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# Manual Transmission/Transaxle

## General Description

### Manual Transaxle Construction

S6RW0C5201001

The transaxle provides five forward speeds and one reverse speed by means of three synchromesh devices and three shafts-input shaft, countershaft and reverse gear shaft. All forward gears are in constant mesh, and reverse uses a sliding idler gear arrangement.

The low speed sleeve & hub is mounted on countershaft and engaged with countershaft 1st gear or 2nd gear, while the high speed sleeve & hub is done on input shaft and engaged with input shaft 3rd gear or 4th gear. The 5th speed sleeve & hub on input shaft is engaged with input shaft 5th gear mounted on the input shaft.

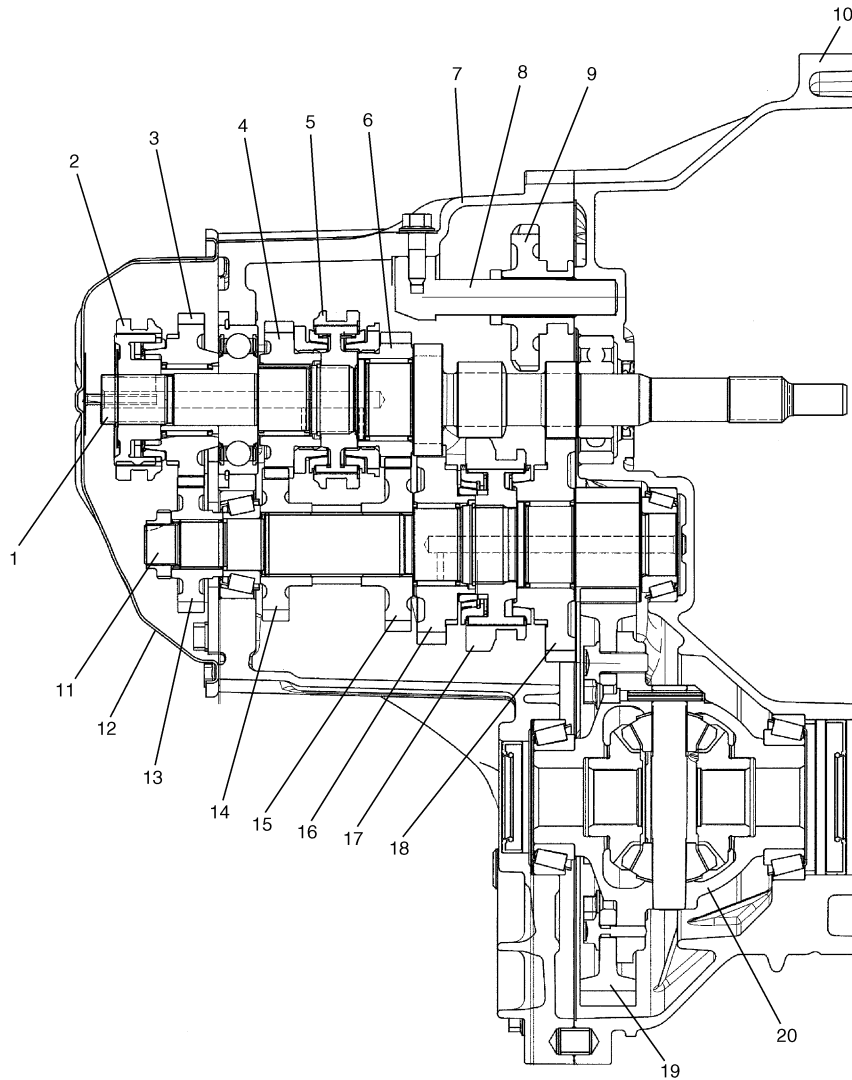
To prevent the cracking noise from the reverse gear when shifting transaxle gear into the reverse gear, the reverse shift braking device is used.

The device utilizes the 5th synchromesh, which is the lever synchro type, to apply the brake on the input shaft rotation. The double cone synchronizing mechanism is provided to 2nd gear synchromesh device for high performance of shifting to 2nd gear.

For servicing, it is necessary to use genuine sealant or its equivalent on mating surfaces of transaxle case which is made of aluminum. The case fastening bolts must be tightened to specified torque by means of torque wrench. It is also important that all parts are thoroughly cleaned with cleaning fluid and air dried before reassembling.

Further, care must be taken to adjust preload of countershaft taper roller bearings. New synchronizer rings are prohibited from being lapped with respective gear cones by using lapping compound before they are assembled.

