

## GROUP 23B

# AUTOMATIC TRANSMISSION OVERHAUL

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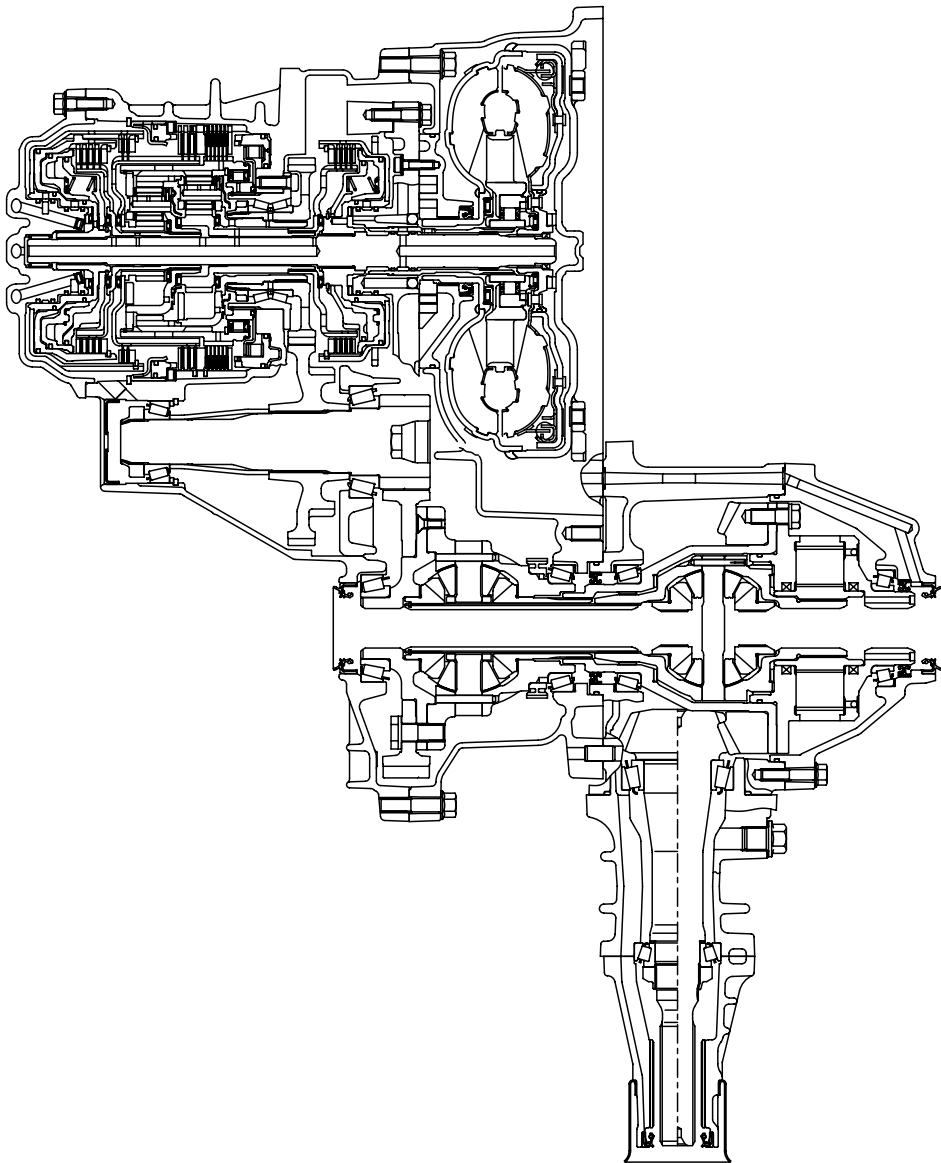
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GENERAL INFORMATION

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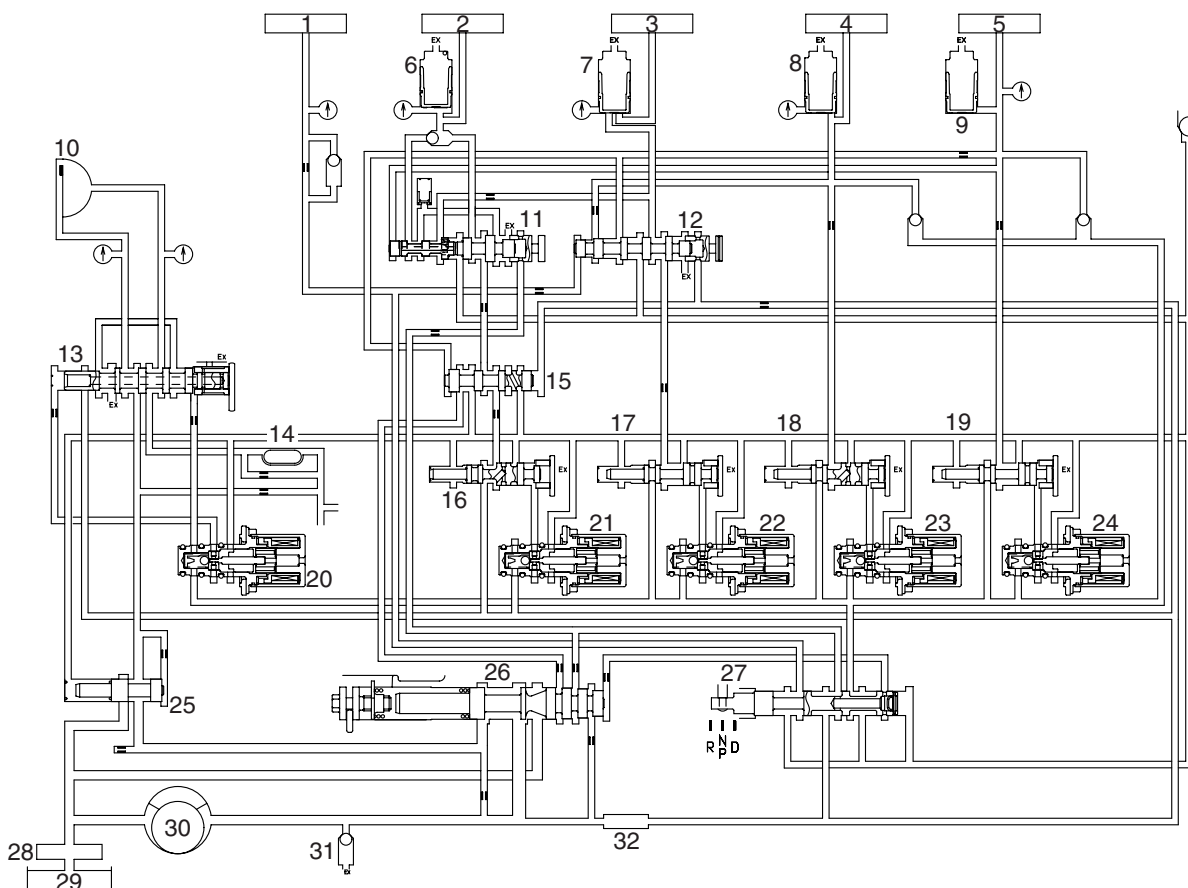
Transmission model	Combined engine	Vehicle model
W4A4B-4-R2ZE	4G69-S4-MIVEC	CU5W

SECTIONAL VIEW



AK202057

## HYDRAULIC CIRCUIT



AK202328AD

- |  |   |
|--|---|
| 1. Reverse clutch                      | 17. Second pressure control valve           |
| 2. Low-reverse brake                   | 18. Underdrive pressure control valve       |
| 3. Second brake                        | 19. Overdrive pressure control valve        |
| 4. Underdrive clutch                   | 20. Damper clutch control solenoid valve    |
| 5. Overdrive clutch                    | 21. Low-reverse solenoid valve              |
| 6. Low-reverse accumulator             | 22. Second solenoid valve                   |
| 7. Second accumulator                  | 23. Underdrive solenoid valve               |
| 8. Underdrive accumulator              | 24. Overdrive solenoid valve                |
| 9. Overdrive accumulator               | 25. Torque converter pressure control valve |
| 10. Damper clutch                      | 26. Regulator valve                         |
| 11. Fail-safe valve A                  | 27. Manual valve                            |
| 12. Fail-safe valve B                  | 28. Oil filter                              |
| 13. Damper clutch control valve        | 29. Oil pan                                 |
| 14. Cooler                             | 30. Oil pump                                |
| 15. Switch valve                       | 31. Relief valve                            |
| 16. Low-reverse pressure control valve | 32. Oil strainer                            |

## GENERAL SPECIFICATIONS

M1233000200529

Transmission model	Drive system	Number of speed	Damper clutch	Low-reverse one-way clutch	Final gear ratio
W4A4B-4-R2ZE	4WD	4 speed	Provided	Provided	4.625

Item			W4A4B
Torque converter	Type		3-element, 1-stage, 2-phase
Transmission	Type		4-speed forward, 1-speed reverse
	Gear ratio	1st	2.842
		2nd	1.573
		3rd	1.000
		4th	0.688
		Reverse	2.214
	Number of underdrive clutch discs		4
	Number of overdrive clutch discs		4
	Number of reverse clutch discs		2
	Number of low-reverse brake discs		6
	Number of second brake discs		3
Transfer	Type		Constant mesh
	Transfer gear ratio		3.312

## VALVE BODY SPRING IDENTIFICATION TABLE

Spring	Wire diameter mm	Coil diameter mm	Free length mm	Number of loops
Regulator valve spring	1.8	15.7	86.7	24
Underdrive pressure control valve spring	0.7	7.6	37.7	25
Overdrive pressure control valve spring	0.7	7.6	37.7	25
Low-reverse pressure control valve spring	0.7	7.6	37.7	25
Second pressure control valve spring	0.7	7.6	37.7	25
Torque converter valve spring	1.6	11.2	34.4	12.5
Damper clutch control valve spring	0.7	5.9	28.1	19
Fail-safe valve A spring	0.7	8.9	21.9	9.5
Damping valve spring	1.0	7.7	35.8	17
Line relief valve spring	1.0	7.0	17.3	10
Orifice check ball spring	0.5	4.5	17.2	15

## SERVICE SPECIFICATIONS

M1233000300399

Item	Standard value
Brake reaction plate end play mm	0 – 0.16
Second brake end play mm	0.79 – 1.25
Low-reverse brake end play mm	1.65 – 2.11
Output shaft preload mm	0.01 – 0.09
Underdrive sun gear end play mm	0.25 – 0.45
Input shaft end play mm	0.70 – 1.45
Center differential case preload mm	0.045 – 0.105
Underdrive clutch piston end play mm	1.6 – 1.8
Overdrive clutch return spring retainer end play mm	0 – 0.09
Overdrive clutch end play mm	1.6 – 1.8
Reverse clutch end play mm	1.5 – 1.7
Backlash between center differential side gear and pinion mm	0.025 – 0.150

# SNAP RING, SPACER, THRUST WASHER, THRUST RACE AND PRESSURE PLATE FOR ADJUSTMENT

M1233023000485

## SNAP RING (FOR ADJUSTMENT OF BRAKE REACTION PLATE END PLAY)

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

## PRESSURE PLATE (FOR ADJUSTMENT OF LOW-REVERSE BRAKE END PLAY AND SECOND BRAKE END PLAY)

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.6	L	2.4	4
1.8	1	2.6	6
2.0	0	2.8	8
2.2	2	3.0	D

## SPACER (FOR ADJUSTMENT OF OUTPUT SHAFT PRELOAD)

Thickness mm	Identification symbol	Thickness mm	Identification symbol
1.88	88	2.36	36
1.92	92	2.40	40
1.96	96	2.44	44
2.00	00	2.48	48
2.04	04	2.52	52
2.08	08	2.56	56
2.12	12	2.60	60
2.16	16	2.64	64
2.20	20	2.68	68
2.24	24	2.72	72
2.28	28	2.76	76
2.32	32		

## 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	—
1.9	—	2.5	—
2.0	—	2.6	—
2.1	—		

**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

**SPACER (FOR ADJUSTMENT OF CENTER DIFFERENTIAL CASE PRELOAD)**

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.83	83	1.10	10
0.86	86	1.13	13
0.89	89	1.16	16
0.92	92	1.19	19
0.95	95	1.22	22
0.98	98	1.25	25
1.01	01	1.28	28
1.04	04	1.31	31
1.07	07		

**SNAP RING (FOR ADJUSTMENT OF UNDERDRIVE CLUTCH PISTON END PLAY AND OVERDRIVE CLUTCH END PLAY)**

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

**SNAP RING (FOR ADJUSTMENT OF OVERDRIVE CLUTCH RETURN SPRING RETAINER END PLAY)**

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

**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		

**SPACER (FOR ADJUSTMENT OF BACKLASH BETWEEN CENTER DIFFERENTIAL SIDE GEARS AND PINION)**

Thickness mm	Identification colour	Thickness mm	Identification colour
0.48 – 0.55	–	0.74 – 0.81	–
0.56 – 0.65	–	0.82 – 0.89	–
0.66 – 0.73	–		

**TORQUE SPECIFICATIONS**

M1233023100642

Item	Specifications
<b>TRANSMISSION</b>	
Output shaft bearing retainer mounting bolts	29 ± 2 N·m
Output shaft lock nuts	170 ± 10 N·m
Transfer drive gear mounting bolts	33.5 ± 2.5 N·m
Rear cover mounting bolts	23 ± 3 N·m
Oil pump mounting bolts	29 ± 2 N·m
Converter housing mounting bolts	48 ± 6 N·m
Solenoid valve harness mounting bolts	11 ± 1 N·m
Valve body mounting bolts	11 ± 1 N·m
Manual control shaft detent mounting bolts	6.0 ± 1.0 N·m
Valve body cover bolts	11 ± 1 N·m
Sealing cap mounting bolts <Type with sealing cap>	5.0 ± 1.0 N·m
Inhibitor switch mounting bolts	11 ± 1 N·m
Manual control lever mounting nuts	22 ± 3 N·m
Output shaft speed sensor	11 ± 1 N·m
Input shaft speed sensor	11 ± 1 N·m
Oil cooler feed tube clamp bolts	11 ± 1 N·m
Eye bolt	24 ± 3 N·m
Control cable support bracket & harness bracket bolts	23 ± 3 N·m
Harness bracket bolt	23 ± 3 N·m
Roll stopper bracket bolts	70 ± 10 N·m
Transfer mounting bolts	69 ± 9 N·m
<b>COMPONENTS</b>	
Center differential drive gear bolts	135 ± 5 N·m
Valve body bolts (5 × 10)	6.0 ± 1.0 N·m
Valve body bolts (6 × 70)	11 ± 1 N·m
Solenoid valve support mounting bolts	6.0 ± 1.0 N·m
<b>TRANSFER</b>	
Transfer cover bolts	23 ± 3 N·m



## SEALANTS

M1233000500326

Item	Specified sealant
Rear cover	Mitsubishi Part No. MD974421 or equivalent
Converter housing	Mitsubishi Part No. MD974421 or equivalent
Valve body cover	Mitsubishi 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.

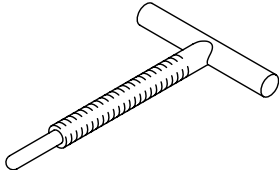
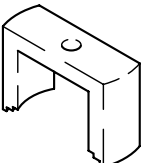
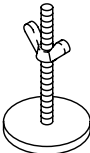
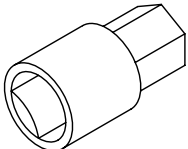
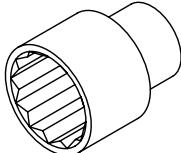
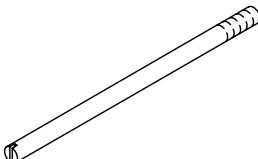
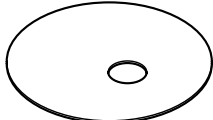
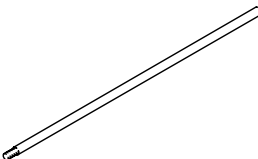
### FIPG Application

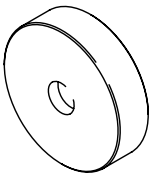
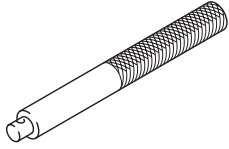
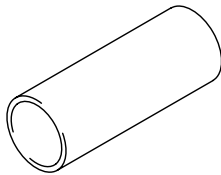
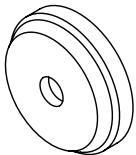
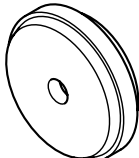
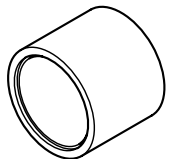
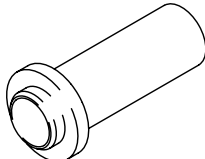
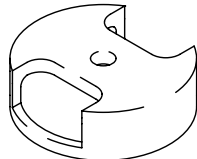
Applied FIPG bead should be of the specified size and free of any break. FIPG can be wiped away unless it has completely hardened. Install the mating parts in position while the FIPG is still wet (in less than 10 minutes after application). Do not allow FIPG to spread beyond the sealing areas during 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.

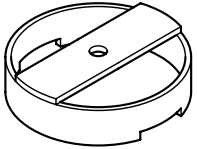

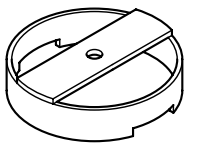
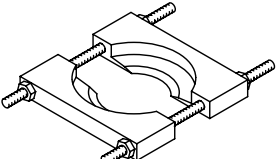
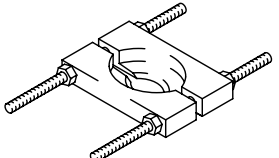
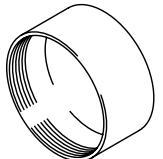
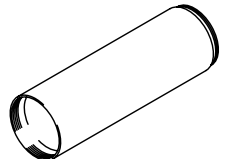
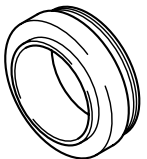
FIPG application method may vary from location to location. Follow the instruction for each particular case described later in this manual.

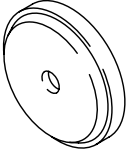
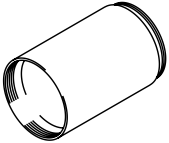
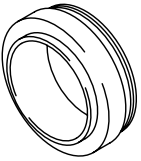
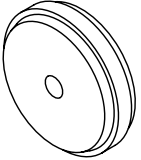
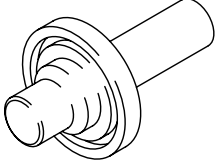
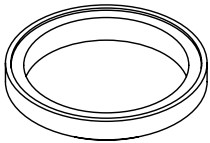
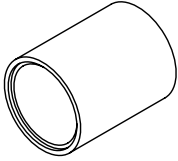
## SPECIAL TOOLS

M1233000600390

Tool	Number	Name	Use
	MD998333	Oil pump remover	Removal of oil pump
	MD998903	Spring compressor	Removal and installation of one-way clutch inner race snap ring
	MD998924	Spring compressor retainer	<ul style="list-style-type: none"> <li>Removal and installation of snap ring</li> <li>Measurement of underdrive clutch, overdrive clutch and reverse clutch end plays</li> </ul>
	MB990607	Torque wrench socket	Removal and installation of output shaft lock nut
	MB991625	Special socket (41)	Removal and installation of output shaft lock nut
	MD998412	Guide	Installation of transfer drive gear and oil pump
	MB991631	Clearance dummy plate	Measurement of brake reaction plate, second brake and low-reverse brake end plays
	MD998913	Dial gauge extension	Measurement of low-reverse brake end plays

Tool	Number	Name	Use
	MB990930	Installer adapter	Installation of output shaft taper roller bearing outer race
	MB990938	Handle	Use with installer adapter
	MD998350	Bearing installer	Installation of output shaft collar and taper roller bearing
	MB990931	Installer adapter	Installation of cap
	MB990935	Installer adapter	Installation of center differential taper roller bearing outer race
	MB991445	Bush remover & installer base	Installation of outer race
	MD998334	Oil seal installer	Installation of oil pump oil seal
	MD998907	Spring compressor	Removal and installation of underdrive clutch snap ring

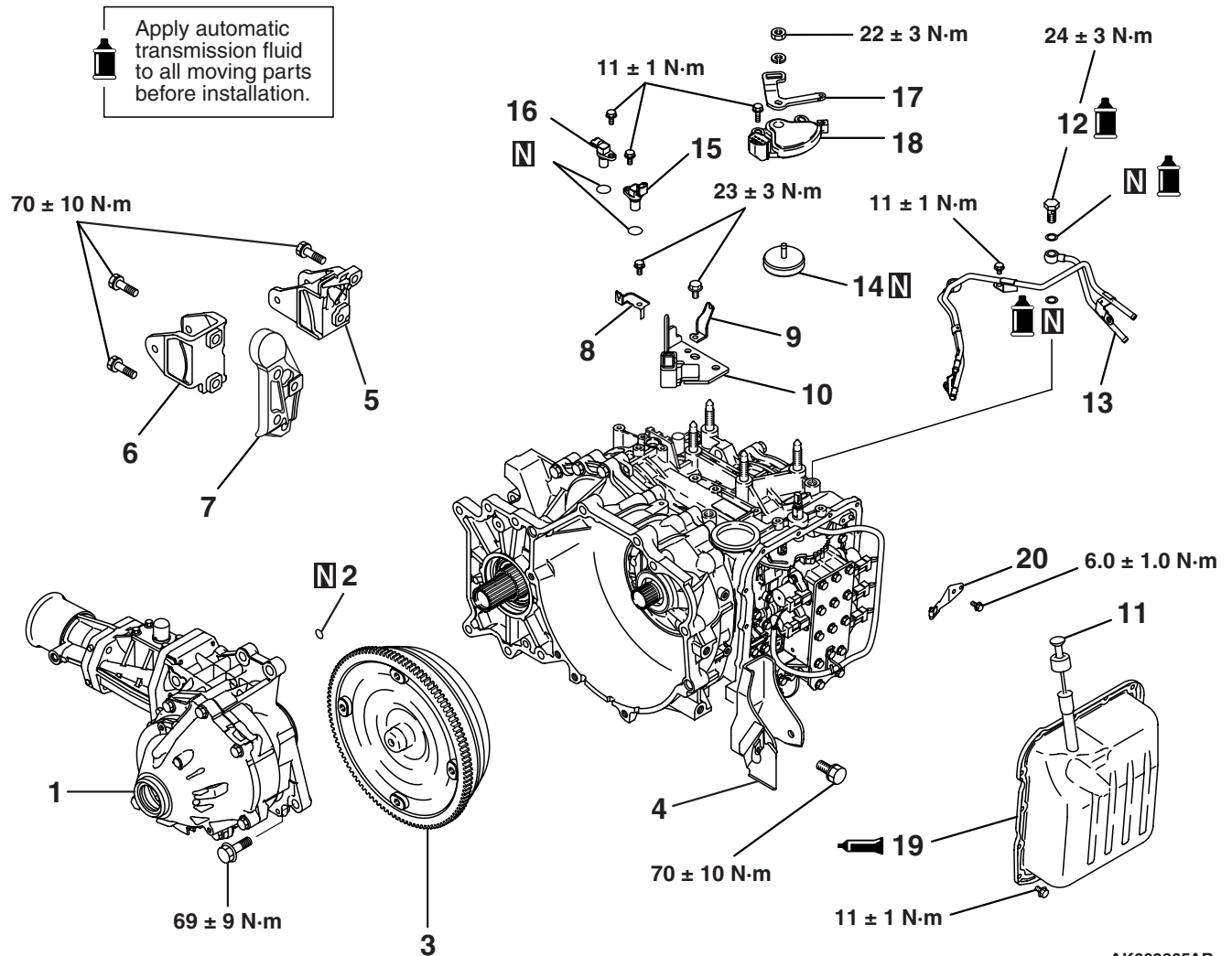
Tool	Number	Name	Use
	MB991628	Spring compressor	Measurement of underdrive clutch and overdrive clutch end plays
	MD999590	Spring compressor	Removal and installation of overdrive clutch snap ring
	MB991790	Spring compressor	Measurement of reverse clutch end play
	MD998917	Bearing remover	<ul style="list-style-type: none"> <li>Removal of output shaft transfer driven gear</li> <li>Removal and installation of center differential taper roller bearing</li> </ul>
	MD998801	Bearing remover	<ul style="list-style-type: none"> <li>Removal of output shaft taper roller bearing</li> </ul>
	MD998812	Installer cap	Use with installer and installer adapter
	MD998814	Installer 200	Use with installer cap and installer adapter
	MD998823	Installer adapter (48)	Installation of output shaft taper roller bearing and transfer driven gear

Tool	Number	Name	Use
	MB990936	Installer adapter	<ul style="list-style-type: none"> <li>• Installation of output shaft taper roller bearing outer race</li> <li>• Installation of transfer extension housing oil seal</li> </ul>
	MD998813	Installer 100	Use with installer cap and installer adapter
	MD998824	Installer adapter (50)	Installation of center differential taper roller bearing
	MB990937	Installer adapter	<ul style="list-style-type: none"> <li>• Installation of center differential taper roller bearing</li> <li>• Installation of transfer cover oil seal</li> </ul>
	MD998800	Oil seal installer	<ul style="list-style-type: none"> <li>• Installation of drive shaft oil seal</li> <li>• Installation of transfer cover oil seal</li> </ul>
	MB990887	Arm bushing remover and installer ring	Installation of transfer oil seal
	MB990891	Bushings remover and installer base	Use with arm bushing remover and installer ring

