

# GROUP 22B

# MANUAL TRANSMISSION OVERHAUL

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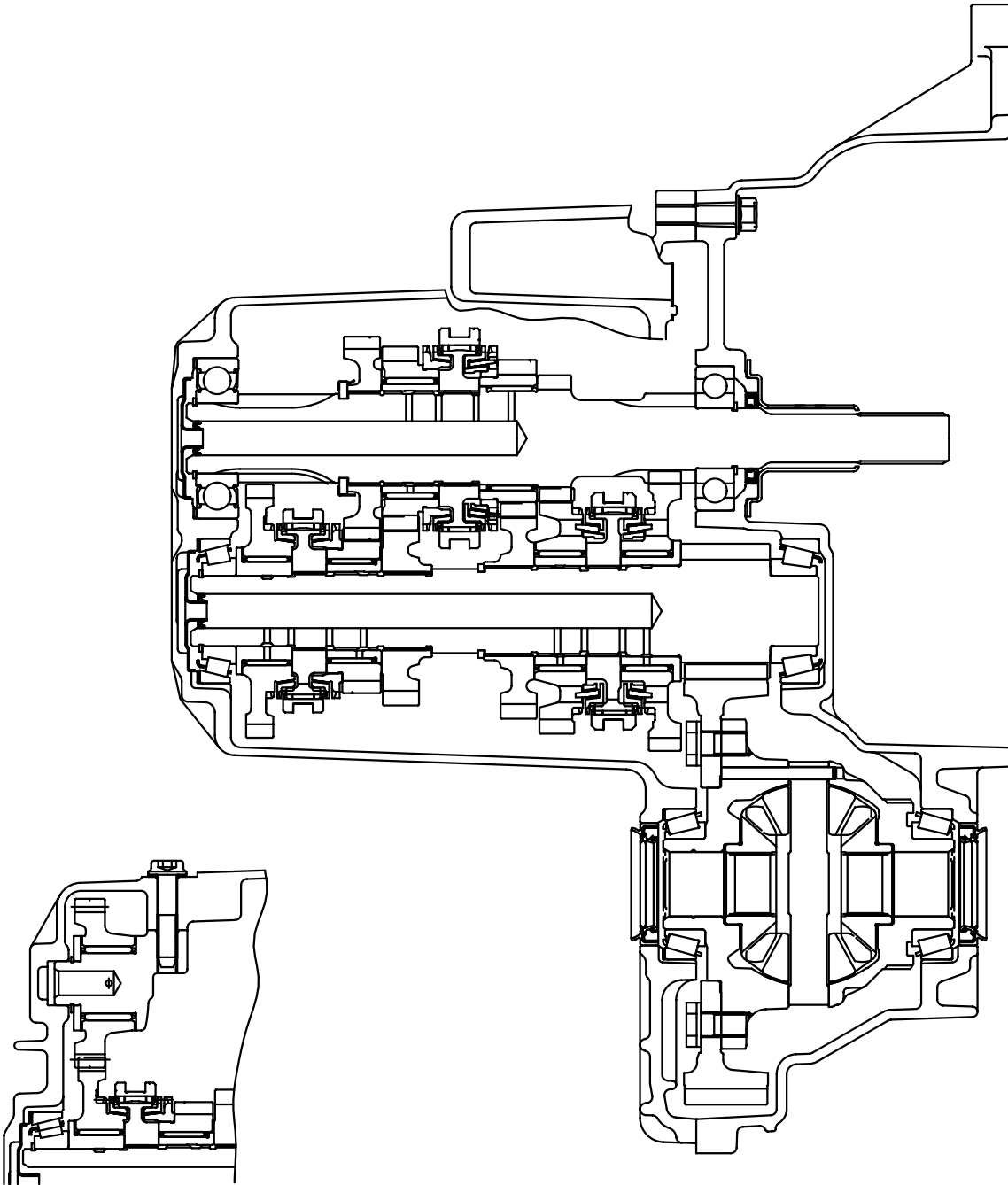
## GENERAL INFORMATION

M1222000100379

### MANUAL TRANSMISSION MODELS

Transmission model	Combined engine	Vehicle model
F5M51-1-S5P	6G75-S4-MPI	DL1ASN

### SECTIONAL VIEW



AK502566

## GENERAL SPECIFICATIONS

M1222000200495

### TRANSMISSION MODEL TABLE

Transmission model	Speedometer gear ratio	Final gear ratio	Vehicle model	Engine model
F5M51-1-S5P	28/36	4.111	DL1ASN	6G75-S4-MPI

### GEAR RATIO TABLE

Item	F5M51
1st	3.333
2nd	2.105
3rd	1.407
4th	1.031
5th	0.804
Reverse	3.416

## SERVICE SPECIFICATIONS

M1222000300362

Item	Standard value	Minimum limit
Input shaft end play mm	0.05 – 0.17	–
Input shaft front bearing end play mm	0 – 0.12	–
Input shaft rear bearing end play mm	0 – 0.12	–
Input shaft 5th speed gear end play mm	0 – 0.09	–
Output shaft preload mm	0.13 – 0.18	–
Output shaft rear bearing end play mm	0 – 0.09	–
Output shaft 3rd speed gear end play mm	0 – 0.09	–
Backlash between differential gear and pinion mm	0.025 – 0.150	–
Differential case preload mm	0.05 – 0.11	–
Synchronizer ring back surface to gear clearance mm	–	0.5

## SNAP RING, SPACER AND THRUST PLATE FOR ADJUSTMENT

M1222012000409

### SPACER (FOR ADJUSTMENT OF INPUT SHAFT END PLAY)

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.98	98	1.43	43
1.07	07	1.52	52
1.16	16	1.61	61
1.25	25	1.70	70
1.34	34	1.79	79

**SNAP RING (FOR ADJUSTMENT OF INPUT SHAFT FRONT BEARING END PLAY)**

Thickness mm	Identification colour	Thickness mm	Identification colour
1.43	Green (2)	1.59	Yellow (2)
1.51	White (2)		

**SNAP RING (FOR ADJUSTMENT OF INPUT SHAFT REAR BEARING END PLAY)**

Thickness mm	Identification colour	Thickness mm	Identification colour
1.44	None	1.58	Brown
1.51	Blue		

**THRUST PLATE (FOR ADJUSTMENT OF INPUT SHAFT 5TH SPEED GEAR END PLAY)**

Thickness mm	Identification symbol	Thickness mm	Identification symbol
3.82	0	3.98	6
3.86	2	4.02	7
3.90	3	4.06	8
3.94	5	4.10	9

**SPACER (FOR ADJUSTMENT OF OUTPUT SHAFT PRELOAD)**

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.86	86	1.19	L
0.89	89	1.22	G
0.92	92	1.25	M
0.95	95	1.28	N
0.98	98	1.31	E
1.01	01	1.34	O
1.04	04	1.37	P
1.07	07	1.40	None
1.10	J	1.43	Q
1.13	D	1.46	R
1.16	K		

**SNAP RING (FOR ADJUSTMENT OF OUTPUT SHAFT REAR BEARING END PLAY)**

Thickness mm	Identification colour	Thickness mm	Identification colour
1.36	Yellow	1.55	White
1.40	Green	1.58	Brown
1.44	None	1.63	Orange
1.48	Black	1.68	Blue
1.51	Blue		

**SNAP RING (FOR ADJUSTMENT OF OUTPUT SHAFT 3RD SPEED GEAR END PLAY)**

Thickness mm	Identification colour	Thickness mm	Identification colour
2.81	None	2.97	Green
2.85	Blue	3.01	Black
2.89	Brown	3.05	White
2.93	Yellow	3.09	Orange

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

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.74	74	1.04	04
0.77	77	1.07	07
0.80	80	1.10	J
0.83	83	1.13	D
0.86	86	1.16	K
0.89	89	1.19	L
0.92	92	1.22	G
0.95	95	1.25	M
0.98	98	1.28	N
1.01	01	1.31	E

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

Thickness mm	Identification symbol	Thickness mm	Identification symbol
0.6	–	0.9	–
0.7	–	1.0	–
0.8	–	1.1	–

## TORQUE SPECIFICATIONS

M1222012100387

Item	Specifications
Roll stopper bracket mounting bolt	70 ± 10 N·m
Shift cable bracket mounting bolt	18 ± 3 N·m
Select lever mounting bolt	18 ± 3 N·m
Vehicle speed sensor mounting bolt	3.9 ± 1.0 N·m
Back-up lamp switch	32 ± 2 N·m
Poppet spring	32 ± 2 N·m
Interlock plate bolt	30 ± 3 N·m
Control housing mounting bolt	18 ± 3 N·m
Under cover mounting bolt	6.9 ± 0.9 N·m
Reverse idler gear shaft mounting bolt	48 ± 6 N·m
Clutch housing-transmission case mounting bolt	44 ± 5 N·m
Select lever mounting nut	11 ± 1 N·m
Stopper bracket mounting bolt	21.7 ± 0.3 N·m
Clutch release bearing retainer mounting bolt	9.8 ± 2.0 N·m
Differential drive gear mounting bolt	133 ± 4 N·m

## SEALANTS

M1222000500366

Item	Specified sealant
Clutch housing-transmission case mating surface	Mitsubishi Genuine sealant part No. MD997740 or equivalent
Control housing-transmission case mating surface	
Under cover-transmission case mating surface	
Air breather	3M SUPER WEATHERSTRIP No. 8001 or equivalent
Differential drive gear bolt	3M STUD Locking No. 4170 or equivalent

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

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

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

### Disassembly

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

### Surface Preparation

Thoroughly remove all substances deposited on the FIPG application surface, using a gasket scraper. Make sure that the FIPG application 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 (in less than 10 minutes after application). Do not allow FIPG to spread beyond the sealing areas during installation. Avoid operating the transmission or letting oils or water come in contact with the sealed area before a time sufficient for FIPG to harden (approximately one hour) has passed.

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

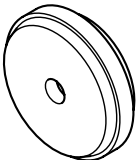
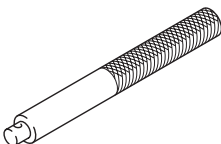
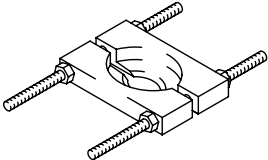
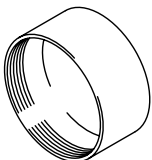
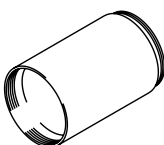
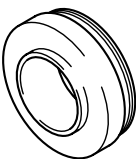
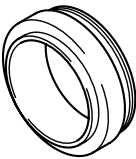
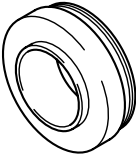
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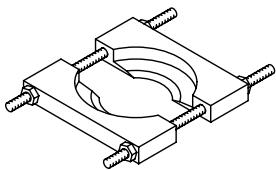
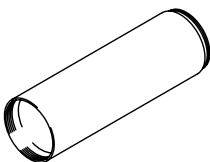
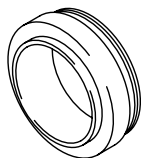
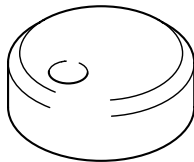
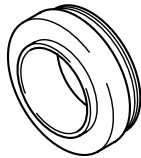
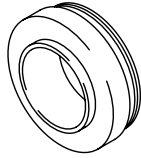
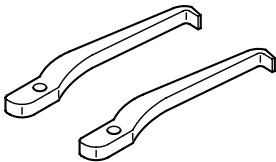
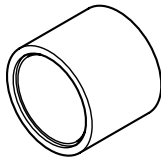
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Item	Specified sealant
Control shaft oil seal lip gear oil	GENUINE MITSUBISHI MTF
Drive shaft oil seal lip gear oil	
Each O-ring	
Select lever shoe	Mitsubishi part No. 0101011 or equivalent
Input shaft oil seal lip gear oil	

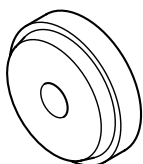
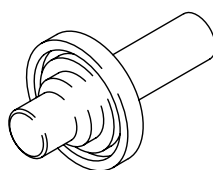
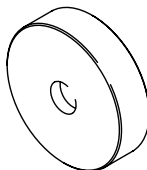
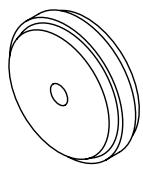
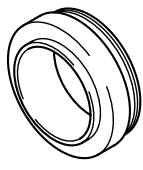
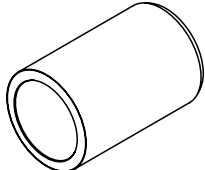
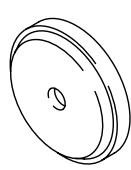
## SPECIAL TOOLS

M1222000600396

Tool	Number	Name	Use
	MB990935	Installer adapter	<ul style="list-style-type: none"> <li>Installation of output shaft taper roller bearing outer race</li> <li>Installation of differential rear taper roller bearing outer race</li> </ul>
	MB990938	Handle	Use with Installer adapter
	MD998801	Bearing remover	Installation and removal of gears, bearings and sleeves
	MD998812	Installer cap	Use with Installer and Installer adapter
	MD998813	Installer-100	Use with Installer cap and Installer adapter
	MD998818	Installer adapter (38)	Installation of input shaft front bearing
	MD998825	Installer adapter (52)	Installation of 1st speed gear sleeve, 3rd-4th speed synchronizer hub, 4th speed gear sleeve, 5th speed gear and thrust plate stopper
	MD998819	Installer adapter (40)	<ul style="list-style-type: none"> <li>Installation of input shaft rear bearing</li> <li>Installation of output shaft taper roller bearing</li> </ul>

Tool	Number	Name	Use
	MD998917	Bearing remover	Installation and removal of gears, bearing and sleeves
	MD998814	Installer-200	Use with Installer cap and Installer adapter
	MD998824	Installer adapter (50)	<ul style="list-style-type: none"> <li>• Installation of 1st speed gear sleeve</li> <li>• Installation of 1st-2nd speed synchronizer hub</li> <li>• Installation of 2nd speed gear sleeve</li> <li>• Installation of 3rd speed gear</li> </ul>
	MD998364	Camshaft oil seal installer	Installation of gear, bearing and sleeve
	MD998821	Installer adapter (44)	<ul style="list-style-type: none"> <li>• Installation of 4th speed gear</li> <li>• Installation of 5th speed gear sleeve</li> <li>• Installation of 5th-reverse speed synchronizer hub</li> </ul>
	MD998820	Installer adapter (42)	Installation of reverse gear bearing sleeve
	MD999566	Claw	Removal of taper roller bearing outer race
	MB991445	Bushing remover and installer base	Installation of differential front taper roller bearing outer race

