

GROUP 22B

MANUAL TRANSAXLE OVERHAUL

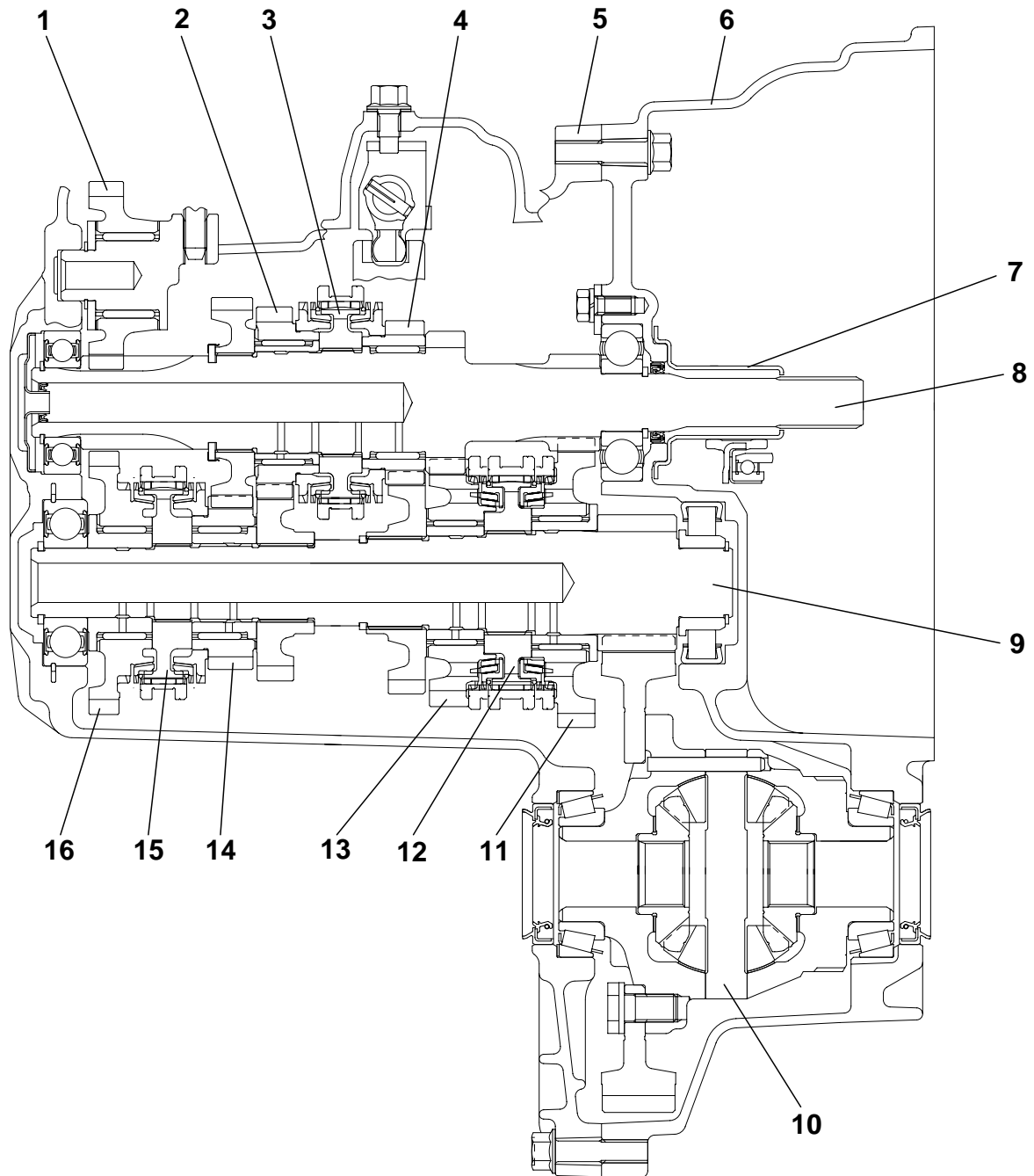
CONTENTS

GENERAL DESCRIPTION	22B-2	SELECT LEVER	22B-51
		DISASSEMBLY AND ASSEMBLY	22B-51
SPECIAL TOOLS	22B-4	CONTROL HOUSING	22B-53
		DISASSEMBLY AND ASSEMBLY	22B-53
TRANSAXLE (TRANSMISSION)	22B-8	CLUTCH HOUSING	22B-56
DISASSEMBLY AND ASSEMBLY	22B-8	DISASSEMBLY AND ASSEMBLY	22B-56
INSPECTION	22B-22	TRANSMISSION CASE	22B-63
		DISASSEMBLY AND ASSEMBLY	22B-63
INPUT SHAFT	22B-23	DIFFERENTIAL	22B-67
DISASSEMBLY AND ASSEMBLY	22B-23	DISASSEMBLY AND ASSEMBLY	22B-67
INSPECTION	22B-30	SPECIFICATIONS	22B-71
		FASTENER TIGHTENING	
OUTPUT SHAFT	22B-33	SPECIFICATIONS.....	22B-71
DISASSEMBLY AND ASSEMBLY	22B-33	GENERAL SPECIFICATIONS	22B-71
INSPECTION	22B-47	SERVICE SPECIFICATIONS	22B-71
		SEALANTS	22B-72
REVERSE IDLER GEAR	22B-49	LUBRICANTS	22B-72
DISASSEMBLY AND ASSEMBLY	22B-49		
SPEEDOMETER GEAR	22B-50		
DISASSEMBLY AND ASSEMBLY	22B-50		

GENERAL DESCRIPTION

M1222000100023

SECTIONAL VIEW<F5M42>

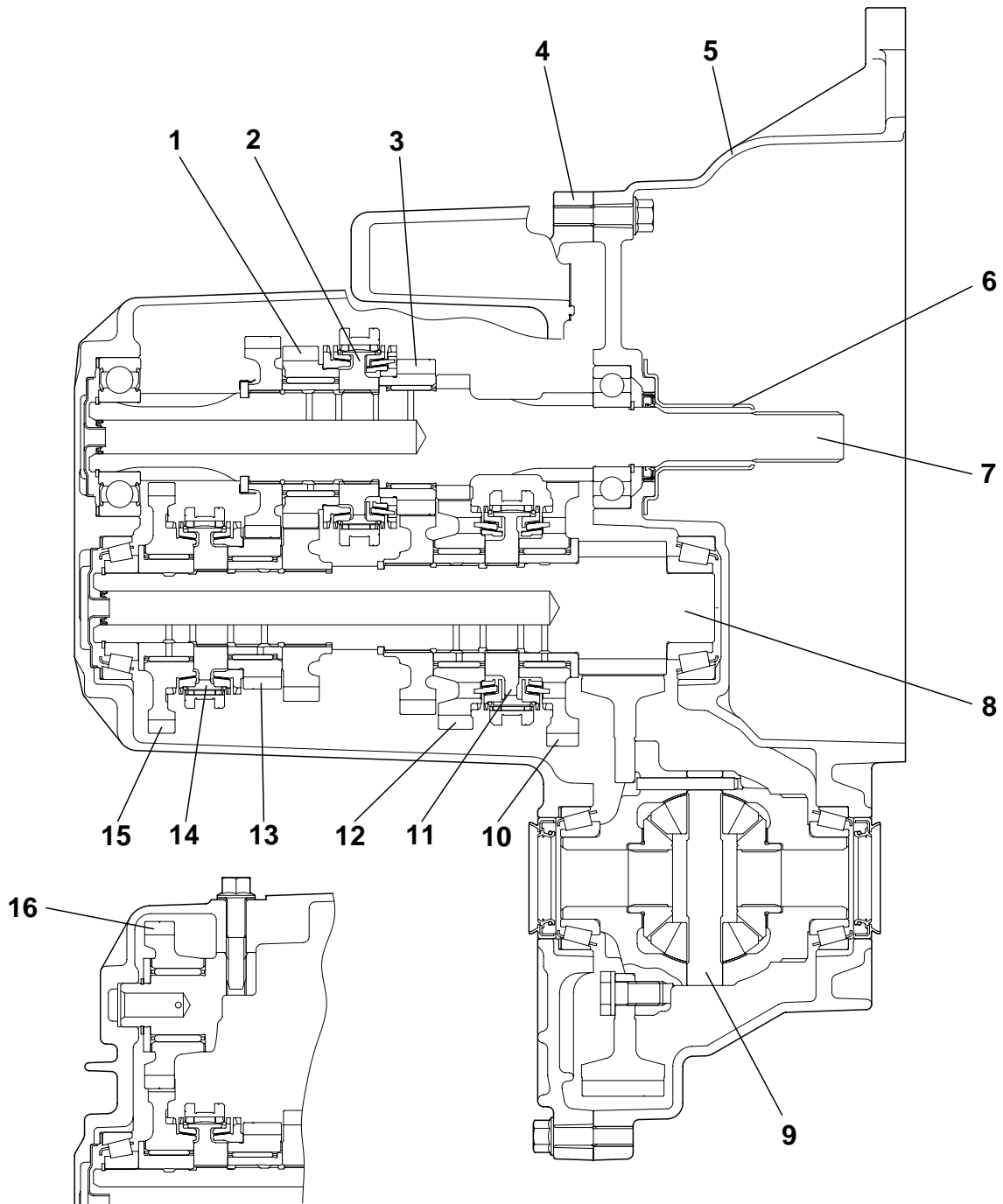


AKX00944AB

- | | |
|-----------------------------------|--|
| 1. REVERSE IDLER GEAR | 10. DIFFERENTIAL |
| 2. 4TH SPEED GEAR | 11. 1ST SPEED GEAR |
| 3. 3RD-4TH SPEED SYNCHRONIZER HUB | 12. 1ST-2ND SPEED SYNCHRONIZER HUB |
| 4. 3RD SPEED GEAR | 13. 2ND SPEED GEAR |
| 5. TRANSAXLE CASE | 14. 5TH SPEED GEAR |
| 6. CLUTCH HOUSING | 15. 5TH-REVERSE SPEED SYNCHRONIZER HUB |
| 7. RELEASE BEARING RETAINER | 16. REVERSE GEAR |
| 8. INPUT SHAFT | |
| 9. OUTPUT SHAFT | |

TSB Revision

SECTIONAL VIEW<F5M51>



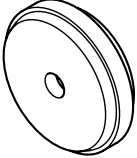
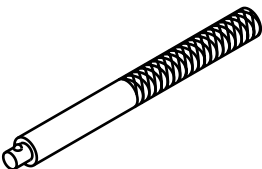

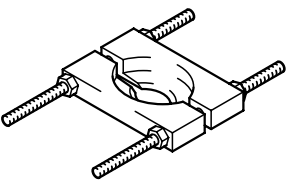

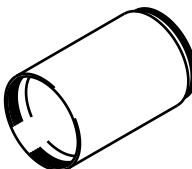
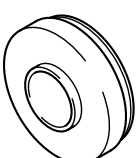
AKX00912AB

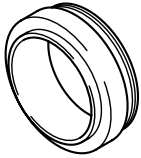
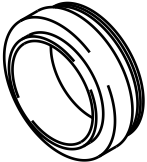

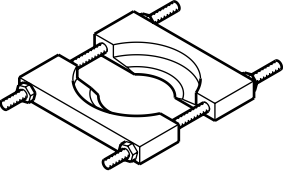
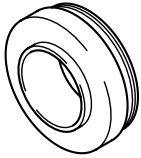
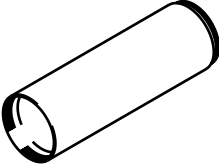
- | | |
|-----------------------------------|--|
| 1. 4TH SPEED GEAR | 10. 1ST SPEED GEAR |
| 2. 3RD-4TH SPEED SYNCHRONIZER HUB | 11. 1ST-2ND SPEED SYNCHRONIZER HUB |
| 3. 3RD SPEED GEAR | 12. 2ND SPEED GEAR |
| 4. TRANSMISSION CASE | 13. 5TH SPEED GEAR |
| 5. CLUTCH HOUSING | 14. 5TH-REVERSE SPEED SYNCHRONIZER HUB |
| 6. RELEASE BEARING RETAINER | 15. REVERSE GEAR |
| 7. INPUT SHAFT | 16. REVERSE IDLER GEAR |
| 8. OUTPUT SHAFT | |
| 9. DIFFERENTIAL | |

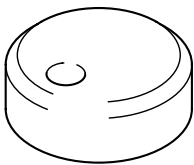
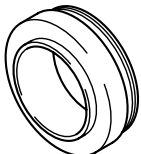
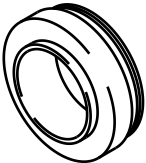
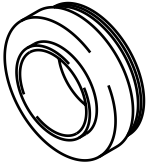
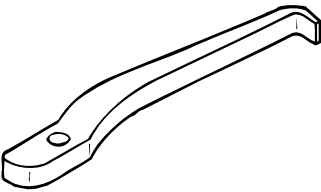
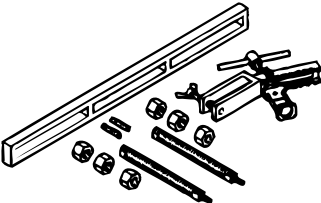
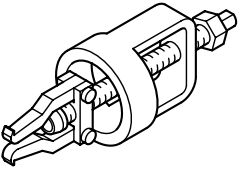

TSB Revision


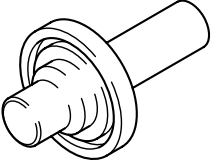
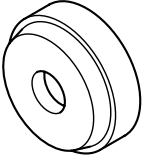
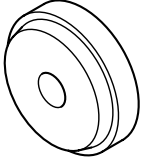
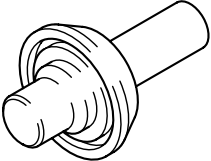
SPECIAL TOOLS

M1222000600028

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MB990935 Installer adapter	MB990935-01 OR GENERAL SERVICE TOOL	<ul style="list-style-type: none"> • Installation of differential case taper roller bearing outer race <F5M42> • Installation of output shaft front taper roller bearing outer race <F5M51>
	MB990938 Handle	MB990938-01	Use with Installer adapter
	MB990927 Installer adapter	MB990927-01 OR GENERAL SERVICE TOOL	Installation of sealing cap <F5M42>
	MD998801 Bearing remover	MD998348-01 OR GENERAL SERVICE TOOL	Installation and removal of gears, bearings and sleeves
	MD998812 Installer cap	GENERAL SERVICE TOOL	Use with Installer and Installer adapter
	MD998813 Installer-100	GENERAL SERVICE TOOL	Use with Installer cap and Installer adapter
	MD998816 Installer adapter (30)	GENERAL SERVICE TOOL	Installation of input shaft front bearing

TOOL	TOOL NUMBER AND NAME	SUPERSESSSION	APPLICATION
	MD998825 Installer adapter (52)	GENERAL SERVICE TOOL	<ul style="list-style-type: none"> • Installation of 1st-2nd speed synchronizer hub, 3rd-4th speed synchronizer hub and 1st speed gear sleeve <F5M42> • Installation of 1st speed gear sleeve, 3rd-4th speed synchronizer hub, 4th speed gear sleeve, 5th speed gear and thrust plate stopper <F5M51>
	MD998824 Installer adapter (50)	GENERAL SERVICE TOOL	<ul style="list-style-type: none"> • Installation of 4th speed gear sleeve and 5th speed gear <F5M42> • Installation of 1st-2nd speed synchronizer hub, 2nd speed gear sleeve and 3rd speed gear <F5M51>
	MD998818 Installer adapter (38)	MD998818	<ul style="list-style-type: none"> • Installation of input shaft rear bearing, roller bearing inner race, reverse gear sleeve and output shaft rear ball bearing <F5M41> • Installation of input shaft front bearing <F5M51>
	MD998917 Bearing remover	GENERAL SERVICE TOOL	Installation and removal of gears, bearing and sleeves
	MD998819 Installer adapter (40)	GENERAL SERVICE TOOL	<ul style="list-style-type: none"> • Installation of 5th-reverse speed synchronizer hub, differential case bearing, 4th speed gear and 5th speed gear sleeve <F5M42> • Installation of input shaft rear bearing and output shaft taper roller bearing <F5M51>
	MD998814 Installer-200	MIT304180	Use with Installer cap and Installer adapter

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
	MD998364 Camshaft oil seal installer	MD998364-01	Installation of gear, bearing and sleeve <F5M51>
	MD998822 Installer adapter (46)	GENERAL SERVICE TOOL	Installation of 2nd speed gear sleeve and 3rd speed gear <F5M42>
	MD998821 Installer adapter (44)	MD998821	Installation of 4th speed gear, 5th speed gear sleeve and 5th-reverse speed synchronizer hub <F5M51>
	MD998820 Installer adapter (42)	MIT215013	Installation of reverse gear bearing sleeve <F5M51>
	MD999566 Claw	GENERAL SERVICE TOOL	Removal of taper roller bearing outer race
	MD998772 Valve spring compressor	GENERAL SERVICE TOOL	Removal of output shaft front roller bearing outer race <F5M42>
	MD998346 Bearing outer race remover	MD998346-01 OR GENERAL SERVICE TOOL	Removal of output shaft front roller bearing outer race <F5M42>
	MB990934 Installer adapter	MB990934-01 OR GENERAL SERVICE TOOL	Installation of output shaft front roller bearing outer race <F5M42>

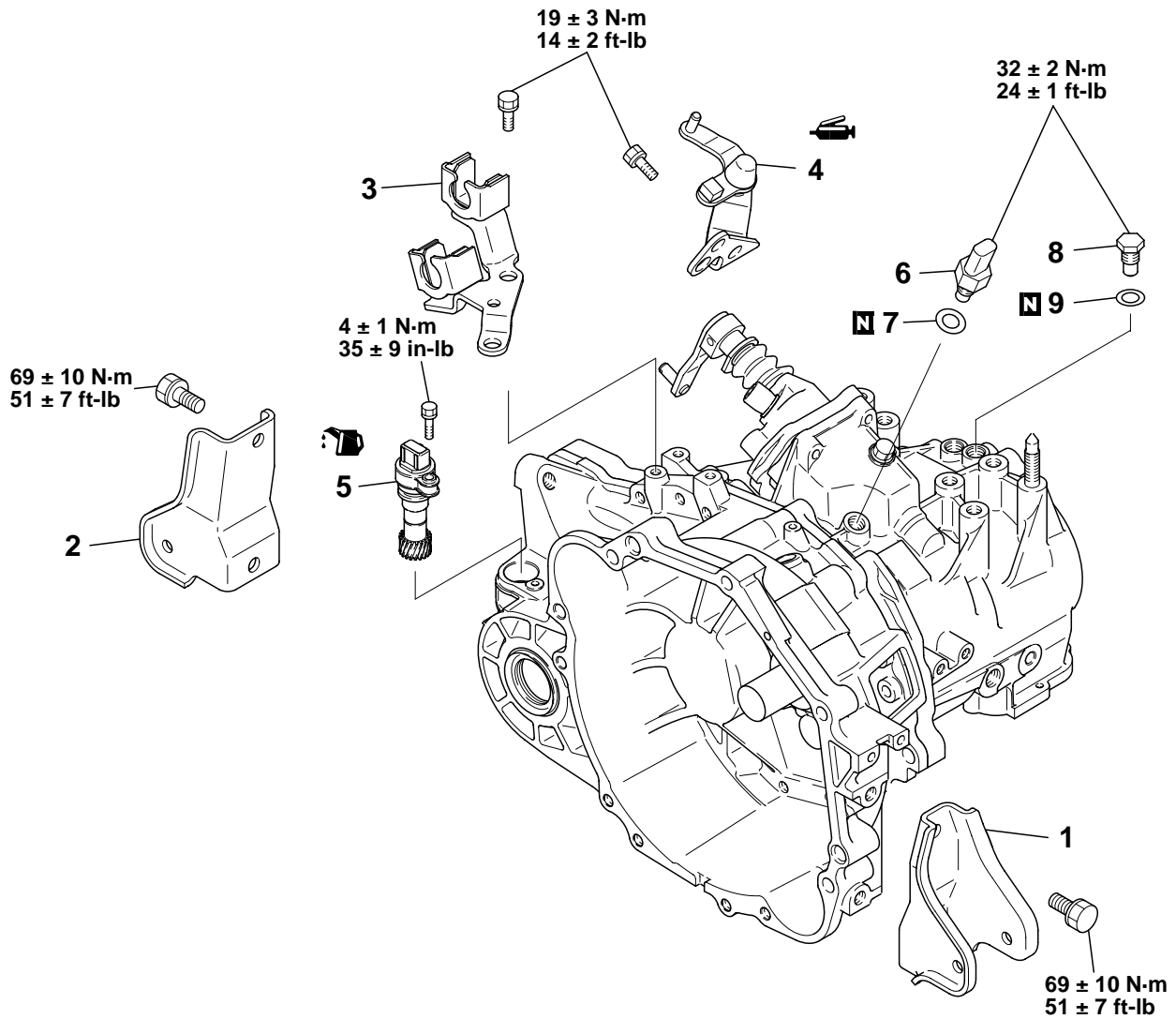
TOOL	TOOL NUMBER AND NAME	SUPERSESSSION	APPLICATION
 <p align="center">MB991445</p>	MB991445 Bushing remover and installer base	MB991445	Installation of differential case taper roller bearing outer race <F5M51>
	MD998800 Oil seal installer	GENERAL SERVICE TOOL	Installation of differential oil seal <F5M51>
	MB990926 Installer adapter	MB990926-01 OR GENERAL SERVICE TOOL	Installation of clutch housing input shaft oil seal <F5M42>
	MB990928 Installer adapter	MB990928-01	Installation of input shaft oil seal <F5M51>
	MD998325 Differential oil seal installer	MD998325-01	Installation of differential oil seal <F5M42>

TRANSAXLE (TRANSMISSION)

DISASSEMBLY AND ASSEMBLY

M122200100029

<F5M42>



AKX00940AB

DISASSEMBLY STEPS

1. ROLL STOPPER BRACKET, FRONT
2. ROLL STOPPER BRACKET, REAR
3. SHIFT CABLE BRACKET
- >>M<< 4. SELECT LEVER

DISASSEMBLY STEPS (Continued)

- >>L<< 5. SPEEDOMETER GEAR
6. BACKUP LIGHT SWITCH
7. GASKET
8. POPPET SPRING
9. GASKET

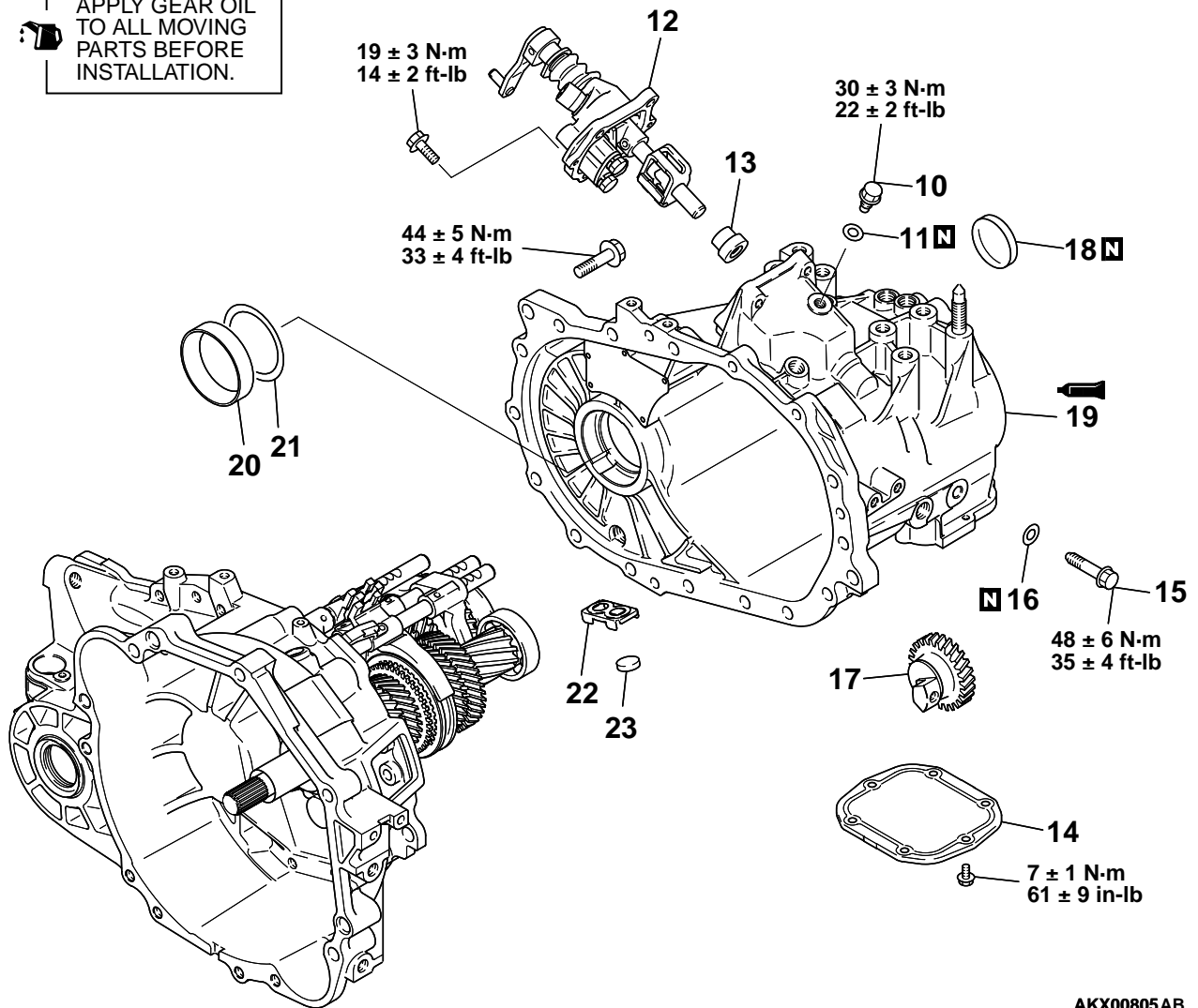
Required Special Tools:

MB990927: Installer Adapter <F5M42>

MB990935: Installer Adapter

MB990938: Handle

APPLY GEAR OIL TO ALL MOVING PARTS BEFORE INSTALLATION.



