

# MANUAL TRANSMISSION AND DIFFERENTIAL

**3-1**

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	Page
<b>S SPECIFICATIONS AND SERVICE DATA</b>	2
1. Manual Transmission and Differential	2
<b>C COMPONENT PARTS</b>	7
1. Transfer Case and Extension	7
2. Rear Case (FWD Model)	8
3. Transmission Case	9
4. Shifter Fork and Shifter Rod	10
5. Drive Pinion Assembly	12
6. Main Shaft Assembly	14
7. Center Differential	16
8. Front Differential	17
<b>W SERVICE PROCEDURE</b>	18
1. General	18
2. Transfer Case and Extension (AWD Model)	21
3. Rear Case (FWD Model)	31
4. Transmission Case (AWD Model)	35
5. Transmission Case (FWD Model)	52
6. Drive Pinion Assembly (AWD Model)	69
7. Drive Pinion Assembly (FWD Model)	76
8. Main Shaft Assembly (AWD Model)	80
9. Main Shaft Assembly (FWD Model)	83
10. Center Differential (AWD Model)	86
11. Front Differential	88
<b>T DIAGNOSTICS</b>	92
1. Manual Transmission and Differential	92

## 1. Manual Transmission and Differential

### A: SPECIFICATIONS

Item	Model			
	FWD	AWD		
	1800 cc			
Type	5-forward speeds with synchromesh and 1-reverse			
Transmission gear ratio	1st	3.545		
	2nd	2.111		
	3rd	1.448		
	4th	1.088		
	5th	0.825		
	Reverse	3.416		
Front reduction gear	Final	Type of gear	Hypoid	
		Gear ratio	3.700	3.900
Rear reduction gear	Transfer	Type of gear	—	Helical
		Gear ratio	—	1.000
	Final	Type of gear	—	Hypoid
		Gear ratio	—	3.900
Front differential	Type and number of gear		Straight bevel gear (Bevel pinion: 2, Bevel gear: 2)	
Center differential	Type and number of gear		—	Straight bevel gear (Bevel pinion: 2, Bevel gear: 2 and viscous coupling)
Transmission gear oil		GL-5		
Transmission oil capacity		3.3 ℥ (3.5 US qt, 2.9 Imp qt)	4.0 ℥ (4.2 US qt, 3.5 Imp qt)	

## B: SERVICE DATA

### 1. EXTENSION (AWD Model)

Snap ring (Inner-72) to ball bearing side clearance:  
0 — 0.15 mm (0 — 0.0059 in)

Snap ring (Inner-72)	
Part No.	Thickness mm (in)
805172071	1.78 (0.0701)
805172072	1.90 (0.0748)
805172073	2.02 (0.0795)

Snap ring (Outer-30) to ball bearing side clearance:  
0 — 0.15 mm (0 — 0.0059 in)

Snap ring (Outer-30)	
Part No.	Thickness mm (in)
805030041	1.53 (0.0602)
805030042	1.65 (0.0650)
805030043	1.77 (0.0697)

### 2. EXTENSION ASSEMBLY (AWD Model)

Thrust washer (52 x 61 x T) to ball bearing side clearance:  
0.05 — 0.30 mm (0.0020 — 0.0118 in)

Thrust washer (52 x 61 x t)	
Part No.	Thickness mm (in)
803052021	0.50 (0.0197)
803052022	0.75 (0.0295)
803052023	1.00 (0.0394)

### 3. TRANSFER CASE OR REAR CASE

Neutral position adjustment

Adjustment shim	
Part No.	Thickness mm (in)
32190AA000	0.15 (0.0059)
32190AA010	0.30 (0.0118)

Reverse accent shaft (AWD Model)		
Part No.	Mark	Remarks
32188AA020	A	Neutral position is closer to 1st gear.
32188AA002	No mark or B	Standard
32188AA030	C	Neutral position is closer to reverse gear.

Reverse accent shaft (FWD Model)		
Part No.	Mark	Remarks
32188AA020	A	Neutral position is closer to 1st gear.
32188AA002	No mark or B	Standard
32188AA030	C	Neutral position is closer to reverse gear.

Reverse checking plate adjustment

Reverse checking plate			
Part No.	Mark	Angle $\theta$	Remarks
32189AA000	0	28°	Arm stops closer to 5th gear.
32189AA010	1	31°	Arm stops closer to 5th gear.
33189AA020	2	34°	Arm stops in the center.
32189AA030	3	37°	Arm stops closer to reverse gear.
32189AA040	4	40°	Arm stops closer to reverse gear.

### 4. REVERSE IDLER GEAR (AWD Model)

Adjustment of reverse idler gear position  
Reverse idler gear to transmission case (LH) wall clearance  
6.0 — 7.5 mm (0.236 — 0.295 in)

Reverse shifter lever		
Part No.	Mark	Remarks
32820AA000	0	Further from case wall
32820AA010	No mark	Standard
32820AA020	2	Closer to the case wall

After installing a suitable reverse shifter lever, adjust reverse idler gear-to-transmission case wall clearance to within 0 to 0.5 mm (0 to 0.020 in) using washers.

Washer (20.5 x 26 x t)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
803020151	0.4 (0.016)	803020154	1.9 (0.075)
803020152	1.1 (0.043)	803020155	2.3 (0.091)
803020153	1.5 (0.059)		

## 5. REVERSE IDLER GEAR (FWD Model)

Adjustment of reverse idler gear position

Reverse idler gear to transmission case (LH) wall clearance  
6.0 — 7.5 mm (0.236 — 0.295 in)

Reverse shifter lever		
Part No.	Mark	Remarks
32820AA000	0	Further from case wall
32820AA010	No mark	Standard
32820AA020	2	Closer to the case wall

After installing a suitable reverse shifter lever, adjust reverse idler gear-to-transmission case wall clearance to within 0 to 0.5 mm (0 to 0.020 in) using washers.

Washer (20.5 x 26 x t)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
803020151	0.4 (0.016)	803020154	1.9 (0.075)
803020152	1.1 (0.043)	803020155	2.3 (0.091)
803020153	1.5 (0.059)		

## 6. SHIFTER FORK AND ROD (AWD Model)

Select suitable shifter forks so that both coupling sleeve and reverse driven gear are positioned in the center of their synchromesh mechanisms.

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in)
32804AA070	No mark	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in)

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA060	1	Approach to 4th gear by 0.2 mm (0.008 in)
32810AA070	No mark	Standard
32810AA100	3	Approach to 3rd gear by 0.2 mm (0.008 in)

5th shifter fork		
Part No.	Mark	Remarks
32812AA060	1	Approach to 5th gear by 0.2 mm (0.008 in)
32812AA070	No mark	Standard
32812AA100	3	Become distant from 5th gear by 0.2 mm (0.008 in)

Rod end clearance

A: 1st-2nd — 3rd-4th

0.5 — 1.5 mm (0.020 — 0.059 in)

B: 3rd-4th — 5th

0.6 — 1.4 mm (0.024 — 0.055 in)

## 7. SHIFTER FORK AND ROD (FWD Model)

Select suitable shifter forks so that both coupling sleeve and reverse driven gear are positioned in the center of their synchromesh mechanisms.

1st-2nd shifter fork		
Part No.	Mark	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in)
32804AA070	No mark	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in)

3rd-4th shifter fork		
Part No.	Mark	Remarks
32810AA060	1	Approach to 4th gear by 0.2 mm (0.008 in)
32810AA070	No mark	Standard
32810AA100	3	Approach to 3rd gear by 0.2 mm (0.008 in)

5th shifter fork		
Part No.	Mark	Remarks
32812AA060	1	Approach to 5th gear by 0.2 mm (0.008 in)
32812AA070	No mark	Standard
32812AA100	3	Become distant from 5th gear by 0.2 mm (0.008 in)

Rod end clearance

A: 1st-2nd — 3rd-4th

0.5 — 1.5 mm (0.020 — 0.059 in)

B: 3rd-4th — 5th

0.6 — 1.4 mm (0.024 — 0.055 in)

## 8. TRANSMISSION CASE ASSEMBLY (AWD Model)

Drive pinion shim adjustment

Drive pinion shim			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
32295AA031	0.150 (0.0059)	32295AA071	0.250 (0.0098)
32295AA041	0.175 (0.0069)	32295AA081	0.275 (0.0108)
32295AA051	0.200 (0.0079)	32295AA091	0.300 (0.0118)
32295AA061	0.225 (0.0089)	32295AA101	0.500 (0.0197)

Hypoid gear backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Selection of main shaft rear plate

Main shaft rear plate		
Dimension "A" mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA040	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA050	2

## 9. TRANSMISSION CASE ASSEMBLY (FWD Model)

Drive pinion shim adjustment

Drive pinion shim			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
32295AA031	0.150 (0.0059)	32295AA071	0.250 (0.0098)
32295AA041	0.175 (0.0069)	32295AA081	0.275 (0.0108)
32295AA051	0.200 (0.0079)	32295AA091	0.300 (0.0118)
32295AA061	0.225 (0.0089)	32295AA101	0.500 (0.0197)

Hypoid gear backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Selection of main shaft rear plate

Main shaft rear plate		
Dimension "A" mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA040	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA050	2

## 10. DRIVE PINION ASSEMBLY (AWD Model)

Preload adjustment of thrust bearing:

Starting torque

0.3 — 0.8 N·m (3 — 8 kg·cm, 2.6 — 6.9 in-lb)

Adjusting washer No. 1	
Part No.	Thickness mm (in)
803025051	3.925 (0.1545)
803025052	3.950 (0.1555)
803025053	3.975 (0.1565)
803025054	4.000 (0.1575)
803025055	4.025 (0.1585)
803025056	4.050 (0.1594)
803025057	4.075 (0.1604)

Adjusting washer No. 2	
Part No.	Thickness mm (in)
803025059	3.850 (0.1516)
803025054	4.000 (0.1575)
803025058	4.150 (0.1634)

Assemble a driven shaft and 1st driven gear that are selected for the proper radial clearance adjustment.

Driven shaft		1st driven gear
Part No.	Diameter A mm (in)	Part No.
32229AA130	49.959 — 49.966 (1.9669 — 1.9672)	32231AA270
32229AA120	49.967 — 49.975 (1.9672 — 1.9675)	32231AA260

## 11. CENTER DIFFERENTIAL

Snap ring (Inner-110) to center differential case clearance:  
0 — 0.15 mm (0 — 0.0059 in)

Snap ring (Inner-110)	
Part No.	Thickness mm (in)
805100061	2.10 (0.0827)
805100062	2.21 (0.0870)
805100063	2.32 (0.0913)

Backlash adjustment axial movement:

0.62 — 0.86 mm (0.0244 — 0.0339 in)

Adjusting washer (45 x 62 x t)	
Part No.	Thickness mm (in)
803045041	1.60 (0.0630)
803045042	1.80 (0.0709)
803045043	2.00 (0.0787)
803045044	2.20 (0.0866)
803045045	2.40 (0.0945)

**12. FRONT DIFFERENTIAL (AWD Model)**

Bevel gear to pinion backlash

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Washer (38.1 x 50 x t)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
803038021	0.925 — 0.950 (0.0364 — 0.0374)	803038023	1.025 — 1.050 (0.0404 — 0.0413)
803038022	0.975 — 1.000 (0.0384 — 0.0394)		

Pinion shaft to axle drive shaft clearance

0 — 0.2 mm (0 — 0.008 in)

Snap ring (Outer-28)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
805028011	1.05 (0.0413)	805028012	1.20 (0.0472)

**13. FRONT DIFFERENTIAL (FWD Model)**

Bevel gear to pinion backlash

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Washer (38.1 x 50 x t)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
803038021	0.925 — 0.950 (0.0364 — 0.0374)	803038023	1.025 — 1.050 (0.0404 — 0.0413)
803038022	0.975 — 1.000 (0.0384 — 0.0394)		

Pinion shaft to axle drive shaft clearance

0 — 0.2 mm (0 — 0.008 in)

Snap ring (Outer-28)			
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
805028011	1.05 (0.0413)	805028012	1.20 (0.0472)

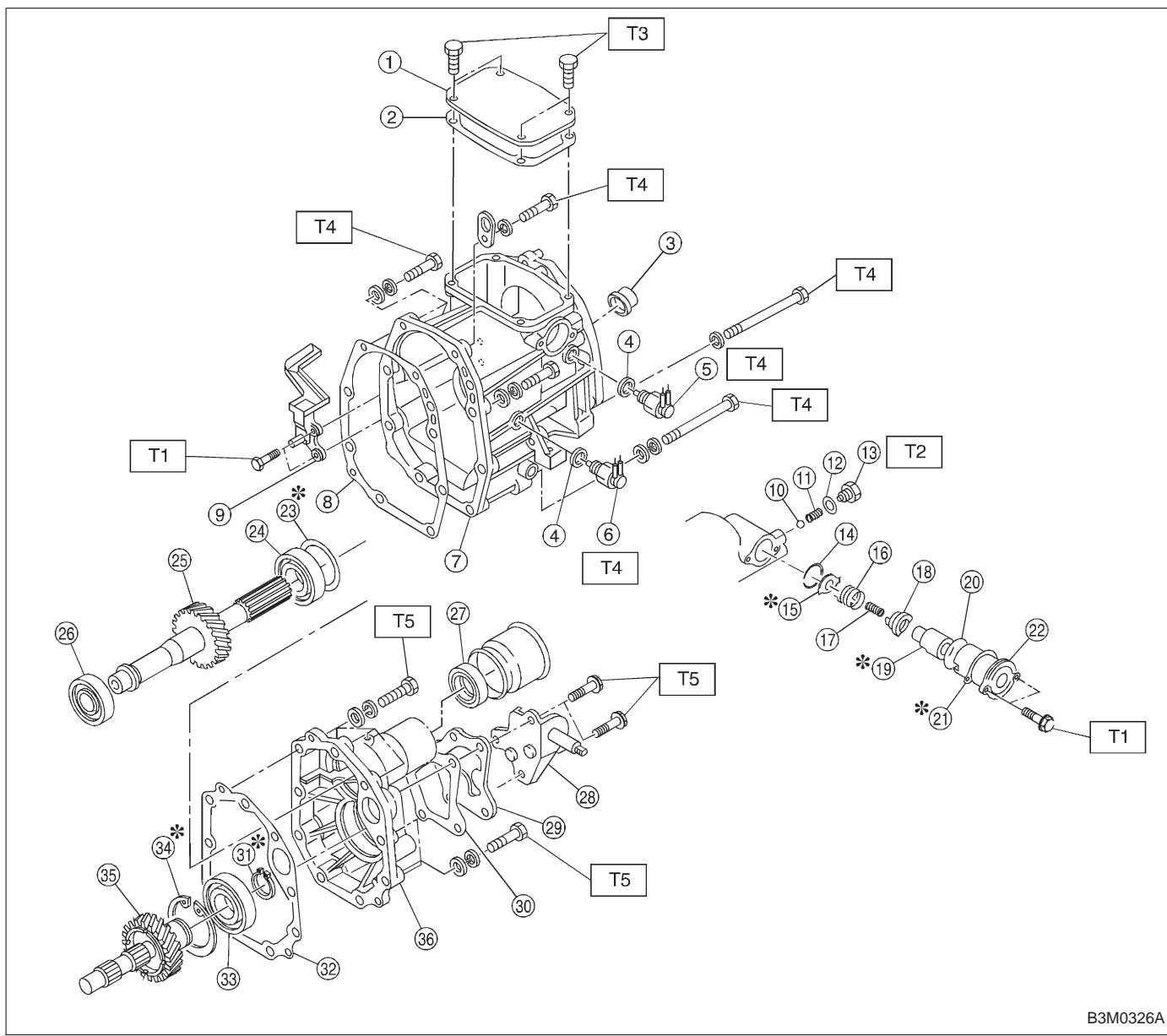
**14. DRIVE PINION ASSEMBLY (FWD Model)**

Selection of 1st driven gear

1st driven gear	
Outer diameter of bushing mm (in)	Part No.
41.983 — 41.996 (1.6529 — 1.6534)	32231AA320
41.968 — 41.982 (1.6523 — 1.6528)	32231AA330
41.954 — 41.967 (1.6517 — 1.6522)	32231AA340

## 1. Transfer Case and Extension

## 1. AWD MODEL



B3M0326A

- ① Transfer cover
- ② Cover gasket
- ③ Oil seal
- ④ Gasket
- ⑤ Neutral switch
- ⑥ Back-up light switch
- ⑦ Transfer case
- ⑧ Gasket
- ⑨ Oil guide
- ⑩ Ball
- ⑪ Reverse accent spring
- ⑫ Gasket
- ⑬ Plug
- ⑭ Snap ring (Inner)
- ⑮ Reverse check plate

- ⑯ Reverse checking spring
- ⑰ Reverse return spring
- ⑱ Reverse checking cam
- ⑲ Reverse accent shaft
- ⑳ O-ring
- ㉑ Adjusting select shim
- ㉒ Reverse checking sleeve
- ㉓ Adjusting washer
- ㉔ Ball bearing
- ㉕ Transfer driven gear
- ㉖ Ball bearing
- ㉗ Oil seal
- ㉘ Shift bracket
- ㉙ Extension cover
- ㉚ Gasket

- ㉛ Snap ring (Outer-30)
- ㉜ Gasket
- ㉝ Ball bearing
- ㉞ Snap ring (Inner-72)
- ㉟ Transfer drive gear
- ㉞ Extension

**Tightening torque: N·m (kg·m, ft·lb)**

T1: 6 — 7 (0.6 — 0.7, 4.3 — 5.1)

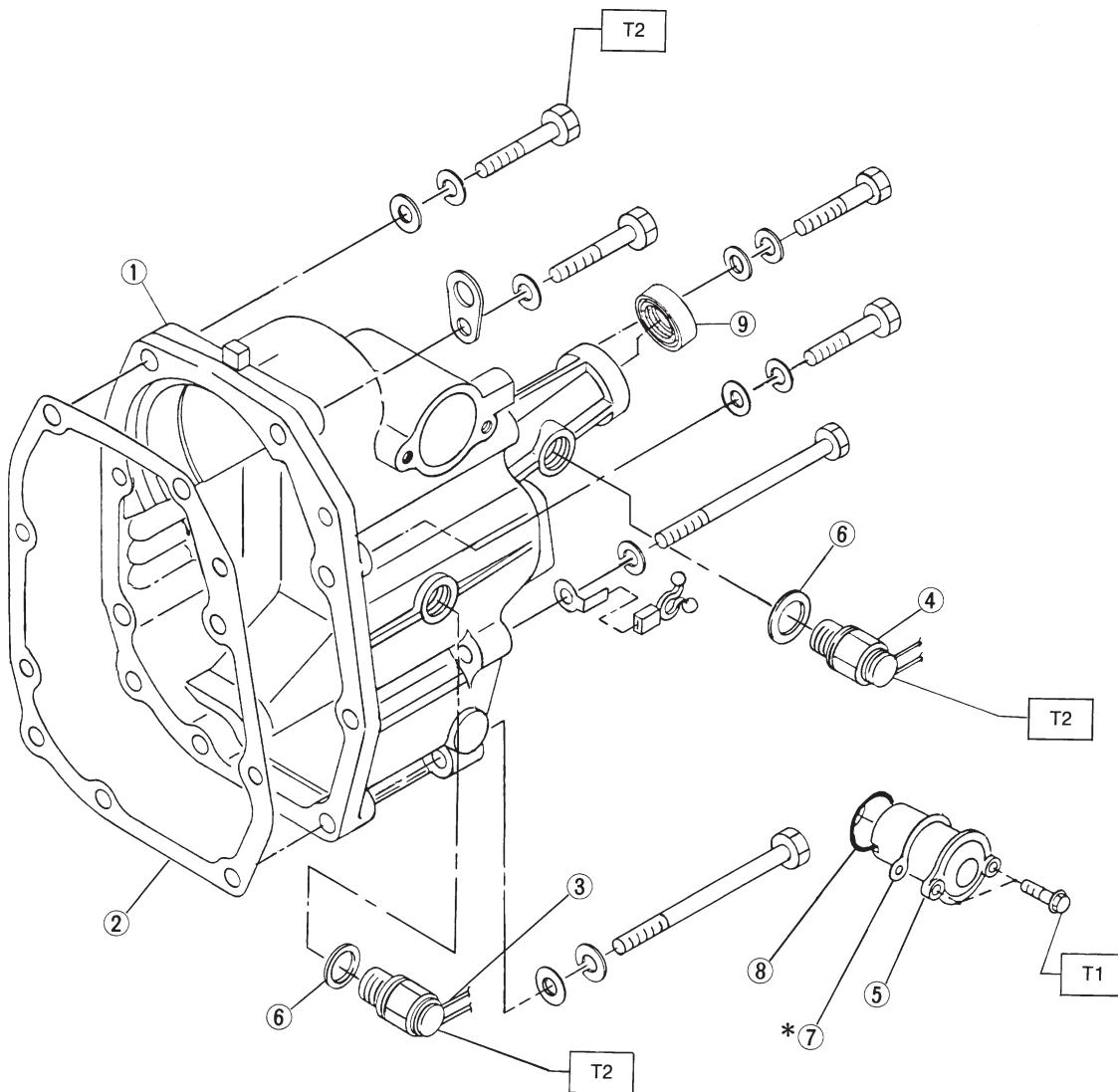
T2: 9 — 11 (0.9 — 1.1, 6.5 — 8.0)

T3: 14.2 — 17.2 (1.45 — 1.75, 10.5 — 12.7)

T4: 23 — 26 (2.3 — 2.7, 17 — 20)

T5: 34 — 40 (3.5 — 4.1, 25 — 30)

## 2. Rear Case (FWD Model)



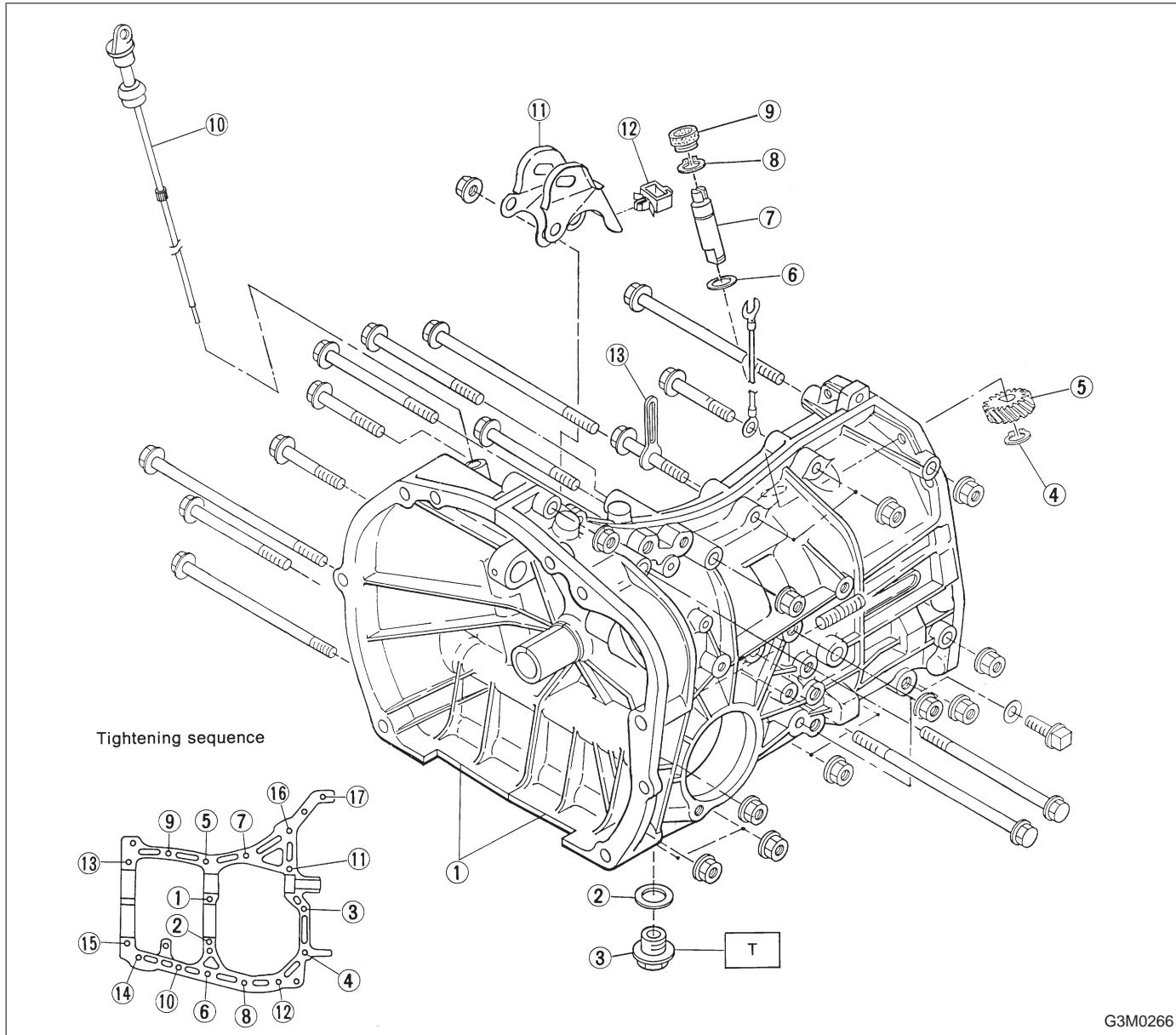
G3M0265

- ① Rear case
- ② Case gasket
- ③ Back-up light switch
- ④ Neutral switch
- ⑤ Reverse check sleeve ASSY
- ⑥ Gasket
- ⑦ Adjusting shim

- ⑧ O-ring
- ⑨ Oil seal

**Tightening torque: N·m (kg·m, ft·lb)**  
 T1:  $6.4 \pm 0.5$  ( $0.65 \pm 0.05$ ,  $4.7 \pm 0.4$ )  
 T2:  $25 \pm 5$  ( $2.5 \pm 0.5$ ,  $18.1 \pm 3.6$ )

## 3. Transmission Case



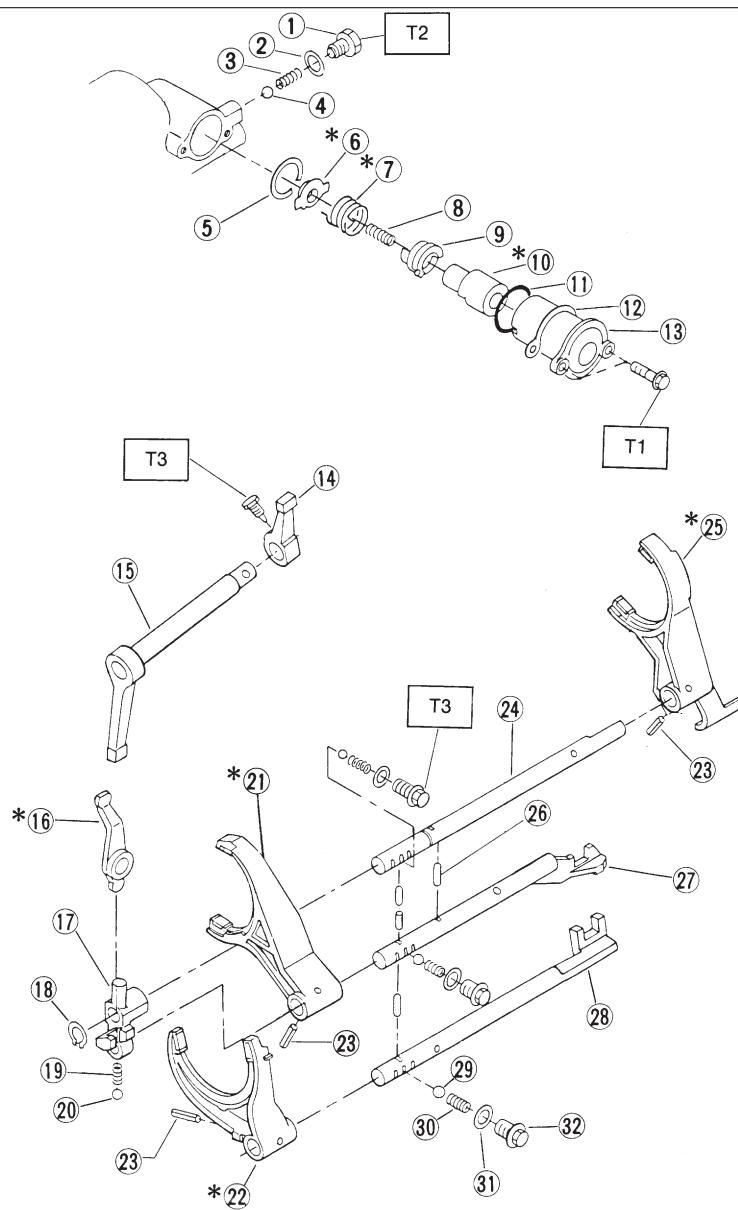
- ① Transmission case ASSY
- ② Gasket
- ③ Drain plug
- ④ Snap ring (Outer)
- ⑤ Speedometer driven gear
- ⑥ Washer
- ⑦ Speedometer shaft
- ⑧ Snap ring (Outer)
- ⑨ Oil seal
- ⑩ Oil level gauge
- ⑪ Pitching stopper bracket
- ⑫ Clamp
- ⑬ Clip

**Tightening torque: N·m (kg·m, ft·lb)**  
**T: 41 — 47 (4.2 — 4.8, 30 — 35)**

Size	All models	Torque
8 mm bolt	⑤—⑯	23 — 26 N·m (2.3 — 2.7 kg·m, 17 — 20 ft·lb)
10 mm bolt	①—④ ⑯—⑰	36 — 42 N·m (3.7 — 4.3 kg·m, 27 — 31 ft·lb)

## 4. Shifter Fork and Shifter Rod

## 1. AWD MODEL



G3M0508

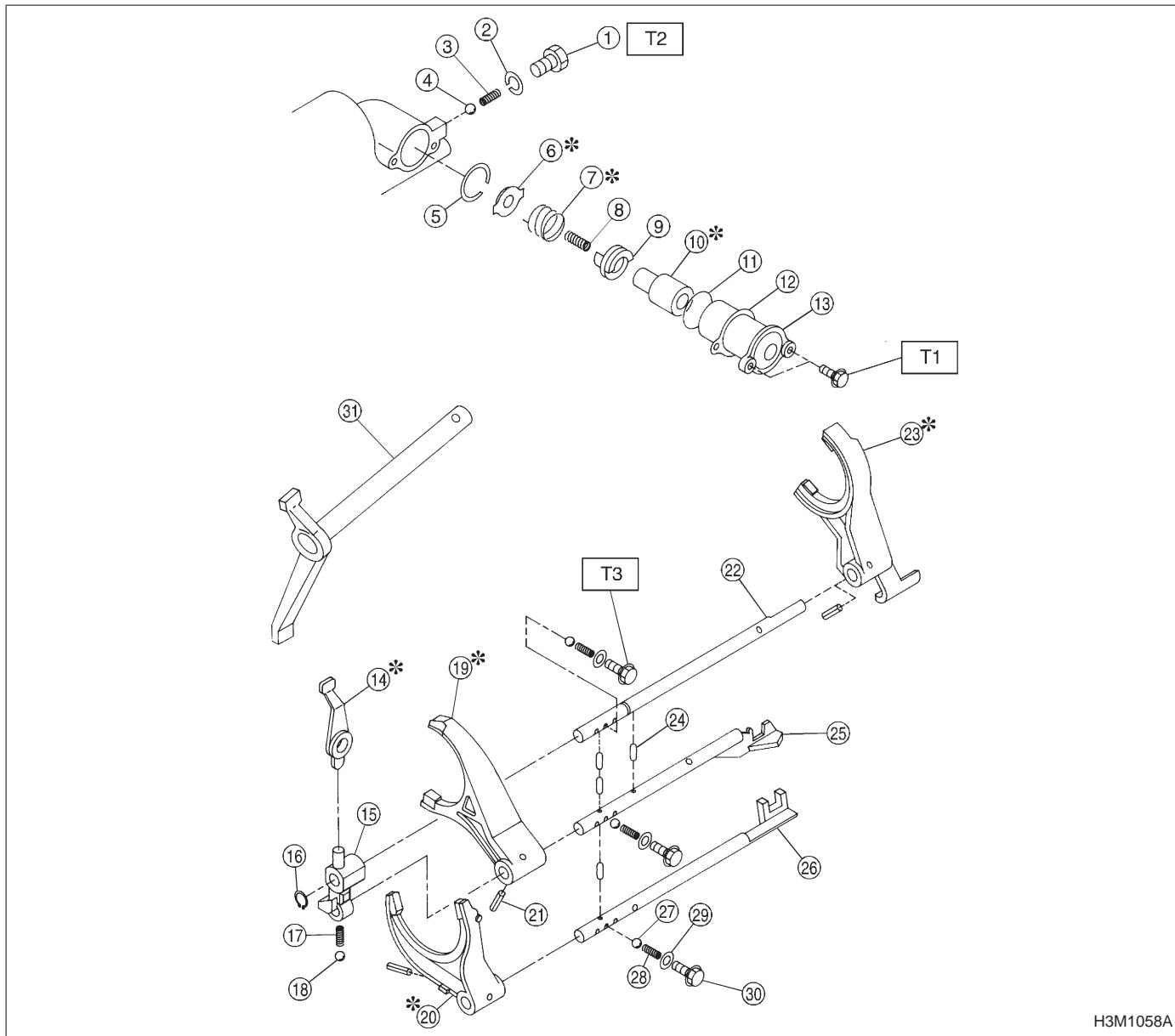
- ① Plug
- ② Gasket
- ③ Reverse accent spring
- ④ Ball
- ⑤ Snap ring (Inner)
- ⑥ Reverse check plate
- ⑦ Reverse checking spring
- ⑧ Reverse return spring
- ⑨ Reverse checking cam
- ⑩ Reverse accent shaft
- ⑪ O-ring
- ⑫ Adjusting select shim
- ⑬ Reverse checking sleeve