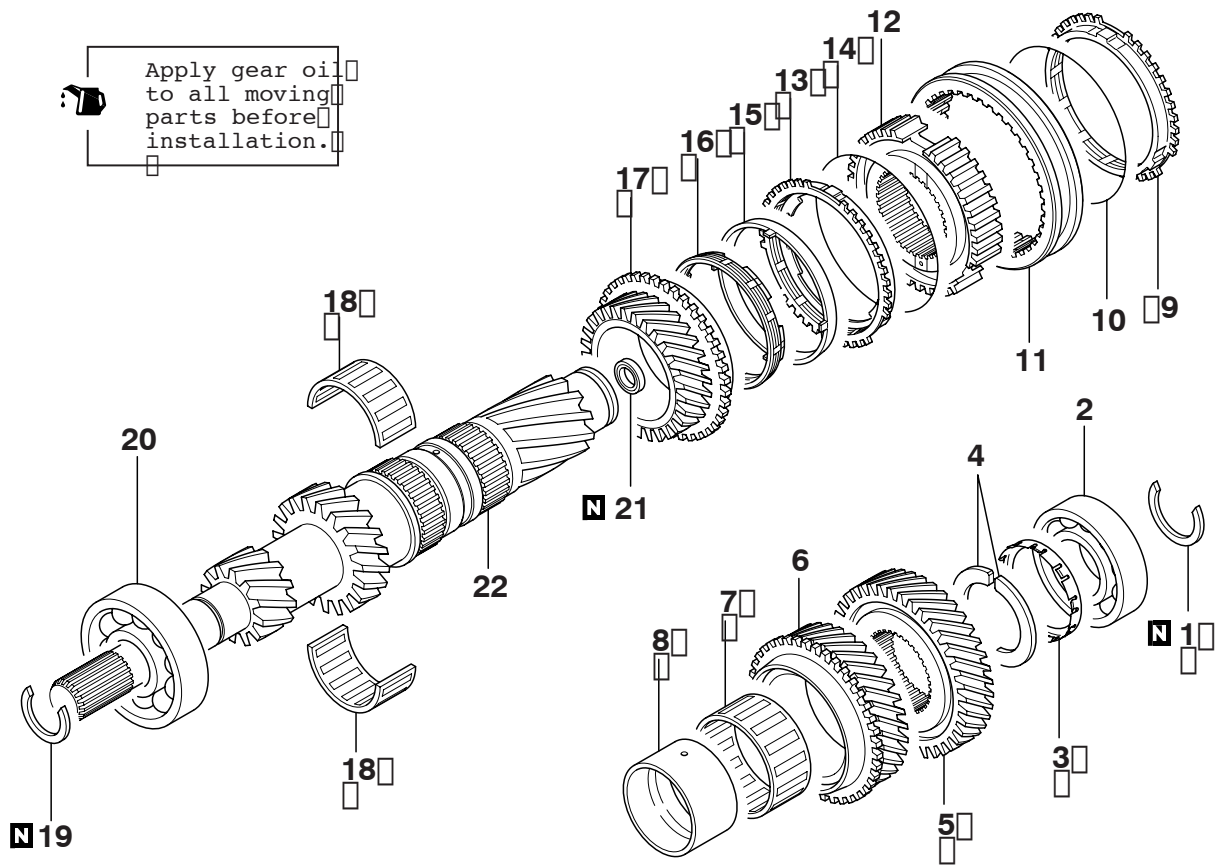


Tool	Number	Name	Use
	MB990928	Installer adapter	Installation of input shaft oil seal
	MD998800	Oil seal installer	<ul style="list-style-type: none"> <li>• Installation of differential oil seal</li> <li>• Installation of transfer oil seal</li> </ul>
	MB990930	Installer adapter	Removal of differential front taper roller bearing
	MB990937	Installer adapter	<ul style="list-style-type: none"> <li>• Installation of differential front taper roller bearing</li> <li>• Installation of transfer oil seal</li> </ul>
	MD998823	Installer adapter (48)	Installation of differential rear taper roller bearing
	MD999506	Crankshaft installer	Installation of transfer oil seal
	MB990933	Installer adapter	Installation of transfer oil seal

# INPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

M1222001600355



AKX00877AC

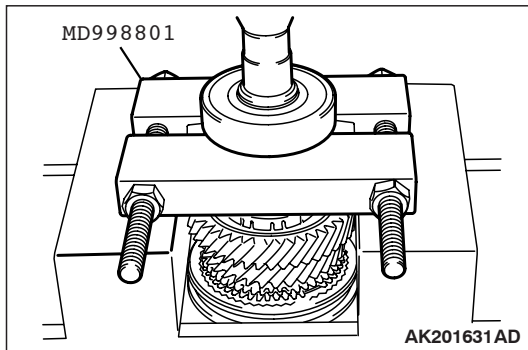
- Disassembly steps**
- >>L<< 1. Snap ring
  - <<A>> >>K<< 2. Ball bearing
  - <<B>> >>J<< 3. Thrust plate stopper
  - >>I<< 4. Thrust plate
  - <<C>> >>H<< 5. 5th speed gear
  - 6. 4th speed gear
  - 7. Needle roller bearing
  - <<D>> >>G<< 8. 4th speed gear sleeve
  - 9. Synchronizer ring
  - >>D<< 10. Synchronizer spring
  - >>F<< 11. Synchronizer sleeve

- Disassembly steps ( つづき )**
- >>E<< 12. 3rd-4th speed synchronizer hub
  - 13. Outer synchronizer ring
  - >>D<< 14. Synchronizer spring
  - 15. Synchronizer cone
  - 16. Inner synchronizer ring
  - 17. 3rd speed gear
  - 18. Needle roller bearing
  - >>C<< 19. Snap ring
  - <<E>> >>B<< 20. Ball bearing
  - >>A<< 21. Oil seal
  - 22. Input shaft

## DISASSEMBLY SERVICE POINTS

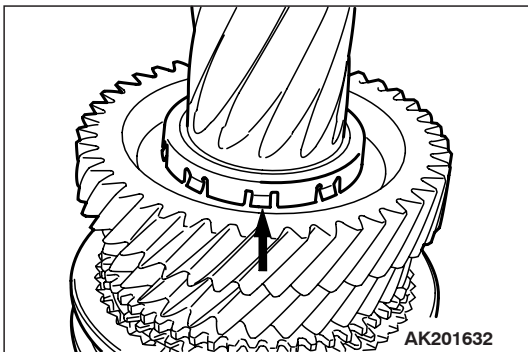
### <<A>> BALL BEARING REMOVAL

1. Using special tool Bearing remover (MD998801), support the ball bearing, and then set them on the press.
2. Push down on the input shaft with the press and extract the ball bearing.



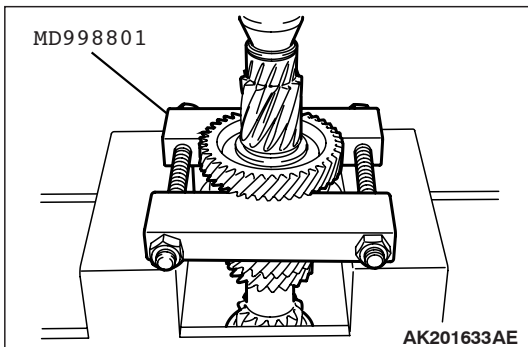
### <<B>> THRUST PLATE STOPPER REMOVAL

- Using a screwdriver, pry up the position shown in the illustration and remove the thrust plate stopper.



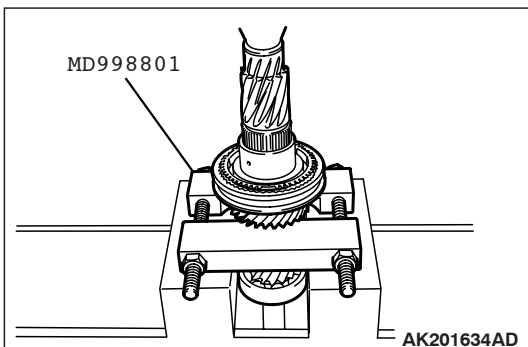
### <<C>>5TH SPEED GEAR REMOVAL

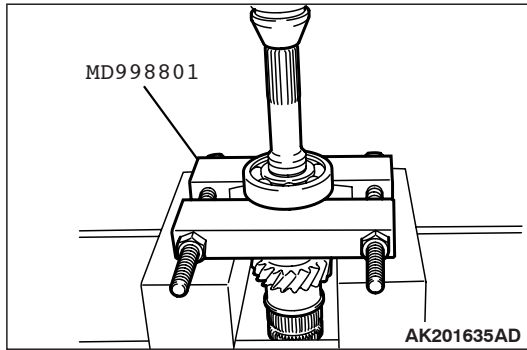
1. Using special tool Bearing remover (MD998801), support the 5th speed gear, and then set them on the press.
2. Push down on the input shaft with the press and take off the 5th speed gear.



### <<D>>4TH SPEED GEAR SLEEVE REMOVAL

1. Using special tool Bearing remover (MD998801), support the 3rd speed gear, and then set them on the press.
2. Push down on the input shaft with the press and remove the 4th speed gear sleeve.

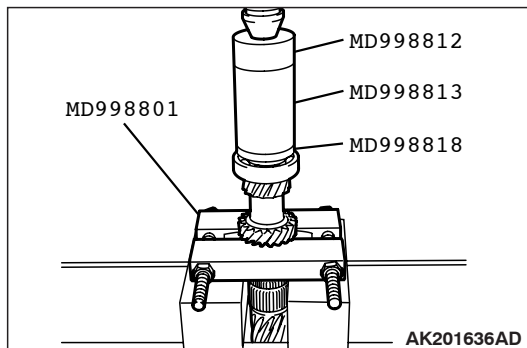
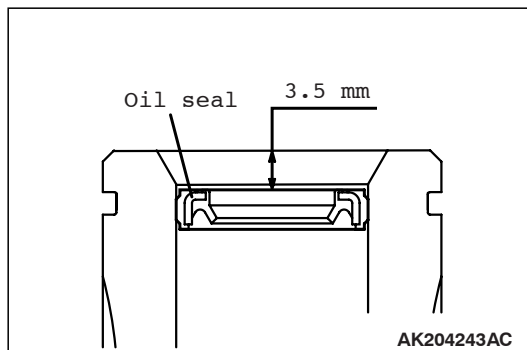


**<<E>> BALL BEARING REMOVAL**

1. Using special tool Bearing remover (MD998801), support the ball bearing, and then set them on the press.
2. Push down on the input shaft with the press and extract the ball bearing.

**REASSEMBLY SERVICE POINTS****>>A<< OIL SEAL INSTALLATION**

Install the oil seal into the illustrated position of the input shaft.

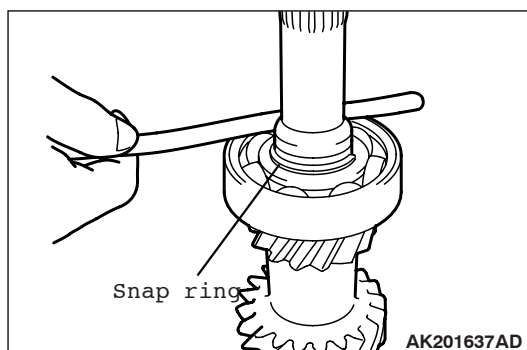
**>>B<< BALL BEARING INSTALLATION**

1. Using special tool Bearing remover (MD998801), support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools, press install the bearing with the press.
  - Installer cap (MD998812)
  - Installer-100 (MD998813)
  - Installer adapter (MD998818)

**>>C<< SNAP RING INSTALLATION**

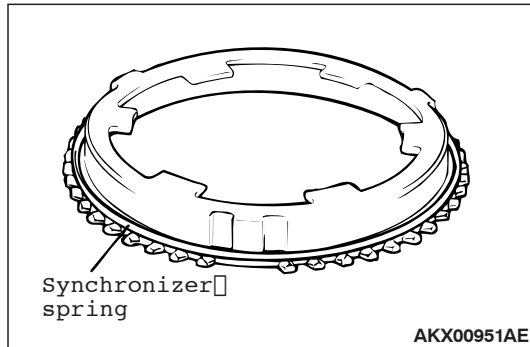
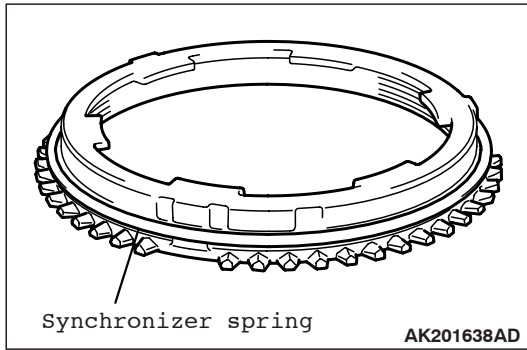
1. Install the thickest snap ring that can be fitted in the snap ring groove of input shaft.
2. Make sure that the front bearing end play meets the standard value.

**Standard value: 0 – 0.12 mm**



### >>D<< SYNCHRONIZER SPRING INSTALLATION

Install the synchronizer spring to the illustrated position of the synchronizer ring and outer synchronizer ring.

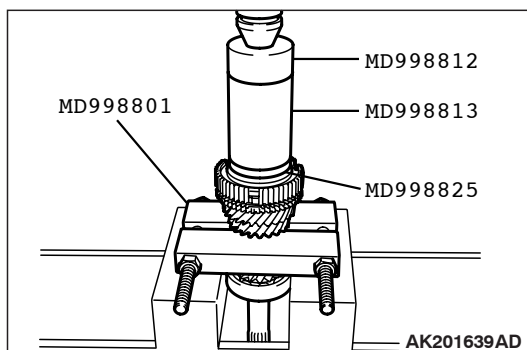
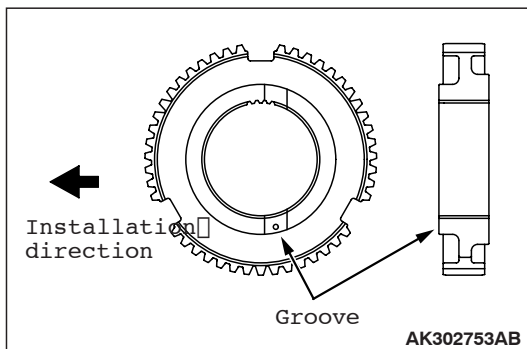


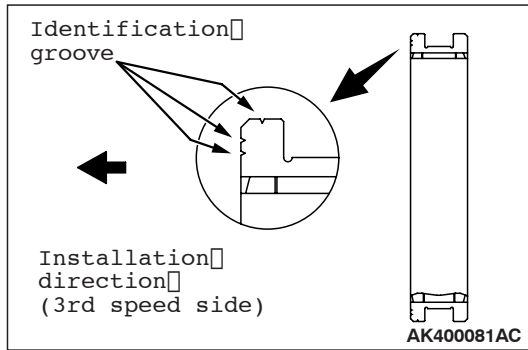
### >>E<< 3RD-4TH SPEED SYNCHRONIZER HUB INSTALLATION

1. Using special tool Bearing remover (MD998801), support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Make sure that the inner synchronizer ring has been perfectly matched to the 3rd speed gear cone.
3. Check the installation direction of the 3rd-4th speed synchronizer hub, and put it on the input shaft.
4. Using special tools, press install the 3rd-4th speed synchronizer hub with the press.

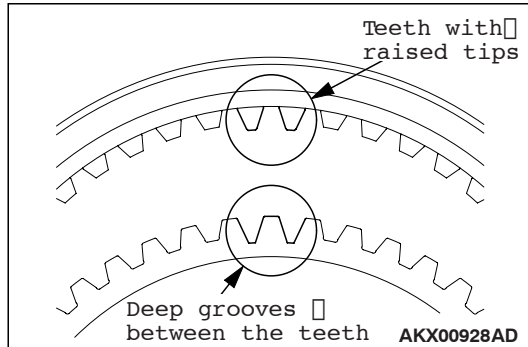
- Installer cap (MD998812)
- Installer-100 (MD998813)
- Installer adapter (MD998825)

5. Make sure that the outer synchronizer ring can rotate freely.

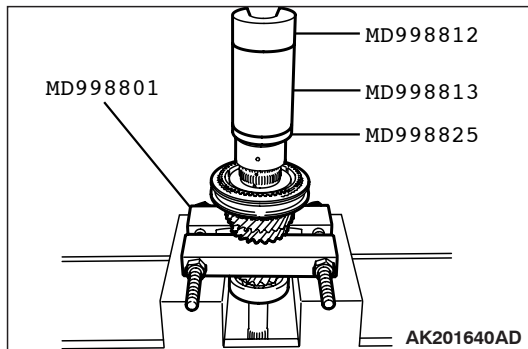


**>>F<< SYNCHRONIZER SLEEVE INSTALLATION**

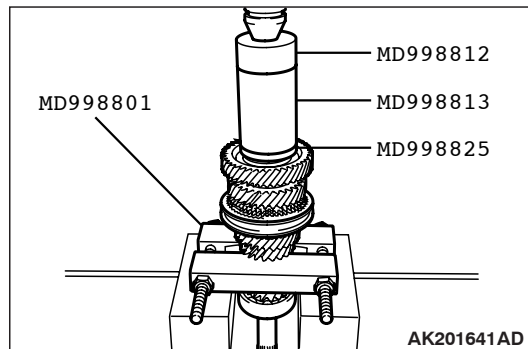
1. Check the installation direction of the synchronizer sleeve, and install it onto the 3rd-4th speed synchronizer hub.



