



NAME	SECTION
<b>GENERAL</b>	<b>0</b>
<b>ENGINE</b>	<b>1</b>
<b>CLUTCH</b>	<b>2</b>
<b>TORQUE CONVERTER &amp; TRANSMISSION</b>	<b>3</b>
<b>MANUAL TRANSMISSION</b>	<b>4</b>
<b>PROPELLER SHAFT</b>	<b>5</b>
<b>DIFFERENTIAL</b>	<b>6</b>
<b>FRONT AXLE</b>	<b>7</b>
<b>REAR AXLE</b>	<b>8</b>
<b>STEERING</b>	<b>9</b>
<b>BRAKE</b>	<b>10</b>
<b>BODY</b>	<b>11</b>
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# FOREWORD

This manual covers the service procedures of the TOYOTA FORKLIFT 7FG/7FD35 ~ 45 series. Please use this manual for providing quick, correct servicing of the corresponding forklift models.

This manual deals with the above models as of January 1999. Please understand that disagreement can take place between the descriptions in the manual and actual vehicles due to change in design and specifications. Any change or modifications thereafter will be informed by Toyota Industrial Equipment Parts & Service News.

For the service procedures of the mounted engine, read the repair manuals listed below as reference together with this manual.

(Reference)

Repair manuals related to this manual are as follows:

TOYOTA G4(GM6-262)ENGINE REPAIR MANUAL  
(No.C4630)

TOYOTA 11Z,12Z,13Z,14Z ENGINE REPAIR MANUAL  
(No.C4615)

**TOYOTA MOTOR CORPORATION**

## GENERAL

**0**

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Hello dear friend!

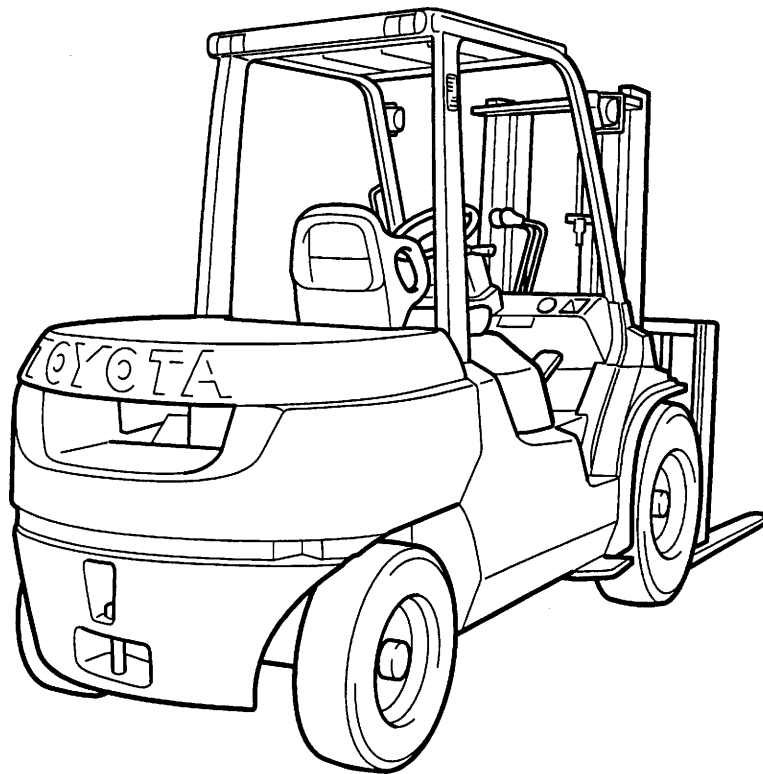
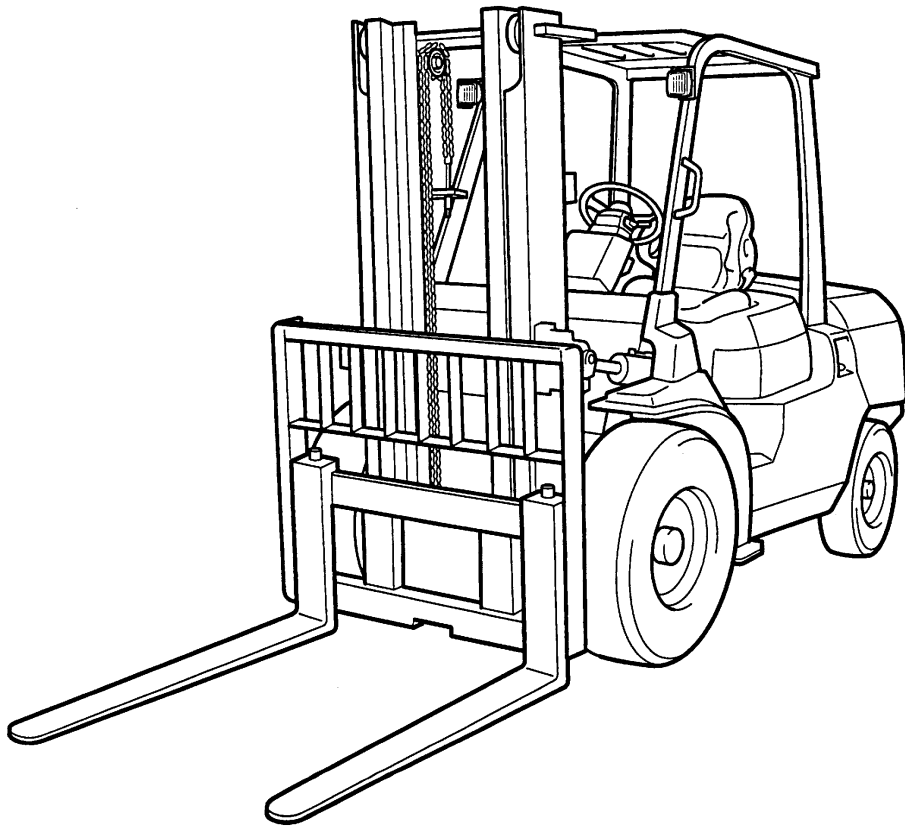
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# EXTERIOR VIEWS



## VEHICLE MODEL

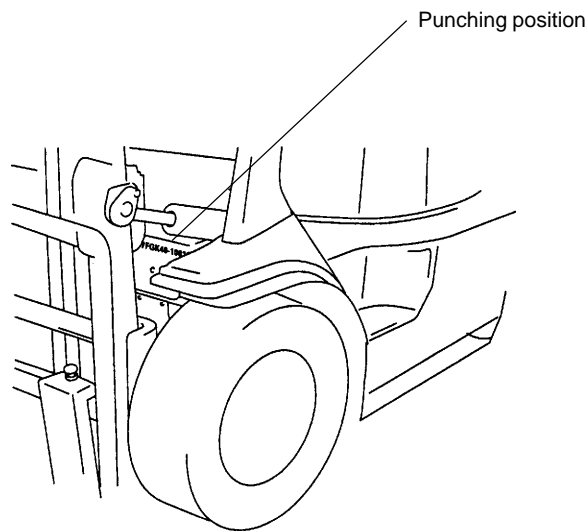
Classification		Vehicle Model	Transmission Type	Engine	
Series	Model				
3.5 ton series	3.5 ton model	7FG35	M/T	G4 (GM6-262)	Gasoline
		02-7FG35	T/C		
		7FD35	M/T	13Z	Diesel
		02-7FD35	T/C		
4.0 ton series	K4.0 ton model	7FGK40	M/T	G4 (GM6-262)	Gasoline
		02-7FGK40	T/C		
		7FDK40	M/T	13Z	Diesel
		02-7FDK40	T/C		
	4.0 ton model	7FG40	M/T	G4 (GM6-262)	Gasoline
		02-7FG40	T/C		
		7FD40	M/T	13Z	Diesel
		02-7FD40	T/C		
4.5 ton series	4.5 ton model	7FG45	M/T	G4 (GM6-262)	Gasoline
		02-7FG45	T/C		
		7FD45	M/T	13Z	Diesel
		02-7FD45	T/C		
5.0 ton series	5.0 ton model	02-7FGA50	T/C	G4 (GM6-262)	Gasoline
		02-7FDA50	T/C	13Z	Diesel

**Note:**

The G4 engine is the same as the GM6-262 engine except for the nomenclature.

## FRAME NUMBER

### Frame No. Punching Position



### Punching format

Series	Engine	Vehicle model	Punching format
3.5 • K4.0 ton model	G4(GM6-262)	7FG35	EEC spec. models
		02-7FG35	7FGK40@10011
		7FGK40	Other models
		02-7FGK40	7FGK40-10011
	13Z	7FD35	EEC spec. models
		02-7FD35	7FDK40@10011
		7FDK40	Other models
		02-7FDK40	7FDK40-10011
4.0 ~ 5.0 ton model	G4(GM6-262)	7FG40	EEC spec. models
		02-7FG40	7FGA50@10011
		7FG45	Other mod ls
		02-7FG45	7FGA50-10011
		02-7FGA50	
	13Z	7FD40	EEC spec. models
		02-7FD40	7FDA50@10011
		7FD45	Other models
		02-7FD45	7FDA50-10011
		02-7FDA50	

## HOW TO USE THIS MANUAL

### EXPLANATION METHOD

#### 1. Operation procedure

(1) The operation procedure is described in either pattern A or pattern B below.