## TRANSMISSION

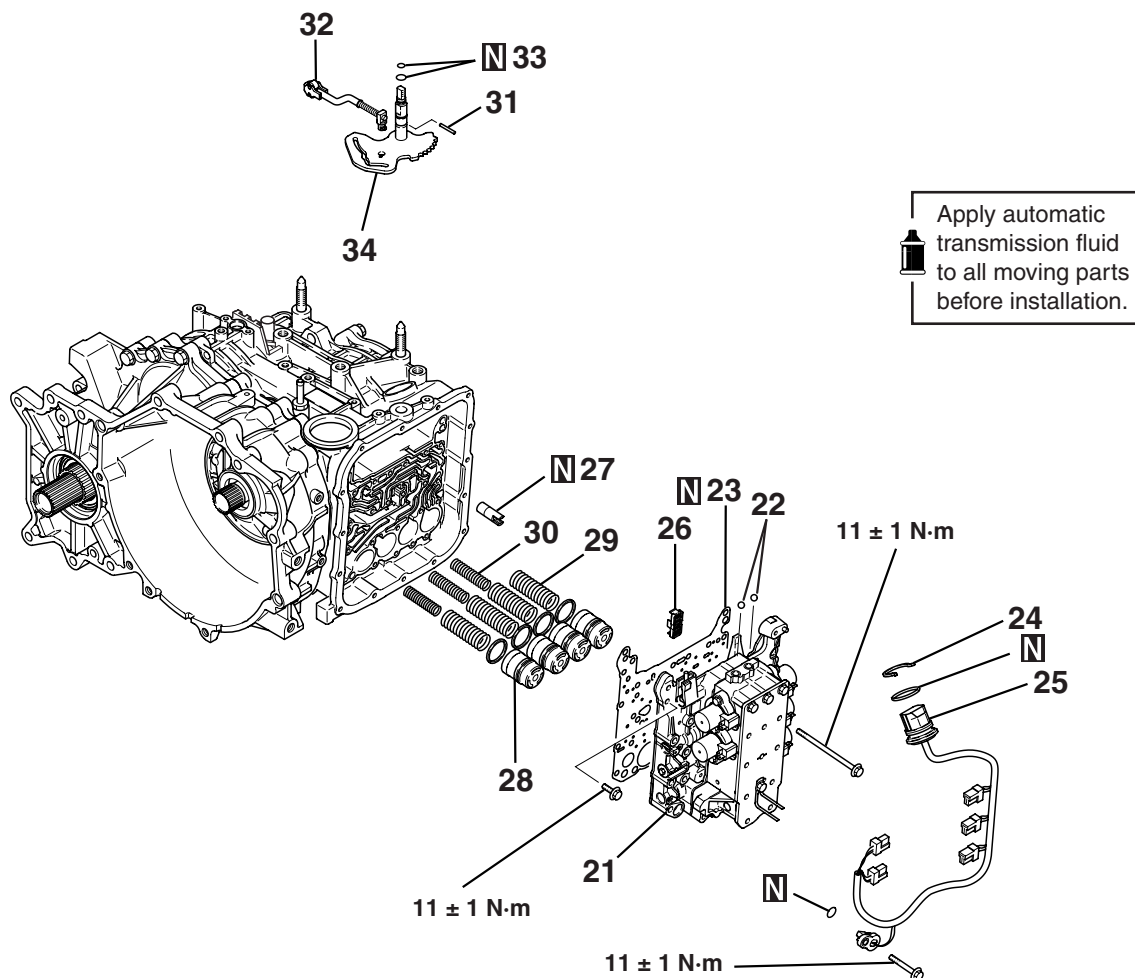
## DISASSEMBLY AND REASSEMBLY

M1233001000669



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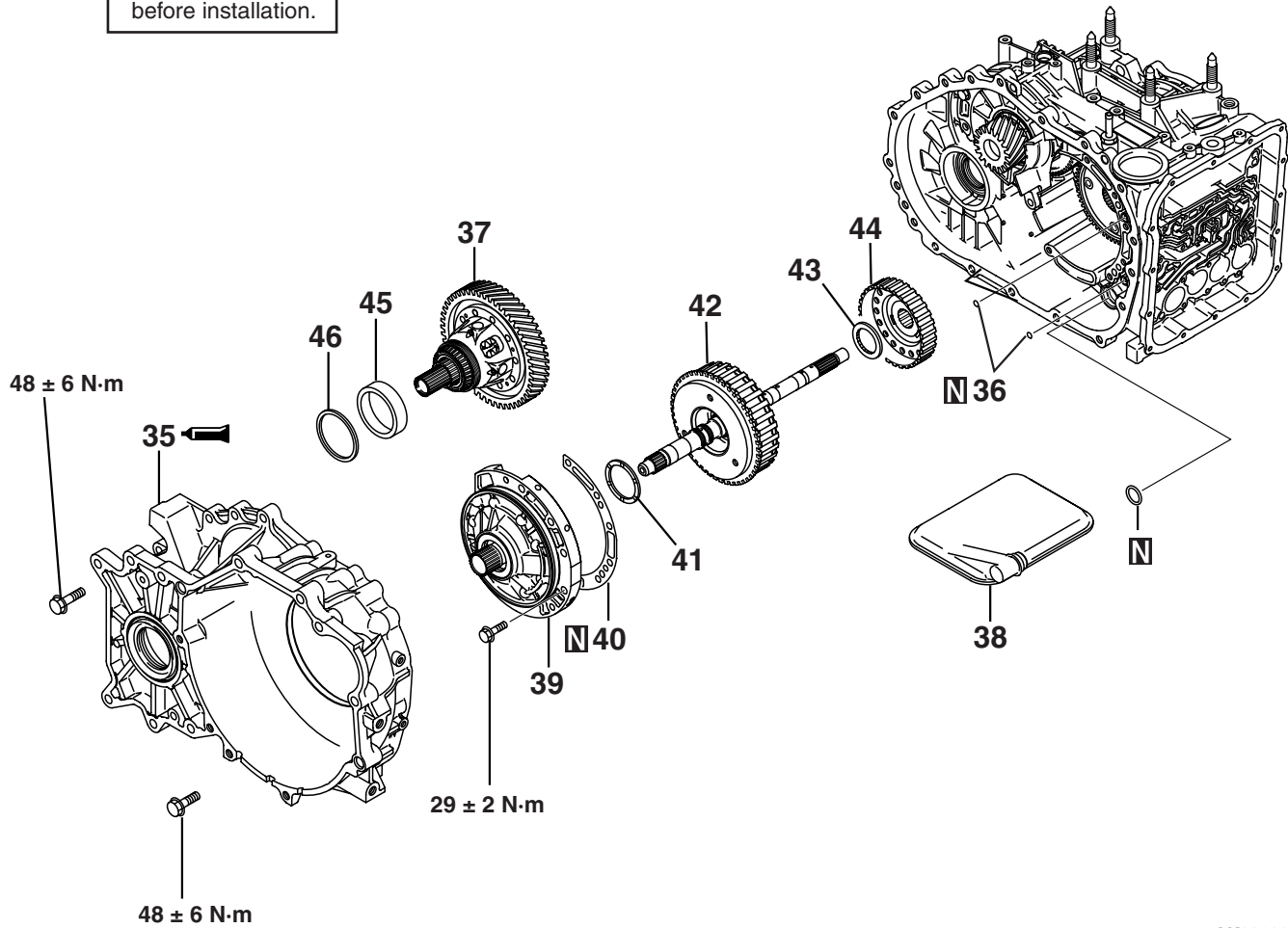
- |  |                                 |
|--|---------------------------------|
| 1. Transfer  | 11. Oil level gauge             |
| 2. O-ring  | 12. Eye bolt                    |
| 3. Torque converter                                    | 13. Oil cooler feed tube        |
| 4. Roll stopper bracket, front                         | 14. Air breather                |
| 5. Roll stopper bracket, rear <R. H. drive vehicles>   | 15. Input shaft speed sensor    |
| 6. Roll stopper bracket, rear <L. H. drive vehicles>   | 16. Output shaft speed sensor   |
| 7. Roll stopper bracket adapter <L. H. drive vehicles> | 17. Manual control lever        |
| 8. Harness bracket                                     | 18. Inhibitor switch            |
| 9. Harness bracket                                     | 19. Valve body cover            |
| 10. Control cable support bracket                      | 20. Manual control shaft detent |



AK602666AB

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| 21. Valve body                     | 28. Accumulator piston                |
| 22. Steel ball                     | 29. Accumulator spring                |
| 23. Gasket                         | 30. Accumulator spring                |
| 24. Snap ring                      | 31. Manual control lever shaft roller |
| 25. Solenoid valve harness         | 32. Parking pawl rod                  |
| 26. Strainer                       | 33. O-ring                            |
| 27. Second brake retainer oil seal | 34. Manual control lever shaft        |

Apply automatic transmission fluid to all moving parts before installation.



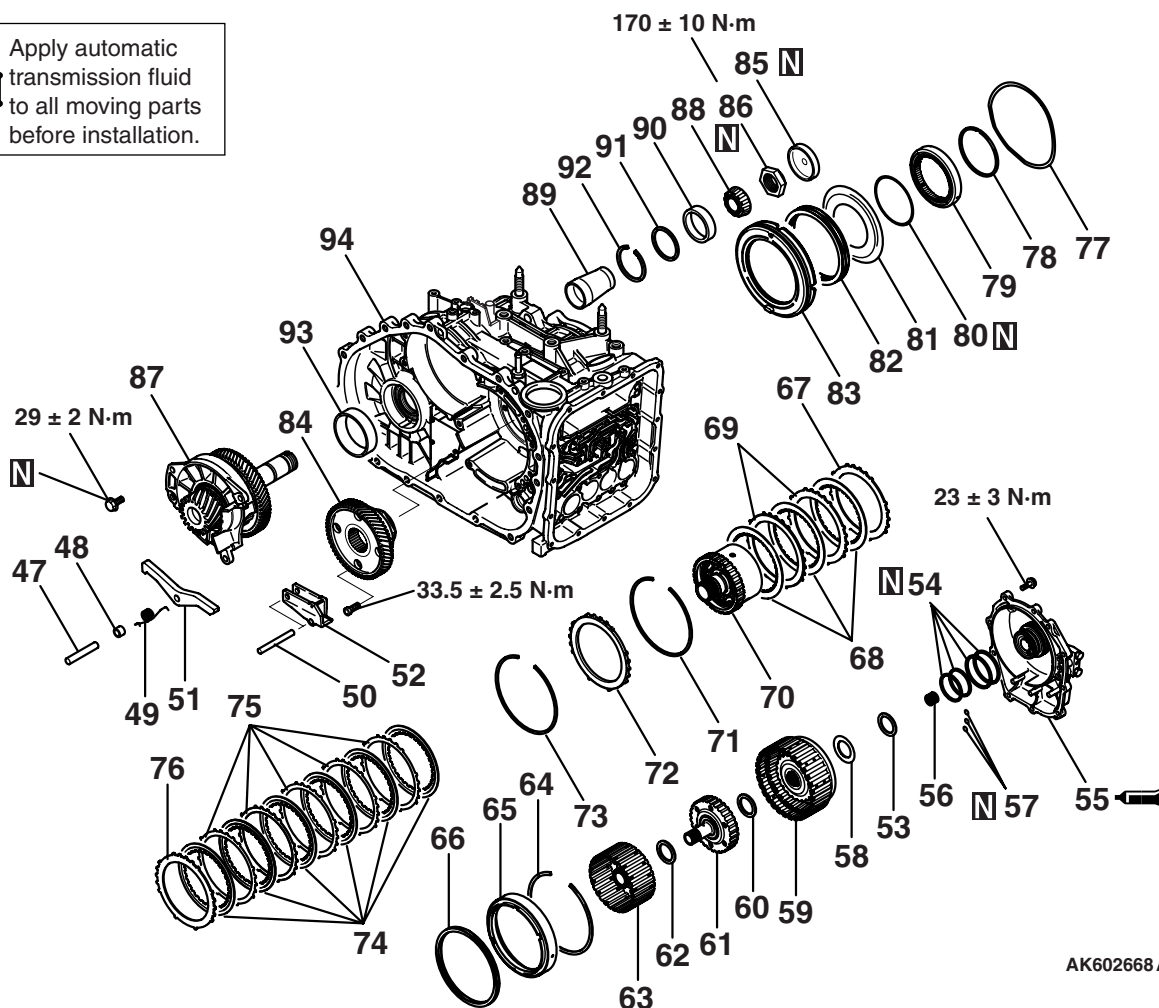
- 35. Converter housing
- 36. O-ring
- 37. Center differential
- 38. Oil filter
- 39. Oil pump
- 40. Gasket

- 41. Thrust washer #1
- 42. Underdrive clutch and input shaft
- 43. Thrust bearing #2
- 44. Underdrive clutch hub
- 45. Outer race
- 46. Spacer

AK602667AB



Apply automatic transmission fluid to all moving parts before installation.



AK602668 AB

- 47. Parking pawl shaft
- 48. Spacer
- 49. Parking pawl spring
- 50. Parking roller support shaft
- 51. Parking pawl
- 52. Parking roller support
- 53. Thrust race #8
- 54. Seal ring
- 55. Rear cover
- 56. Input shaft rear bearing
- 57. O-ring
- 58. Thrust bearing #7
- 59. Reverse and overdrive clutch
- 60. Thrust bearing #6
- 61. Overdrive clutch hub
- 62. Thrust bearing #5
- 63. Planetary reverse sun gear
- 64. Snap ring
- 65. Second brake
- 66. Return spring
- 67. Pressure plate
- 68. Second brake disc
- 69. Second brake plate
- 70. Planetary gear

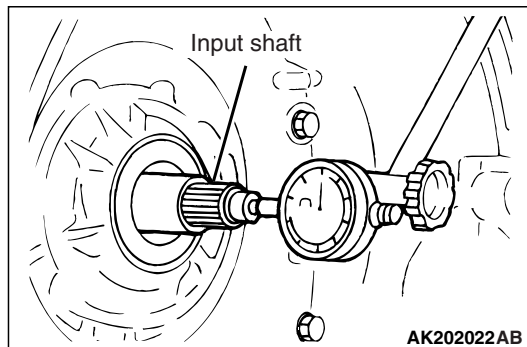
- 71. Snap ring
- 72. Reaction plate
- 73. Snap ring
- 74. Low-reverse brake disc
- 75. Low-reverse brake plate
- 76. Pressure plate
- 77. Wave spring
- 78. Snap ring
- 79. One-way clutch inner race
- 80. O-ring
- 81. Spring retainer
- 82. Return spring
- 83. Low-reverse brake
- 84. Transfer drive gear
- 85. Cap
- 86. Lock nut
- 87. Output shaft
- 88. Taper roller bearing
- 89. Collar
- 90. Outer race
- 91. Spacer
- 92. Snap ring
- 93. Outer race
- 94. Transmission case

## DISASSEMBLY

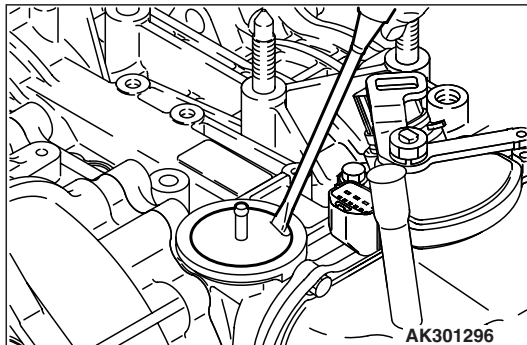
**⚠ CAUTION**

- 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.

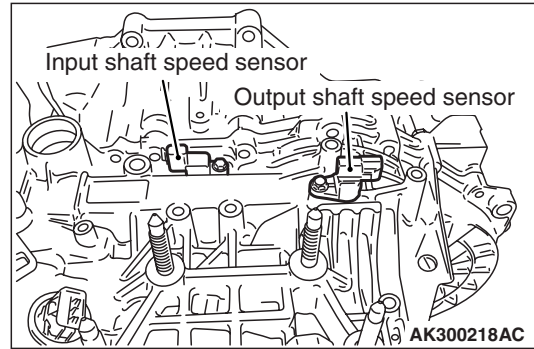
1. Remove the transfer and O-ring.
2. Remove the torque converter.



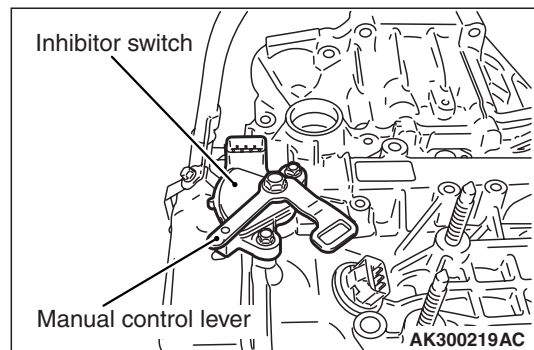
3. Use a dial gauge to measure the input shaft end play.
4. Remove each bracket.
5. Remove the oil level gauge.
6. Remove the oil cooler feed tube.



7. Remove the air breather.

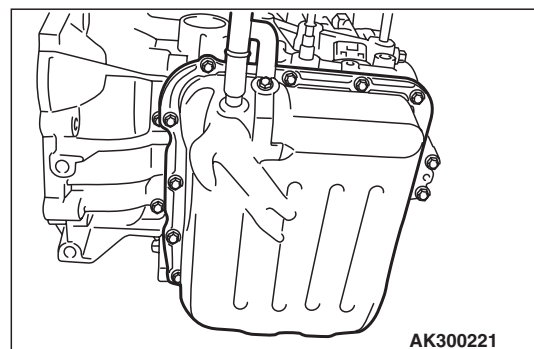


8. Remove the input shaft speed sensor and output shaft speed sensor.

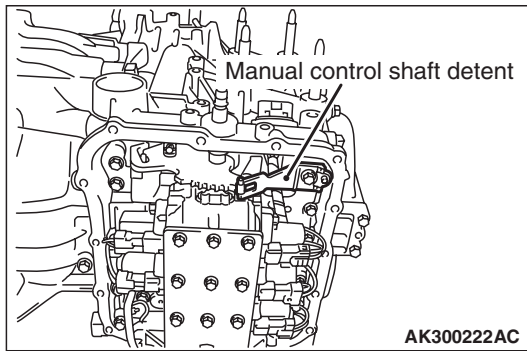
**⚠ CAUTION**

Be sure to remove the manual control lever mounting nut before removing the valve body. If the removal sequence is reversed, the inhibitor switch could be broken.

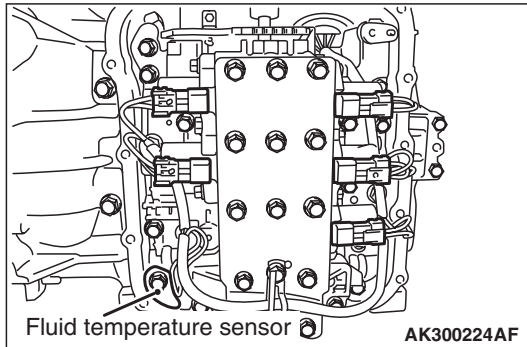
9. Remove the manual control lever, then remove the inhibitor switch.



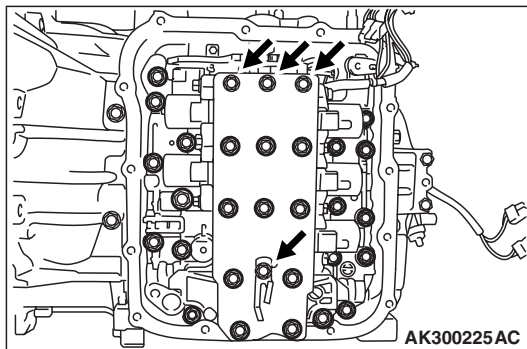
10. Remove the valve body cover.



11.Remove the manual control shaft detent.



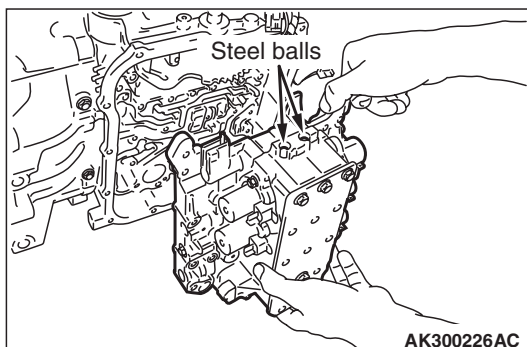
12.Disconnect the solenoid valve harness from the valve body by undoing the fluid temperature sensor and all the connectors.



**CAUTION**

**Do not remove the bolts (four pieces) shown in the illustration.**

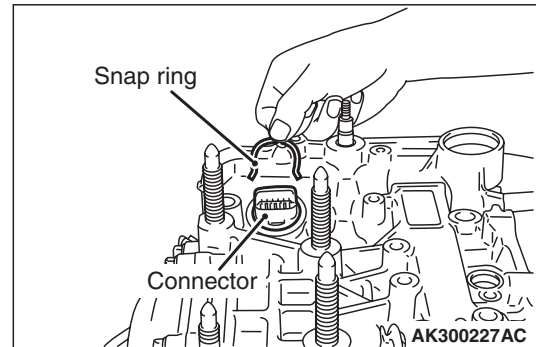
13.Remove the valve body mounting bolts (twenty seven pieces).



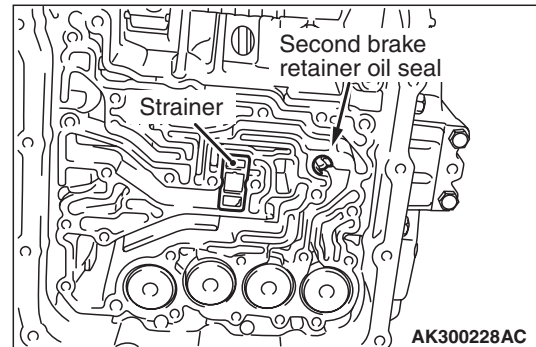
**CAUTION**

**Be careful not to lose the steel balls (two pieces).**

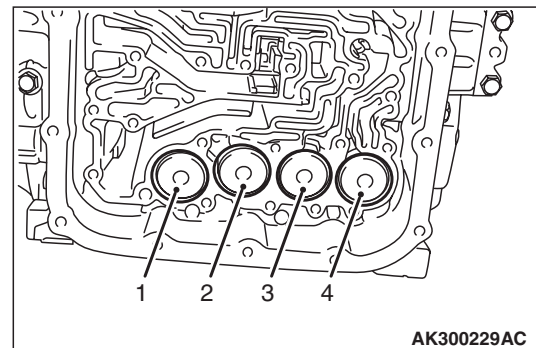
14.Remove the valve body, gasket and the steel balls (two pieces).



15.Remove the snap ring from the connector, then push the connector into the transmission case to remove the solenoid valve harness.



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

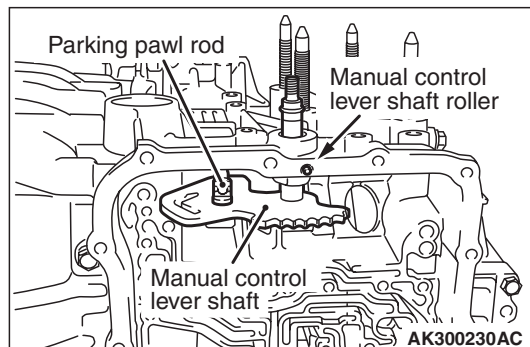


17.Remove the accumulator pistons and their springs.

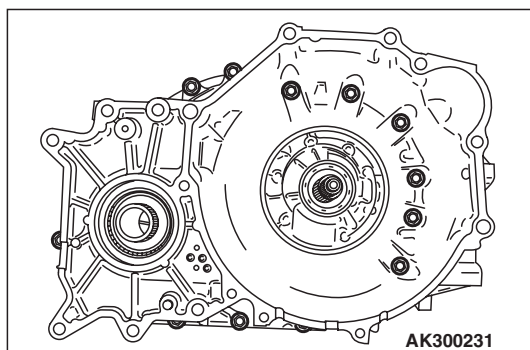
No.	Accumulator
1	For low-reverse brake
2	For underdrive clutch
3	For second brake
4	For overdrive clutch

*NOTE: Put tags to the removed accumulator pistons and springs so that you will be able to re-install them in the correct positions.*

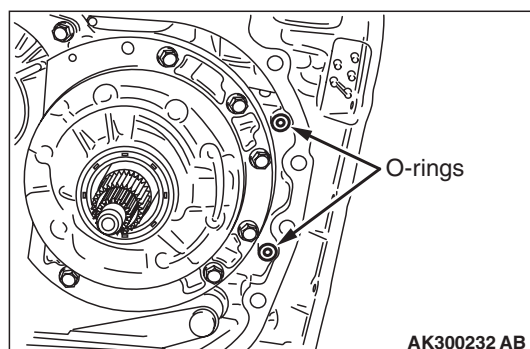
18. Remove the manual control lever shaft roller.



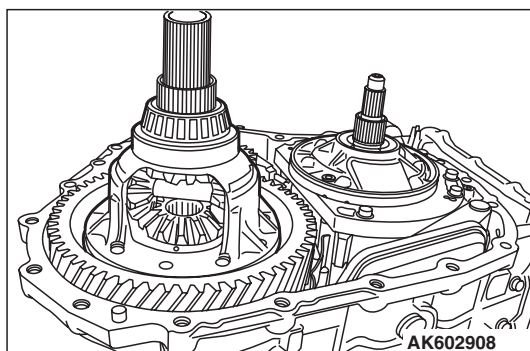
19. Remove the manual control lever shaft and the parking pawl rod.



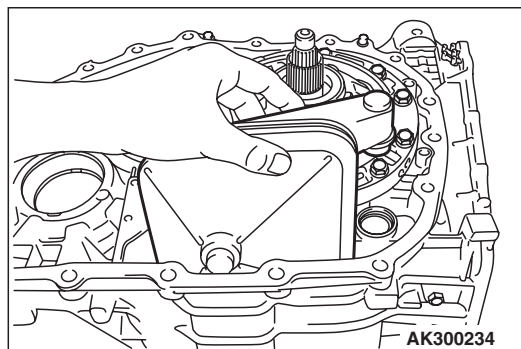
20. Remove the converter housing mounting bolts, then remove the converter housing.



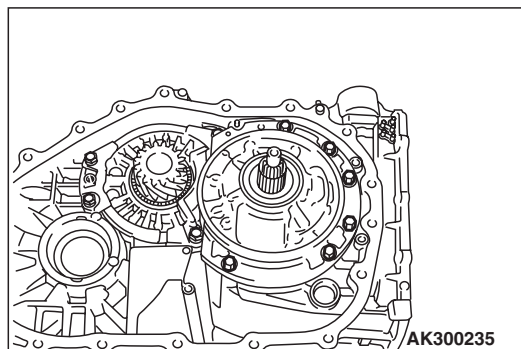
21. Remove the O-rings (two pieces).



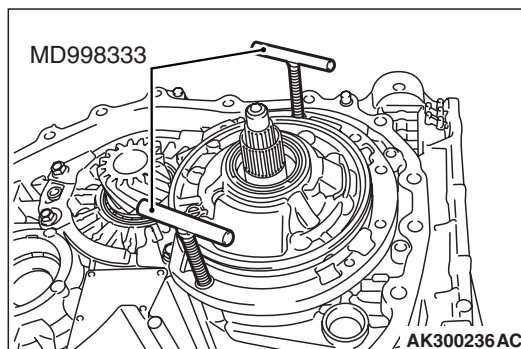
22. Remove the center differential.



23. Remove the oil filter.



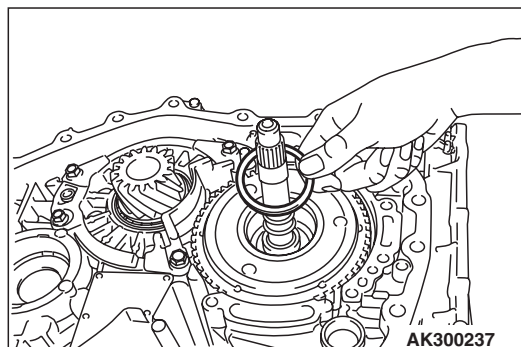
24. Remove the oil pump mounting bolts.



25. Use special tool oil pump remover (MD998333) in position shown in the drawing.

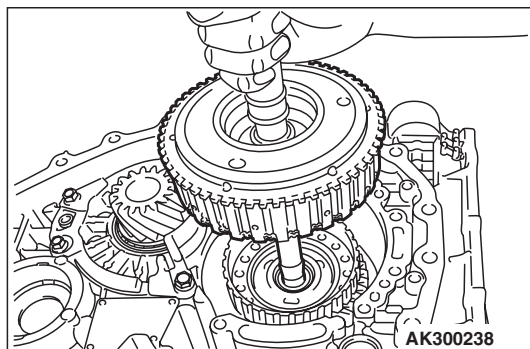
26. Screw the special tools Oil pump remover (MD998333) evenly to remove the oil pump.

