

## GROUP 23B

# CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL

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GENERAL INFORMATION

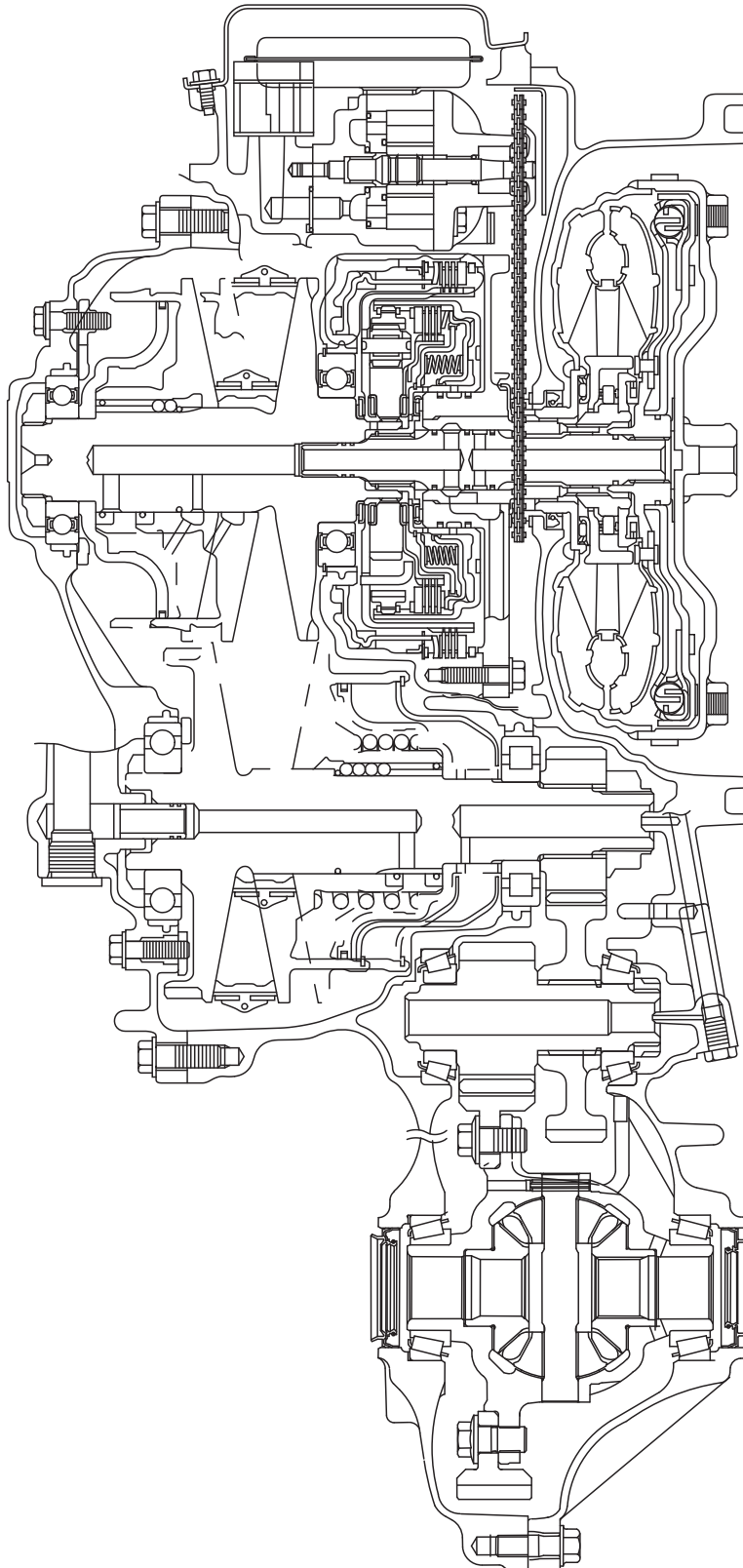
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TRANSAXLE MODELS

Transaxle model	Engine model	Vehicle model
F1CJA-1-A3X	4B12 DOHC MIVEC	CW5WX
F1CJA-1-13X	4B12 DOHC MIVEC	CW5WX
W1CJA-1-A3XA	4B12 DOHC MIVEC	CW5WX
W1CJA-1-13XA	4B12 DOHC MIVEC	CW5WX

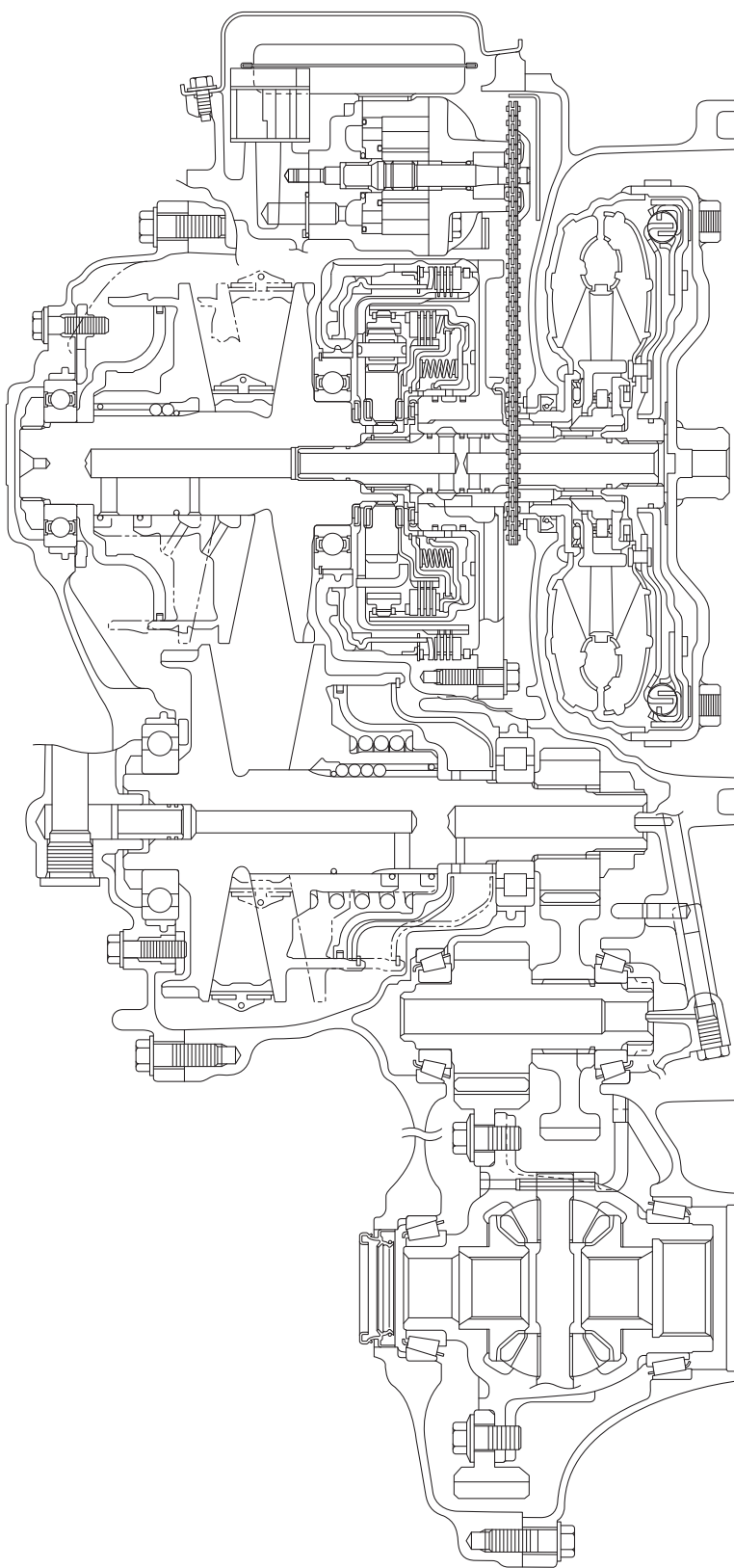
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<F1CJA>



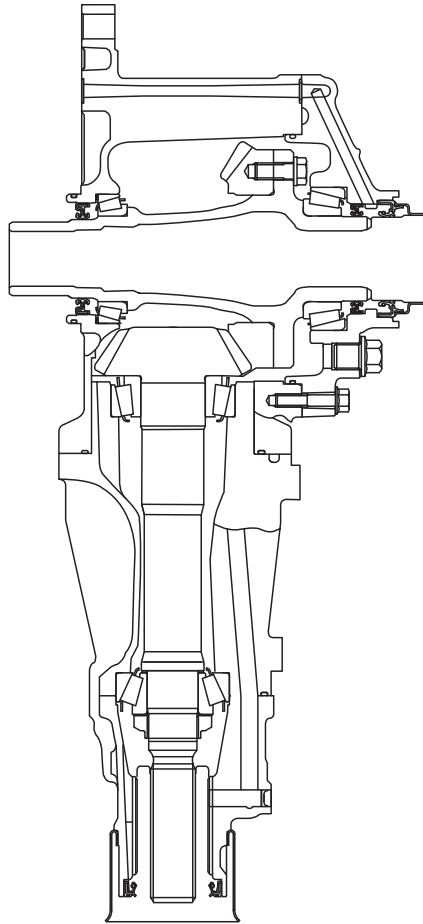
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SECTIONAL VIEW <TRANSFER>



AK502599

GENERAL SPECIFICATIONS

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Item		Specification	
Transaxle model		F1CJA	W1CJA
Torque converter	Type	3-element, 1-stage, 2-phase	
	Stall torque ratio	1.83	
	Lock-up	Present	
Transaxle type		Forward automatic continuously variable (steel belt-driven), reverse 1 speed	
Pulley ratio	Forward	2.349 –0.394	
	Reverse	1.750	
Final gear ratio		6.466	
Transfer type		Center differential type full-time 4WD	
Transfer gear ratio		0.425	

TSB Revision

## SERVICE SPECIFICATIONS

M1233202000398

Item		Standard value mm (in)
Reverse brake clearance		1.2 –1.5 (0.05 –0.06)
Total end play		0.25 –0.55 (0.010 –0.022)
Differential preload		0.17 –0.29 (0.007 –0.011)
Reduction gear preload		0.11 –0.17 (0.004 –0.006)
Mounting bore diameter of reduction gear bearing outer race	Converter housing side	φ61.949 –61.979
	Transaxle case side	(φ2.4389 –2.4401)
Mounting bore diameter of differential side bearing outer race	Converter housing side <F1CJA>	φ67.949 –67.979 (φ2.6752 –2.6763)
	Converter housing side <W1CJA>	φ84.941 –84.976 (φ3.3441 –3.3455)
	Transaxle case side	φ67.949 –67.979 (φ2.6752 –2.6763)
Mounting bore diameter of reduction gear bearing inner race	Converter housing side	φ30.008 –30.029
	Transaxle case side	(φ1.1814 –1.1822)
Mounting bore diameter of differential side bearing inner race	Converter housing side <F1CJA>	φ40.026 –40.051 (φ1.5758 –1.5768)
	Converter housing side <W1CJA>	φ60.032 –60.078 (φ2.3635 –2.3653)
	Transaxle case side	φ40.026 –40.051 (φ1.5758 –1.5768)

## FASTENER TIGHTENING SPECIFICATIONS

M1233205000654

## TRANSAXLE

Item	N· m
Detent spring mounting bolt	6.9 (61 in-lb)
Plug	7.5 (66 in-lb)
Clip mounting bolt	6.9 (61 in-lb)
Oil pump mounting bolt (M8 x 1.25 x 70 mm)	19 (14 ft-lb)
Oil pump mounting bolt (M8 x 1.25 x 36 mm)	28 (21 ft-lb)
Control valve assembly mounting bolt	7.9 (70 in-lb)
Manual lever mounting bolt	22.1 (16 ft-lb)
Bracket mounting bolt	7.9 (70 in-lb)
Oil strainer mounting bolt	7.9 (70 in-lb)
Oil pan mounting bolt	7.9 (70 in-lb)
Drain plug	34.3 (25 ft-lb)
Oil guide mounting bolt	5.9 (52 in-lb)
Bracket mounting bolt	26 (19 ft-lb)
Baffle plate mounting bolt	26 (19 ft-lb)
Oil pump cover mounting bolt	26 (19 ft-lb)

Item	N· m
Chain cover mounting nut	5.9 (52 in-lb)
Converter housing mounting bolt	45 (33 ft-lb)
Shift lever mounting bolt	17.2 (13 ft-lb)
Inhibitor switch mounting bolt	5.5 (49 in-lb)
Primary pulley speed sensor mounting bolt	5.9 (52 in-lb)
Secondary pulley speed sensor mounting bolt	5.9 (52 in-lb)
CVT fluid cooler mounting bolt	4.2 (37 in-lb)
Plug	7.5 (66 in-lb)
Control cable bracket mounting bolt	25 ± 4 (18 ± 2 ft-lb)
Oil filler tube mounting bolt	8.5 ± 3.5 (75 ± 31 in-lb)
Harness bracket mounting bolt	25 ± 4 (18 ± 2 ft-lb)
FR roll stopper bracket mounting bolt	90 ± 10 (66 ± 7 ft-lb)
RR roll stopper bracket mounting bolt	90 ± 10 (66 ± 7 ft-lb)
Reduction gear nut	250 (184 ft-lb)
Final gear mounting bolt	154 (114 ft-lb)

**TRANSFER**

Item	N· m
Transfer mounting bolt	68 ± 9 (50 ± 7 ft-lb)
Cover mounting bolt	12 ± 2 (106 ± 18 in-lb)

## SNAP RING, NEEDLE BEARING AND SHIM FOR ADJUSTMENT

M1233204000413

**Snap rings (For adjustment of reverse brake)**

Thickness mm (in)	Identification	Thickness mm (in)	Identification
2.2 (0.09)	–	2.8 (0.11)	–
2.4 (0.09)	–	3.0 (0.12)	–
2.6 (0.10)	–		

**Needle bearings (For adjustment of total end play)**

Thickness mm (in)	Identification	Thickness mm (in)	Identification
3.58 (0.141)	–	4.26 (0.168)	–
3.75 (0.148)	–	4.43 (0.174)	–
3.92 (0.154)	–	4.60 (0.181)	–
4.09 (0.161)	–	4.77 (0.188)	–

**Adjusting shims (For adjustment of differential preload) <F1CJA>**

Thickness mm (in)	Identification	Thickness mm (in)	Identification
0.40 (0.016)	–	0.96 (0.038)	–
0.44 (0.017)	–	1.00 (0.039)	–
0.48 (0.019)	–	1.04 (0.041)	–
0.52 (0.021)	–	1.08 (0.043)	–
0.56 (0.022)	–	1.12 (0.044)	–
0.60 (0.023)	–	1.16 (0.046)	–
0.64 (0.025)	–	1.20 (0.047)	–
0.68 (0.027)	–	1.24 (0.049)	–
0.72 (0.028)	–	1.28 (0.050)	–
0.76 (0.030)	–	1.32 (0.052)	–

**Adjusting shims (For adjustment of differential preload) <W1CJA>**

Thickness mm (in)	Identification	Thickness mm (in)	Identification
0.24 (0.009)	–	0.80 (0.032)	–
0.28 (0.011)	–	0.84 (0.033)	–
0.32 (0.013)	–	0.88 (0.035)	–
0.36 (0.014)	–	0.92 (0.036)	–
0.40 (0.016)	–	0.96 (0.038)	–
0.44 (0.017)	–	1.00 (0.039)	–
0.48 (0.019)	–	1.04 (0.041)	–
0.52 (0.021)	–	1.08 (0.043)	–
0.56 (0.022)	–	1.12 (0.044)	–
0.60 (0.024)	–	1.16 (0.046)	–
0.64 (0.025)	–	1.20 (0.047)	–
0.68 (0.027)	–	1.24 (0.049)	–
0.72 (0.028)	–	1.28 (0.050)	–
0.76 (0.030)	–	1.32 (0.052)	–

**Adjusting shims (For adjustment of reduction gear preload)**

Thickness mm (in)	Identification	Thickness mm (in)	Identification
0.56 (0.022)	–	1.32 (0.052)	–
0.60 (0.023)	–	1.36 (0.054)	–
0.64 (0.025)	–	1.40 (0.055)	–
0.68 (0.027)	–	1.44 (0.057)	–
0.72 (0.028)	–	1.48 (0.058)	–
0.76 (0.030)	–	1.52 (0.060)	–
0.80 (0.032)	–	1.56 (0.061)	–
0.84 (0.033)	–	1.60 (0.063)	–

Thickness mm (in)	Identification	Thickness mm (in)	Identification
0.88 (0.035)	–	1.64 (0.065)	–
0.92 (0.036)	–	1.68 (0.066)	–
0.96 (0.038)	–	1.72 (0.068)	–
1.00 (0.039)	–	1.76 (0.069)	–
1.04 (0.041)	–	1.80 (0.071)	–
1.08 (0.043)	–	1.84 (0.072)	–
1.12 (0.044)	–	1.88 (0.074)	–
1.16 (0.046)	–	1.92 (0.076)	–
1.20 (0.047)	–	1.96 (0.077)	–
1.24 (0.049)	–	2.00 (0.079)	–
1.28 (0.050)	–		

## SEALANTS AND ADHESIVES

M1233206000378

### Transaxle

Item	Specified sealant and adhesive
Converter housing	Loctite 509

### Transfer

Item	Specified sealant and adhesive
Cover	3M™ATD Part No.8660 or equivalent

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

This transaxle 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.

### CAUTION

When re-applying liquid gasket (FIPG), be sure that:

1. Residues of FIPG are cleared from all the ins and outs of parts;
2. Use Mitsubishi genuine parts cleaner (MZ100387) or equivalent to well degrease the FIPG-applied surface.
3. FIPG is correctly applied in accordance with FIPG Application.

### 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 surfaces 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. Do not allow FIPG to spread beyond the sealing areas during installation. Avoid operating the transaxle 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.

## LUBRICANTS

M1233200400323

### Transaxle

Item	Specified lubricant
CVT fluid application parts	DiaQueen CVTF-J1
Vaseline application parts	White vaseline (main ingredient: isoparaffinic hydrocarbon)

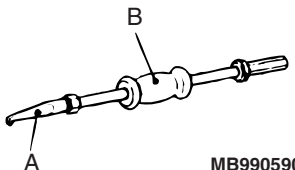
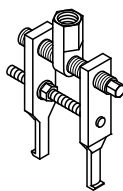
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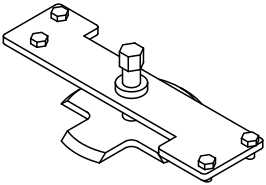
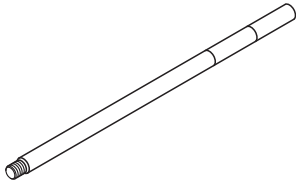
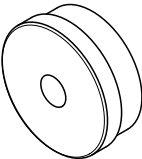
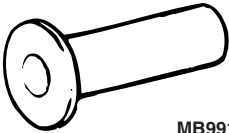
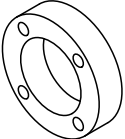
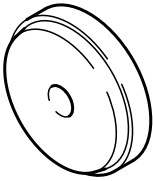
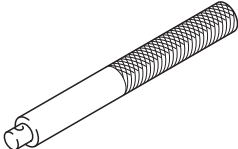
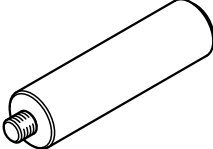
Item	Specified lubricant
Grease application parts	Retinax A
Hypoid gear oil application parts	Hypoid gear oil API classification GL-5 SAE 80

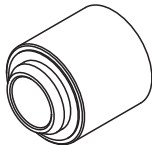
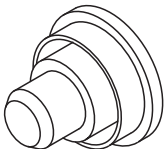
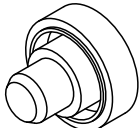

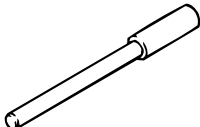
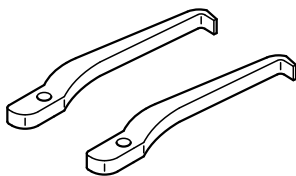
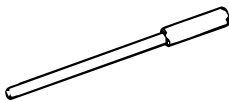
## SPECIAL TOOLS

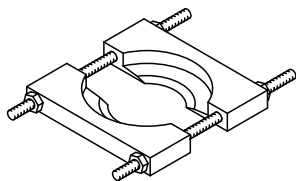
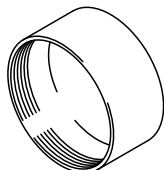
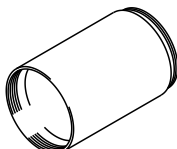
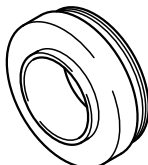

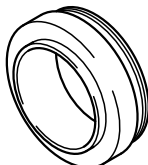
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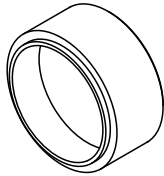
### Transaxle

Tool	Tool number and name	Supersession	Application
 MB990590	MB990590 Real axle shaft oil seal remover	MB990211-01	Removal of outer race of reduction gear bearing and differential side bearing
 MB992039	MB992039 Slide hammer puller	MB992039-01	Removal of outer race of reduction gear bearing and differential side bearing

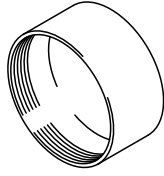
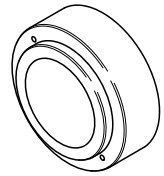
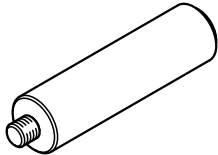

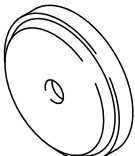
Tool	Tool number and name	Supersession	Application
	MB992139 Spring compressor	–	Removal and installation of reverse brake
	MB990779 Bar	–	Installation of differential side bearing outer race (converter housing side) <F1CJA>
	MB990780 Real axle shaft bushing installer	–	Installation of differential side bearing outer race (converter housing side and transaxle case side) <F1CJA>
 MB991168	MB991168 Differential oil seal installer	MB991168-01	Installation of differential side bearing outer race (converter housing side and transaxle case side) <W1CJA>
	MB991702 Adapter	–	Installation of differential side bearing outer race (converter housing side) <W1CJA>
	MB990932 Installer adapter	–	Reduction gear bearing outer race
	MB990938 Installer bar	–	Reduction gear bearing outer race
	MB992075 Handle	–	Installation of oil seal

Tool	Tool number and name	Supersession	Application
	MB992141 Oil seal installer	–	Installation of converter housing oil seal
	MB992206 Oil seal installer	–	Installation of converter housing side oil seal <F1CJA>
	MB992140 Oil seal installer	–	Installation of side oil seal
 MB990810	MB990810 Side bearing puller	–	Removal of reduction gear bearing inner race (converter housing side), removal of differential side bearing inner race (converter housing side), removal of differential side bearing inner race (transaxle case side)
 MB990947	MB990947 Lower arm push arbor	MB990947-01	Removal of reduction gear bearing inner race (converter housing side)
	MD999566 Crow	–	Removal of reduction gear bearing inner race (converter housing side)
	MB990984 Mount bushing lower roll insulator arbor	–	Removal of reduction gear bearing inner race (transaxle case side)

Tool	Tool number and name	Supersession	Application
	MD998917 Bearing remover	–	Removal of reduction gear bearing inner race (transaxle case side)
	MD998812 Installer cap	MIT304180-A or General service tool	Installation of reduction gear bearing inner race (converter housing side and transaxle case side), installation of differential side bearing outer race (converter housing side), installation of differential side bearing inner race (converter housing side), installation of reduction pinion gear
	MD998813 Installer-100	MIT304180-A or General service tool	Installation of reduction gear bearing inner race (converter housing side and Transaxle case side), installation of differential side bearing outer race (converter housing side), installation of differential side bearing inner race (converter housing side), installation of reduction pinion gear
	MD998819 Installer adapter (40)	–	Installation of reduction gear bearing inner race (converter housing side and Transaxle case side), installation of reduction pinion gear
	MB991452 Oil seal installer	–	Removal of differential side bearing inner race (converter housing side) <W1CJA>
	MD998823 Installer adapter (48)	–	Installation of differential side bearing inner race (transaxle case side)

Tool	Tool number and name	Supersession	Application
	MB992138 Bearing Installer	–	Installation of differential side bearing inner race (converter housing side) <W1CJA>

**Transfer**

Tool	Tool number and name	Supersession	Application
	MD998812 Installer cap	MIT304180-A or General service tool	Installation of reduction gear bearing inner race (converter housing side and transaxle case side), installation of differential side bearing outer race (converter housing side), installation of differential side bearing inner race (converter housing side), installation of reduction pinion gear installation of transfer oil seal
	MB992154 Oil seal installer	–	Installation of transfer oil seal
	MB992075 Handle	–	Installation of oil seal
	MB992142 Oil seal installer	–	Installation of transfer oil seal
	MB990936 Oil seal installer	–	Installation of transfer oil seal