2. Install the synchronizer sleeve so that the areas with teeth that have raised tips (three areas total) are aligned with the areas on the synchronizer hub that have deep grooves between the teeth (three areas total).

**>>G<< 4TH SPEED GEAR SLEEVE INSTALLATION**

1. Using special tool Bearing remover (MD998801), support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools, press install the 4th speed gear sleeve with the press.
  - Installer cap (MD998812)
  - Installer-100 (MD998813)
  - Installer adapter (MD998825)

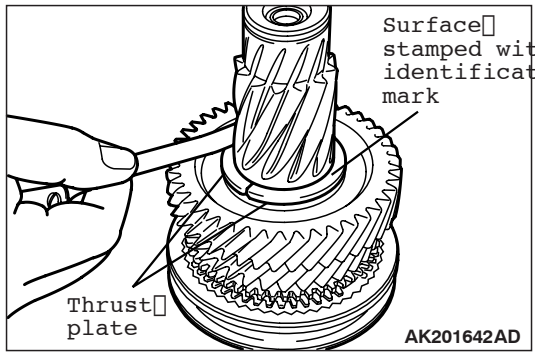
**>>H<< 5TH SPEED GEAR INSTALLATION**

1. Using special tool Bearing remover (MD998801), support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools, press install the 5th speed gear in the input shaft.
  - Installer cap (MD998812)
  - Installer-100 (MD998813)
  - Installer adapter (MD998825)

### >>I<< THRUST PLATE INSTALLATION

1. Install the thickest thrust plates that can be fitted in the groove of input shaft. Install the thrust plate so the surface stamped with the identification mark is facing up.
2. Make sure that the 5th speed gear end play meets the standard value.

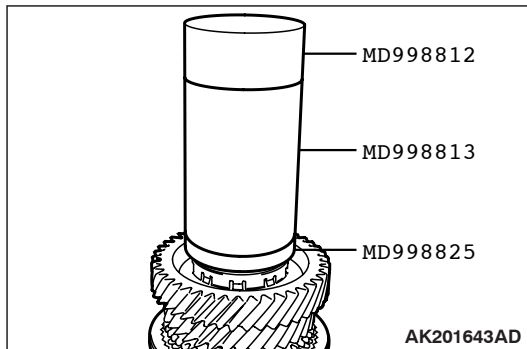
**Standard value: 0 – 0.09 mm**



### >>J<< THRUST PLATE STOPPER INSTALLATION

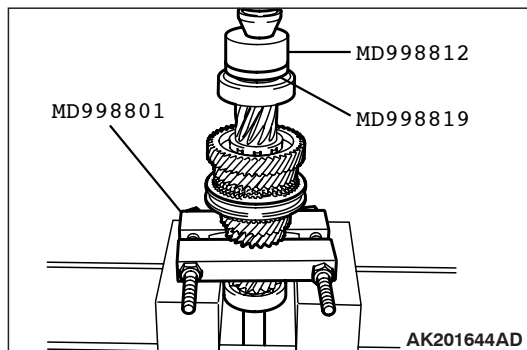
Install the thrust plate stopper by pressing special tools by hand. Make sure that it is not tilted.

- Installer cap (MD998812)
- Installer-100 (MD998813)
- Installer adapter (MD998825)



### >>K<< BALL BEARING INSTALLATION

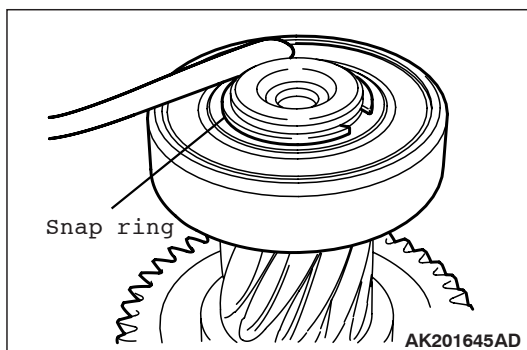
1. Using special tool Bearing remover (MD998801), support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools, press install the ball bearing in the input shaft.
  - Installer cap (MD998812)
  - Installer adapter (MD998819)



### >>L<< SNAP RING INSTALLATION

1. Install the thickest snap ring that can be fitted in the groove of input shaft.
2. Make sure that the rear bearing end play meets the standard value.

**Standard value: 0 – 0.12 mm**

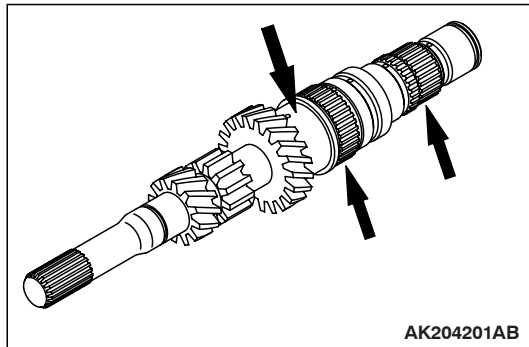


## INSPECTION

M1222001700095

## INPUT SHAFT

1. Check the outside diameter of the needle bearing mounting portion for damage, abnormal wear and seizure.
2. Check the splines for damage and wear.
3. Check that the helical gear teeth surfaces are not damaged or worn.

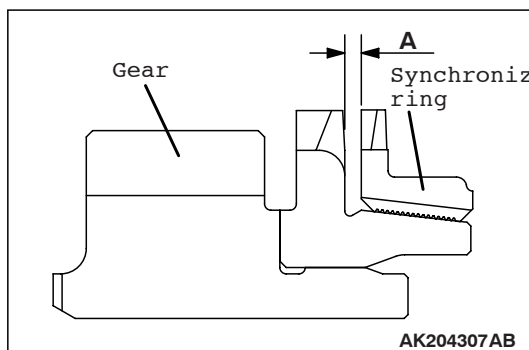
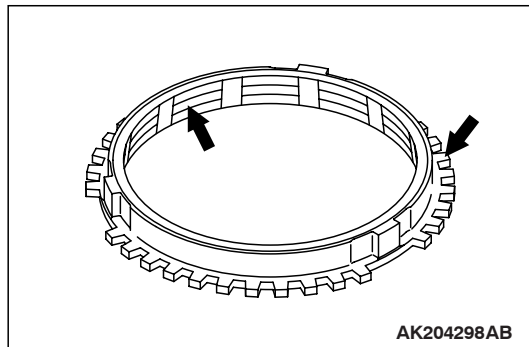


## NEEDLE ROLLER BEARING

1. Combine the needle roller bearing with the input shaft or bearing sleeve and gear, and check that it rotates smoothly without noise or play.
2. Check the needle roller bearing cage for deformation.

## SYNCHRONIZER RING

1. Check the clutch gear teeth for damage and broken.
2. Check internal surface for damage, wear and broken threads.



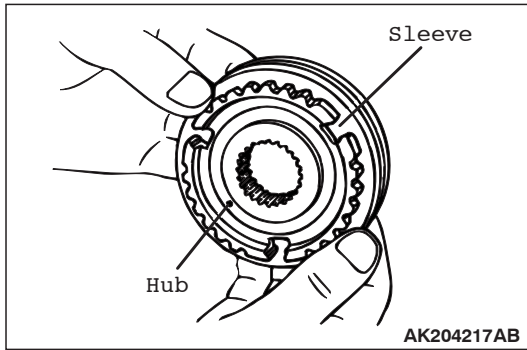
3. Force the synchronizer ring toward the clutch gear and check clearance "A". If "A" is less than the limit, replace the synchronizer ring.

**Minimum limit: 0.5 mm**



### SYNCHRONIZER SLEEVE AND HUB

1. Combine the synchronizer sleeve and hub, and check that they slide smoothly.
2. Check that the sleeve is free from damage at its inside splines ends.

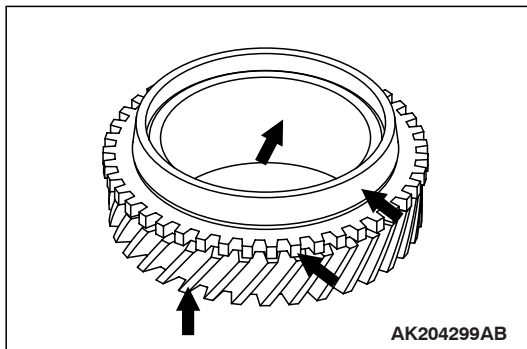


### SYNCHRONIZER SPRING

Check that the spring is not sagging, deformed or broken.

### SPEED GEARS

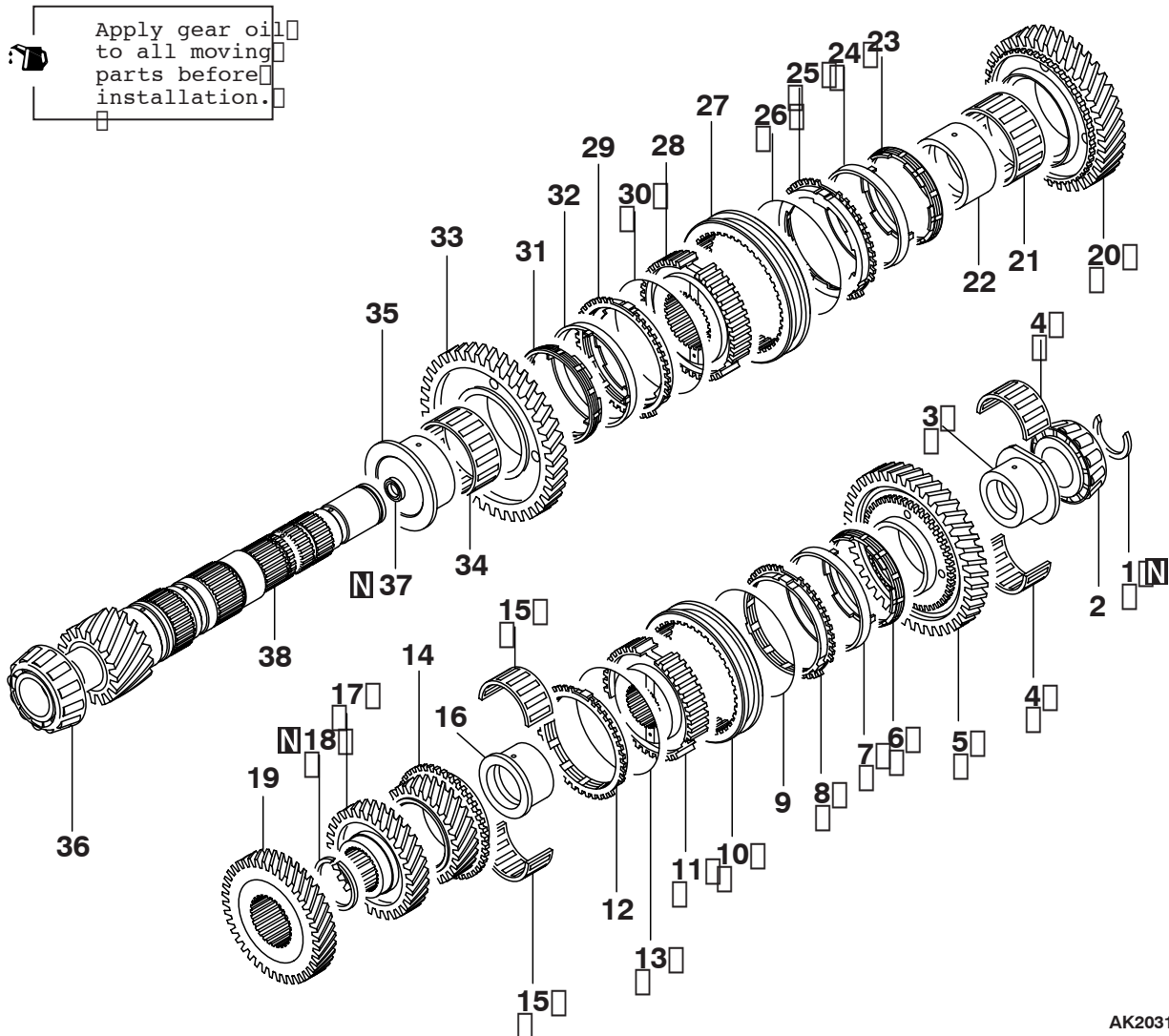
1. Check that the helical and clutch gear tooth surfaces are not damaged or worn.
2. Check that the synchronizer cone surfaces are not roughened, damaged or worn.
3. Check that the gear inside diameter and front and rear surfaces are not damaged and worn.



## OUTPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

M1222002200220



AK203133AD

## Disassembly steps

- <<A>> >>Q<< 1. Snap ring  
 <<B>> >>P<< 2. Taper roller bearing  
 <<B>> >>O<< 3. Reverse gear bearing sleeve  
 4. Needle roller bearing  
 5. Reverse gear  
 6. Inner synchronizer ring  
 7. Synchronizer cone  
 8. Outer synchronizer ring  
 >>L<< 9. Synchronizer spring  
 >>N<< 10. Synchronizer sleeve  
 <<C>> >>M<< 11. 5th speed-reverse synchronizer hub  
 12. Synchronizer ring  
 >>L<< 13. Synchronizer spring  
 14. 5th speed gear  
 15. Needle roller bearing  
 >>K<< 16. 5th speed gear sleeve  
 >>J<< 17. 4th speed gear

## Disassembly steps ( つづき )

- >>I<< 18. Snap ring  
 <<D>> >>H<< 19. 3rd speed gear  
 20. 2nd speed gear  
 21. Needle roller bearing  
 <<E>> >>G<< 22. 2nd speed gear sleeve  
 23. Inner synchronizer ring  
 24. Synchronizer cone  
 25. Outer synchronizer ring  
 >>D<< 26. Synchronizer spring  
 >>F<< 27. Synchronizer sleeve  
 >>E<< 28. 1st-2nd speed synchronizer hub  
 29. Outer synchronizer ring  
 >>D<< 30. Synchronizer spring  
 31. Inner synchronizer ring  
 32. Synchronizer cone  
 33. 1st speed gear  
 34. Needle roller bearing  
 <<F>> >>C<< 35. 1st speed gear sleeve  
 <<G>> >>B<< 36. Taper roller bearing

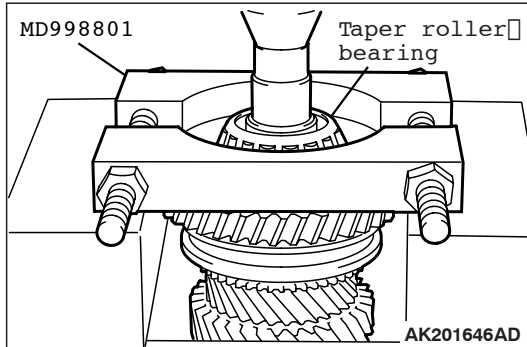
Disassembly steps ( つづき )

- >>A<< 37. Oil seal  
38. Output shaft

DISASSEMBLY SERVICE POINTS

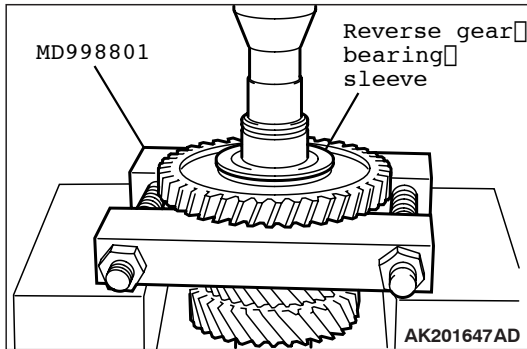
<<A>> TAPER ROLLER BEARING REMOVAL

1. Using special tool Bearing remover (MD998801), support the taper roller bearing, and then set them on the press.
2. Push down on the output shaft with the press, and take out the taper roller bearing.