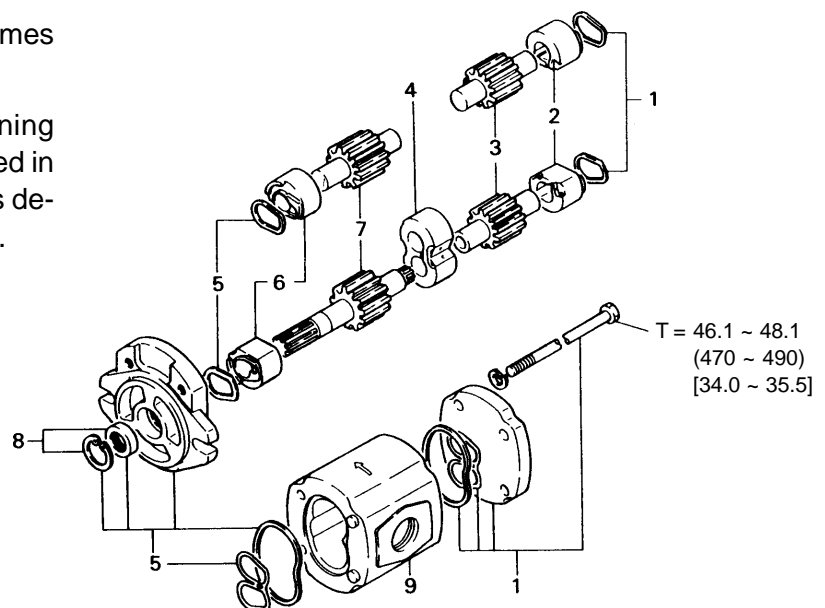
Pattern A: Explanation of each operation step with illustration.

Pattern B: Explanation of operation procedure by indicating step numbers in one illustration, followed by explanation of cautions and notes summarized as point operations.

Example of description in pattern B

### DISASSEMBLY-INSPECTION-REASSEMBLY Tightening torque unit T = N·m (kgf·cm) [ft·lbf]

- Step Nos. are partially sometimes omitted in illustrations.
- When a part requiring tightening torque instruction is not indicated in the illustration, the part name is described in the illustration frame.



#### Disassembly Procedure

- 1 Remove the cover. **[Point 1]**
- 2 Remove the bushing **[Point 2]** ← Operation explained later
- 3 Remove the gear.

**Point Operations** Explanation of key point for operation with an illustration

#### **[Point 1]**



Disassembly: Put a match mark when removing the pump cover.

#### **[Point 2]**

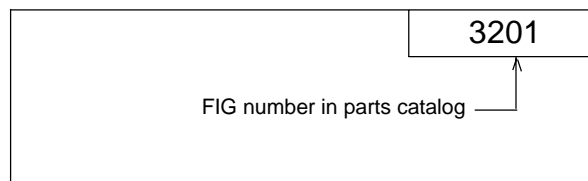
Inspection: Measure the bush inside diameter.

**Limit: 19.12 mm (0.7528 in)**

## 2. How to read components figures

- (1) The components figure uses the illustration in the parts catalog for the vehicle model. Please refer to the catalog for checking the part name.  
The number at the right shoulder of each components figure indicates the Fig. number in the parts catalog.

(Example)



## 3. Matters omitted in this manual

- (1) This manual omits description of the following jobs, but perform them in actual operation:
- ① Cleaning and washing of removed parts as required
  - ② Visual inspection (partially described)

**TERMINOLOGY****Caution:**

**Important matters of which negligence may cause accidents. Be sure to observe them.**

**Note:**

**Important items of which negligence may cause accidents, or matters in operation procedure requiring special attention.**

Standard: Values showing allowable range in inspection and adjustment.

Limit: Maximum or minimum allowable value in inspection or adjustment.

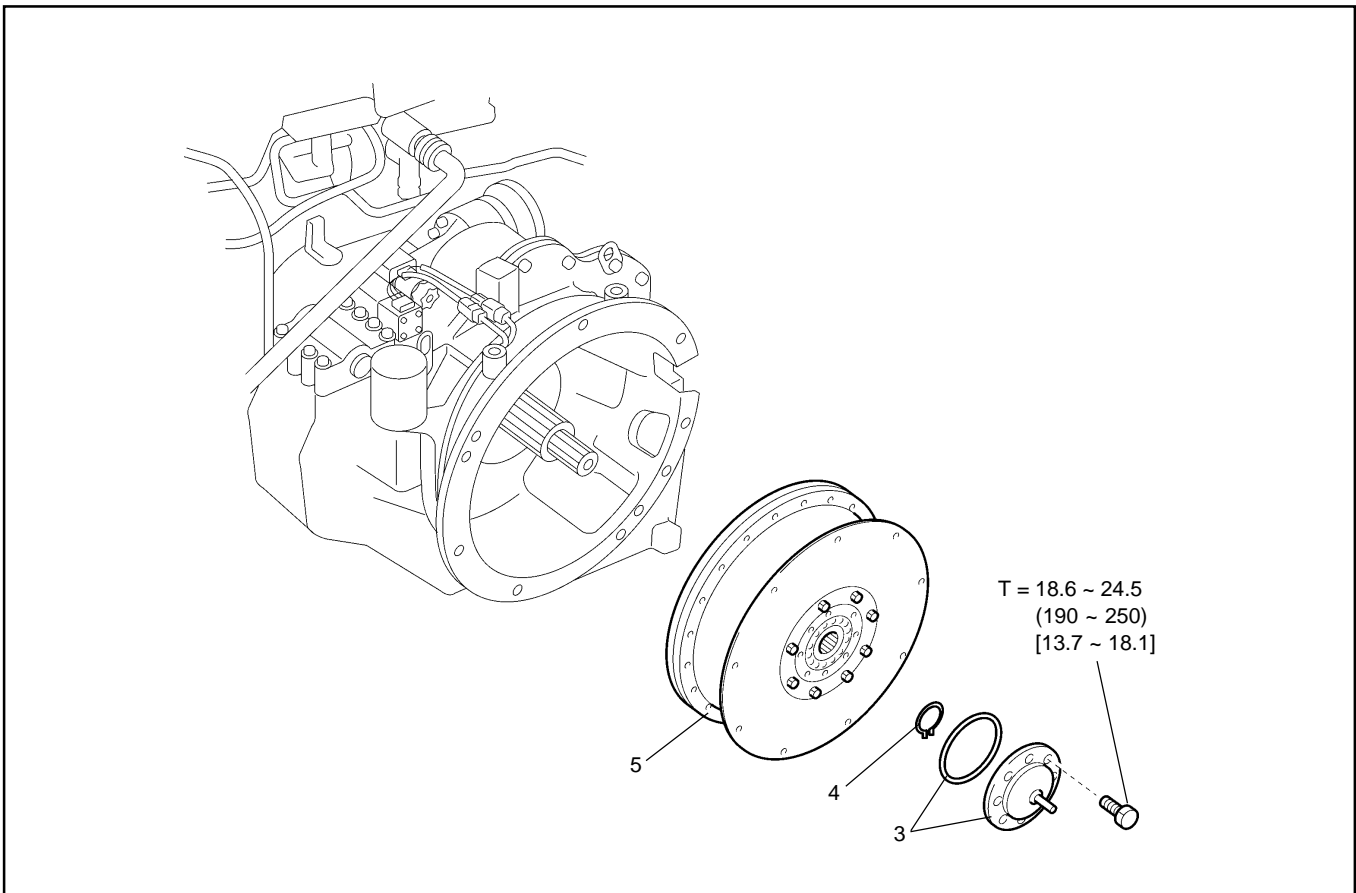
**ABBREVIATIONS**

Abbreviation (code)	Meaning	Abbreviation (code)	Meaning
ASSY	Assembly	SAS	System of active stability
LH	Left hand	SST	Special service tool
LLC	Long life coolant	STD	Standard
M/T	Manual transmission	T =	Tightening torque
OPT	Option	T/C	Torque converter & transmission
O/S	Oversize	○ ○ T	Number of teeth (○ ○)
PS	Power steering	U/S	Undersize
RH	Right hand	W/	With
SAE	Society of Automotive Engineers (USA)	L/	Less

## TORQUE CONVERTER

### REMOVAL·INSTALLATION

T = N·m (kgf·cm) [ft·lbf]