27. Remove the oil pump gasket.

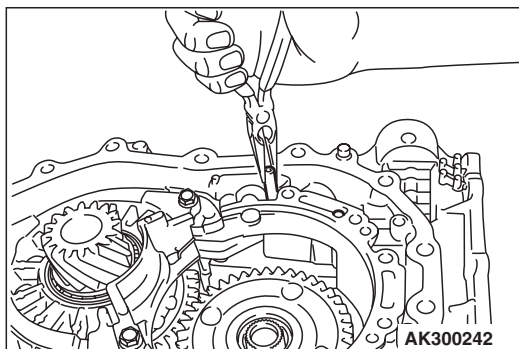


28. Remove the thrust washer #1.

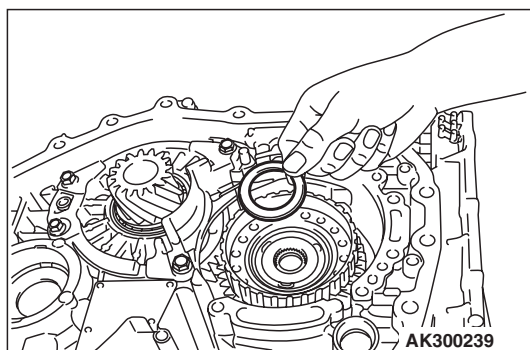




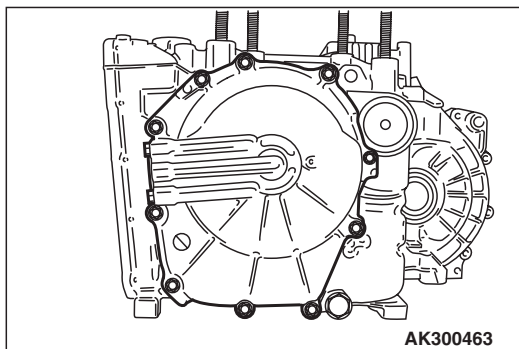
29. Holding the input shaft, remove the underdrive clutch and input shaft.



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



30. Remove the thrust bearing #2.

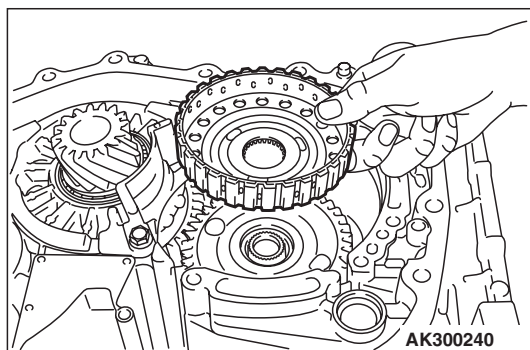


34. Remove the rear cover.

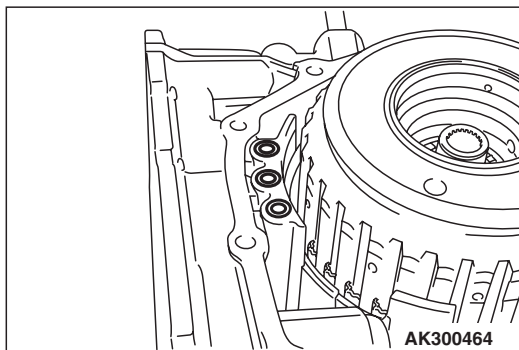
35. Remove the thrust race #8.

36. Remove the seal rings (four pieces).

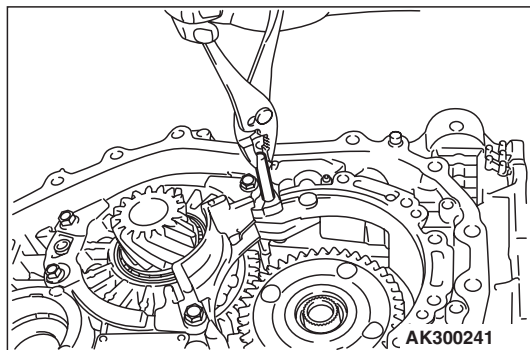
37. Remove the input shaft rear bearing.



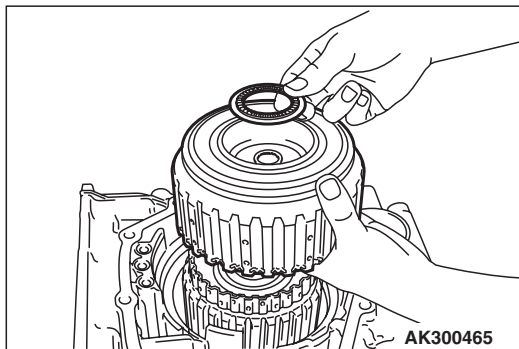
31. Remove the underdrive clutch hub.



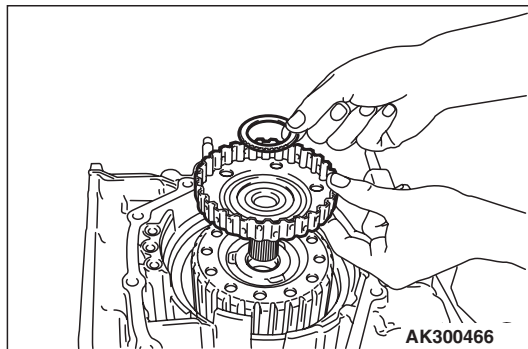
38. Remove the O-rings (three pieces).



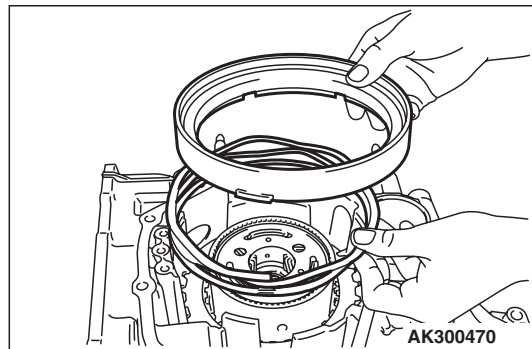
32. Pull out the parking pawl shaft, then remove the spacer and spring.



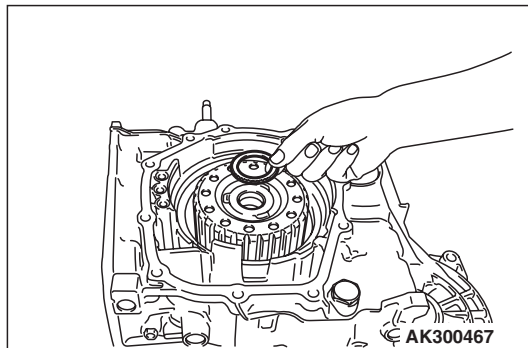
39. Remove the reverse and overdrive clutch and the thrust bearing #7.



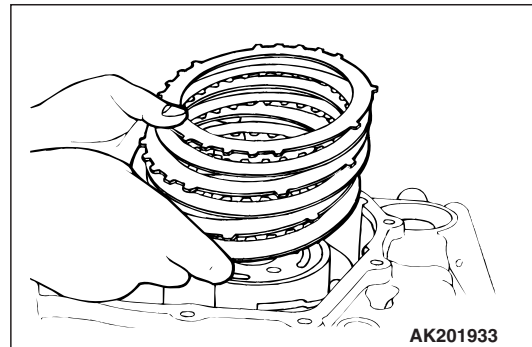
40. Remove the overdrive clutch hub and thrust bearing #6.



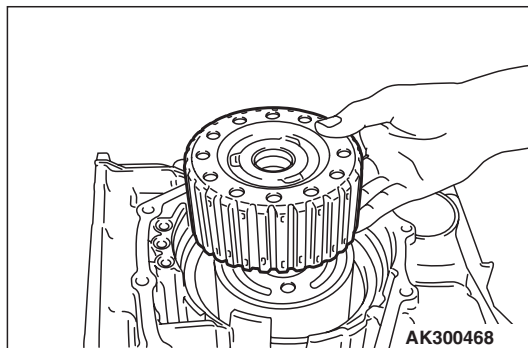
44. Remove the second brake and return spring.



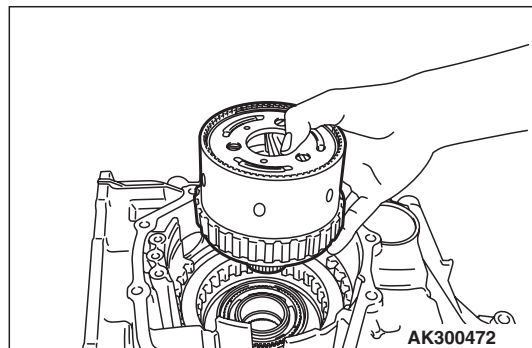
41. Remove the thrust bearing #5.



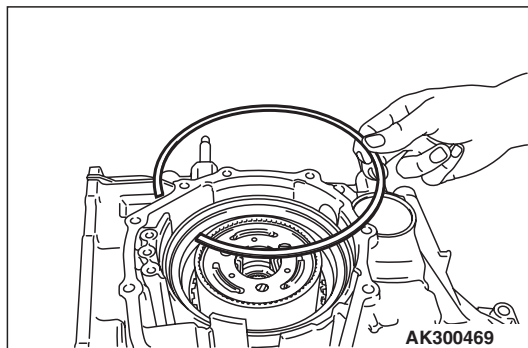
45. Remove the pressure plate, brake discs (three pieces) and brake plates (two pieces).



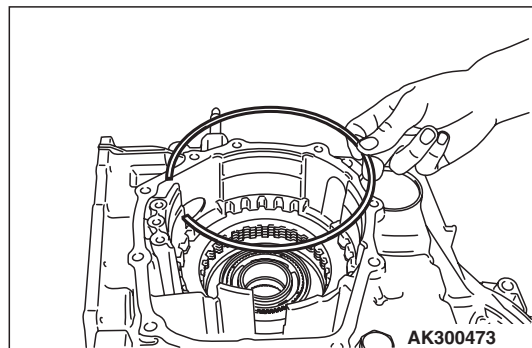
42. Remove the planetary reverse sun gear.



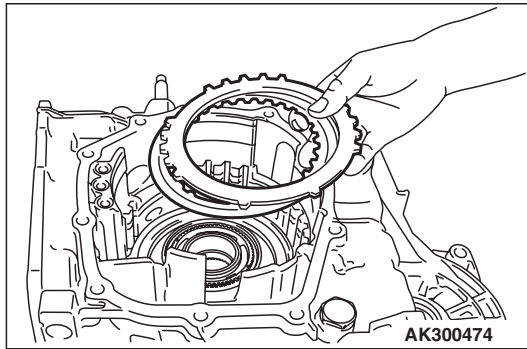
46. Remove the planetary carrier assembly.



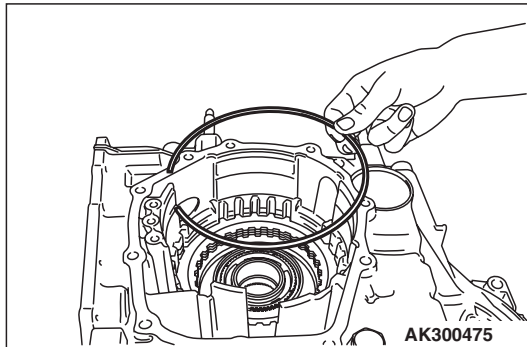
43. Remove the snap ring.



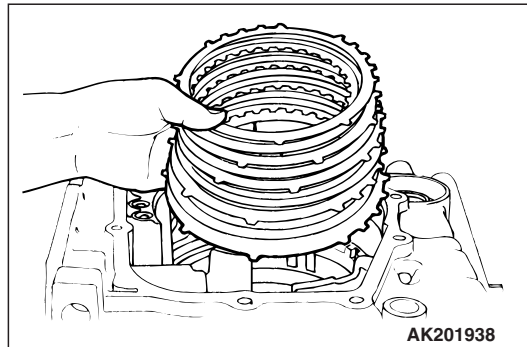
47. Remove the snap ring.



48. Remove the reaction plate and brake disc.

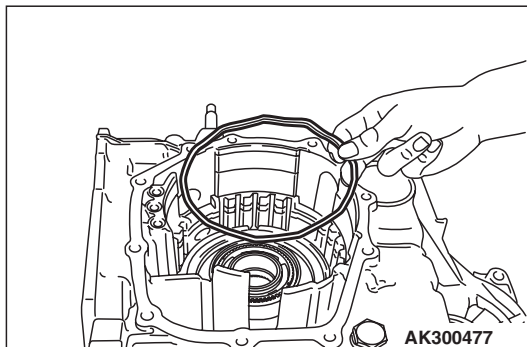


49. Remove the snap ring.

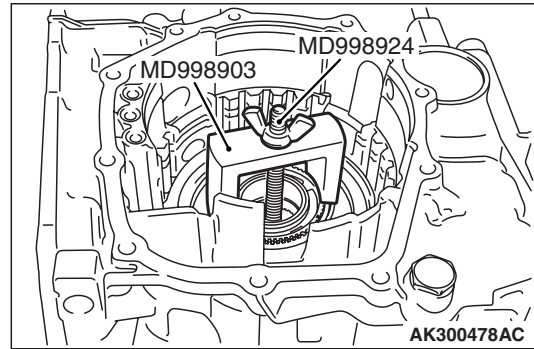


50. Remove the brake plates (five pieces), brake discs (six\* pieces) and pressure plate.

*NOTE: \*Includes the brake discs removed in step 49.*



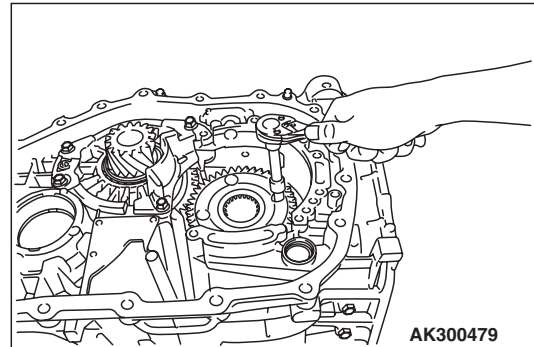
51. Remove the wave spring.



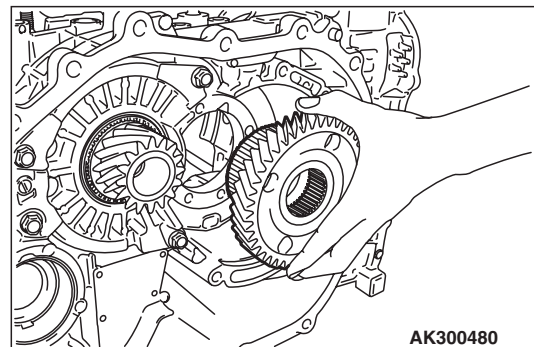
52. Use the special tools to press down the one-way clutch inner race, then remove the snap ring.

- Spring compressor (MD998903)
- Spring compressor retainer (MD998924)

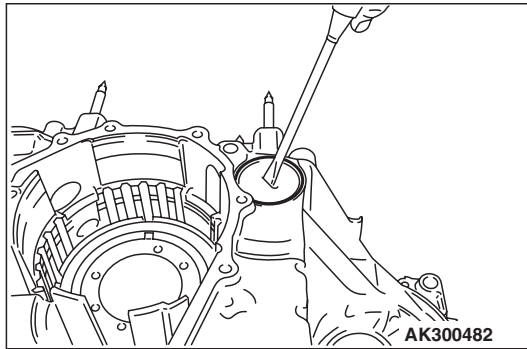
53. Remove the one-way clutch inner race, O-ring, spring retainer, return spring, and low-reverse brake.



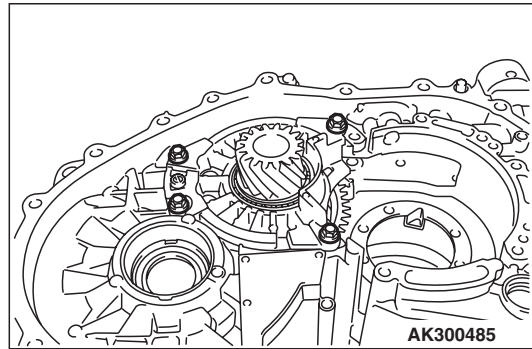
54. Remove the four or three of the transfer drive gear mounting bolts. Then turn the gear 1/8 of a turn (45°) and remove the remaining three or four bolts.



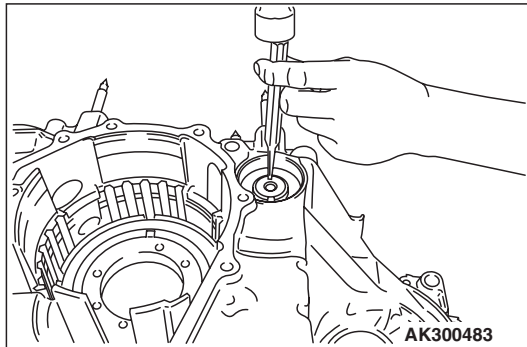
55. Remove the transfer drive gear.



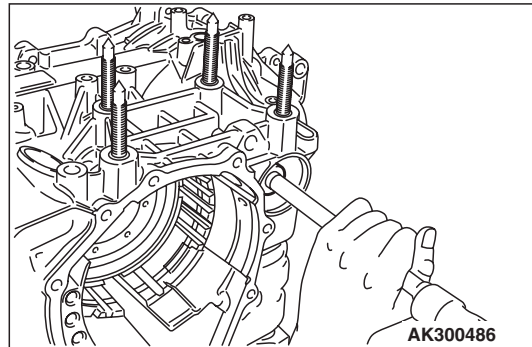
56. Remove the cap.



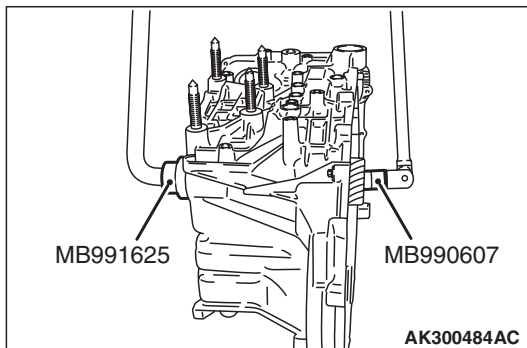
59. Remove the bearing retainer mounting bolts.



57. Unbend the locking tab of the output shaft lock nut.



60. Remove the output shaft, taper roller bearing, and collar by striking the rear end of the output shaft.

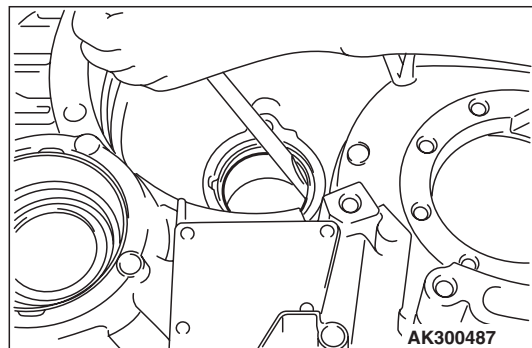


**CAUTION**

The lock nut thread is left-handed.

58. Use the special tools to remove the output shaft lock nut.

- Special socket (MB991625)
- Torque wrench socket (MB990607)



61. Remove the spacer and outer race.

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

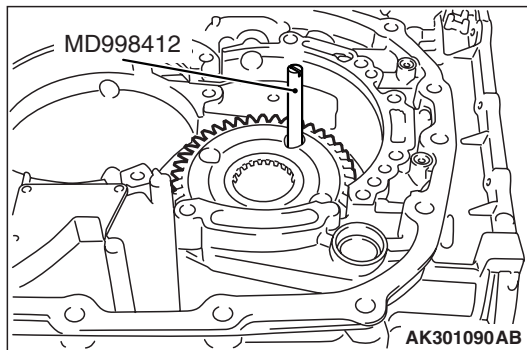
63. Remove the center differential bearing outer race from the transmission case.



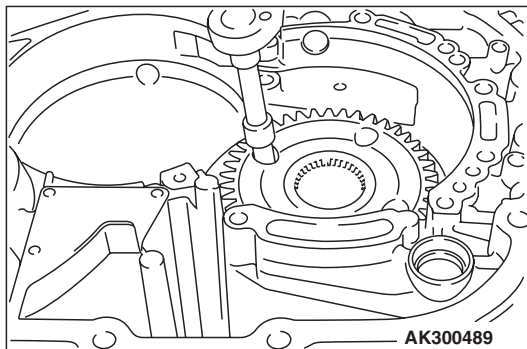
## REASSEMBLY

### **⚠ CAUTION**

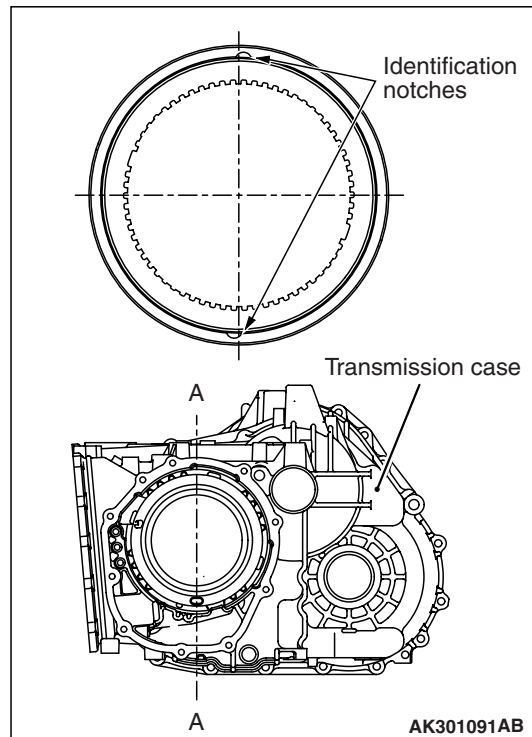
- Never reuse any gasket, O-ring, and oil seal. Always replace them with new ones.
- Never use any product other than blue petroleum jelly or white Vaseline to lubricate or hold parts during assembly.
- Apply ATF to friction elements, rotating parts, and sliding parts before installation. Soak new clutch 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.



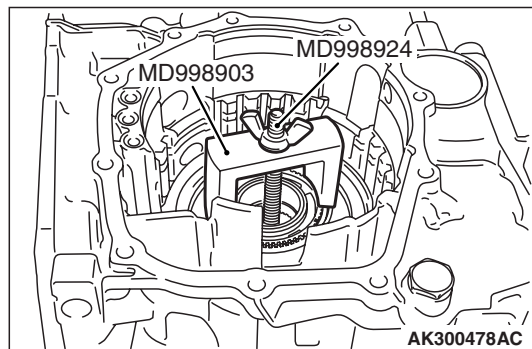
1. Use the special tool Guide (MD998412) to install the transfer drive gear.



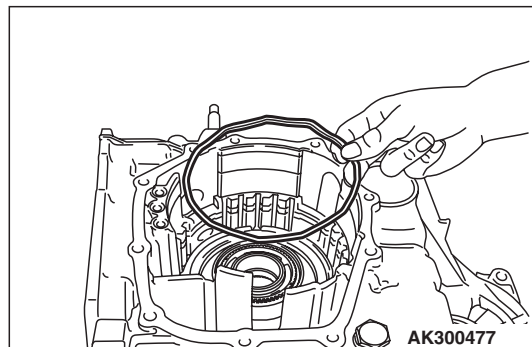
2. Tighten the transfer drive gear mounting bolts to the specified torque of  $33.5 \pm 2.5$  N·m.
3. Install the low-reverse brake piston, return spring and spring retainer.
4. Fit a new O-ring in the groove in the one-way clutch inner race.



5. Locate the identification notches on the one-way clutch inner race, then install the one-way clutch inner race in the transfer drive gear bearing with the notches aligned with the A-A line as shown in the drawing.



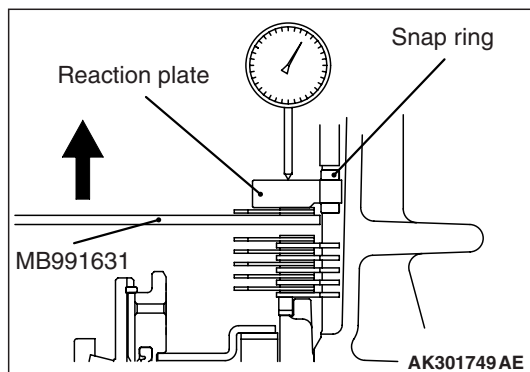
6. Use the special tools to hold down the one-way clutch inner race, then fit the snap ring in position.
  - Spring compressor retainer (MD998924)
  - Spring compressor (MD998903)



7. Install the wave spring on the low-reverse brake piston.
8. Install the brake discs (six pieces), brake plates (five pieces), and snap ring for the low-reverse brake.

*NOTE: Do not install the pressure plate yet.*

9. Install the special tool on the stack of the brake discs.
10. Install the reaction plate and the snap ring that was removed during disassembly.

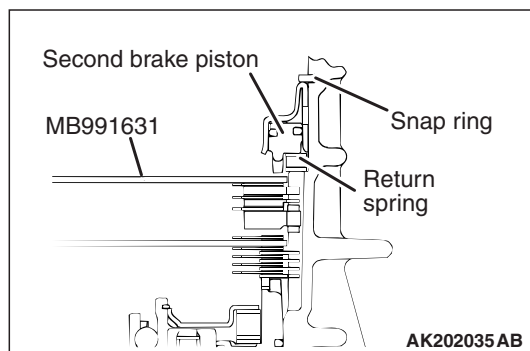


11. Move up the special tool Clearance dummy plate (MB991631) to check whether the end play of the reaction plate is within the standard value range. If necessary, remove the snap ring that has been installed in step 10 and install another appropriate snap ring.

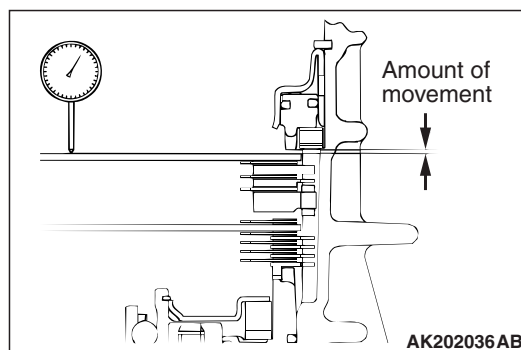
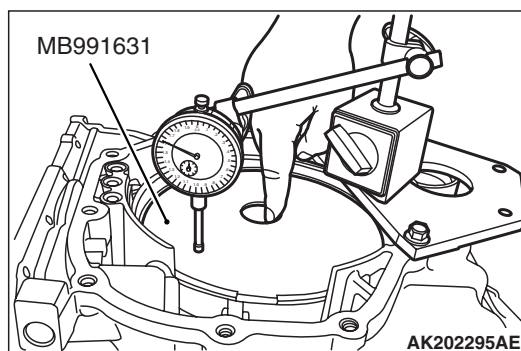
**Standard value: 0 – 0.16 mm**

12. Install the brake discs (three pieces) and brake plates (two pieces) for the second brake.

*NOTE: Do not install the pressure plate yet.*



13. Install the special tool Clearance dummy plate (MB991631).
14. Install the return spring, second brake piston, and snap ring.



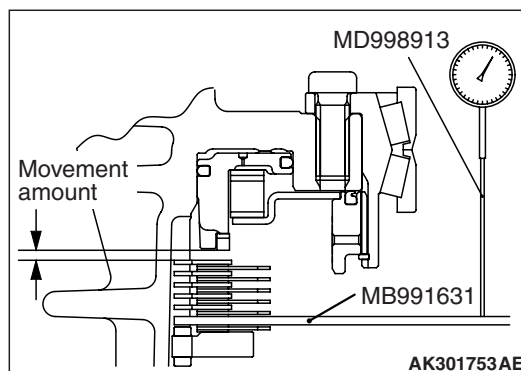
15. Move the special tool Clearance dummy plate (MB991631) to measure the amount of movement. Select a pressure plate whose thickness corresponds to the measured amount of movement from the following table.