## TRANSAXLE

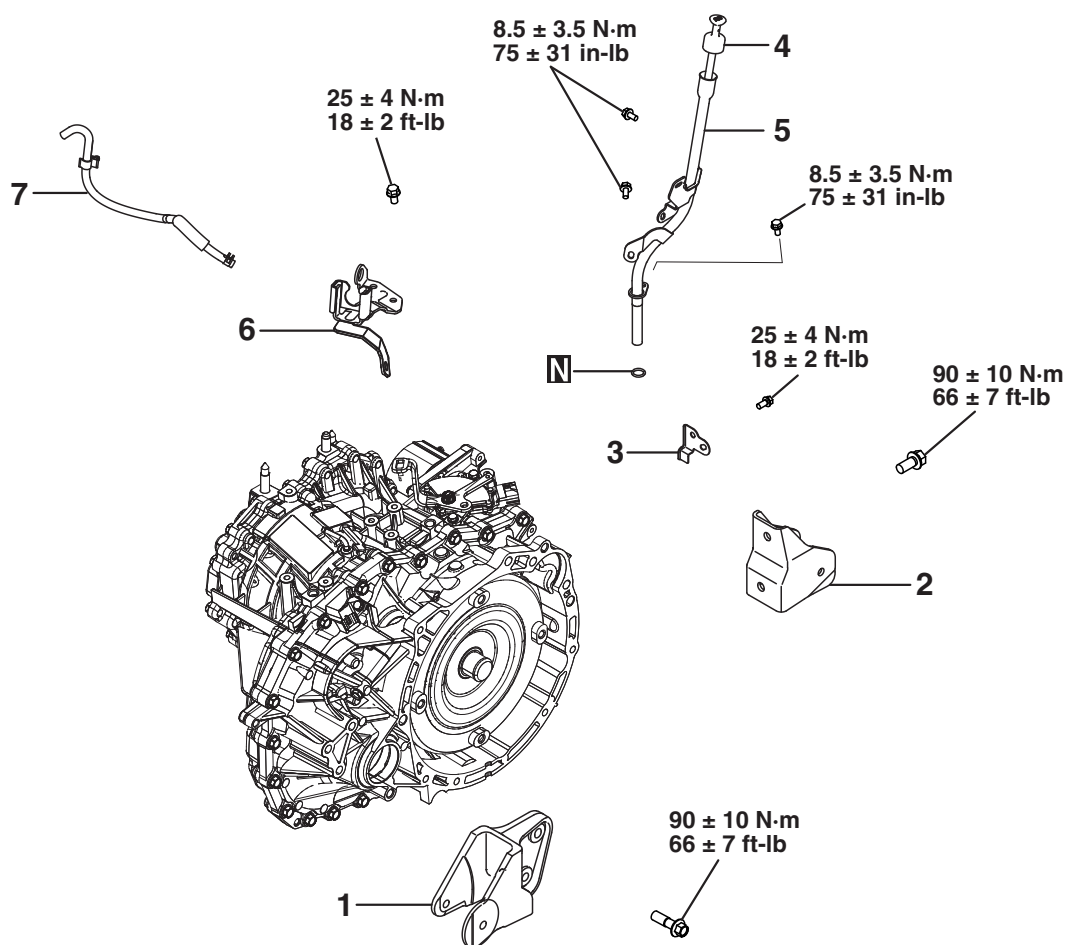
### DISASSEMBLY AND ASSEMBLY

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#### CAUTION

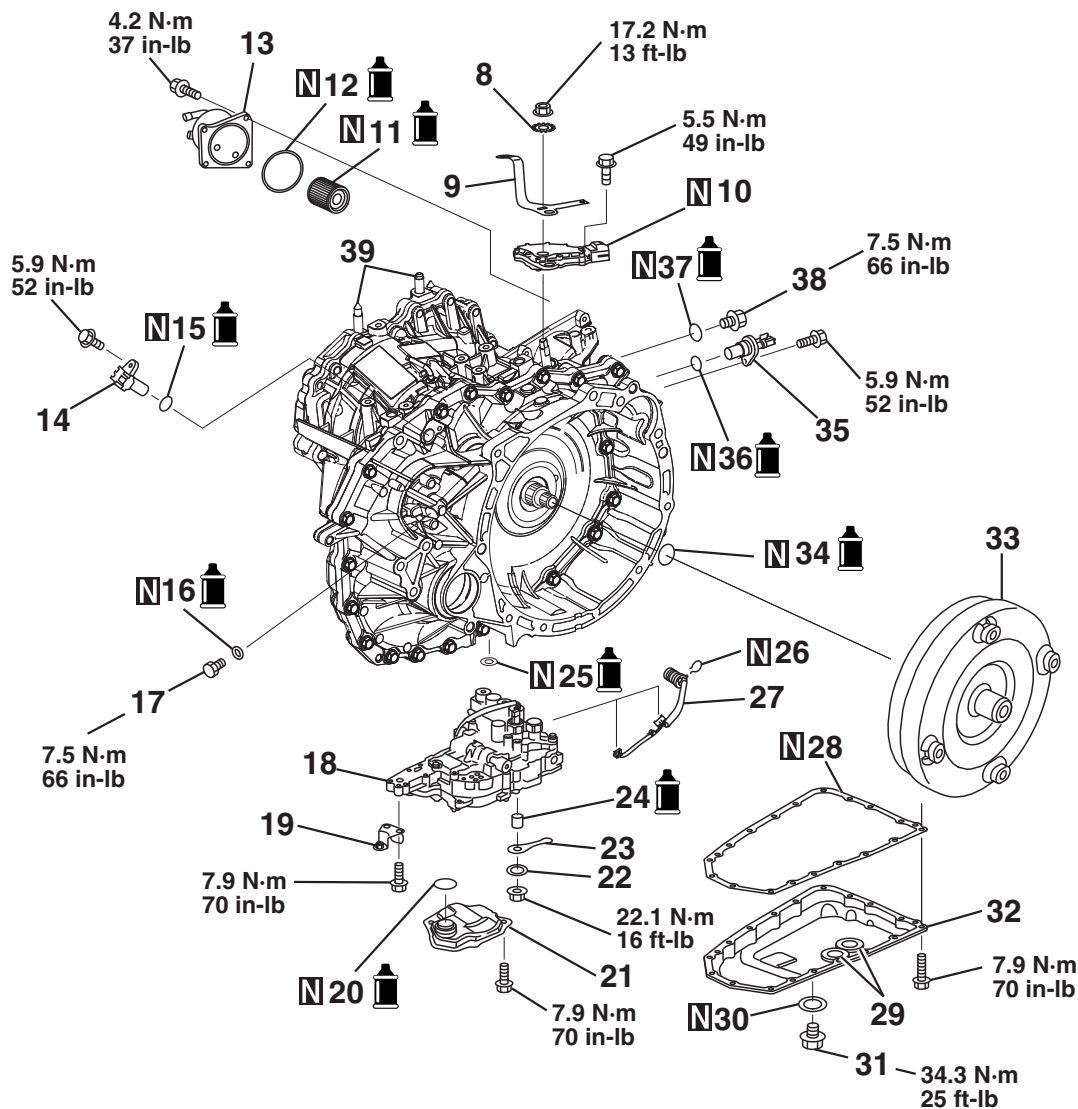
- Only use transmission fluid of the specified brand. Use of transmission fluid other than specified will impair driveability and CVT endurance, and may lead to breakage of CVT.
- Only use the specified vaseline. Use of vaseline other than specified will impair driveability and CVT endurance, and may lead to breakage of CVT.
- Disassembly work should be done in a clean dust-proof room.
- Prior to disassembly, clean any sand or dirt adhered to the outer parts of transaxle using steam, washing oil or another solvent, outside the clean room, so as not to contaminate inner parts of transaxle during disassembly or assembly. (Do not allow steam to get inside the transaxle, and do not clean rubber parts with washing oil.)
- After cleaning, remove the torque converter, and drain the transmission fluid.
- Disassembly and assembly work should be done with bare hands or using plastic gloves.
- Do not touch inner parts of the transaxle after touching its outer parts. (Wash hands after touching the outer parts.)
- Do not use cotton gloves and rags to prevent from lint; instead, use paper rags.
- Prior to assembly or disassembly work, make sure conditions are appropriate.
- Do not re-use the drained transmission fluid.

&lt;F1CJA&gt;



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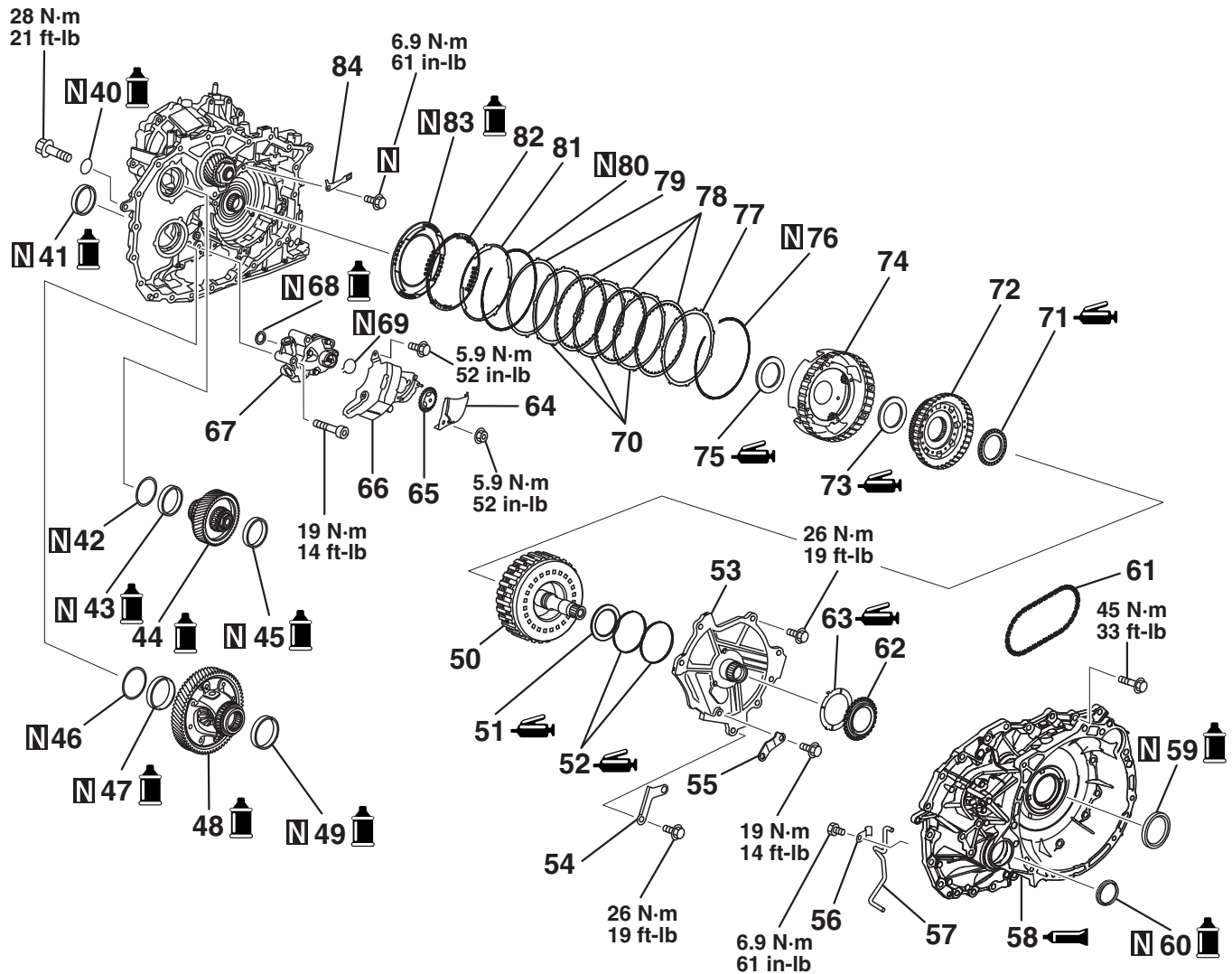
- |                            |                          |
|----------------------------|--------------------------|
| 1. RR roll stopper bracket | 5. Oil filler tube       |
| 2. FR roll stopper bracket | 6. Control cable bracket |
| 3. Harness bracket         | 7. Breather hose         |
| 4. Oil level gage          |                          |



- 8. Washer
- 9. Shift lever
- 10. Inhibitor switch
- 11. CVT fluid filter
- 12. O-ring
- 13. CVT fluid cooler
- 14. Secondary pulley speed sensor
- 15. O-ring
- 16. O-ring
- 17. Plug
- 18. Control valve
- 19. Bracket
- 20. O-ring
- 21. Oil strainer
- 22. Spring washer
- 23. Manual lever

- 24. Bush
- 25. Lip seal
- 26. Snap ring
- 27. Valve body harness
- 28. Oil pan gasket
- 29. Magnet
- 30. Drain plug gasket
- 31. Drain plug
- 32. Oil pan
- 33. Torque converter
- 34. O-ring
- 35. Primary pulley speed sensor
- 36. O-ring
- 37. O-ring
- 38. Plug
- 39. Stud bolt

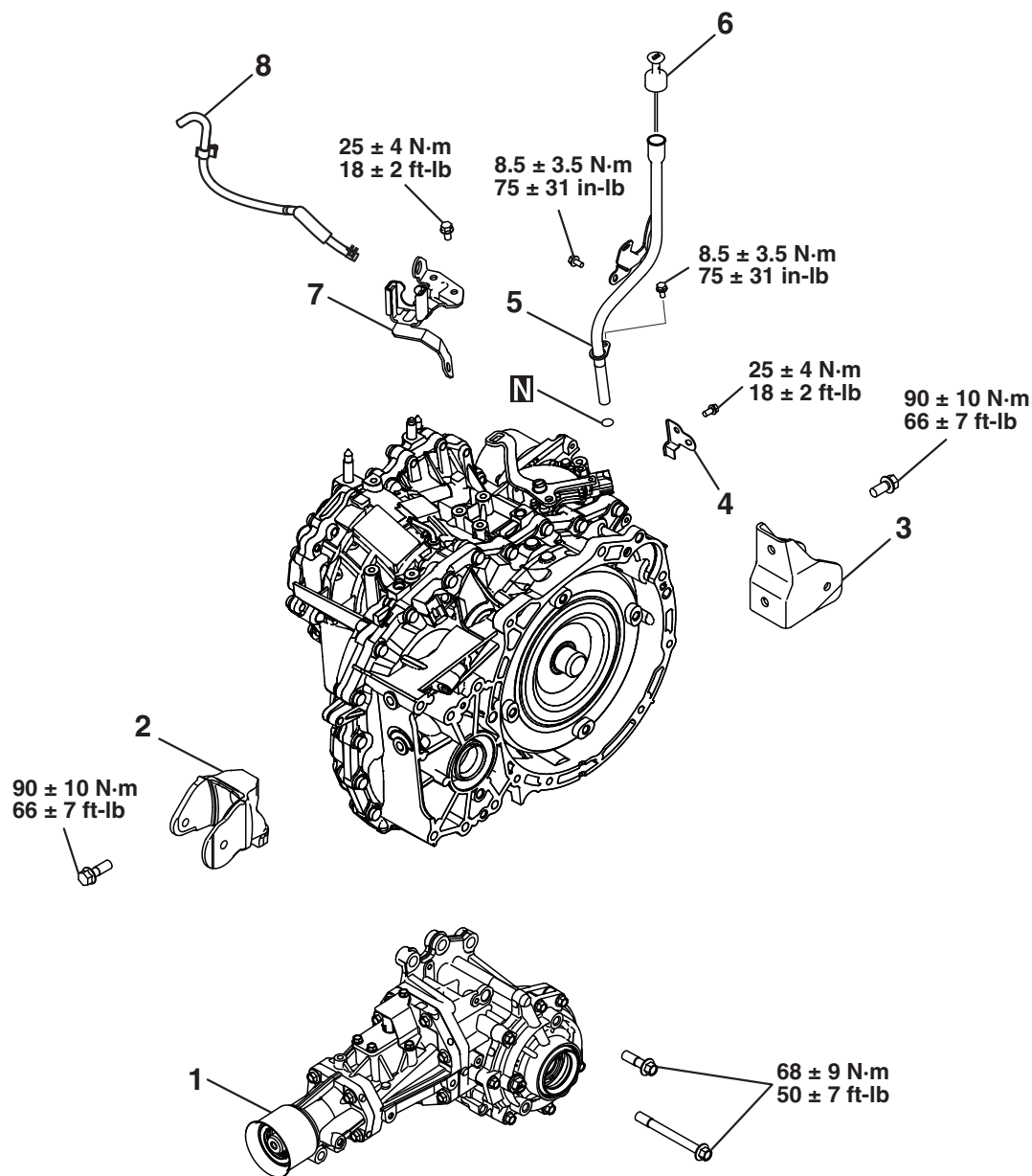
AK802919AE



AK802927AE

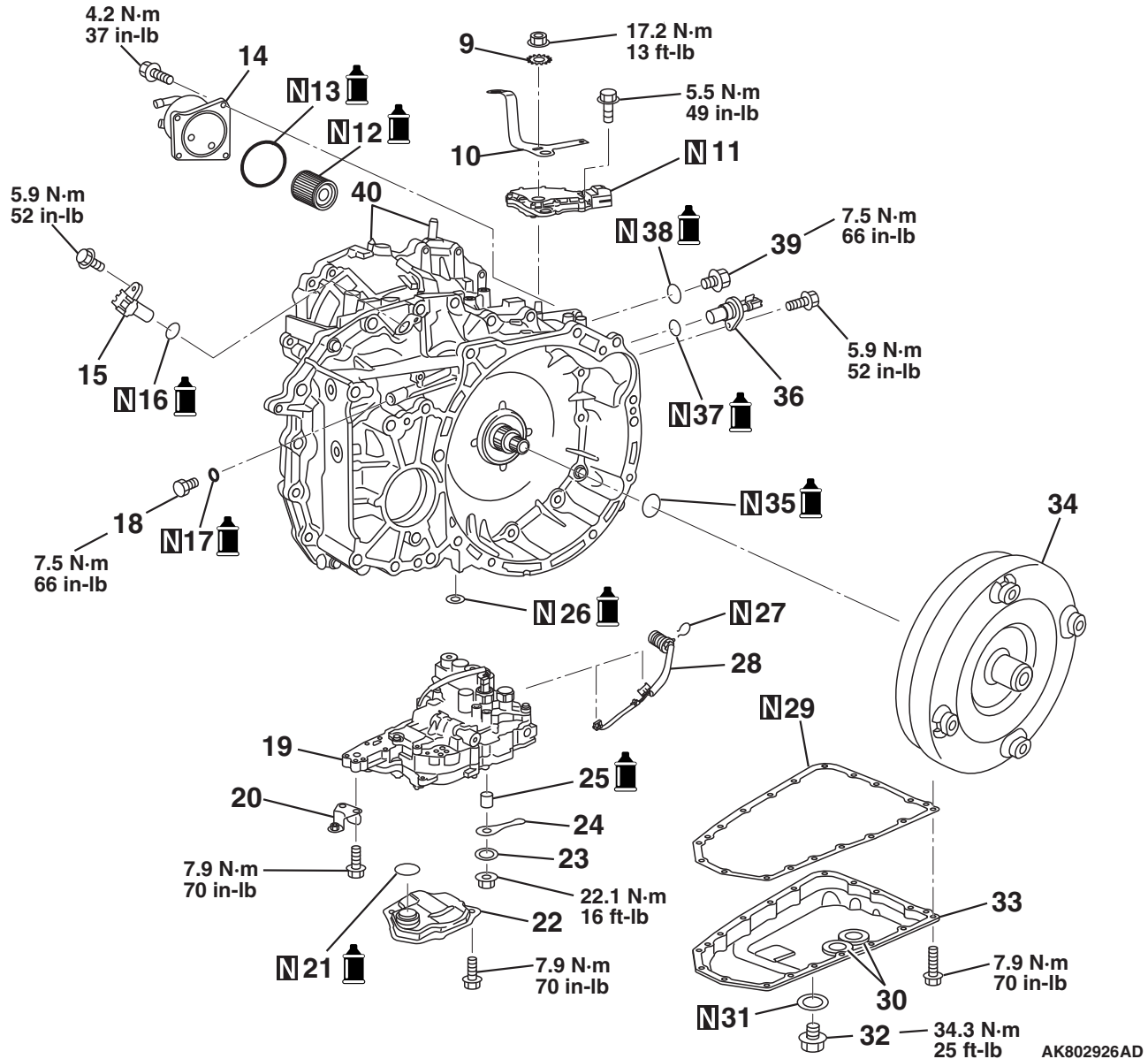
- |                                     |                              |
|-------------------------------------|------------------------------|
| 40. O-ring                          | 63. Thrust washer            |
| 41. Side oil shim                   | 64. Chain cover              |
| 42. Adjusting shim                  | 65. Driven sprocket          |
| 43. Outer race                      | 66. Oil guide                |
| 44. Reduction gear assembly         | 67. Oil pump                 |
| 45. Outer race                      | 68. Lip seal                 |
| 46. Adjusting shim                  | 69. Snap ring                |
| 47. Outer race                      | 70. Driven plate             |
| 48. Differential assembly           | 71. Needle bearing           |
| 49. Outer race                      | 72. Sun gear                 |
| 50. Forward clutch assembly         | 73. Needle bearing           |
| 51. Needle bearing                  | 74. Planet carrier           |
| 52. Seal ring                       | 75. Needle bearing           |
| 53. Oil pump cover                  | 76. Snap ring                |
| 54. Baffle plate                    | 77. Retaining plate          |
| 55. Bracket                         | 78. Drive plate              |
| 56. Clip                            | 79. Dish plate               |
| 57. Pipe                            | 80. Snap ring                |
| 58. Converter housing               | 81. Retaining plate          |
| 59. Converter housing oil seal      | 82. Spring retainer assembly |
| 60. Converter housing side oil seal | 83. Reverse brake piston     |
| 61. Oil pump chain                  | 84. Detent spring            |
| 62. Drive sprocket                  |                              |

<W1CJA>



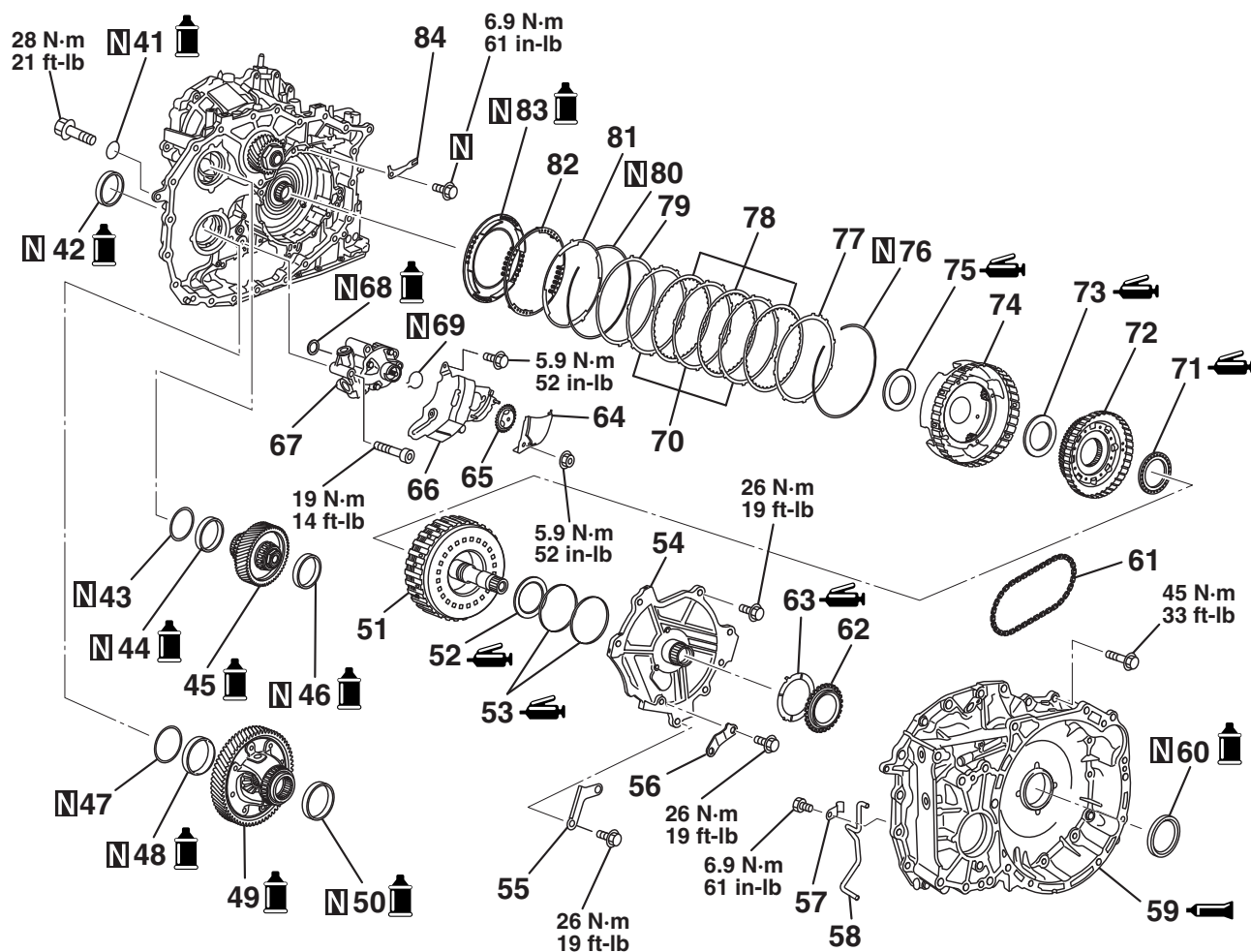
AK701558AG

- |                            |                          |
|----------------------------|--------------------------|
| 1. Transfer                | 5. Oil filler tube       |
| 2. RR roll stopper bracket | 6. Oil level gage        |
| 3. FR roll stopper bracket | 7. Control cable bracket |
| 4. Harness bracket         | 8. Breather hose         |



- 9. Washer
- 10. Shift lever
- 11. Inhibitor switch
- 12. CVT fluid filter
- 13. O-ring
- 14. CVT fluid cooler
- 15. Secondary pulley speed sensor
- 16. O-ring
- 17. O-ring
- 18. Plug
- 19. Control valve
- 20. Bracket
- 21. O-ring
- 22. Oil strainer
- 23. Spring washer
- 24. Manual lever

- 25. Bush
- 26. Lip seal
- 27. Snap ring
- 28. Valve body harness
- 29. Oil pan gasket
- 30. Magnet
- 31. Drain plug gasket
- 32. Drain plug
- 33. Oil pan
- 34. Torque converter
- 35. O-ring
- 36. Primary pulley speed sensor
- 37. O-ring
- 38. O-ring
- 39. Plug
- 40. Stud bolt



AK802810AD

- |                                |                              |
|--------------------------------|------------------------------|
| 41. O-ring                     | 63. Thrust washer            |
| 42. Side oil shim              | 64. Chain cover              |
| 43. Adjusting shim             | 65. Driven sprocket          |
| 44. Outer race                 | 66. Oil guide                |
| 45. Reduction gear assembly    | 67. Oil pump                 |
| 46. Outer race                 | 68. Lip seal                 |
| 47. Adjusting shim             | 69. Snap ring                |
| 48. Outer race                 | 70. Driven plate             |
| 49. Differential assembly      | 71. Needle bearing           |
| 50. Outer race                 | 72. Sun gear                 |
| 51. Forward clutch assembly    | 73. Needle bearing           |
| 52. Needle bearing             | 74. Planet carrier           |
| 53. Seal ring                  | 75. Needle bearing           |
| 54. Oil pump cover             | 76. Snap ring                |
| 55. Baffle plate               | 77. Retaining plate          |
| 56. Bracket                    | 78. Drive plate              |
| 57. Clip                       | 79. Dish plate               |
| 58. Pipe                       | 80. Snap ring                |
| 59. Converter housing          | 81. Retaining plate          |
| 60. Converter housing oil seal | 82. Spring retainer assembly |
| 61. Oil pump chain             | 83. Reverse brake piston     |
| 62. Drive sprocket             | 84. Detent spring            |

**Required special tools:**

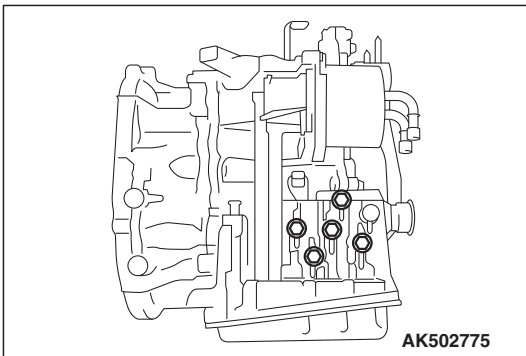
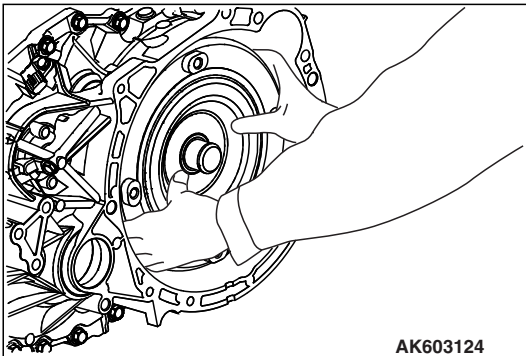
- MB990590: Real axle shaft oil seal remover
- MB992039: Slide hammer puller
- MB992139: Spring compressor
- MB990779: Bar

- MB990780: Real axle shaft bushing installer
- MB991168: Differential oil seal installer
- MB991702: Adapter
- MB990932: Installer adapter
- MB990938: Installer bar
- MB992075: Handle
- MB992141: Oil seal installer
- MB992206: Oil seal installer
- MB992140: Oil seal installer

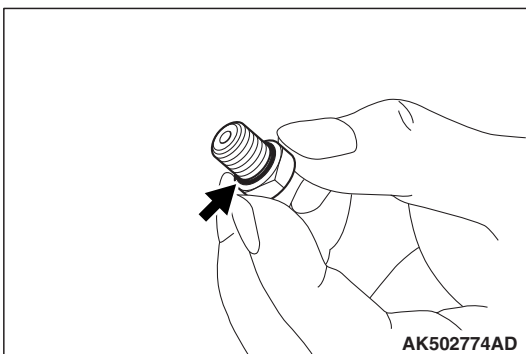
**DISASSEMBLY SERVICE POINT****⚠ CAUTION**

**Do not disassemble parts other than specified in this manual.**

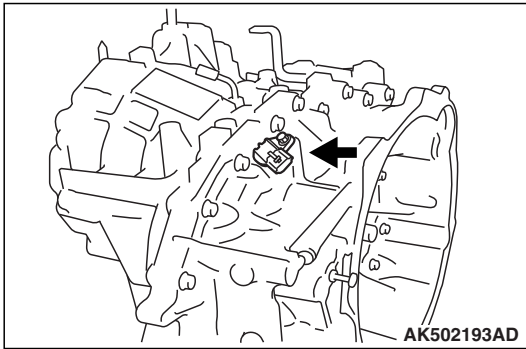
1. Remove the transfer from the transaxle. <W1CJA>
2. Remove the RR roll stopper bracket and FR roll stopper bracket from the transaxle.
3. Remove the harness bracket from the transaxle.
4. Remove the oil filler tube and oil level gage from the transaxle.
5. Remove the control cable bracket and breather hose from the transaxle.
6. Remove the torque converter from the transaxle.



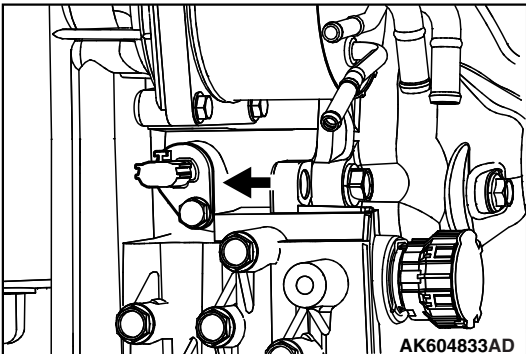
7. Remove the plug from the transaxle case.



