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# CONTINUOUSLY VARIABLE TRANSMISSION (CVT)

## CONTENTS

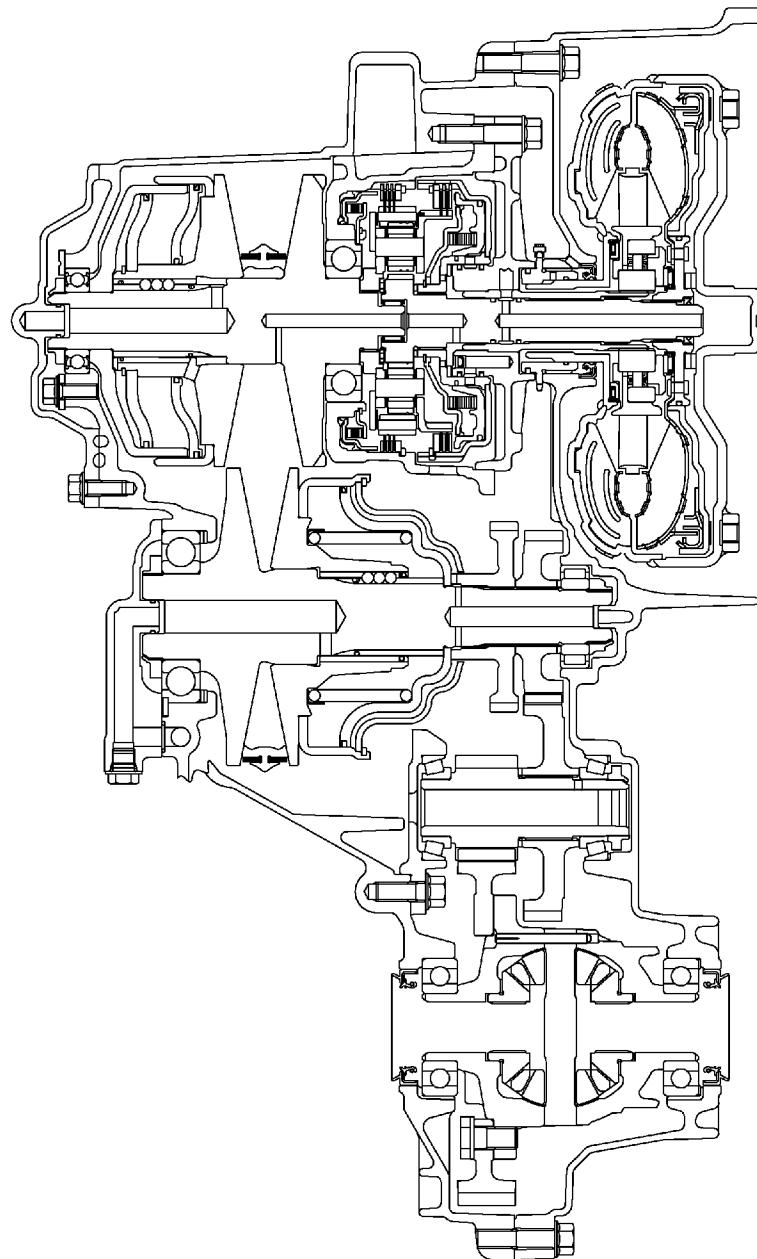
GENERAL INFORMATION .....	23B-0-3
1. SPECIFICATIONS .....	23B-1-1
TRANSMISSION MODEL TABLE .....	23B-1-1
GENERAL SPECIFICATIONS .....	23B-1-2
SERVICE SPECIFICATIONS .....	23B-1-3
VALVE BODY SPRING IDENTIFICATION TABLE .....	23B-1-4
SNAP RING, SPACER AND THRUST WASHER FOR ADJUSTMENT .....	23B-1-5
TORQUE SPECIFICATIONS .....	23B-1-7
SEALANTS .....	23B-1-8
2. SPECIAL TOOLS .....	23B-2-1
3. TRANSMISSION .....	23B-3-1
4. FORWARD CLUTCH AND INPUT SHAFT .....	23B-4-1
5. REVERSE BRAKE .....	23B-5-1
6. VALVE BODY .....	23B-6-1
7. OUTPUT SHAFT .....	23B-7-1
8. DIFFERENTIAL .....	23B-8-1

**NOTES**

## **GENERAL INFORMATION**

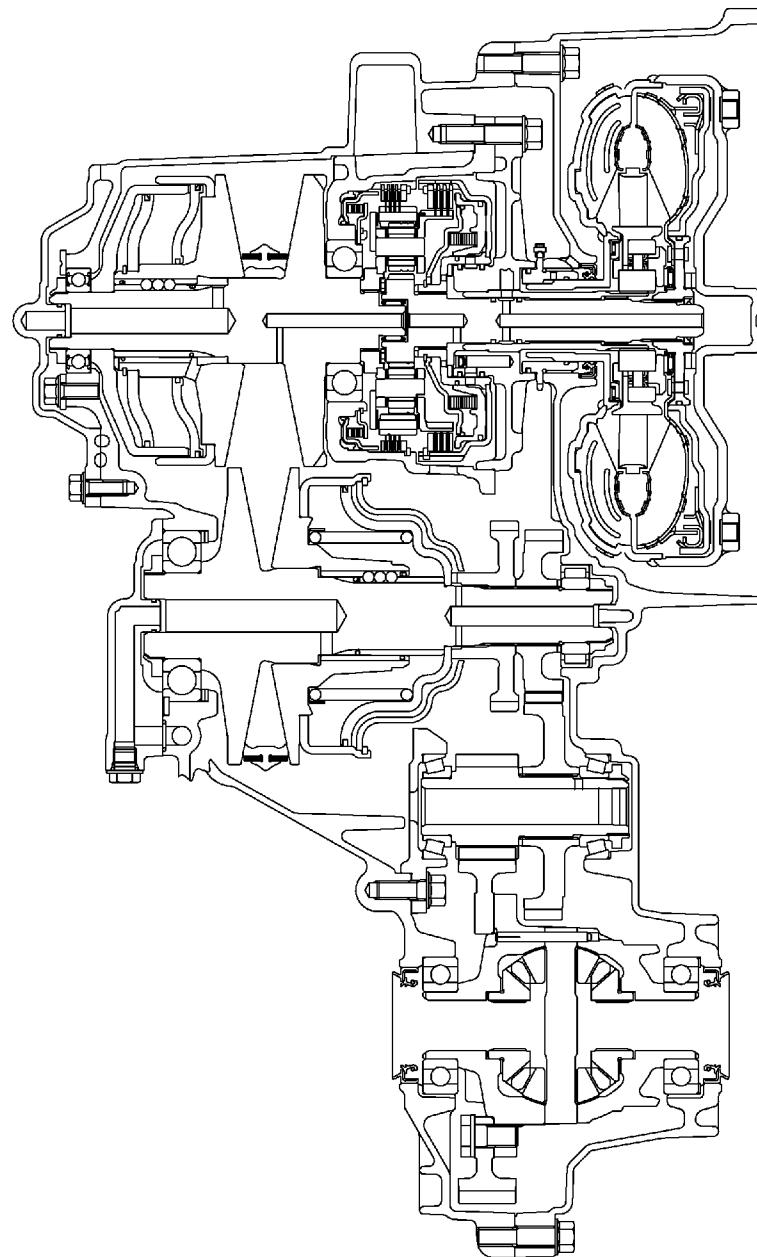
## SECTIONAL VIEW

<F1C1A-1>



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&lt;F1C1A-2&gt;



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# 1. SPECIFICATIONS

## TRANSMISSION MODEL TABLE

### MODEL 2001

Transmission models		Vehicle model	Engine model
EXP	F1C1A-1-J4Z	CS3A	4G18-SOHC
	F1C1A-1-J5Z	CS2A	4G15-GDI
	F1C1A-2-F2Z	CS5A	4G93-GDI

### MODEL 2002

Transmission models		Vehicle model	Engine model
EXP	F1C1A-1-J4Z	CS3A	4G18-SOHC
	F1C1A-1-J6Z	CS3A	4G18-SOHC
	F1C1A-1-J5Z	CS2A	4G15-GDI
	F1C1A-2-F2Z	CS5A	4G93-GDI

## GENERAL SPECIFICATIONS

Item		Specifications			
Transmission model		F1C1A-1	F1C1A-2		
Torque converter	Type	3-element, 1-stage, 2-phase type			
	Lock-up	Provided			
Transmission type	Steel-belt-driver, continuously variable automatic transmission				
Forward gear ratios	2.316 – 0.445				
Reverse gear ratio	2.588				
Final reduction ratio	5.686	5.219			
Number of forward clutch discs	2	3			
Number of reverse brake discs	3 or 4 (J6Z)	4			

**SERVICE SPECIFICATIONS**

Item	Standard value
Input shaft end play mm	0.30 – 0.60
Output shaft preload mm	0.045 – 0.105
Differential case end play mm	0.045 – 0.165
Forward clutch piston end play mm	1.2 – 1.4
Reverse brake piston end play mm	1.6 – 1.8

## VALVE BODY SPRING IDENTIFICATION TABLE

Spring	Wire diameter	Outside diameter	Inside diameter	Free length	Number of loops
Shift control valve spring	0.9	–	5.1 ± 0.15	16.496	9
Reducing valve spring	1.4	–	6.8 ± 0.15	33.882	13
Damper clutch control valve spring	0.6	5.2 ± 0.15	–	26.521	16
One-way valve spring	0.6	4.5 ± 0.1	–	13.46	13
Primary pressure relief valve spring	1.4	–	7.5 ± 0.15	36.09	15
Exhaust valve spring	0.6	6.8 ± 0.2	–	24.90	12
Torque converter pressure valve spring	1.4	–	8.0 ± 0.15	53.50	17
Regulator valve spring	1.0	–	6.9 ± 0.2	25.62	11
Clutch pressure reducing valve spring	1.2	–	6.0 ± 0.15	24.95	11
Line pressure relief valve spring	1.2	–	7.5 ± 0.15	40.71	13
Clutch pressure control valve spring	1.0	–	4.1 ± 0.15	27.15	15

## SNAP RING, SPACER AND THRUST WASHER FOR ADJUSTMENT

Part name	Thickness mm	Identification symbol	Part No.
Thrust washer (For adjustment of input shaft end play)	1.8	18	MD754509
	2.0	20	MD754508
	2.2	22	MD754507
	2.4	24	MD753793
	2.6	26	MD753794
	2.8	28	MD753795
Spacer (For adjustment of output shaft end play)	0.71	94	MR410594
	0.74	95	MR410595
	0.77	96	MR410596
	0.80	97	MR410597
	0.83	98	MR410598
	0.86	99	MR410599
	0.89	00	MR410600
	0.92	01	MR410601
	0.95	02	MR410602
	0.98	03	MR410603
	1.01	04	MR410604
	1.04	05	MR410605
	1.07	06	MR410606
	1.10	07	MR410607
	1.13	08	MR410608
	1.16	09	MR410609
	1.19	10	MR410610
	1.22	11	MR410611
	1.25	12	MR410612
Spacer (For adjustment of differential case end play)	1.10	J	MD710454
	1.19	L	MD710456
	1.28	N	MD710458
	1.37	P	MD710460
	1.46	R	MD710462
	1.55	T	MD710464
	1.64	V	MD710466
	1.73	X	MD710468
	1.82	Z	MD710470
Snap ring (For adjustment of forward clutch end play and reverse brake end play)	1.6	None	MD759666
	1.7	Blue	MD759667
	1.8	Brown	MD759668
	1.9	None	MD752124
	2.0	Blue	MD752125
	2.1	Brown	MD752126
	2.2	None	MD752127
	2.3	Blue	MD752128
	2.4	Brown	MD752129
	2.5	None	MD752130

Part name	Thickness mm	Identification symbol	Part No.
Snap ring (For adjustment of forward clutch end play and reverse brake end play)	2.6	Blue	MD752131
	2.7	Brown	MD752132
	2.8	None	MD752133
	2.9	Blue	MD752134
	3.0	Brown	MD754680
Spacer (For adjustment of backlash between differential side gears and pinion)	0.75 – 0.82	–	MD722986
	0.83 – 0.92	–	MD722985
	0.93 – 1.00	–	MD722984
	1.01 – 1.08	–	MD722982
	1.09 – 1.16	–	MD722983

## TORQUE SPECIFICATIONS

Item	Nm
Oil guide mounting bolts	6 ± 1
Reaction support mounting bolts	48 ± 6
Oil pump mounting bolts	11 ± 1
Bearing retainer mounting bolts	48 ± 6
Oil pipe mounting bolts	11 ± 1
Converter housing mounting bolts	48 ± 6
Valve body mounting bolts	11 ± 1
Valve body cover mounting bolts	11 ± 1
Primary rear cover mounting bolts	23 ± 3
Secondary rear cover mounting bolts	23 ± 3
Inhibitor switch mounting bolts	11 ± 1
Manual control lever mounting nut	22 ± 3
Secondary pressure sensor mounting bolts	19 ± 3
Primary pressure sensor mounting bolts	19 ± 3
Primary speed sensor mounting bolts	11 ± 1
Turbine speed sensor mounting bolts	11 ± 1
Secondary speed sensor mounting bolts	11 ± 1
Eyebolts	30 ± 3
Oil cooler feed pipe mounting bolts	11 ± 1
Control cable bracket mounting bolts	23 ± 3
Harness bracket mounting bolt (M6)	11 ± 1
Harness bracket mounting bolt (M8)	23 ± 3
Solenoid valve mounting bolts	6 ± 1
Adjusting screw assembly mounting bolts	6 ± 1
Outside valve body mounting bolts	11 ± 1
Inside separating plate mounting bolts	6 ± 1
Detent spring mounting bolt	6 ± 1
Output shaft lock nut	190 ± 20
Differential drive gear mounting bolts	135 ± 5

## SEALANTS

Items	Specified sealant
Primary rear cover	Mitsubishi genuine sealant Part No. MD974421 or equivalent (Form-in-place gasket)
Secondary rear cover	
Torque converter housing	
Valve body cover	

## FORM-IN-PLACE GASKET (FIPG)

The transmission has several areas where the form-in-place gasket (FIPG) is in use. To ensure that the gasket fully serves its purpose, it is necessary to observe some precautions when applying the gasket. 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 the fluid feed line. To eliminate the possibility of leaks from a joint, therefore, it is absolutely necessary to apply the gasket evenly without a break, while observing the correct bead size.

Since the FIPG used in the transmission hardens as it reacts with the moisture in the atmospheric air, it is normally used in the metallic flange areas.

### Disassembly

The parts assembled with the FIPG can be easily disassembled without use of a special method. In some cases, however, the sealant between the joined surfaces may have to be broken by lightly striking with a mallet or similar tool. A flat and thin gasket scraper may be lightly hammered in between the joined surfaces. In this case, however, care must be taken to prevent damage to the joined surfaces.

### Surface Preparation

Thoroughly remove all substances deposited on the gasket application surfaces, using a gasket scraper or wire brush. Check to ensure that the surfaces to which the FIPG is to be applied is flat. Make sure that there are no oils, greases and foreign substances deposited on the application surfaces. Do not forget to remove the old FIPG remaining in the bolt holes.

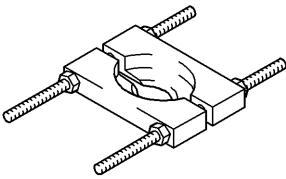
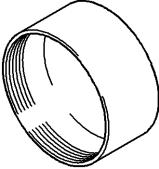
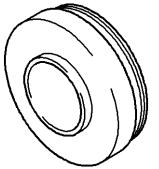
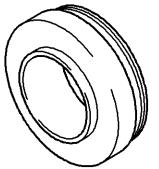
### FIPG Application

When assembling parts with the FIPG, you must observe some precautions, but the procedures is very simple as in the case of a conventional precut gasket.

Applied FIPG bead should be of the specified size and without breaks. Also be sure to encircle the bolt hole circumference with a completely continuous bead. The FIPG can be wiped away unless it is hardened. While the FIPG is still moist (in less than 15 minutes), mount the parts in position. When the parts are mounted, make sure that the gasket is applied to the required area only. In addition, do not apply any oil or water to the sealing locations and do not start the engine until a sufficient amount of time (about one hour) has passed after installation has been completed. The FIPG application procedure may vary from area to area. Observe the procedure described in the text when applying the FIPG.

## 2. SPECIAL TOOLS

Tool	Number	Name	Application
	MB990930	Installer Adapter	Installation of output shaft bearing outer race
	MB990938	Handle	Used together with the Installer Adapter
	MD998334	Oil Seal Installer	Installation of torque converter oil seal
	MD998800	Oil Seal Installer	Installation of drive shaft oil seal
	MD998924	Spring Compressor Retainer	<ul style="list-style-type: none"> <li>Removal and installation of snap rings in forward clutch and reverse brake</li> <li>End play adjustment of forward clutch and reverse brake</li> </ul>
	MD999590	Spring Compressor	Removal and installation of snap ring in forward clutch
	MB991628	Spring Compressor	End play adjustment of forward clutch and reverse brake
	MD999577	Spring Compressor	Removal and installation of snap ring in reverse brake
	MD998809	Lock Nut Wrench	Removal and installation of lock nut on output shaft

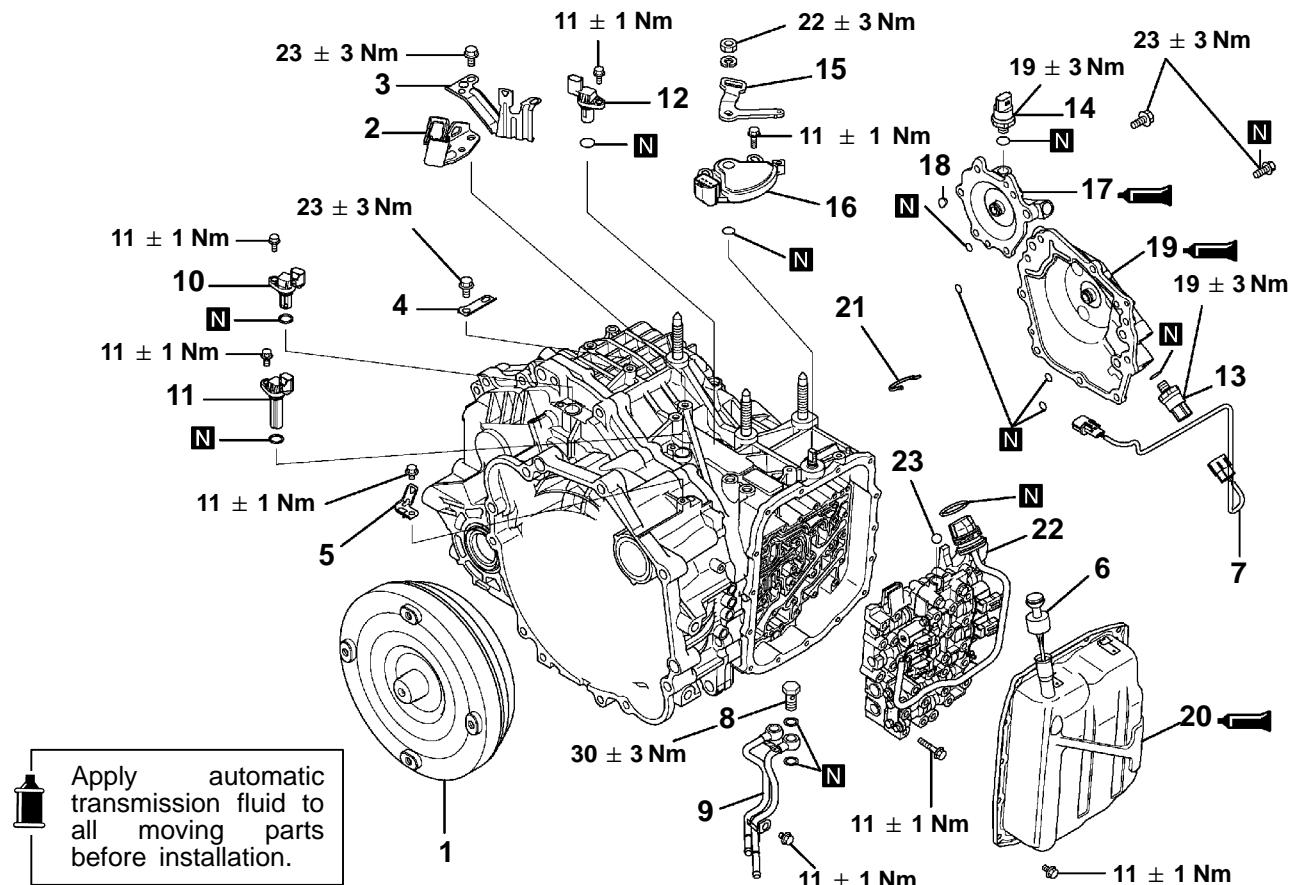
Tool	Number	Name	Application
	MD998801	Bearing Remover	Removal of output shaft bearing and differential bearing
	MD998812	Installer Cap	Used together with Installer and Installer Adapter
	MD998817	Installer Adapter (34)	Installation of output shaft bearing
	MD998819	Installer Adapter (40)	Installation of differential bearing