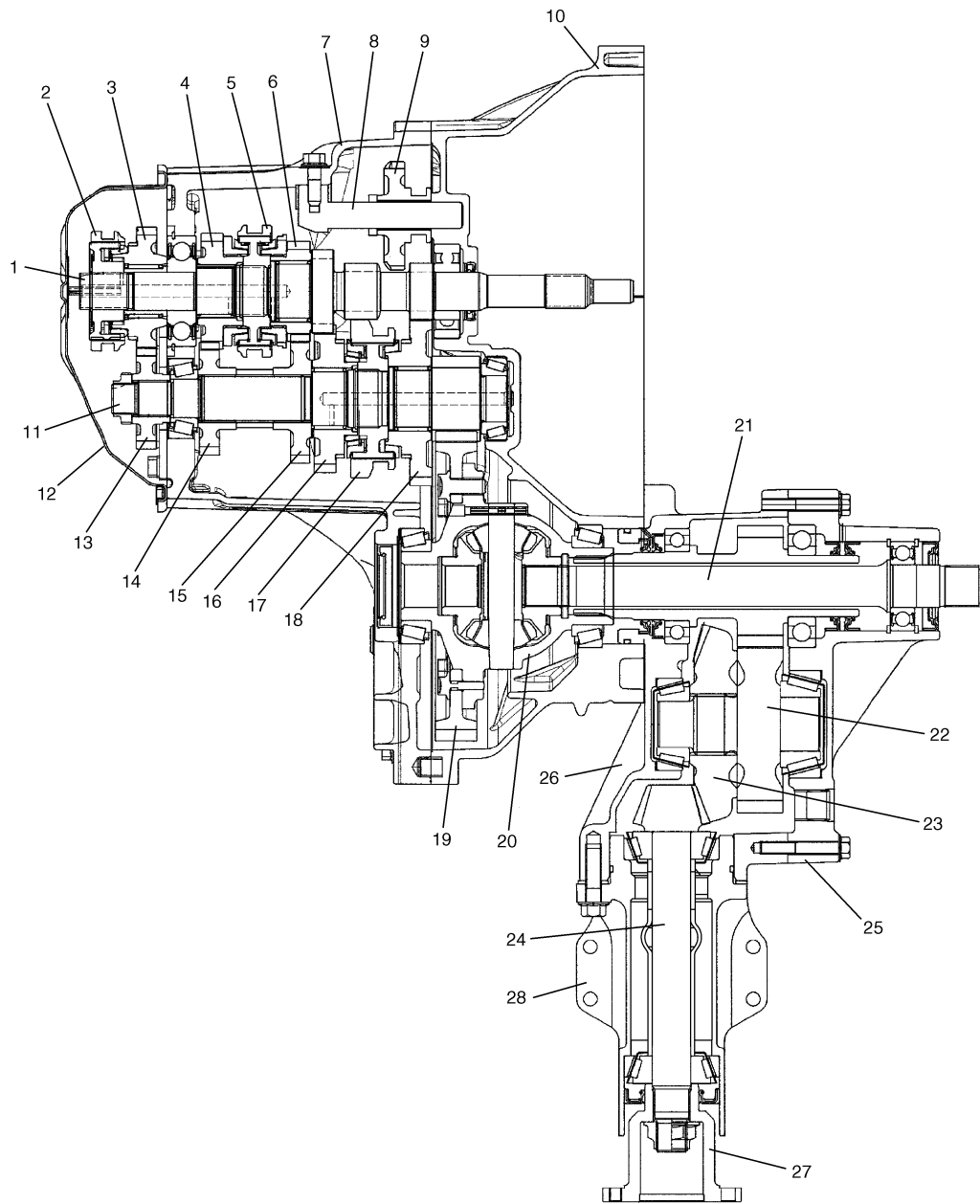
2WD



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1. Input shaft	6. Input shaft 3rd gear	11. Countershaft	16. Countershaft 2nd gear
2. 5th speed sleeve & hub	7. Left case	12. Side cover	17. Low speed sleeve & hub
3. Input shaft 5th gear	8. Reverse gear shaft	13. Countershaft 5th gear	18. Countershaft 1st gear
4. Input shaft 4th gear	9. Reverse idler gear	14. Countershaft 4th gear	19. Final gear
5. High speed sleeve & hub	10. Right case	15. Countershaft 3rd gear	20. Differential case