AKX00805AB

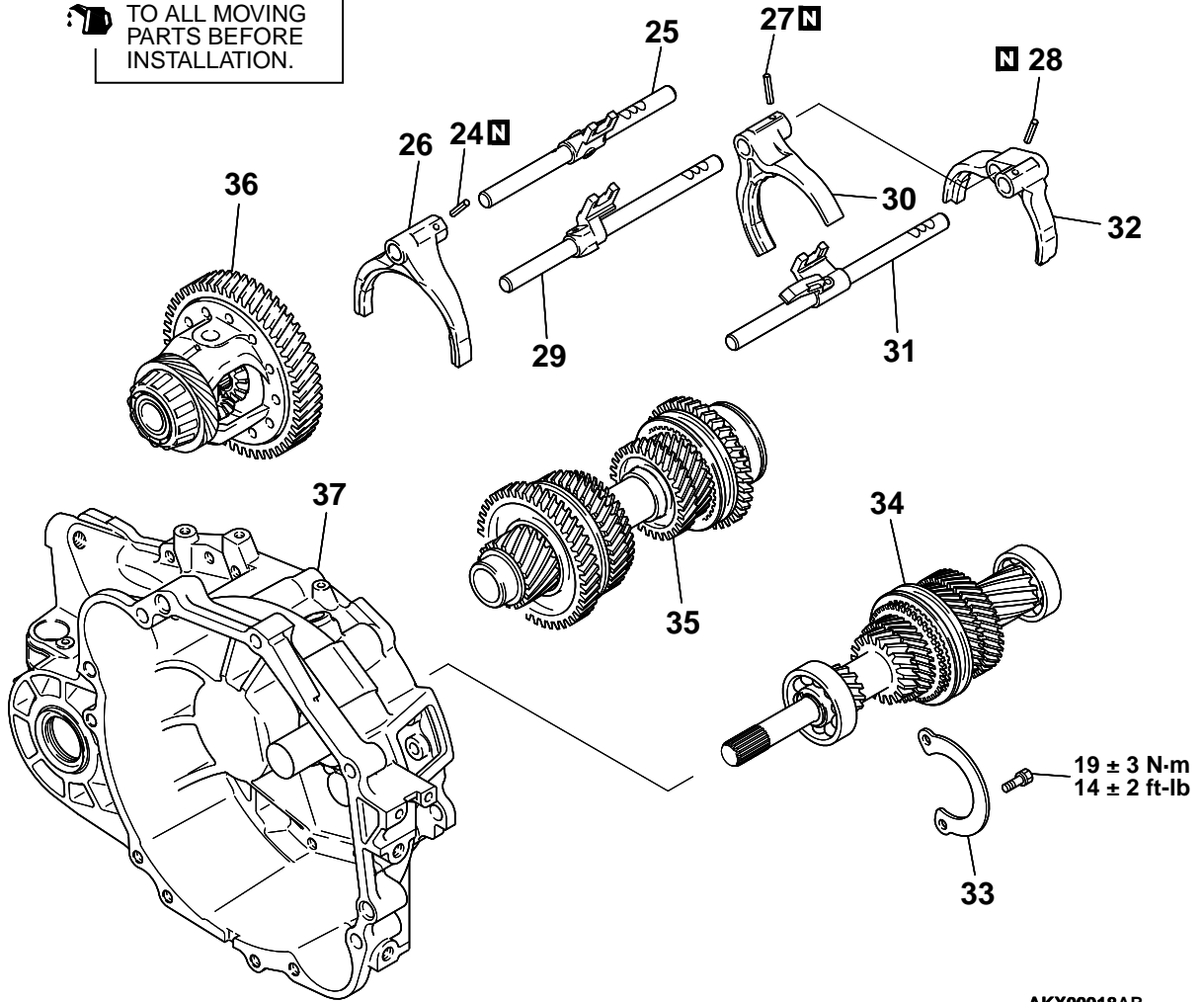
DISASSEMBLY STEPS

- 10. INTERLOCK PLATE BOLT
- >>K<< 12. CONTROL HOUSING
- >>J<< 13. NEUTRAL RETURN SPRING
- >>J<< 14. UNDER COVER
- 15. REVERSE IDLER GEAR SHAFT BOLT
- 16. GASKET

DISASSEMBLY STEPS (Continued)

- 17. REVERSE IDLER GEAR ASSEMBLY
- <<A>> >>I<< 18. SEALING CAP
- <> >>G<< 19. TRANSAXLE CASE
- >>F<< 20. OUTER RACE
- >>F<< 21. SPACER
- 22. MAGNET HOLDER
- 23. MAGNET

 APPLY GEAR OIL TO ALL MOVING PARTS BEFORE INSTALLATION.



AKX00918AB

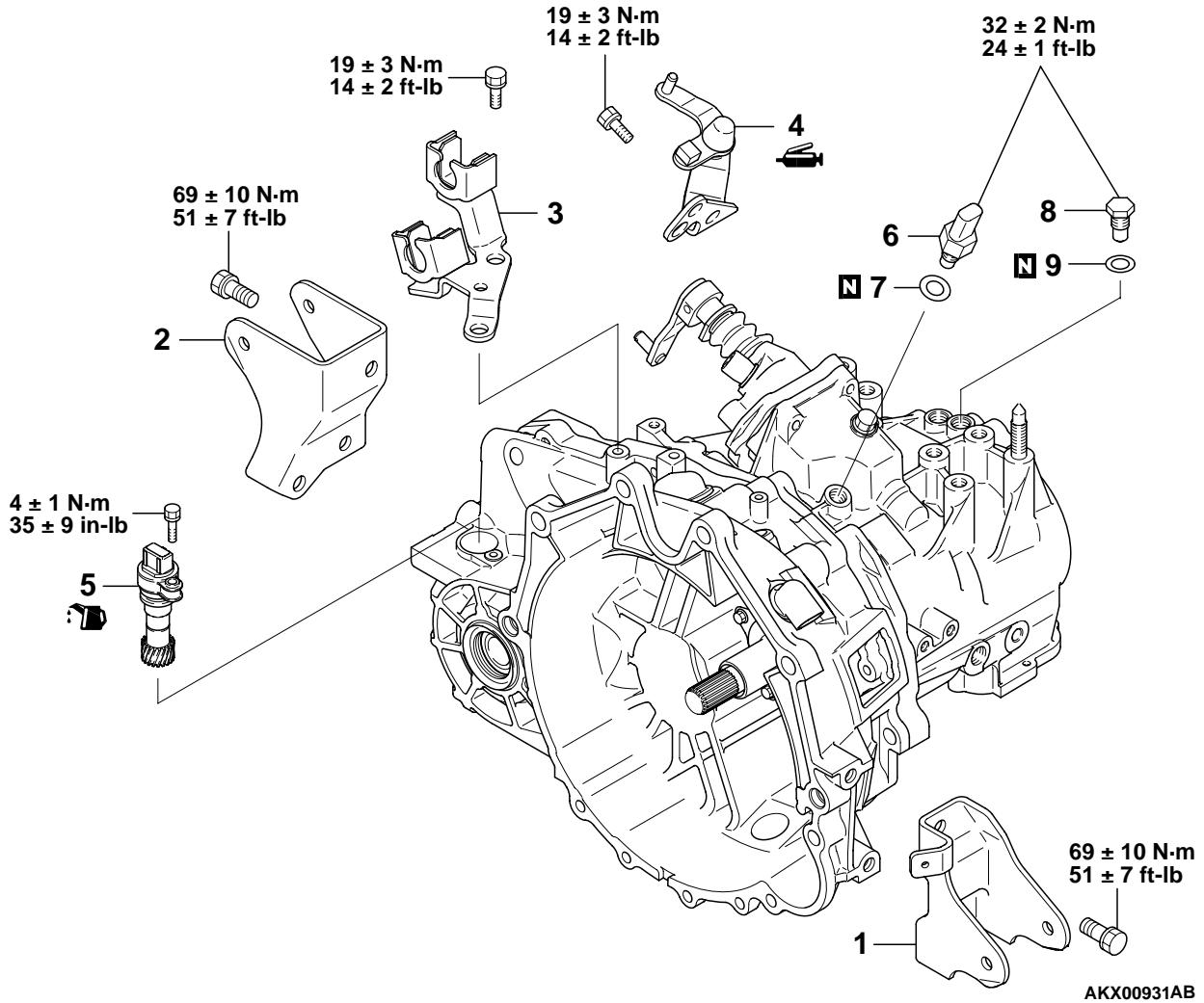
DISASSEMBLY STEPS

- >>E<< 24. SPRING PIN
- >>E<< 25. 1ST-2ND SPEED SHIFT RAIL
- >>E<< 26. 1ST-2ND SPEED SHIFT FORK
- >>E<< 27. SPRING PIN
- >>E<< 28. SPRING PIN
- <<D>> >>C<< 29. 3RD-4TH SPEED SHIFT RAIL
- <<D>> >>C<< 30. 3RD-4TH SPEED SHIFT FORK
- <<D>> >>C<< 31. 5TH SPEED-REVERSE SHIFT RAIL

DISASSEMBLY STEPS (Continued)

- <<D>> >>C<< 32. 5TH SPEED-REVERSE SHIFT FORK
- <<F>> >>A<< 33. FRONT BEARING RETAINER
- <<F>> >>A<< 34. INPUT SHAFT
- <<F>> >>A<< 35. OUTPUT SHAFT
- <<F>> >>A<< 36. DIFFERENTIAL
- <<F>> >>A<< 37. CLUTCH HOUSING

<F5M51>



DISASSEMBLY STEPS

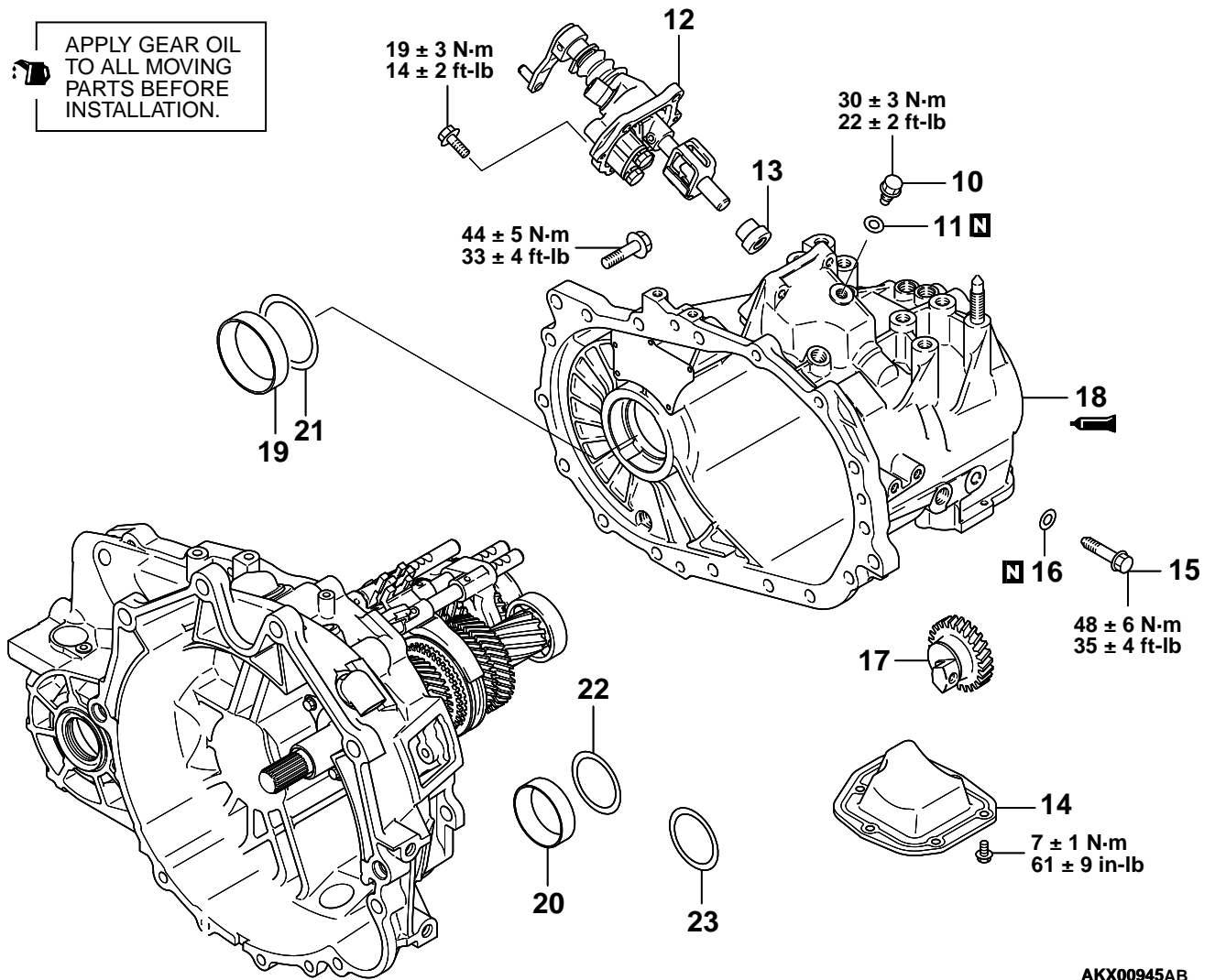
1. ROLL STOPPER BRACKET, FRONT
2. ROLL STOPPER BRACKET, REAR
3. SHIFT CABLE BRACKET
- >>M<< 4. SELECT LEVER

>>L<<

DISASSEMBLY STEPS (Continued)

5. SPEEDOMETER GEAR
6. BACKUP LIGHT SWITCH
7. GASKET
8. POPPET
9. GASKET

APPLY GEAR OIL TO ALL MOVING PARTS BEFORE INSTALLATION.



AKX00945AB

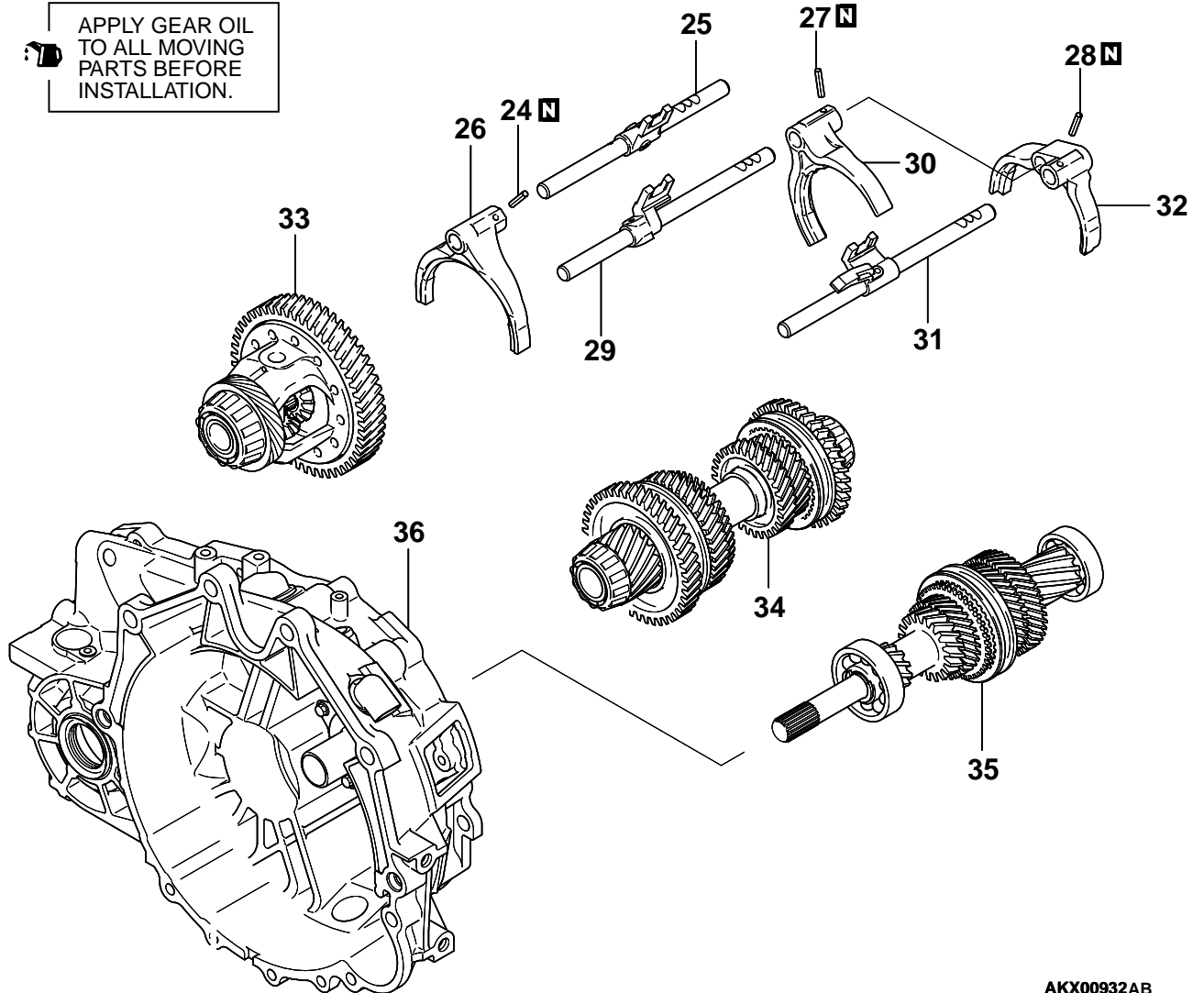
DISASSEMBLY STEPS

- 10. INTERLOCK PLATE BOLT
- 11. GASKET
- >>K<< 12. CONTROL HOUSING
- 13. NEUTRAL RETURN SPRING
- >>J<< 14. UNDER COVER
- 15. REVERSE IDLER GEAR SHAFT BOLT
- 16. GASKET

DISASSEMBLY STEPS (Continued)

- 17. REVERSE IDLER GEAR
- >>H<< 18. TRANSAXLE CASE
- >>F<< 19. OUTER RACE
- >>F<< 20. OUTER RACE
- >>F<< 21. SPACER
- >>F<< 22. SPACER
- >>F<< 23. SPACER

 APPLY GEAR OIL TO ALL MOVING PARTS BEFORE INSTALLATION.



AKX00932AB

DISASSEMBLY STEPS

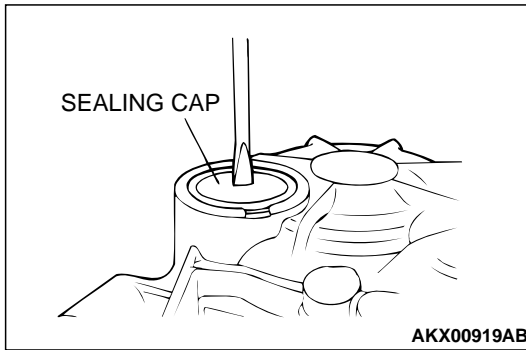
- >>E<< 24. SPRING PIN
- 25. 1ST-2ND SPEED SHIFT RAIL
- 26. 1ST-2ND SPEED SHIFT FORK
- >>E<< 27. SPRING PIN
- <<C>> >>E<< 28. SPRING PIN
- <<E>> >>D<< 29. 3RD-4TH SPEED SHIFT RAIL
- <<E>> >>D<< 30. 3RD-4TH SPEED SHIFT FORK

DISASSEMBLY STEPS (Continued)

- <<E>> >>D<< 31. 5TH-REVERSE SPEED SHIFT RAIL
- <<E>> >>D<< 32. 5TH-REVERSE SPEED SHIFT FORK
- <<G>> >>B<< 33. DIFFERENTIAL
- <<G>> >>B<< 34. OUTPUT SHAFT
- <<G>> >>B<< 35. INPUT SHAFT
- 36. CLUTCH HOUSING

DISASSEMBLY SERVICE POINTS**<<A>> SEALING CAP REMOVAL**

1. Drive a screwdriver into the center of the sealing cap.
2. Bend the screwdriver back to remove the sealing cap.

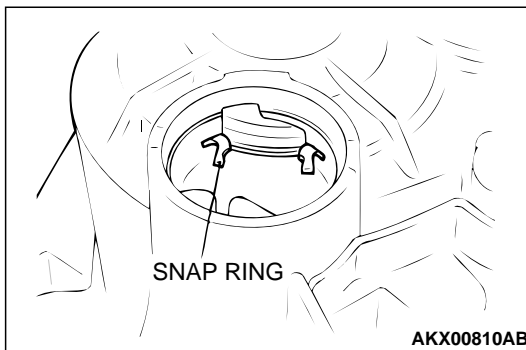
**<> TRANSAXLE CASE REMOVAL**

1. Remove all sixteen bolts securing the transaxle case to the clutch housing.
2. Use snap ring pliers to expand the indicated snap ring. The snap ring will separate from the ball bearing groove, and the output shaft assembly will fall under its own weight.

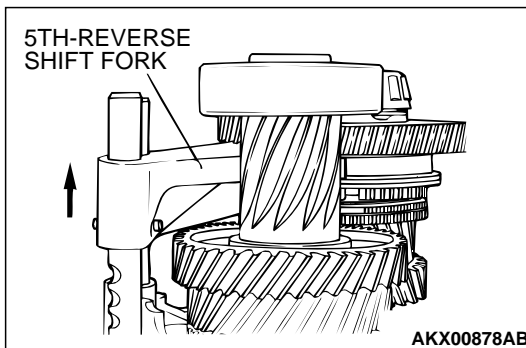
⚠ CAUTION

Do not use a scraper or chisel to remove the transaxle case.

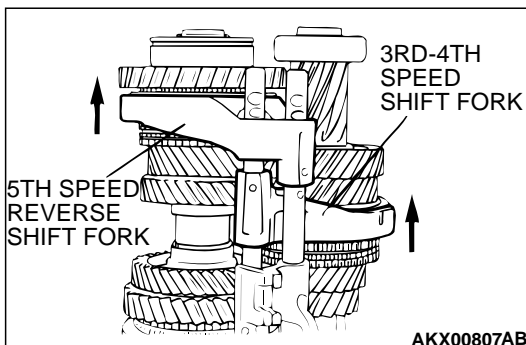
3. Remove the transaxle case from the clutch housing.

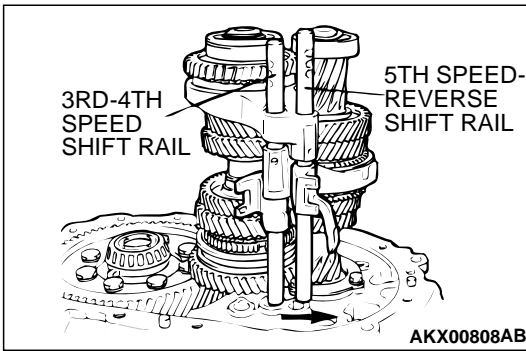
**<<C>> SPRING PIN REMOVAL**

1. Shift the 5th-reverse shift fork in the direction shown in the illustration.
2. Using a pin punch, remove the spring pin from the shift fork and rail.

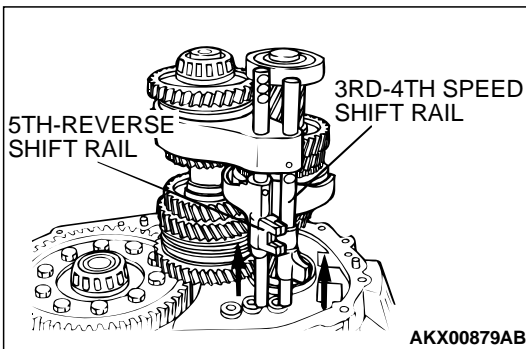
**<<D>> 3RD-4TH SPEED SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/5TH SPEED-REVERSE SHIFT RAIL/5TH SPEED-REVERSE SHIFT FORK REMOVAL**

1. Shift the 3rd-4th speed shift fork and 5th speed-reverse shift fork in the direction shown.



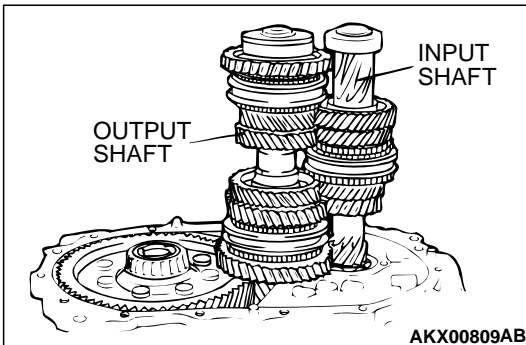


2. Pull up on the 3rd-4th speed shift rail and 5th speed-reverse shift rail and take them out of the hole in the clutch housing.
3. Slide the 3rd-4th speed shift rail and 5th speed-reverse shift rail in the direction shown and remove them together with the shift forks.



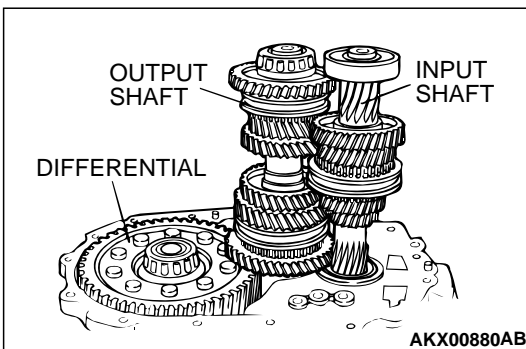
<<E>> 3RD-4TH SPEED SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/5TH-REVERSE SPEED SHIFT RAIL/5TH-REVERSE SPEED SHIFT FORK REMOVAL

1. Pull out the shift rails from the shift rail holes in the clutch housing.
2. Remove the shift rails together with the shift forks.



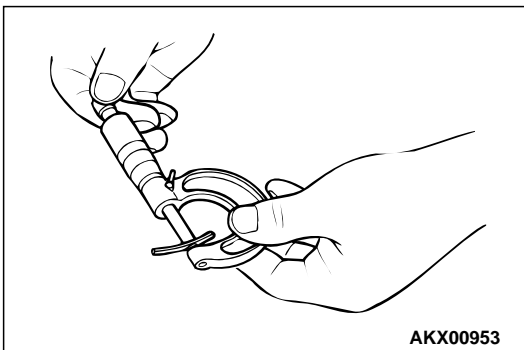
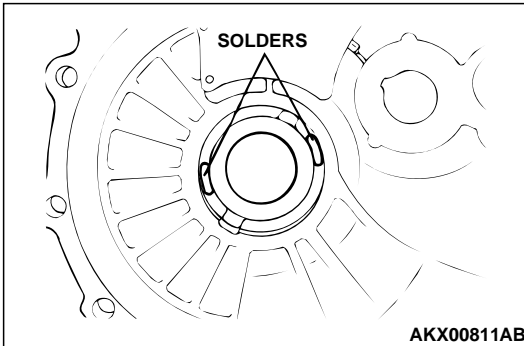
<<F>> INPUT SHAFT AND OUTPUT SHAFT REMOVAL

Remove the input and output shafts together.



<<G>> DIFFERENTIAL/OUTPUT SHAFT/INPUT SHAFT REMOVAL

Remove the input and output shafts together.

ADJUSTMENT BEFORE ASSEMBLY**SPACER SELECTION FOR DIFFERENTIAL CASE
PRELOAD ADJUSTMENT <F5M42>**

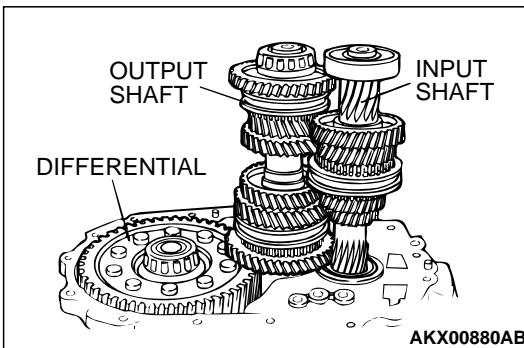
1. Put solders [1.6 mm (0.063 inch) diameter, about 10 mm (0.39 inch) long] in the illustrated positions of the transaxle case.
2. Install the taper bearing outer race and differential assembly into the transaxle case.
NOTE: If necessary, replace the differential case and taper bearing before carrying out these adjustments.
3. Install the clutch housing and tighten the bolts to the specified torque.

Tightening torque: 44 ± 5 N·m (33 ± 4 ft-lb)

4. Remove the clutch housing, and then remove the differential assembly.
5. Remove the outer race and take out crushed solders.
6. Measure the thickness of the crushed solder with a micrometer and select a spacer that will provide the standard preload value.

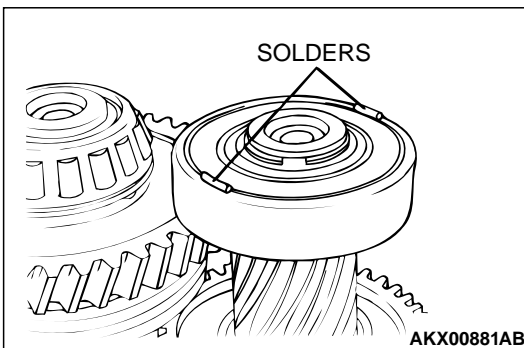
Standard value:

0.05 – 0.11 mm (0.0020 – 0.0043 inch) preload

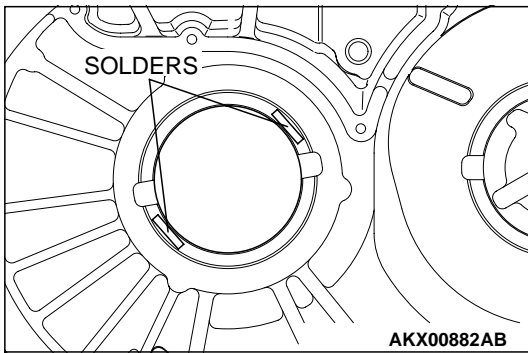
**SPACER SELECTION FOR ADJUSTING INPUT SHAFT END
PLAY/OUTPUT SHAFT PRELOAD/DIFFERENTIAL
PRELOAD <F5M51>**

1. Install the input shaft, output shaft and differential as a set to the clutch housing.

NOTE: If necessary, replace the input shaft, output shaft, differential case and/or bearings before carrying out these adjustments.

