

HOW TO USE THIS MANUAL

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RANGE OF TOPICS

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
 - Removal/Installation
 - Disassembly/Assembly
 - Replacement
 - Inspection
 - Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts and visual inspection) have been omitted.

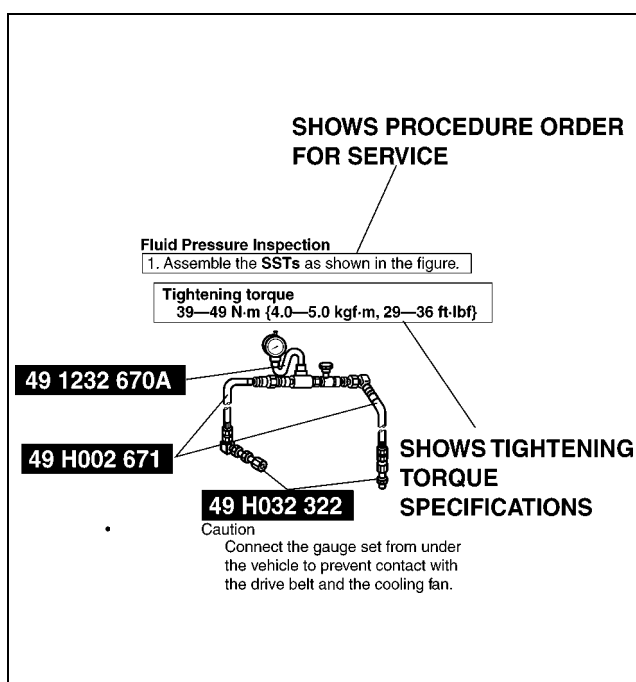
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SERVICING PROCEDURE

Inspection, Adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.

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UNITS

UNITS

UNITS TABLE

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Electrical current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Number of revolutions	rpm (revolutions per minute)
Positive pressure	kPa (kilo pascal)
	kgf/cm ² (kilogram force per square centimeter)
	psi (pounds per square inch)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)

Volume	L (liter)
	US qt (U.S. quart)
	imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
Weight	fl oz (fluid ounce)
	N (Newton)
	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm² in the following specifications:

210—260 kPa {2.1—2.7 kgf/cm², 30—38 psi}
270—310 kPa {2.7—3.2 kgf/cm², 39—45 psi}

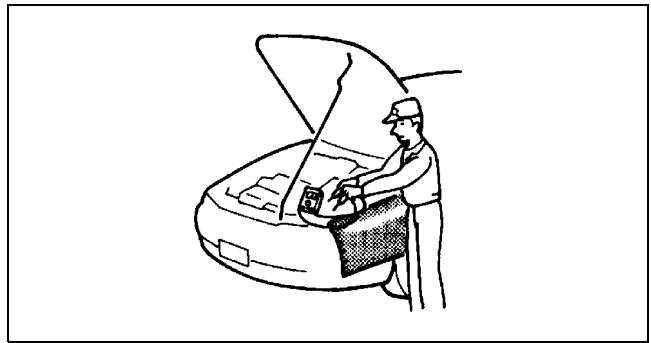
- The actual converted values for 2.7 kgf/cm² are 265 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

FUNDAMENTAL PROCEDURES

ADJUSTMENT

- Use suitable gauges and/or testers when making adjustments.

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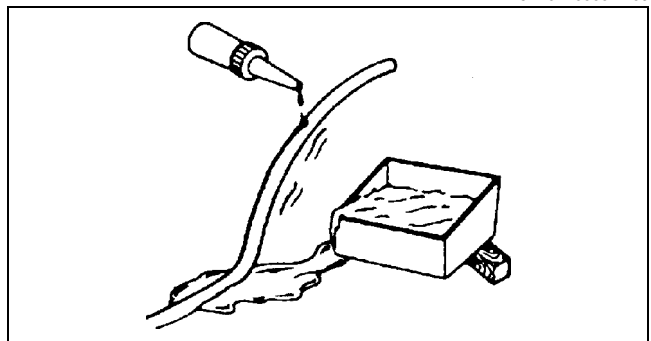


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RUBBER PARTS AND TUBING

- Prevent gasoline or oil from getting on rubber parts or tubing.

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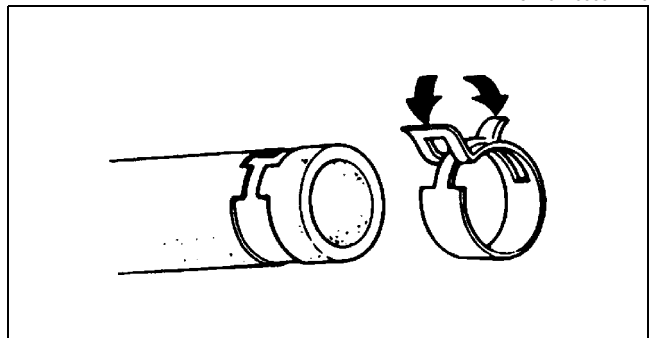


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HOSE CLAMPS

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.

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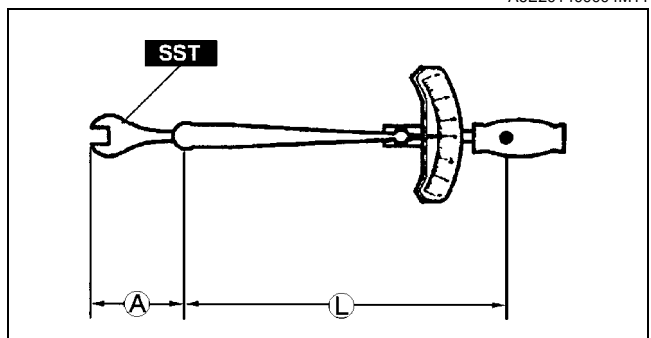


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TORQUE FORMULAS

- When using a torque wrench-SST or equivalent combination, the written torque must be recalculated due to the extra length that the SST or equivalent adds to the torque wrench. Recalculate the torque using the following formulas. Choose the formula that applies to you.