**4WD**

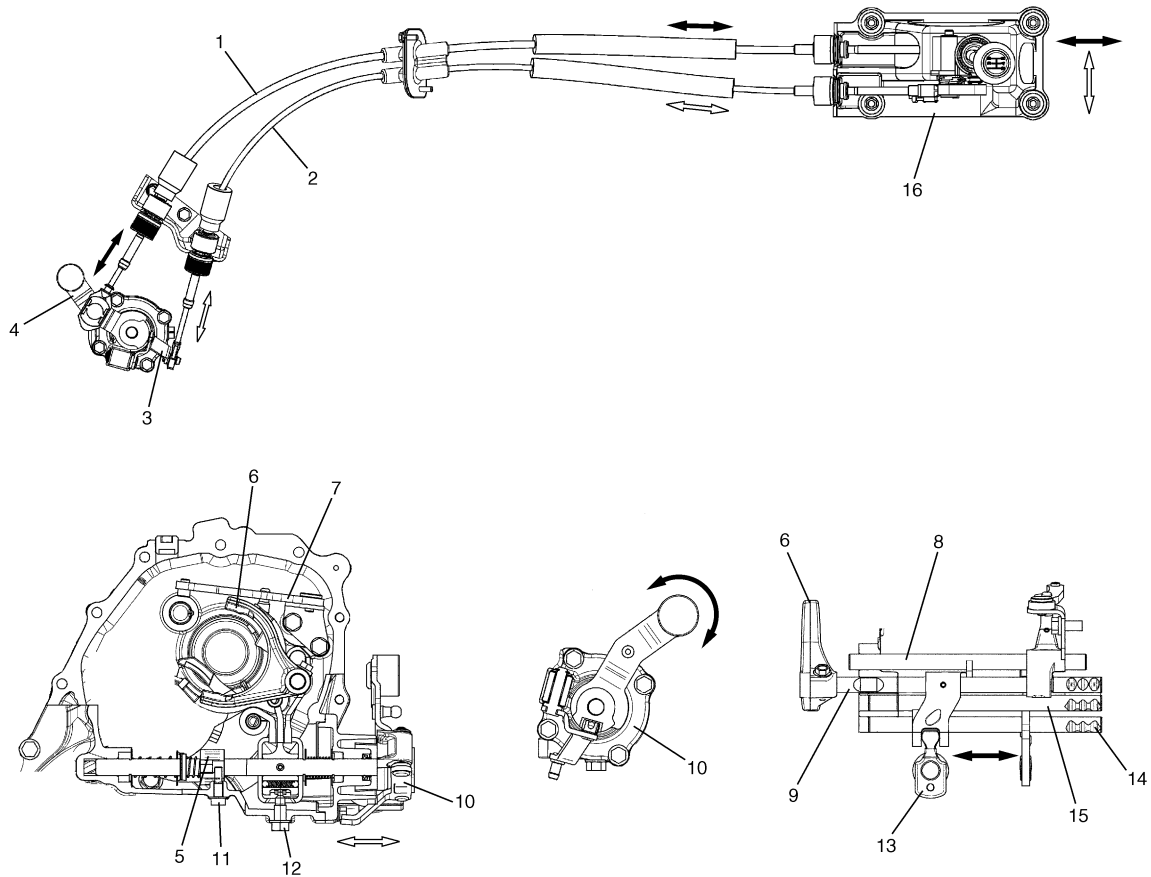


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1. Input shaft	8. Reverse gear shaft	15. Countershaft 3rd gear	22. Transfer driven gear
2. 5th speed sleeve & hub	9. Reverse idler gear	16. Countershaft 2nd gear	23. Transfer bevel gear
3. Input shaft 5th gear	10. Right case	17. Low speed sleeve & hub	24. Transfer bevel pinion
4. Input shaft 4th gear	11. Countershaft	18. Countershaft 1st gear	25. Transfer right case
5. High speed sleeve & hub	12. Side cover	19. Final gear	26. Transfer left case
6. Input shaft 3rd gear	13. Countershaft 5th gear	20. Differential case	27. Transfer output flange
7. Left case	14. Countershaft 4th gear	21. Transfer intermediate shaft	28. Transfer output retainer

**Gear Shift Mechanism**

The gear shifting control system consists of the following main parts. Movement of gear shift control lever is transmitted to gear shift & select shaft through gear shift and gear select cables.

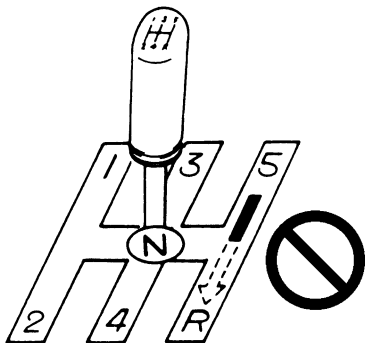


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1. Gear shift control cable	7. Reverse gear shift lever	13. Gear shift & select lever
2. Gear select control cable	8. 5th & reverse gear shift guide shaft	14. Low speed gear shift shaft
3. Select cable lever	9. 5th & reverse gear shift shaft	15. High speed gear shift shaft
4. Shift cable lever	10. Gear shift & select shaft assembly	16. Gear shift control lever assembly
5. 5th & reverse gear shift cam	11. 5th to reverse interlock guide bolt	
6. 5th gear shift fork	12. Gear shift interlock bolt	

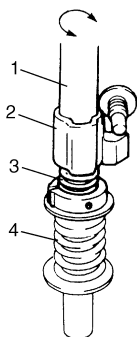
### 5th & Reverse Gear Shift Cam

5th & reverse gear shift cam, cam guide return spring and 5th to reverse interlock guide bolt are provided to prevent the gear from being directly shifted from 5th to reverse.



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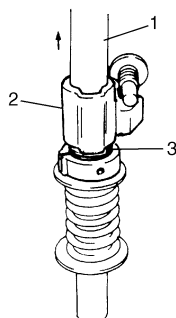
1) When shift lever is at neutral position between 3rd and 4th gear, shift cam (2) is under guide bolt and can turn freely clockwise (to 3rd gear) and counterclockwise (to 4th gear).



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1. Shift & select shaft
3. Return spring (expanded)
4. Reverse select spring (expanded)

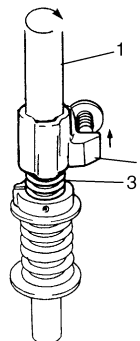
2) When shift lever is shifted toward the right from neutral position, shift and select shaft (1) moves up but shift cam (2) is restricted by guide bolt and return spring is contracted.



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3. Reverse select spring (contracted)
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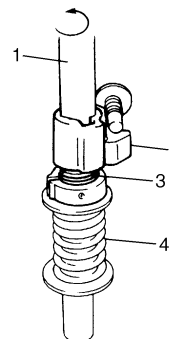
3) When shift lever is shifted to 5th gear, shift & select shaft (1) turns clockwise letting shift cam (2) off from guide bolt and pushed up by return spring. In this state, movement of shift cam is restricted by guide bolt and therefore, gearshift to reverse is not attainable.



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3. Reverse select spring (expanded)
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4) When shift lever is shifted from neutral position between 5th gear and reverse gear to reverse gear, shift cam (2) turns counterclockwise to attain reverse gear.