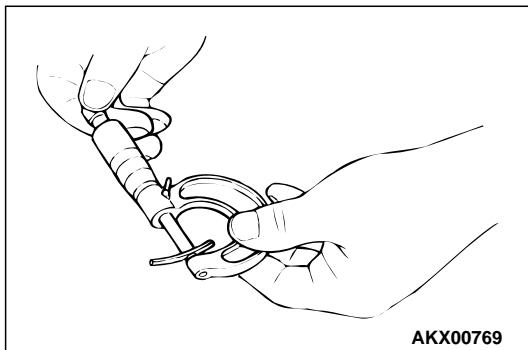
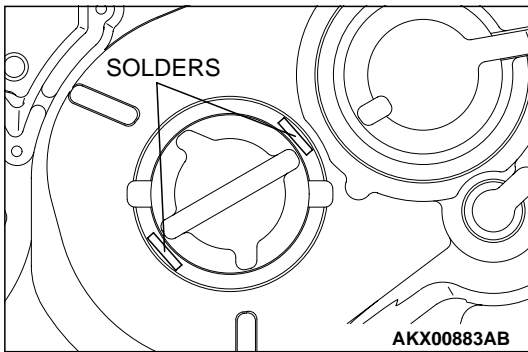


2. Put solders [1.6 mm (0.063 inch) diameter, about 10 mm (0.39 inch) long] on the input shaft rear bearing at the positions shown in the illustration.



3. Put solders [1.6 mm (0.063 inch) diameter, about 10 mm (0.39 inch) long] on the transaxle case at the positions shown in the illustration.
4. Install the bearing outer races of the differential and output shaft.
5. Install the transaxle case and tighten the bolts to the specified torque.

Tightening torque: 44 ± 5 N·m (33 ± 4 ft-lb)



6. Remove the transaxle case.
7. Remove the outer races and take out the crushed solders.
8. Measure the thickness of the crushed solder with a micrometer and select spacers that will provide the standard end play/preload value.

Standard value:

Input shaft end play: 0.05 – 0.17 mm (0.0020 – 0.0067 inch)

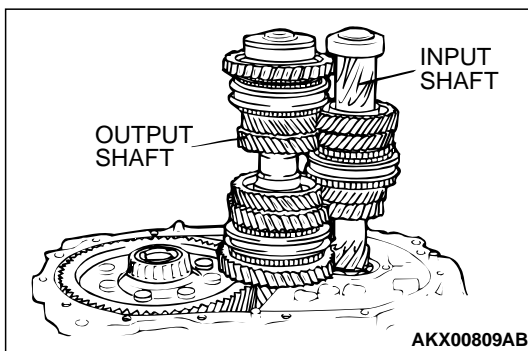
Output shaft preload: 0.13 – 0.18 mm (0.0051 – 0.0071 inch)

Differential preload: 0.05 – 0.11 mm (0.0020 – 0.0043 inch)

ASSEMBLY SERVICE POINTS

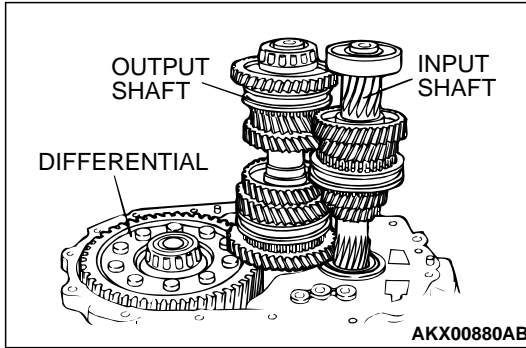
>>A<< OUTPUT SHAFT/INPUT SHAFT INSTALLATION

Install the input and output shafts together.



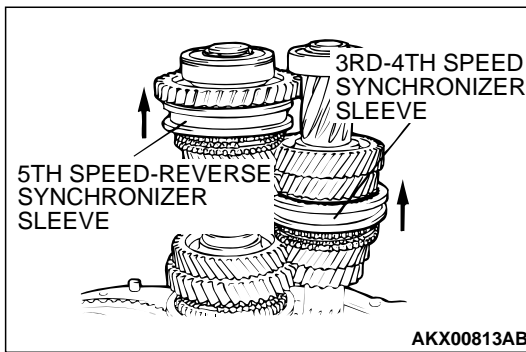
>>B<< INPUT SHAFT/OUTPUT SHAFT/DIFFERENTIAL INSTALLATION

Install the input shaft, output shaft and differential as a set.

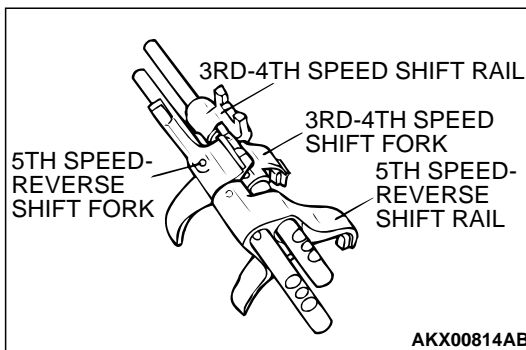


>>C<< 5TH SPEED-REVERSE SHIFT FORK/5TH SPEED-REVERSE SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/3RD-4TH SPEED SHIFT RAIL INSTALLATION

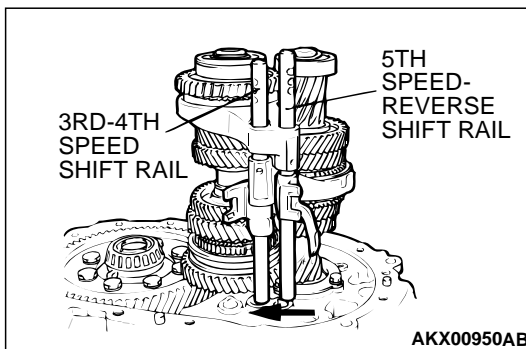
1. Shift the 3rd-4th speed synchronizer sleeve and 5th speed-reverse synchronizer sleeve in the direction shown.



2. Assemble the 3rd-4th speed shift rail and fork, and the 5th speed-reverse shift rail and fork.

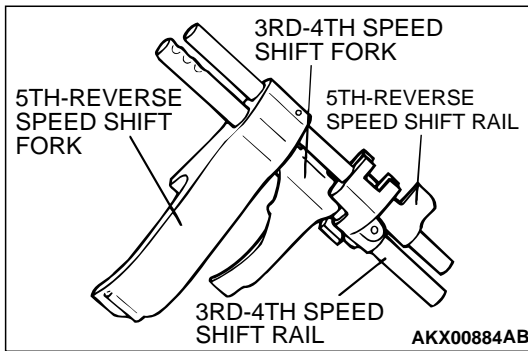


3. While fitting each shift fork in the groove of synchronizer sleeve, slide the shift rails in the direction shown and install.
4. Insert the 3rd-4th speed shift rail and 5th speed-reverse shift rail into the rail hole in the clutch housing.

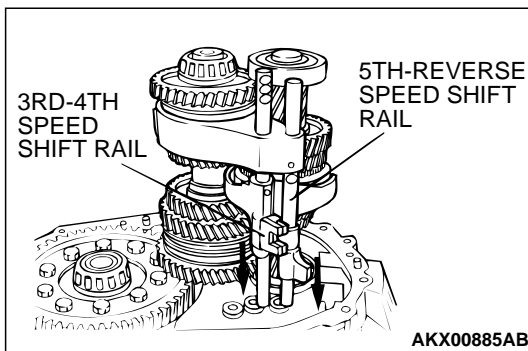


>>D<< 5TH-REVERSE SPEED SHIFT FORK/5TH-REVERSE SPEED SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/3RD-4TH SPEED SHIFT RAIL INSTALLATION

1. Assemble the 3rd-4th speed shift rail and fork, and 5th-reverse speed shift rail and fork.

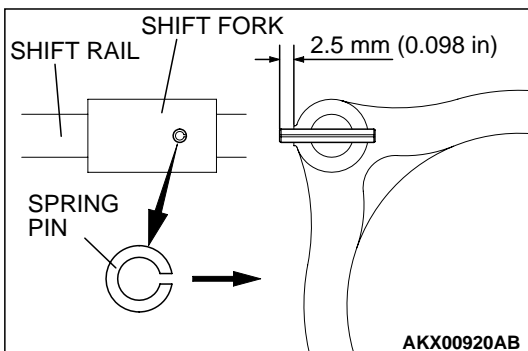


2. Fit each shift fork in the groove of synchronizer sleeve and install the shift fork and rail assembly.
3. Insert the 3rd-4th speed shift rail and 5th speed-reverse shift rail into the rail hole in the clutch housing.



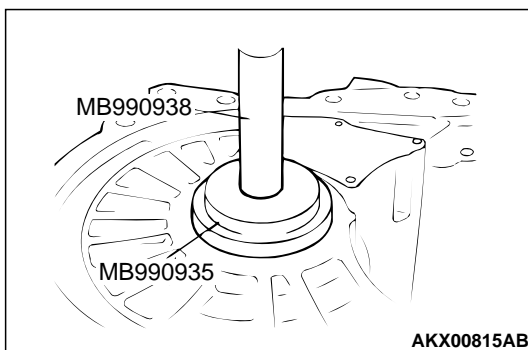
>>E<< SPRING PIN INSTALLATION

1. Align the pin holes in the shift rail and shift fork.
2. Insert the new spring pin. Push it in so that the slit and center axis of the rail are aligned.



>>F<< SPACER AND OUTER RACE INSTALLATION

1. Install the spacer selected in the section "ADJUSTMENT BEFORE ASSEMBLY."
2. Using special tools MB990935 and MB990938, press install the outer race into the transaxle case.



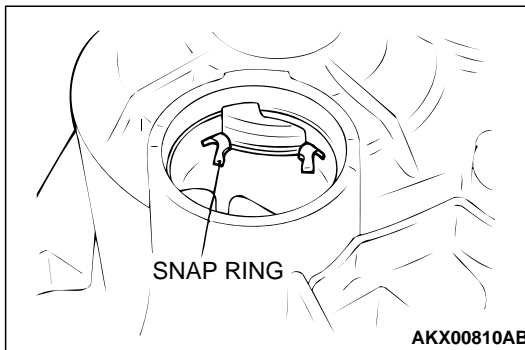
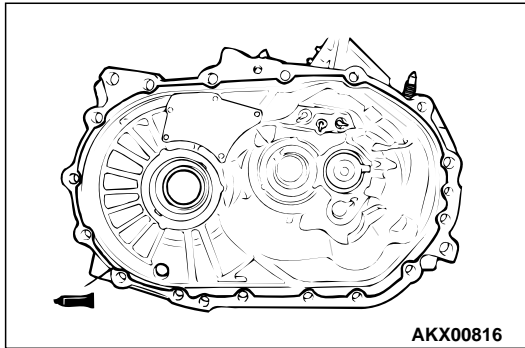
>>G<< TRANSAXLE CASE INSTALLATION

⚠ CAUTION

Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.

1. Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD997740 or equivalent) to the illustrated position of the transaxle case.

NOTE: Be sure to install the transaxle case while the sealant is wet (within 15 minutes).



2. Install the transaxle case and expand the snap ring.
3. Tighten the transaxle case mounting bolts to the specified torque.

Tightening torque: 44 ± 5 N·m (33 ± 4 ft-lb)

4. Place the transaxle upside down and let the snap ring fit in the groove by taking advantage of the output shaft's own weight.

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

>>H<< TRANSAXLE CASE INSTALLATION

⚠ CAUTION

Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.

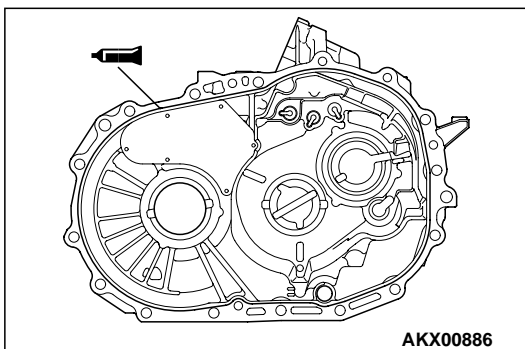
1. Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD997740 or equivalent) to the illustrated position of the transaxle case.

NOTE: Be sure to install the transaxle case while the sealant is wet (within 15 minutes).

2. Install the transaxle case.
3. Tighten the transaxle case mounting bolts to the specified torque.

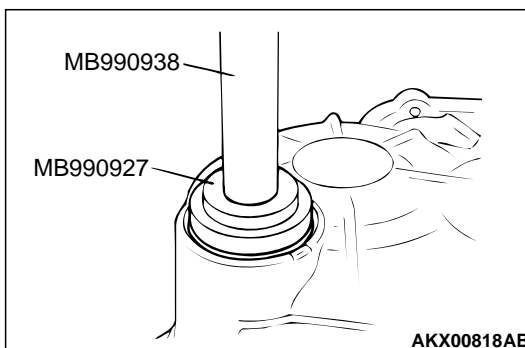
Tightening torque: 44 ± 5 N·m (33 ± 4 ft-lb)

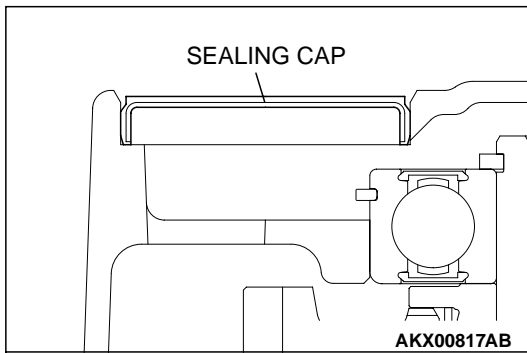
NOTE: After installation, keep the sealed area away from the oil for approximately one hour.



>>I<< SEALING CAP INSTALLATION

1. Using special tools MB990927 and MB990938, press install the sealing cap onto the case.





2. Evenly press the sealing cap so it is not placed at an angle.

>>J<< UNDER COVER INSTALLATION

⚠ CAUTION

Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.

1. Apply a 2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD997740 or equivalent) to the illustrated position of the transaxle case.

NOTE: Be sure to install the case quickly while the sealant is wet (within 15 minutes).

2. Install the under cover to the transaxle case and tighten the bolts to specified torque.

Tightening torque: 7 ± 1 N·m (61 ± 9 in-lb)

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

>>K<< CONTROL HOUSING INSTALLATION

⚠ CAUTION

Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.

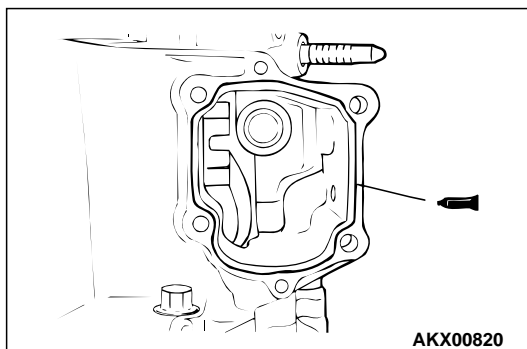
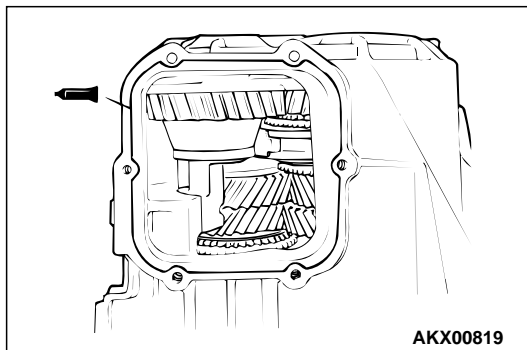
1. Apply a 0.2 mm (0.08 inch) diameter bead of sealant (Mitsubishi Genuine Part number MD997740 or equivalent) to the illustrated position of the transaxle case.

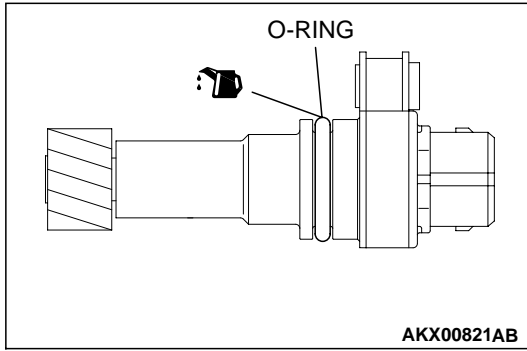
NOTE: Be sure to install the case quickly while the sealant is wet (within 15 minutes).

2. Install the control housing to the transaxle case and tighten the bolts to specified torque.

Tightening torque: 19 ± 3 N·m (14 ± 2 ft-lb)

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

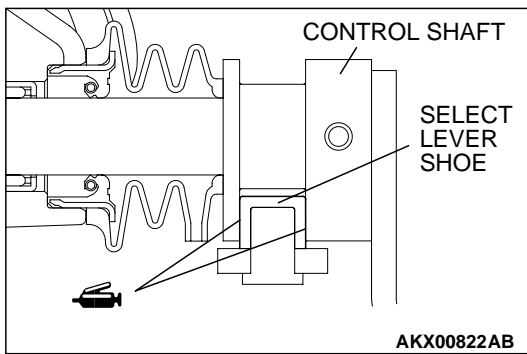




>>L<< SPEEDOMETER GEAR INSTALLATION

1. Apply gear oil (Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4) to the O-ring of the speedometer gear.
2. Tighten the bolt to specified torque.

Tightening torque: 4 ± 1 N·m (35 ± 9 in-lb)



>>M<< SELECT LEVER INSTALLATION

1. Apply grease (Mitsubishi Genuine Part number 0101011 or equivalent) to the control shaft sliding portion of the select lever shoe.
2. Install the select lever and tighten the bolts to specified torque.

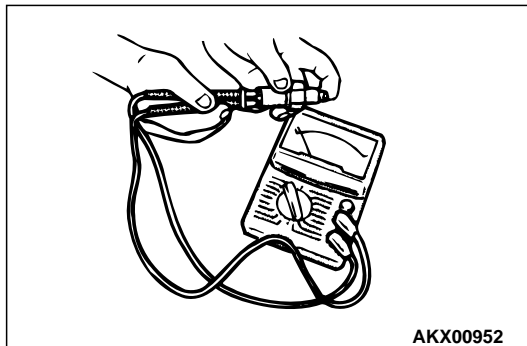
Tightening torque: 19 ± 3 N·m (14 ± 2 ft-lb)

INSPECTION

M1222001100026

BACKUP LIGHT SWITCH

Check for continuity between terminals.



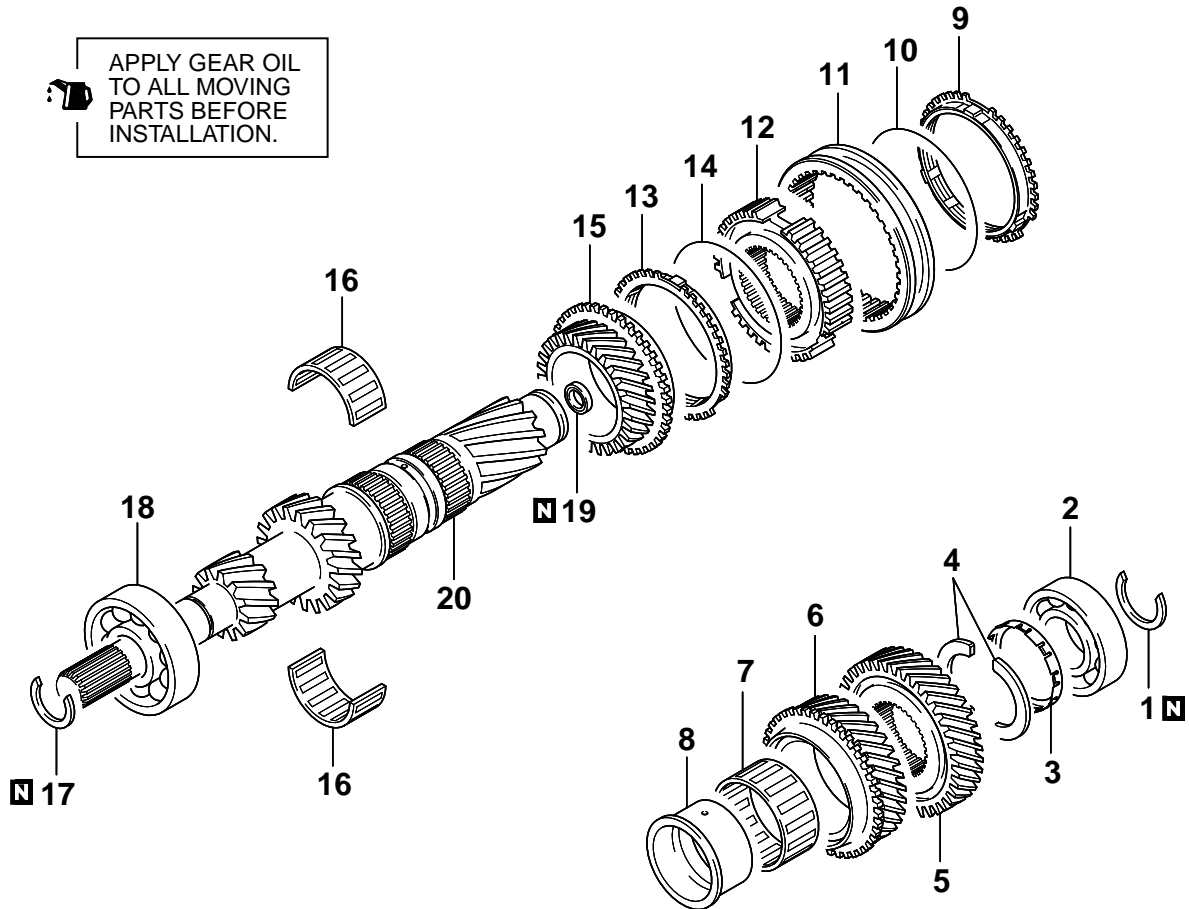
SWITCH CONDITION	CONTINUITY
Pressed	Open
Released	Conductive

INPUT SHAFT

DISASSEMBLY AND ASSEMBLY

M1222001600021

<F5M42>



AKX00803AB

DISASSEMBLY STEPS

- | | |
|-------------|--------------------------|
| >>M<< | 1. SNAP RING |
| <<A>> >>L<< | 2. BALL BEARING |
| <> >>K<< | 3. THRUST PLATE STOPPER |
| >>J<< | 4. THRUST PLATE |
| <<C>> >>I<< | 5. 5TH SPEED GEAR |
| | 6. 4TH SPEED GEAR |
| | 7. NEEDLE ROLLER BEARING |
| <<D>> >>H<< | 8. 4TH SPEED GEAR SLEEVE |
| >>E<< | 9. SYNCHRONIZER RING |
| >>D<< | 10. SYNCHRONIZER SPRING |
| >>G<< | 11. SYNCHRONIZER SLEEVE |

DISASSEMBLY STEPS (Continued)

- | | |
|-------------|------------------------------------|
| >>F<< | 12. 3RD-4TH SPEED SYNCHRONIZER HUB |
| >>E<< | 13. SYNCHRONIZER RING |
| >>D<< | 14. SYNCHRONIZER SPRING |
| | 15. 3RD SPEED GEAR |
| | 16. NEEDLE ROLLER BEARING |
| >>C<< | 17. SNAP RING |
| <<E>> >>B<< | 18. BALL BEAR |
| >>A<< | 19. OIL SEAL |
| | 20. INPUT SHAFT |

Required Special Tools:

MD998801: Bearing Remover
MD998812: Installer Cap

MD998813: Installer-100

MD998816: Installer Adapter (30)

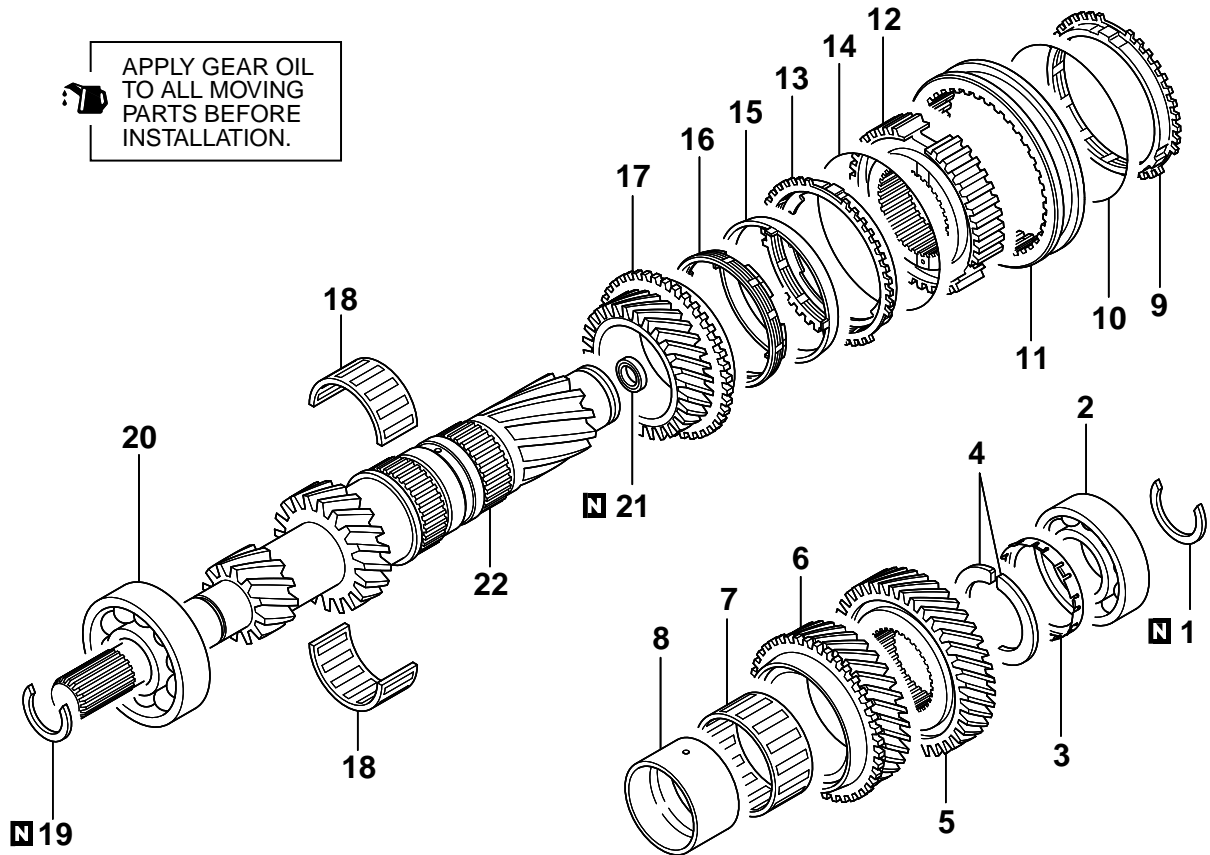
MD998818: Installer Adapter (38)

TSB Revision

MD998824: Installer Adapter (50) <F5M42>

MD998825: Installer Adapter (52)