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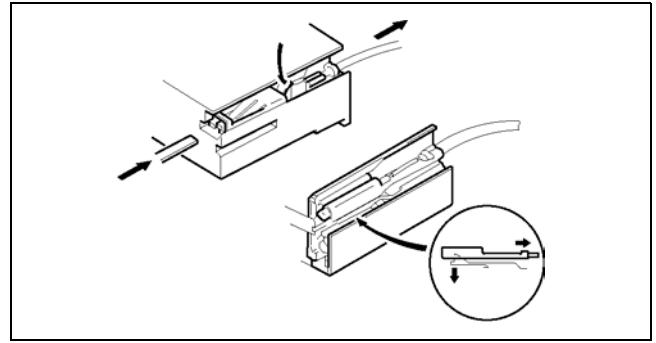
Torque Unit	Formula
N·m	$N \cdot m \times [L / (L + A)]$
kgf·m	$kgf \cdot m \times [L / (L + A)]$
kgf·cm	$kgf \cdot cm \times [L / (L + A)]$
ft·lbf	$ft \cdot lbf \times [L / (L + A)]$
in·lbf	$in \cdot lbf \times [L / (L + A)]$

A : The length of the **SST** past the torque wrench drive
 L : The length of the torque wrench

ELECTRICAL SYSTEM

Replacement

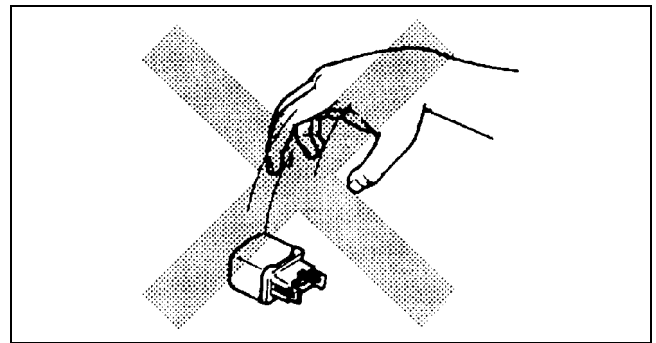
- Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.
- Insert a thin piece of metal from the terminal side of the connector and with the terminal locking tab pressed down, pull the terminal out from the connector.



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Sensors, Switches, and Relays

- Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.



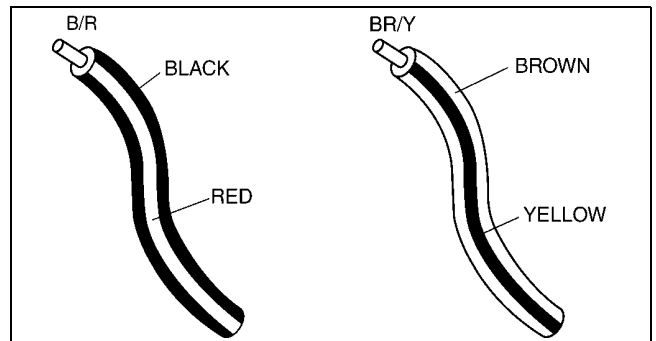
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Wiring Harness

Wiring color codes

- Two-color wires are indicated by a two-color code symbol.
- The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		



X3U000WB7

MANUAL TRANSAXLE

MANUAL TRANSAXLE

PRECAUTION

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1. Clean the transaxle exterior thoroughly using a steam cleaner or cleaning solvents before disassembly.

Warning

- Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.

Caution

- Cleaning sealed bearings using cleaning fluids or a steam cleaner can wash the grease out of the bearing.

2. Clean the removed parts using cleaning solvent, and dry them using compressed air.
3. Clean out all holes and passages using compressed air, and check that there are no obstructions.
4. Use a plastic hammer when disassembling the transaxle case and other light alloy metal parts.
5. Make sure each part is cleaned before assembling.
6. Coat all movable parts with the specified oil.
7. Replace parts whenever required.
8. Remove old sealant from contact surfaces before applying new sealant.
9. Assemble the parts within **10 minutes** after applying sealant. Allow all sealant to cure at least **30 minutes** after assembly before filling the transaxle with transaxle oil.

Warning

- Although the stand has a self-locking brake system, there is a possibility that the brake may not hold when the transaxle is held in a lopsided position on the stand. This would cause the transaxle to turn suddenly, causing serious injury. Never keep the transaxle tilted to one side. Always hold the rotating handle firmly when turning the transaxle.

5TH GEAR THRUST CLEARANCE PREINSPECTION

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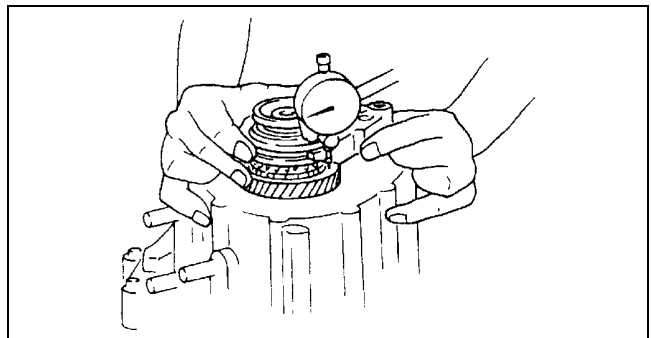
1. Remove the rear cover.
2. Measure the 5th gear thrust clearance using a dial indicator.
 - If the clearance exceeds the maximum, check the contact surfaces of 5th gear and the clutch hub. Replace worn or damaged parts.