### 3. TRANSMISSION

#### DISASSEMBLY AND REASSEMBLY

##### KEY POINTS FOR DISASSEMBLY AND REASSEMBLY

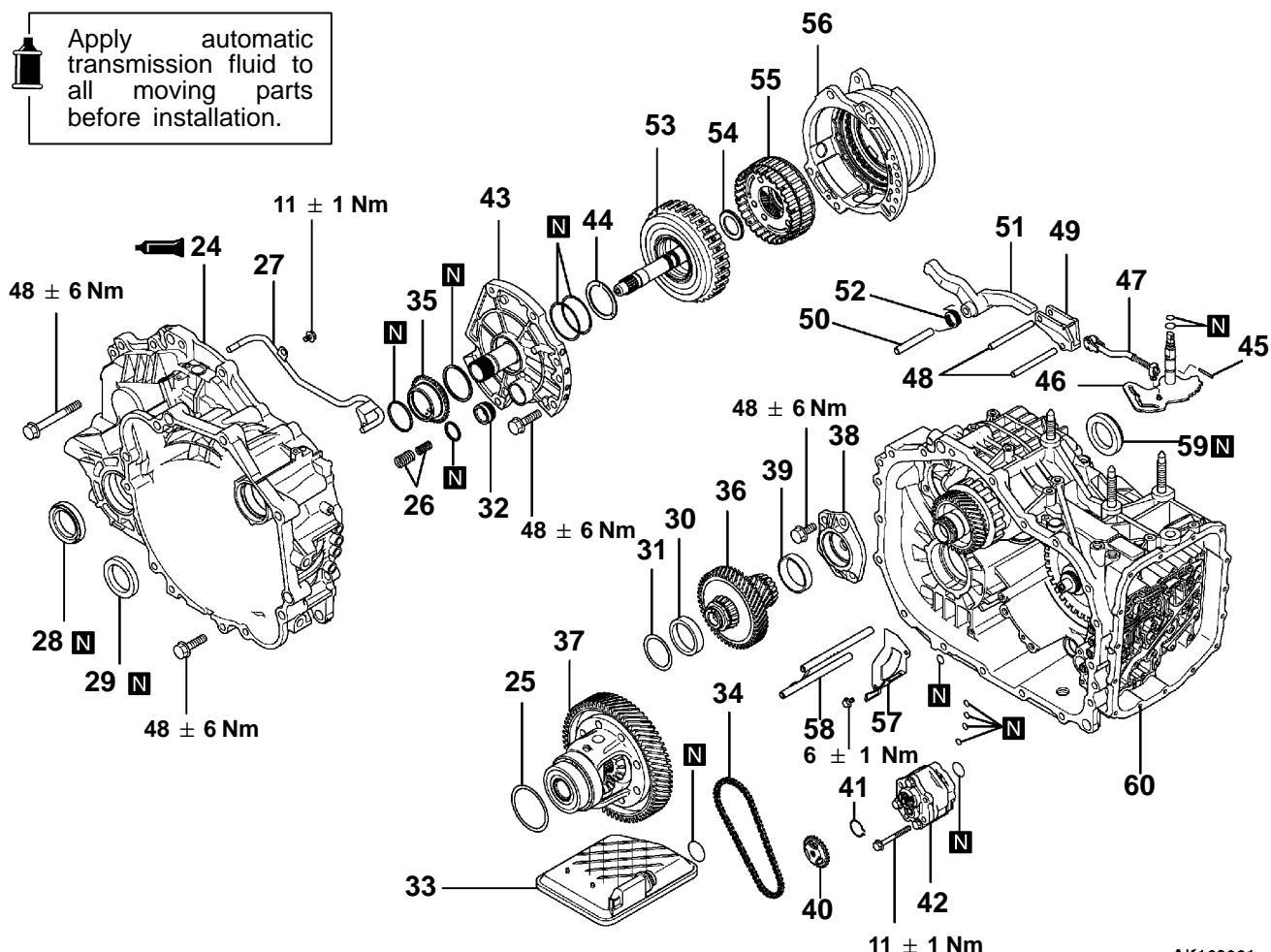
- The valve body assembly underwent fluid pressure adjustments at the factory. Do not disturb setting of the adjusting screw.
- The shift control solenoid valve must be installed into the original position whenever it has been removed. Otherwise the factory-adjusted primary pressure characteristics will be affected.



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##### Disassembly sequence

1. Torque converter
2. Control cable support bracket
3. Harness bracket
4. Harness bracket
5. Harness bracket
6. Oil level gauge
7. Primary pressure sensor harness
8. Eyebolt
9. Oil cooler feed tube
10. Secondary speed sensor
11. Turbine speed sensor
12. Primary speed sensor
13. Primary pressure sensor
14. Secondary pressure sensor
15. Manual control lever
16. Inhibitor switch
17. Secondary rear cover
18. Stopper
19. Primary rear cover
20. Valve body cover
21. Solenoid valve harness connector clamp
22. Valve body assembly
23. Steel ball



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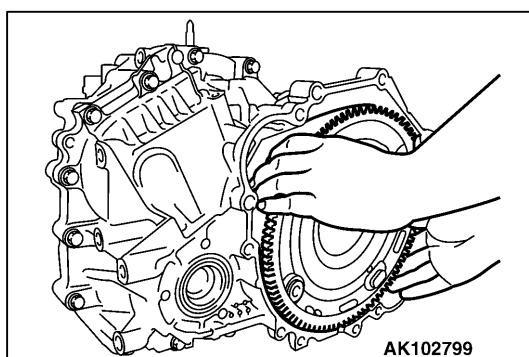
#### Disassembly sequence

24. Converter housing	43. Reaction support
25. Spacer	44. Thrust washer
26. Accumulator spring	45. Pin
27. Oil pipe	46. Manual control lever shaft
28. Oil seal	47. Parking roller rod
29. Oil seal	48. Parking roller support shaft
30. Outer race	49. Parking roller support
31. Spacer	50. Parking sprag shaft
32. Accumulator piston	51. Parking sprag
33. Oil filter	52. Spring
34. Chain	53. Forward clutch assembly
35. Oil pump drive sprocket	54. Thrust bearing
36. Output shaft assembly	55. Planetary carrier
37. Differential assembly	56. Reverse brake assembly
38. Bearing retainer	57. Oil guide
39. Outer race	58. Oil pipe
40. Oil pump driven sprocket assembly	59. Oil seal
41. Snap ring	60. Gear and case kit
42. Oil pump assembly	

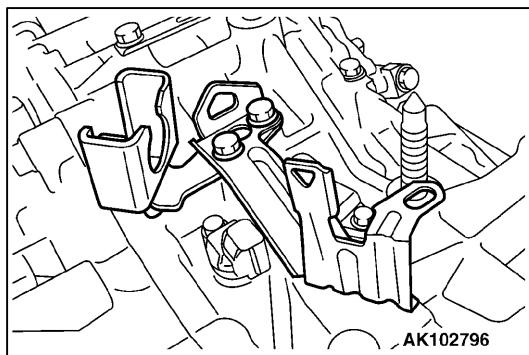
## DISASSEMBLY

### Caution

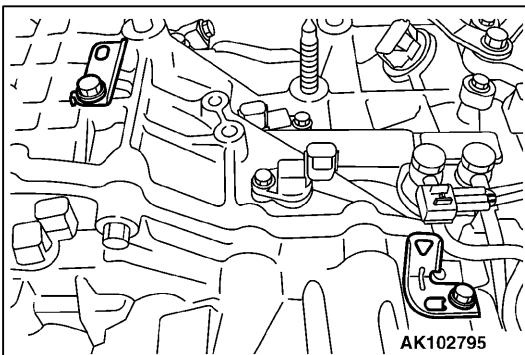
- The automatic transmission includes many high-precision components. All parts must be handled carefully not to give damage to them when the transmission is disassembled and reassembled.
- Place a rubber mat over the bench on which disassembly work is going to be performed. Always keep the mat surface clean.
- Do not use cotton gloves and shop towel or rag when disassembling the transmission. Use nylon cloth or paper towel if necessary.
- All removed parts must be washed. Metal parts may be washed in solvent but must be dried using compressed air after washing.
- Wash the clutch discs, brake discs, plastic thrust plates and rubber parts in automatic transmission fluid (ATF). Keep the washed parts away from dust.
- Whenever transmission parts are found damaged, the oil cooler system components must be disassembled and washed.



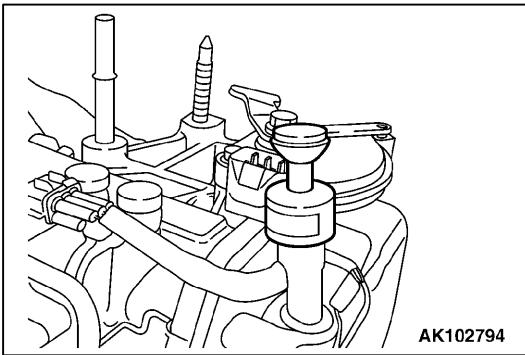
(1) Remove the torque converter from the transmission.



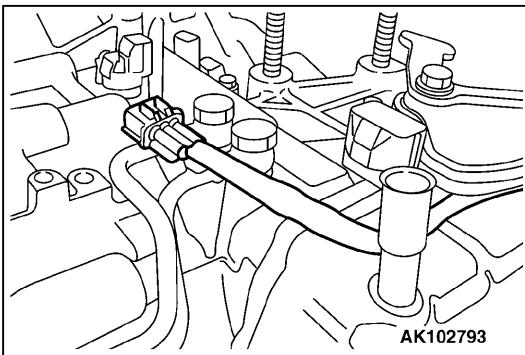
(2) Remove the control cable support bracket and harness bracket from the transmission case.



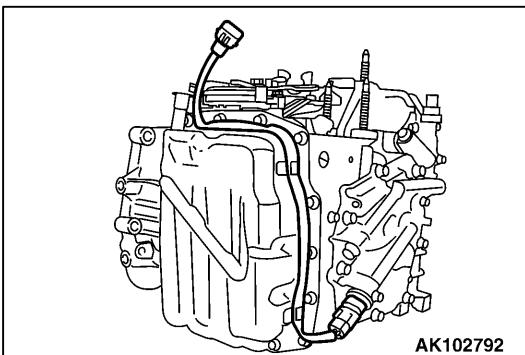
(3) Remove the harness brackets at two places on the transmission case.



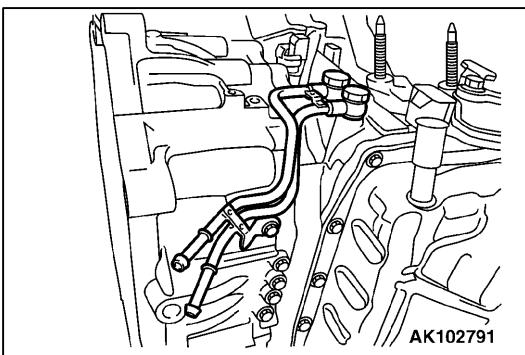
(4) Remove the oil level gauge from the valve body cover.



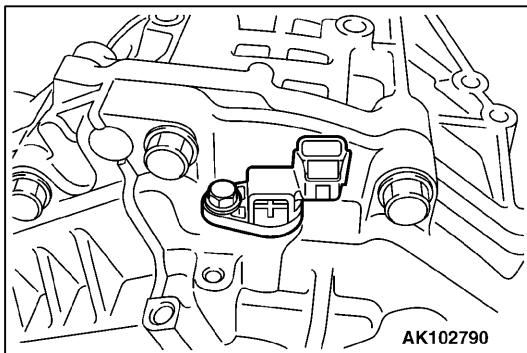
(5) Unclamp and detach the primary pressure sensor harness connector from the oil cooler feed tube.



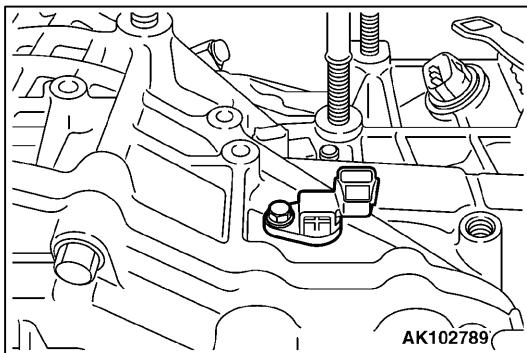
(6) Unclamp and detach the primary pressure sensor harness from the valve body cover, disconnect the harness connector from the primary pressure sensor, then remove the primary pressure sensor harness.



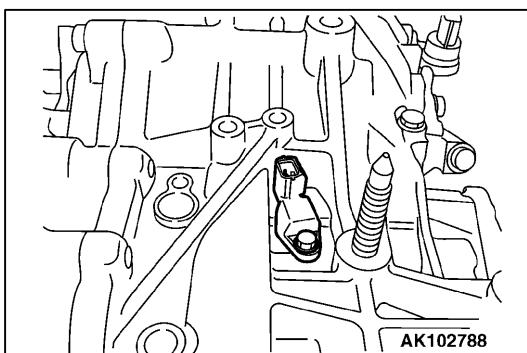
(7) Remove the two eyebolts, four gaskets, and oil cooler feed tube from the transmission case.



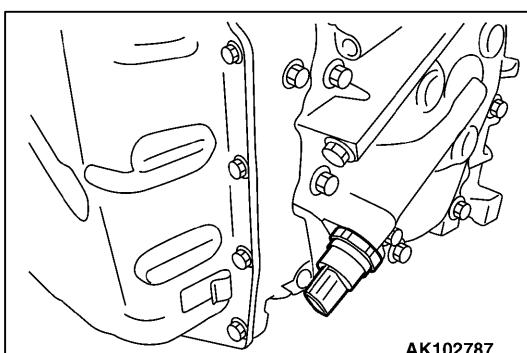
(8) Remove the secondary speed sensor from the converter housing.



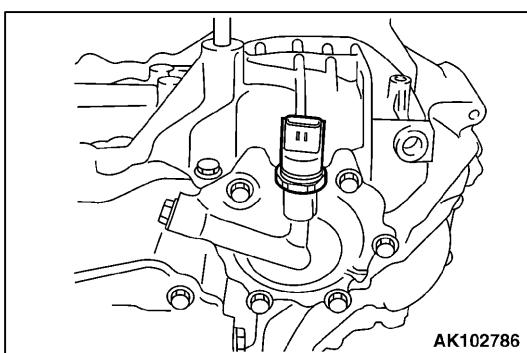
(9) Remove the turbine speed sensor from the transmission case.



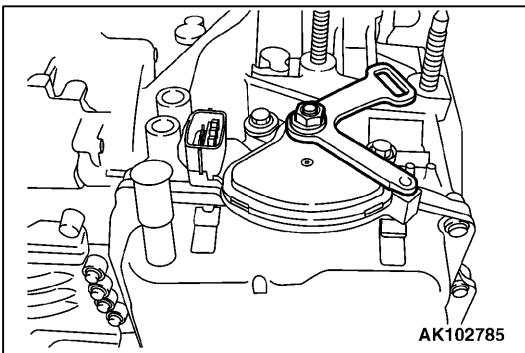
(10) Remove the primary speed sensor from the transmission case.



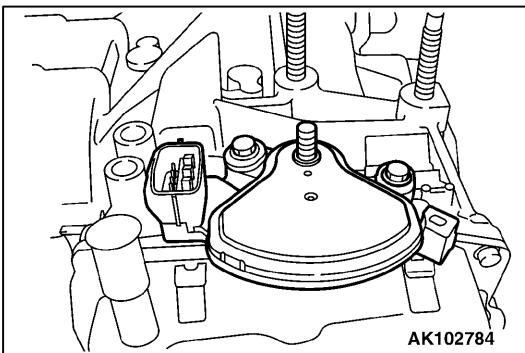
(11) Remove the primary pressure sensor from the primary rear cover.



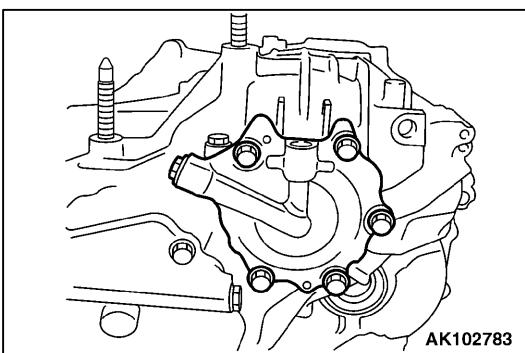
(12) Remove the secondary pressure sensor from the secondary rear cover.



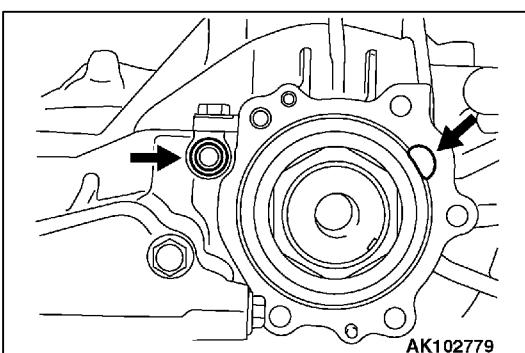
(13) Remove the manual control lever from the manual control shaft.



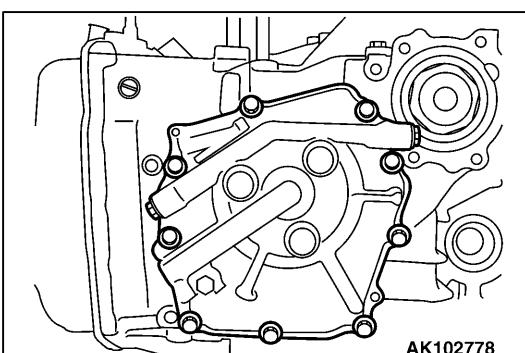
(14) Remove the inhibitor switch from the transmission case.



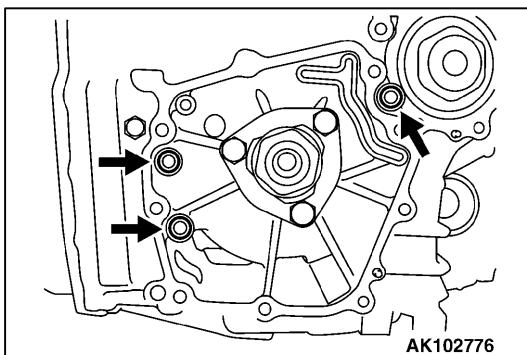
(15) Remove the secondary rear cover from the transmission case.



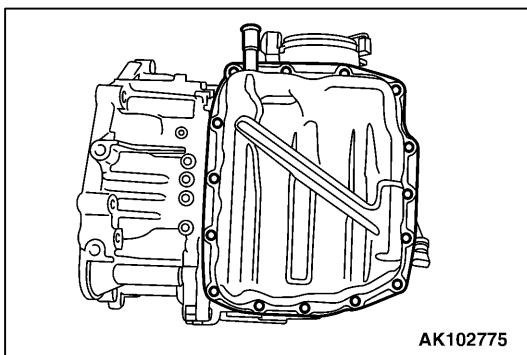
(16) Remove the O-ring and stopper from the transmission case.



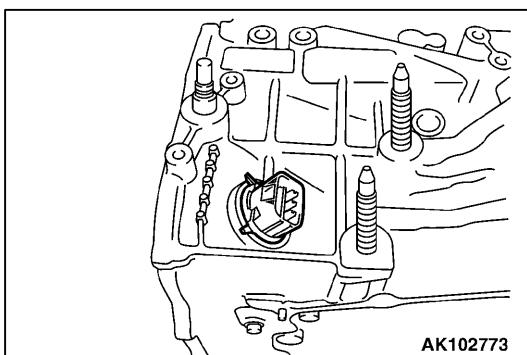
(17) Remove the primary rear cover from the transmission case.



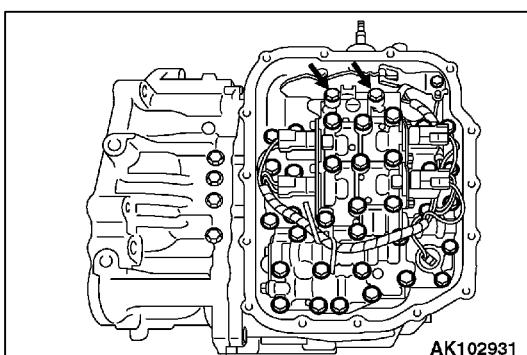
(18) Remove the three O-rings from the transmission case.



(19) Remove the valve body cover from the transmission case.