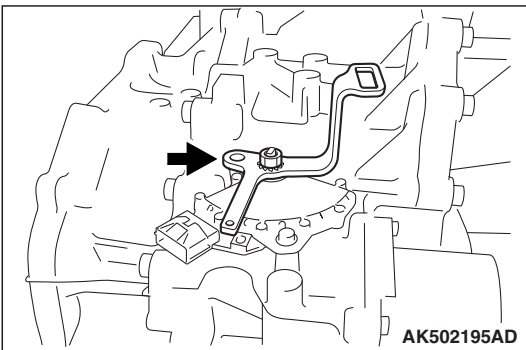
8. Remove the O-ring from the plug.



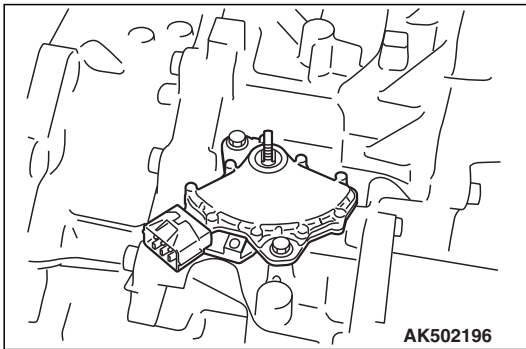
9. Remove the secondary pulley speed sensor from the converter housing, and detach the O-ring from the sensor.



10. Remove the primary pulley speed sensor from the transaxle case, and detach the O-ring from the sensor.



11. Remove the shift lever from the manual shaft.

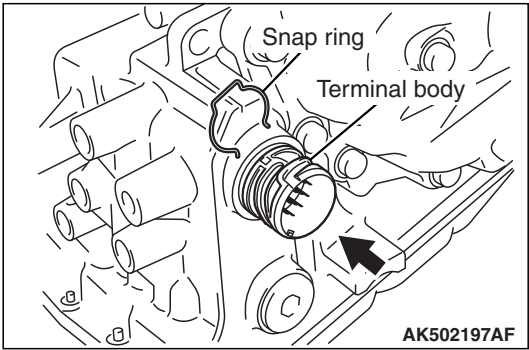


12. Remove the inhibitor switch from the transaxle.

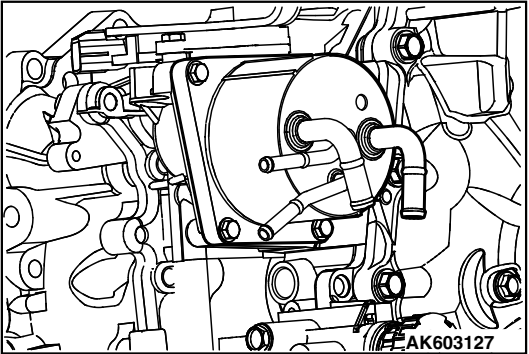
**⚠ CAUTION**

Be careful not to cause damage to the terminal body.

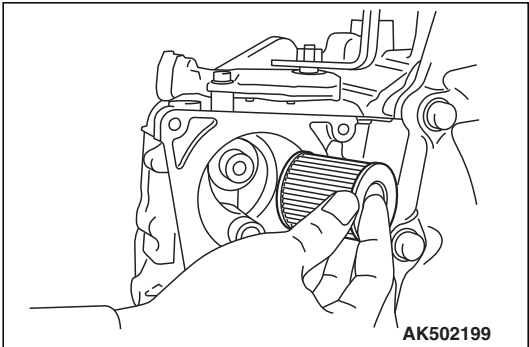
13.Remove the snap ring from the terminal body, and press the terminal body into the transaxle case.



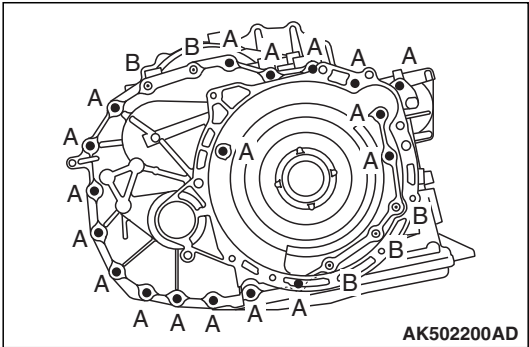
14.Remove the CVT fluid cooler from the transaxle case, and detach the O-ring from the cooler.



15.Remove the CVT fluid filter from the transaxle case.



16.Remove the fastening bolts of converter housing.

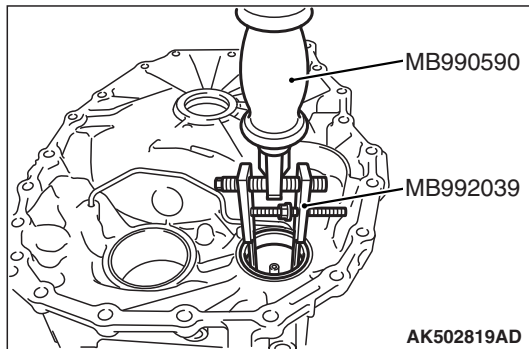
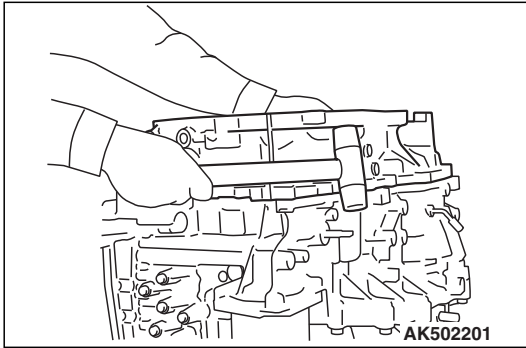


Bolt symbol	A	B
Shank length mm	30	35
Quantity	18	5

**⚠ CAUTION**

Be careful because adjusting shim of the drive sprocket may depart.

17. Remove the converter housing by tapping with a plastic hammer etc.

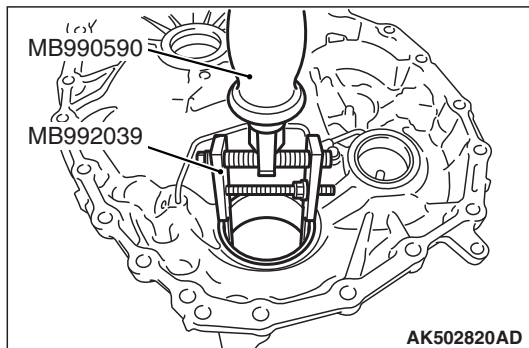


18. Using the special tools MB990590 and MB992039, remove the outer race of reduction gear bearing from the converter housing.

19. Using cylinder gage etc., measure the mounting bore diameter of reduction gear bearing outer race at the converter housing side; if the standard value is not satisfied, then replace the converter housing.

**Standard value**

φ61.949 – 61.979 mm (φ2.4389 – 2.4401 in)



20. Using the special tools MB990590 and MB992039, remove the outer race of differential side bearing from the converter housing.

21. Using cylinder gage etc., measure the mounting bore diameter of differential side bearing outer race at the converter housing side; if the standard value is not satisfied, then replace the converter housing.

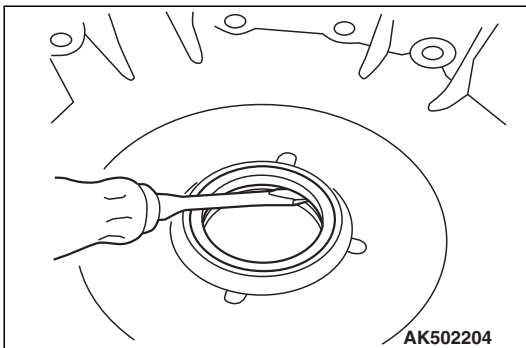
**Standard value**

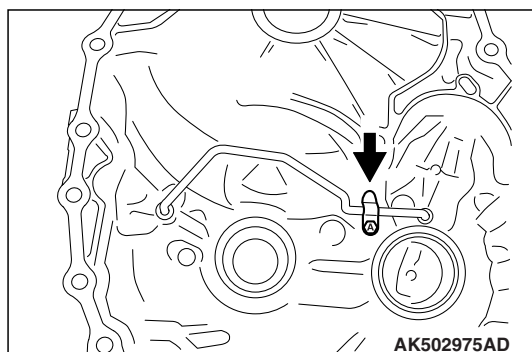
- F1CJA: φ67.949 – 67.979 mm (φ2.6752 – 2.6763 in)
- W1CJA: φ84.941 – 84.976 mm (φ3.3441 – 3.3455 in)

**⚠ CAUTION**

When removing the oil seal, be careful not to cause damage to the converter housing.

22. Using a flat blade screwdriver etc., remove the converter housing oil seal from the housing.

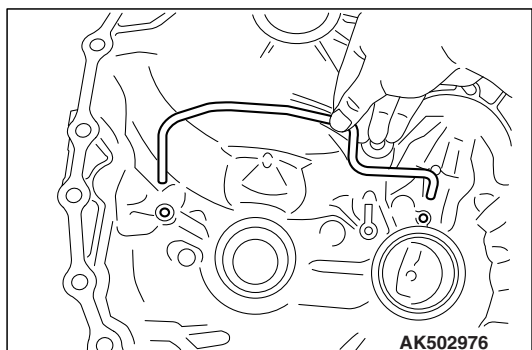




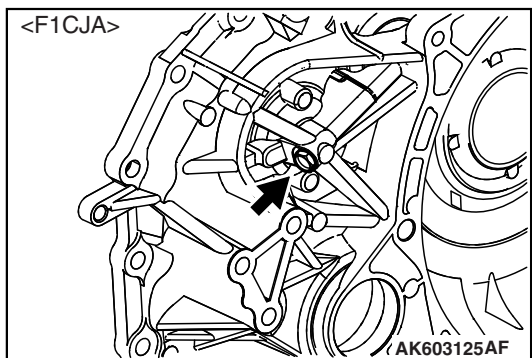
23.Remove the clip.

**⚠ CAUTION**

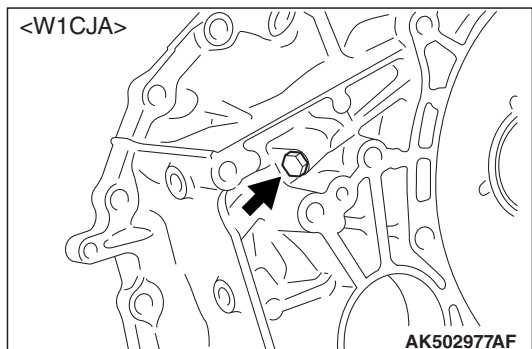
**When removing the pipe, be careful not to bend it.**

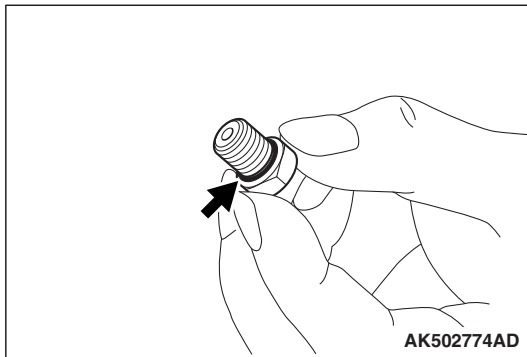


24.Remove the pipe from the converter housing.

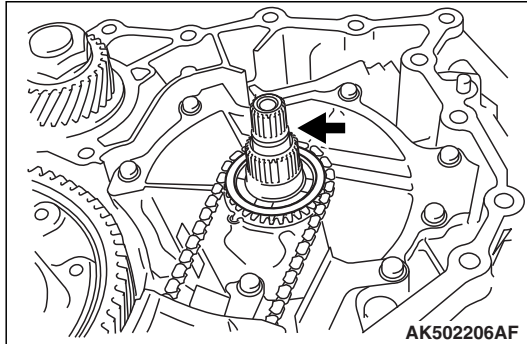


25.Remove the plug from the converter housing.

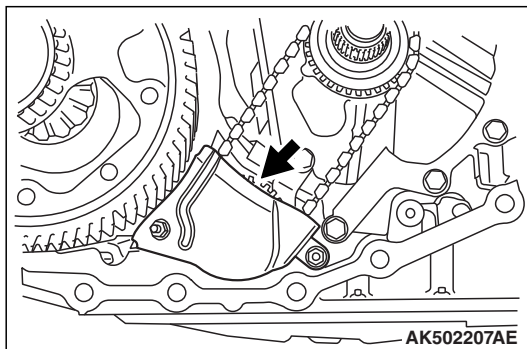




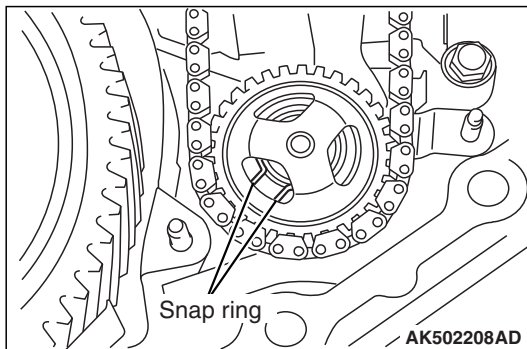
26.Remove the O-ring from the plug.



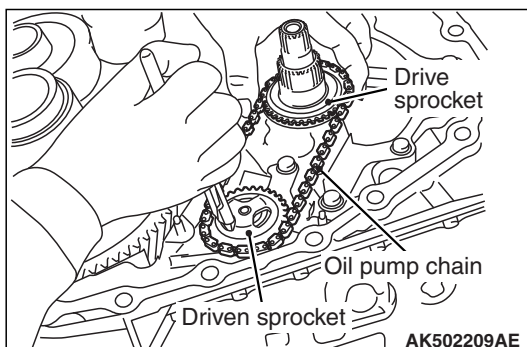
27.Remove the O-ring from the input shaft.

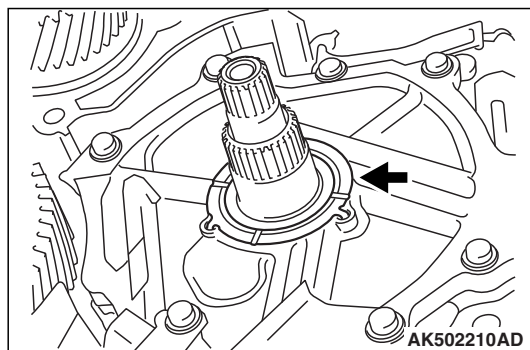


28.Remove the chain cover.

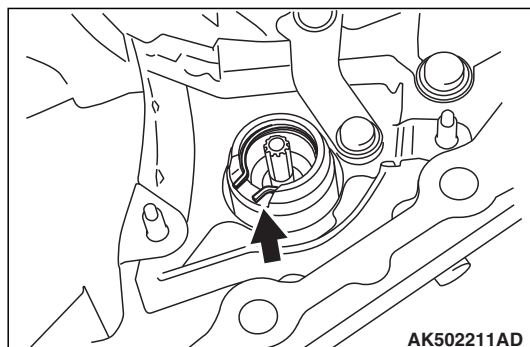


29.Expand the snap ring, and remove the driven sprocket, oil pump chain, and drive sprocket.

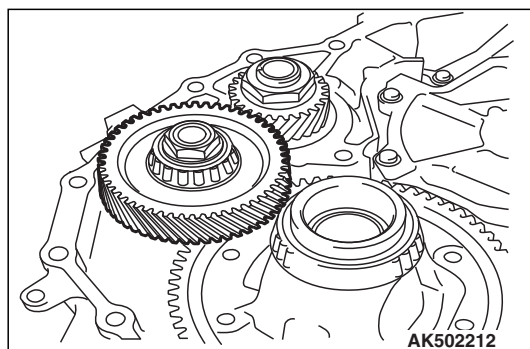




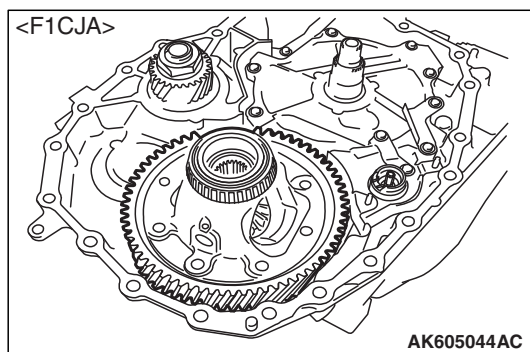
30.Remove the thrust washer from the oil pump cover.



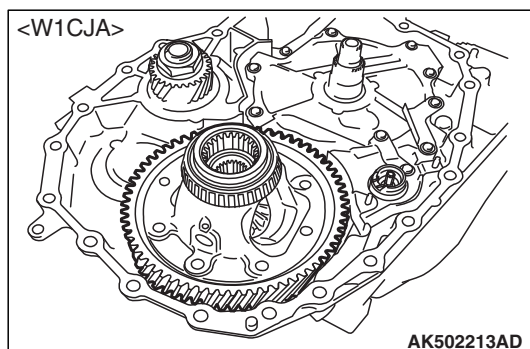
31.Remove the snap ring from the oil pump.

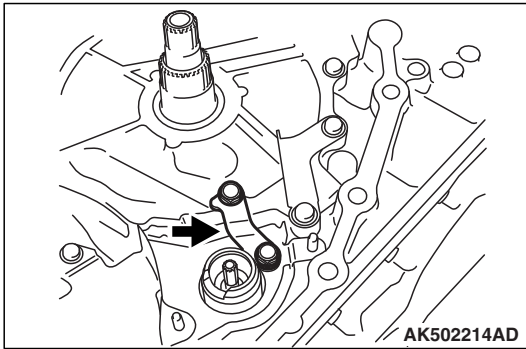


32.Remove the reduction gear assembly from the transaxle case.

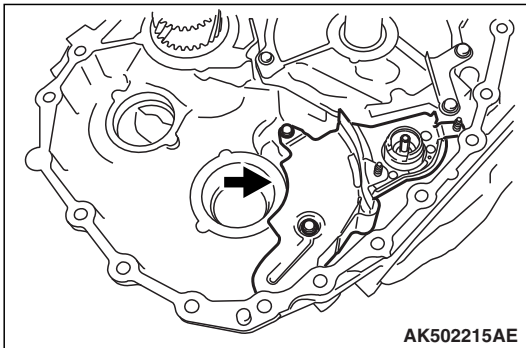


33.Remove the differential assembly from the transaxle case.

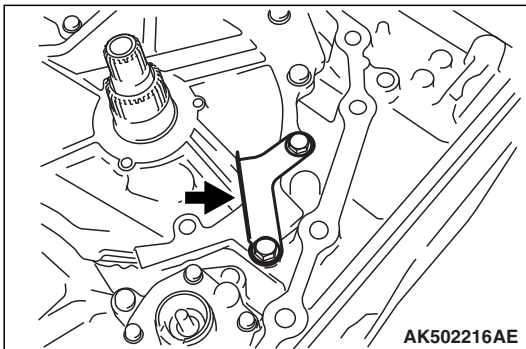




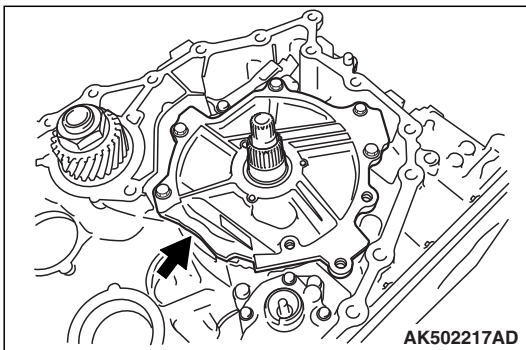
34.Remove the bracket.



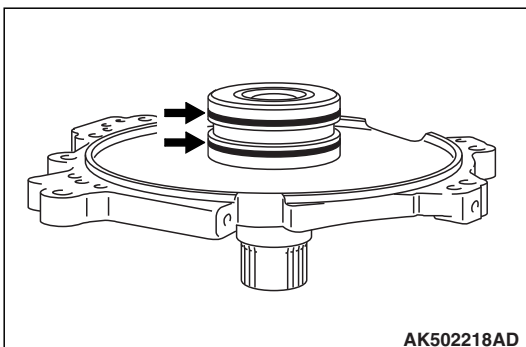
35.Remove the oil guide.



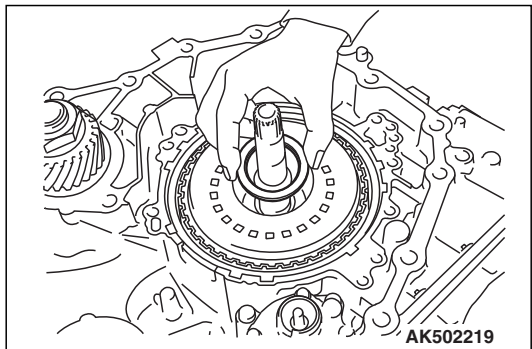
36.Remove the baffle plate.



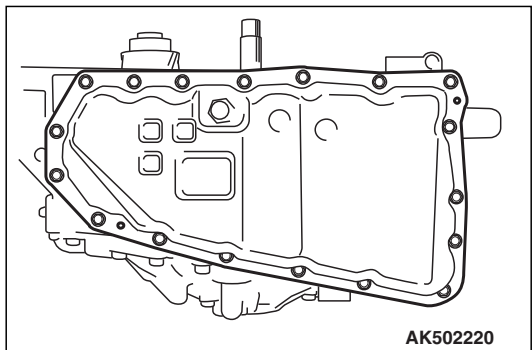
37.Remove the oil pump cover from the transaxle case.



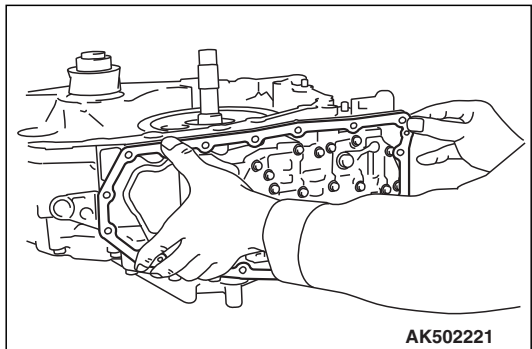
38.Remove the seal rings from the oil pump cover.



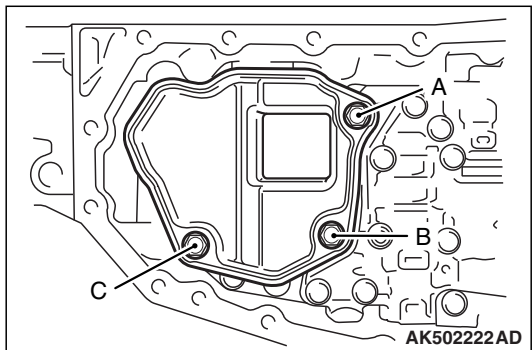
39.Remove the needle bearing from the forward clutch assembly.



40.Remove the oil pan from the transaxle case.  
41.Remove the magnet from the oil pan.

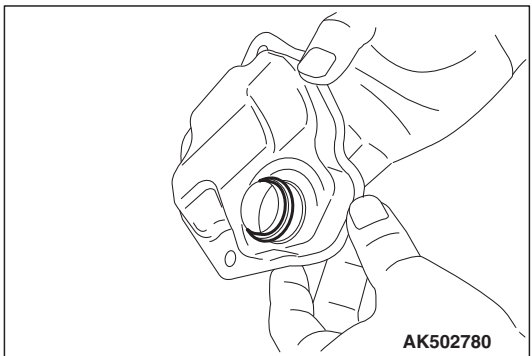


42.Remove the oil pan gasket from the transaxle case.

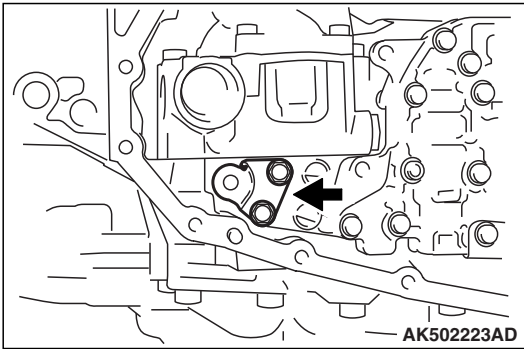


43.Remove the oil strainer

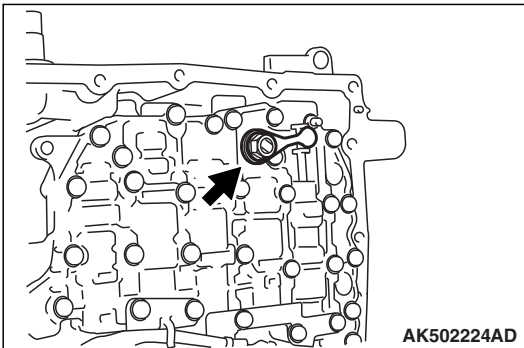
Bolt symbol	A	B	C
Shank length mm	12	44	12
Quantity	1	1	1



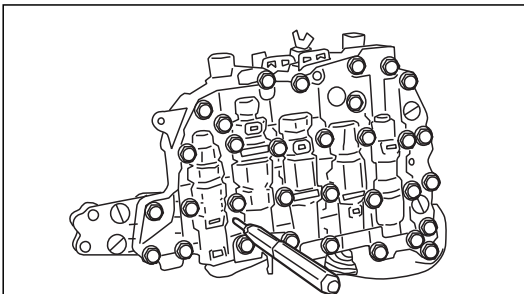
44.Remove the O-ring from the oil strainer.



45.Remove the bracket from the control valve assembly.

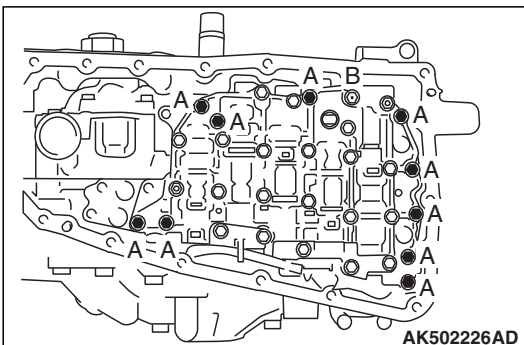
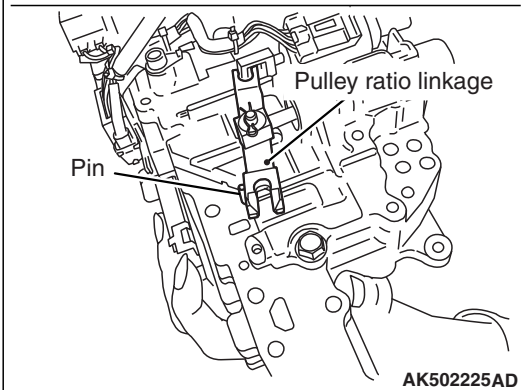


46.Remove the manual lever.



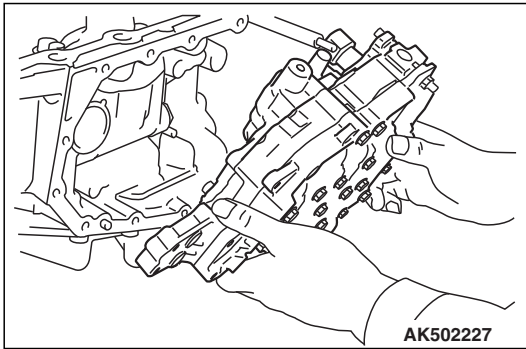
47.Remove the control valve assembly from the transaxle case as follows:

- (1) Insert pins etc. ( $\phi 3$  mm) into linkage stopper holes of the control valve assembly to fix the pulley ratio linkage.



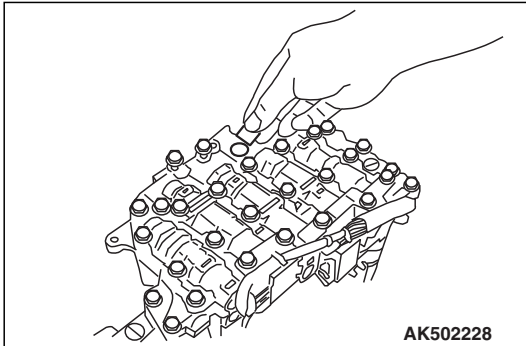
- (2) Remove fastening bolts of the control valve assembly.

Bolt symbol	A	B
Shank length mm	54	44
Quantity	10	1

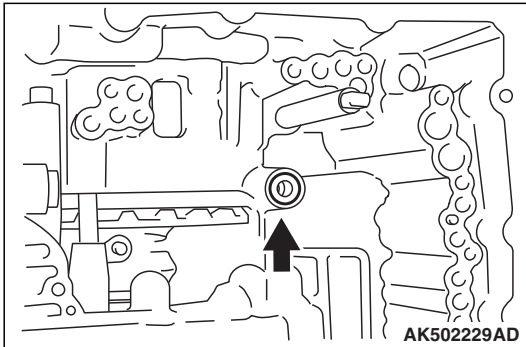


- (3) Remove the control valve assembly from the transaxle case.

