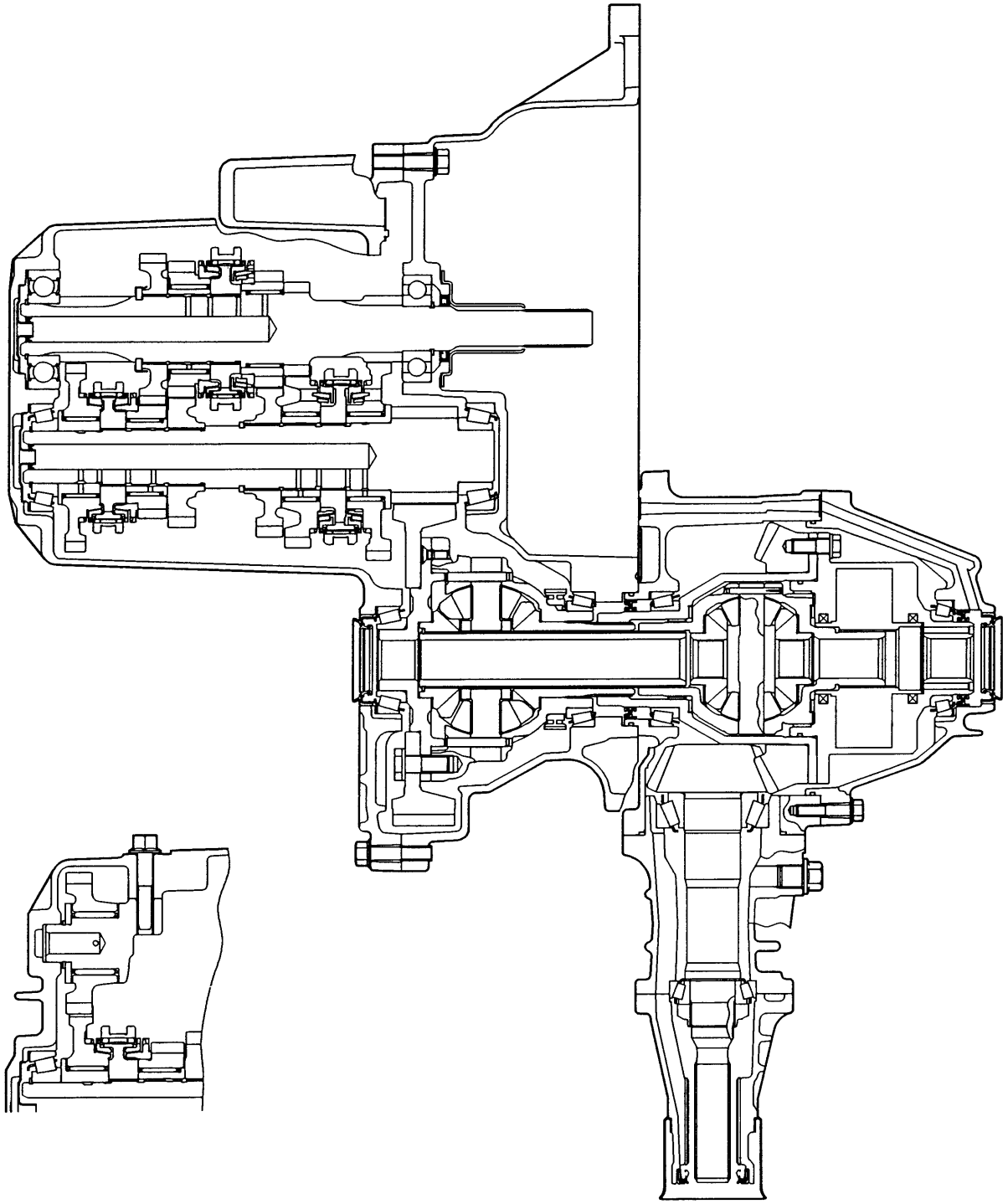
MANUAL TRANSMISSION OVERHAUL

CONTENTS

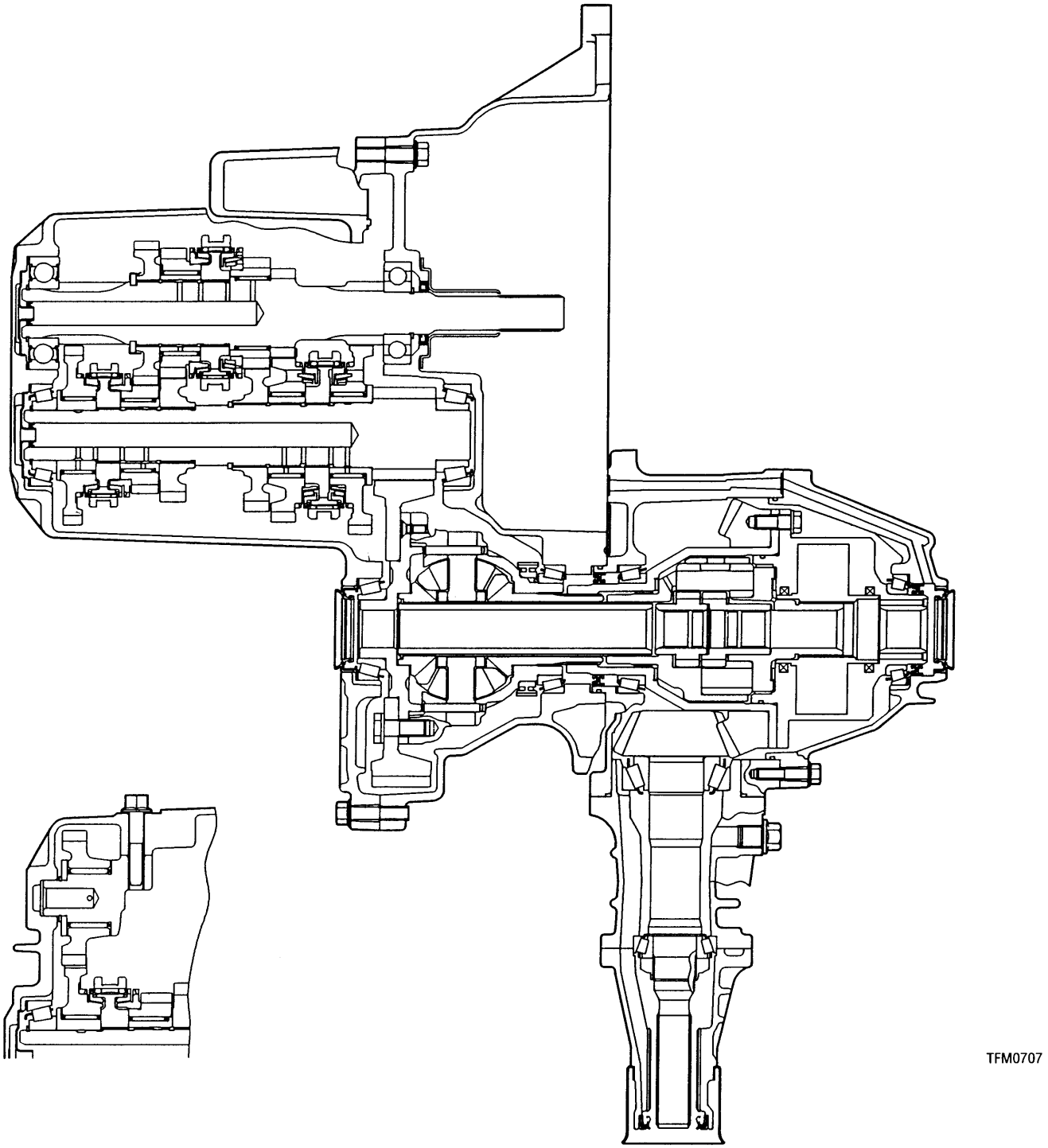
GENERAL INFORMATION

SECTIONAL VIEW – Without Front Limited Slip Differential (Front LSD)



TFM0706

SECTIONAL VIEW – With Front Limited Slip Differential (Front LSD)



SPECIFICATIONS

TRANSMISSION MODEL TABLE

Transmission model	Gear ratio	Speedometer gear ratio	Final gear ratio	Front LSD
W5M51-1-X6A	A	29/36	4.529	Not available
W5M51-1-X6A1	A	29/36	4.529	Available
W5M51-1-X7A	A	30/36	4.529	Not available
W5M51-1-X7A1	A	30/36	4.529	Available
W5M51-1-Z6A	B	29/36	4.875	Not available
W5M51-1-Z6A1	B	29/36	4.875	Available
W5M51-1-Z7A	B	30/36	4.875	Not available
W5M51-1-Z7A1	B	30/36	4.875	Available

GEAR RATIO TABLE

	A	B
1st	2.785	←
2nd	1.950	←
3rd	1.407	1.444
4th	1.031	1.096
5th	0.761	0.825
Reverse	3.416	←
Transfer gear ratio	0.3018	←

SERVICE SPECIFICATIONS

Items	Allowable range	Limit
Input shaft end play mm	0.05 – 0.17	–
Input shaft front bearing clearance mm	0 – 0.12	–
Input shaft rear bearing clearance mm	0 – 0.12	–
Input shaft 5th speed gear clearance mm	0 – 0.09	–
Output shaft preload mm	0.13 – 0.18	–
Output shaft bearing clearance mm	0 – 0.09	–
Output shaft 3rd speed gear clearance mm	0 – 0.09	–
Center differential case preload mm	0.05 – 0.11	–
Center differential case pinion backlash mm	0.025 – 0.150	–
Synchronizer ring back surface to gear clearance mm	–	0.5

SEALANTS AND ADHESIVES

TRANSMISSION

Items	Specified sealants and adhesives
Clutch housing-transmission case mating surface	THREEBOND 1216
Control housing-transmission case mating surface	
Under cover-transmission case mating surface	
Air breather	THREEBOND 1501
Center differential drive gear bolt	THREEBOND 1303 or LOKTITE 648

TRANSFER

Items	Specified sealants and adhesives
Air breather	THREEBOND 1501

FORM-IN-PLACE GASKET

The transmission has several areas where the form-in-place gasket (FIPG) is in use. To ensure that the gasket fully serves its purpose, it is necessary to observe some precautions when applying the gasket. Bead size, continuity and location are of paramount importance. Too thin a bead could cause leaks. Too thick a bead, on the other hand, could be squeezed out of location, causing blocking or narrowing of the fluid feed line. To eliminate the possibility of leaks from a joint, therefore, it is absolutely necessary to apply the gasket evenly without a break, while observing the correct bead size.

DISASSEMBLY

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

SURFACE PREPARATION

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

FORM-IN-PLACE GASKET APPLICATION

Applied FIPG bead should be of the specified size and without breaks. Also be sure to encircle the bolt hole circumference with a completely continuous bead. The FIPG can be wiped away unless it is hardened. While the FIPG is still moist (in less than 10 minutes), mount the parts in position. When the parts are mounted, make sure that the gasket is applied to the required area only. In addition, do not apply any oil or water to the sealing locations or start the engine until a sufficient amount of time (about one hour) has passed after installation is completed.
The FIPG application procedure may vary on different areas. Observe the procedure described in the text when applying the FIPG.

LUBRICANTS

TRANSMISSION

Items	Specified lubricants
Drive shaft oil seal lip area	DIA QUEEN MULTI-GEAR OIL 75W/85W (Transmission oil)
Input shaft oil seal lip area	
Control shaft oil seal lip area	
Select lever shoe	MOLYWHITE TA No.1 or No.2

TRANSFER

Items	Specified lubricants
Drive shaft oil seal lip area	DIA QUEEN MULTI-GEAR OIL 75W/85W (Transmission oil)
Front differential oil seal lip area	
O-rings	

SNAP RINGS, SPACERS AND THRUST PLATES FOR ADJUSTMENT

Part name	Thickness mm	Identification symbol	Part No.
Spacer (For adjustment of input shaft end play)	1.34	34	MD723600
	1.43	43	MD723603
	1.52	52	MD723606
	1.61	61	MD723609
	1.70	70	MD756760
	1.79	79	MD756763
Snap ring (For adjustment of input shaft front bearing clearance)	1.43	Green (2)	MD746708
	1.51	White (2)	MD746709
	1.59	Yellow (2)	MD746710
Snap ring (For adjustment of input shaft rear bearing clearance)	1.44	None	MD746602
	1.51	Blue	MD746603
	1.58	Brown	MD746604

Part name	Thickness mm	Identification symbol	Part No.
Thrust plate (For adjustment of input shaft 5th speed gear clearance)	3.82	0	MD748465
	3.86	2	MD748466
	3.90	3	MD748467
	3.94	5	MD748468
	3.98	6	MD748469
	4.02	7	MD748470
	4.06	8	MD748471
	4.10	9	MD748472
Spacer (For adjustment of output shaft preload)	0.86	86	MD720938
	0.89	89	MD720939
	0.92	92	MD720940
	0.95	95	MD720941
	0.98	98	MD720942
	1.01	01	MD720943
	1.04	04	MD720944
	1.07	07	MD720945
	1.10	J	MD710454
	1.13	D	MD700270
	1.16	K	MD710455
	1.19	L	MD710456
	1.22	G	MD700271
	1.25	M	MD710457
	1.28	N	MD710458
	1.31	E	MD706574
	1.34	O	MD710459
	1.37	P	MD710460
	1.40	None	MD706573
	1.43	Q	MD710461
	1.46	R	MD710462

Part name	Thickness mm	Identification symbol	Part No.
Snap ring (For adjustment of output shaft bearing clearance)	1.36	Yellow	MD748449
	1.40	Green	MD748450
	1.44	None	MD746602
	1.48	Black	MD748451
	1.51	Blue	MD746603
	1.55	White	MD748452
	1.58	Brown	MD746604
	1.63	Orange	MD748453
	1.68	Blue	MD748454
Snap ring (For adjustment of output shaft 3rd speed gear clearance)	2.81	None	MD746594
	2.85	Blue	MD746595
	2.89	Brown	MD746596
	2.93	Yellow	MD746597
	2.97	Green	MD746598
	3.01	Black	MD746599
	3.05	White	MD746600
	3.09	Orange	MD746601
Spacer (For adjustment of center differential case preload)	0.74	74	MD727660
	0.77	77	MD754476
	0.80	80	MD727661
	0.83	83	MD720937
	0.86	86	MD720938
	0.89	89	MD720939
	0.92	92	MD720940
	0.95	95	MD720941
	0.98	98	MD720942
	1.01	01	MD720943
	1.04	04	MD720944
	1.07	07	MD720945
	1.10	J	MD710454
	1.13	D	MD700270
	1.16	K	MD710455

Part name	Thickness mm	Identification symbol	Part No.
Spacer (For adjustment of center differential case preload)	1.19	L	MD710456
	1.22	G	MD700271
	1.25	M	MD710457
	1.28	N	MD710458
	1.31	E	MD706574
Spacer (For adjustment of center differential case pinion backlash)	0.6	–	MD748362
	0.7	–	MD748363
	0.8	–	MD748364
	0.9	–	MD748365
	1.0	–	MD748366
	1.1	–	MD748367

TORQUE SPECIFICATIONS

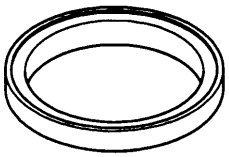
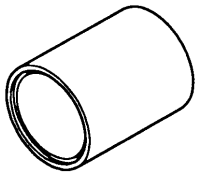
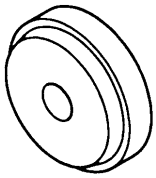
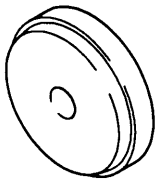
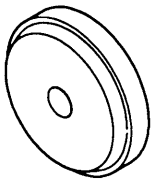
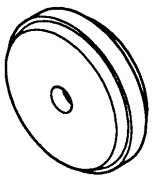
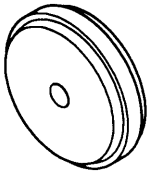
TRANSMISSION

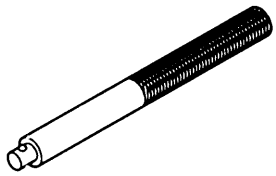
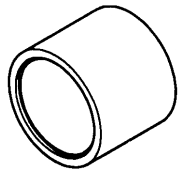
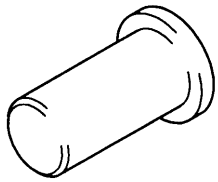
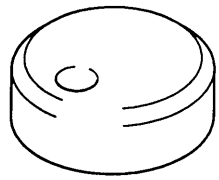
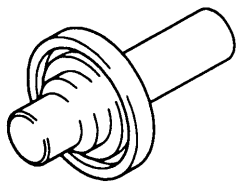
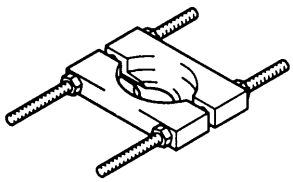
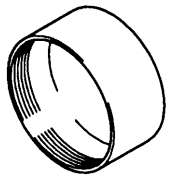
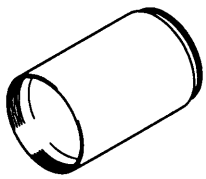
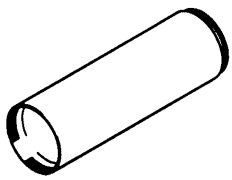
Items	Nm {kgf·m}
Under cover mounting bolt	6.9 {0.7}
Interlock plate bolt	30 {3.1}
Clutch housing-transmission case mounting bolt	44 {4.5}
Clutch release bearing retainer mounting bolt	9.8 {1.0}
Control housing mounting bolt	18 {1.9}
Shift cable bracket mounting bolt	18 {1.9}
Speedometer gear mounting bolt	3.9 {0.4}
Stopper bracket mounting bolt	18 {1.9}
Select lever mounting bolt	18 {1.9}
Select lever mounting nut	11 {1.2}
Center differential drive gear mounting bolt	132 {13.5}
Back-up lamp switch	32 {3.3}
Poppet spring plug	32 {3.3}
Reverse idler gear shaft mounting bolt	48 {4.9}
Roll stopper bracket mounting bolt	69 {7.0}

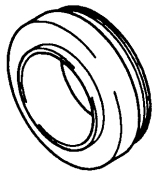
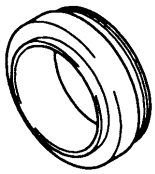
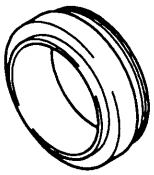
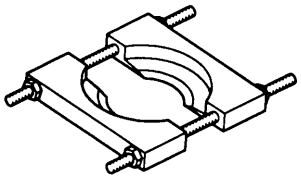
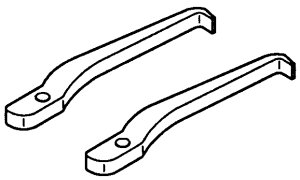
TRANSFER

Items	Nm {kgf·m}
Transfer cover mounting bolt	23 {2.4}
Transmission-transfer mounting bolt	69 {7.0}