<F5M51>



AKX00877AB

DISASSEMBLY STEPS

- >>M<< 1. SNAP RING
- <<A>> >>L<< 2. BALL BEARING
- <> >>K<< 3. THRUST PLATE STOPPER
- >>J<< 4. THRUST PLATE
- <<C>> >>I<< 5. 5TH SPEED GEAR
- >>H<< 6. 4TH SPEED GEAR
- <<D>> >>G<< 7. NEEDLE ROLLER BEARING
- >>F<< 8. 4TH SPEED GEAR SLEEVE
- >>E<< 9. SYNCHRONIZER RING
- >>D<< 10. SYNCHRONIZER SPRING
- >>C<< 11. SYNCHRONIZER SLEEVE

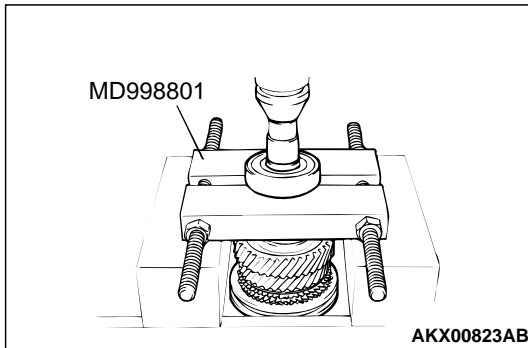
DISASSEMBLY STEPS (Continued)

- >>F<< 12. 3RD-4TH SPEED SYNCHRONIZER HUB
- >>D<< 13. OUTER SYNCHRONIZER RING
- >>D<< 14. SYNCHRONIZER SPRING
- >>D<< 15. SYNCHRONIZER CONE
- >>D<< 16. INNER SYNCHRONIZER RING
- >>D<< 17. 3RD SPEED GEAR
- >>D<< 18. NEEDLE ROLLER BEARING
- >>C<< 19. SNAP RING
- <<E>> >>B<< 20. BALL BEAR
- >>A<< 21. OIL SEAL
- >>A<< 22. INPUT SHAFT

DISASSEMBLY SERVICE POINTS

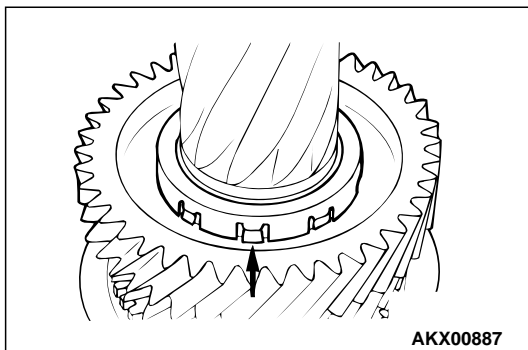
<<A>> BALL BEARING REMOVAL

1. Using special tool 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.



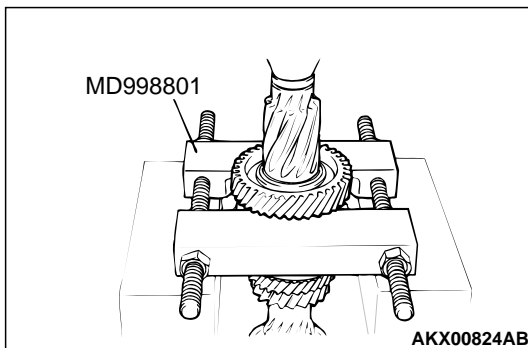
<> THRUST PLATE STOPPER REMOVAL

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



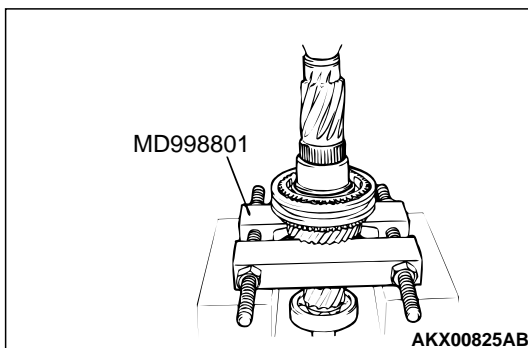
<<C>> 5TH SPEED GEAR REMOVAL

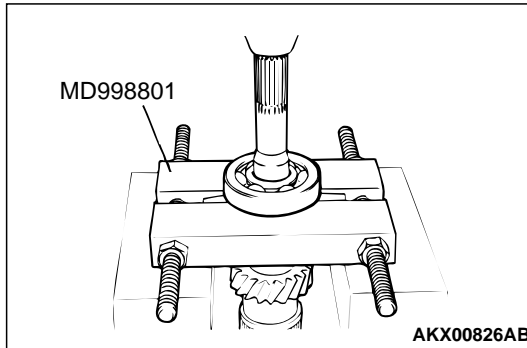
1. Using special tool MD998801, support the 5th speed gear, and then set them on the press.
2. Push down on the input shaft with the press and take off the 5th speed gear.



<<D>> 4TH SPEED GEAR SLEEVE REMOVAL

1. Using special tool 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.

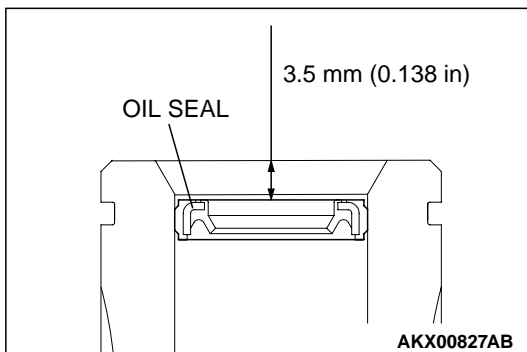


**<<E>> BALL BEARING REMOVAL**

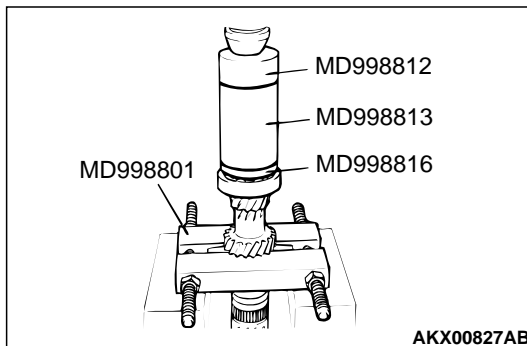
1. Using special tool MD998801, support the ball bearing, and then set them on the press.
2. Push down on the input shaft with the press and extract the ball bearing.

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

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

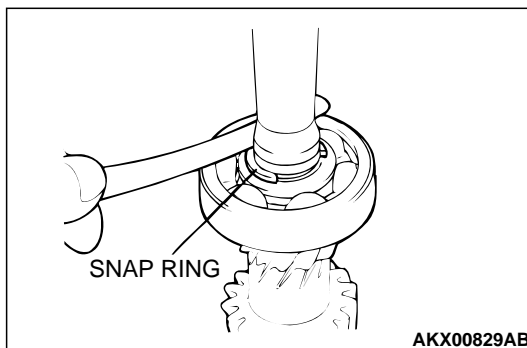
**>>B<< BALL BEARING INSTALLATION**

1. Using special tool MD998801, support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools MD998812, MD998813 and MD998816, press install the bearing with the press.

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

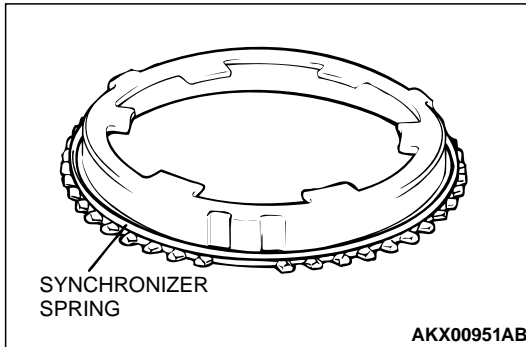
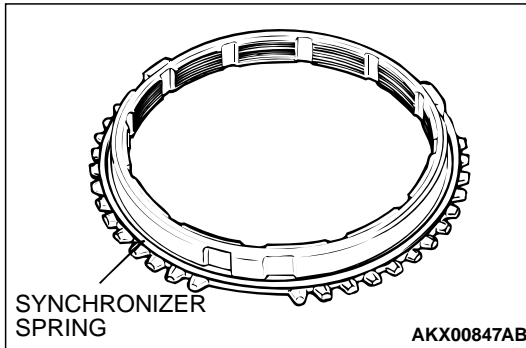
1. Install the thickest snap ring that can be fitted in the snap ring groove of input shaft.
2. Make sure that the ball bearing end play meets the standard value.

Standard value: 0 – 0.12 mm (0 – 0.0047 inch)



>>D<< SYNCHRONIZER SPRING INSTALLATION

Install the synchronizer spring to the illustrated position of the synchronizer ring and outer synchronizer ring <F5M51>.



>>E<< SYNCHRONIZER RING INSTALLATION

⚠ CAUTION

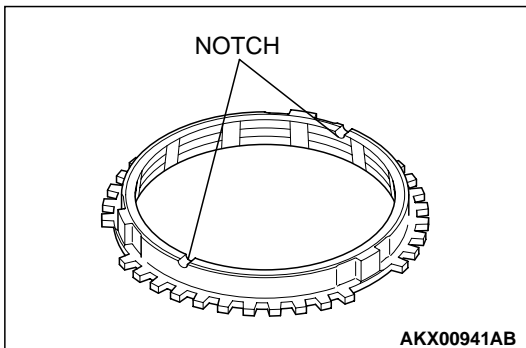
There are 3rd speed and 4th speed synchronizer rings, if the wrong one is installed it will effect the shift feeling.

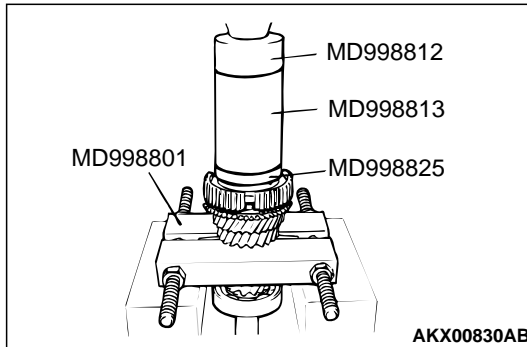
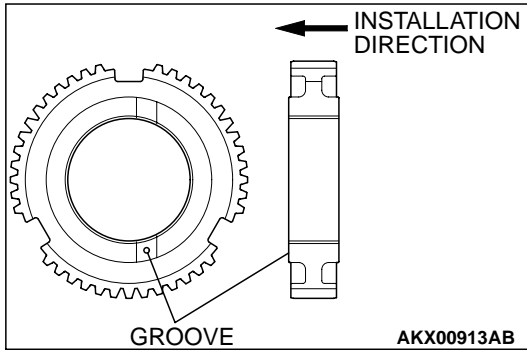
1. Ascertain whether or not there are identification notches on the synchronizer ring.

Two notches: 3rd speed synchronizer ring

No notches: 4th speed synchronizer ring

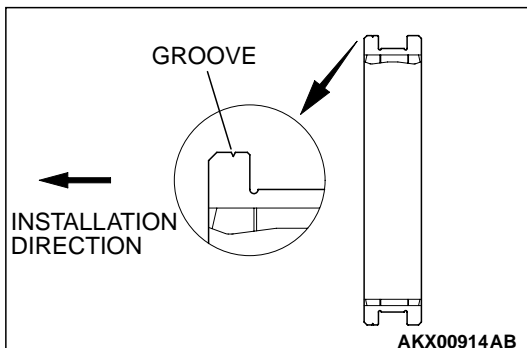
2. Install the synchronizer ring so that it does not angle to the cone of the gear.





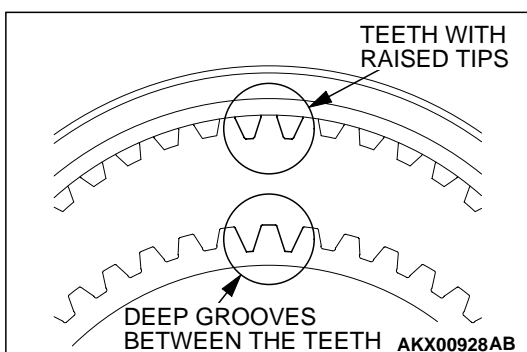
>>F<< 3RD-4TH SPEED SYNCHRONIZER HUB INSTALLATION

1. Using special tool MD998801, support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Make sure that the synchronizer ring <F5M42> or inner synchronizer ring <F5M51> 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 MD998812, MD998813 and MD998825, press install the 3rd-4th speed synchronizer hub with the press.
5. Make sure that the synchronizer ring <F5M42> or outer synchronizer ring <F5M51> can rotate freely.



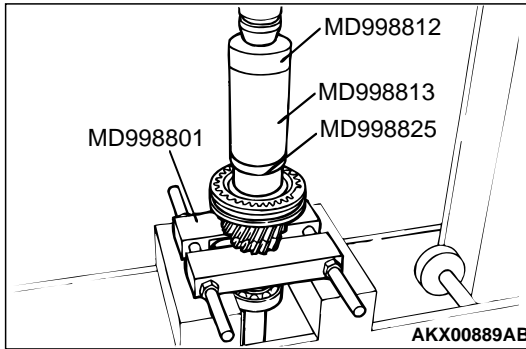
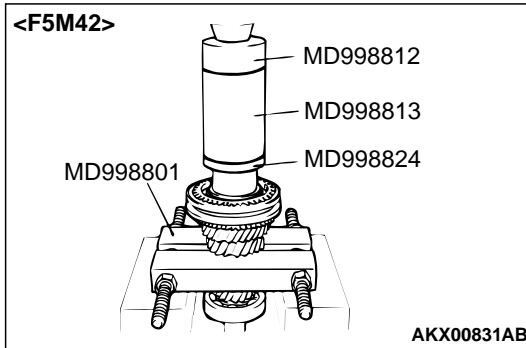
>>G<< SYNCHRONIZER SLEEVE INSTALLATION

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).



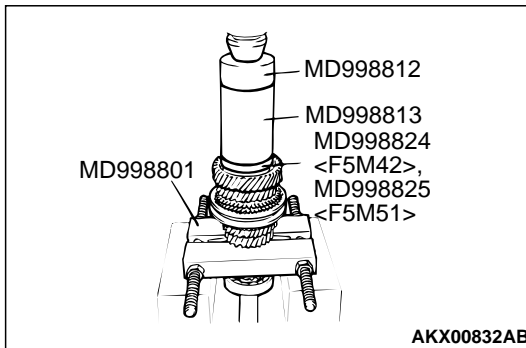
>>H<< 4TH SPEED GEAR SLEEVE INSTALLATION

1. Using special tool MD998801, support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools MD998812, MD998813, MD998824 <F5M42> and MD998825 <F5M51>, press install the 4th speed gear sleeve with the press.



>>I<< 5TH SPEED GEAR INSTALLATION

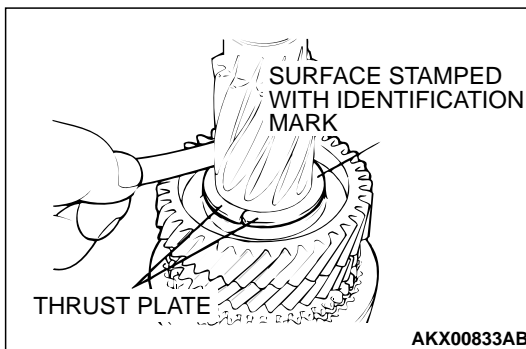
1. Using special tool MD998801, support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools MD998812, MD998813, MD998824 <F5M42> and MD998825 <F5M51>, press install the 5th speed gear in the input shaft.

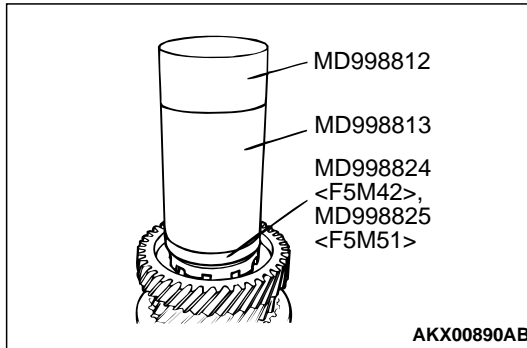


>>J<< THRUST PLATE INSTALLATION

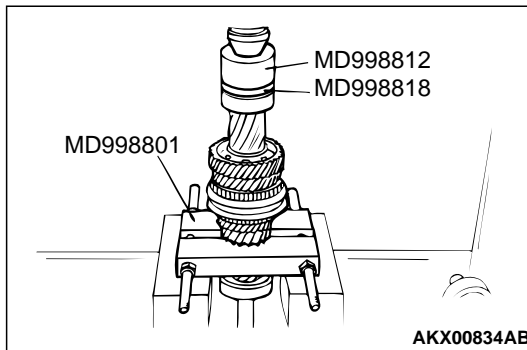
1. Install the thickest thrust plates that can be fitted in the groove of input shaft. Install the thrust plate so the surface stamped with the identification mark is facing up.
2. Make sure that the 5th speed gear end play meets the standard value.

Standard value: 0 – 0.09 mm (0 – 0.0035 inch)

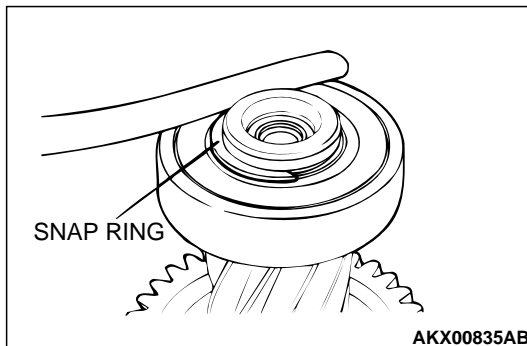


**>>K<< THRUST PLATE STOPPER INSTALLATION**

Install the thrust plate stopper by pressing special tools MD998812, MD998813, MD998824 <F5M42> and MD998825 <F5M51> by hand. Make sure that it is not tilted.

**>>L<< BALL BEARING INSTALLATION**

1. Using special tool MD998801, support the 2nd speed gear portion of the input shaft, and then set them on the press.
2. Using special tools MD998812 and MD998818, press install the ball bearing in the input shaft.

**>>M<< SNAP RING INSTALLATION**

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

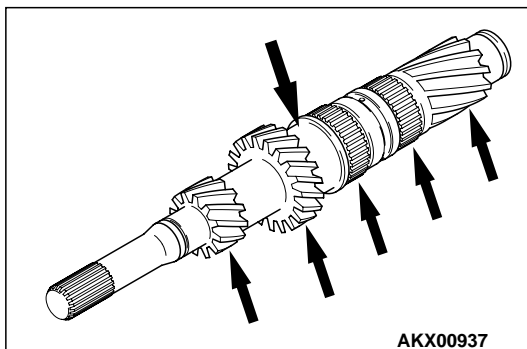
Standard value: 0 – 0.12 mm (0 – 0.0047 inch)

INSPECTION

M1222001700028

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.

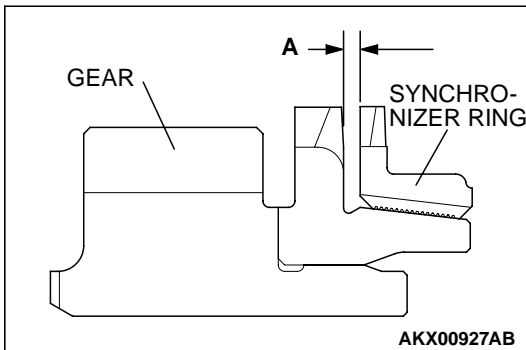
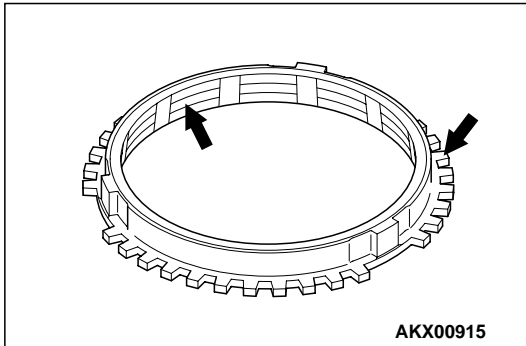


NEEDLE ROLLER BEARING

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.

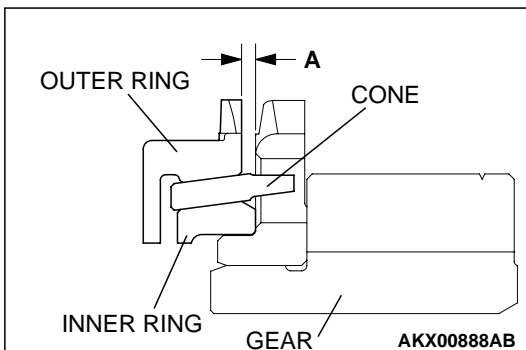
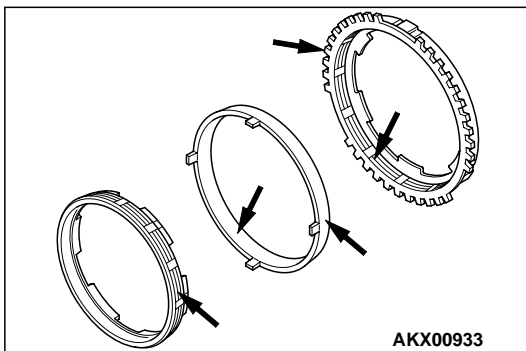
Minimum limit: 0.5 mm (0.020 inch)

OUTER SYNCHRONIZER RING/INNER SYNCHRONIZER RING/SYNCHRONIZER CONE

⚠ CAUTION

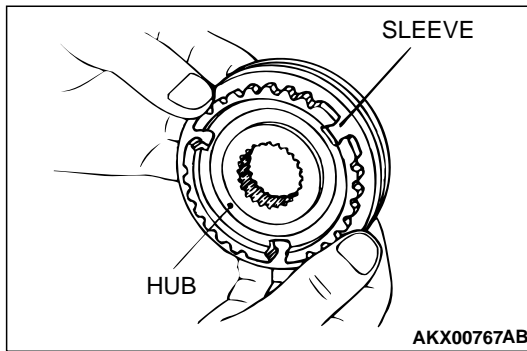
When any of the outer ring, inner ring or cone has to be replaced, replace them as a set.

1. Check to ensure that the clutch gear tooth surface and cone surface are not damaged and broken.



2. Install the outer ring, inner ring and cone, press them against the gear, and check clearance "A." If "A" is less than the limit, replace.

Limit: 0.5 mm (0.020 inch)

**SYNCHRONIZER SLEEVE AND HUB**

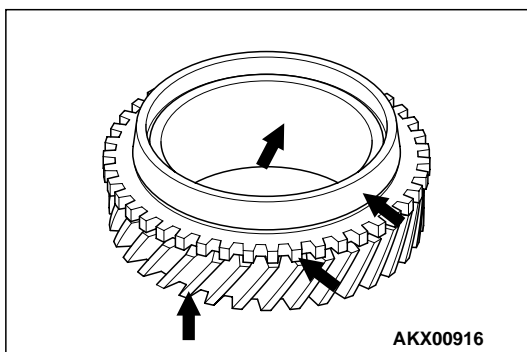
1. Combine the synchronizer sleeve and hub, and check that they slide smoothly.
2. Check that the sleeve is free from damage at its inside splines ends.

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.



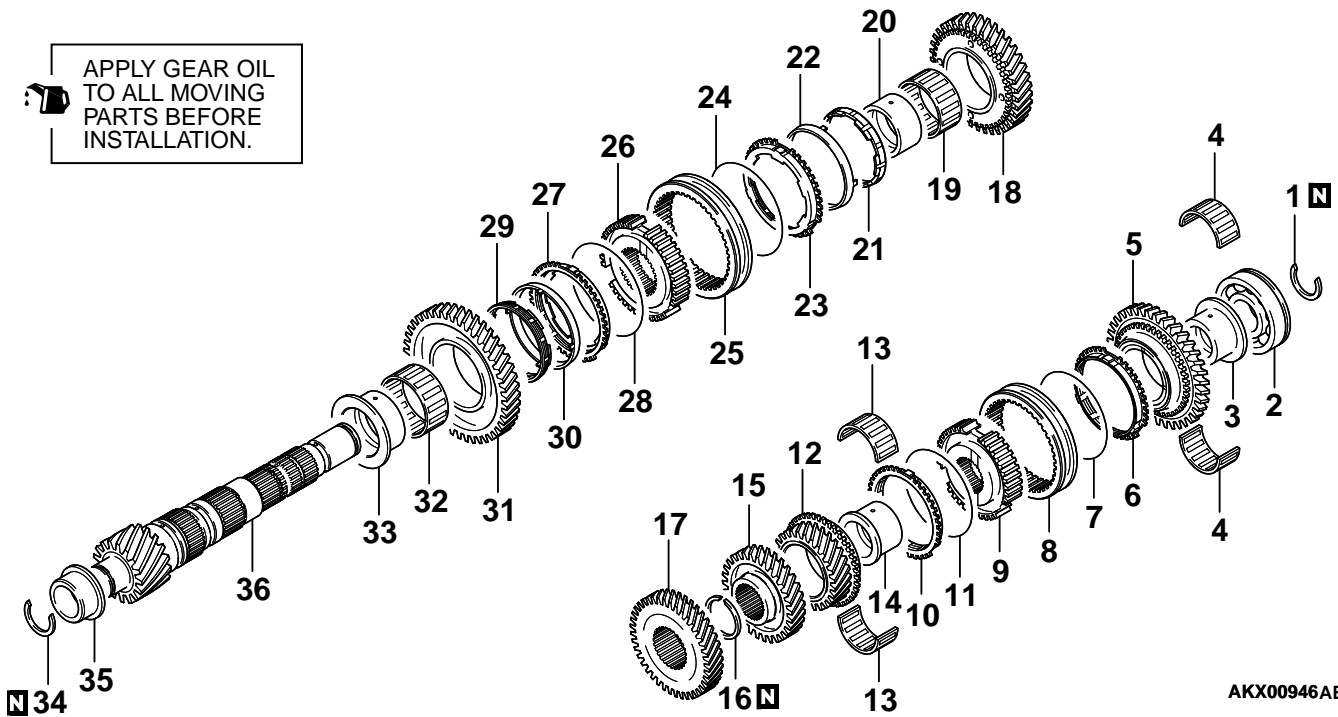
OUTPUT SHAFT

DISASSEMBLY AND ASSEMBLY

M1222002200026

<F5M42>

APPLY GEAR OIL
TO ALL MOVING
PARTS BEFORE
INSTALLATION.