Clearance

0.100—0.220 mm {0.0040—0.0086 in}

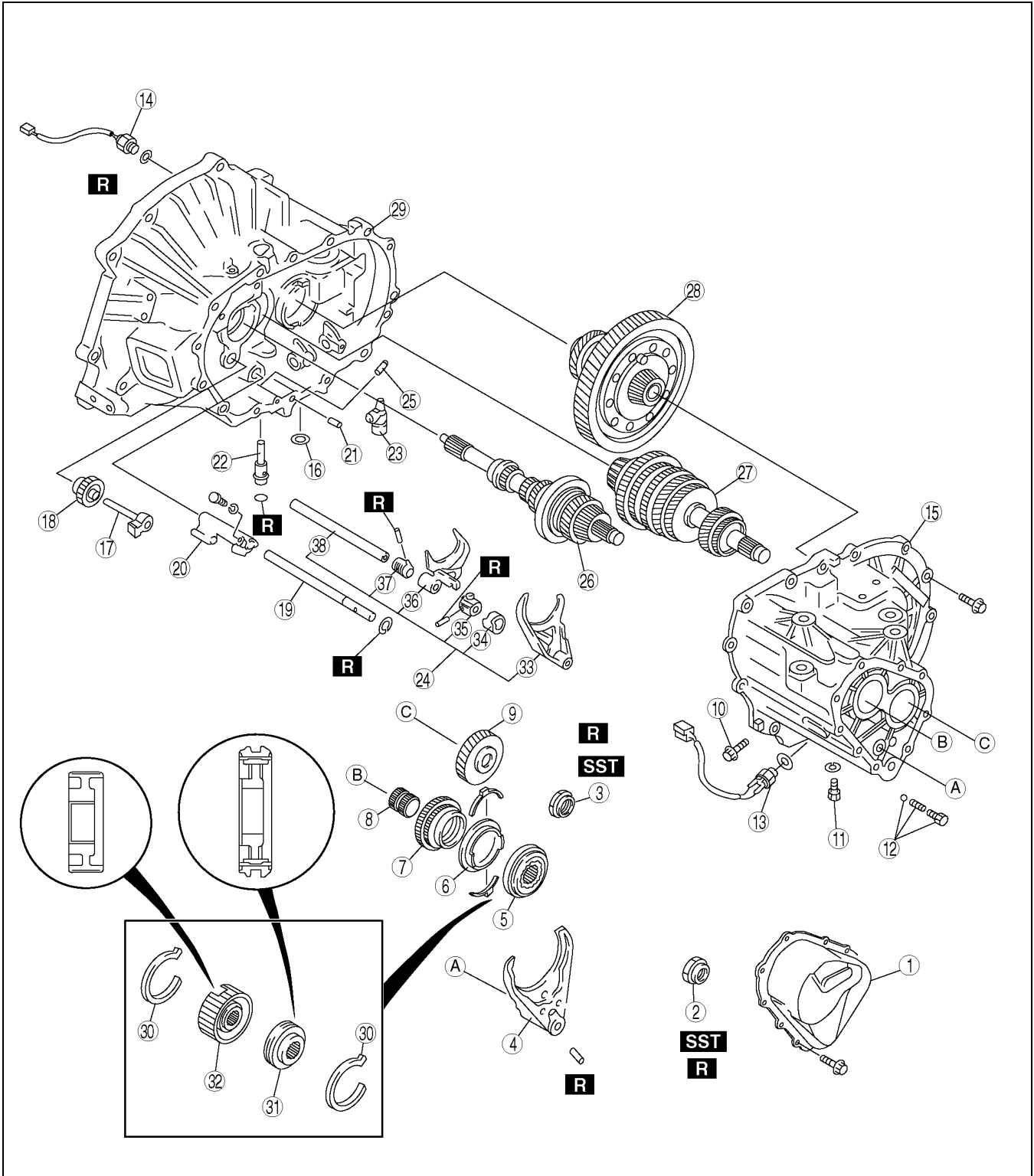
Maximum

0.270 mm {0.0106 in}



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MANUAL TRANSAXLE



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1	Rear cover
2	Locknut (primary shaft) (See J-5 Locknut Disassembly Note)
3	Locknut (secondary shaft) (See J-5 Locknut Disassembly Note)
4	5th/reverse shift fork
5	5th/reverse clutch hub component
6	5th synchronizer ring
7	5th gear

8	Gear sleeve
9	Secondary 5th gear
10	Lock bolt
11	Guide bolt
12	Lock bolt, ball, and spring
13	Back-up light switch
14	Neutral switch
15	Transaxle case component
16	Magnet

MANUAL TRANSAXLE

Reverse Idle Gear and Reverse Lever Inspection

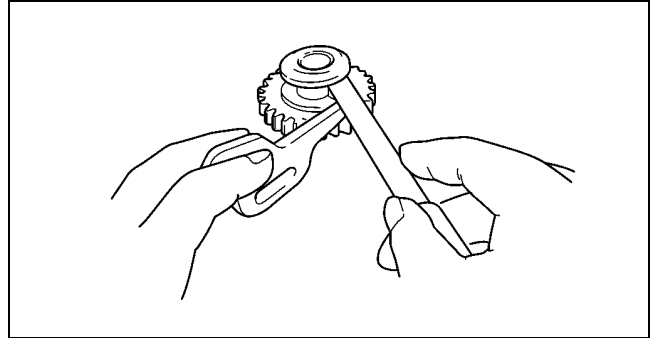
1. Inspect the gear teeth for damage, wear, and cracks.
 - If there is malfunction, replace the reverse idle gear.
2. Measure the clearance between the reverse idle gear bushing and the reverse lever.
 - If not as specified, replace as necessary.

Standard clearance

0.10—0.35 mm {0.004—0.013 in}

Maximum Clearance

0.85 mm {0.033 in}



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5th Gear and Sleeve Inspection

1. Measure the clearance between the 5th gear and the Sleeve.
 - If not as specified, replace parts as necessary.

5th gear inner diameter

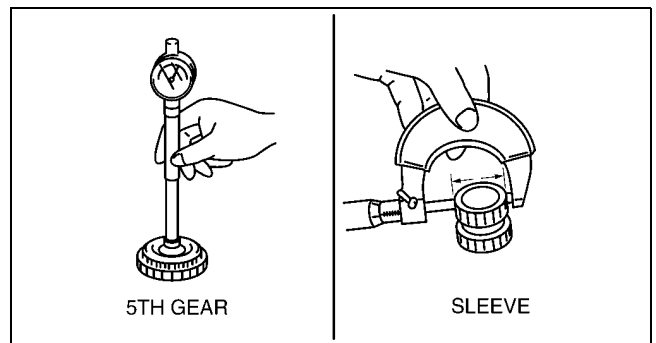
34.000—34.025 mm {1.3386—1.3395 in}

Sleeve outer diameter

33.945—33.970 mm {1.3365—1.3373 in}

Clearance

0.030—0.080 mm {0.0012—0.0031 in}



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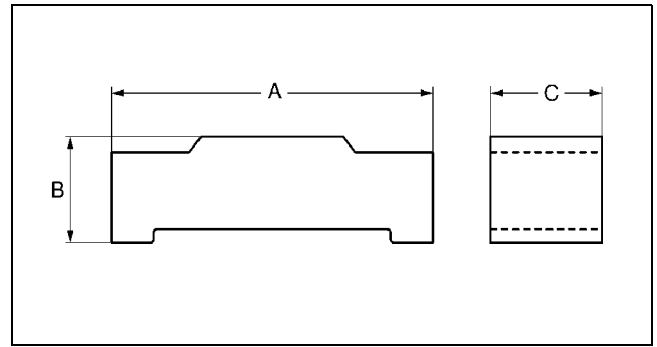
MANUAL TRANSAXLE

3rd/4th Clutch Hub Assembly Note

1. Install the synchronizer key springs in the clutch hub with the hooks in the grooves to hold the three synchronizer key in place.