- ⑭ Selector arm
- ⑮ Shifter arm
- ⑯ Reverse shifter lever
- ⑰ Reverse fork rod arm
- ⑱ Snap ring (Outer)
- ⑲ Spring
- ⑳ Ball
- ㉑ 3rd-4th shifter fork
- ㉒ 1st-2nd shifter fork
- ㉓ Straight pin
- ㉔ Reverse fork rod
- ㉕ 5th shifter fork
- ㉖ Interlock plunger

- ㉗ 3rd-4th fork rod
- ㉘ 1st-2nd fork rod
- ㉙ Ball
- ㉚ Checking ball spring
- ㉛ Gasket
- ㉜ Checking ball plug

**Tightening torque: N·m (kg·m, ft·lb)**  
**T1: 6 — 7 (0.6 — 0.7, 4.3 — 5.1)**  
**T2: 9 — 11 (0.9 — 1.1, 6.5 — 8.0)**  
**T3: 18.1 — 21.1 (1.85 — 2.15, 13.4 — 15.6)**

## 2. FWD MODEL



H3M1058A

- ① Plug
- ② Gasket
- ③ Reverse accent spring
- ④ Ball
- ⑤ Snap ring (Inner)
- ⑥ Reverse check plate
- ⑦ Reverse check spring
- ⑧ Reverse return spring
- ⑨ Reverse check cam
- ⑩ Reverse accent shaft
- ⑪ O-ring
- ⑫ Adjusting select shim
- ⑬ Reverse check sleeve

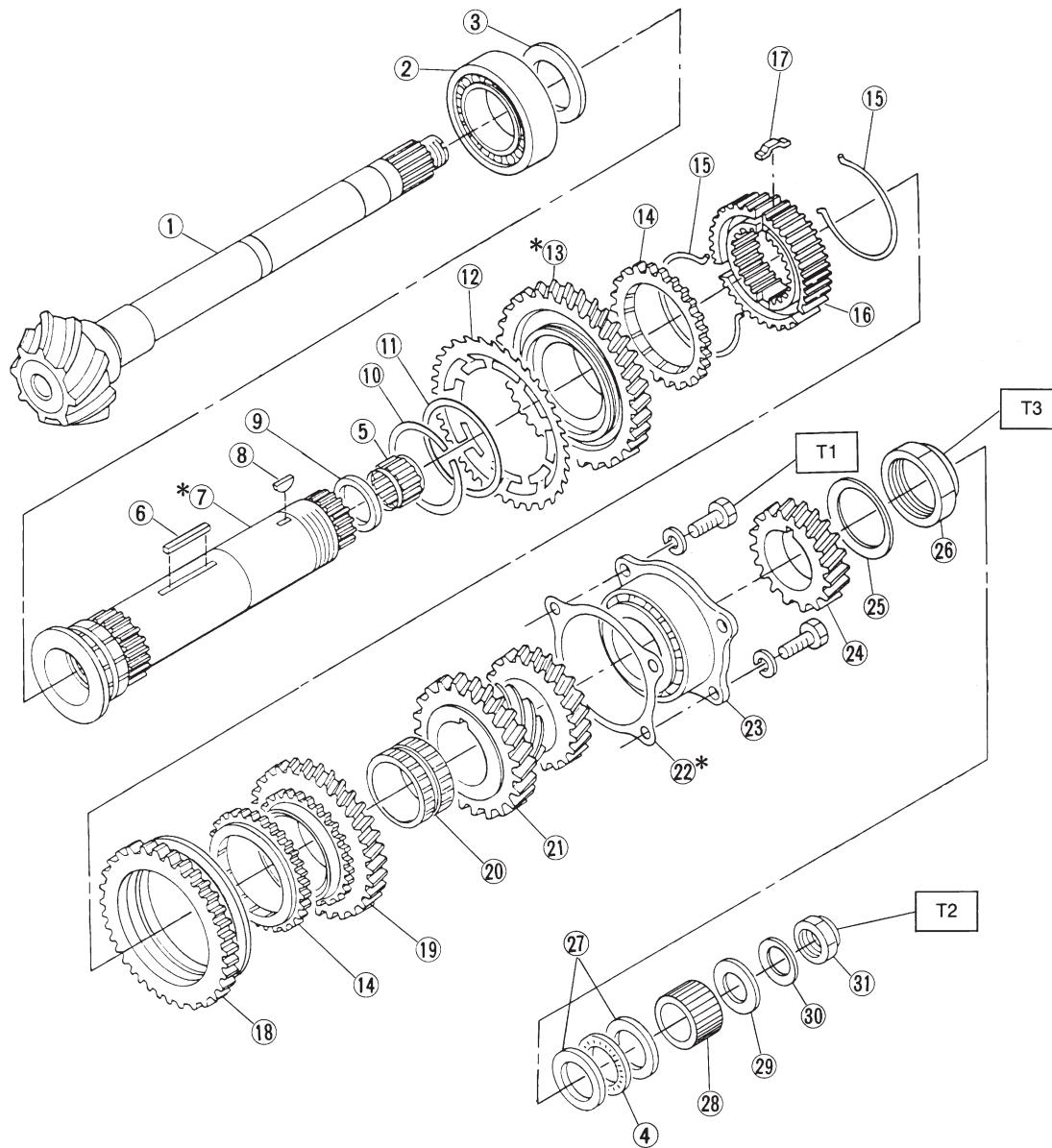
- ⑭ Reverse shifter lever
- ⑮ Reverse fork rod arm
- ⑯ Snap ring (Outer)
- ⑰ Spring
- ⑱ Ball
- ⑲ 3rd-4th shifter fork
- ⑳ 1st-2nd shifter fork
- ㉑ Straight pin
- ㉒ Reverse fork rod
- ㉓ 5th shifter fork
- ㉔ Interlock plunger
- ㉕ 3rd-4th fork rod
- ㉖ 1st-2nd fork rod

- ㉗ Ball
- ㉘ Checking ball spring
- ㉙ Gasket
- ㉚ Checking ball plug
- ㉛ Shifter arm

**Tightening torque: N·m (kg·m, ft·lb)**  
**T1:  $6.4 \pm 0.5$  ( $0.65 \pm 0.05$ ,  $4.7 \pm 0.4$ )**  
**T2:  $10 \pm 1$  ( $1.0 \pm 0.1$ ,  $7.2 \pm 0.7$ )**  
**T3:  $19.6 \pm 1.5$   
 $(2.00 \pm 0.15, 14.5 \pm 1.1)$**

## 5. Drive Pinion Assembly

## 1. AWD MODEL



G3M0510

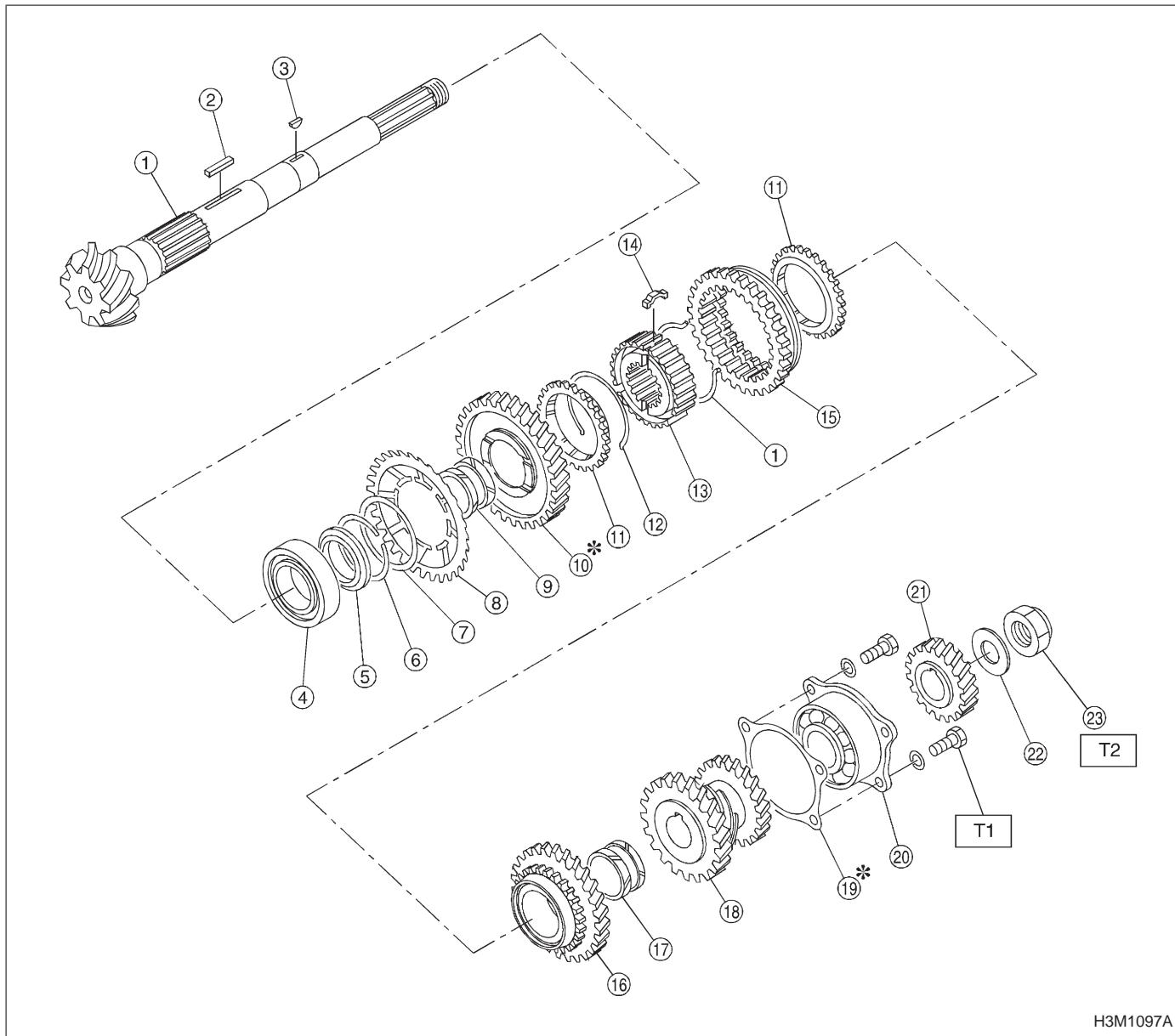
- ① Drive pinion shaft
- ② Roller bearing
- ③ Washer
- ④ Thrust bearing
- ⑤ Needle bearing
- ⑥ Key
- ⑦ Driven shaft
- ⑧ Woodruff key
- ⑨ Drive pinion collar
- ⑩ Snap ring (Outer)
- ⑪ Washer
- ⑫ Sub gear
- ⑬ 1st driven gear

- ⑭ Baulk ring
- ⑮ Spring
- ⑯ 1st-2nd synchronizer hub
- ⑰ Insert
- ⑱ Reverse driven gear
- ⑲ 2nd driven gear
- ⑳ 2nd driven gear bush
- ㉑ 3rd-4th driven gear
- ㉒ Drive pinion shim
- ㉓ Roller bearing
- ㉔ 5th driven gear
- ㉕ Lock washer
- ㉖ Lock nut

- ㉗ Washer
- ㉘ Differential bevel gear sleeve
- ㉙ Washer
- ㉚ Lock washer
- ㉛ Lock nut

**Tightening torque: N·m (kg·m, ft·lb)**  
**T1: 26 — 32 (2.7 — 3.3, 20 — 24)**  
**T2: 110 — 126 (11.2 — 12.8, 81 — 93)**  
**T3: 235 — 255 (24 — 26, 174 — 188)**

## 2. FWD MODEL



H3M1097A

- ① Drive pinion shaft
- ② Key
- ③ Woodruff key
- ④ Roller bearing
- ⑤ 1st gear thrust plate
- ⑥ Snap ring (Outer)
- ⑦ Washer
- ⑧ 1st sub gear
- ⑨ 1st gear bushing
- ⑩ 1st driven gear

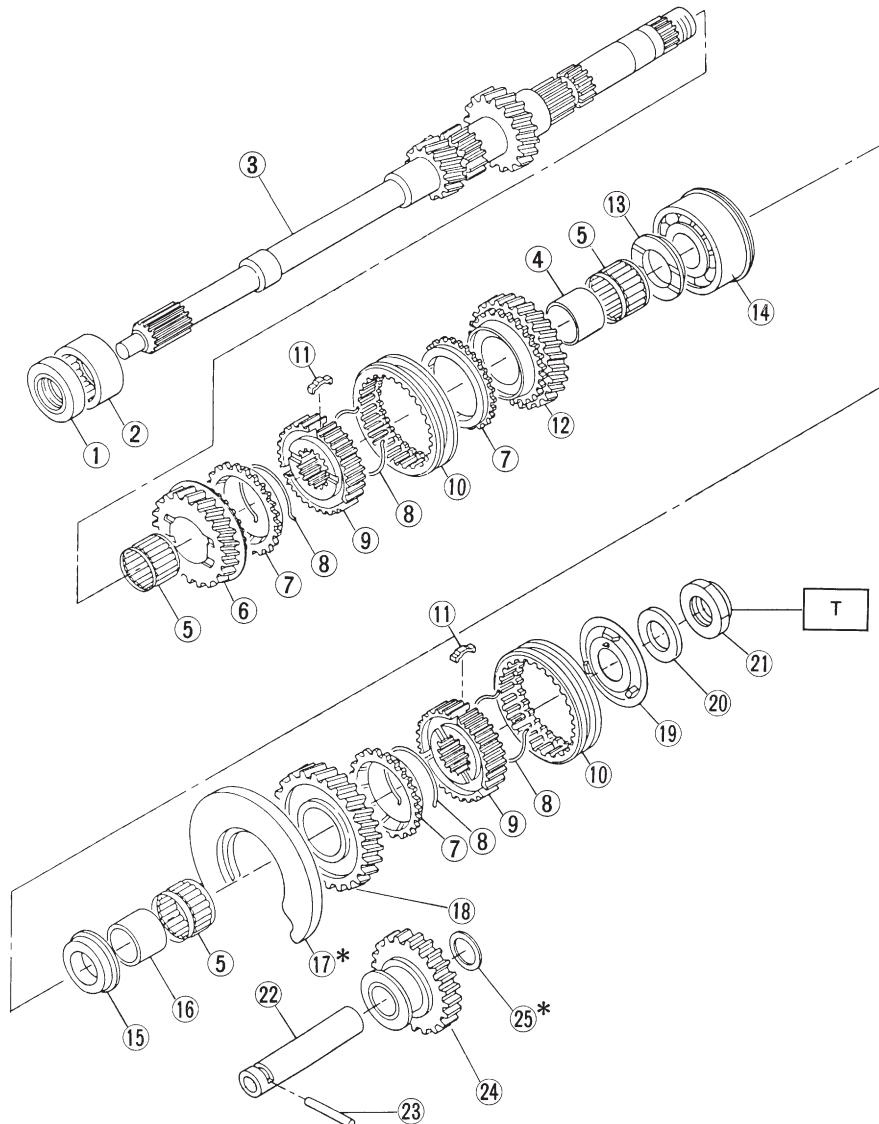
- ⑪ 1st-2nd baulk ring
- ⑫ 1st-2nd synchronizer spring
- ⑬ 1st-2nd synchronizer hub
- ⑭ 1st-2nd shifting insert
- ⑮ Reverse driven gear
- ⑯ 2nd driven gear
- ⑰ 2nd gear bushing
- ⑱ 3rd-4th driven gear
- ⑲ Drive pinion shim
- ⑳ Ball bearing

- ㉑ 5th driven gear
- ㉒ Lock washer
- ㉓ Lock nut

**Tightening torque: N·m (kg·m, ft·lb)**  
**T1:  $29\pm3$  ( $3.0\pm0.3$ ,  $22\pm2$ )**  
**T2:  $118\pm6$  ( $12.0\pm0.6$ ,  $86.8\pm4.3$ )**

## 6. Main Shaft Assembly

## 1. AWD MODEL



G3M0841

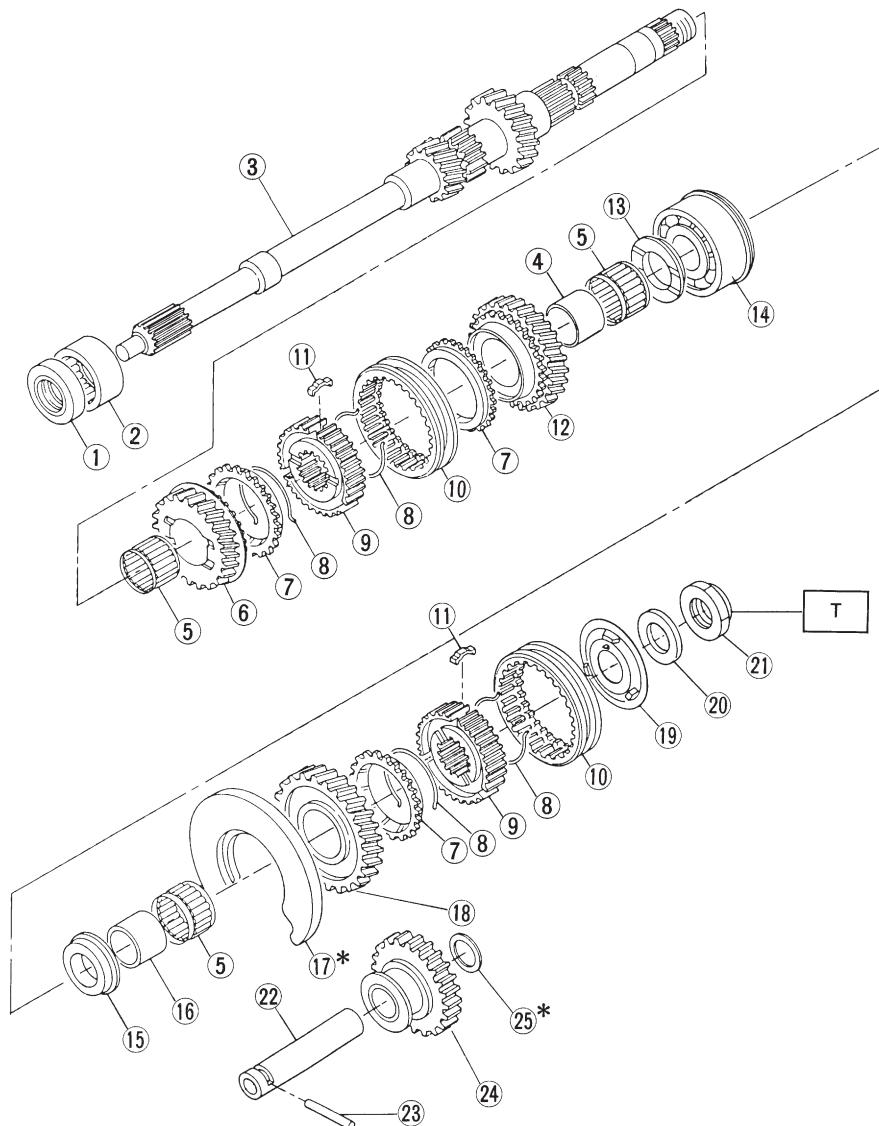
- ① Oil seal
- ② Needle bearing
- ③ Transmission main shaft
- ④ 4th needle bearing race
- ⑤ Needle bearing
- ⑥ 3rd drive gear
- ⑦ Baulk ring
- ⑧ Synchronizer spring
- ⑨ Synchronizer hub
- ⑩ Coupling sleeve

- ⑪ Shifting insert
- ⑫ 4th drive gear
- ⑬ 4th gear thrust washer
- ⑭ Ball bearing
- ⑮ 5th gear thrust washer
- ⑯ 5th needle bearing race
- ⑰ Main shaft rear plate
- ⑱ 5th drive gear
- ⑲ Insert stopper plate
- ⑳ Lock washer

- ㉑ Lock nut
- ㉒ Reverse idler gear shaft
- ㉓ Straight pin
- ㉔ Reverse idler gear
- ㉕ Washer

**Tightening torque: N·m (kg-m, ft-lb)**  
**T: 118±6**  
**(12.0±0.6, 86.8±4.3)**

## 2. FWD MODEL



G3M0841

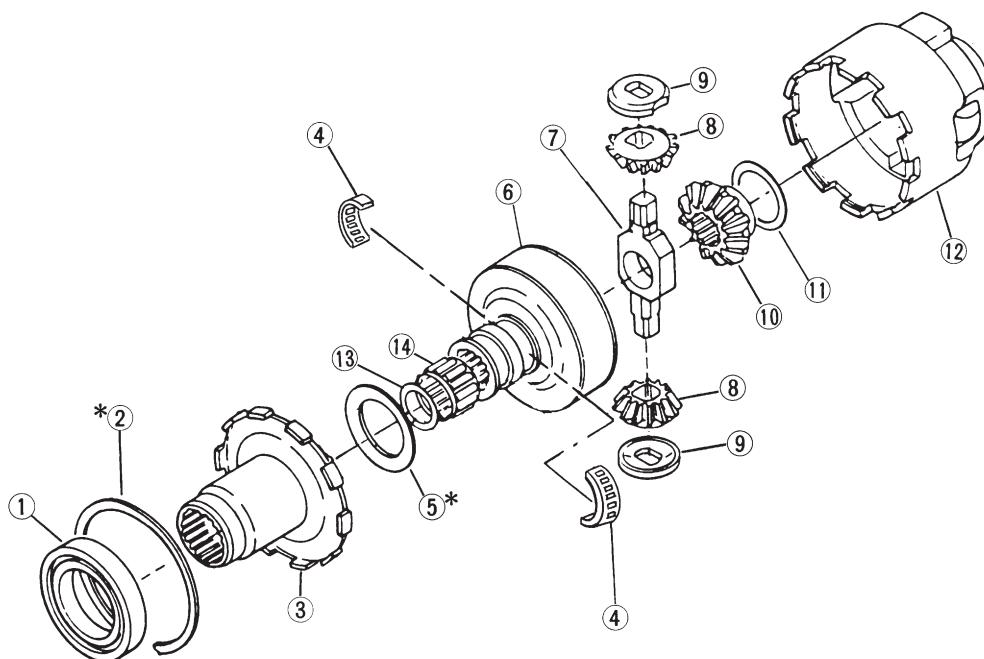
- ① Oil seal
- ② Needle bearing
- ③ Transmission main shaft
- ④ 4th needle bearing race
- ⑤ Needle bearing
- ⑥ 3rd drive gear
- ⑦ Baulk ring
- ⑧ Synchronizer spring
- ⑨ Synchronizer hub
- ⑩ Coupling sleeve

- ⑪ Shifting insert
- ⑫ 4th drive gear
- ⑬ 4th gear thrust washer
- ⑭ Ball bearing
- ⑮ 5th gear thrust washer
- ⑯ 5th needle bearing race
- ⑰ Main shaft rear plate
- ⑱ 5th drive gear
- ⑲ Insert stopper plate
- ⑳ Lock washer

- ㉑ Lock nut
- ㉒ Reverse idler gear shaft
- ㉓ Straight pin
- ㉔ Reverse idler gear
- ㉕ Washer

**Tightening torque: N·m (kg·m, ft·lb)**  
**T: 118±6 (12.0±0.6, 86.8±4.3)**

## 7. Center Differential

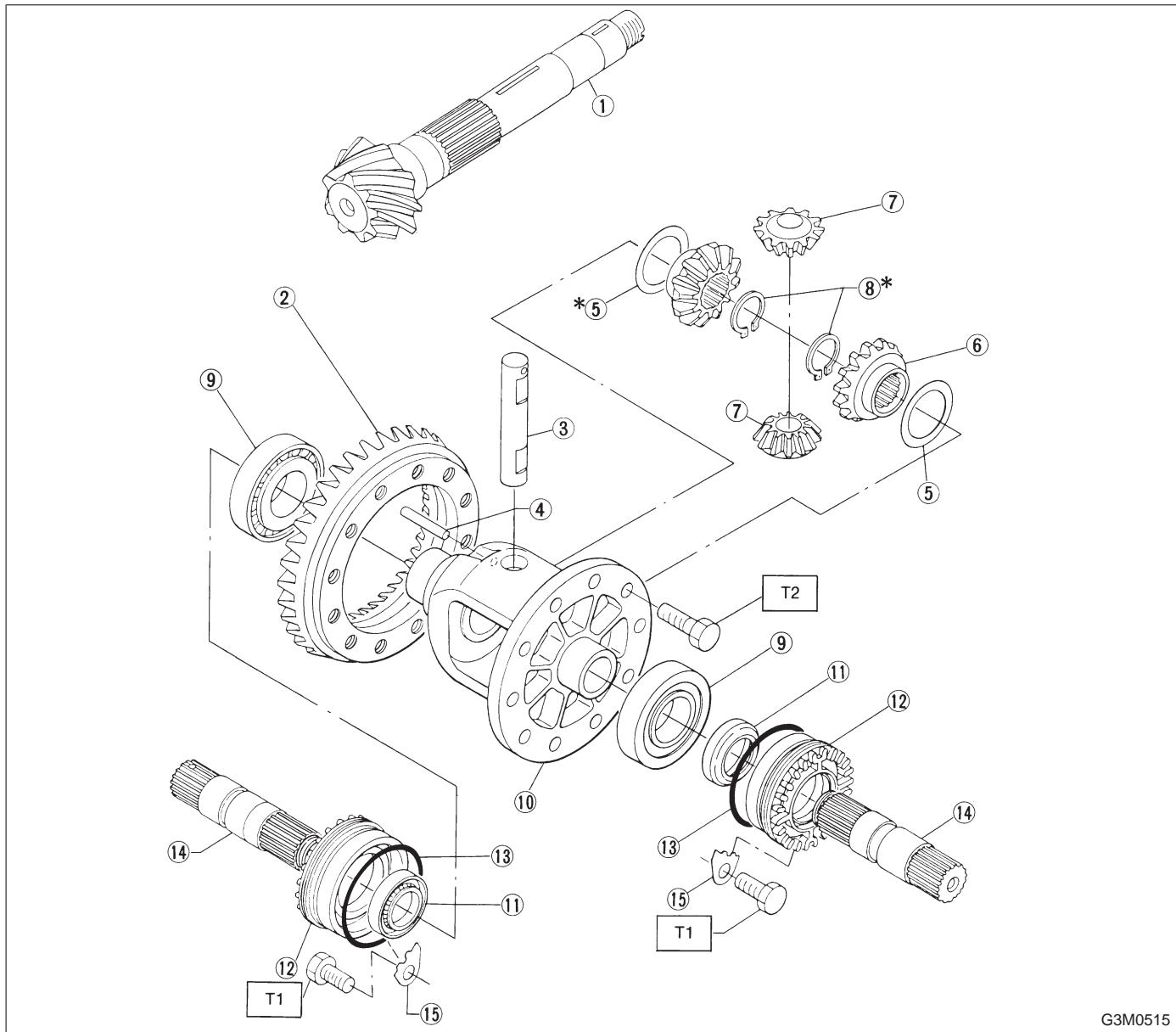


G3M0514

- ① Ball bearing
- ② Snap ring (Inner-110)
- ③ Center differential cover
- ④ Needle bearing
- ⑤ Adjusting washer
- ⑥ Viscous coupling
- ⑦ Pinion shaft

- ⑧ Differential bevel pinion
- ⑨ Retainer
- ⑩ Differential bevel gear
- ⑪ Washer
- ⑫ Center differential case
- ⑬ Snap ring
- ⑭ Roller bearing

## 8. Front Differential



G3M0515

- ① Drive pinion shaft
- ② Hypoid driven gear
- ③ Pinion shaft
- ④ Straight pin
- ⑤ Washer
- ⑥ Differential bevel gear
- ⑦ Differential bevel pinion
- ⑧ Snap ring (Outer)
- ⑨ Roller bearing
- ⑩ Differential case

- ⑪ Oil seal
- ⑫ Differential side retainer
- ⑬ O-ring
- ⑭ Axle drive shaft
- ⑮ Retainer lock plate

**Tightening torque: N·m (kg·m, ft-lb)**

T1:  $25\pm3$  (2.5±0.3, 18±2)

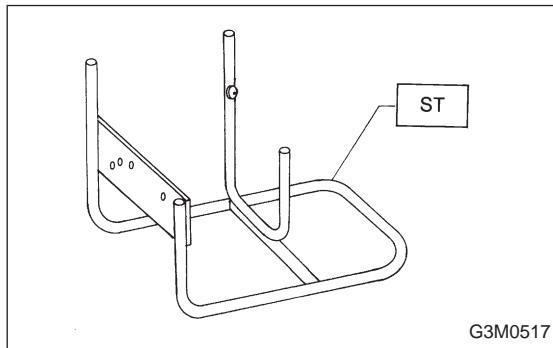
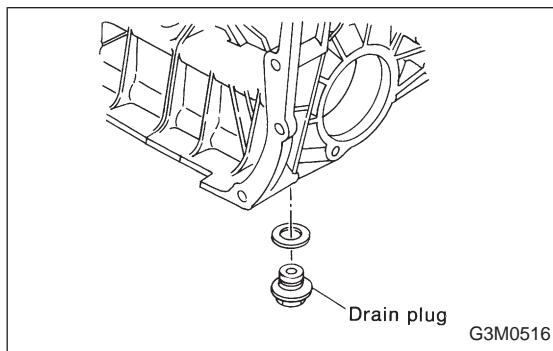
T2:  $62\pm5$  (6.3±0.5, 45.6±3.6)

## 1. General

### A: APPLICATION

Large title	Model	
	AWD	FWD
1 General	<input type="radio"/>	<input type="radio"/>
2 Transfer Case and Extension (AWD Model)	<input type="radio"/>	
3 Rear Case (FWD Model)		<input type="radio"/>
4 Transmission Case (AWD Model)	<input type="radio"/>	
5 Transmission Case (FWD Model)		<input type="radio"/>
6 Drive Pinion Assembly (AWD Model)	<input type="radio"/>	
7 Drive Pinion Assembly (FWD Model)		<input type="radio"/>
8 Main Shaft Assembly (AWD Model)	<input type="radio"/>	
9 Main Shaft Assembly (FWD Model)		<input type="radio"/>
10 Center Differential (AWD Model)	<input type="radio"/>	
11 Front Differential	<input type="radio"/>	<input type="radio"/>

The table above shows the titles of the main sections in Service Procedures and the applicable vehicle models. Carry out service operations by referring to the sections applicable to the vehicle to be serviced.



### B: PRECAUTIONS

- 1) The following job should be followed before disassembly:
  - Clean oil, grease, dirt and dust from transmission.
  - Remove drain plug to drain oil. After draining, retighten it as before.

#### CAUTION:

Replace gasket with a new one.

#### Tightening torque:

41 — 47 N·m (4.2 — 4.8 kg·m, 30 — 35 ft-lb)

- Attach transmission to ST.

ST 499937100 TRANSMISSION STAND SET

- 2) Rotating parts should be coated with oil prior to assembly.
- 3) All disassembled parts, if to be reused, should be reinstalled in the original positions and directions.
- 4) Gaskets and lock washers must be replaced with new ones.
- 5) Liquid gasket should be used where specified to prevent leakage.