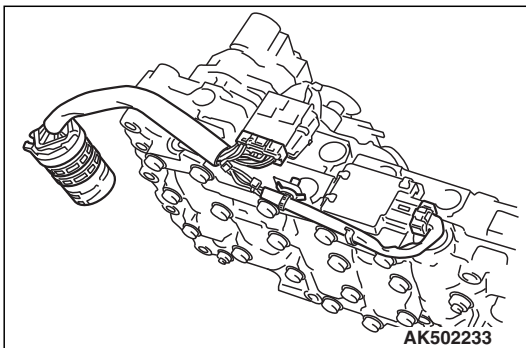
*NOTE: Tilt the control valve assembly, and after removing from the manual shaft side, remove the terminal body from the transaxle case.*



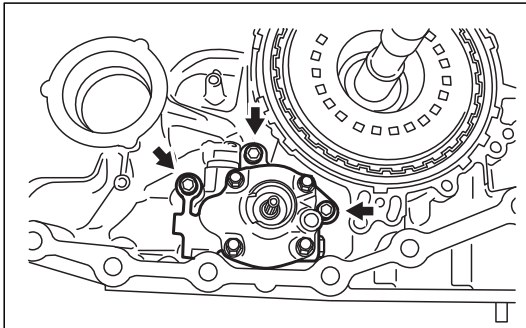
48. Remove the bush from the control valve.



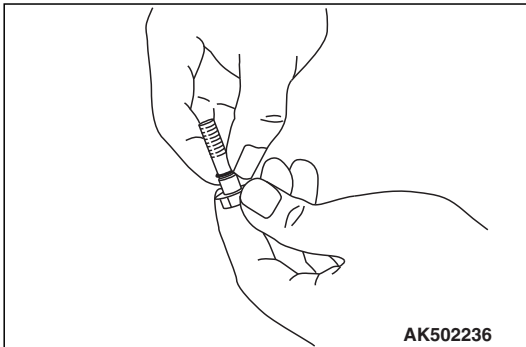
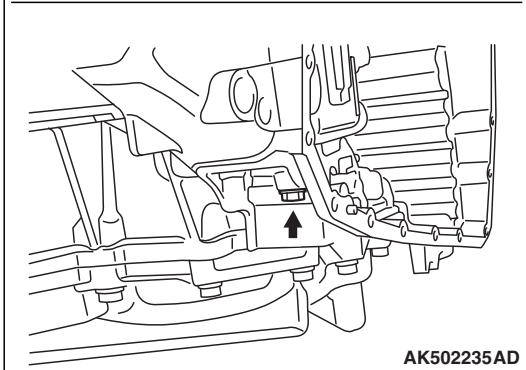
49. Remove the lip seal from the transaxle case.



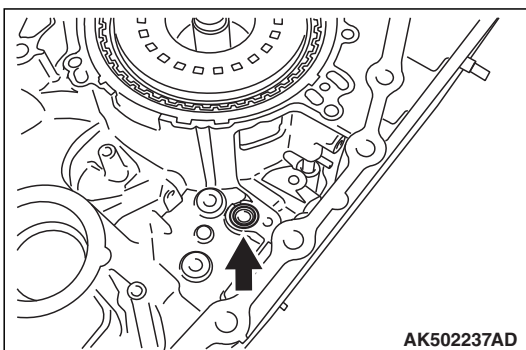
50. Remove the valve body harness from the control valve.



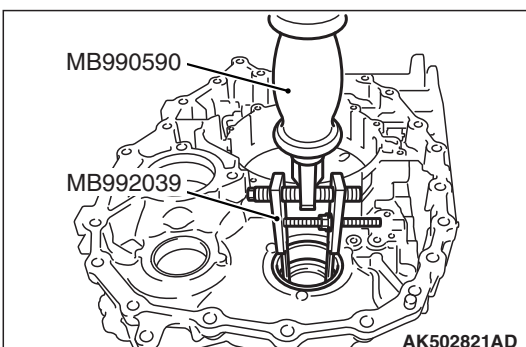
51. Remove the oil pump from the transaxle case. (One fastening bolt is installed at the backside from the transaxle case side.)



52. Remove the O-ring from the oil pump fastening bolt.



53. Remove the lip seal from the transaxle case.

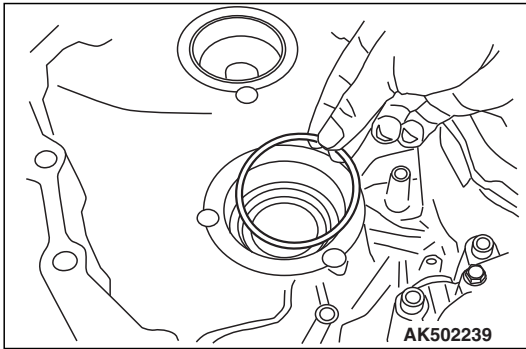


54. Using the special tools MB990590 and MB992039, remove outer race of the differential side bearing from the transaxle case.

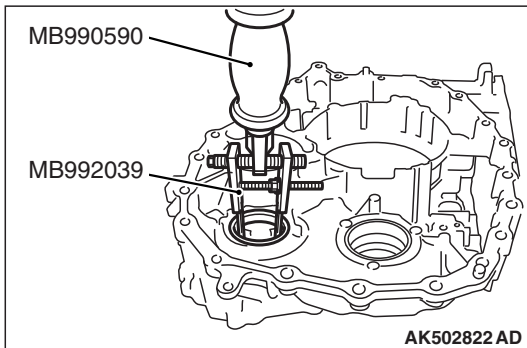
55. Using cylinder gage etc., measure the mounting bore diameter of differential side bearing outer race at the transaxle case side; if the standard value is not satisfied, then replace the CVT assembly.

**Standard value**

φ67.949 – 67.979 mm (φ2.6752 – 2.6763 in)



56. Remove the adjusting shim from the transaxle case.

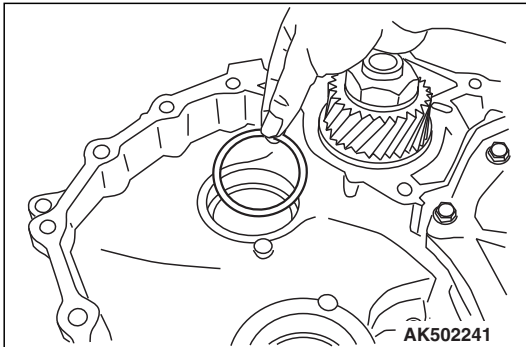


57. Using the special tools MB990590 and MB992039, remove outer race of the reduction gear bearing from the transaxle case.

58. Using cylinder gage etc., measure the mounting bore diameter of reduction gear bearing outer race at the transaxle case side; if the standard value is not satisfied, then replace the CVT assembly.

**Standard value**

$\phi 61.949 - 61.979 \text{ mm } (\phi 2.4389 - 2.4401 \text{ in})$

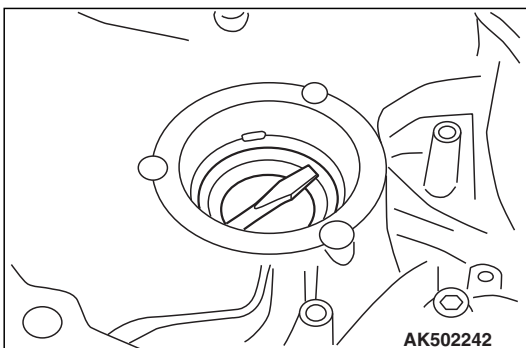


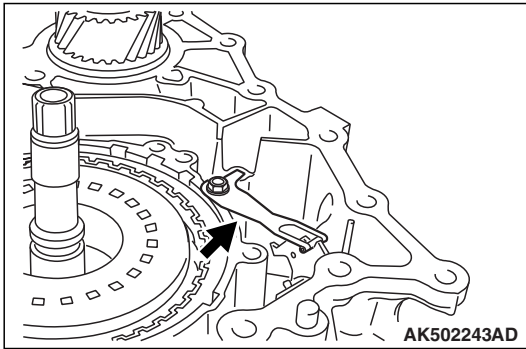
59. Remove the adjusting shim from the transaxle case.

**⚠ CAUTION**

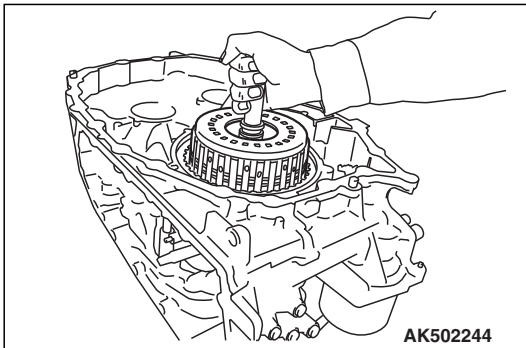
**When removing the side oil seal, be careful not to cause damage to the transaxle case.**

60. Using a flat blade screwdriver etc., remove the side oil seal from the transaxle case.

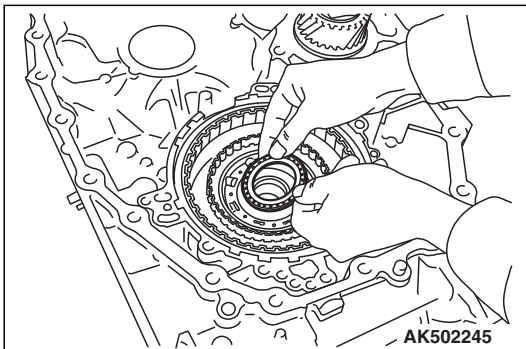




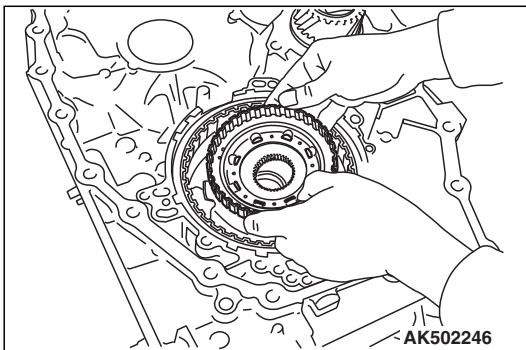
61.Remove the detent spring from the transaxle case.



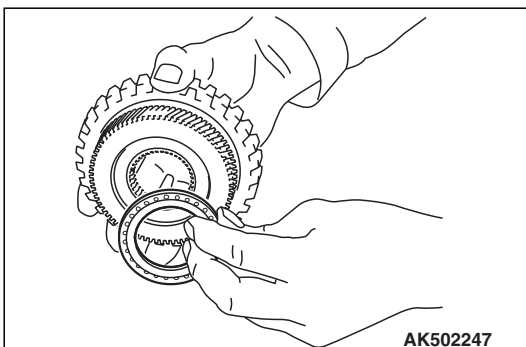
62.Remove the forward clutch assembly from the transaxle case.



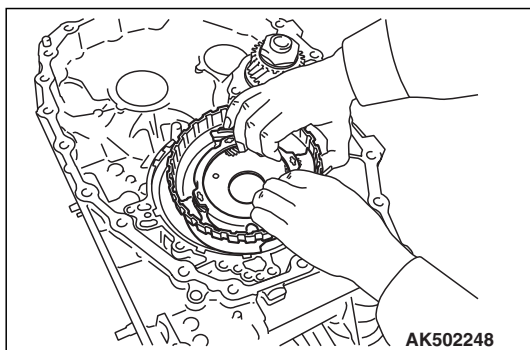
63.Remove the needle bearing on forward clutch drum side from the sun gear.



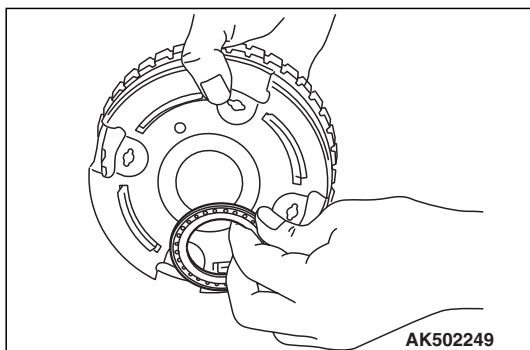
64.Remove the sun gear from the planet carrier.



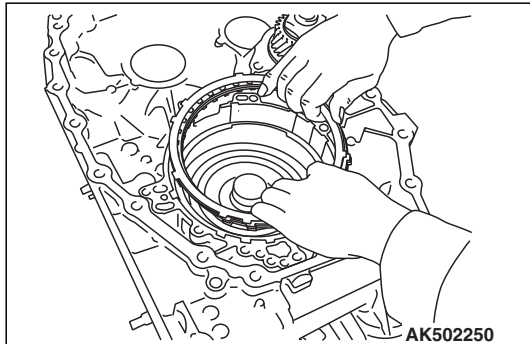
65.Remove the needle bearing on primary pulley side from the sun gear.



66. Remove the planet carrier from the transaxle case.



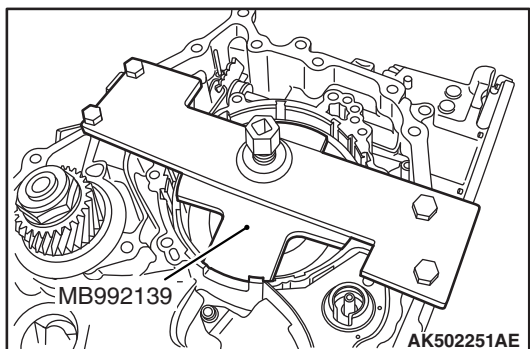
67. Remove the needle bearing from the planet carrier.



**⚠ CAUTION**

Check if there is damage, deformation, burn marks or permanent sets of the dish plate, driven plate, snap ring, and drive plate. Replace any defective part.

68. Using a flat blade screwdriver etc., remove the reverse brake retaining plate, drive plate, driven plate, and dish plate from the transaxle case.



**⚠ CAUTION**

- Set the spring compressor right on top of the spring of spring retainer assembly.
- Do not remove the return spring from the spring retainer assembly.

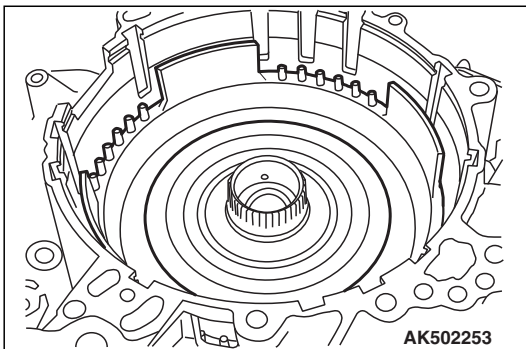
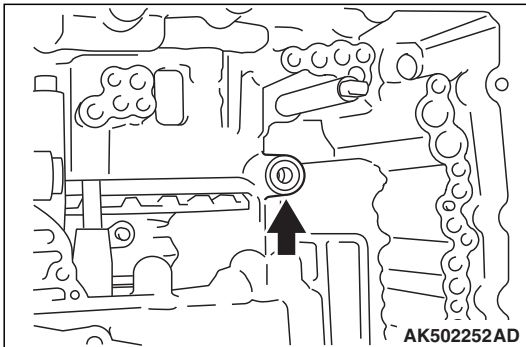
69. Using the special tool MB992139, compress the return spring, and remove the snap ring from the transaxle case.

70. Remove the retaining plate and return spring assembly.

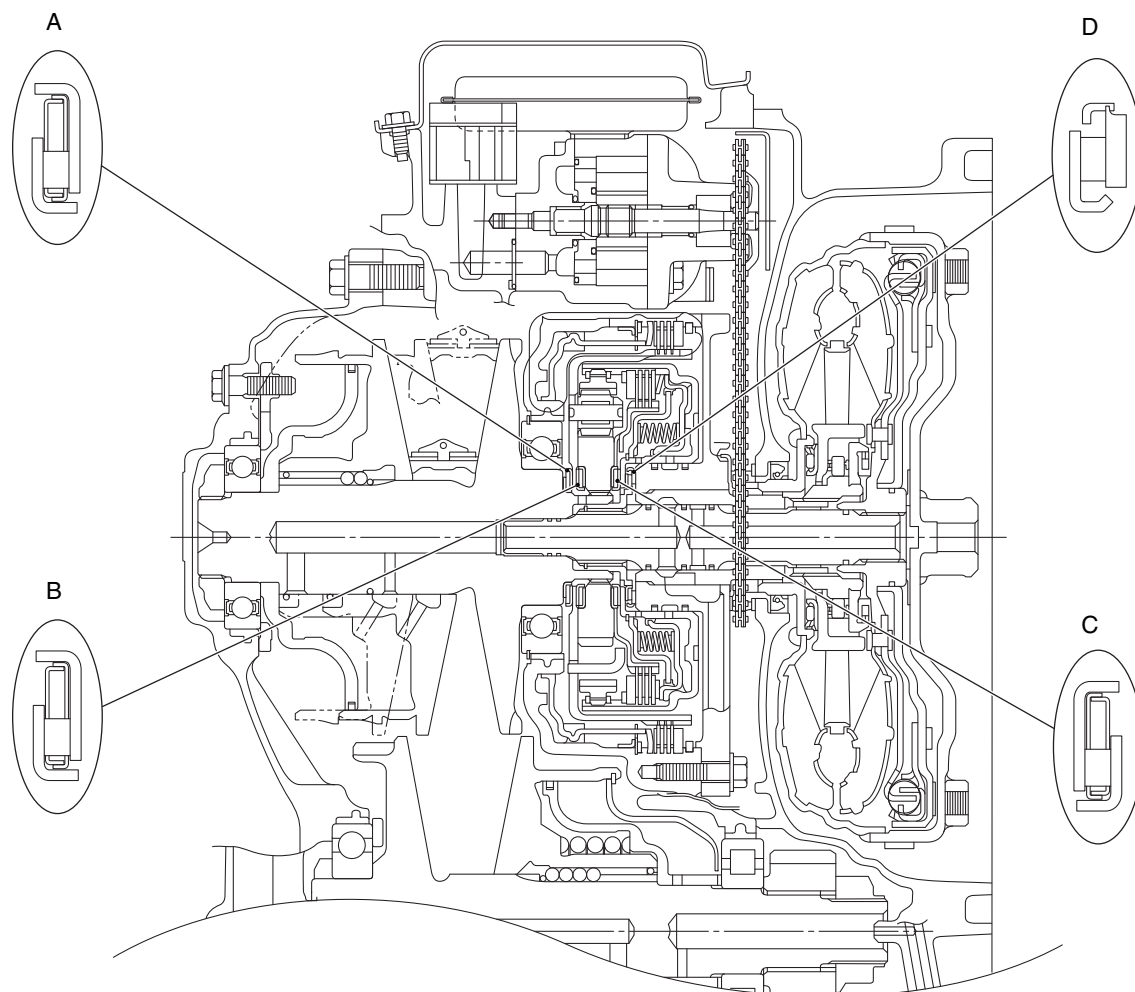
**⚠ CAUTION**

**Be careful. Do not use too much air pressure as this may cause the reverse brake piston to be stuck.**

71. Feed the air in the oil hole shown in the diagram, and remove the reverse brake piston from the transaxle case.



## IDENTIFICATION OF NEEDLE BEARINGS



AK502299AD

## ASSEMBLY SERVICE POINT

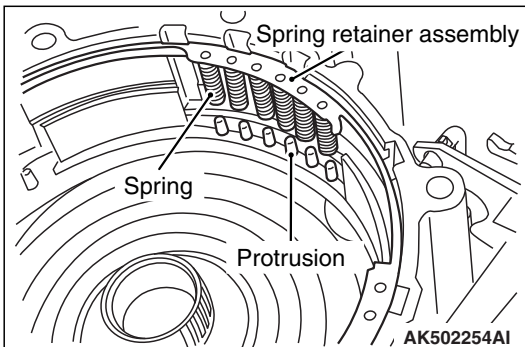
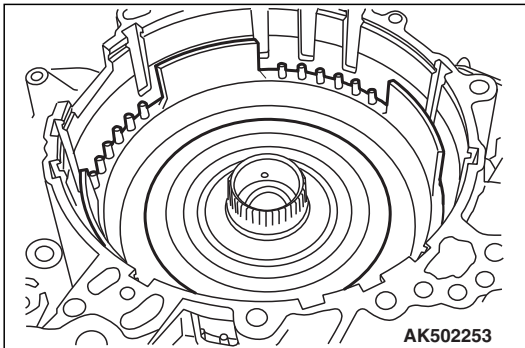
### CAUTION

When the outer races of reduction gear bearing and differential side bearing are removed, measure the mounting bore diameters of outer race in the converter housing and transaxle case, and replace the housing case or the CVT assembly if the standard value is not satisfied. The standard values are listed in "SERVICE SPECIFICATIONS."

### CAUTION

- Do not re-use the reverse brake piston.
- Apply transmission fluid when installing the reverse brake piston.

1. Install the reverse brake piston, while turning it, on the transaxle case.

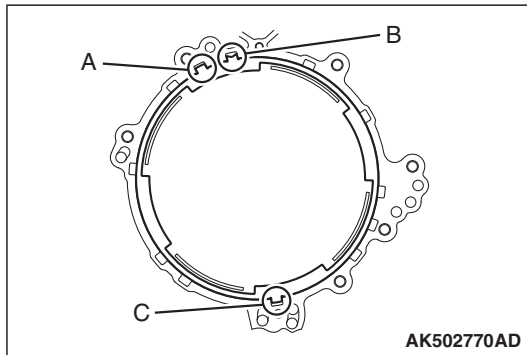
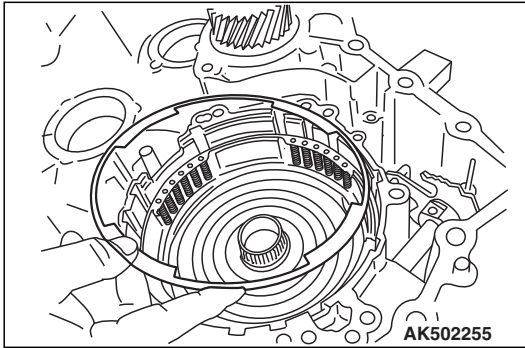


2. Align the spring portion of spring retainer assembly with the projections of the reverse brake piston, and install the spring retainer assembly.

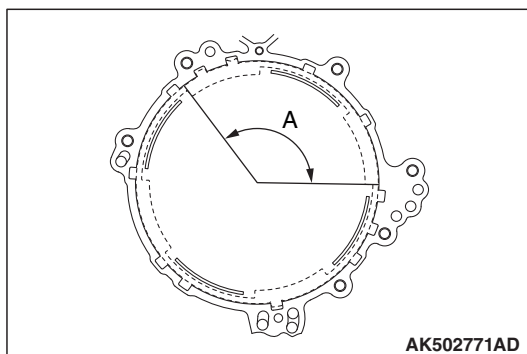
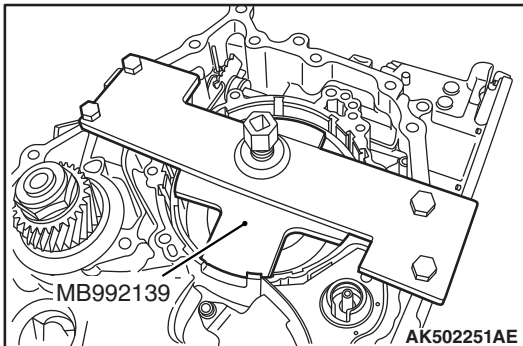
**⚠ CAUTION**

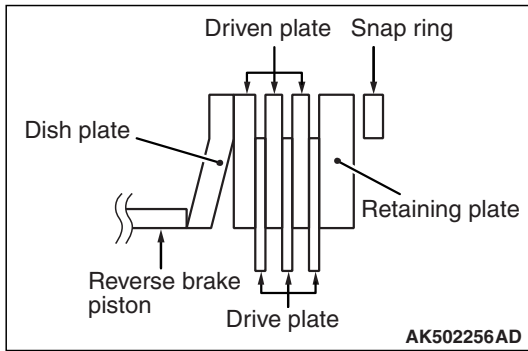
When installing the retaining plate, align the tangs at positions A, B, C in the diagram.

3. Install the retaining plate on the transaxle case.

**⚠ CAUTION**

- Set the spring compressor right on top of the spring of spring retainer assembly.
  - Do not re-use the snap ring.
  - When installing the snap ring, make sure that the joint falls in the area A in the diagram.
4. Using the special tool MB992139, compress the return spring, and install the snap ring on the transaxle case by means of a flat blade screwdriver etc.





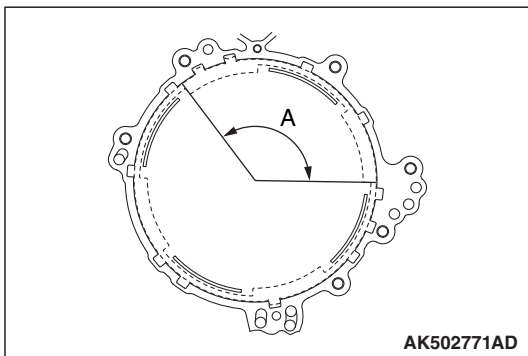
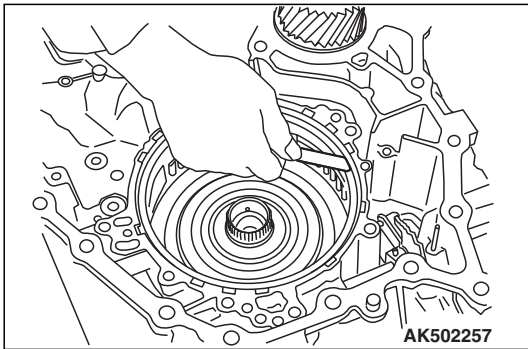
5. Install the reverse brake retaining plate, drive plate, driven plate, and dish plate on the transaxle case.

**⚠ CAUTION**

- When conducting measurements, measure two or more places, and find the average value.
- Do not re-use the snap ring.
- When installing the snap ring, make sure that the joint falls in the area A in the diagram.

6. Using a flat blade screwdriver etc., install the snap-ring on the transaxle case, and measure clearance between the snap ring and retaining plate. Select the snap ring so as to obtain standard value of the clearance. For selection of the snap ring, refer to "SERVICE SPECIFICATIONS."

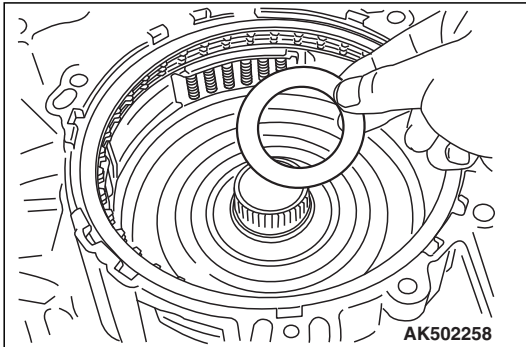
**Standard value: 1.2 –1.5 mm (0.05 –0.06 in)**  
**(For reverse clutch clearance)**



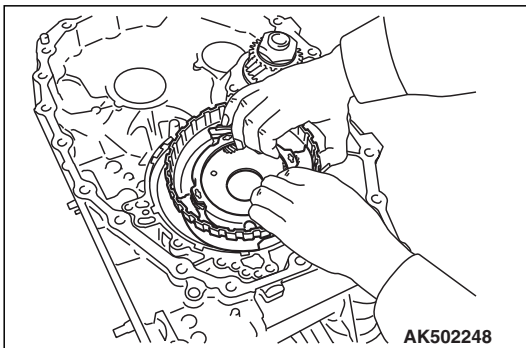
**⚠ CAUTION**

- Apply vaseline when installing the needle bearing.
- Be careful to attach the needle bearing in right direction.

7. Install the needle bearing on the reverse brake piston. Refer to A in the "IDENTIFICATION OF NEEDLE BEARINGS" for right direction.

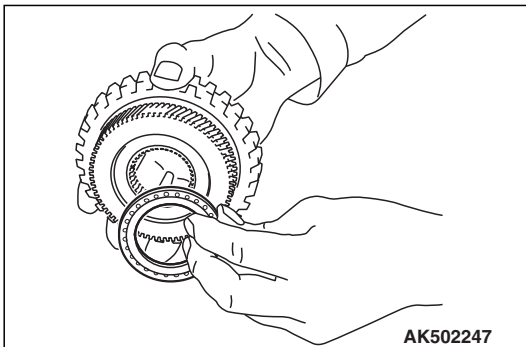


8. Install the planet carrier on the reverse brake.

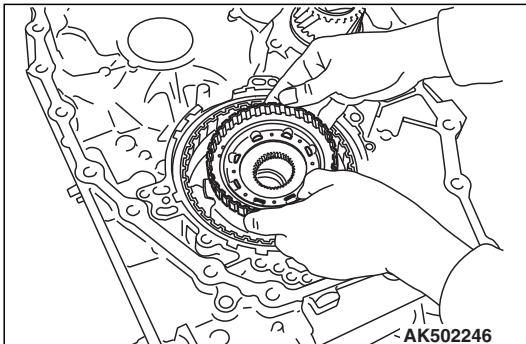
**⚠ CAUTION**

- Apply vaseline when installing the needle bearing.
- Be careful to attach the needle bearing in right direction.