AKX00946AB

DISASSEMBLY STEPS

- >>T<< 1. SNAP RING
<<A>> >>R<< 2. BALL BEARING
<<C>> >>Q<< 3. REVERSE GEAR SLEEVE
4. NEEDLE ROLLER BEARING
5. REVERSE GEAR
>>O<< 6. SYNCHRONIZER RING
>>N<< 7. SYNCHRONIZER SPRING
>>H<< 8. SYNCHRONIZER SLEEVE
<<D>> >>P<< 9. 5TH SPEED-REVERSE
SYNCHRONIZER HUB
>>O<< 10. SYNCHRONIZER RING
>>N<< 11. SYNCHRONIZER SPRING
12. 5TH SPEED GEAR
13. NEEDLE ROLLER BEARING
>>M<< 14. 5TH SPEED GEAR SLEEVE
>>L<< 15. 4TH SPEED GEAR
>>K<< 16. SNAP RING
<<E>> >>J<< 17. 3RD SPEED GEAR
18. 2ND SPEED GEAR

DISASSEMBLY STEPS (Continued)

- <<F>> >>I<< 19. NEEDLE ROLLER BEARING
20. 2ND SPEED GEAR SLEEVE
21. INNER SYNCHRONIZER RING
22. SYNCHRONIZER CONE
23. OUTER SYNCHRONIZER RING
>>F<< 24. SYNCHRONIZER SPRING
>>H<< 25. SYNCHRONIZER SLEEVE
>>G<< 26. 1ST-2ND SPEED SYNCHRONIZER
HUB
>>F<< 27. OUTER SYNCHRONIZER RING
28. SYNCHRONIZER SPRING
29. INNER SYNCHRONIZER RING
30. SYNCHRONIZER CONE
31. 1ST SPEED GEAR
32. NEEDLE ROLLER BEARING
<<G>> >>E<< 33. 1ST SPEED GEAR SLEEVE
>>D<< 34. SNAP RING
<<H>> >>B<< 35. ROLLER BEARING INNER RACE
36. OUTPUT SHAFT

Required Special Tools:

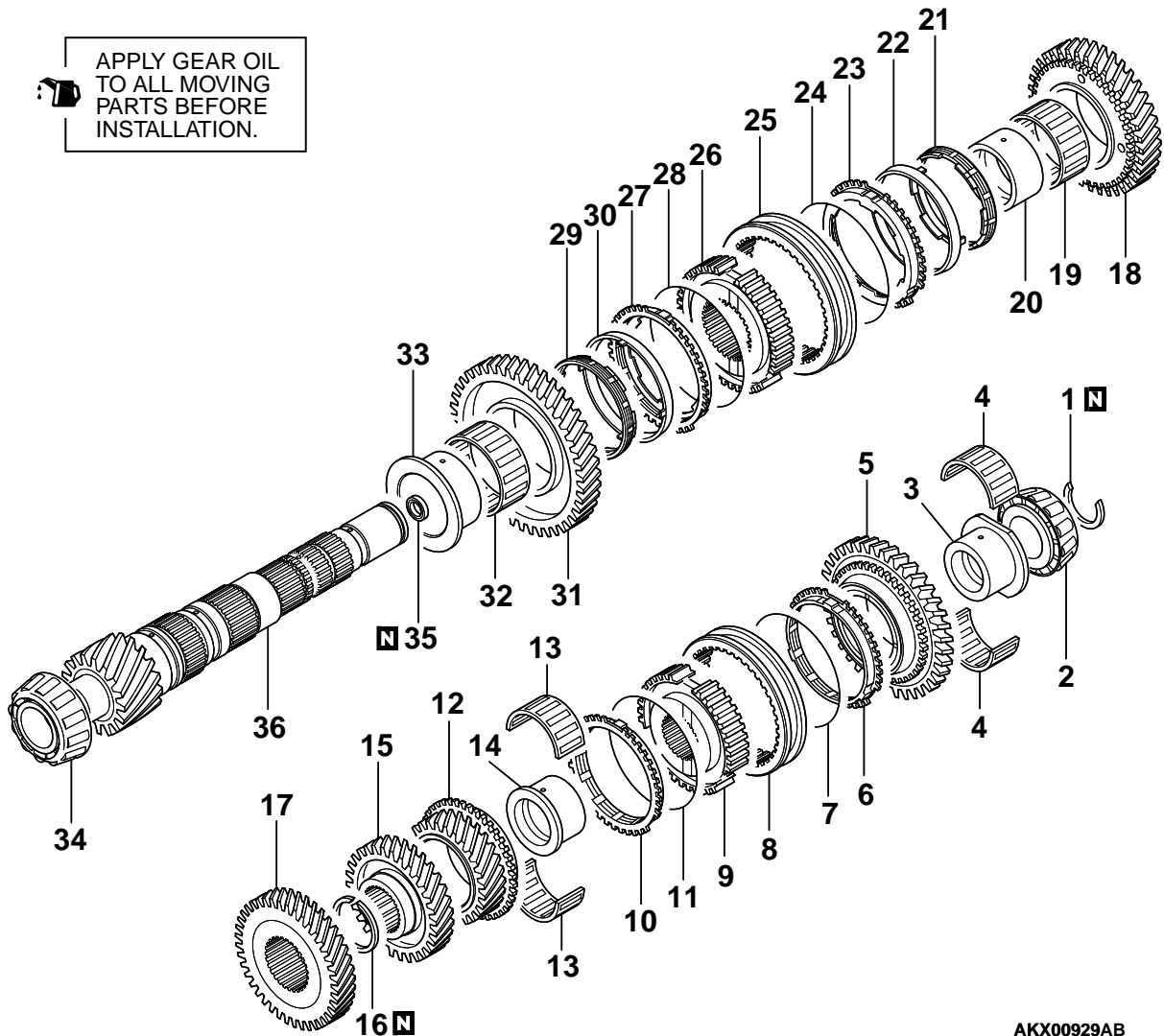
- MD998364: Camshaft Oil Seal Installer <F5M51>
MD998801: Bearing Remover
MD998812: Installer Cap
MD998813: Installer – 100 <F5M42>
MD998814: Installer – 200
MD998818: Installer Adapter (38) <F5M42>

- MD998819: Installer Adapter (40)
MD998820: Installer Adapter (42) <F5M51>
MD998821: Installer Adapter (44) <F5M51>
MD998822: Installer Adapter (46) <F5M42>
MD998824: Installer Adapter (50) <F5M51>
MD998825: Installer Adapter (52) <F5M42>
MD998917: Bearing Remover

TSB Revision

<F5M51>

APPLY GEAR OIL
TO ALL MOVING
PARTS BEFORE
INSTALLATION.



AKX00929AB

DISASSEMBLY STEPS

- >>T<< 1. SNAP RING
- <> >>S<< 2. TAPER ROLLER BEARING
- <<C>> >>Q<< 3. REVERSE GEAR BEARING SLEEVE
- 4. NEEDLE ROLLER BEARING
- 5. REVERSE GEAR
- >>O<< 6. SYNCHRONIZER RING
- >>N<< 7. SYNCHRONIZER SPRING
- >>H<< 8. SYNCHRONIZER SLEEVE
- <<D>> >>P<< 9. 5TH SPEED-REVERSE SYNCHRONIZER HUB
- >>O<< 10. SYNCHRONIZER RING
- >>N<< 11. SYNCHRONIZER SPRING
- 12. 5TH SPEED GEAR
- >>M<< 13. NEEDLE ROLLER BEARING
- >>L<< 14. 5TH SPEED GEAR SLEEVE
- >>K<< 15. 4TH SPEED GEAR
- <<E>> >>J<< 16. SNAP RING
- 17. 3RD SPEED GEAR
- 18. 2ND SPEED GEAR

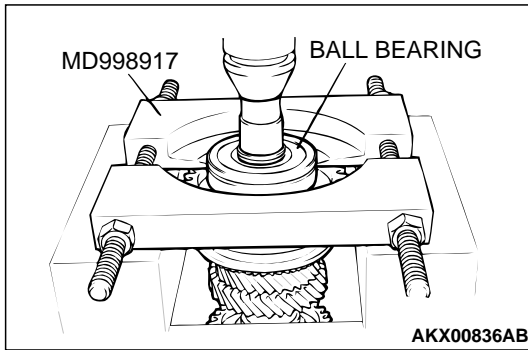
DISASSEMBLY STEPS (Continued)

- 19. NEEDLE ROLLER BEARING
- <<F>> >>I<< 20. 2ND SPEED GEAR SLEEVE
- 21. INNER SYNCHRONIZER RING
- 22. SYNCHRONIZER CONE
- >>F<< 23. OUTER SYNCHRONIZER RING
- >>H<< 24. SYNCHRONIZER SPRING
- >>G<< 25. SYNCHRONIZER SLEEVE
- >>F<< 26. 1ST-2ND SPEED SYNCHRONIZER HUB
- >>F<< 27. OUTER SYNCHRONIZER RING
- >>F<< 28. SYNCHRONIZER SPRING
- >>F<< 29. INNER SYNCHRONIZER RING
- >>F<< 30. SYNCHRONIZER CONE
- >>F<< 31. 1ST SPEED GEAR
- >>F<< 32. NEEDLE ROLLER BEARING
- <<G>> >>E<< 33. 1ST SPEED GEAR SLEEVE
- <<I>> >>C<< 34. TAPER ROLLER BEARING
- >>A<< 35. OIL SEAL
- 36. OUTPUT SHAFT

DISASSEMBLY SERVICE POINTS

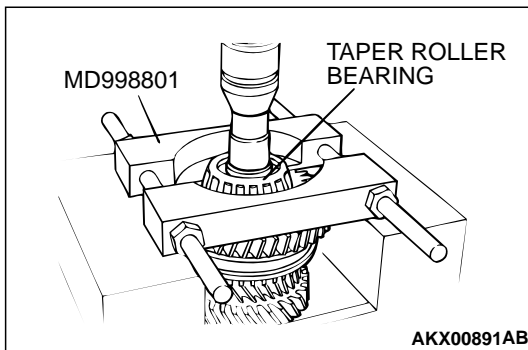
<<A>> BALL BEARING REMOVAL

1. Using special tool MD998917, support the ball bearing, and then set them on the press.
2. Push down on the output shaft with the press, and take out the ball bearing.



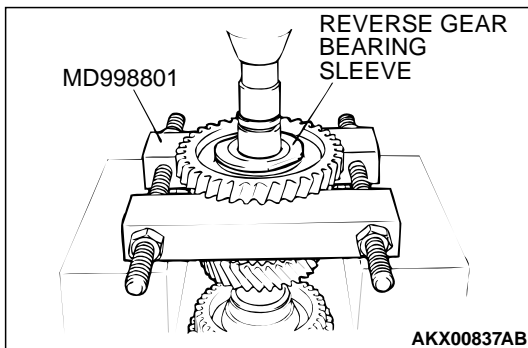
<> TAPER ROLLER BEARING REMOVAL

1. Using special tool 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.



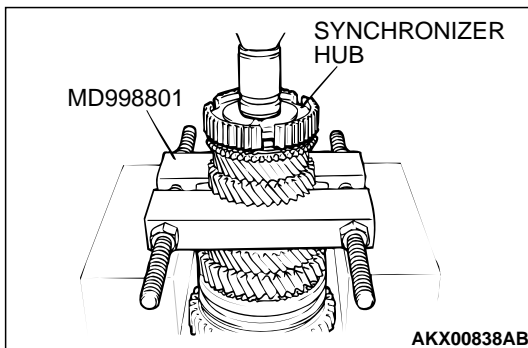
<<C>> REVERSE GEAR BEARING SLEEVE REMOVAL

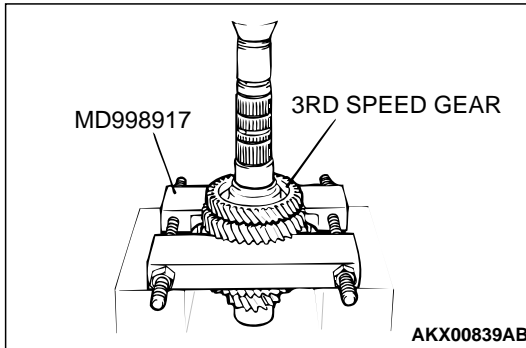
1. Using special tool MD998801, support the reverse gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the reverse gear bearing sleeve.



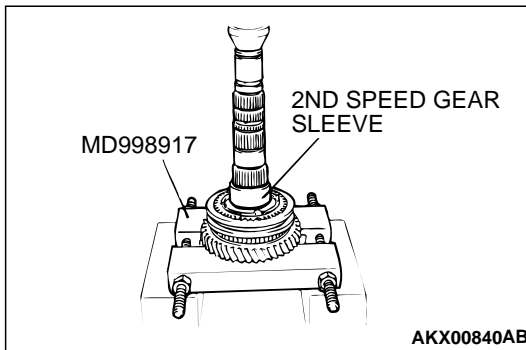
<<D>> 5TH SPEED-REVERSE SYNCHRONIZER HUB REMOVAL

1. Using special tool 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.

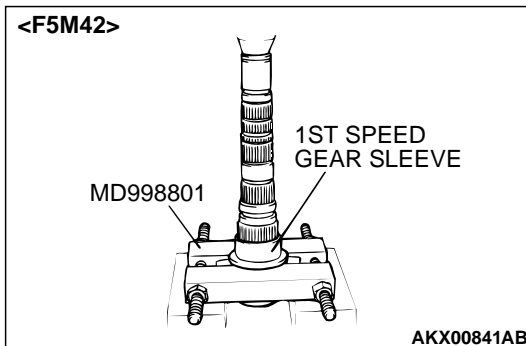


**<<E>> 3RD SPEED GEAR REMOVAL**

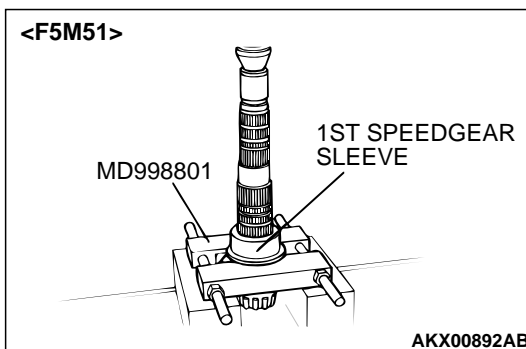
1. Using special tool MD998917, support the 2nd speed gear, and then set them on the press.
2. Push down on the output shaft with the press and remove the 3rd speed gear.

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

1. Using special tool 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.

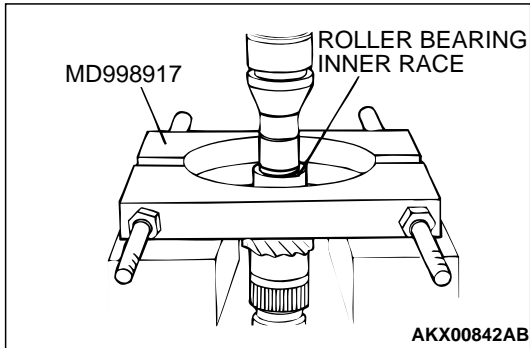
**<<G>> 1ST SPEED GEAR SLEEVE REMOVAL**

1. Using special tool 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.



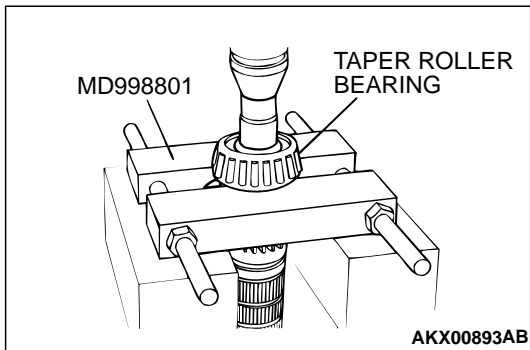
<<H>> ROLLER BEARING INNER RACE REMOVAL

1. Using special tool MD998917, support the roller bearing inner race, and then set them on the press.
2. Push down on the output shaft with the press and remove the roller bearing inner race.



<<I>> TAPER ROLLER BEARING REMOVAL

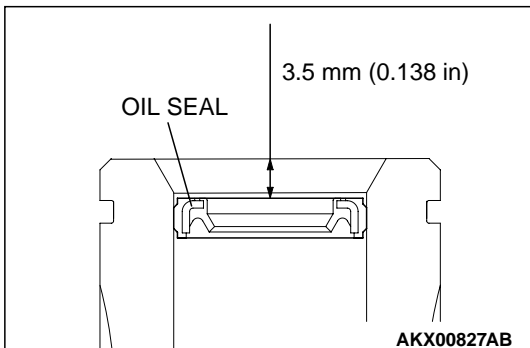
1. Using special tool MD998801, support the taper roller bearing, and then set them on the press.
2. Push down on the output shaft with the press and remove the taper roller bearing.



ASSEMBLY SERVICE POINTS

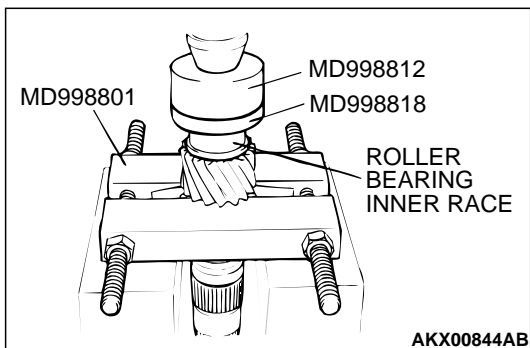
>>A<< OIL SEAL INSTALLATION

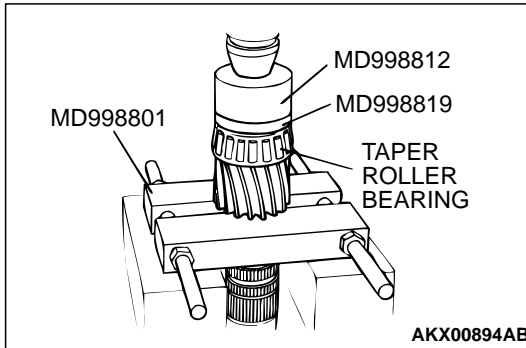
Make sure that the oil seal is pressed into the position shown in the illustration.



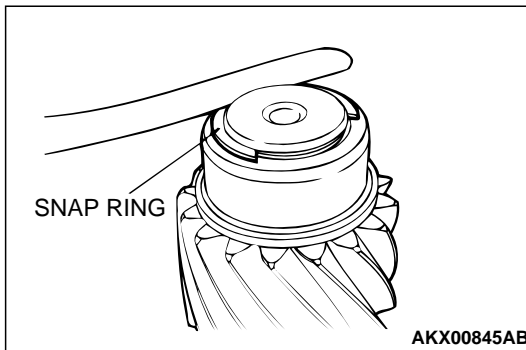
>>B<< ROLLER BEARING INNER RACE INSTALLATION

1. Using special tool MD998801, support the output shaft gear, and then set them on the press.
2. Using special tools MD998812 and MD998818, press install the roller bearing inner race with the press.



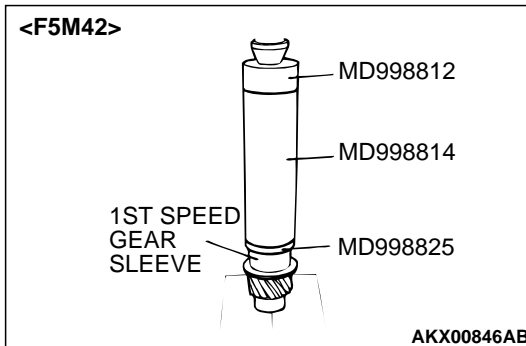
**>>C<< TAPER ROLLER BEARING INSTALLATION**

1. Using special tool MD998801, support the output shaft gear, and then set them on the press.
2. Using special tools MD998812 and MD998819, press install the taper roller bearing with the press.

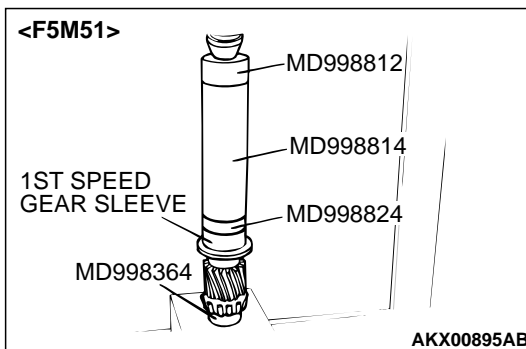
**>>D<< SNAP RING INSTALLATION**

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

Standard value: 0 – 0.12 mm (0 – 0.0047 inch)

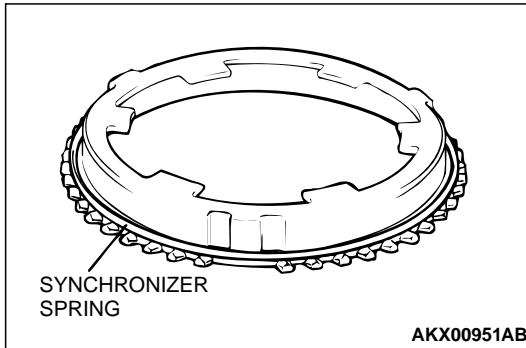
**>>E<< 1ST SPEED GEAR SLEEVE INSTALLATION**

1. Set the output shaft on the press support stand.
2. Using special tools MD998812, MD998814, MD998825 <F5M42>, MD998824 <F5M51> and MD998364 <F5M51>, press install the 1st speed gear sleeve with the press.



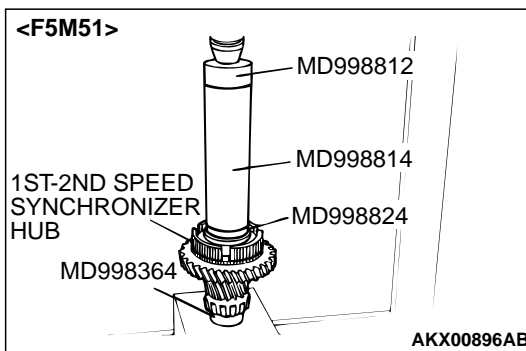
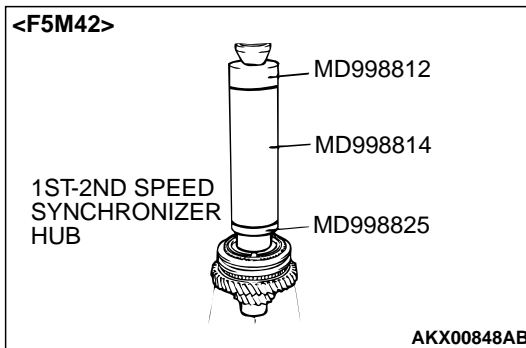
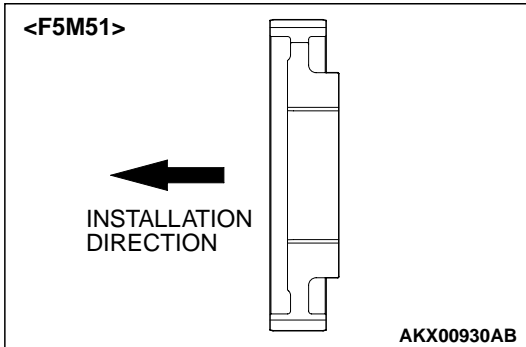
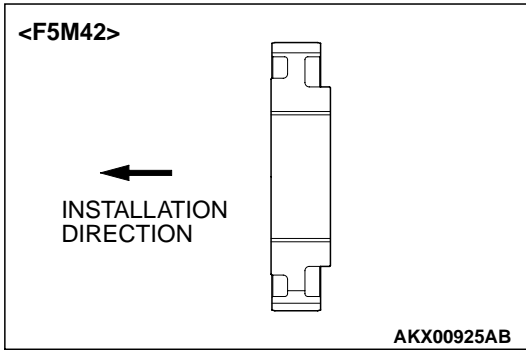
>>F<< SYNCHRONIZER SPRING INSTALLATION

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



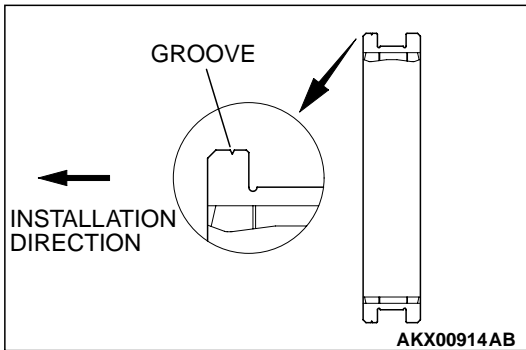
**>>G<< 1ST-2ND SPEED SYNCHRONIZER HUB
INSTALLATION**

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 MD998812, MD998814, MD998825 <F5M42>, MD998824 <F5M51> and MD998364 <F5M51>, press install the 1st-2nd speed synchronizer hub with the press.
4. Make sure that the outer synchronizer ring on the 1st speed gear side can rotate freely.

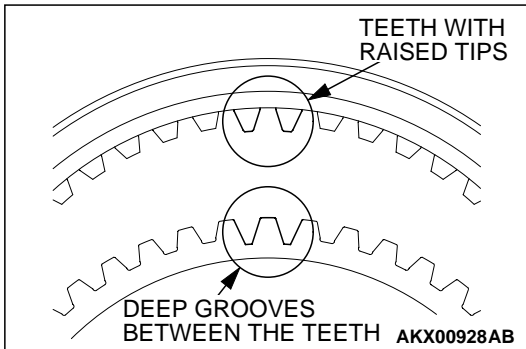


>>H<< SYNCHRONIZER SLEEVE INSTALLATION

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

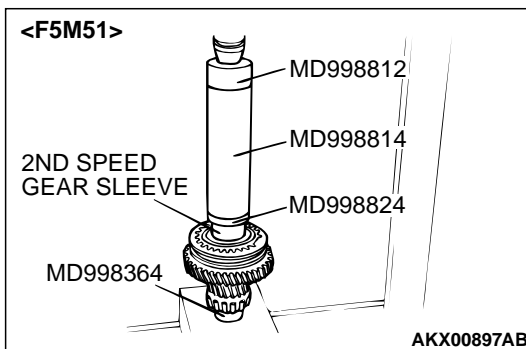
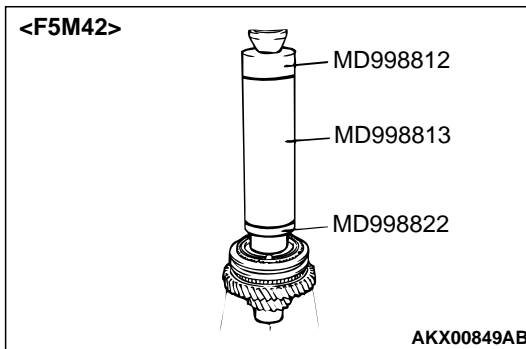


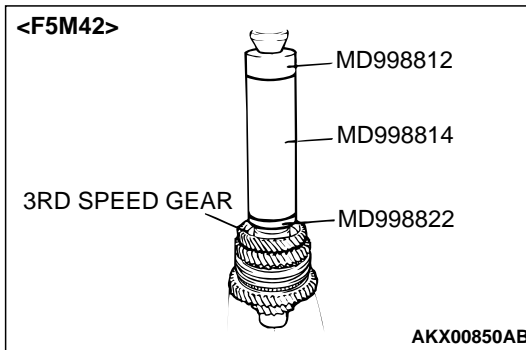
2. Install the synchronizer sleeve so that the areas with teeth that have raised tips (three areas total) are aligned with the areas on the synchronizer hub that have deep grooves between the teeth (three areas total).



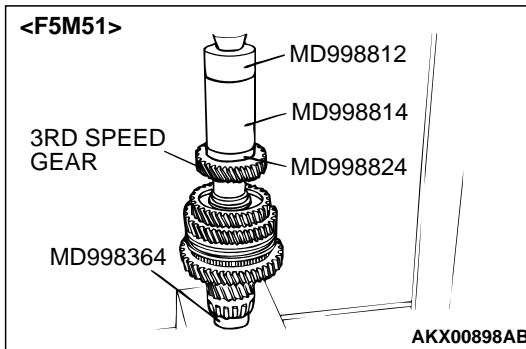
>>I<< 2ND SPEED GEAR SLEEVE INSTALLATION

1. Set the output shaft on the press support stand.
2. Using special tools MD998812, MD998813, MD998822 <F5M42>, MD998824 <F5M51> and MD998364 <F5M51>, press install the 2nd speed sleeve onto the output shaft.



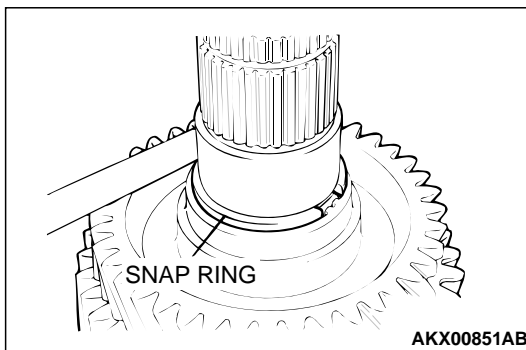
**>>J<< 3RD SPEED GEAR INSTALLATION**

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 MD998812, MD998814, MD998822 <F5M42>, MD998824 <F5M51> and MD998364 <F5M51>, press install the 3rd speed gear onto the output shaft.
3. Make sure that the 2nd speed gear and the outer synchronizer ring can rotate freely.