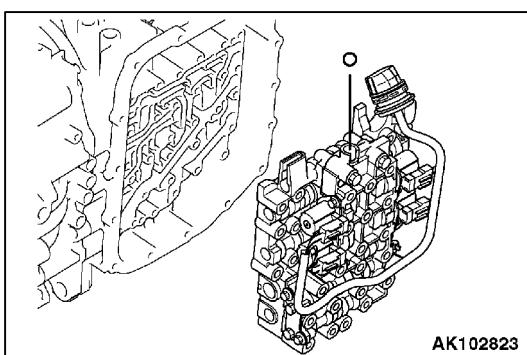
(20) Remove the clamp that holds the connector of solenoid valve harness.



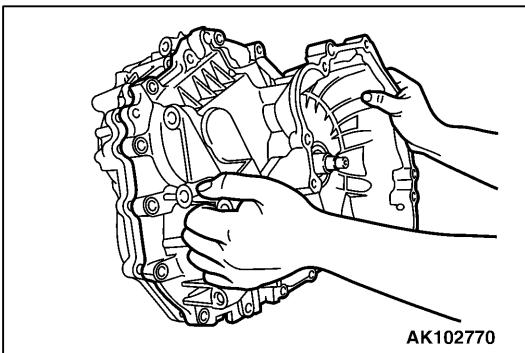
(21) Remove 34 bolts shown in the illustration, then remove the valve body assembly from the transmission case.

**NOTE**

Do not remove the two bolts shown in the illustration.



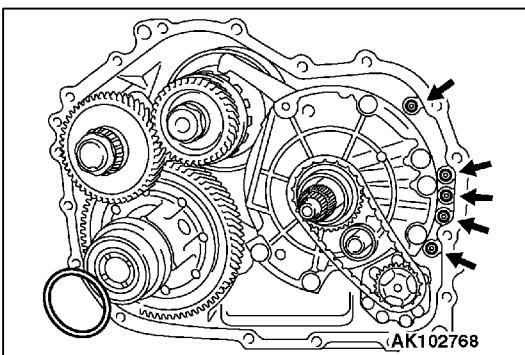
(22) Remove from the valve body the steel ball indicated in the illustration.



(23) Remove the converter housing from the transmission case.

**Caution**

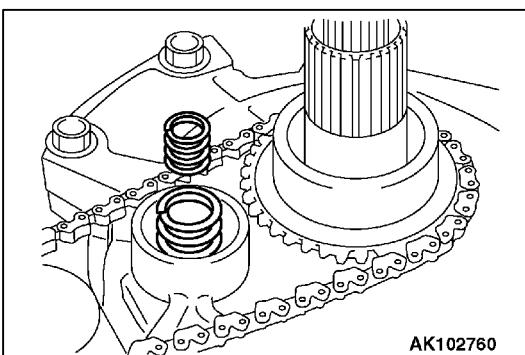
The spacer (for adjusting the differential bearing clearance), five O-rings, and two accumulator springs may come off together with the converter housing.



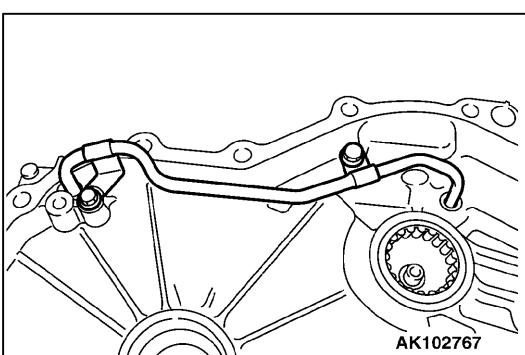
(24) Remove the five O-rings and the spacer for adjusting the differential bearing clearance (see the illustration).

**NOTE**

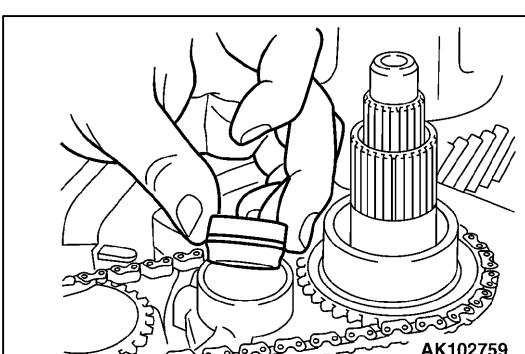
The O-ring and spacer may attach to the converter housing which was removed in the preceding step.



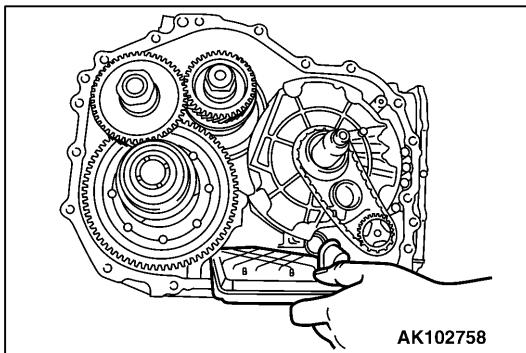
(25) Remove the two accumulator springs from the reaction shaft support.



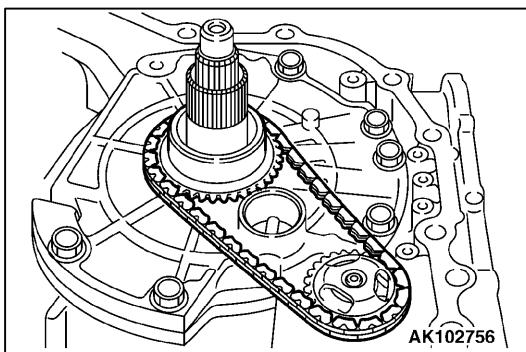
(26) Remove the oil pipe from the converter housing.



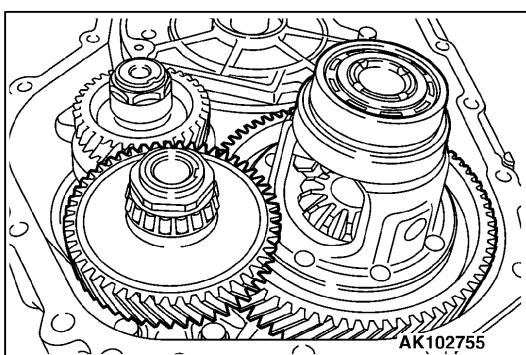
(27) Remove the accumulator piston from the reaction shaft support.



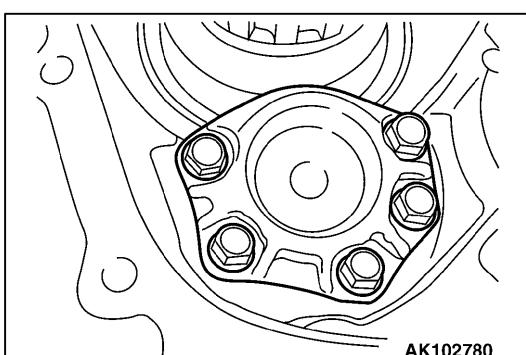
(28) Remove the oil filter from the transmission case.



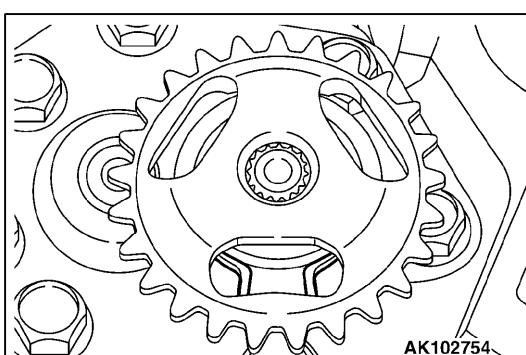
(29) Remove the chain and oil pump drive sprocket.



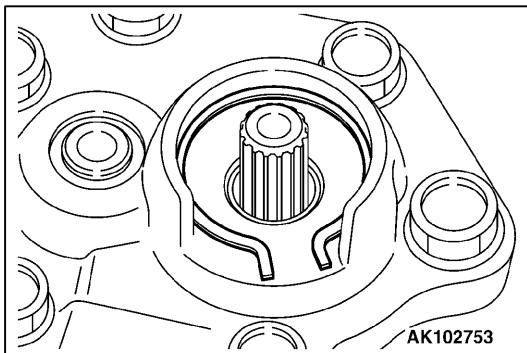
(30) Remove the output shaft assembly and differential assembly from the transmission case.



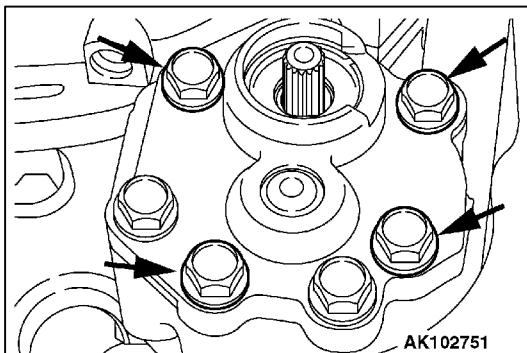
(31) Remove the bearing retainer and outer race.



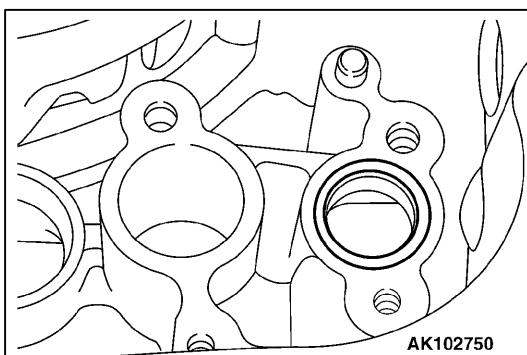
(32) Remove the oil pump driven sprocket from the oil pump by opening the snap ring shown in the illustration.



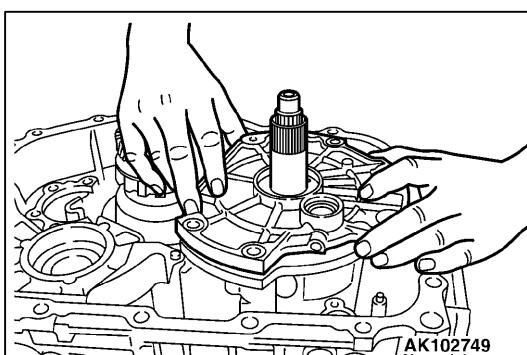
(33) Detach from the oil pump the snap ring that retains the oil pump driven sprocket.



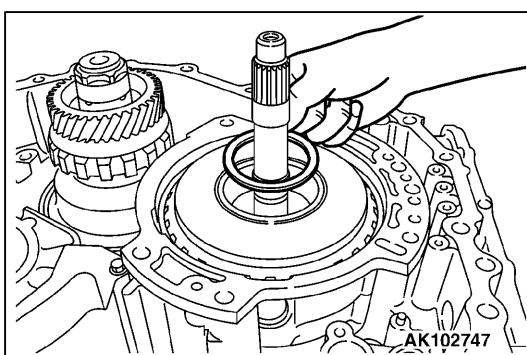
(34) Remove the four bolts shown in the illustration, then remove the oil pump assembly from the transmission case.



(35) Remove the O-ring shown in the illustration from the transmission case.



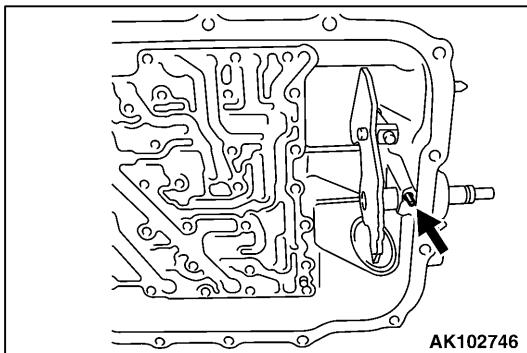
(36) Remove the reaction shaft support from the transmission case.



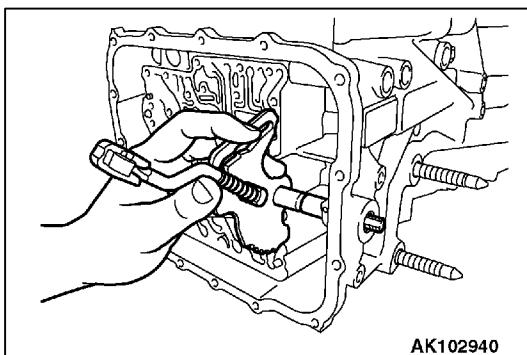
(37) Remove the thrust washer from the forward clutch.

**NOTE**

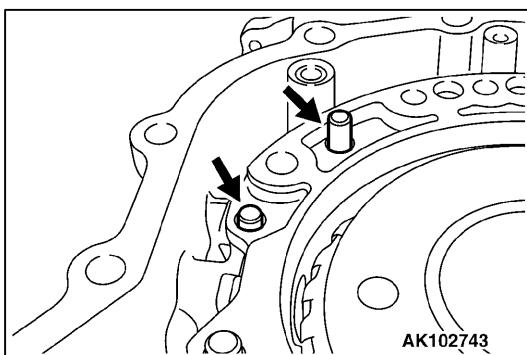
The thrust washer may attach to the reaction shaft support which was removed in the preceding step.



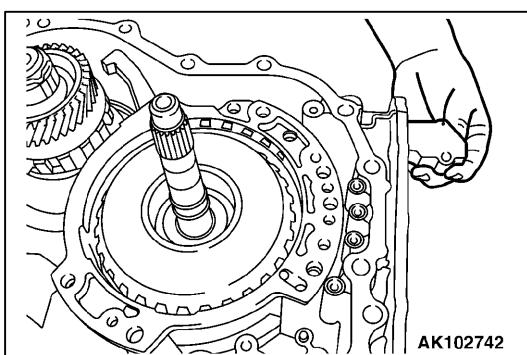
(38) Remove the knock pin that is positioning the manual control shaft.



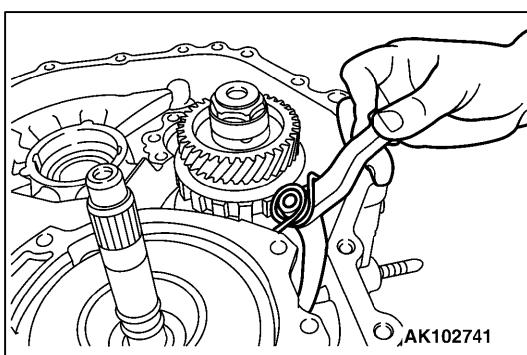
(39) Remove the manual control shaft and parking roller rod from the transmission case.



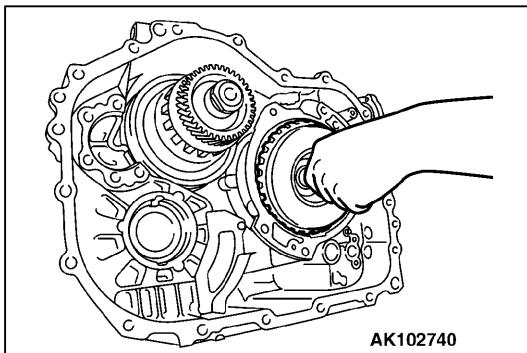
(40) Remove the two parking roller support shafts from the transmission case.



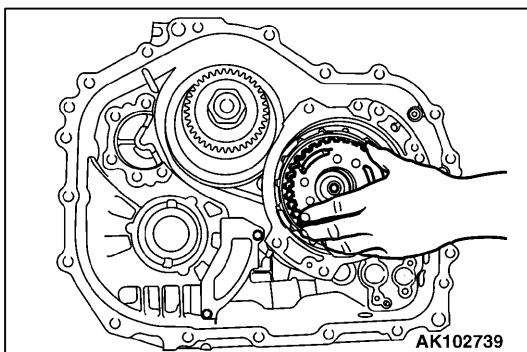
(41) Remove the parking roller support from the transmission case.



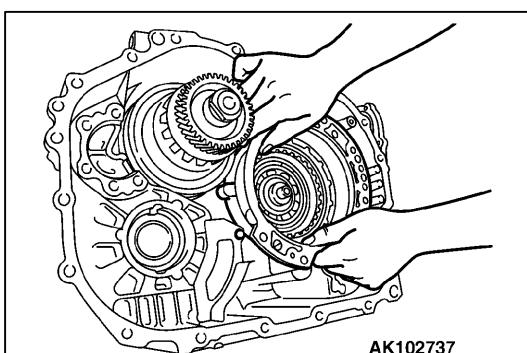
(42) Remove the parking sprag shaft, then remove the parking sprag and spring from the transmission case.



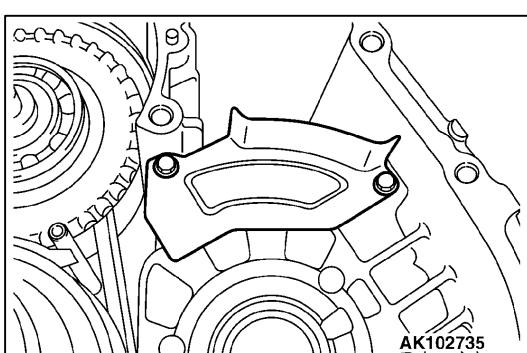
(43) Remove the forward clutch assembly and input shaft out of the transmission case.



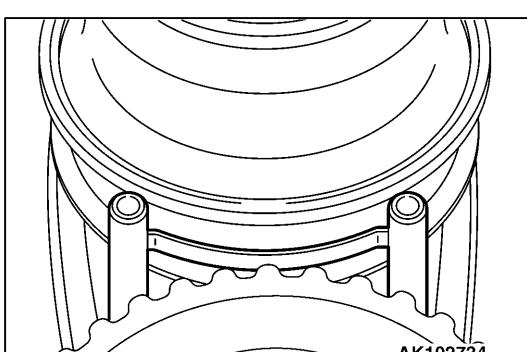
(44) Remove the planetary carrier assembly out of the transmission case.



(45) Remove the reverse brake assembly out of the transmission case.



(46) Remove the oil guide from the transmission case.

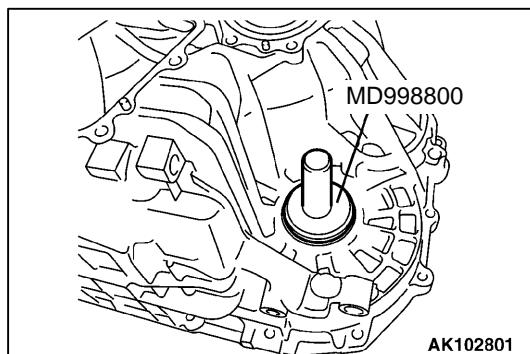


(47) Remove the oil pipes out of the transmission case.

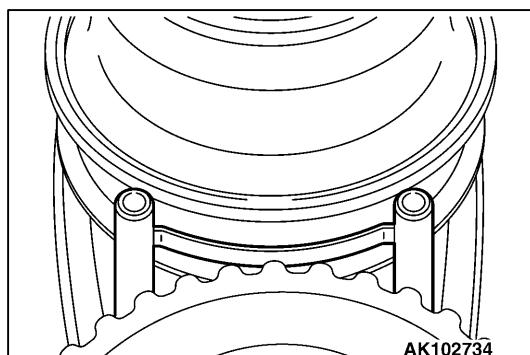
## ASSEMBLY

### Caution

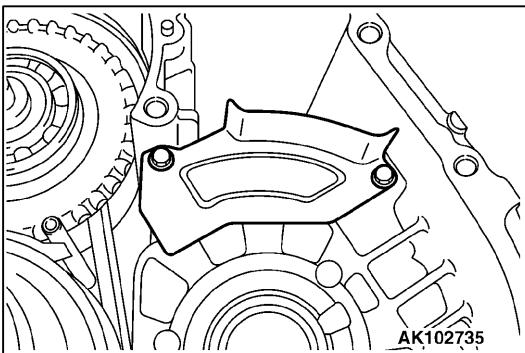
- Do not reuse any of the removed O-rings and oil seals. Be sure to use new O-rings and oil seals when the transmission is reassembled.
- Only blue petrolatum jelly and white Vaseline may be used during assembly.
- The friction elements and the parts having surfaces on which other parts rotate or slide must be coated with ATF before they are assembled. New brake and clutch discs must be immersed in ATF for more than 2 hours before installation.
- Do not apply sealant and adhesive to any preformed gaskets.
- If a bushing is excessively worn or otherwise damaged, replace the assembly of which the bushing forms part.
- Do not use cotton gloves and shop towel or rag during assembly work. Use nylon cloth gloves and paper towel if necessary.
- Do not forget to change the fluid in the oil cooler.



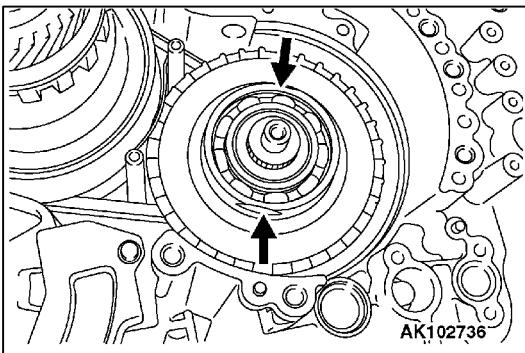
(1) Install a new oil seal in the transmission case using the special tool.