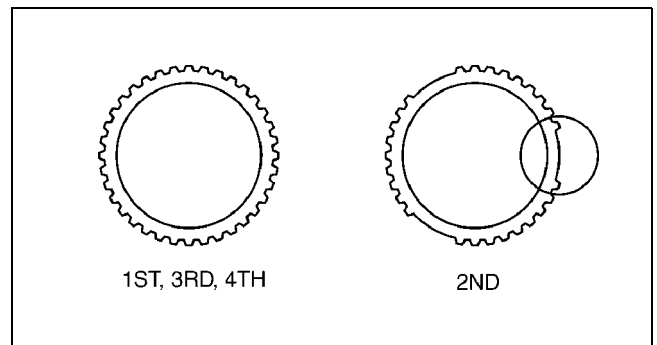
Synchronizer key size

- A: 17.0 mm {0.669 in}
- B: 4.3 mm {0.17 in}
- C: 5.0 mm {0.20 in}



A6E5110M131

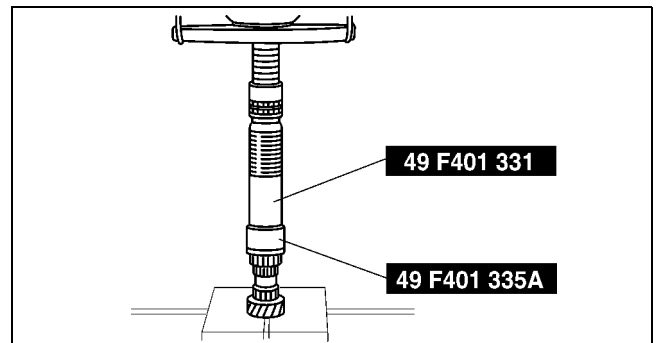
2. Align the synchronizer ring grooves with the synchronizer key during assembly.



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Bearing (Primary Shaft End) Assembly Note

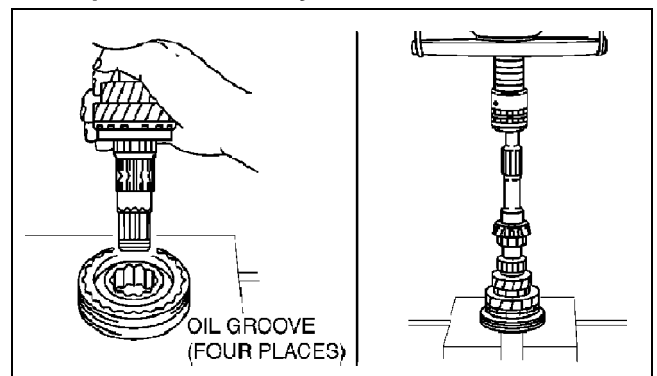
1. Install the new bearing using the SST.



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3rd Gear, 3rd Synchronizer Ring, and 3rd/4th Clutch Hub Component Assembly Note

1. Install the 3rd gear, 3rd synchronizer ring, and 3rd/4th clutch hub component using a press.



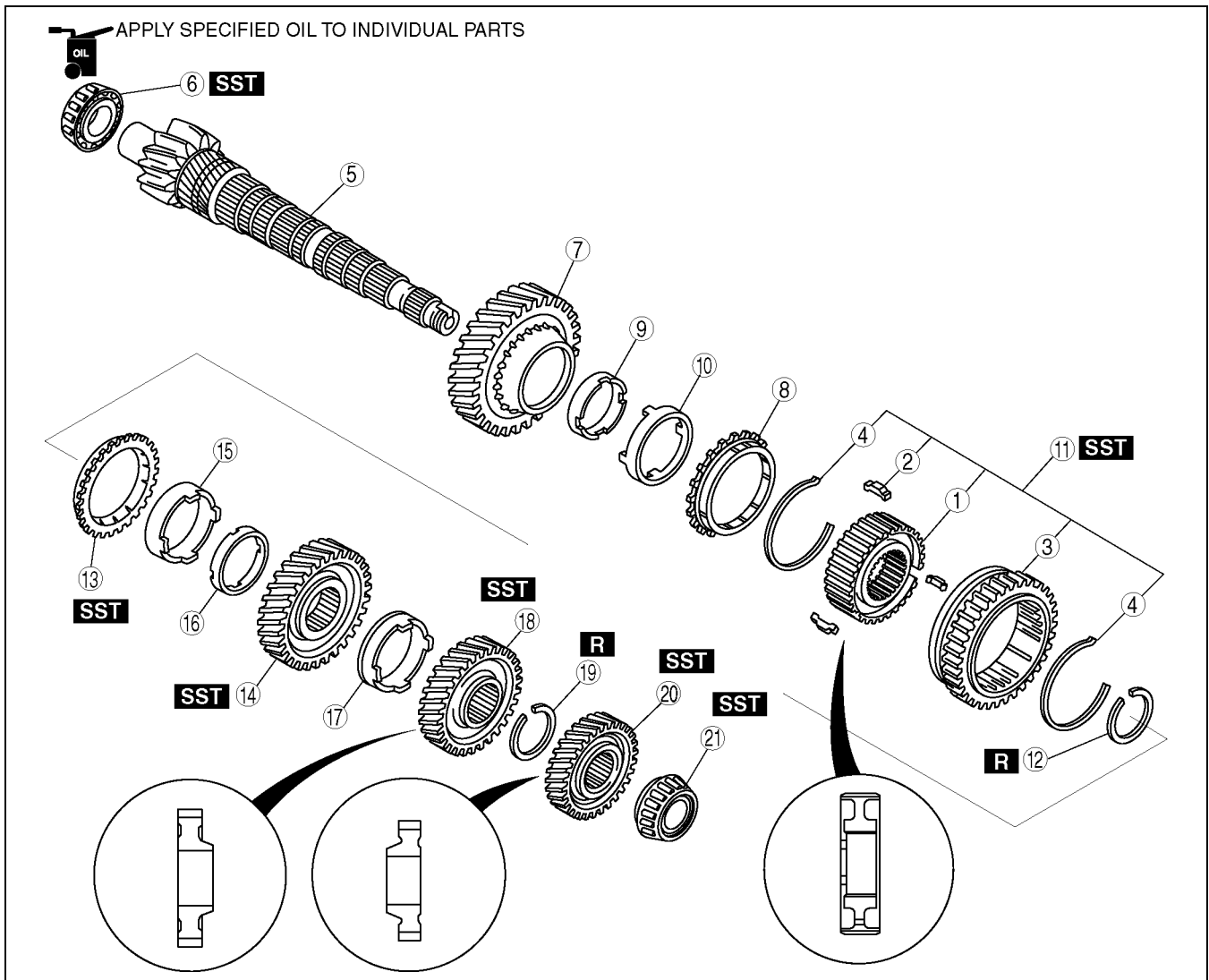
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MANUAL TRANSAXLE

SECONDARY SHAFT COMPONENTS ASSEMBLY

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1. Assemble in the order shown in the figure.