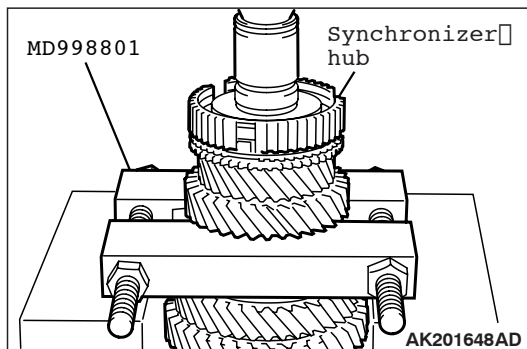
<<B>> REVERSE GEAR BEARING SLEEVE REMOVAL

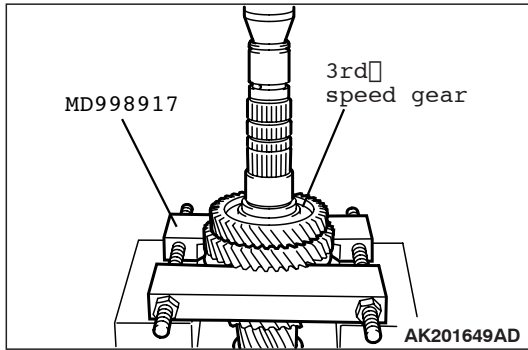
1. Using special tool Bearing remover (MD998801), support the reverse gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the reverse gear bearing sleeve.



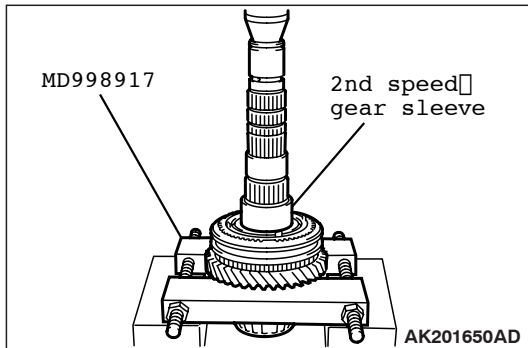
<<C>> 5TH SPEED-REVERSE SYNCHRONIZER HUB REMOVAL

1. Using special tool Bearing remover (MD998801), support the 4th speed gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the 5th speed-reverse synchronizer hub.

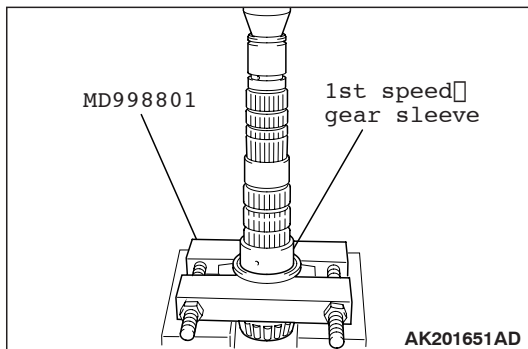


**<<D>> 3RD SPEED GEAR REMOVAL**

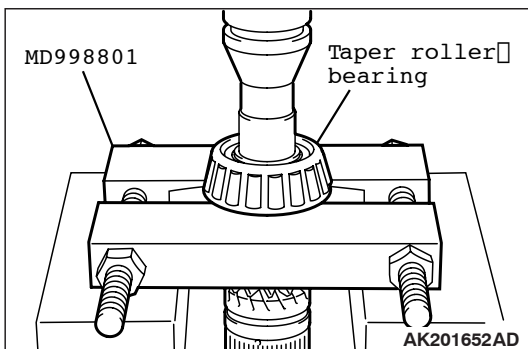
1. Using special tool Bearing remover (MD998917), support the 2nd speed gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the 3rd speed gear.

**<<E>> 2ND SPEED GEAR SLEEVE REMOVAL**

1. Using special tool Bearing remover (MD998917), support the 1st speed gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the 2nd speed gear sleeve.

**<<F>> 1ST SPEED GEAR SLEEVE REMOVAL**

1. Using special tool Bearing remover (MD998801), support the 1st speed gear sleeve, and then set them on the press.
2. Push down on the output shaft with the press and remove the 1st speed gear sleeve.

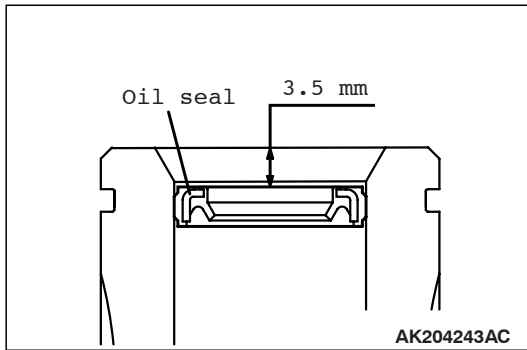
**<<G>> TAPER ROLLER BEARING REMOVAL**

1. Using special tool Bearing remover (MD998801), support the taper roller bearing, and then set them on the press.
2. Push down on the output shaft with the press and remove the taper roller bearing.

## REASSEMBLY SERVICE POINTS

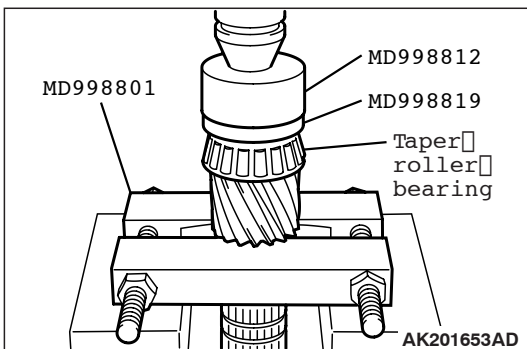
### >>A<< OIL SEAL INSTALLATION

Make sure that the oil seal is pressed into the position shown in the illustration.



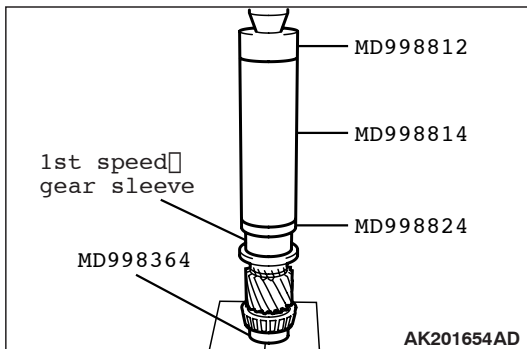
### >>B<< TAPER ROLLER BEARING INSTALLATION

1. Using Bearing remover (MD998801), support the output shaft gear, and then set them on the press.
2. Using special tools, press install the taper roller bearing with the press.
  - Installer cap (MD998812)
  - Installer adapter (MD998819)



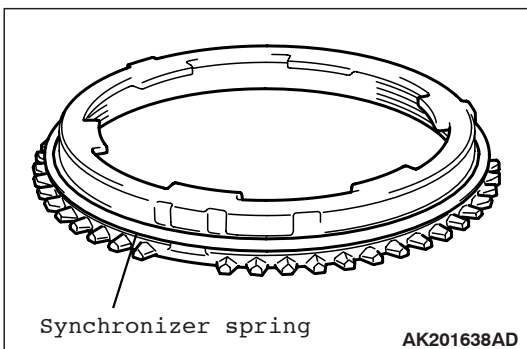
### >>C<< 1ST SPEED GEAR SLEEVE INSTALLATION

1. Set the output shaft on the press support stand.
2. Using special tools, press install the 1st speed gear sleeve with the press.
  - Installer cap (MD998812)
  - Installer-200 (MD998814)
  - Installer adapter (MD998824)
  - Camshaft oil seal installer (MD998364)



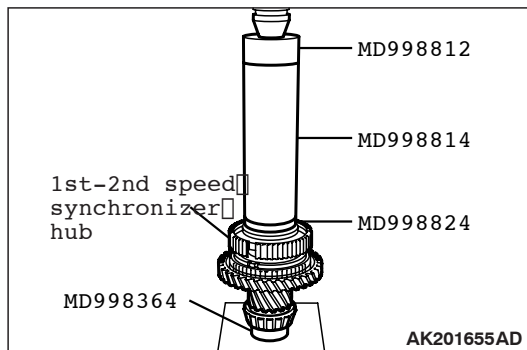
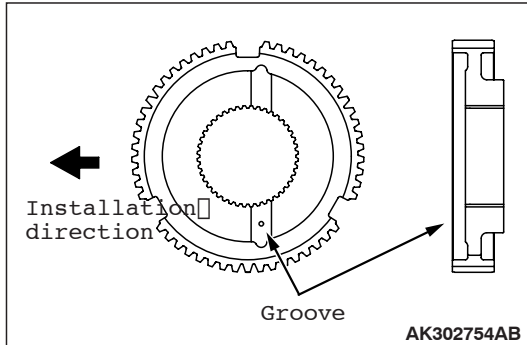
### >>D<< SYNCHRONIZER SPRING INSTALLATION

Install the synchronizer spring to the illustrated position of the outer synchronizer ring.



**>>E<< 1ST-2ND SPEED SYNCHRONIZER HUB  
INSTALLATION**

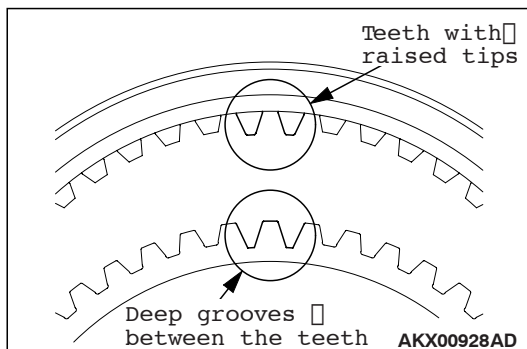
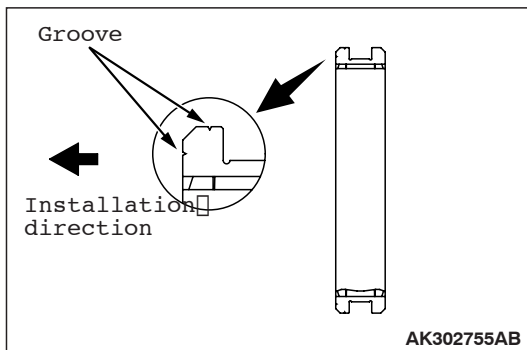
1. Set the output shaft on the press support stand.
2. Check that the 1st-2nd speed synchronizer hub is in the correct installation direction, and put it on the output shaft.



3. Using special tools, press install the 1st-2nd speed synchronizer hub with the press.
  - Installer cap (MD998812)
  - Installer-200 (MD998814)
  - Installer adapter (MD998824)
  - Camshaft oil seal installer (MD998364)
4. Make sure that the outer synchronizer ring on the 1st speed gear side can rotate freely.

**>>F<< SYNCHRONIZER SLEEVE INSTALLATION**

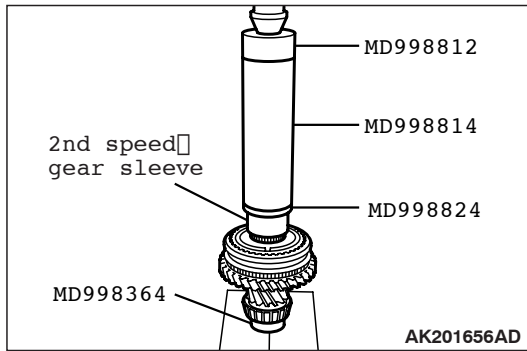
1. Check that the synchronizer sleeve is in the correct direction for installation, and install it on the 1st-2nd speed synchronizer hub.



2. Install the synchronizer sleeve so that the areas with teeth that have raised tips (three areas total) are aligned with the areas on the synchronizer hub that have deep grooves between the teeth (three areas total).

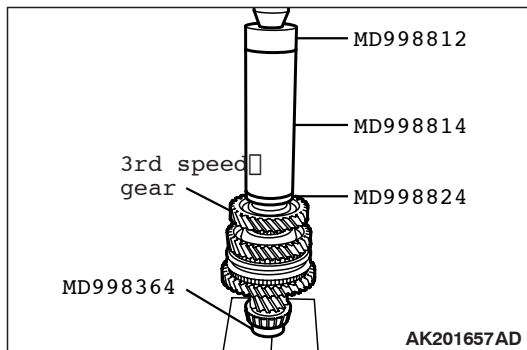
**>>G<< 2ND SPEED GEAR SLEEVE INSTALLATION**

1. Set the output shaft on the press support stand.



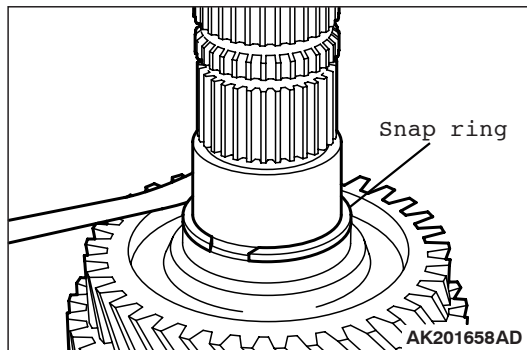
2. Using special tools, press install the 2nd speed sleeve onto the output shaft.
  - Installer cap (MD998812)
  - Installer-200 (MD998814)
  - Installer adapter (MD998824)
  - Camshaft oil seal installer (MD998364)

### >>H<< 3RD SPEED GEAR INSTALLATION



1. Check that the 2nd speed gear and the outer synchronizer ring have been properly installed. Also, make sure the claws on the synchronizer cone (four places) are correctly fitted into the holes in the 2nd speed gear (four places).
2. Using special tools, press install the 3rd speed gear onto the output shaft.
  - Installer cap (MD998812)
  - Installer-200 (MD998814)
  - Installer adapter (MD998824)
  - Camshaft oil seal installer (MD998364)
3. Make sure that the 2nd speed gear and the outer synchronizer ring can rotate freely.

### >>I<< SNAP RING INSTALLATION

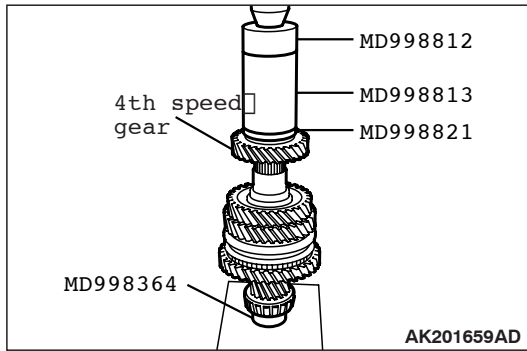


1. Install the thickest snap ring that can be fitted in the groove of output shaft.
2. Make sure that the 3rd speed gear end play meets the standard value.

