF TRANSMISSION**

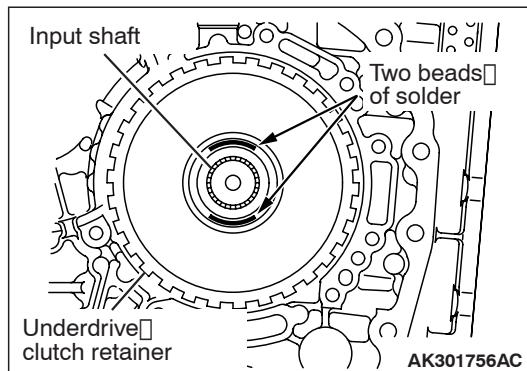
M1233030400098

**THRUST WASHER SELECTION FOR  
ADJUSTMENT OF INPUT SHAFT END  
PLAY**

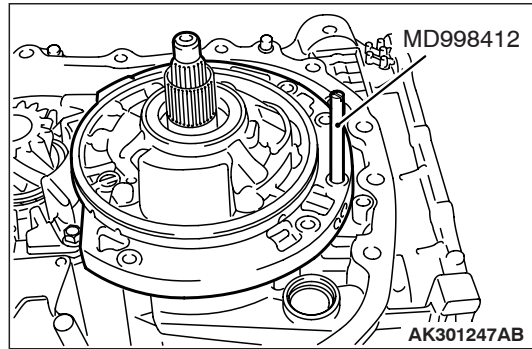
<Measurement using Solder>

**⚠ CAUTION**

- If the solder is not available, select the thrust washer in accordance with Plastigage method.
- If the thrust washer appropriate for the standard value cannot be selected using the solder, select the thrust washer in accordance with Plastigage method.



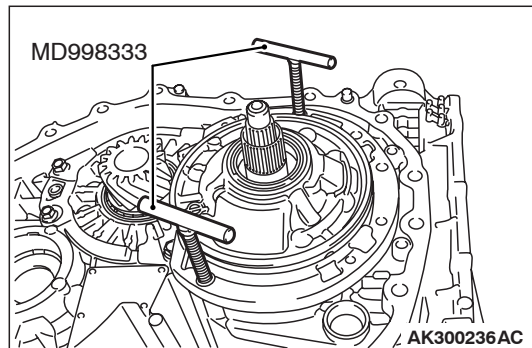
1. Put the solders (1.0 mm diameter, about 10 mm long) in the illustrated positions of the underdrive clutch retainer.
2. Install the adjusting thrust washer having minimum thickness.



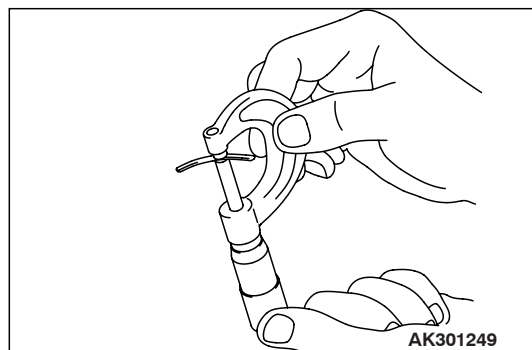
**⚠ CAUTION**

Never use a gasket that has been tightened.

3. Use the special tool Guide (MD998412) to install a new oil pump gasket and the oil pump. Tighten the oil pump mounting bolts to the specified torque of  $29 \pm 2$  N·m.
4. Remove the oil pump mounting bolts.



5. Using special tools Oil pump remover (MD998333) remove the oil pump and then take out the crushed solders.
6. If the solders have not crushed, use thicker thrust washer and repeat steps 3 to 5.



7. Use a micrometer to measure the thickness of the crushed solder beads and record the measured value.
8. Select the thrust washer, calculated by the following formula, in the table.

$$T = T1 + T2$$

**T: Clearance mm**

**T1: The crushed solder thickness mm**

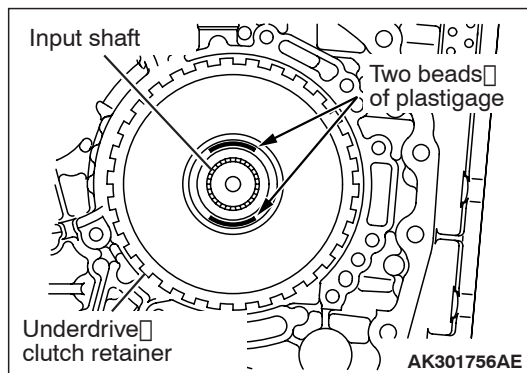


**T2: The thrust washer thickness used for measurement mm**

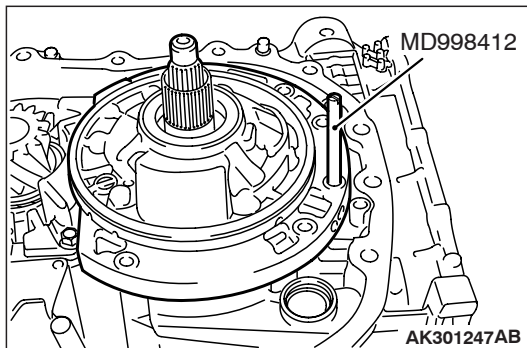
**Available thrust washer**

Clearance mm (T)	Thickness mm	Identification mark
2.25 – 2.45	1.8	18
2.45 – 2.65	2.0	20
2.65 – 2.85	2.2	22
2.85 – 3.05	2.4	24
3.05 – 3.25	2.6	26
3.25 – 3.45	2.8	28

**<Measurement using Plastigage>**



1. Put the plastigage (about 10 mm long) in the illustrated positions of the underdrive clutch retainer.
2. Install the adjusting thrust washer having the minimum thickness.

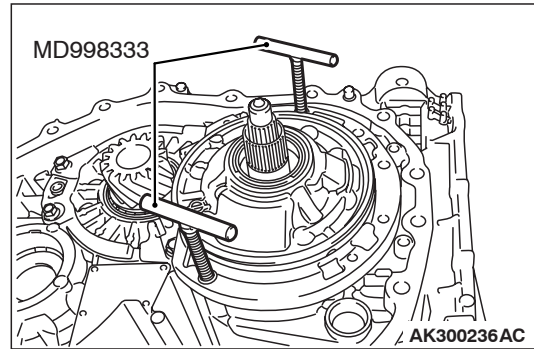


**⚠ CAUTION**

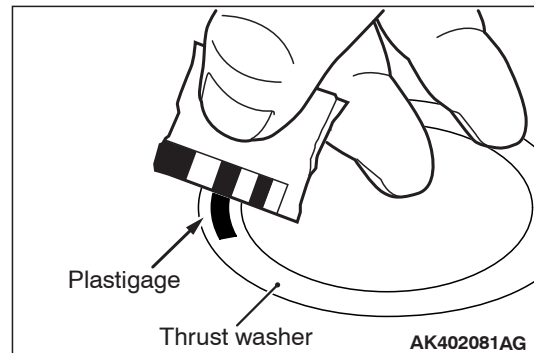
**Never use a gasket that has been tightened.**

3. Use the special tool Guide (MD998412) to install a new oil pump gasket and the oil pump. Tighten the oil pump mounting bolts to the specified torque of  $29 \pm 2$  N·m.

4. Remove the oil pump mounting bolts.



5. Using special tools Oil pump remover (MD998333) to remove the oil pump and then take out the crushed plastigages.
6. If the plastigages have not crushed, use thicker adjusting thrust washer and repeat steps 3 to 5.



7. Measure the width of the crushed plastigage at its widest part using a scale printed on the plastigage package.
8. Select the thrust washer, calculated by the following formula, in the table.

$$T = T3 + T2$$

**T: Clearance mm**

**T3: The crushed plastigage thickness mm**

**T2: The thrust washer thickness used for measurement mm**

**Available thrust washer**

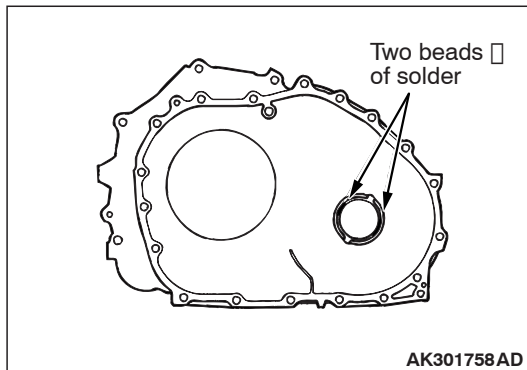
Clearance mm (T)	Thickness mm	Identification mark
2.25 – 2.45	1.8	18
2.45 – 2.65	2.0	20
2.65 – 2.85	2.2	22
2.85 – 3.05	2.4	24
3.05 – 3.25	2.6	26
3.25 – 3.45	2.8	28

## SPACER SELECTION FOR ADJUSTMENT OF DIFFERENTIAL CASE PRELOAD

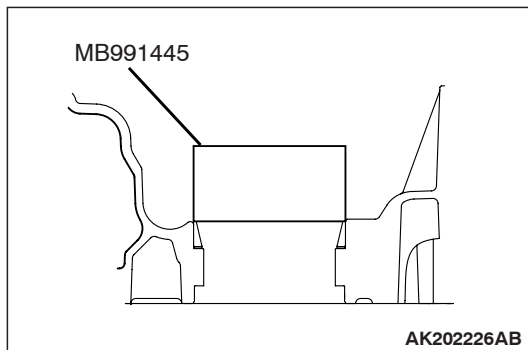
### <Measurement using Solder>

#### **⚠ CAUTION**

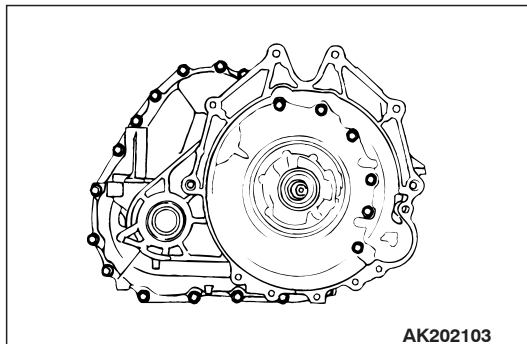
- If the solder is not available, select the spacer in accordance with Plastigage method.
- If the spacer appropriate for the standard value cannot be selected using the solder, select the spacer in accordance with Plastigage method.



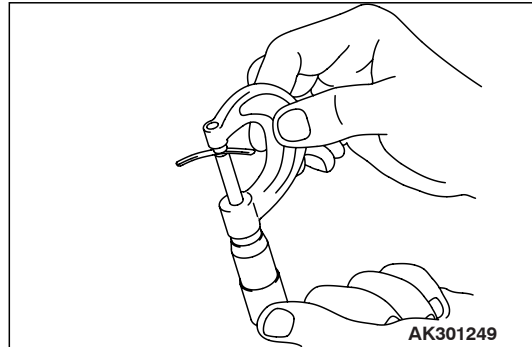
1. Put the solders (1.0 mm diameter, about 10 mm long) in the illustrated positions of the converter housing.



2. Use the special tools Bush remover and installer (MB991445) to press the differential bearing outer race into the torque converter housing.



3. Install the converter housing on the transmission case without applying FIPG. Tighten the mounting bolts to the specified torque of  $48 \pm 6$  N·m.
4. Remove the bolts and converter housing, and take out the solder pieces.
5. If the solders have not crushed, use thicker the solders (1.6 mm diameter, about 10 mm long) and repeat steps 2 to 4.



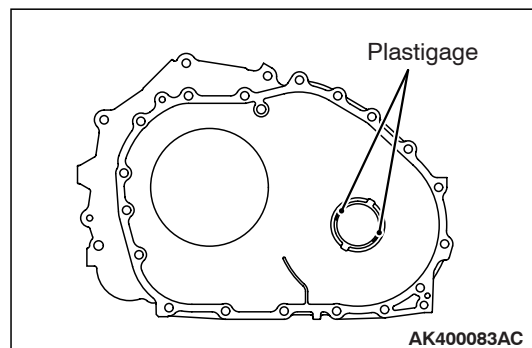
6. Measure the thickness of the crushed solder with a micrometer, and then select a spacer that will provide the standard value.