**Standard value (reference): 0.79 – 1.25 mm**

**Available pressure plates**

Amount of movement mm	Thickness mm	Identification symbol
0.6 – 0.8	1.6	L
0.8 – 1.0	1.8	1
1.0 – 1.2	2.0	0
1.2 – 1.4	2.2	2
1.4 – 1.6	2.4	4
1.6 – 1.8	2.6	6

16. Turn the transmission upside down.



17. Move the special tool Clearance dummy plate (MB991631) and measure the amount of movement using a dial gauge fitted with the special tool Dial gauge extension (MD998913). Select a pressure plate whose thickness corresponds to the measured amount of movement from the following table.

**Standard value of low-reverse brake end play (reference): 1.65 – 2.11 mm**

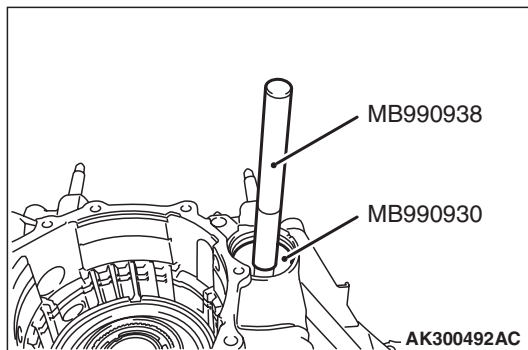
**Available pressure plates**

Amount of movement mm	Thickness mm	Identification mark
1.3 – 1.5	1.6	L
1.5 – 1.7	1.8	1
1.7 – 1.9	2.0	0
1.9 – 2.1	2.2	2
2.1 – 2.3	2.4	4
2.3 – 2.5	2.6	6
2.5 – 2.7	2.8	8
2.7 – 2.9	3.0	D

18. Remove all the parts has been installed in steps 7 through 17.

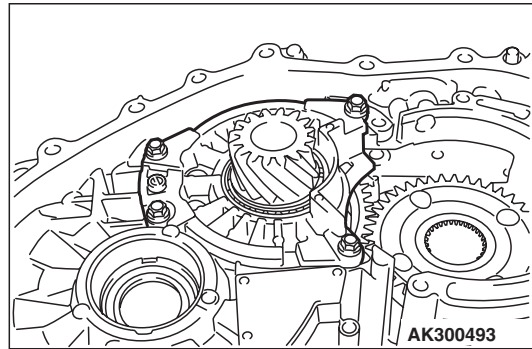
19. Install the snap ring in the groove formed in the output shaft hole in the transmission case.

20. Install the thinnest spacer (thickness: 1.88 mm) for adjusting the output shaft preload.



21. Use the special tool to drive the output shaft bearing outer race into the transmission case.

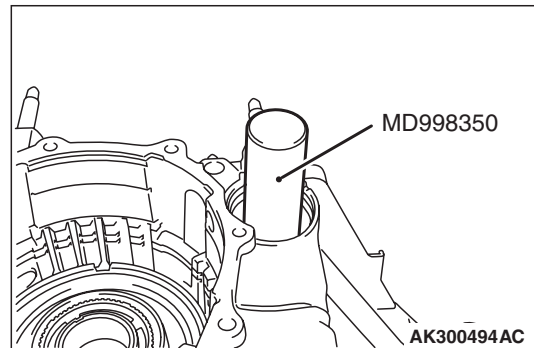
- Installer adapter (MB990930)
- Handle (MB990938)



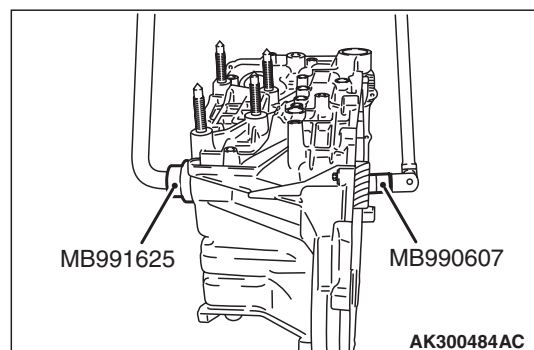
**⚠ CAUTION**

**Do not reuse the output shaft bearing retainer mounting bolts as they are pre-coated with a sealant.**

22. Install the output shaft bearing retainer mounting bolts and tighten them to the specified torque of  $29 \pm 2$  N·m.



23. Use the special tool Bearing installer (MD998350) to install the collar and taper roller bearing on the output shaft.

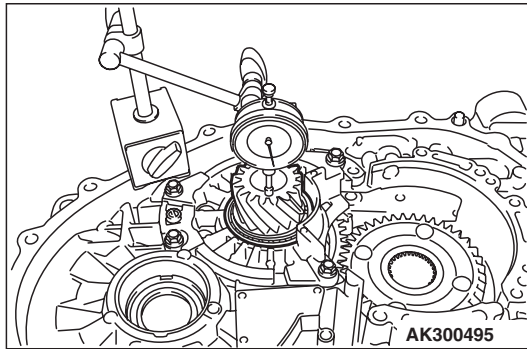


**⚠ CAUTION**

**The lock nut thread is left-handed.**

24. Apply ATF to a new lock nut, and use the special tool to tighten the lock nut to the specified torque of  $170 \pm 10$  N·m. Then loosen the nut one turn, then tighten it again to the specified torque of  $170 \pm 10$  N·m.

- Torque wrench socket (MB990607)
- Special socket (MB991625)

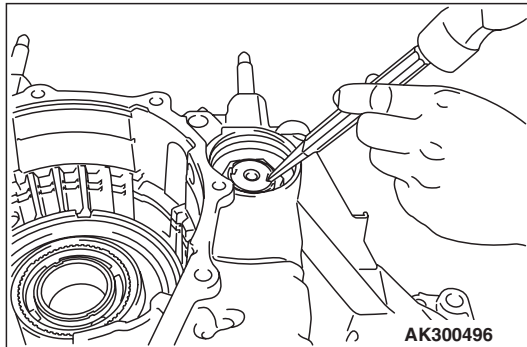


25. Move the output shaft and to measure the amount of movement; record the measurement.

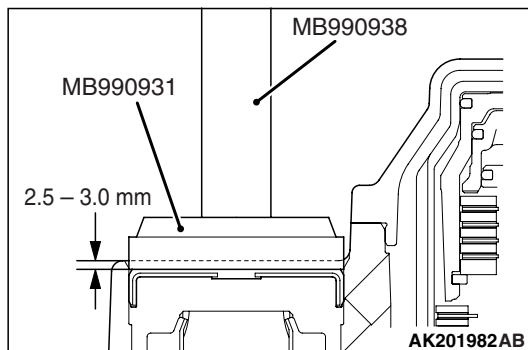
26. Remove all the parts having installed in steps 20 through 24.

27. Select and install a spacer whose thickness is equivalent to the sum of the measurement recorded in step 25, 1.88 mm (the thickness of the spacer installed in step 20.), and an amount between 0.01 and 0.09 mm (output shaft preload).

28. Repeat steps 21 through 24 to reinstall the parts.

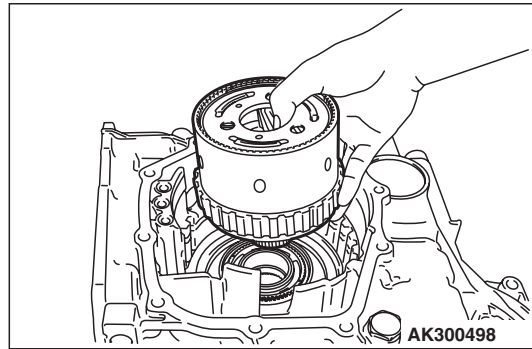


29. Stake the lock nut (at two places).

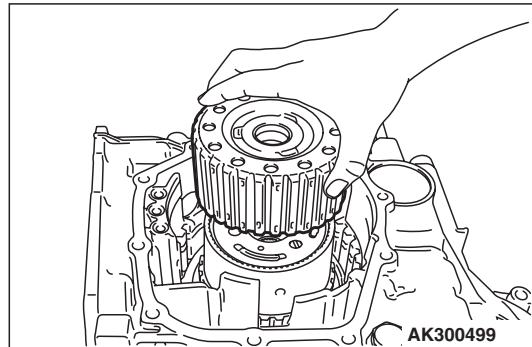


30. Use the special tools to install the cap as shown in the drawing.

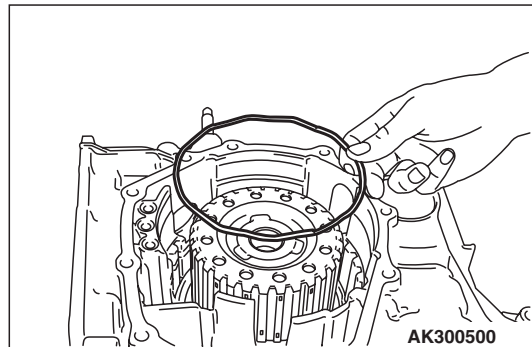
- Installer adapter (MB990931)
- Handle (MB990938)



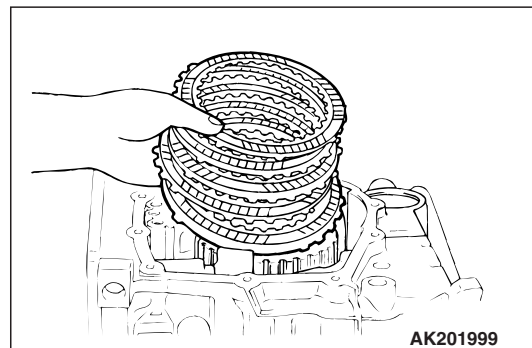
31. Install the planetary carrier assembly.



32. Install the planetary reverse sun gear.

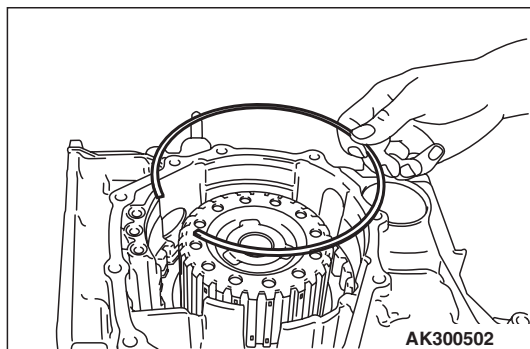


33. Install the wave spring on the low-reverse brake piston.

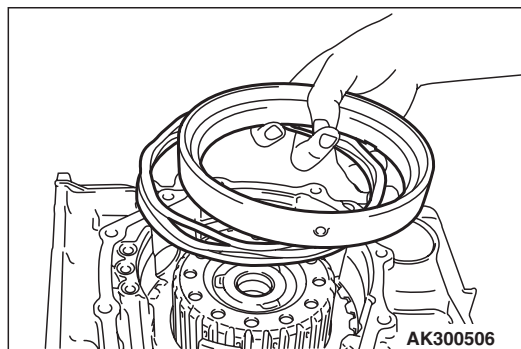


34. Install the pressure plate that has been selected in step 17. Then install the brake discs (six pieces) and brake plates (five pieces).

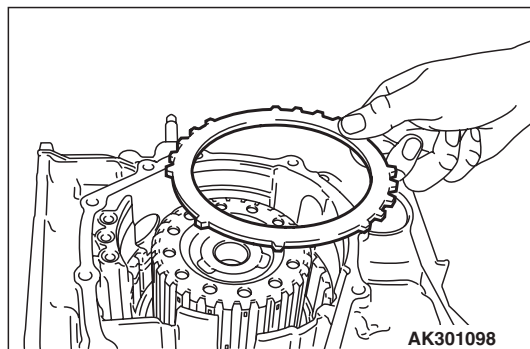




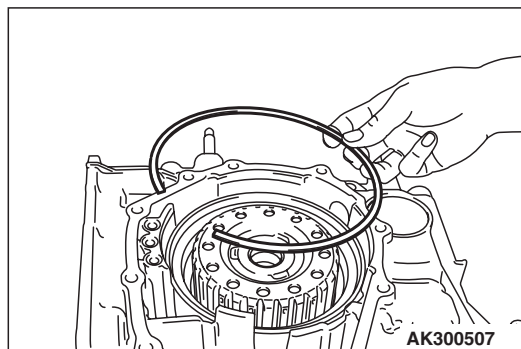
35. Install the snap ring.



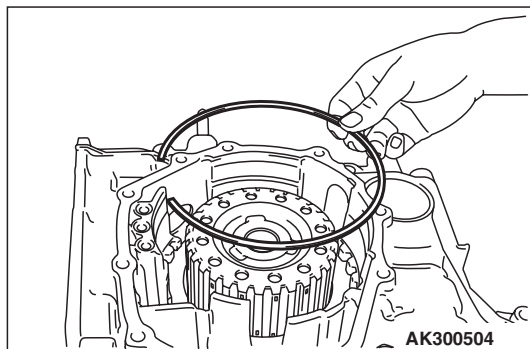
39. Install the return spring and second brake.



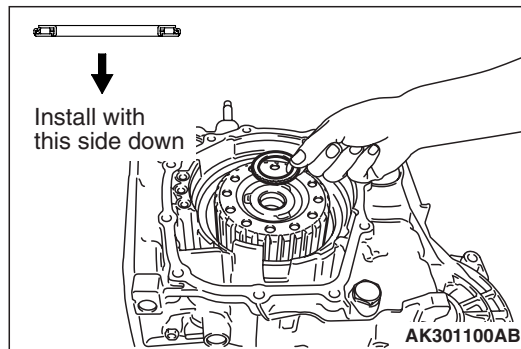
36. Install the reaction plate.



40. Install the snap ring.



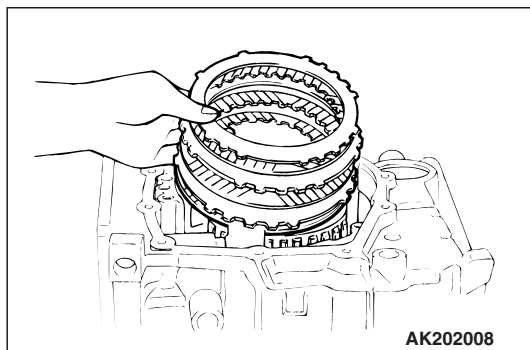
37. Install the snap ring that has been selected in step 11.



**⚠ CAUTION**

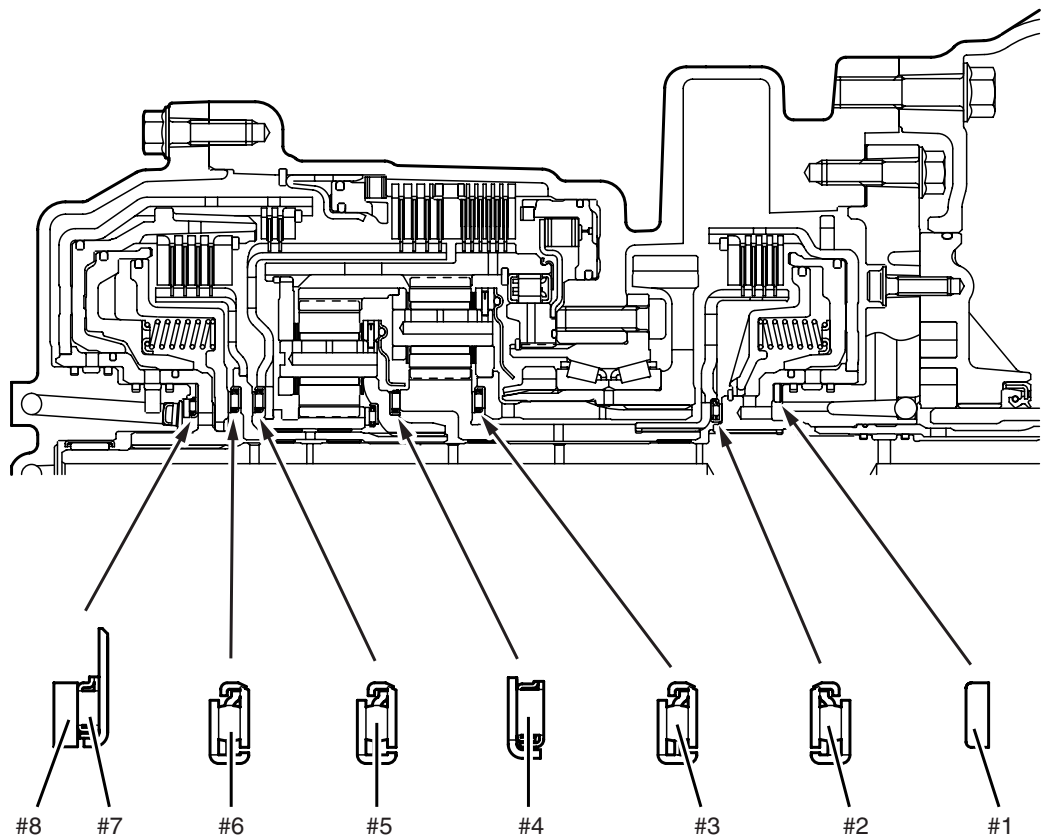
**Be sure to install the thrust bearing with the indicated side facing down.**

41. Install the thrust bearing #5.



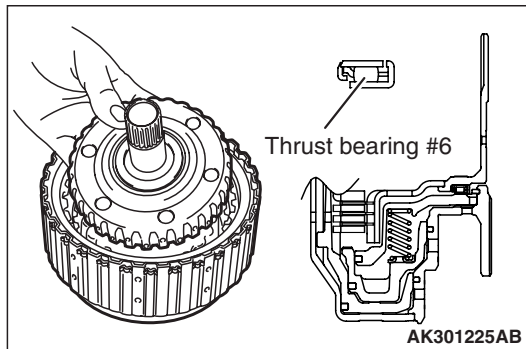
38. Install the brake discs (three pieces), brake plates (two pieces), and the pressure plate that has been selected in step 15.

IDENTIFICATION OF THRUST BEARINGS, THRUST RACES, AND THRUST WASHERS



AK202062AC

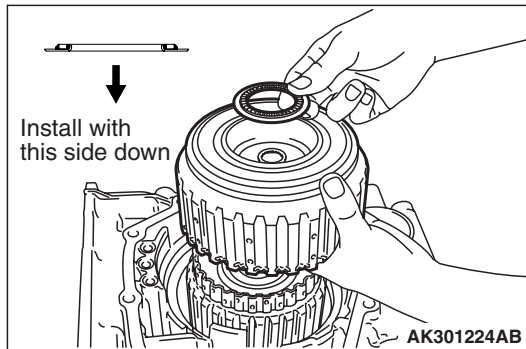
Symbol	O.D. mm	I.D. mm	Thickness mm	Symbol	O.D. mm	I.D. mm	Thickness mm
#1	59	47	1.8	#8	48.9	37	1.6
			2.0				1.7
			2.2				1.8
			2.4				1.9
			2.6				2.0
			2.8				2.1
#2	49	34	3.6				2.2
#3	49	34	3.6				2.3
#4	46	31	3.3				2.4
#5	49	34	3.6				2.5
#6	49	34	3.6				2.6
#7	59	37	2.8				



**⚠ CAUTION**

**Be sure to install the thrust bearing with the indicated side facing down.**

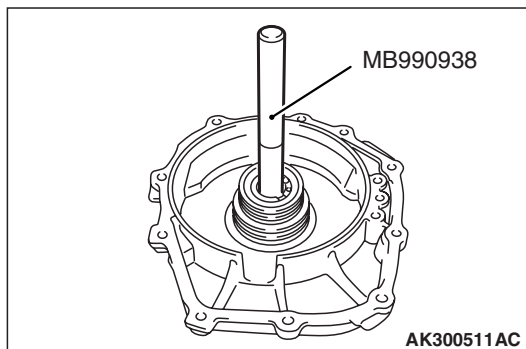
42. Install the overdrive clutch hub and thrust bearing #6 in the reverse and overdrive clutch.



**⚠ CAUTION**

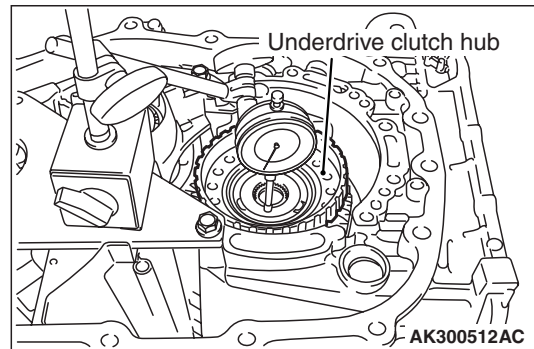
**Be sure to install the thrust bearing with the indicated side facing down.**

43. Install the reverse and overdrive clutch and thrust bearing #7.



44. Use the special tool Handle (MB990938) to press-fit the input shaft rear bearing into the rear cover.

45. Install the four seal rings.

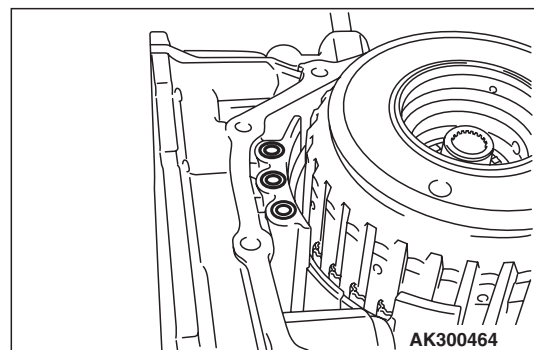


46. Measure the end play of the underdrive sun gear using the following procedure to select a thrust race #8 of proper thickness.

- (1) Install the thinnest thrust race #8 (thickness: 1.6 mm) on the thrust bearing #7.
- (2) Install the rear cover on the transmission and tighten the bolts to the specified torque of  $23 \pm 3$  N·m.
- (3) Turn the transmission upside down, thus making the torque converter housing mounting end face up.
- (4) Install the underdrive clutch hub on the underdrive sun gear.
- (5) Measure the end play of the underdrive sun gear and record the measurement.

**Standard value (reference): 0.25 – 0.45 mm**

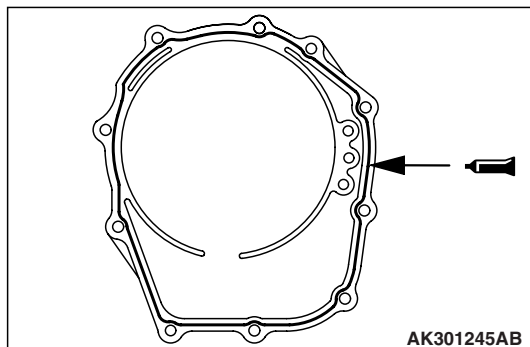
- (6) Remove all the parts installed in substeps (1) through (4).



47. Install the O-rings (three places).
48. Select a thrust race #8 whose thickness corresponds to the measurement recorded in substep (5) of step 46 from the table below and install the thrust race on the 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

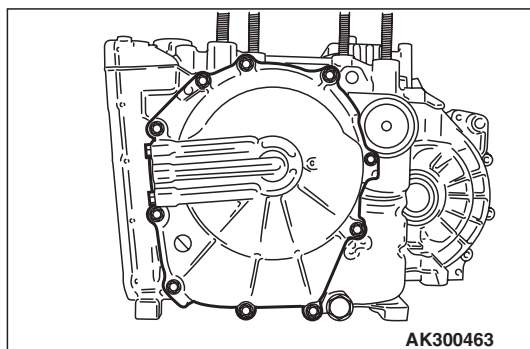
Measurement mm	Thickness mm
0.7 – 0.8	2.0
0.8 – 0.9	2.1
0.9 – 1.0	2.2
1.0 – 1.1	2.3
1.1 – 1.2	2.4
1.2 – 1.3	2.5
1.3 – 1.4	2.6



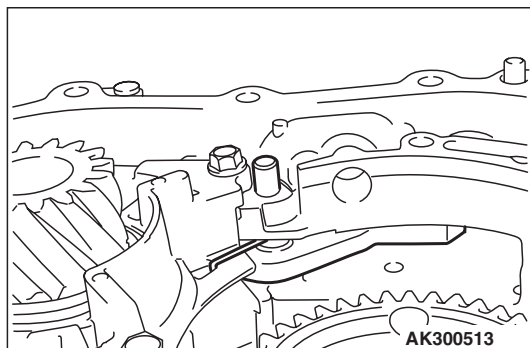
49. Apply an approx. 1.6 mm diameter bead of form-in-place gasket (FIPG) to the rear cover along its circumference as shown in the drawing.

**Specified sealant:**

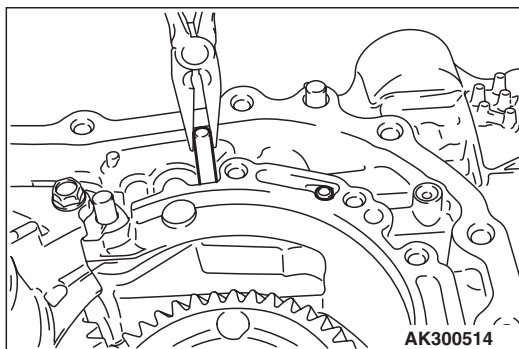
**Mitsubishi genuine sealant Part No. MD974421 or equivalent**



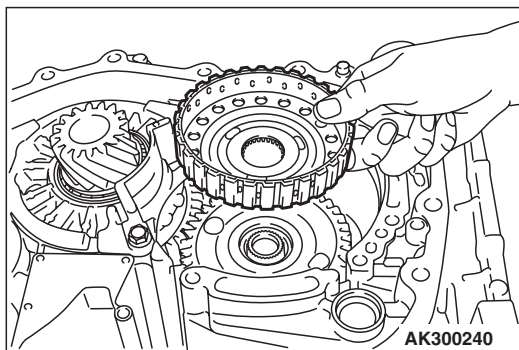
50. Install the rear cover and tighten its mounting bolts to the specified torque of  $23 \pm 3$  N·m.



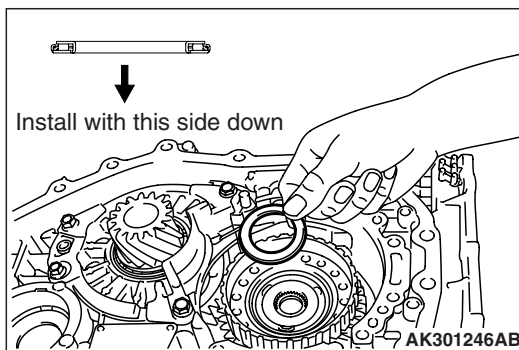
51. Install the parking pawl, spacer and spring in position, then install the parking pawl shaft.



52. Install the parking roller support, then install the two parking roller support shafts.



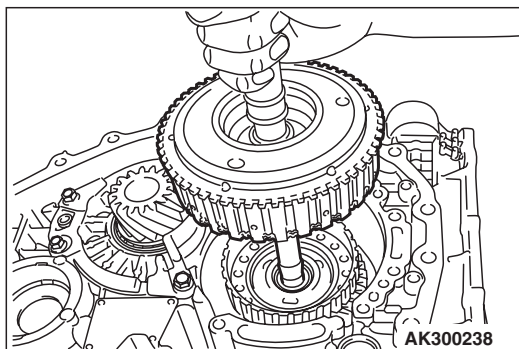
53. Install the underdrive clutch hub.