9. Install the needle bearing on the primary pulley side of the sun gear. Refer to B in the "IDENTIFICATION OF NEEDLE BEARINGS" for right direction.



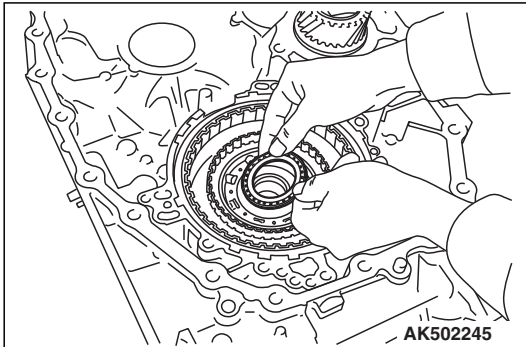
10. Install the sun gear on the planet carrier.



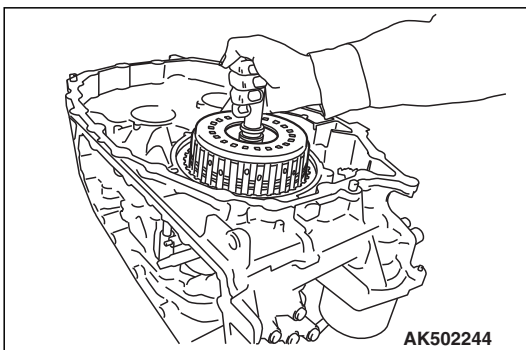
**⚠ CAUTION**

- Apply vaseline when installing the needle bearing.
- Be careful to attach the needle bearing in right direction.

11. Install the needle bearing on the forward clutch drum side of the sun gear. Refer to C in the "IDENTIFICATION OF NEEDLE BEARINGS" for right direction.



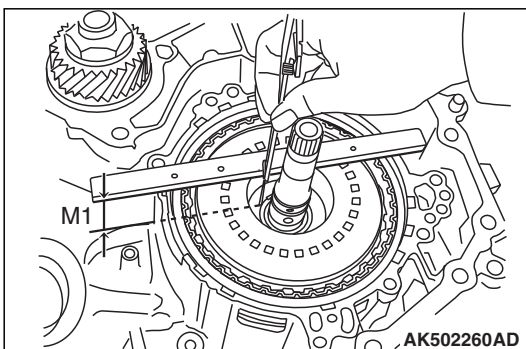
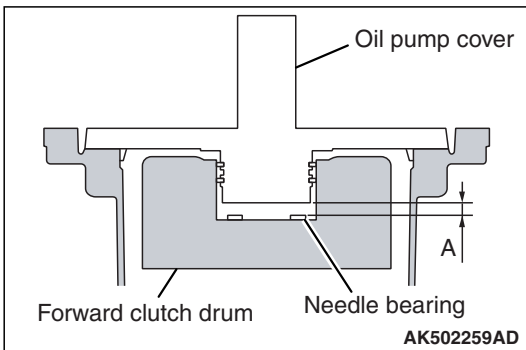
12. Install the forward clutch assembly on the transaxle case.



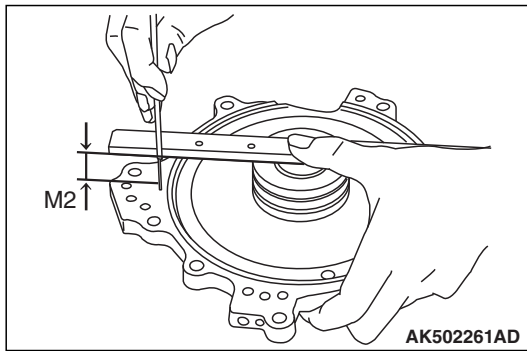
**⚠ CAUTION**

**When conducting measurements, measure two or more places, and find the average value.**

13. Measure the total end play as follows:



- (1) Measure the distance M1 from the oil pump cover mounting surface of the transaxle case to the needle bearing mounting surface of the forward clutch drum.



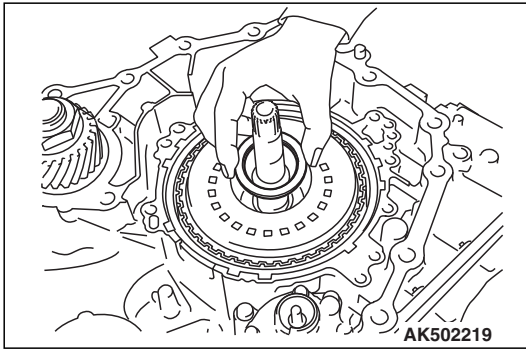
- (2) Measure the distance M2 from the edge of oil pump cover to the mounting surface on the transaxle case.
- (3) Calculate the total end play by the following expression.  
Select the needle bearing so that the total end play meets its standard value.

**Total end play = M1 – M2 – bearing thickness**  
**Standard value: 0.25 – 0.55 mm (0.010 – 0.022 in)**  
**(For total end play)**

**⚠ CAUTION**

- Apply vaseline when installing the needle bearing.
- Be careful to attach the needle bearing in right direction.

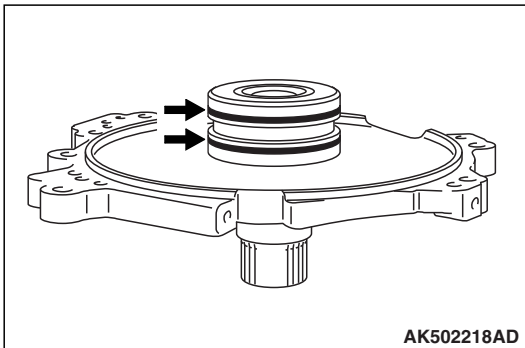
14. Install the selected needle bearing on the forward clutch assembly. Refer to D in the "IDENTIFICATION OF NEEDLE BEARINGS" for right direction.



**⚠ CAUTION**

- Do not re-use the seal rings.
- Apply vaseline when installing the seal rings.

15. Install the seal rings on the oil pump cover.

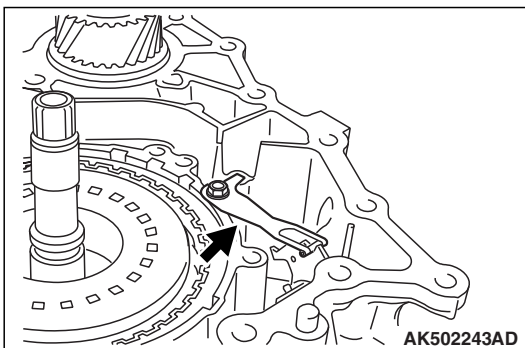


**⚠ CAUTION**

**Do not re-use the bolt.**

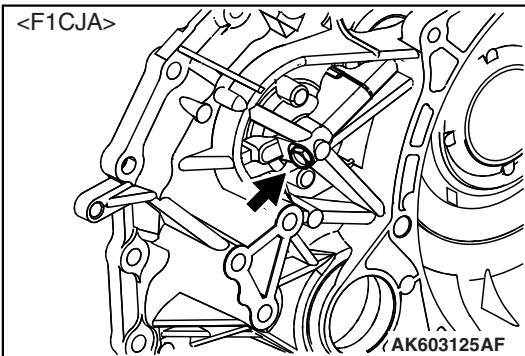
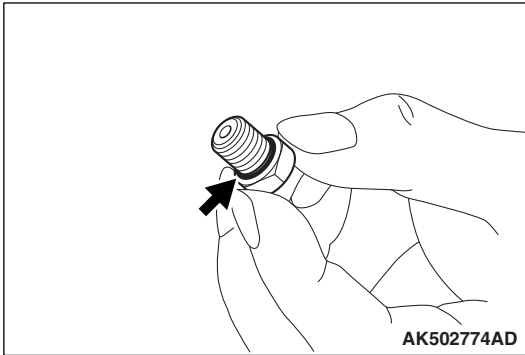
16. Install the detent spring on the transaxle case and tighten the bolt to the specified torque.

**Tightening torque: 6.9 N·m (61 in-lb)**



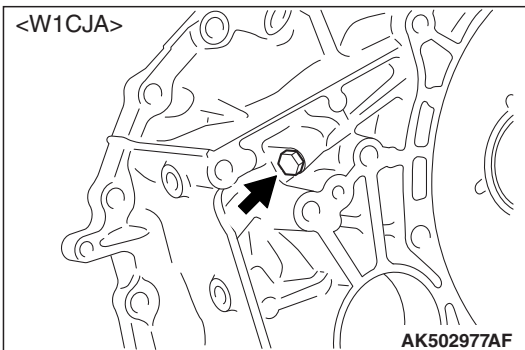
**⚠ CAUTION**

- Do not re-use the O-ring.
  - Apply transmission fluid when installing the O-ring.
17. Install the O-ring on the plug.



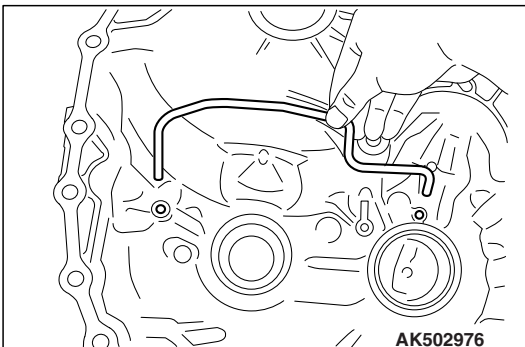
18. Install the plug on the converter housing to the specified torque.

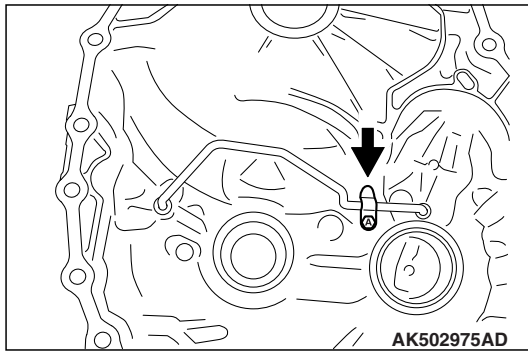
**Tightening torque: 7.5 N·m (66 in-lb)**



**⚠ CAUTION**

- Do not bend the pipe when attaching it.**
19. Install the pipe on the converter housing.





20. Install the clip and tighten the bolt to the specified torque.

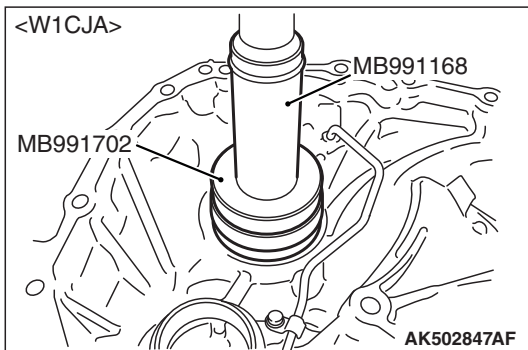
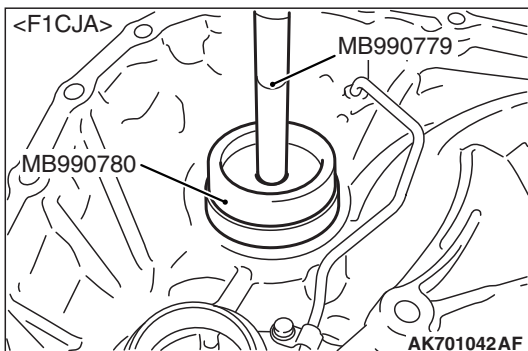
**Tightening torque: 6.9 N·m (61 in-lb)**

**CAUTION**

- Do not re-use the outer race.
- Replace the outer race together with the inner race.

21. Using the special tools MB990779 and MB990780

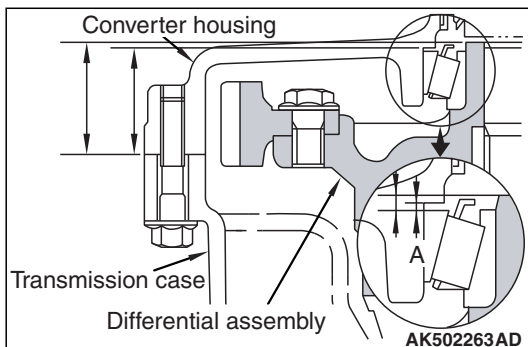
<F1CJA> or MB991168 and MB991702 <W1CJA>, Install the differential bearing outer race of differential side bearing on the converter housing.

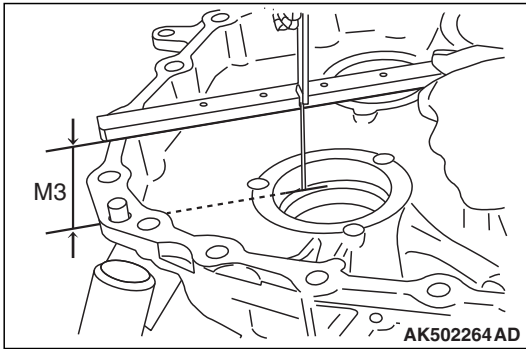


**CAUTION**

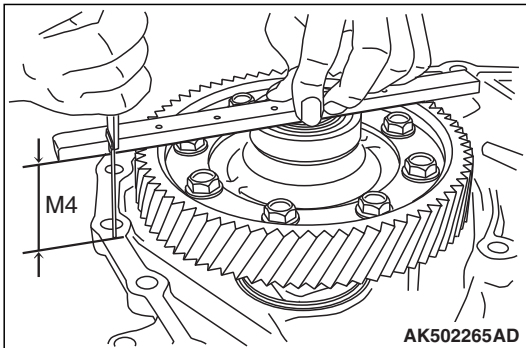
- When adjusting the preload, apply transmission fluid to the bearing to make it roll smoothly.
- When conducting measurements, measure two or more places, and find the average value.

22. Measure the preload A of the differential assembly as follows:

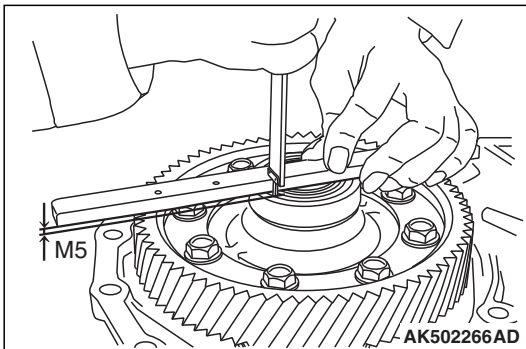




- (1) Measure the distance M3 from the edge of transaxle case to the mounting surface of adjusting shim.



- (2) Install the differential assembly on the converter housing, and measure the distance M4 from the differential case to the edge of converter housing.



- (3) Install the outer race on differential side bearing, and measure the distance M5 from the differential case to the outer race of differential side bearing.
- (4) Using the following expression, calculate the distance M6 from the edge of converter housing to the outer race of differential side bearing.

$$M6 = M4 - M5$$

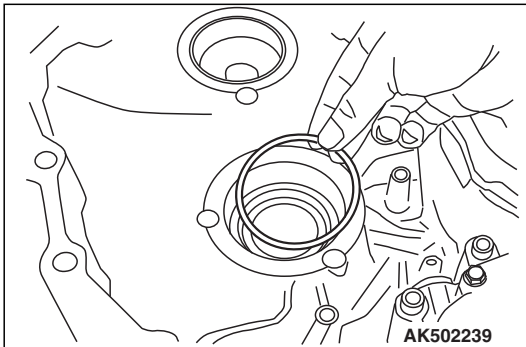
- (5) Using the following expression, calculate thickness of the adjusting shim.

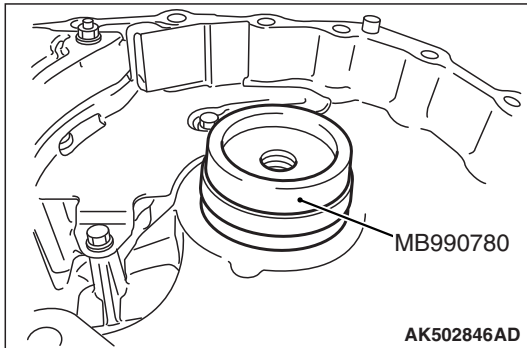
**Thickness of adjusting shim = M3 – M6 + preload**  
**Standard value: 0.17 – 0.29 mm (0.007 – 0.011 in)**  
**(For differential preload)**

**⚠ CAUTION**

**Do not re-use the adjusting shim.**

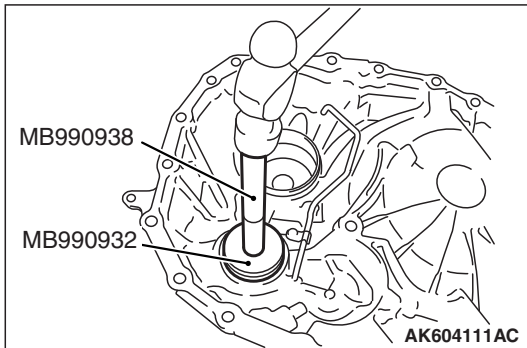
23. Install the selected shim on the transaxle case. For selection of the adjusting shim, refer to "SERVICE SPECIFICATIONS."



**⚠ CAUTION**

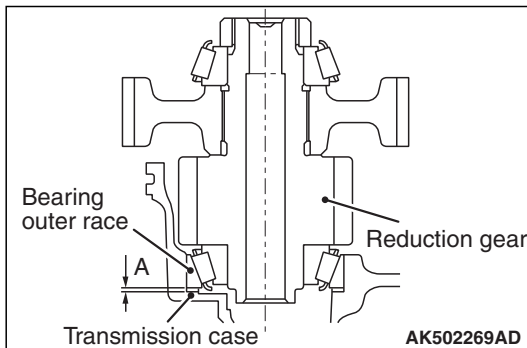
- Do not re-use the outer race.
- Replace the outer race together with the inner race.

24. Using the special tool MB990780, install the outer race of differential side bearing on the transaxle case.

**⚠ CAUTION**

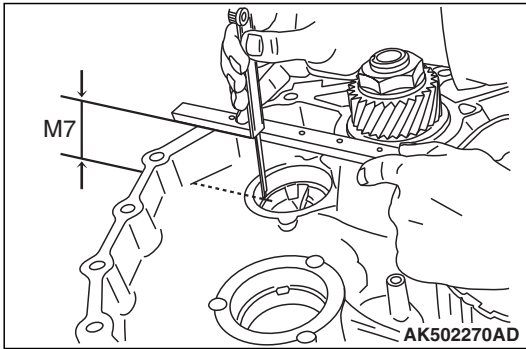
- Do not re-use the outer race.
- Replace the outer race together with the inner race.

25. Using the special tools MB990932 and MB990938, install the outer race of reduction gear bearing on the converter housing.

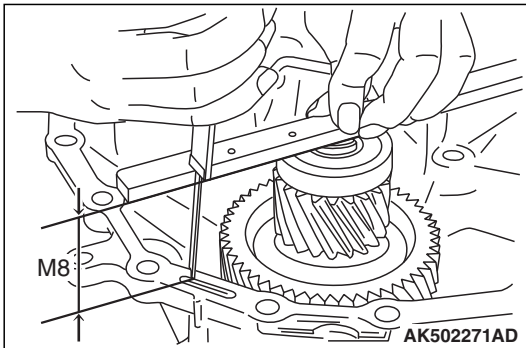
**⚠ CAUTION**

- When adjusting the preload, apply transmission fluid to the bearing to make it roll smoothly.
- When conducting measurements, measure two or more places, and find the average value.

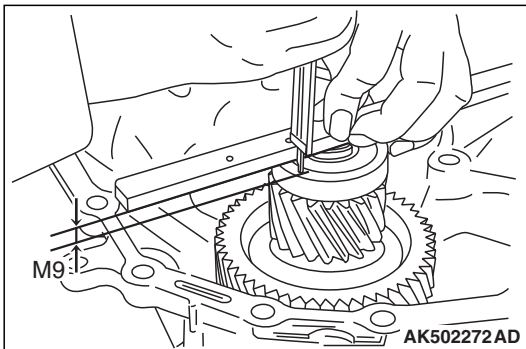
26. Measure the preload A of the reduction gear assembly in the following way.



- (1) Measure the distance M7 from the edge of transaxle case to the mounting surface of adjusting shim.



- (2) Install the reduction gear assembly on the converter housing, and measure the distance M8 from the edge of reduction gear assembly to the edge of converter housing.



- (3) Install the outer race of reduction gear side bearing on the bearing, and measure the distance M9 from the edge of reduction gear assembly to the outer race of reduction gear bearing.
- (4) Using the following expression, calculate the difference M10 from the outer race of reduction gear bearing to the edge of converter housing.

$$M10 = M8 - M9$$

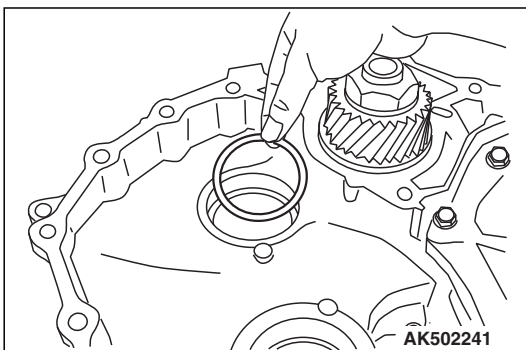
- (5) Using the following expression, calculate the thickness of adjusting shim.

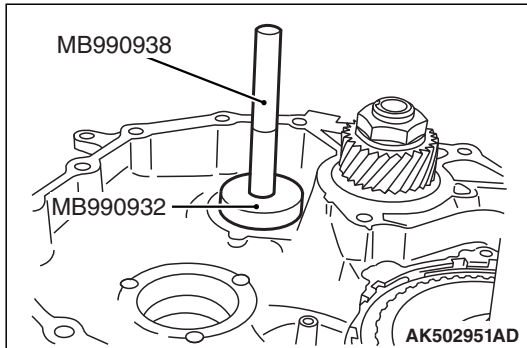
**Thickness of adjusting shim = M7 - M10 + preload**  
**Standard value: 0.11 - 0.17 mm (0.004 - 0.006 in)**  
**(For reduction gear preload)**

**⚠ CAUTION**

**Do not re-use the adjusting shim.**

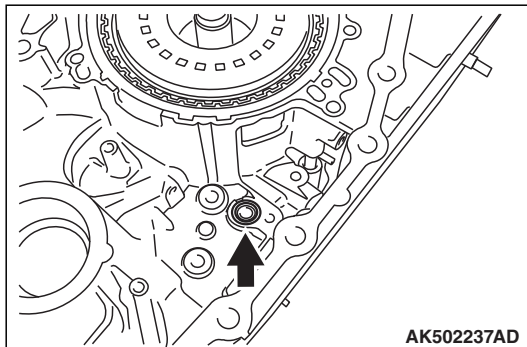
27. Install the selected adjusting shim on the transaxle case.  
 For selection of the adjusting shim, refer to "SERVICE SPECIFICATIONS."



**⚠ CAUTION**

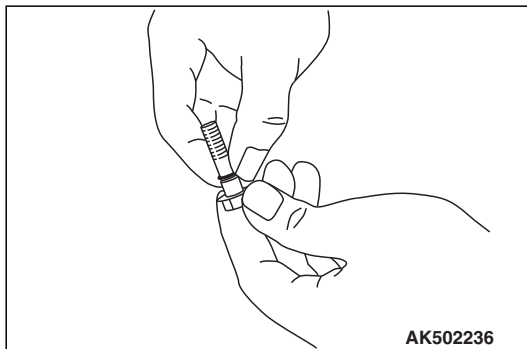
- Do not re-use the outer race.
- Replace the outer race together with the inner race.

28. Using the special tools MB990932 and MB990938, install the outer race of reduction gear bearing on the transaxle case.

**⚠ CAUTION**

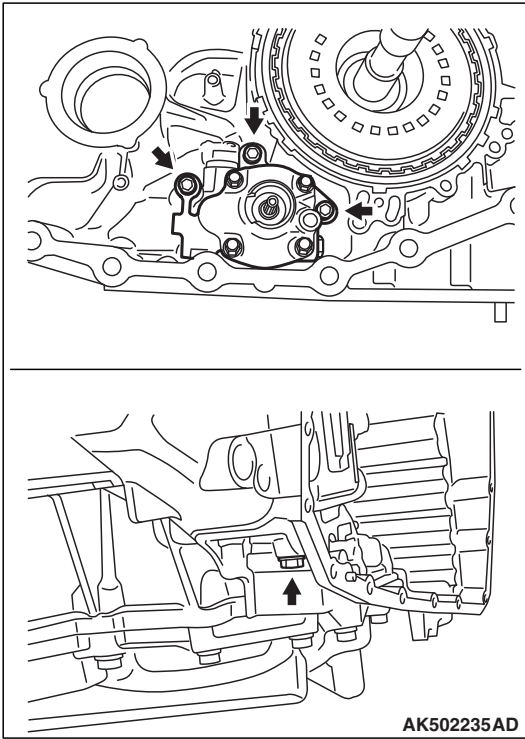
- Do not re-use the lip seal.
- Apply transmission fluid when installing the lip seal.

29. Install the lip seal on the transaxle case.

**⚠ CAUTION**

- Do not re-use the O-rings.
- Apply transmission fluid when installing the O-rings.

30. Install the O-rings on the oil pump fastening bolts.



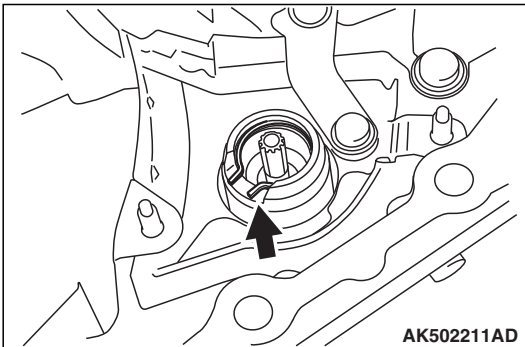
31. Install the oil pump on the transaxle case and tighten the bolt to the specified torque. (One fastening bolt is installed at the backside from the transaxle case side. Only this bolt should be tightened to the specified torque of 28 N·m [21 ft-lb].)

**Tightening torque: 19 N·m (14 ft-lb)**

**⚠ CAUTION**

**Do not re-use the snap ring.**

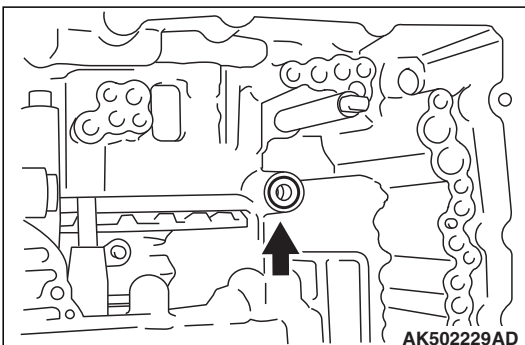
32. Install the snap ring on the oil pump.

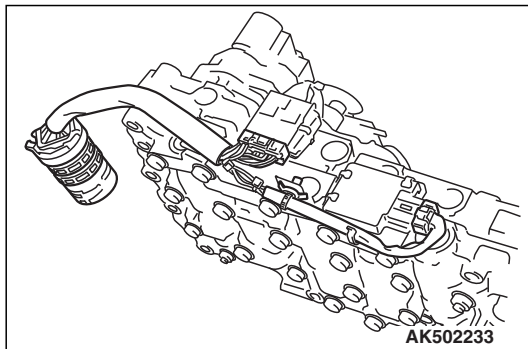


**⚠ CAUTION**

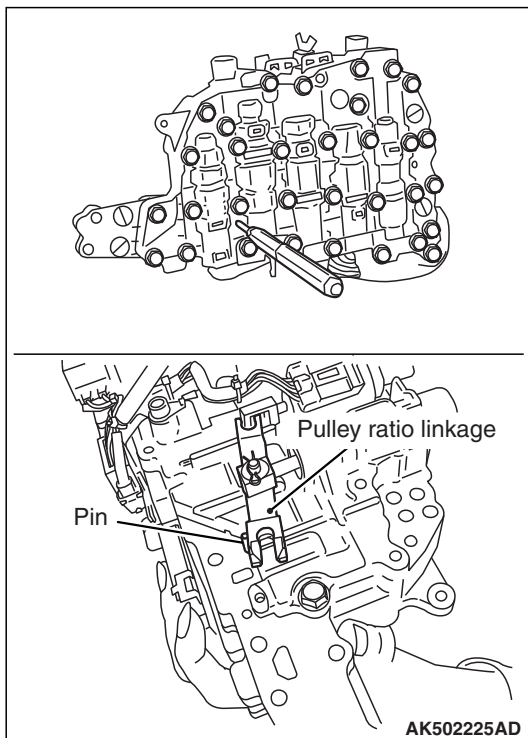
- Do not re-use the lip seal.
- Apply transmission fluid or vaseline when installing the lip seal.