### Removal Procedure

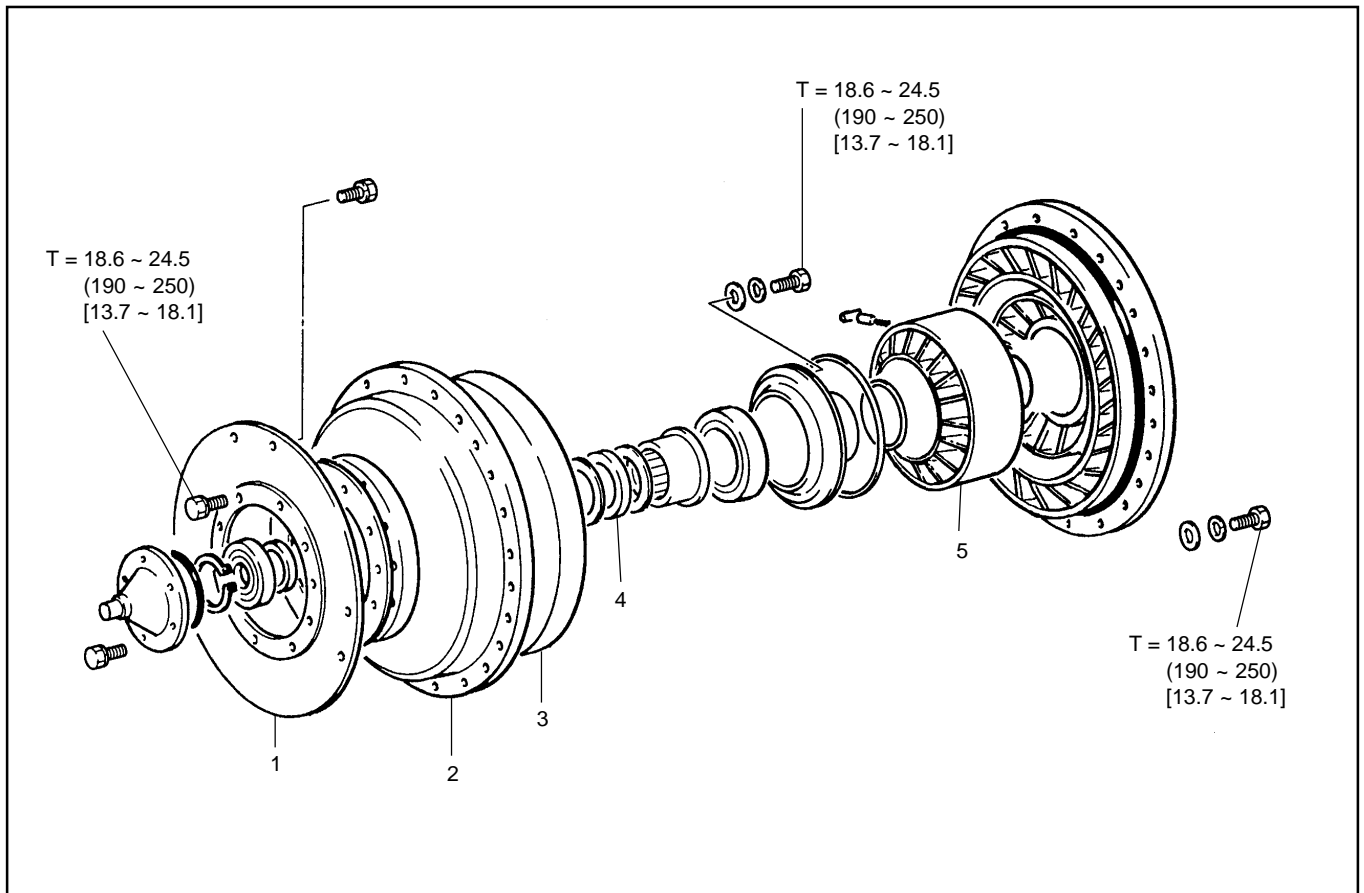
- 1 Remove the engine. (See page 1-8.)
- 2 Drain torque converter oil.
- 3 Remove the pilot boss.
- 4 Remove the snap ring.
- 5 Remove the torque converter.

### Installation Procedure

The installation procedure is reverse of the removal procedure.

**DISASSEMBLY•INSPECTION•REASSEMBLY**

T = N·m (kgf·cm) [ft·lbf]

**Disassembly Procedure**

- 1 Remove the flexible plate.
- 2 Remove the drive cover. **[Point 1]**
- 3 Remove the turbine runner. **[Point 2]**
- 4 Remove the thrust bearing.
- 5 Remove the stator. **[Point 3]**
- 6 Remove the pump boss. **[Point 4]**

**Reassembly Procedure**

The reassembly procedure is the reverse of the removal procedure.

## Point Operations

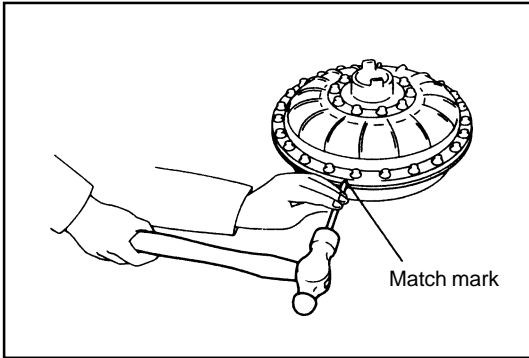
### [Point 1]

Disassembly:

Punch a match mark on the drive cover and pump impeller.

Reassembly:

Align the match marks on the drive cover and pump impeller.

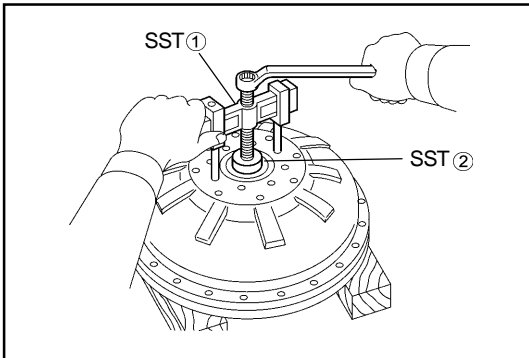


Disassembly:

Remove the drive cover.

SST 09950-50012...①

09950-60010...②

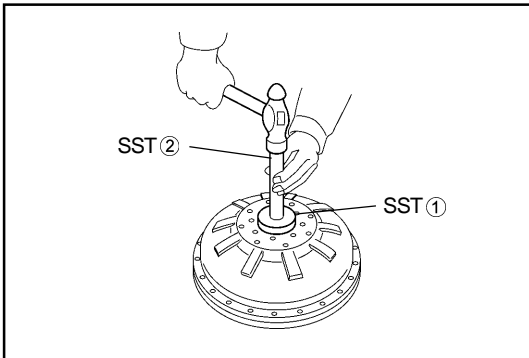


Disassembly:

Remove the bearing.

SST 09950-60010...①

09950-70010...②



Reassembly:

Bearing installation

1. Temporarily install the pilot boss on the drive cover.

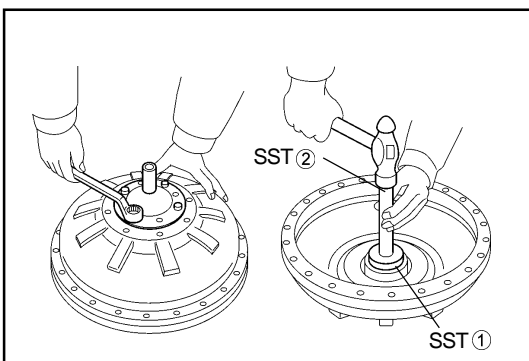
2. Install the bearing.

SST 09950-60010...①

SST 09950-70010...②

3. Remove the pilot boss.

Install the pilot boss and flexible plate after the torque converter is installed in the housing.



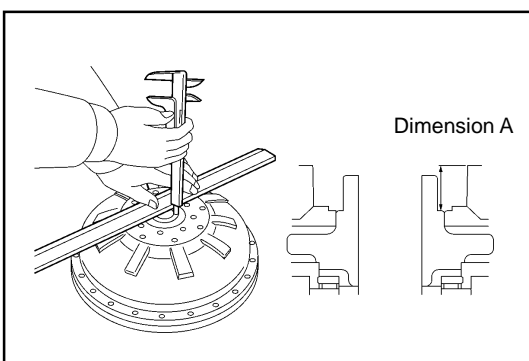
### [Point 2]

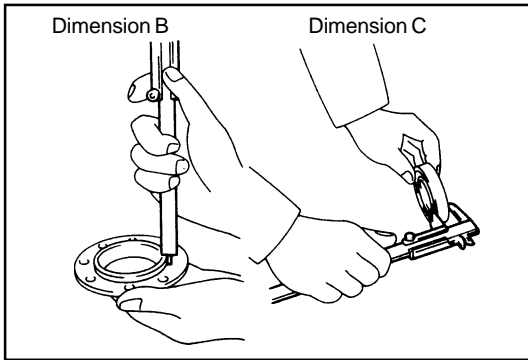
Reassembly:

Select the turbine runner spacer before installing the turbine runner as follows.

1. Measure dimension A after temporarily installing the turbine runner (without spacer) on the drive cover.

Remove the O-ring of the pump impeller beforehand.