**Spacer thickness: (T1 – 0.045 mm) to (T1 – 0.105 mm)**

**T1: The crushed solder thickness mm**

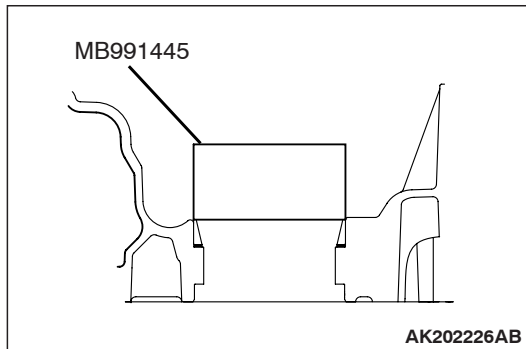
**Standard value: 0.045 – 0.105 mm**

### <Measurement using Plastigage>

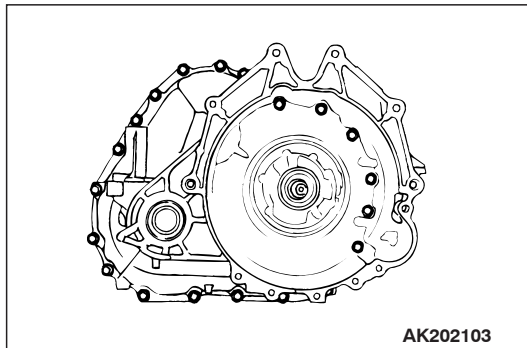


1. Put the plastigage (about 10 mm long) in the illustrated positions of the converter housing.
2. Install the adjusting spacer having the minimum thickness.

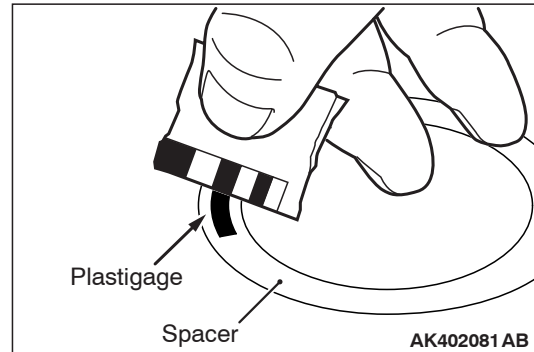




3. Use the special tools Bush remover and installer (MB991445) to press the differential bearing outer race into the torque converter housing.



4. Install the converter housing on the transmission case without applying FIPG. Tighten the mounting bolts to the specified torque of  $48 \pm 6$  N·m.
5. Remove the bolts and converter housing, and take out the crushed plastigage.
6. If the plastigages have not crushed, replace the spacer with a thicker one and repeat steps 3 to 5.



7. Measure the width of the crushed plastigage at its widest part using a scale printed on the plastigage package, and then select a spacer that will provide the standard value.

**Spacer thickness: (T3 – 0.045 mm) to (T3 – 0.105 mm)**

**T3: The crushed plastigage thickness mm**

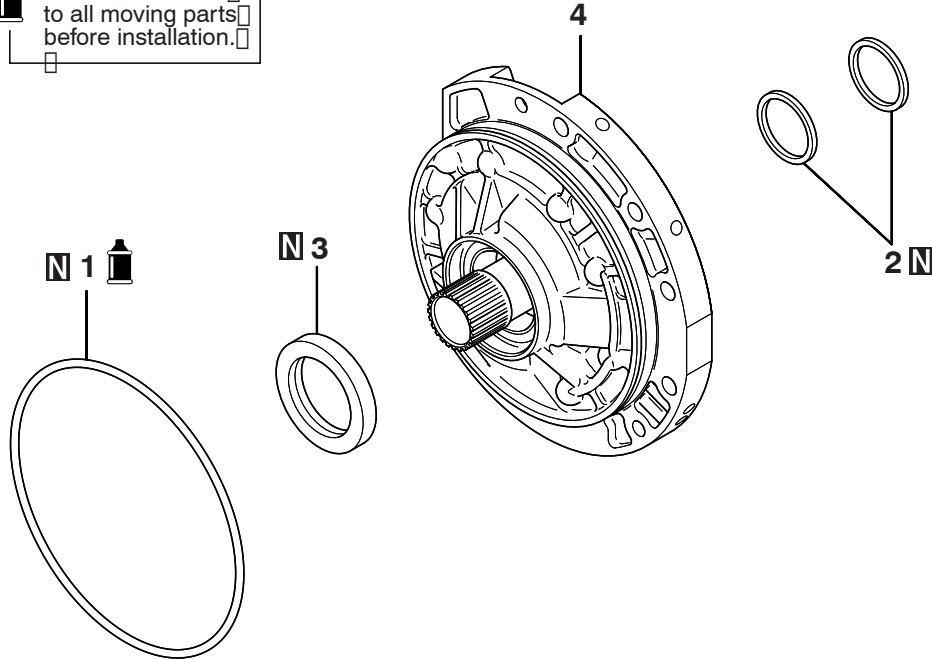
**Standard value: 0.045 – 0.105 mm**

## OIL PUMP

### DISASSEMBLY AND REASSEMBLY

M1233001300325

Apply automatic transmission fluid to all moving parts before installation.



AK301599 AC

#### Disassembly steps

- >>B<< 1. O-ring  
2. Seal ring  
>>A<< 3. Oil seal  
4. Oil pump assembly

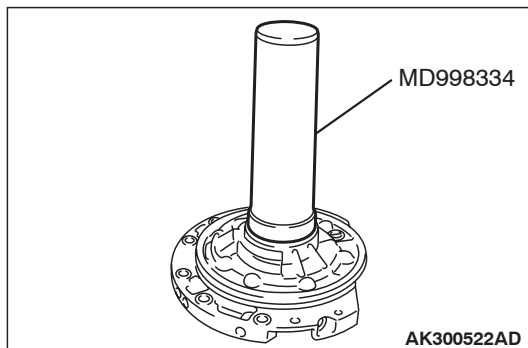
1. Apply a small amount of ATF to the oil seal lip.
2. Use special tool Oil installer (MD998334) to tap the oil seal in the oil pump body.

#### >>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.

### REASSEMBLY SERVICE POINTS

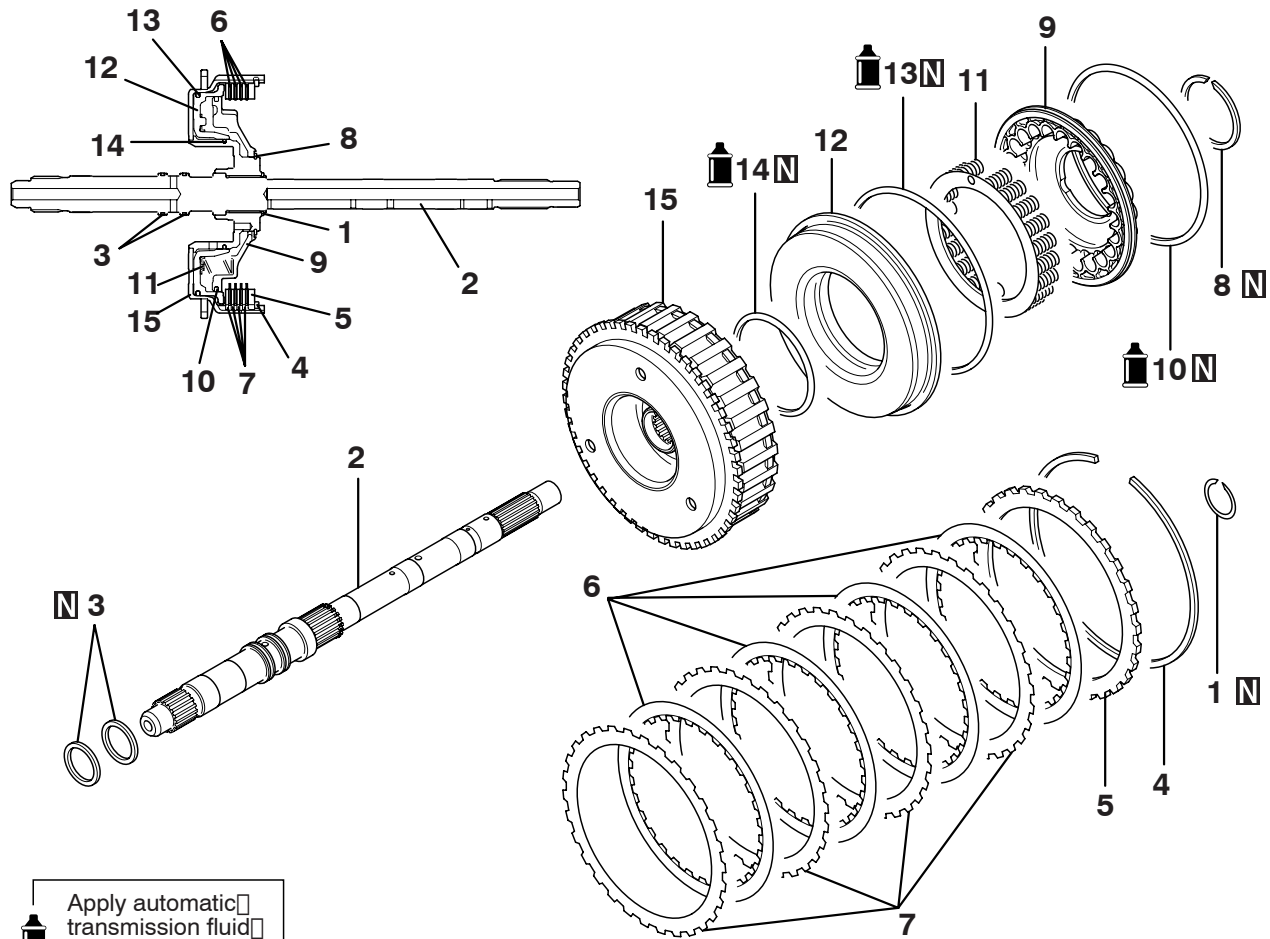
#### >>A<< OIL SEAL INSTALLATION



# UNDERDRIVE CLUTCH AND INPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

M1233020900199

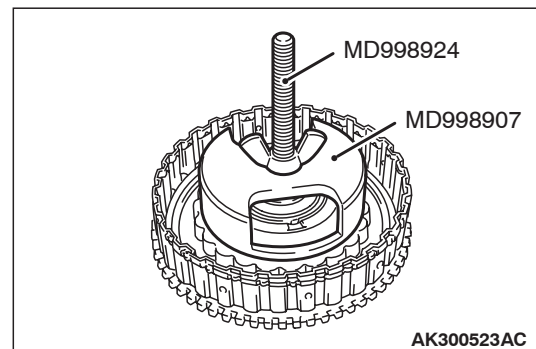


Apply automatic transmission fluid to all moving parts before installation.

AK301600AC

## DISASSEMBLY SERVICE POINT

### <<A>> SNAP RING REMOVAL



AK300523AC

- 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
  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

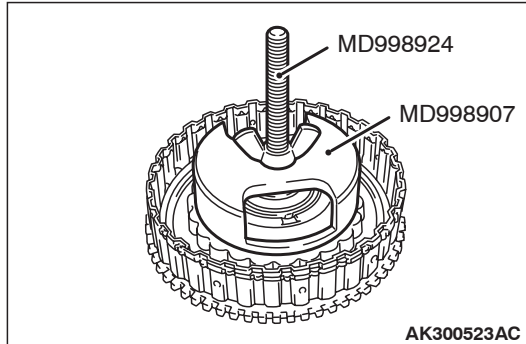
1. Use the special tools to install the snap ring.
  - Spring compressor (MD998907)
  - Spring compressor retainer (MD998924)
2. Compress the return spring and remove the snap ring.

## REASSEMBLY SERVICE POINTS

### >>A<< D-RING INSTALLATION

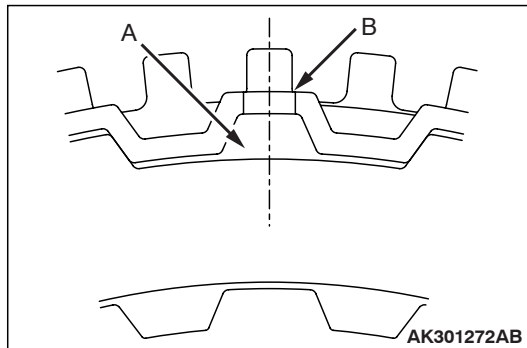
1. Install a D-ring in the groove in the underdrive clutch retainer and piston, and in the groove in the outside of the spring retainer. Be careful not to twist or damage the D-rings.
2. Apply ATF or petroleum jelly (Vaseline) to the D-rings.