**Standard value: 0 – 0.09 mm**

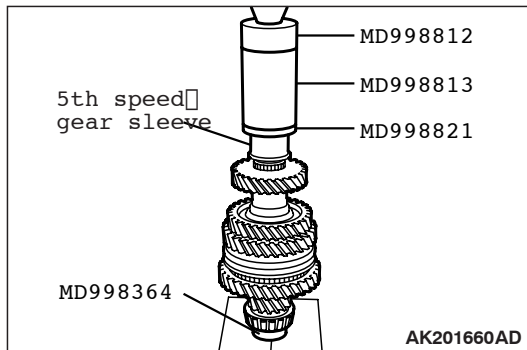
### >>J<< 4TH SPEED GEAR INSTALLATION

1. Set the output shaft on the press support stand.



2. Using special tools, press install the 4th speed gear onto the output shaft.

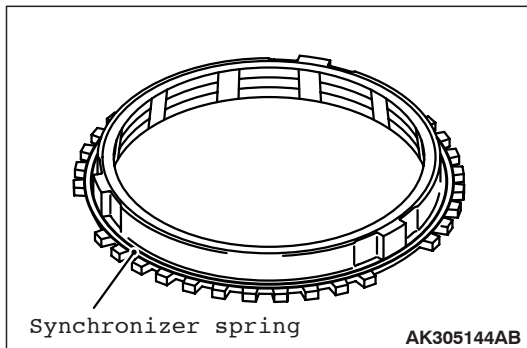
- Installer cap (MD998812)
- Installer-100 (MD998813)
- Installer adapter (MD998821)
- Camshaft oil seal installer (MD998364)



### >>K<< 5TH SPEED GEAR SLEEVE INSTALLATION

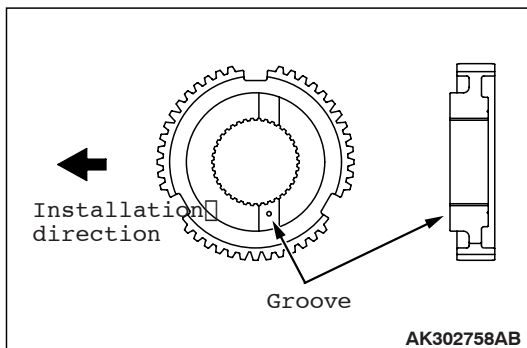
Using special tools, press install the 5th speed gear sleeve onto the output shaft.

- Installer cap (MD998812)
- Installer-100 (MD998813)
- Installer adapter (MD998821)
- Camshaft oil seal installer (MD998364)



### >>L<< SYNCHRONIZER SPRING INSTALLATION

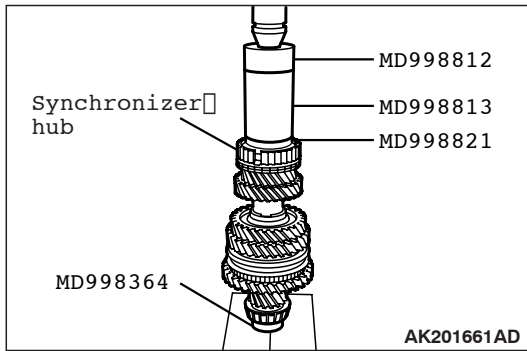
Install the synchronizer spring to the illustrated position of the synchronizer ring.



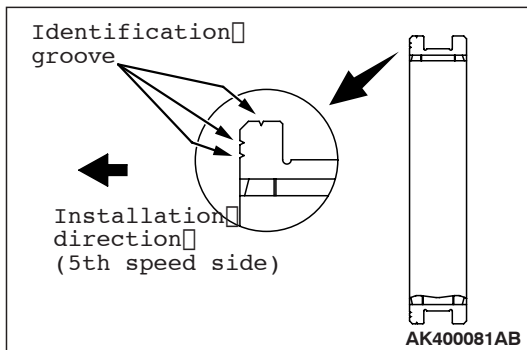
### >>M<< 5TH SPEED-REVERSE SYNCHRONIZER HUB INSTALLATION

1. Set the output shaft on the press support stand.
2. Make sure that the synchronizer ring is fitted correctly on the cone of the 5th speed gear.
3. Check that the 5th speed-reverse synchronizer hub is oriented correctly for installation, and fit it on the output shaft.



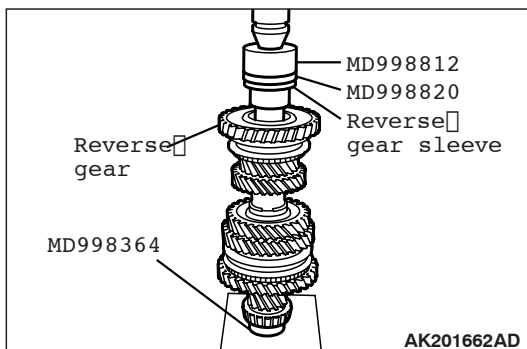
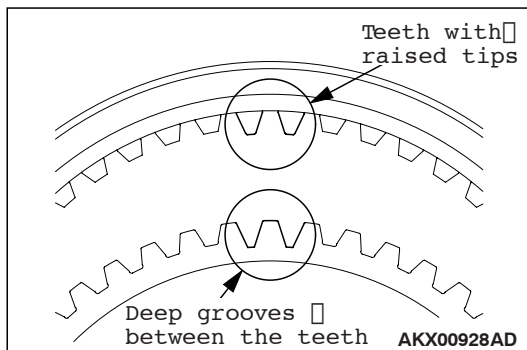


4. Using special tools, press install the 5th speed-reverse synchronizer hub with the press.
  - Installer cap (MD998812)
  - Installer-100 (MD998813)
  - Installer adapter (MD998821)
  - Camshaft oil seal installer (MD998364)
5. Make sure that the synchronizer ring on the 5th speed gear side can rotate freely.



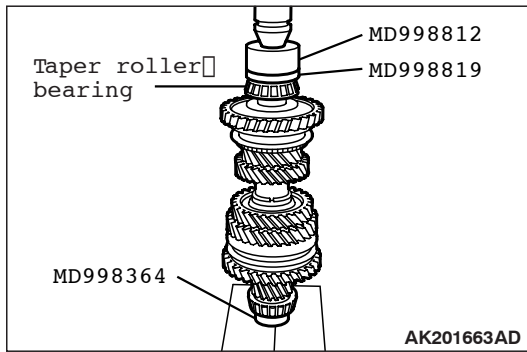
### >>N<< SYNCHRONIZER SLEEVE INSTALLATION

1. Check that the synchronizer sleeve is in the correct direction for installation, and install it on the 5th speed-reverse synchronizer hub.
2. Install the synchronizer sleeve so that the areas with teeth that have raised tips (three areas total) are aligned with the areas on the synchronizer hub that have deep grooves between the teeth (three areas total).



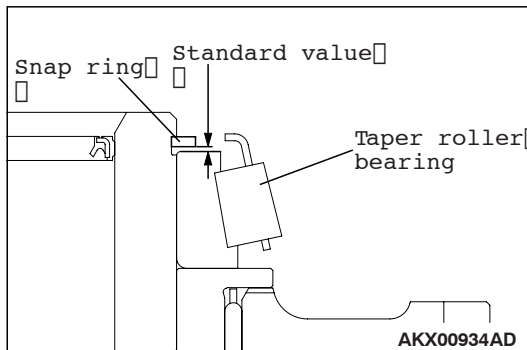
### >>O<< REVERSE GEAR BEARING SLEEVE INSTALLATION

1. Make sure the synchronizer ring, reverse gear and needle roller bearing have been correctly installed.
2. Using special tools, press fit the reverse gear sleeve. Make sure that the reverse gear and the synchronizer ring can rotate freely during the pressing process.
  - Installer cap (MD998812)
  - Installer adapter (MD998820)
  - Camshaft oil seal installer (MD998364)

**>>P<< TAPER ROLLER BEARING INSTALLATION**

Using special tools, press install the taper roller bearing.

- Installer cap (MD998812)
- Installer adapter (MD998819)
- Camshaft oil seal installer (MD998364)

**>>Q<< SNAP RING INSTALLATION**

1. Install the thickest snap ring that can be fitted in the groove of output shaft.
2. Make sure that the rear bearing end play meets the standard value.

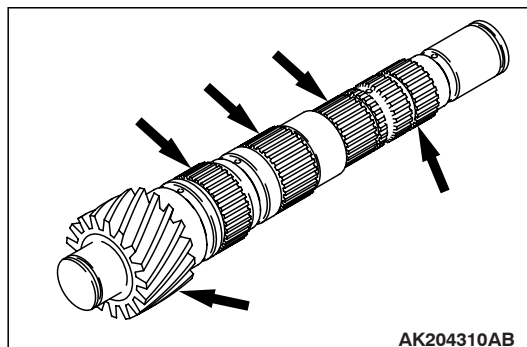
**Standard value: 0 – 0.09 mm**

**INSPECTION**

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**OUTPUT SHAFT**

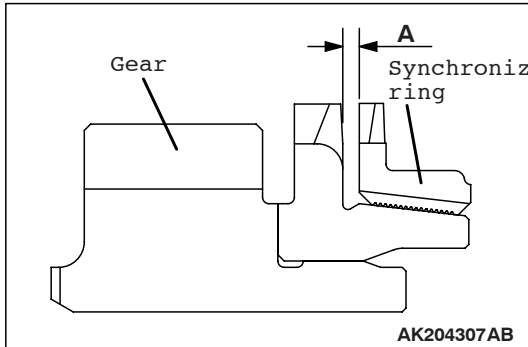
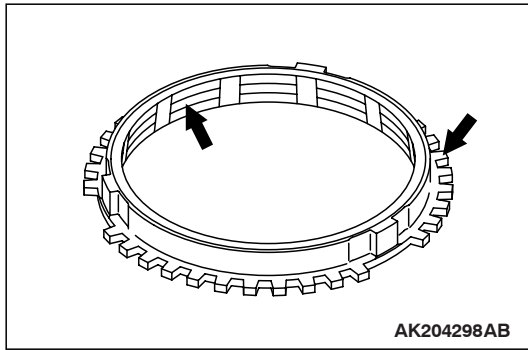
1. Check the splines for damage and wear.
2. Check that the helical gear teeth surfaces are not damaged or worn.

**NEEDLE ROLLER BEARING**

1. Combine the needle roller bearing with the bearing sleeve and gear, and check that it rotates smoothly without noise or play.
2. Check the needle roller bearing cage for deformation.

### SYNCHRONIZER RING <FOR 5TH SPEED>

1. Check if the clutch gear teeth are damaged.
2. Check internal surface for damage, wear and broken threads.



3. Force the synchronizer ring toward the clutch gear and check clearance "A." If "A" is less than the limit, replace the synchronizer ring.

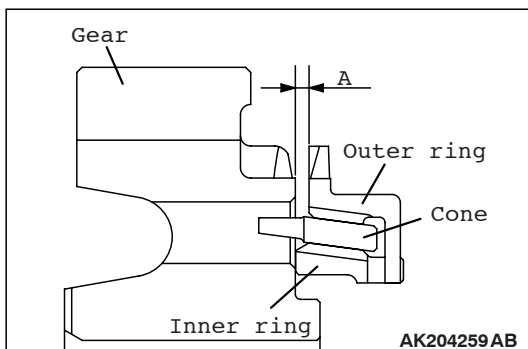
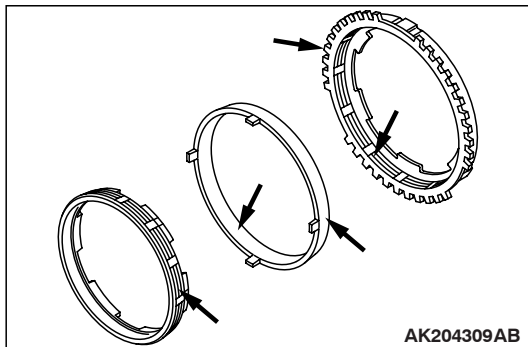
**Minimum limit: 0.5 mm**

### OUTER SYNCHRONIZER RING/INNER SYNCHRONIZER

#### **CAUTION** SYNCHRONIZER CONE <FOR REVERSE>

When replacing, replace the outer ring, inner ring and cone as a set.

1. Check that the clutch gear tooth surfaces and cone surfaces are not damaged or broken.



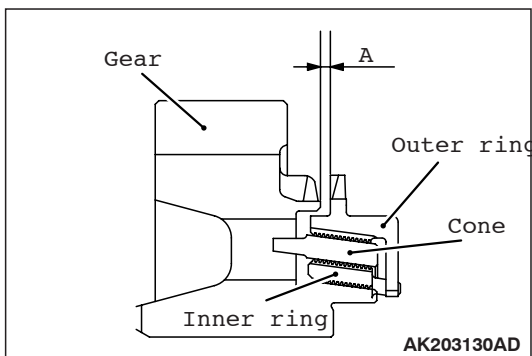
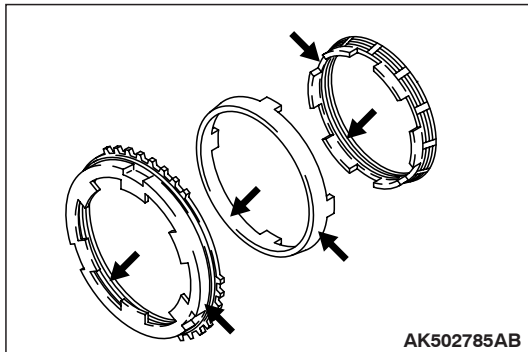
2. Install the outer ring, inner ring and cone, force them toward the gear, and check clearance "A." If "A" is less than the limit, replace them as a set.

**Minimum limit: 0.5 mm**

**OUTER SYNCHRONIZER RING/INNER SYNCHRONIZER RING/SPRING CONE <FOR 1ST SPEED AND 2ND SPEED>****⚠ CAUTION**

When replacing, replace the outer ring, inner ring and cone as a set.

1. Check that the clutch gear tooth surfaces and cone surfaces are not damaged or broken.

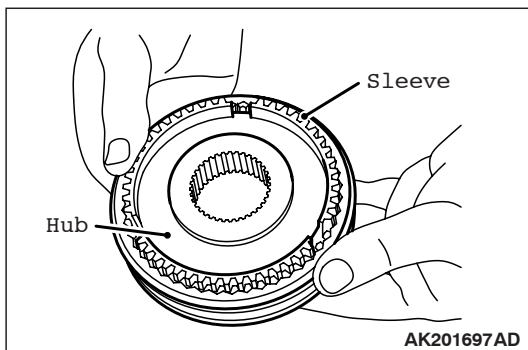


2. Install the outer ring, inner ring and cone, force them toward the gear, and check clearance "A." If "A" is less than the limit, replace them as a set.

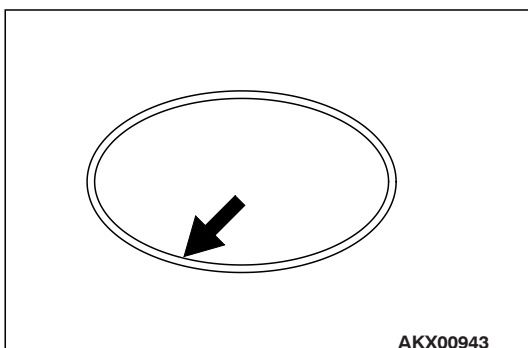
**Minimum limit: 0.5 mm**

**SYNCHRONIZER SLEEVE AND HUB**

1. Combine the synchronizer sleeve and hub, and check that they slide smoothly.
2. Check that the sleeve is free from damage at its inside splines ends.

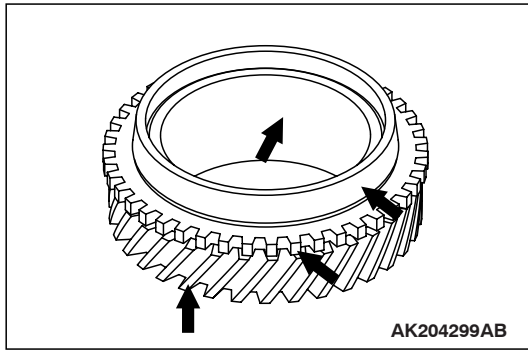
**SYNCHRONIZER SPRING**

Check that the spring is not sagging, deformed or broken.



### SPEED GEARS

1. Check that the helical and clutch gear tooth surfaces are not damaged or worn.
2. Check that the synchronizer cone surfaces are not roughened, damaged or worn.
3. Check that the gear inside diameter and front and rear surfaces are not damaged or worn.