2. Measure pilot boss dimension B and bearing thickness C.

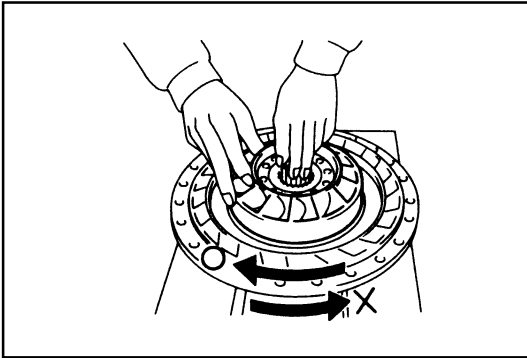
3. Select the turbine runner spacer so as to satisfy the following equation:

$$A - (B + C + \text{spacer thickness}) = 0.2 \sim 0.8 \text{ mm (0.008} \sim 0.031 \text{ in)}$$

Types of spacer thickness:

2.5, 2.7 and 3.0 mm (0.098, 0.106 and 0.118 in)

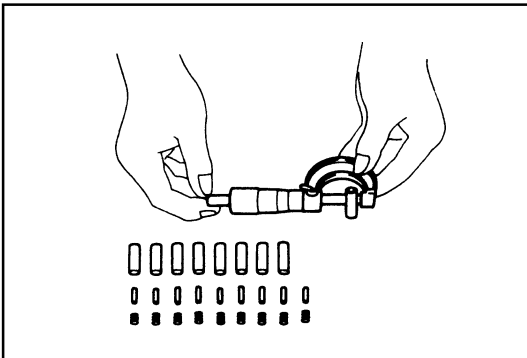
4. Remove the drive cover, and install the pump impeller O-ring and the spacer selected above.



### [Point 3]

Inspection:

Check the one-way clutch function before removing the stator.



Disassembly:

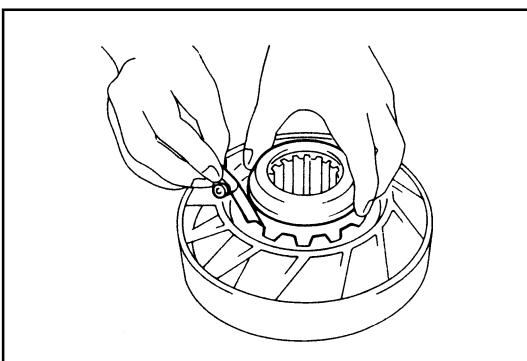
Slowly remove the stator hub because rollers, springs and spring caps come off at a time.

Inspection:

Measure the roller outside diameter.

**Standard: 8.30 mm (0.327 in)**

**Limit: 8.17 mm (0.322 in)**



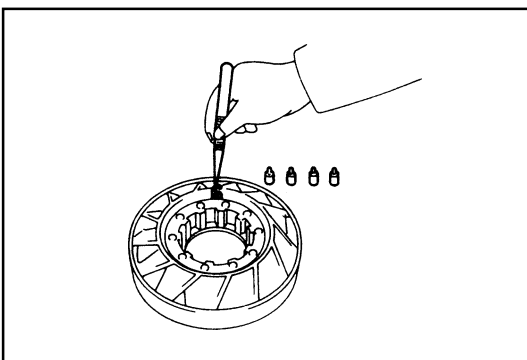
Inspection:

Measure the clearance between the stator hub and stator cam.

**Standard: 0.08 ~ 0.119 mm**

**(0.0031 ~ 0.00469 in)**

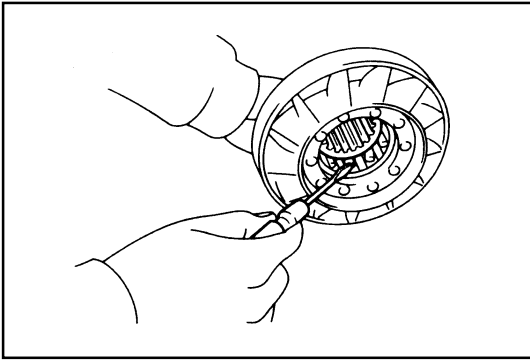
**Limit: 0.15 mm (0.0059 in)**



Reassembly:

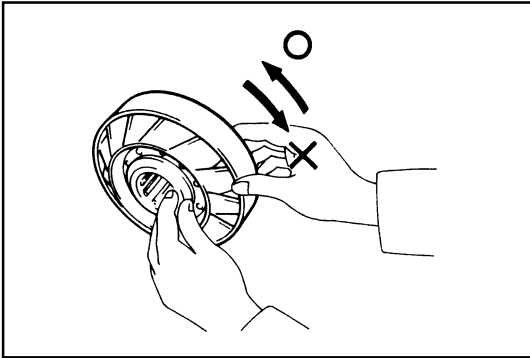
Stator installation

1. Apply grease on the springs and spring caps, and install them with tweezers or a similar tool.

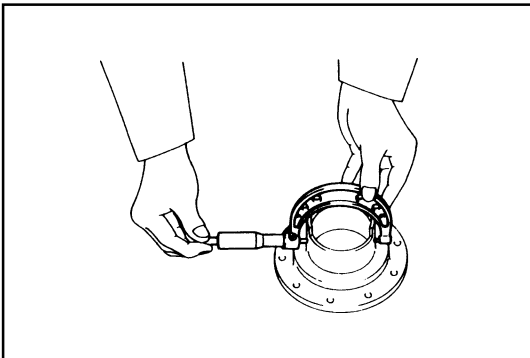


2. Install rollers while pushing each spring cap with a screwdriver.

3. Install the stator hub on the stator by turning it in the unlocking direction.



4. Check the one-way clutch function after reassembly.



**[Point 4]**

Inspection:

Measure the outside diameter at the oil seal sliding surface.

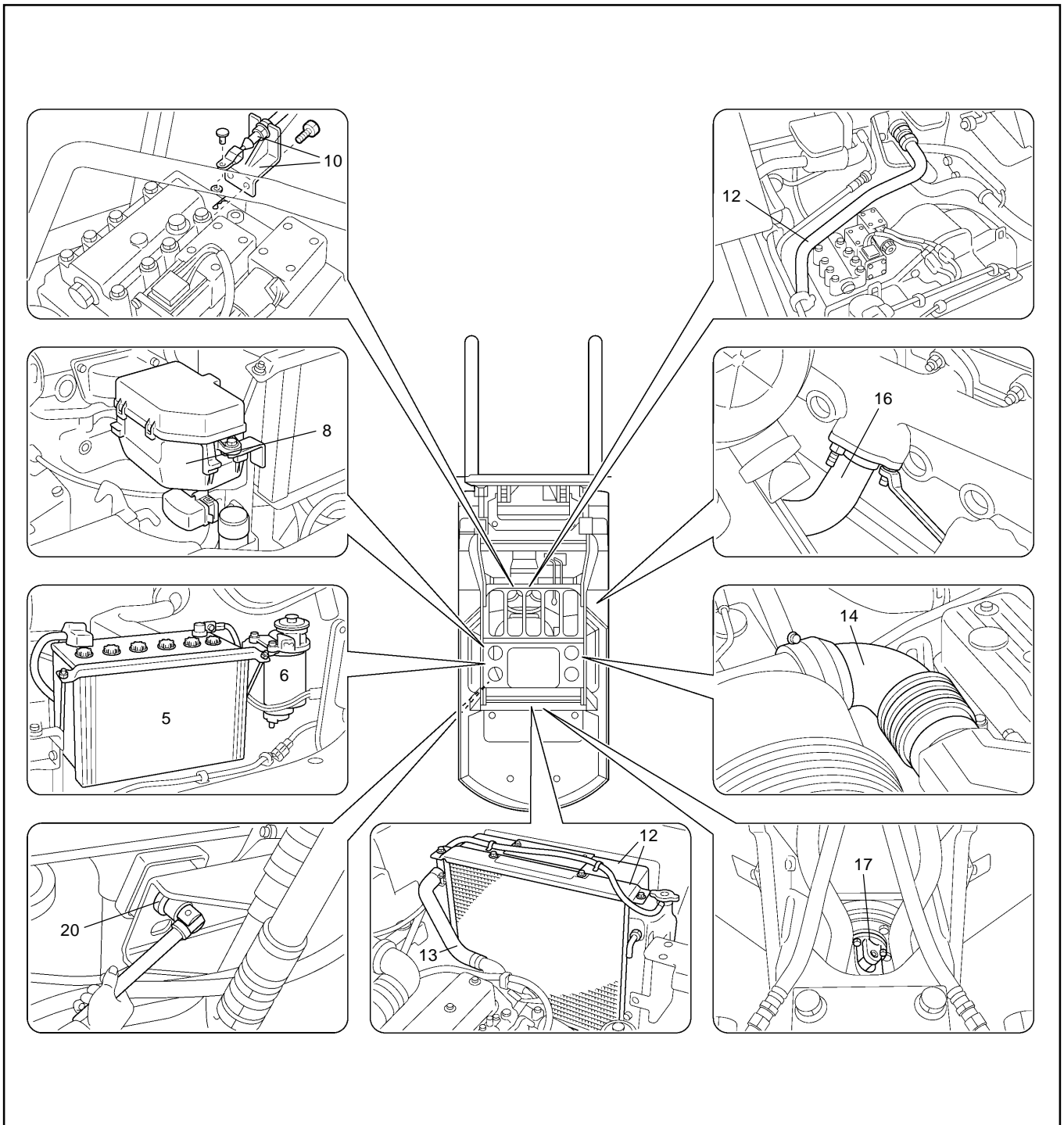
**Standard: 70.00 mm (2.7559 in)**

**Limit: 69.85 mm (2.7450 in)**

# TORQUE CONVERTER & TRANSMISSION ASSY

## REMOVAL-INSTALLATION

T = N·m (kgf-cm) [ft-lbf]