### >>B<< SNAP RING INSTALLATION



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

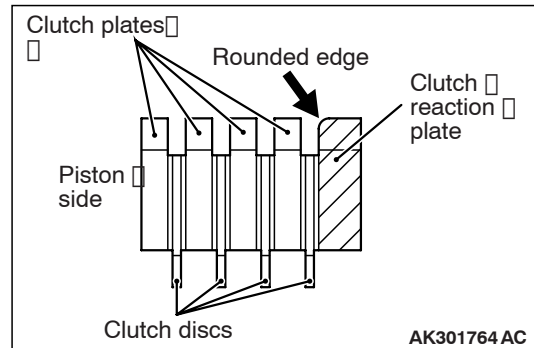
### >>C<< CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION



### **⚠ CAUTION**

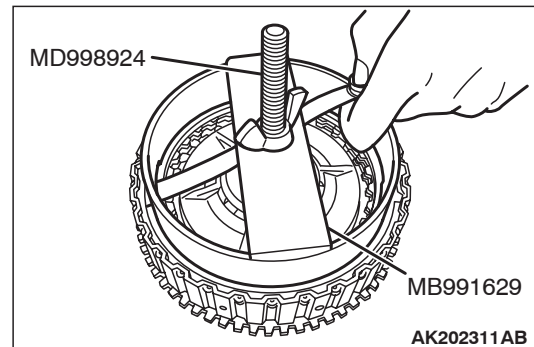
**Immerse the clutch disc in ATF before assembling it. If the clutch disc is new, soak it in ATF for at least two hours.**

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 as shown in the illustration, and then compress the clutch element.
  - Spring compressor (MB991629)
  - Spring compressor retainer (MD998924)
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 to achieve the standard value clearance.

**Standard value: 1.60 – 1.80 mm**

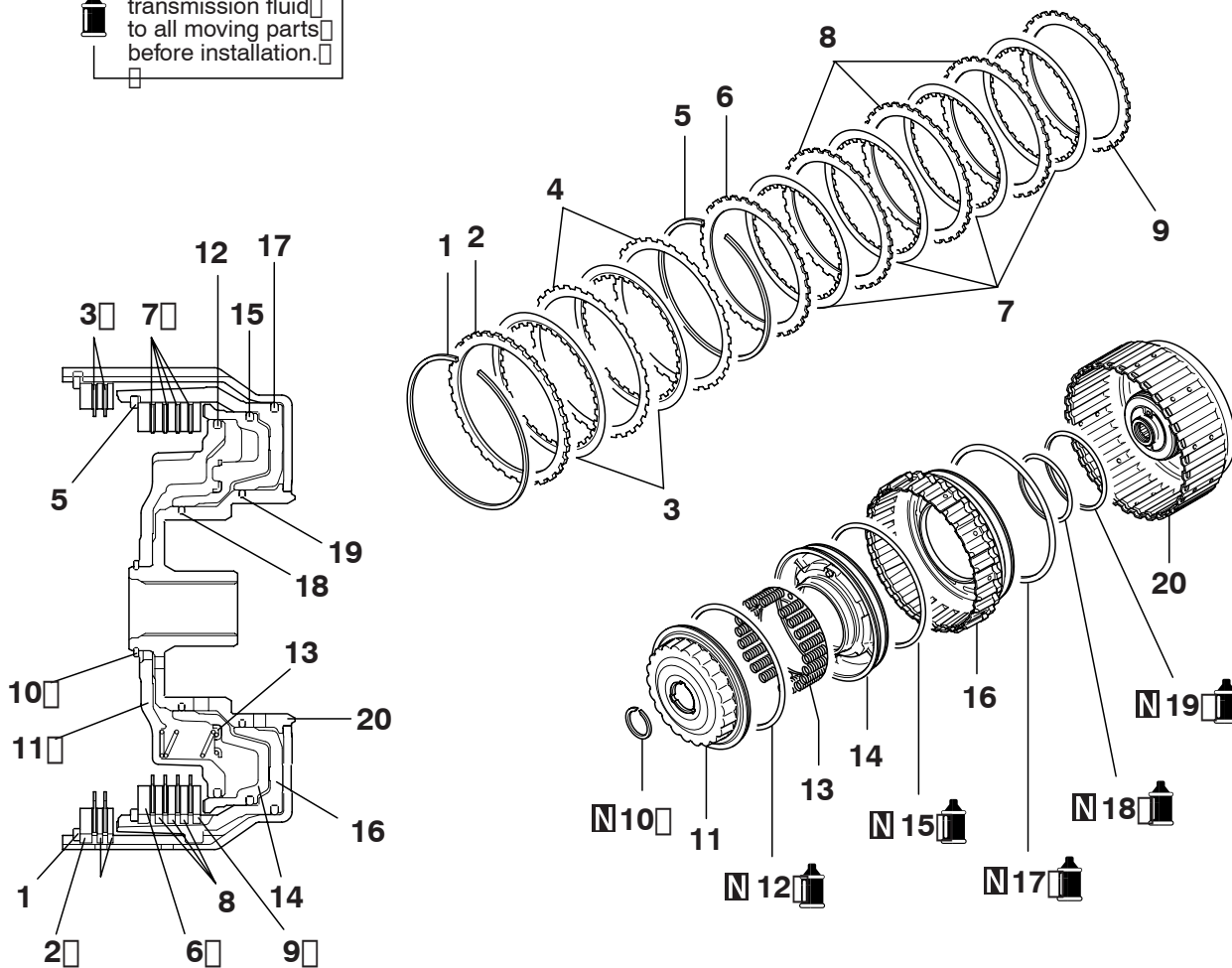
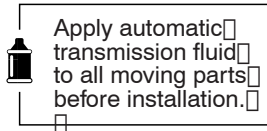
# REVERSE AND OVERDRIVE CLUTCH

## DISASSEMBLY AND REASSEMBLY

M1233021200256

### Number of clutch discs and plates

	Pressure plate	Clutch disc	Clutch plate	Clutch reaction plate
Over drive clutch	1	4	3	1
Reverse clutch	—	2	2	1



AKX01127AE

### Disassembly steps

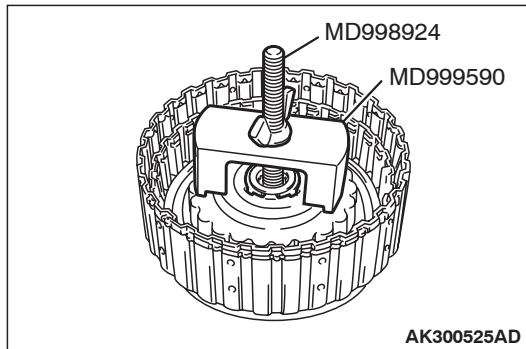
- >>G<< 1. Snap ring
- >>F<< 2. Clutch reaction plate
- >>F<< 3. Clutch disc
- >>F<< 4. Clutch plate
- >>E<< 5. Snap ring
- >>D<< 6. Clutch reaction plate
- >>D<< 7. Clutch disc
- >>D<< 8. Clutch plate
- >>D<< 9. Pressure plate
- <<A>> >>C<< 10. Snap ring

### Disassembly steps ( つづき )

- 11. Spring retainer
- >>A<< 12. D-ring
- 13. Return spring
- 14. Overdrive clutch piston
- >>A<< 15. D-ring
- >>B<< 16. Reverse clutch piston
- >>A<< 17. D-ring
- >>A<< 18. D-ring
- >>A<< 19. D-ring
- 20. Reverse clutch retainer

## DISASSEMBLY SERVICE POINT

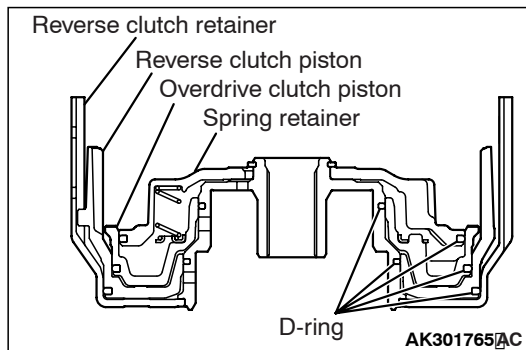
### <<A>> SNAP RING REMOVAL



1. Set special tools as shown in the illustration.
  - Spring compressor (MD999590)
  - Spring compressor retainer (MD998924)
2. Compress the return spring and remove the snap ring.

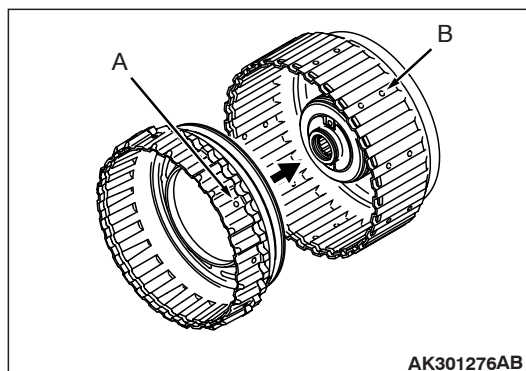
## REASSEMBLY SERVICE POINTS

### >>A<< D-RING INSTALLATION



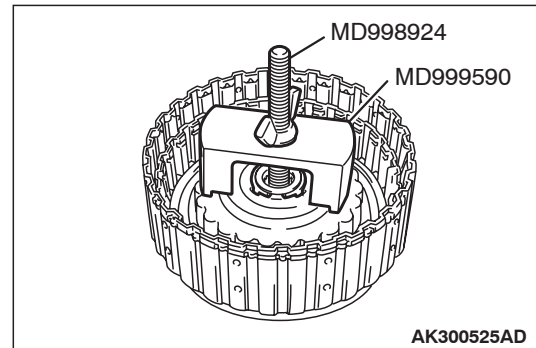
1. Install D-rings in the grooves on the reverse clutch retainer, piston, overdrive clutch piston and spring retainer. Be careful not to twist or damage the D-rings.
2. Apply ATF or petroleum jelly (Vaseline) to D-rings.

### >>B<< REVERSE CLUTCH PISTON INSTALLATION

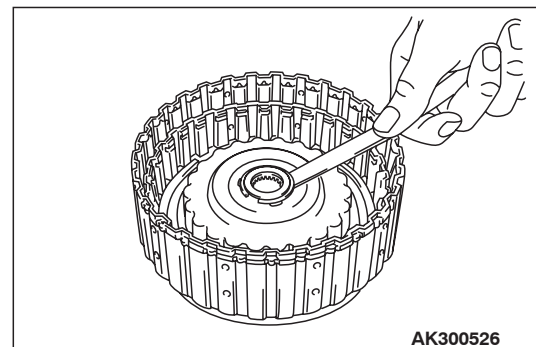


Align the outer circumference holes ("A" and "B") of the reverse clutch piston and the reverse clutch retainer to assemble them.

### >>C<< SNAP RING INSTALLATION



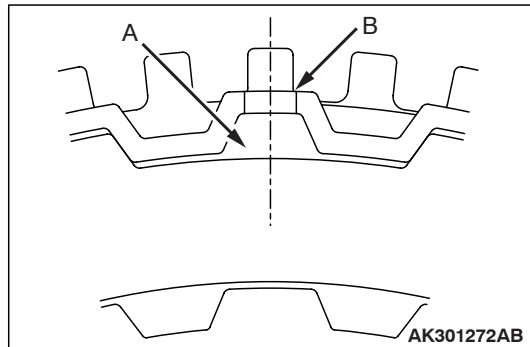
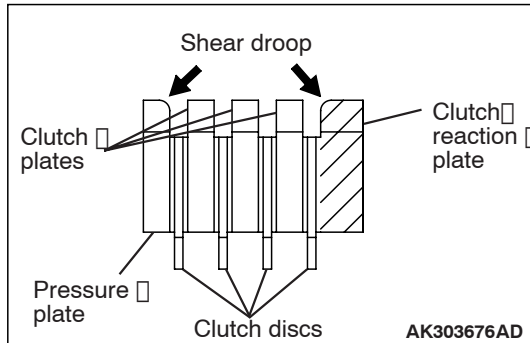
1. Set special tools as shown in the illustration.
  - Spring compressor (MD999590)
  - Spring compressor retainer (MD998924)
2. Tighten the nut on the special tool to press down on the spring retainer and reverse clutch retainer, and then install the snap ring.



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 to achieve the standard value clearance.