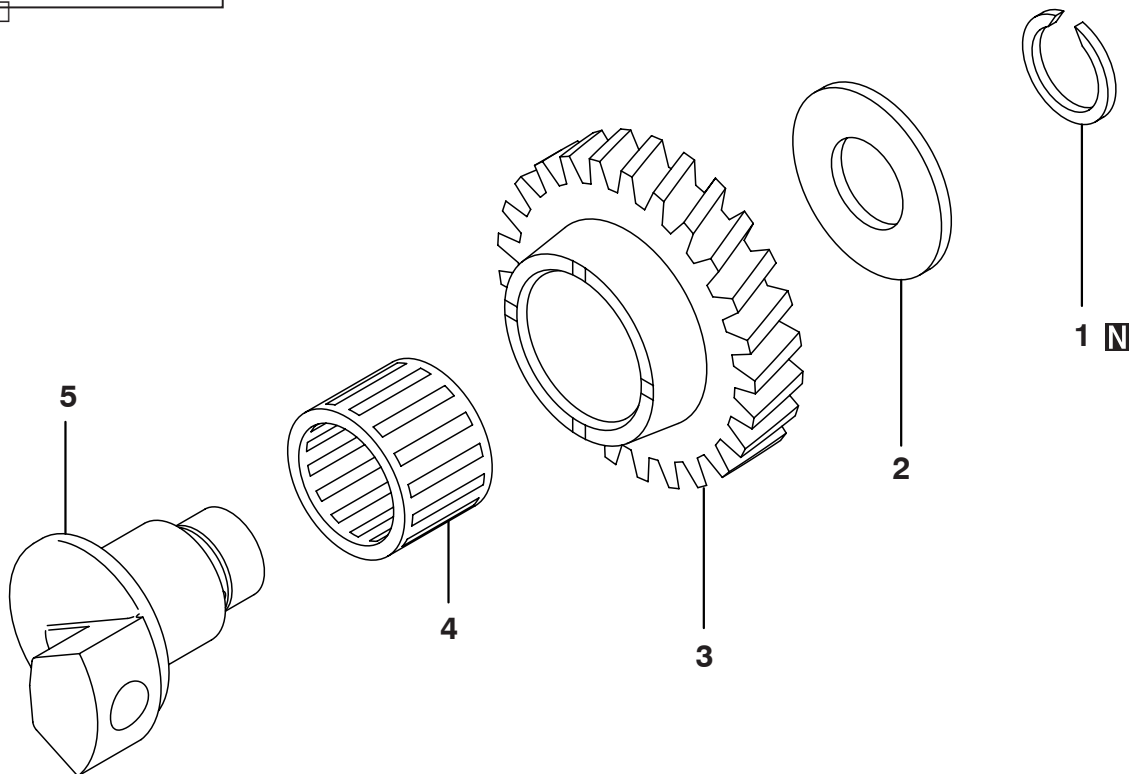


## REVERSE IDLER GEAR

### DISASSEMBLY AND REASSEMBLY

M1222012500277

Apply gear oil to all  
moving parts before  
installation.



AK305225AB

#### Disassembly steps

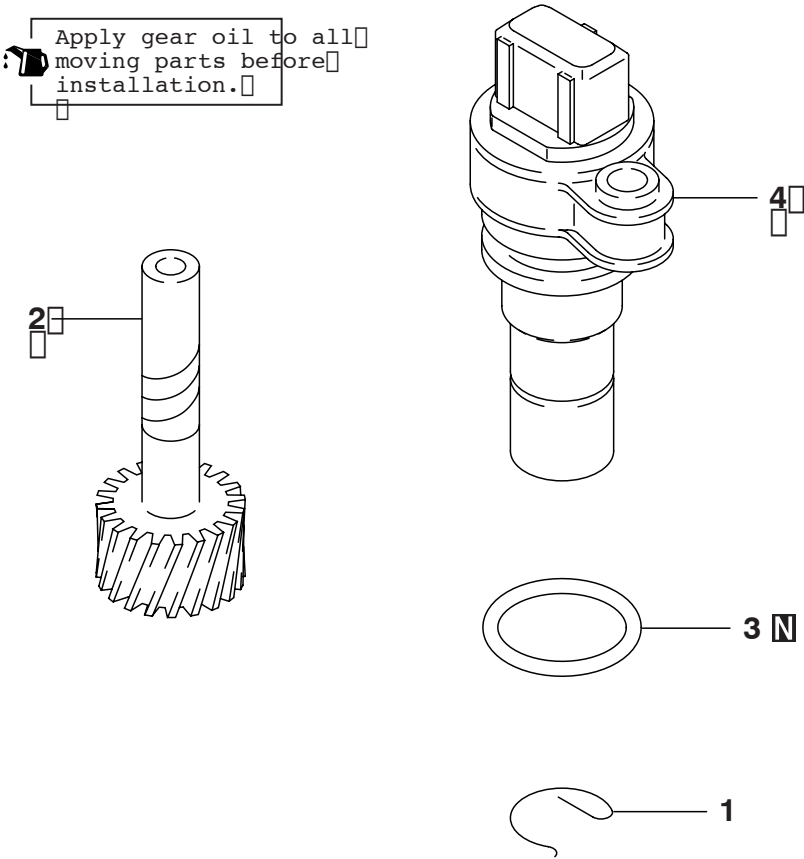
1. Snap ring
2. Thrust washer
3. Reverse idler gear

#### Disassembly steps ( つづき )

4. Needle roller bearing
5. Reverse idler gear shaft

VEHICLE SPEED SENSOR  
DISASSEMBLY AND REASSEMBLY

M1222007000038



- Disassembly steps**
- 1. E-clip
  - 2. Speed sensor gear

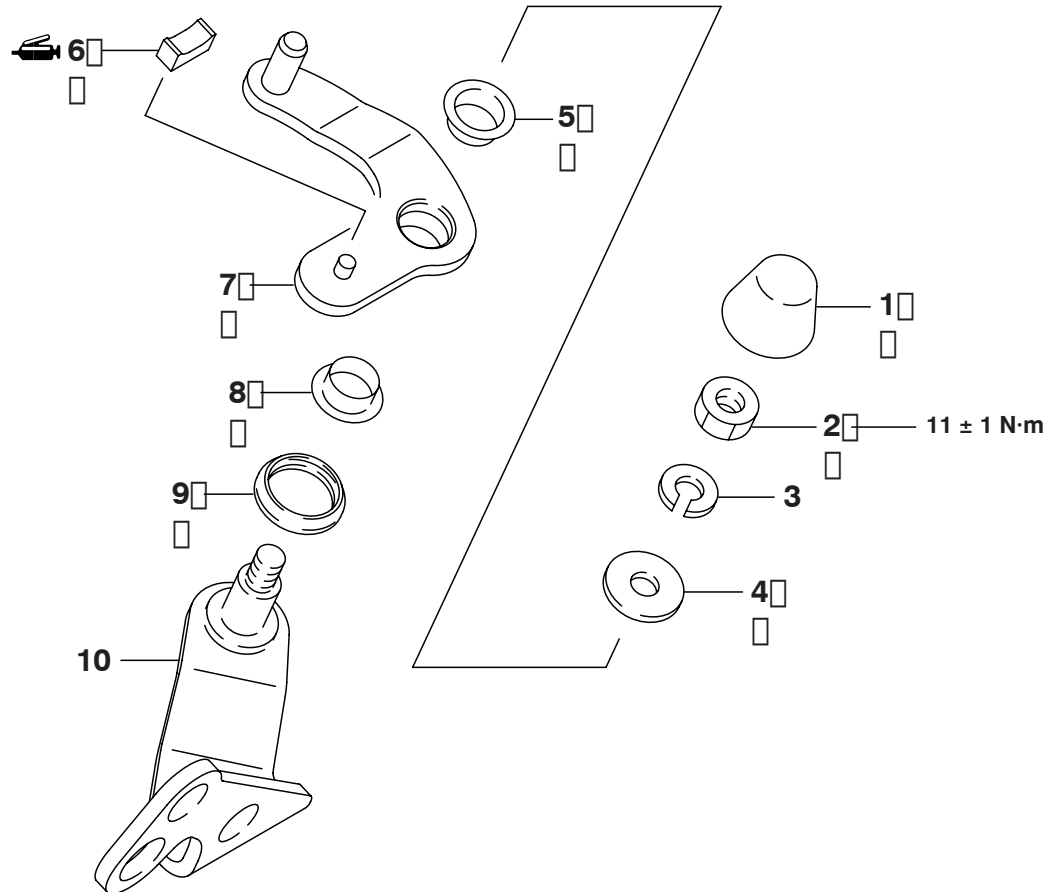
- Disassembly steps ( つづき )**
- 3. O-ring
  - 4. Speed sensor

AK204397AB

# SELECT LEVER

## DISASSEMBLY AND REASSEMBLY

M1222012800193



AK502136AB

### Disassembly steps

1. Dust cover
2. Nut
3. Spring washer
4. Washer
- >>A<< 5. Select lever bushing

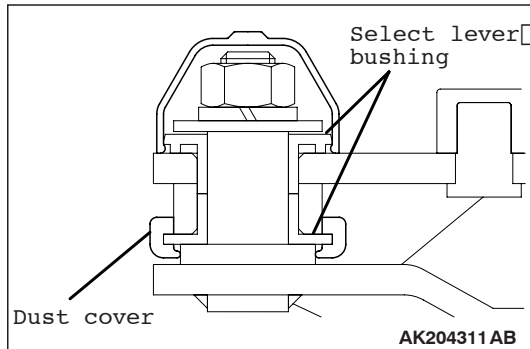
### Disassembly steps ( つづき )

6. Select lever shoe
7. Select lever
- >>A<< 8. Select lever bushing
- >>A<< 9. Dust cover
10. Select lever shaft

## REASSEMBLY SERVICE POINT

>>A<< DUST COVER AND SELECT LEVER BUSHING  
INSTALLATION

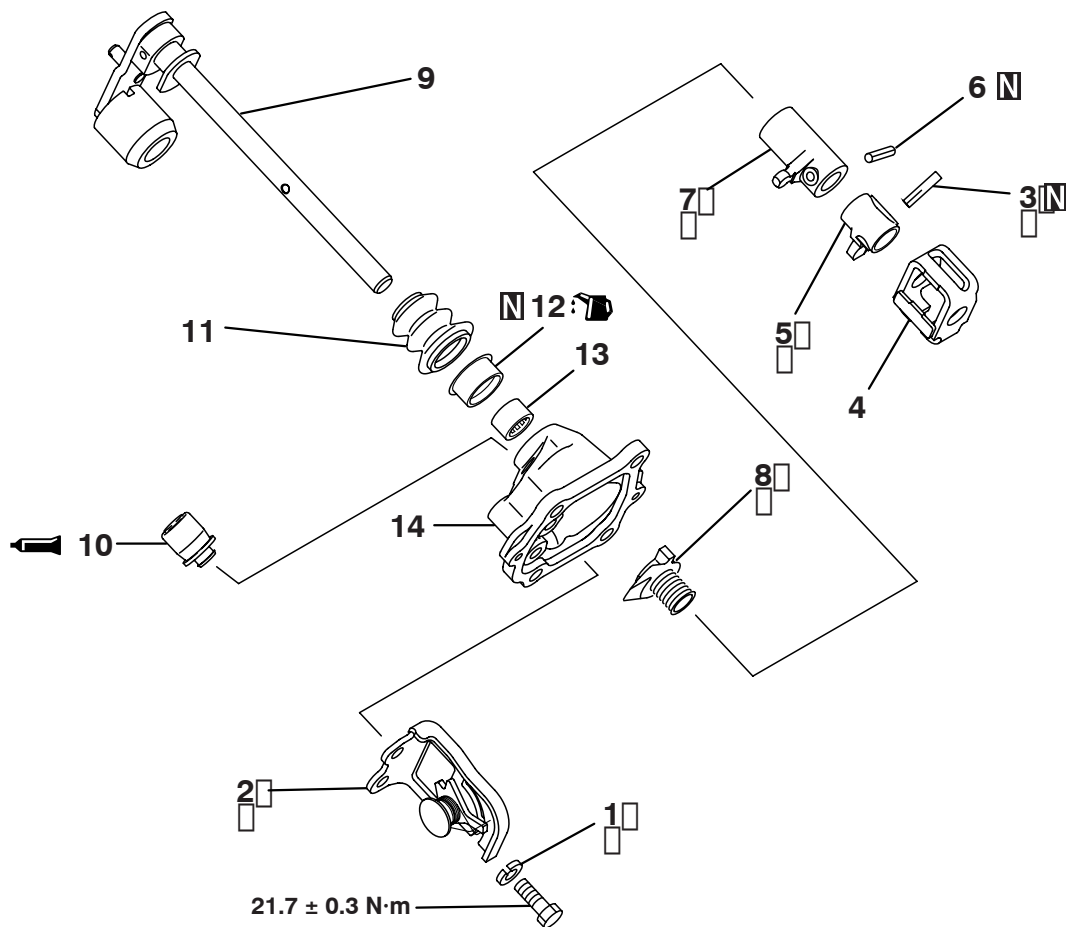
Make sure the dust cover and select lever bushing installation direction is correct, and distinguished parts are correctly assembled. Refer to the figure at left.



## CONTROL HOUSING

## DISASSEMBLY AND REASSEMBLY

M1222013100302



AK502052AB



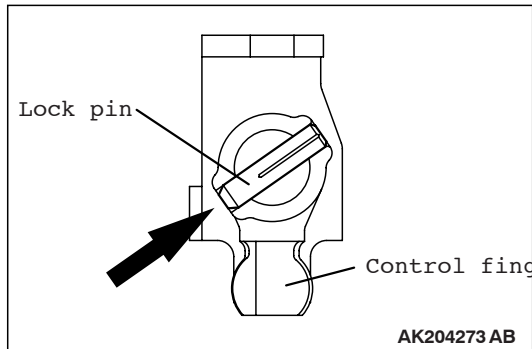
- Disassembly steps**
- <<A>> >>E<<
1. Spring washer
  2. Stopper bracket
  3. Lock pin
  4. Interlock plate
  5. Control finger
  - >>D<< 6. Spring pin
  7. Stopper body

- Disassembly steps ( つづき )**
8. Neutral return spring
  9. Control shaft
  - >>C<< 10. Air breather
  11. Control shaft boot
  - >>B<< 12. Oil seal
  - >>A<< 13. Needle bearing
  14. Control housing

## DISASSEMBLY SERVICE POINT

### <<A>> LOCK PIN REMOVAL

Drive out the lock pin from the direction shown.

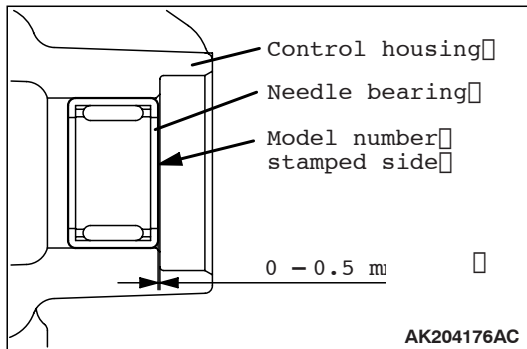


## REASSEMBLY SERVICE POINTS

### >>A<< NEEDLE BEARING INSTALLATION

Press fit the needle bearing into the control housing side as shown.

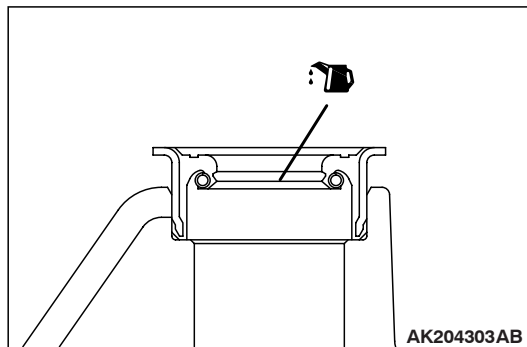
Make sure that the side with the model number stamped on it faces the end of the control housing as shown.



### >>B<< OIL SEAL INSTALLATION

Apply transmission oil to the oil seal lip area.