**>>K<< SNAP RING INSTALLATION**

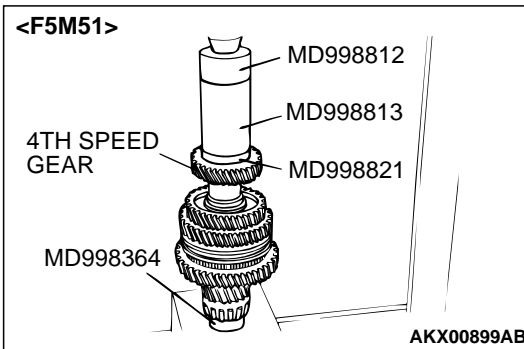
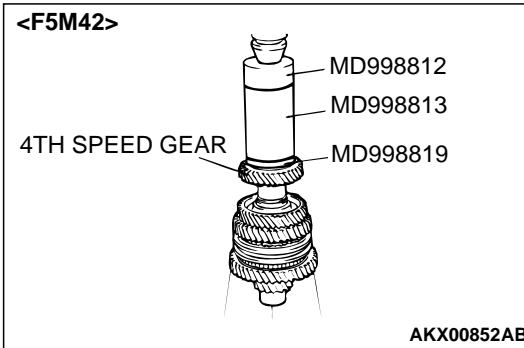
1. Install the thickest snap ring that can be fitted in the groove of output shaft.
2. Make sure that the 3rd speed gear end play meets the standard value.

Standard value: 0 – 0.09 mm (0 – 0.0035 inch)



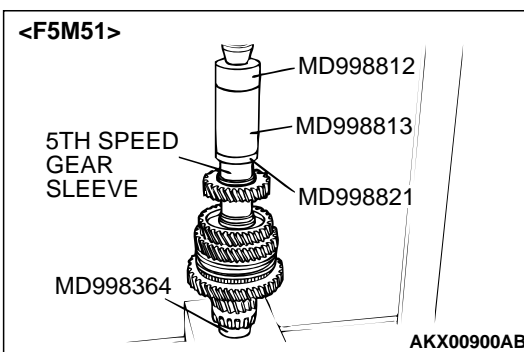
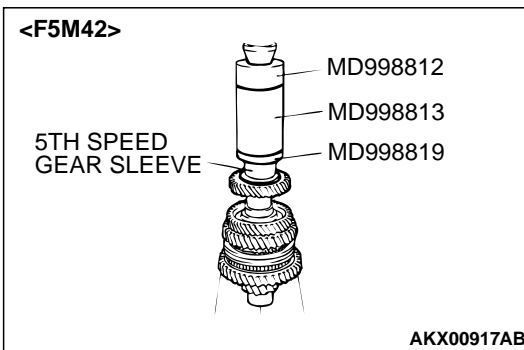
>>L<< 4TH SPEED GEAR INSTALLATION

1. Set the output shaft on the press support stand.
2. Using special tools MD998812, MD998813, MD998819 <F5M42>, MD998821 <F5M51> and MD998364 <F5M51>, press install the 4th speed gear onto the output shaft.



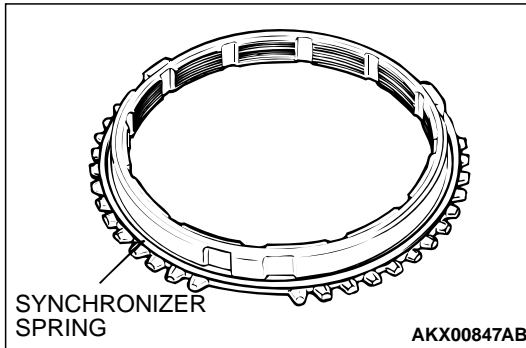
>>M<< 5TH SPEED GEAR SLEEVE INSTALLATION

Using special tools MD998812, MD998813, MD998819 <F5M42>, MD998821 <F5M51> and MD998364 <F5M51>, press install the 5th speed gear sleeve onto the output shaft.



>>N<< SYNCHRONIZER SPRING INSTALLATION

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



>>O<< SYNCHRONIZER RING INSTALLATION

⚠ CAUTION

There is a 5th speed synchronizer ring and a reverse synchronizer ring. Be careful not to confuse the two when installing, as a mistake can effect the shift feeling.

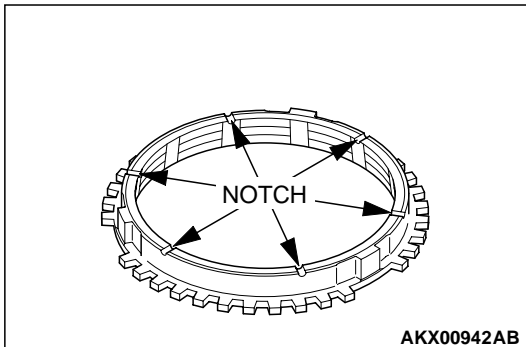
1. Check for the presence of identification notches on the synchronizer ring.

No notches: 5th speed synchronizer ring

Six notches: Reverse synchronizer ring <F5M42>

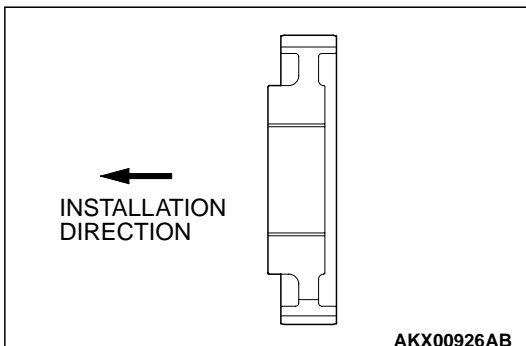
Three notches: Reverse synchronizer ring <F5M51>

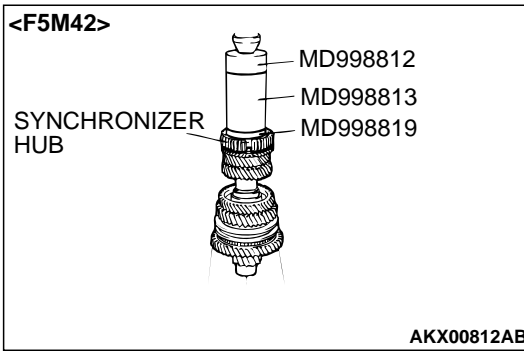
2. Install the synchronizer ring so that it does not incline toward the cone of the gear.



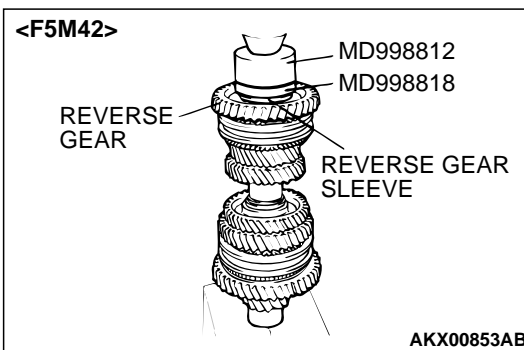
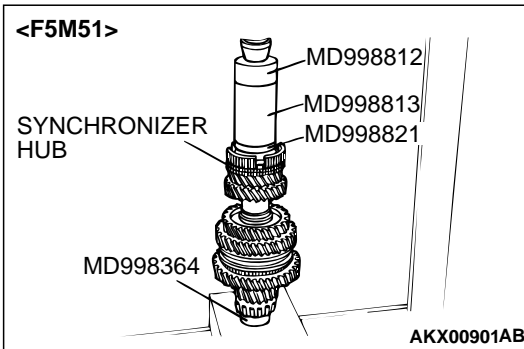
>>P<< 5TH SPEED-REVERSE SYNCHRONIZER HUB INSTALLATION

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.



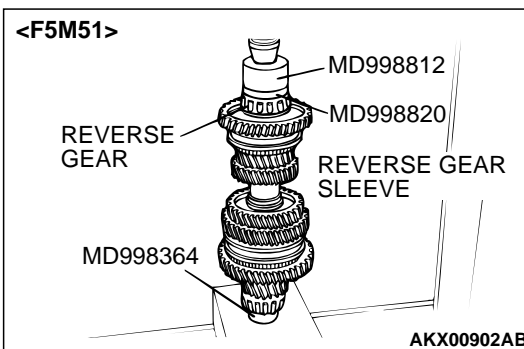


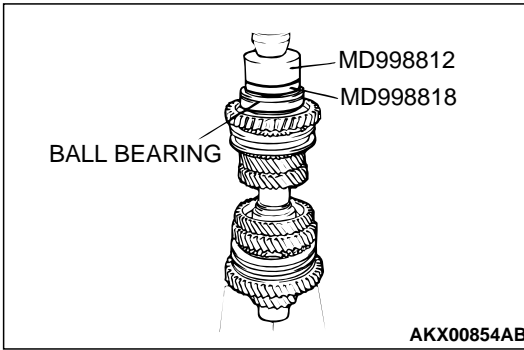
4. Using special tools MD998812, MD998813, MD998819 <F5M42>, MD998821 <F5M51> and MD998364 <F5M51>, press install the 5th speed-reverse synchronizer hub with the press.
5. Make sure that the synchronizer ring on the 5th speed gear side can rotate freely.



>>Q<< REVERSE GEAR SLEEVE INSTALLATION

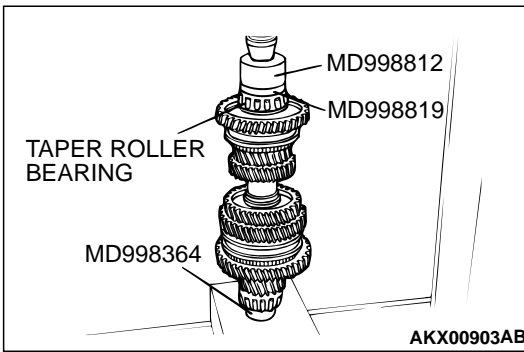
1. Make sure the synchronizer ring, reverse gear and needle roller bearing have been correctly installed.
2. Using special tools MD998812, MD998818 <F5M42>, MD998820 <F5M51> and MD998364 <F5M51>, press fit the reverse gear sleeve. Make sure that the reverse gear and the synchronizer ring can rotate freely during the pressing process.





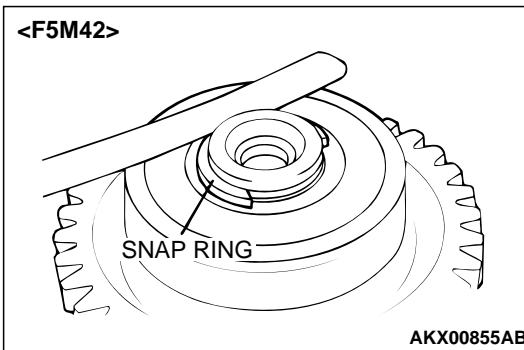
>>R<< BALL BEARING INSTALLATION

1. Check the installation direction of the ball bearing.
2. Using special tools MD998812 and MD998818, press install the ball bearing.



>>S<< TAPER ROLLER BEARING INSTALLATION

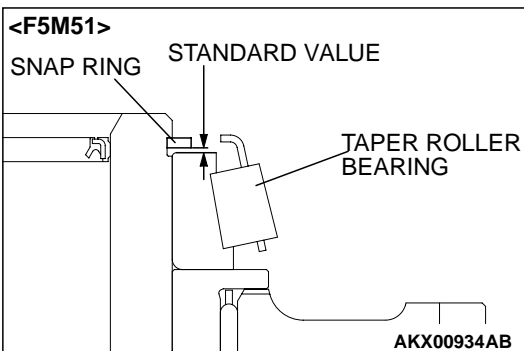
Using special tools MD998812, MD998819 and MD998364, press install the taper roller bearing.



>>T<< SNAP RING INSTALLATION

1. Install the thickest snap ring that can be fitted in the groove of output shaft.
2. Make sure that the ball bearing <F5M42> or taper roller bearing <F5M51> end play meets the standard value.

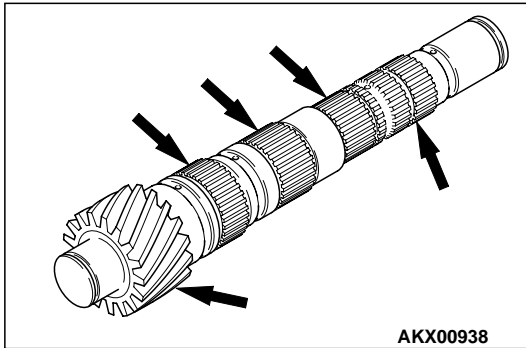
Standard value: 0 – 0.09 mm (0 – 0.0035 inch)



INSPECTION

OUTPUT SHAFT

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

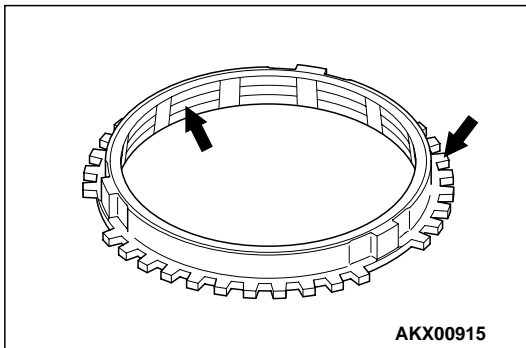


NEEDLE ROLLER BEARING

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.

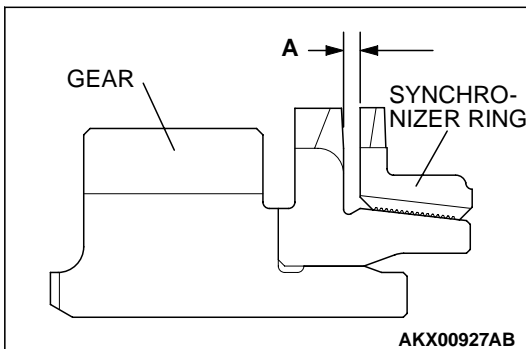
SYNCHRONIZER RING

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.

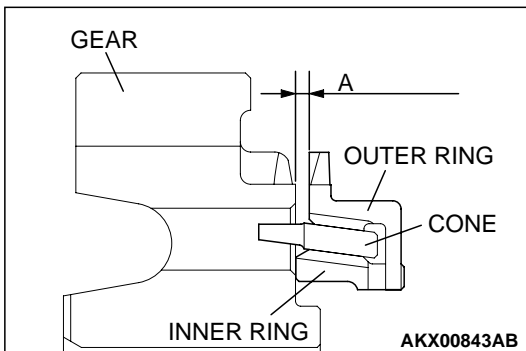
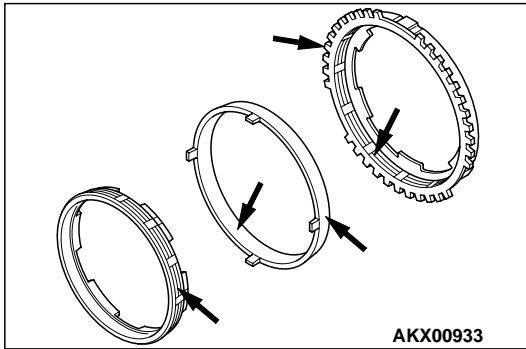
Minimum limit: 0.5 mm (0.020 inch)



OUTER SYNCHRONIZER RING/INNER SYNCHRONIZER RING/SYNCHRONIZER CONE**⚠ 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 and broken.

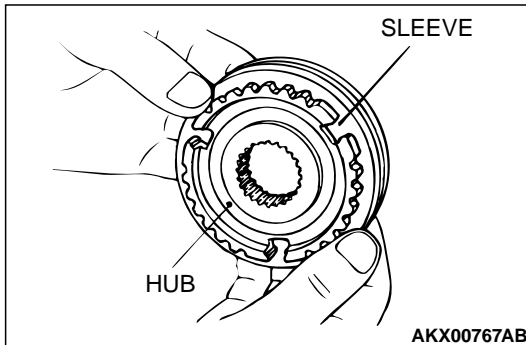


2. Install the outer ring, inner ring and cone, force them toward the gear, and check clearance "A". If "A" is less than the limit, replace.

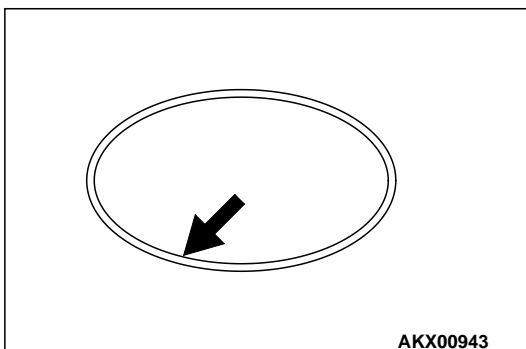
Minimum limit: 0.5 mm (0.020 inch)

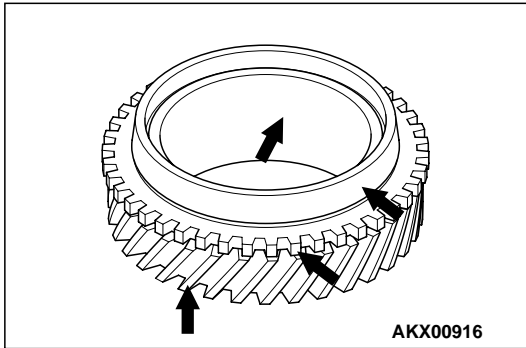
SYNCHRONIZER SLEEVE AND HUB

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

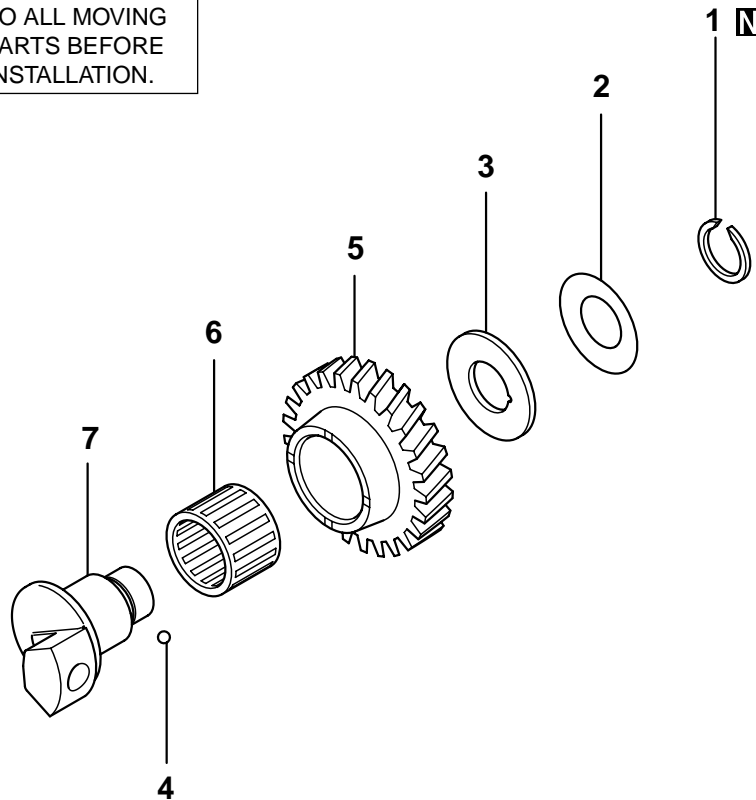
1. Check that the helical and clutch gear tooth surfaces are not damaged or worn.
2. Check that the synchronizer cone surfaces are not roughened, damaged or worn.
3. Check that the gear inside diameter and front and rear surfaces are not damaged and worn.

REVERSE IDLER GEAR

DISASSEMBLY AND ASSEMBLY

M1222012500028

APPLY GEAR OIL
TO ALL MOVING
PARTS BEFORE
INSTALLATION.



AK000202AB

DISASSEMBLY STEPS

1. SNAP RING
2. CONE SPRING
3. THRUST WASHER
4. STEEL BALL

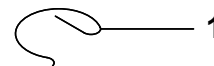
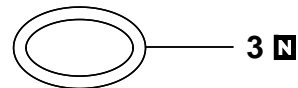
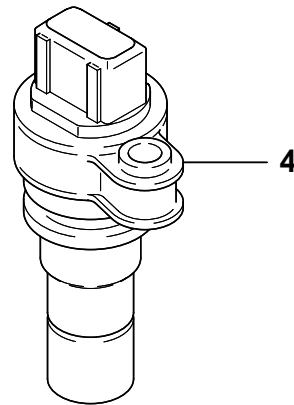
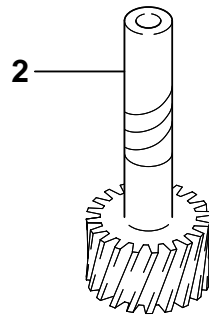
DISASSEMBLY STEPS (Continued)

5. REVERSE IDLER GEAR
6. NEEDLE ROLLER BEARING
7. REVERSE IDLER GEAR SHAFT

SPEEDOMETER GEAR**DISASSEMBLY AND ASSEMBLY**

M1222003400023

 APPLY GEAR OIL
TO ALL MOVING
PARTS BEFORE
INSTALLATION.



AKX00804AB

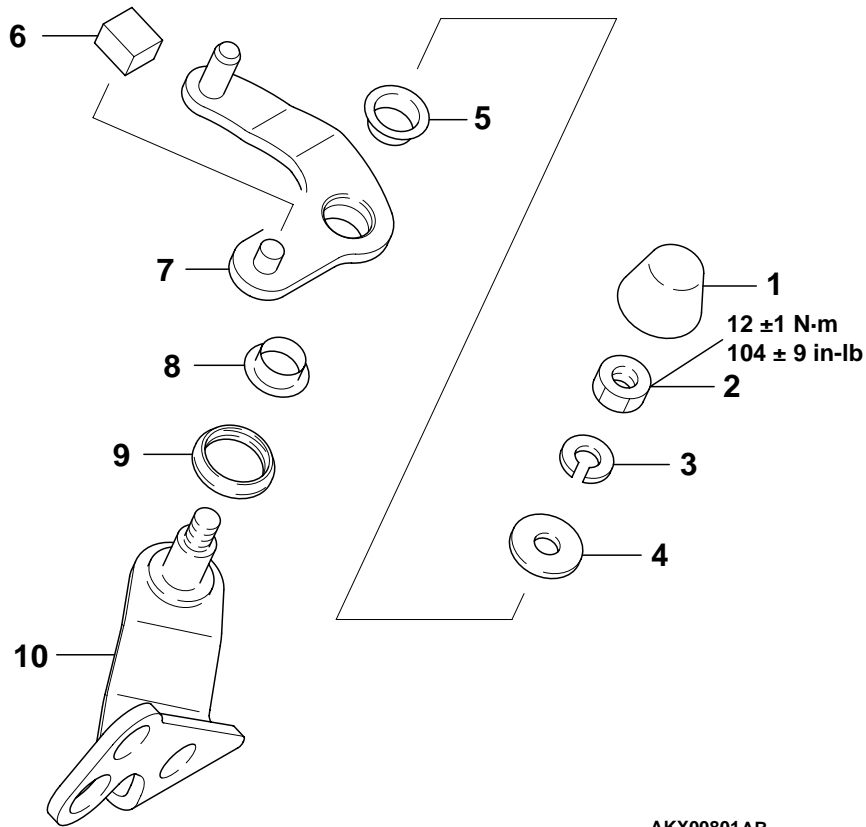
DISASSEMBLY STEPS

1. E-CLIP
2. SPEEDOMETER DRIVEN GEAR
3. O-RING
4. SLEEVE

SELECT LEVER

DISASSEMBLY AND ASSEMBLY

M1222012800029



AKX00801AB

DISASSEMBLY STEPS

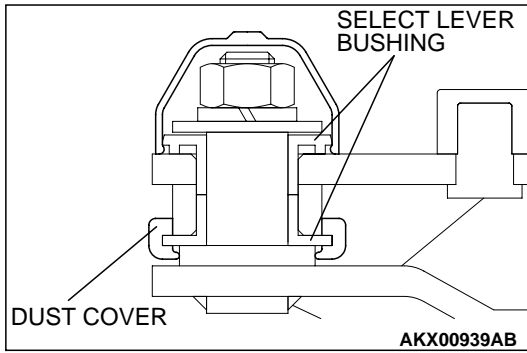
1. DUST COVER
 2. NUT
 3. SPRING WASHER
 4. WASHER
 5. SELECT LEVER BUSHING
- >>A<<

DISASSEMBLY STEPS (Continued)

6. SELECT LEVER SHOE
 7. SELECT LEVER
 8. SELECT LEVER BUSHING
 9. DUST COVER
 10. SELECT LEVER SHAFT
- >>A<<

ASSEMBLY SERVICE POINT**>>A<< DUST COVER AND SELECT LEVER BUSHING
INSTALLATION**

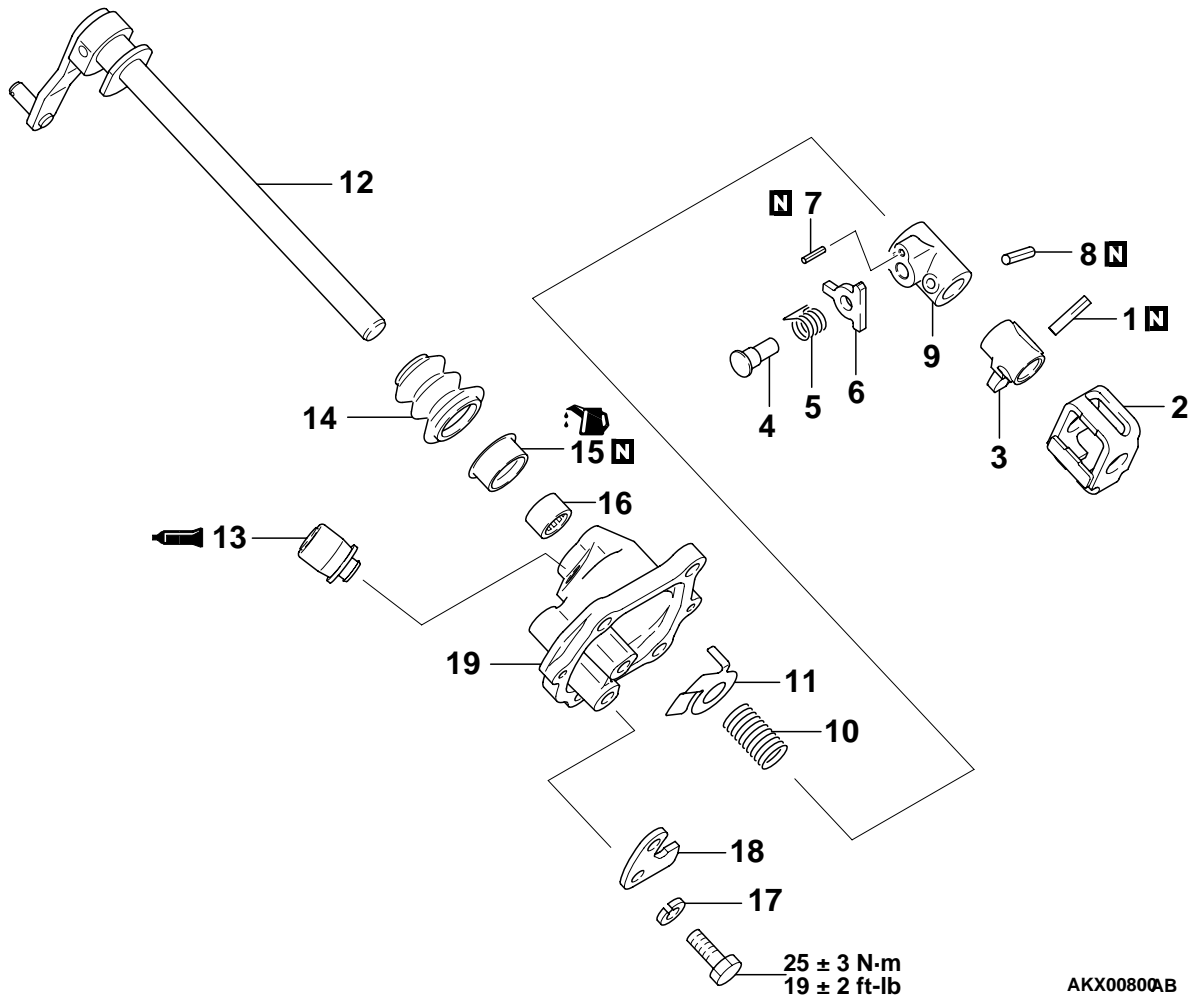
Use the figure to make sure the dust cover and select lever bushing installation direction is correct, and the distinguished parts are correctly assembled.