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1	1st/2nd clutch hub (See J-25 1st/2nd Clutch Hub Assembly Note)
2	Synchronizer keys
3	Clutch hub sleeve (reverse gear)
4	Synchronizer key spring
5	Secondary shaft gear
6	Bearing (secondary shaft end) (See J-25 Bearing (Secondary Shaft End) Assembly Note)
7	1st gear (See J-25 1st Gear, 1st Synchronizer Ring, and 1st/2nd Clutch Hub Component Assembly Note)
8	Synchronizer ring
9	Inner cone

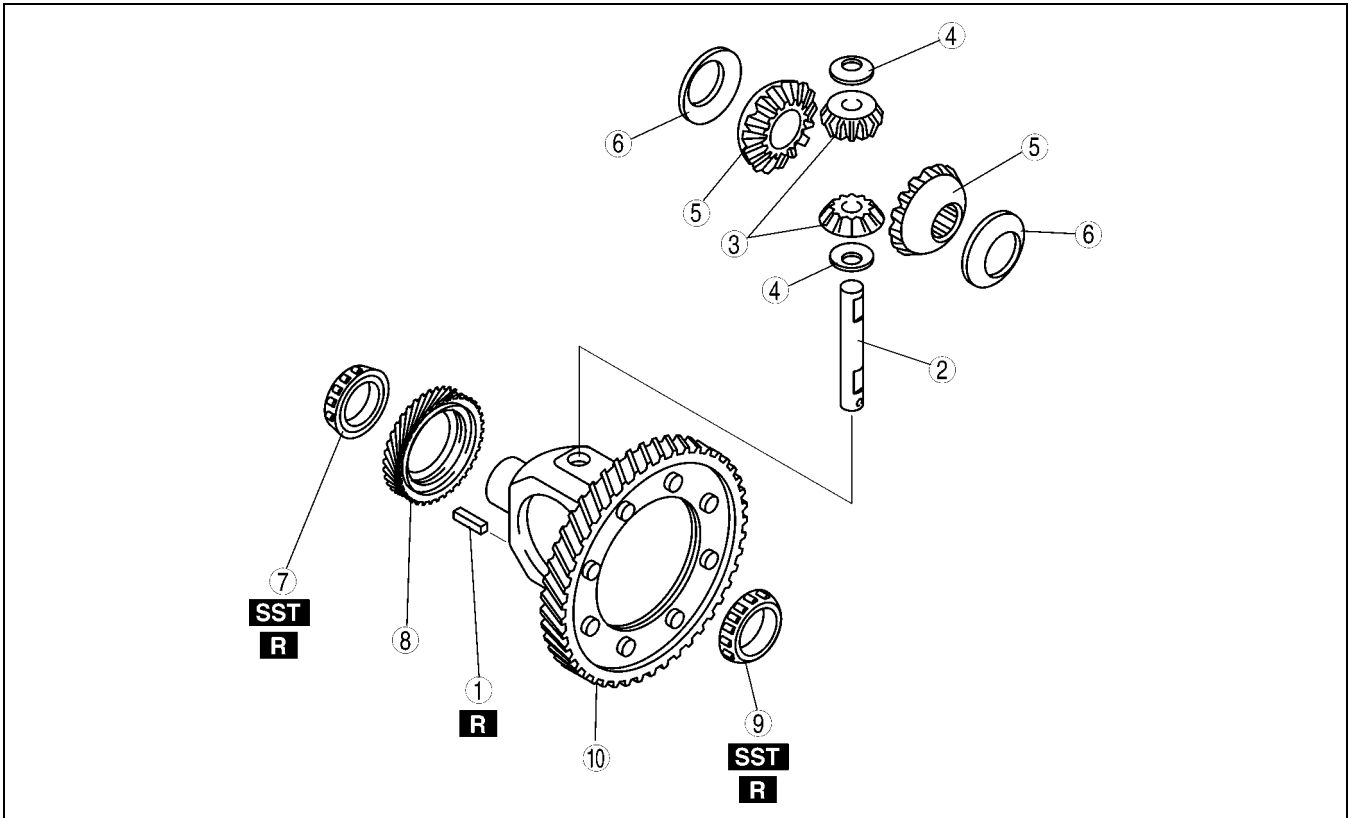
10	Double cone
11	1st/2nd clutch hub component
12	Retaining ring
13	Synchronizer ring
14	2nd gear
15	Double cone
16	Inner cone
17	Friction damper
18	Secondary 3rd gear
19	Retaining ring
20	Secondary 4th gear (See J-26 Secondary 4th Gear and Bearing Assembly Note)
21	Bearing

MANUAL TRANSAXLE

DIFFERENTIAL DISASSEMBLY

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1. Disassemble in the order shown in the figure.



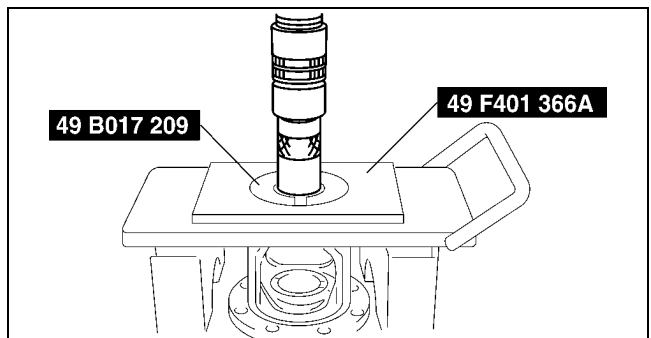
Z4F5112M061

1	Roll pin
2	Pinion shaft
3	Pinion gear
4	Thrust washer
5	Side gear
6	Thrust washer

7	Bearing (side opposite ring gear) (See J-28 Bearing (Side Opposite Ring Gear) Disassembly Note)
8	Speedometer drive gear
9	Bearing (ring gear side) (See J-29 Bearing (Ring Gear Side) Disassembly Note)
10	Ring gear and gear case component

Bearing (Side Opposite Ring Gear) Disassembly Note

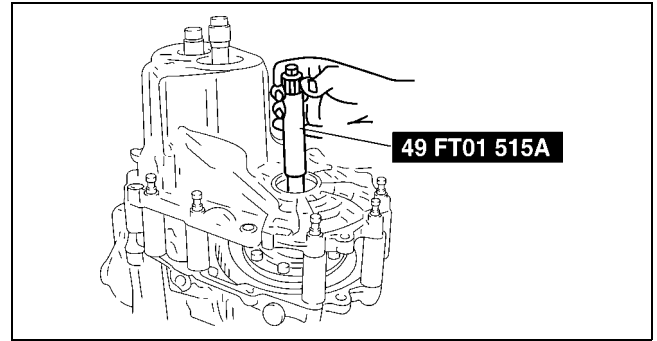
1. Remove the bearing using the SSTs.