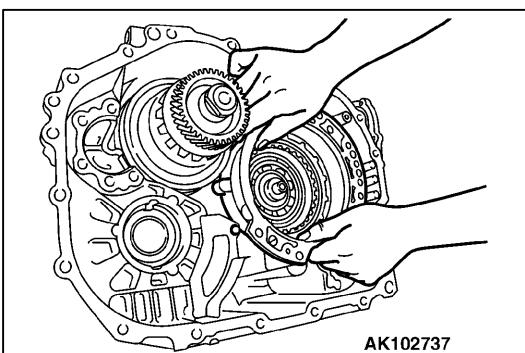
(2) Install the oil pipes in the transmission case.



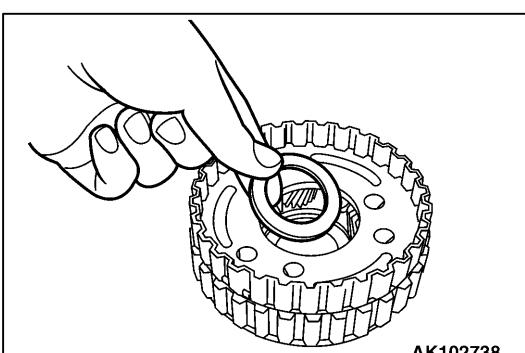
(3) Install the oil guide on the transmission case.



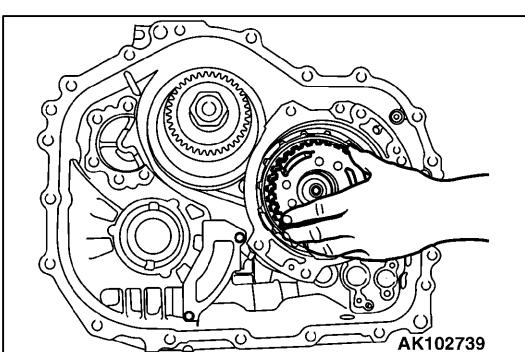
(4) Turn the flats of the reverse brake bearing to the positions indicated in the illustration.



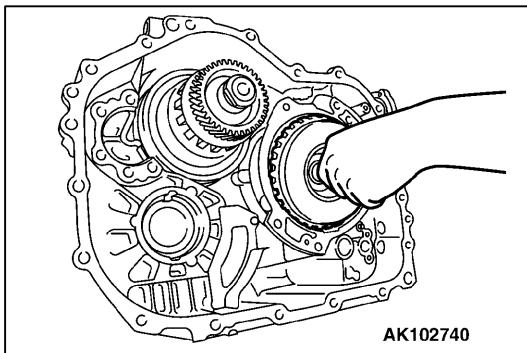
(5) Install the reverse brake assembly in the transmission case while aligning the oil pipe and knock pin positions.



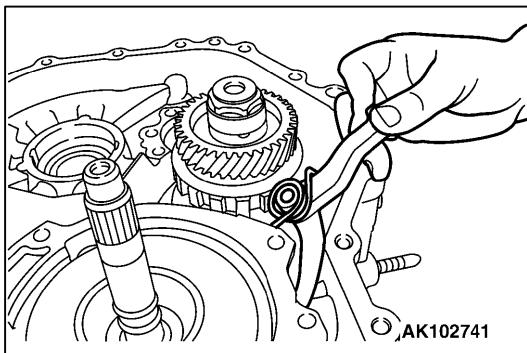
(6) Install the thrust bearing in the planetary carrier.



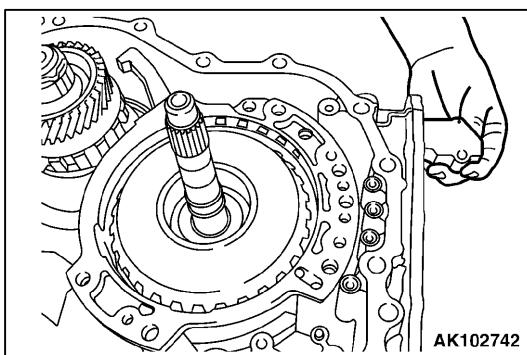
(7) Install the planetary carrier assembly in the transmission case.



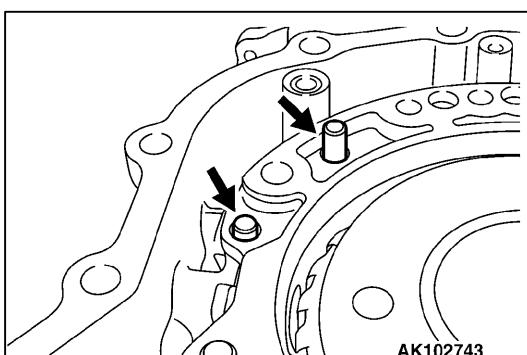
(8) Install the input shaft and forward clutch assembly in position in the transmission case.



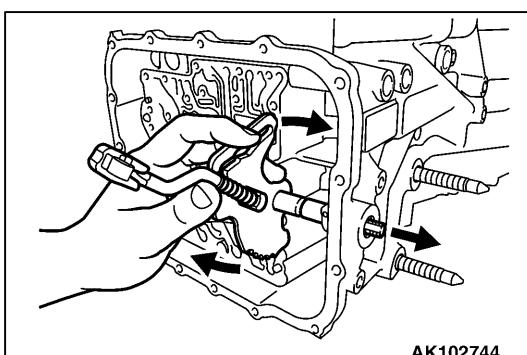
(9) Install the parking sprag and spring in position in the transmission case, then install the parking sprag shaft.



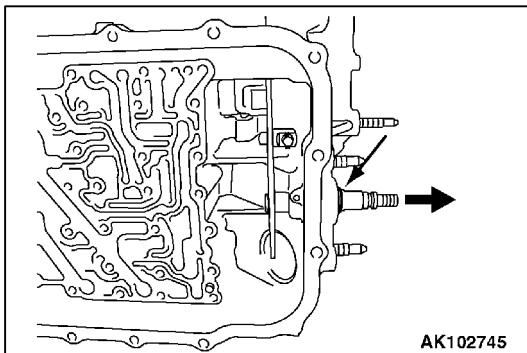
(10) Install the parking roller support on the transmission case.



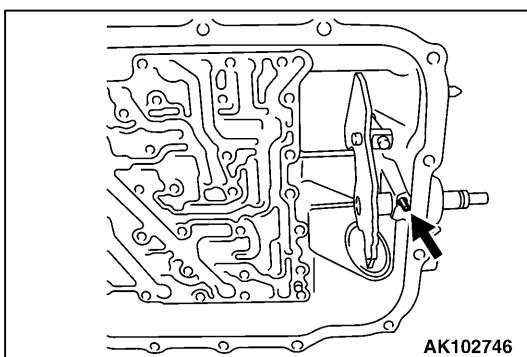
(11) Install the two parking roller support shafts in the transmission case.



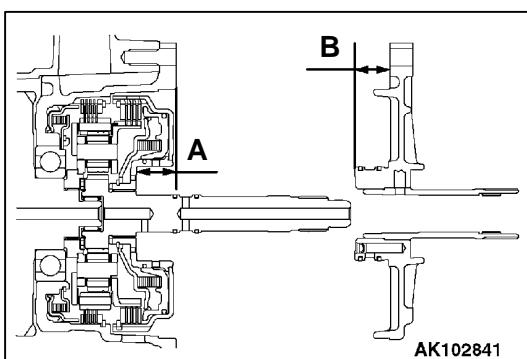
(12) Install the manual control shaft and parking roller rod on the transmission case.



(13)Push the manual control shaft in the direction indicated in the illustration, then fit a new O-ring in the O-ring groove.



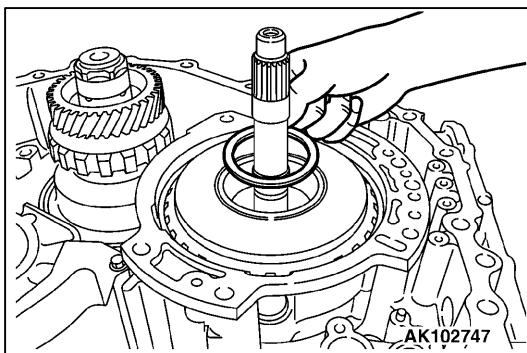
(14)Install the knock pin for positioning the manual control shaft in the transmission case.



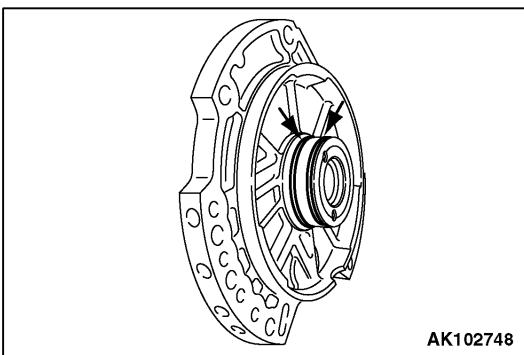
(15)Measure the dimensions A and B and obtain the difference between them ( $A - B$ ). Select an appropriate thrust washer according to the table below such that the end play is within the standard value range.

**Standard value: 0.3 – 0.6 mm**

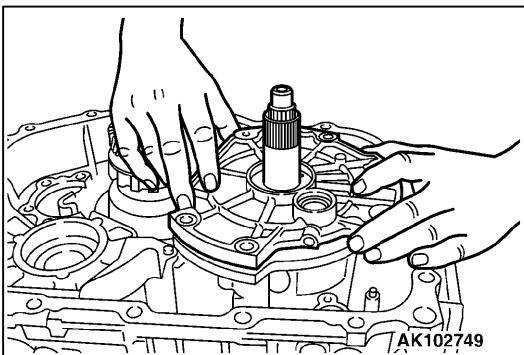
Difference between measurements (A – B) mm	Part No. (thickness mm)
2.15 – 2.35	MD754509 (1.8)
2.35 – 2.55	MD754508 (2.0)
2.55 – 2.75	MD754507 (2.2)
2.75 – 2.95	MD753793 (2.4)
2.95 – 3.15	MD753794 (2.6)
3.15 – 3.35	MD753795 (2.8)



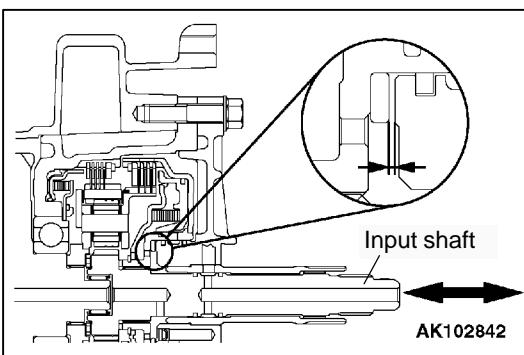
(16)Install the selected thrust washer on the forward clutch.



(17)Install new seal rings on the reaction shaft support.

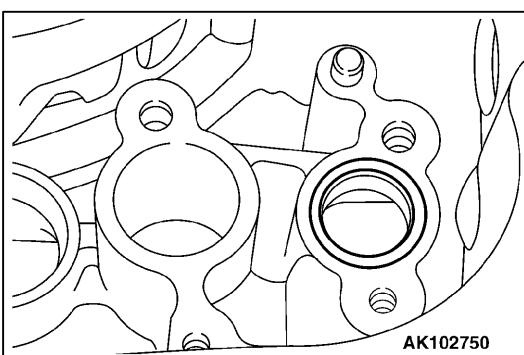


(18)Install the reaction shaft support in position in the transmission case.

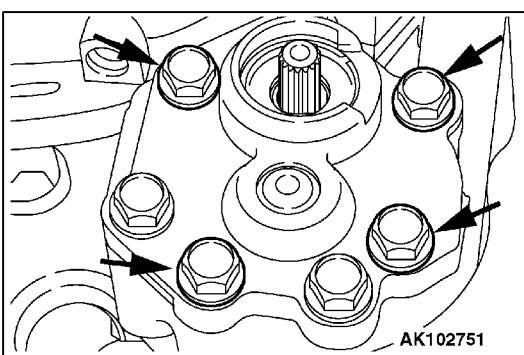


(19)Make sure the end play of the input shaft is within the standard value range.

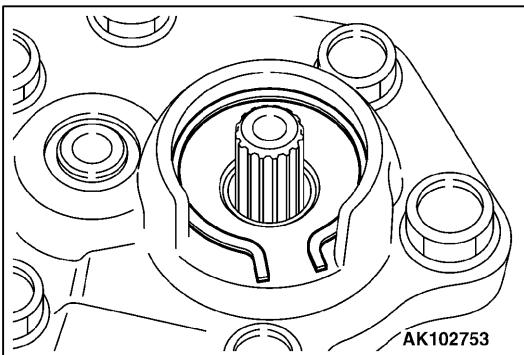
**Standard value: 0.3 – 0.6 mm**



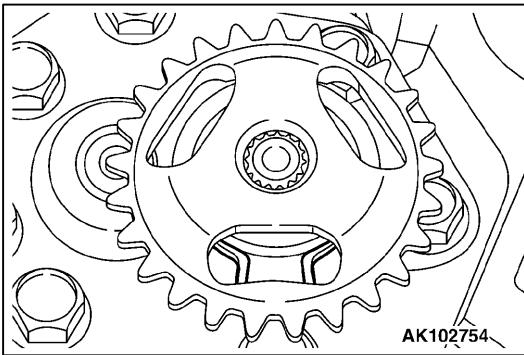
(20)Install a new O-ring in the shown position in the transmission case.



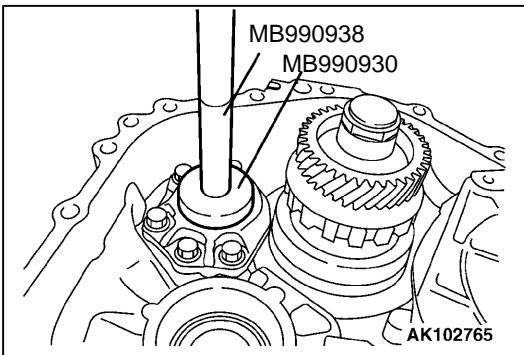
(21)Install the oil pump assembly in the transmission case.



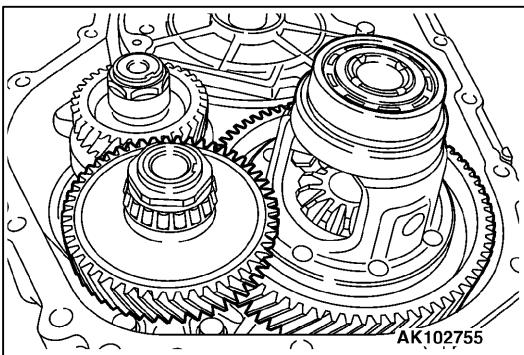
(22) Retain the oil pump driven sprocket with the snap ring as shown.



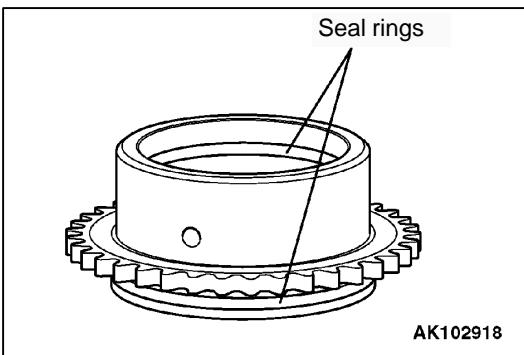
(23) Install the oil pump driven sprocket while opening the snap ring.



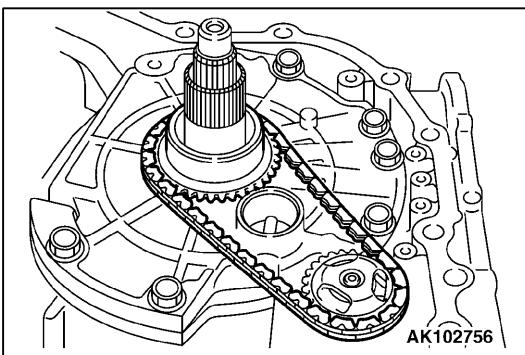
(24) Install the bearing retainer in the shown position in the transmission case, then install the bearing outer race using the indicated special tools.



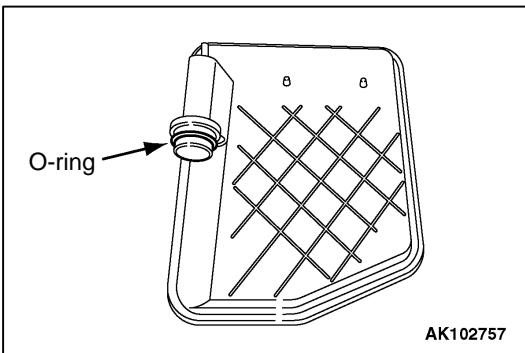
(25) Install the output shaft assembly and differential assembly in the transmission case, as shown.



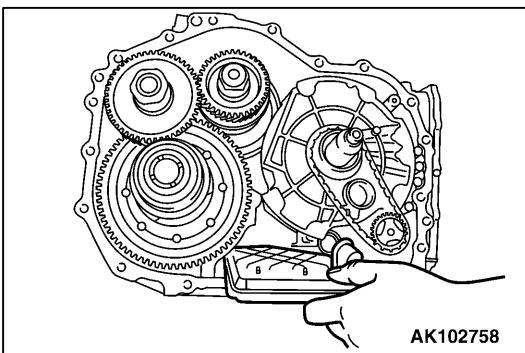
(26) Install two new seal rings on the oil pump drive sprocket.



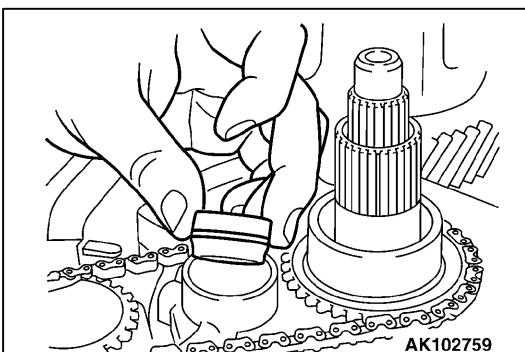
(27) Install the chain and oil pump drive sprocket.



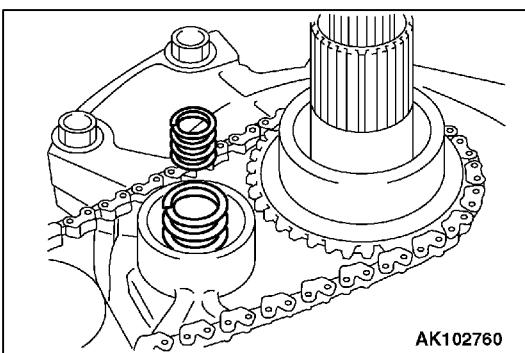
(28) Fit a new O-ring on the oil filter.



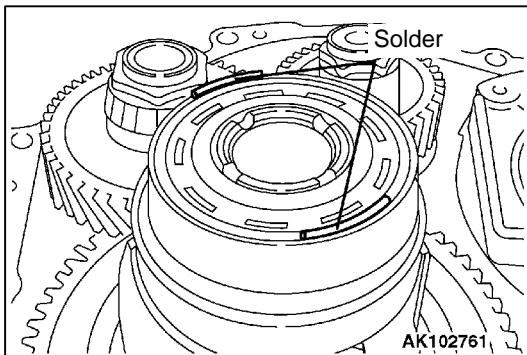
(29) Install the oil filter in the shown position in the transmission case.



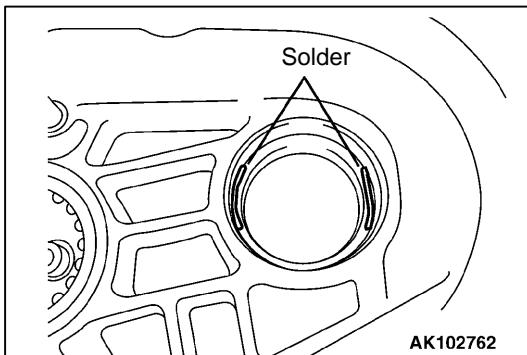
(30) Fit a new seal ring on the accumulator piston, then install the piston on the reaction shaft support.



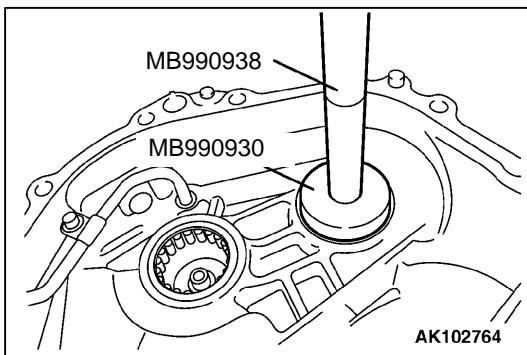
(31) Install the two accumulator springs on the reaction shaft support.