33. Install the lip seal on the transaxle case.



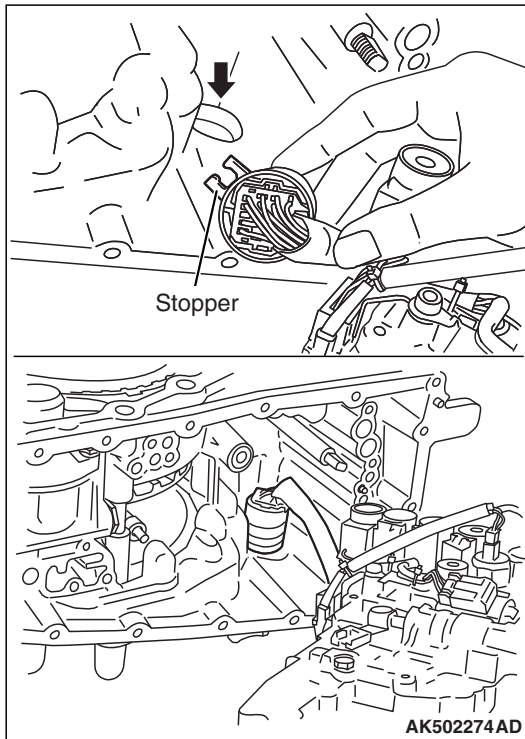


34. Install the valve body harness on the control valve.



35. Install the control valve assembly on the transaxle case as follows:

- (1) Insert pins etc. ( $\phi 3$  mm) into linkage stopper holes of the control valve assembly to fix the pulley ratio linkage.



- (2) Install the terminal body on the transaxle case, while aligning the detent of terminal body with the transaxle case as shown in the diagram.

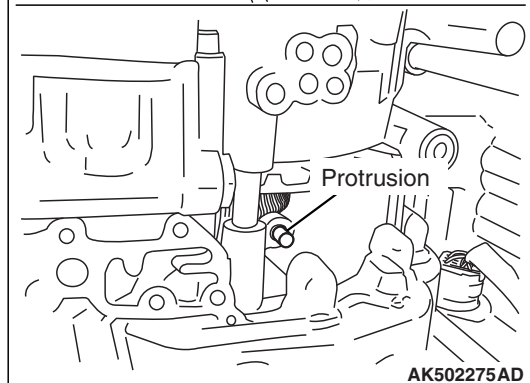
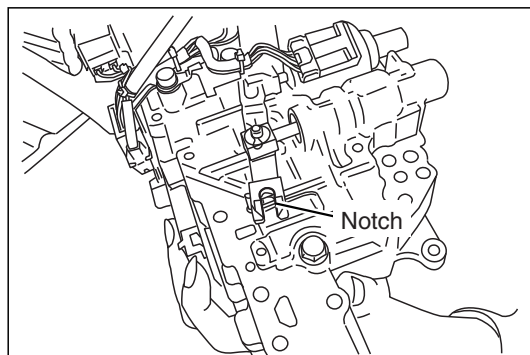
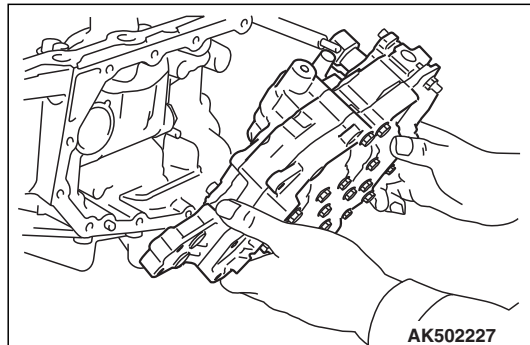
**⚠ CAUTION**

Align the notch of pulley ratio linkage with the prong of pulley sensor.

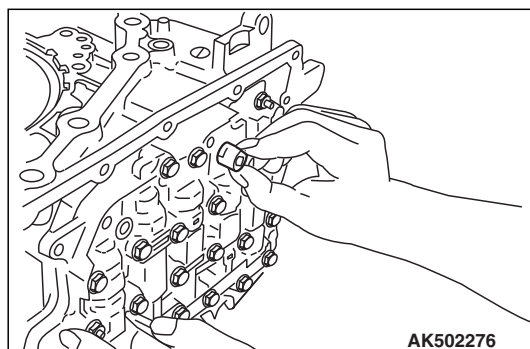
- (3) Slide the control valve assembly from the bottom, and install it on the transaxle case.

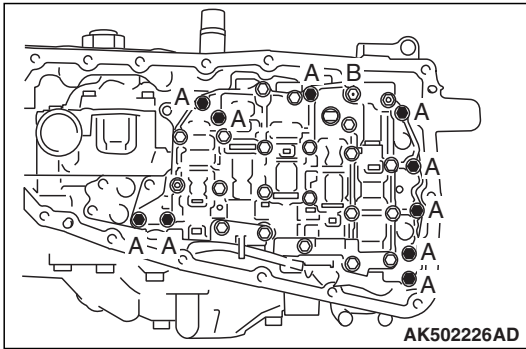
**⚠ CAUTION**

Apply transmission fluid when attaching the bush.



- (4) Install the bush on the control valve assembly.

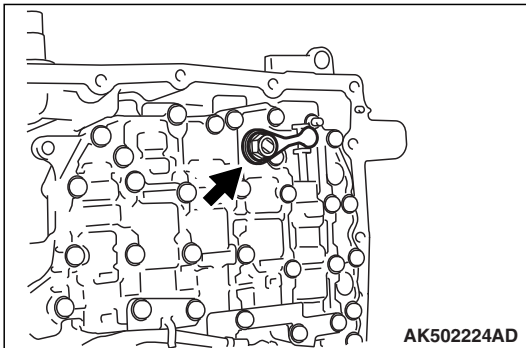




- (5) Install the fastening bolts of control valve assembly and tighten the bolt to the specified torque.

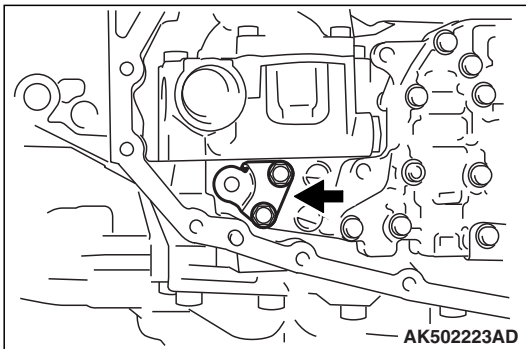
**Tightening torque: 7.9 N·m (70 in-lb)**

Bolt symbol	A	B
Shank length mm	54	44
Quantity	10	1



36. Install the manual lever and tighten the bolt to the specified torque.

**Tightening torque: 22.1 N·m (16 ft-lb)**



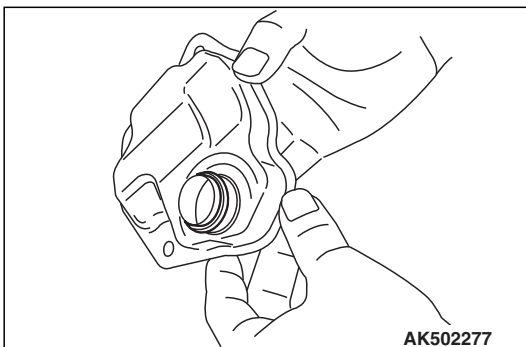
37. Install the bracket on the control valve assembly and tighten the bolt to the specified torque.

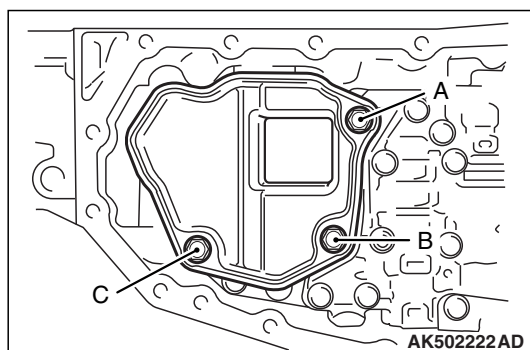
**Tightening torque: 7.9 N·m (70 in-lb)**

**⚠ CAUTION**

- Do not re-use the O-ring.
- Apply transmission fluid when installing the O-ring.

38. Install the O-ring on the oil strainer.





39. Install the oil strainer and tighten the bolt to the specified torque.

**Tightening torque: 7.9 N·m (70 in-lb)**

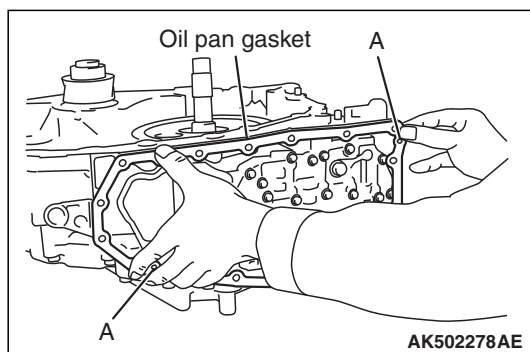
Bolt symbol	A	B	C
Shank length mm	12	44	12
Quantity	1	1	1

**⚠ CAUTION**

- Do not re-use the oil pan gasket.
- Remove any moisture, oil, and used gasket from the mounting surface of oil pan gasket.
- When installing the oil pan gasket, align the dowel pins of transaxle case with dowel pin holes A of the oil pan gasket.

40. Install the oil pan gasket on the transaxle case.

41. Install the magnet on the oil pan.

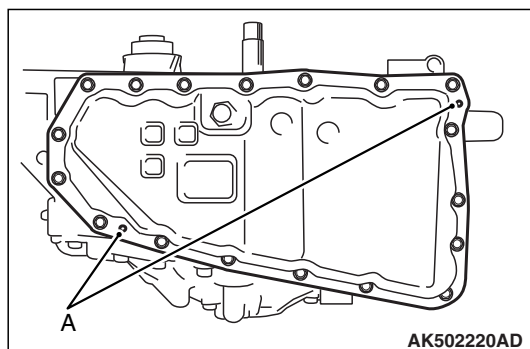


**⚠ CAUTION**

When installing the oil pan, align the dowel pins of transaxle case with dowel pin holes A of the oil pan.

42. Install the oil pan on the transaxle case and tighten the bolts to the specified torque.

**Tightening torque: 7.9 N·m (70 in-lb)**

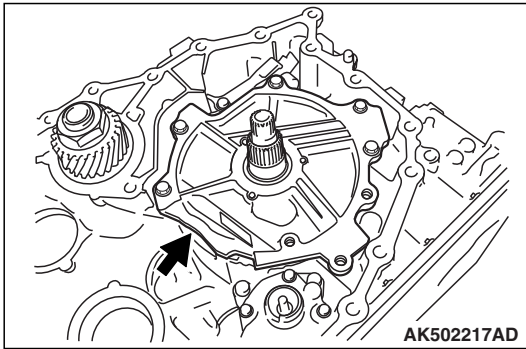


**⚠ CAUTION**

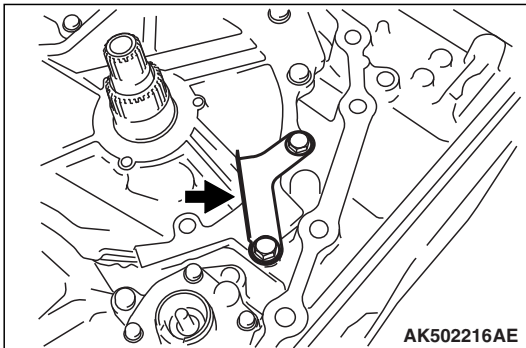
Do not re-use the drain plug gasket.

43. Install the drain plug and drain plug gasket on the transaxle case and tighten the bolt to the specified torque.

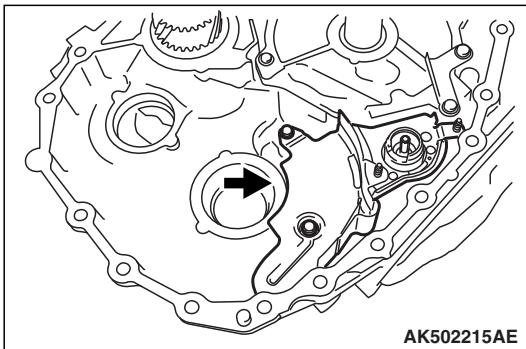
**Tightening torque: 34.3 N·m (25 ft-lb)**



44. Install the oil pump cover on the transaxle case, and fix the fastening bolts temporarily.

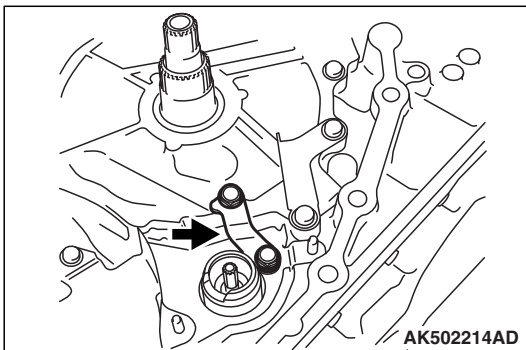


45. Install the baffle plate, and fix the fastening bolts temporarily.



46. Install the oil guide and tighten the bolt to the specified torque.

**Tightening torque: 5.9 N·m (52 in-lb)**

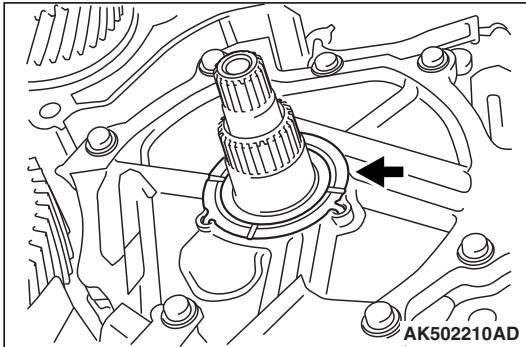


47. Install the bracket, and tighten the fastening bolts of the oil pump cover, baffle plate and tighten the bolts to the specified torque.

**Tightening torque: 26 N·m (19 ft-lb)**

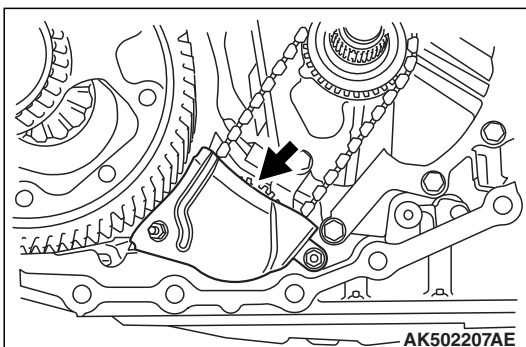
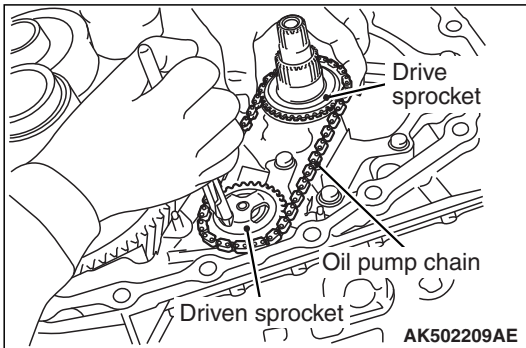
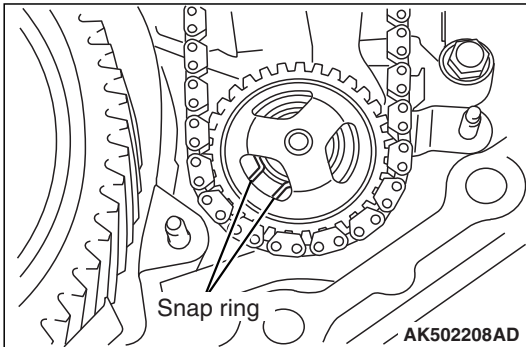
**⚠ CAUTION**

- Make sure the tang of thrust washer is aligned with the mounting hole of oil pump cover.
  - Apply vaseline when installing the thrust washer.
48. Install the thrust washer on the oil pump cover.

**⚠ CAUTION**

**Pull the driven sprocket up softly to make sure it is securely attached.**

49. Expand the snap ring, and install the driven sprocket, oil pump chain, and drive sprocket.



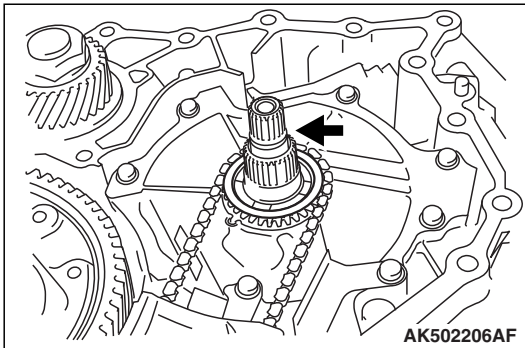
50. Install the chain cover, and tighten the fastening nuts to the specified torque.

**Tightening torque: 5.9 N·m (52 in-lb)**

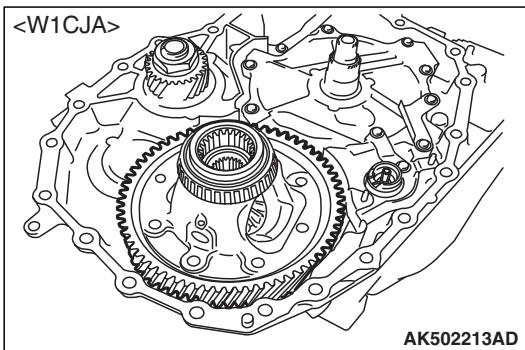
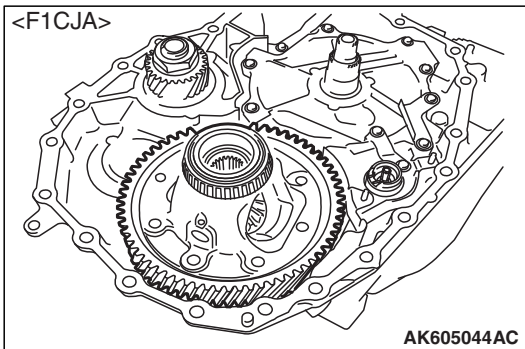
**CAUTION**

- Do not re-use the O-ring.
- Apply transmission fluid when installing the O-ring.

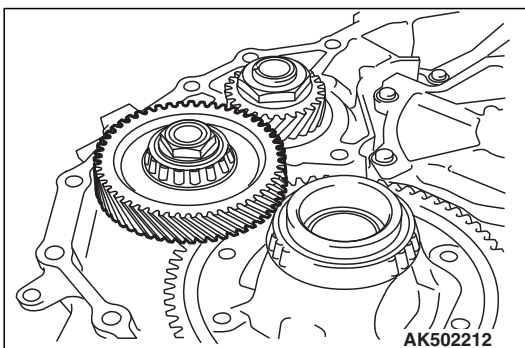
51. Install the O-ring on the input shaft.

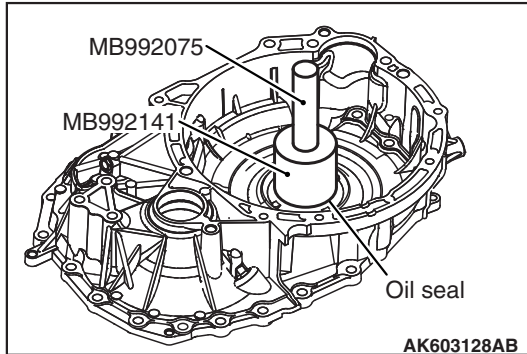


52. Install the differential assembly on the transaxle case.



53. Install the reduction gear assembly on the transaxle case.

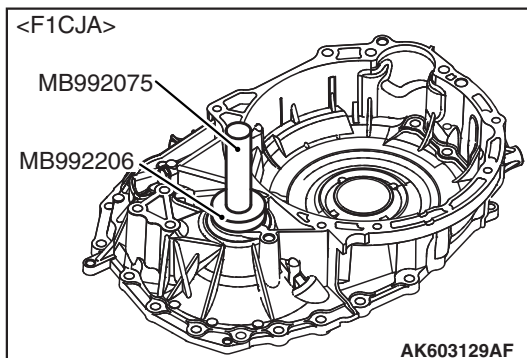


**⚠ CAUTION**

- Do not re-use the converter housing oil seal.
- Apply transmission fluid when installing the converter housing oil seal.

54. Using the special tools MB992141 and MB992075, install the converter housing oil seal on the converter housing.

**Depth from the case edge: within  $-1.0 \pm 0.5$  mm (recessed)**

**⚠ CAUTION**

- Do not re-use the converter housing side oil seal.
- Apply transmission fluid when installing the converter housing side oil seal.

55. Using the special tools MB992206 and MB992075, install the converter housing side oil seal on the converter housing.

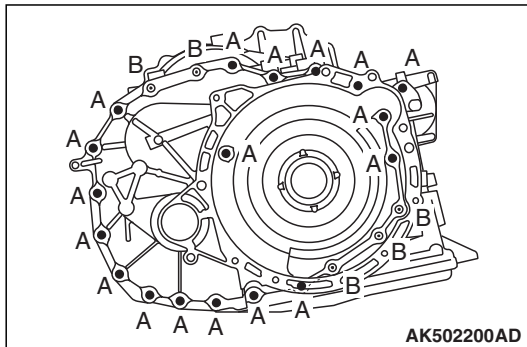
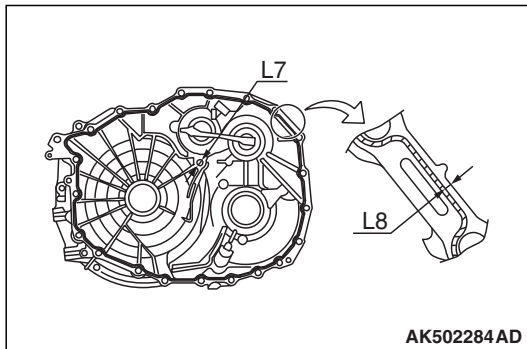
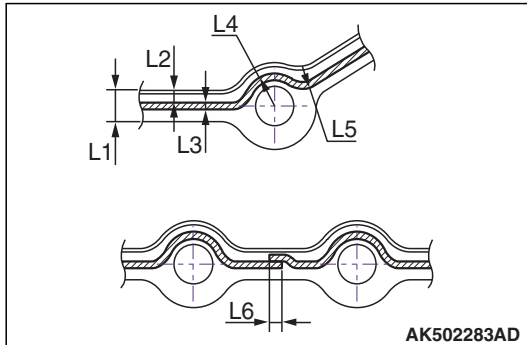
**CAUTION**

- Remove any moisture, oil and oil sealant from the application surface.
- Make sure the starting point and the ending point are about the middle between the bolts.

56. Apply the sealant on the converter housing mounting surface of the transaxle case in the following way.

**Specified sealant: Loctite 509**

L1	9 mm
L2	5 mm
L3	φ1.5 mm
L4	R8.5 mm
L5	R5 –8 mm
L6	3 –5 mm
L7	φ17 mm
L8	3.5 mm



57. Install the converter housing on the transaxle case, and tighten the fastening bolts to the specified torque.

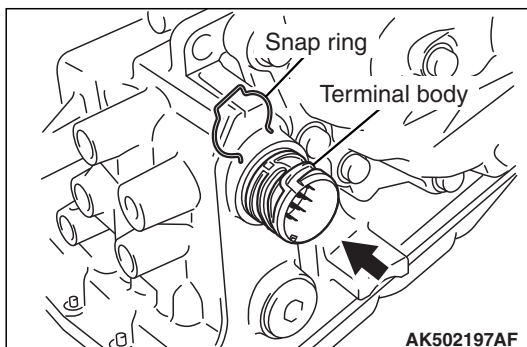
**Tightening torque: 45 N·m (33 ft-lb)**

Bolt symbol	A	B
Shank length mm	30	35
Quantity	18	5

**CAUTION**

**Do not re-use the snap ring.**

58. Install the snap ring on the terminal body.

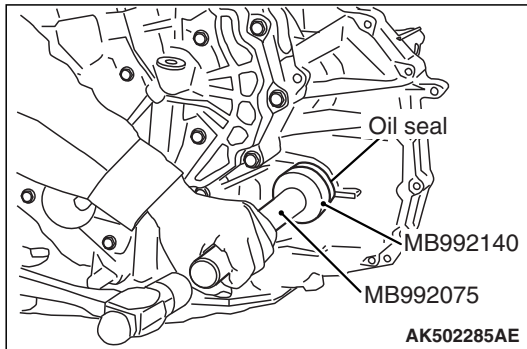


**⚠ CAUTION**

- Do not re-use the side oil seal.
- Apply transmission fluid when installing the side oil seal.

59. Using the special tool MB992140 and MB992075, install the side oil seal on the transaxle case.

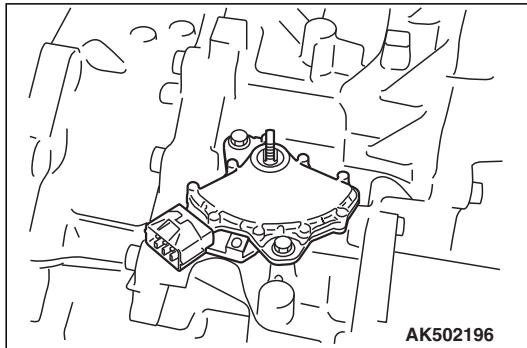
**Depth from the case edge: within  $-1.8 \pm 0.5$  mm (recessed)**

**⚠ CAUTION**

**Do not re-use the inhibitor switch.**

60. Install the inhibitor switch on the transaxle case as follows:

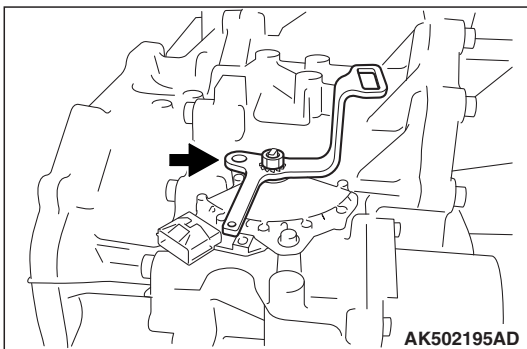
- (1) Install the inhibitor switch on the transaxle case.



- (2) Install the shift lever on the manual shaft, and tighten the fastening nuts to the specified torque.

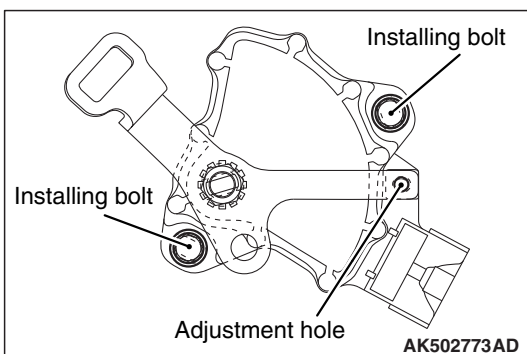
**Tightening torque: 17.2 N·m (13 ft-lb)**

- (3) Set the manual shaft at N position.



- (4) Insert pins etc. ( $\phi 5$  mm) in adjusting holes in both inhibitor switch and shift lever, and after alignment, tighten the fastening bolts to the specified torque.

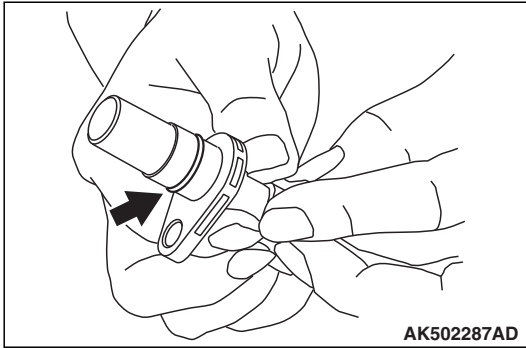
**Tightening torque: 5.5 N·m (49 in-lb)**



**⚠ CAUTION**

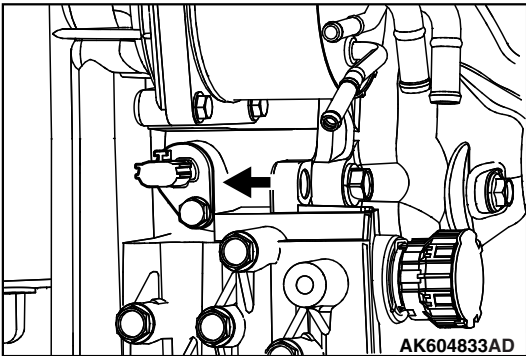
- Do not re-use the O-ring.
- Apply transmission fluid when installing the O-ring.