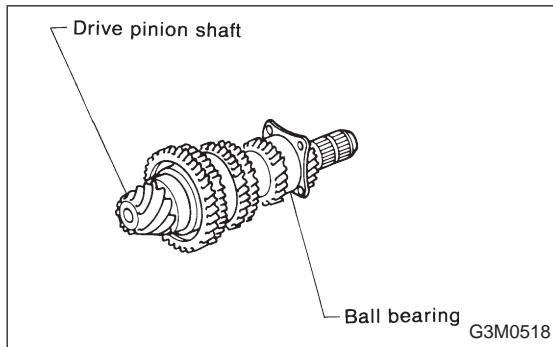
## C: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

### 1) Bearings

Replace bearings in the following cases:

- Bearings whose balls, outer races and inner races are broken or rusty.
- Worn bearings.
- Bearings that fail to turn smoothly or make abnormal noise when turned after gear oil lubrication.



The ball bearing on the rear side of the drive pinion shaft should be checked for smooth rotation before the drive pinion assembly is disassembled. In this case, because a preload is working on the bearing, its rotation feels like it is slightly dragging unlike the other bearings.

- Bearings having other defects.

### 2) Bushing (each gear)

Replace the bushing in the following cases:

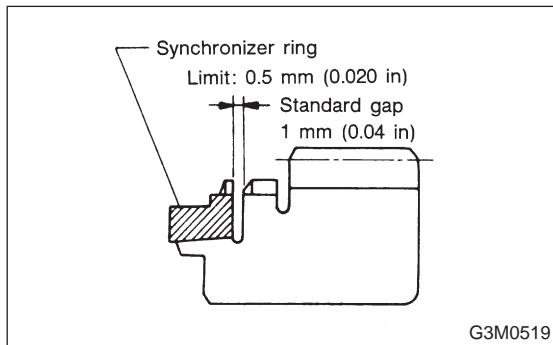
- (1) When the sliding surface is damaged or abnormally worn.
- (2) When the inner wall is abnormally worn.

### 3) Gears

- (1) Replace gears with new ones if their tooth surfaces are broken, damaged, or excessively worn.

- (2) Correct or replace if the cone that contacts the balk ring is rough or damaged.

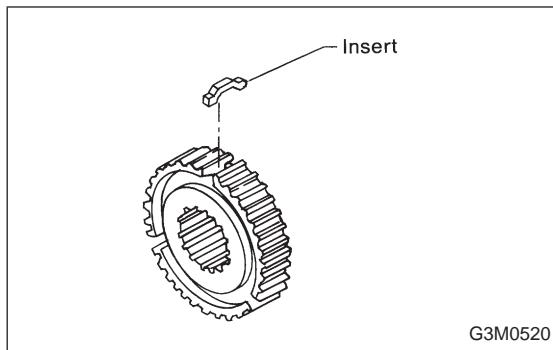
- (3) Correct or replace if the inner surface or end face is damaged.



### 4) Balk ring

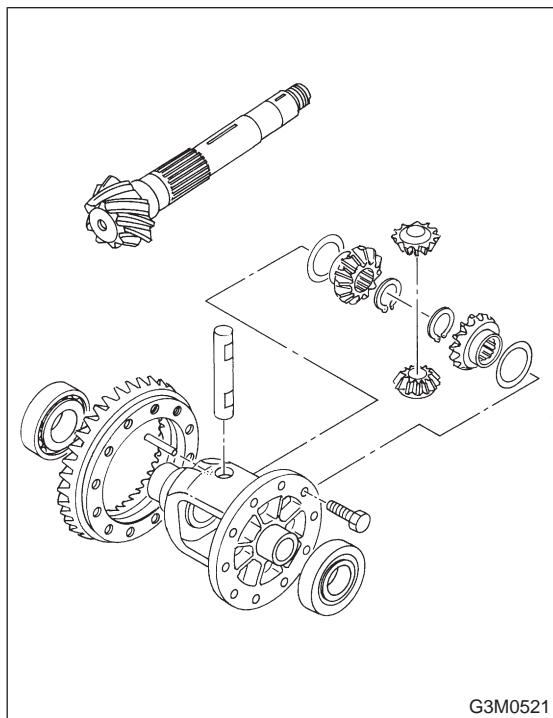
Replace the ring in the following cases:

- When the inner surface and end face are damaged.
- When the ring inner surface is abnormally or partially worn down.
- If the gap between the end faces of the ring and the gear splined part is excessively small when the ring is pressed against the cone.
- When the contact surface of the synchronizer insert is scored or abnormally worn down.



5) Insert (shifting)

Replace the insert if deformed, excessively worn, or defective in any way.



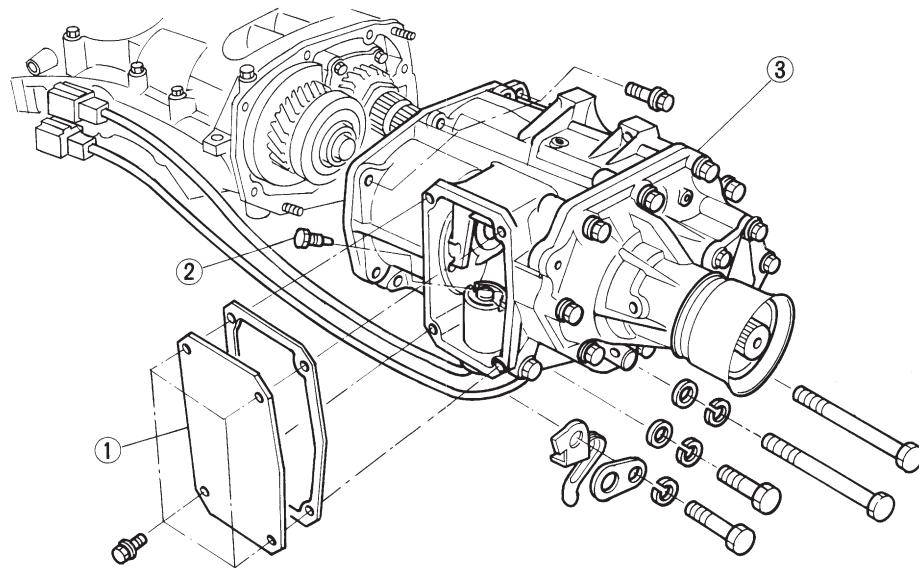
9) Differential gear

Repair or replace the differential gear in the following cases.

- (1) The hypoid drive gear and drive pinion shaft tooth surface are damaged, excessively worn, or seized.
- (2) The roller bearing on the drive pinion shaft has a worn or damaged roller path.
- (3) There is damage, wear, or seizure of the differential bevel pinion, differential bevel gear, washer, pinion shaft, and straight pin.
- (4) The differential case has worn or damaged sliding surfaces.

## 2. Transfer Case and Extension (AWD Model)

### A: REMOVAL

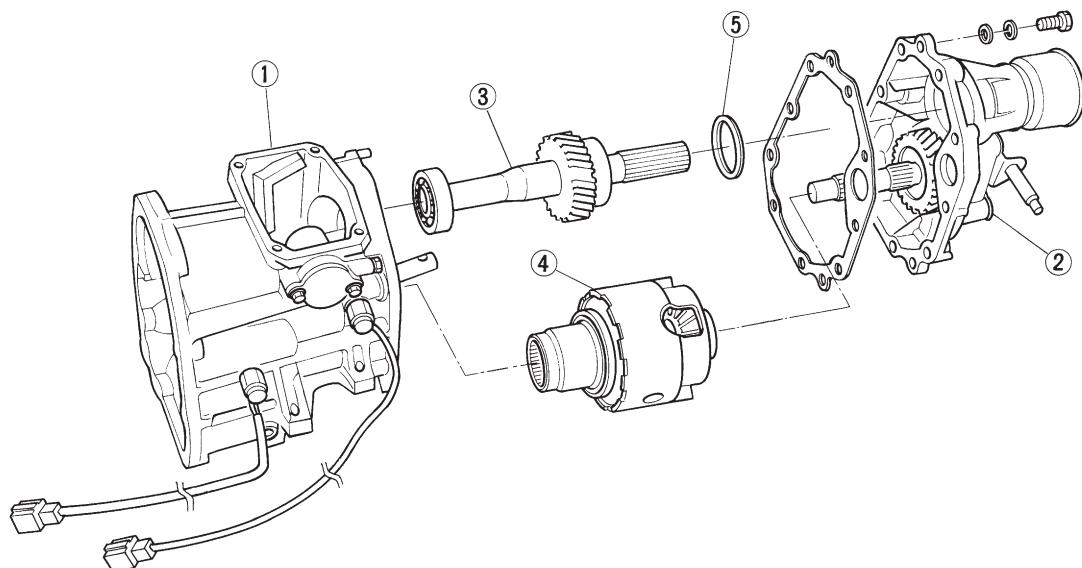


G3M0789

- 1) Remove transfer cover ①.
- 2) Remove shifter fork screw ② which secures selector arm to shifter arm.
- 3) Remove transfer case ③ with extension assembly.

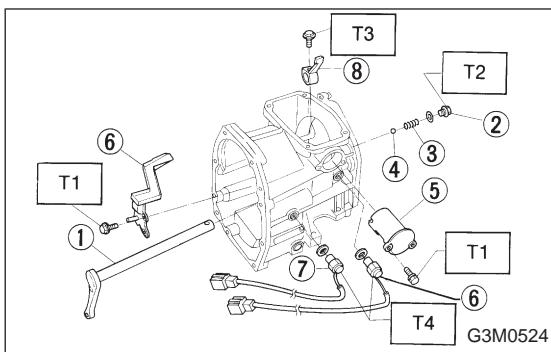
### B: DISASSEMBLY

#### 1. SEPARATION OF TRANSFER CASE AND EXTENSION ASSEMBLY



G3M0523

- 1) Separate transfer case ① and extension assembly ②.
- 2) Remove transfer driven shaft ③ and center differential ④ as a set.
- 3) Remove thrust washer ⑤ (52 x 61 x t).



## 2. TRANSFER CASE

- 1) Remove neutral switch ⑥.

### NOTE:

Before removing shifter arm, disconnect neutral switch.

- 2) Draw out shifter arm ① and remove selector arm ⑧.
- 3) Remove plug ②, spring ③ and reverse check ball ④.

### Tightening torque:

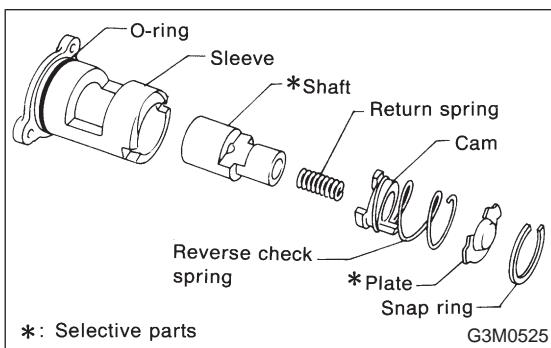
**T1: 6 — 7 N·m (0.6 — 0.7 kg-m, 4.3 — 5.1 ft-lb)**

**T2: 9 — 11 N·m (0.9 — 1.1 kg-m, 6.5 — 8.0 ft-lb)**

**T3: 18.1 — 21.1 N·m**

**(1.85 — 2.15 kg-m, 13.4 — 15.6 ft-lb)**

**T4: 23 — 26 N·m (2.3 — 2.7 kg-m, 17 — 20 ft-lb)**



- 4) Remove reverse checking sleeve.

Disassembly procedure is as follows:

- (1) Using a standard screwdriver, remove snap ring (Inner-28).

### NOTE:

Replace snap ring with a new one if deformed or weakened.

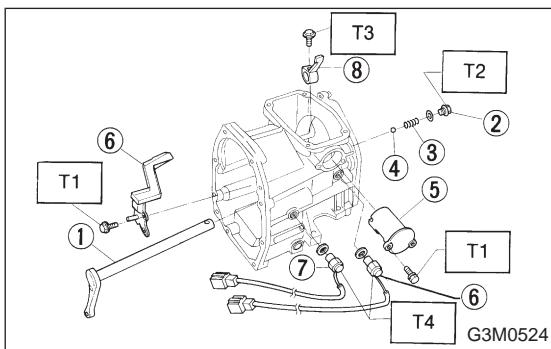
- (2) Remove reverse checking plate.

- (3) Remove reverse checking spring with cam.

- (4) Remove reverse return spring.

- (5) Remove reverse accent shaft.

- (6) Remove O-ring.



- 5) Remove back-up light switch ⑦.

- 6) Remove oil guide.

### Tightening torque:

**T1: 6 — 7 N·m (0.6 — 0.7 kg-m, 4.3 — 5.1 ft-lb)**

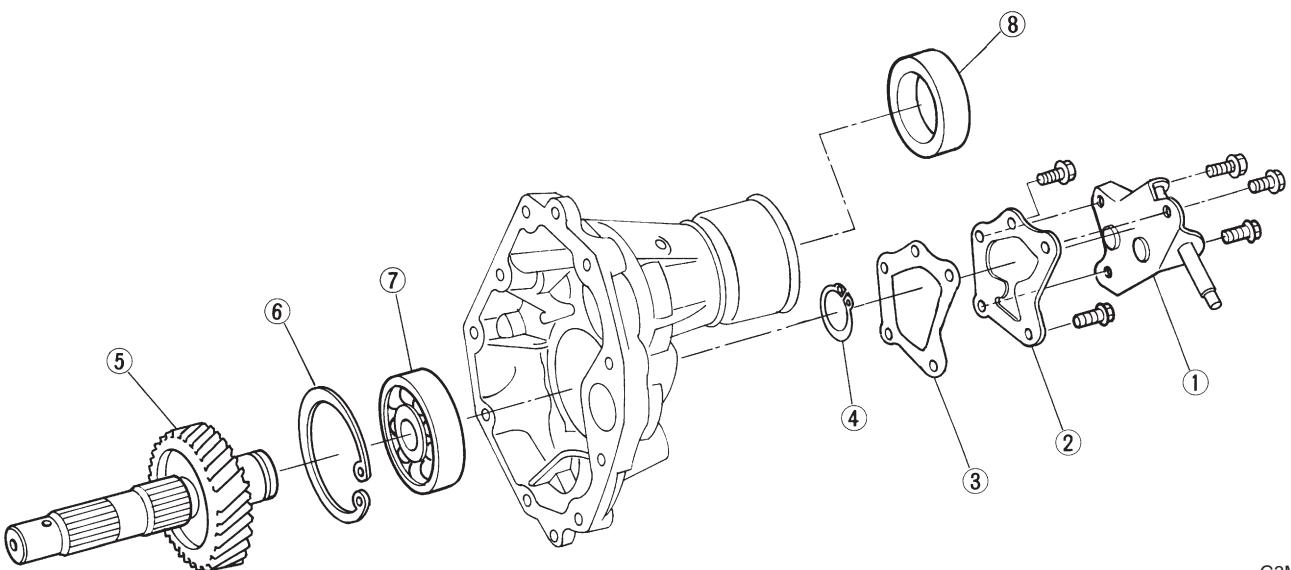
**T2: 9 — 11 N·m (0.9 — 1.1 kg-m, 6.5 — 8.0 ft-lb)**

**T3: 18.1 — 21.1 N·m**

**(1.85 — 2.15 kg-m, 13.4 — 15.6 ft-lb)**

**T4: 23 — 26 N·m (2.3 — 2.7 kg-m, 17 — 20 ft-lb)**

## 3. EXTENSION



G3M0526

- 1) Remove extension cover ② and shift bracket ①.
- 2) Remove snap ring (Outer-30) ④.
- 3) Remove transfer drive shaft ⑤.

**CAUTION:****Do not remove ball bearing unless replacing.**

- 4) Remove snap ring (Inner-72) ⑥.
- 5) Removal of ball bearing ⑦.

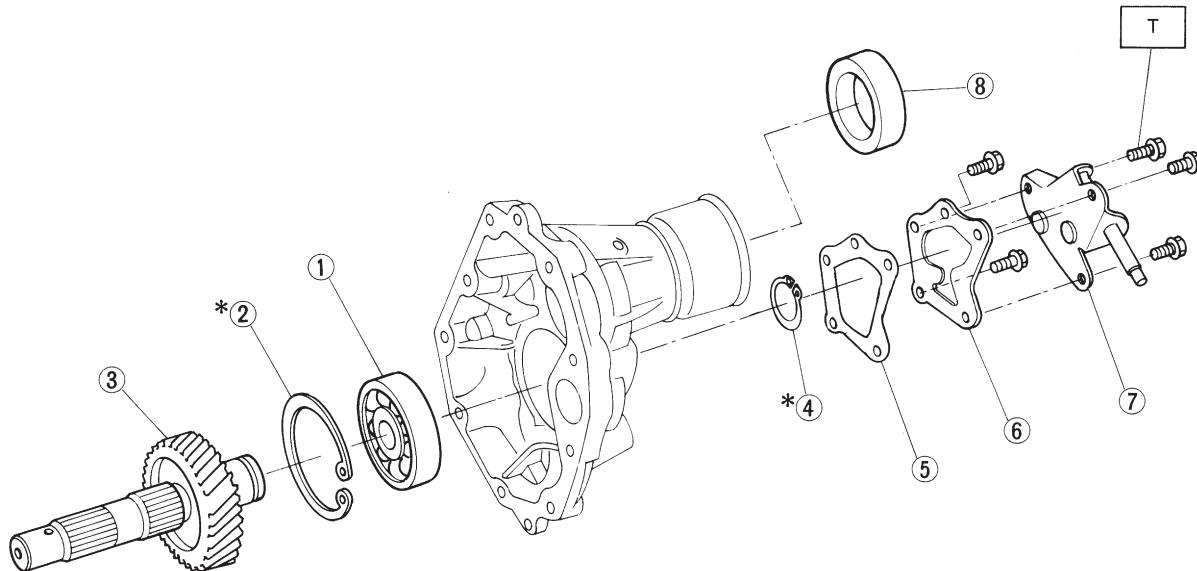
**CAUTION:****Do not reuse ball bearing.**

- 6) Removal of oil seal ⑧.

**CAUTION:****Do not reuse oil seal.**

## C: ASSEMBLY

## 1. EXTENSION



G3M0953

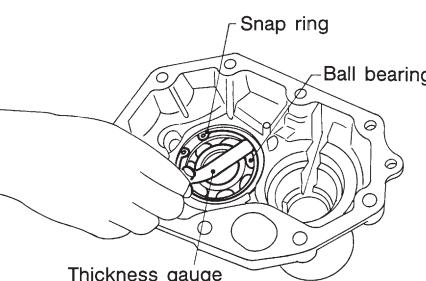
**Tightening torque: N·m (kg·m, ft-lb)**  
**T: 23 — 26 (2.3 — 2.7, 17 — 20)**

- 1) Installation of ball bearing ① and selection of snap ring (Inner-72) ②.
  - (1) Attach ball bearing ① (30 x 72 x 17) to extension and install snap ring.

- (2) Measure clearance between snap ring and outer race of ball bearing ①.

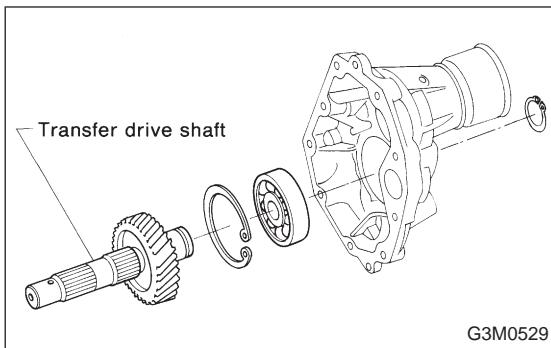
**CAUTION:****Replace ball bearing with a new one.****Clearance:****0 — 0.15 mm (0 — 0.0059 in)**

- (3) If the measurement is not within the specification, select suitable snap ring ②.

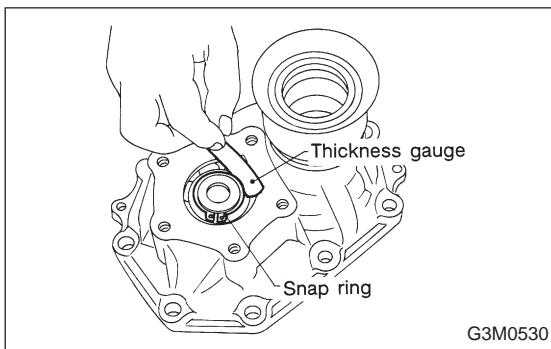


G3M0528

• Snap ring (Inner-72)	Part No.	Thickness mm (in)
	805172071	1.78 (0.0701)
	805172072	1.90 (0.0748)
	805172073	2.02 (0.0795)



2) Installation of transfer drive shaft.  
Press transfer drive shaft into inner race of ball bearing.



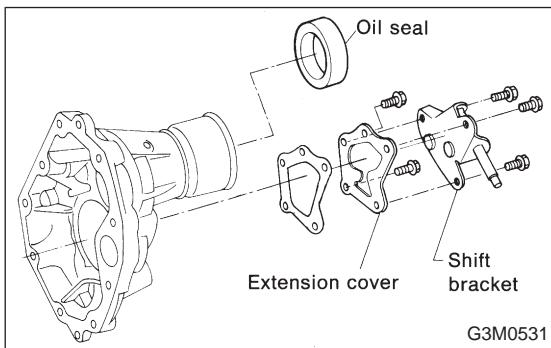
3) Selection of snap ring (Outer-30).

- (1) Install snap ring on transfer drive shaft.
- (2) Measure clearance between snap ring and inner race of ball bearing.

**Clearance:**  
***0 — 0.15 mm (0 — 0.0059 in)***

- (3) If the measurement is not within the specification, select suitable ring.

● Snap ring (Outer-30)	Part No.	Thickness mm (in)
	805030041	1.53 (0.0602)
	805030042	1.65 (0.0650)
	805030043	1.77 (0.0697)

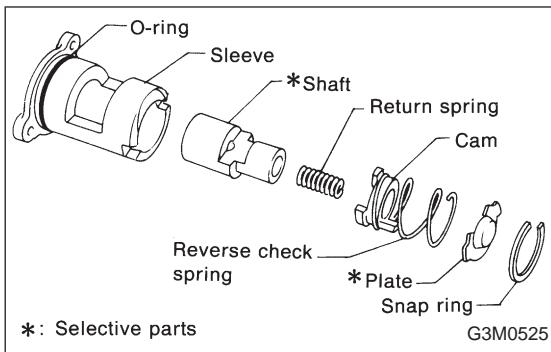


4) Install extension cover and shift bracket.

**CAUTION:**  
**Use new gasket.**

5) Install oil seal with ST.  
ST 498057300 INSTALLER

**CAUTION:**  
**Use new oil seal.**



## 2. TRANSFER CASE

Assembly of transfer case is in the reverse order of disassembly. Observe the following:

### 1) Assembly of reverse checking sleeve.

(1) Install reverse accent shaft, checking cam, return spring and checking spring onto reverse checking sleeve.

#### NOTE:

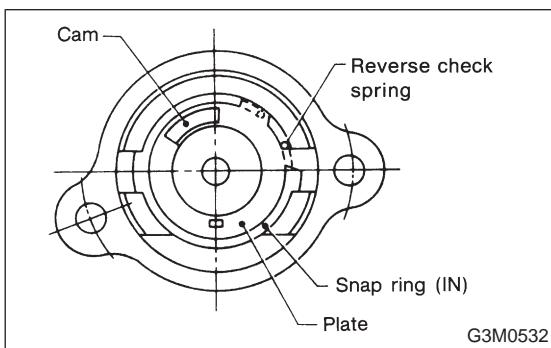
Be sure the bent section of reverse checking spring is positioned in the groove in checking cam.

(2) Hook the bent section of reverse checking spring over reverse check plate.

(3) Rotate cam so that the protrusion of reverse checking cam is at the opening in plate.

(4) With cam held in that position, install plate onto reverse checking sleeve and hold with snap ring (Inner-28).

(5) Position O-ring (35.4 x 1.5) in groove in sleeve.



#### CAUTION:

- Make sure the cutout section of reverse accent shaft is aligned with the opening in reverse checking sleeve.

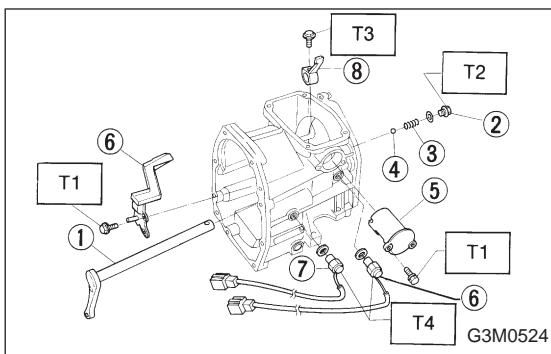
- Spin cam by hand for smooth rotation.

If it does not return properly, replace reverse checking spring.

- Move cam and shaft all the way toward plate and release.

If cam does not return properly, replace reverse checking spring; if shaft does not, check for scratches on the inner surface of sleeve. If sleeve is in good order, replace spring.

- Select a suitable reverse accent shaft and reverse check plate by referring to "Neutral Position Adjustment."



2) Installation of shifter arm ① and selector arm ⑧.  
Install shifter arm into the partition from the front while inserting selector arm into the opening in reverse checking sleeve. Pass shaft through hole in selector arm until its end comes out of the rear of transfer case.

**NOTE:**

Apply a coat of gear oil to shifter arm. Also make sure oil seal is positioned properly.

**Tightening torque:**

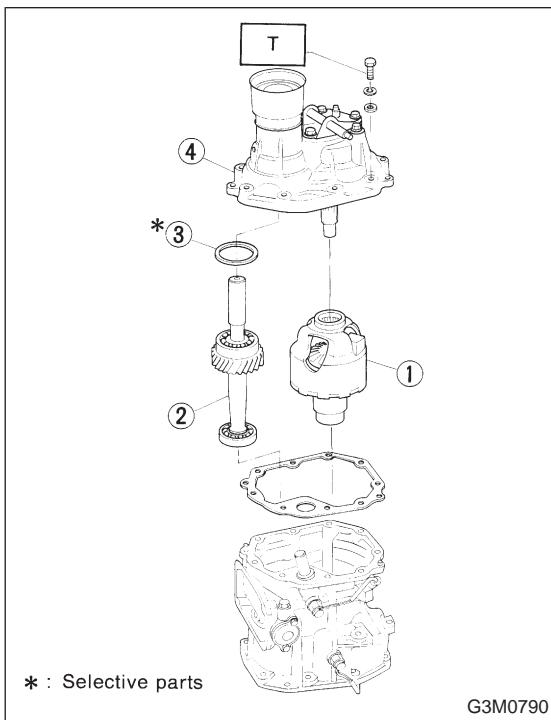
T1: 6 — 7 N·m (0.6 — 0.7 kg-m, 4.3 — 5.1 ft-lb)

T2: 9 — 11 N·m (0.9 — 1.1 kg-m, 6.5 — 8.0 ft-lb)

T3: 18.1 — 21.1 N·m

(1.85 — 2.15 kg-m, 13.4 — 15.6 ft-lb)

T4: 23 — 26 N·m (2.3 — 2.7 kg-m, 17 — 20 ft-lb)

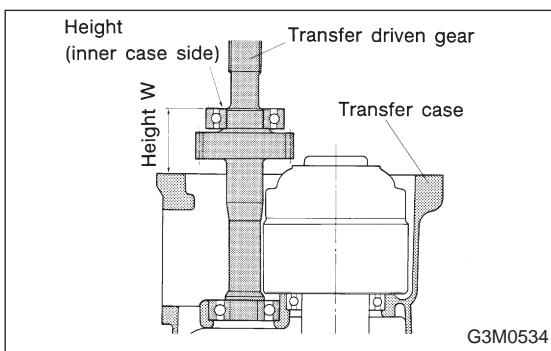


### 3. COMBINATION OF TRANSFER CASE AND EXTENSION ASSEMBLY

1) Install center differential ① and transfer drive shaft ② into transfer case.

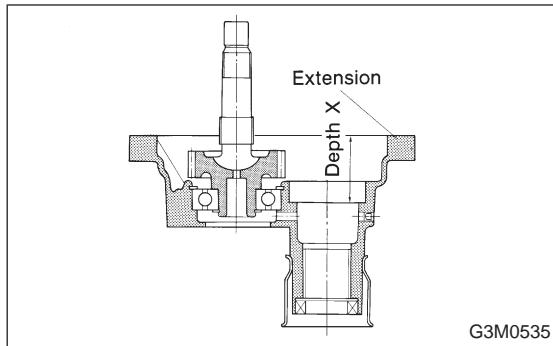
**Tightening torque:**

T: 34 — 40 N·m (3.5 — 4.1 kg-m, 25 — 30 ft-lb)



2) Selection of thrust washers ③ (52 x 61 x t)

(1) Measure height "W" as shown in figure.



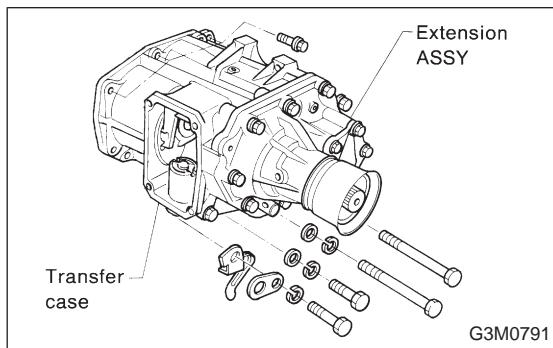
- (2) Measure depth "X" as shown in figure.
- (3) Calculate space "Y" using the following equation:  $Y = X - W + 0.24 \text{ mm (0.0094 in)}$  [Thickness of gasket]
- (4) Select suitable washer in the following table.

• Thrust washer (52 x 61 x t)	Space "Y" mm (in)	Part No.	Thickness mm (in)
	0.55 — 0.79 (0.0217 — 0.0311)	803052021	0.50 (0.0197)
	0.80 — 1.04 (0.0315 — 0.0409)	803052022	0.75 (0.0295)
	1.05 — 1.30 (0.0413 — 0.0512)	803052023	1.00 (0.0394)

**Standard clearance between thrust washer and ball bearing:**

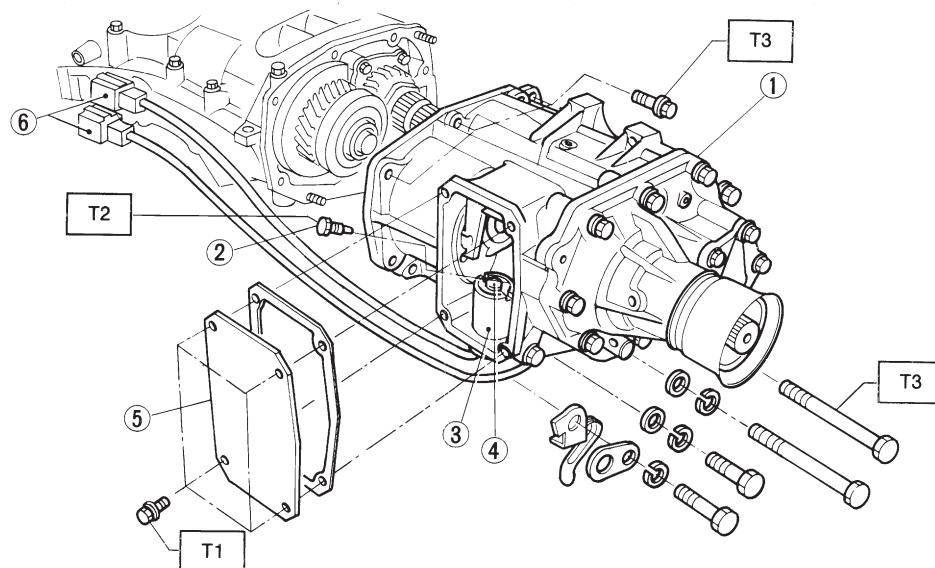
**0.05 — 0.30 mm (0.0020 — 0.0118 in)**

- (5) Fit thrust washers on transfer drive shaft.



- 3) Install extension assembly into transfer case.

## D: INSTALLATION



G3M0792

**Tightening torque: N·m (kg·m, ft·lb)**

T1: 14.2 – 17.2 (1.45 – 1.75, 10.5 – 12.7)

T2: 18.1 – 21.1 (1.85 – 2.15, 13.4 – 15.6)

T3: 23 – 26 (2.3 – 2.7, 17 – 20)

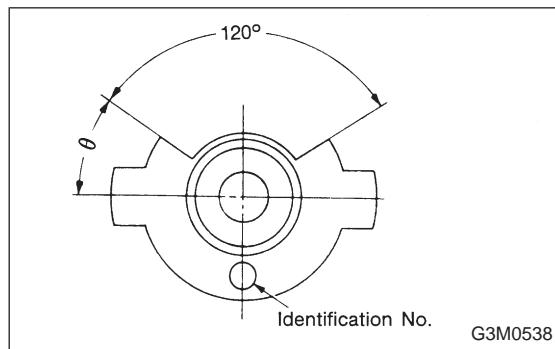
- 1) Install transfer case with extension assembly ①.
- 2) Secure selector arm to shifter arm with shifter fork screw ②. Shifter arm should be caught by pawl of rod. Selector arm must be engaged with reverse check sleeve assembly.
- 3) Adjustment of neutral position.
  - (1) Shift gear into 3rd gear position.
  - (2) Shifter arm turns lightly toward the 1st/2nd gear side but heavily toward the reverse gear side because of the function of the return spring, until arm contacts the stopper.
  - (3) Make adjustment so that the heavy stroke (reverse side) is a little more than the light stroke (1st/2nd side).
  - (4) To adjust, remove bolts holding reverse check sleeve assembly ③ to the case, move sleeve assembly outward, and place adjustment shim (0 to 1 ea.) between sleeve assembly and case to adjust the clearance.