**CAUTION**

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

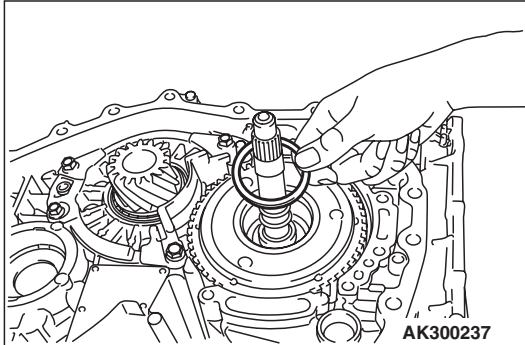
54. Install the thrust bearing #2.



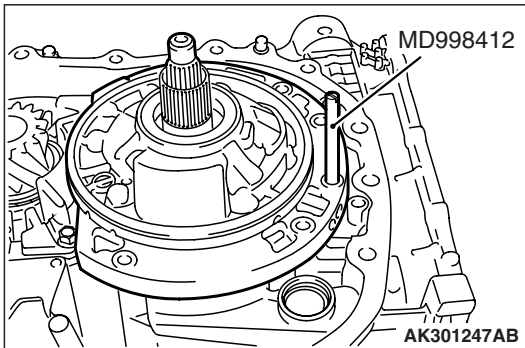
55. Install the underdrive clutch holding the input shaft.



56. 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-37](#))



57. Install thrust washer #1 that was selected in step 56 on the underdrive clutch retainer.

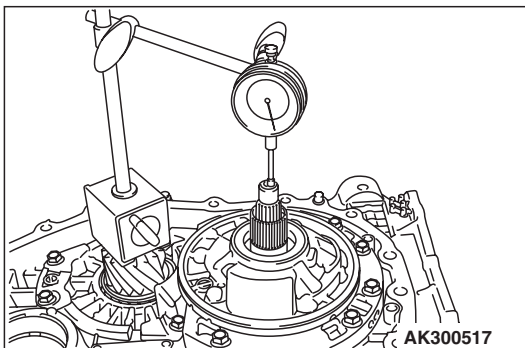


**CAUTION**

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

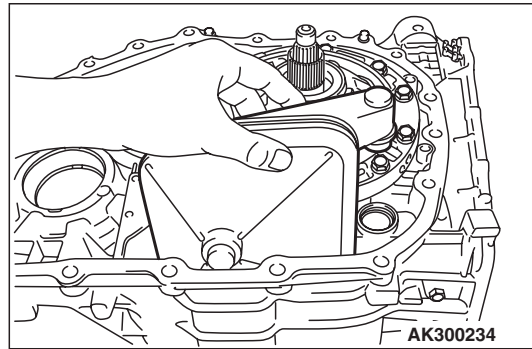
58. Use the special tool Guide (MD998412) to install a new oil pump gasket and the oil pump.

59. Tighten the oil pump mounting bolts to the specified torque of  $29 \pm 2$  N·m.

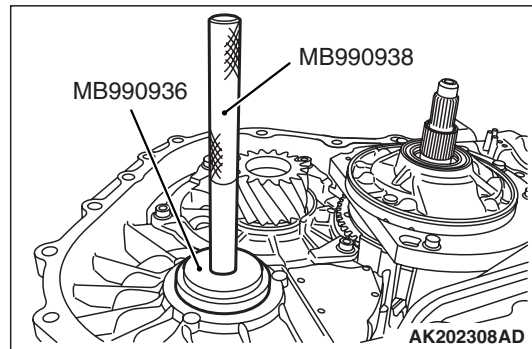


60. Measure the end play of the input shaft. Make sure that the end play of the input shaft is within the standard value range with the thrust washer #1 in place.

**Standard value (reference): 0.70 – 1.45 mm**

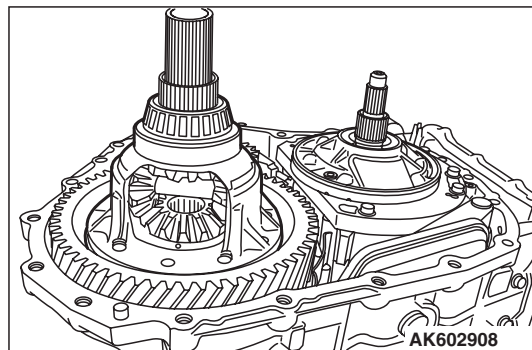


61. Install the oil filter.



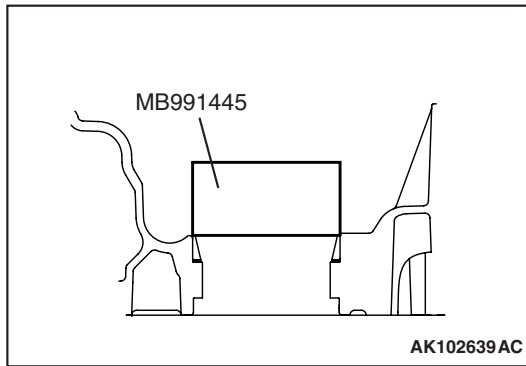
62. Use the special tools to drive the center differential bearing outer race into the transmission case.

- Installer adapter (MB990935)
- Handle (MB990938)

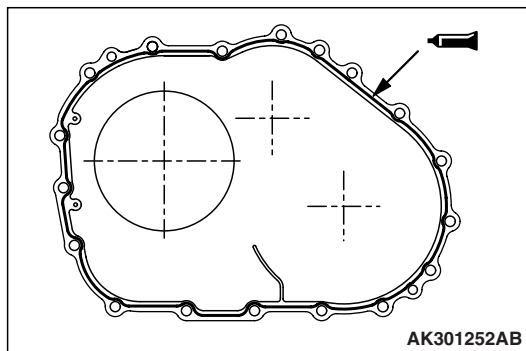


63. Install the center differential.

64. Adjustment of center differential case preload and select the spacer. (Refer to adjustment of transmission - spacer selection for adjustment of center differential case preload [P.23B-37](#))



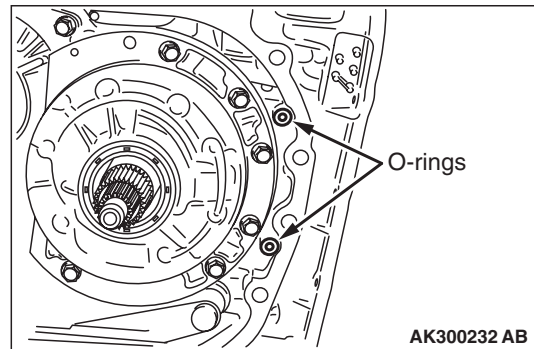
65. Use the special tool Bush remover & installer base (MB991445) to drive the outer race into position.



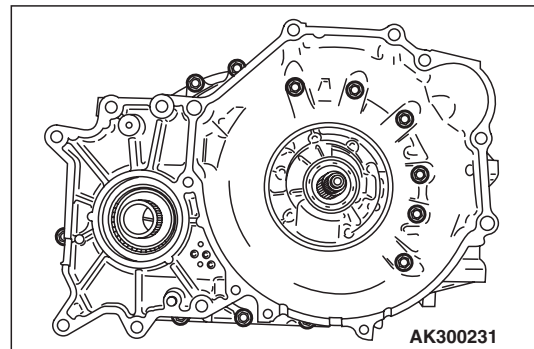
66. Apply an approx. 1.6 mm diameter bead of from-in-place gasket (FIPG) to the converter housing along its circumference as shown in the drawing.

**Specified sealant:**

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

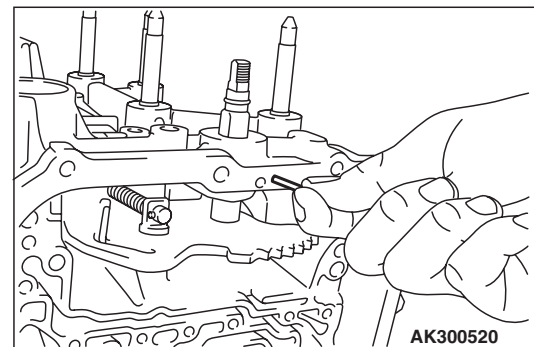


67. Install the two O-rings (two pieces).



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

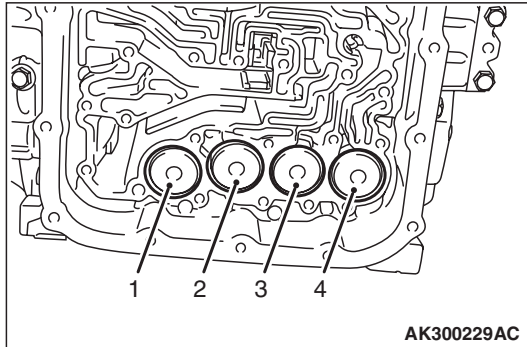
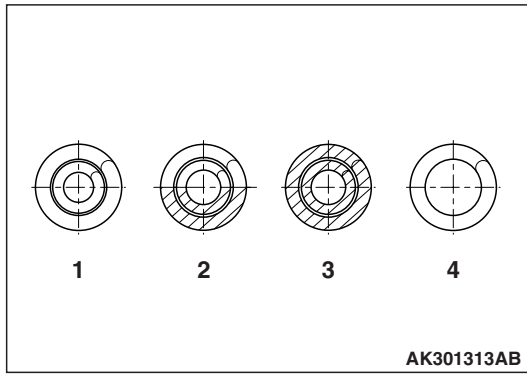
69. Install the manual control lever shaft and parking pawl rod.



70. Install the manual control lever shaft roller.

71. Fit a new seal ring to each accumulator piston.

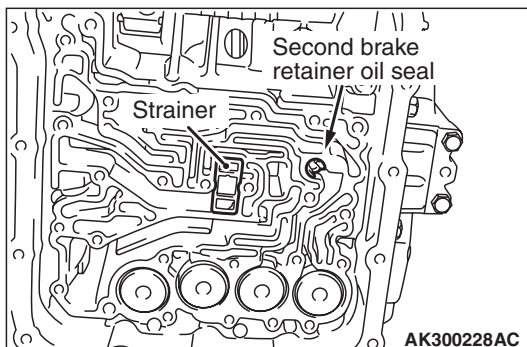
*NOTE: All the four accumulator pistons and seal rings are identical.*



72. Identify the accumulator spring for each accumulator and install it in the correct hole in the transmission case together with the piston.

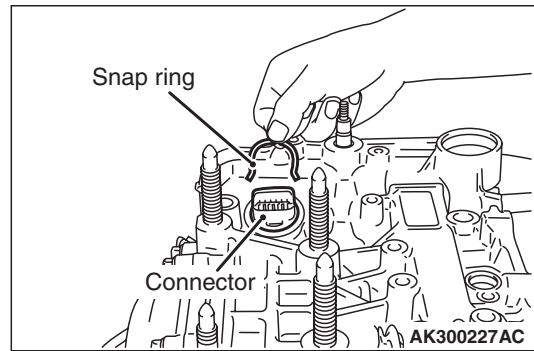
*NOTE: The accumulator springs are identified as shown in the table below.*

No.	Accumulator spring	Blue ink marking
1	For low-reverse brake	No marking
2	For underdrive clutch	Half of surface
3	For second brake	Entire surface
4	For overdrive clutch	No marking

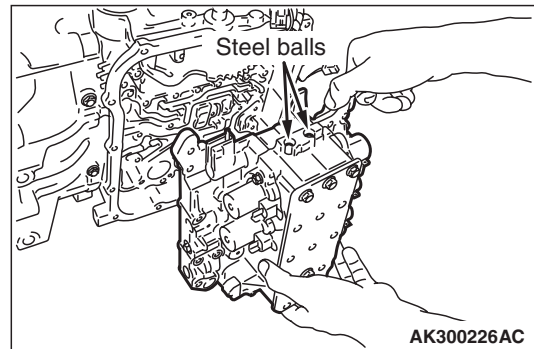


73. Install the strainer and second brake retainer oil seal as shown in the drawing.

74. Fit a new O-ring into the groove in the solenoid valve harness connector.

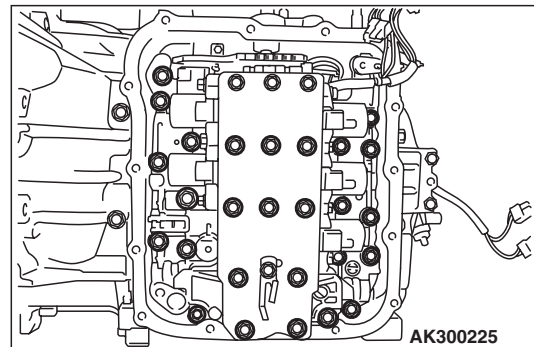


75. Insert the solenoid valve harness connector into the hole in the transmission case from inside the case. After making sure that the connector is positioned as shown in the drawing, fit the snap ring snugly into the connector groove.

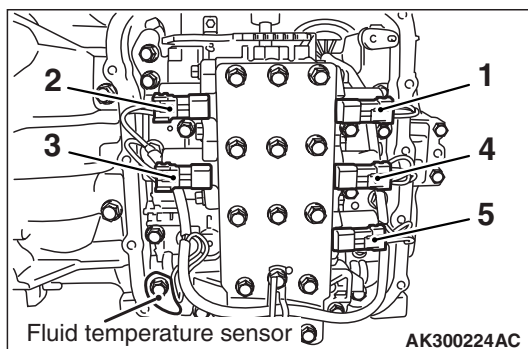


76. Install the steel balls one each in the two holes on the top of the valve body (outside valve body).

77. Install the valve body and gasket. Make sure that the pin of the manual valve is in place in the detent plate groove in the manual control lever shaft.

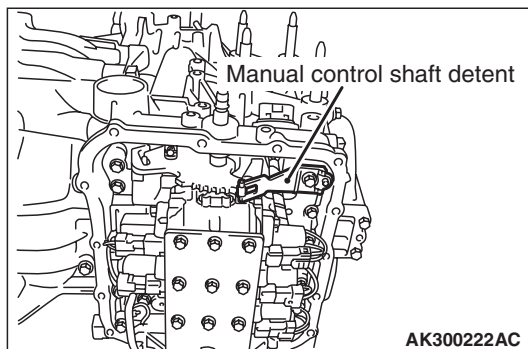


78. Install the valve body mounting bolts and tighten them to the specified torque of  $11 \pm 1$  N·m.

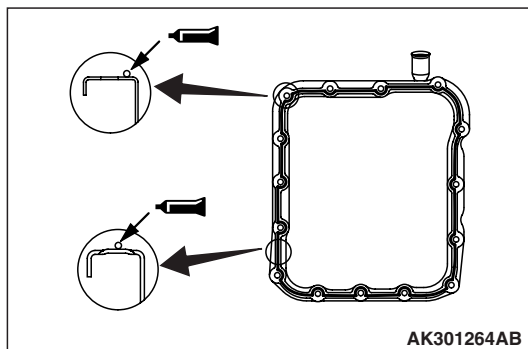


79. Install the oil temperature sensor and then connect the connector to the valve body.

No.	Solenoid valve	Wire 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



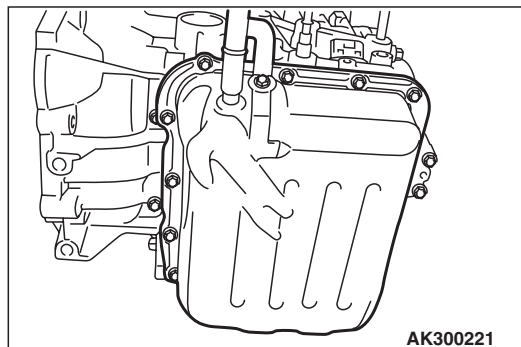
80. Install the manual control shaft detent spring and detent.



81. Apply an approx. 2.5 mm diameter bead of from-in-place gasket (FIPG) to the valve body cover along its circumference as shown in the drawing.

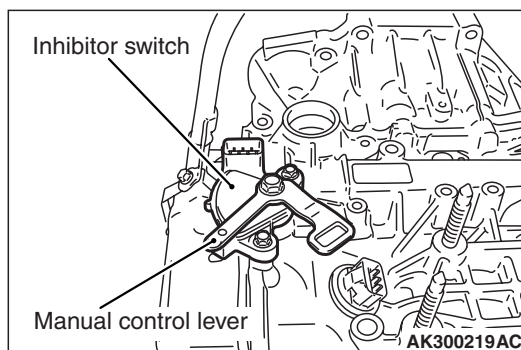
**Specified sealant:**

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

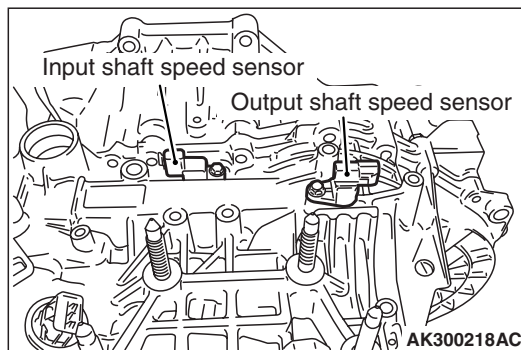


82. Install the valve body cover and tighten its mounting bolts to the specified torque of  $11 \pm 1$  N·m.

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

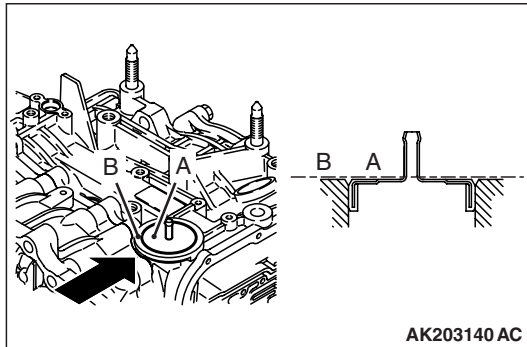


84. Install the manual control lever and tighten the bolt to the specified torque of  $22 \pm 3$  N·m.

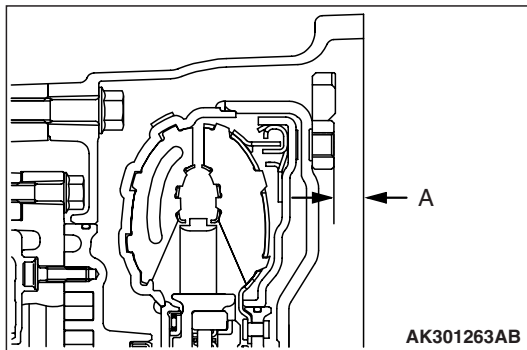


85. Install the input shaft speed sensor and output shaft speed sensor and tighten the bolt to the specified torque of  $11 \pm 3$  N·m.





86. 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 drawing.
87. Apply ATF on the both sides of the new gasket and threads of the eyebolt, and then tighten to the specified torque of  $24 \pm 3$  N·m.
88. Install the oil level gauge.
89. Install the cable bracket to the specified torque of  $23 \pm 3$  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.**

90. Install the torque converter, and secure it so that the dimension (A) indicated in the drawing meets the reference value.

**Reference value: 12.2 mm**

91. Install the transfer after fitting a new O-ring on it.

## ADJUSTMENT OF TRANSMISSION

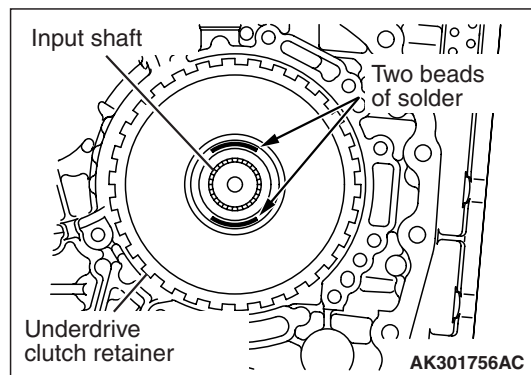
M1233030400043

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

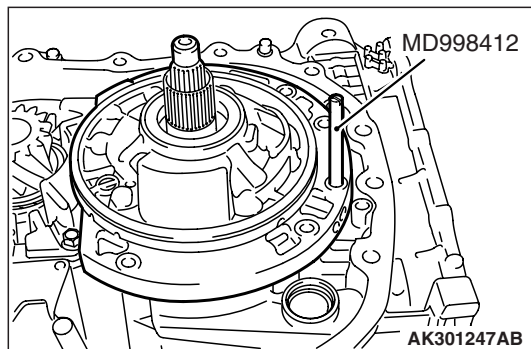
#### <Measurement using a Solder>

**⚠ CAUTION**

- If 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 solder, select the thrust washer in accordance with Plastigage method.



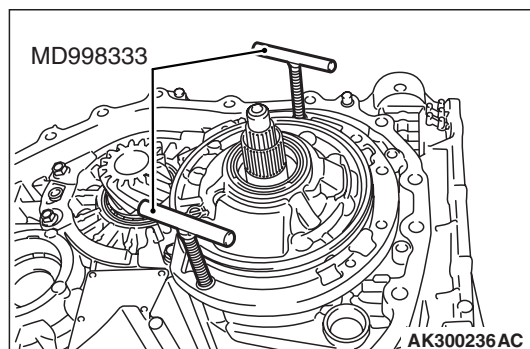
1. Put solders (1.0 mm diameter, about 10 mm long) in the illustrated positions of the underdrive clutch retainer.
2. Install the adjusting thrust washer having minimum thickness.



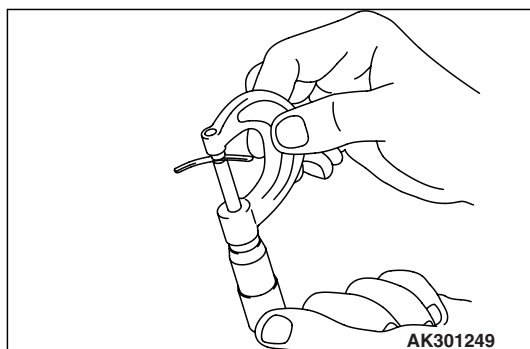
**⚠ CAUTION**

**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 MD998333, remove the oil pump and then take out 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

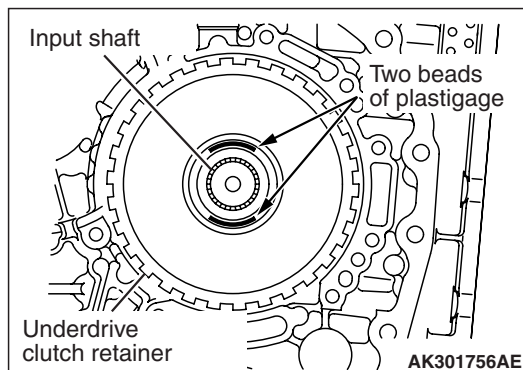
**T1:** The crushed solder thickness mm

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

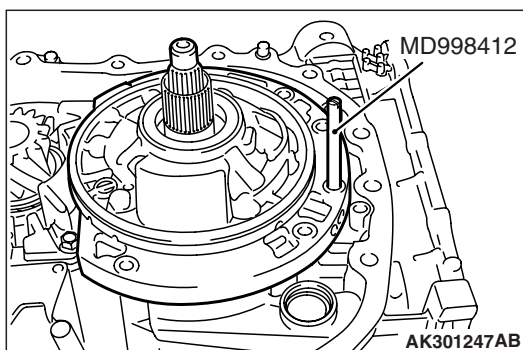
#### Available thrust washer

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>



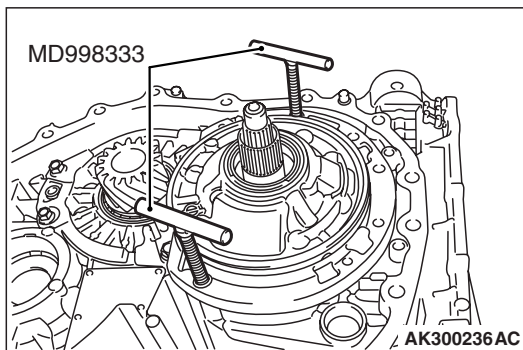
1. Put plastigage (about 10 mm long) in the illustrated positions of the underdrive clutch retainer.
2. Install the adjusting thrust washer having the minimum thickness.



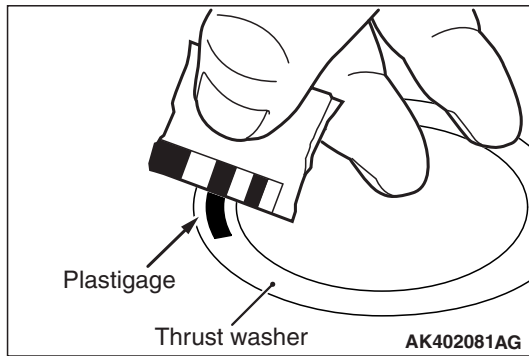
#### **CAUTION**

**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 MD998333, remove the oil pump and then take out 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**

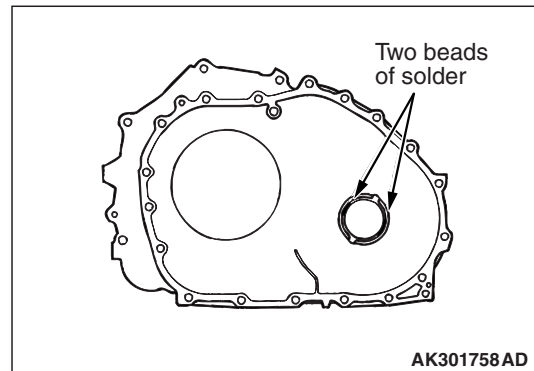
Clearance mm (T)	Thickness mm	Identification mark
2.25 – 2.45	1.8	18
2.45 – 2.65	2.0	20
2.65 – 2.85	2.2	22
2.85 – 3.05	2.4	24
3.05 – 3.25	2.6	26
3.25 – 3.45	2.8	28

## SPACER SELECTION FOR ADJUSTMENT OF CENTER DIFFERENTIAL CASE PRELOAD

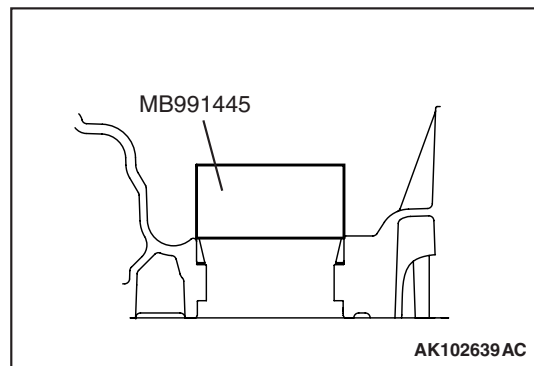
### <Measurement using a Solder>

#### **CAUTION**

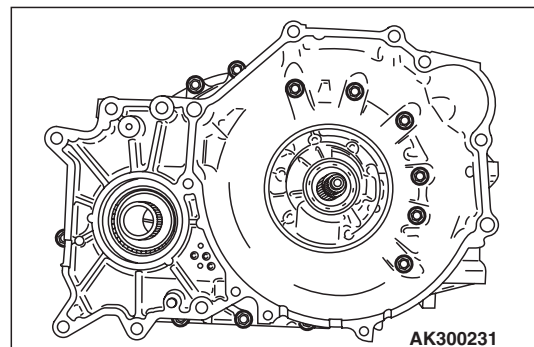
- If solder is not available, select the spacer in accordance with Plastigage method.
- If the spacer appropriate for the standard value cannot be selected using solder, select the spacer in accordance with Plastigage method.