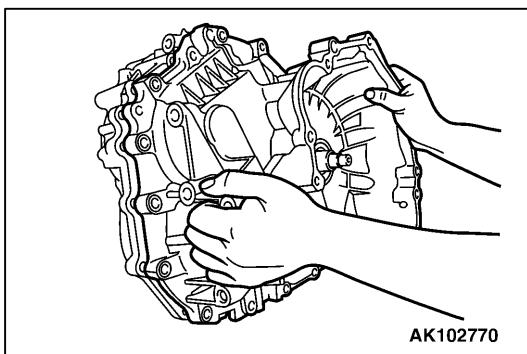
(32) Place two pieces of solder (each approx. 10 mm in length and 2 mm in diameter) in the shown locations of the differential ball bearing.



(33) Place two pieces of solder (each approx. 10 mm in length and 2 mm in diameter) in the shown locations of the output shaft hole in the converter housing.



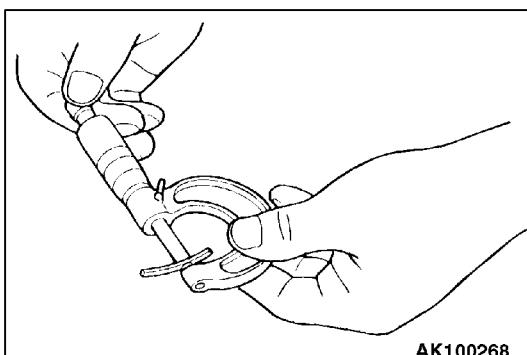
(34) Install the bearing outer race in the converter housing using the indicated special tools.



(35) Install the converter housing on the transmission case.

(36) Remove the converter housing from the transmission case and take out the solder pieces (to be used in obtaining the differential bearing end play).

(37) Remove the bearing outer race from the converter housing and take out the solder pieces (to be used in obtaining the output shaft bearing preload).



(38) Measure using a micrometer the thickness of the crushed solder pieces. Based on the results, select spacers which adjust the end play and preload to the following standard values, respectively, according to the tables below.

**Standard value for differential bearing end play:**  
0.045 – 0.165 mm

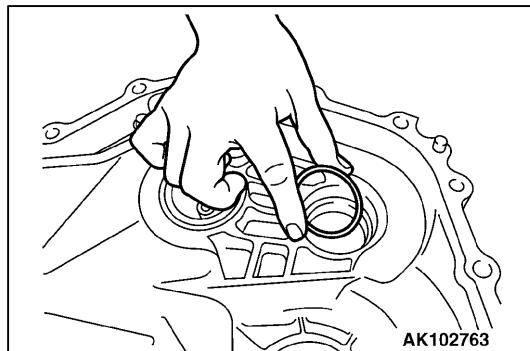
**Standard value for output shaft bearing preload:**  
0.045 – 0.105 mm

**Differential bearing spacer**

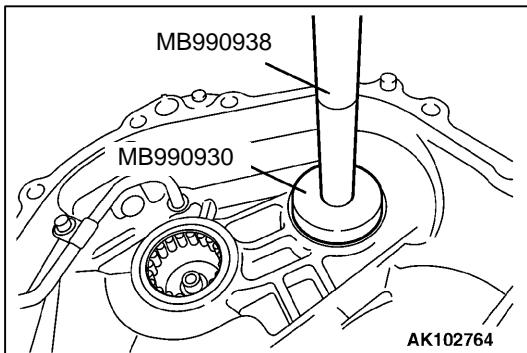
Solder thickness mm	Part No. (thickness mm)
1.16 – 1.25	MD710454 (1.10)
1.25 – 1.34	MD710456 (1.19)
1.34 – 1.43	MD710458 (1.28)
1.43 – 1.52	MD710460 (1.37)
1.52 – 1.61	MD710462 (1.46)
1.61 – 1.70	MD710464 (1.55)
1.70 – 1.79	MD710466 (1.64)
1.79 – 1.88	MD710468 (1.73)
1.88 – 1.97	MD710470 (1.82)

**Output shaft bearing spacer**

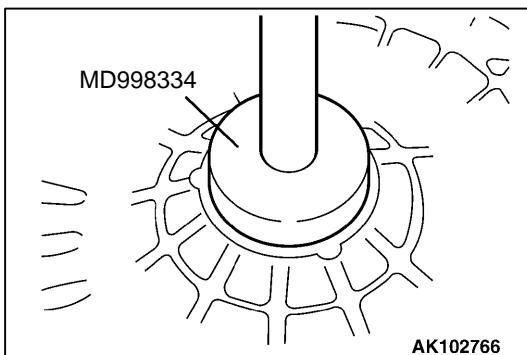
Solder thickness mm	Part No. (thickness mm)
0.62 – 0.65	MR410594 (0.71)
0.65 – 0.68	MR410595 (0.74)
0.68 – 0.71	MR410596 (0.77)
0.71 – 0.74	MR410597 (0.80)
0.74 – 0.77	MR410598 (0.83)
0.77 – 0.80	MR410599 (0.86)
0.80 – 0.83	MR410600 (0.89)
0.83 – 0.86	MR410601 (0.92)
0.86 – 0.89	MR410602 (0.95)
0.89 – 0.92	MR410603 (0.98)
0.92 – 0.95	MR410604 (1.01)
0.95 – 0.98	MR410605 (1.04)
0.98 – 1.01	MR410606 (1.07)
1.01 – 1.04	MR410607 (1.10)
1.04 – 1.07	MR410608 (1.13)
1.07 – 1.10	MR410609 (1.16)
1.10 – 1.13	MR410610 (1.19)
1.13 – 1.16	MR410611 (1.22)
1.16 – 1.19	MR410612 (1.25)



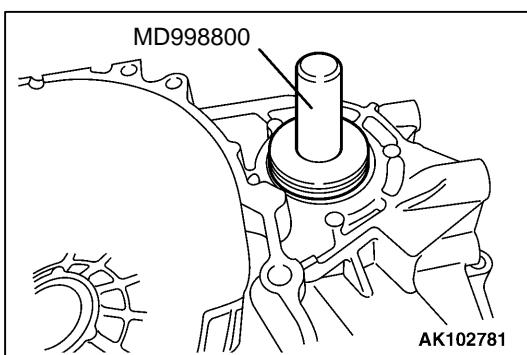
(39) Install the selected output shaft bearing spacer in the converter housing as shown.



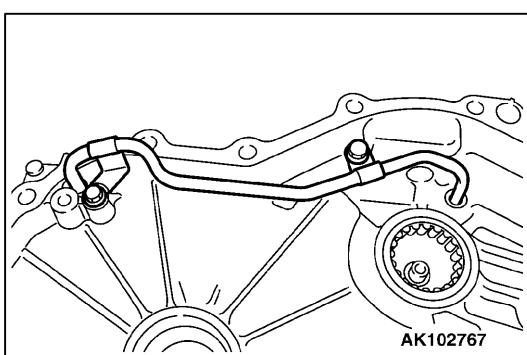
(40) Use the indicated special tools to install the bearing outer race in the converter housing.



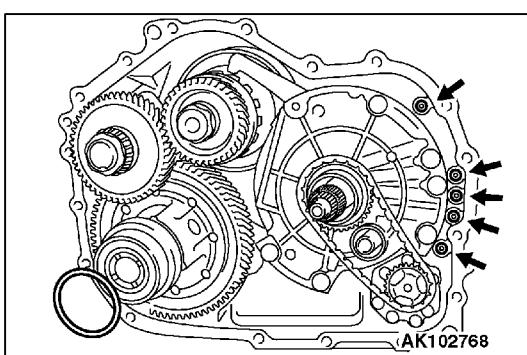
(41) Use the indicated special tool to install a new oil seal in the converter housing.



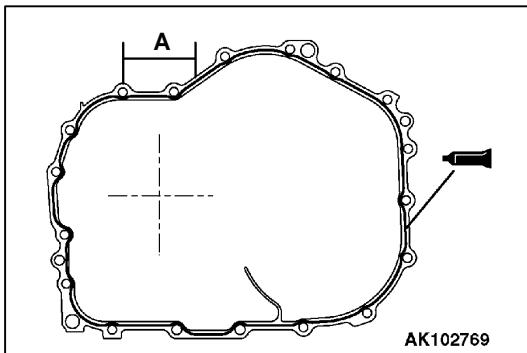
(42) Use the indicated special tool to install a new oil seal in the converter housing.



(43) Install the oil pipe on the converter housing.



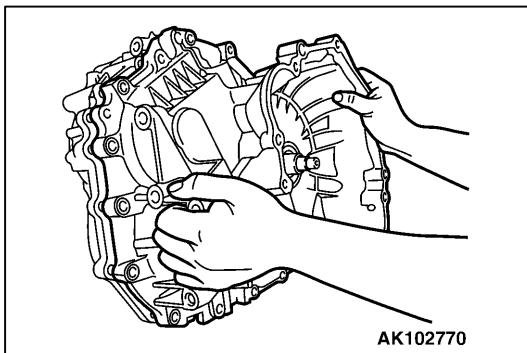
(44) Install the differential bearing spacer selected in step 38 on the differential bearing, then install new O-rings in the five places in the transmission case as shown in the illustration.



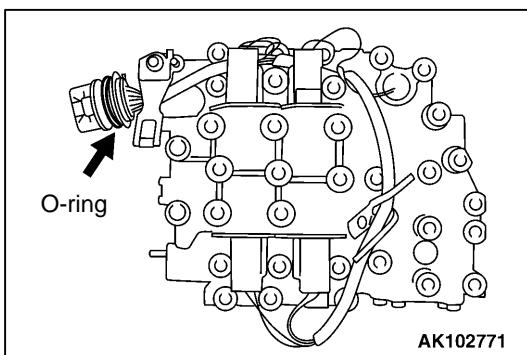
(45) Apply a 1.6 mm diameter bead of liquid gasket to the converter housing flange, beginning with a point in zone A shown in the illustration.

**Specified sealant:**

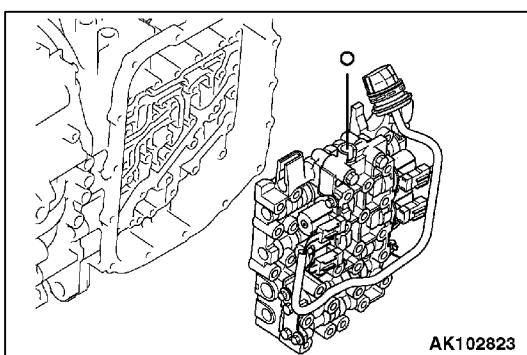
Mitsubishi genuine sealant Part No. MD974421 or equivalent



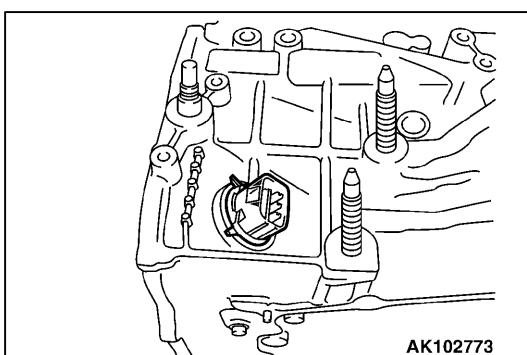
(46) Install the converter housing in the transmission case.



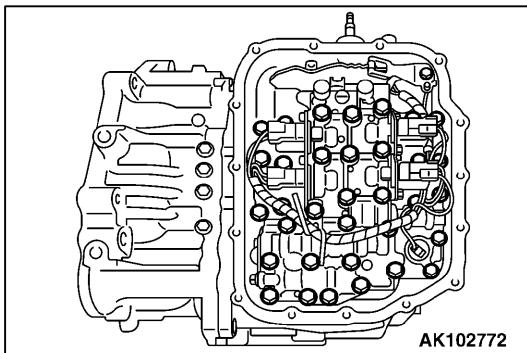
(47) Fit a new O-ring on the solenoid valve harness connector.



(48) Install the steel ball in the indicated position of the valve body.



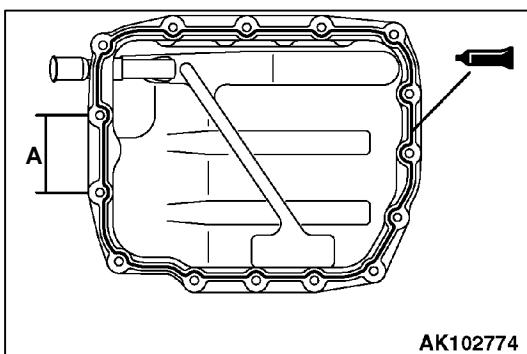
(49) Install the solenoid valve harness connector on the transmission case as shown in the illustration and attach the clamp to the connector.



(50)Insert the pin of the manual valve in the groove formed in the detent plate of the manual control lever shaft.  
 (51)Install the valve body assembly on the transmission case, then secure it with 34 bolts as shown in the illustration.

**Caution**

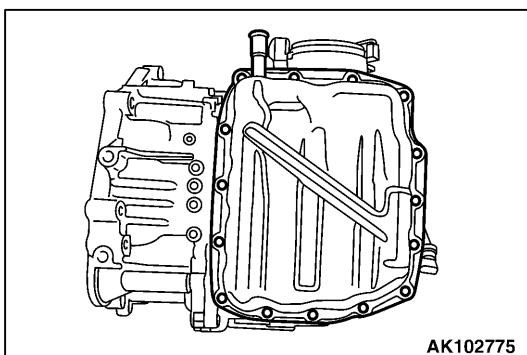
**The inside separating plate has to be replaced with a new one before the valve body assembly is installed. Replacement of the plate involves disassembly of the valve body assembly. (Refer to 6. Valve Body – Disassembly and Reassembly.)**



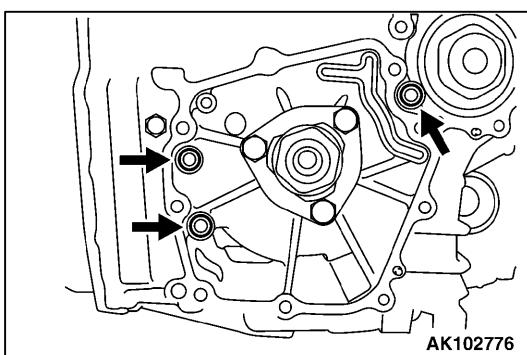
(52)Apply a 2.5 mm diameter bead of liquid gasket to the valve body cover flange, beginning with a point in zone A shown in the illustration.

**Specified sealant:**

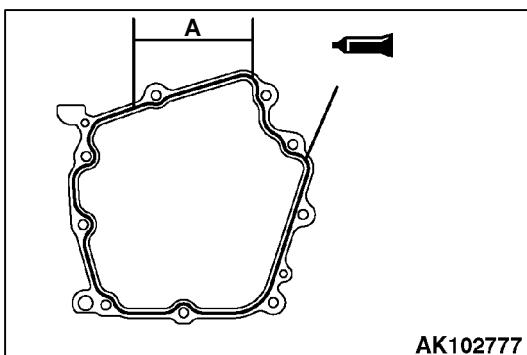
**Mitsubishi genuine sealant Part No. MD974421 or equivalent**



(53)Install the valve body cover on the transmission case.



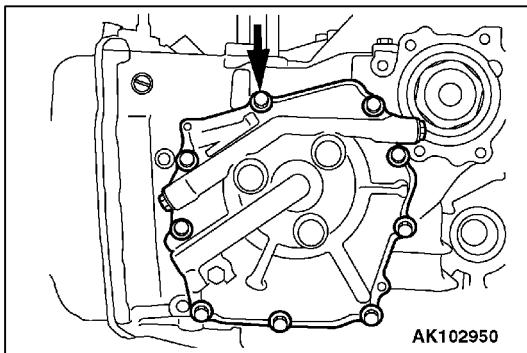
(54)Install the new O-rings in the three places on the transmission case as shown in the illustration.



(55)Apply a 1.6 mm diameter bead of liquid gasket to the primary rear cover mounting surface of the transmission case, beginning with a point in zone A shown in the illustration.

**Specified sealant:**

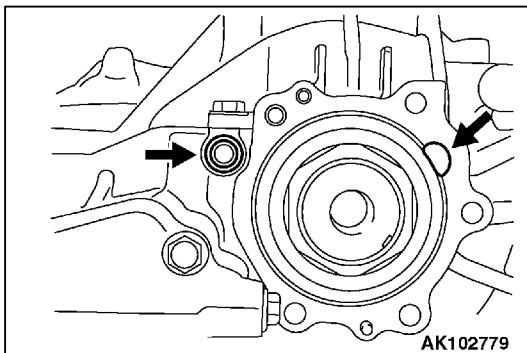
**Mitsubishi genuine sealant Part No. MD974421 or equivalent**



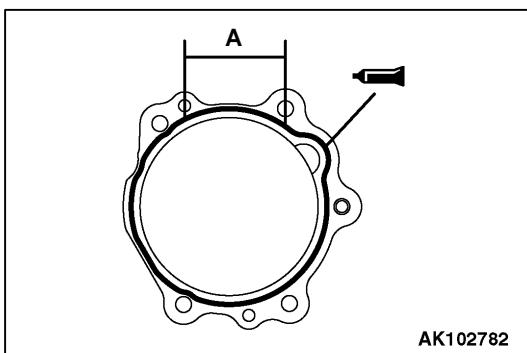
(56) Install the primary rear cover on the transmission case.

**Caution**

Replace the seal bolt shown with a new one.



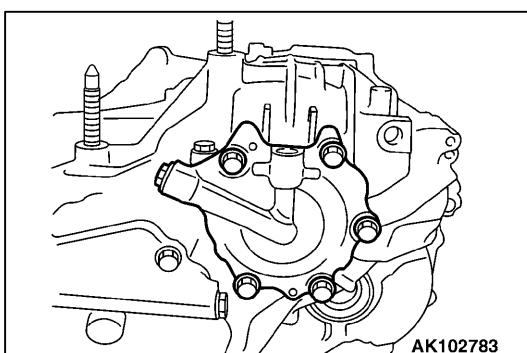
(57) Install a stopper and a new O-ring in the shown place on the transmission case.



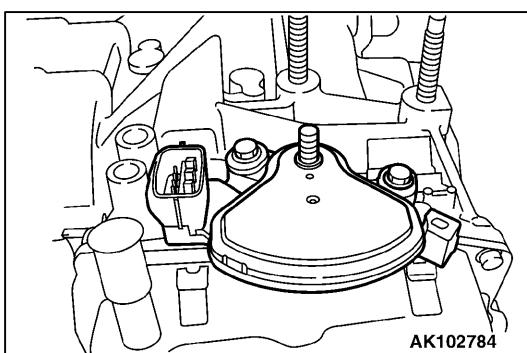
(58) Apply a 1.6 mm diameter bead of liquid gasket to the secondary rear cover mounting surface of the transmission case, starting with a point within zone A shown in the illustration.

**Specified sealant:**

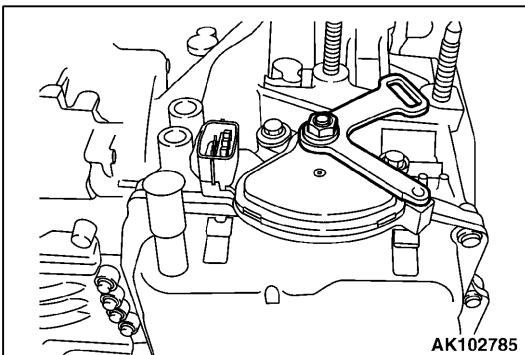
Mitsubishi genuine sealant Part No. MD974421 or equivalent



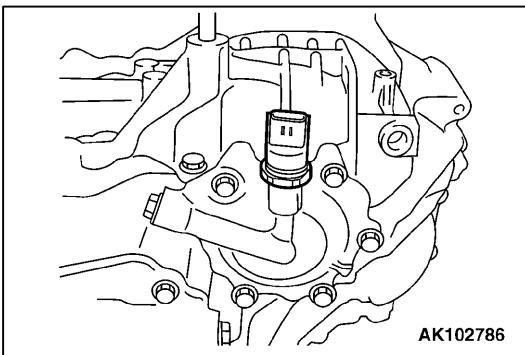
(59) Install the secondary rear cover on the transmission case.



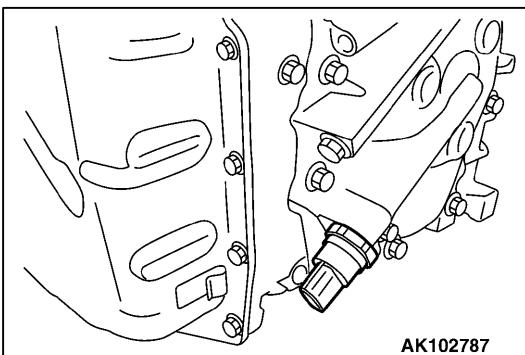
(60) Install the inhibitor switch on the transmission case.