SPECIAL TOOLS

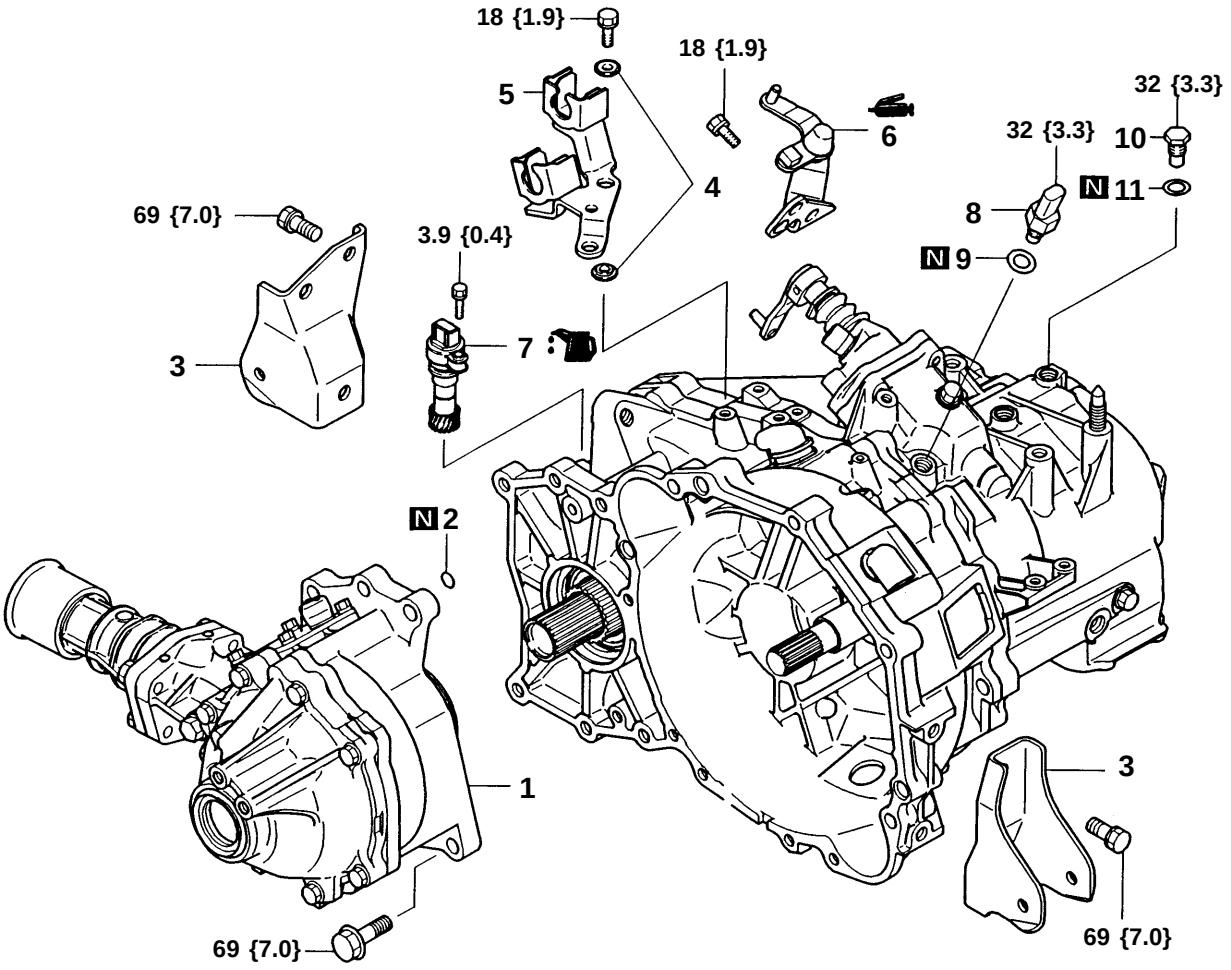
Tool	Number	Name	Use
	MB990887	Arm bushing remover & installer ring	Installation of transfer oil seal
	MB990891	Bushing remover & installer base	Installation of transfer oil seal
	MB990928	Installer adapter	Installation of input shaft oil seal
	MB990932	Installer adapter	Removal of differential case taper roller bearing
	MB990933	Installer adapter	Installation of transfer oil seal
	MB990935	Installer adapter	Installation of output shaft front taper roller bearing outer race
	MB990937	Installer adapter	Installation of differential case taper roller bearing

Tool	Number	Name	Use
	MB990938	Handle	Use with Installer adapter
	MB991445	Bushing remover and installer base	Installation of differential case taper roller bearing outer race
	MD998304	Oil seal installer	Installation of transfer extension housing oil seal
	MD998364	Camshaft oil seal installer	Installation of gear, bearing and sleeve
	MD998800	Oil seal installer	Installation of differential oil seal and transfer cover oil seal
	MD998801	Bearing remover	Installation and removal of gear, bearing and sleeve
	MD998812	Installer cap	Use with Installer and installer adapter
	MD998813	Installer-100	Use with Installer cap and installer adapter
	MD998814	Installer-200	Use with Installer cap and installer adapter

Tool	Number	Name	Use
	MD998818	Installer adapter (38)	Installation of input shaft front bearing
	MD998819	Installer adapter (40)	Installation of input shaft rear bearing and output shaft taper roller bearing
	MD998820	Installer adapter (42)	Installation of reverse gear bearing sleeve
	MD998821	Installer adapter (44)	Installation of 4th speed gear, 5th speed gear sleeve and 5th-reverse speed synchronizer hub
	MD998824	Installer adapter (50)	Installation of 1st-2nd speed synchronizer hub, 2nd speed gear sleeve and 3rd speed gear
	MD998825	Installer adapter (52)	Installation of 1st speed gear sleeve, 3rd-4th speed synchronizer hub, 4th speed gear sleeve, 5th speed gear and thrust plate stopper
	MD998917	Bearing remover	Removal and installation of gear, bearing and sleeve
	MD999566	Claw	Removal of taper roller bearing outer race

TRANSMISSION

DISASSEMBLY AND REASSEMBLY

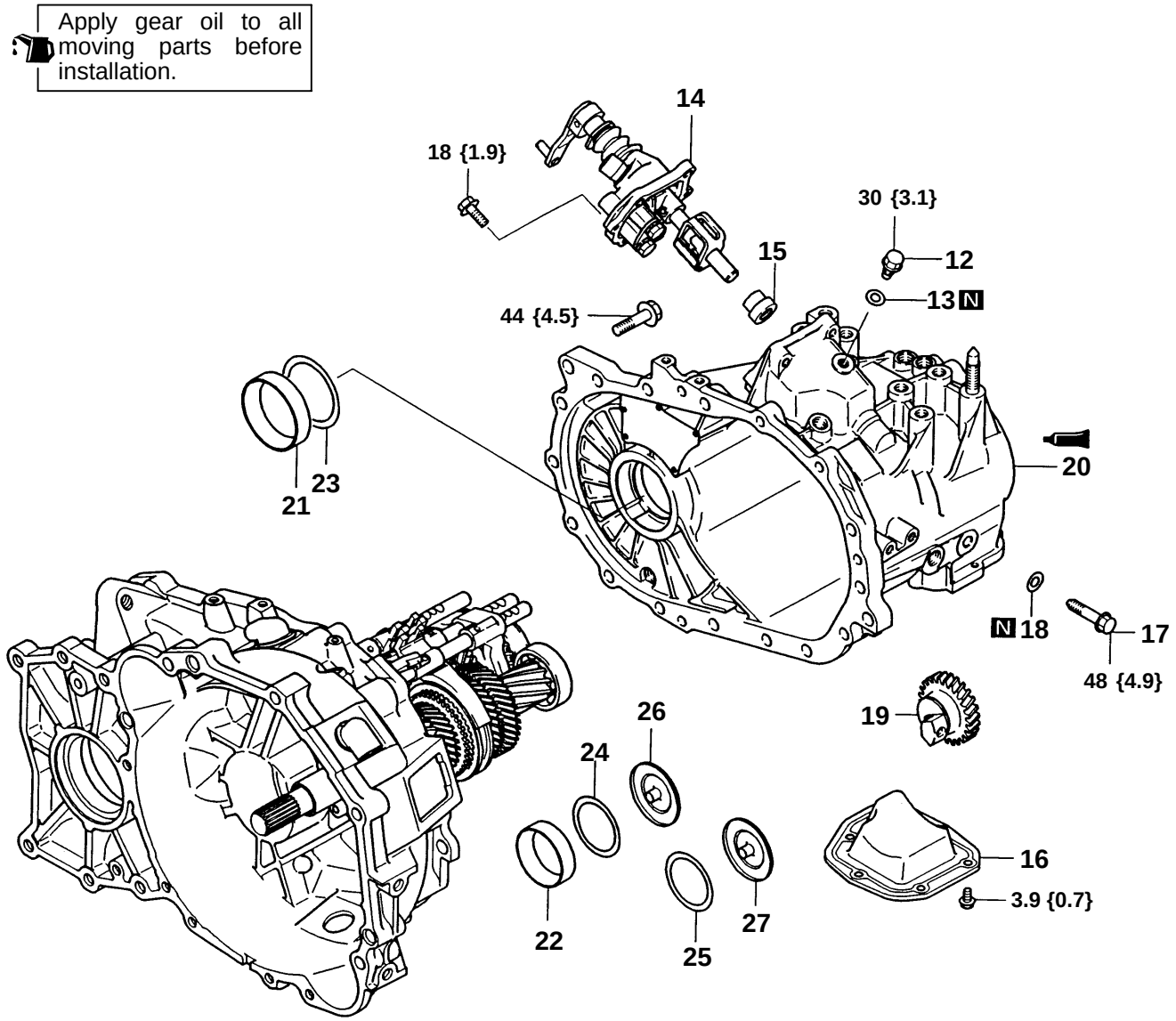


TFM0881

Unit: Nm {kgf·m}

Disassembly steps

1. Transfer
▶J◀ 2. O-ring
3. Roll stopper bracket
4. Insulator washer
5. Shift cable bracket
▶I◀ 6. Select lever
▶H◀ 7. Speedometer gear
8. Back-up lamp switch
9. Gasket
10. Plug
11. Gasket

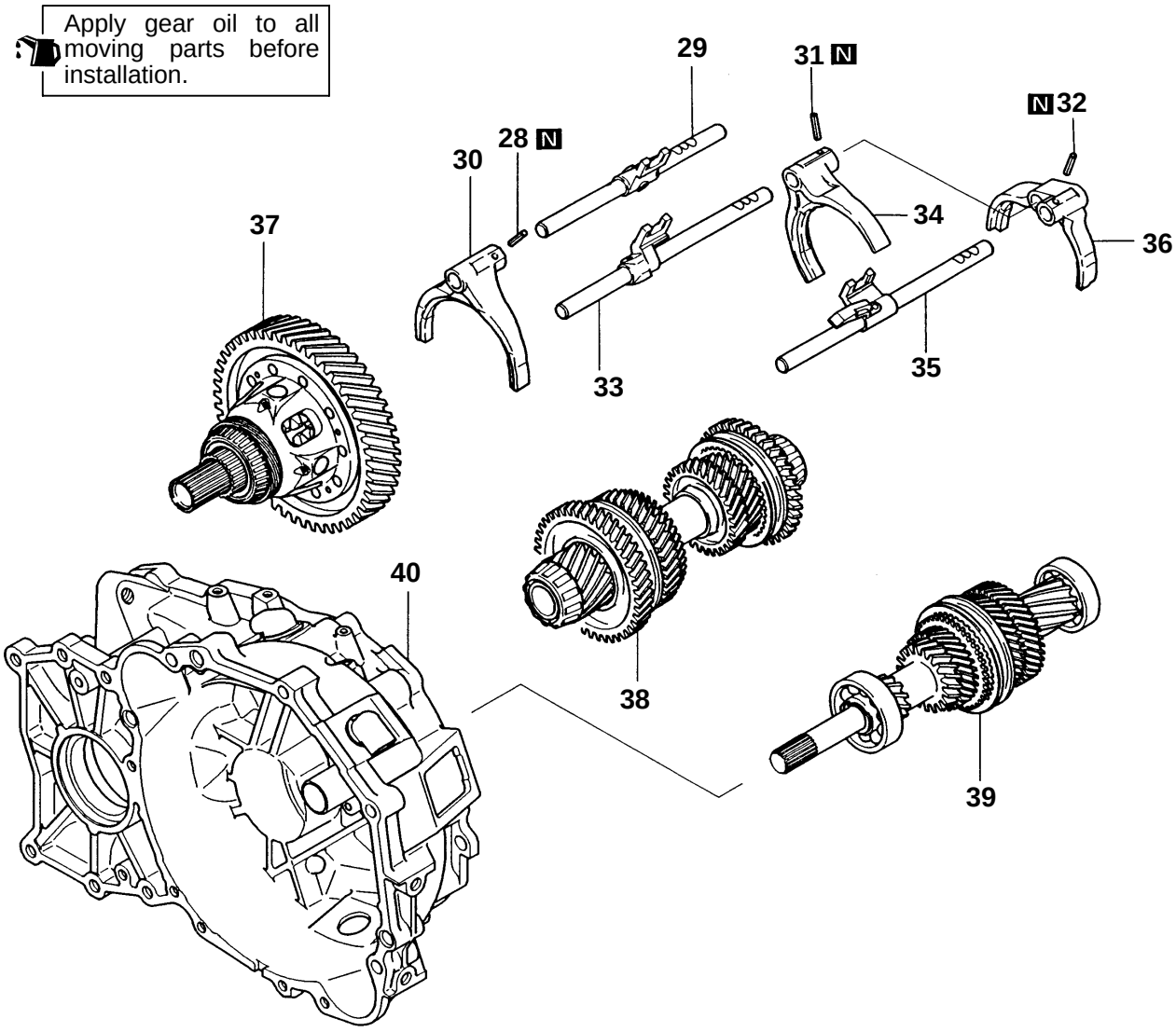


TFM0762

Unit: Nm {kgf·m}

Disassembly steps

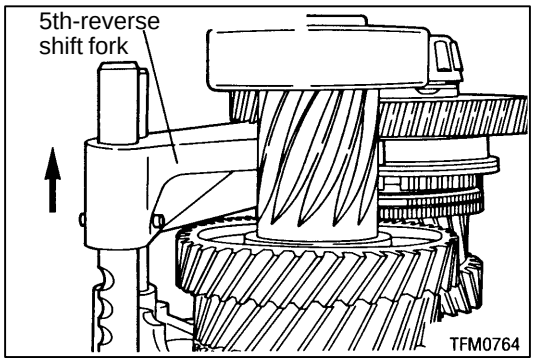
12. Interlock plate bolt
13. Gasket
▶G◀ 14. Control housing
15. Neutral return spring
▶F◀ 16. Under cover
17. Reverse idler gear shaft bolt
18. Gasket
19. Reverse idler gear
▶E◀ 20. Transmission case
21. Outer race
22. Outer race
▶D◀ 23. Spacer
▶D◀ 24. Spacer
▶D◀ 25. Spacer
26. Oil guide
27. Oil guide



TFM0882

Disassembly steps

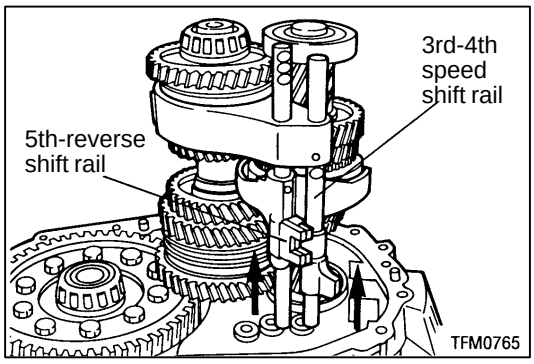
- ▶C◀ 28. Spring pin
- 29. 1st-2nd speed shift rail
- 30. 1st-2nd speed shift fork
- ▶C◀ 31. Spring pin
- ◀A▶ ▶C◀ 32. Spring pin
- ◀B▶ ▶B◀ 33. 3rd-4th speed shift rail
- ◀B▶ ▶B◀ 34. 3rd-4th speed shift fork
- ◀B▶ ▶B◀ 35. 5th-reverse speed shift rail
- ◀B▶ ▶B◀ 36. 5th-reverse speed shift fork
- ◀C▶ ▶A◀ 37. Center differential
- ◀C▶ ▶A◀ 38. Output shaft
- ◀C▶ ▶A◀ 39. Input shaft
- 40. Clutch housing



DISASSEMBLY SERVICE POINTS

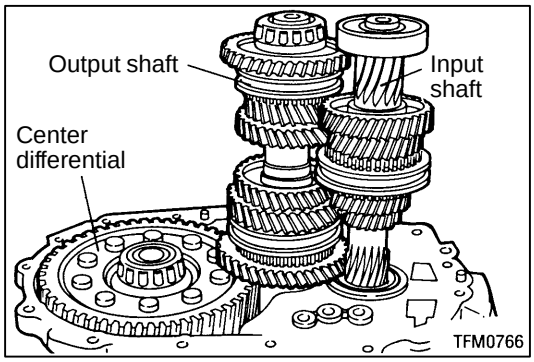
◀A▶ SPRING PIN REMOVAL

Shift the 5th-reverse shift fork in the direction shown in the illustration.



◀B▶ 3RD-4TH SPEED SHIFT RAIL / 3RD-4TH SPEED SHIFT FORK / 5TH-REVERSE SPEED SHIFT RAIL / 5TH-REVERSE SPEED SHIFT FORK REMOVAL

Pull out the shift rails from the shift rail holes in the clutch housing.



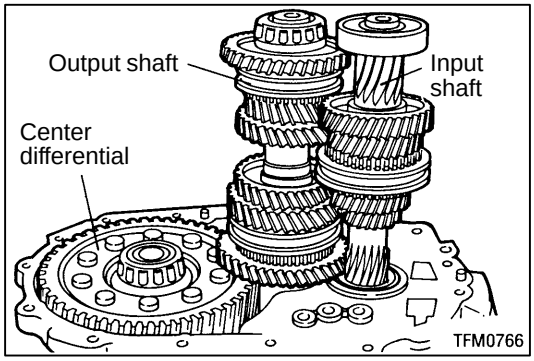
◀C▶ CENTER DIFFERENTIAL / OUTPUT SHAFT / INPUT SHAFT REMOVAL

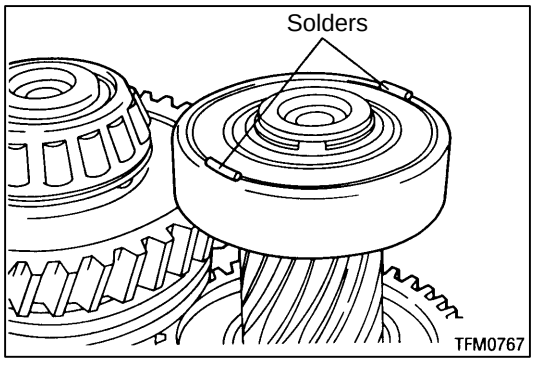
Remove the input shaft, output shaft and center differential together.

ADJUSTMENT BEFORE REASSEMBLY

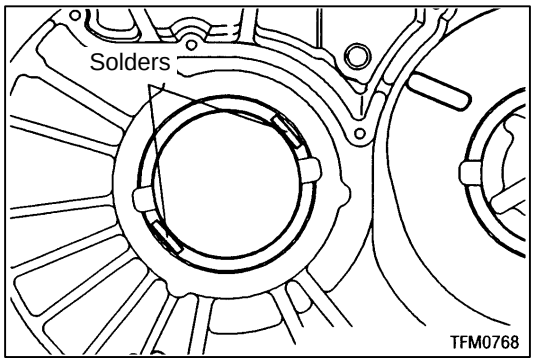
SPACER SELECTION FOR ADJUSTING INPUT SHAFT END PLAY / OUTPUT SHAFT PRELOAD / DIFFERENTIAL PRELOAD

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

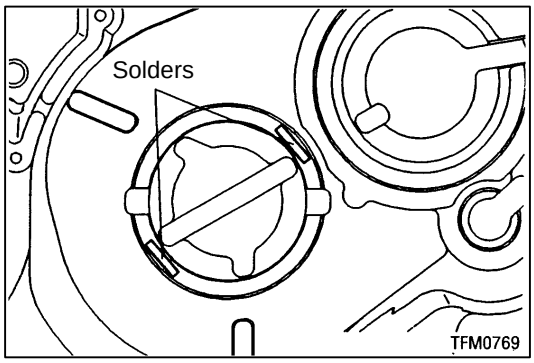




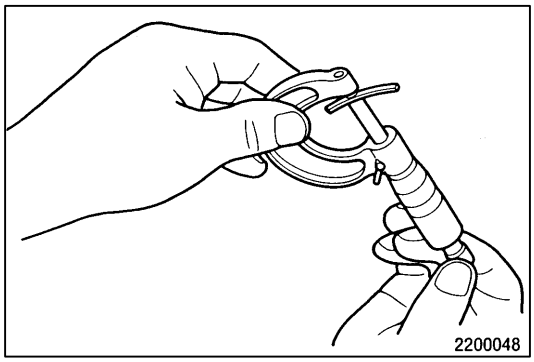
(2) Place two pieces of solder (1.6 mm in diameter and approx. 10 mm in length) on the input shaft rear bearing at the positions shown in the illustration.



(3) Place two pieces of solder (1.6 mm in diameter and approx. 10 mm in length) on the transmission case at the positions shown in the illustration.
(4) Install the bearing outer race.
(5) Install the transmission case and tighten the bolts to the specified torque.

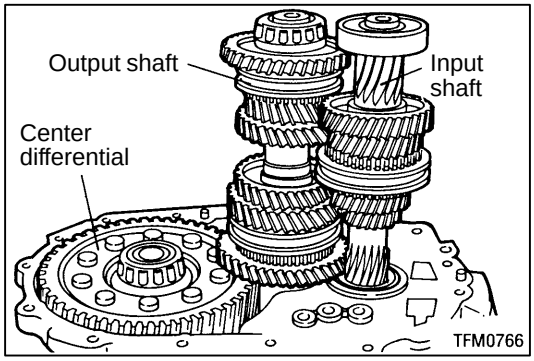


(6) Remove the transmission case. If the solder is not crushed, repeat the steps (2) through (5) using the solder with larger diameter.