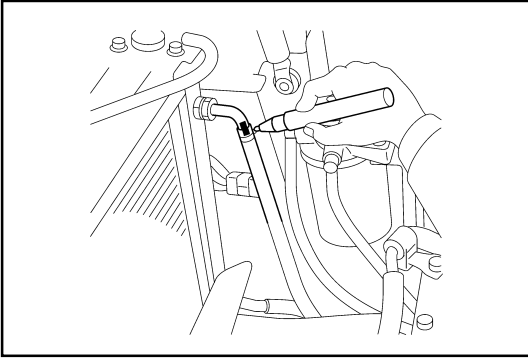
Engine mounting nut	T = 53.9 ~ 99.0 (550 ~ 1010) [39.8 ~ 73.1]
Torque converter mounting set bolt	T = 49.0 ~ 78.5 (500 ~ 800) [36.2 ~ 57.9]
Fly wheel set bolt	Gasoline model: T = 98.07 ~ 156.9 (1000 ~ 1600) [72.35 ~ 115.8] Diesel model: T = 98.07 ~ 156.9 (1000 ~ 1600) [72.35 ~ 115.8]
Flexible plate set bolt	T = 14.7 ~ 24.5 (150 ~ 250) [10.9 ~ 18.1]

## Removal Procedure

- 1 Remove the engine hood. (See page 11-5.)
- 2 Remove the toe board.
- 3 Remove the radiator cover.
- 4 Drain the coolant.
- 5 Remove the battery and battery tray.
- 6 13Z engine vehicle:
  - Disconnect the fuel hose.
  - Remove the sedimenter bracket set bolt to set the bracket free.
  - Disconnect the accelerator wire.
- 7 G4 (GM6-262) engine vehicle: Disconnect the fuel hose.
- 8 Remove the relay block and electrical parts plate set bolts to set them free.
- 9 Disconnect connectors and wiring harness clamps around the engine.
- 10 Disconnect the inching wire.
- 11 Disconnect the torque converter cooler hose and hydraulic oil cooler hose. **[Point 1]**
- 12 13Z engine vehicle:
  - Remove the radiator and fan shroud.
  - Disconnect the oil control valve piping.
- 13 G4 (GM6-262) engine vehicle:
  - Disconnect the radiator hose.
- 14 Remove the air cleaner hose.
- 15 Remove the under cover.
- 16 Disconnect the exhaust pipe.
- 17 Remove the oil pump drive shaft ASSY. (See page 15-11.)
- 18 Remove the propeller shaft. (See page 5-3.)
- 19 Remove the transmission mounting bolts and pin bolts. **[Point 2]**
- 20 Remove the engine mounting nuts.
- 21 Remove the torque converter & transmission ASSY W/engine. **[Point 3]**
- 22 Remove the flexible plate set bolts. **[Point 4]**
- 23 Separate the engine from the torque converter housing.

## Installation Procedure

The installation procedure is the reverse of the removal procedure.

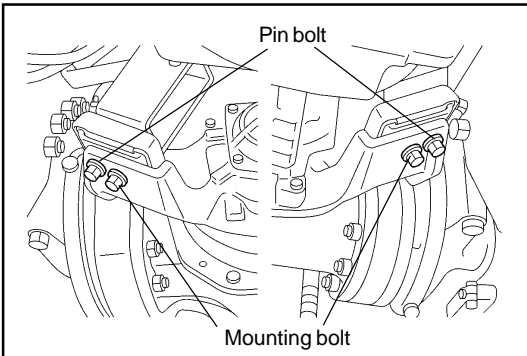


## Point Operations

### [Point 1]

Removal:

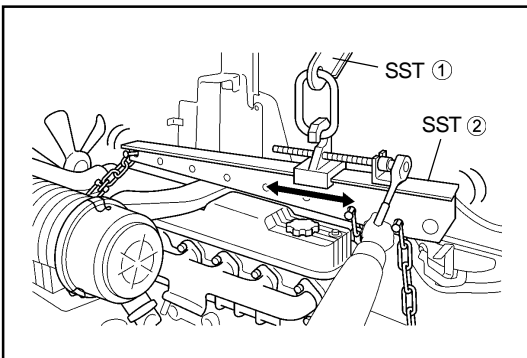
Put match marks on the fuel hose and the mating joint.



### [Point 2]

Installation:

Install the mounting bolt and pin bolt first on the right-hand side, and then on the left-hand side.



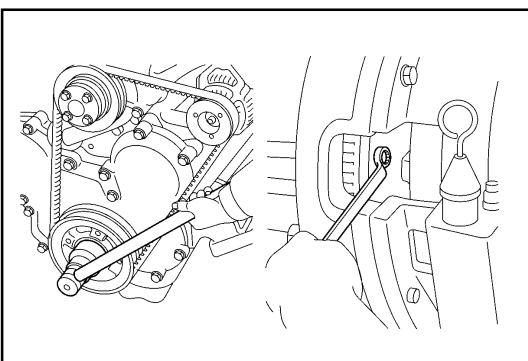
### [Point 3]

Removal•Installation:

SST 09010-20111-71 ..... ①

09010-23320-71 ..... ②

Move the SST hook position to adjust the balance.



### [Point 4]

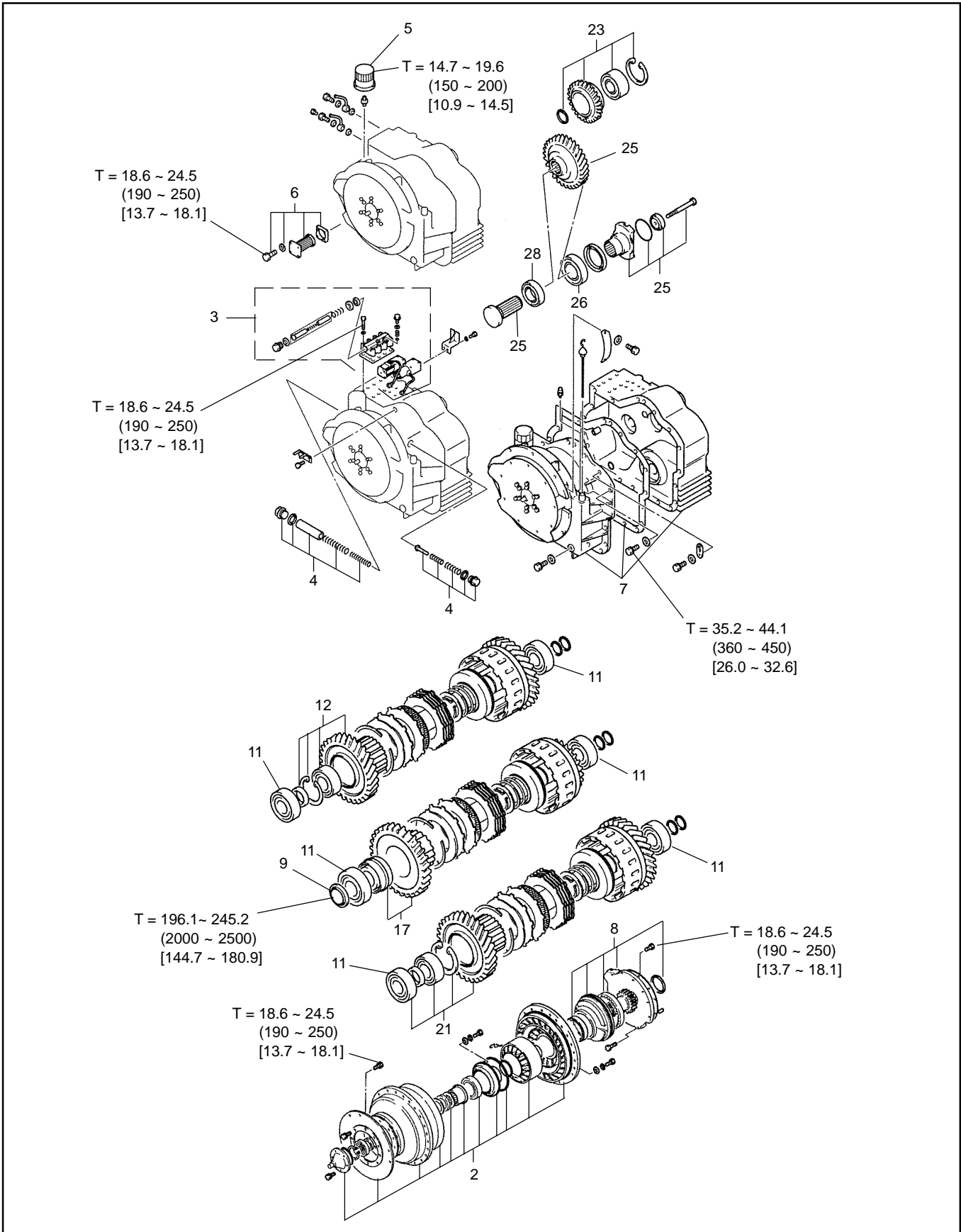
Removal•Installation:

Turn the flywheel using the crankshaft pulley set bolt.