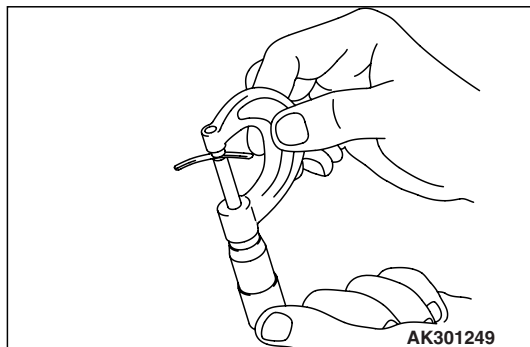
1. Put solders (1.0 mm diameter, about 10 mm long) in the illustrated positions of the converter housing.



2. Use the special tool Bush remover & installer base (MB991445) to drive the outer race into position.



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 solders (1.6 mm diameter, about 10 mm long) and repeat steps 2 to 4.



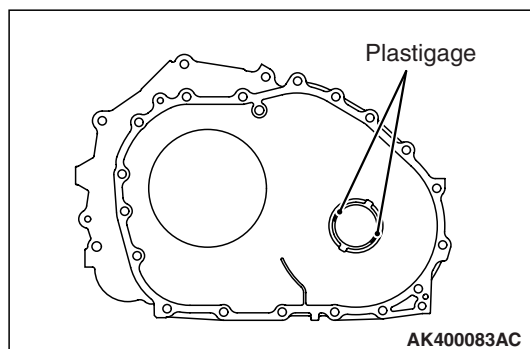
6. Measure the thickness of the crushed solder with a micrometer, and then select a spacer that will provide the standard value.

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

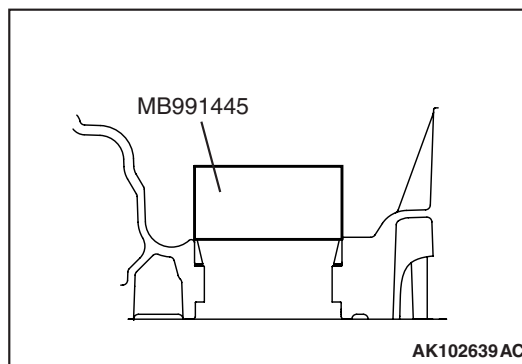
**T1: The crushed solder thickness mm**

**Standard value: 0.045 – 0.105 mm**

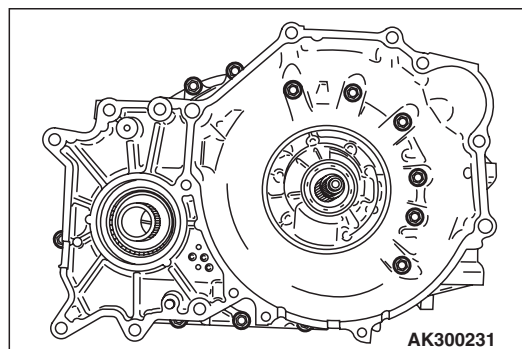
### <Measurement using Plastigage>



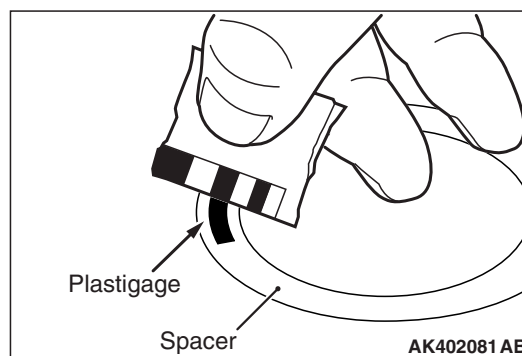
1. Put plastigage (about 10 mm long) in the illustrated positions of the converter housing.
2. Install the adjusting spacer having the minimum thickness.



3. Use the special tool Bush remover & installer base (MB991445) to drive the outer race into position.



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 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**

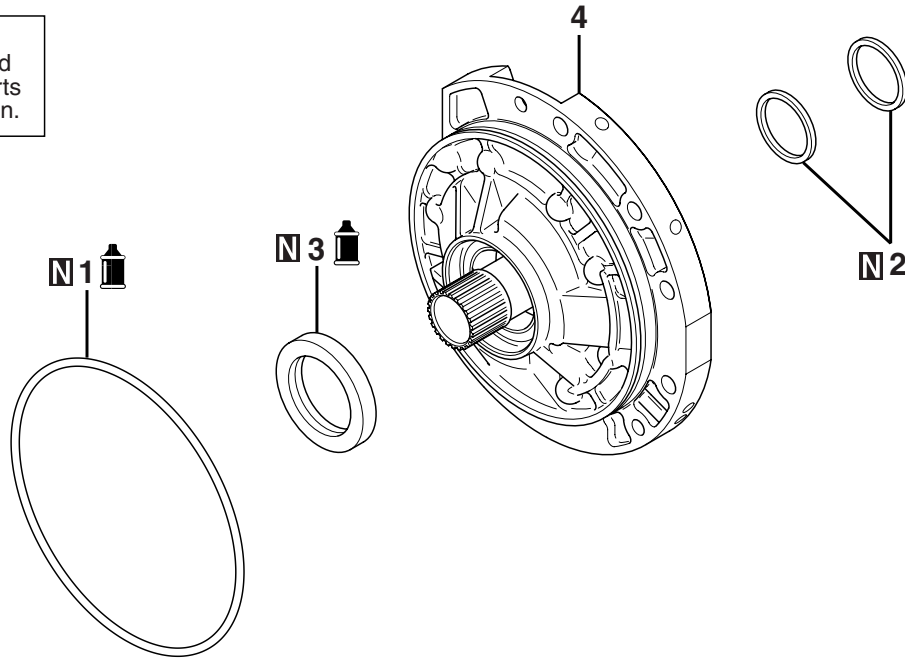


## OIL PUMP

### DISASSEMBLY AND REASSEMBLY

M1233001300262

Apply automatic transmission fluid to all moving parts before installation.



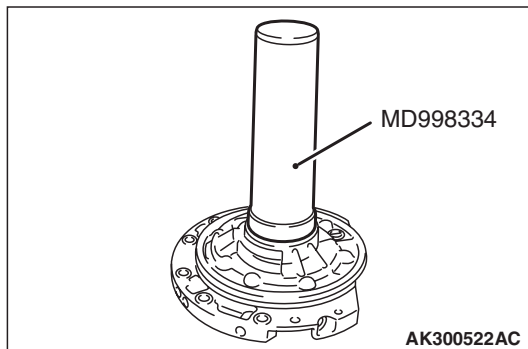
AK602669AB

- >>B<< Disassembly steps**
1. O-ring
  2. Seal ring

- >>A<< Disassembly steps (Continued)**
3. Oil seal
  4. Oil pump

### REASSEMBLY SERVICE POINTS

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



1. Apply a small amount of ATF to the oil seal lip. Use the special tool Oil seal installer (MD998334) to install the oil seal.

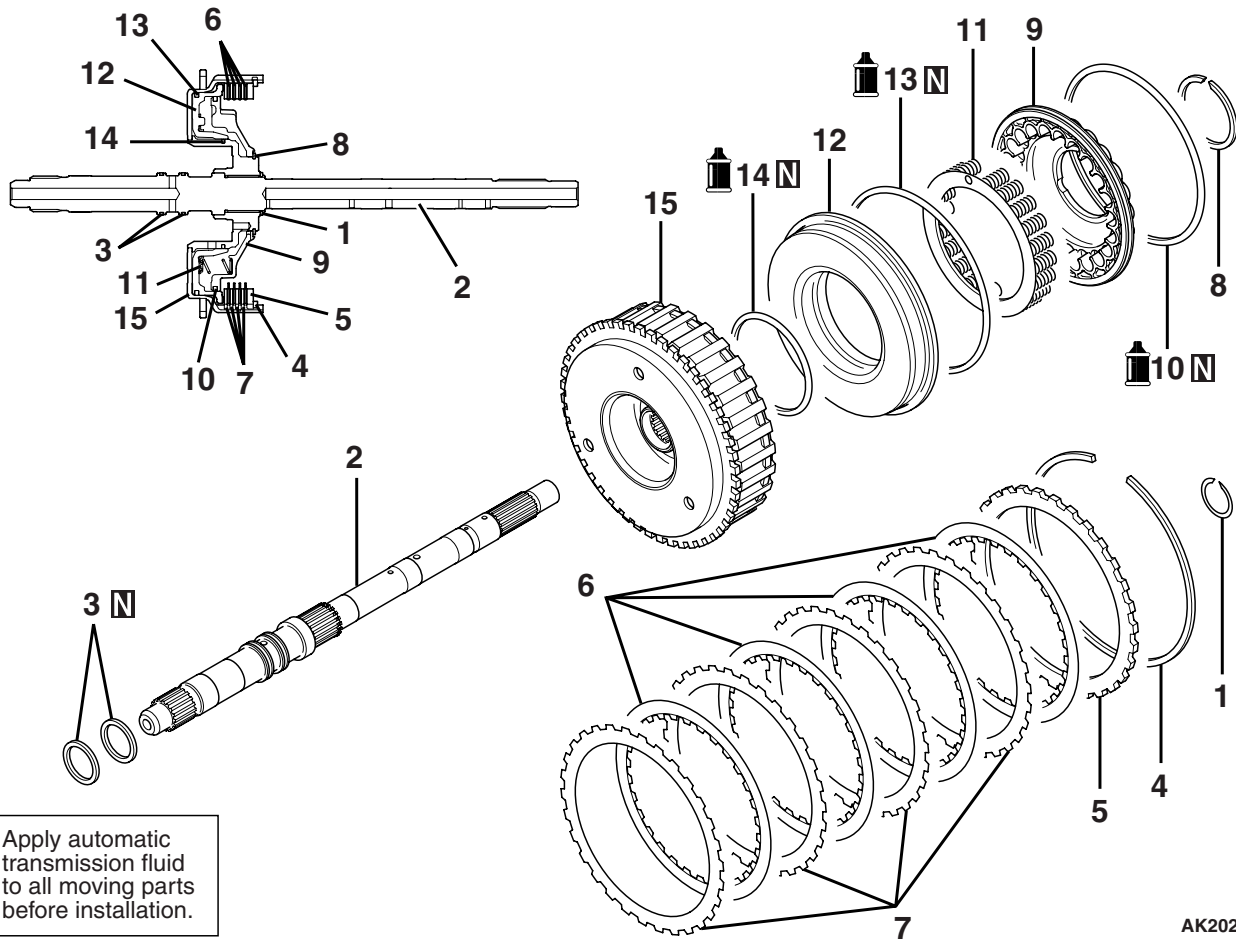
#### >>B<< O-RING INSTALLATION

Install a new O-ring in the groove on the periphery of the oil pump, and apply ATF, blue petrolatum jelly or white Vaseline to the periphery of the O-ring.

# UNDERDRIVE CLUTCH AND INPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

M1233020900177

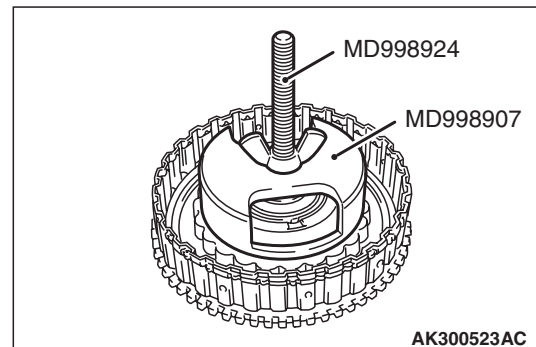


AK202041AB

### Disassembly steps

1. Snap ring  
2. Input shaft  
3. Seal ring  
4. Snap ring  
5. Clutch reaction plate  
6. Clutch disc  
7. Clutch plate  
8. Snap ring  
9. Spring retainer  
10. D-ring  
11. Return spring  
12. Underdrive clutch piston  
13. D-ring  
14. D-ring  
15. Underdrive clutch retainer
- <<A>> >>D<<  
>>C<< >>C<<  
>>C<< >>B<<  
>>A<< >>A<<  
>>A<< >>A<<

### DISASSEMBLY SERVICE POINT <<A>> SNAP RING REMOVAL



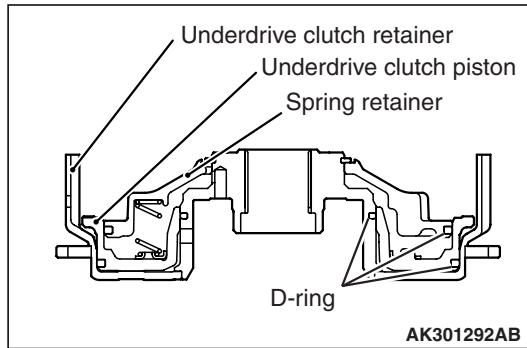
AK300523AC

Use the special tools to remove the snap ring.

- Spring compressor (MD998907)
- Spring compressor retainer (MD998924)

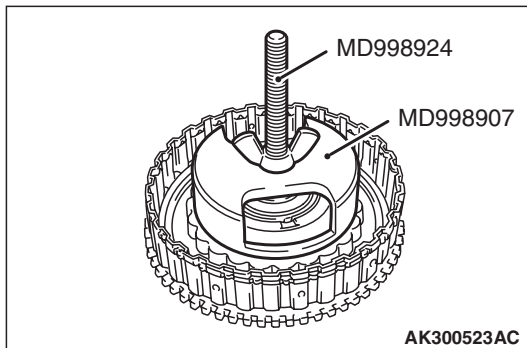
## REASSEMBLY SERVICE POINTS

### >>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.

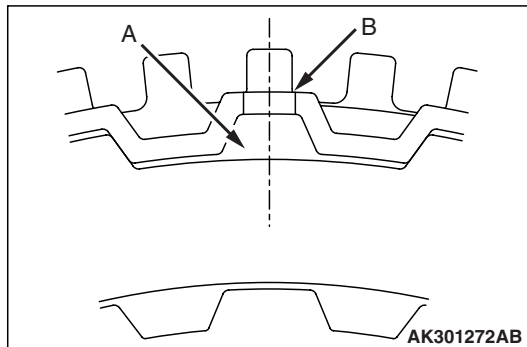
### >>B<< SNAP RING INSTALLATION



Use the special tools to install the snap ring.

- Spring compressor (MD998907)
- Spring compressor retainer (MD998924)

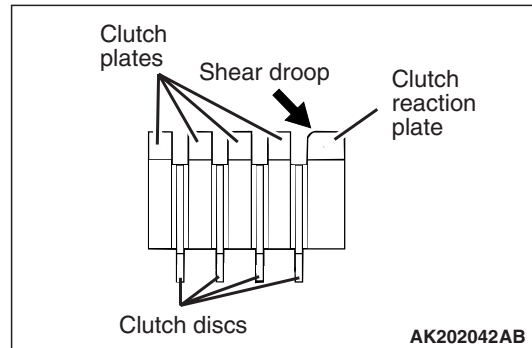
### >>C<< CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION



### **CAUTION**

**Soak the clutch discs in ATF before assembling it.**

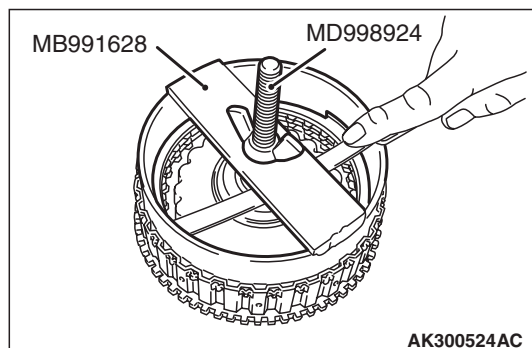
1. Assemble the clutch plates, clutch discs, and clutch reaction plates with their non-toothed portions (A in the illustration) aligned with the hole (B in the illustration) formed in a crest of the underdrive clutch retainer.



2. Orient the clutch reaction 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 on its entire circumference using the special tools.
  - Spring compressor (MB991628)
  - Spring compressor retainer (MD998924)
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.

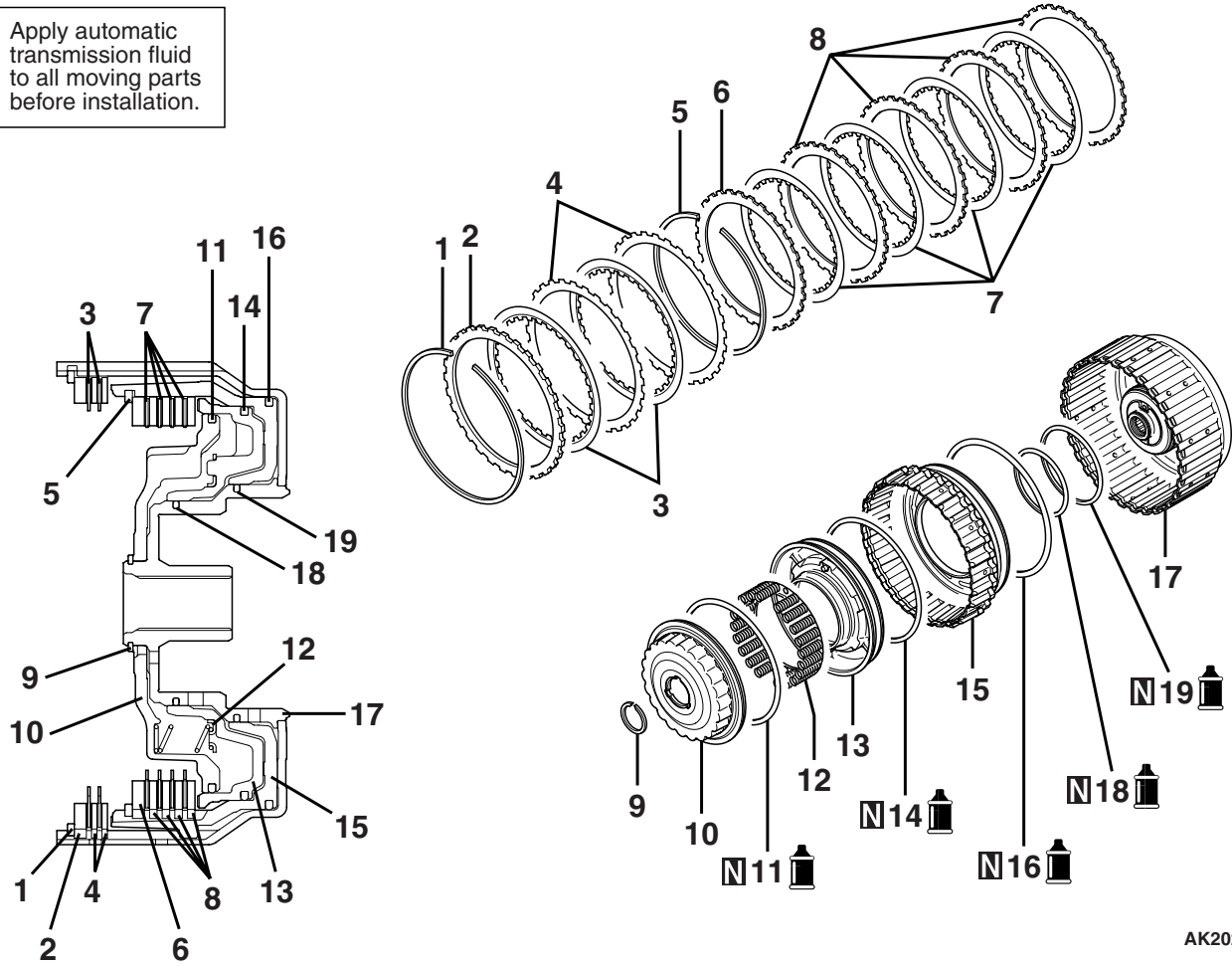
**Standard value: 1.6 – 1.8 mm**

## REVERSE AND OVERDRIVE CLUTCH

## DISASSEMBLY AND REASSEMBLY

M1233021200234

Apply automatic transmission fluid to all moving parts before installation.



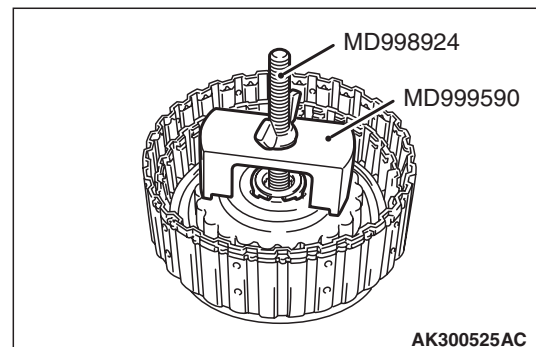
AK202064AB

## Disassembly steps

- >>G<< 1. Snap ring  
>>F<< 2. Clutch reaction plate  
>>F<< 3. Clutch disc  
>>F<< 4. Clutch plate  
>>E<< 5. Snap ring  
>>D<< 6. Clutch reaction plate  
>>D<< 7. Clutch disc  
>>D<< 8. Clutch plate  
<<A>> >>C<< 9. Snap ring  
10. Spring retainer  
>>A<< 11. D-ring  
12. Clutch return spring  
13. Overdrive clutch piston  
>>A<< 14. D-ring  
>>B<< 15. Reverse clutch piston  
>>A<< 16. D-ring  
17. Reverse clutch retainer  
>>A<< 18. D-ring  
>>A<< 19. D-ring

## DISASSEMBLY SERVICE POINT

## &lt;&lt;A&gt;&gt; SNAP RING REMOVAL

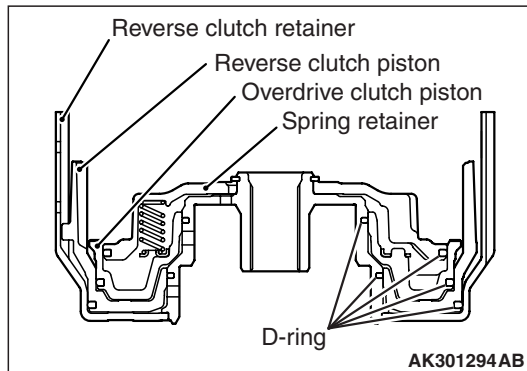


Use the special tools to remove the snap ring.

- Spring compressor retainer (MD998924)
- Spring compressor (MD999590)

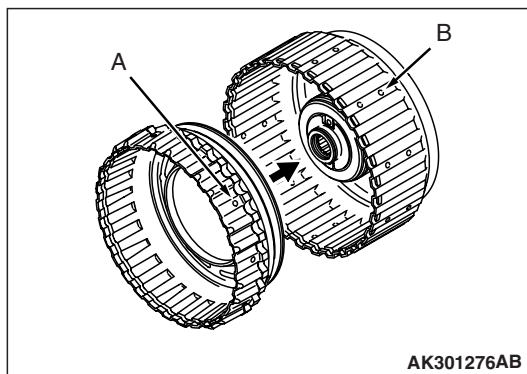
## REASSEMBLY SERVICE POINTS

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



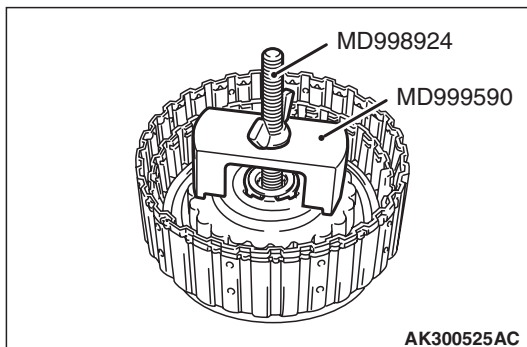
Apply ATF, blue petrolatum jelly or white Vaseline to the D-rings and handle them carefully to avoid damage during installation.

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

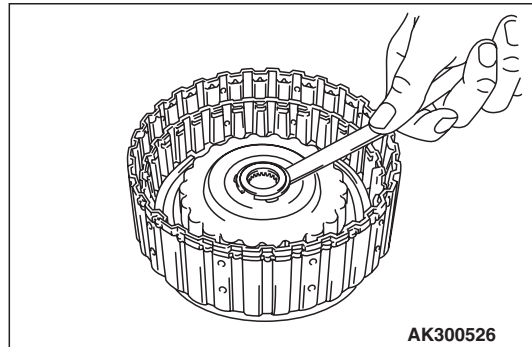


Assemble the reverse clutch piston with the reverse clutch retainer with their holes (A and B in the illustration) aligned.

### >>C<< SNAP RING INSTALLATION



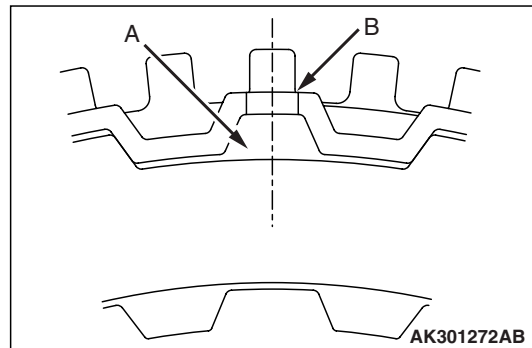
1. Use the special tools to install the snap ring.
  - Spring compressor retainer (MD998924)
  - Spring compressor (MD999590)
2. Press down the return spring retainer tightly on its entire circumference (with a force of 49N).



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

**Standard value: 0 – 0.09 mm**

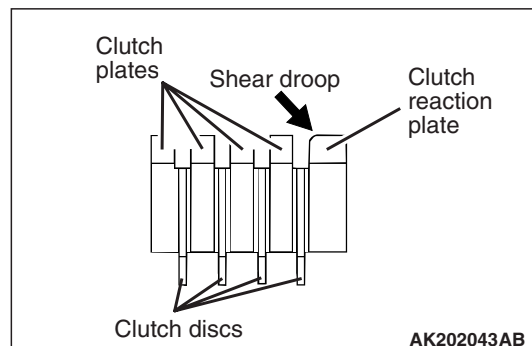
### >>D<< CLUTCH PLATE/CLUTCH DISC/CLUTCH REACTION PLATE INSTALLATION



#### **CAUTION**

**Soak the clutch discs in ATF before installing them.**

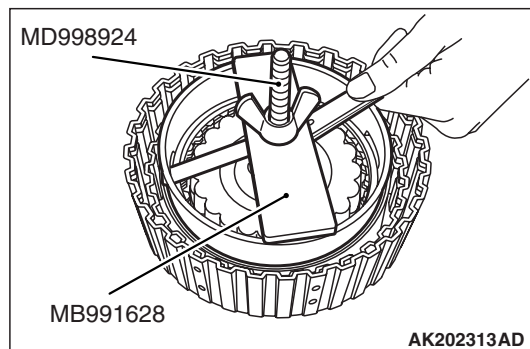
1. Assemble the clutch plates, clutch discs, and clutch reaction plate with their non-toothed portions (A in the illustration) aligned with the hole (B in the illustration) formed in a crest of the reverse clutch piston.