**Transmission oil:**  
**Genuine Mitsubishi MTF**

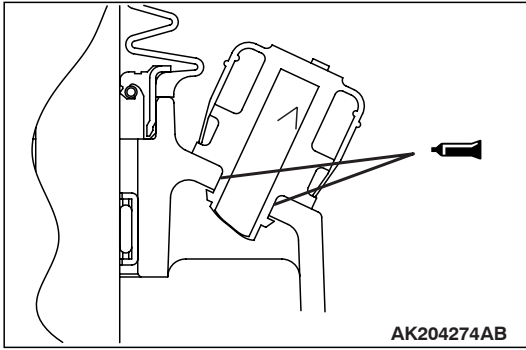


## &gt;&gt;C&lt;&lt; AIR BREATHER INSTALLATION

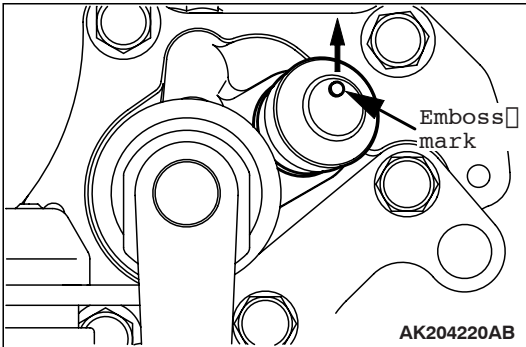
1. Apply sealant to the inserting portion of air breather.

**Specified sealant:**

**3M SUPER WEATHERSTRIP No.8001 or equivalent**

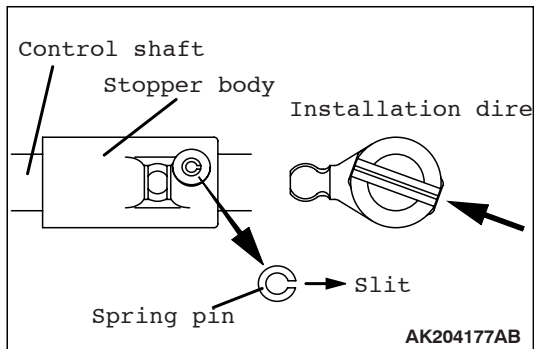


2. Install the air breather so that the emboss mark is in the direction shown in the figure.



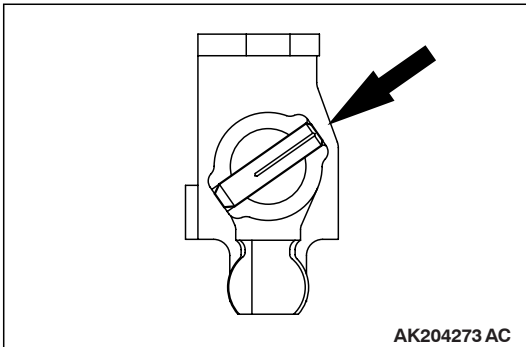
## &gt;&gt;D&lt;&lt; SPRING PIN INSTALLATION

Drive in the spring pin so that the slit is in the direction shown in the figure.



## &gt;&gt;E&lt;&lt; LOCK PIN INSTALLATION

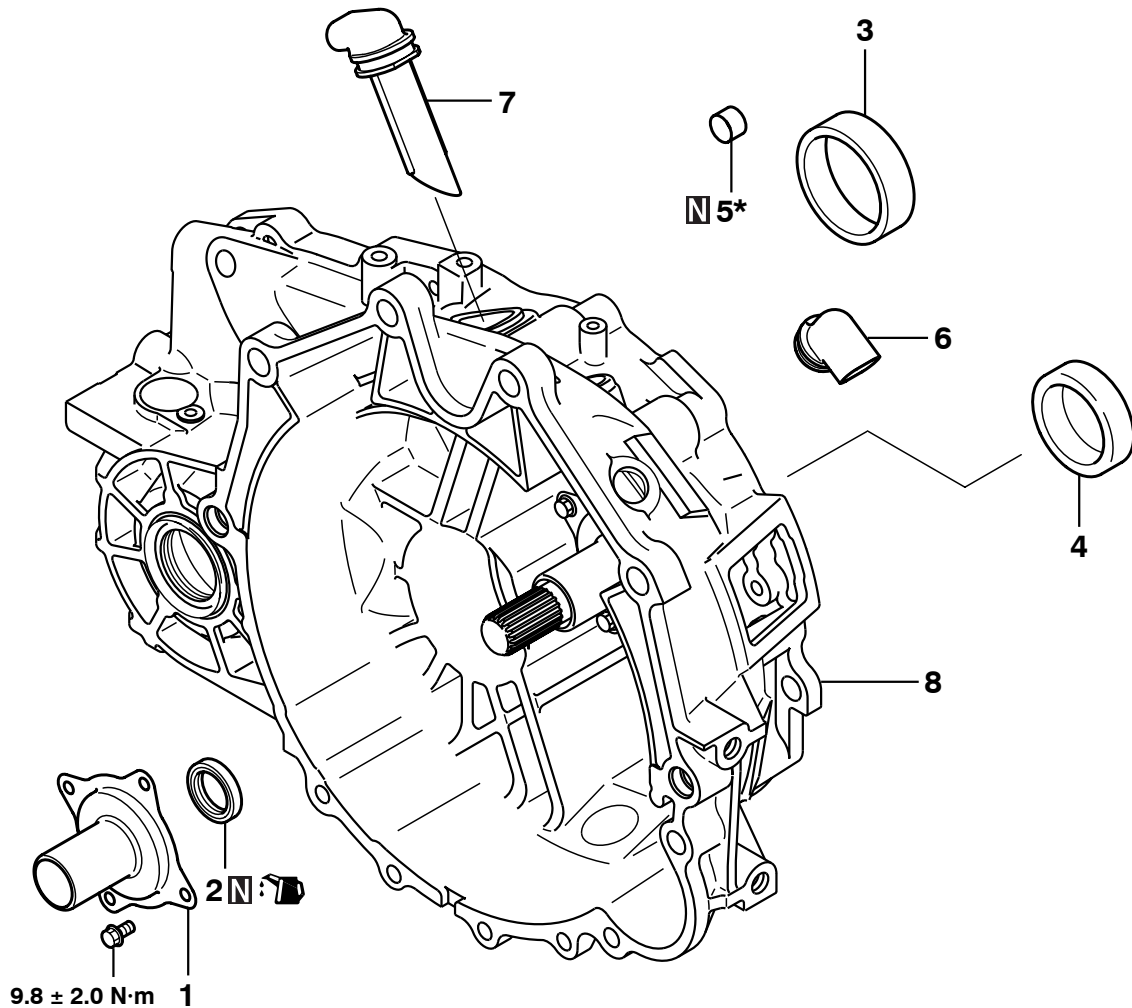
Drive the lock pin in from the direction shown in the figure.



# CLUTCH HOUSING

## DISASSEMBLY AND REASSEMBLY

M1222003700369



AK502134AB

### Disassembly steps

- |       |       |                                 |
|-------|-------|---------------------------------|
|       | 1.    | Clutch release bearing retainer |
| >>E<< | 2.    | Oil seal                        |
| <<A>> | >>D<< | 3. Outer race                   |
| <<B>> | >>C<< | 4. Outer race                   |
|       | >>B<< | 5. Bushing*                     |
|       | >>A<< | 6. Cover-A                      |

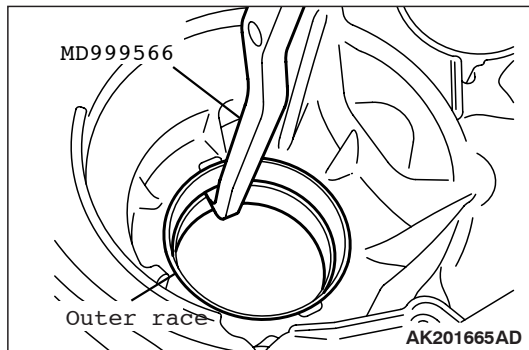
### Disassembly steps ( つづき )

- |       |    |                |
|-------|----|----------------|
| >>A<< | 7. | Cover-B        |
|       | 8. | Clutch housing |

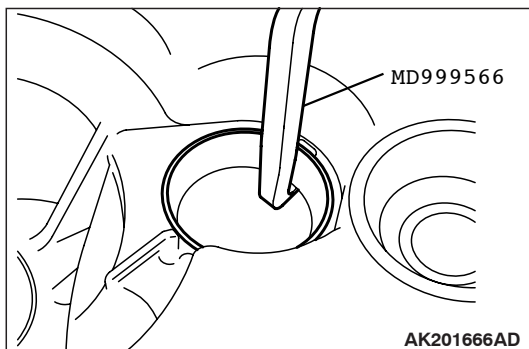
NOTE: \*Refer to the bushing installation procedures only when replacing the clutch housing.

**DISASSEMBLY SERVICE POINTS****<<A>> OUTER RACE REMOVAL**

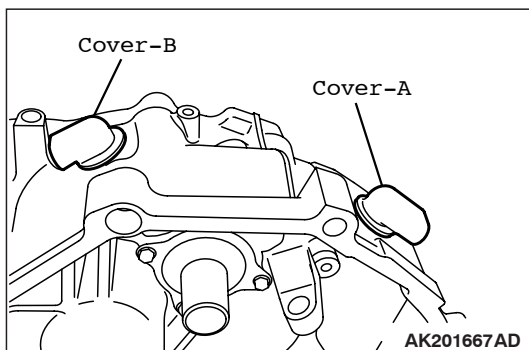
Using special tool Claw (MD999566), remove the outer race from the clutch housing.

**<<B>> OUTER RACE REMOVAL**

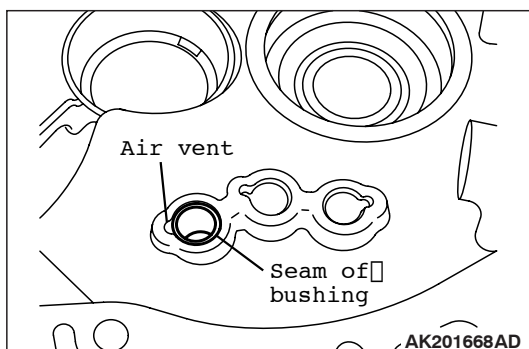
Using special tool Claw (MD999566), remove the outer race from the clutch housing.

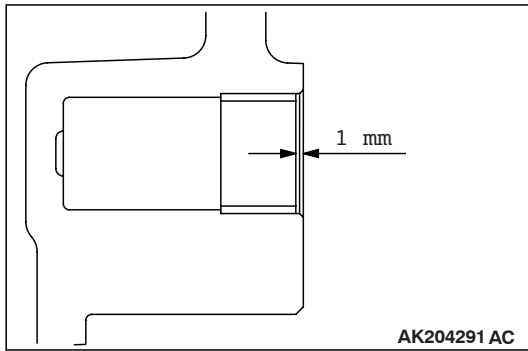
**REASSEMBLY SERVICE POINTS****>>A<< COVER-B/COVER-A INSTALLATION**

Install the covers directed as shown in the illustration.

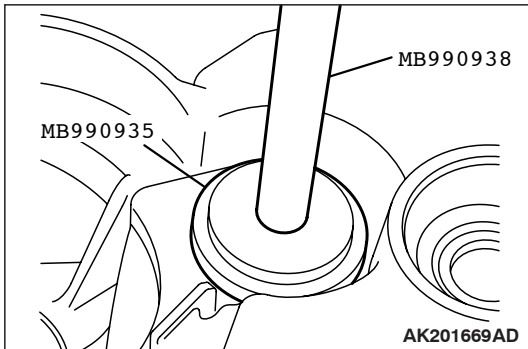
**>>B<< BUSHING INSTALLATION**

1. Press fit the bushing so the seam is away from the air vent.





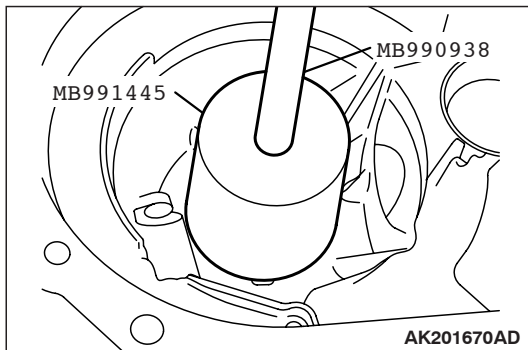
2. Be sure the bushing is fully seated as shown. It must be 1 mm below the housing surface.



### >>C<< OUTER RACE INSTALLATION

Using special tools, press fit the outer race into the clutch housing.

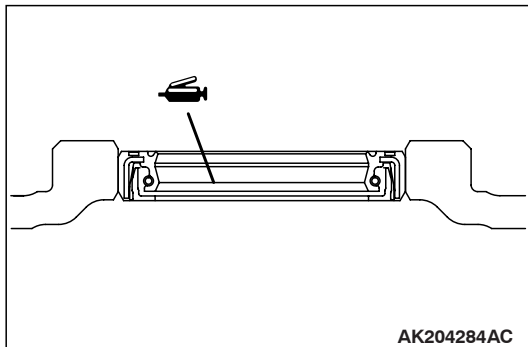
- Handle (MB990938)
- Installer adapter (MB990935)



### >>D<< OUTER RACE INSTALLATION

1. Check the installation direction of the outer race.
2. Using special tools, press fit the outer race into the clutch housing.

- Handle (MB990938)
- Bushing remover and installer base (MB991445)

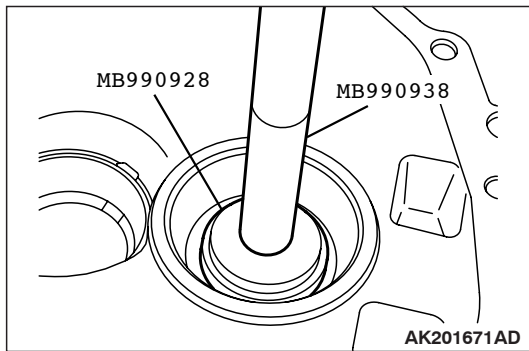


### >>E<< OIL SEAL INSTALLATION

1. Pack grease in the oil seal lip area.

**Specified grease:**

**Mitsubishi Part No. 0101011 or equivalent**



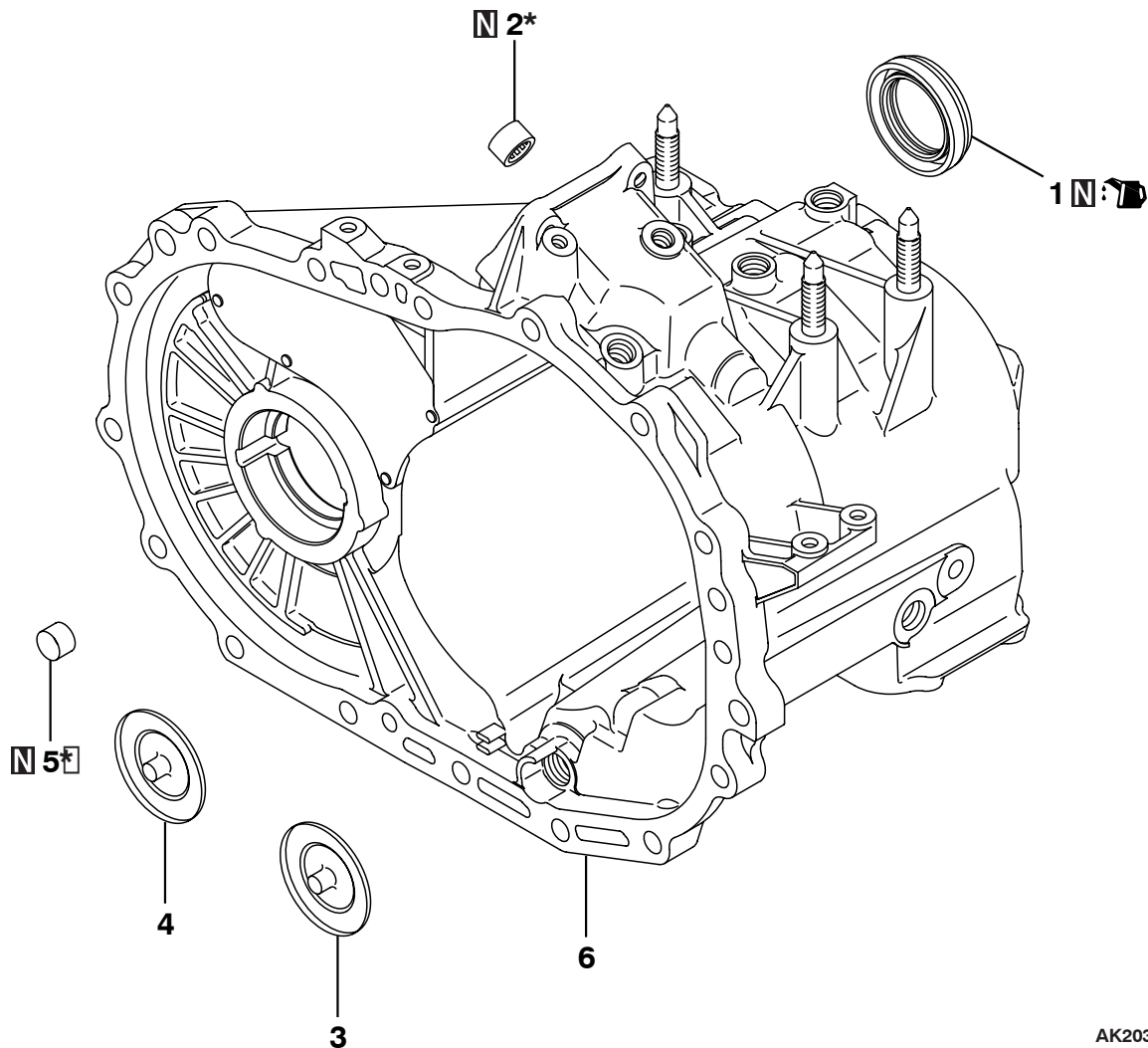
2. Using special tools, press fit the oil seal into the clutch housing.