**CAUTION:****Be careful not to break O-ring when placing shim(s).**

• Adjustment shim	Part No.	Thickness mm (in)
	32190AA000	0.15 (0.0059)
	32190AA010	0.30 (0.0118)

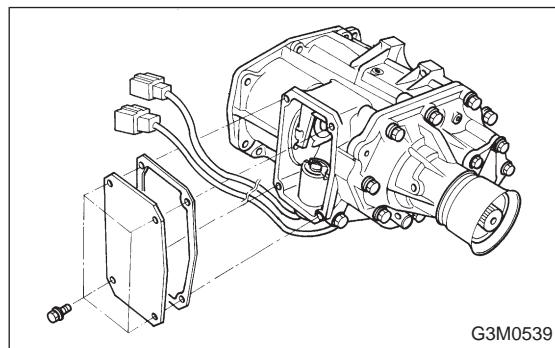
- When shim is removed, the neutral position will move closer to reverse; when shim is added, the neutral position will move closer to 1st gear.
- If shims alone cannot adjust the clearance, replace reverse accent shaft and re-adjust.

• Reverse accent shaft	Part No.	Mark	Remarks
	32188AA020	A	Neutral position is closer to 1st gear.
	32188AA002	No mark or B	Standard
	32188AA030	C	Neutral position is closer to reverse gear.



4) Reverse check plate ④ adjustment.  
Shift shifter arm to "5th" and then to reverse to see if reverse check mechanism operates properly. Also check to see if arm returns to Neutral when released from the reverse position. If arm does not return properly, replace reverse check plate.

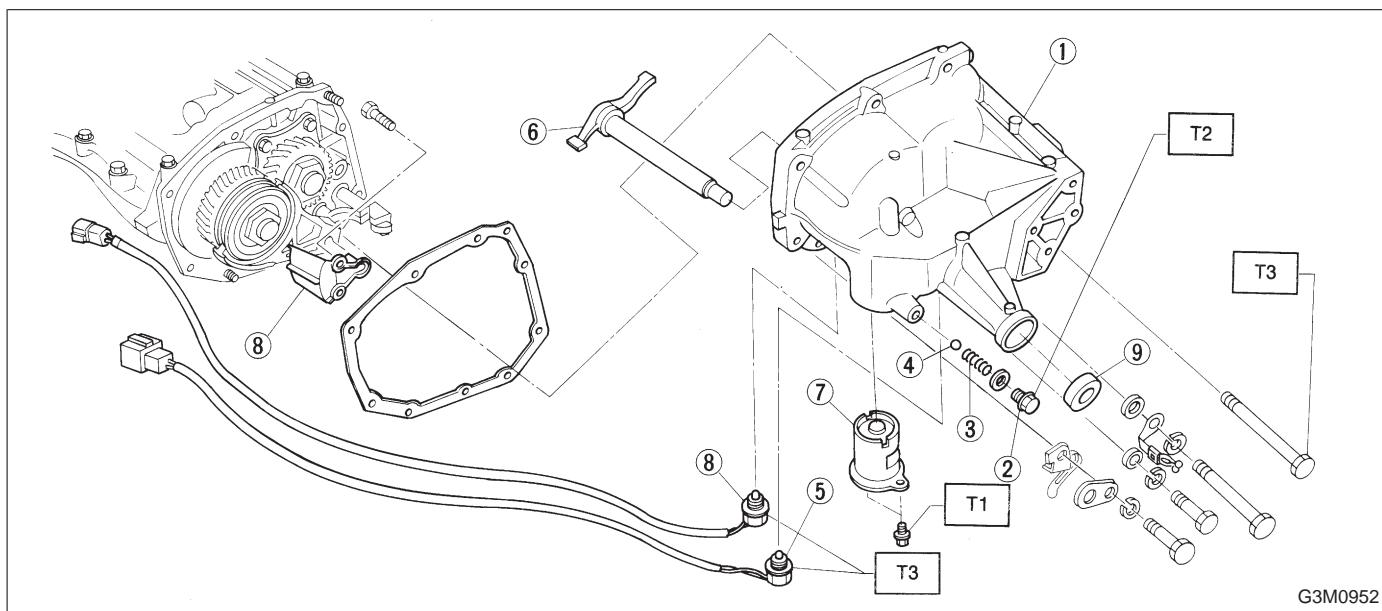
• Reverse check plate	Part No.	No.	Angle $\theta$	Remarks
	32189AA000	0	28°	Arm stops closer to 5th.
	32189AA010	1	31°	Arm stops closer to 5th.
	32189AA020	2	34°	Arm stops in the center.
	32189AA030	3	37°	Arm stops closer to reverse gear.
	32189AA040	4	40°	Arm stops closer to reverse gear.



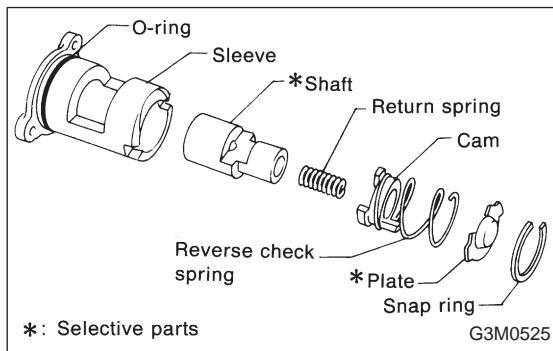
5) Install transfer cover and gasket.  
6) Connect each switch.

### 3. Rear Case (FWD Model)

#### A: DISASSEMBLY



- 1) Remove rear case ①.
- 2) Remove plug ②, spring ③ and reverse check ball ④.
- 3) Remove neutral switch ⑤.
- 4) Pull out shifter arm ⑥.



- 5) Remove reverse checking sleeve ⑦.

Procedure for disassembly is as follows:

- Reverse check sleeve assembly uses an O-ring which should not be scratched.
- Be careful not to break adjustment shim placed between reverse check sleeve assembly and case.

(1) Using a standard screwdriver, remove snap ring (Inner-28).

#### NOTE:

Replace snap ring with a new one if deformed or weakened.

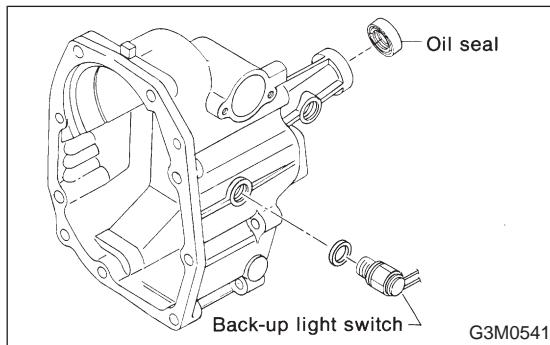
- (2) Remove reverse checking plate.
- (3) Remove reverse checking spring with cam.
- (4) Remove reverse return spring.
- (5) Remove reverse accent shaft.
- (6) Remove O-ring.

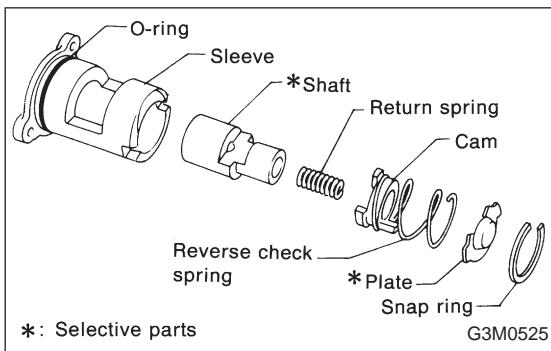
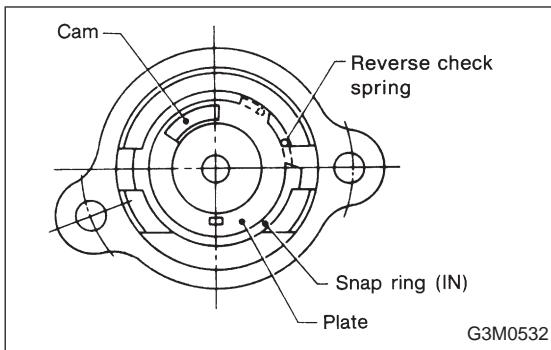
- 6) Remove back-up light switch.

- 7) Removal of oil seal.

#### CAUTION:

**Do not reuse oil seal.**





## B: ASSEMBLY

Assembly of rear case is in the reverse order of disassembly. Observe the following:

### 1) Assembly of reverse checking sleeve.

(1) Install reverse accent shaft, checking cam, return spring and checking spring onto reverse checking sleeve.

#### NOTE:

Be sure the bent section of reverse checking spring is positioned in the groove in checking cam.

(2) Hook the bent section of reverse checking spring over reverse check plate.

(3) Rotate cam so that the protrusion of reverse checking cam is at the opening in plate.

(4) With cam held in that position, install plate onto reverse checking sleeve and hold with snap ring (Inner-28).

(5) Position O-ring (35.4 x 1.5) in groove in sleeve.

#### NOTE:

- Make sure the cutout section of reverse accent shaft is aligned with the opening in reverse checking sleeve.

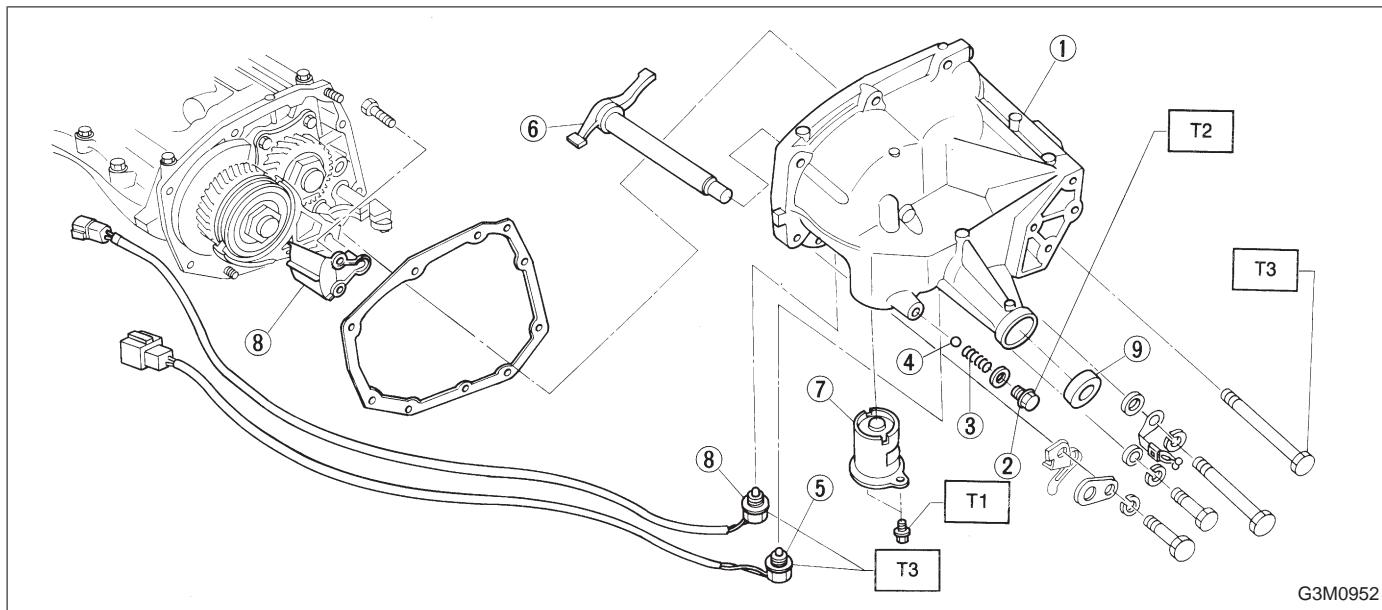
- Spin cam by hand for smooth rotation.

If it does not return properly, replace reverse checking spring.

- Move cam and shaft all the way toward plate and release.

If cam does not return properly, replace reverse checking spring; if shaft does not, check for scratches on the inner surface of sleeve. If sleeve is in good order, replace spring.

- Select a suitable reverse accent shaft and reverse check plate by referring to "Neutral Position Adjustment."



**Tightening torque: N·m (kg·m, ft·lb)**

T1:  $6.4 \pm 0.5$  ( $0.65 \pm 0.05$ ,  $4.7 \pm 0.4$ )

T2:  $10 \pm 1$  ( $1.0 \pm 0.1$ ,  $7.2 \pm 0.7$ )

T3:  $25 \pm 5$  ( $2.5 \pm 0.5$ ,  $18.1 \pm 3.6$ )

2) Installation of shifter arm ⑥

Install shifter arm into the partition from the front while inserting selector arm into the opening in reverse check sleeve. Pass shaft through hole in selector arm until its end comes out of the rear of transfer case.

**CAUTION:**

**Apply a coat of gear oil to shifter arm. Also make sure oil seal is positioned properly.**

3) Adjustment of neutral position

**NOTE:**

After assembling and installing rear case, adjust neutral position.

(1) Shift gear into 3rd gear position.

(2) Shifter arm turns lightly toward the 1st/2nd gear side but heavily toward the reverse gear side because of the function of the return spring, until arm contacts the stopper.

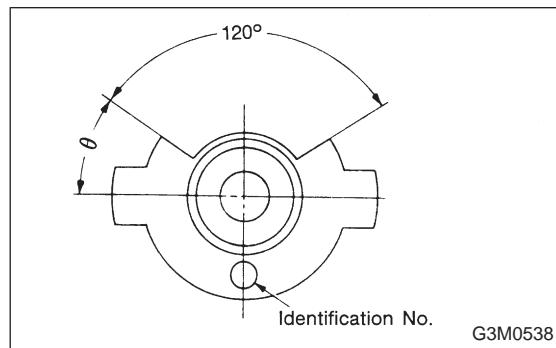
(3) Make adjustment so that the heavy stroke (reverse side) is a little more than the light stroke (1st/2nd side).

(4) To adjust, remove bolts holding reverse check sleeve assembly to the case, move sleeve assembly outward, and place adjustment shim (0 to 1 ea.) between sleeve assembly and case to adjust the clearance.

## NOTE:

- When shim is removed, the neutral position will move closer to reverse; when shim is added, the neutral position will move closer to 1st gear.
- If shims alone cannot adjust the clearance, replace reverse accent shaft and re-adjust.

• Reverse accent shaft	Part No.	Mark	Remarks
	32188AA020	A	Neutral position is closer to 1st gear.
	32188AA002	No mark or B	Standard
	32188AA030	C	Neutral position is closer to reverse gear.



## 4) Reverse checking plate adjustment

## NOTE:

After assembling and installing rear case, adjust reverse checking plate.

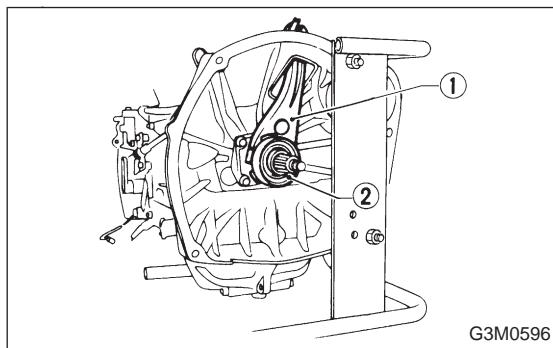
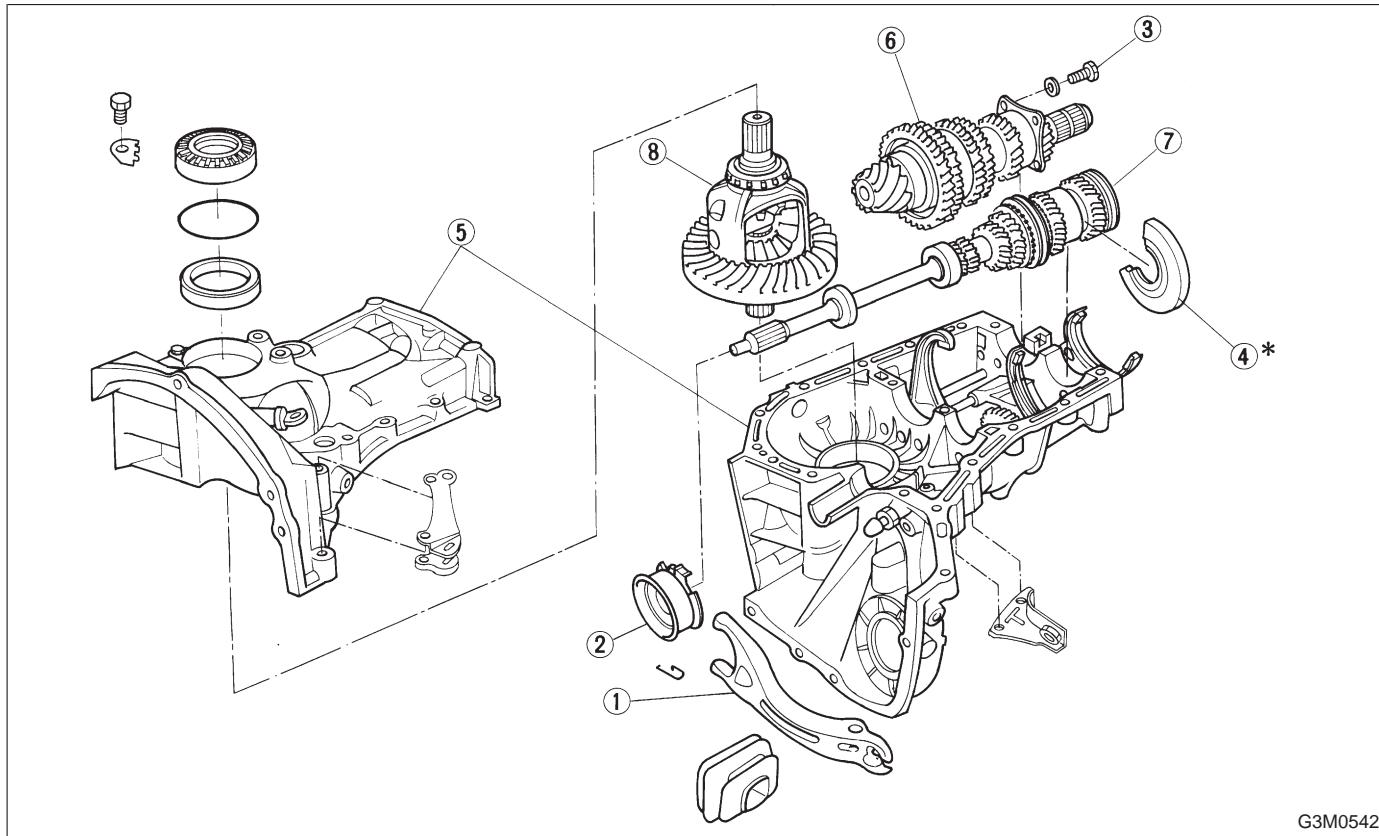
Shift shifter arm to "5th" and then to reverse to see if reverse checking mechanism operates properly. Also check to see if arm returns to Neutral when released from the reverse position. If arm does not return properly, replace reverse checking plate.

• Reverse checking plate	Part No.	No.	Angle θ	Remarks
	32189AA000	0	28°	Arm stops closer to 5th gear.
	32189AA010	1	31°	Arm stops closer to 5th gear.
	32189AA020	2	34°	Arm stops in the center.
	32189AA030	3	37°	Arm stops closer to reverse gear.
	32189AA040	4	40°	Arm stops closer to reverse gear.

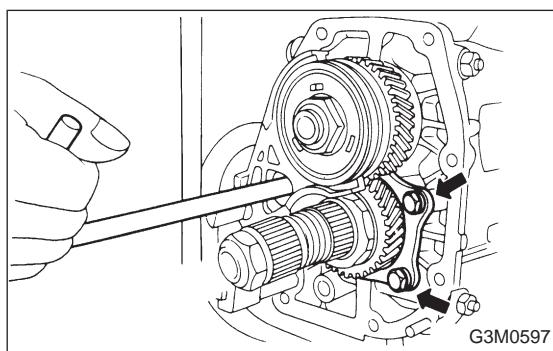
## 4. Transmission Case (AWD Model)

### A: DISASSEMBLY

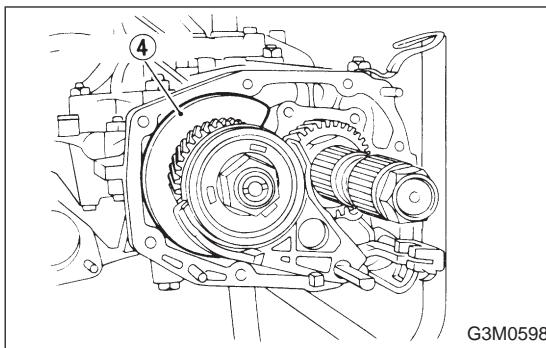
#### 1. SEPARATION OF TRANSMISSION



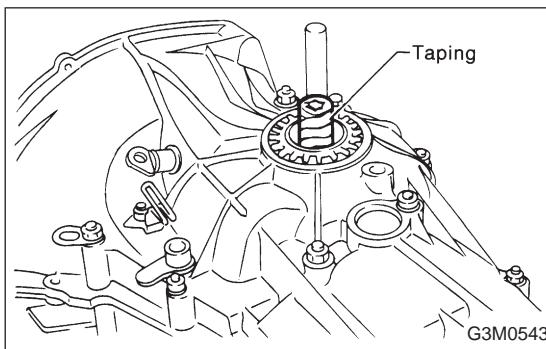
1) Remove clutch release lever ① and bearing ②. <Ref. to 2-10 [W3A0].>



2) Remove bearing mounting bolts.

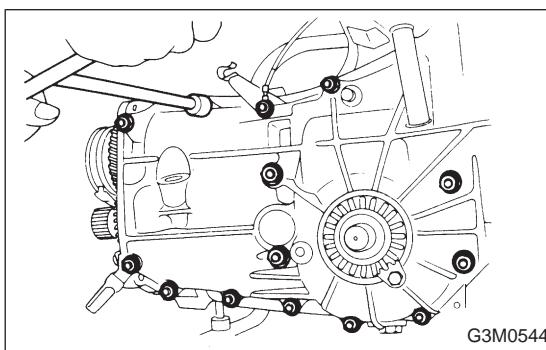


3) Remove main shaft rear plate ④.

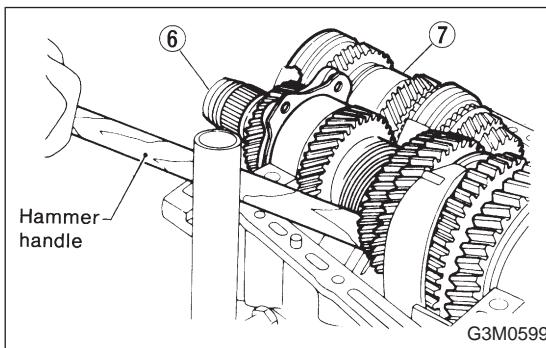


4) Separating transmission case.

(1) Put vinyl tape around splines of right and left axle drive shafts to prevent damage to oil seals.



(2) Separate transmission case into right and left cases by loosening seventeen coupling bolts and nuts.

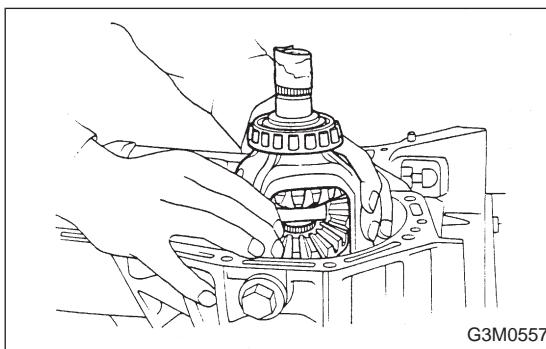


5) Remove drive pinion shaft assembly ⑥ from left side transmission case.

**NOTE:**

Use a hammer handle, etc. to remove if too tight.

6) Remove main shaft assembly ⑦.

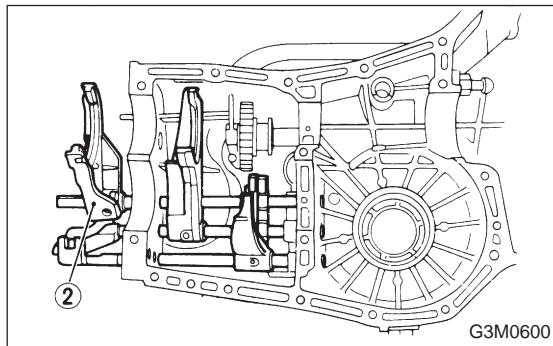
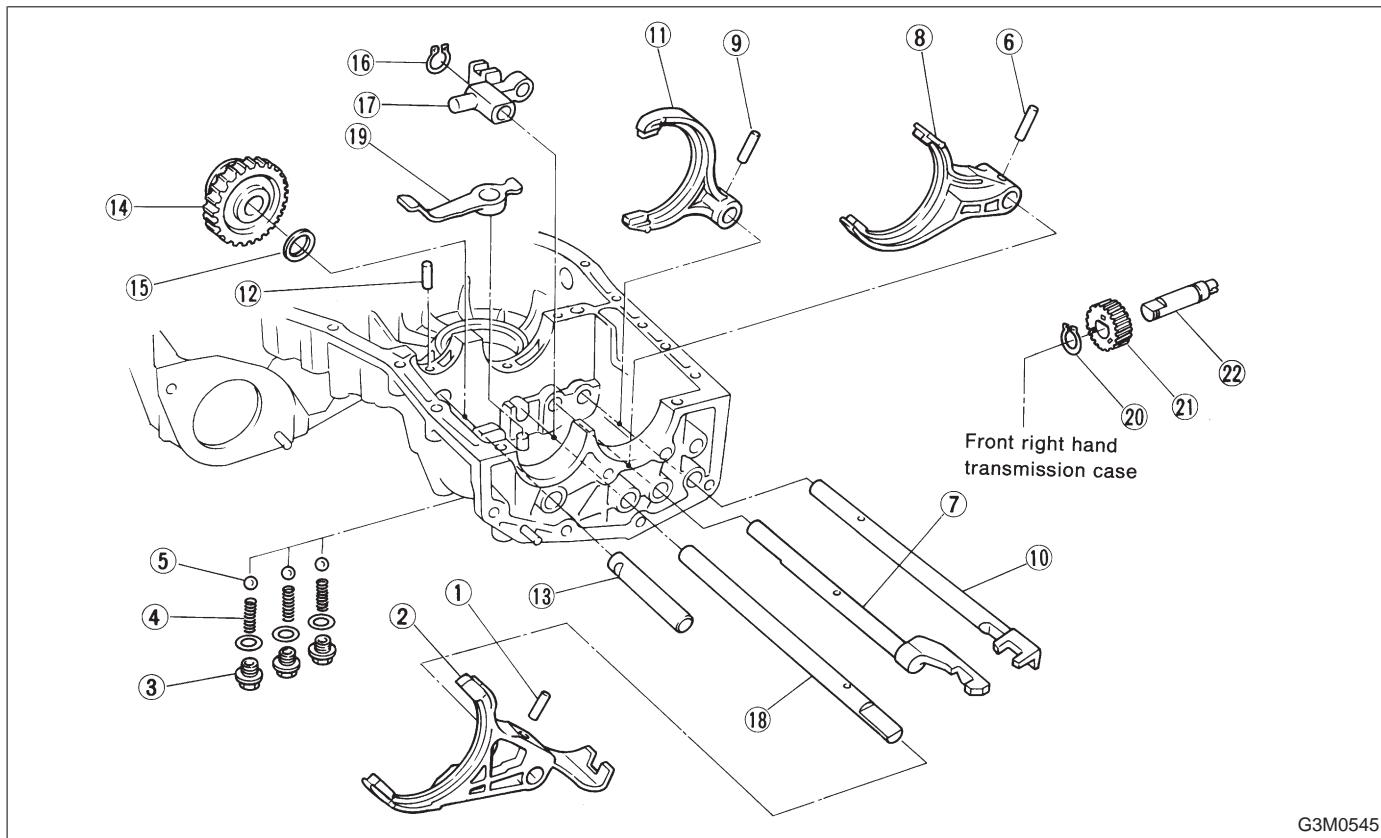


7) Remove differential assembly.

**CAUTION:**

- Be careful not to confuse right and left roller bearing outer races.
- Be careful not to damage retainer oil seal.

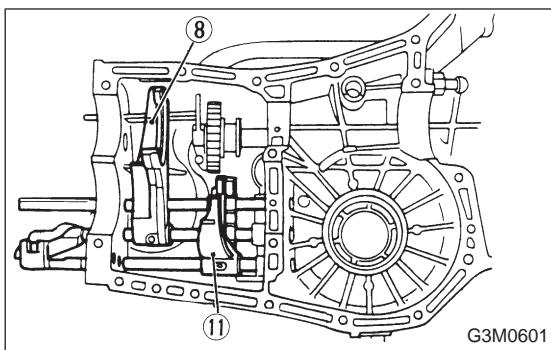
## 2. TRANSMISSION CASE



1) Drive out straight pin ① with ST, and remove 5th shifter fork ②.

ST 398791700 STRAIGHT PIN REMOVER

2) Remove plugs ③, springs ④ and checking balls ⑤.



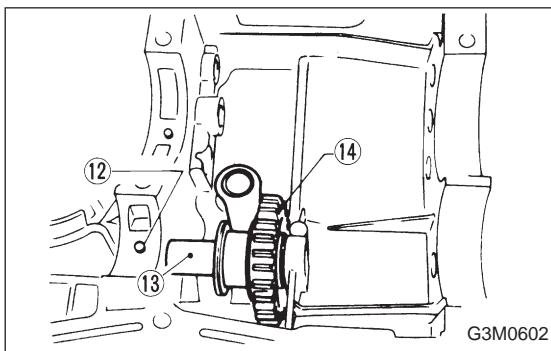
G3M0601

3) Drive out straight pin ⑥, and pull out 3-4 fork rod ⑦ and shifter fork ⑧.

**NOTE:**

When removing rod, keep other rods in neutral. Also, when pulling out straight pin, remove it toward inside of case so that it may not hit against case.

4) Drive out straight pin ⑨, and pull out 1-2 fork rod ⑩ and shifter fork ⑪.



G3M0602

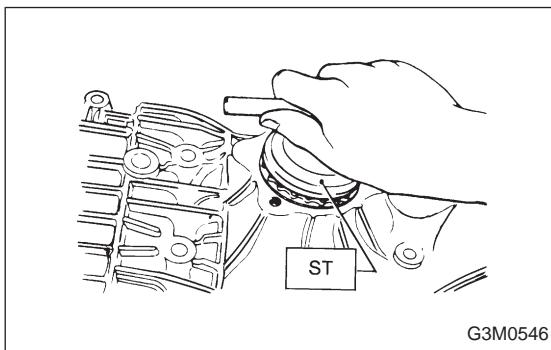
5) Pull out straight pin ⑫, and remove idler gear shaft ⑬, reverse idler gear ⑭ and washer ⑮.

6) Remove outer snap ring ⑯, and pull out reverse shifter rod arm ⑰ from reverse fork rod ⑱. Then take out ball, spring and interlock plunger from rod. And then remove rod.

**NOTE:**

When pulling out reverse shifter rod arm, be careful not to let ball pop out of arm.

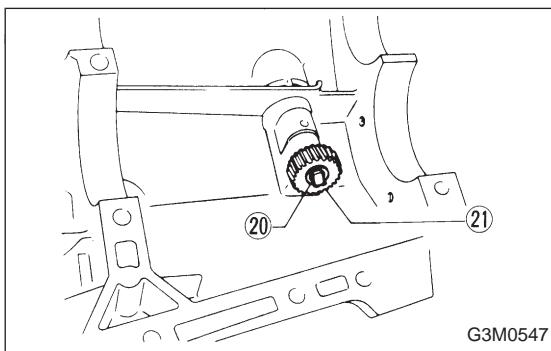
7) Remove reverse shifter lever ⑲.