CONTROL HOUSING

DISASSEMBLY AND ASSEMBLY

M1222013100023

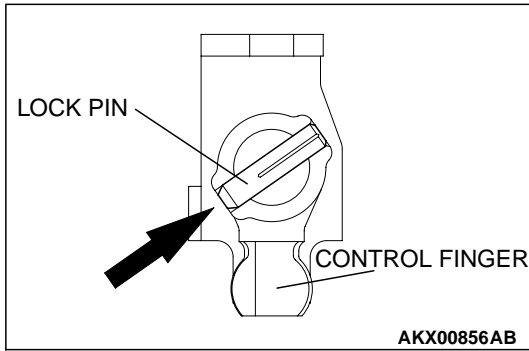


- DISASSEMBLY STEPS**
- <<A>> >>F<<
1. LOCK PIN
 2. INTERLOCK PLATE
 3. CONTROL FINGER
 4. PIN
 5. RETURN SPRING
 6. STOPPER PLATE
 - >>E<< 7. SPRING PIN
 - >>D<< 8. SPRING PIN
 9. STOPPER BODY
 10. NEUTRAL RETURN SPRING

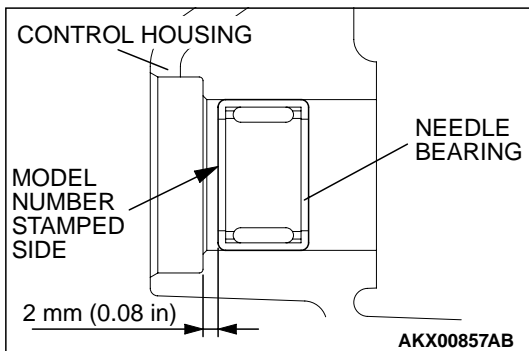
- DISASSEMBLY STEPS (Continued)**
11. SPACER
 12. CONTROL SHAFT
 - >>C<< 13. AIR BREATHER
 14. CONTROL SHAFT BOOT
 - >>B<< 15. OIL SEAL
 - >>A<< 16. NEEDLE BEARING
 17. SPRING WASHER
 18. STOPPER BRACKET
 19. CONTROL HOUSING

DISASSEMBLY SERVICE POINT**<<A>> LOCK PIN REMOVAL**

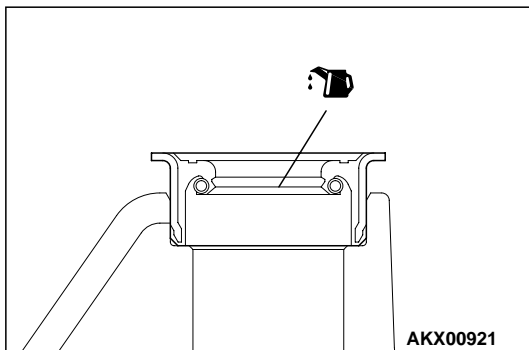
Drive the lock pin out of position from the direction shown.

**ASSEMBLY SERVICE POINTS****>>A<< NEEDLE BEARING INSTALLATION**

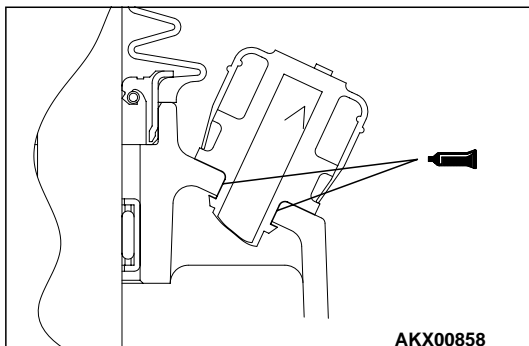
Press fit the needle bearing up the illustrated dimension, while making sure that the model number stamped side is oriented toward the control housing side.

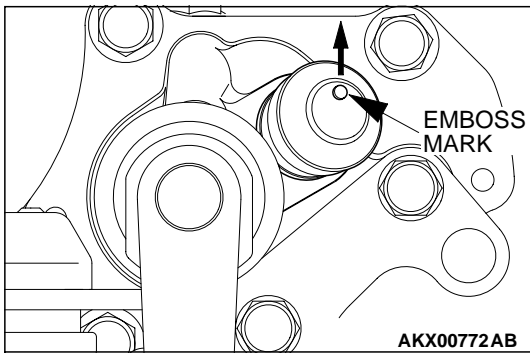
**>>B<< OIL SEAL INSTALLATION**

Apply gear oil (Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4) to the oil seal lip area.

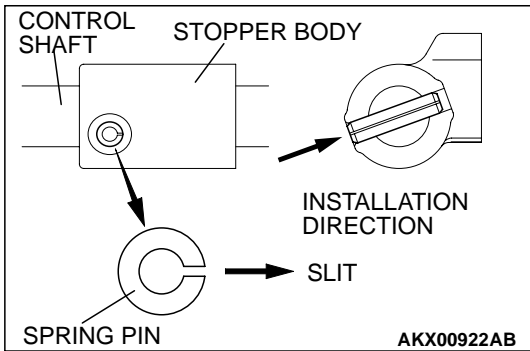
**>>C<< AIR BREATHER INSTALLATION**

1. Apply sealant (3M™ AAD Part Number 8001 or equivalent) to the inserting portion of air breather.



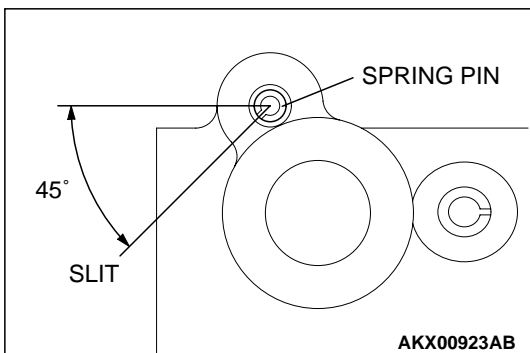


2. Install the air breather so that the embossed mark is in the direction shown in the figure.



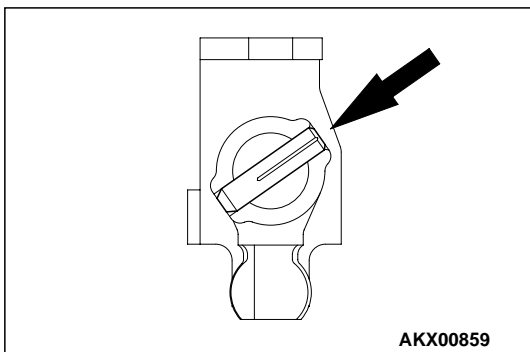
>>D<< SPRING PIN INSTALLATION

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



>>E<< SPRING PIN INSTALLATION

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



>>F<< LOCK PIN INSTALLATION

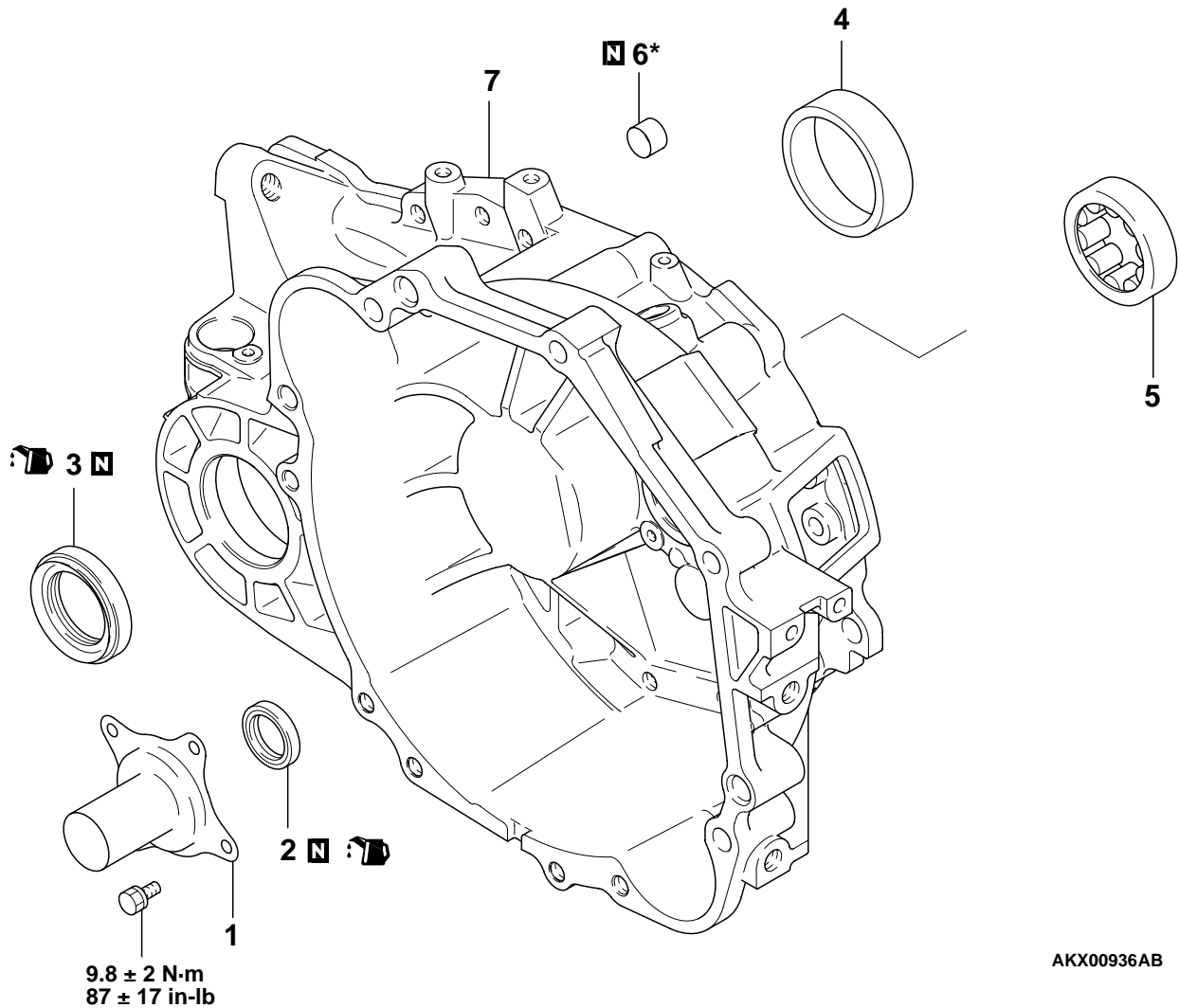
Drive the lock pin in from the direction shown in the figure.

CLUTCH HOUSING

DISASSEMBLY AND ASSEMBLY

M1222003700035

<F5M42>



AKX00936AB

DISASSEMBLY STEPS

- 1. CLUTCH RELEASE BEARING RETAINER
- >>G<< 2. OIL SEAL
- >>F<< 3. OIL SEAL
- <<A>> >>E<< 4. OUTER RACE
- <> >>C<< 5. OUTER RACE

DISASSEMBLY STEPS (Continued)

- >>B<< 6. BUSHING*
- 7. CLUTCH HOUSING

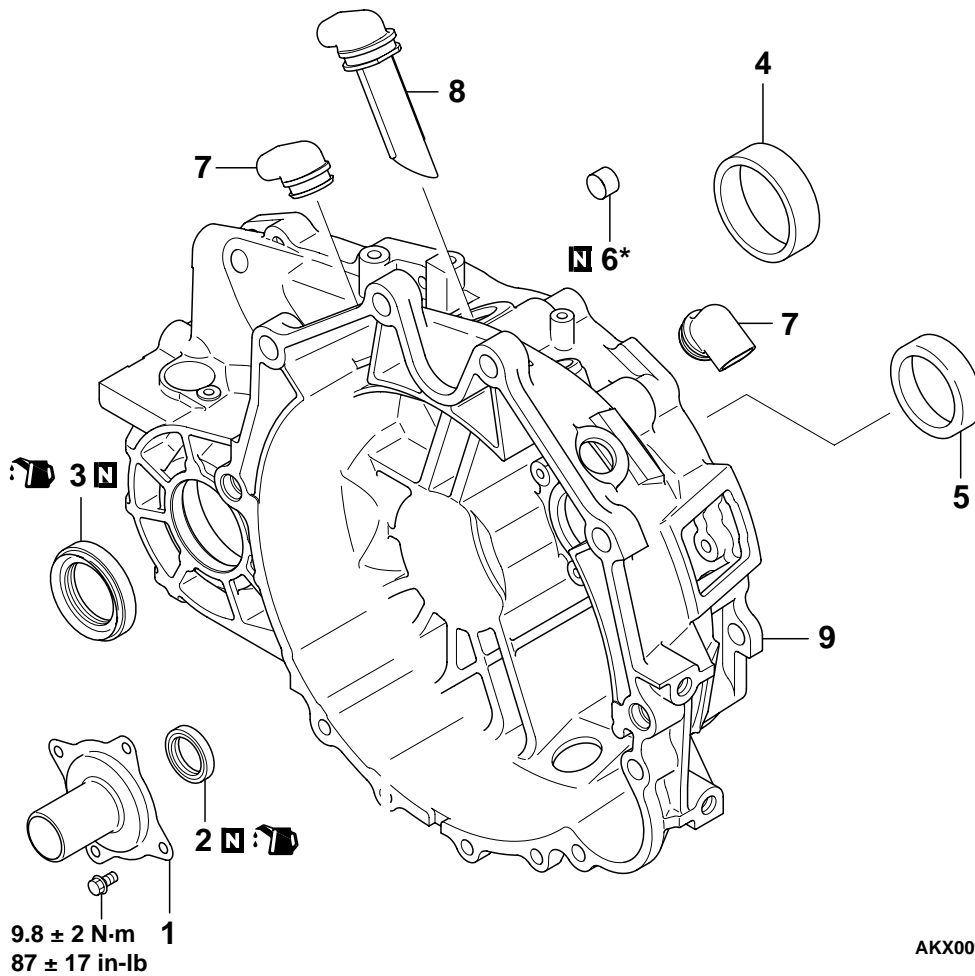
*NOTE: *Refer to the bushing installation procedures only when replacing the clutch housing.*

Required Special Tools:

- MB990926: Installer Adapter <F5M42>
- MB990928: Installer Adapter <F5M51>
- MB990934: Installer Adapter <F5M42>
- MB990935: Installer Adapter
- MB990938: Handle

- MB991445: Bushing Remover and Installer Base <F5M51>
- MD998325: Differential Oil Seal Installer <F5M42>
- MD998346: Bearing Outer Race Remover <F5M42>
- MD998772: Valve Spring Compressor <F5M42>
- MD998800: Differential Oil Seal Installer <F5M51>
- MD999566: Claw

<F5M51>



AKX00947AB

DISASSEMBLY STEPS

- 1. CLUTCH RELEASE BEARING RETAINER
- >>G<< 2. OIL SEAL
- >>F<< 3. OIL SEAL
- <<A>> >>E<< 4. OUTER RACE
- <> >>C<< 5. OUTER RACE
- >>B<< 6. BUSHING*

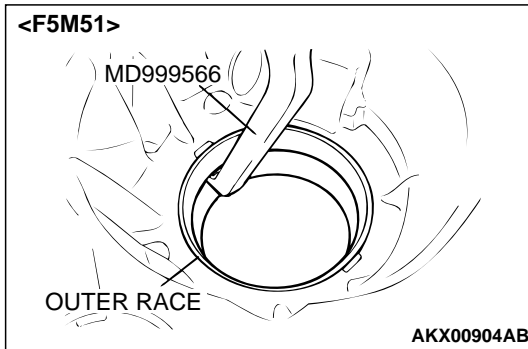
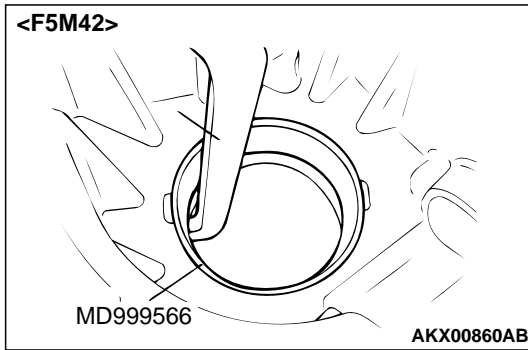
DISASSEMBLY STEPS (Continued)

- >>A<< 7. COVER-A
- >>A<< 8. COVER-B
- 9. CLUTCH HOUSING

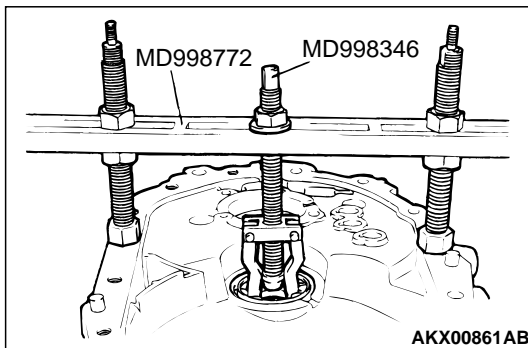
*NOTE: *:Refer to the bushing installation procedures only when replacing the clutch housing.*

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

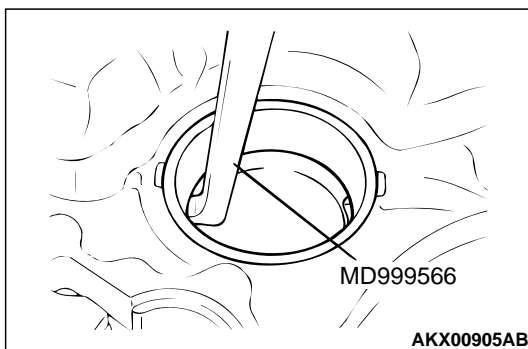
Using special tool MD999566, remove the outer race from the clutch housing.

**<> OUTER RACE REMOVAL**

1. Set special tools MD998772 and MD998346 as indicated in the figure.
2. Turn the nut on special tool MD998346 to pull up on the tool and take out the outer race.

**<<C>> OUTER RACE REMOVAL**

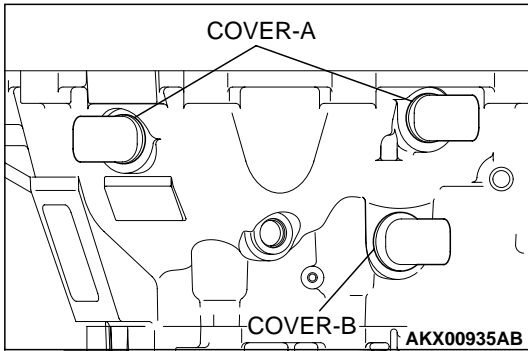
Using special tool MD999566, remove the outer race from the clutch housing.



ASSEMBLY SERVICE POINTS

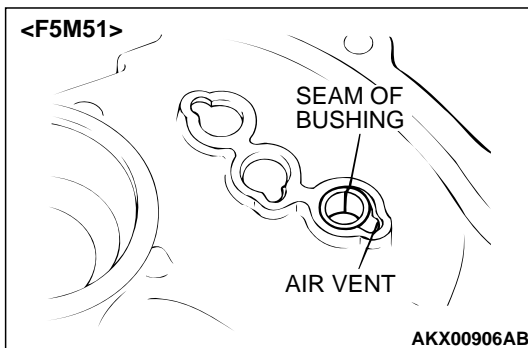
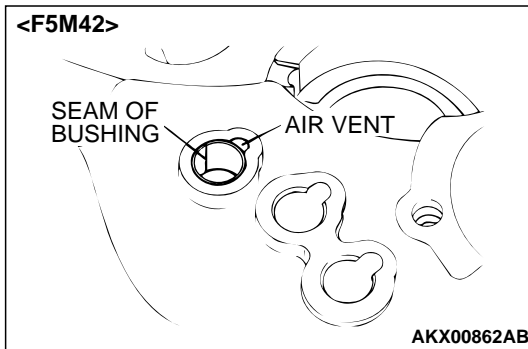
>>A<< COVER-B/COVER-A INSTALLATION

Install the covers directed as shown in the illustration.

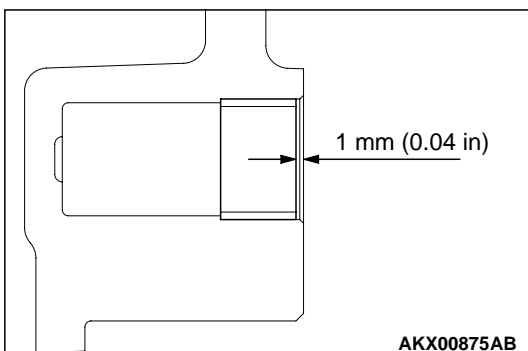


>>B<< BUSHING INSTALLATION

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

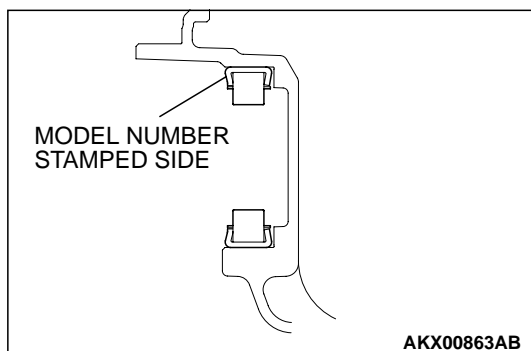


2. Be sure the bushing is fully seated as shown. It must be 1 mm (0.04 inch) below the housing surface.

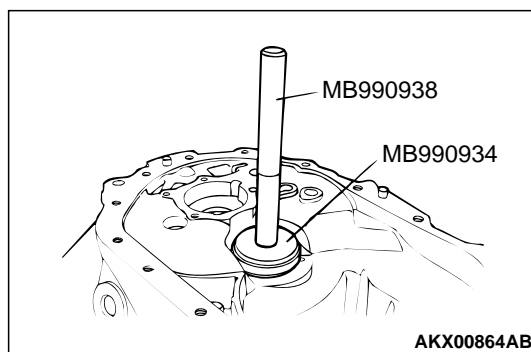


>>C<< OUTER RACE INSTALLATION

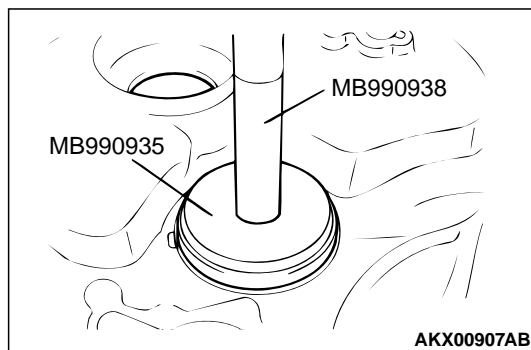
1. Check the installation direction of the outer race.



2. Using special tools MB990938 and MB990934, press fit the outer race into the clutch housing.

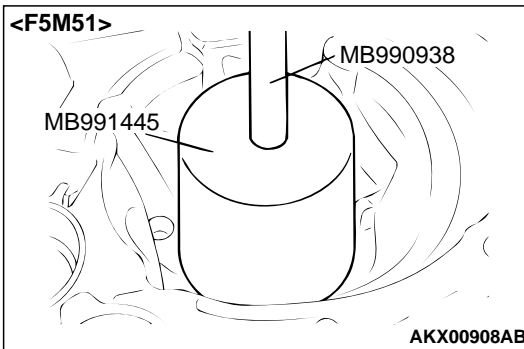
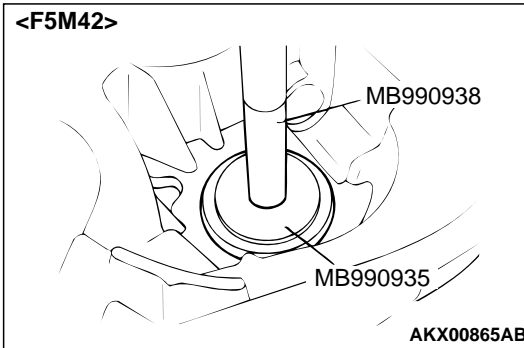
**>>D<< OUTER RACE INSTALLATION**

- Using special tools MB990938 and MB990935, press fit the outer race into the clutch housing.



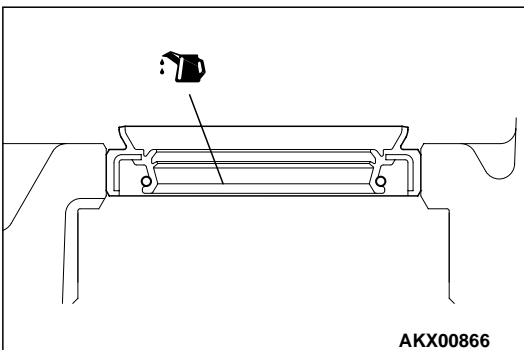
>>E<< OUTER RACE INSTALLATION

1. Check the installation direction of the outer race.
2. Using special tools MB990938, MB990935 <F5M42> and MB991445 <F5M51>, press fit the outer race into the clutch housing.