# TRANSMISSION ASSY

## DISASSEMBLY·INSPECTION·REASSEMBLY

T = N·m (kgf-cm) [ft-lbf]



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## Disassembly Procedure

- 1 Drain the torque converter oil.
- 2 Remove the torque converter. (See page 3-14.)
- 3 Remove the inching valve and solenoid valve. **[Point 1]**
- 4 Remove the accumulator and regulator valve. **[Point 2]**
- 5 Remove the oil filter. **[Point 3]**
- 6 Remove the oil strainer.
- 7 Separate the torque converter housing. **[Point 4]**
- 8 Remove the stator shaft and oil pump. (See page 3-33.)
- 9 2-speed vehicle: Loosen the main shaft lock nut. **[Point 5]**
- 10 Remove the reverse shaft ASSY, main shaft ASSY and F1 shaft ASSY (2-speed vehicle). **[Point 6]**
- 11 Remove the reverse shaft bearing, main shaft bearing and F1 shaft bearing (2-speed vehicle). **[Point 7]**

### Reverse clutch shaft parts

- 12 Remove the reverse clutch gear W/reverse clutch gear bearing and spacer. **[Point 8]**
- 13 After removing the snap ring, remove the reverse clutch gear bearing from the reverse clutch gear. **[Point 9]**

### Main shaft parts

- 14 1-speed vehicle:  
Remove the F clutch gear W bearing and spacer. **[Point 10]**
- 15 After removing the snap ring, remove the F clutch gear bearing from the F clutch gear. **[Point 11]**
- 16 2-speed vehicle:  
Remove the shaft lock nut.
- 17 Remove the shaft bearing inner race, F2 clutch gear W/clutch bearing outer races No.1-2, clutch gear bearing inner race No. 1 and spacer. **[Point 12]**
- 18 Remove the clutch gear bearing inner race No. 1. **[Point 13]**
- 19 Remove the clutch gear bearing outer races No. 1-2 from the F2 clutch gear. **[Point 14]**
- 20 Remove the shaft bearing outer race from the torque converter housing. **[Point 15]**

### F1 clutch shaft parts (2-speed vehicle)

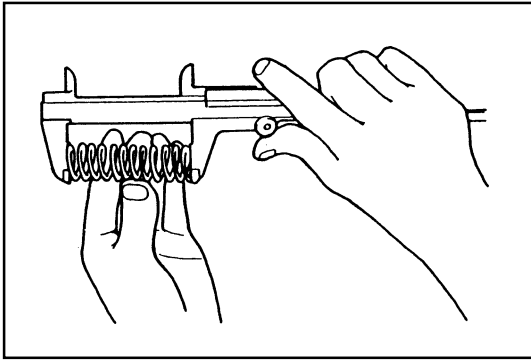
- 21 Remove the F1 clutch gear W/F1 clutch gear bearing and spacer. **[Point 16]**
- 22 Remove the F1 clutch gear bearing from the F1 clutch gear. **[Point 17]**

### Counter gear parts (2-speed vehicle)

- 23 Remove the counter gear W/bearing. **[Point 18]**
- 24 Remove the bearing from the counter gear. **[Point 19]**

### Output shaft parts

- 25 Remove the output shafts No. 1-2 and the output shaft. **[Point 20]**
- 26 Remove the output shaft front bearing. **[Point 21]**
- 27 Remove the oil seal. **[Point 22]**
- 28 Remove the output shaft rear bearing from the output shaft No. 1. **[Point 23]**



### Point Operations

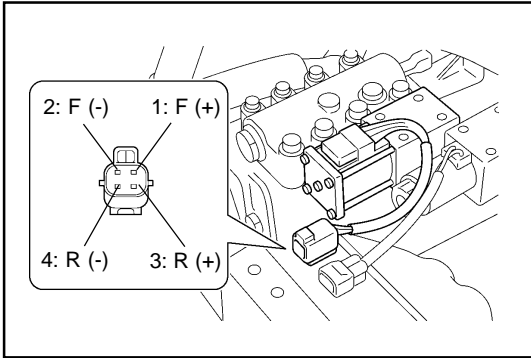
**[Point 1]**

Inspection:

Measure the free length of the inching valve spring.

mm (in)

	Standard	Limit
Inner spring	28 (1.10)	24 (0.94)
Outer spring	64 (2.52)	58 (2.28)



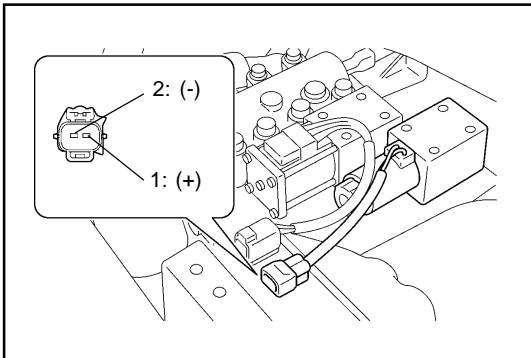
Inspection:

Inspect the solenoid valve for continuity.

F/R:

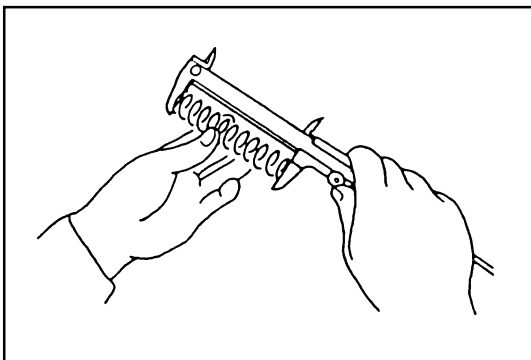
Between 1 and 2: Continuity

Between 3 and 4: Continuity



F2 (2-speed vehicle)

Between 1 and 2: Continuity



**[Point 2]**

Inspection:

Measure the free length of the accumulator spring.

mm (in)

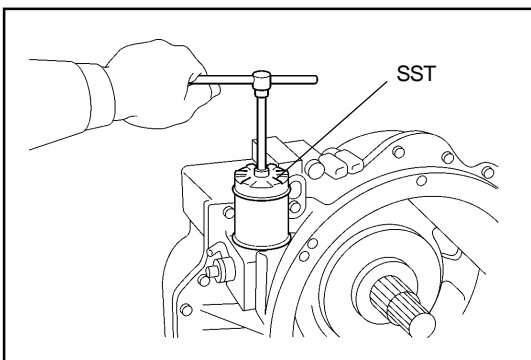
	Standard	Limit
Inner spring	150.0 (5.906)	135.0 (5.315)
Outer spring	153.5 (6.043)	138.5 (5.453)

Inspection:

Measure the free length of the regulator valve spring.

mm (in)

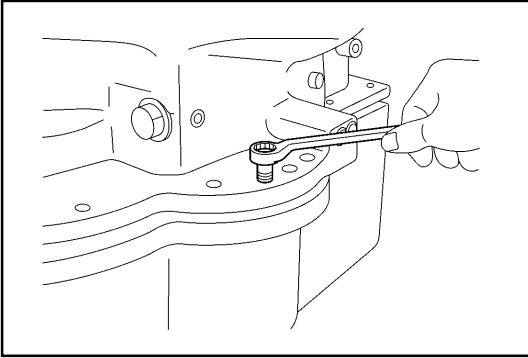
	Standard	Limit
Inner spring	153.5 (6.043)	135.5 (5.315)
Outer spring	148.0 (5.827)	131.0 (5.157)



**[Point 3]**

Disassembly • Reassembly:

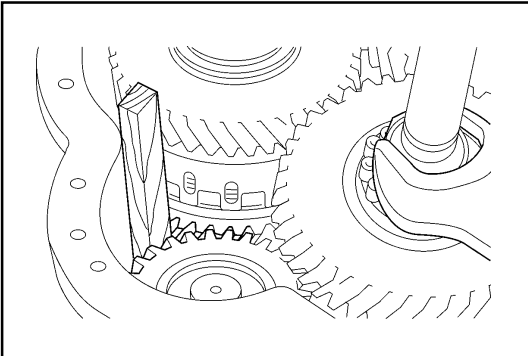
SST 09228-07501

**[Point 4]**

## Disassembly:

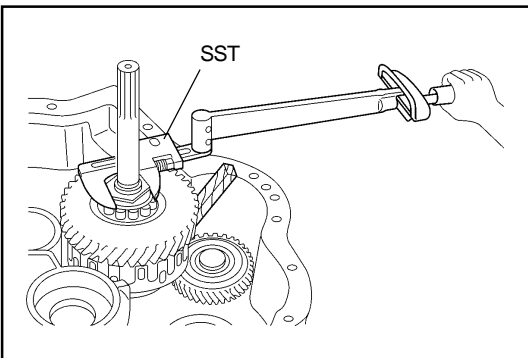
Place the torque converter horizontally on wooden blocks with the engine side facing upward, and separate it by using the service bolt.