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

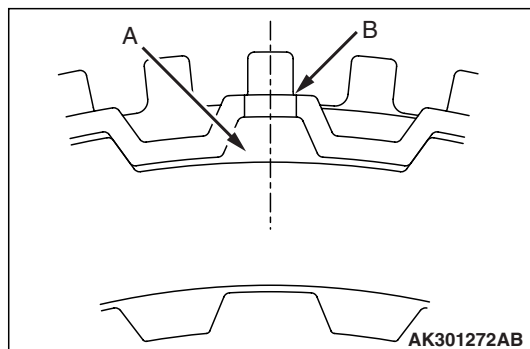
**>>E<< SNAP RING INSTALLATION**

1. Install the snap ring.



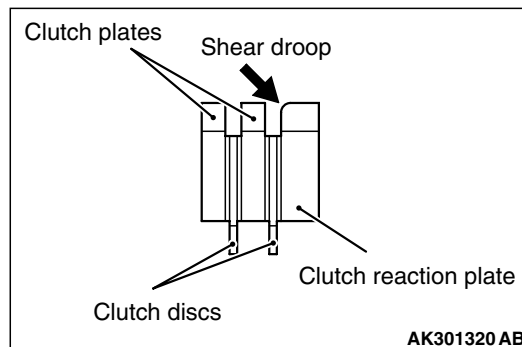
2. Press down the clutch reaction plate on the circumference using the special tools.
  - Spring compressor (MB991628)
  - Spring compressor retainer (MD998924)
3. Check the clearance between the snap ring and clutch reaction plate. If the clearance is not within the standard value range, make adjustment by selecting a snap ring of an appropriate thickness.

**Standard value: 1.6 – 1.8 mm**

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

**Soak the clutch discs in ATF before installing them.**

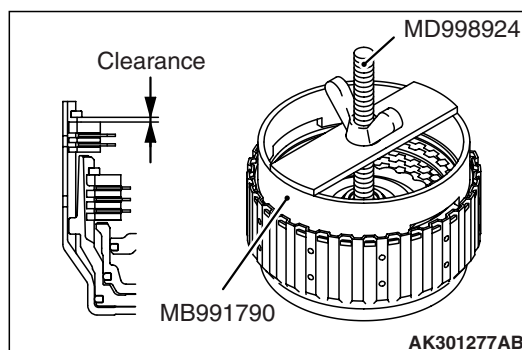
1. Assemble the clutch plates, clutch discs, and reaction plate with their non-toothed portions (A in the illustration) aligned with the hole (B in the illustration) formed in a crest of the reverse retainer.



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

**>>G<< SNAP RING INSTALLATION**

1. Install the snap ring.



2. Press down the clutch reaction plate on its entire circumference using the special tools.
  - Spring compressor (MB991790)
  - Spring compressor retainer (MD998924)
3. Check the clearance between the snap ring and the clutch reaction plate. If the clearance is not within the standard value range, make adjustment by selecting a snap ring of an appropriate thickness.

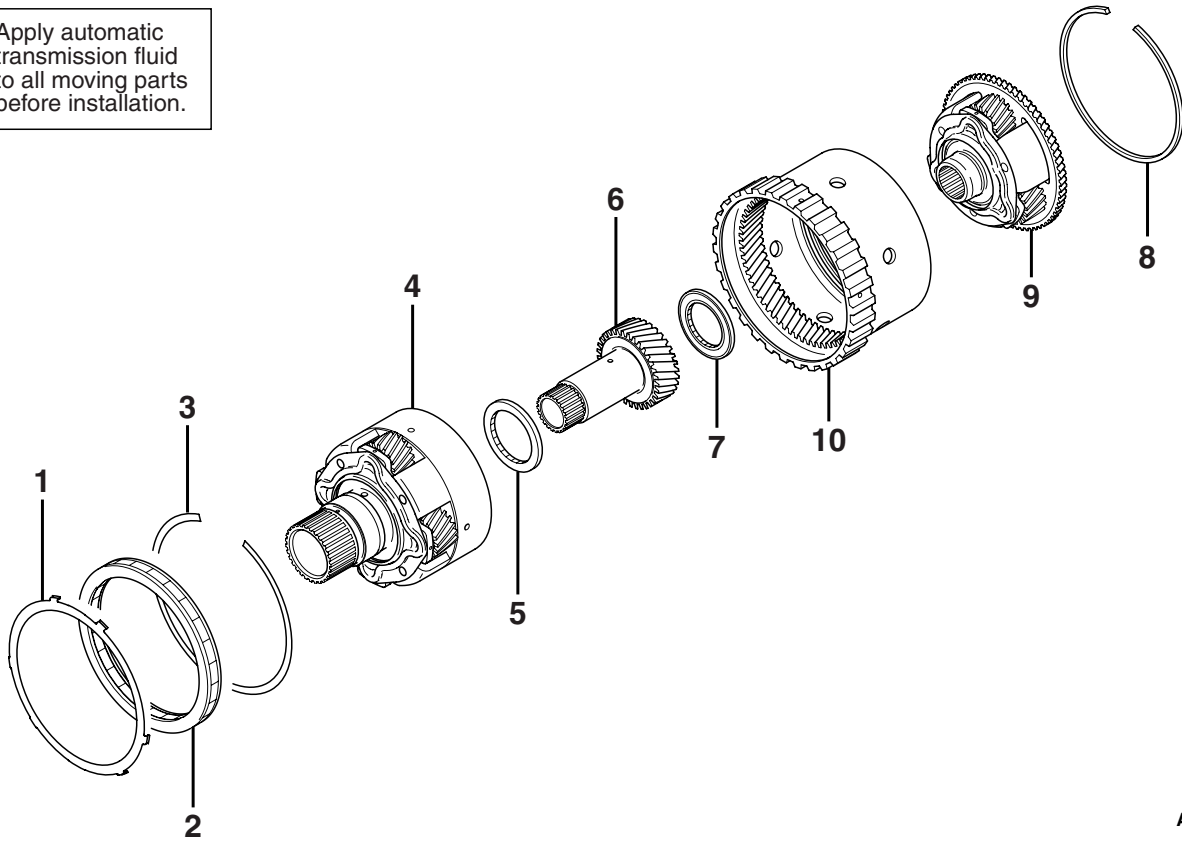
**Standard value: 1.5 – 1.7 mm**

# PLANETARY CARRIER ASSEMBLY

## DISASSEMBLY AND REASSEMBLY

M1233002500225

Apply automatic transmission fluid to all moving parts before installation.



AK202029AB

### Disassembly steps

- >>B<<
1. Stopper plate
  2. One-way clutch
  3. Snap ring
  4. Output planetary carrier ASSY
- >>A<<
5. Thrust bearing #3

### Disassembly steps (Continued)

- >>A<<
6. Underdrive sun gear
  7. Thrust bearing #4
  8. Snap ring
  9. Overdrive planetary carrier ASSY
  10. Low-reverse annulus gear

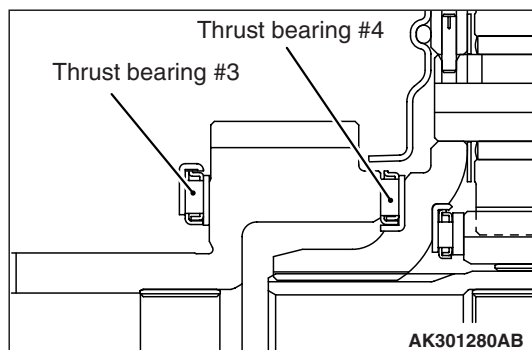


## REASSEMBLY SERVICE POINTS

## &gt;&gt;A&lt;&lt; THRUST BEARING #3/#4 INSTALLATION

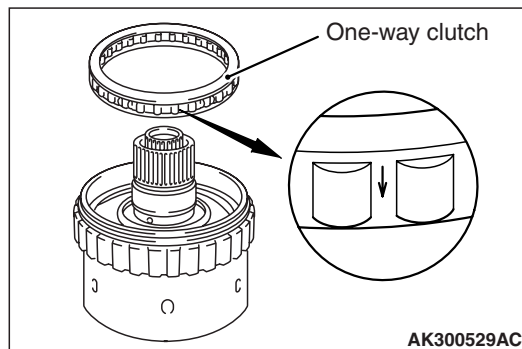
**⚠ CAUTION**

Make sure the ends of each thrust bearing are oriented correctly.



Install the thrust bearings #3 and #4 in position as shown in the illustration.

## &gt;&gt;B&lt;&lt; ONE-WAY CLUTCH INSTALLATION




Insert the one-way clutch into the overdrive annulus gear ASSY with the arrow pointing as shown in the illustration.

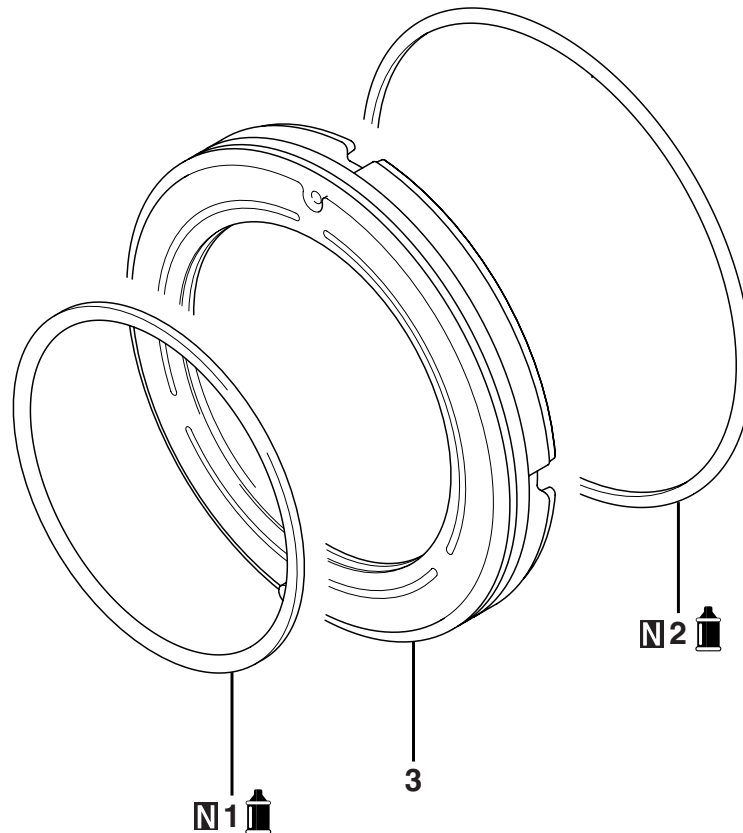


## LOW-REVERSE BRAKE

### DISASSEMBLY AND REASSEMBLY

M1233003700266

 Apply automatic transmission fluid to all moving parts before installation.



AK202044AB

#### Disassembly steps

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

#### REASSEMBLY SERVICE POINT

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

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

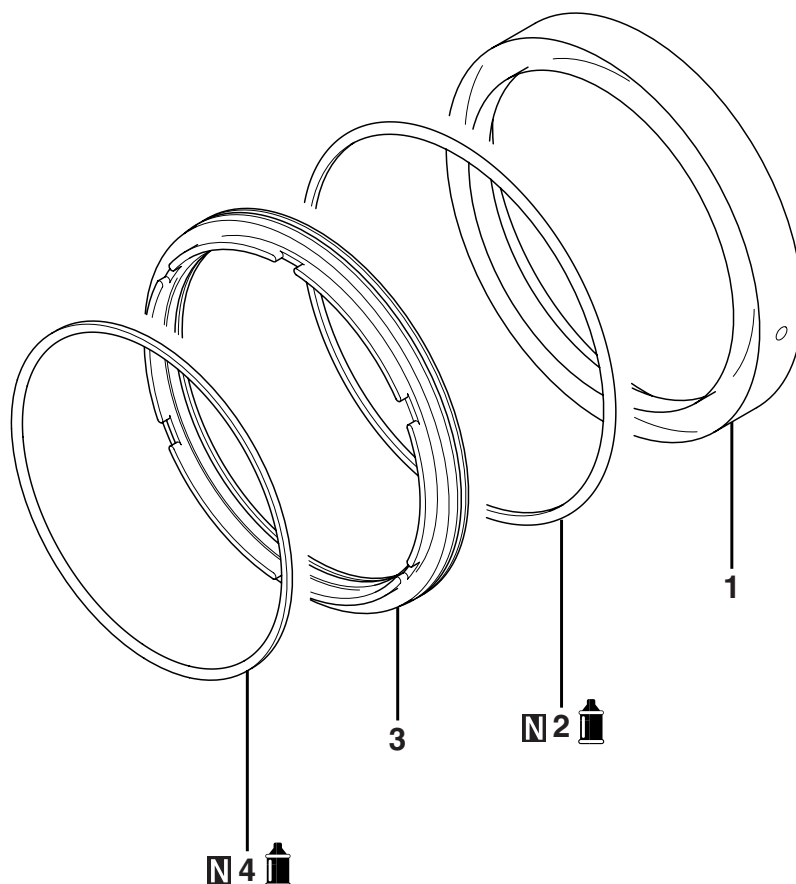
## SECOND BRAKE

## DISASSEMBLY AND REASSEMBLY

M1233021800140



Apply automatic transmission fluid to all moving parts before installation.



AK202045AB

**Disassembly steps**

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

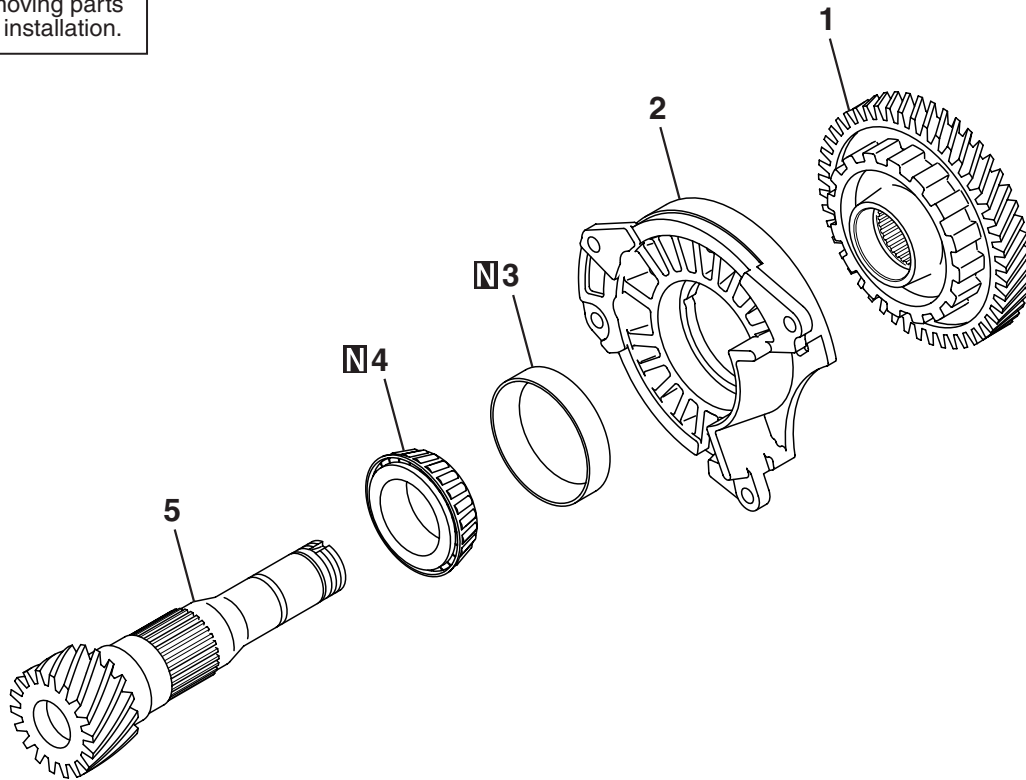
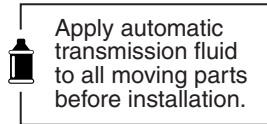
**REASSEMBLY SERVICE POINT****>>A<< D-RING INSTALLATION**

Apply ATF, blue petrolatum jelly or white Vaseline to the D-rings, and handle them carefully to avoid damage during installation.

## OUTPUT SHAFT

### DISASSEMBLY AND REASSEMBLY

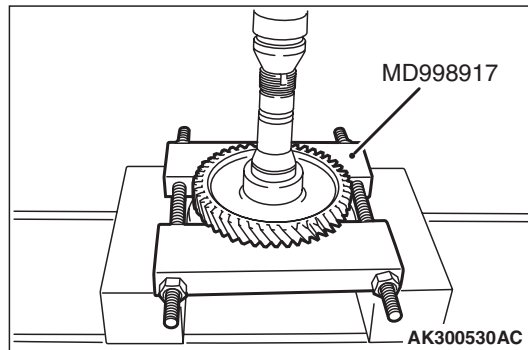
M1233022100111



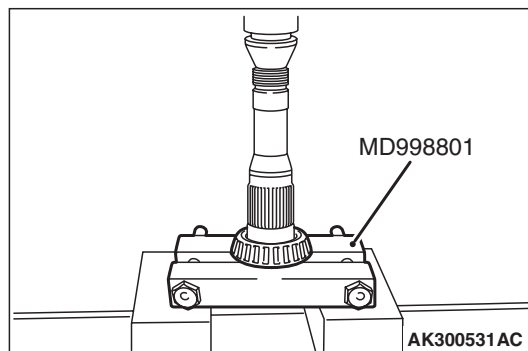
AK304529AB

- <<A>>    >>C<<    **Disassembly steps**
1. Transfer driven gear
  2. Bearing retainer
  - >>B<<    3. Outer race

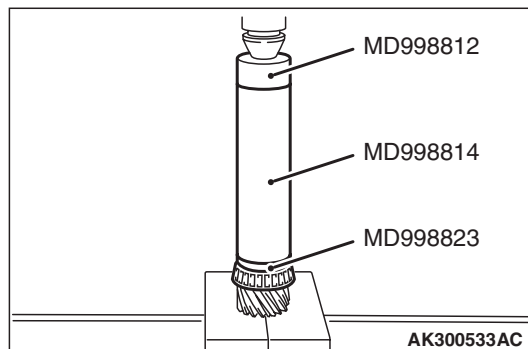
- <<B>>    >>A<<    **Disassembly steps (Continued)**
4. Taper roller bearing
  5. Output shaft

**DISASSEMBLY SERVICE POINTS**  
**<<A>> TRANSFER DRIVEN GEAR**  
**REMOVAL**

Use the special tool Bearing remover (MD998917) to remove the transfer driven gear.

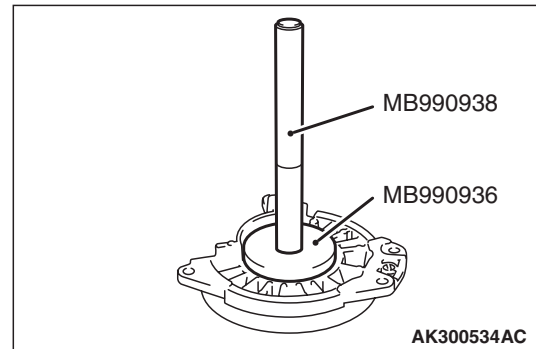
**<<B>> TAPER ROLLER BEARING**  
**REMOVAL**

Use the special tool Bearing remover (MD998801) to remove the taper roller bearing.

**REASSEMBLY SERVICE POINTS**  
**>>A<< TAPER ROLLER BEARING**  
**INSTALLATION**

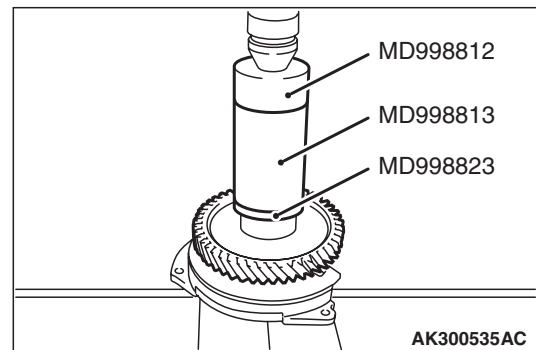
Use the special tools to install the taper roller bearing.

- Installer cap (MD998812)
- Installer 200 (MD998814)
- Installer adapter (MD998823)

**>>B<< OUTER RACE**  
**INSTALLATION**

Use the special tools to install the outer race.

- Installer adapter (MB990936)
- Handle (MB990938)

**>>C<< TRANSFER DRIVEN GEAR**  
**INSTALLATION**


Use the special tools to install the transfer driven gear.

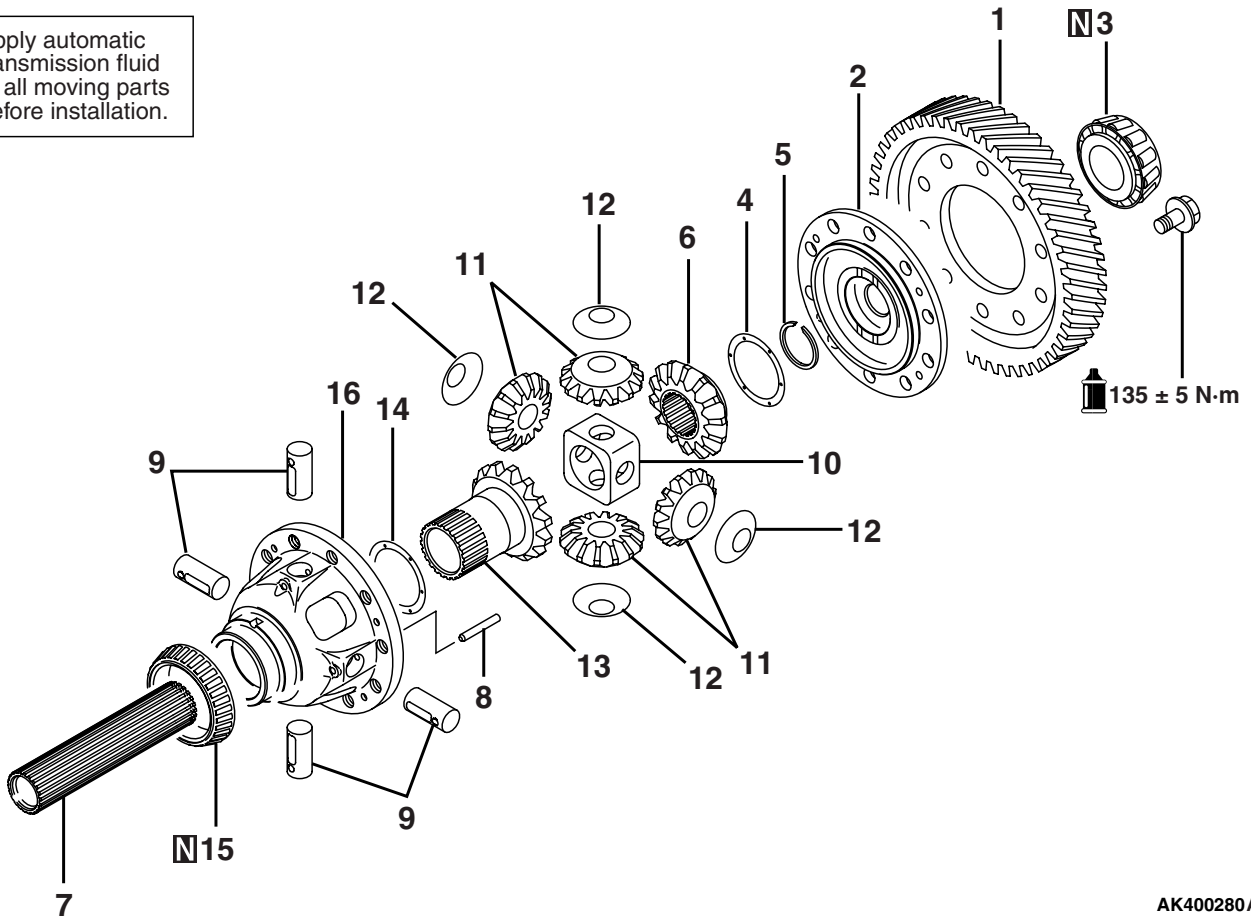
- Installer cap (MD998812)
- Installer 100 (MD998813)
- Installer adapter (MD998823)

## CENTRE DIFFERENTIAL

### DISASSEMBLY AND REASSEMBLY

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 Apply automatic transmission fluid to all moving parts before installation.



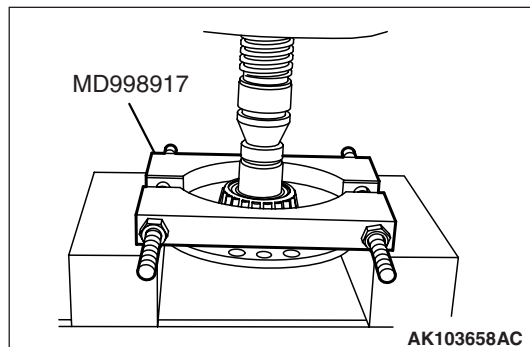
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#### Disassembly steps

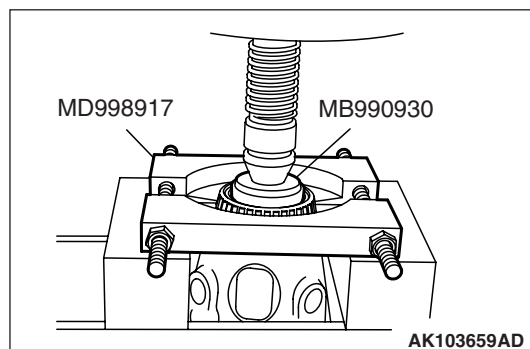
- |   |  |
|---|--|
| <p>&gt;&gt;D&lt;&lt; 1. Centre differential drive gear</p> <p>&gt;&gt;C&lt;&lt; 2. Centre differential flange</p> <p>&lt;&lt;A&gt;&gt; &gt;&gt;B&lt;&lt; 3. Taper roller bearing</p> <p>&gt;&gt;C&lt;&lt; 4. Spacer</p> <p>&gt;&gt;C&lt;&lt; 5. Snap ring</p> <p>&gt;&gt;C&lt;&lt; 6. Side gear</p> <p>&gt;&gt;C&lt;&lt; 7. Front output shaft</p> <p>&gt;&gt;C&lt;&lt; 8. Lock pin</p> |  |
|---|--|

#### Disassembly steps (Continued)

- |  |  |
|--|--|
| <p>&gt;&gt;C&lt;&lt; 9. Pinion shaft</p> <p>&gt;&gt;C&lt;&lt; 10. Pinion shaft holder</p> <p>&gt;&gt;C&lt;&lt; 11. Pinion</p> <p>&gt;&gt;C&lt;&lt; 12. Washer</p> <p>&gt;&gt;C&lt;&lt; 13. Side gear</p> <p>&gt;&gt;C&lt;&lt; 14. Spacer</p> <p>&lt;&lt;B&gt;&gt; &gt;&gt;A&lt;&lt; 15. Taper roller bearing</p> <p>16. Center differential case</p> |  |
|--|--|

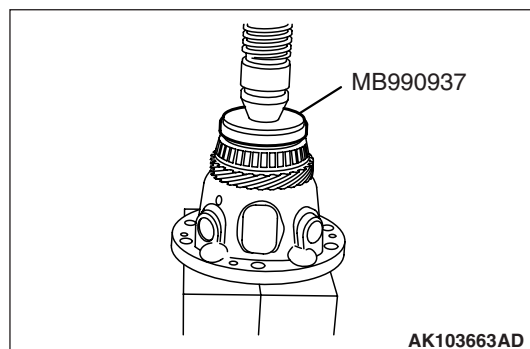
**DISASSEMBLY SERVICE POINTS**  
**<<A>> TAPER ROLLER BEARING**  
**REMOVAL**

Use the special tool Bearing remover (MD998917) to remove the taper roller bearing.