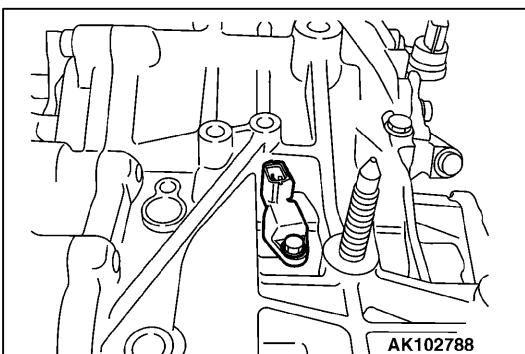
(61)Install the manual control lever on the manual control shaft.



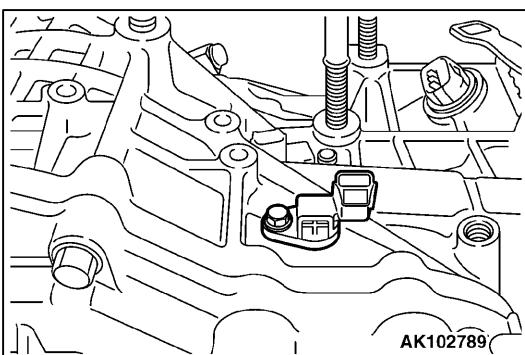
(62)Install the secondary pressure sensor fitted with a new O-ring on the secondary rear cover.



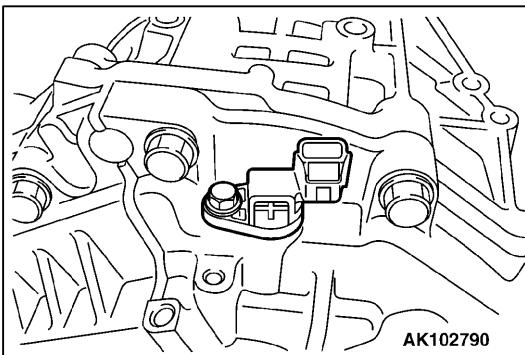
(63)Install the primary pressure sensor fitted with a new O-ring on the primary rear cover.



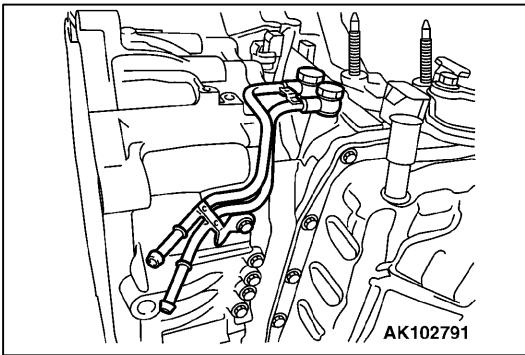
(64)Install the primary speed sensor fitted with a new O-ring on the transmission case.



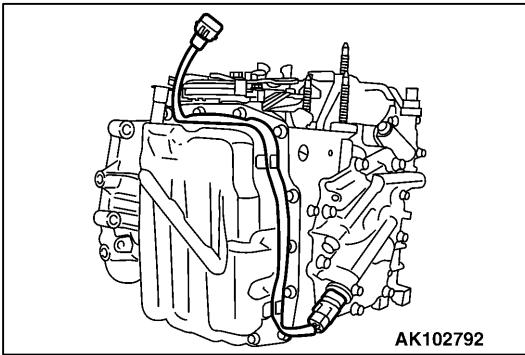
(65)Install the turbine speed sensor fitted with a new O-ring on the transmission case.



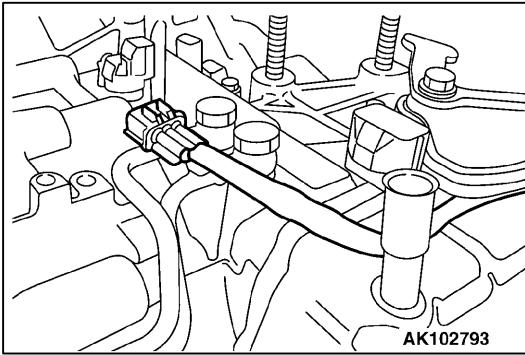
(66) Install the secondary speed sensor fitted with a new O-ring on the converter housing.



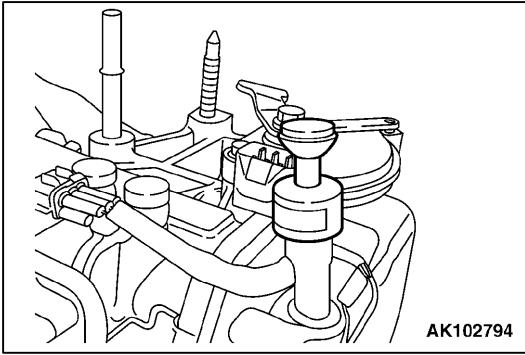
(67) Install a new gasket, the eyebolt and the oil cooler feed tube on the transmission case as shown in the illustration.



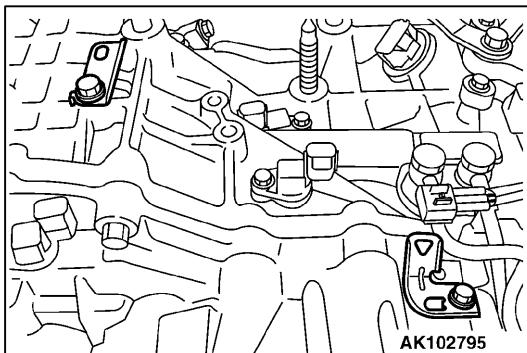
(68) To the primary pressure sensor connect the connector of its harness and secure the connector with the clamp on the valve body cover.



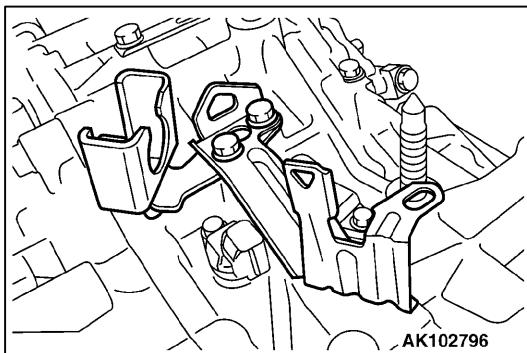
(69) Secure the connector of the primary pressure sensor harness with the clamp on the oil cooler feed tube.



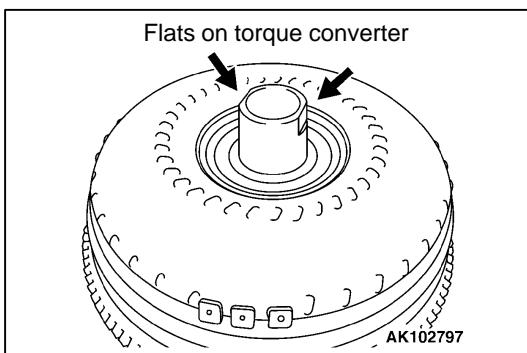
(70) Install the oil level gauge on the valve body cover.



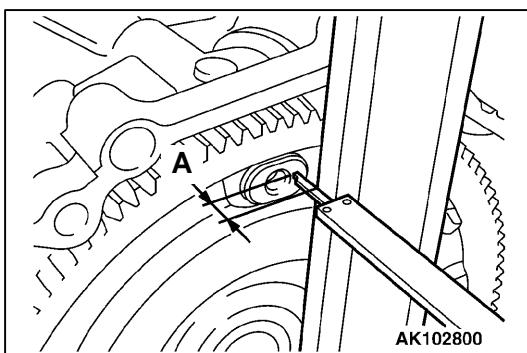
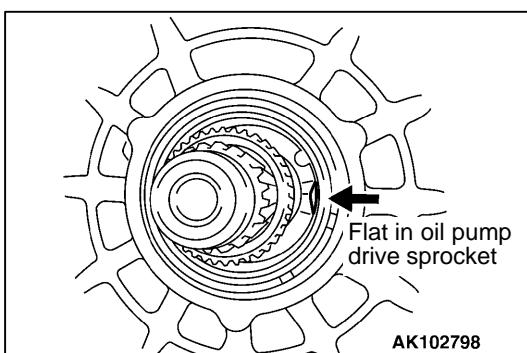
(71) Install the two harness brackets on the transmission case.



(72) Install the control cable support bracket and harness bracket on the transmission case.



(73) Install the torque converter on the transmission while aligning the flats on the torque converter with those in the oil pump drive sprocket.

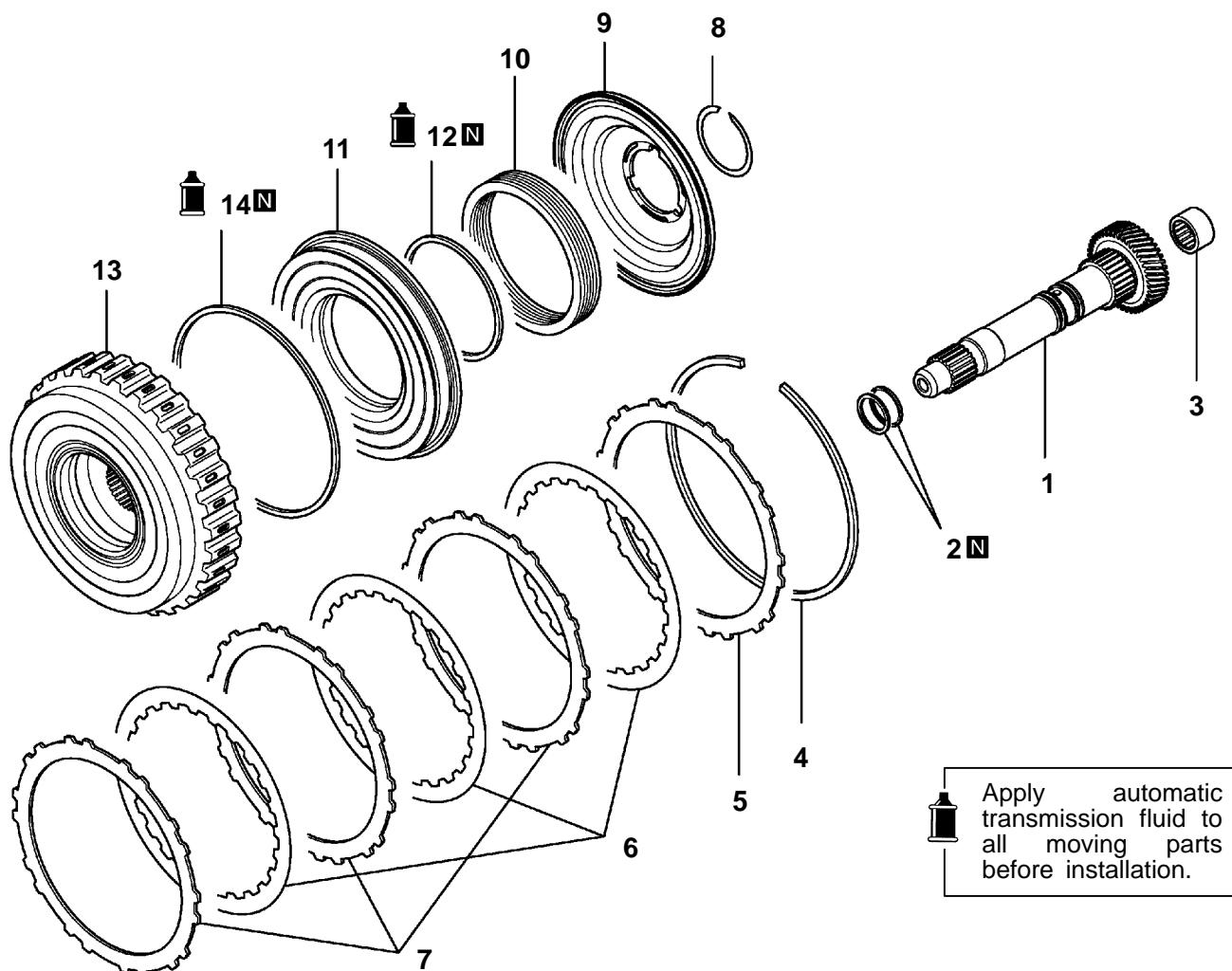


(74) Measure dimension A indicated in the illustration. The measurement should be equal to the reference value shown below. If necessary push the torque converter into the transmission completely.

**Reference value: 12.2 mm**

## 4. FORWARD CLUTCH AND INPUT SHAFT

### DISASSEMBLY AND REASSEMBLY



AK102833

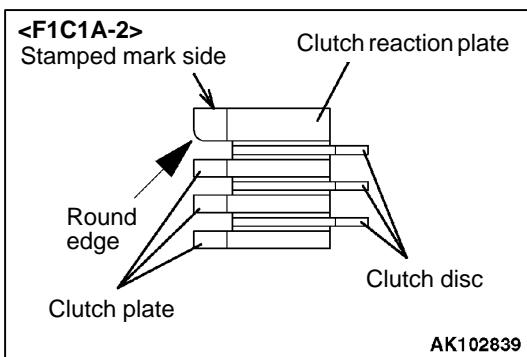
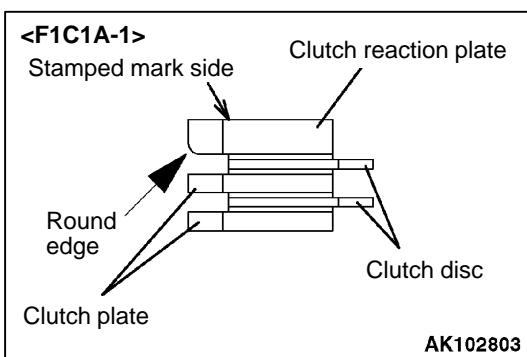
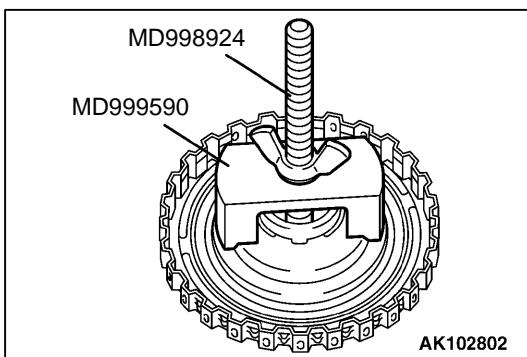
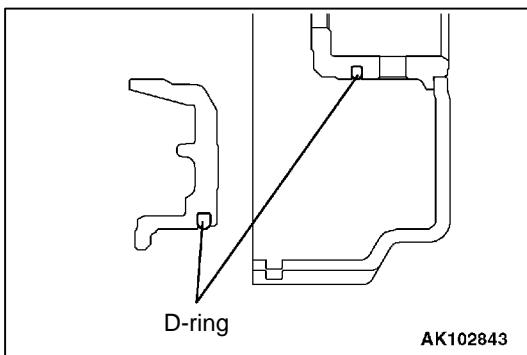
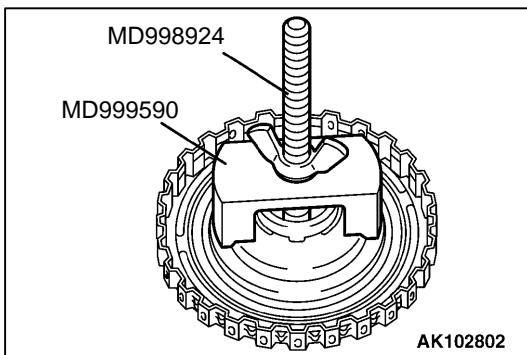
Model	Clutch disc	Clutch plate	Clutch reaction plate
F1C1A-1	2	2	1
F1C1A-2	3	3	1

#### Disassembly steps

►E  
►D  
►C  
►C  
►C

1. Input shaft
2. Seal ring
3. Bearing
4. Snap ring
5. Clutch reaction plate
6. Clutch disc
7. Clutch plate

◀A▶ ▶B◀ 8. Snap ring  
 9. Spring retainer  
 10. Return spring  
 11. Clutch piston  
 ▶A◀ 12. D-ring  
 ▶A◀ 13. Clutch retainer  
 ▶A◀ 14. D-ring



## DISASSEMBLY SERVICE POINT

### ◀A▶ SNAP RING REMOVAL

To remove the snap ring, compress the return spring by holding down the spring retainer using the indicated special tools.

## REASSEMBLY SERVICE POINTS

### ▶A◀ D-RING INSTALLATION

Coat new D-rings with ATF, blue petrolatum or white Vaseline, then fit them into the illustrated locations, taking care not to give damage to them.

### ▶B◀ SNAP RING INSTALLATION

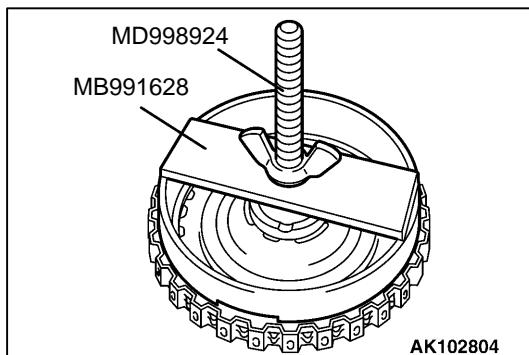
- (1) Coat the lip seal of the spring retainer with blue petrolatum.
- (2) To install the snap ring, compress the return spring by holding down the spring retainer using the indicated special tools.

### ▶C◀ CLUTCH PLATES / CLUTCH DISCS / CLUTCH REACTION PLATE INSTALLATION

Install the clutch plates, clutch discs, and reaction plate, directing their ends as shown in the illustration.

#### Caution

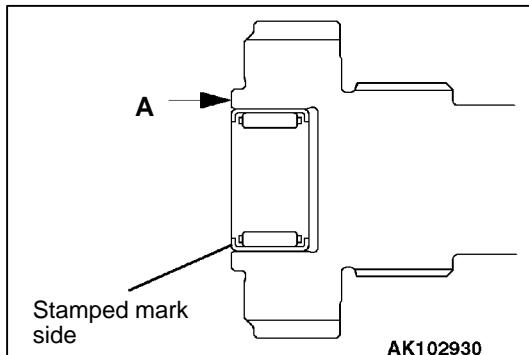
**Immerse the clutch discs in ATF before assembling them with the other parts.**



#### ►D◀ SNAP RING INSTALLATION

- (1) Fit the snap ring in the groove formed in the forward clutch retainer.
- (2) Press all around the clutch reaction plate using the indicated special tools.
- (3) Check whether the clearance between the snap ring and clutch reaction plate conforms to the standard value indicated below.
- (4) If the clearance deviates from the standard value, adjust it by changing the snap ring to a one of an appropriate size.

**Standard value:  $1.3 \pm 0.1$  mm**

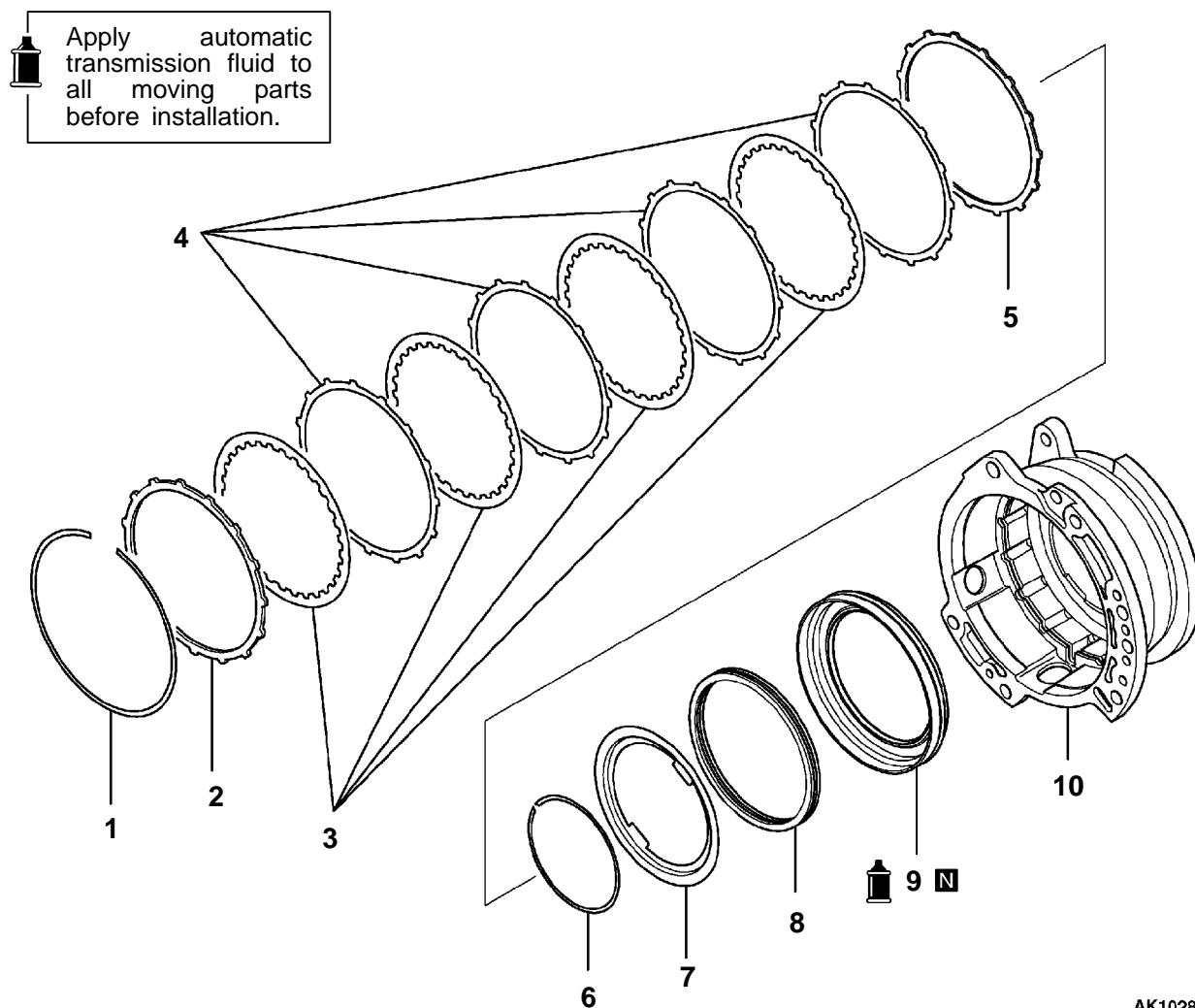


#### ►E◀ BEARING INSTALLATION

Press fit the bearing until its stamped mark surface becomes flush with the surface A shown.