G3M0546

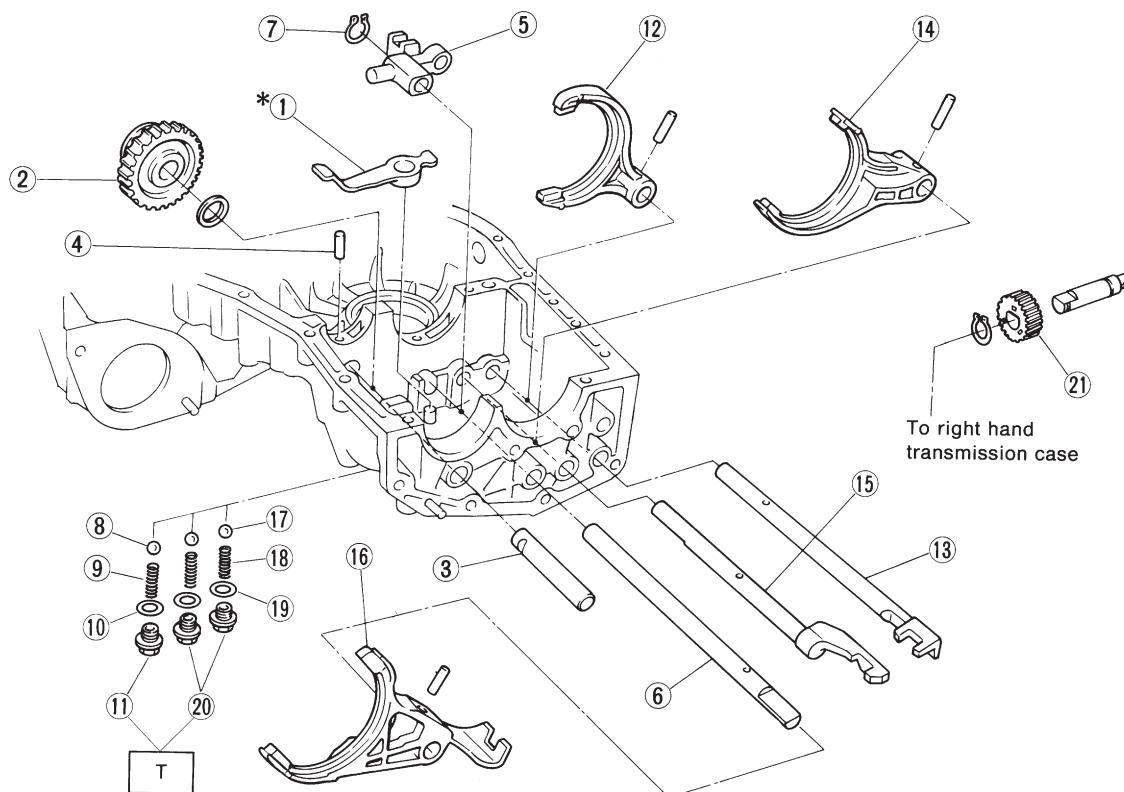
8) Remove differential side retainers using ST.

ST 499787000 WRENCH ASSY



G3M0547

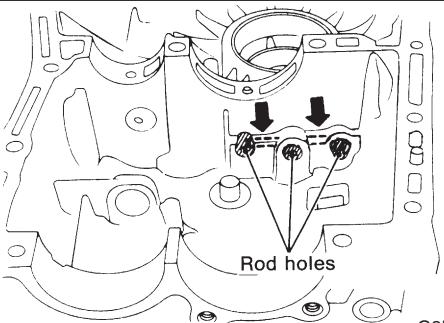
9) Remove outer snap ring ⑳ and pull out speedometer driven gear ㉑. Next, remove speedometer shaft ㉒ and washer.

**B: ASSEMBLY****1. TRANSMISSION CASE**

G3M0548

**Tightening torque: N·m (kg·m, ft·lb)**  
**T: 18.1 — 21.1 (1.85 — 2.15, 13.4 — 15.6)**

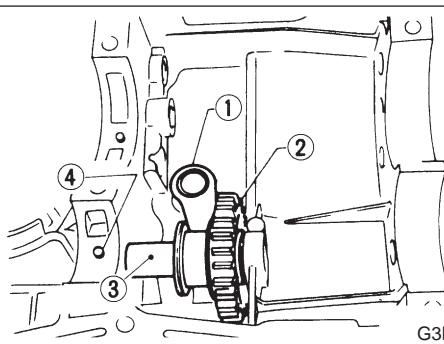
- 1) Position interlock plungers (5.56 x 19.6), one plunger in hole between 1-2 and 3-4 fork rod holes, and one plunger in hole between 3-4 and reverse fork rod holes.



G3M0603

- 2) Install reverse shifter lever ①, reverse idler gear ② and reverse idler gear shaft ③, and secure with straight pin ④.

**NOTE:**  
 Be sure to install reverse idler shaft from the rear side.



G3M0604

3) Install reverse arm fork spring, ball and interlock plunger (5.56 x 19.6) to reverse fork rod arm ⑤. Insert reverse fork rod ⑥ into hole in reverse fork rod arm ⑤, and hold it with outer snap ring ⑦ using ST.

ST 399411700 ACCENT BALL INSTALLER

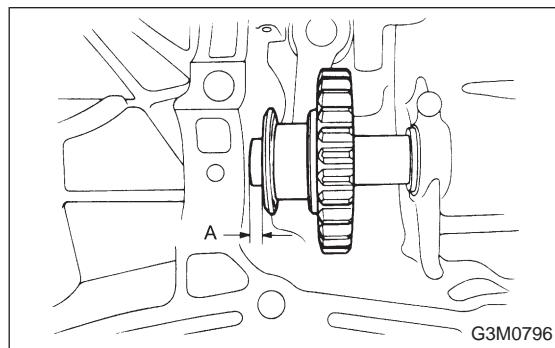
**CAUTION:**

**Apply grease to plunger to prevent it from falling.**

4) Position ball (7.1438) ⑧, spring ⑨ and gasket ⑩ in reverse shifter rod hole, on left side transmission case, and tighten checking ball plug ⑪.

**CAUTION:**

**Replace gasket with a new one.**



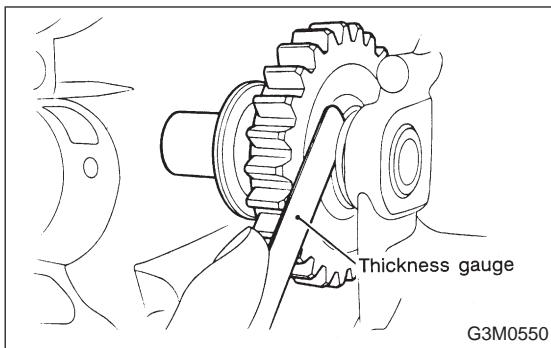
5) Adjustment of reverse idler gear position.

(1) Move reverse shifter rod toward REV side. Adjust clearance between reverse idler gear and transmission case wall, using reverse shifter lever ①.

**Clearance A:**

**6.0 — 7.5 mm (0.236 — 0.295 in)**

• Reverse shifter lever	Part No.	No.	Remarks
	32820AA000	0	Further from case wall
	32820AA010	No mark	Standard
	32820AA020	2	Closer to case wall

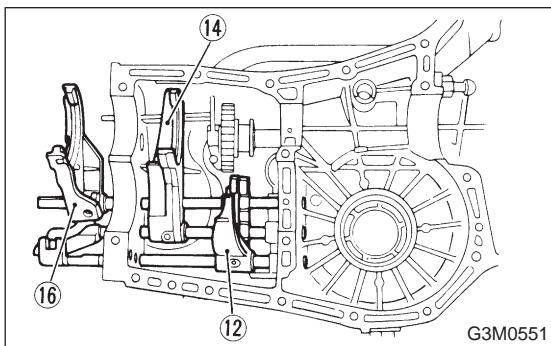


(2) After installing a suitable reverse shifter lever, shift into Neutral. Adjust clearance between reverse idler gear and transmission case wall, using washer(s).

**Clearance:**

0 — 0.5 mm (0 — 0.020 in)

• Washer (20.5 x 26 x t)	Part No.	Thickness mm (in)
	803020151	0.4 (0.016)
	803020152	1.1 (0.043)
	803020153	1.5 (0.059)
	803020154	1.9 (0.075)
	803020155	2.3 (0.091)



6) Installation of 1-2 shifter fork ⑭ and rod ⑬.

(1) Install 1-2 fork rod into 1-2 shifter fork via the hole on the rear of transmission case.

(2) Align the holes in rod and fork, and drive straight pin (6 x 22) into these holes using ST.

ST 398791600 STRAIGHT PIN REMOVER

**NOTE:**

- Set other rods to Neutral.
- Make sure interlock plunger (5.56 x 19.6) is on the 3-4 fork rod side.

7) Installation of 3-4 shifter fork ⑭ and rod ⑬.

(1) Install interlock plunger (3 x 11.9) onto 3-4 fork rod.

**CAUTION:**

**Apply a coat of grease to plunger to prevent it from falling.**

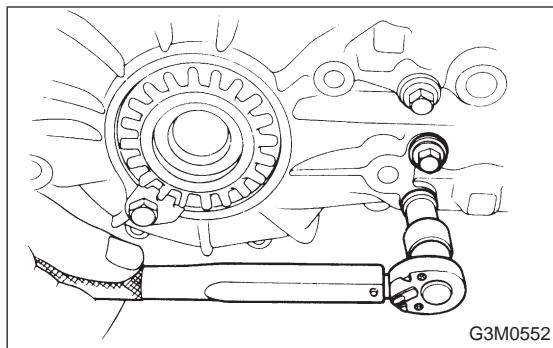
(2) Install 3-4 fork rod into 3-4 shifter fork via the hole on the rear of transmission case.

(3) Align the holes in rod and fork, and drive straight pin (6 x 22) into these holes.

**NOTE:**

- Set reverse fork rod to Neutral.
- Make sure interlock plunger (installed before) is on the reverse fork rod side.

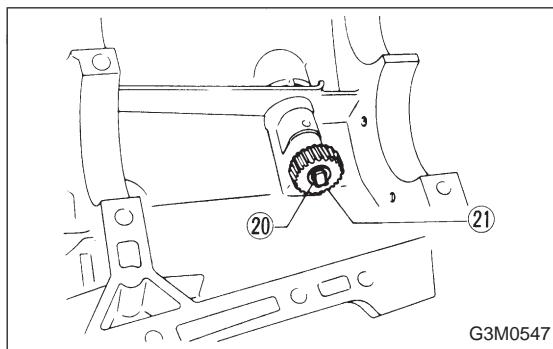
8) Install 5th shifter fork ⑯ onto the rear of reverse fork rod ⑯. Align holes in the two parts and drive straight pin into place.



9) Position balls (7.1438 mm dia.) ⑯, checking ball springs ⑯ and gaskets ⑯ into 3-4 and 1-2 rod holes, and install plugs ⑯.

**CAUTION:**

Replace gasket with a new one.



10) Installation of speedometer driven gear ⑯.

(1) Install washer and speedometer shaft, and press fit oil seal with ST.

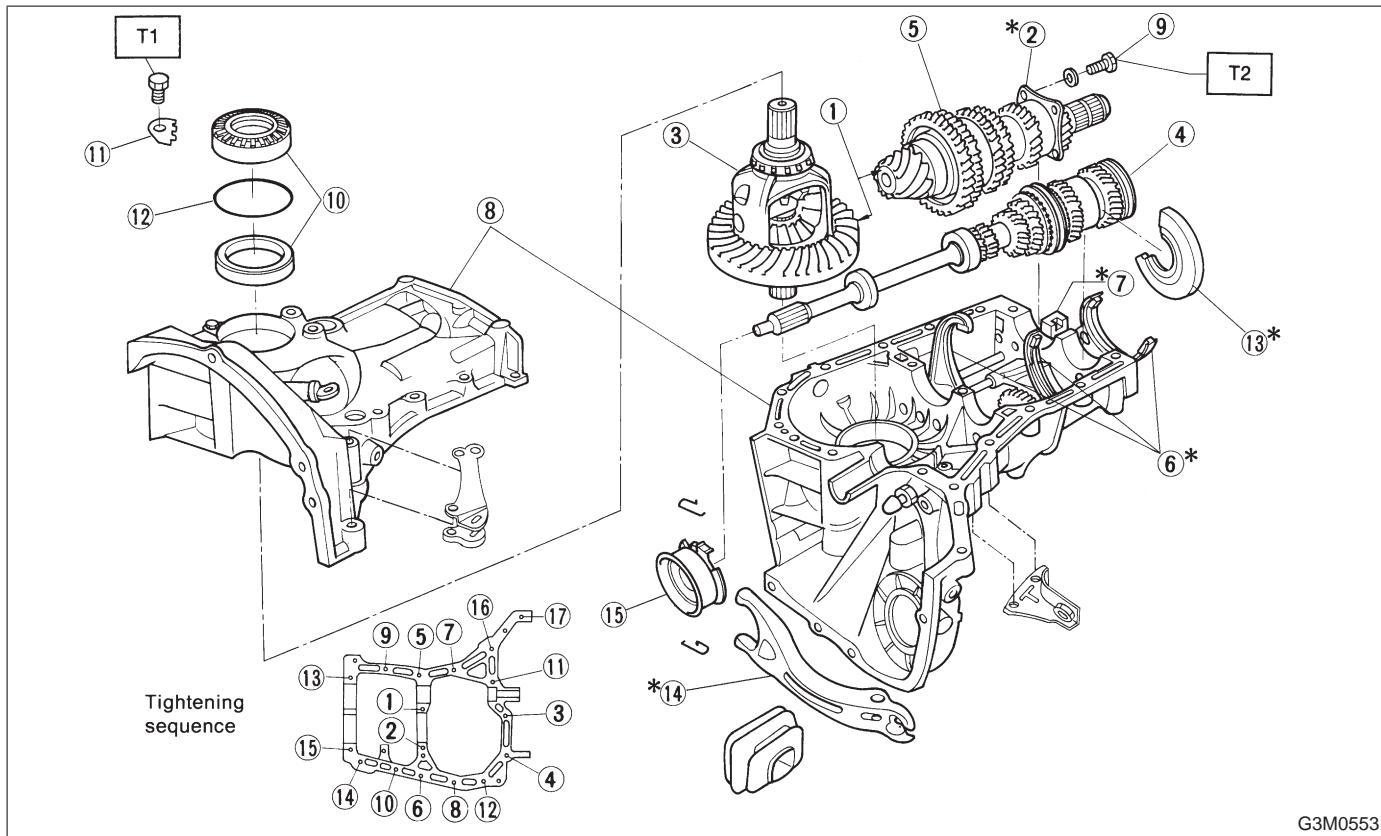
ST 899824100 or 499827000 PRESS

**CAUTION:**

Use new oil seal, if it has been removed.

(2) Install speedometer driven gear and snap ring.

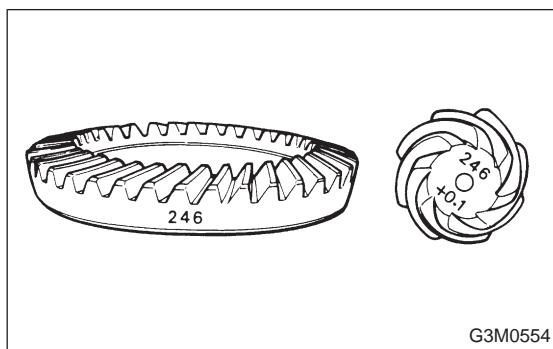
## 2. COMBINATION OF TRANSMISSION CASE



*Tightening torque: N·m (kg·m, ft·lb)*

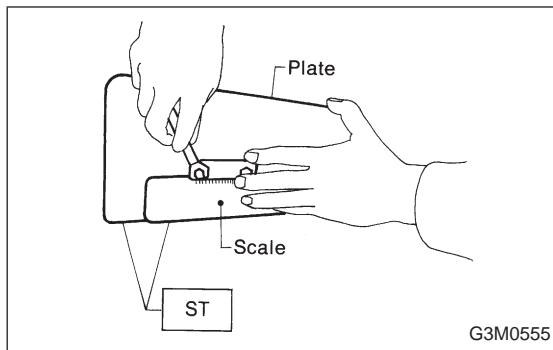
T1: 25 (2.5, 18)

T2: 26 — 32 (2.7 — 3.3, 20 — 24)



1) Alignment marks/figures on hypoid gear set ①

The upper figure on driven pinion is the match number for combining it with hypoid driven gear. The lower figure is for shim adjustment. If no lower figure is shown, the value is zero. The figure on hypoid driven gear indicates a number for combination with drive pinion.



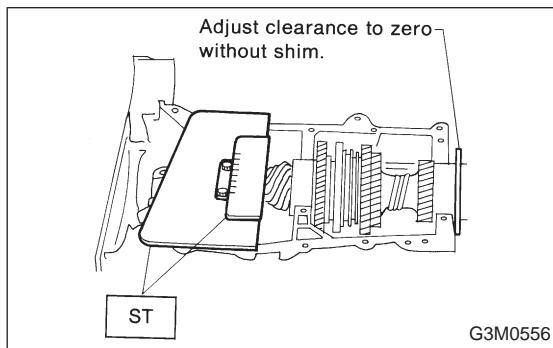
2) Adjustment of drive pinion shim ②

- (1) Place drive pinion shaft assembly on right hand transmission main case without shim and tighten bearing mounting bolts.
- (2) Inspection and adjustment of ST.

NOTE:

- Loosen the two bolts and adjust so that the scale indicates 0.5 correctly when the plate end and the scale end are on the same level.
- Tighten two bolts.

ST 499917500 DRIVE PINION GAUGE ASSY



- (3) Position the ST by inserting the knock pin of ST into the knock hole in the transmission case.

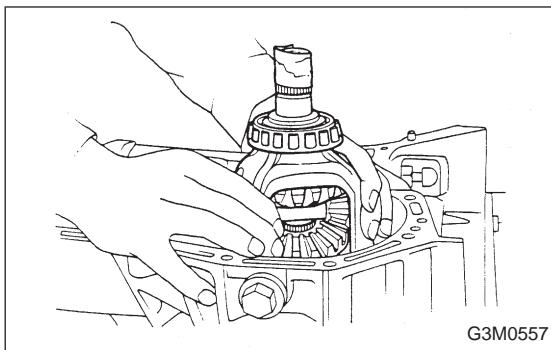
- (4) Slide the drive pinion gauge scale with finger tip and read the value at the point where it matches with the end face of drive pinion.

- (5) The thickness of shim shall be determined by adding the value indicated on drive pinion to the value indicated on the ST. (Add if the figure on drive pinion is prefixed by + and subtract if the figure is prefixed by -.)

ST 499917500 DRIVE PINION GAUGE ASSY

Select one to three shims from the next table for the value determined as described above and take a shim thickness which is closest to the said value.

● Drive pinion shim	Part No.	Thickness mm (in)
	32295AA031	0.150 (0.0059)
	32295AA041	0.175 (0.0069)
	32295AA051	0.200 (0.0079)
	32295AA061	0.225 (0.0089)
	32295AA071	0.250 (0.0098)
	32295AA081	0.275 (0.0108)
	32295AA091	0.300 (0.0118)
	32295AA101	0.500 (0.0197)



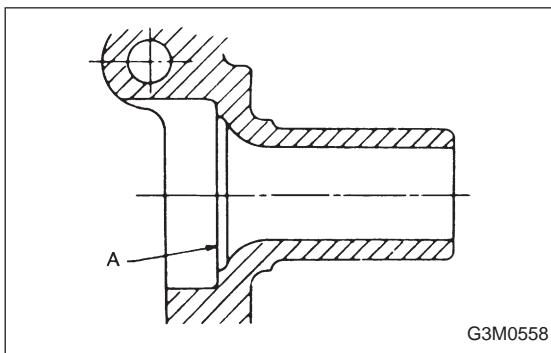
3) Install differential assembly ③ on left hand transmission case.

**CAUTION:**

**Be careful not to fold the sealing lip of oil seal.**

**NOTE:**

Wrap the left and right splined sections of axle shaft with vinyl tape to prevent scratches.



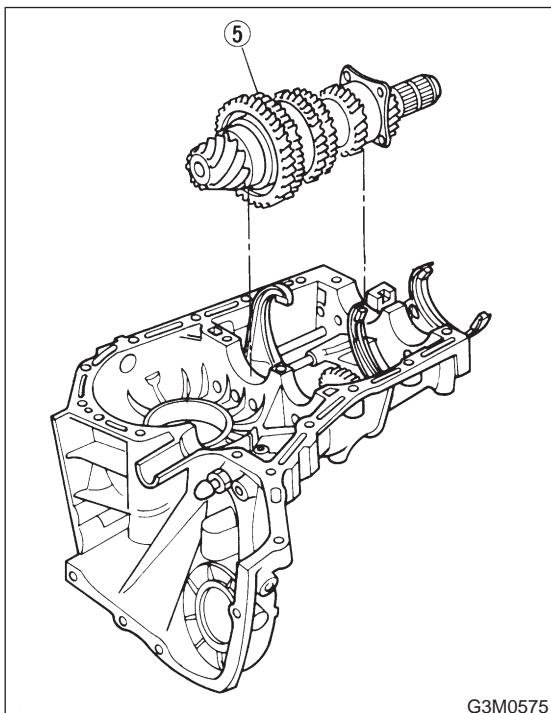
4) Install needle bearing and oil seal onto the front of transmission main shaft assembly, and position in left side transmission case.

**CAUTION:**

- **Wrap clutch splined section with vinyl tape to prevent damage to oil seal.**
- **Apply grease (Unilube #2 or equivalent) to the sealing lip of oil seal.**

**NOTE:**

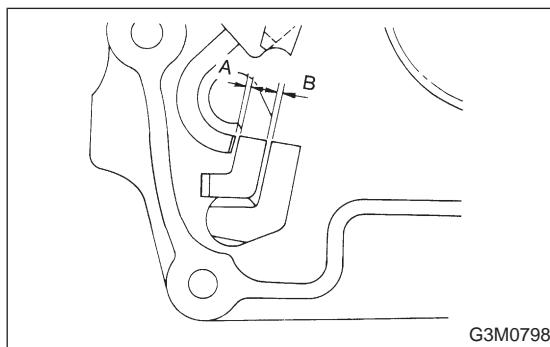
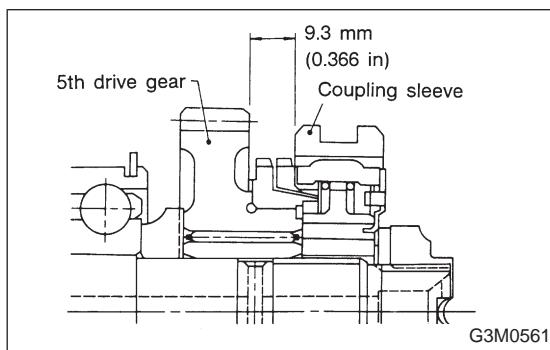
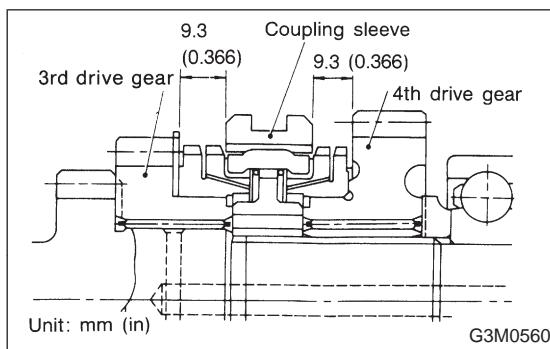
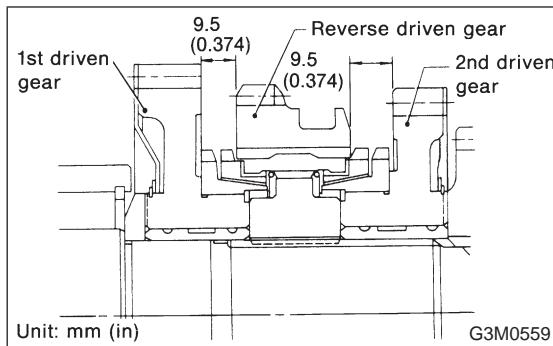
- Align the end face of seal with surface A of left side transmission main case when installing oil seal.
- Be careful not to drop oil seal when installing right side transmission main case.
- Make sure straight pin is positioned in hole in needle bearing's outer race.



5) Install drive pinion shaft assembly ⑤ with shims selected before into transmission case.

**NOTE:**

Ensure that the knock pin of the case is fitted into the hole in the bearing outer race.



6) Selection of suitable 1st-2nd, 3rd-4th and 5th shifter forks.

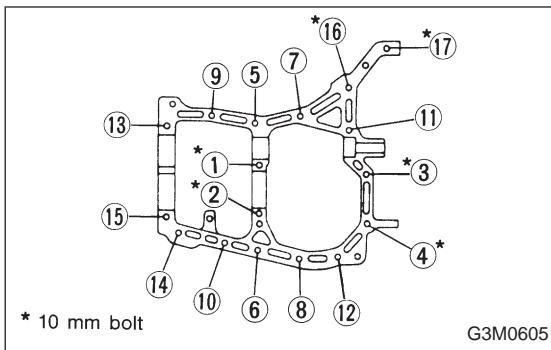
Set transmission main shaft assembly and drive pinion shaft assembly in position (so there is no clearance between the two when moved all the way to the front). Select suitable 1st-2nd, 3rd-4th and 5th shifter forks so that coupling sleeve and reverse driven gear are positioned in the center of their synchronizing mechanisms.

1st-2nd shifter fork		
Part No.	No.	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in)
32804AA070	No mark	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in)
3rd-4th shifter fork		
Part No.	No.	Remarks
32810AA060	1	Approach to 4th gear by 0.2 mm (0.008 in)
32810AA070	No mark	Standard
32810AA100	3	Approach to 3rd gear by 0.2 mm (0.008 in)
5th shifter fork		
Part No.	No.	Remarks
32812AA060	1	Approach to 5th gear by 0.2 mm (0.008 in)
32812AA070	No mark	Standard
32812AA100	3	Become distant from 5th gear by 0.2 mm (0.008 in)

7) Inspection of rod end clearance.

Measure rod end clearances A and B. If any clearance is not within specifications, replace rod or fork as required.

A: 1st-2nd to 3rd-4th	0.5 — 1.5 mm (0.020 — 0.059 in)
B: 3rd-4th to 5th	0.6 — 1.4 mm (0.024 — 0.055 in)



8) Combination of transmission case.

(1) Wipe off grease, oil and dust on the mating surfaces of transmission cases with white gasoline, and apply liquid gasket, and then put case right side and left side together.

**Liquid gasket:**

**Three-bond 1215 or equivalent**

(2) Tighten 17 bolts with bracket, clip, etc. in the following sequence.

**Tightening torque:**

**8 mm bolt**

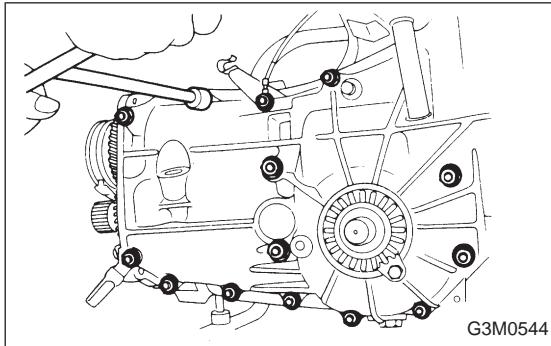
**23 — 26 N·m (2.3 — 2.7 kg-m, 17 — 20 ft-lb)**

**10 mm bolt**

**36 — 42 N·m (3.7 — 4.3 kg-m, 27 — 31 ft-lb)**

**NOTE:**

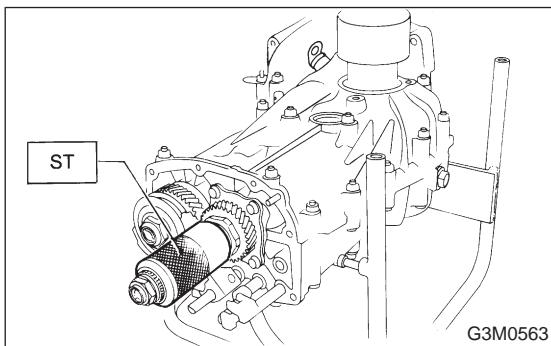
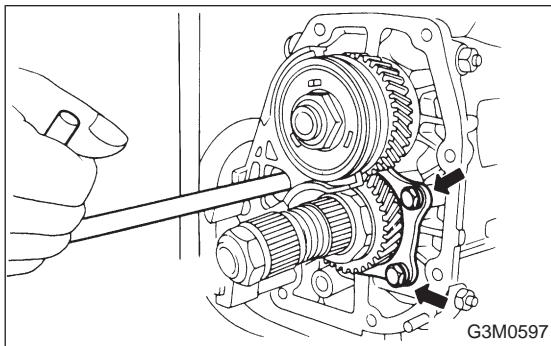
- Insert bolts from the bottom and tighten nuts at the top.
- Put cases together so that drive pinion shim and input shaft holder shim are not caught up in between.
- Confirm that counter gear and speedometer gear are meshed.



9) Tighten ball bearing attachment bolts.

**Tightening torque:**

**26 — 32 N·m (2.7 — 3.3 kg-m, 20 — 24 ft-lb)**

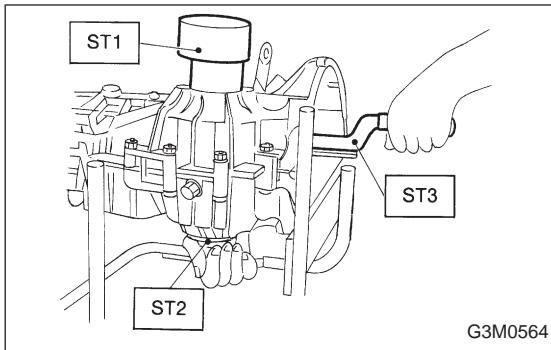


10) Backlash adjustment of hypoid gear and preload adjustment of roller bearing.

**NOTE:**

Support drive pinion assembly with ST.

ST 498427100 STOPPER



(1) Place the transmission with case left side facing downward and put ST1 on bearing cup.

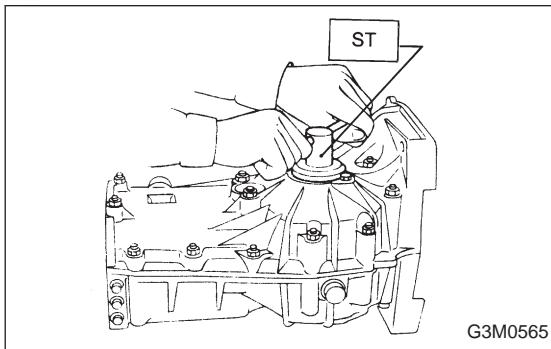
(2) Screw retainer assembly into left case from the bottom with ST2. Fit ST3 on the transmission main shaft. Shift gear into 4th or 5th and turn the shaft several times. Screw in the retainer while turning ST3 until a slight resistance is felt on ST2.

This is the contact point of hypoid gear and drive pinion shaft. Repeat the above sequence several times to ensure the contact point.

ST1 399780104 WEIGHT

ST2 499787000 WRENCH ASSY

ST3 499927100 HANDLE

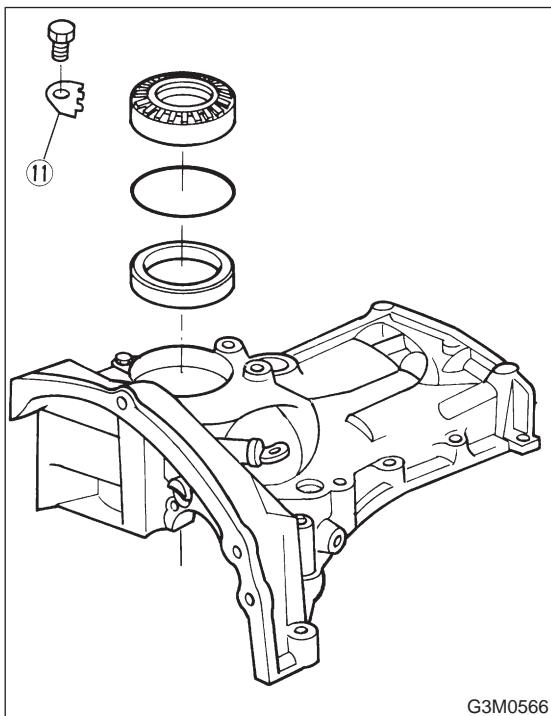


(3) Remove weight and screw in retainer without O-ring on the upper side and stop at the point where slight resistance is felt.