61. Install the oil ring on the primary pulley speed sensor.



62. Install the primary pulley speed sensor on the transaxle case, and tighten the fastening bolts to the specified torque.

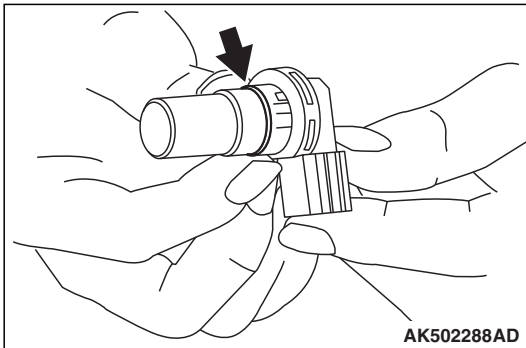
**Tightening torque: 5.9 N·m (52 in-lb)**



**⚠ CAUTION**

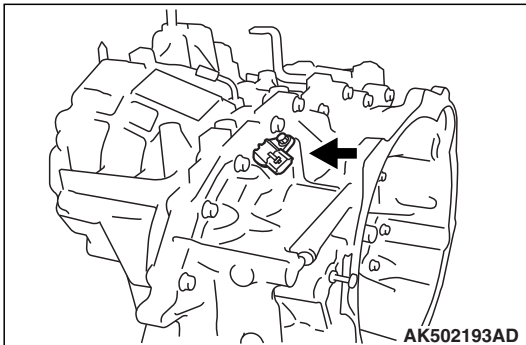
- Do not re-use the O-ring.
- Apply transmission fluid when installing the O-ring.

63. Install the O-ring on the secondary pulley speed sensor.



64. Install the secondary pulley speed sensor on the transaxle case, and tighten the fastening bolts to the specified torque.

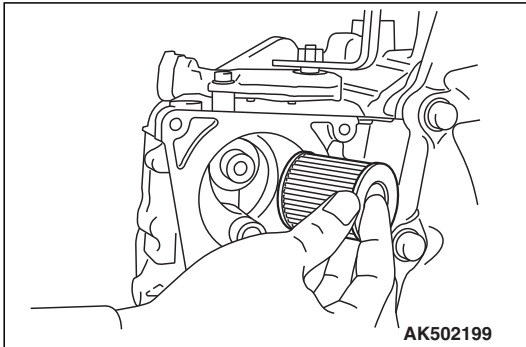
**Tightening torque: 5.9 N·m (52 in-lb)**



**⚠ CAUTION**

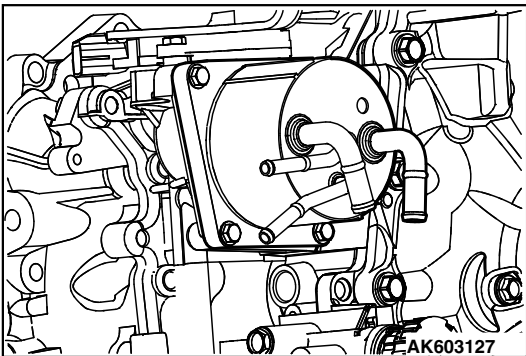
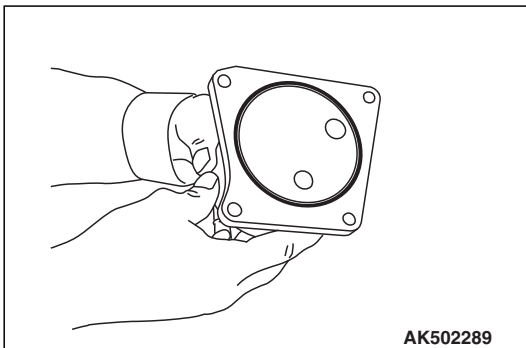
- Apply transmission fluid or vaseline when installing the transmission fluid cooler filter.
- Do-not re-use the transmission fluid cooler filter.

65. Install the CVT fluid filter on the transaxle case.

**⚠ CAUTION**

- Do not re-use the O-ring.
- Apply transmission fluid when installing the O-ring.
- When installing O-ring, make sure that projection of the O-ring is put into the groove on the filter.

66. Install the O-ring on the CVT fluid filter.

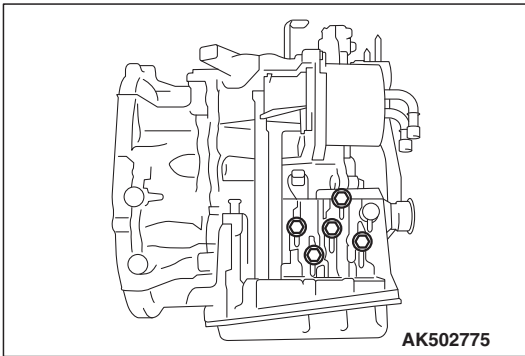
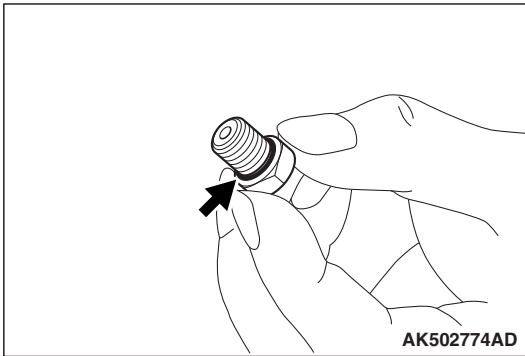


67. Install the CVT fluid cooler on the transaxle case, and tighten the fastening bolts to the specified torque.

**Tightening torque: 4.2 N·m (37 in-lb)**

**⚠ CAUTION**

- Do not re-use the O-ring.
  - Apply transmission fluid when installing the O-ring.
68. Install the O-ring on the plug.



69. Fasten the plug on the transaxle case and tighten the bolt to the specified torque.

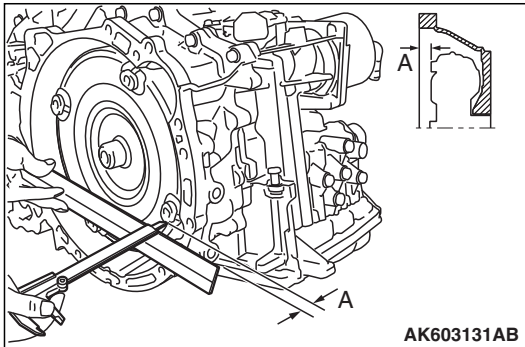
**Tightening torque: 7.5 N·m (66 in-lb)**

**⚠ CAUTION**

**When conducting measurements, measure two or more places, and find the average value.**

70. Install the converter on the transaxle, and measure the size A to check if it meets the standard value.

**Standard value: 15.9 mm (0.63 in)**



71. Install the control cable bracket and breather hose on the transaxle. Refer to the following or the exploded view for the tightening torque.

**Tightening torque: 25 ± 4 N·m (18 ± 2 ft-lb)**

72. Install the oil filler tube and oil level gage on the transaxle. Refer to the following or the exploded view for the tightening torque.

**Tightening torque: 8.5 ± 3.5 N·m (75 ± 31 in-lb)**

73. Install the harness bracket on the transaxle. Refer to the following or the exploded view for the tightening torque.

**Tightening torque: 25 ± 4 N·m (18 ± 2 ft-lb)**

74. Install the RR roll stopper bracket and FR roll stopper bracket on the transaxle. Refer to the following or the exploded view for the tightening torque.

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

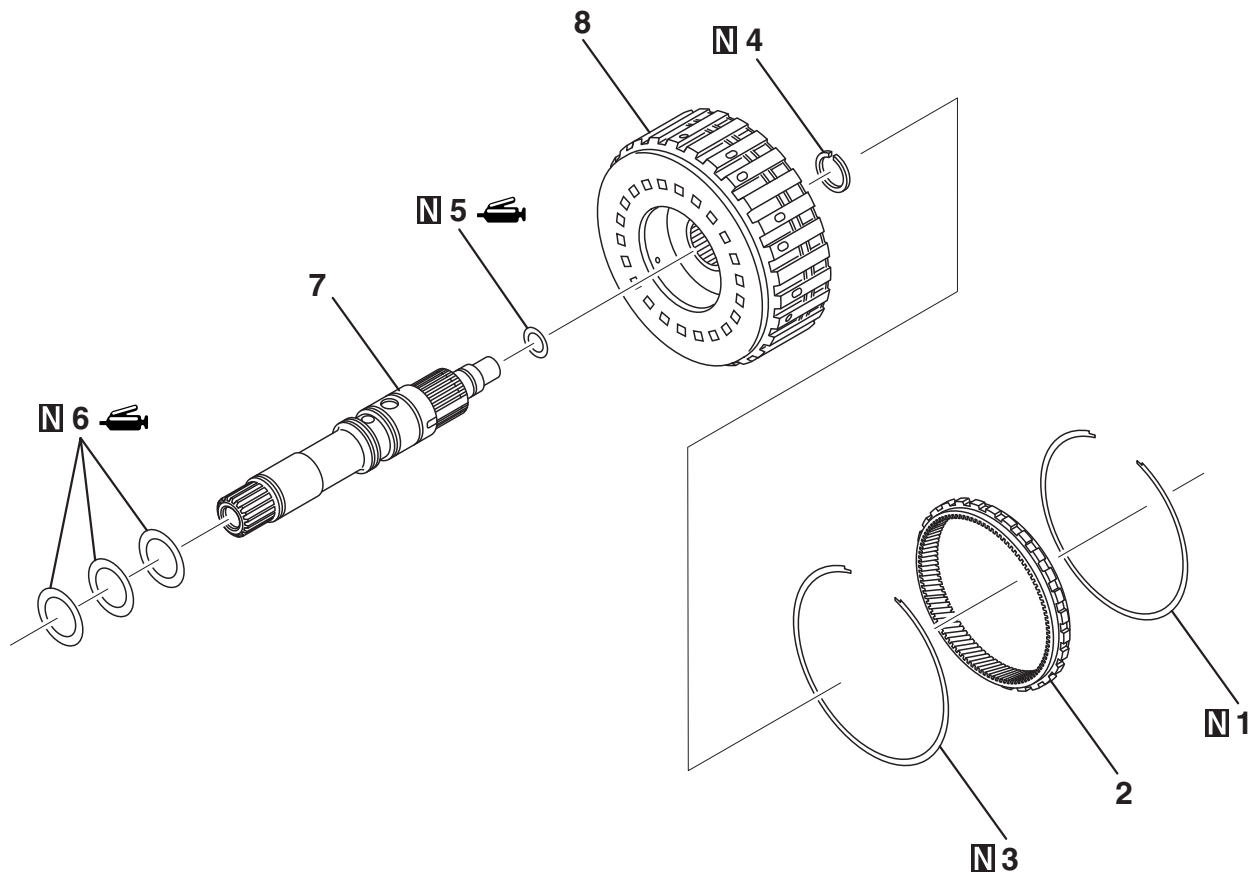
75. Install the transfer on the transaxle. Refer to the following or the exploded view for the tightening torque.

**Tightening torque: 68 ± 9 N·m (50 ± 7 ft-lb)**

## FORWARD CLUTCH

## DISASSEMBLY AND ASSEMBLY

M1233209000270



AK701411AC

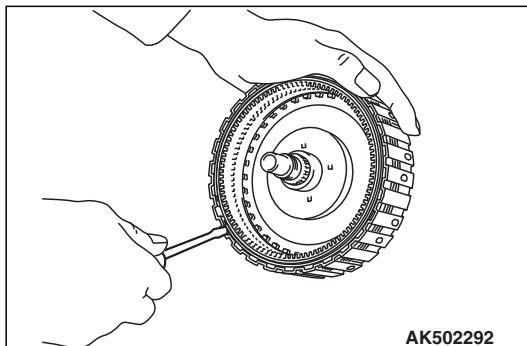
- Disassembly steps**
- |       |       |    |               |
|-------|-------|----|---------------|
| <<A>> | >>E<< | 1. | Snap ring     |
| <<B>> | >>D<< | 2. | Internal gear |
| <<C>> | >>C<< | 3. | Snap ring     |
| <<D>> | >>B<< | 4. | Snap ring     |

- Disassembly steps (Continued)**
- |       |       |    |                             |
|-------|-------|----|-----------------------------|
| <<E>> | >>A<< | 5. | Seal ring (small)           |
| <<E>> | >>A<< | 6. | Seal ring (big)             |
|       |       | 7. | Input shaft                 |
|       |       | 8. | Forward clutch sub-assembly |

## DISASSEMBLY SERVICE POINT

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

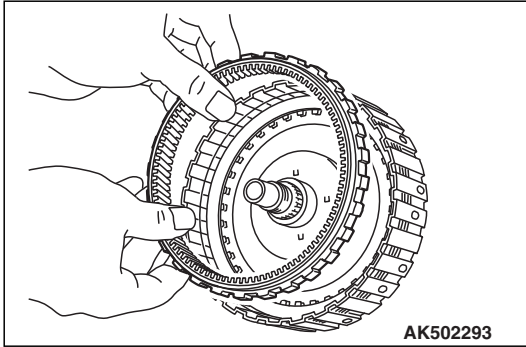
Using a flat blade screwdriver etc., remove the snap ring from the forward clutch drum.



AK502292

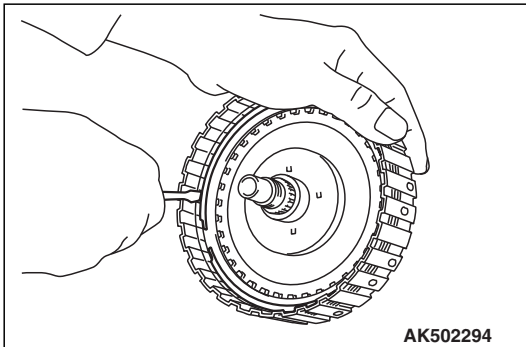
### <<B>> INTERNAL GEAR REMOVAL

Remove the internal gear from the forward clutch drum.



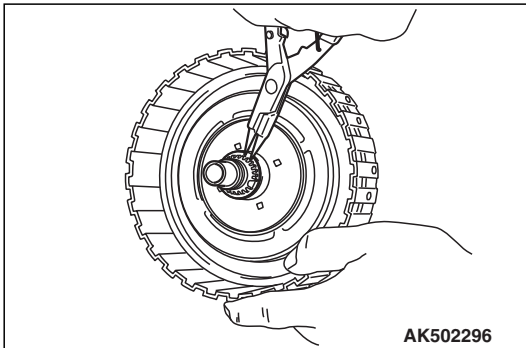
### <<C>> SNAP RING REMOVAL

Using a flat blade screwdriver etc., remove the snap ring from the forward clutch drum.



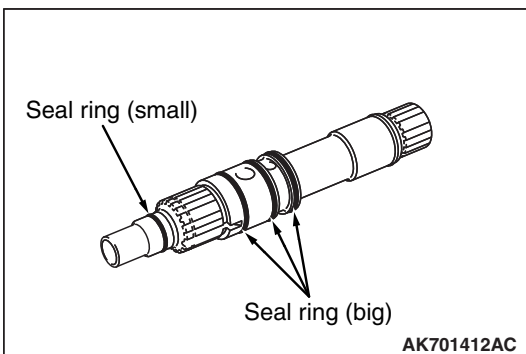
### <<D>> SNAP RING REMOVAL

Remove the snap ring using snap ring pliers, and remove the input shaft from the forward clutch drum.



### <<E>> SEAL RING REMOVAL

Remove the seal rings (small and big) from the input shaft.



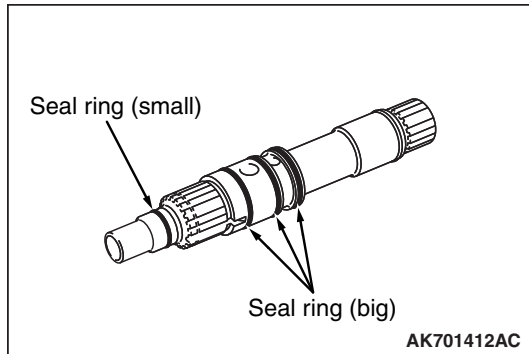
## REASSEMBLY SERVICE POINT

## &gt;&gt;A&lt;&lt; SEAL RING INSTALLATION

 CAUTION

- Apply vaseline when installing the seal rings.
- Do not re-use the seal rings.

Install the seal rings (small and big) on the input shaft.

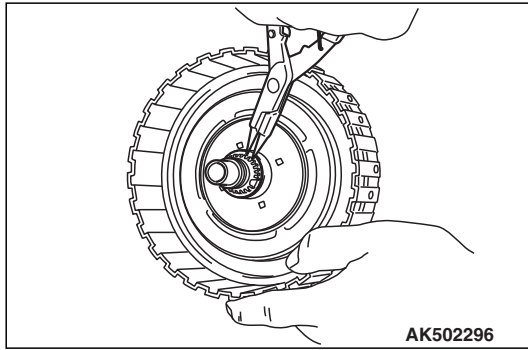


## &gt;&gt;B&lt;&lt; SNAP RING INSTALLATION

 CAUTION

- Be careful not to strain the snap ring by expanding it excessively.
- Do not re-use the snap ring.

Install the input shaft on the forward clutch drum, and attach the snap ring.

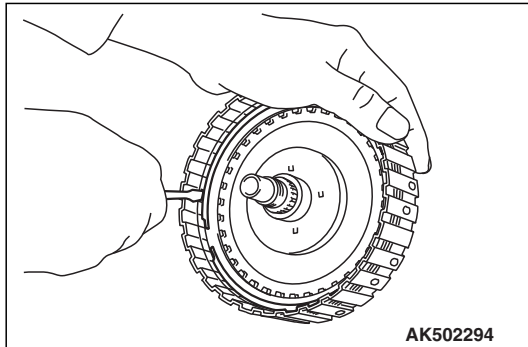


## &gt;&gt;C&lt;&lt; SNAP RING INSTALLATION

 CAUTION

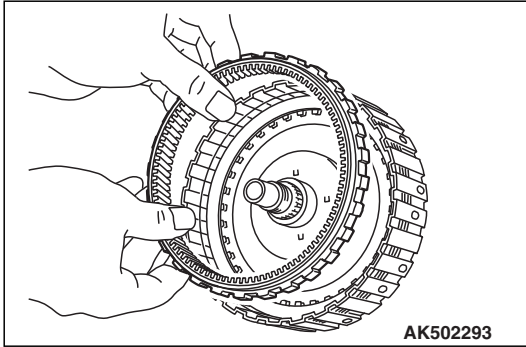
**Do not re-use the snap ring.**

Install the snap ring on the forward clutch drum.



### >>D<< INTERNAL GEAR INSTALLATION

Install the internal gear on the forward clutch drum.

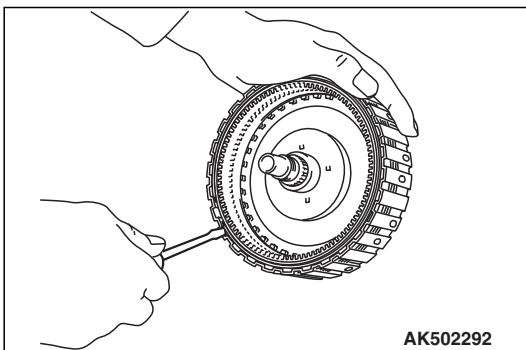


### >>E<< SNAP RING INSTALLATION

#### CAUTION

**Do not re-use the snap ring.**

Install the snap ring on the forward clutch drum.



### INSPECTION

M1233200200040

#### FORWARD CLUTCH SUB-ASSEMBLY

Check if there is a damage, deformation, or burn marks, and replace the forward clutch sub-assembly if any defect is found.

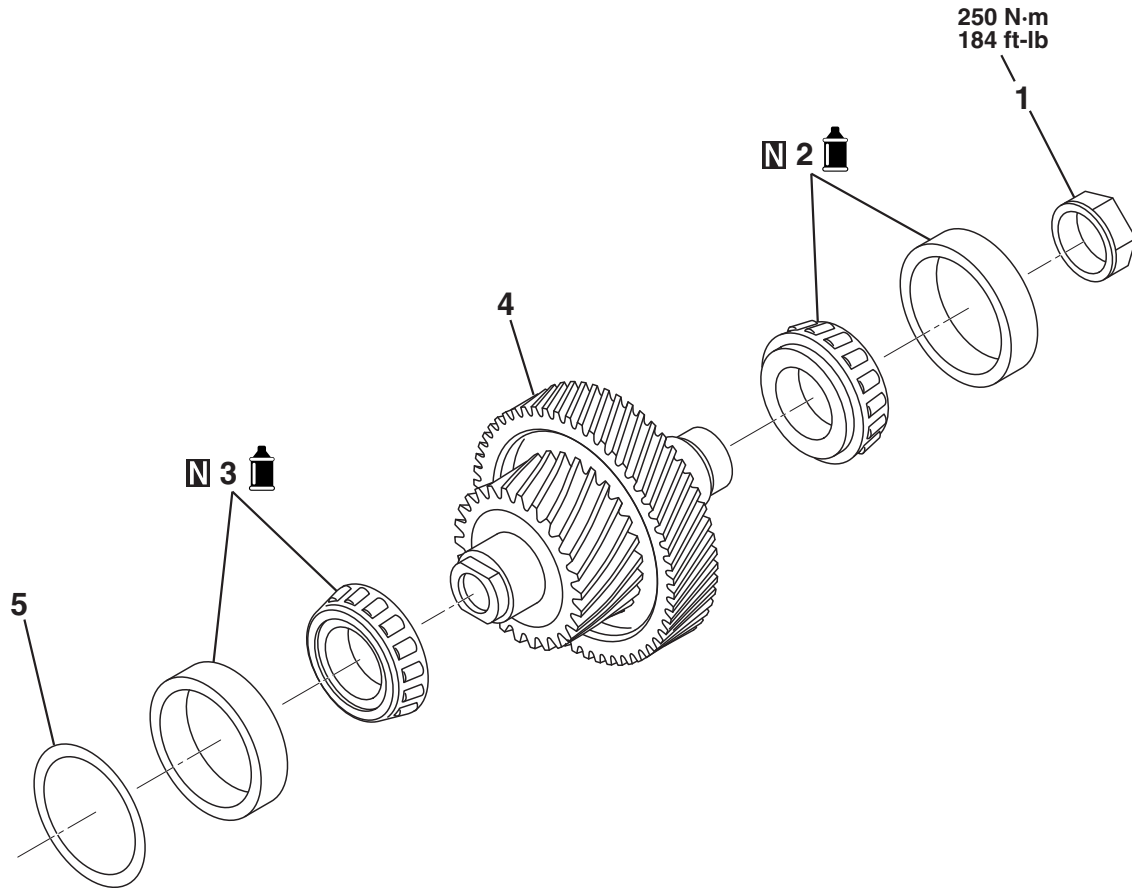
#### INPUT SHAFT AND INTERNAL GEAR

Check if there is a damage or deformation, and replace if any defect is found.

## REDUCTION GEAR

## DISASSEMBLY AND ASSEMBLY

M1233200600093



AK502978AD

## Disassembly steps

- <<A>> >>C<< 1. Nut  
 <<B>> >>B<< 2. Reduction gear bearing  
 <<C>> >>A<< 3. Reduction gear bearing

## Disassembly steps (Continued)

4. Reduction gear sub-assembly  
 5. Adjusting shim

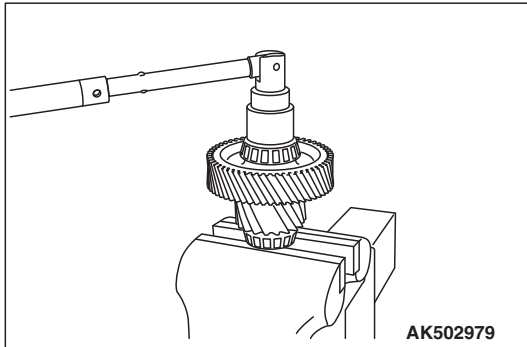
## Required special tools:

- MB990810: Side bearing puller
- MB990947: Lower arm push arbor
- MD999566: Crow
- MB990984: Mount bushing lower roll insulator arbor
- MD998917: Bearing remover
- MD998812: Installer Cap
- MD998813: Installer-100
- MD998819: Installer adapter (40)

## DISASSEMBLY SERVICE POINT

### <<A>> NUT REMOVAL

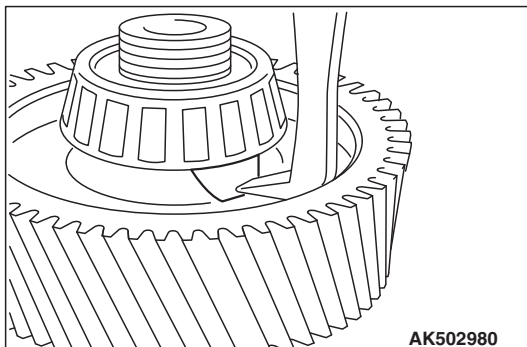
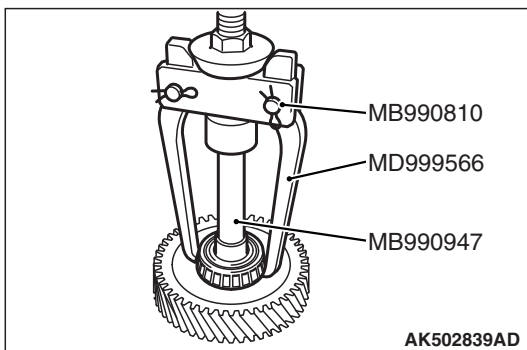
Remove the nut from the reduction gear sub-assembly.



### <<B>> REDUCTION GEAR BEARING REMOVAL

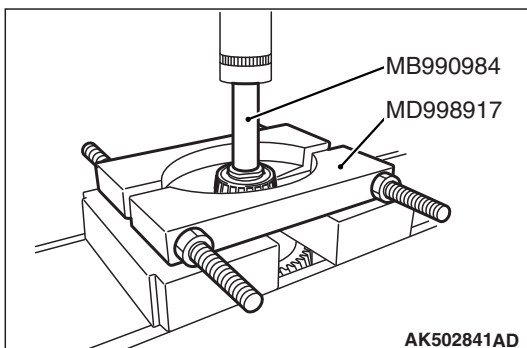
#### **CAUTION**

**Align the tang of special tool as shown in the diagram.**  
Using the special tools MB990810, MB990947 and MD999566, remove the inner race of reduction gear bearing (converter housing side) from the reduction gear sub-assembly.



### <<C>> REDUCTION GEAR BEARING REMOVAL

Using the special tools MB990984 and MD998917, remove the outer race of reduction gear bearing (transaxle case side) from the reduction gear sub-assembly.



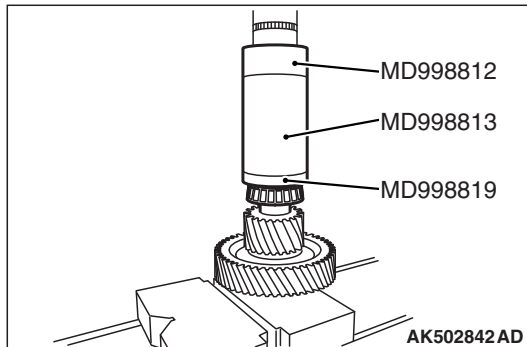
## ASSEMBLY SERVICE POINT

## &gt;&gt;A&lt;&lt; REDUCTION GEAR BEARING INSTALLATION

 CAUTION

- Do not re-use the inner race.
- Replace the inner race together with the outer race.

Using the special tools MD998812, MD998813 and MD998819, install the inner race of reduction gear bearing (transaxle case side) on the reduction gear sub-assembly.

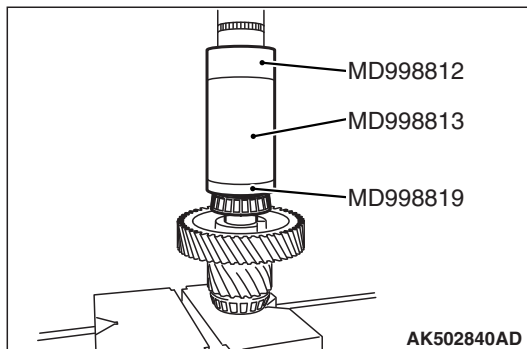


## &gt;&gt;B&lt;&lt; REDUCTION GEAR BEARING INSTALLATION

 CAUTION

- Do not re-use the inner race.
- Replace the inner race together with the outer race.