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1. Shift & select shaft
3. Return spring (contracted)
4. Reverse select spring (contracted)

## Diagnostic Information and Procedures

### Manual Transaxle Symptom Diagnosis

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Condition	Possible cause	Correction / Reference Item
<b>Gears slipping out of mesh</b>	Worn shift fork shaft	Replace
	Worn shift fork or synchronizer sleeve	Replace
	Weak or damaged locating springs	Replace
	Worn bearings on input shaft or countershaft	Replace
	Worn chamfered tooth on sleeve and gear	Replace sleeve and gear
<b>Hard shifting</b>	Inadequate lubricant	Replenish
	Improper clutch pedal free travel	Replace clutch arm or master cylinder
	Distorted or broken clutch disc	Replace
	Damaged clutch pressure plate	Replace clutch cover
	Worn synchronizer ring	Replace
	Worn chamfered tooth on sleeve or gear	Replace sleeve or gear
	Worn gear shift control shaft joint bush	Replace
	Distorted shift shaft	Replace
<b>Noise</b>	Broken gear shift / select control cables	Replace
	Inadequate or insufficient lubricant	Replenish
	Damaged or worn bearing(s)	Replace
	Damaged or worn gear(s)	Replace
	Damaged or worn synchronizer parts	Replace

## Repair Instructions

### Manual Transaxle Oil Level Check

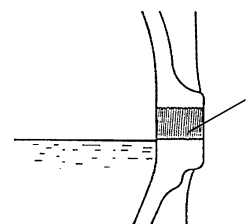
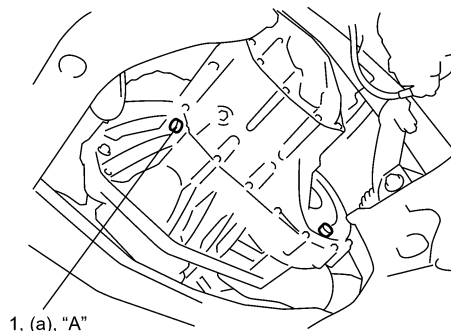
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- Lift up vehicle and check oil leakage. Repair leaky point, if any.
- Remove oil level / filler plug (1) and check oil contamination and oil level is lower end of oil level / filler plug hole (2).  
If oil is excessive dirty or insufficient, replace oil or pour specified oil up to plug hole.
- Apply sealant to thread of level / filler plug, and then tighten it to specified torque.

**"A": Sealant 99000-31260 (SUZUKI Bond No.1217G)**

#### Tightening torque

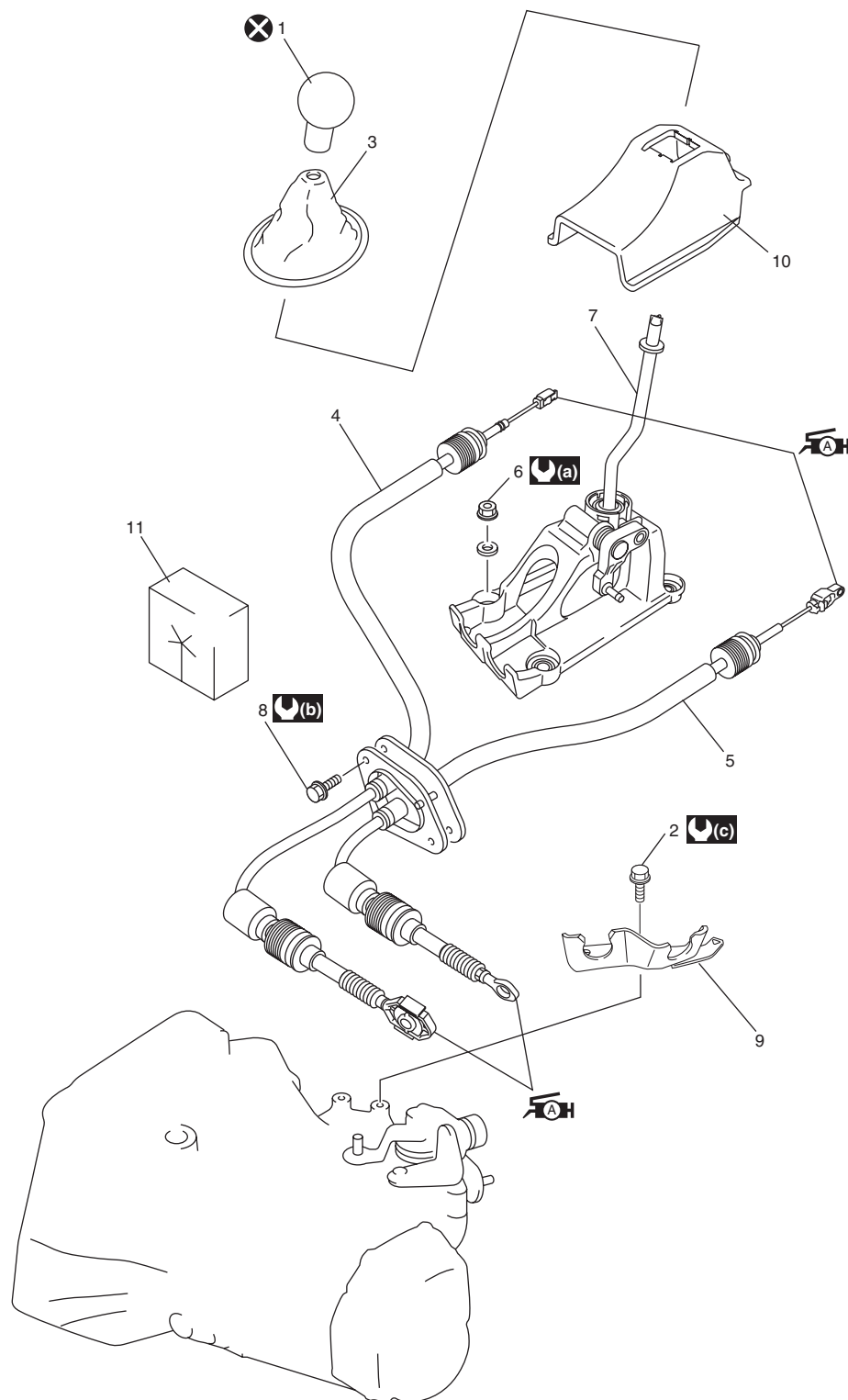
Transaxle oil level / filler plug (a): 21 N·m (2.1 kgf-m, 15.5 lb-ft)