**NOTE:**

At this point, the backlash between the hypoid gear and drive pinion shaft is zero.

ST 499787000 WRENCH ASSY



(4) Fit lock plate 11. Loosen the retainer on the lower side by 1-1/2 notches of lock plate and turn in the retainer on the upper side by the same amount in order to obtain the backlash.

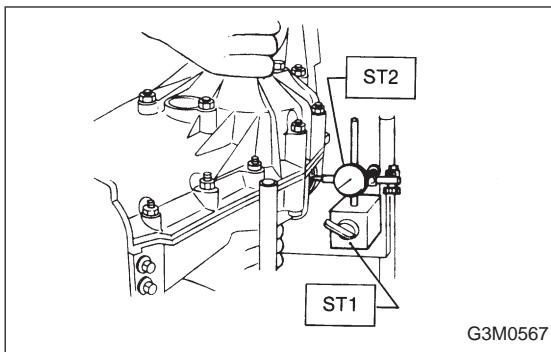
**NOTE:**

The notch on the lock plate moves by 1/2 notch if the plate is turned upside down.

(5) Turn in the retainer on the upper side additionally by 1 notch in order to apply preload on taper roller bearing.

(6) Tighten temporarily both the upper and lower lock plates and mark both holder and lock plate for later readjustment.

(7) Turn transmission main shaft several times while tapping around retainer lightly with plastic hammer.



(8) Set ST1 and ST2. Insert the needle through transmission oil drain plug hole so that the needle comes in contact with the tooth surface at a right angle and check the backlash.

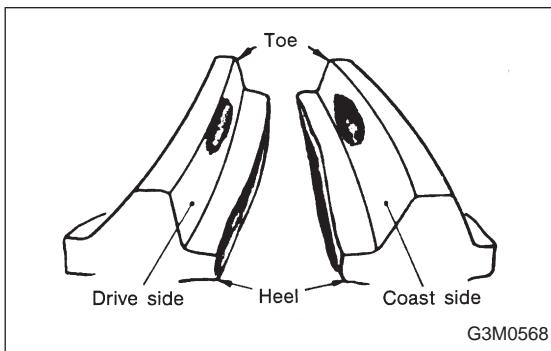
ST1 498247001 MAGNET BASE  
ST2 498247100 DIAL GAUGE

**Backlash:**

***0.13 — 0.18 mm (0.0051 — 0.0071 in)***

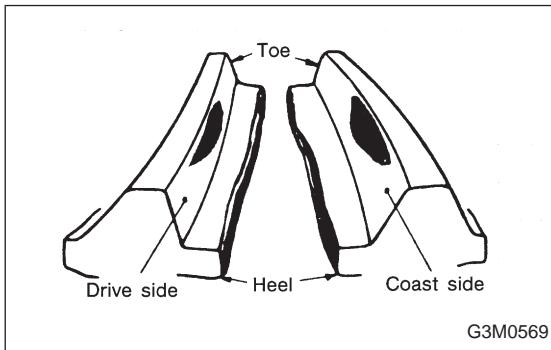
**NOTE:**

- If backlash is outside specified range, adjust it by turning holder in right side case.
- Turning holder pawl 1/2 rotation changes backlash by approximately 0.04 mm (0.0016 in).

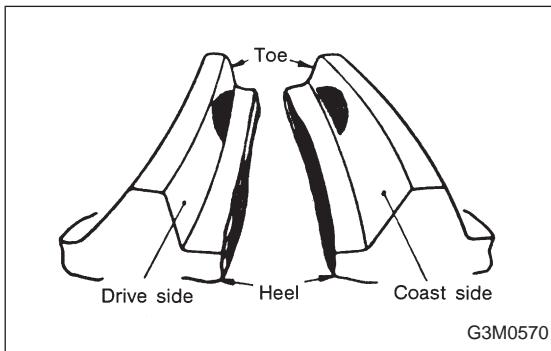


(9) Check tooth contact of hypoid gear as follows: Apply a uniform thin coat of red lead on both tooth surfaces of 3 or 4 teeth of the hypoid gear. Move the hypoid gear back and forth by turning the transmission main shaft until a definite contact pattern is developed on hypoid gear, and judge whether face contact is correct. If it is incorrect, make the following correction.

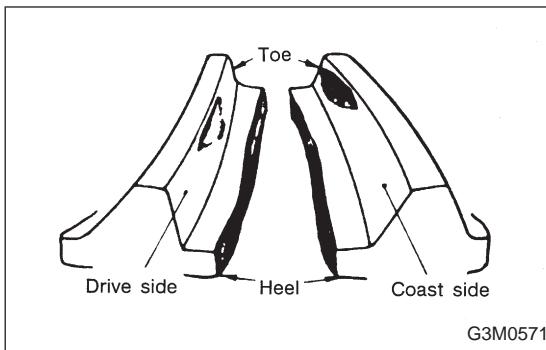
- Tooth contact is correct.



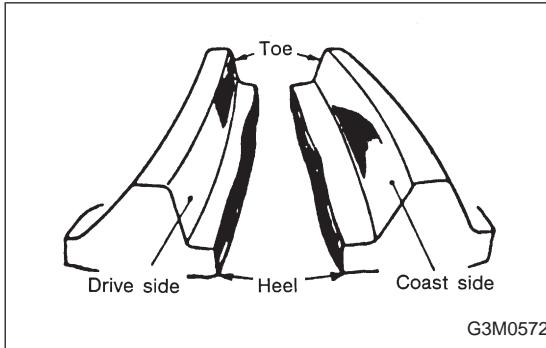
- Backlash is excessive.  
To reduce backlash, loosen holder on the upper side (case right side) and turn in the holder on the lower side (case left side) by the same amount.



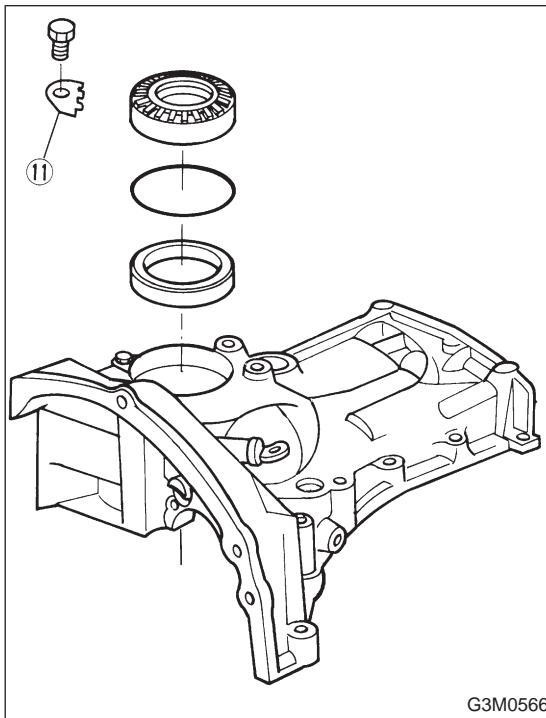
- Backlash is insufficient.  
To increase backlash, loosen holder on the lower side (case left side) and turn in the holder on the upper side (case right side) by the same amount.



- The drive pinion shim selected before is too thick. Reduce its thickness.



- The drive pinion shim selected before is too thin. Increase its thickness.



11) After checking the tooth contact of hypoid gears, remove the lock plate ⑪. Then loosen retainer until the O-ring groove appears. Fit O-ring into the groove and tighten retainer into the position where retainer has been tightened in.

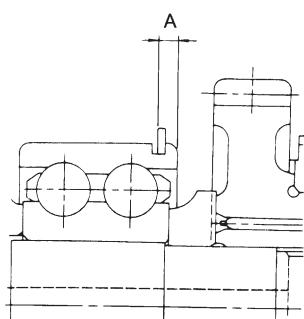
Tighten lock plate ⑪.

***Tightening torque:***

***22 — 27 N·m (2.2 — 2.8 kg·m, 16 — 20 ft-lb)***

**NOTE:**

Carry out this job on both upper and lower retainers.



G3M0573

## 12) Selecting of main shaft rear plate.

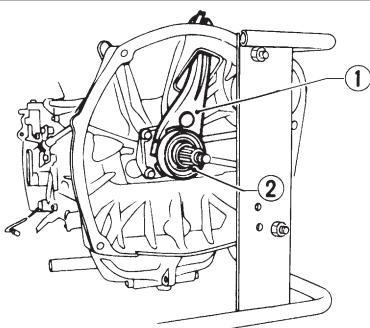
Using ST, measure the amount (A) of ball bearing protrusion from transmission main case surface and select the proper plate in the following table.

ST 498147000 DEPTH GAUGE

Dimension A mm (in)	Part No.	Identification
4.0 — 4.13 (0.1575 — 0.1626)	32294AA040	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA050	2

## NOTE:

Before measuring, tap the end of main shaft with a plastic hammer lightly in order to make the clearance zero between the main case surface and the moving flange of bearing.



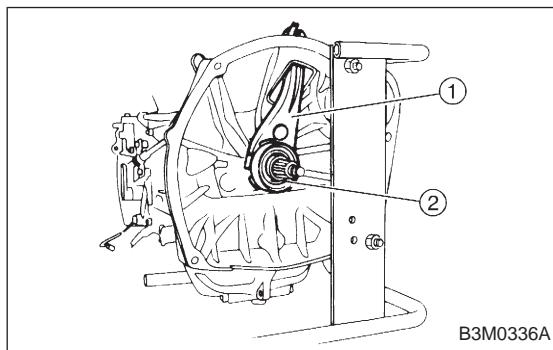
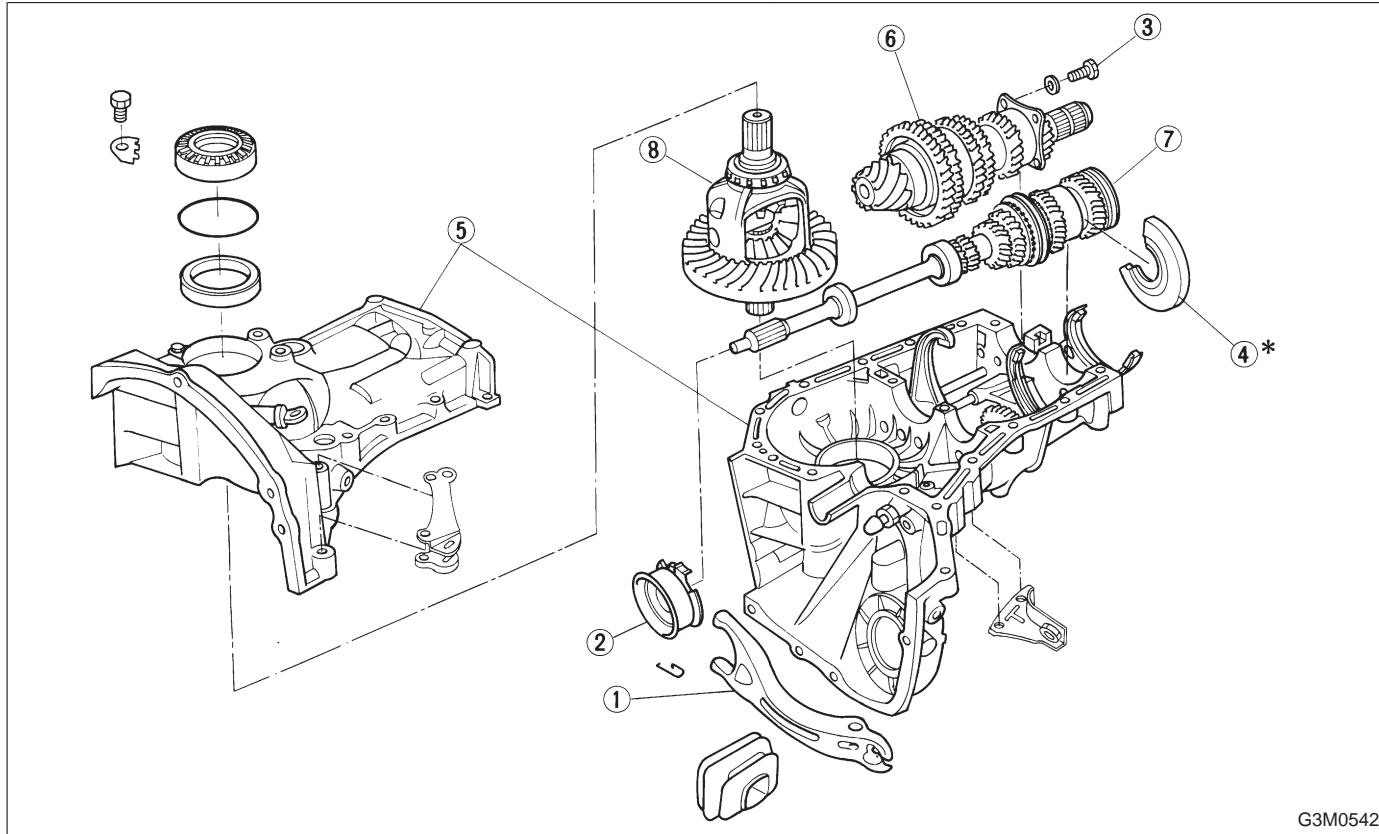
G3M0596

## 13) Install clutch release lever ① and bearing ②.

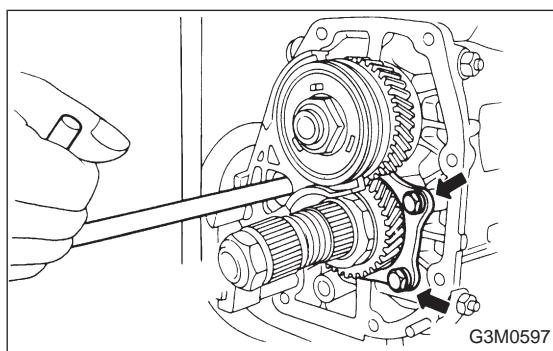
## 5. Transmission Case (FWD Model)

### A: DISASSEMBLY

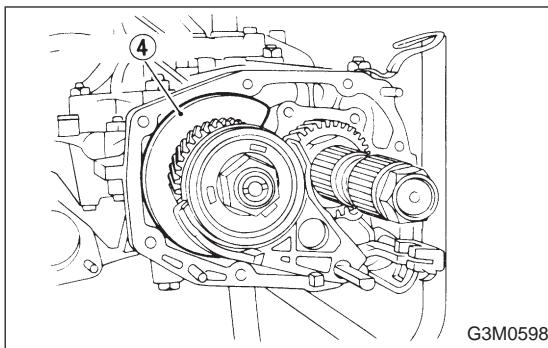
#### 1. SEPARATION OF TRANSMISSION



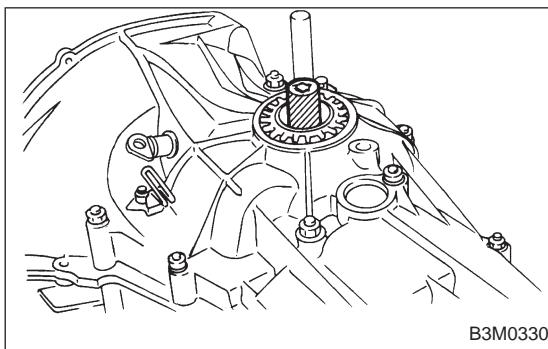
1) Remove clutch release lever ① and bearing ②. <Ref. to 2-10 [W3A0].>



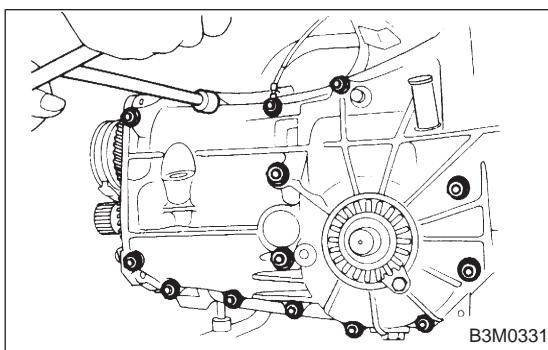
2) Remove bearing mounting bolts.



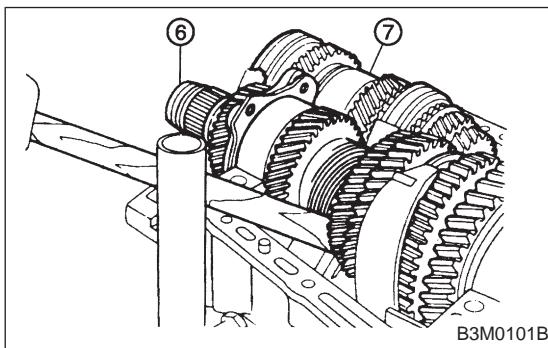
- 3) Remove main shaft rear plate ④.



- 4) Separating transmission case
  - (1) Put vinyl tape around splines of right and left axle drive shafts to prevent damage to oil seals.



- (2) Separate transmission case into right and left cases by loosening seventeen coupling bolts and nuts.

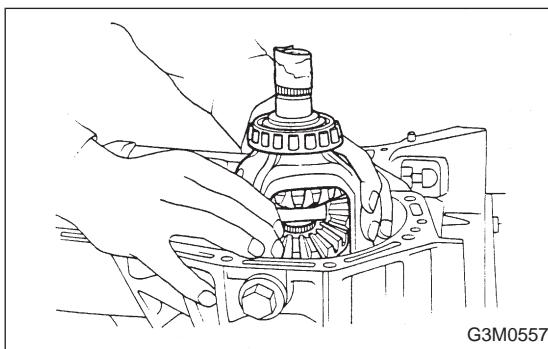


- 5) Remove drive pinion shaft assembly ⑥ from left side transmission case.

**NOTE:**

Use a hammer handle, etc. to remove if too tight.

- 6) Remove main shaft assembly ⑦.

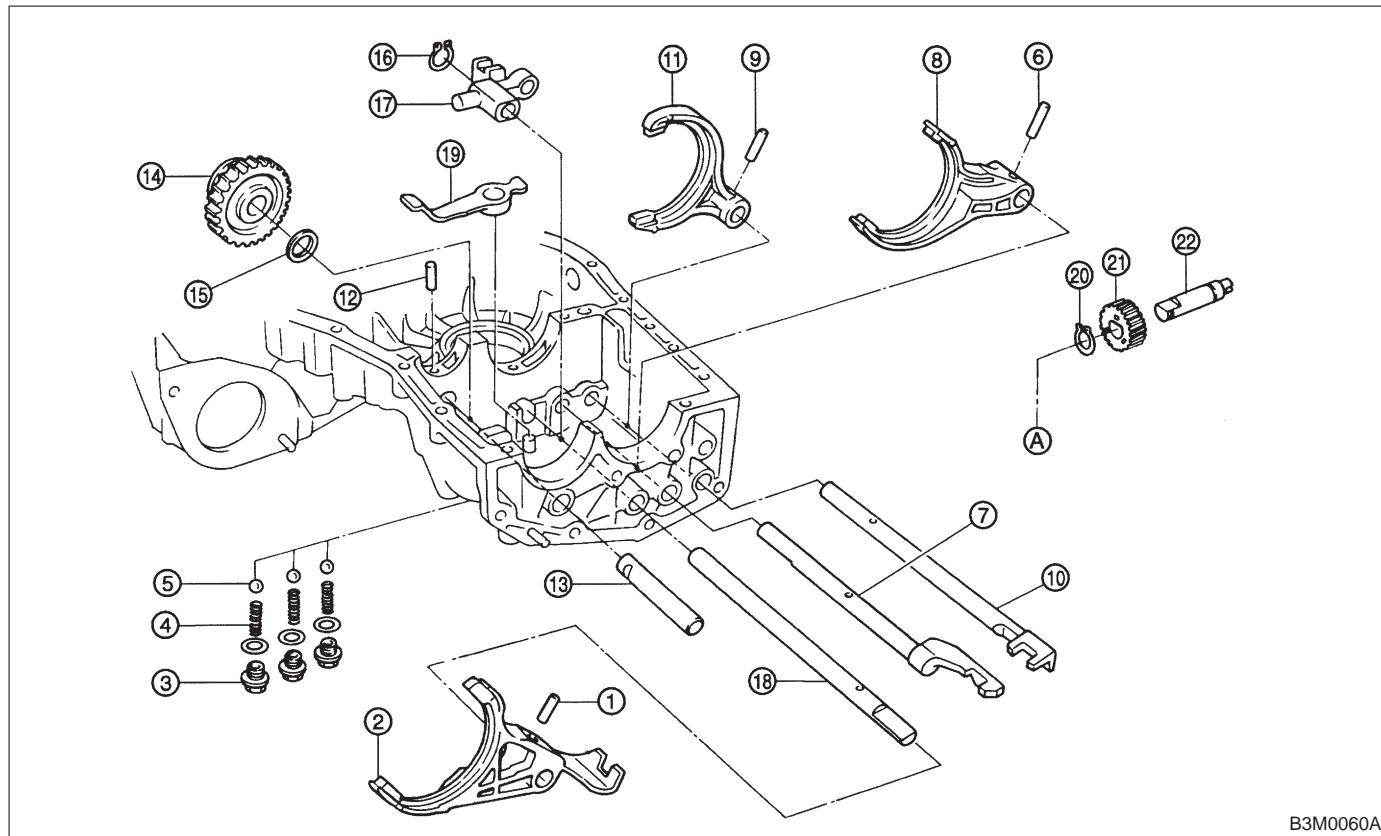


- 7) Remove differential assembly.

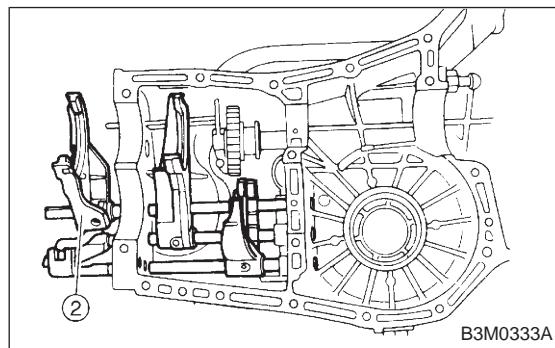
**CAUTION:**

- Be careful not to confuse right and left roller bearing outer races.
- Be careful not to damage retainer oil seal.

## 2. TRANSMISSION CASE



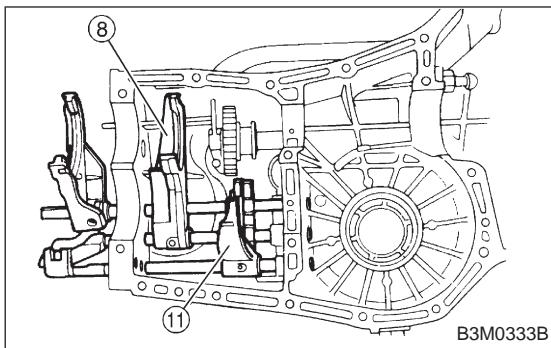
Ⓐ: To right hand transmission case



1) Drive out spring pin ① with ST, and remove 5th shifter fork ②.

ST 398791700 STRAIGHT PIN REMOVER

2) Remove plugs ③, springs ④ and checking balls ⑤.

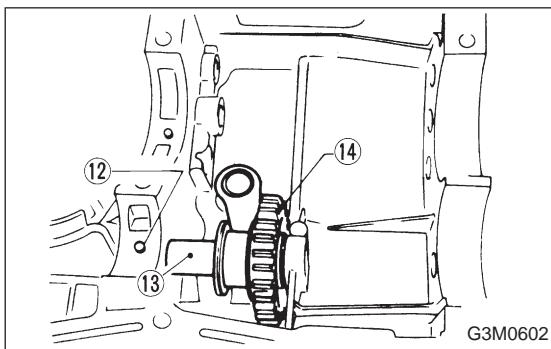


3) Drive out spring pin ⑥, and pull out 3-4 fork rod ⑦ and shifter fork ⑧.

**NOTE:**

When removing rod, keep other rods in neutral. Also, when pulling out straight pin, remove it toward inside of case so that it may not hit against case.

4) Drive out straight pin ⑨, and pull out 1-2 fork rod ⑩ and shifter fork ⑪.



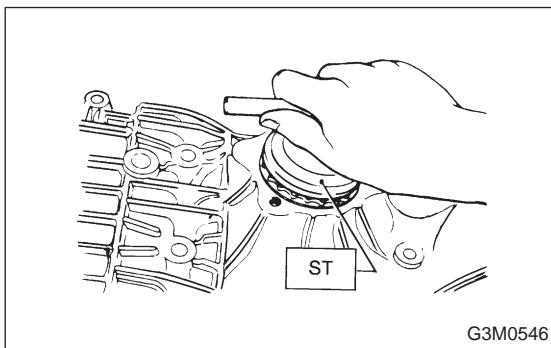
5) Pull out straight pin ⑫, and remove idler gear shaft ⑬, reverse idler gear ⑭ and washer ⑮.

6) Remove outer snap ring ⑯, and pull out reverse shifter rod arm ⑰ from reverse fork rod ⑱. Then take out ball, spring and interlock plunger from rod. And then remove rod.

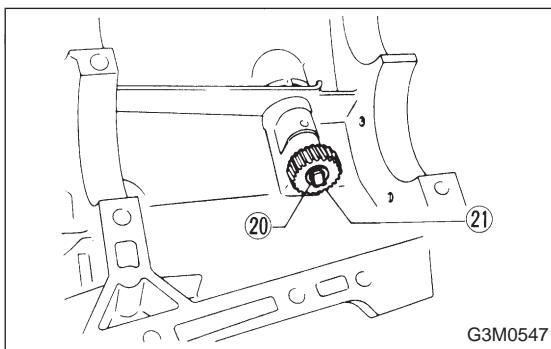
**NOTE:**

When pulling out reverse shifter rod arm, be careful not to let ball pop out of arm.

7) Remove reverse shifter lever ⑲.



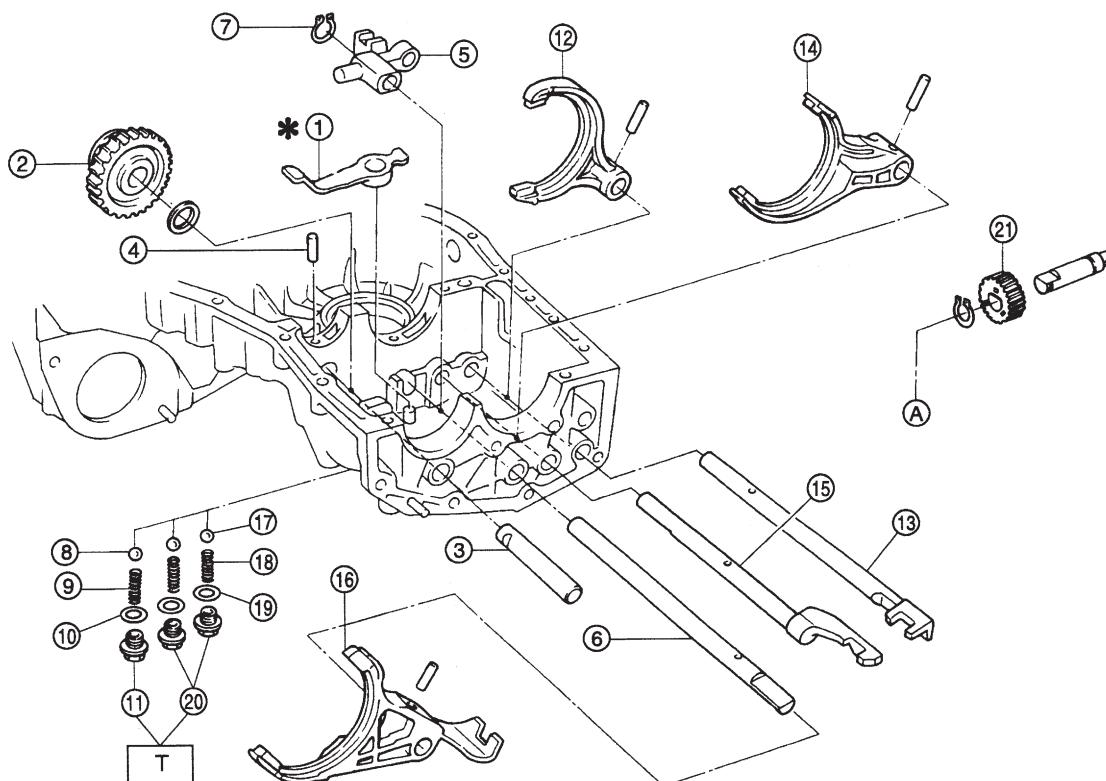
8) Remove differential side retainers using ST.  
ST 499787000 WRENCH ASSY



9) Remove outer snap ring ⑳ and pull out speedometer driven gear ㉑. Next, remove oil seal, speedometer shaft ㉒ and washer.

## B: ASSEMBLY

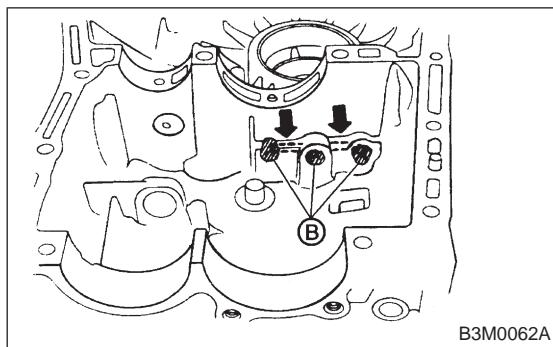
### 1. TRANSMISSION CASE



B3M0061A

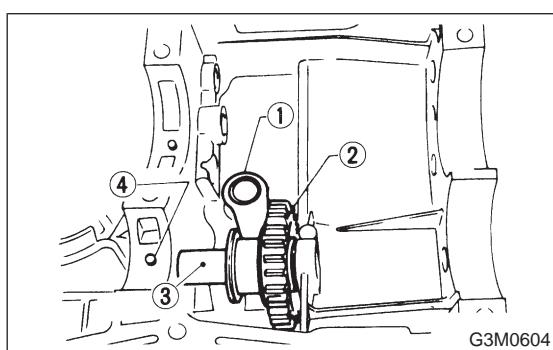
Ⓐ: To right hand transmission case

**Tightening torque: N·m (kg·m, ft·lb)**  
**T:  $19.6 \pm 0.1$  (2.00  $\pm 0.015$ , 14.5  $\pm 0.1$ )**



B3M0062A

- 1) Position interlock plungers (5.56 x 19.6), one plunger in hole between 1-2 and 3-4 fork rod holes, and one plunger in hole between 3-4 and reverse fork rod holes.  
 Ⓐ: Rod holes



G3M0604

- 2) Install reverse shifter lever ①, reverse idler gear ② and reverse idler gear shaft ③, and secure with straight pin ④.  
**NOTE:**  
 Be sure to install reverse idler shaft from the rear side.

3) Install reverse arm fork spring, ball and interlock plunger (5.56 x 19.6) to reverse fork rod arm ⑤. Insert reverse fork rod ⑥ into hole in reverse fork rod arm ⑤, and hold it with outer snap ring ⑦ using ST.

ST 399411700 ACCENT BALL INSTALLER

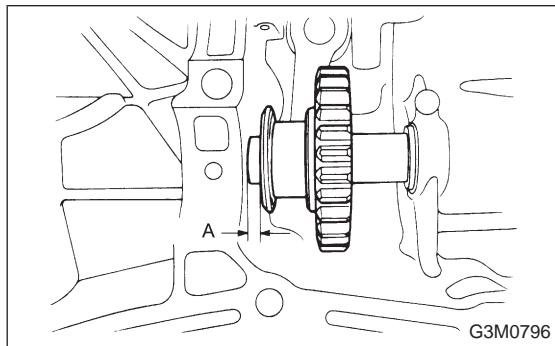
**CAUTION:**

**Apply grease to plunger to prevent it from falling.**

4) Position ball ⑧ (7.1438), spring ⑨ and gasket ⑩ in reverse shifter rod hole, on left side transmission case, and tighten checking ball plug ⑪.

**CAUTION:**

**Replace gasket with a new one.**



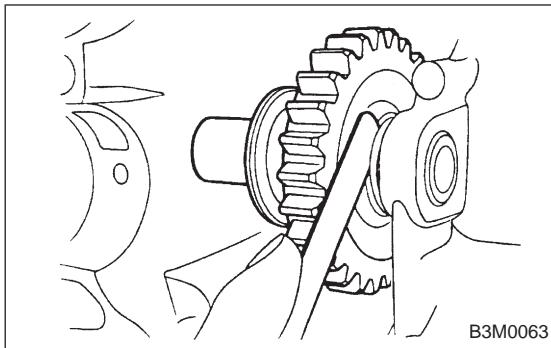
5) Adjustment of reverse idler gear position

(1) Move reverse shifter rod toward REV side. Adjust clearance between reverse idler gear and transmission case wall, using reverse shifter lever ①.