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MANUAL TRANSAXLE

11. Install the **SST** and a pull scale or torque wrench.



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12. Adjust the clearance of the **SST (selector)** to obtain the specified preload/pull scale reading.

Note

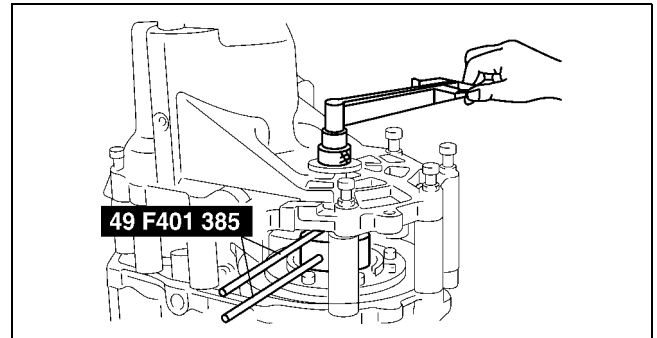
- Read the preload when the differential starts to turn.
- Measure several times and calculate the average value.

Preload

0.5 N·m {5.0 kgf·cm, 4.3 in·lbf}

Reading on pull scale

5 N {0.5 kgf, 1.1 lbf}



Z4F5112M077

13. Use a feeler gauge to measure the gap in the selector for the differential.

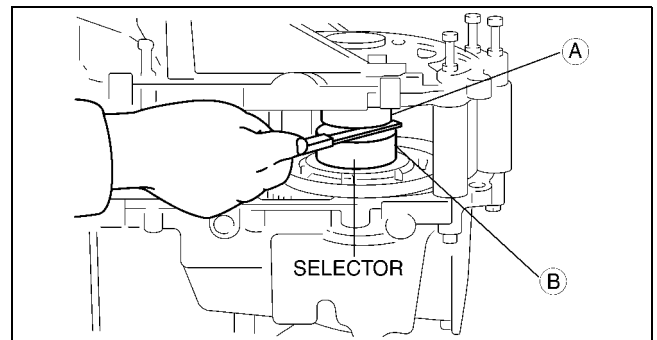
14. Add **0.15 mm {0.006 in}** to the measured clearance and select the combination of shims closest in value to that measurement.

Example

0.32 mm {0.013 in}

0.32 mm {0.013 in} + 0.15 mm {0.006 in} = 0.47 mm {0.019 in}

Nearest shim (on thick side) to 0.47 mm {0.019 in} is 0.50 mm {0.020 in}



Z4F5112M078

Thickness of shim

				mm{in}
0.1 {0.004}	0.20 {0.008}	0.25 {0.010}	0.30 {0.012}	
0.35 {0.014}	0.40 {0.016}	0.45 {0.018}	0.50 {0.020}	
0.55 {0.022}	0.60 {0.024}	0.65 {0.026}	0.70 {0.028}	
0.75 {0.030}	0.80 {0.031}	0.85 {0.033}	0.90 {0.035}	
0.95 {0.037}	1.0 {0.039}	1.05 {0.041}	1.10 {0.043}	
1.15 {0.045}	1.20 {0.047}	—	—	

15. Remove the transaxle case and the **SST**.

16. Remove the selectors, the primary shaft component, and the differential.

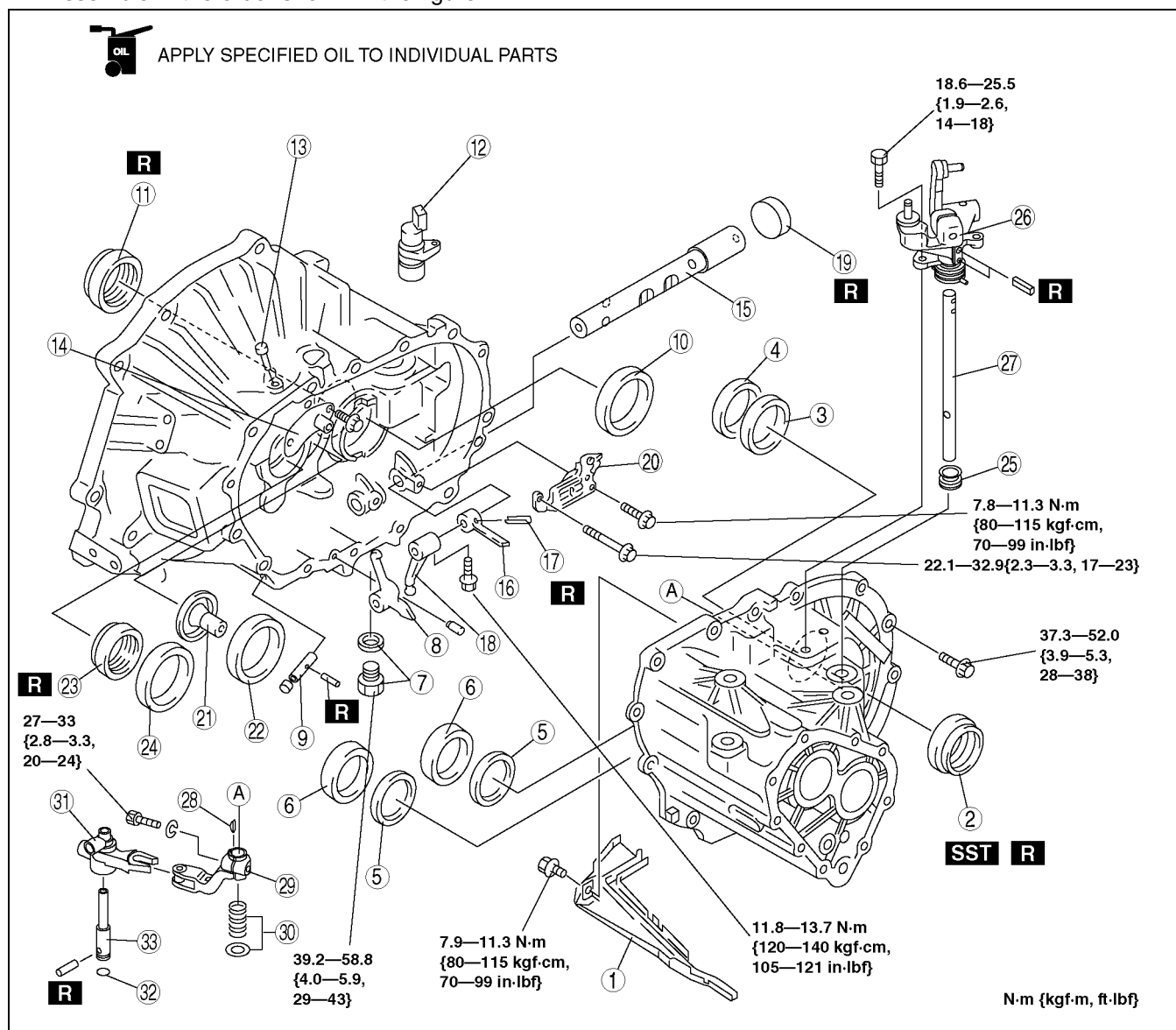
17. Remove the bearing races.