**Standard value: 0 – 0.09 mm**

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



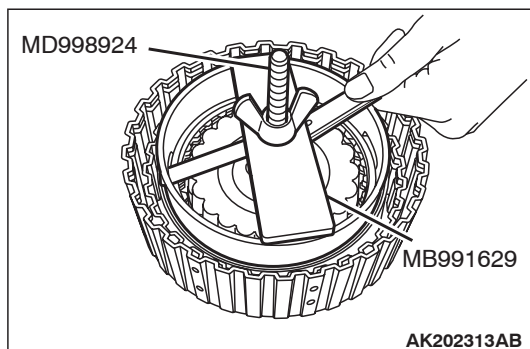
1. Install the pressure plate in the direction shown

**⚠ 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.**

2. Assemble the clutch discs and clutch plates, 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").
3. Install the clutch reaction plate in the direction shown.

**>>E<< SNAP RING INSTALLATION**

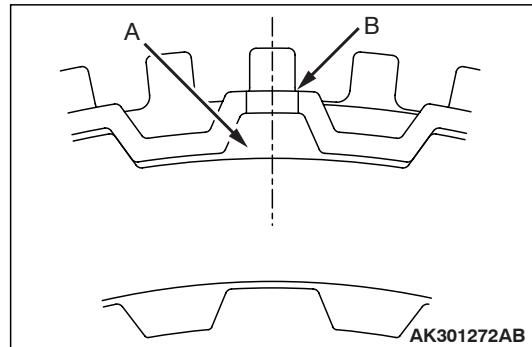


1. Install the snap ring into the groove in the reverse clutch piston.

2. Set special tools as shown in the illustration, and compress the clutch element.
  - Spring compressor (MB991629)
  - Spring compressor retainer (MD998924)
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 to achieve the standard value clearance.

**Standard value: 1.6 – 1.8 mm**

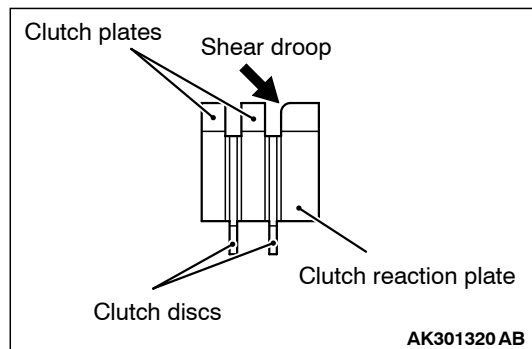
**>>F<< CLUTCH PLATE/CLUTCH DISC/CLUTCH  
REACTION PLATE INSTALLATION**



**⚠ 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.**

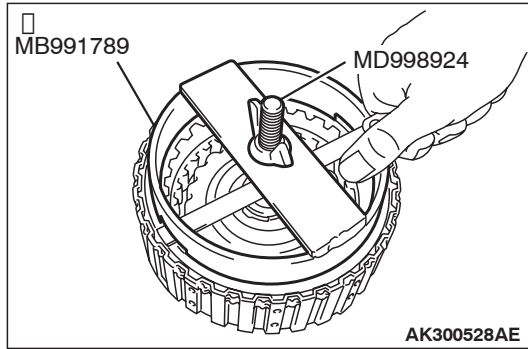
1. Assemble two clutch discs and two clutch plates, one on top of the other, inside the reverse clutch retainer. Assemble both clutch plates so that the places with no teeth (marked "A") are aligned with the holes in the retainer (marked "B").



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**



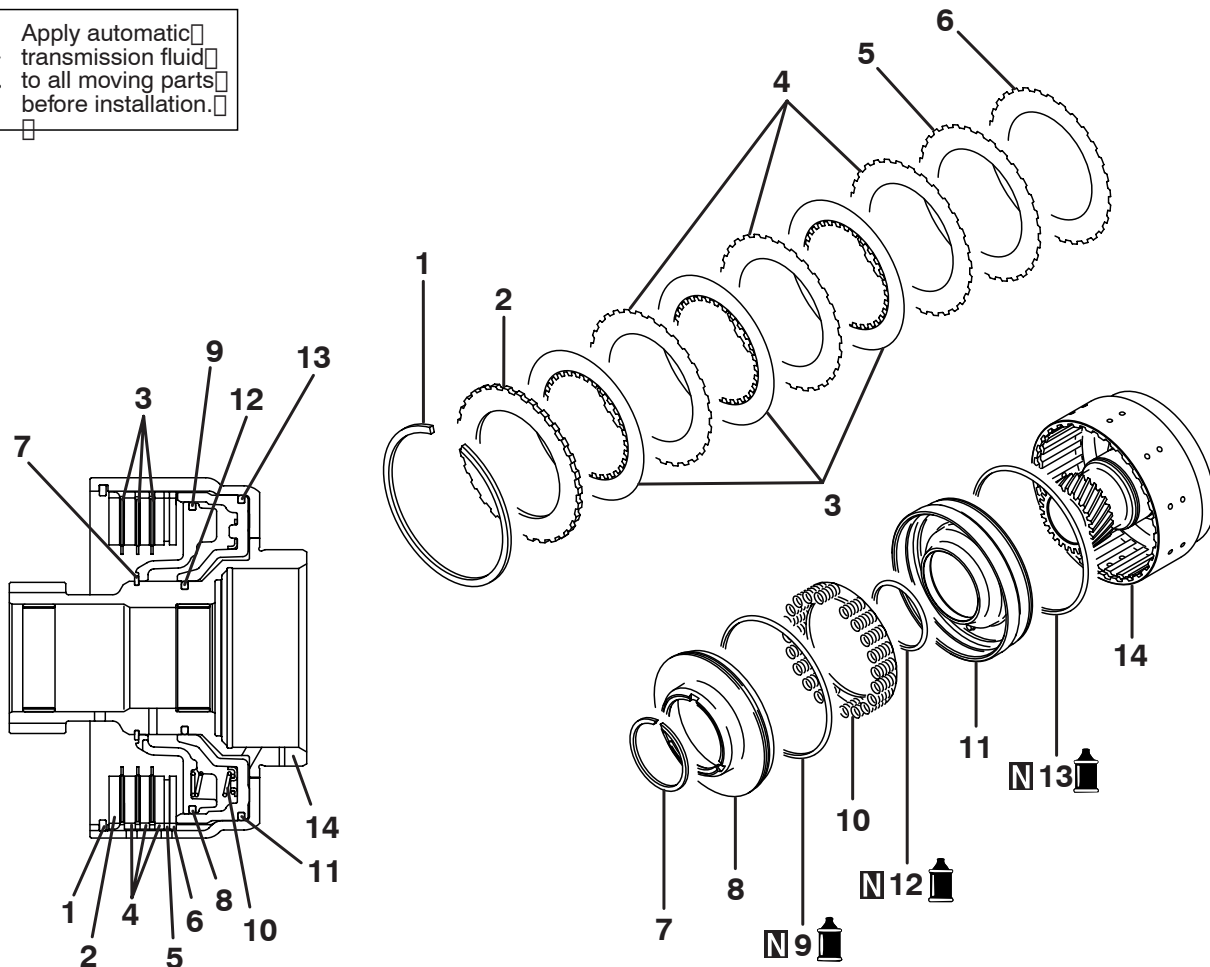
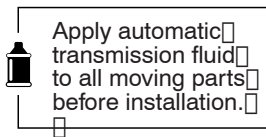
1. Install the snap ring into the groove of reverse clutch retainer.
2. Set special tools as shown in the illustration, and compress the clutch element.
  - Spring compressor (MB991789)
  - Spring compressor retainer (MD998924)
3. Check that the clearance between the snap ring and the clutch reaction plate is within the standard value. If not within the standard value, select a snap ring to achieve the standard value clearance.

**Standard value: 1.5 – 1.7 mm**

## DIRECT CLUTCH

**DISASSEMBLY AND REASSEMBLY**

M1233019400071



AK403291AC

- Disassembly steps**
- >>D<<** 1. Snap ring
- >>C<<** 2. Clutch reaction plate

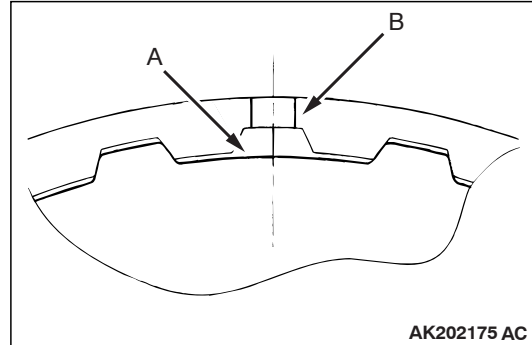
- Disassembly steps ( つづき )**
- >>C<<** 3. Clutch disc
- >>C<<** 4. Clutch plate

**Disassembly steps ( つづき )**

- >>C<< 5. Cushion plate
- >>C<< 6. Intermediate plate
- <<A>> >>B<< 7. Snap ring
- 8. Spring retainer
- >>A<< 9. D-ring
- 10. Return spring
- 11. Underdrive clutch piston
- >>A<< 12. D-ring
- >>A<< 13. D-ring
- 14. Direct clutch retainer

- Spring compressor (MB991630)
  - Spring compressor retainer (MB998924)
2. Using special tool to press down on the spring retainer, and then install the snap ring.

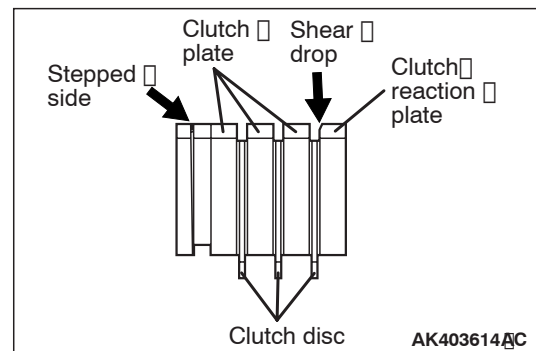
**>>C<< INTERMEDIATE PLATE/CUSHION PLATE/  
CLUTCH PLATE/CLUTCH DISC/CLUTCH  
REACTION PLATE INSTALLATION**



**⚠ CAUTION**

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

1. Assemble the intermediate plate, cushion plate, clutch plates, clutch discs, and clutch reaction plates with their non-toothed portions (A in the illustration) aligned with the hole (B in the illustration) formed in a crest of the direct clutch retainer.



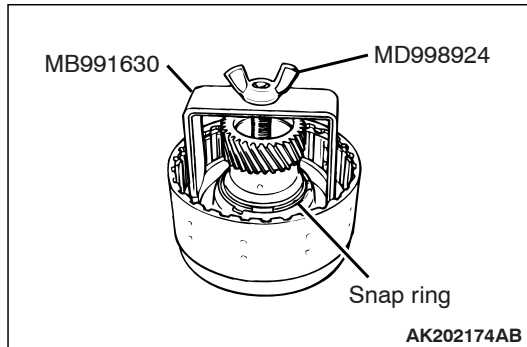
2. Orient the clutch reaction plate and intermediate plate as shown in the illustration when it is installed.

**>>D<< SNAP RING INSTALLATION**

1. Install the snap ring.
2. Press down the clutch reaction plate with a force of 49 N on its entire circumference.

**DISASSEMBLY SERVICE POINT**

**<<A>> SNAP RING REMOVAL**



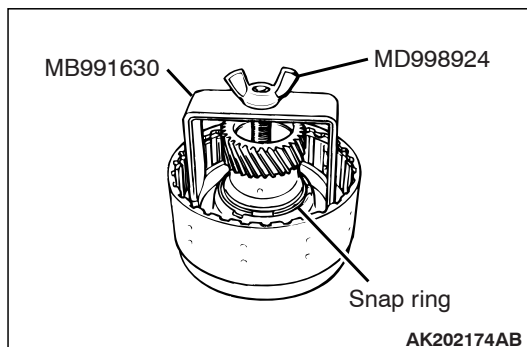
1. Set special tools as shown in the illustration.
  - Spring compressor (MB991630)
  - Spring compressor retainer (MB998924)
2. Compress the return spring and remove the snap ring.

**REASSEMBLY SERVICE POINTS**

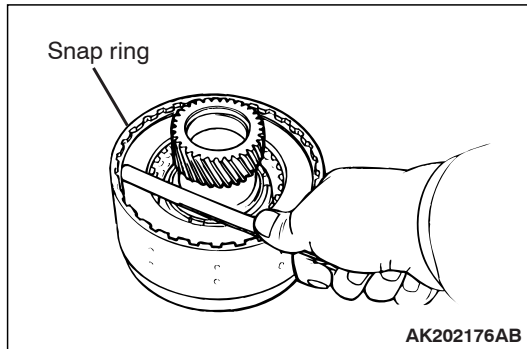
**>>A<< D-RING INSTALLATION**

Apply ATF, blue petrolatum jelly or white Vaseline to the D-rings and handle them carefully not to damage them during installation.