**Clearance A:**

**6.0 — 7.5 mm (0.236 — 0.295 in)**

Reverse shifter lever		
Part No.	No.	Remarks
32820AA000	0	Further from case wall
32820AA010	No mark	Standard
32820AA020	2	Closer to case wall

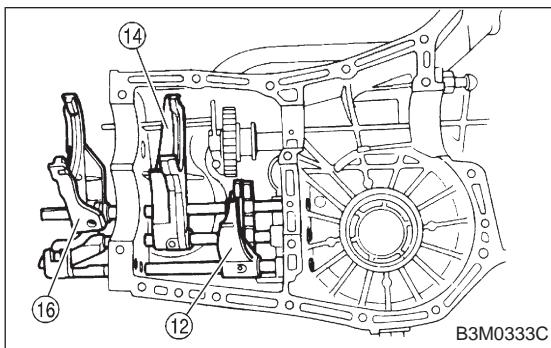


(2) After installing a suitable reverse shifter lever, shift into neutral. Using a thickness gauge, measure clearance between reverse idler gear and transmission case wall and adjust with washer(s).

**Clearance:**

**0 — 0.5 mm (0 — 0.020 in)**

Washer (20.5 x 26 x t)	
Part No.	Thickness mm (in)
803020151	0.4 (0.016)
803020152	1.1 (0.043)
803020153	1.5 (0.059)
803020154	1.9 (0.075)
803020155	2.3 (0.091)



**6) Installation of 1-2 shifter fork ⑫ and rod ⑬**

- (1) Install 1-2 fork rod into 1-2 shifter fork via the hole on the rear of transmission case.
- (2) Align the holes in rod and fork, and drive straight pin (6 x 22) into these holes using ST.

ST 398791700 STRAIGHT PIN REMOVER

**NOTE:**

- Set other rods to neutral.
- Make sure interlock plunger (5.56 x 19.6) is on the 3-4 fork rod side.

**7) Installation of 3-4 shifter fork ⑭ and rod ⑮**

- (1) Install interlock plunger (3 x 11.9) onto 3-4 fork rod.

**CAUTION:**

**Apply a coat of grease to plunger to prevent it from falling.**

- (2) Install 3-4 fork rod into 3-4 shifter fork via the hole on the rear of transmission case.

- (3) Align the holes in rod and fork, and drive straight pin (6 x 22) into these holes.

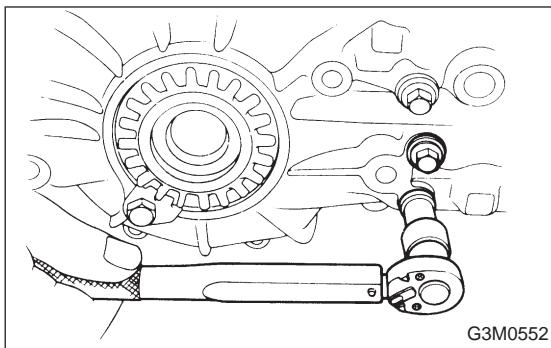
ST 398791700 STRAIGHT PIN REMOVER

**NOTE:**

- Set reverse fork rod to neutral.
- Make sure interlock plunger (installed before) is on the reverse fork rod side.

**8) Install 5th shifter fork ⑯ onto the rear of reverse fork rod ⑯.** Align holes in the two parts and drive straight pin into place.

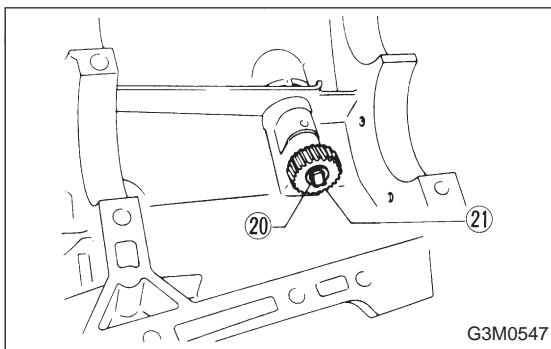
ST 398791700 STRAIGHT PIN REMOVER



- 9) Position balls ⑯, checking ball springs ⑯ and gaskets ⑯ into 3-4 and 1-2 rod holes, and install plugs ⑯.

**CAUTION:**

Replace gasket with a new one.



- 10) Installation of speedometer driven gear ⑯

- (1) Install washer and speedometer shaft, and press fit oil seal with ST.

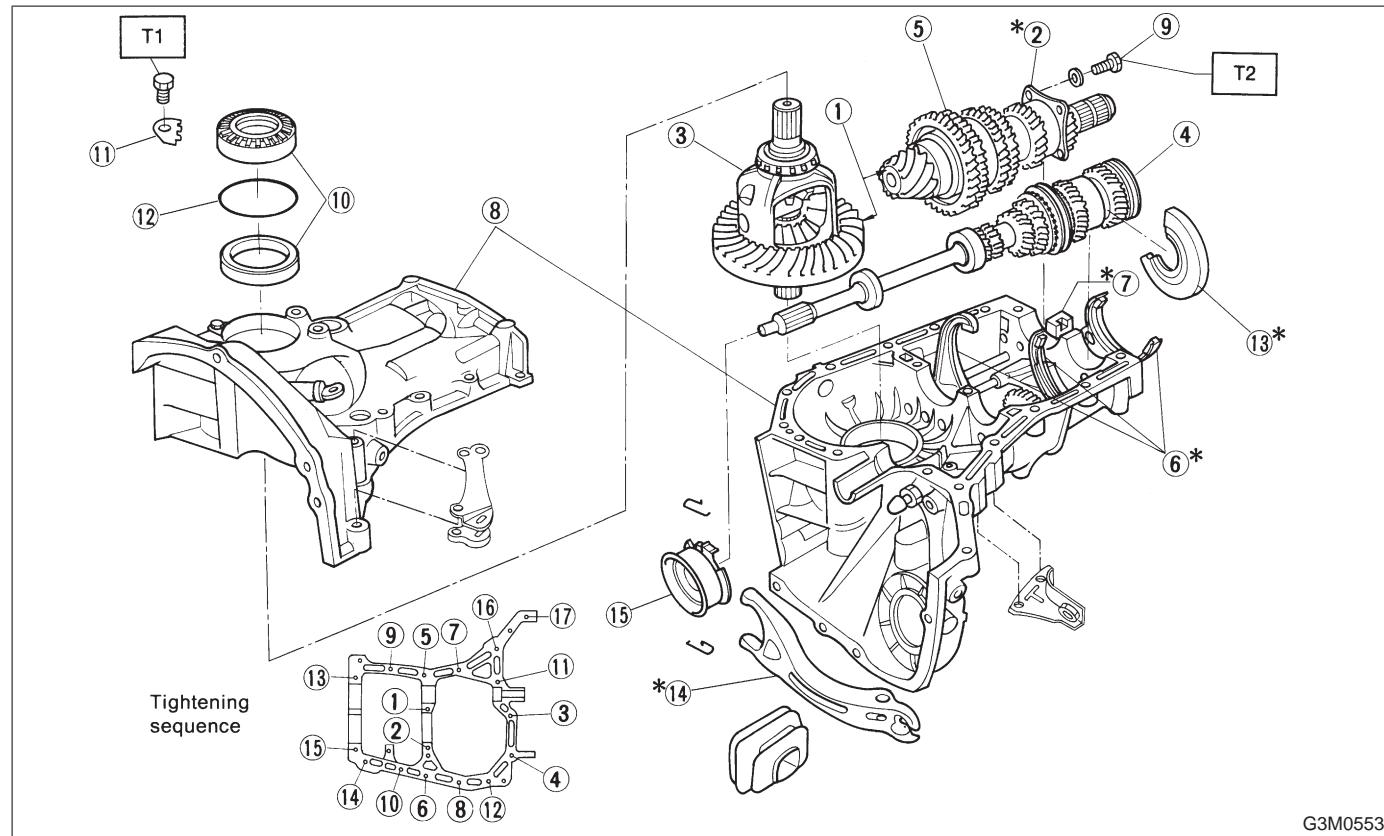
ST 899824100 or 499827000 PRESS

**CAUTION:**

Use new oil seal, if it has been removed.

- (2) Install speedometer driven gear and snap ring.

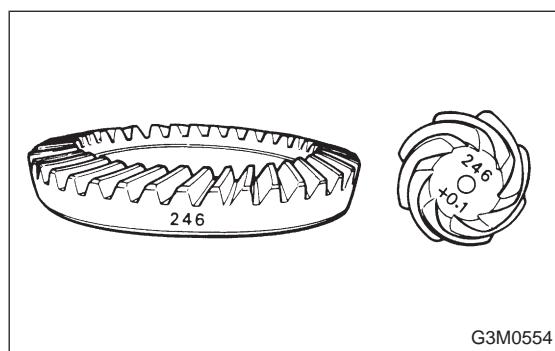
## 2. COMBINATION OF TRANSMISSION CASE



**Tightening torque: N·m (kg·m, ft·lb)**

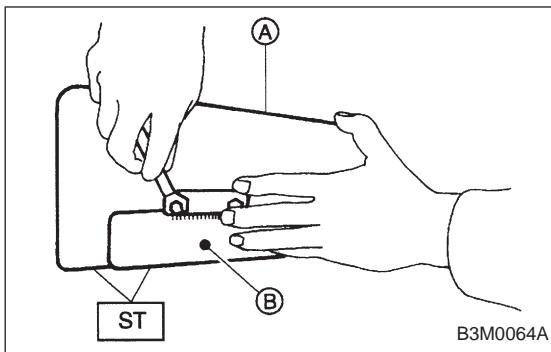
T1: 25 (2.5, 18)

T2:  $29 \pm 3$  ( $3.0 \pm 0.3$ ,  $21.7 \pm 2.2$ )



1) Alignment marks/numbers on hypoid gear set ①

The upper number on driven pinion is the match number for combining it with hypoid driven gear. The lower number is for shim adjustment. If no lower number is shown, the value is zero. The number on hypoid driven gear indicates a number for combination with drive pinion.



## 2) Adjustment of drive pinion shim ②

(1) Place drive pinion shaft assembly on right hand transmission main case without shim and tighten bearing mounting bolts.

(2) Inspection and adjustment of ST

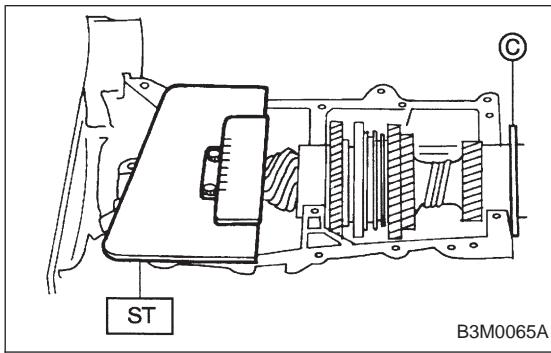
## NOTE:

- Loosen the two bolts and adjust so that the scale indicates 0.5 correctly when the plate end and the scale end are on the same level.
- Tighten the two bolts.

ST 499917500 DRIVE PINION GAUGE ASSY

(A): Plate

(B): Scale



(3) Position the ST by inserting the knock pin of ST into the knock hole in the transmission case.

(4) Slide the drive pinion gauge scale with finger tip and read the value at the point where it matches with the end face of drive pinion.

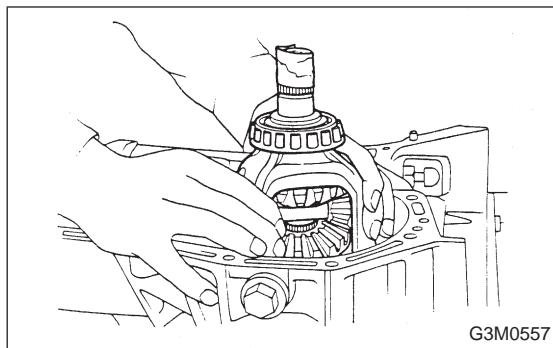
(C): Adjust clearance to zero without shim.

(5) The thickness of shim shall be determined by adding the value indicated on drive pinion to the value indicated on the ST. (Add if the number on drive pinion is prefixed by + and subtract if the number is prefixed by -.)

ST 499917500 DRIVE PINION GAUGE ASSY

Select one to three shims from the next table for the value determined as described above and take a shim thickness which is closest to the said value.

Drive pinion shim	
Part No.	Thickness mm (in)
32295AA031	0.150 (0.0059)
32295AA041	0.175 (0.0069)
32295AA051	0.200 (0.0079)
32295AA061	0.225 (0.0089)
32295AA071	0.250 (0.0098)
32295AA081	0.275 (0.0108)
32295AA091	0.300 (0.0118)
32295AA101	0.500 (0.0197)



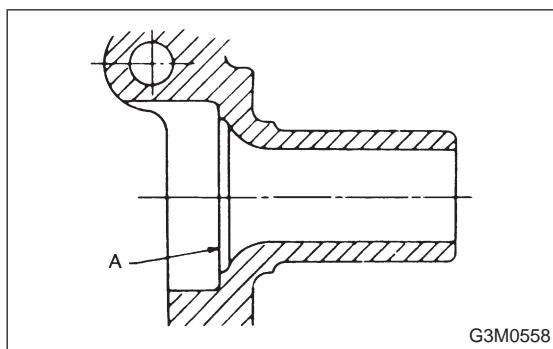
3) Install differential assembly ③ on left hand transmission case.

**CAUTION:**

**Be careful not to fold the sealing lip of oil seal.**

**NOTE:**

Wrap the left and right splined sections of axle shaft with vinyl tape to prevent scratches.



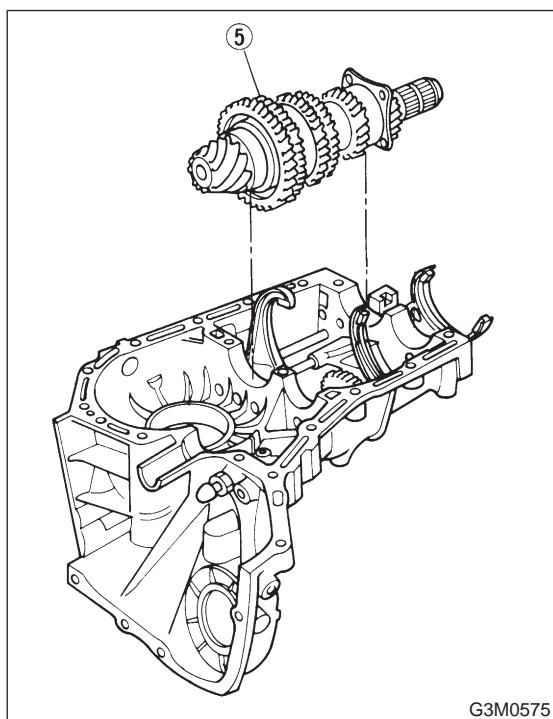
4) Install needle bearing and oil seal onto the front of transmission main shaft assembly ④, and position in left side transmission case.

**CAUTION:**

- **Wrap clutch splined section with vinyl tape to prevent damage to oil seal.**
- **Apply grease (Unilube #2 or equivalent) to the sealing lip of oil seal.**

**NOTE:**

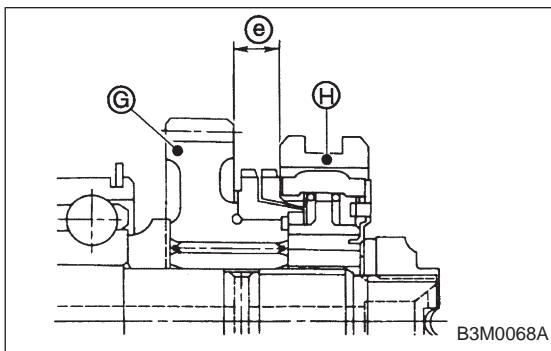
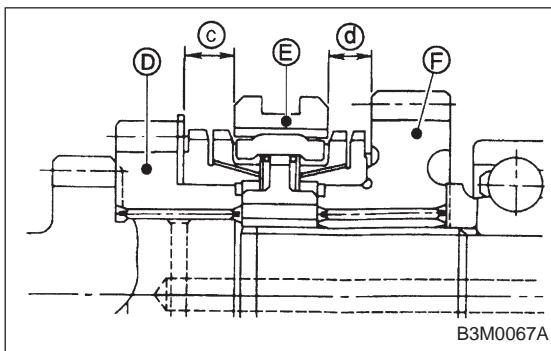
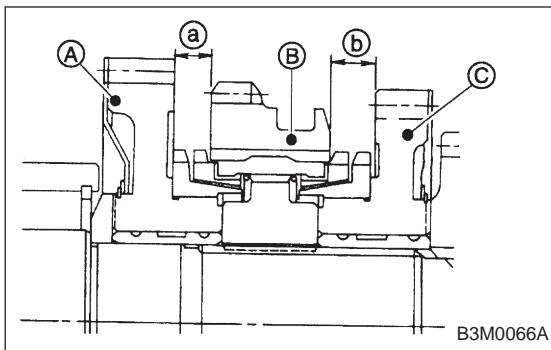
- Align the end face of seal with surface A of left side transmission main case when installing oil seal.
- Be careful not to drop oil seal when installing right side transmission main case.
- Make sure straight pin is positioned in hole in needle bearing's outer race.



5) Install drive pinion shaft assembly ⑤ with shims selected before into transmission case.

**NOTE:**

Ensure that the knock pin of the case is fitted into the hole in the bearing outer race.



## 6) Selection of suitable 1st-2nd, 3rd-4th and 5th shifter fork

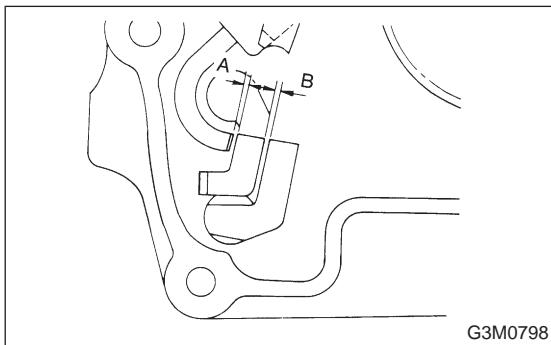
Set transmission main shaft assembly and drive pinion shaft assembly in position (so there is no clearance between the two when moved all the way to the front). Select suitable 1st-2nd, 3rd-4th and 5th shifter fork so that coupling sleeve and reverse driven gear are positioned in the center of their synchronizing mechanisms.

	Clearance mm (in)
1st driven gear <b>A</b> to reverse driven gear <b>B</b>	<b>a</b> : 9.5 (0.374)
2nd driven gear <b>C</b> to reverse driven gear <b>B</b>	<b>b</b> : 9.5 (0.374)
3rd drive gear <b>D</b> to coupling sleeve <b>E</b>	<b>c</b> : 9.3 (0.366)
4th drive gear <b>F</b> to coupling sleeve <b>E</b>	<b>d</b> : 9.3 (0.366)
5th drive gear <b>G</b> to coupling sleeve <b>H</b>	<b>e</b> : 9.3 (0.366)

1st-2nd shifter fork		
Part No.	No.	Remarks
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in)
32804AA070	No mark	Standard
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in)

3rd-4th shifter fork		
Part No.	No.	Remarks
32810AA060	1	Approach to 4th gear by 0.2 mm (0.008 in)
32810AA070	No mark	Standard
32810AA100	3	Approach to 3rd gear by 0.2 mm (0.008 in)

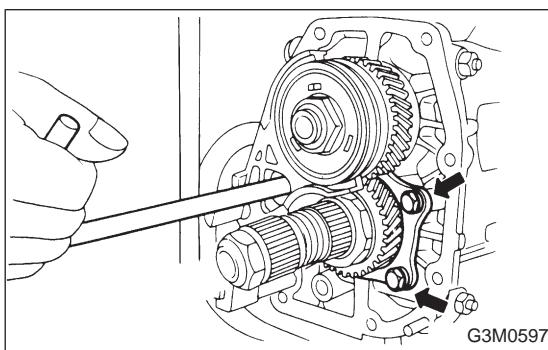
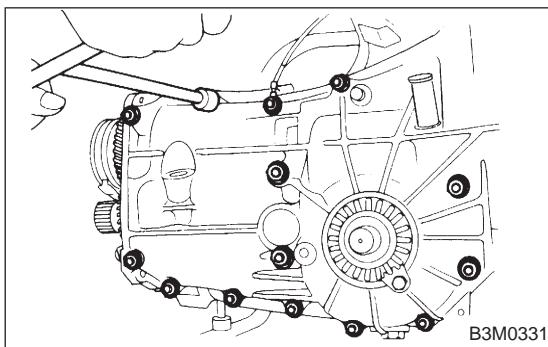
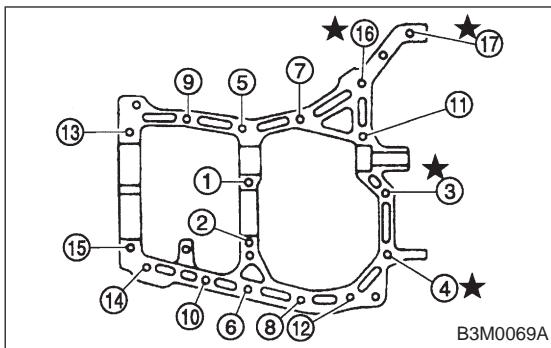
5th shifter fork		
Part No.	No.	Remarks
32812AA060	1	Approach to 5th gear by 0.2 mm (0.008 in)
32812AA070	No mark	Standard
32812AA100	3	Become distant from 5th gear by 0.2 mm (0.008 in)



## 7) Inspection of rod end clearance

Measure rod end clearances A and B. If any clearance is not within specifications, replace rod or fork as required.

A: 1st-2nd to 3rd-4th	0.5 — 1.5 mm (0.020 — 0.059 in)
B: 3rd-4th to 5th	0.6 — 1.4 mm (0.024 — 0.055 in)



8) Combination of transmission case

(1) Wipe off grease, oil and dust on the mating surfaces of transmission cases with white gasoline, and apply liquid gasket, and then put case right side and left side together.

**Liquid gasket:**

**THREE BOND 1215 or equivalent**

(2) Tighten 17 bolts with bracket, clip, etc. as shown in the figure.

**Tightening torque:**

**8 mm bolt**

**$25 \pm 2 \text{ N}\cdot\text{m}$  ( $2.5 \pm 0.2 \text{ kg}\cdot\text{m}$ ,  $18.1 \pm 1.4 \text{ ft-lb}$ )**

**★ 10 mm bolt**

**$39 \pm 3 \text{ N}\cdot\text{m}$  ( $4.0 \pm 0.3 \text{ kg}\cdot\text{m}$ ,  $28.9 \pm 2.2 \text{ ft-lb}$ )**

**NOTE:**

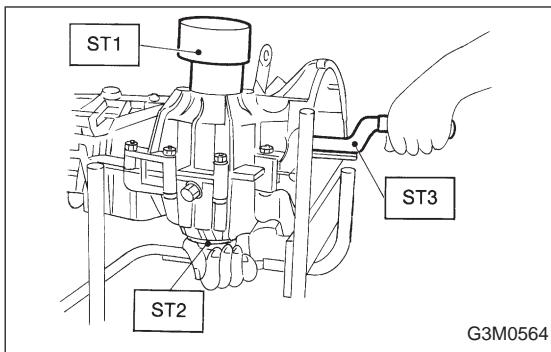
- Insert bolts from the bottom and tighten nuts at the top.
- Put cases together so that drive pinion shim and input shaft holder shim are not caught up in between.
- Confirm that counter gear and speedometer gear are meshed.

9) Tighten ball bearing attachment bolts.

**Tightening torque:**

**$29 \pm 3 \text{ N}\cdot\text{m}$  ( $3.0 \pm 0.3 \text{ kg}\cdot\text{m}$ ,  $21.7 \pm 2.2 \text{ ft-lb}$ )**

10) Backlash adjustment of hypoid gear and preload adjustment of roller bearing



(1) Place the transmission with case left side facing downward and put ST1 on bearing cup.

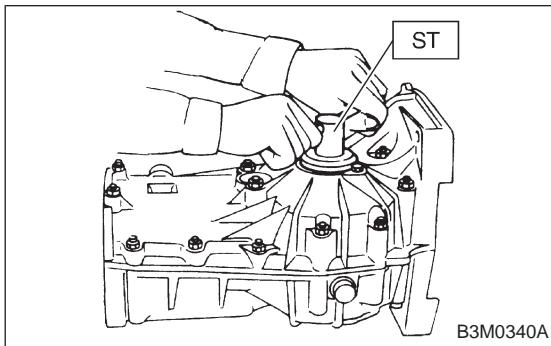
(2) Screw retainer assembly into left case from the bottom with ST2. Fit ST3 on the transmission main shaft. Shift gear into 4th or 5th and turn the shaft several times. Screw in the retainer while turning ST3 until a slight resistance is felt on ST2.

This is the contact point of hypoid gear and drive pinion shaft. Repeat the above sequence several times to ensure the contact point.

ST1 399780104 WEIGHT

ST2 499787000 WRENCH ASSY

ST3 499927100 HANDLE

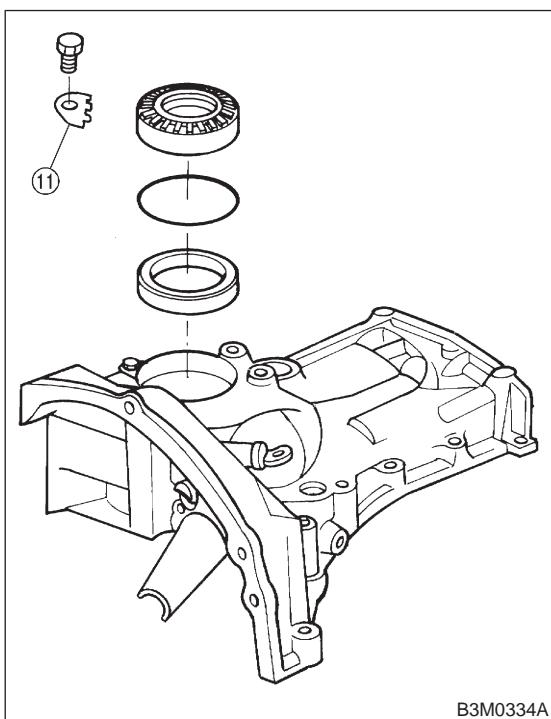


(3) Remove weight and screw in retainer without O-ring on the upper side and stop at the point where slight resistance is felt.

**NOTE:**

At this point, the backlash between the hypoid gear and drive pinion shaft is zero.

ST 499787000 WRENCH ASSY



(4) Fit lock plate ⑪. Loosen the retainer on the lower side by 1-1/2 notches of lock plate and turn in the retainer on the upper side by the same amount in order to obtain the backlash.

**NOTE:**

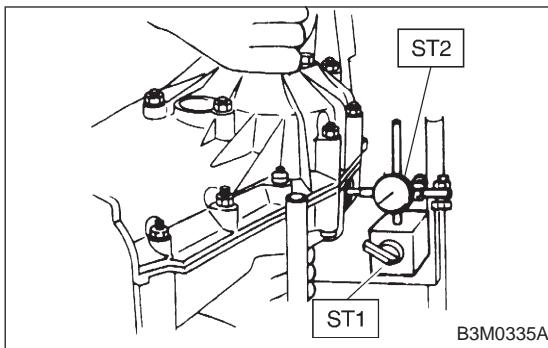
The notch on the lock plate moves by 1/2 notch if the plate is turned upside down.

(5) Turn in the retainer on the upper side additionally by 1 notch in order to apply preload on taper roller bearing.

(6) Tighten temporarily both the upper and lower lock plates and mark both holder and lock plate for later readjustment.

(7) Turn transmission main shaft several times while tapping around retainer lightly with plastic hammer.

(8) Set ST1 and ST2. Insert the needle through transmission oil drain plug hole so that the needle comes in contact with the tooth surface at a right angle and check the backlash.



ST1 498247001 MAGNET BASE  
 ST2 498247100 DIAL GAUGE

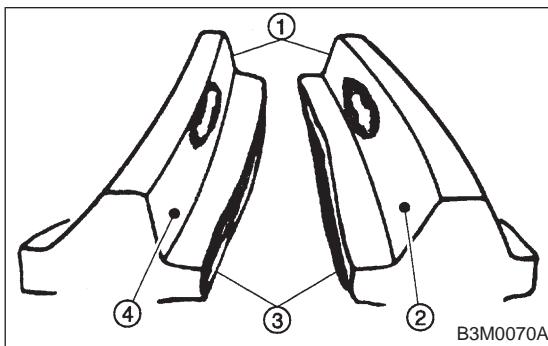
**Backlash:**

*0.13 — 0.18 mm (0.0051 — 0.0071 in)*

**NOTE:**

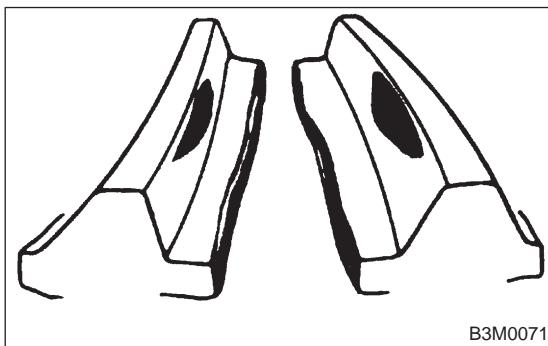
- If backlash is outside specified range, adjust it by turning holder in right side case.
- Turning holder pawl 1/2 rotation changes backlash by approximately 0.04 mm (0.0016 in).

(9) Check tooth contact of hypoid gear as follows:  
 Apply a uniform thin coat of red lead on both tooth surfaces of 3 or 4 teeth of the hypoid gear. Move the hypoid gear back and forth by turning the transmission main shaft until a definite contact pattern is developed on hypoid gear, and judge whether face contact is correct. If it is incorrect, make the following correction.



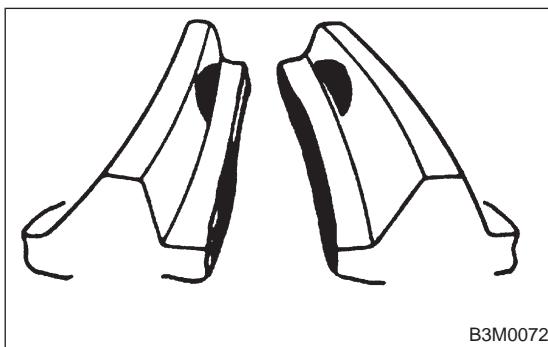
- Tooth contact is correct.

- ① Toe
- ② Coast side
- ③ Heel
- ④ Drive side



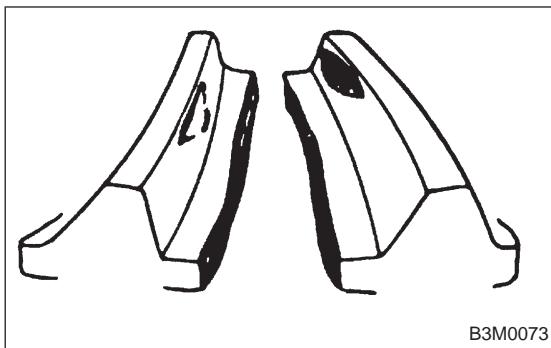
- Backlash is excessive.

To reduce backlash, loosen holder on the upper side (case right side) and turn in the holder on the lower side (case left side) by the same amount.

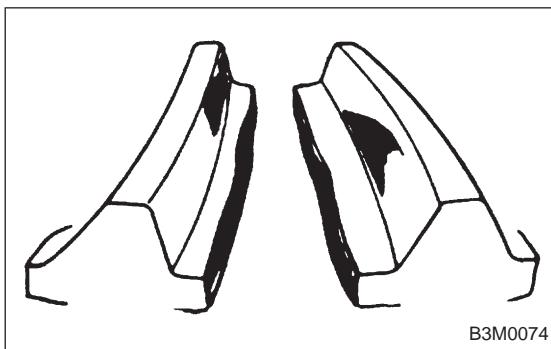


- Backlash is insufficient.