MANUAL TRANSAXLE

CLUTCH HOUSING AND TRANSAXLE CASE COMPONENTS ASSEMBLY

A6E511217010M02

1. Assemble in the order shown in the figure..



A6E5112M112

1	Oil passage
2	Oil seal (differential) (See J-37 Oil Seal (Differential) Assembly Note)
3	Adjustment shim(s)
4	Bearing race (differential) (See J-37 Bearing Race (Differential) Assembly Note)
5	Adjustment shim(s)
6	Bearing race (transaxle case) (See J-37 Bearing Race (Transaxle Case) Assembly Note)
7	Drain plug and washer
8	Reverse lever
9	Reverse lever shaft
10	Bearing race (differential) (See J-37 Bearing Race (Differential) Assembly Note)
11	Oil seal (differential) (See J-37 Oil Seal (Differential) Assembly Note)
12	Hole cover
13	Bleather

14	Bleather cover component
15	Control rod
16	Selector
17	Roll pin
18	Change arm
19	Sealing cap
20	Guide plate component
21	Funnel
22	Bearing race (secondary shaft)
23	Oil seal (primary shaft) (See J-38 Oil Seal (Primary Shaft) Assembly Note)
24	Bearing race (primary shaft)
25	Boots
26	Shift lever component
27	shift lever shaft
28	Key
29	Control end
30	Spring and washer
31	Clank component lever

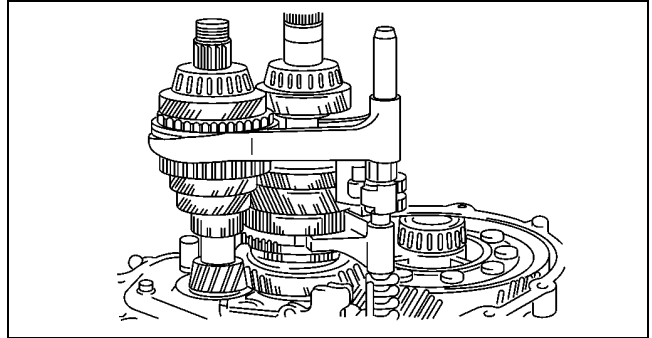
MANUAL TRANSAXLE

Primary Shaft Gear Component and Secondary Shaft Gear Component Assembly Note

1. Install the primary shaft gear component and the secondary shaft gear component together.

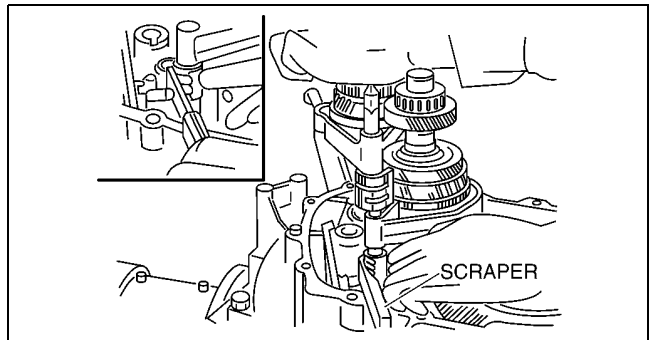
Shift Fork and Shift Rod Component Assembly Note

1. Shift to 2nd gear and position the shift fork and shift rod component as shown.



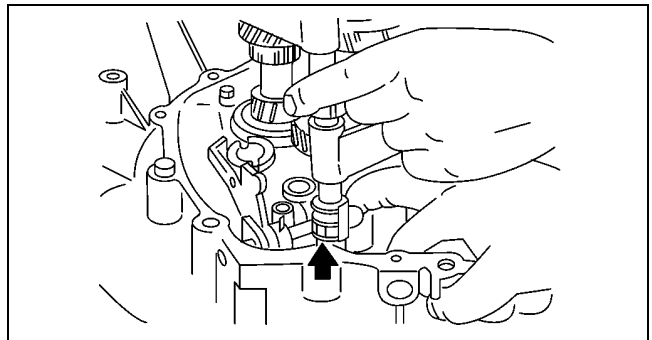
A6E5112M091

2. Insert the spring seat and spring into the reverse lever shaft, install the steel ball, and place a scraper so that it contacts the steel ball.
3. With the edge of the control end against the scraper, when the control end is pushed in the direction of the arrow in the figure so that the ball goes into the shaft, the rod will at the same time line up with the shift rod coupling hole in the clutch housing.



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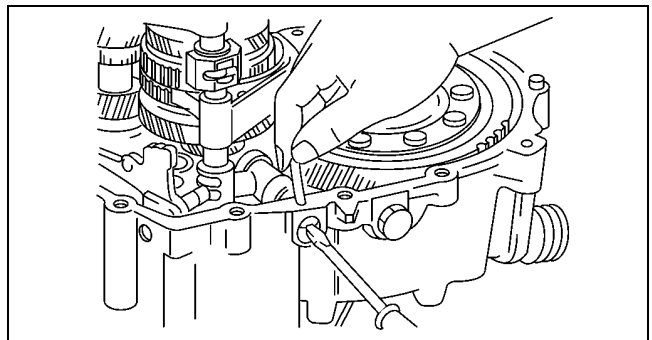
4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the three grooves in the control end).
5. Pull the ball part of the control end forward so that the steel ball goes into the detent in the groove.



A6E5112M093

Crank Lever Component and Crank Lever Shaft Assembly Note

1. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
2. Align the pin holes of the crank lever shaft and the clutch housing, and insert a new pin.