- Handle (MB990938)
- Installer adapter (MB990928)

## TRANSMISSION CASE

### DISASSEMBLY AND REASSEMBLY

M1222013400303



AK203131AD

#### Disassembly steps

- >>D<< 1. Oil seal  
>>C<< 2. Needle bearing\*  
>>B<< 3. Oil guide

#### Disassembly steps ( つづき )

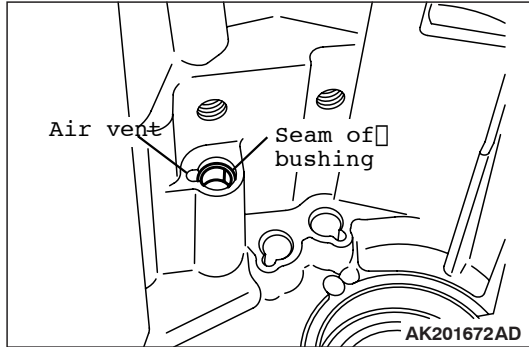
- >>B<< 4. Oil guide  
>>A<< 5. Bushing\*  
6. Transmission

**NOTE:** \*Refer to the needle bearing and bushing installation procedures only when replacing the transmission case.

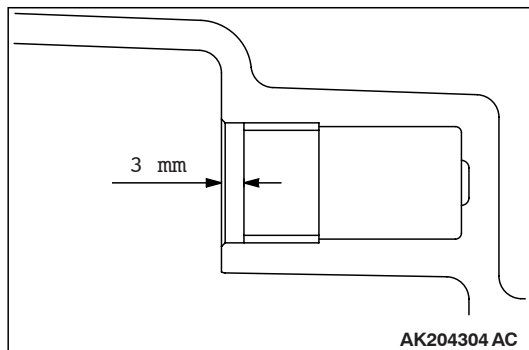
## REASSEMBLY SERVICE POINTS

### >>A<< BUSHING INSTALLATION

1. Press fit the bushing so the seam is away from the air vent.

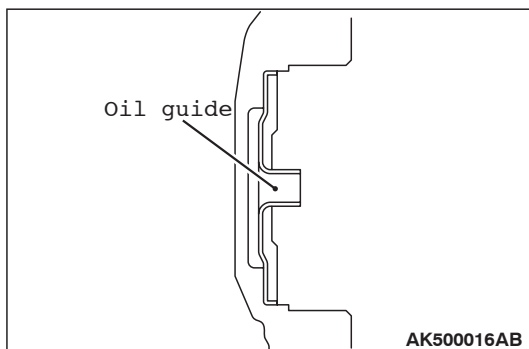


2. Be sure the bushing is fully seated as shown. It must be 3 mm below the housing surface.



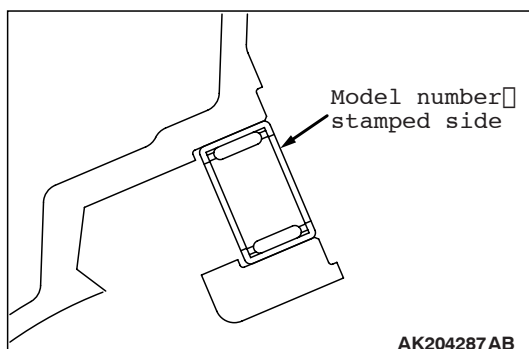
### >>B<< OIL GUIDE INSTALLATION

Evenly press the oil guide so it is fully seated and not at an angle.



### >>C<< NEEDLE BEARING INSTALLATION

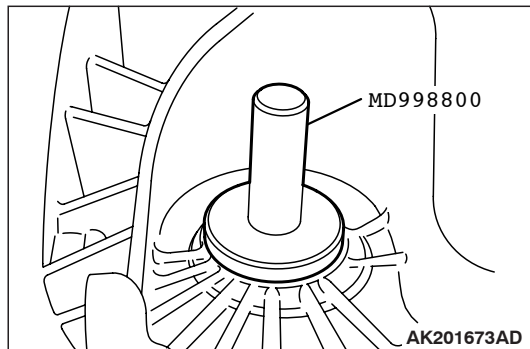
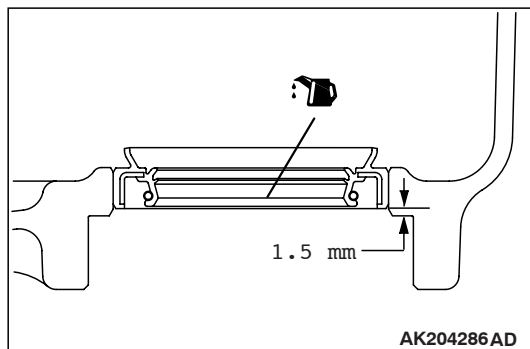
1. Check the installation direction of the needle bearing.
2. Press fit the needle bearing until it is flush with the case.



## &gt;&gt;D&lt;&lt; OIL SEAL INSTALLATION

1. Apply transmission oil to the oil seal lip area.

**Transmission oil:**  
**Genuine Mitsubishi MTF**



2. Using special tool Differential oil seal installer (MD998800), press fit the oil seal into the transmission case.

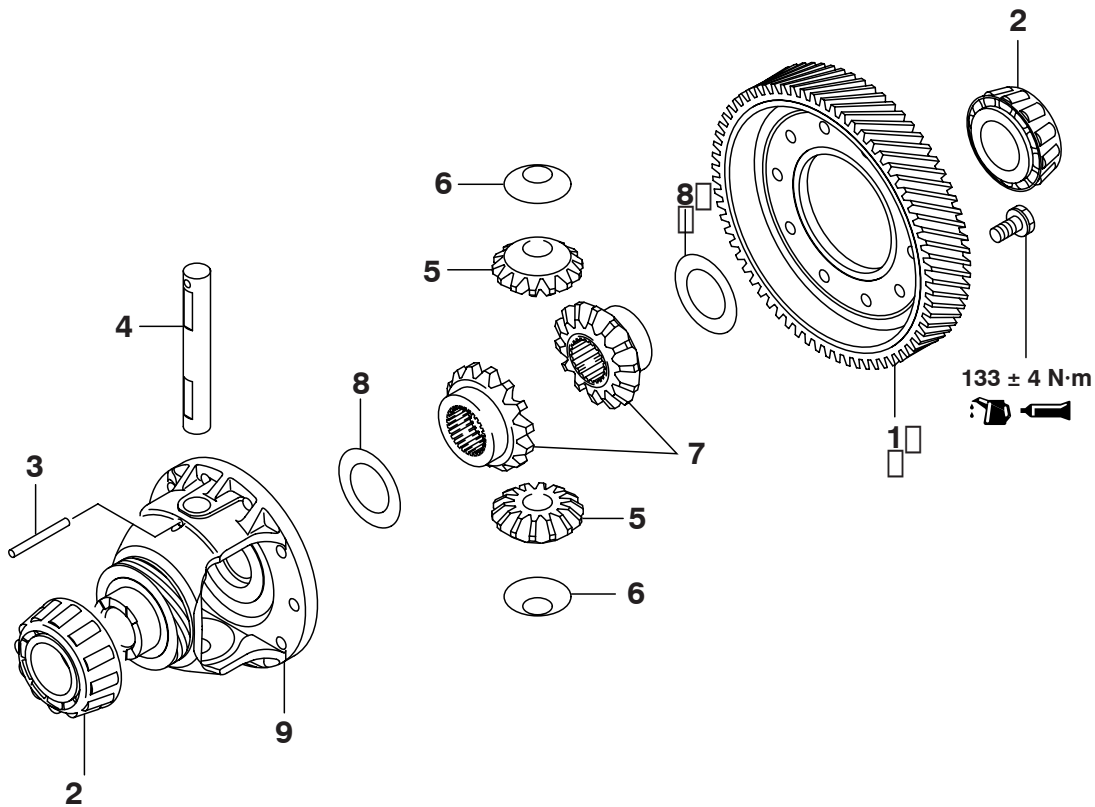


# DIFFERENTIAL

## DISASSEMBLY AND REASSEMBLY

M1222002500254

Apply gear oil to all  
moving parts before  
installation.



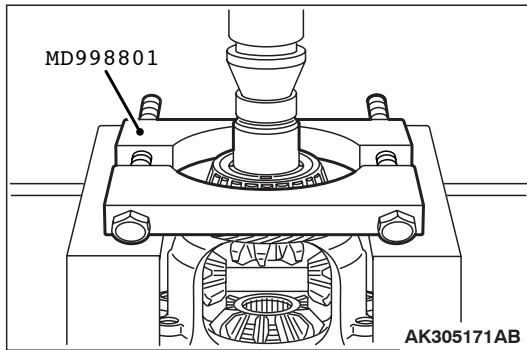
AK502153AB

- <<A>>
- Disassembly steps**
- >>D<< 1. Differential drive gear
  - >>C<< 2. Taper roller bearing
  - >>B<< 3. Lock pin
  - >>A<< 4. Pinion shaft
  - >>A<< 5. Pinion

- Disassembly steps ( つづき )**
- >>A<< 6. Washer
  - >>A<< 7. Side gear
  - >>A<< 8. Spacer
  - 9. Differential case

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

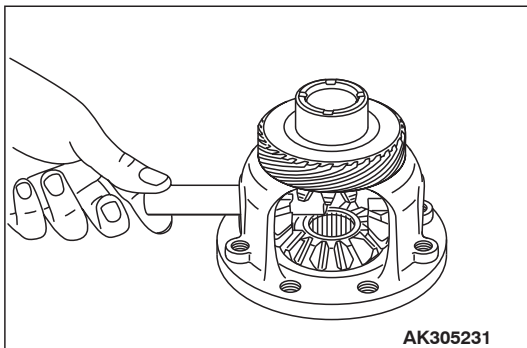
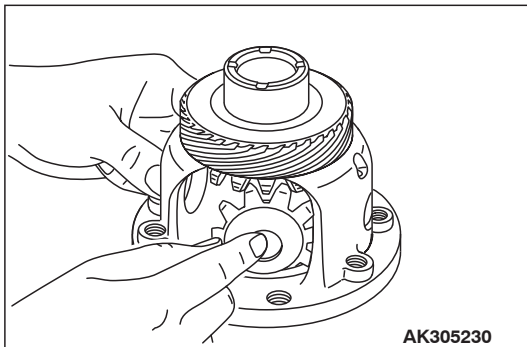
1. Using special tool Bearing remover (MD998801), support the taper roller bearing, and then set them on the press.
2. Push down on the differential case with the press and remove the bearing.

**REASSEMBLY SERVICE POINTS****>>A<< SPACER/SIDE GEAR/WASHER/PINION/PINION SHAFT INSTALLATION**

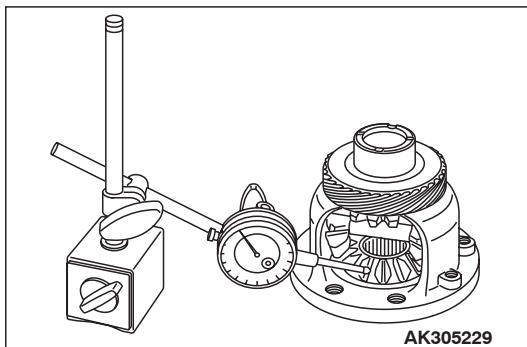
1. After a spacer has been mounted on the back surface of the side gear, install the side gear in the differential case.

*NOTE: When a new side gear is to be installed, mount a medium thickness spacer.*

2. Set the washer on the back of each pinion, and put both pinions simultaneously in mesh with the side gears. While rotating them, install them in position.



3. Insert the pinion shaft.



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

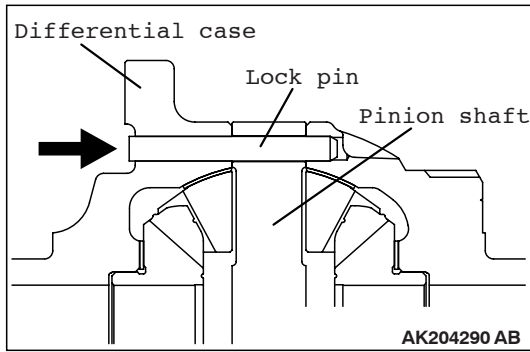
**Standard value: 0.025 – 0.150 mm**

5. If the backlash is out of specification, select a spacer that should get the back lash with in the standard value and re-measure the backlash.

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

### >>B<< LOCK PIN INSTALLATION

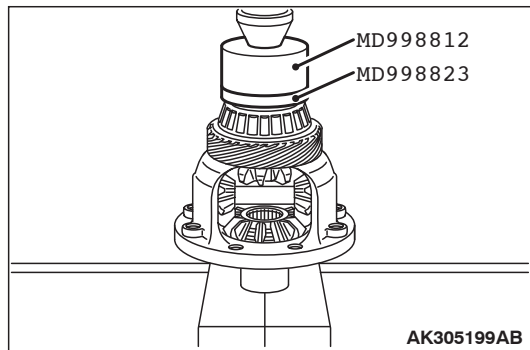
Install the lock pin so that it will be oriented in the direction shown.



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

Using special tools, install the taper roller bearing with the press.

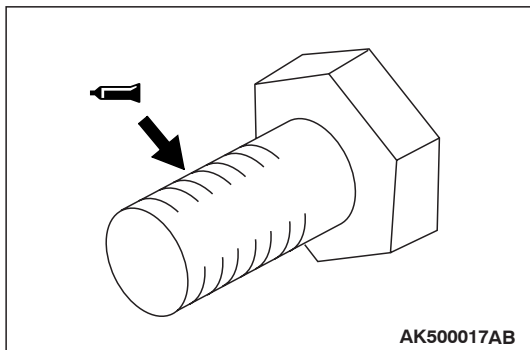
- Installer cap (MD998812)
- Installer adapter (MD998823)



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

1. Apply sealant to the entire threaded portion of the bolt.

**Specified sealant: 3M STUD Locking No.4170 or equivalent**



2. Tighten to the specified torque of  $133 \pm 4$  N·m in the illustrated sequence.