Service bolt size: M10 x 1.5

**[Point 5]**

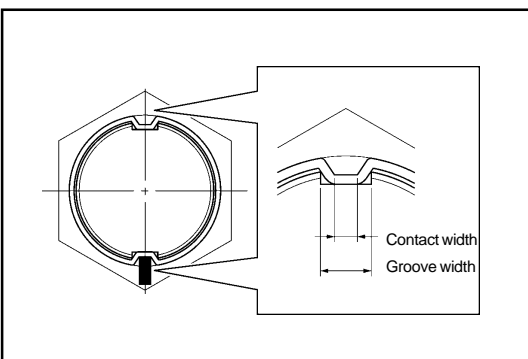
## Disassembly:

Fix the shaft with a piece of wood inserted between clutch gears on the front side, and loosen the lock nut.

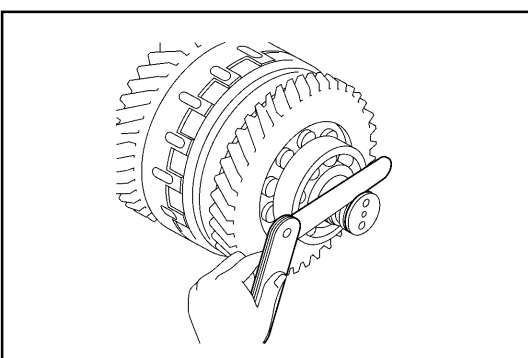


## Reassembly:

1. Temporarily install two clutch shaft ASSY in the housing, and fix the shaft in the same as at the time of nut loosening.
2. Use the SST and tighten the shaft lock nut to the specified torque. (See the instruction manual supplied with the SST.)  
SST 09922-10010



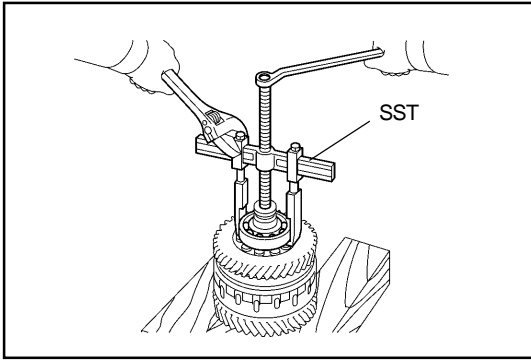
3. Caulk so that the close contact width exceeds 1/3 of the shaft groove width.
4. Remove the temporarily installed clutch shaft ASSY, and wash the housing and clutch shaft ASSY.

**[Point 6]**

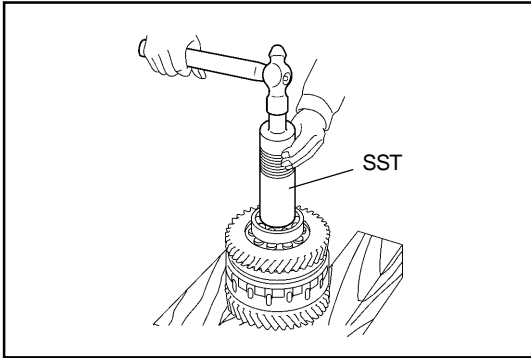
## Inspection:

Measure the side clearance of each shaft seal ring.

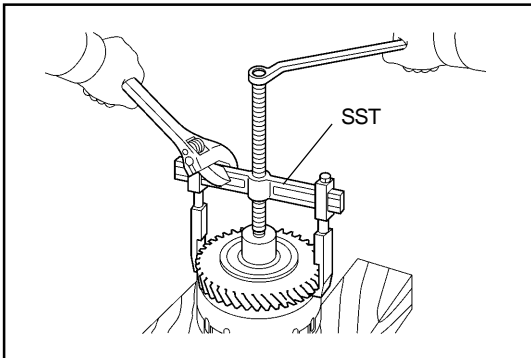
	Limit mm (in)
Main shaft	0.29 (0.0114)
Reverse shaft	0.29 (0.0114)
F1 shaft	0.29 (0.0114)



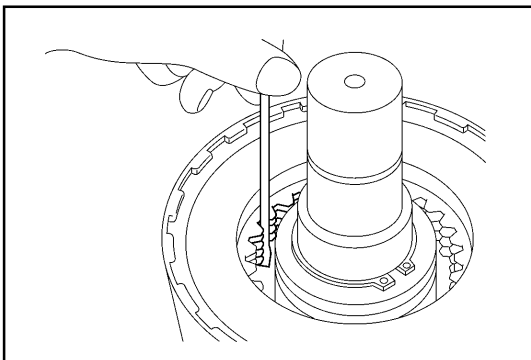
**[Point 7]**  
 Disassembly:  
 SST 09950-40011



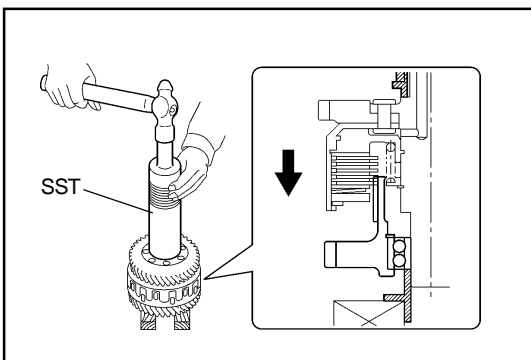
Reassembly:  
 SST 09316-60011



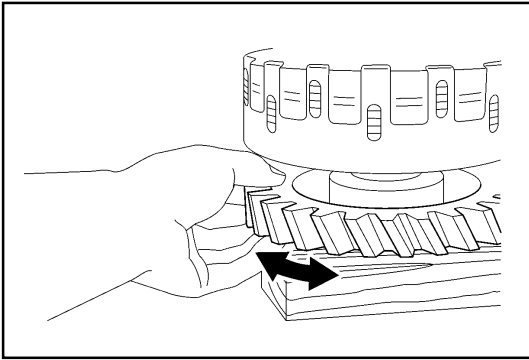
**[Point 8]**  
 Disassembly:  
 SST 09950-40011



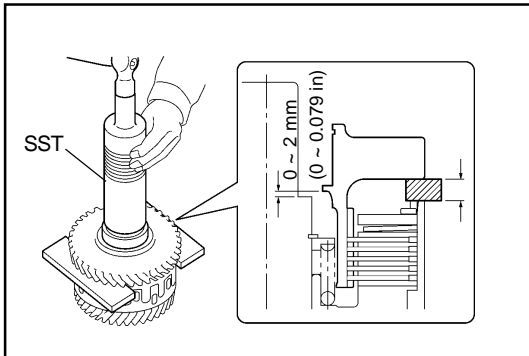
Reassembly:  
 After matching the clutch disc serration using a screwdriver,  
 install the clutch gear.



Reassembly:  
 1-speed vehicle  
 SST 09316-60011  
 While observing the clutch disc state through the side hole  
 in the clutch drum, gradually install with the clutch drum  
 side facing upward.

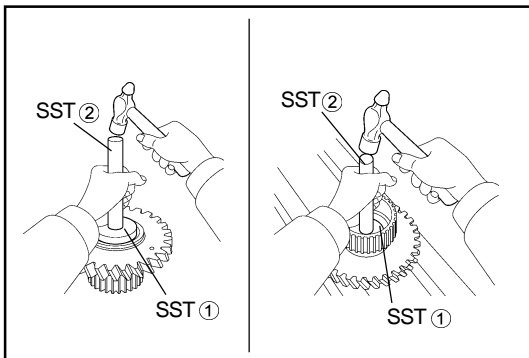


When the clutch disc is sticking, move the clutch gear little by little to let the clutch disc fall.



Reassembly:  
2-speed vehicle

1. Insert a plate between the clutch gear and clutch drum as illustrated, and temporarily install the gear first.
2. Install the clutch gear bearing on the clutch gear.  
SST 09316-60011
3. Remove the plate, and use the SST to install the clutch gear W/clutch gear bearing.