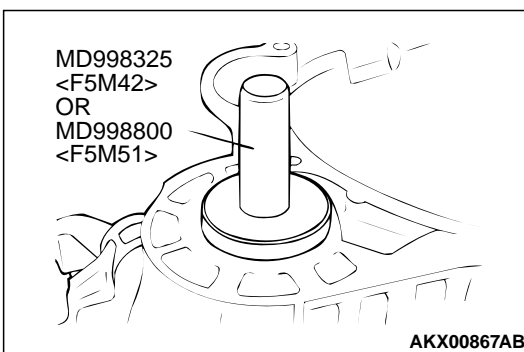


>>F<< OIL SEAL INSTALLATION

1. Apply gear oil (Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4) to the oil seal lip.

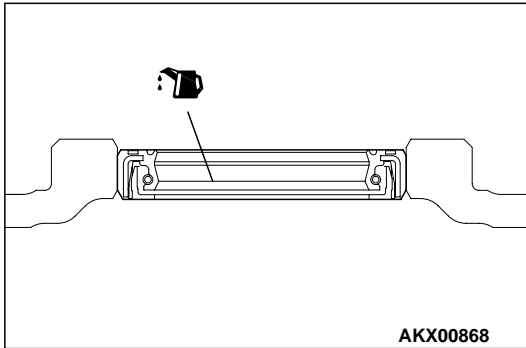


2. Using special tool MD998325 <F5M42> or MD998800 <F5M51>, press fit the oil seal into the clutch housing.

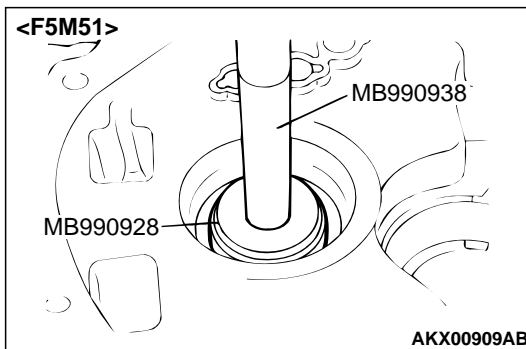
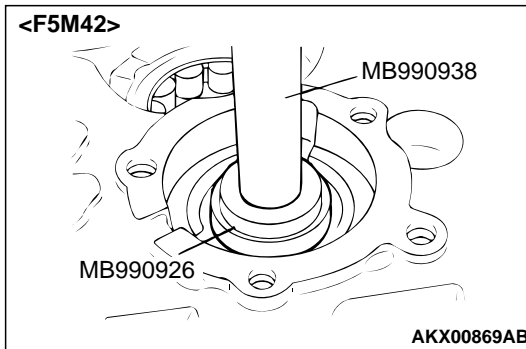


>>G<< OIL SEAL INSTALLATION

1. Apply transmission oil (Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4) to the oil seal lip.



2. Using special tools MB990938, MB990926 <F5M42> and MB990928 <F5M51>, press fit the oil seal into the clutch housing.

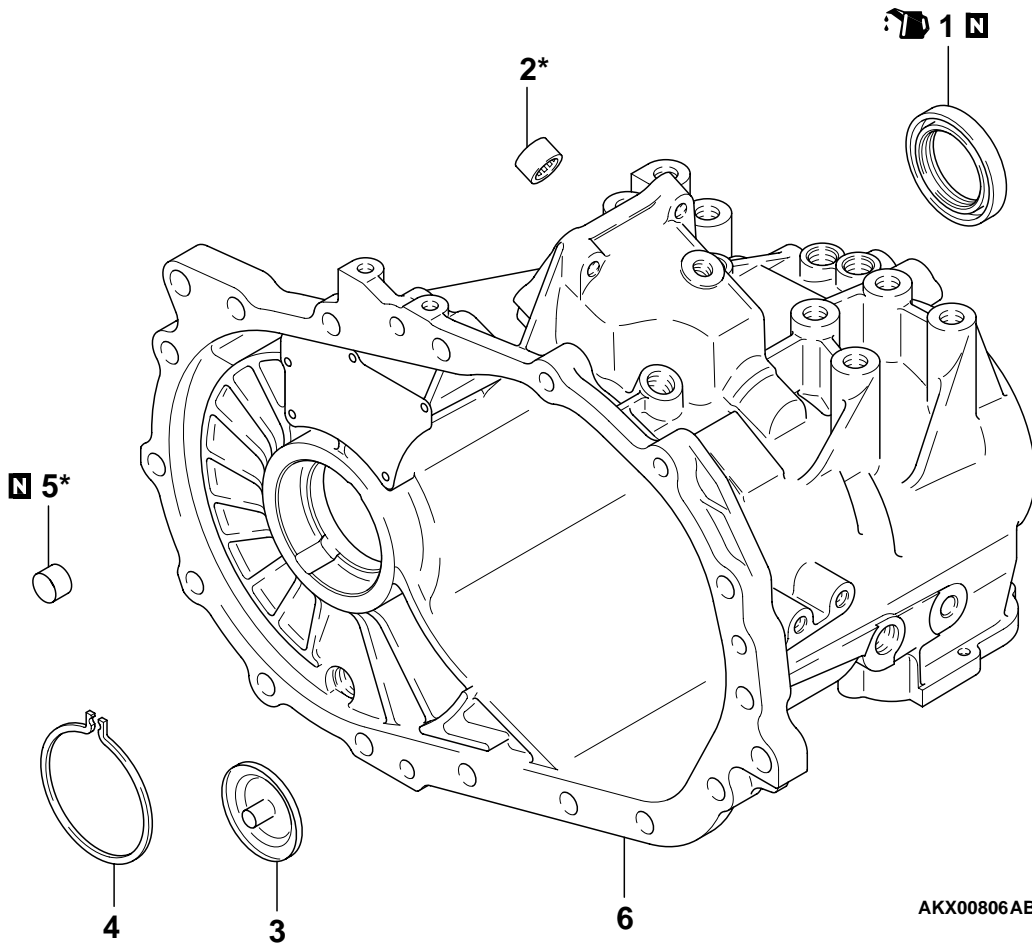


TRANSMISSION CASE

DISASSEMBLY AND ASSEMBLY

M1222013400024

<F5M42>



AKX00806AB

- DISASSEMBLY STEPS**
- >>C<< 1. OIL SEAL
 - >>B<< 2. NEEDLE BEARING*
 - 3 OIL GUIDE
 - 4. SNAP RING

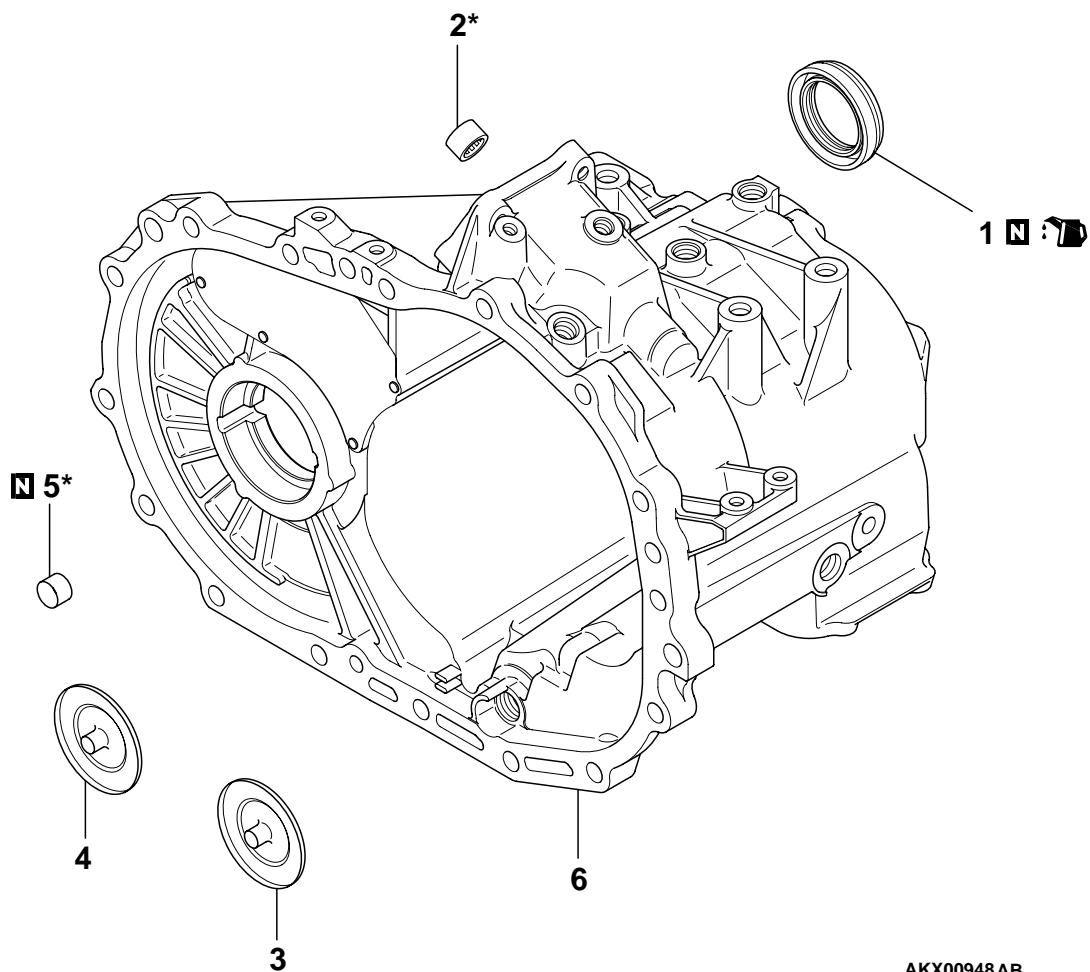
- DISASSEMBLY STEPS (Continued)**
- >>A<< 5. BUSHING*
 - 6. TRANSAXLE

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

Required Special Tools:
MD998325: Differential Oil Seal Installer <F5M42>

MD998800: Differential Oil Seal Installer <F5M51>

<F5M51>



- DISASSEMBLY STEPS**
- >>C<< 1. OIL SEAL
>>B<< 2. NEEDLE BEARING*
3. OIL GUIDE
4. OIL GUIDE

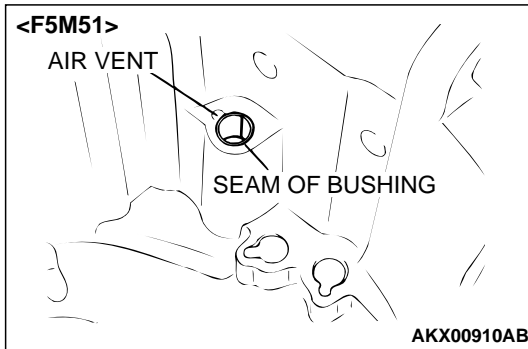
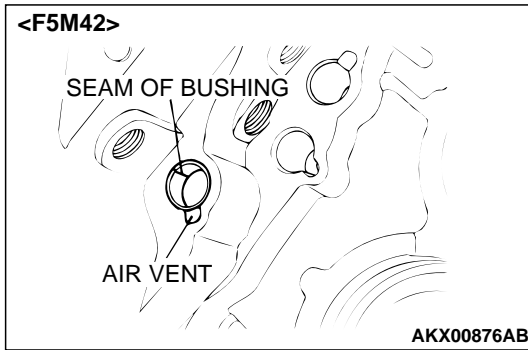
- DISASSEMBLY STEPS (Continued)**
- >>A<< 5. BUSHING*
6. TRANSAXLE

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

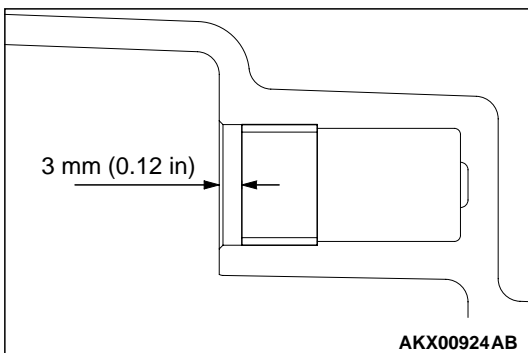
ASSEMBLY SERVICE POINTS

>>A<< BUSHING INSTALLATION

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

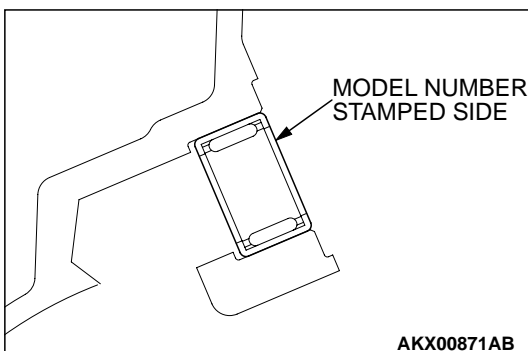


2. Be sure the bushing is fully seated as shown. It must be 3 mm (0.12 inch) below the housing surface.



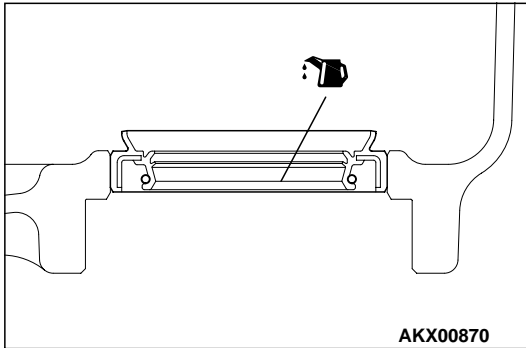
>>B<< NEEDLE BEARING INSTALLATION

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

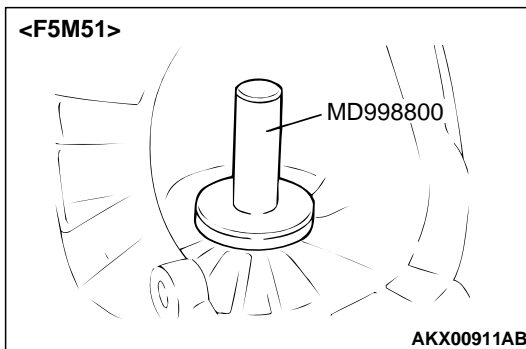
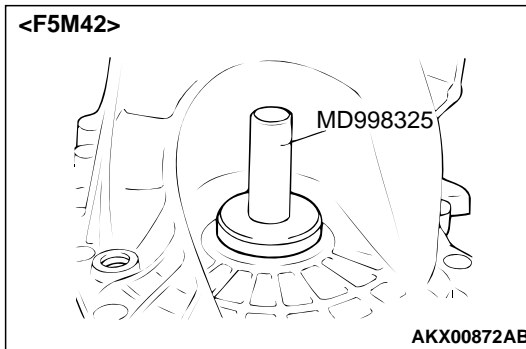


>>C<< OIL SEAL INSTALLATION

1. Apply gear oil (Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4).



2. Using special tool MD998325 <F5M42> or MD998800 <F5M51>, press fit the oil seal into the transaxle case.

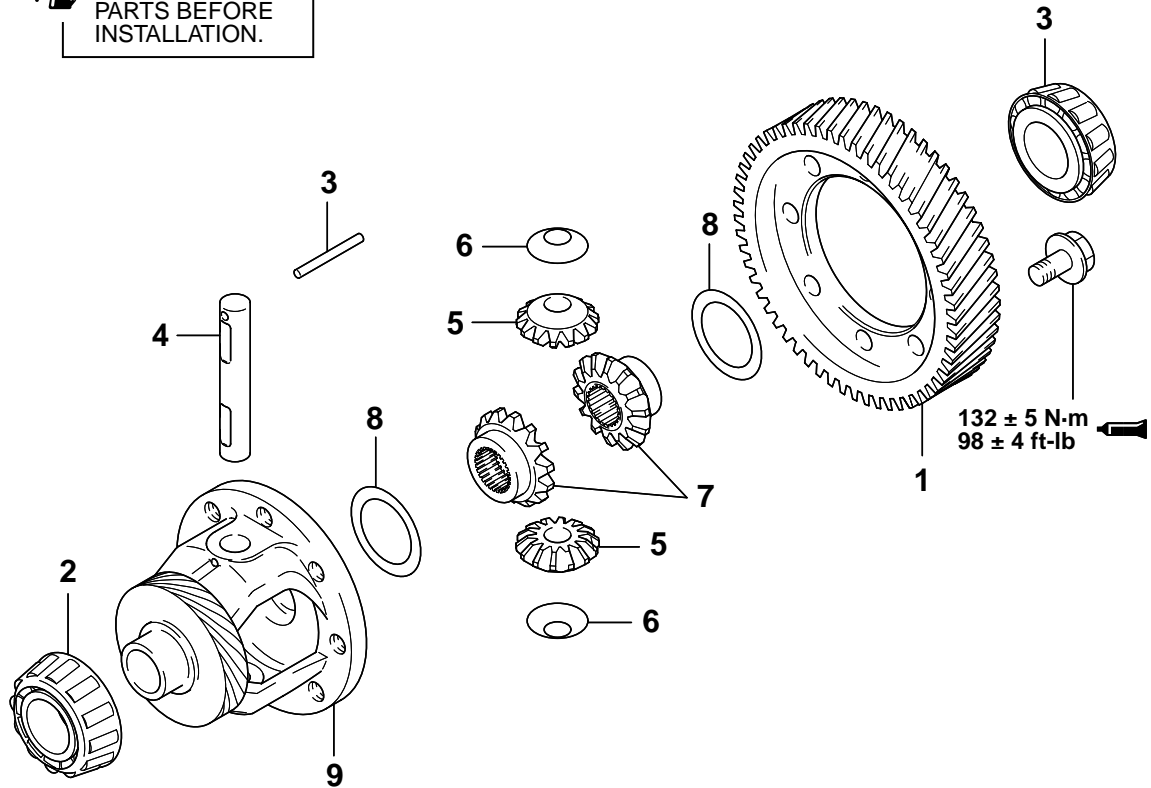


DIFFERENTIAL

DISASSEMBLY AND ASSEMBLY

M1222002500027

 APPLY GEAR OIL TO ALL MOVING PARTS BEFORE INSTALLATION.



AKX00771AB

DISASSEMBLY STEPS

- >>D<< 1. DIFFERENTIAL DRIVE GEAR
- <<A>> >>C<< 2. TAPER ROLLER BEARING
- >>B<< 3 LOCK PIN
- >>A<< 4. PINION SHAFT
- >>A<< 5. PINION

DISASSEMBLY STEPS (Continued)

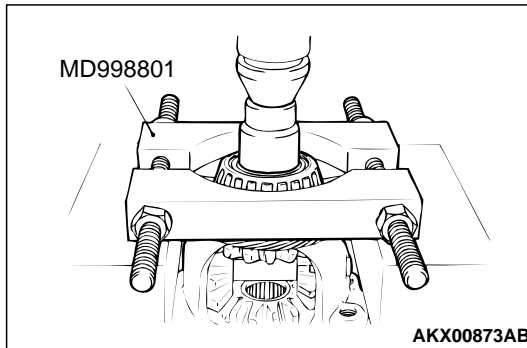
- >>A<< 6. WASHER
- >>A<< 7. SIDE GEAR
- >>A<< 8. SPACER
- 9. DIFFERENTIAL CASE

Required Special Tools:
MD998801: Bearing Remover

MD998812: Installer Cap
MD998819: Installer Adapter (40)

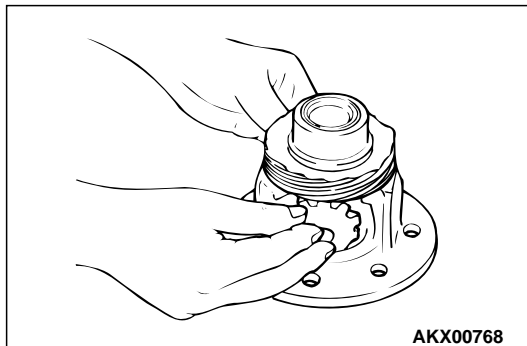
DISASSEMBLY SERVICE POINT**<<A>> TAPER ROLLER BEARING REMOVAL**

1. Using special tool MD998801, support the taper roller bearing, and then set them on the press.
2. Push down on the differential case with the press and take out the bearing.

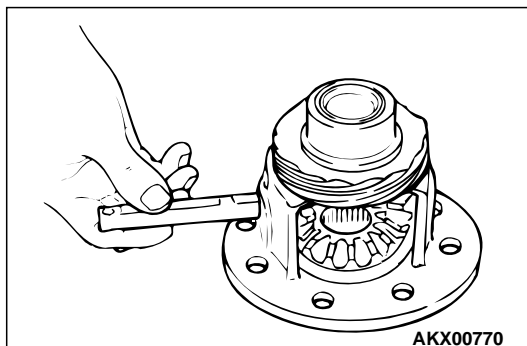
**ASSEMBLY SERVICE POINTS****>>A<< SPACER/SIDE GEAR/WASHER/PINION/PINION SHAFT INSTALLATION**

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 [0.93 – 1.00 mm (0.0366 – 0.0395 inch)].
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.



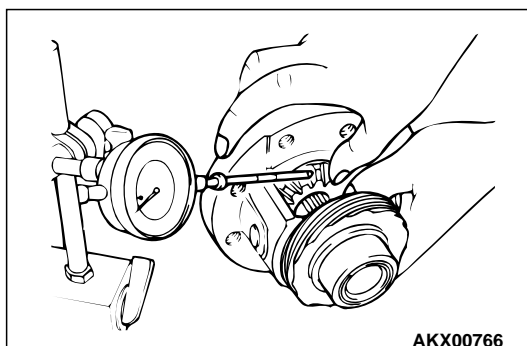
4. Measure the backlash between the side gear and pinion.

Standard value:

0.025 – 0.150 mm (0.0010 – 0.0059 inch)

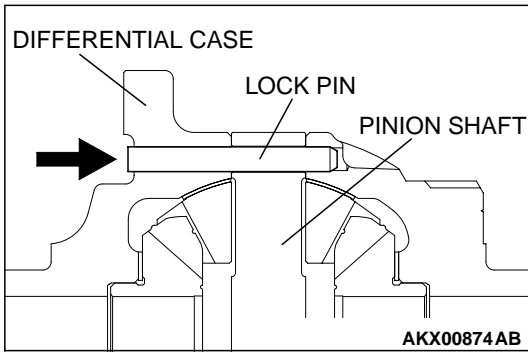
5. If the backlash is out of specification, select a spacer and re-measure the backlash.

NOTE: Adjust until the backlashes on both sides are equal.



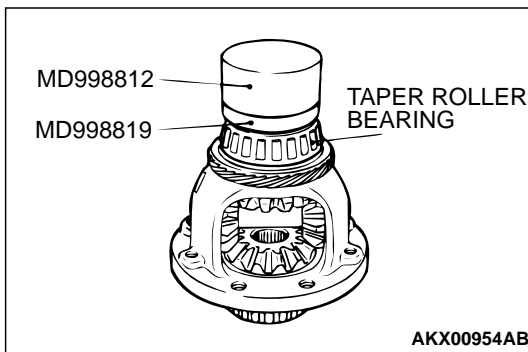
>>B<< LOCK PIN INSTALLATION

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



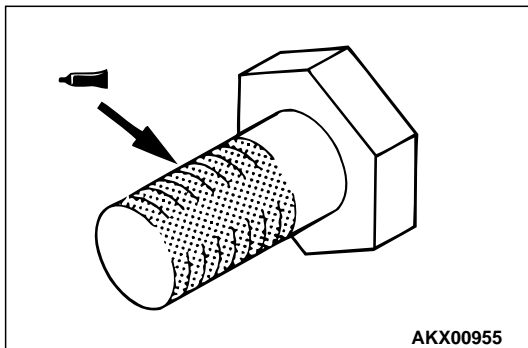
>>C<< TAPER ROLLER BEARING INSTALLATION

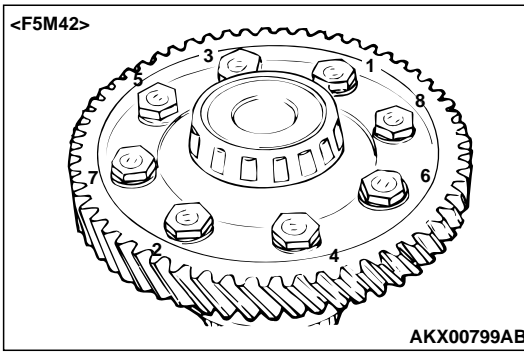
Using special tools MD998812 and MD998819, press install the taper roller bearing.



>>D<< DIFFERENTIAL DRIVE GEAR INSTALLATION

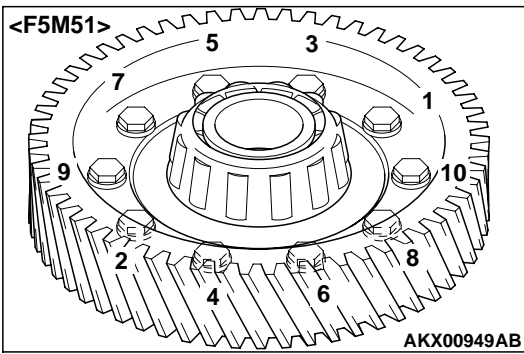
1. Apply a sealant (3M™AAD Part Number 8730 or 8731 or equivalent) to the entire threaded portion of the bolt.





2. Tighten to the specified torque in the illustrated sequence.

Tightening torque: 132 ± 5 N·m (98 ± 4 ft·lb)



SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1222012100020

ITEMS	SPECIFICATIONS
Roll stopper bracket mounting bolt	69 ± 10 N·m (51 ± 7 ft-lb)
Shift cable bracket mounting bolt	19 ± 3 N·m (14 ± 2 ft-lb)
Select lever mounting bolt	19 ± 3 N·m (14 ± 2 ft-lb)
Speedometer gear mounting bolt	4 ± 1 N·m (35 ± 9 in-lb)
Backup light switch	32 ± 2 N·m (24 ± 1 ft-lb)
Interlock plate bolt	30 ± 3 N·m (22 ± 2 ft-lb)
Poppet spring	32 ± 2 N·m (24 ± 1 ft-lb)
Control housing mounting bolt	19 ± 3 N·m (14 ± 2 ft-lb)
Under cover mounting bolt	7 ± 1 N·m (61 ± 9 in-lb)
Reverse idler gear shaft mounting bolt	48 ± 6 N·m (35 ± 4 ft-lb)
Clutch housing-transaxle case mounting bolt	44 ± 5 N·m (33 ± 4 ft-lb)
Front bearing retainer mounting bolt <F5M42>	19 ± 3 N·m (14 ± 2 ft-lb)
Select lever mounting nut	12 ± 1 N·m (104 ± 9 in-lb)
Stopper bracket mounting bolt	25 ± 3 N·m (19 ± 2 ft-lb)
Clutch release bearing retainer mounting bolt	9.8 ± 2 N·m (87 ± 17 in-lb)
Differential drive gear mounting bolt	132 ± 5 N·m (98 ± 4 ft-lb)

GENERAL SPECIFICATIONS

M1222000200031

ITEMS	SPECIFICATIONS		
Model	F5M42	F5M51	
Applicable engine	4G64	6G72	
Type	5-speed transaxle floor shift		
Gear ratio	1st	3.583	3.333
	2nd	1.947	2.105
	3rd	1.379	1.407
	4th	1.030	1.031
	5th	0.767	0.761
	Reverse	3.363	3.416
Final reduction ratio	3.722	3.736	
Speedometer gear ratio (driven/drive)	29/36	28/36	

SERVICE SPECIFICATIONS

M1222000300027

ITEM	STANDARD VALUE	MINIMUM LIMIT
Input shaft end play <F5M51> mm (in)	0.05 – 0.17 (0.020 – 0.0067)	-
Input shaft front bearing end play mm (in)	0 – 0.12 (0 – 0.0047)	-
Input shaft rear bearing end play mm (in)	0 – 0.12 (0 – 0.0047)	-
Input shaft 5th speed gear end play mm (in)	0 – 0.09 (0 – 0.0035)	-

TSB Revision

ITEM	STANDARD VALUE	MINIMUM LIMIT
Output shaft roller bearing inner race end play <F5M42> mm (in)	0 – 0.12 (0 – 0.0047)	-
Output shaft ball bearing end play <F5M42> mm (in)	0 – 0.09 (0 – 0.0035)	-
Output shaft preload <F5M51> mm (in)	0.13 – 0.18 (0.0051 – 0.0071)	-
Output shaft taper roller bearing end play <F5M51> mm (in)	0 – 0.09 (0 – 0.0035)	-
Output shaft 3rd speed gear end play mm (in)	0 – 0.09 (0 – 0.0035)	-
Differential pinion backlash mm (in)	0.025 – 0.150 (0.0010 – 0.0059)	-
Differential case preload mm (in)	0.05 – 0.11 (0.0020 – 0.0043)	-
Synchronizer ring back surface to gear clearance mm (in)	-	0.5 (0.020)

SEALANTS

M1222000500021

ITEM	SPECIFIED SEALANT
Clutch housing-transaxle case mating surface	MITSUBISHI Genuine sealant part No. MD997740 or equivalent
Control housing-transaxle case mating surface	
Under cover-transaxle case mating surface	
Air breather	3M™AAD Part No.8001 or equivalent
Differential drive gear bolt	3M™AAD Part No.8730 or 8731 or equivalent

LUBRICANTS

M1222000400024

ITEM	SPECIFIED LUBRICANT
Driveshaft oil seal lip Gear oil	Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4
Input shaft oil seal lip Gear oil	
Control shaft oil seal lip Gear oil	
Select lever shoe	MITSUBISHI genuine grease part No.0101011 or equivalent