(7) Measure the thickness of the crushed solder with a micrometer and select spacers that will provide the standard end play/preload value.

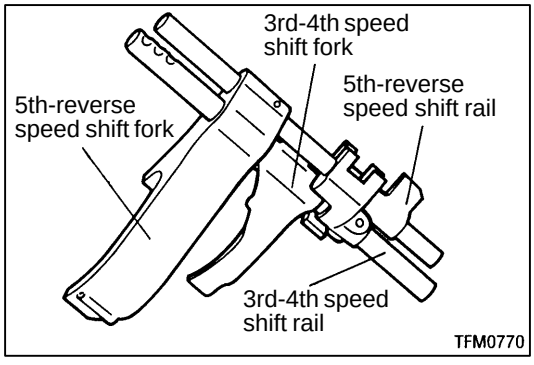
Standard value:
Input shaft end play ..... 0 – 0.17 mm
Output shaft end play ..... 0.13 – 0.18 mm
Center differential preload .... 0.05 – 0.11 mm



REASSEMBLY SERVICE POINTS

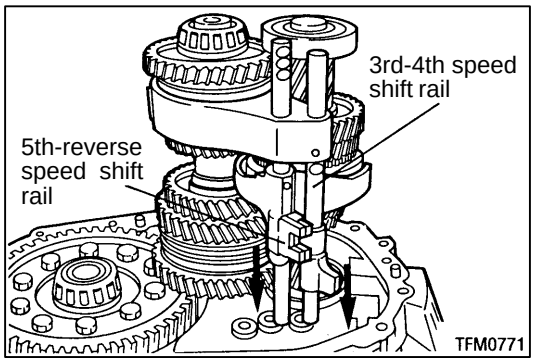
▶A◀ INPUT SHAFT / OUTPUT SHAFT / CENTER DIFFERENTIAL INSTALLATION

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

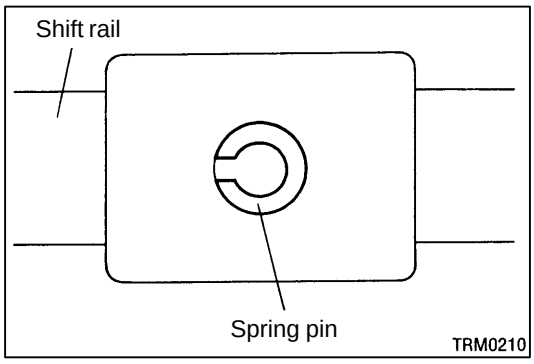


▶B◀ 5TH-REVERSE SPEED SHIFT FORK / 5TH-REVERSE SPEED SHIFT RAIL / 3RD-4TH SPEED SHIFT FORK / 3RD-4TH SPEED SHIFT RAIL INSTALLATION

(1) Install the 3rd-4th speed shift rails and fork, and 5th-reverse speed shift rail and fork.



(2) Slide the shift rails into the shift rail holes in the clutch housing.

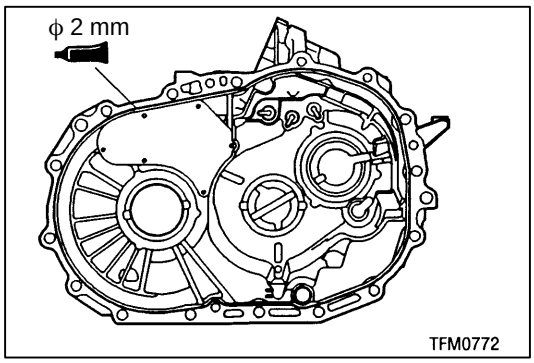


▶C◀ SPRING PIN INSTALLATION

Install the spring pin with its slit directed as shown in the illustration.

▶D◀ SPACER INSTALLATION

Install the spacer selected in the section “ADJUSTMENT BEFORE REASSEMBLY”.

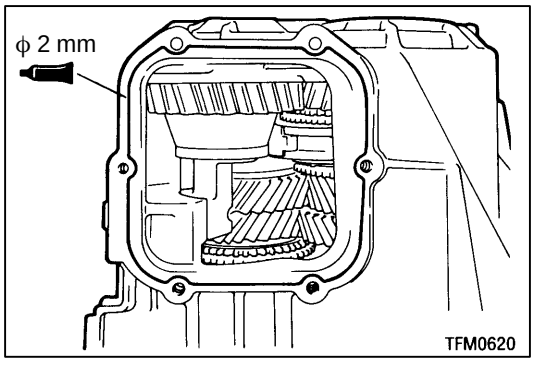


▶E◀ TRANSMISSION CASE INSTALLATION

Apply sealant to the illustrated position of the transmission case.

Specified sealant: THREEBOND 1216

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

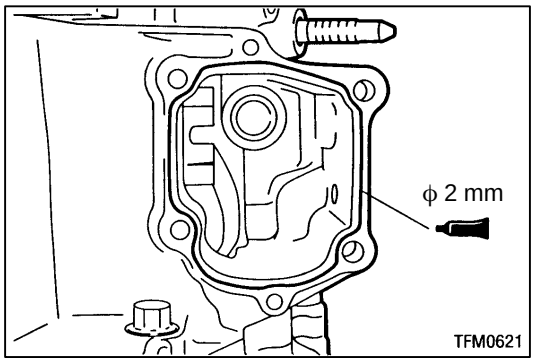


▶F◀ UNDER COVER INSTALLATION

Apply sealant to the illustrated position of the transmission case.

Specified sealant: THREEBOND 1216

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

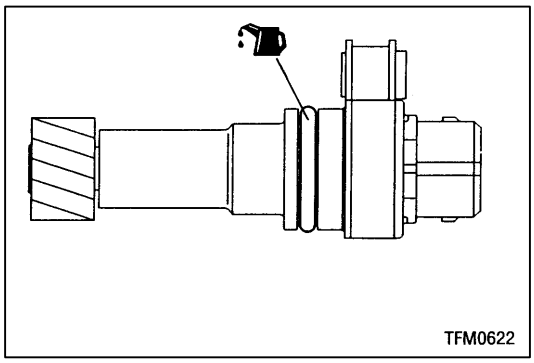


▶G◀ CONTROL HOUSING INSTALLATION

Apply sealant to the illustrated position of the transmission case.

Specified sealant: THREEBOND 1216

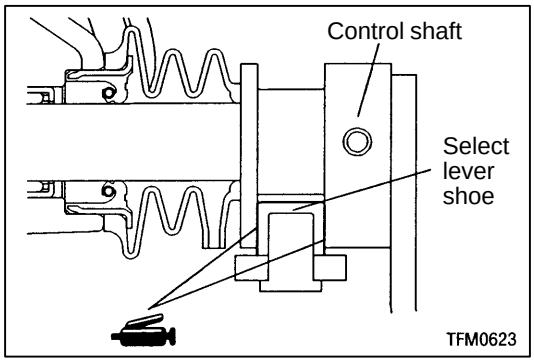
Caution
Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.



▶H◀ SPEEDOMETER GEAR INSTALLATION

Apply transmission oil to the O-ring of the speedometer gear.

Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W



▶I◀ SELECT LEVER INSTALLATION

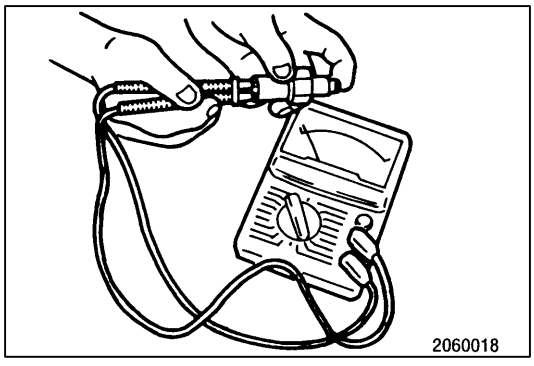
Apply grease to the control shaft sliding portion of the select lever shoe.

Specified grease: MOLYWHITE TA No.1 or No.2

▶J◀ O-RING INSTALLATION

Lubricate O-ring with transmission oil.

Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W



INSPECTION

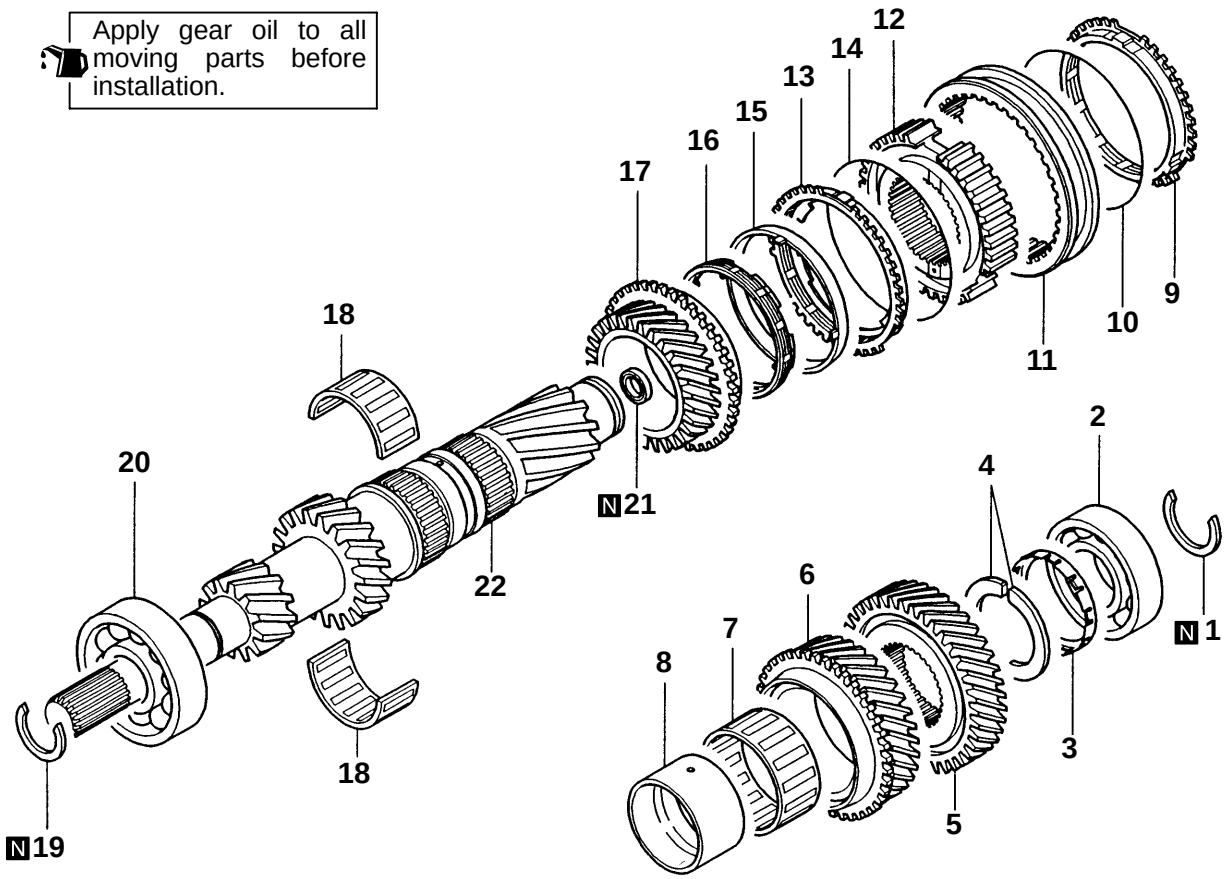
BACK-UP LAMP SWITCH

Check for continuity between terminals.

Switch condition	Continuity
Pressed	Not exist
Released	Exists

INPUT SHAFT

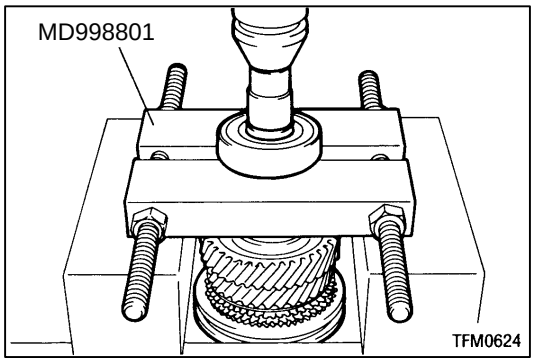
DISASSEMBLY AND REASSEMBLY



TFM0716

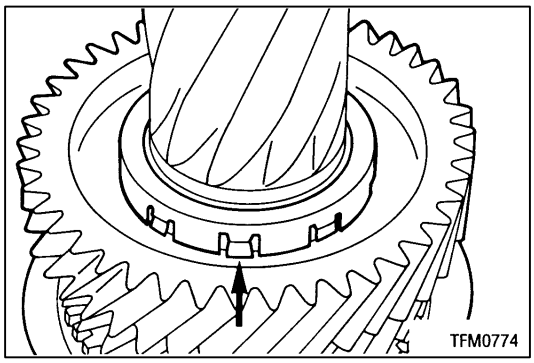
Disassembly steps

- ▶M◀ 1. Snap ring
- ◀A▶ ▶L◀ 2. Ball bearing
- ◀B▶ ▶K◀ 3. Thrust plate stopper
- ▶J◀ 4. Thust plate
- ◀C▶ ▶I◀ 5. 5th speed gear
- 6. 4th speed gear
- 7. Needle roller bearing
- ◀D▶ ▶H◀ 8. 4th speed gear sleeve
- 9. Synchronizer ring
- ▶G◀ 10. Synchronizer spring
- ▶F◀ 11. Synchronizer sleeve
- ▶E◀ 12. 3rd-4th speed synchronizer hub
- 13. Outer synchronizer ring
- ▶D◀ 14. Synchronizer spring
- 15. Synchronizer cone
- 16. Inner synchronizer ring
- 17. 3rd speed gear
- 18. Needle roller bearing
- ▶C◀ 19. Snap ring
- ◀E▶ ▶B◀ 20. Ball bearing
- ▶A◀ 21. Oil seal
- 22. Input shaft



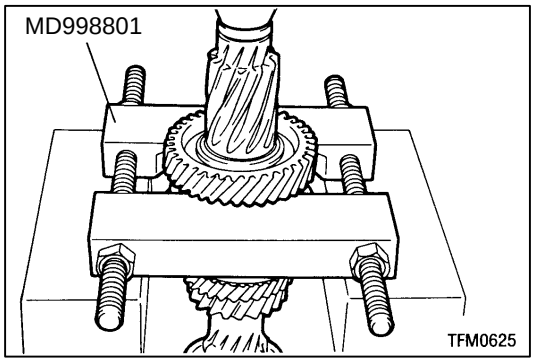
DISASSEMBLY SERVICE POINTS

◀A▶ BALL BEARING REMOVAL

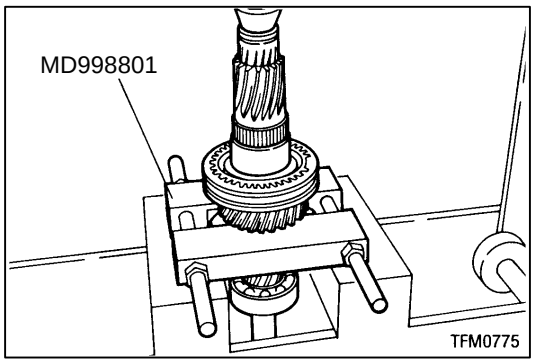


◀B▶ THRUST PLATE STOPPER REMOVAL

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

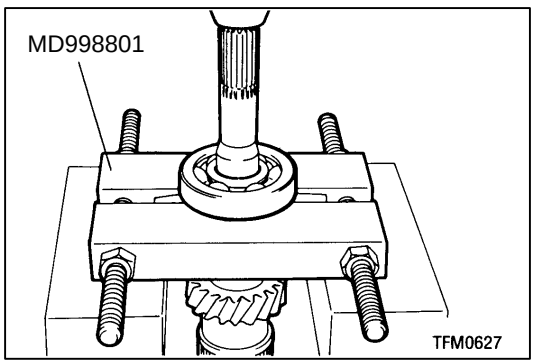


◀C▶ 5TH SPEED GEAR REMOVAL

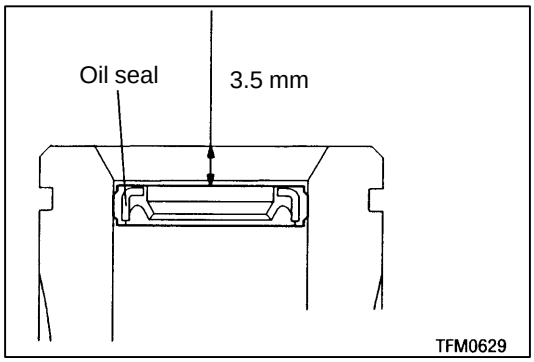


◀D▶ 4TH SPEED GEAR SLEEVE REMOVAL

Install the special tool to the 3rd speed gear and remove the 4th speed gear sleeve.



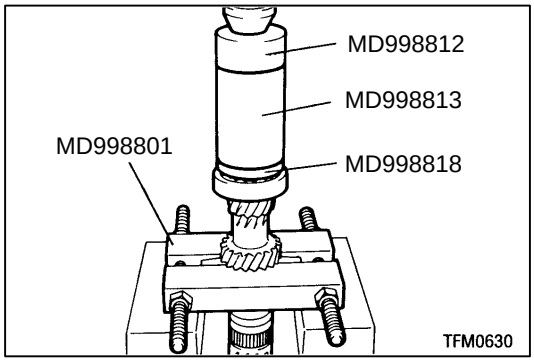
◀E▶ BALL BEARING REMOVAL



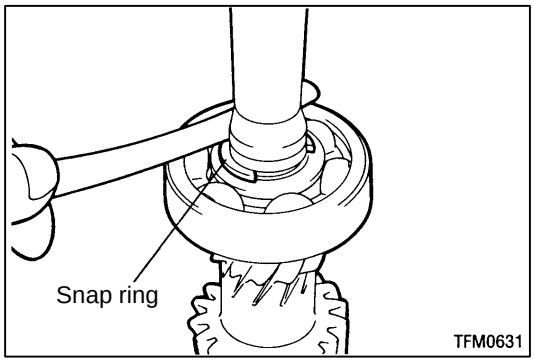
REASSEMBLY SERVICE POINTS

▶A◀ OIL SEAL INSTALLATION

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



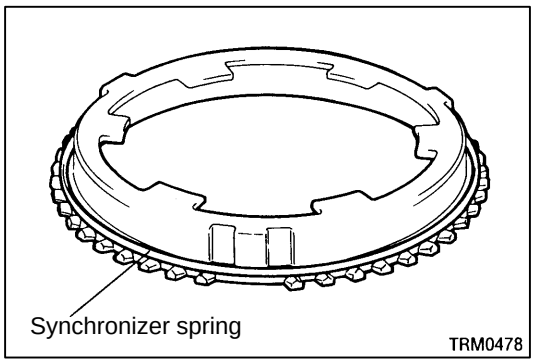
▶B◀ BALL BEARING INSTALLATION



▶C◀ SNAP RING INSTALLATION

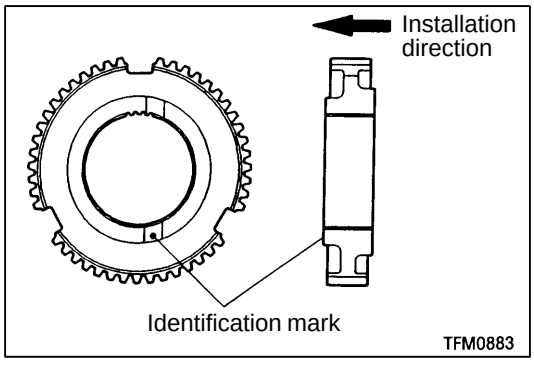
Select and install a snap ring so that the input shaft front bearing end play will have the standard value.