## 5. REVERSE BRAKE

### DISASSEMBLY AND REASSEMBLY



AK102835

Model	Brake disc	Brake plate	Brake pressure plate	Brake reaction plate
3-brake-disc type	3	2	1	1
4-brake-disc type	4	3	1	1

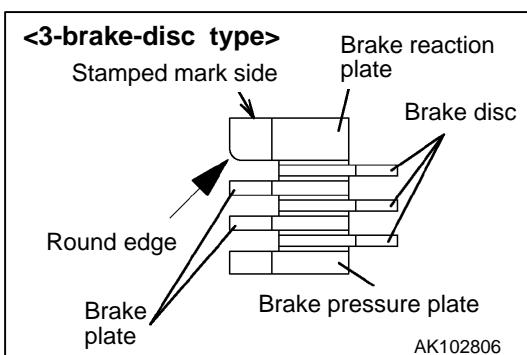
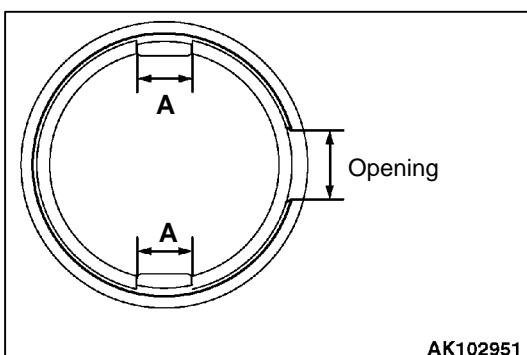
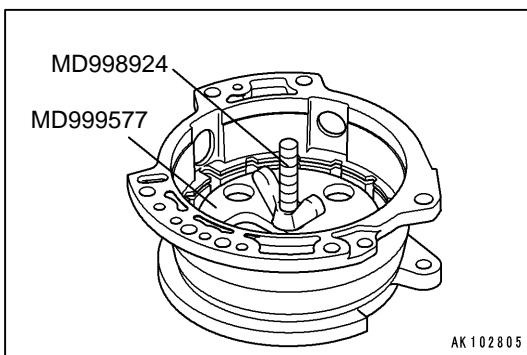
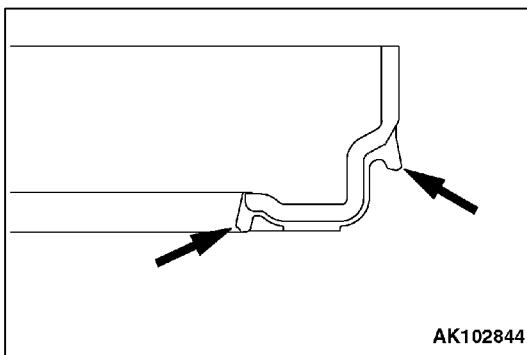
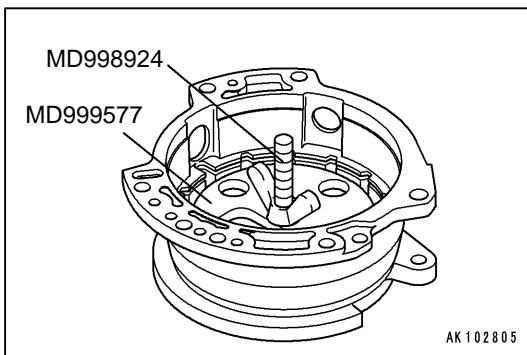
#### Disassembly steps



1. Snap ring
2. Brake reaction plate
3. Brake disc
4. Brake plate
5. Brake pressure plate



6. Snap ring
7. Spring retainer
8. Return spring
9. Brake piston
10. Brake retainer



## DISASSEMBLY SERVICE POINT

### ◀A▶ SNAP RING REMOVAL

To remove the snap ring, compress the return spring by holding down the spring retainer using the indicated special tools.

## REASSEMBLY SERVICE POINTS

### ▶A◀ BRAKE PISTON INSTALLATION

Apply blue petrolatum to the indicated portions of the brake piston in order to prevent it from being damaged during installation.

### ▶B◀ SNAP RING INSTALLATION

(1) Compress the return spring by holding down the spring retainer using the indicated special tools.

(2) Install the snap ring with its ends directed as shown in the illustration.

#### Caution

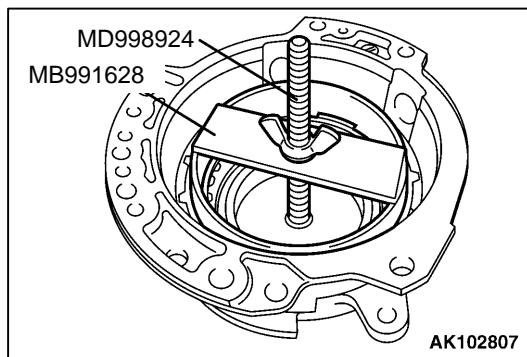
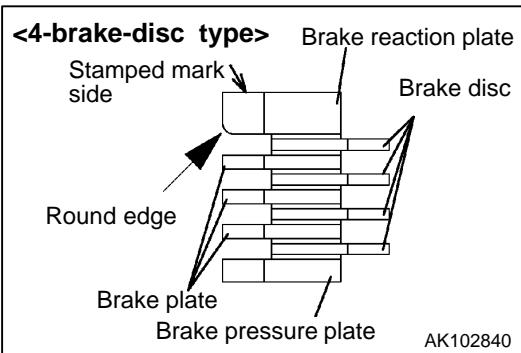
Never locate the ends at the positions A shown.

### ▶C◀ BRAKE PLATES / BRAKE DISCS / BRAKE REACTION PLATE / BRAKE PRESSURE PLATE INSTALLATION

Install the brake plates, brake discs, brake reaction plate and brake pressure plate, directing their ends as shown in the illustration.

#### Caution

Immerse the brake discs in ATF before assembling them with the other parts.



#### ►D◀ SNAP RING INSTALLATION

- (1) Fit the snap ring in the groove formed in the reverse brake retainer.
- (2) Press all around the brake reaction plate using the indicated special tools.
- (3) Check whether the clearance between the snap ring and brake reaction plate conforms to the standard value.
- (4) If the clearance deviates from the standard value, adjust it by changing the snap ring to a one of an appropriate size.

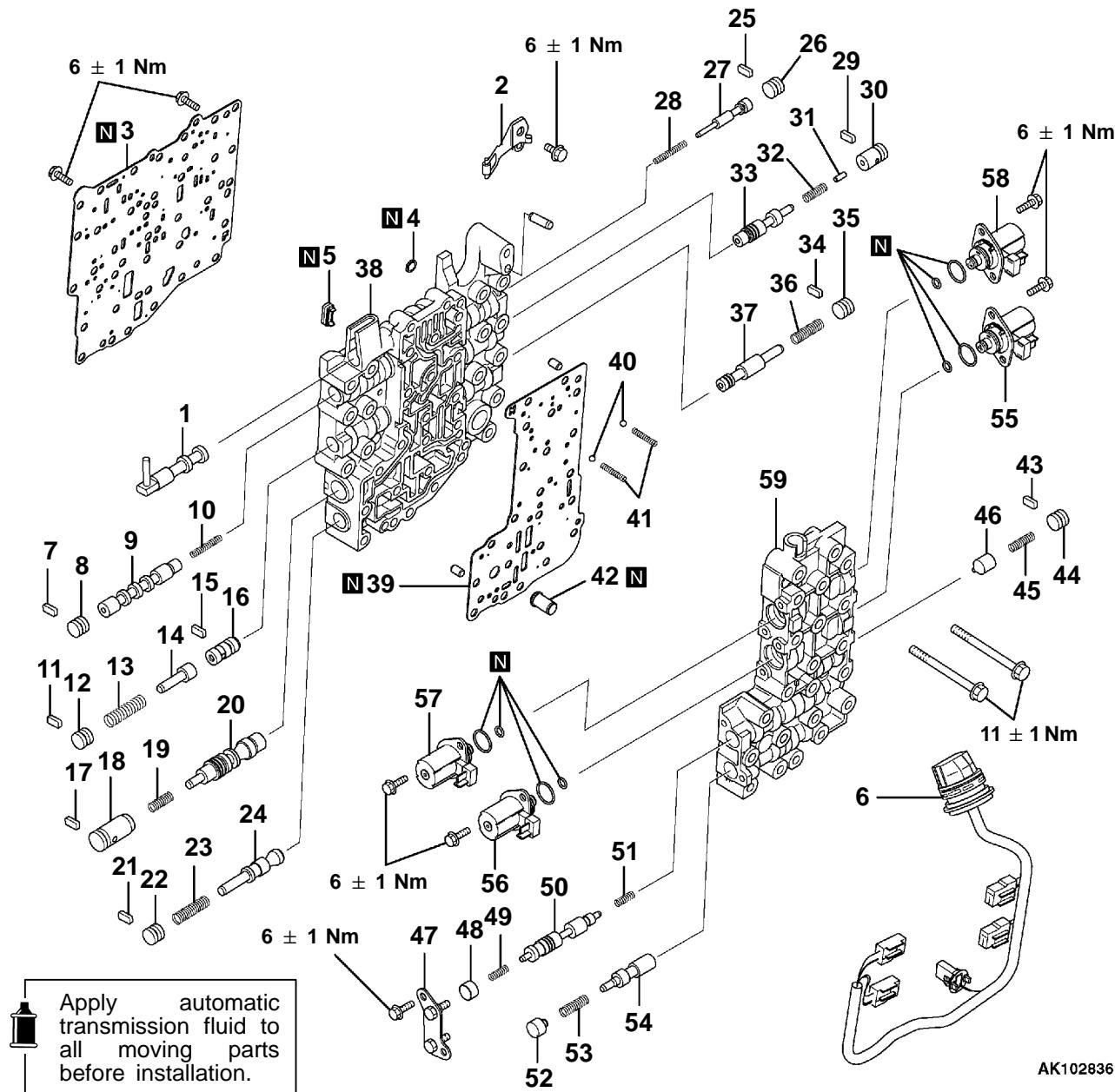
**Standard value:  $1.7 \pm 0.1$  mm**

## 6. VALVE BODY

### DISASSEMBLY AND REASSEMBLY

#### KEY POINTS FOR DISASSEMBLY AND REASSEMBLY

- The valve body assembly underwent fluid pressure adjustments at the factory. Do not disturb setting of the adjusting screw.
- The shift control solenoid valve must be installed into the original position whenever it has been removed. Otherwise the factory-adjusted primary pressure characteristics will be affected.

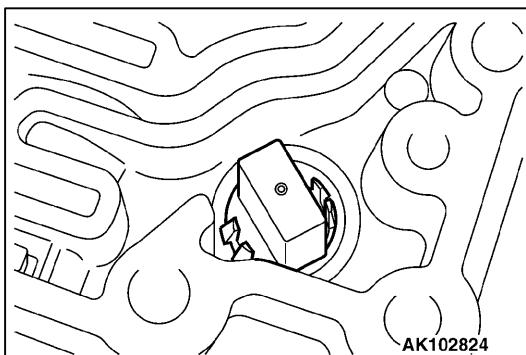


**Disassembly steps**

►E◀  
◀A▶ ▶D◀

1. Manual valve
2. Detent spring
3. Inside separating plate
4. Oil strainer
5. Oil strainer
6. Solenoid valve harness
7. Stopper plate
8. Stopper plug
9. Damper clutch control valve
10. Damper clutch control valve spring
11. Stopper plate
12. Stopper plug
13. Line pressure relief valve spring
14. Line pressure relief valve
15. Stopper plate
16. Line pressure relief sleeve
17. Stopper plate
18. Regulator valve sleeve
19. Regulator valve spring
20. Regulator valve
21. Stopper plate
22. Stopper plug
23. Torque converter pressure valve spring
24. Torque converter pressure valve
25. Stopper plate
26. Stopper plug
27. Clutch pressure control valve spring
28. Clutch pressure control valve
29. Stopper plate
30. Stopper plug
31. Needle roller

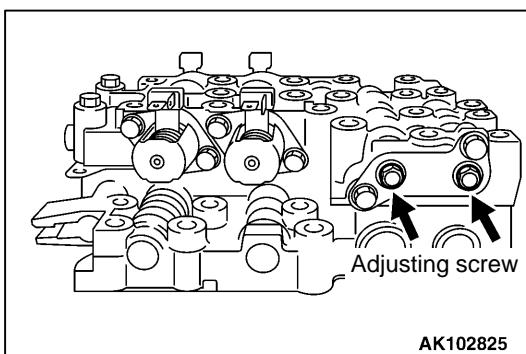
32. Clutch pressure reducing valve spring
33. Clutch pressure reducing valve
34. Stopper plate
35. Stopper plug
36. Primary pressure relief valve spring
37. Primary pressure relief valve
38. Inside valve body
39. Outside separating plate
- C◀  
►C◀  
►C◀  
◀B▶ ▶B◀  
◀C▶ ▶A◀  
◀C▶ ▶A◀  
◀C▶ ▶A◀
40. Steel ball
41. One-way valve spring
42. Oil strainer
43. Stopper plate
44. Stopper plug
45. Exhaust valve spring
46. Exhaust relief valve
47. Adjusting screw assembly
48. Plug
49. Shift control valve spring
50. Shift control valve
51. Shift control valve spring
52. Plug
53. Reducing valve spring
54. Reducing valve
55. Line pressure control solenoid valve
56. Shift control solenoid valve
57. Damper clutch control solenoid valve
58. Clutch pressure control solenoid valve
59. Outside valve body



## DISASSEMBLY SERVICE POINTS

### ◀A▶ SOLENOID VALVE HARNESS REMOVAL

- (1) Remove the oil temperature sensor from the valve body by pressing the claws indicated in the illustration.
- (2) Remove all the solenoid valve harness by disconnecting their connectors from the solenoid valves.

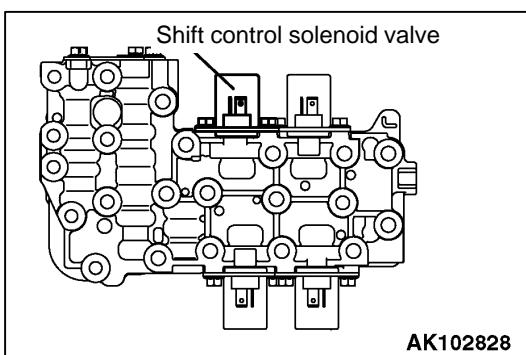


### ◀B▶ ADJUSTING SCREW ASSEMBLY REMOVAL

Remove the adjusting screw assembly.

#### Caution

Never turn the adjusting screws indicated in the illustration. If either or both of them are accidentally turned, replace the whole valve body assembly.

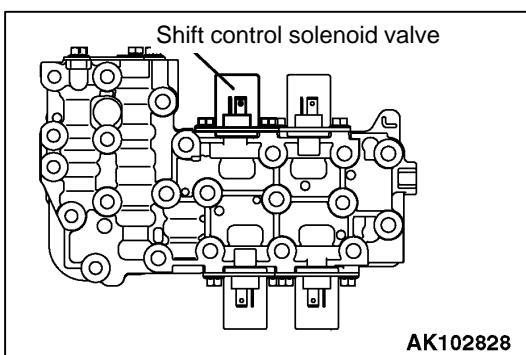


### ◀C▶ SOLENOID VALVE REMOVAL

Before removing the solenoid valves, put marks on them and the valve body to help identify their locations during reinstallation.

#### Caution

The shift control solenoid valve can not be replaced individually. If it requires replacement, replace the valve body assembly.



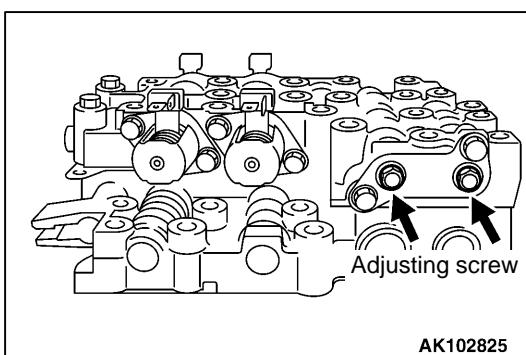
## REASSEMBLY SERVICE POINTS

### ▶A◀ SOLENOID VALVE INSTALLATION

Set new O-rings on solenoid valves. Install the solenoid valves into correct locations in accordance with the marks made at the time of removal.

#### Caution

The shift control solenoid valve cannot be replaced individually. If it requires replacement, replace the valve body assembly.

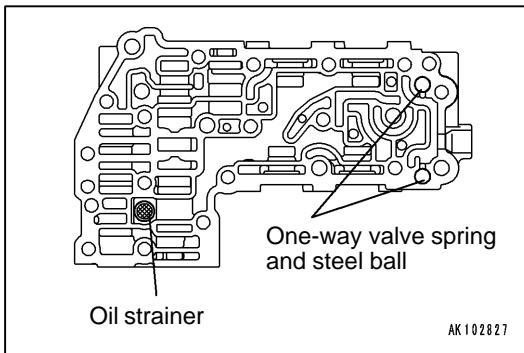


### ▶B◀ ADJUSTING SCREW ASSEMBLY INSTALLATION

Install the adjusting screw assembly in portion.

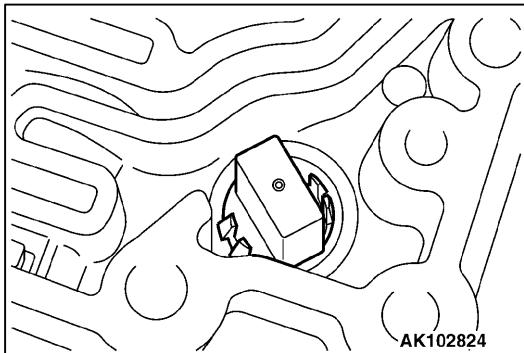
#### Caution

Never turn the adjusting screws indicated in the illustration. If either or both of them are accidentally turned, replace the whole valve body assembly.



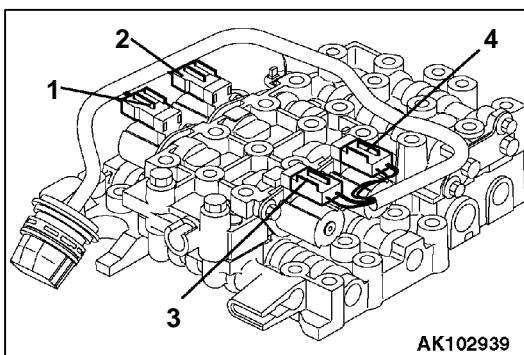
►C◄ OIL STRAINER / ONE-WAY VALVE SPRING / STEEL BALL INSTALLATION

Install the oil strainer, one-way valve springs and steel balls into the indicated locations.