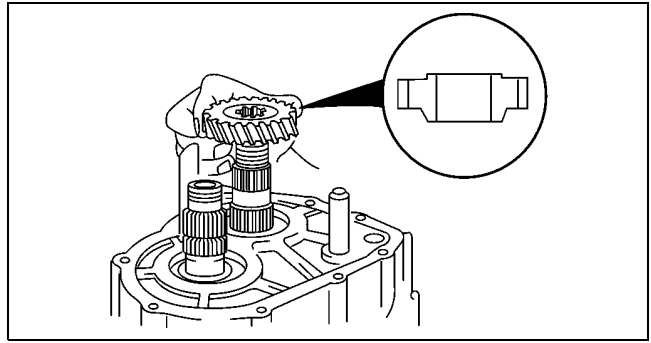


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MANUAL TRANSAXLE

Secondary 5th Gear Assembly Note

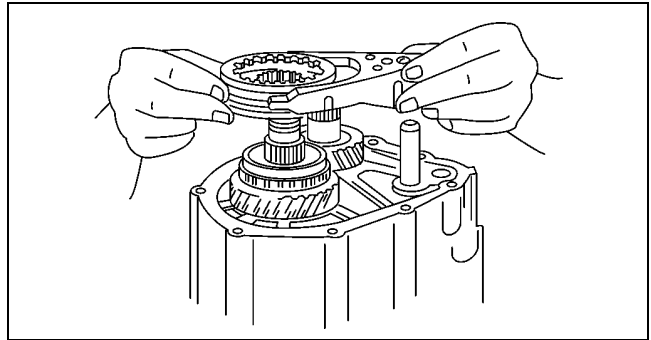
1. Install the secondary 5th gear as shown.



A6E5112M098

5th/Reverse Clutch Hub Component and 5th/Reverse Shift Fork Assembly Note

1. Install the 5th/reverse clutch hub component and the 5th/reverse shift fork together.



A6E5112M099

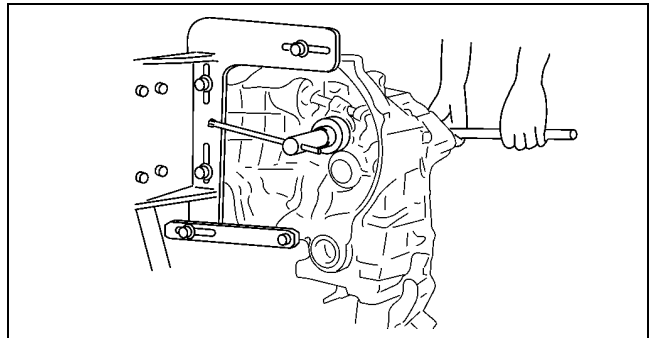
Locknut Assembly Note

1. Shift to 1st gear.
2. Lock the primary shaft using the **SST**.
3. Tighten new lock nuts onto the primary and secondary shafts.

Tightening torque

127.5—205.8 N·m {13.0—20.0 kgf·m, 95—144 ft·lbf}

4. Stake the locknuts.



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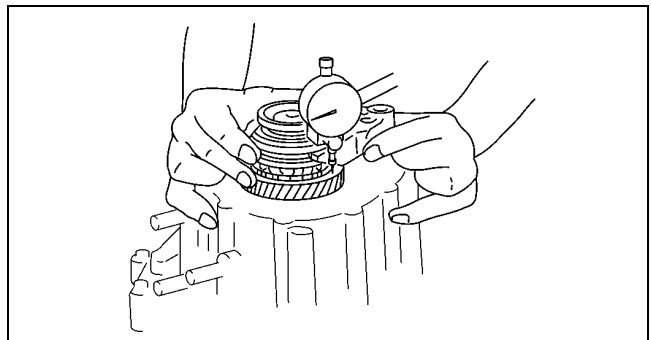
5. Measure the 5th gear thrust clearance using a dial indicator.
 - If not as specified, reassemble the transaxle.

Clearance

0.100—0.220 mm {0.0039—0.0087 in}

Maximum

0.270 mm {0.0106 in}



A6E5112M101

TECHNICAL DATA

TECHNICAL DATA

MANUAL TRANSAXLE

A6E931001029M01

Item		Specification	
Transaxle type		G35M-R	
Thrust clearance	1st gear	Clearance (mm {in})	0.05—0.28 {0.002—0.011}
		Maximum (mm {in})	0.33 {0.013}
	2nd gear	Clearance (mm {in})	0.18—0.46 {0.007—0.018}
		Maximum (mm {in})	0.51 {0.020}
	3rd gear	Clearance (mm {in})	0.05—0.20 {0.002—0.007}
		Maximum (mm {in})	0.25 {0.010}
	4th gear	Clearance (mm {in})	0.17—0.37 {0.007—0.014}
		Maximum (mm {in})	0.42 {0.017}
	5th gear	Clearance (mm {in})	0.100—0.220 {0.0040—0.0086}
		Maximum (mm {in})	0.270 {0.0106}
Oil clearance	1st gear	1st gear inner diameter (mm {in})	39.500—39.525 {1.555—1.556}
		Secondary shaft outer diameter (mm {in})	39.445—39.470 {1.553—1.554}
		Clearance (mm {in})	0.030—0.080 {0.002—0.003}
	2nd gear	2nd gear inner diameter (mm {in})	35.015—35.035 {1.378—1.379}
		Secondary shaft outer diameter (mm {in})	34.945—34.905 {1.376—1.374}
		Clearance (mm {in})	0.05—0.09 {0.002—0.003}
	3rd gear	3rd gear inner diameter (mm {in})	36.000—36.025 {1.417—1.418}
		Primary shaft outer diameter (mm {in})	35.945—35.970 {1.415—1.416}
		Clearance (mm {in})	0.030—0.080 {0.001—0.003}
	4th gear	4th gear inner diameter (mm {in})	31.000—31.025 {1.220—1.221}
		Primary shaft outer diameter (mm {in})	30.945—30.970 {1.218—1.219}
		Clearance (mm {in})	0.030—0.080 {0.001—0.003}
	5th gear	5th gear inner diameter (mm {in})	34.000—34.025 {1.3386—1.3395}
		Sleeve outer diameter (mm {in})	33.945—33.970 {1.3365—1.3373}
		Clearance (mm {in})	0.030—0.080 {0.0012—0.0031}
Shift fork and hub sleeve	Clearance between 1st/2nd shift fork and hub sleeve	Standard (mm {in})	0.10—0.45 {0.004—0.017}
		Maximum (mm {in})	0.95 {0.037}
	Clearance between 3rd/4th shift fork and hub sleeve	Standard (mm {in})	0.10—0.40 {0.004—0.015}
		Maximum (mm {in})	0.90 {0.035}
	Clearance between 5th shift fork and hub sleeve	Standard (mm {in})	0.10—0.36 {0.004—0.014}
		Maximum (mm {in})	0.86 {0.034}
Synchronizer ring	Clearance between synchronizer ring and flank surface of gear	Standard (mm {in})	1.50 {0.059}
		Maximum (mm {in})	0.80 {0.031}
Reverse idle gear and reverse lever	Clearance between reverse idle gear bushing and reverse lever	Standard (mm {in})	0.10—0.35 {0.004—0.013}
		maximum (mm {in})	0.85 {0.033}