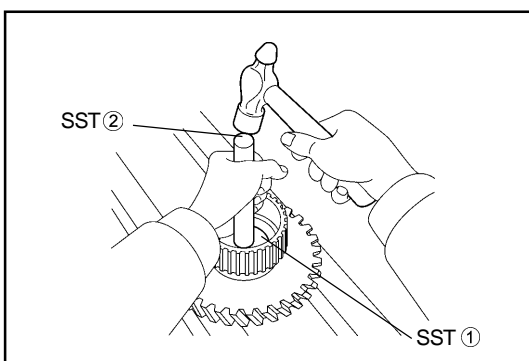


**[Point 9]**

1-speed vehicle

Disassembly • Reassembly:

- SST 09950-60010 ..... ①  
09950-70010 ..... ②



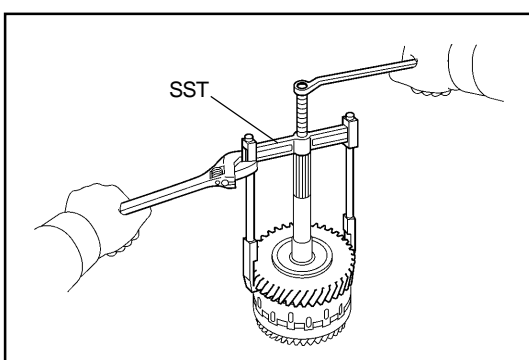
2-speed vehicle

Disassembly:

- SST 09950-60010 ..... ①  
09950-70010 ..... ②

Reassembly:

Reassemble after temporarily installing the clutch gear. (See Point 8.)



**[Point 10]**

Disassembly:

- SST 09950-40011



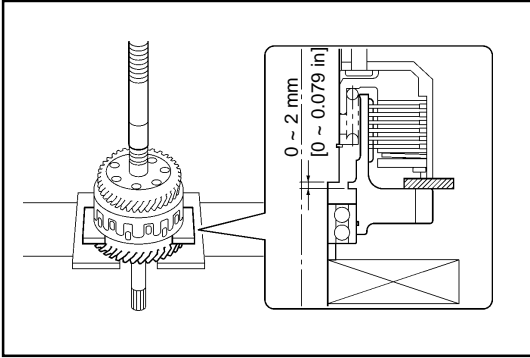
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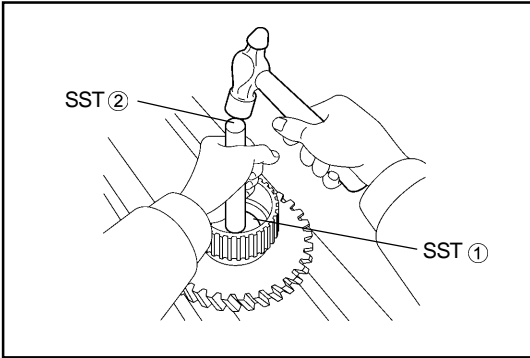
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Reassembly:

1. Insert as plate as illustrated between the clutch gear and clutch drum, and temporarily install the gear first.
2. Install the clutch gear bearing on the clutch gear.  
SST 09316-60011
3. Remove the plate, and use the above SST to install the clutch gear W/clutch gear bearing.



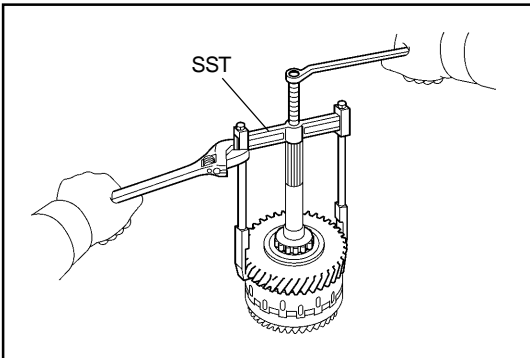
[Point 11]

Disassembly:

- SST 09950-60010 ..... ①
- SST 09950-70010 ..... ②

Reassembly:

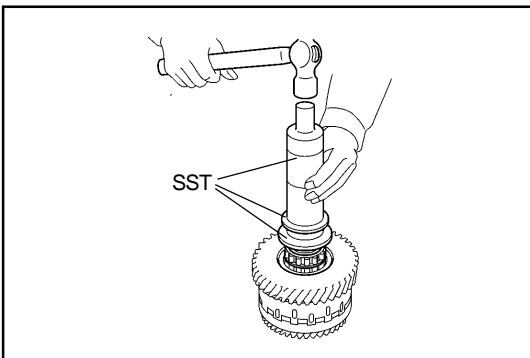
Reassemble after temporarily installing the clutch gear. (See Point 10.)



[Point 12]

Disassembly:

- SST 09950-40011

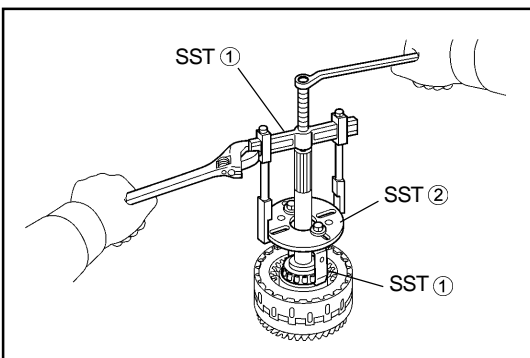


Disassembly:

Take a note of the bearing composition so as not to install in an incorrect order.

Reassembly:

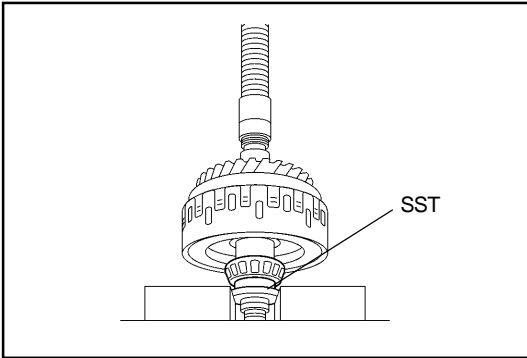
Use the SST and temporarily reassemble the clutch gear bearing outer race, F2 shaft bearing and spacer to the state allowing lock nut tightening.  
SST 09316-60011



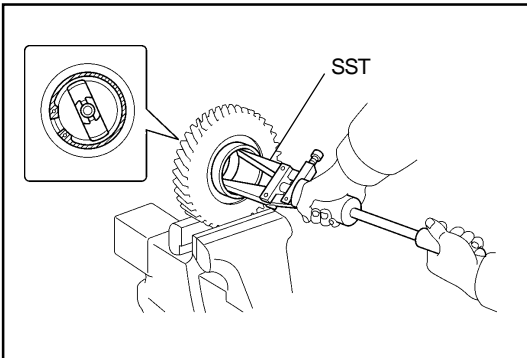
[Point 13]

Disassembly:

- SST 09950-40011 ..... ①
  - 09950-30010 ..... ②
- Use the SSTs in combined state.

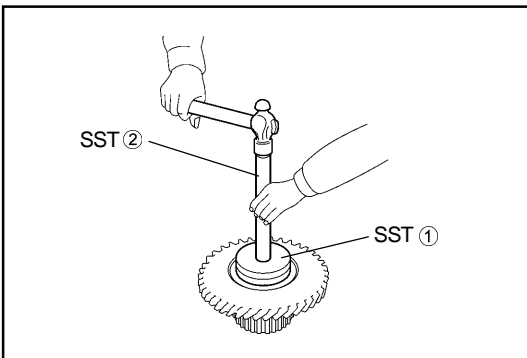


Reassembly:  
SST 09316-60011

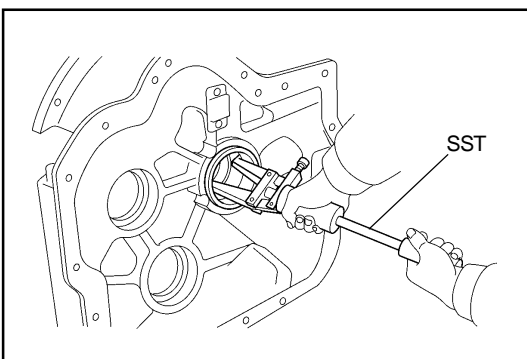


**[Point 14]**

Disassembly:  
SST 09308-00010  
Carefully operate so that the claw of the SST does not catch the snap ring.  
Take a note of the bearing outer race mounting position.

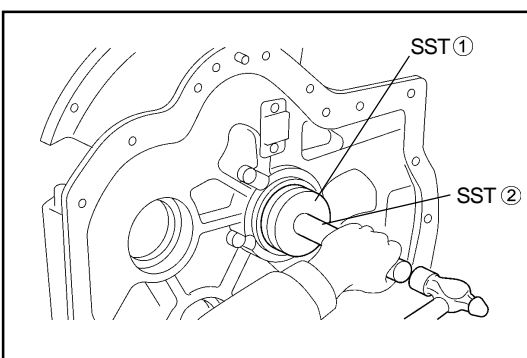


Reassembly:  
SST 09950-60020 ..... ①  
09950-70010 ..... ②



**[Point 15]**

Disassembly:  
SST 09308-00010



Reassembly:  
SST 09950-60020 ..... ①  
09950-70010 ..... ②

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