Standard value: 0 – 0.12 mm



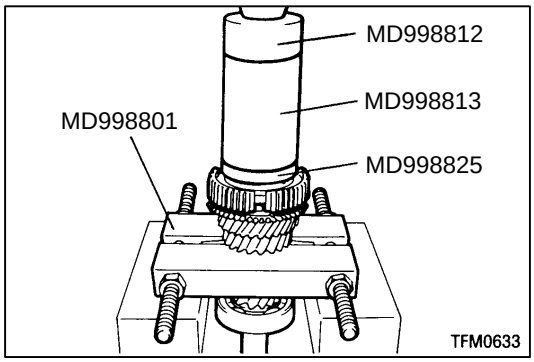
▶D◀ SYNCHRONIZER SPRING INSTALLATION

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

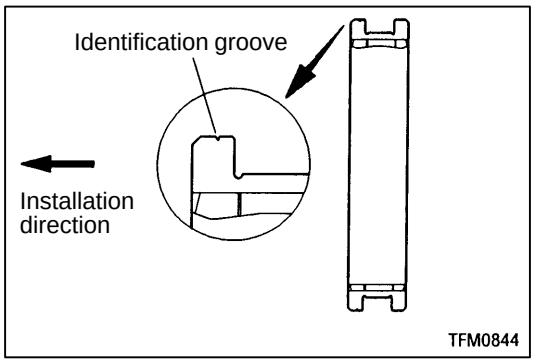


▶E◀ 3RD-4TH SPEED SYNCHRONIZER HUB INSTALLATION

Install the synchronizer hub in such a way that it will be oriented in the direction shown.

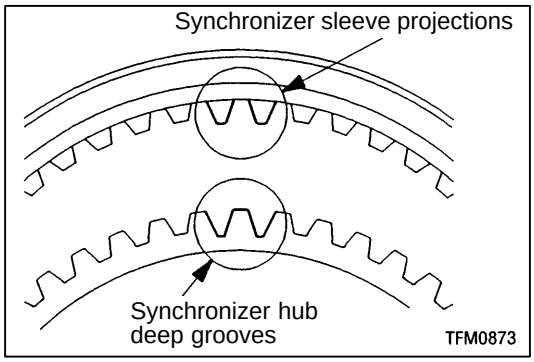


Caution
When the hub is installed, make sure that the synchronizer ring is not caught.

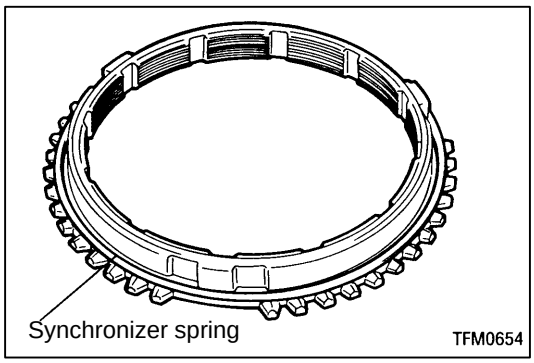


▶F◀ SYNCHRONIZER SLEEVE INSTALLATION

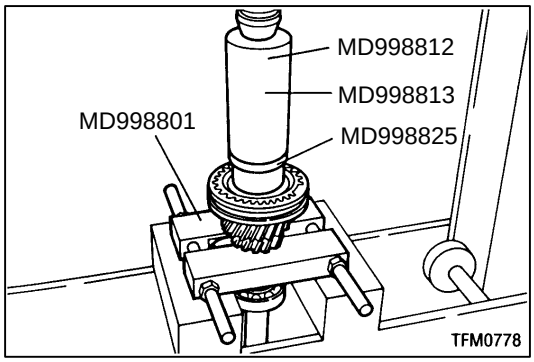
(1) Install the synchronizer sleeve in such a way that it will be oriented in the direction shown.



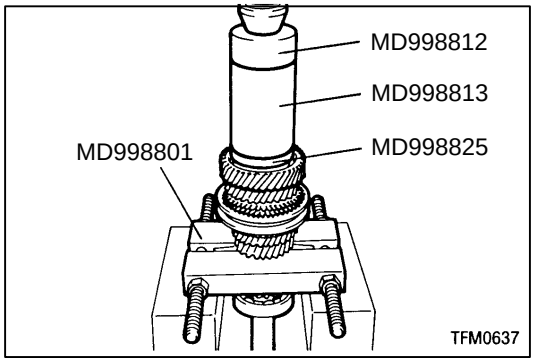
(2) When the synchronizer sleeve is installed, make sure that the deep groove portion of the synchronizer hub is aligned with the projecting portion of the sleeve.



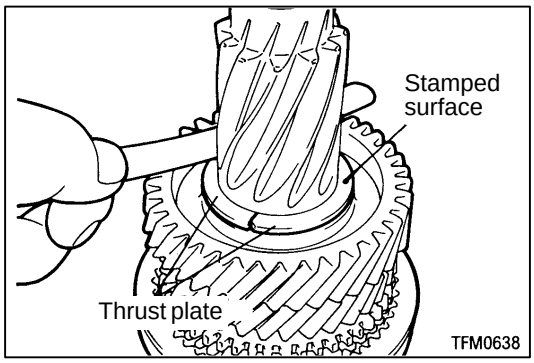
▶G◀ SYNCHRONIZER SPRING INSTALLATION



▶H◀ 4TH SPEED GEAR SLEEVE INSTALLATION



▶I◀ 5TH SPEED GEAR INSTALLATION

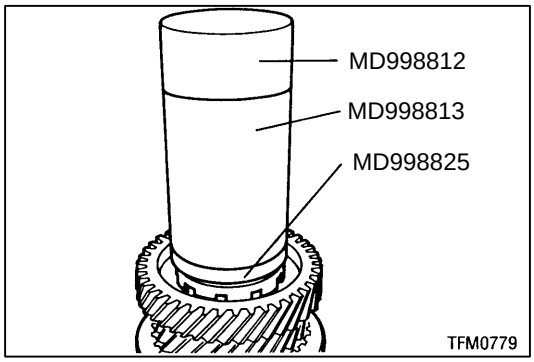


▶J◀ THRUST PLATE INSTALLATION

Select and install a thrust plate so that the input shaft 5th speed gear clearance will have the standard value.

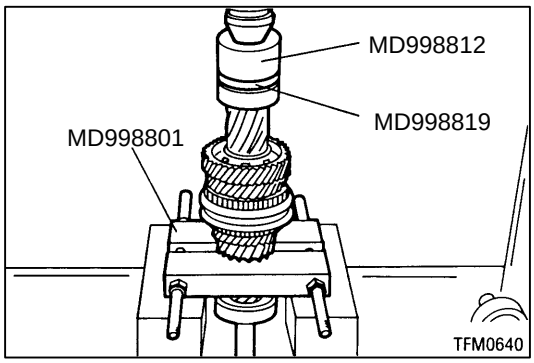
Standard value: 0 – 0.09 mm

Caution
Install the plate with its identification stamped surface faced against the thrust plate stopper.

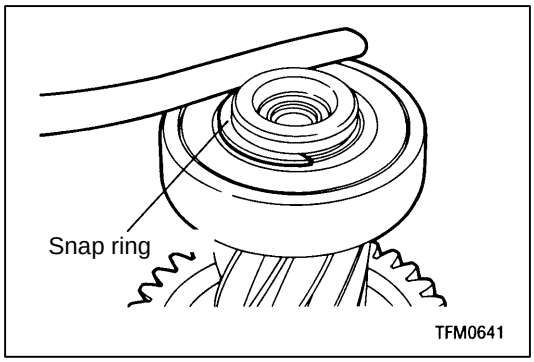


▶K◀ THRUST PLATE STOPPER INSTALLATION

Install the thrust plate stopper by pressing the special tools with hand. Make sure that the stopper is not installed aslant.



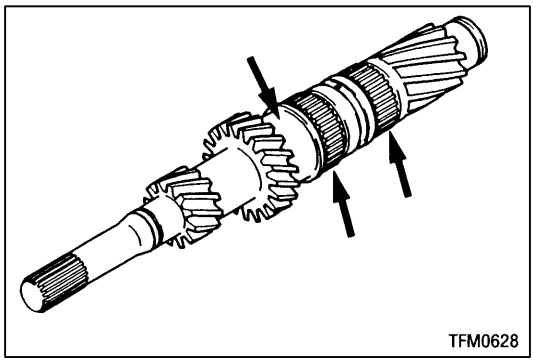
▶L◀ BALL BEARING INSTALLATION



▶M◀SNAP RING INSTALLATION

Select and install a snap ring so that the input shaft rear bearing clearance will have the standard value.

Standard value: 0 – 0.12 mm


TFM0628

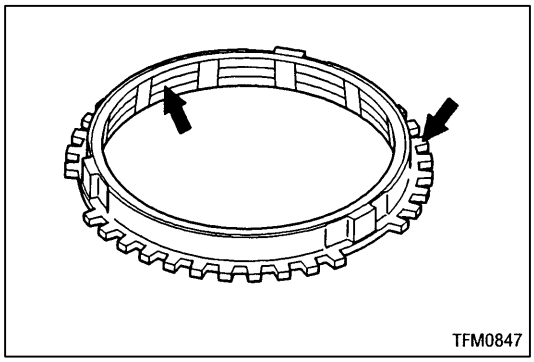
INSPECTION

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.

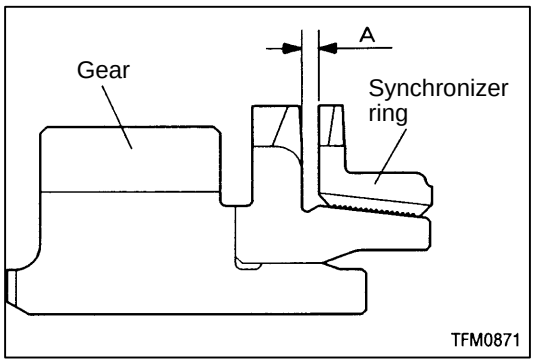
NEEDLE ROLLER BEARING

(1) Check to ensure that when the input shaft and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
(2) Check to ensure that the cage is not deformed.


TFM0847

SYNCHRONIZER RING

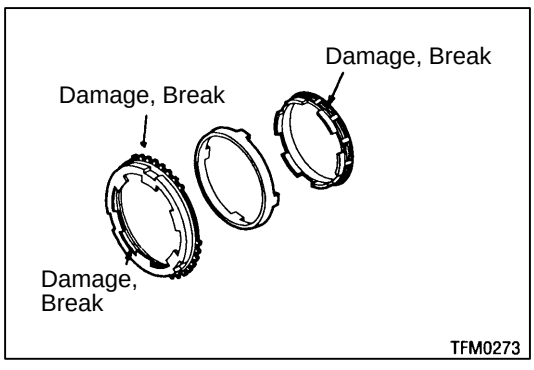
(1) Check to ensure that the clutch gear tooth surfaces are not damaged and broken.
(2) Check to ensure that the cone inside surface is not damaged or worn and that the threads are not crushed.



TFM0871

(3) Press the synchronizer ring against the gear and check clearance “A”. If “A” is less than the limit, replace.

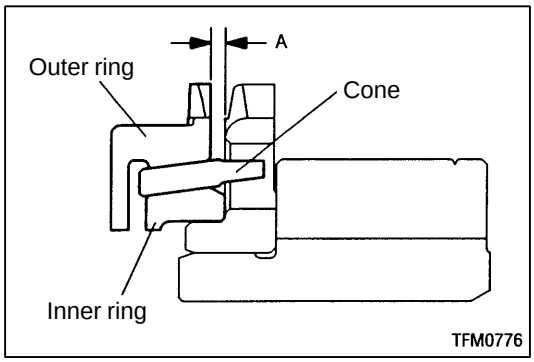
Limit: 0.5 mm



TFM0273

OUTER SYNCHRONIZER RING / INNER SYNCHRONIZER RING / SYNCHRONIZER CONE

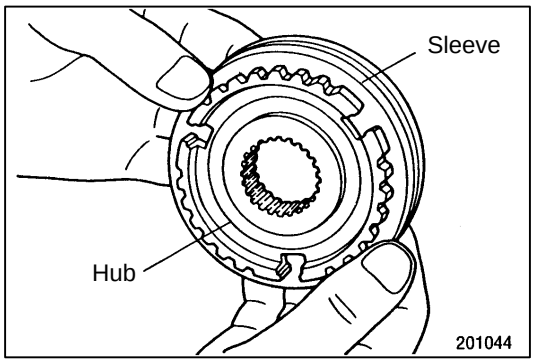
(1) Check to ensure that the clutch gear tooth surface and cone surface are not damaged and broken.



(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

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



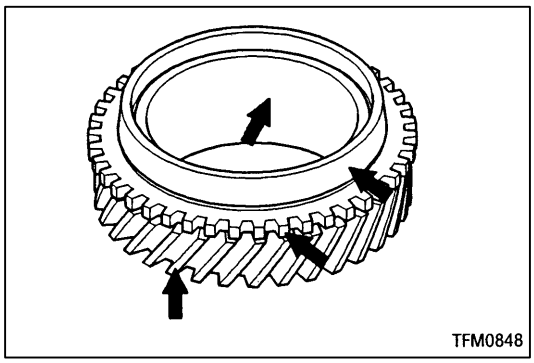
SYNCHRONIZER SLEEVE AND HUB

(1) Check to ensure that when the synchronizer sleeve and hub are combined and made to slide, they slide smoothly without binding.
(2) Check to ensure that the front and rear ends of the sleeve inside surface are not damaged.

Caution
When replacement of either the synchronizer sleeve or hub is necessary, make sure that the synchronizer sleeve and hub are replaced as a set.

SYNCHRONIZER SPRING

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



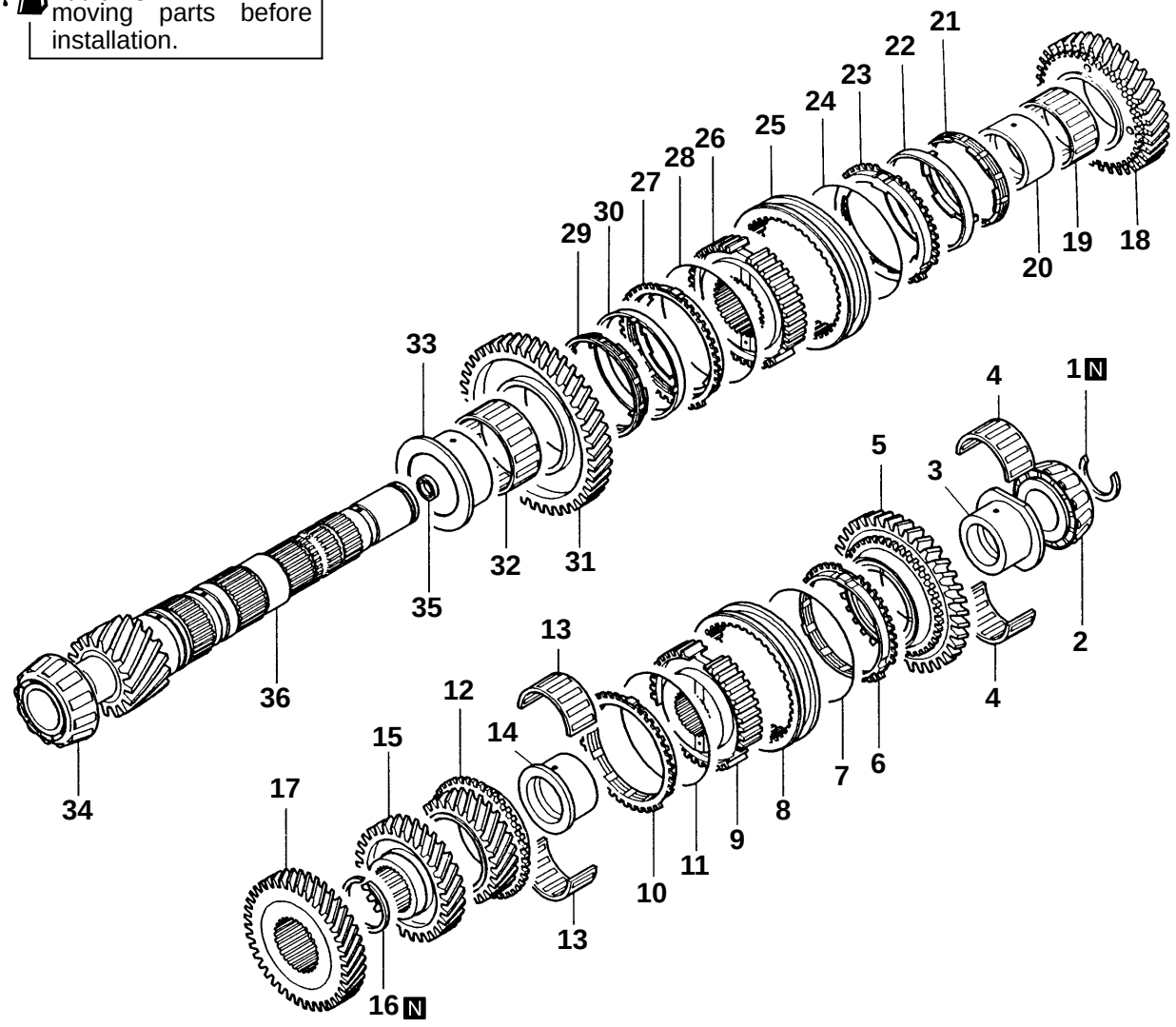
SPEED GEARS

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

OUTPUT SHAFT

DISASSEMBLY AND REASSEMBLY

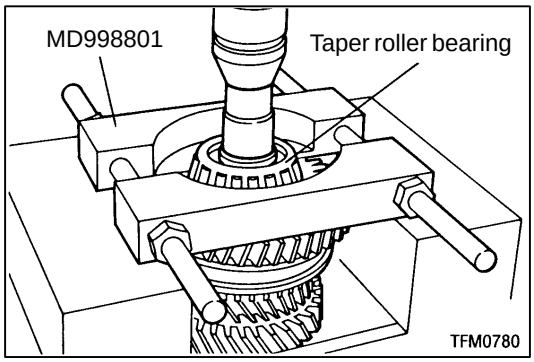
Apply gear oil to all moving parts before installation.



TFM0884

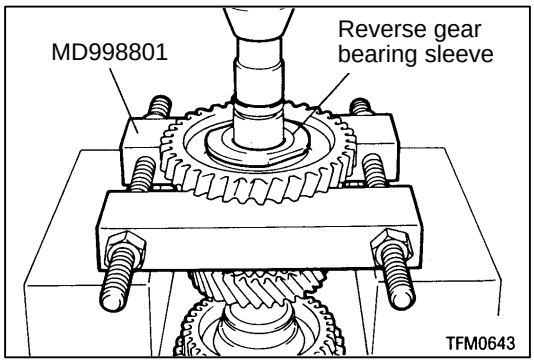
Disassembly steps

- ▶P◀ 1. Snap ring
- ◀A▶ ▶O◀ 2. Taper roller bearing
- ◀B▶ ▶N◀ 3. Reverse gear bearing sleeve
- ▶N◀ 4. Needle roller bearing
- ▶N◀ 5. Reverse gear
- 6. Synchronizer ring
- ▶L◀ 7. Synchronizer spring
- ▶F◀ 8. Synchronizer sleeve
- ◀C▶ ▶M◀ 9. 5th-reverse speed synchronizer hub
- 10. Synchronizer ring
- ▶L◀ 11. Synchronizer spring
- 12. 5th speed gear
- 13. Needle roller bearing
- ▶K◀ 14. 5th speed gear sleeve
- ▶J◀ 15. 4th speed gear
- ▶I◀ 16. Snap ring
- ◀D▶ ▶H◀ 17. 3rd speed gear
- 18. 2nd speed gear
- 19. Needle roller bearing
- ◀E▶ ▶G◀ 20. 2nd speed gear sleeve
- 21. Inner synchronizer ring
- 22. Synchronizer cone
- 23. Outer synchronizer ring
- ▶D◀ 24. Synchronizer spring
- ▶F◀ 25. Synchronizer sleeve
- ▶E◀ 26. 1st-2nd speed synchronizer hub
- 27. Outer synchronizer ring
- ▶D◀ 28. Synchronizer spring
- 29. Inner synchronizer ring
- 30. Synchronizer cone
- 31. 1st speed gear
- 32. Needle roller bearing
- ◀F▶ ▶C◀ 33. 1st speed gear sleeve
- ◀G▶ ▶B◀ 34. Taper roller bearing
- ▶A◀ 35. Oil seal
- 36. Output shaft



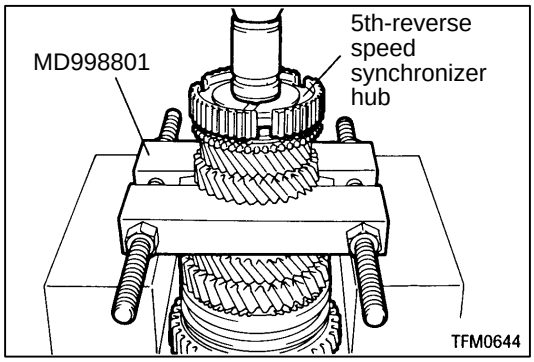
DISASSEMBLY SERVICE POINTS

◀A▶ TAPER ROLLER BEARING REMOVAL



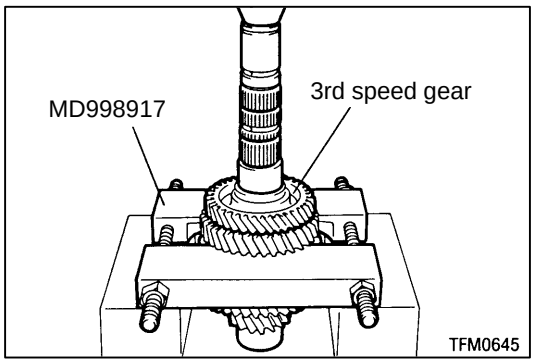
◀B▶ REVERSE GEAR BEARING SLEEVE REMOVAL

Mount a special tool on the reverse gear and remove the reverse gear bearing sleeve.