**>>B<< SNAP RING INSTALLATION**



1. Set special tools as shown in the illustration.

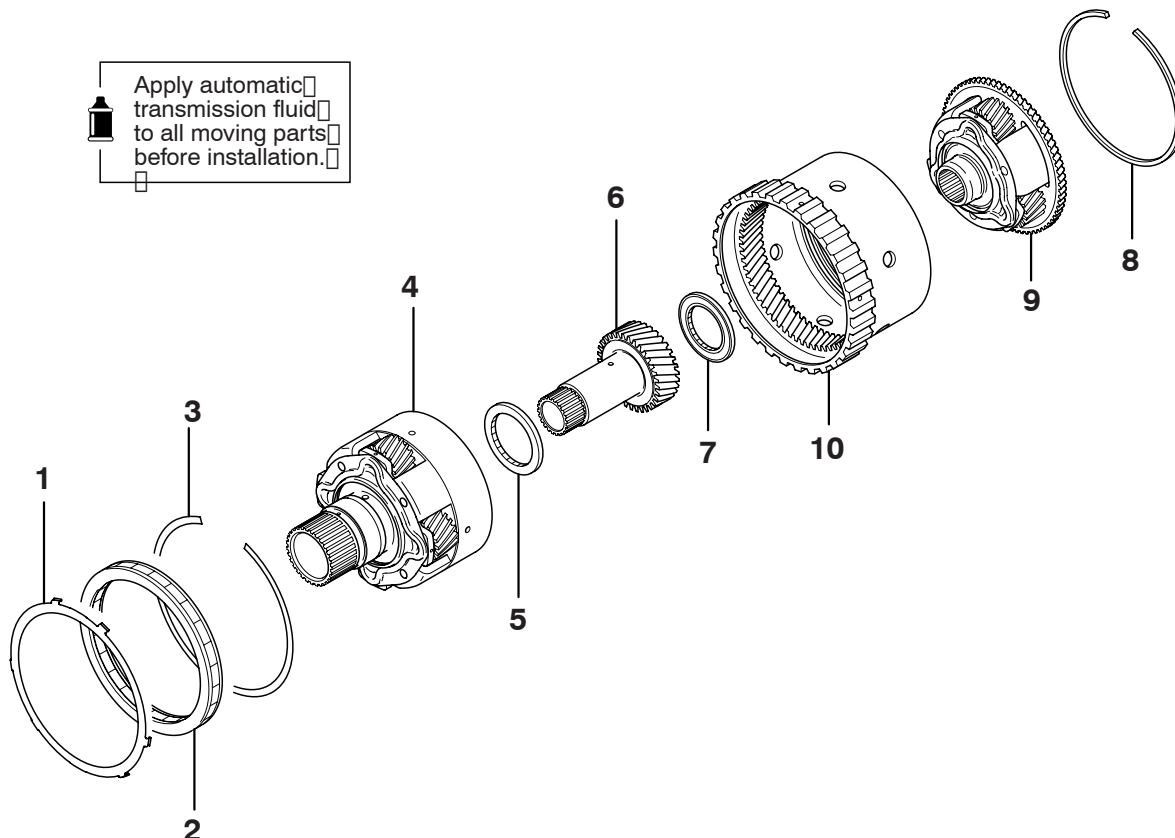


3. Check the clearance between the snap ring and clutch reaction plate. If the clearance is not within the standard value range, make adjustment by selecting a snap ring of an appropriate thickness.

**Standard value:**  
**0.6 – 0.8 mm**

## PLANETARY CARRIER ASSEMBLY DISASSEMBLY AND REASSEMBLY

M1233002500258



AK301602AC

- Disassembly steps**
- >>B<<
1. Stopper plate
  2. One-way clutch
  3. Snap ring
  4. Output planetary carrier

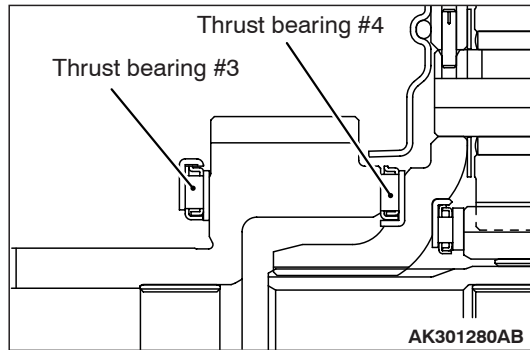
- Disassembly steps ( つづき )**
- >>A<<
5. Thrust bearing #3
  6. Underdrive sun gear
  - >>A<<
  7. Thrust bearing #4
  8. Snap ring

**Disassembly steps ( つづき )**

9. Overdrive planetary carrier
10. Overdrive annulus gear

**REASSEMBLY SERVICE POINTS**

**>>A<< THRUST BEARING #3 AND THRUST BEARING #4 INSTALLATION**

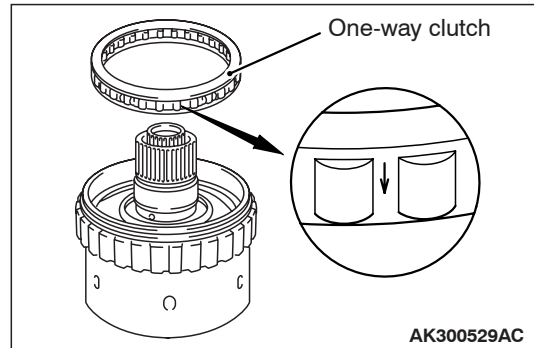


**⚠ CAUTION**

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

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

**>>B<< ONE-WAY CLUTCH INSTALLATION**

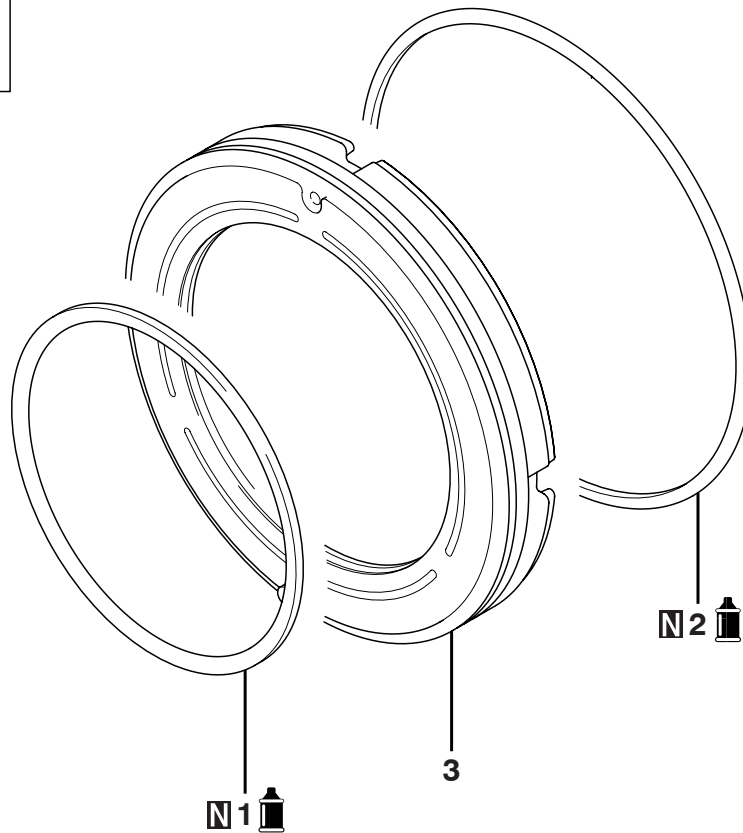
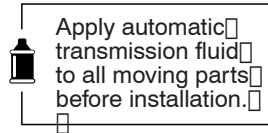


Insert the one-way clutch into the overdrive annulus gear so that the arrow points towards the output planetary carrier.

## LOW-REVERSE BRAKE

### DISASSEMBLY AND REASSEMBLY

M1233003700307



AK301603AC

#### Disassembly steps

- >>A<< 1. D-ring  
>>A<< 2. D-ring  
3. Low -reverse brake piston

#### REASSEMBLY SERVICE POINT

##### >>A<< D-RING INSTALLATION

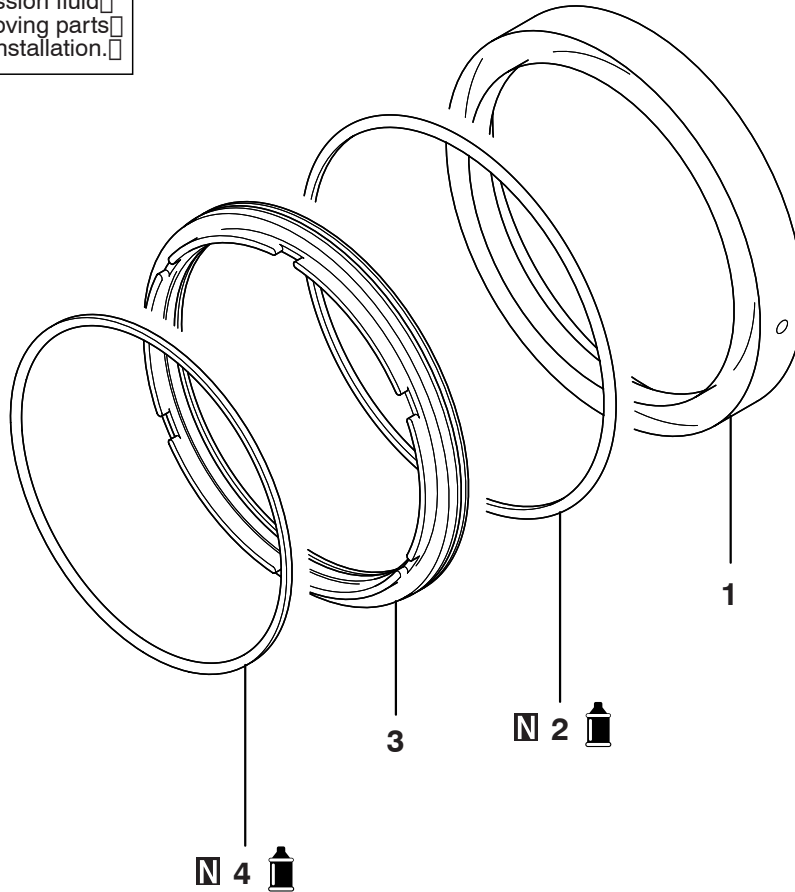
Apply ATF or petroleum jelly (Vaseline) to the D-ring, and install carefully.

## SECOND BRAKE

### DISASSEMBLY AND REASSEMBLY

M1233021800173

Apply automatic transmission fluid to all moving parts before installation.



AK301604AC

#### Disassembly steps

- >>A<< 1. Second brake retainer  
>>A<< 2. D-ring  
>>A<< 3. Second brake piston  
>>A<< 4. D-ring

#### REASSEMBLY SERVICE POINT

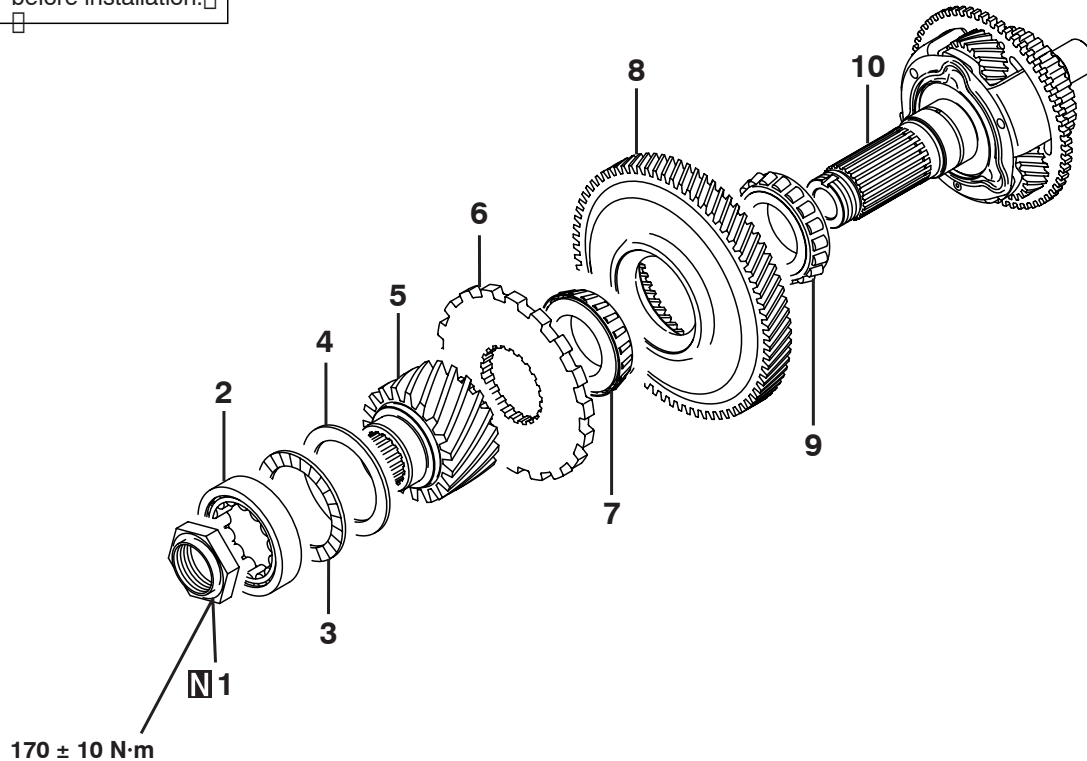
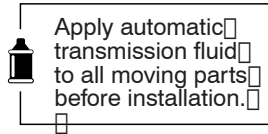
##### >>A<< D-RING INSTALLATION