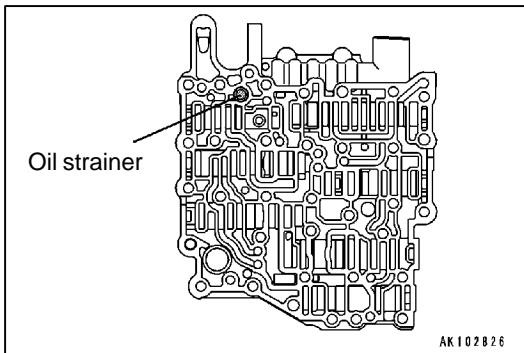
►D◄ SOLENOID VALVE HARNESS INSTALLATION

(1) Fit the claws of the oil temperature sensor indicated in the illustration snugly in the valve body.



(2) Connect the solenoid valve harness connectors to the corresponding solenoid valves correctly.

Location	Solenoid valve	Wire color code	Connector housing color
1	Clutch pressure control solenoid valve	Yellow, red, red	Milky white
2	Line pressure control solenoid valve	Orange, yellow, yellow	Black
3	Dumper clutch control solenoid valve	Green, yellow	Milky white
4	Shift control solenoid valve	Blue, red	Black

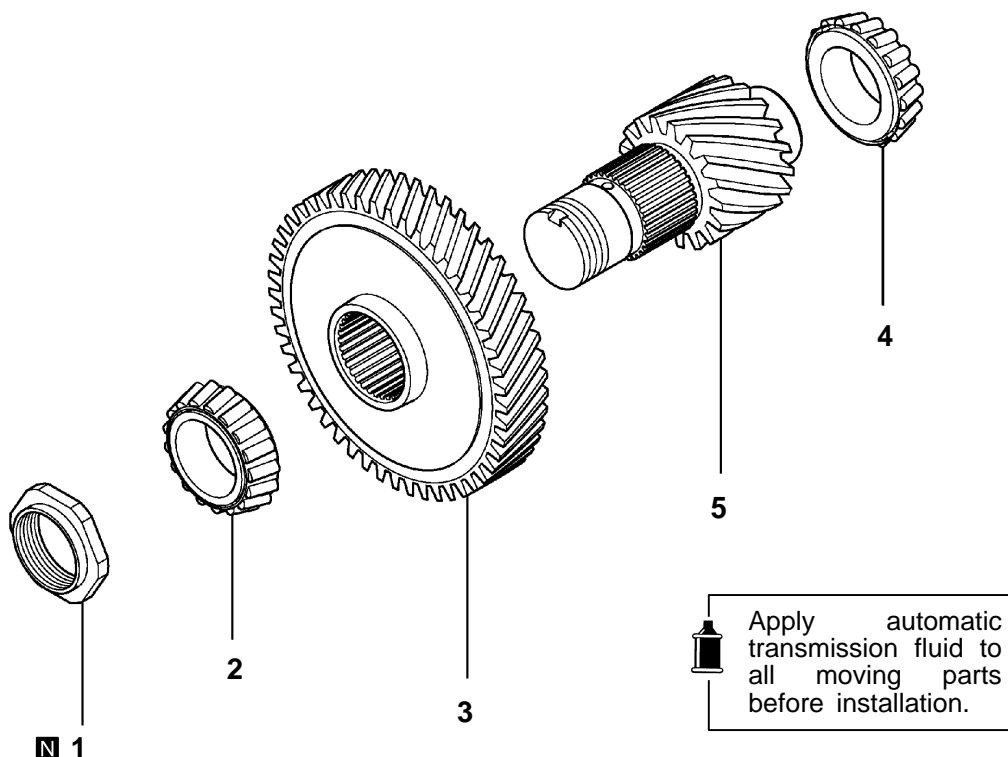


►E◄ OIL STRAINER INSTALLATION

Install the oil strainer into the indicated location.

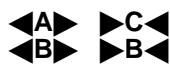
## 7. OUTPUT SHAFT

### DISASSEMBLY AND REASSEMBLY



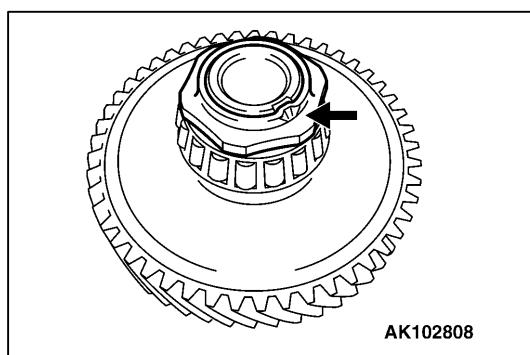
AK102837

#### Disassembly steps



1. Lock nut
2. Taper roller bearing
3. Transfer driven gear

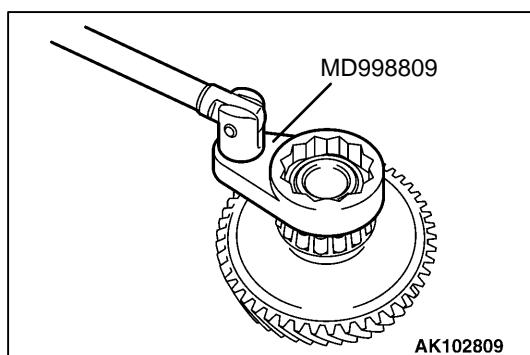
◀C▶ ▶A◀ 4. Taper roller bearing  
◀A▶ 5. Output shaft



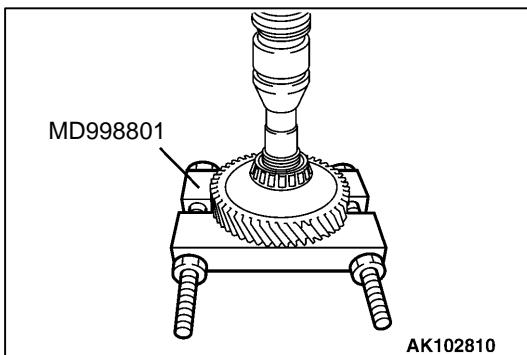
#### DISASSEMBLY SERVICE POINTS

##### ◀A▶ LOCK NUT REMOVAL

- (1) Undo staking of the lock nut.

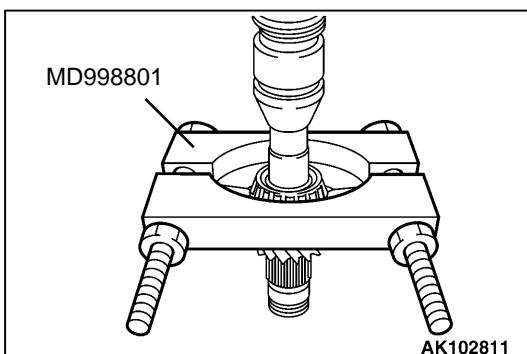


- (2) Remove the lock nut using the indicated special tool.



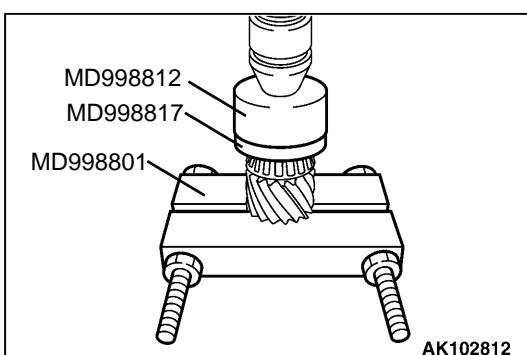
### ◀B▶ TAPER ROLLER BEARING REMOVAL

Use the indicated special tool to remove the taper roller bearing.



### ◀C▶ TAPER ROLLER BEARING REMOVAL

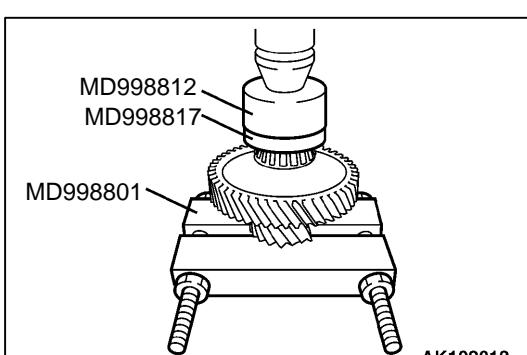
Use the indicated special tool to remove the taper roller bearing.



### REASSEMBLY SERVICE POINTS

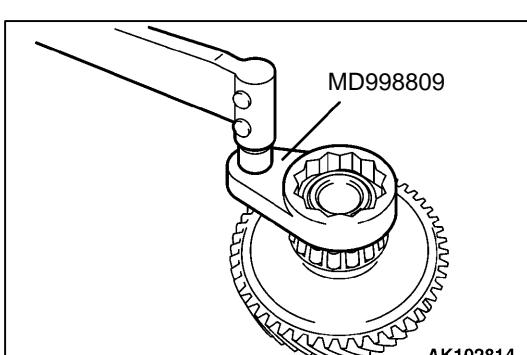
#### ▶A◀ TAPER ROLLER BEARING INSTALLATION

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



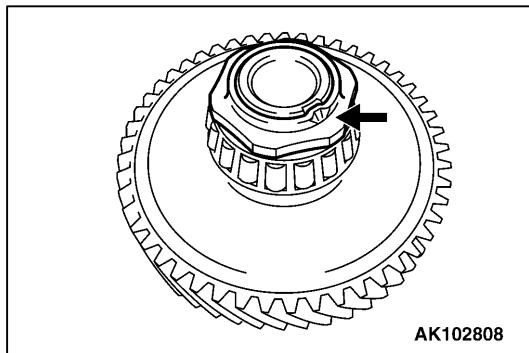
#### ▶B◀ TAPER ROLLER BEARING INSTALLATION

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



#### ▶C◀ LOCK NUT INSTALLATION

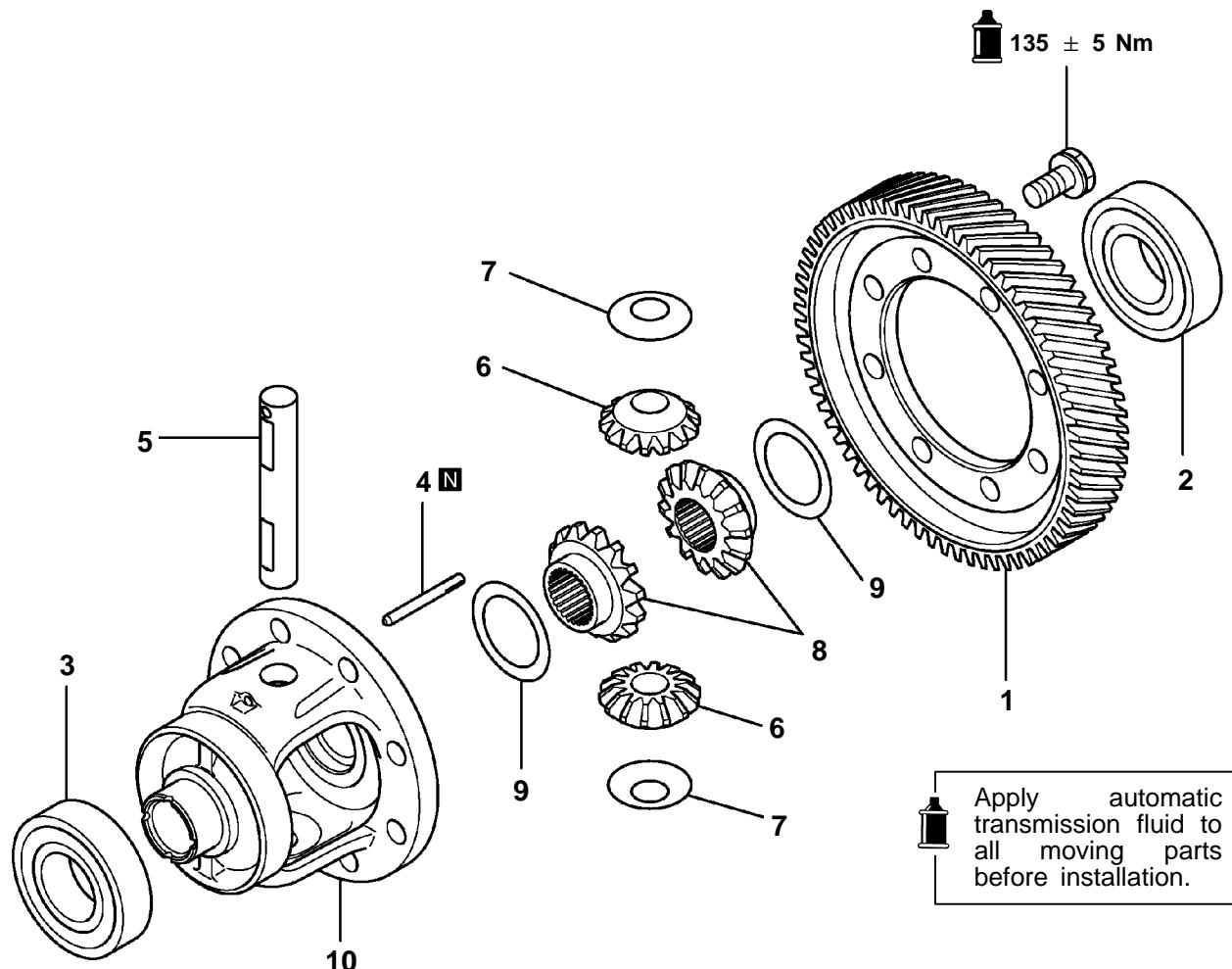
- (1) Apply ATF to the thread portion of the lock nut before installation.
- (2) Use the indicated special tool to tighten the lock nut to the specified torque.
- (3) Loosen the lock nut one complete turn, then tighten it again to the specified torque.



4. Stake the lock nut securely into the notch in the output shaft.

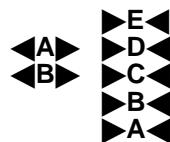
## 8. DIFFERENTIAL

### DISASSEMBLY AND REASSEMBLY



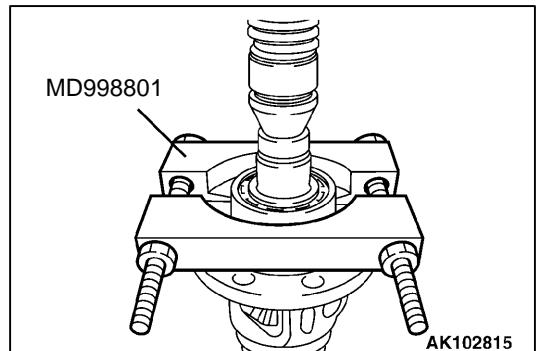
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#### Disassembly steps



1. Differential drive gear
2. Ball bearing
3. Ball bearing
4. Lock pin
5. Pinion shaft

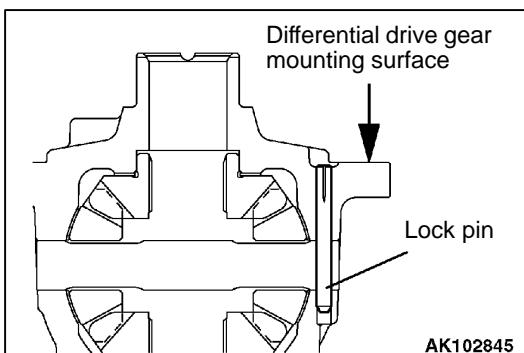
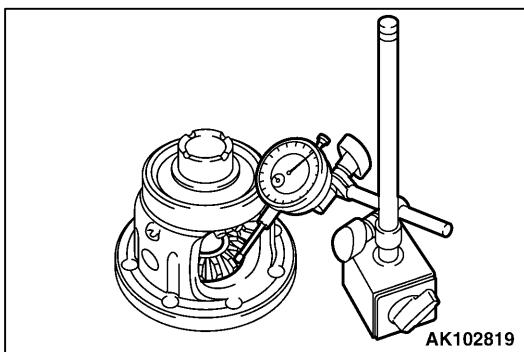
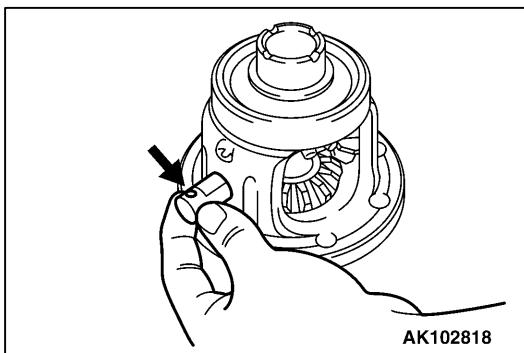
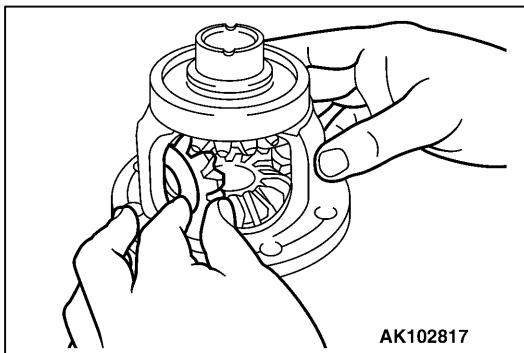
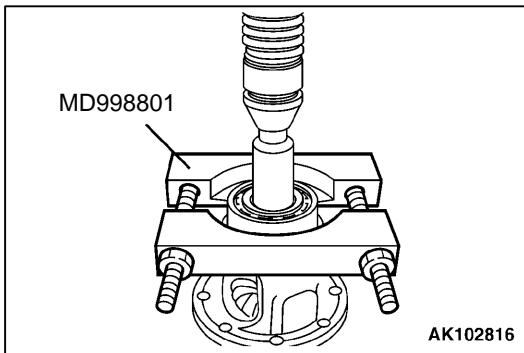
6. Pinion
7. Washers
8. Side gears
9. Spacers
10. Differential case



### DISASSEMBLY SERVICE POINTS

#### ◀ A ▶ BALL BEARING REMOVAL

Use the indicated special tool to remove the ball bearing from the differential case.



### ◀▶ B BALL BEARING REMOVAL

Use the indicated special tool to remove the ball bearing from the differential case.

### REASSEMBLY SERVICE POINTS

#### ▶◀ A SPACER / SIDE GEAR / WASHER / PINION / PINION SHAFT INSTALLATION

- (1) Fit the spacer on the back side of each side gear.
- (2) Install the side gears fitted with the spacers into the differential case.

NOTE

Use spacers of a thickness of 0.93 – 1.00 mm when installing new side gears.

- (3) Fit the washer on the back side of each pinion. Mesh both the pinions simultaneously with the side gears, then bring the pinions into position inside the differential case while rotating them.
- (4) Insert the pinion shaft into the differential case while aligning the lock pin holes.

- (5) Measure the backlash between each side gear and the pinions.

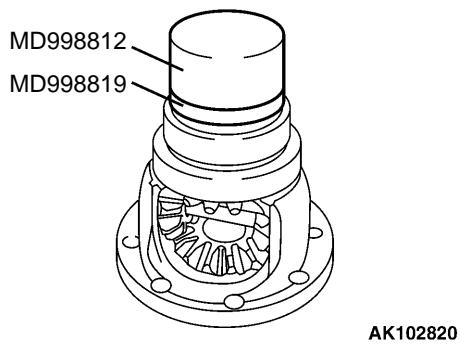
- (6) If the backlash deviates from the standard value, replace the spacer of the side gear with a one of an appropriate thickness and measure the backlash again for confirmation.

NOTE

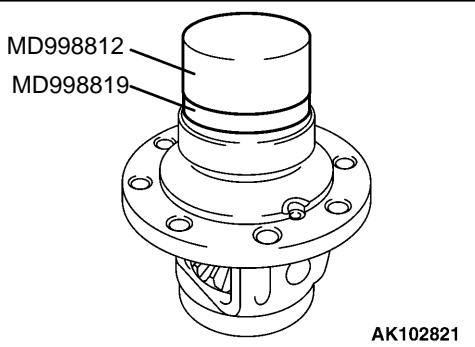
The backlash on one side gear should be equal to that on the other after adjustments.

#### ▶◀ B LOCK PIN INSTALLATION

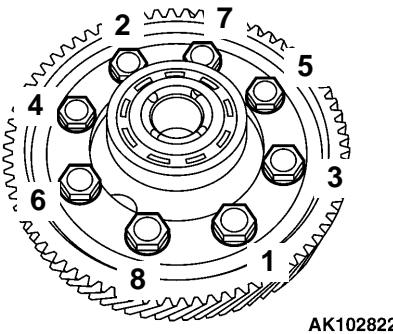
Insert the lock pins into the differential case using a press with a force larger than 5 kN until their top ends are lower than the differential drive gear mounting surface.

**►C◀ BALL BEARING INSTALLATION**

Use the indicated special tools to install the ball bearing on the differential case.

**►D◀ BALL BEARING INSTALLATION**

Use the indicated special tools to install the ball bearing on the differential case.

**►E◀ DIFFERENTIAL DRIVE GEAR INSTALLATION**

- (1) Place the differential drive gear in position on the differential case.
- (2) Apply ATF to each of the bolt and tighten the bolts in the numbered sequence to the specified torque.