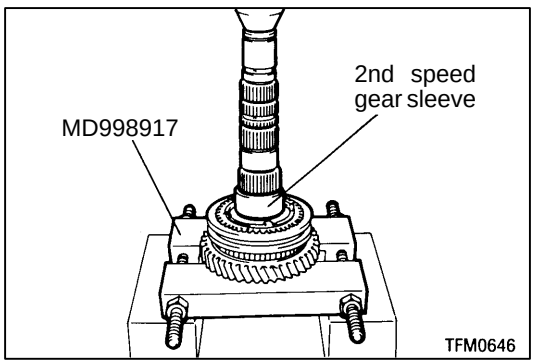
◀C▶ 5TH-REVERSE SPEED SYNCHRONIZER HUB REMOVAL

Mount a special tool on the 4th speed gear and remove the 5th-reverse speed synchronizer hub.



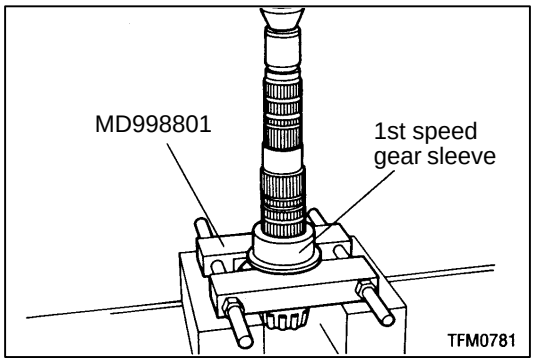
◀D▶ 3RD SPEED GEAR REMOVAL

Mount a special tool on the 2nd speed gear and remove the 3rd speed gear.

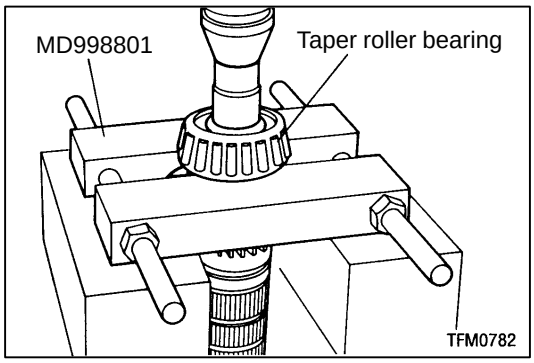


◀E▶ 2ND SPEED GEAR SLEEVE REMOVAL

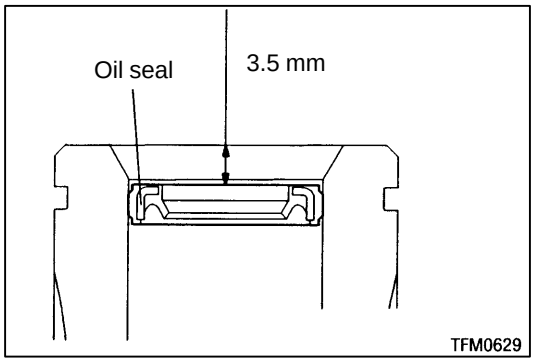
Mount a special tool on the 1st speed gear and remove the 2nd speed gear sleeve.



◀F▶ 1ST SPEED GEAR SLEEVE REMOVAL



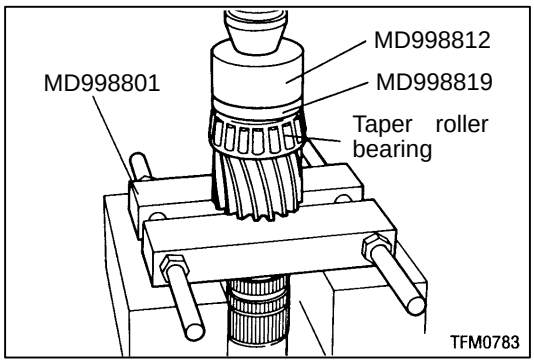
◀G▶ TAPER ROLLER BEARING REMOVAL



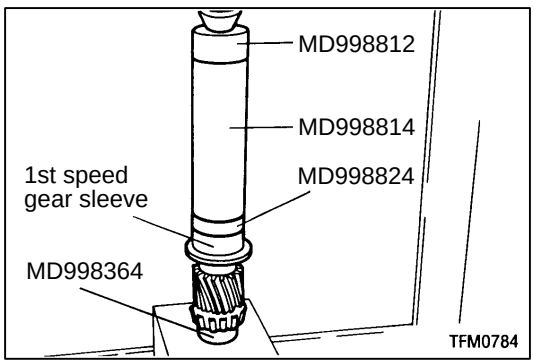
REASSEMBLY SERVICE POINTS

▶A◀ OIL SEAL INSTALLATION

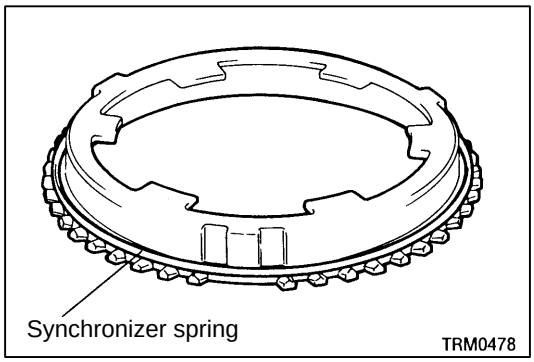
Make sure that the oil seal is pressed into the position shown in the illustration.



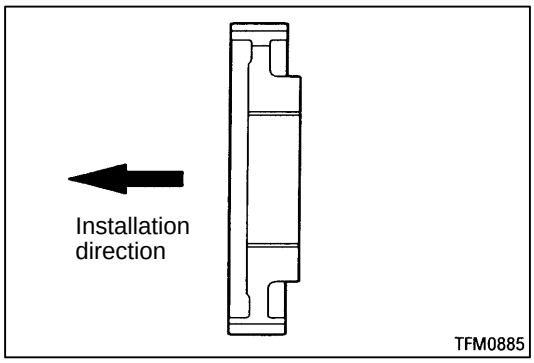
▶B◀ TAPER ROLLER BEARING INSTALLATION



▶C◀ 1ST SPEED GEAR SLEEVE INSTALLATION

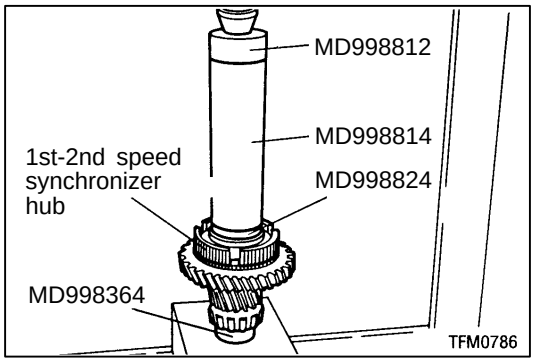


▶D◀ SYNCHRONIZER SPRING INSTALLATION

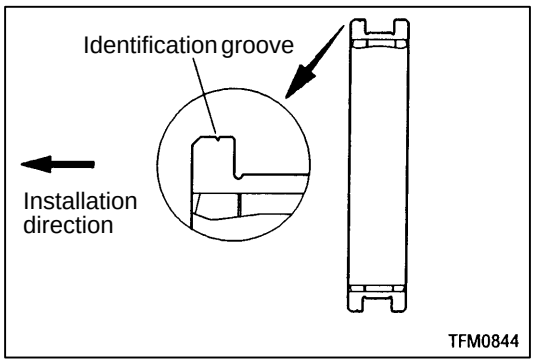


▶E◀ 1ST-2ND SPEED SYNCHRONIZER HUB INSTALLATION

Install the 1st-2nd speed synchronizer hub in such a way that it will be oriented in the direction shown.

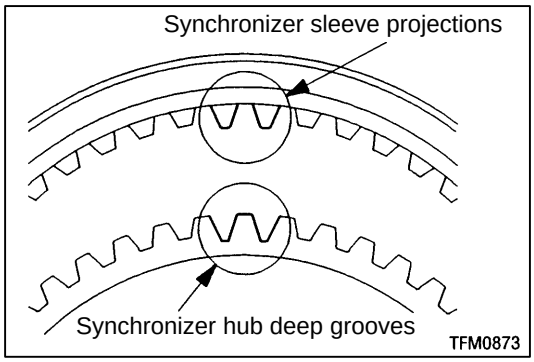


Caution
When the hub is installed, make sure that the synchronizer ring is not caught.

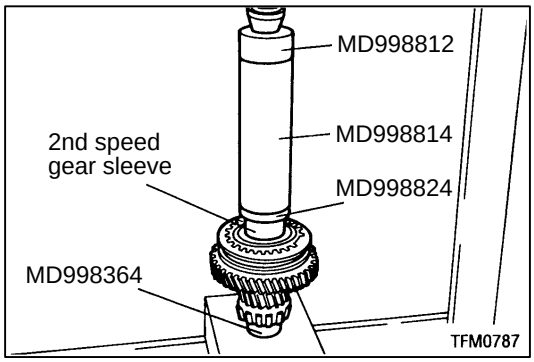


▶F◀ SYNCHRONIZER SLEEVE INSTALLATION

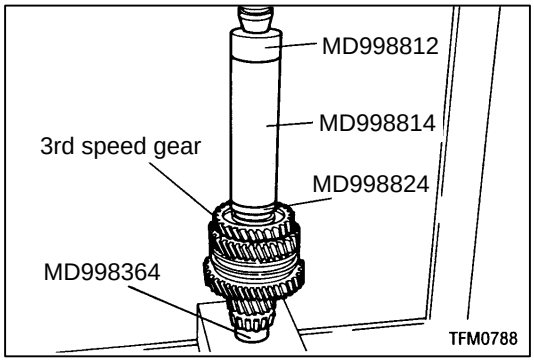
(1) Install the synchronizer sleeve in such a way that it will be oriented in the direction shown.



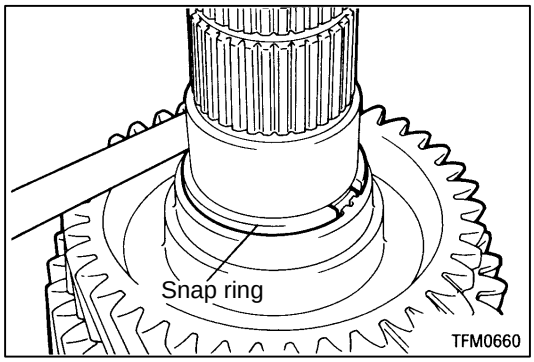
(2) When the synchronizer sleeve is installed, make sure that the deep groove portion of the synchronizer hub is aligned with the projecting portion of the sleeve.



▶G◀ 2ND SPEED GEAR SLEEVE INSTALLATION



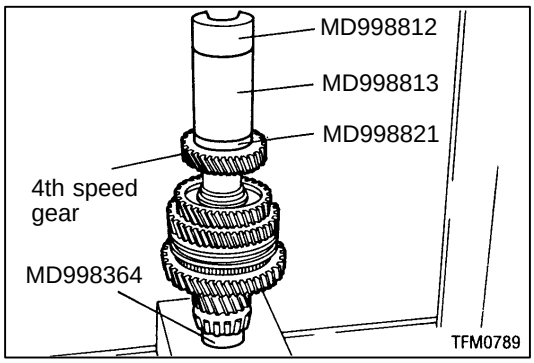
▶H◀ 3RD SPEED GEAR INSTALLATION



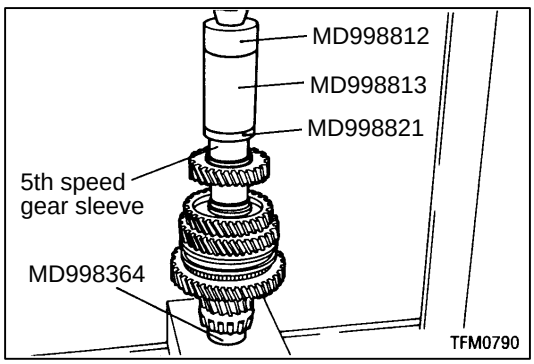
▶I◀ SNAP RING INSTALLATION

Select and install a snap ring so that the output shaft 3rd speed gear clearance will have the standard value.

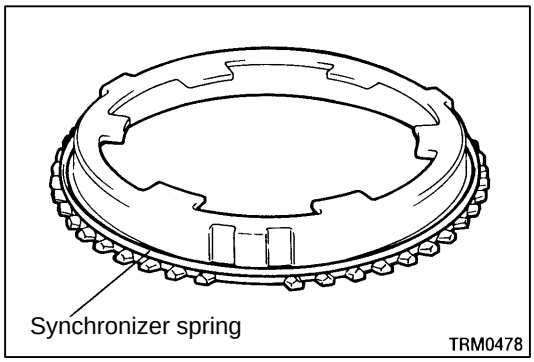
Standard value: 0 – 0.09 mm



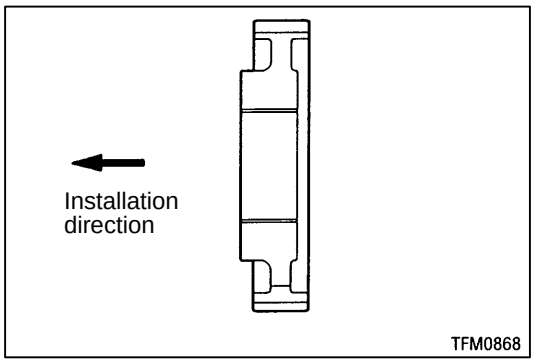
▶J◀ 4TH SPEED GEAR INSTALLATION



▶K◀ 5TH SPEED GEAR SLEEVE INSTALLATION

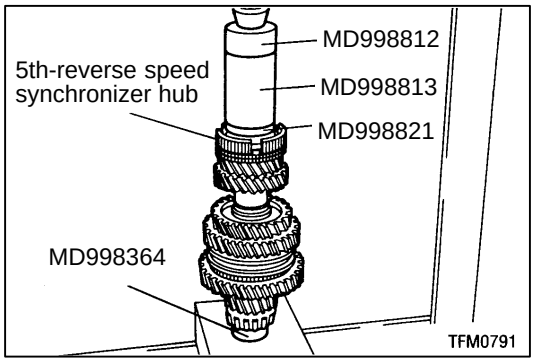


▶L◀ SYNCHRONIZER SPRING INSTALLATION

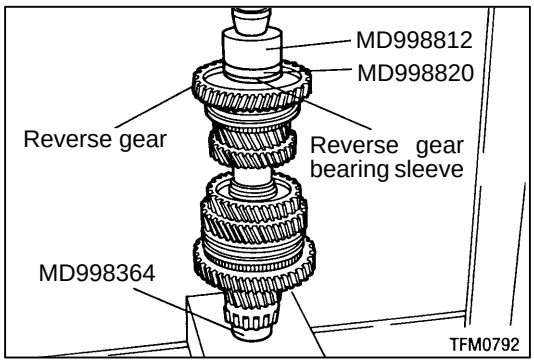


▶M◀ 5TH-REVERSE SPEED SYNCHRONIZER HUB INSTALLATION

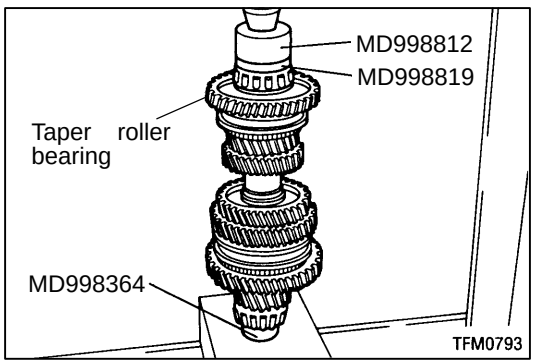
Install the 5th-reverse speed synchronizer hub in such a way that it will be oriented in the direction shown.



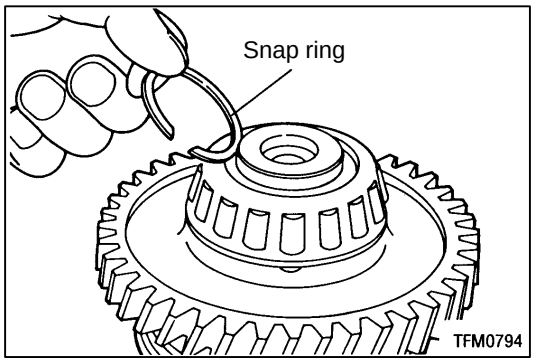
Caution
When the hub is installed, make sure that the synchronizer ring is not caught.



▶N◀ REVERSE GEAR / NEEDLE ROLLER BEARING / REVERSE GEAR BEARING SLEEVE INSTALLATION



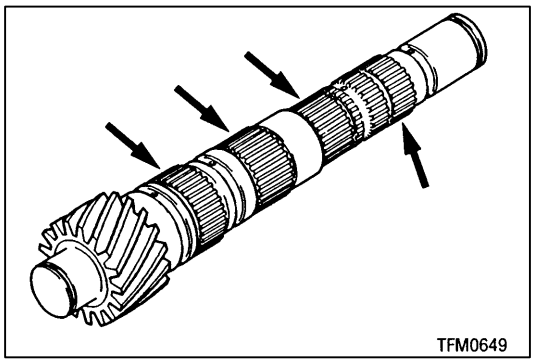
▶O◀ TAPER ROLLER BEARING INSTALLATION



▶P◀ SNAP RING INSTALLATION

Select and install a snap ring so that the output shaft rear bearing clearance will have the standard value.

Standard value: 0 – 0.09 mm



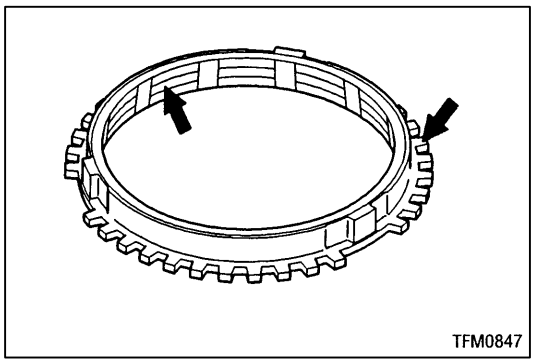
INSPECTION

OUTPUT SHAFT

Check the splines for damage and wear.

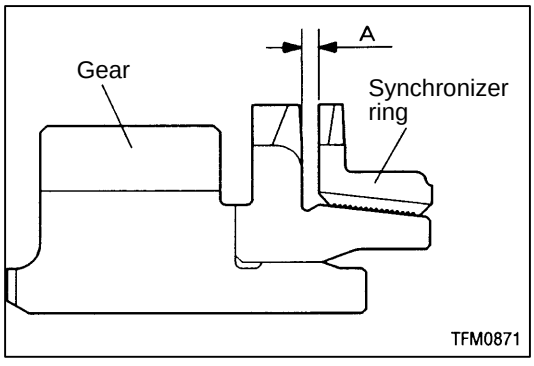
NEEDLE ROLLER BEARING

(1) Check to ensure that when the bearing sleeve and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
(2) Check the cage for deformation.



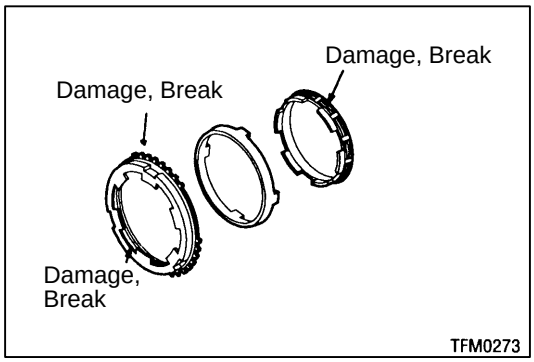
SYNCHRONIZER RING

(1) Check to ensure that the clutch gear tooth surfaces are not damaged and broken.
(2) Check to ensure that the cone inside diameter is not damaged or worn and that the threads are not crushed.