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## Gear Shift Control Lever and Cable Components

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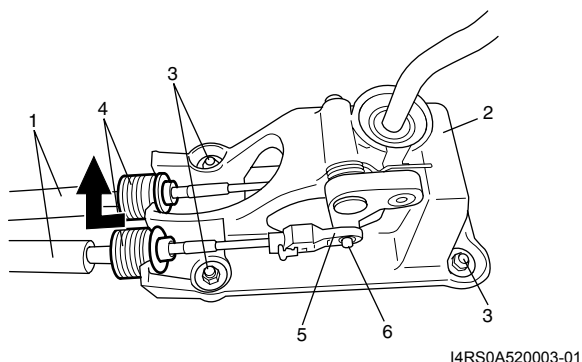
1. Gear shift control lever knob	6. Gear shift control lever assembly mounting nut	11. Shift cable seal
2. Cable bracket bolt	7. Gear shift control lever assembly	: 13 N·m (1.3 kgf·m, 9.5 lb·ft)
3. Gear shift lever boot	8. Cable grommet bolt	: 10 N·m (1.0 kgf·m, 7.5 lb·ft)
4. Gear shift control cable : Apply grease 99000-25010 to cable end.	9. Cable bracket	: 23 N·m (2.3 kgf·m, 17.0 lb·ft)
5. Gear select control cable : Apply grease 99000-25010 to cable end.	10. Shift lever cover	: Do not reuse.

## Gear Shift Control Lever and Cable Removal and Installation

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### Removal

- 1) Remove console box.
- 2) Disconnect cable ends (5) from pivot (6) of gear shift control lever assembly by removing clip.
- 3) Disconnect gear shift and select control cables (1) from gear shift control lever assembly (2) while pulling quick joint (4) as shown in figure.
- 4) Remove gear shift control lever assembly mounting nuts (3) and gear shift lever assembly from floor panel.
- 5) Disconnect gear shift and select control cables from transaxle.
- 6) Remove cable grommet bolt, and then remove gear shift and select control cables from floor panel.



### Installation

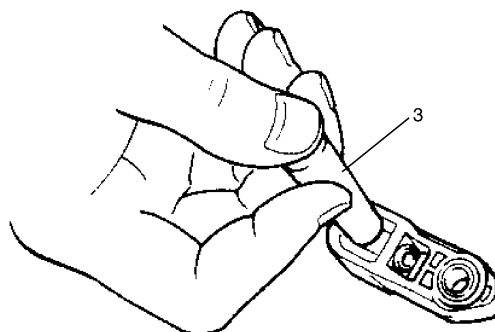
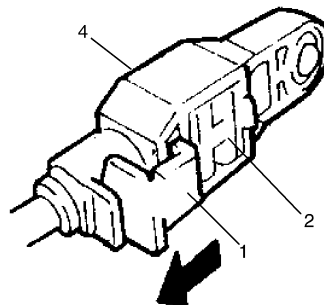
Reverse removal procedure for installation nothing the following.

- Tighten each bolts and nuts to specified torque referring to "Gear Shift Control Lever and Cable Components".
- Adjust gear select control cable referring to "Gear Select Control Cable Adjustment".

## Gear Select Control Cable Adjustment

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- 1) Release lock plate (1) which restricts moving of cable end holder (2).
- 2) Push cable end holder (2) out from adjuster (4) using appropriate tool (3) to disengage cable.



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- 3) Apply grease to pin (5) of gear shift control lever, and then install adjuster (1) into pin of gear shift control lever securely.

**"A": Grease 99000-25011 (SUZUKI Super Grease A)**

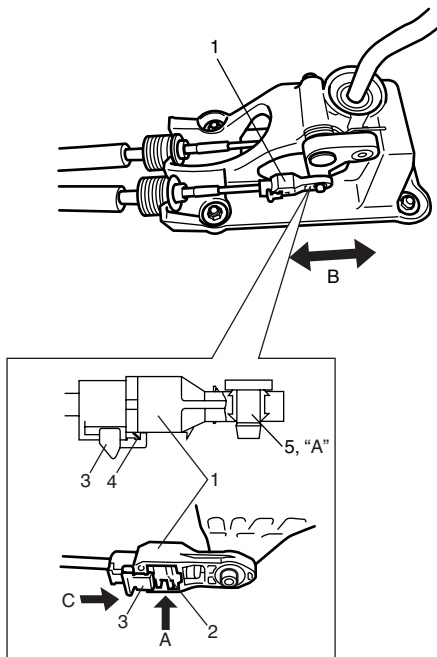
- 4) Push cable end holder (2) in the direction of A.

### NOTE

**At this time, do not apply force in the cable operation direction B to adjuster.**



- 5) Slide lock plate (3) in the direction of C, until it gets over the claw (4) of cable end holder.