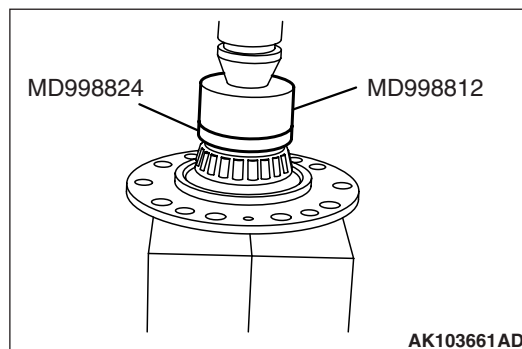
**<<B>> TAPER ROLLER BEARING**  
**REMOVAL**

Use the special tools to remove the taper roller bearing.

- Installer adapter (MB990930)
- Bearing remover (MD998917)

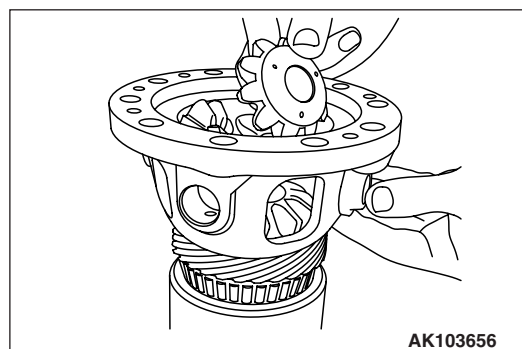
**REASSEMBLY SERVICE POINTS****>>A<< TAPER ROLLER BEARING**  
**INSTALLATION**

Use the special tool Installer adapter (MB990937) to install the new taper roller bearing.

**>>B<< TAPER ROLLER BEARING**  
**INSTALLATION**

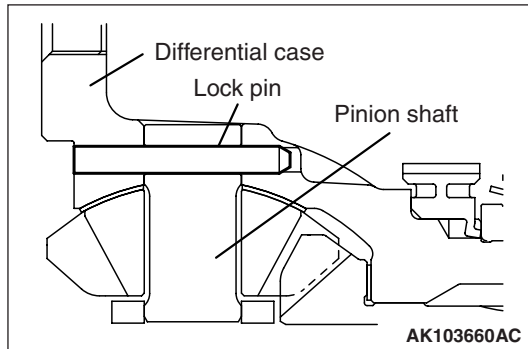
Use the special tools to install the new taper roller bearing.

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

**>>C<< SPACER/SIDE**  
**GEAR/WASHER/PINION/PINION**  
**SHAFT/PINION SHAFT HOLDER/LOCK**  
**PIN/FRONT OUTPUT SHAFT/SNAP**  
**RING/CENTRE DIFFERENTIAL FLANGE**  
**INSTALLATION**

1. Install the spacer on each side gear, then install the side gears into the centre differential case.  
*NOTE: Use spacers of a medium thickness (0.66 – 0.73 mm) when installing a new side gears.*
2. Attach the washer to the back of each pinion, make the four pinions engage with the side gears simultaneously, and bring the pinions into position while turning the gear set. Then install the pinion shaft holder.
3. Insert the pinion shaft.

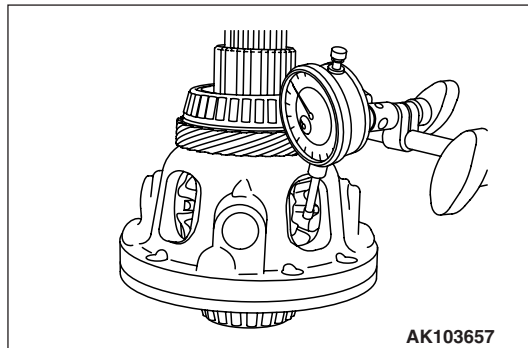




4. Install the lock pin with its ends oriented as shown in the illustration.
5. Install the front output shaft in the side gear, then install the snap ring.
6. Fit the spacer on each side gear, and install the side gears into the centre differential case.

*NOTE: Use spacer of a medium thickness (0.66 – 0.73 mm) when installing new side gears.*

7. Install the centre differential flange while aligning the mating mark on it with that on the center differential case and finger-tighten the machine screws (four places).



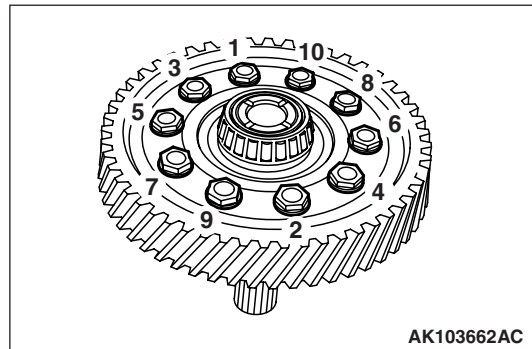
8. Measure the backlash between the side gears and pinions.

**Standard value: 0.025 – 0.150 mm**

9. If the backlash is not within the standard value range, replace the spacers with appropriately selected ones and measure the backlash again.

*NOTE: The amount of the backlash must be the same on both side gears.*

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

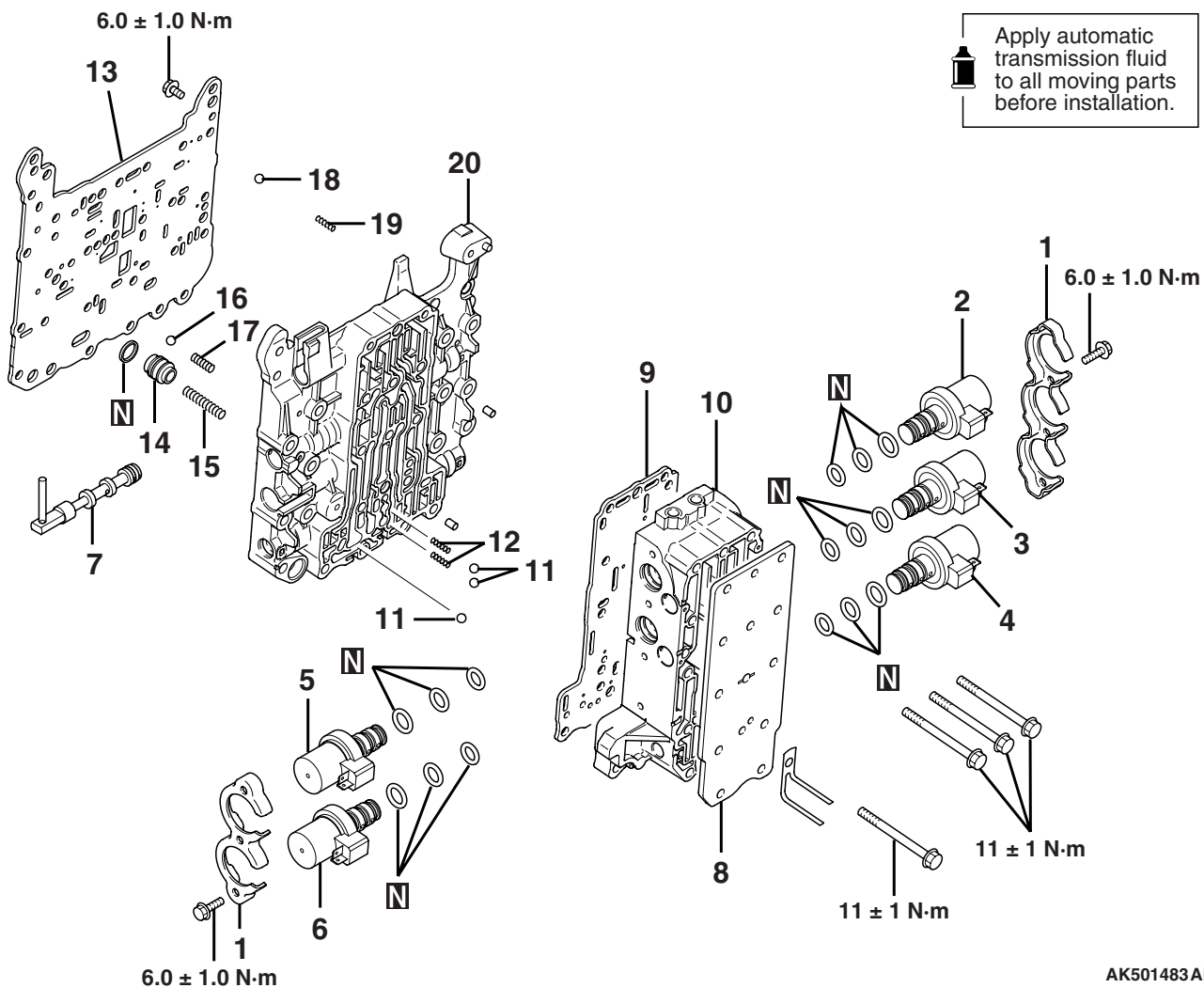


Apply ATF to the bolts, and tighten the bolts to the specified torque of  $135 \pm 5$  N·m in the shown sequence.

## VALVE BODY

## DISASSEMBLY AND REASSEMBLY

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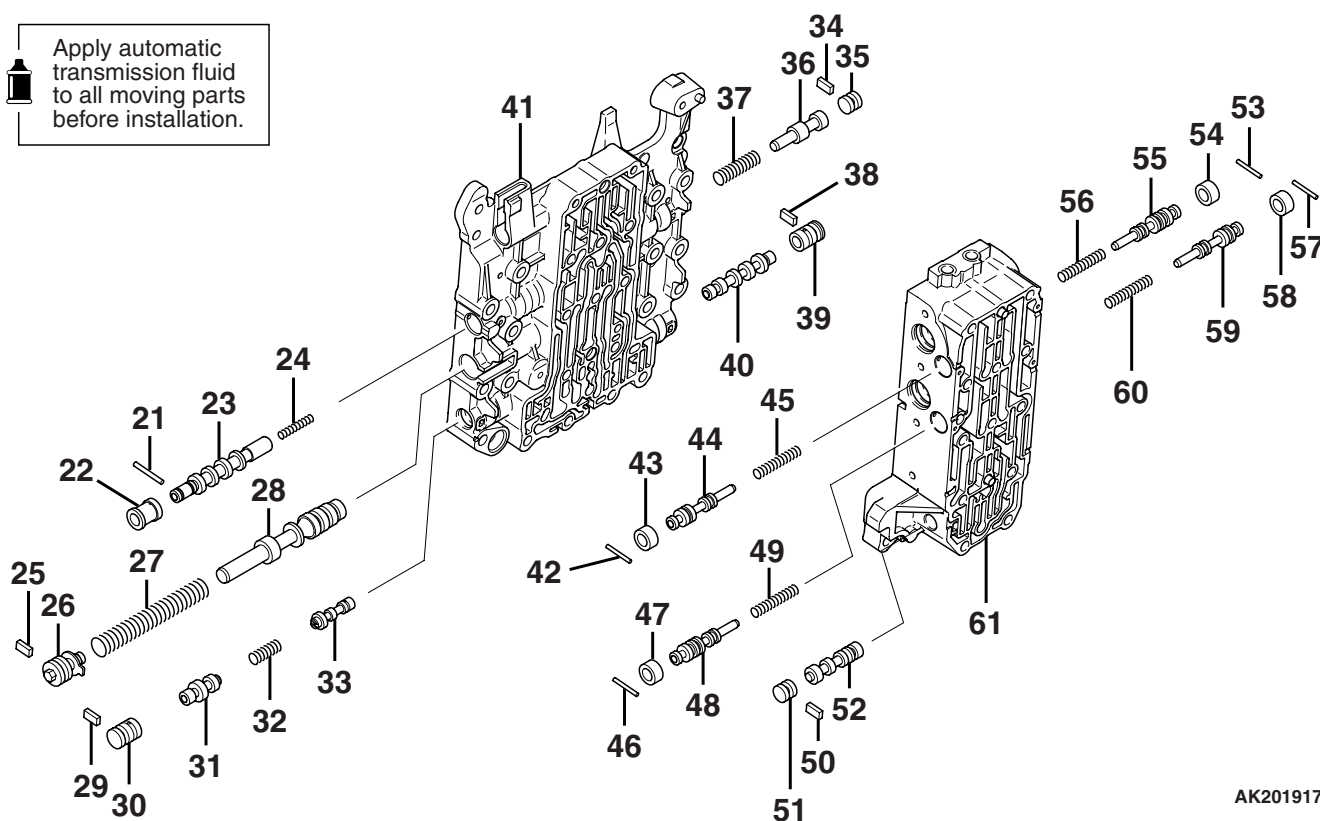
## Disassembly steps

- |       |       |     |                                      |
|-------|-------|-----|--------------------------------------|
| <<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           |
|       |       | 7.  | Manual valve                         |
|       |       | 8.  | Cover                                |
|       |       | 9.  | Plate (separating outside)           |
|       |       | 10. | Outside valve body assembly          |

## Disassembly steps (Continued)

- |       |     |                                 |
|-------|-----|---------------------------------|
| >>B<< | 11. | Steel ball (orifice check ball) |
| >>B<< | 12. | Spring                          |
| >>A<< | 13. | Plate (separating inside)       |
| >>A<< | 14. | Damping valve                   |
| >>A<< | 15. | Damping valve spring            |
| >>A<< | 16. | Steel ball (line relief)        |
| >>A<< | 17. | Spring                          |
| >>A<< | 18. | Steel ball (orifice check ball) |
| >>A<< | 19. | Spring                          |
|       | 20. | Inside valve body assembly      |

 Apply automatic transmission fluid to all moving parts before installation.



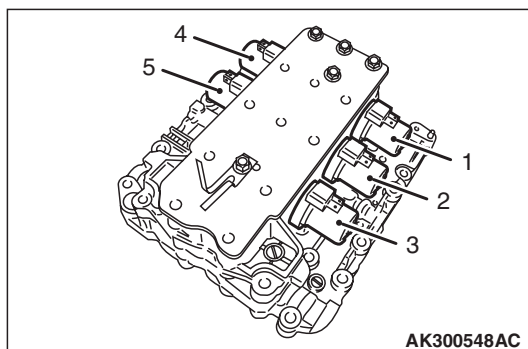
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**Disassembly steps**

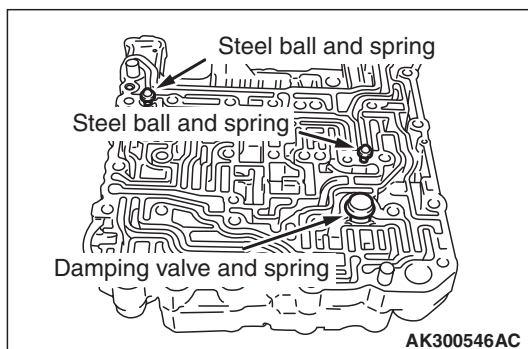
21. Roller
22. Damper clutch control valve sleeve
23. Damper clutch control valve
24. Damper clutch control valve spring
25. Plate
26. Screw
27. Regulator valve spring
28. Regulator valve
29. Plate
30. Fail-safe valve A sleeve
31. Fail-safe valve A2
32. Fail-safe valve A spring
33. Fail-safe valve A1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

**Disassembly steps (Continued)**

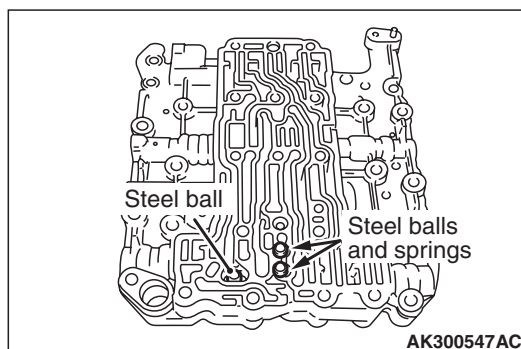
45. Overdrive pressure control valve spring
46. Roller
47. Low-reverse pressure control valve sleeve
48. Low-reverse pressure control valve
49. Low-reverse pressure control valve spring
50. Plate
51. Plug
52. Switch valve
53. Roller
54. Underdrive pressure control valve sleeve
55. Underdrive pressure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

**DISASSEMBLY SERVICE POINT**  
**<<A>> SOLENOID VALVE REMOVAL**

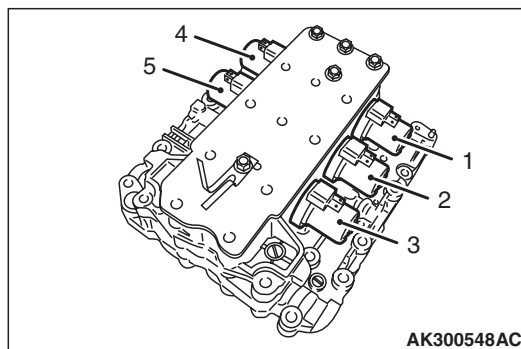
Mark each solenoid valve with white paint to identify its location.

**REASSEMBLY SERVICE POINTS**  
**>>A<< SPRING/STEEL BALL/DAMPING VALVE/DAMPING VALVE SPRING INSTALLATION**

Install the springs (two pieces), steel balls (two pieces), damping valve, and damping valve spring into the locations indicated in the illustration.

**>>B<< SPRING/STEEL BALLS INSTALLATION**

Install the springs (two pieces) and steel balls (three pieces) into the locations indicated in the illustration.

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

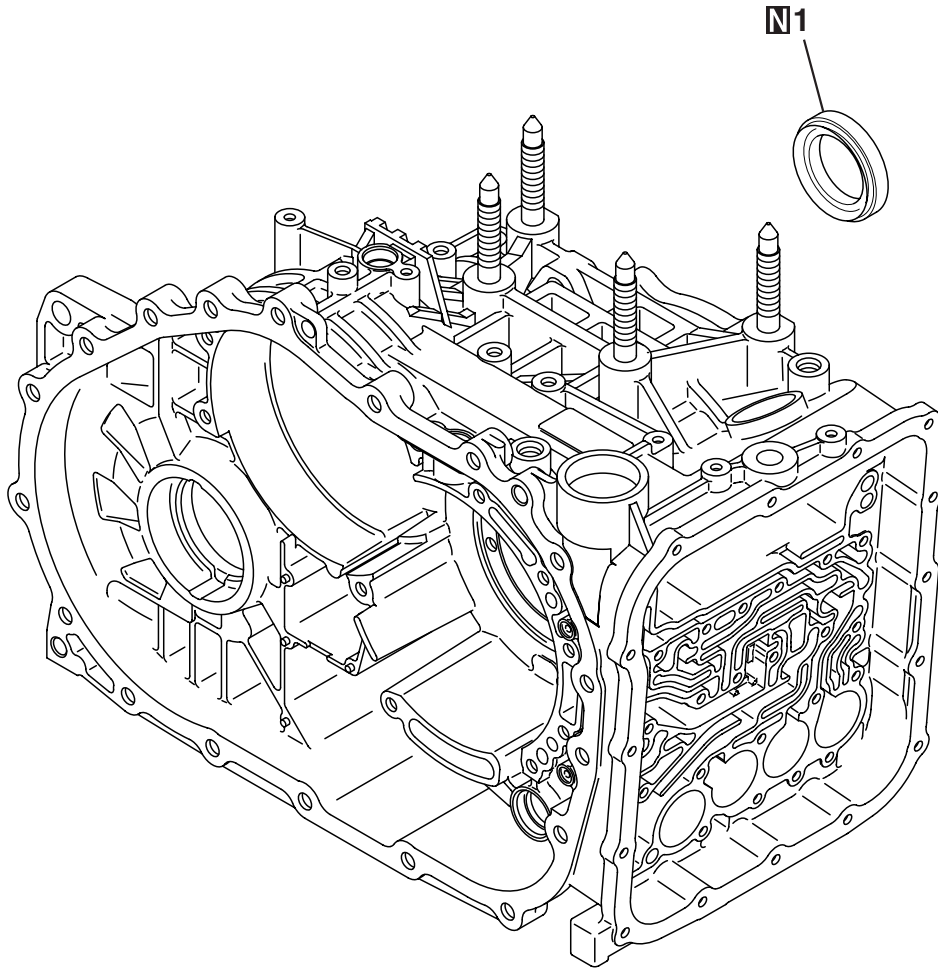
Install the solenoid valves according to the markings that have been made during disassembly.

No.	Solenoid valve
1	Underdrive solenoid valve
2	Second solenoid valve
3	Damper clutch control solenoid valve
4	Overdrive solenoid valve
5	Low-reverse solenoid valve

## DRIVE SHAFT OIL SEAL

### DISASSEMBLY AND REASSEMBLY

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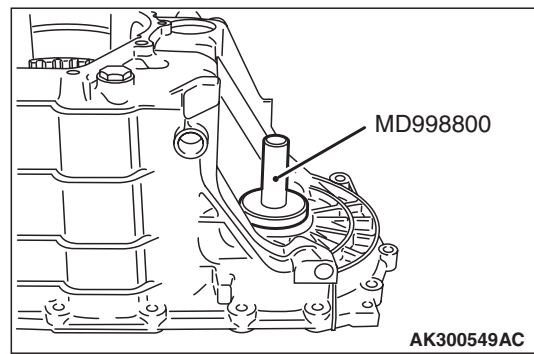


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- Disassembly steps**
- >>A<< 1. Oil seal

### REASSEMBLY SERVICE POINT

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



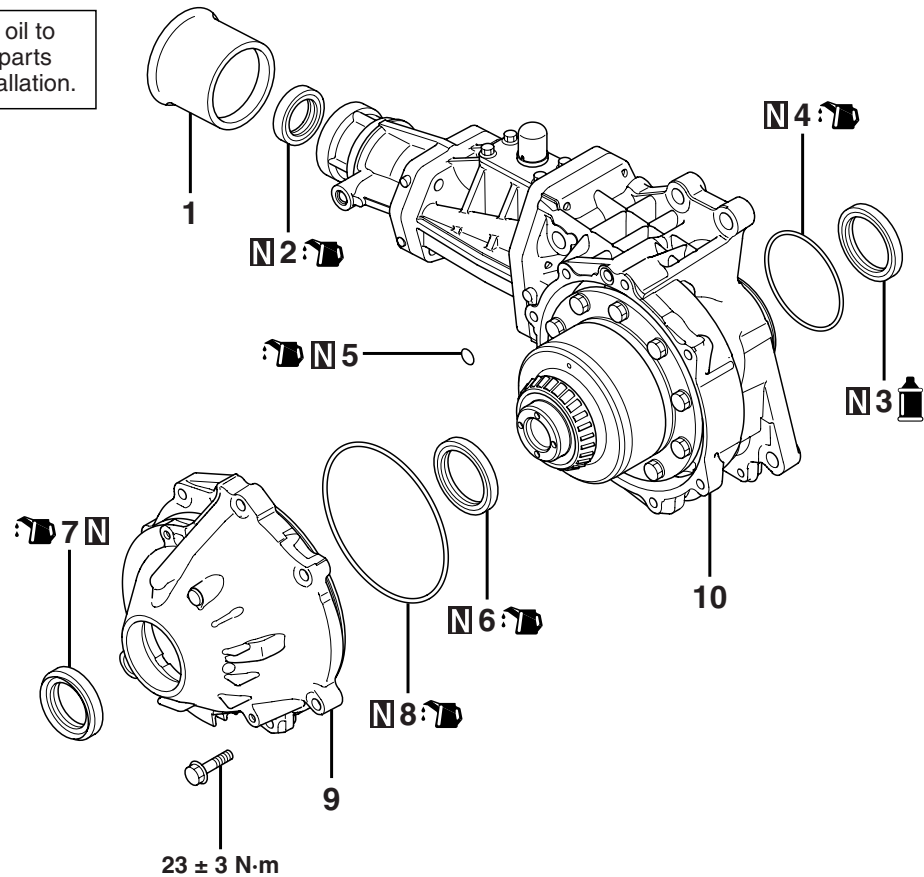
Use the special tool Oil seal installer (MD998800) to install the oil seal.

TRANSFER

DISASSEMBLY AND REASSEMBLY

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Apply gear oil to  
all moving parts  
before installation.



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- Disassembly steps**
- >>E<< 1. Dust seal guard
  - >>D<< 2. Oil seal
  - >>A<< 3. Oil seal
  - >>A<< 4. O-ring
  - >>A<< 5. O-ring

- Disassembly steps (Continued)**
- >>C<< 6. Oil seal
  - >>B<< 7. Oil seal
  - >>A<< 8. O-ring
  - 9. Transfer cover
  - 10. Transfer

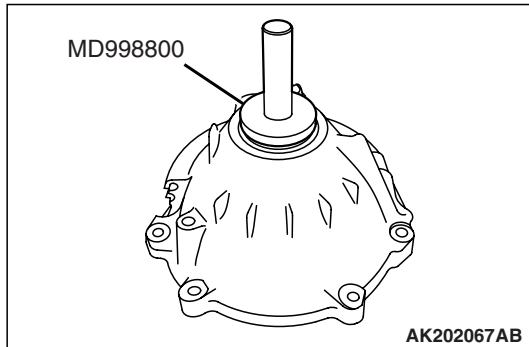


## REASSEMBLY SERVICE POINTS

### >>A<< O-RING INSTALLATION

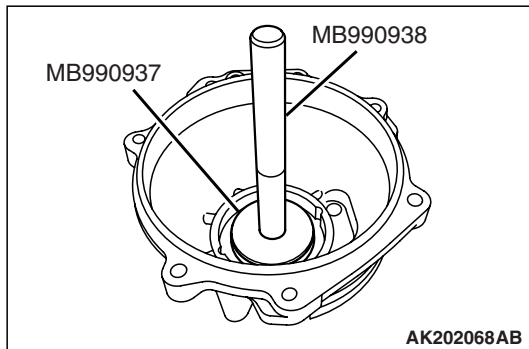
Coat the O-rings with gear oil before installation.

### >>B<< OIL SEAL INSTALLATION



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

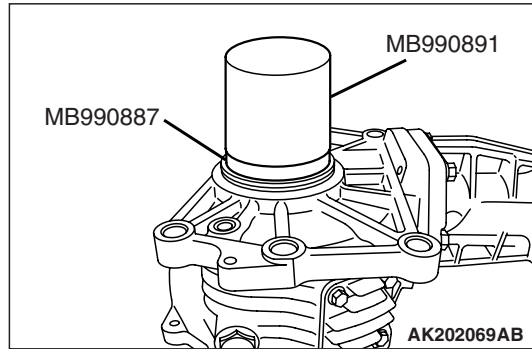
### >>C<< OIL SEAL INSTALLATION



Use the special tools to install the oil seal.

- Installer adapter (MB990937)
- Handle (MB990938)

### >>D<< OIL SEAL INSTALLATION

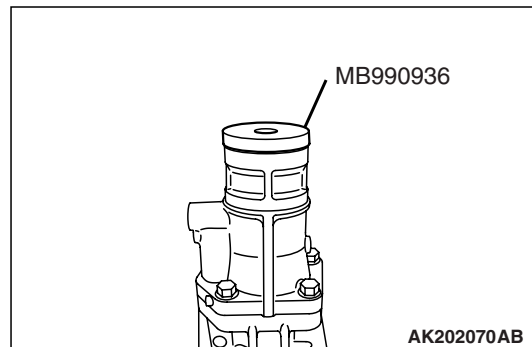


#### **CAUTION**

**Install the oil seal after applying ATF to its lip.**  
Use the special tools to install the oil seal.

- Arm bushing remover and installer ring (MB990887)
- Bushing remover and installer base (MB990891)

### >>E<< OIL SEAL INSTALLATION



#### **CAUTION**

**Install the oil seal after applying gear oil to its lip.**  
Use the special tool Installer adapter (MB990936) to install the oil seal.

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## NOTES