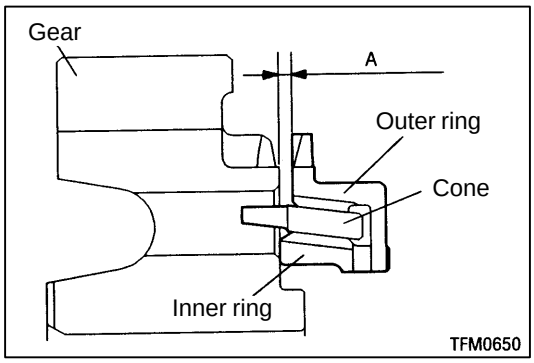
(3) Press the synchronizer ring against the gear and check clearance “A”. If “A” is less than the limit, replace.

Limit: 0.5 mm



OUTER SYNCHRONIZER RING / INNER SYNCHRONIZER RING / SYNCHRONIZER CONE

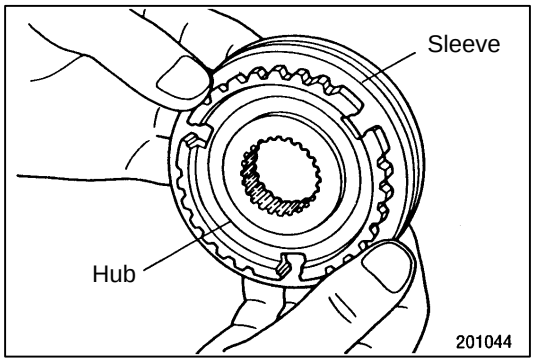
(1) Check to ensure that the clutch gear tooth surfaces and cone surfaces are not damaged and broken.



(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

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



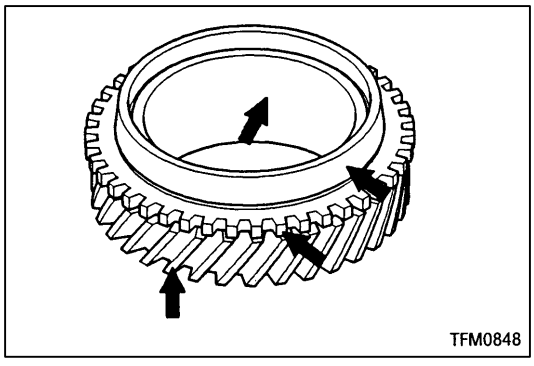
SYNCHRONIZER SLEEVE AND HUB

(1) Check to ensure that when the synchronizer sleeve and hub are combined and made to slide, they slide smoothly without binding.
(2) Check to ensure that the front and rear ends of the sleeve inside surface are not damaged.

Caution
When replacement of either the synchronizer sleeve or hub is necessary, make sure that the synchronizer sleeve and hub are replaced as a set.

SYNCHRONIZER SPRING

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



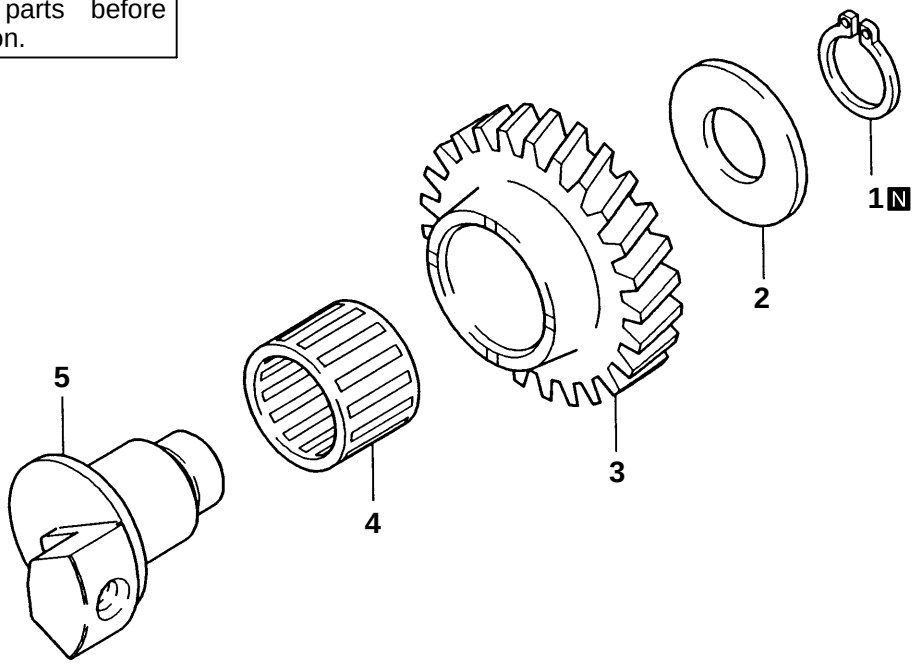
SPEED GEARS

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

REVERSE IDLER GEAR

DISASSEMBLY AND REASSEMBLY

Apply gear oil to all moving parts before installation.



TFM0807

Disassembly steps

1. Snap ring
2. Thrust washer
3. Reverse idler gear
4. Needle roller bearing
5. Reverse idler gear shaft

INSPECTION

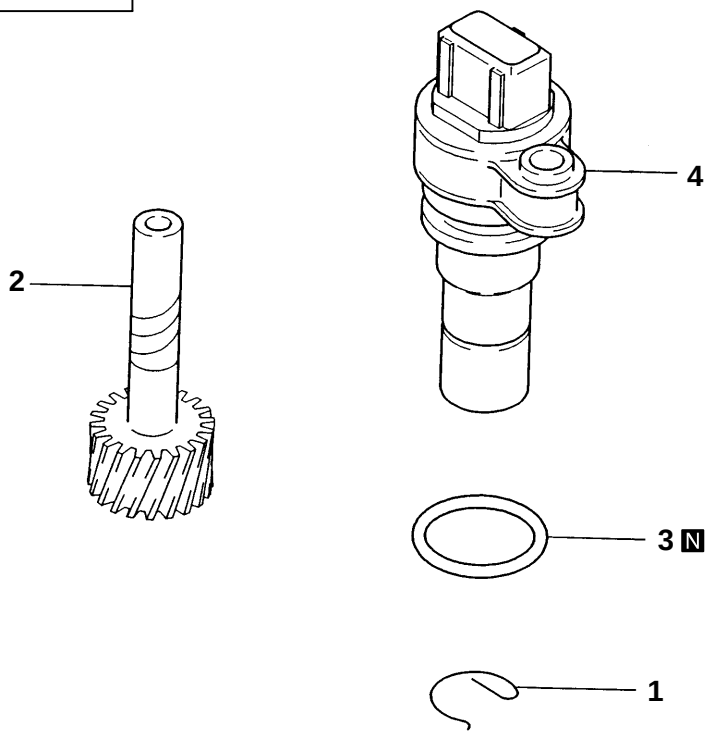
NEEDLE ROLLER BEARING

(1) Check to ensure that when the shaft and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
(2) Check to ensure that the cage is not deformed.

SPEEDOMETER GEAR

DISASSEMBLY AND REASSEMBLY

Apply gear oil to all moving parts before installation.



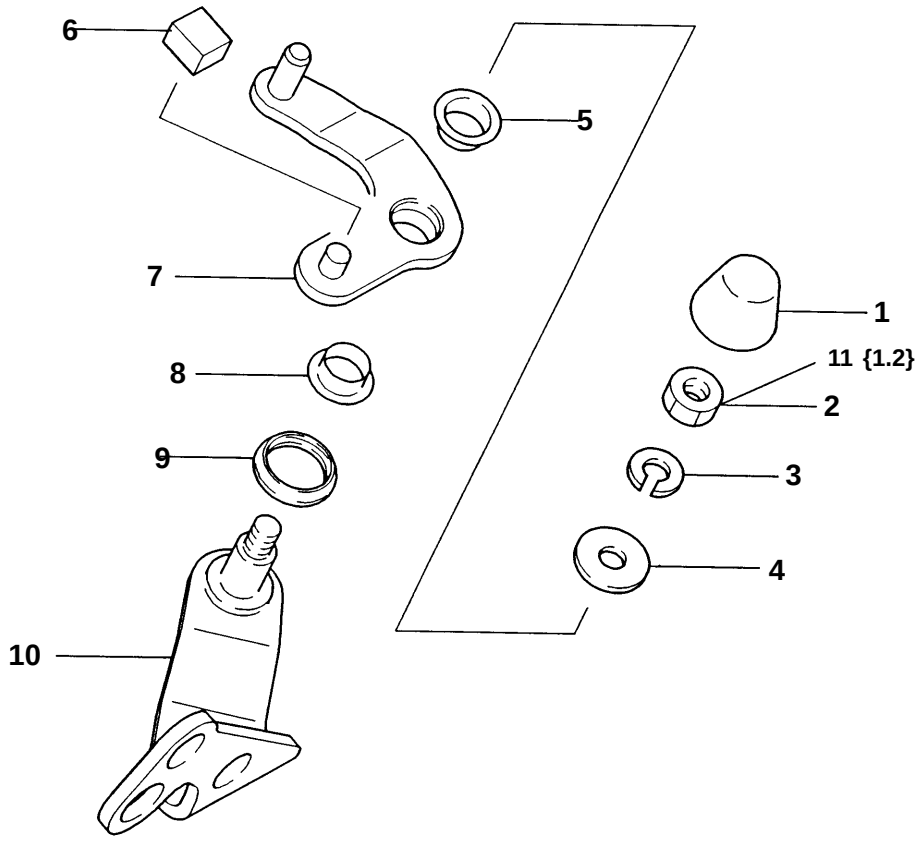
TFM0593

Disassembly steps

1. e-clip
2. Speedometer driven gear
3. O-ring
4. Sleeve

SELECT LEVER

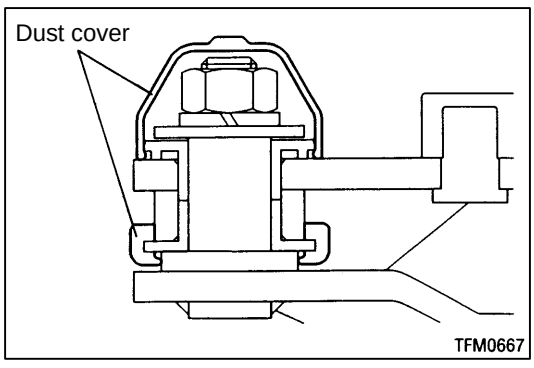
DISASSEMBLY AND REASSEMBLY



Unit: Nm {kgf·m}

Disassembly steps

▶A◀ 1. Dust cover
2. Nut
3. Spring washer
4. Washer
5. Select lever bushing
6. Select lever shoe
7. Select lever
8. Select lever bushing
▶A◀ 9. Dust cover
10. Select lever shaft

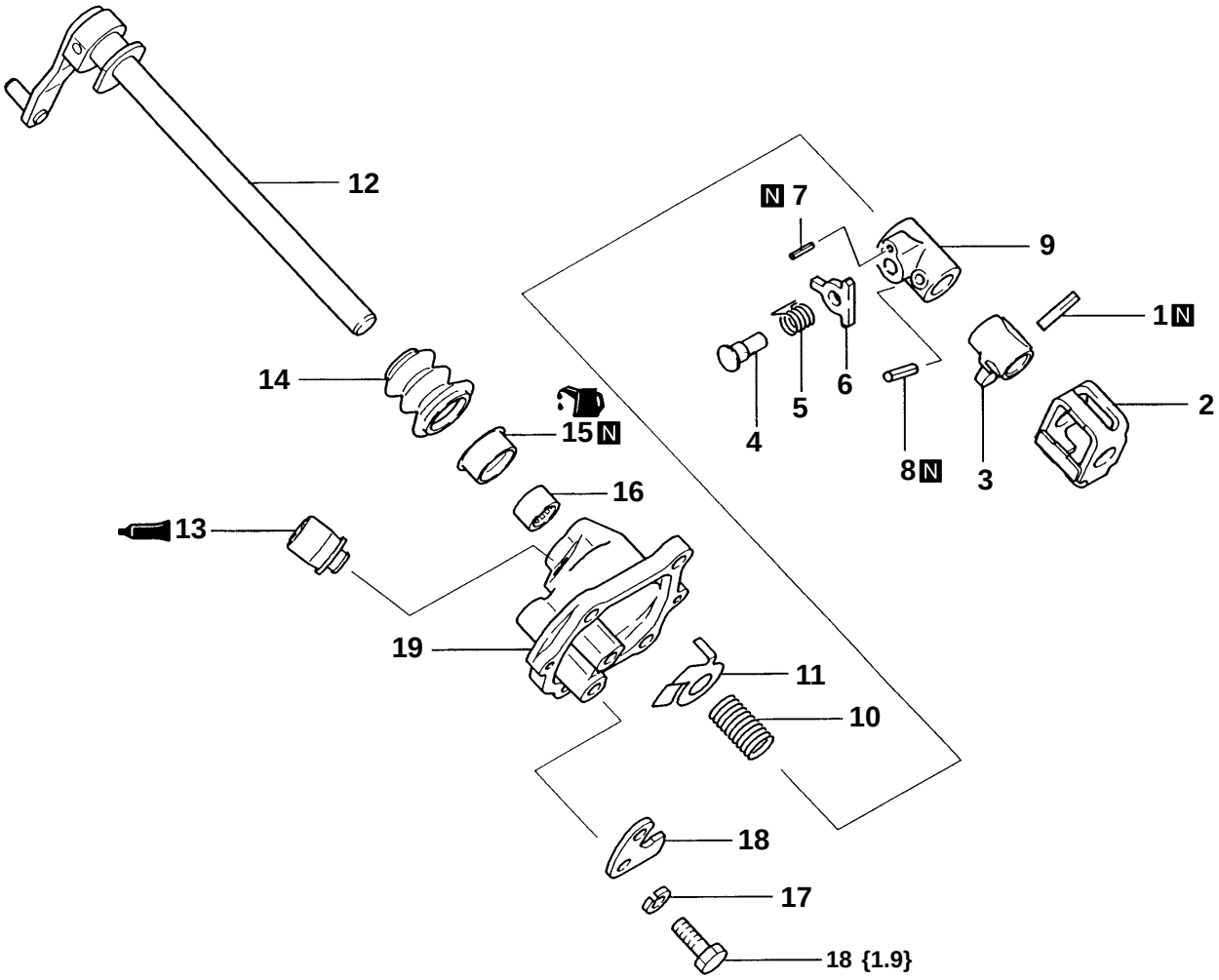


REASSEMBLY SERVICE POINT

▶A◀ DUST COVER INSTALLATION

CONTROL HOUSING

DISASSEMBLY AND REASSEMBLY

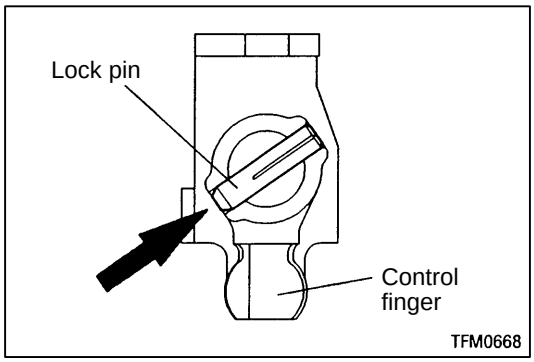


TFM0588

Unit: Nm {kgf·m}

Disassembly steps

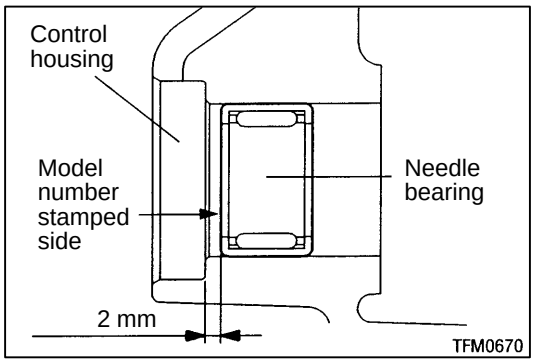
◀A▶ ▶F◀ 1. Lock pin
2. Interlock plate
3. Control finger
4. Pin
5. Return spring
6. Stopper plate
▶E◀ 7. Spring pin
▶D◀ 8. Spring pin
9. Stopper body
10. Neutral return spring
11. Spacer
12. Control shaft
▶C◀ 13. Air breather
14. Control shaft boot
▶B◀ 15. Oil seal
▶A◀ 16. Needle bearing
17. Spring washer
18. Stopper bracket
19. Control housing



DISASSEMBLY SERVICE POINT

◀A▶ LOCK PIN REMOVAL

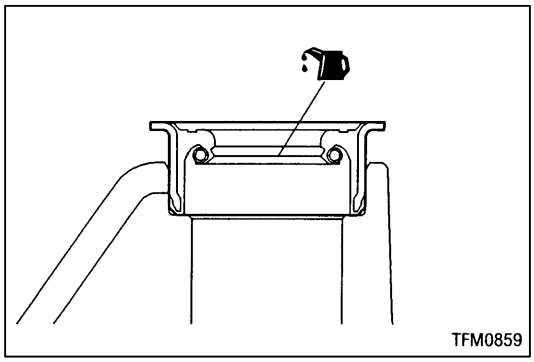
Drive the lock pin out of position from the direction shown.



REASSEMBLY SERVICE POINTS

▶A◀ NEEDLE BEARING INSTALLATION

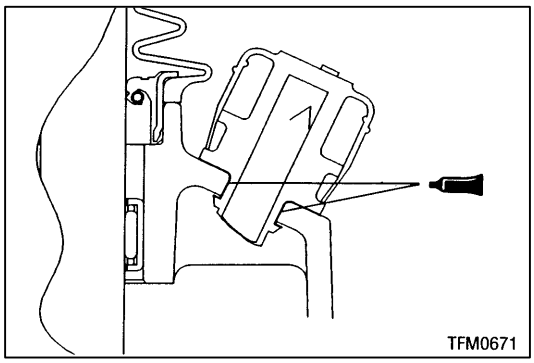
Press fit the needle bearing to the position shown in the illustration, while making sure that the model number stamped side is oriented in the direction shown.



▶B◀ OIL SEAL INSTALLATION

Apply transmission oil to the oil seal lip area.

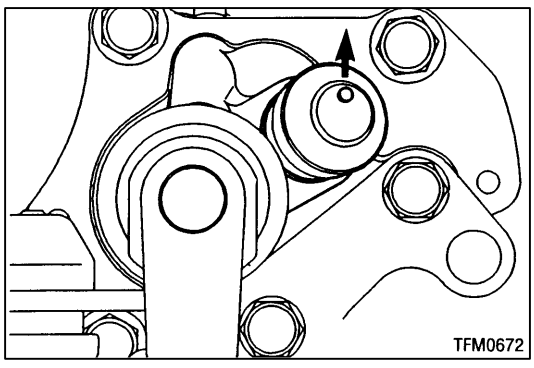
Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W



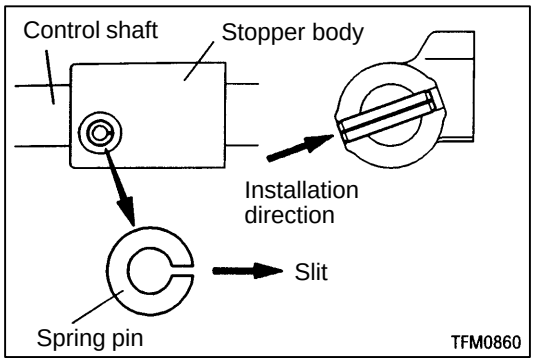
▶C◀ AIR BREATHER INSTALLATION

(1) Apply a sealant to the outside circumference of the inserting portion.

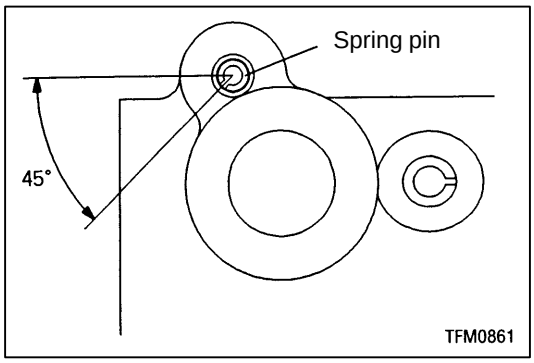
Specified sealant: THREEBOND 1501



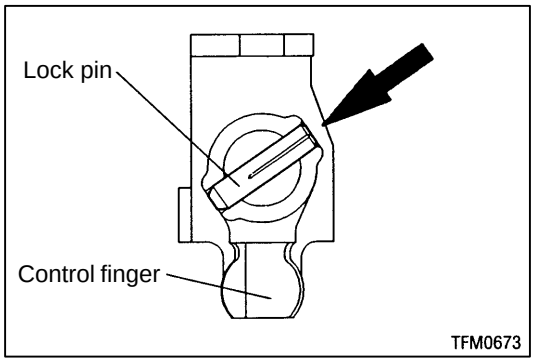
(2) Make sure that the projecting portion is oriented in the direction shown.