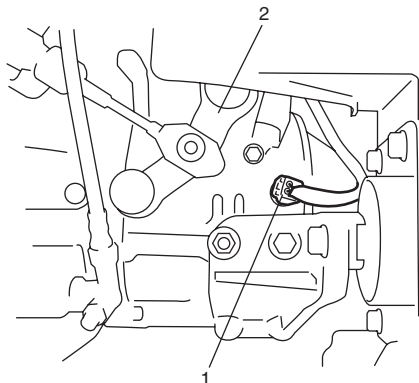
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### Back Up Light Switch Removal and Installation

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#### Removal

- 1) Remove battery and tray with ECM.
- 2) Disconnect back up light switch coupler (1).
- 3) Remove back up light switch.



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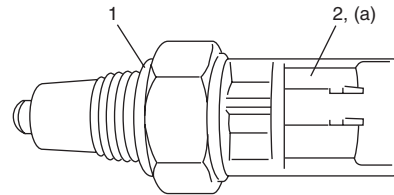
2. Gear shift and select shaft assembly

#### Installation

- 1) Apply oil to new O-ring (1) and tighten back up light switch (2) to specified torque.

#### Tightening torque

Back up light switch (a): 23 N·m (2.3 kgf-m, 17.0 lb-ft)



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- 2) Connect back up light switch coupler.
- 3) Install battery and tray with ECM.

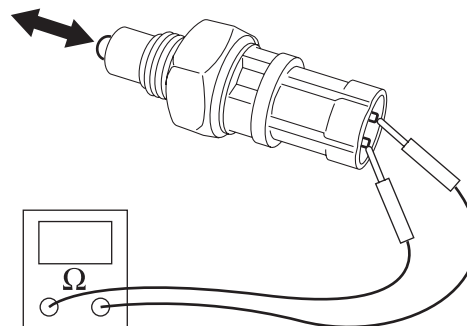
#### Back Up Light Switch Inspection

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Check backup light switch for function using ohmmeter.

Switch ON (Push): Continuity

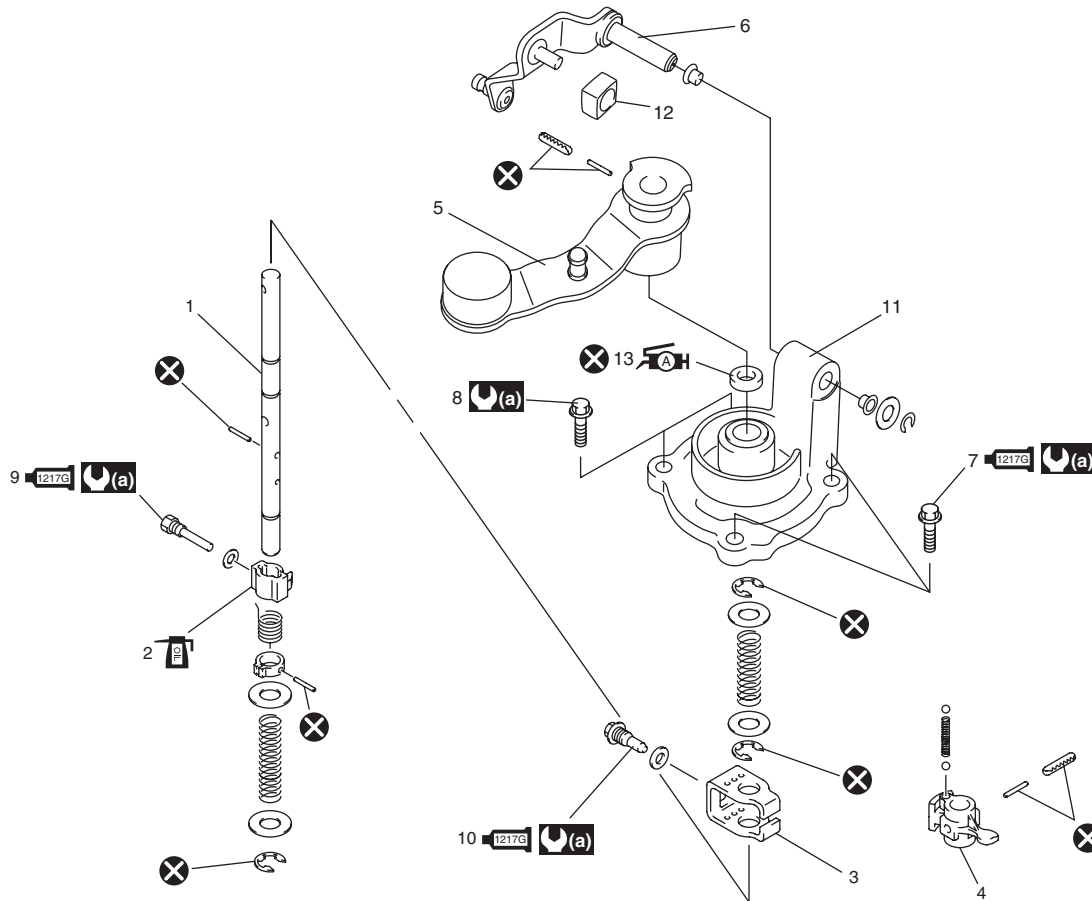
Switch OFF (Release): No continuity



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**Gear Shift and Select Shaft Assembly Components**