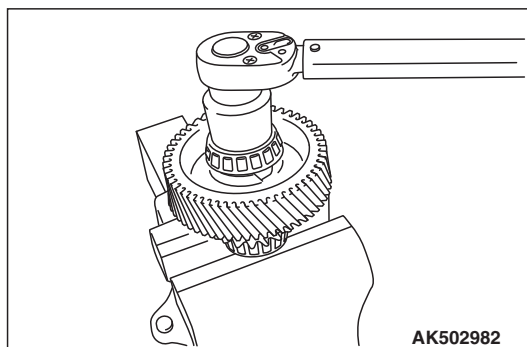
Using the special tools MD998812, MD998813 and MD998819, install the inner race of reduction gear bearing (converter housing side) on the reduction gear sub-assembly.



## &gt;&gt;C&lt;&lt; NUT INSTALLATION

Install the nut on the reduction gear sub-assembly to the specified torque.

**Tightening torque: 250 N·m (184 ft-lb)**



## INSPECTION

M1233200700089

## REDUCTION GEAR SUB-ASSEMBLY

Measure the inner race press-fit shaft diameter of reduction gear sub-assembly, and replace the assembly if the diameter does not meet the standard value.

Standard values

- Converter housing side  
 $\phi 30.008 - 30.029 \text{ mm } (\phi 1.1814 - 1.1822 \text{ in})$
- Transaxle case side  
 $\phi 30.008 - 30.029 \text{ mm } (\phi 1.1814 - 1.1822 \text{ in})$

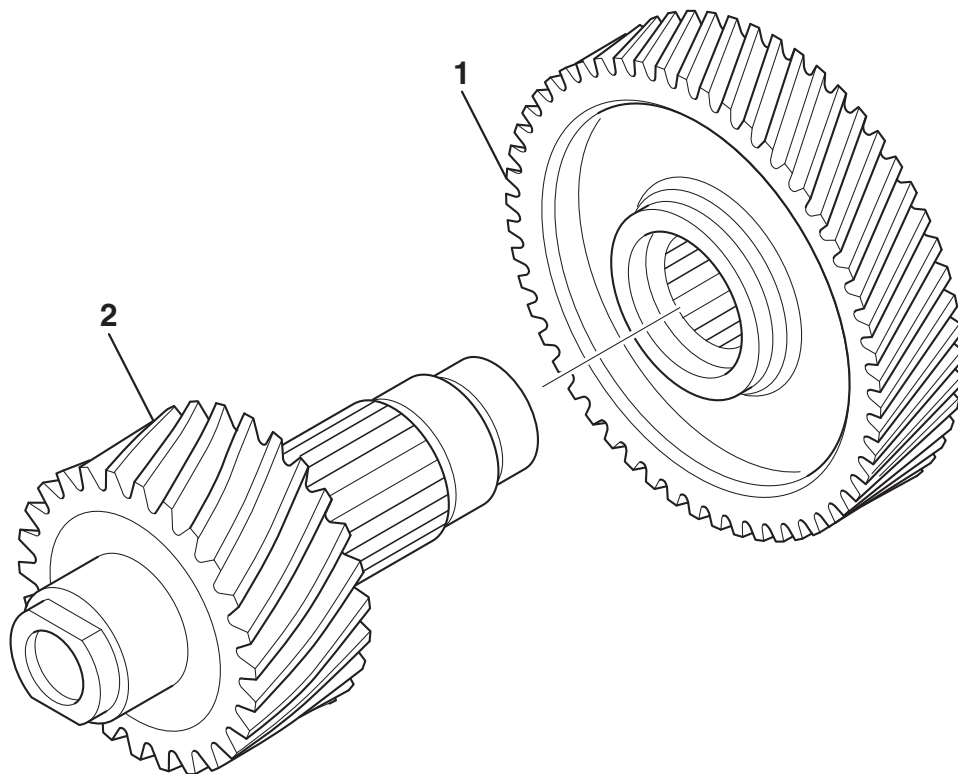
## REDUCTION GEAR SUB-ASSEMBLY

### ASSEMBLY

M1233200900157

**CAUTION**

The reduction gear sub-assembly can only be assembled, not disassembled.



AK503079AD

#### Assembly steps

- >>A<< 1. Idler gear  
>>A<< 2. Reduction pinion gear

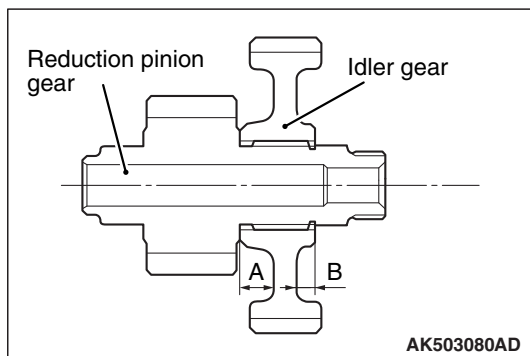
#### Required special tools:

- MD998812: Installer Cap
- MD998813: Installer-100
- MD998819: Installer adapter (40)

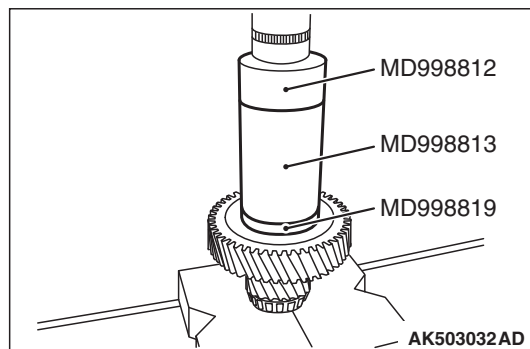
## ASSEMBLY SERVICE POINT

>>A<< REDUCTION PINION GEAR / IDLER GEAR  
INSTALLATION**⚠ CAUTION**

When attaching the idler gear to the reduction pinion gear, make sure the center boss portion A faces the reduction pinion gear.



Center boss portion A	Long
Center boss portion B	Short

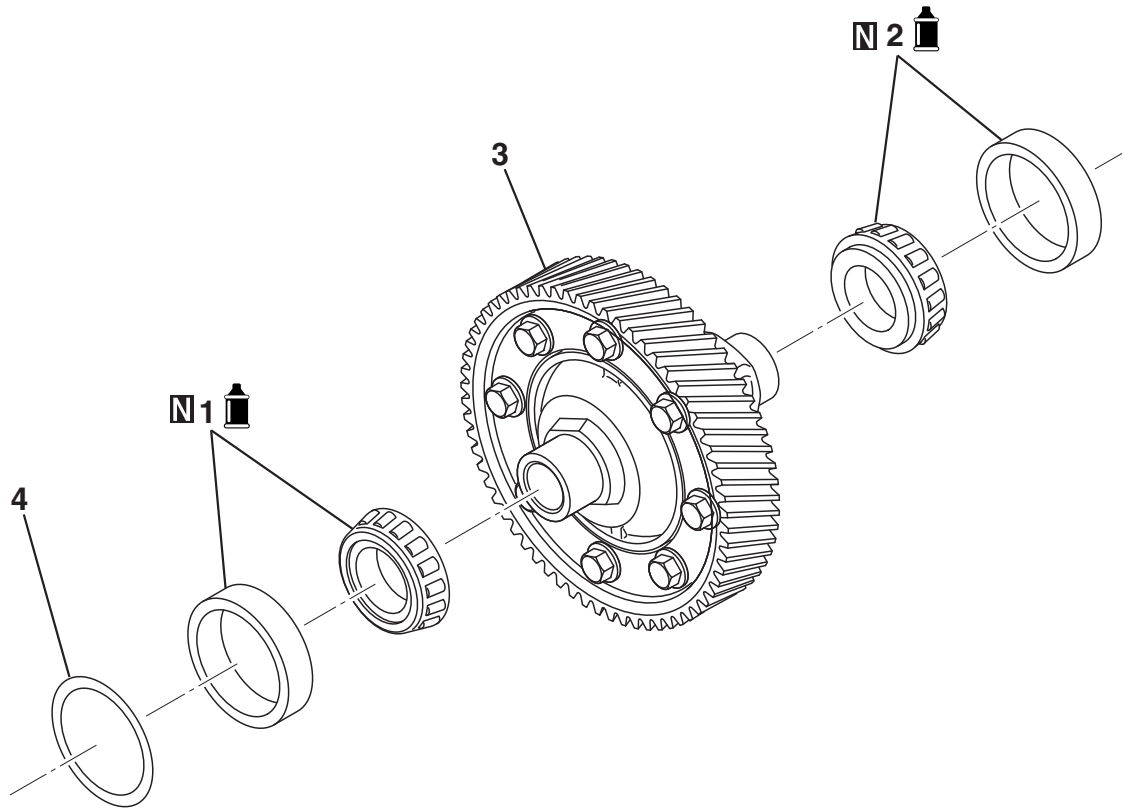


Using the special tools MD998812, MD998813 and MD998819, attach the idler gear to the reduction pinion gear.

## DIFFERENTIAL

### DISASSEMBLY AND ASSEMBLY

M1233213000240



AK502984 AD

#### Disassembly steps

- |       |       |    |                           |
|-------|-------|----|---------------------------|
| <<A>> | >>B<< | 1. | Differential side bearing |
| <<B>> | >>A<< | 2. | Differential side bearing |

#### Disassembly steps (Continued)

- |    |                           |
|----|---------------------------|
| 3. | Differential sub-assembly |
| 4. | Adjusting shim            |

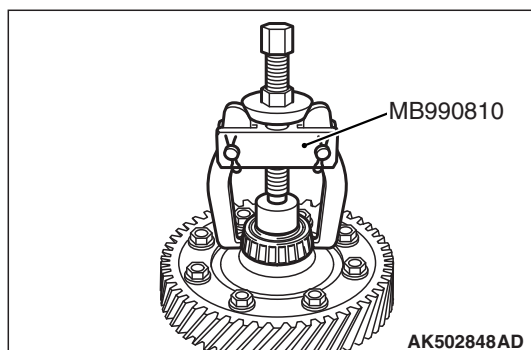
#### Required special tools:

- |                                 |                                    |
|---------------------------------|------------------------------------|
| • MB990810: Side bearing puller | • MD998813: Installer-100          |
| • MB991452: Oil seal installer  | • MD998823: Installer adapter (48) |
| • MD998812: Installer cap       | • MB992138: Bearing Installer      |

## DISASSEMBLY SERVICE POINT

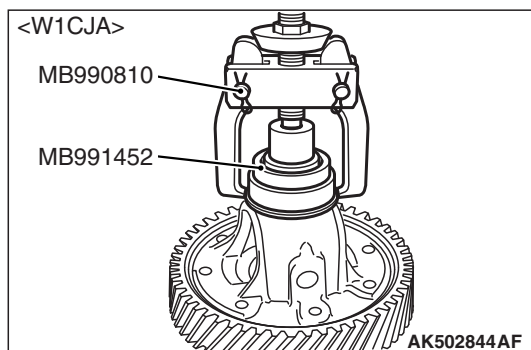
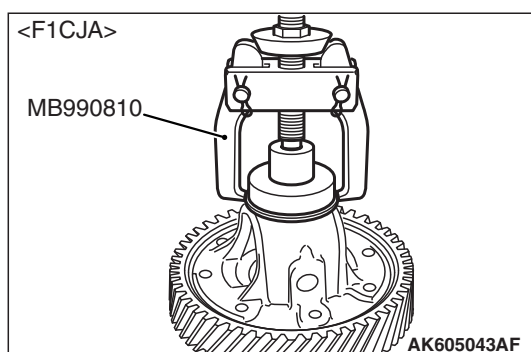
## &lt;&lt;A&gt;&gt; DIFFERENTIAL SIDE BEARING REMOVAL

Using the special tool MB990810, remove the inner race of differential side bearing (transaxle case side) from the differential sub-assembly.



## &lt;&lt;B&gt;&gt; DIFFERENTIAL SIDE BEARING REMOVAL

Using the special tools MB990810 and MB991452 <W1CJA>, remove the inner race of differential side bearing (converter housing side) from the differential sub-assembly.



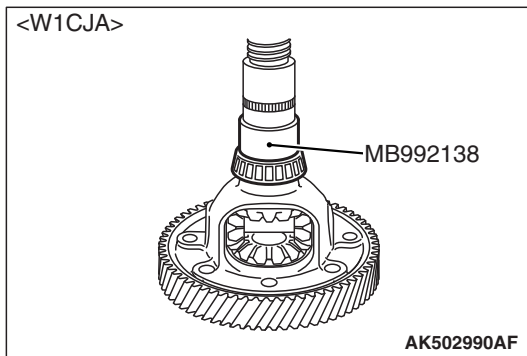
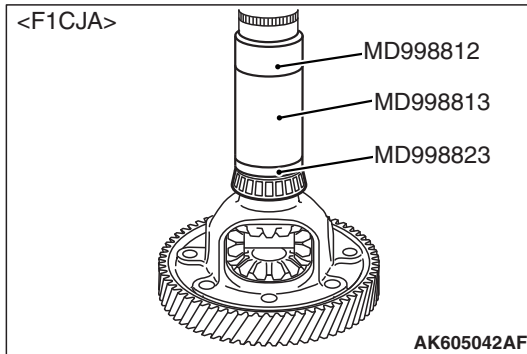
## REASSEMBLY SERVICE POINT

### >>A<< DIFFERENTIAL SIDE BEARING INSTALLATION

#### CAUTION

- Do not re-use the inner race.
- Replace the inner race together with the outer race.

Using the special tool MD998812, MD998813 and MD998823 <F1CJA> or MB992138 <W1CJA>, install the inner race of reduction gear bearing (converter housing side) on the reduction gear sub-assembly.

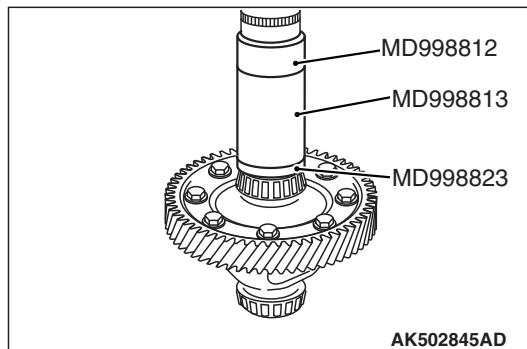


### >>B<< REDUCTION GEAR BEARING INSTALLATION

#### CAUTION

- Do not re-use the inner race.
- Replace the inner race together with the outer race.

Using the special tools MD998812, MD998813 and MD998823, install the inner race of reduction gear bearing (transaxle case side) on the reduction gear sub-assembly.



## DIFFERENTIAL INSPECTION

M1233200800097

### DIFFERENTIAL SUB-ASSEMBLY

Measure the inner race press-fit shaft diameter of differential sub-assembly, and replace the assembly if the diameter does not meet the standard value.

#### Standard values

- Converter housing side <F1CJA>  
 $\phi 40.026 - 40.051$  mm ( $\phi 1.5758 - 1.5768$  in)

- Converter housing side <W1CJA>  
 $\phi 60.032 - 60.078$  mm ( $\phi 2.3635 - 2.3653$  in)
- Transaxle case side  
 $\phi 40.026 - 40.051$  mm ( $\phi 1.5758 - 1.5768$  in)

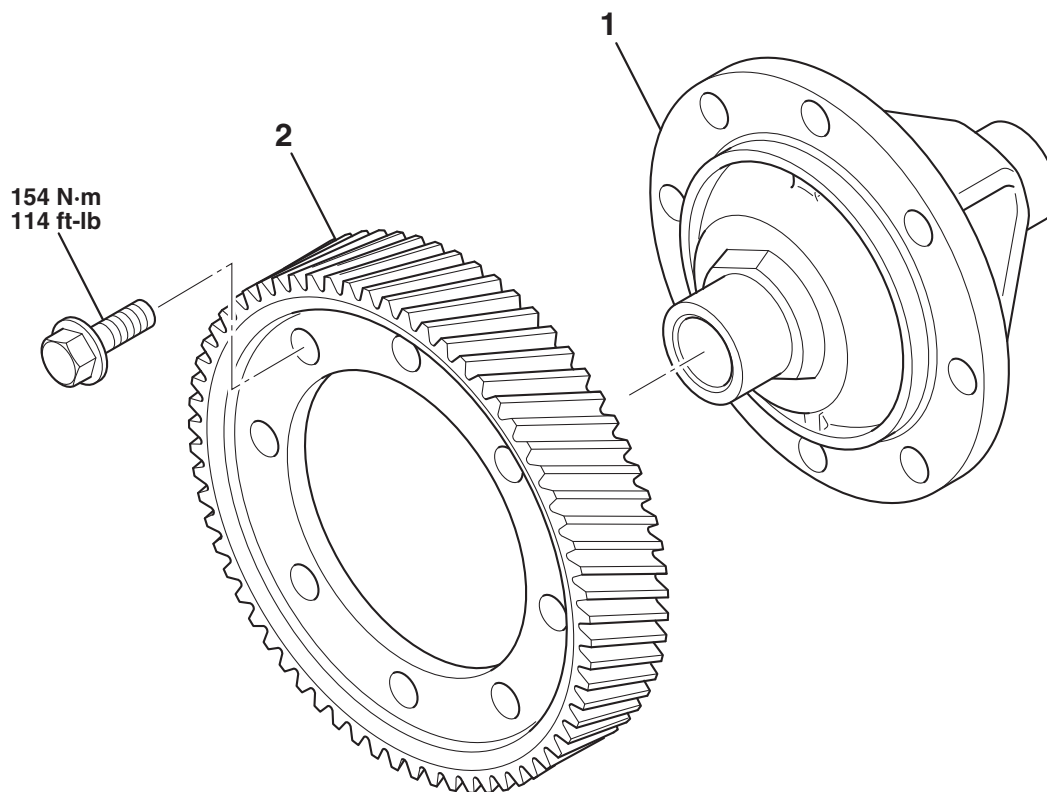
## DIFFERENTIAL SUB-ASSEMBLY

### ASSEMBLY

M1233201200151

#### CAUTION

The differential sub-assembly can only be assembled, not disassembled.



AK503081AD

#### Assembly steps

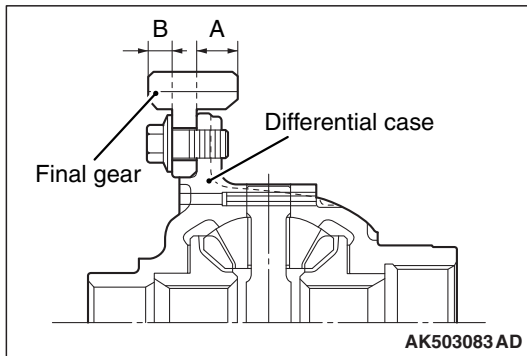
- >>A<< 1. Differential case  
>>A<< 2. Final gear

## ASSEMBLY SERVICE POINT

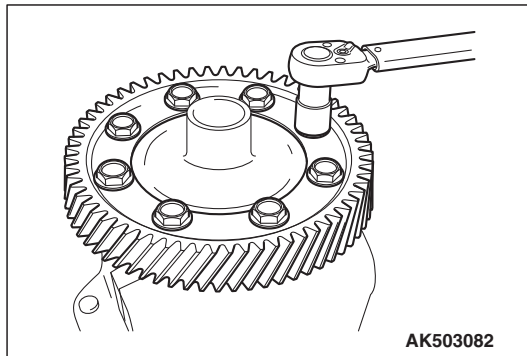
### >>A<< DIFFERENTIAL CASE / FINAL GEAR INSTALLATION

#### **⚠ CAUTION**

When attaching the final gear to the differential case, make sure the side with the bigger distance from the edge to the flange A face the differential case.



Distance from gear edge to flange A	Long
Distance from gear edge to flange B	Short



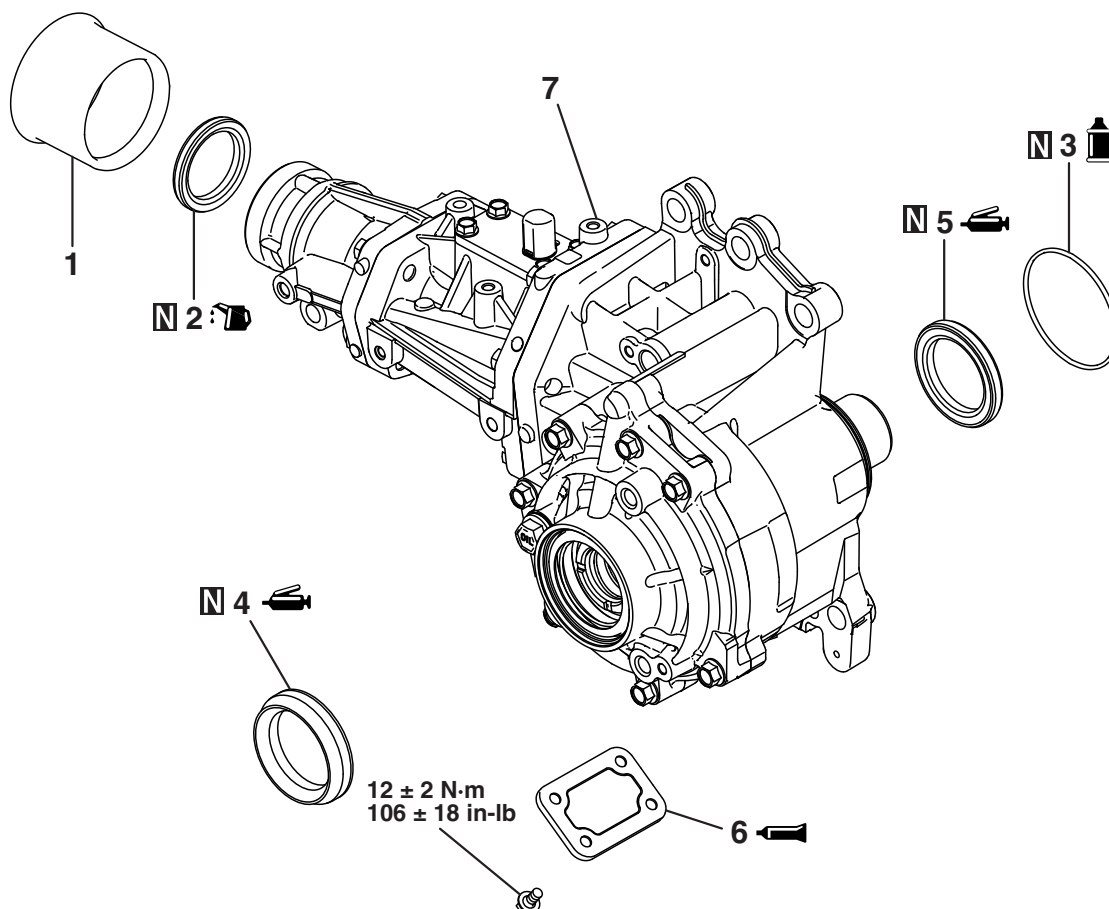
Install the final gear on the differential case, and tighten the fastening bolts to the specified torque.

**Tightening torque: 154 N·m (114 ft-lb)**

## TRANSFER

## DISASSEMBLY AND ASSEMBLY

M1233006700737



AK800123AF

**Disassembly steps**

1. Dust seal guard
- >>D<< 2. Oil seal
3. O-ring
- >>C<< 4. Oil seal

**Disassembly steps (Continued)**

- >>B<< 5. Oil seal
- >>A<< 6. Cover
7. Transfer

**Required special tools:**

- MD998812: Installer cap
- MB992154: Oil seal installer
- MB992075: Handle
- MB992142: Oil seal installer
- MB990936: Installer adapter

## ASSEMBLY SERVICE POINT

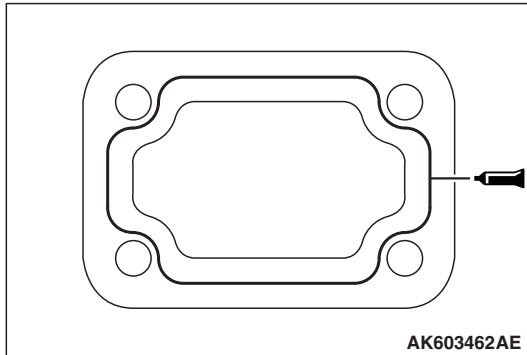
### >>A<< COVER INSTALLATION

1. Apply a 1.5 mm diameter bead of sealant as illustrated onto the cover.

**3M™ ATD Part No.8660 or equivalent**

2. Attach the cover to the transfer and tighten it to the specified torque.

**Tightening torque:  $12 \pm 2$  N·m ( $106 \pm 18$  in-lb)**



### >>B<< OIL SEAL INSTALLATION

#### **⚠ CAUTION**

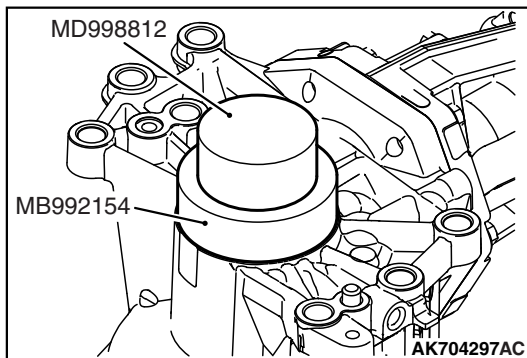
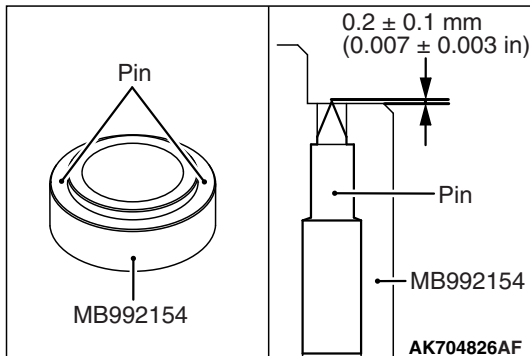
**Pay attention to the transfer case that can possibly twist when the pin projection is too large.**

1. Adjust the projection allowances of the two pins of the special tool, Oil Seal Installer (MB992154) to be  $0.2 \pm 0.1$  mm ( $0.007 \pm 0.003$  in).

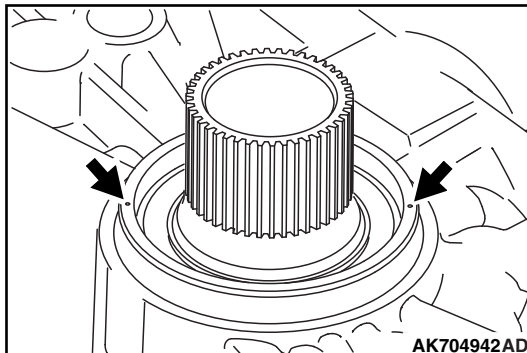
*NOTE: The two pins are inserted into the special tool, Oil Seal Installer (MB992154). When the oil seal is replaced, the traces are found on the transfer case so that the replacement using the specified special tool can be recognized.*

2. Apply specified grease to the oil seal lip area.

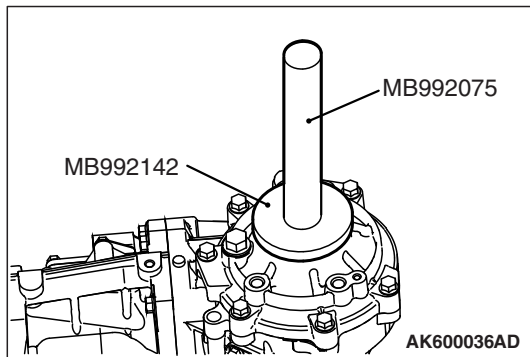
**Specified grease: Retinax A**



3. Using the special tool MD998812 and MB992154, install the oil seal.

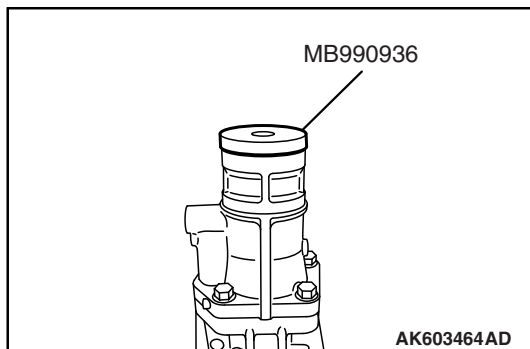


4. Check whether the two traces are found on the transfer case.

**>>C<< OIL SEAL INSTALLATION**

1. Using the special tool MB992075 and MB992142, install the oil seal.
2. Apply specified grease to the oil seal lip area.

**Specified grease: Retinax A**

**>>D<< OIL SEAL INSTALLATION**

1. Using the special tool MB990936, install the oil seal.
2. Apply transfer oil to the lip of oil seal.