▶D◀ SPRING PIN INSTALLATION



▶E◀ SPRING PIN INSTALLATION

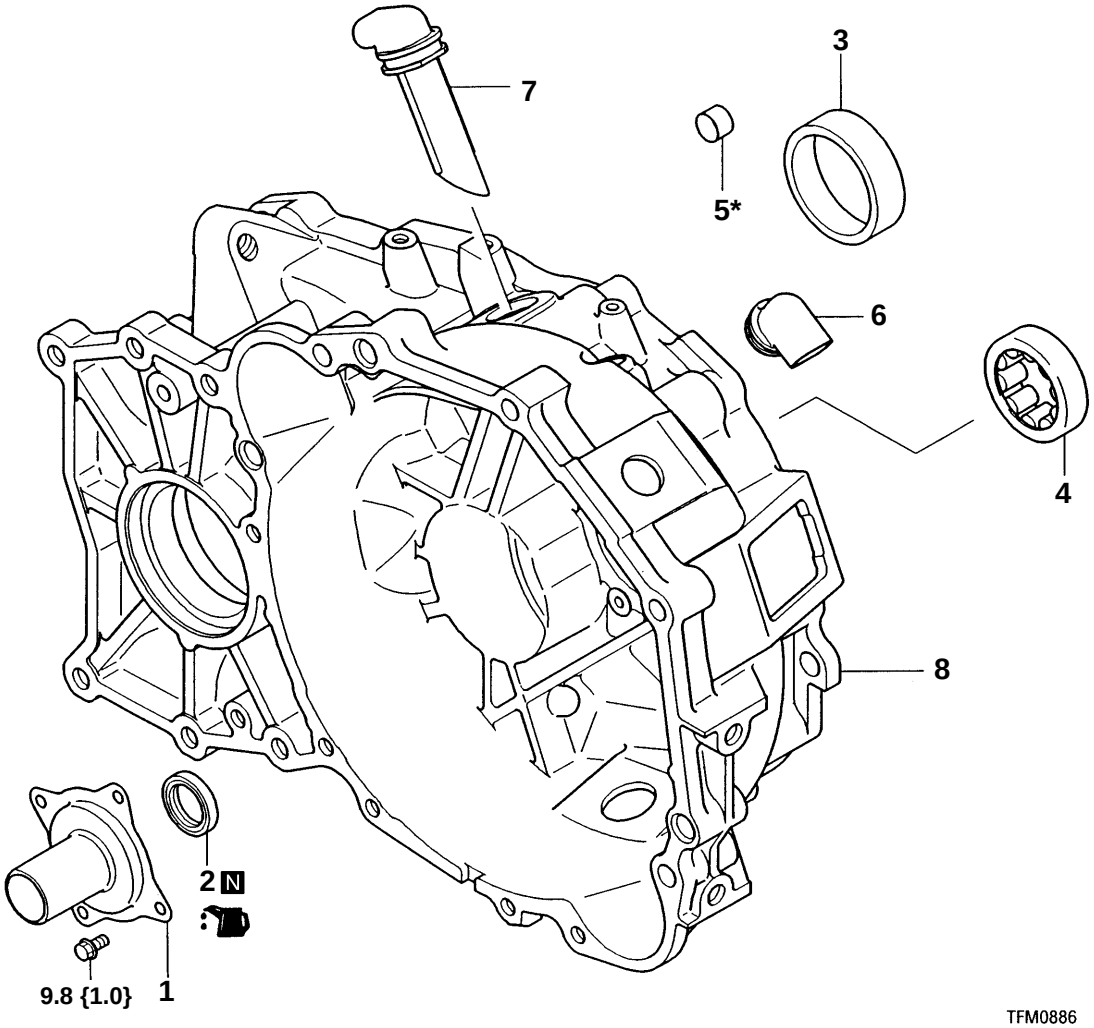


▶F◀ LOCK PIN INSTALLATION

Drive in the lock pin in the direction shown in the illustration.

CLUTCH HOUSING

DISASSEMBLY AND REASSEMBLY

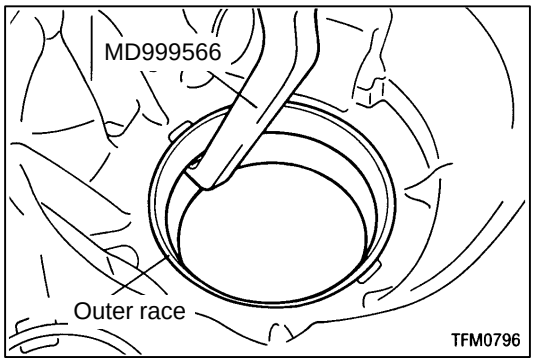


Unit: Nm {kgf·m}

Disassembly steps

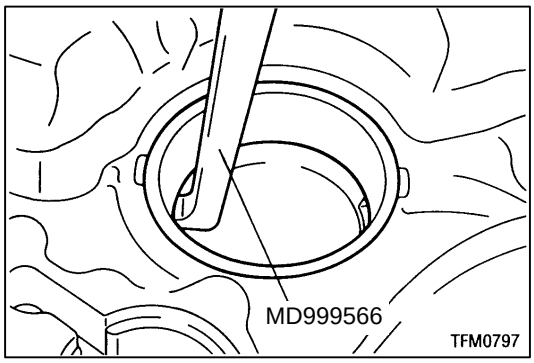
1. Clutch release bearing retainer
2. Oil seal
3. Outer race
4. Outer race
5. Bushing*
6. Cover-A
7. Cover-B
8. Clutch housing

NOTE:
*: Never remove the bushings from the clutch housing.
Only the case when installing new bushings into a new clutch housing, refer to ▶B◀.

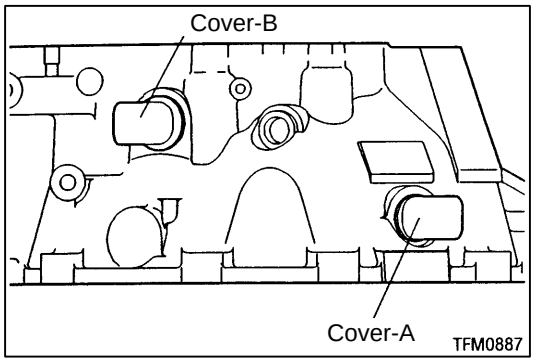


DISASSEMBLY SERVICE POINTS

◀A▶ OUTER RACE REMOVAL



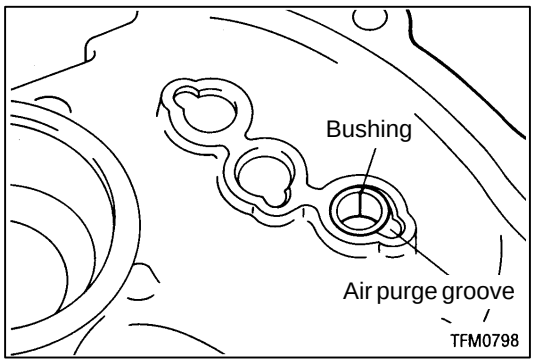
◀B▶ OUTER RACE REMOVAL



REASSEMBLY SERVICE POINTS

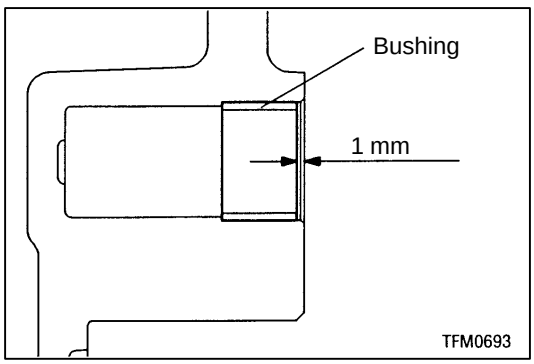
▶A◀ COVER-A / COVER-B INSTALLATION

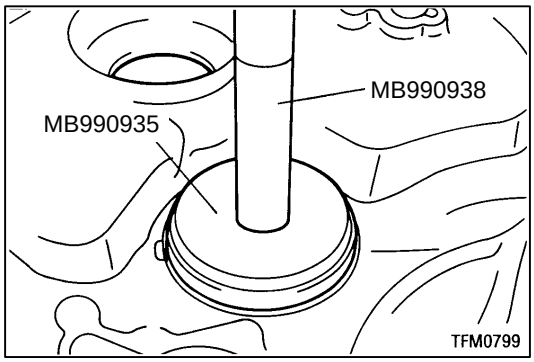
Install the covers directed as shown in the illustration



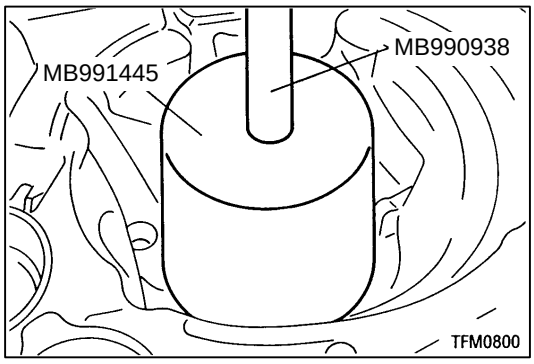
▶B◀ BUSHING INSTALLATION

Press fit the bushing to the illustrated position, while making sure that the split ends of the bushing do not coincide with the air purge groove.

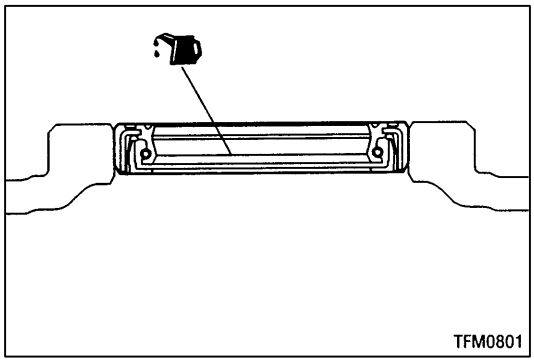




▶C◀ OUTER RACE INSTALLATION



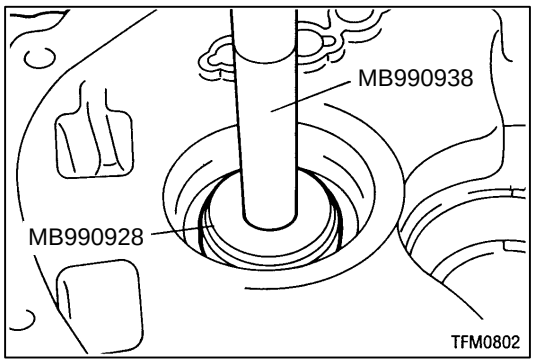
▶D◀ OUTER RACE INSTALLATION



▶E◀ OIL SEAL INSTALLATION

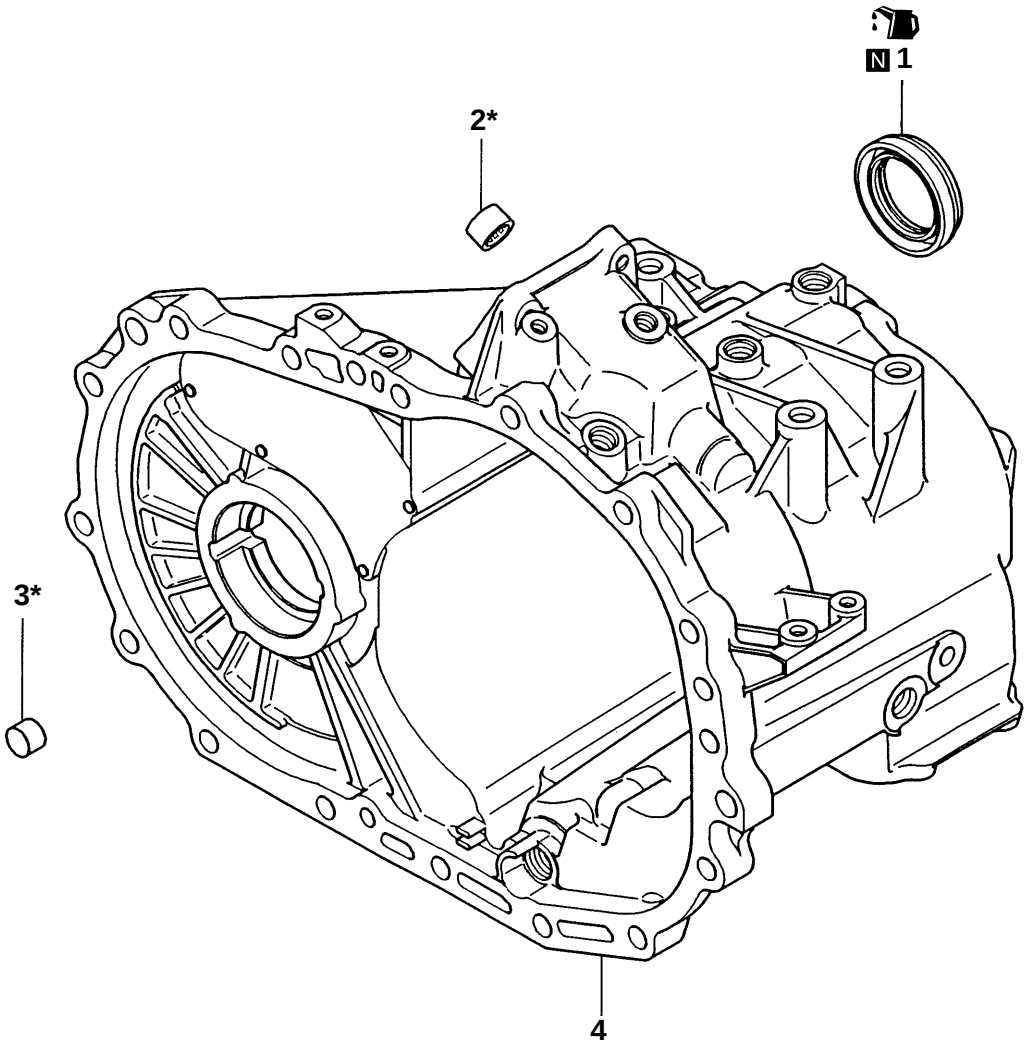
Apply transmission oil to the oil seal lip area.

Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W



TRANSMISSION CASE

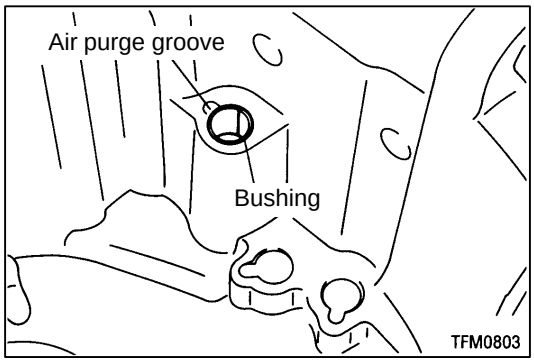
DISASSEMBLY AND REASSEMBLY



Disassembly steps

▶C◀ 1. Oil seal
▶B◀ 2. Needle bearing*
▶A◀ 3. Bushing*
4. Transmission case

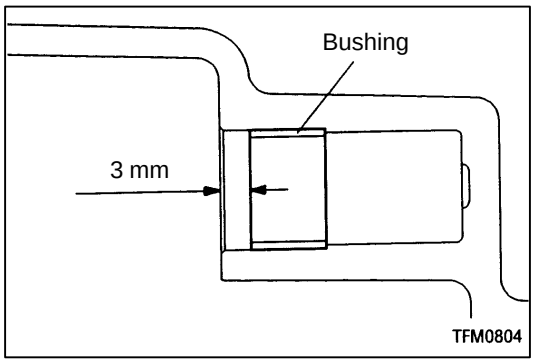
NOTE:
*: Never remove the bearing and bushing from the transmission case.
Only the case when installing new bearing and bushing into a new transmission case, refer to ▶A◀ and ▶B◀.



REASSEMBLY SERVICE POINTS

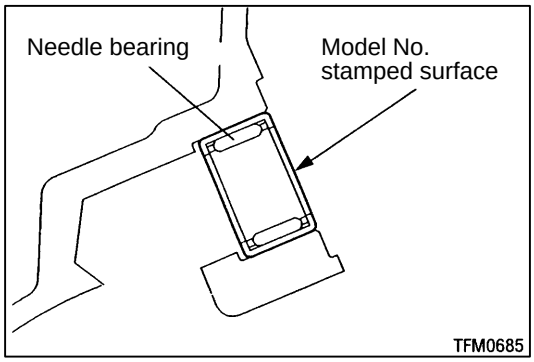
▶A◀ BUSHING INSTALLATION

Press fit the bushing to the illustrated position, while making sure that the split ends of the bushing do not coincide with the air purge groove.



▶B◀ NEEDLE BEARING INSTALLATION

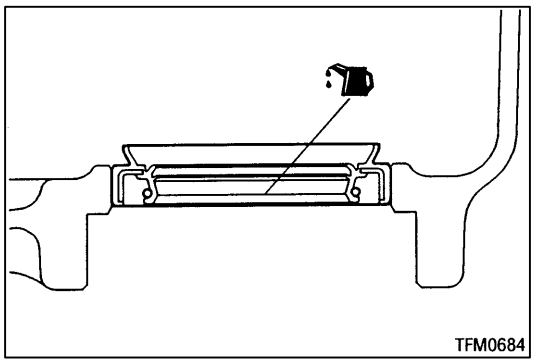
Press fit the needle bearing until it is flush with the case, while making sure that the model number stamped side is oriented in the direction shown.

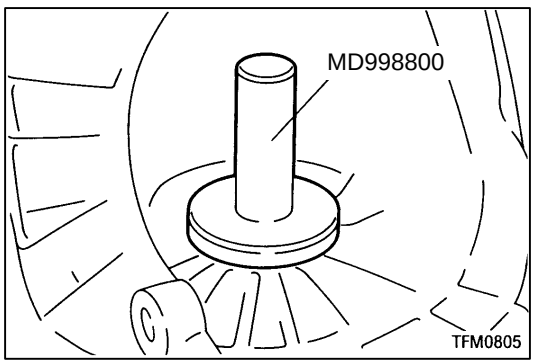


▶C◀ OIL SEAL INSTALLATION

Apply transmission oil to the oil seal lip area.