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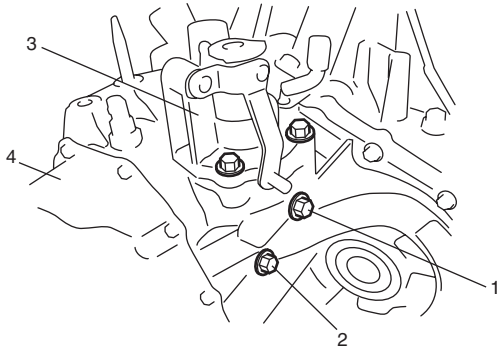
1. Gear shift & select shaft	7. Gear shift guide case bolt No.1 : Apply sealant 99000-31260 to bolt thread.	13. Oil seal : Apply grease 99000-25011 to oil seal lip.
2. 5th & reverse gear shift cam	8. Gear shift guide case bolt No.2	: 23 N·m (2.3 kgf·m, 17.0 lb-ft)
3. Gear shift interlock plate	9. 5th to reverse interlock guide bolt : Apply sealant 99000-31260 to bolt thread.	: Do not reuse.
4. Gear shift & select lever	10. Gear shift interlock bolt : Apply sealant 99000-31260 to bolt thread.	: Apply transaxle oil.
5. Shift cable lever	11. Guide case	
6. Select cable lever	12. Select lever bush	

## Gear Shift and Select Shaft Assembly Removal and Installation

S6RW0C5206012

### Removal

- 1) Remove battery and tray with ECM.
- 2) Disconnect gear shift and gear select control cables from transaxle.
- 3) Remove gear shift interlock bolt (1) and 5th to reverse interlock guide bolt (2) from transaxle case.
- 4) Remove gear shift & select shaft assembly (3).



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4. Transaxle side cover

### Installation

- 1) Clean mating surface of guide case (1) and left case (5), apply sealant to left case as shown in figure by such amount that its section is 1.5 mm (0.059 in.) in diameter, mate guide case with left case.

**“B”:** Sealant 99000–31260 (SUZUKI Bond No.1217G)

- 2) Install guide case bolts No.1 to which sealant has been applied and guide case bolts No.2 (2), and tighten them to specified torque.

**:** Sealant 99000–31260 (SUZUKI Bond No.1217G)

#### Tightening torque

**Guide case bolt No.1:** 23 N·m (2.3 kgf-m, 17.0 lb-ft)

**Guide case bolt No.2 (a):** 23 N·m (2.3 kgf-m, 17.0 lb-ft)

- 3) Install washer and gear shift interlock bolt (3) to which sealant has been applied and then tighten it to specified torque.

**“A”:** Sealant 99000–31260 (SUZUKI Bond No.1217G)

#### Tightening torque

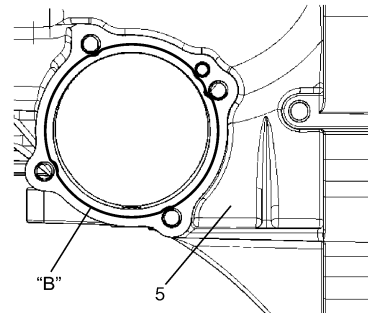
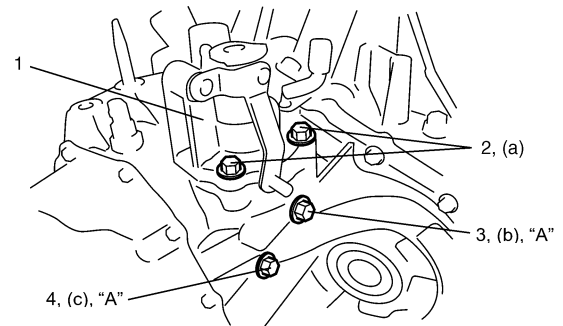
**Gear shift interlock bolt (b):** 23 N·m (2.3 kgf-m, 17.0 lb-ft)

- 4) Install washer and 5th to reverse interlock guide bolt (4) to which sealant has been applied and then tighten it to specified torque.

**“A”:** Sealant 99000–31260 (SUZUKI Bond No.1217G)

#### Tightening torque

**5th to reverse interlock guide bolt (c):** 23 N·m (2.3 kgf-m, 17.0 lb-ft)



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- 5) Connect gear shift and gear select control cables to transaxle.

- 6) Install battery and tray with ECM.

- 7) Check input shaft for rotation in each gear position.

**Gear Shift and Select Shaft Assembly  
 Disassembly and Reassembly**

S6RW0C5206013

1) Push spring pins out using 2.8 – 3.0 mm (0.11 – 0.12 in.) commercially available spring pin remover and specified spring pin removers as shown below.

**Special tool**

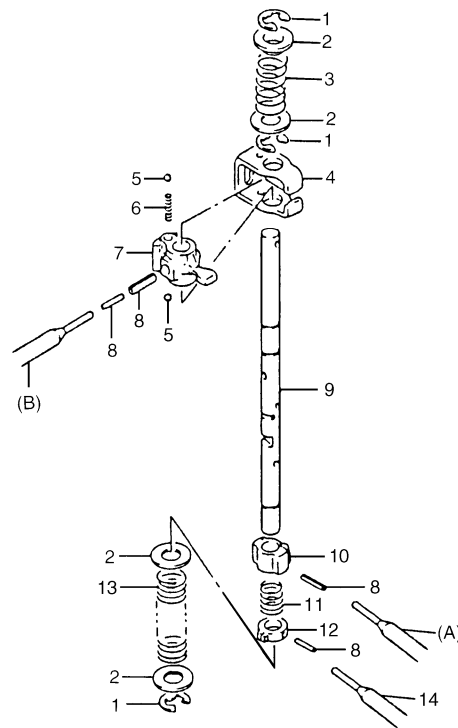
(A): 09922–85811 4.5 mm

(B): 09925–78210 6.0 mm

2) Inspect component parts for wear, distortion or damage. If any detect is found, replace defective part with new one.