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

# DIRECT PLANETARY CARRIER

## DISASSEMBLY AND REASSEMBLY

M1233026300087



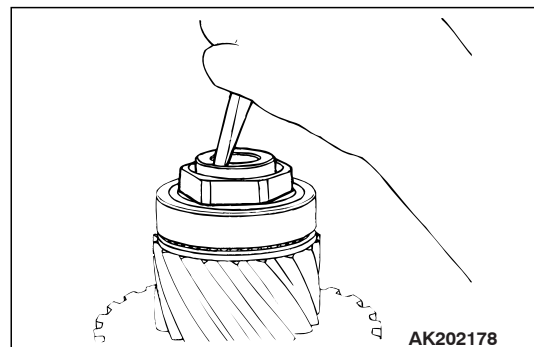
AK403295 AC

### Disassembly steps

- |       |       |     |  |
|-------|-------|-----|--|
| <<A>> | >>D<< | 1.  | Lock nut                                     |
|       |       | 2.  | Roller bearing                               |
|       |       | 3.  | Thrust bearing #9                            |
|       |       | 4.  | Thrust bearing #10                           |
| <<B>> | >>C<< | 5.  | Output gear                                  |
| <<B>> | >>C<< | 6.  | Parking gear                                 |
| <<C>> | >>B<< | 7.  | Taper roller bearing                         |
|       |       | 8.  | Transfer driven gear and direct annulus gear |
| <<D>> | >>A<< | 9.  | Taper roller bearing                         |
|       |       | 10. | Direct planetary carrier                     |

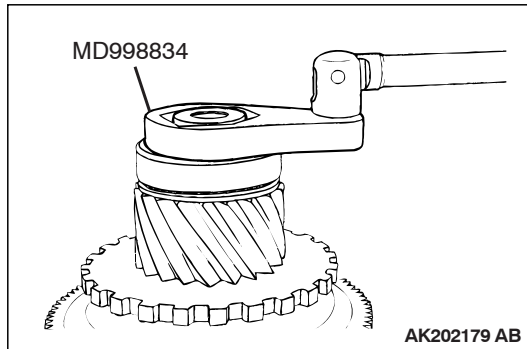
### DISASSEMBLY SERVICE POINTS

#### <<A>> LOCK NUT REMOVAL



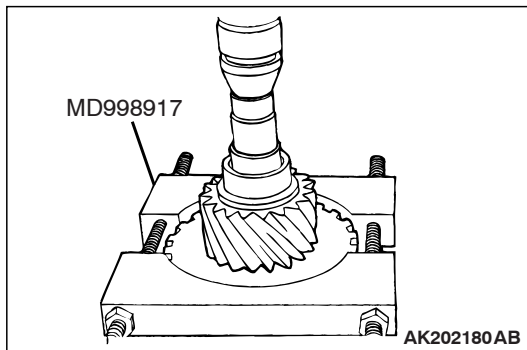
1. Un stake staking of the lock nut.





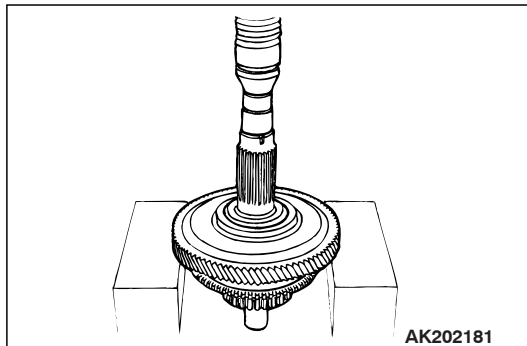
- Using special tool Special spanner (MD998834) to remove the lock nut.

### <<B>> OUTPUT GEAR/PARKING GEAR REMOVAL



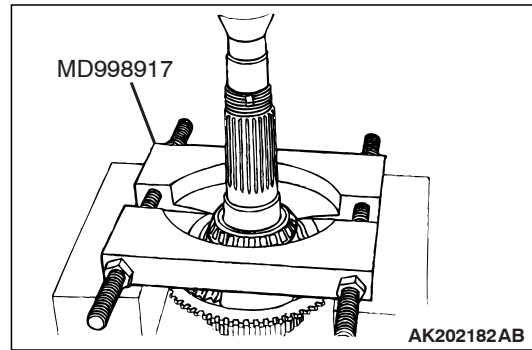
Using special tool Bearing remover (MD998917) to remove the output gear and parking gear.

### <<C>> TAPER ROLLER BEARING REMOVAL



- Support the transfer driven gear as shown in the illustration.
- Push the shaft of the direct planetary carrier to remove the taper roller bearing and gear.

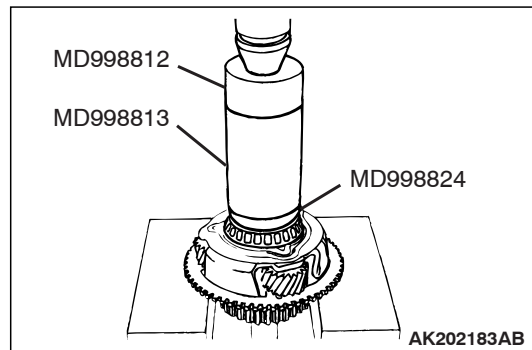
### <<D>> TAPER ROLLER BEARING REMOVAL



- Support the transfer driven gear as shown in the illustration.
- Using special tool Bearing remover (MD998917) to remove the taper roller bearing.

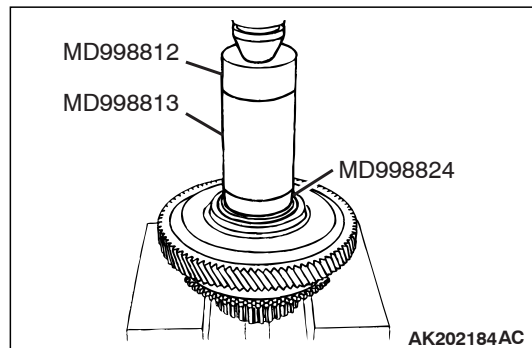
### REASSEMBLY SERVICE POINTS

#### >>A<< TAPER ROLLER BEARING INSTALLATION



- Set the transfer driven gear as shown in the illustration.
- Using special tools to press in the taper roller bearing.
  - Installer cap (MD998812)
  - Installer 100 (MD998813)
  - Installer adapter (MD998824)

#### >>B<< TAPER ROLLER BEARING INSTALLATION

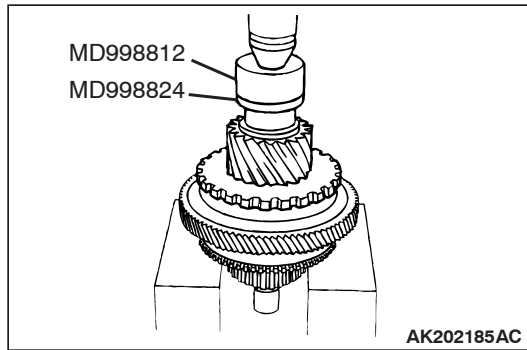


- Set the transfer driven gear as shown in the illustration.

2. Using special tools to press in the taper roller bearing.

- Installer cap (MD998812)
- Installer 100 (MD998813)
- Installer adapter (MD998824)

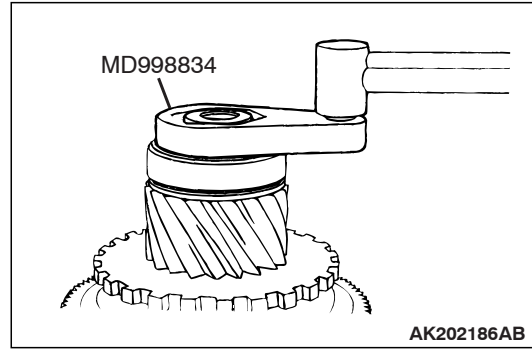
**>>C<< OUTPUT GEAR/PARKING GEAR  
INSTALLATION**



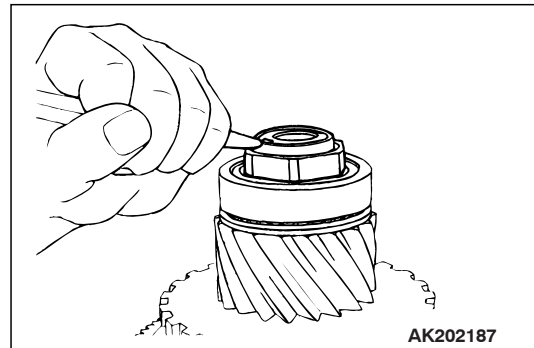
1. Using special tools to press in the parking gear.

- Installer cap (MD998812)
- Installer adapter (MD998824)

**>>D<< LOCK NUT INSTALLATION**



1. Apply ATF on a new locknut, and use special tool Special spanner (MD998834) to tighten the specified torque. Then turn back on turn, and tighten to the specified torque of  $170 \pm 10$  N·m.



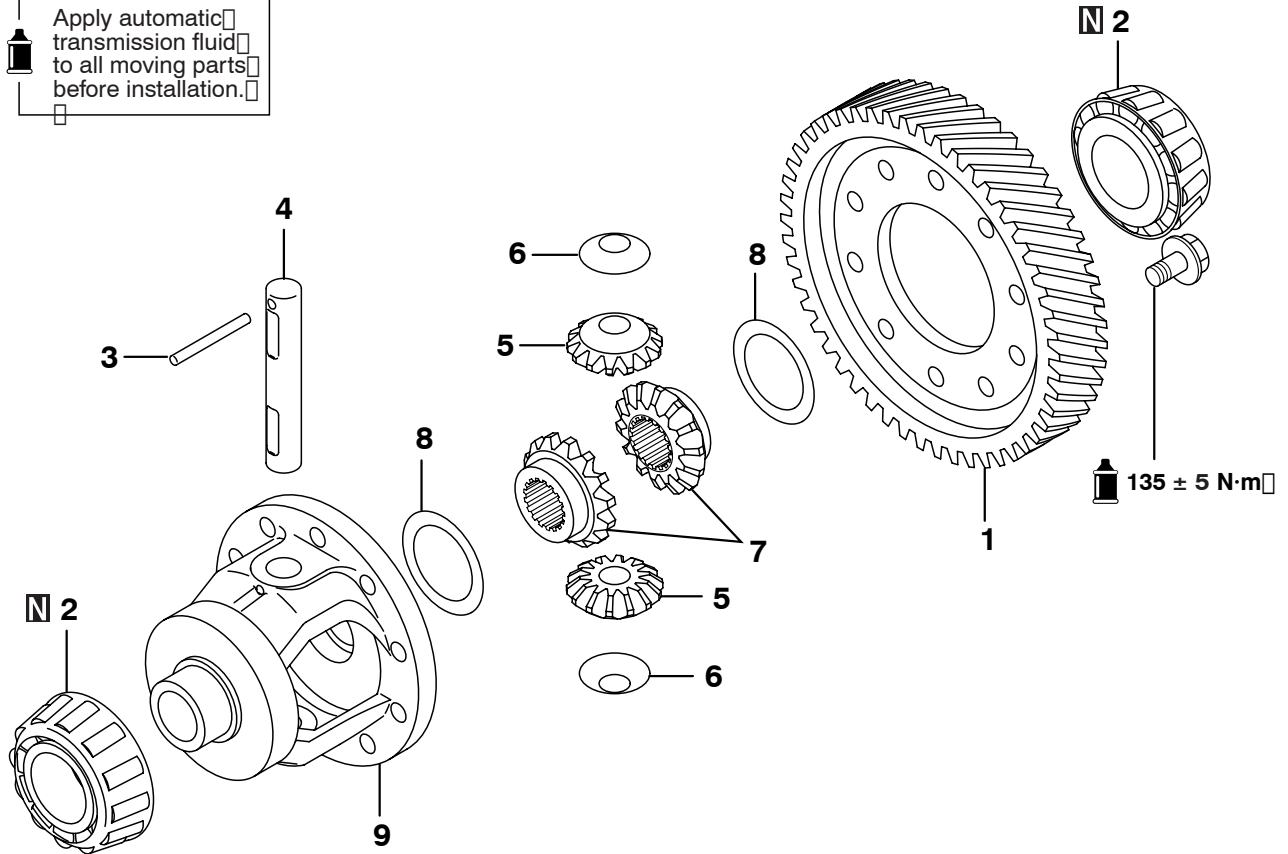
2. Use a punch to stake the lock nut at two places.