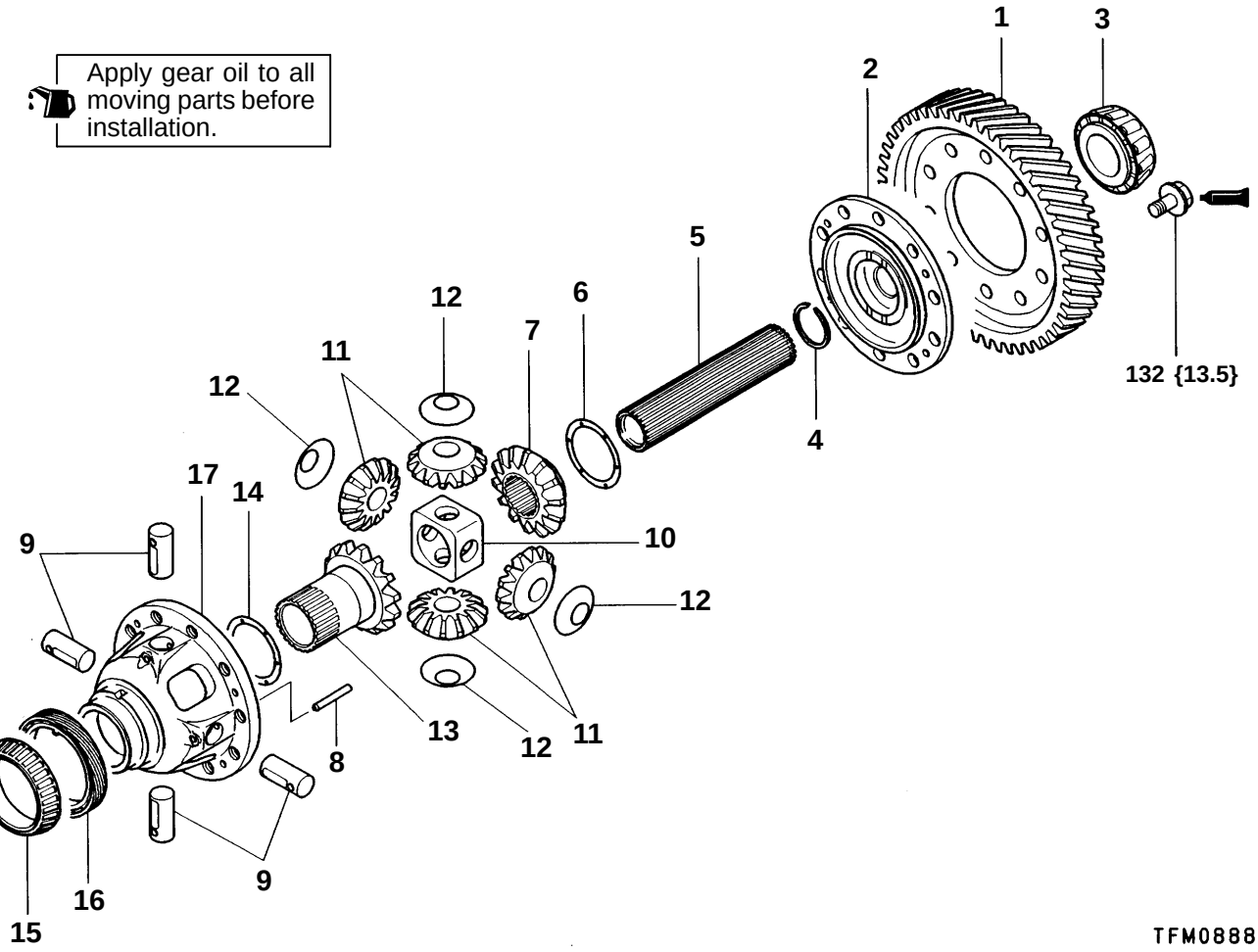
Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W





CENTER DIFFERENTIAL

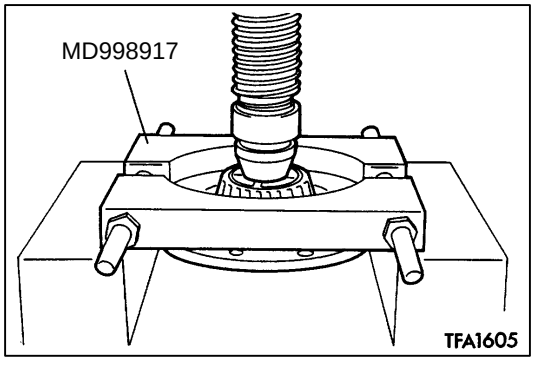
DISASSEMBLY AND REASSEMBLY



Unit: Nm {kgf·m}

Disassembly steps

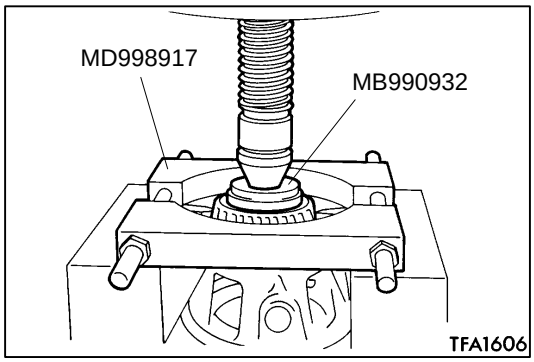
- ▶D◀ 1. Center differential drive gear
- ▶C◀ 2. Center differential flange
- ◀A▶ ▶B◀ 3. Taper roller bearing
- ▶C◀ 4. Snap ring
- ▶C◀ 5. Front output shaft
- ▶C◀ 6. Spacer
- ▶C◀ 7. Side gear
- ▶C◀ 8. Lock pin
- ▶C◀ 9. Pinion shaft
- ▶C◀ 10. Pinion shaft holder
- ▶C◀ 11. Pinion
- ▶C◀ 12. Washer
- ▶C◀ 13. Side gear
- ▶C◀ 14. Spacer
- ◀B▶ ▶A◀ 15. Taper roller bearing
- 16. Speedometer drive gear
- 17. Differential case



DISASSEMBLY SERVICE POINTS

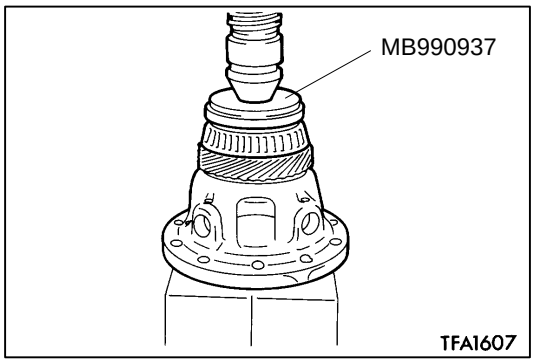
◀A▶ TAPER ROLLER BEARING REMOVAL

Use the special tool to remove the taper roller bearing.



◀B▶ TAPER ROLLER BEARING REMOVAL

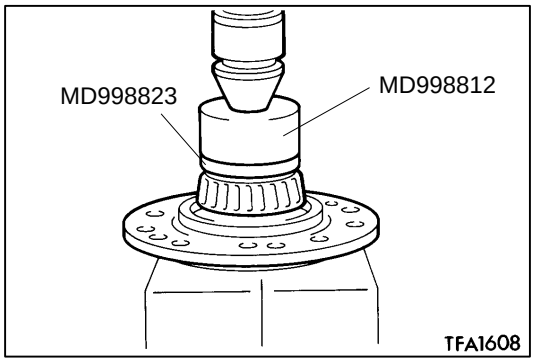
Use the special tools to remove the taper roller bearing.



REASSEMBLY SERVICE POINTS

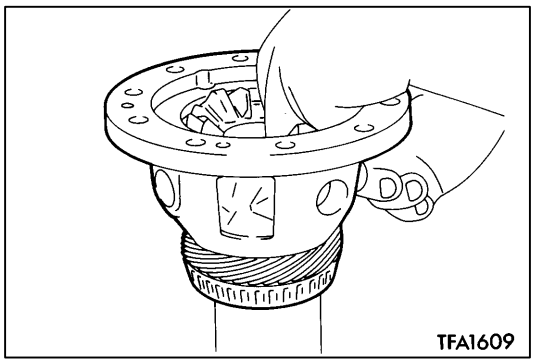
▶A◀ TAPER ROLLER BEARING INSTALLATION

Use the special tool to install the taper roller bearing.



▶B◀ TAPER ROLLER BEARING INSTALLATION

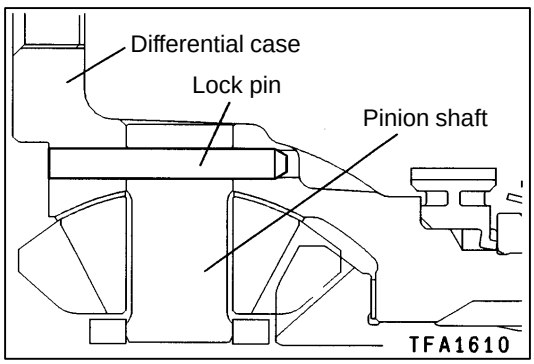
Use the special tools to install the taper roller bearing.



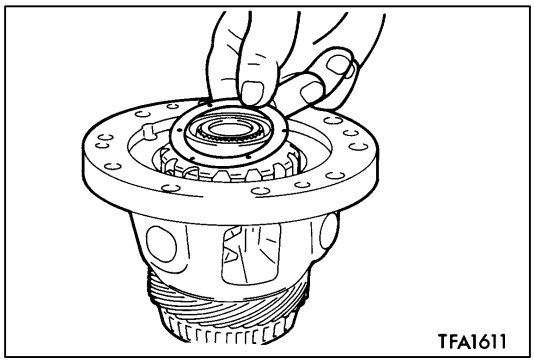
▶C◀ SPACER / SIDE GEAR / WASHER / PINION/PINION HOLDER / PINION SHAFT / LOCK PIN / FRONT OUTPUT SHAFT / SNAP RING / CENTER DIFFERENTIAL FLANGE INSTALLATION

(1) Install the side gear in the center differential case with the spacer attached.

NOTE
If a new side gear is to be installed, select a spacer with medium thickness (0.8 – 0.9 mm).

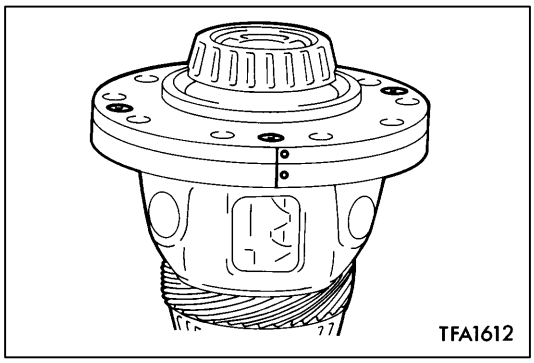


(2) Fit the washer on the back of each pinion. Engage the 4 pinions simultaneously in the side gear.
Rotate the gears to place them in position, then install the pinion shaft holder.
(3) Insert the pinion shafts.
(4) Install the lock pins in the illustrated direction.

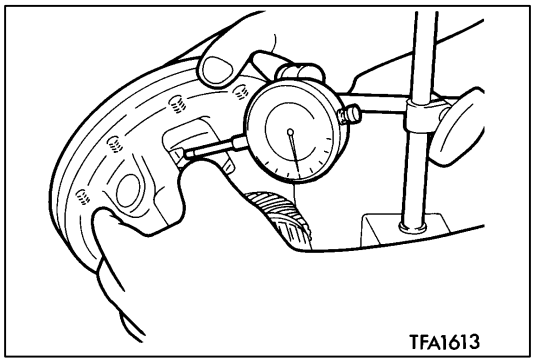


(5) Install the front output shaft to the side gear and fit the snap ring.
(6) Attach the spacer on the other side gear, then install the side gear in the center differential case.

NOTE
If a new side gear is to be installed, select a spacer with medium thickness (0.8 – 0.9 mm).



(7) Install the center differential flange on the case while aligning the mating marks, then secure it temporarily with machine screw.

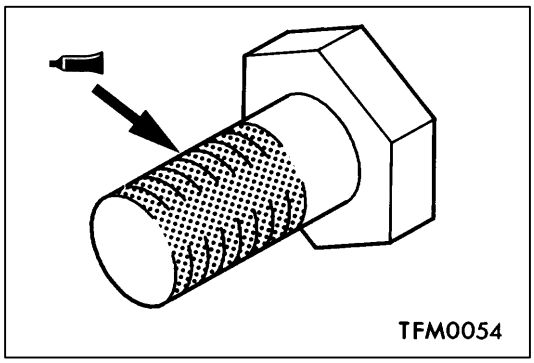


(8) Measure the backlash between the side gear and the pinion.

Standard value: 0.025 – 0.150 mm

(9) If the measurement deviates from the standard value, correct the backlash using a spacer of different thickness and check it again.

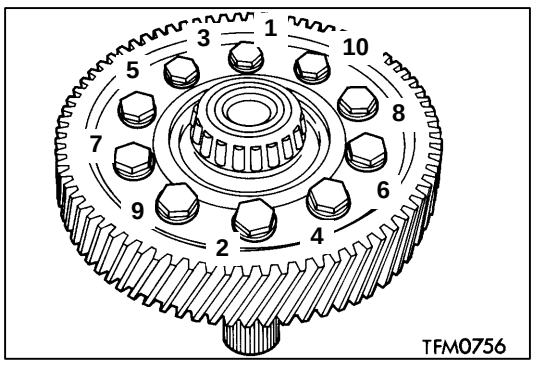
NOTE
The backlash must be the same on both sides.



▶D◀ CENTER DIFFERENTIAL DRIVE GEAR INSTALLATION

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

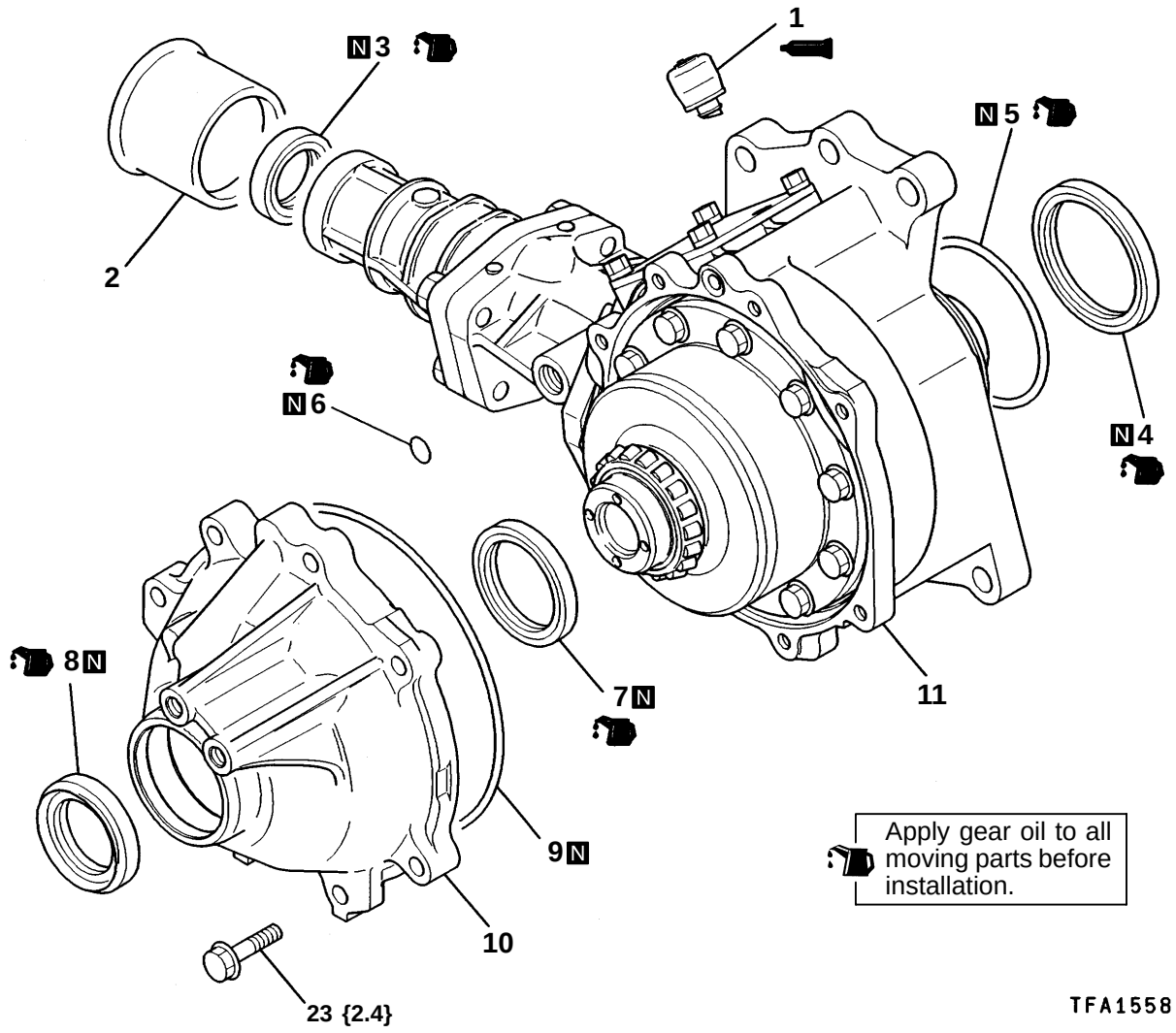
Specified sealant:
THREEBOND 1303 or LOKTITE 648



(2) Tighten the bolts to the specified torque in the illustrated sequence.

TRANSFER

DISASSEMBLY AND REASSEMBLY



Unit: Nm {kgf·m}

Disassembly steps

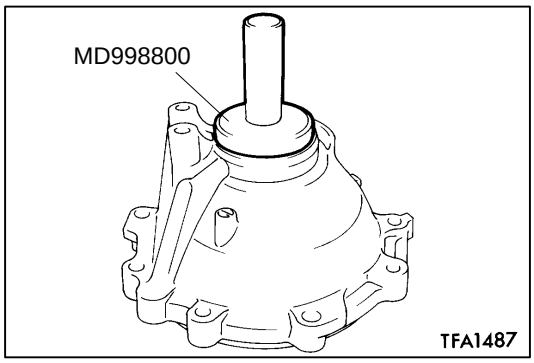
▶F◀ 1. Air breather
2. Dust seal guard
▶E◀ 3. Oil seal
▶D◀ 4. Oil seal
▶A◀ 5. O-ring
▶A◀ 6. O-ring
▶C◀ 7. Oil seal
▶B◀ 8. Oil seal
▶A◀ 9. O-ring
10. Transfer cover
11. Transfer

REASSEMBLY SERVICE POINTS

▶A◀ O-RING INSTALLATION

Apply transmission oil to the O-ring.

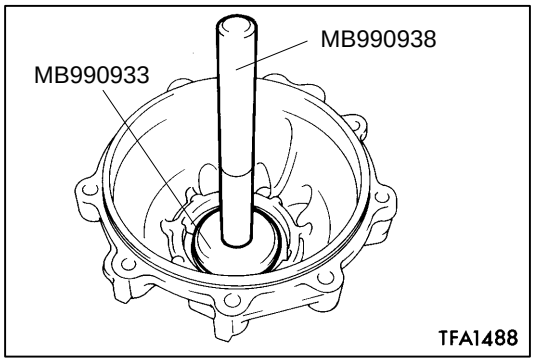
Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W



▶B◀ OIL SEAL INSTALLATION

(1) Apply transmission oil to the oil seal lip area.
Transmission oil:
DIA QUEEN MULTI-GEAR OIL 75W/85W

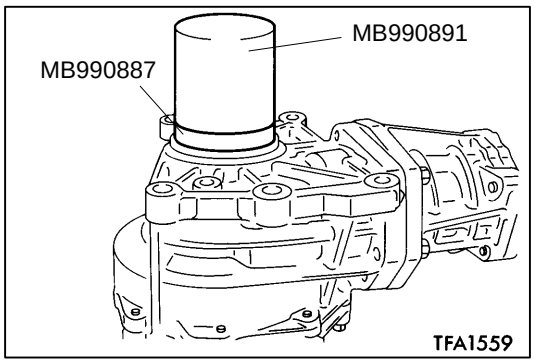
(2) By using the special tool, install the oil seal.



▶C◀ OIL SEAL INSTALLATION

(1) Apply transmission oil to the oil seal lip area.
Transmission oil:
DIA QUEEN MULTI-GEAR OIL 75W/85W

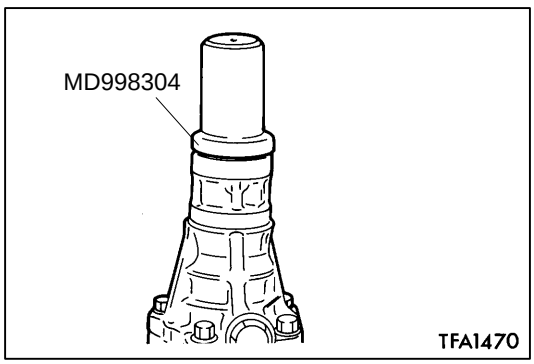
(2) By using the special tool, install the oil seal.



▶D◀ OIL SEAL INSTALLATION

(1) Apply transmission oil to the oil seal lip area.
Transmission oil:
DIA QUEEN MULTI-GEAR OIL 75W/85W

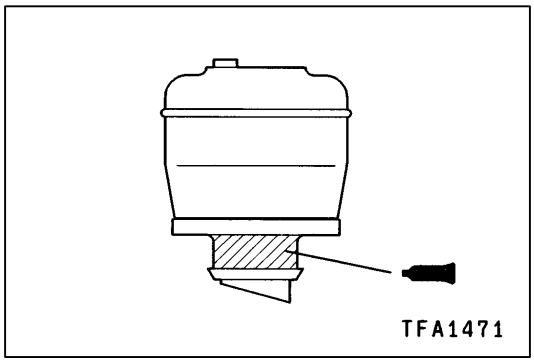
(2) By using the special tool, install the oil seal.



▶E◀ OIL SEAL INSTALLATION

(1) Apply transmission oil to the oil seal lip area.
Transmission oil:
DIA QUEEN MULTI-GEAR OIL 75W/85W

(2) By using the special tool, install the oil seal.



▶F◀ AIR BREATHER INSTALLATION

Apply sealant to the air breather.

Specified sealant: THREEBOND 1501