**NOTE**

- When driving in spring pins, prevent shaft from being bent by supporting it with wood block.
- Assemble 5th & reverse gear shift cam with its pit and spring pin aligned.
- Make sure to select an appropriate spring by identifying the painted colors to keep gear shifting performance as designed.
  - Low speed select spring - Light blue
  - Reverse select spring - Pink

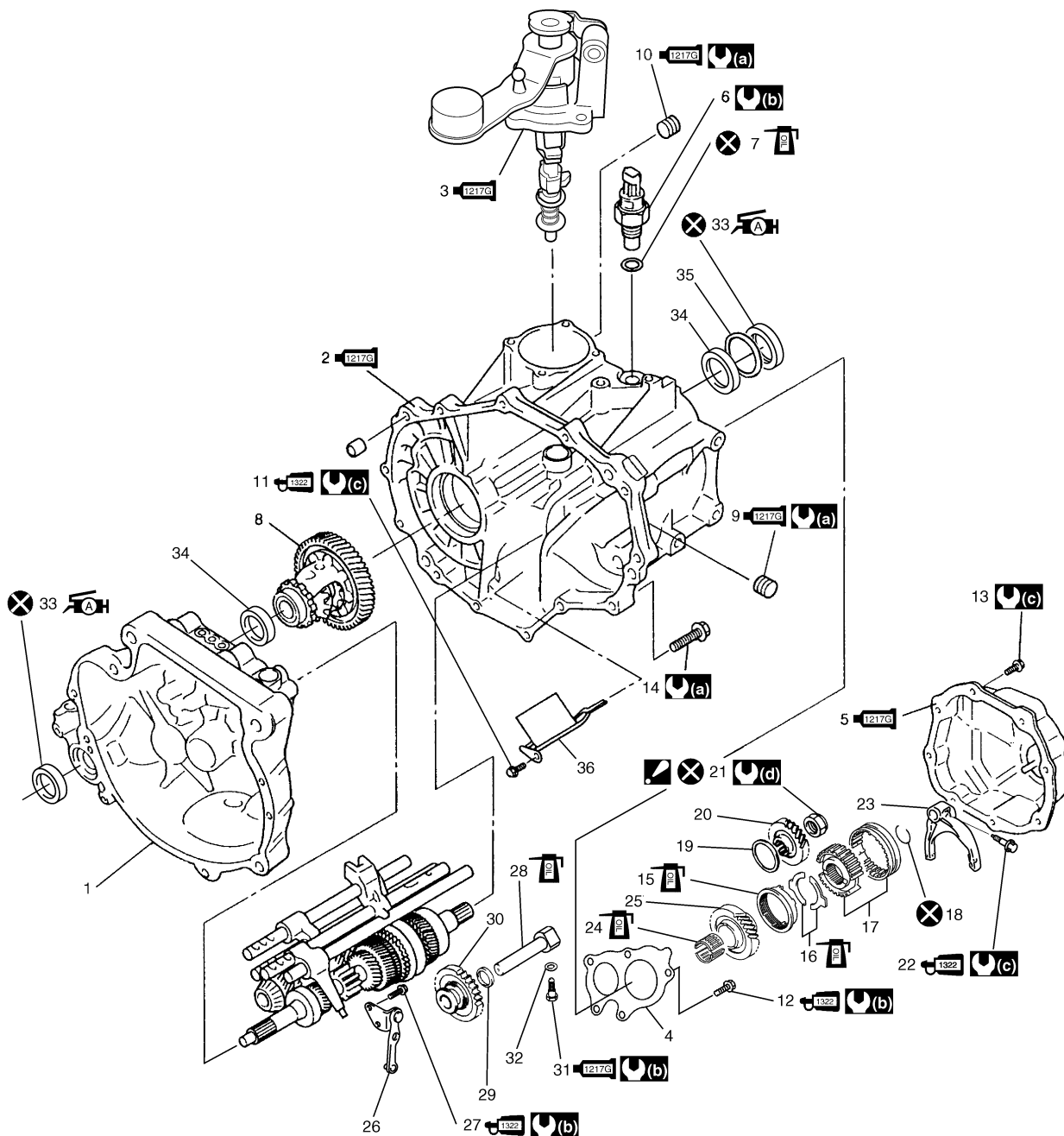


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1. E-ring	8. Spring pin
2. Washer	9. Gear shift & select shaft
3. Reverse select spring	10. 5th & reverse gear shift cam
4. Gear shift interlock plate	11. Cam guide return spring
5. Ball	12. 5th & reverse gear shift cam guide
6. Gear shift interlock spring	13. Low speed select spring
7. Gear shift & select lever	14. Spring pin remover

# Manual Transaxle Assembly Components

S6RW0C5206014



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1. Transaxle right case	1322 22. Shift fork bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
1217G 2. Transaxle left case : Apply sealant 99000-31260 to mating surface of left case and right case.	23. 5th gear shift fork
1217G 3. Gear shift and select shaft assembly : Apply sealant 99000-31260 to mating surface of guide case and left case.	24. Needle bearing
4. Transaxle left case plate	25. Input shaft 5th gear
1217G 5. Transaxle side cover : Apply sealant 99000-31260 to mating surface of side cover and left case.	26. Reverse gear shift lever
6. Back up light switch	1322 27. Reverse gear shift lever bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
7. O-ring	28. Reverse gear shaft
8. Differential assembly	29. Washer
1217G 9. Oil level / filler plug : Apply sealant 99000-31260 to all around thread part of plug.	30. Reverse idler gear