# DIFFERENTIAL

## DISASSEMBLY AND REASSEMBLY

M1233003100402

Apply automatic transmission fluid to all moving parts before installation.

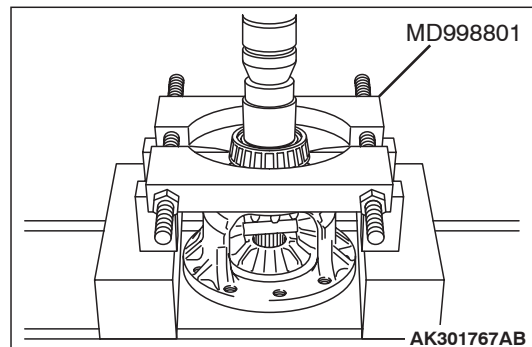


- |       |                            |
|-------|----------------------------|
|       | <b>Disassembly steps</b>   |
| >>D<< | 1. Differential drive gear |
| >>C<< | 2. Taper bearing           |
| >>B<< | 3. Lock pin                |
| >>A<< | 4. Pinion shaft            |
| >>A<< | 5. Pinion                  |
| >>A<< | 6. Washer                  |
| >>A<< | 7. Side gear               |
| >>A<< | 8. Spacer                  |
| >>A<< | 9. Differential case       |

AK301606AE

## DISASSEMBLY SERVICE POINT

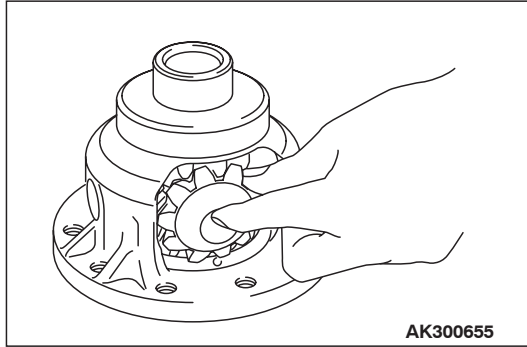
### <<A>> TAPER ROLLER BEARING REMOVAL



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

## REASSEMBLY SERVICE POINTS

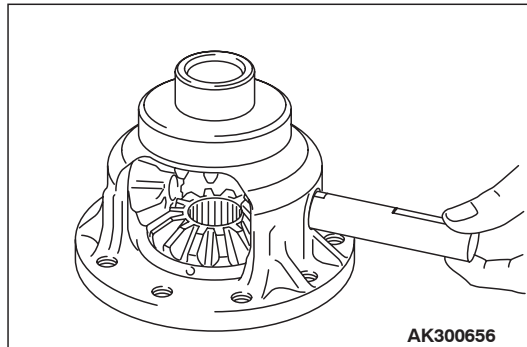
### >>A<< SPACER/SIDE GEAR/WASHER/PINION/ PINION SHAFT INSTALLATION



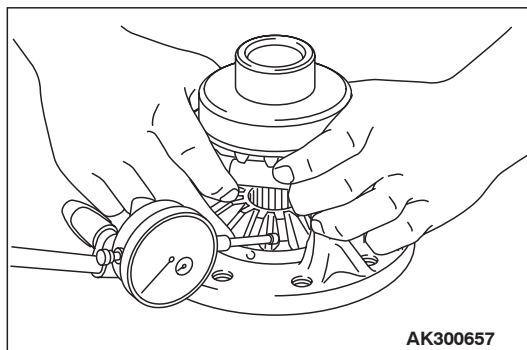
1. Mount a spacer on the back surface of the side gear, and then install the side gear in the differential case.

*NOTE: When a new side gear is to be installed, use a medium thickness spacer (0.93 to 1.00 mm).*

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.



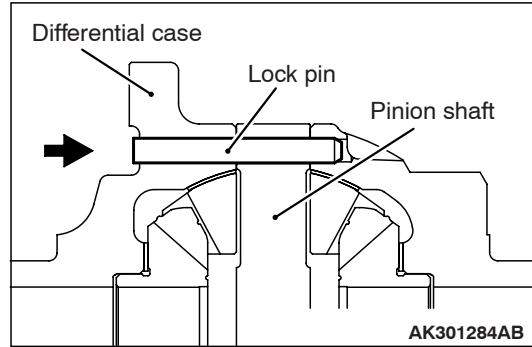
4. Measure the backlash between the side gear and pinion.

**Standard value:**  
**0.025 – 0.150 mm**

5. If the backlash is out of the standard value, select a spacer and re-measure the backlash.

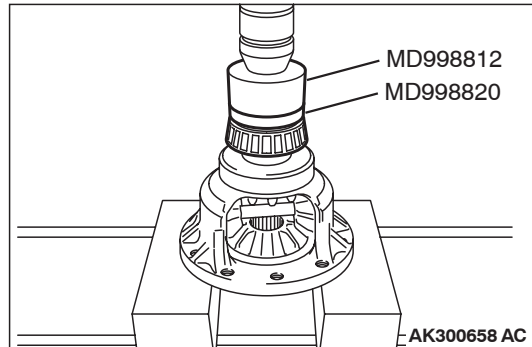
*NOTE: Adjust until the backlash on both sides are equal.*

### >>B<< LOCK PIN INSTALLATION



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

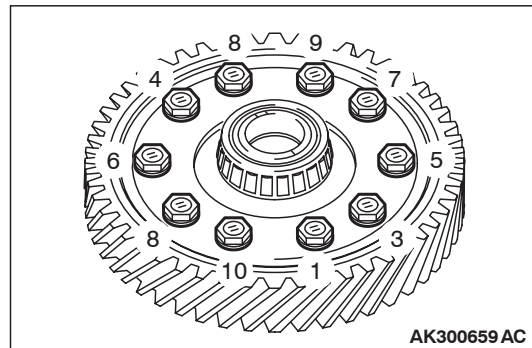
### >>C<< TAPER ROLLER BEARING INSTALLATION



Using special tools to press in the taper roller bearing.

- Installer cap (MD998812)
- Installer adapter (MD998820)

### >>D<< DIFFERENTIAL DRIVE GEAR INSTALLATION

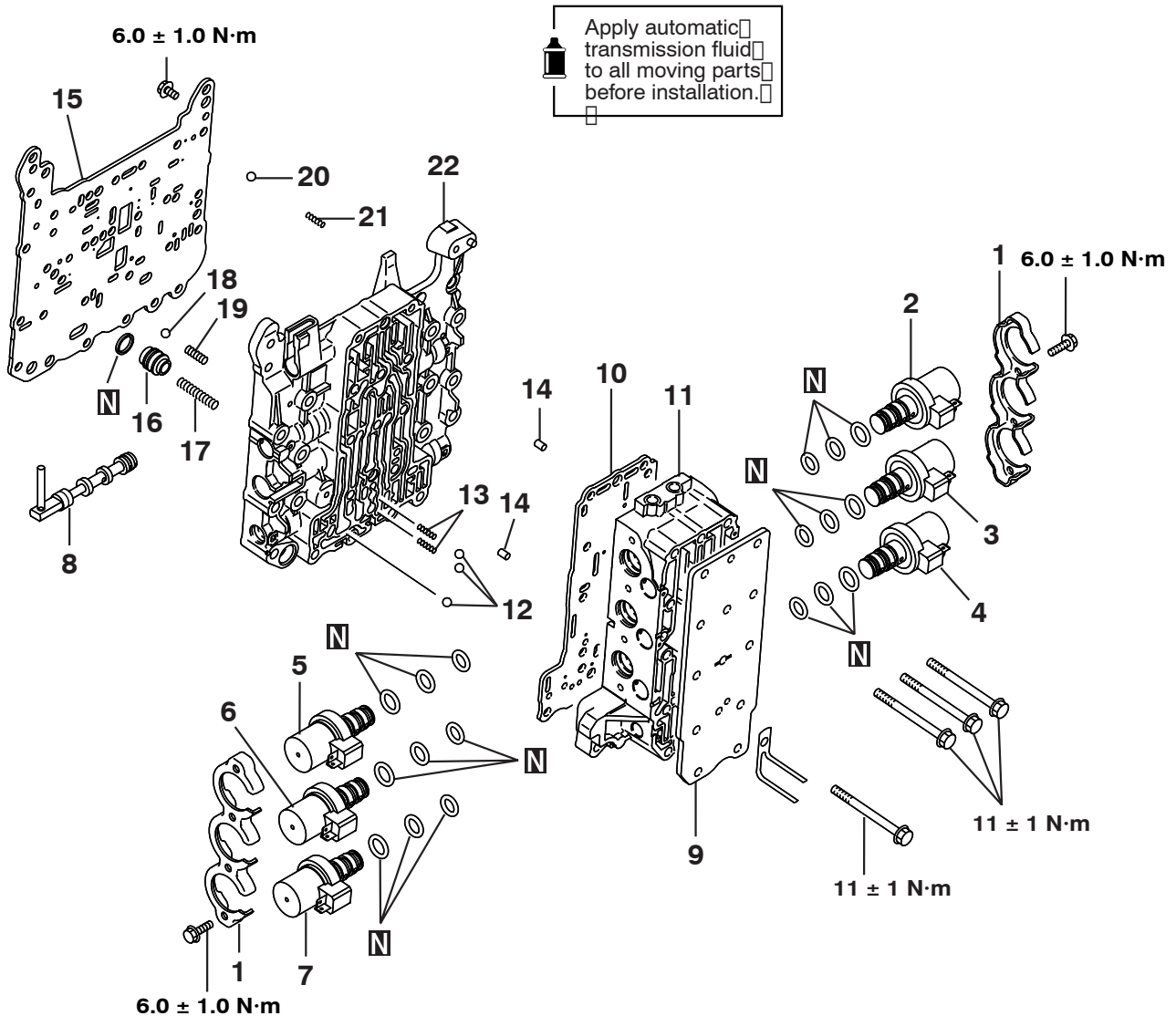


Apply ATF to the bolts, and tighten the bolts to the specified torque of  $135 \pm 5$  N·m in the shown sequence.

# VALVE BODY

## DISASSEMBLY AND REASSEMBLY

M1233005500365



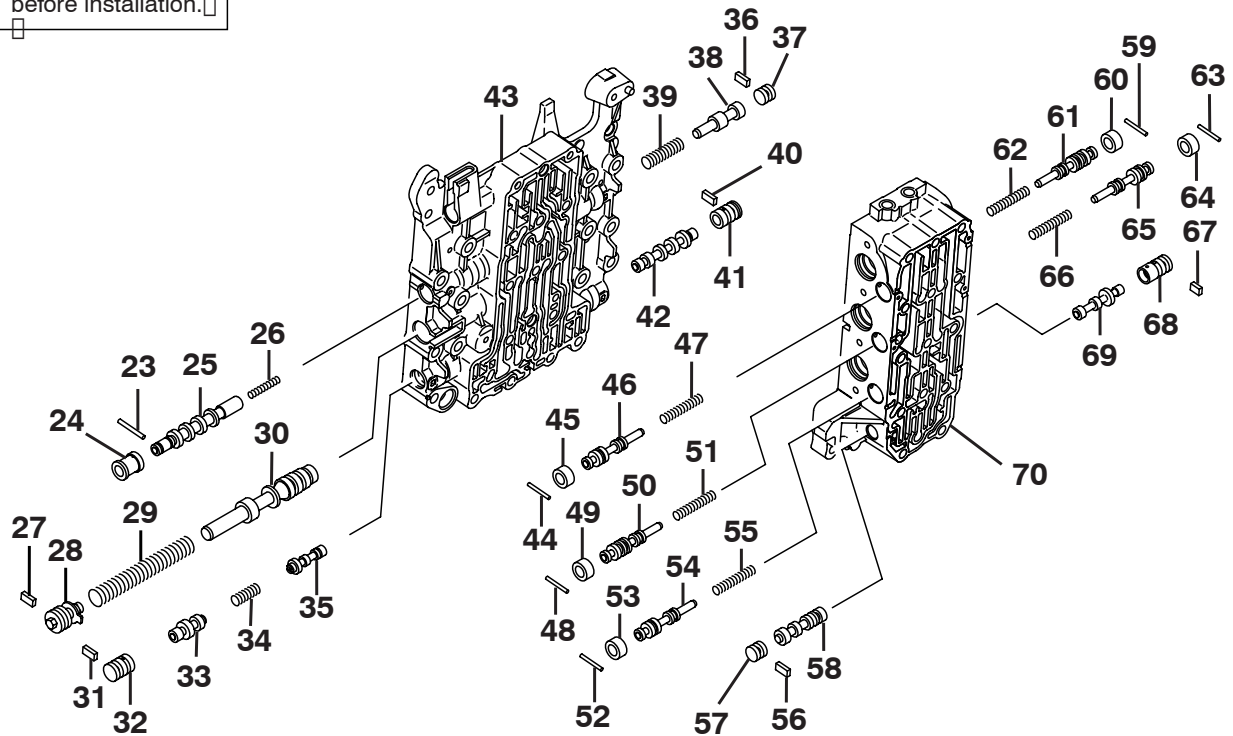
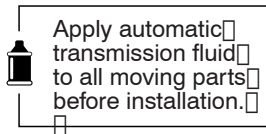
AK501912AB

### Disassembly steps

- |       |       |     |                                      |
|-------|-------|-----|--------------------------------------|
| <<A>> | >>C<< | 1.  | Solenoid valve support               |
| <<A>> | >>C<< | 2.  | Underdrive solenoid valve            |
| <<A>> | >>C<< | 3.  | Second solenoid valve                |
| <<A>> | >>C<< | 4.  | Damper clutch control solenoid valve |
| <<A>> | >>C<< | 5.  | Overdrive solenoid valve             |
| <<A>> | >>C<< | 6.  | Low-reverse solenoid valve           |
| <<A>> | >>C<< | 7.  | Reduction solenoid valve             |
|       |       | 8.  | Manual valve                         |
|       |       | 9.  | Cover                                |
|       |       | 10. | Plate (separating outside)           |
|       |       | 11. | Outside valve body assembly          |

### Disassembly steps ( つづき )

- |       |     |                                 |
|-------|-----|---------------------------------|
| >>B<< | 12. | Steel ball (orifice check ball) |
| >>B<< | 13. | Spring                          |
|       | 14. | Knock bushing                   |
|       | 15. | Plate (separating inside)       |
| >>A<< | 16. | Damping valve                   |
| >>A<< | 17. | Damping valve spring            |
| >>A<< | 18. | Steel ball (line relief)        |
| >>A<< | 19. | Spring                          |
| >>A<< | 20. | Steel ball (orifice check ball) |
| >>A<< | 21. | Spring                          |
|       | 22. | Inside valve body assembly      |



AK403293AD

**Disassembly steps**

23. Roller
24. Damper clutch control valve sleeve
25. Damper clutch control valve
26. Damper clutch control valve spring
27. Plate
28. Screw
29. Regulator valve spring
30. Regulator valve
31. Plate
32. Fail-safe valve A sleeve
33. Fail-safe valve A2
34. Fail-safe valve A spring
35. Fail-safe valve A1
36. Plate
37. Plug
38. Torque converter valve
39. Torque converter valve spring
40. Plate
41. Fail-safe valve B sleeve
42. Fail-safe valve B
43. Inside valve body
44. Roller

**Disassembly steps ( つづき )**

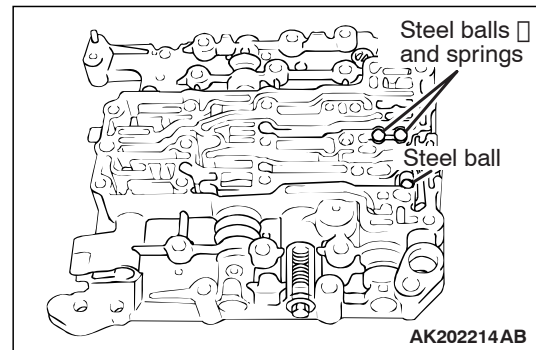
45. Overdrive pressure control valve sleeve
46. Overdrive pressure control valve
47. Overdrive pressure control valve spring
48. Roller
49. Low-reverse pressure control valve sleeve
50. Low-reverse pressure control valve
51. Low-reverse pressure control valve spring
52. Roller
53. Reduction pressure control valve sleeve
54. Reduction pressure control valve
55. Reduction pressure control valve spring
56. Plate
57. Plug
58. Switch valve
59. Roller



**Disassembly steps ( つづき )**

60. Underdrive pressure control valve sleeve
61. Underdrive pressure control valve
62. Underdrive pressure control valve spring
63. Roller
64. Second pressure control valve sleeve
65. Second pressure control valve
66. Second pressure control valve spring
67. Plate
68. fail-save valve C sleeve
69. fail-save valve C
70. fail-save valve body

**>>B<< SPRING AND STEEL BALL INSTALLATION**



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

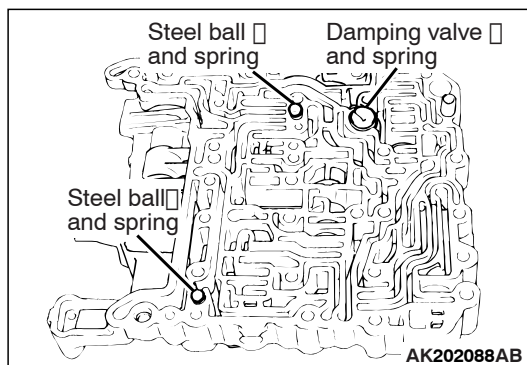
**DISASSEMBLY SERVICE POINT**

**<<A>> SOLENOID VALVES REMOVAL**

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

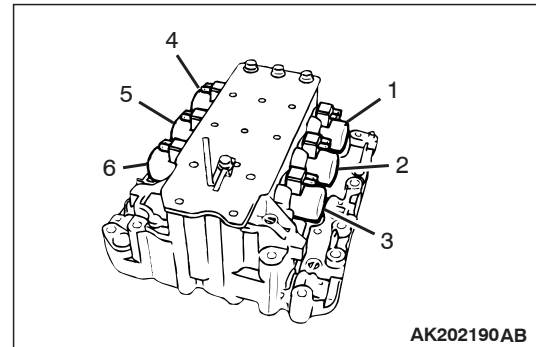
**REASSEMBLY SERVICE POINTS**

**>>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.

**>>C<< SOLENOID VALVES INSTALLATION**



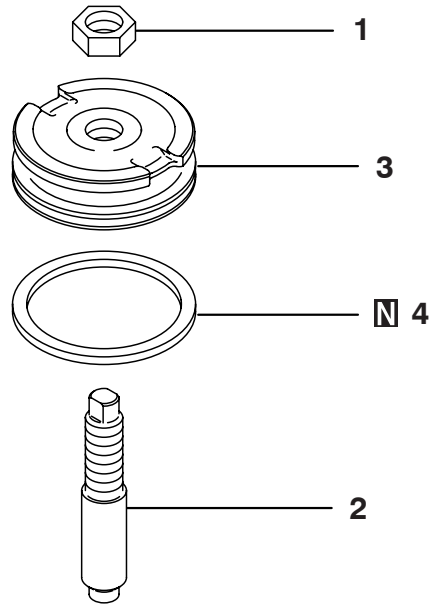
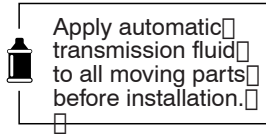
1. Apply ATF or petroleum jelly (Vaseline) to the O-ring and install carefully.
2. Install the solenoid valves by referring to the marks applied during disassembly.

NO.	Name
1	Underdrive solenoid valve
2	Second solenoid valve
3	Damper clutch control solenoid valve
4	Overdrive solenoid valve
5	Low-reverse solenoid valve
6	Reduction solenoid valve

## REDUCTION BRAKE PISTON

### DISASSEMBLY AND REASSEMBLY

M1233026600066



AK403296AC

#### Disassembly steps

1. Nut
2. Adjusting rod

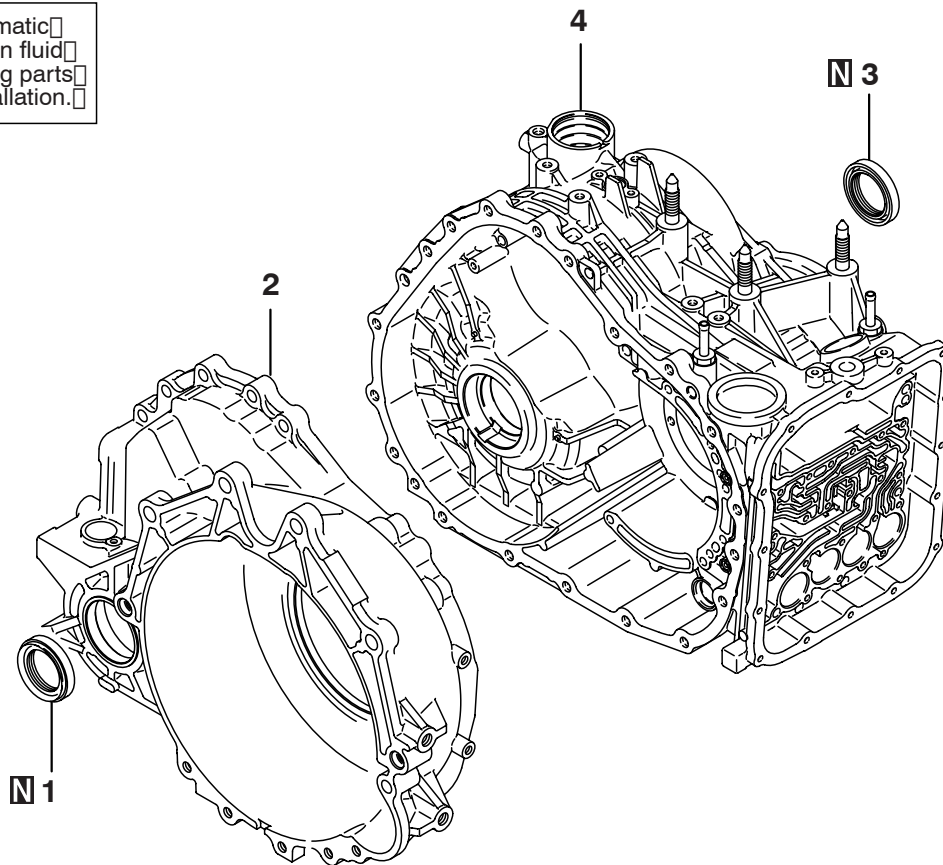
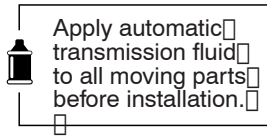
#### Disassembly steps ( つづき )

3. Reduction brake piston
4. Seal ring

## DRIVE SHAFT OIL SEAL

### DISASSEMBLY AND REASSEMBLY

M1233004300283



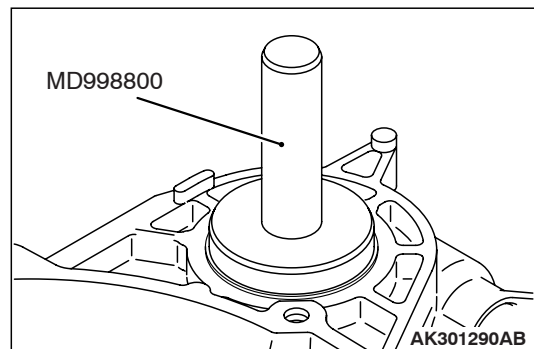
AK403292 AC

#### Disassembly steps

- >>A<< 1. Oil seal  
2. Converter housing  
>>B<< 3. Oil seal  
4. Transmission case

#### REASSEMBLY SERVICE POINTS

##### >>A<< OIL SEAL INSTALLATION



Use the special tool to Oil seal installer (MD998800) install the oil seal.

**>>B<< OIL SEAL INSTALLATION**

Use the special tool Oil seal installer (MD998800) to install the oil seal.