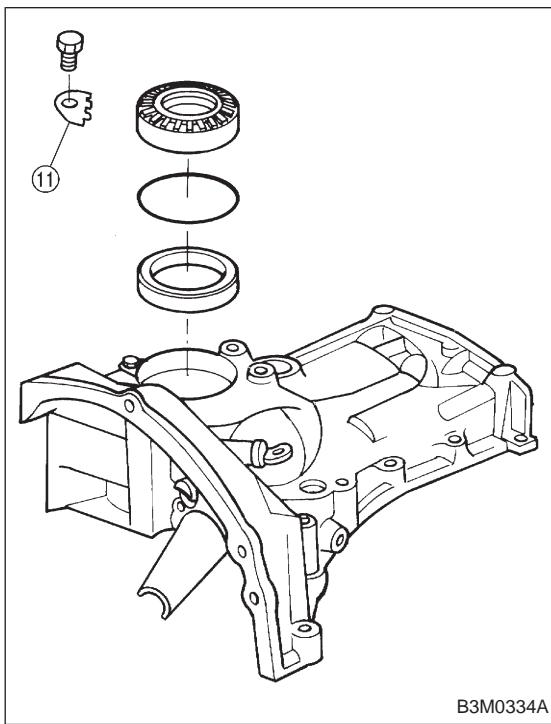
To increase backlash, loosen holder on the lower side (case left side) and turn in the holder on the upper side (case right side) by the same amount.



- The drive pinion shim selected before is too thick. Reduce its thickness.



- The drive pinion shim selected before is too thin. Increase its thickness.



11) After checking the tooth contact of hypoid gears, remove the lock plate ⑪. Then loosen retainer until the O-ring groove appears. Fit O-ring into the groove and tighten retainer into the position where retainer has been tightened in.

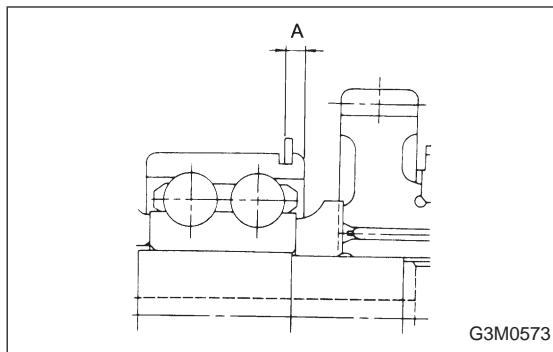
Tighten lock plate ⑪.

***Tightening torque:***

***25±3 N·m (2.5±0.3 kg-m, 18.1±2.2 ft-lb)***

**NOTE:**

Carry out this job on both upper and lower retainers.



## 12) Selecting of main shaft rear plate

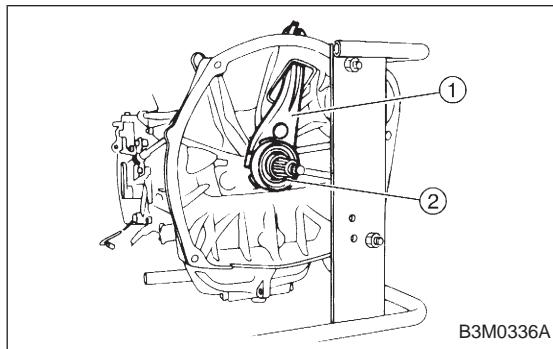
Using ST, measure the amount A of ball bearing protrusion from transmission main case surface and select the proper plate in the following table:

ST 498147000 DEPTH GAUGE

Dimension "A" mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA040	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA050	2

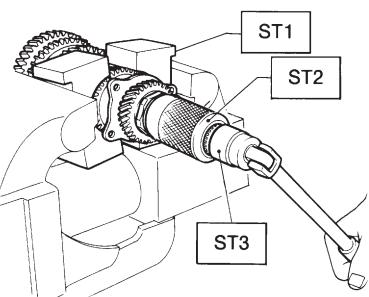
## NOTE:

Before measuring, tap the end of main shaft with a plastic hammer lightly in order to make the clearance zero between the main case surface and the moving flange of bearing.

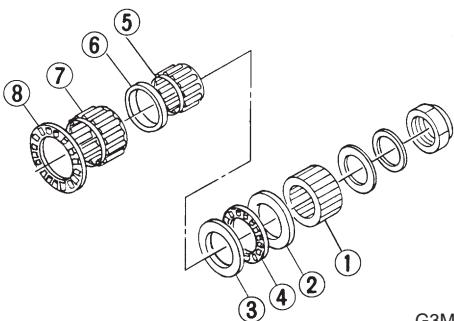


## 13) Install clutch release lever ① and bearing ②.

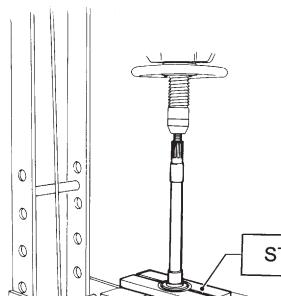
<Ref. to 2-10 [W3C0].>



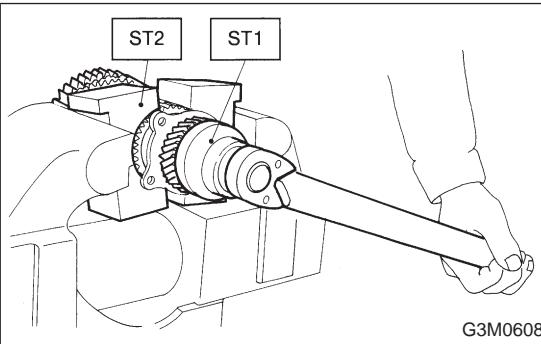
G3M0595



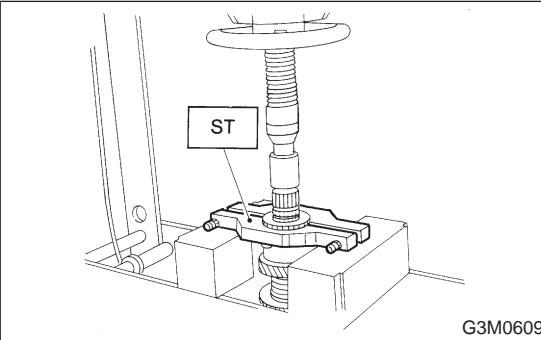
G3M0606



G3M0607



G3M0608



G3M0609

## 6. Drive Pinion Assembly (AWD Model)

### A: DISASSEMBLY

#### 1. DRIVE PINION SHAFT

- 1) Straighten lock nut at staked portion. Remove the lock nut using ST1, ST2 and ST3.

ST1 899884100 HOLDER

ST2 498427100 STOPPER

ST3 899988608 SOCKET WRENCH

- 2) Withdraw drive pinion from driven shaft.

Remove differential bevel gear sleeve ①, Adjusting washer No. 1 ② (25 x 37.5 x t), Adjusting washer No. 2 ③ (25 x 37.5 x 4), thrust bearing ④ (25 x 37.5 x 3), needle bearing ⑤ (25 x 30 x 20), drive pinion collar ⑥, needle bearing ⑦ (30 x 37 x 23) and thrust bearing ⑧ (33 x 50 x 3).

- 3) Remove roller bearing and washer (33 x 50 x 5) using ST and press.

ST 498077000 REMOVER

#### CAUTION:

**Do not reuse roller bearing.**

#### 2. DRIVEN GEAR ASSEMBLY

#### CAUTION:

**Attach a cloth to the end of driven shaft (on the frictional side of thrust needle bearing) during disassembly or reassembly to prevent damage.**

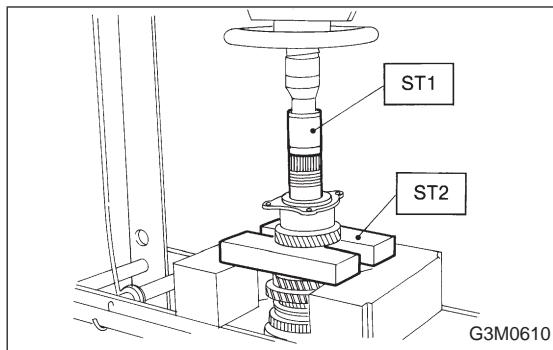
- 1) Straighten lock nut at staked portion. Remove the lock nut using ST1 and ST2.

ST1 499987300 SOCKET WRENCH (50)

ST2 899884100 HOLDER

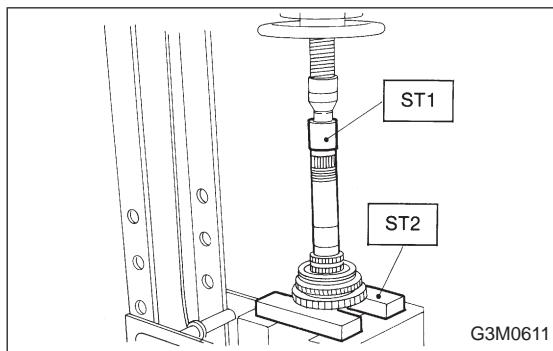
- 2) Remove 5th driven gear using ST.

ST 499857000 5TH DRIVEN GEAR REMOVER



- 3) Remove woodruff key.
- 4) Remove roller bearing (42 x 74 x 40), 3rd and 4th driven gear using ST1 and ST2.

ST1 499757002 SNAP RING PRESS  
 ST2 899714110 REMOVER

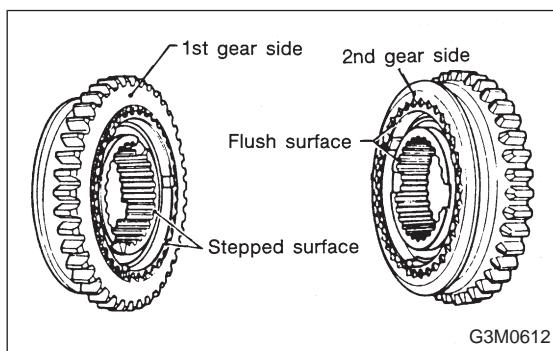


- 5) Remove the key.
- 6) Remove 2nd driven gear assembly.
- 7) Remove 1st driven gear, 2nd gear bushing, gear and hub using ST1 and ST2.

Replace gear and hub if necessary. Do not attempt to disassemble if at all possible because they must engage at a specified point. If they have to be disassembled, mark the engaging point beforehand.

ST1 499757002 SNAP RING PRESS  
 ST2 899714110 REMOVER

- 8) Remove sub gears for 1st and 2nd driven gear.

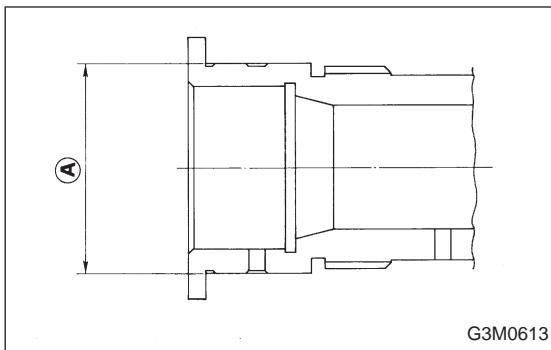


## B: ASSEMBLY

### 1. GEAR AND HUB ASSEMBLY

#### NOTE:

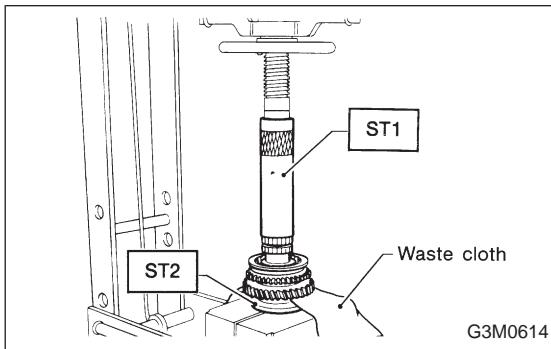
Position open ends of springs 120° apart.



## 2. DRIVEN GEAR ASSEMBLY

Assemble a driven shaft and 1st driven gear that select for adjustment the proper radial clearance.

Driven shaft		1st driven gear
Part No.	Diameter A mm (in)	Part No.
32229AA130	49.959 — 49.966 (1.9669 — 1.9672)	32231AA270
32229AA120	49.967 — 49.975 (1.9672 — 1.9675)	32231AA260



- 1) Install 1st driven gear, 1st-2nd baulk ring, gear and hub assembly onto driven shaft.

**NOTE:**

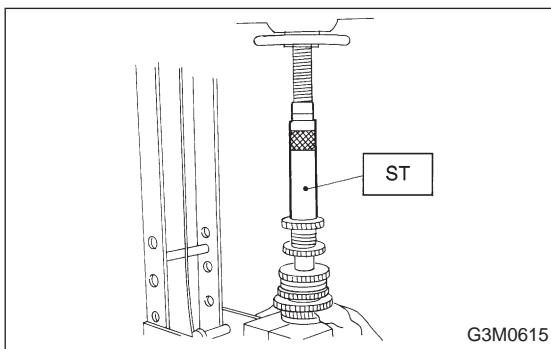
Take care to install gear hub in proper direction.

- 2) Install 2nd driven gear bushing onto driven shaft using ST1, ST2 and press.

ST1 499277200 INSTALLER  
ST2 499587000 INSTALLER

**CAUTION:**

Attach a cloth to the end of driven shaft to prevent damage.

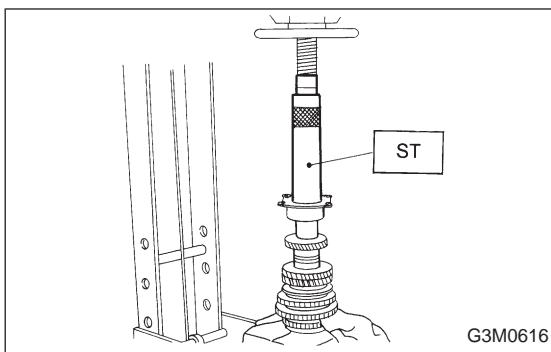


- 3) Install 2nd driven gear, 1st-2nd baulk ring and insert onto driven shaft. After installing key on driven shaft, install 3rd-4th driven gear using ST and press.

ST 499277200 INSTALLER

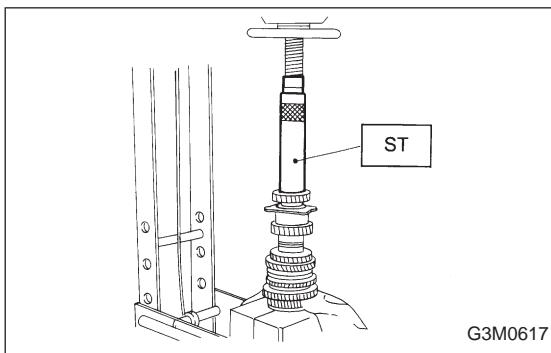
**NOTE:**

Align groove in baulk ring with insert.



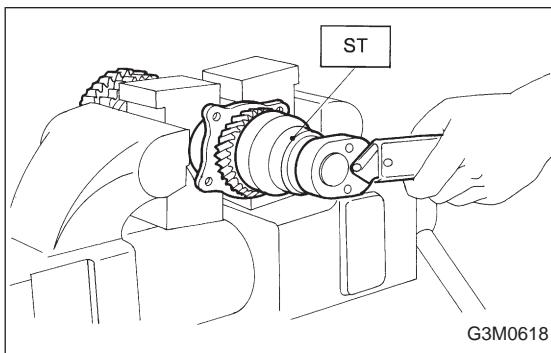
4) Install a set of roller bearings (42 x 74 x 40) onto the driven shaft using ST and press.

ST 499277200 INSTALLER



5) Position woodruff key in groove on the rear of driven shaft. Install 5th driven gear onto drive shaft using ST and press.

ST 499277200 INSTALLER

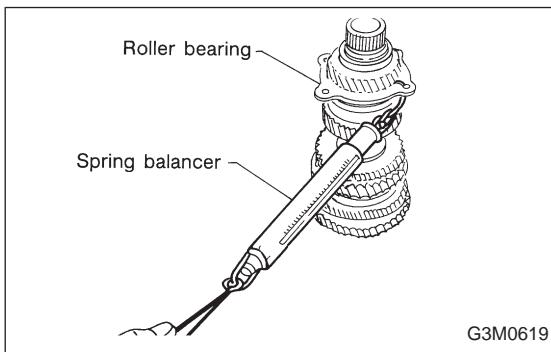


6) Install lock washer (42 x 53 x 2). Install lock nut (42 x 13) and tighten to the specified torque using ST.

ST 499987300 SOCKET WRENCH (50)

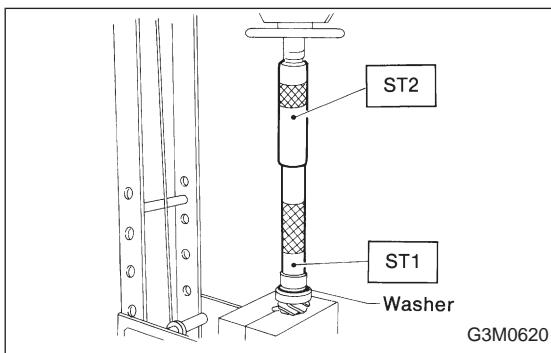
**Tightening torque:**

**$245 \pm 10 \text{ N}\cdot\text{m} (25 \pm 1 \text{ kg}\cdot\text{m}, 181 \pm 7 \text{ ft-lb})$**



**NOTE:**

- Stake lock nut at two points.
- Check that starting torque of roller bearing is 0.1 to 1.5 N·m (1 to 15 kg-cm, 0.9 to 13.0 in-lb).

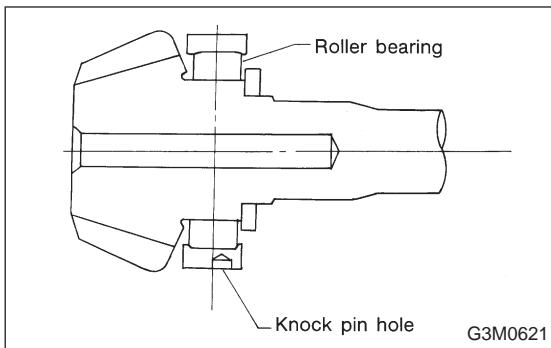


### 3. DRIVE PINION SHAFT

1) Install roller bearing onto drive pinion. Install washer (33 x 50 x 5) using ST1, ST2 and press.

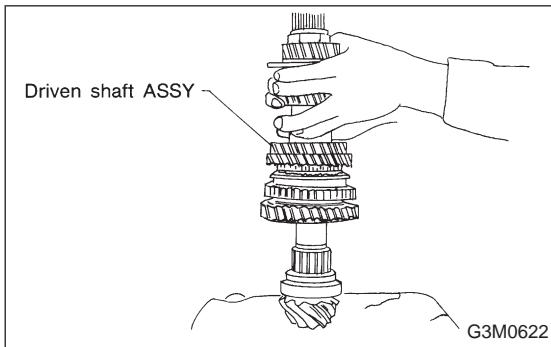
ST1 499277100 BUSH 1-2 INSTALLER

ST2 499277200 INSTALLER

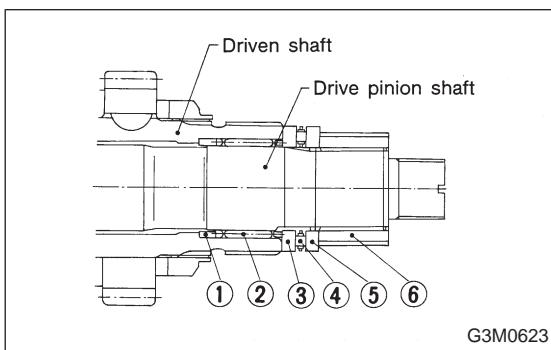


## NOTE:

When installing roller bearing, note its directions (front and rear) because knock pin hole in outer race is offset.



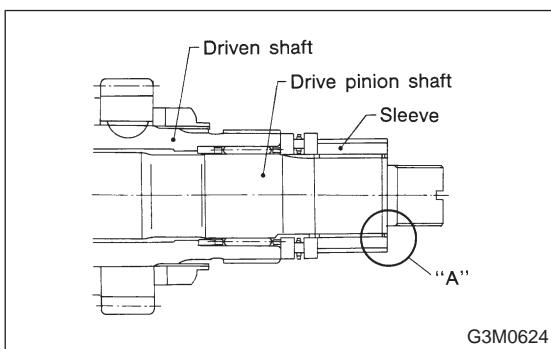
- 2) Install thrust bearing (33 x 50 x 3) and needle bearing (30 x 37 x 23). Install driven shaft assembly.



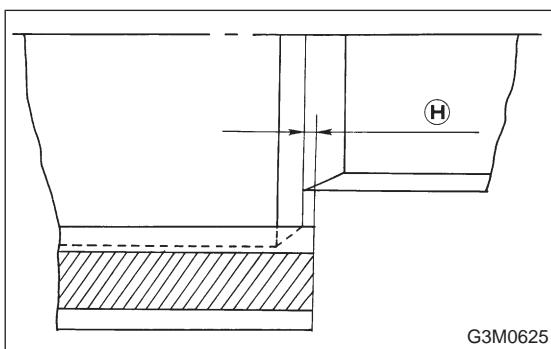
- 3) Install drive pinion collar ①, needle bearing ② (25 x 30 x 20), Adjusting washer No. 2 ③ (25 x 36 x 4), thrust bearing ④ (25 x 37.5 x 3), Adjusting washer No. 1 ⑤ (25 x 36 x t) and differential bevel gear sleeve ⑥ in that order.

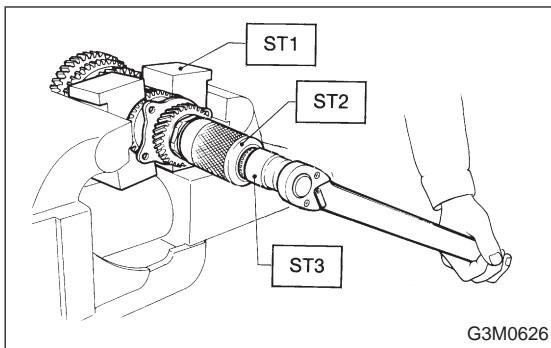
## NOTE:

Be careful because spacer must be installed in proper direction.

**4. ADJUSTMENT OF THRUST BEARING PRELOAD**

- 1) After completing the preceding steps 1 through 3, select adjusting washer No. 2 so that dimension  $\textcircled{H}$  is zero through visual check. Position washer (18.3 x 30 x 4) and lock washer (18 x 30 x 2) and install lock nut (18 x 13.5).





2) Using ST1, ST2 and ST3, tighten lock nut to the specified torque.

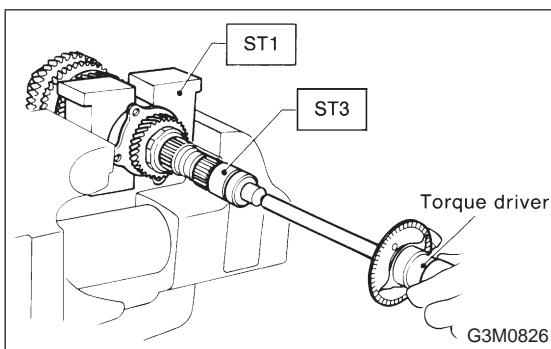
ST1 899884100 HOLDER

ST2 498427100 STOPPER

ST3 899988608 SOCKET WRENCH (27)

**Tightening torque:**

**$118 \pm 8 \text{ N}\cdot\text{m} (12 \pm 0.8 \text{ kg}\cdot\text{m}, 86.8 \pm 5.8 \text{ ft-lb})$**



3) After removing ST1, measure starting torque.

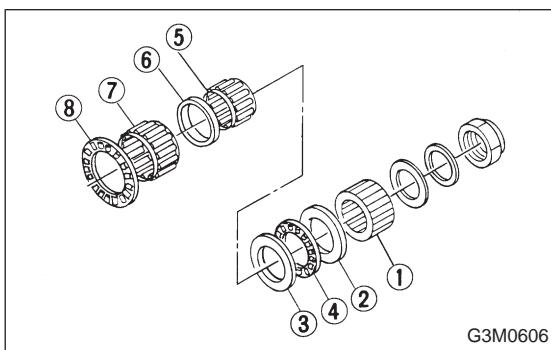
ST1 899884100 HOLDER

ST2 498427100 STOPPER

ST3 899988608 SOCKET WRENCH (27)

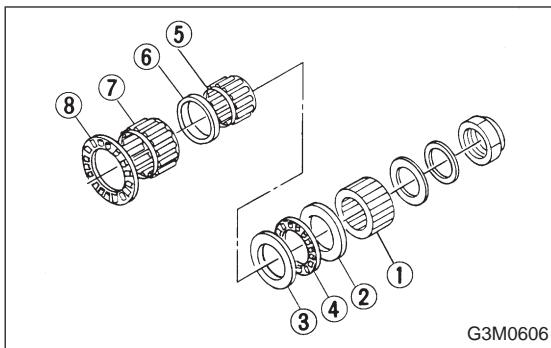
**Starting torque:**

**$0.3 - 0.8 \text{ N}\cdot\text{m} (3 - 8 \text{ kg}\cdot\text{cm}, 2.6 - 6.9 \text{ in-lb})$**



4) If starting torque is not within specified limit, select new adjusting washer No. 1 ② and recheck starting torque.

• Adjusting washer No. 1	Part No.	Thickness mm (in)
	803025051	3.925 (0.1545)
	803025052	3.950 (0.1555)
	803025053	3.975 (0.1565)
	803025054	4.000 (0.1575)
	803025055	4.025 (0.1585)
	803025056	4.050 (0.1594)
	803025057	4.075 (0.1604)

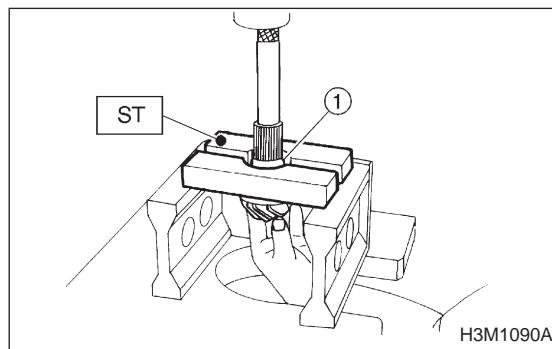
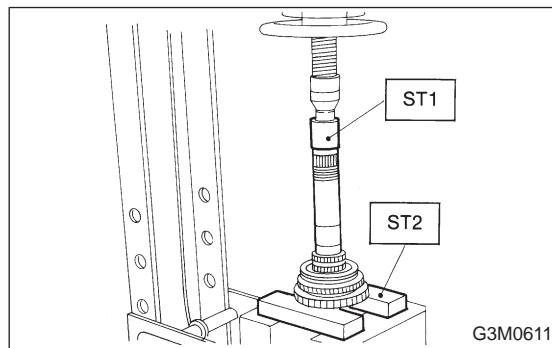
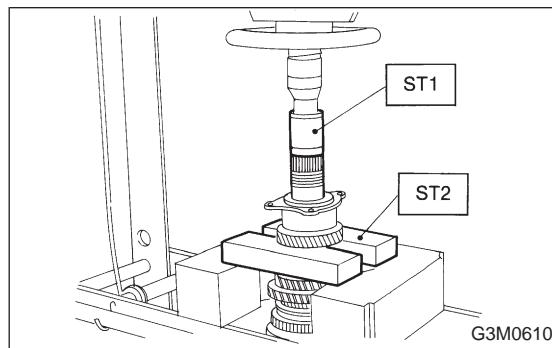
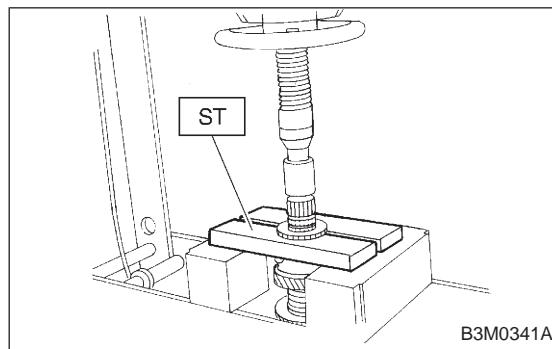
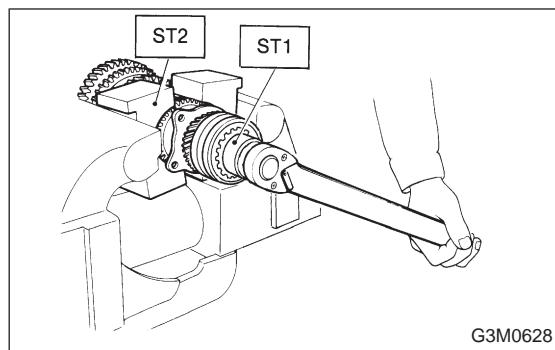


5) If specified starting torque range cannot be obtained when a No. 1 ② adjusting washer is used, then select a suitable No. 2 ③ adjusting washer from those listed in the following table. Repeat steps (1) through (4) to adjust starting torque.

Starting torque	Dimension H	Washer No. 2
Low	Small	Select thicker one.
High	Large	Select thinner one.

• Adjusting washer No. 2	Part No.	Thickness mm (in)
	803025059	3.850 (0.1516)
	803025054	4.000 (0.1575)
	803025058	4.150 (0.1634)

6) Recheck that starting torque is within specified range, then clinch lock nut at four positions.



## 7. Drive Pinion Assembly (FWD Model)

### A: DISASSEMBLY

- 1) Loosen lock nut using ST1 and ST2.

ST1 499987100 or 499987003  
899984103 SOCKET WRENCH (35) or  
ST2 899884100 HOLDER

NOTE:

Remove caulking before taking off lock nut.

- 2) Remove 5th driven gear using a press.

ST 498077000 5TH DRIVEN GEAR REMOVER

- 3) Remove woodruff key.

- 4) Remove roller bearing (29 x 74 x 38) and 3rd-4th driven gear using ST1 and ST2.

ST1 899714110 REMOVER

ST2 499757002 SNAP RING PRESS

- 5) Remove 2nd driven gear assembly.

- 6) Remove 3rd-4th driven gear key.

- 7) Remove 1st driven gear, 2nd gear bushing, and gear & hub assembly using ST1 and ST2.

Replace gear and hub if necessary. Do not attempt to disassemble if at all possible because they must engage at a specified point. If they have to be disassembled, mark the engaging point beforehand.

ST1 499757002 SNAP RING PRESS

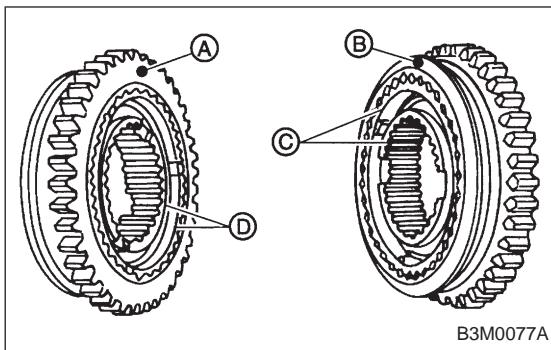
ST2 899714110 REMOVER

- 8) Remove 1st gear bushing ①, 1st driven gear thrust plate, and roller bearing (41 x 71 x 23) using ST and press.

ST 498517000 REPLACER

**CAUTION:**

Replace roller bearing (41 x 71 x 23) with a new one if this disassembly is performed.



## B: ASSEMBLY

1) Assemble gear and hub assembly.

**A**: 1st gear side  
**B**: 2nd gear side  
**C**: Flush surface  
**D**: Stepped surface

**NOTE:**

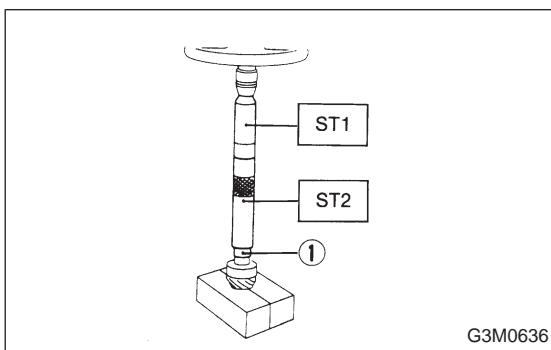
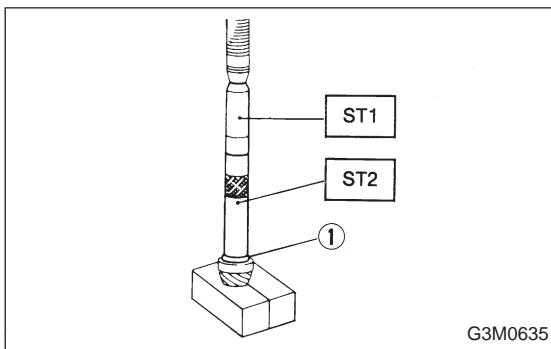
- Use new gear and hub assembly, if gear or hub have been replaced.
- Position open ends of springs 120° apart.

2) Drive roller bearing onto drive pinion shaft and 1st driven gear thrust washer ① using ST1 and ST2.

ST1 499877000 INSTALLER  
 ST2 499277100 INSTALLER

**CAUTION:**

**Use new roller bearing, 1st gear thrust washer.**



3) Install 1st-2nd driven gear bushing ① onto drive pinion shaft.

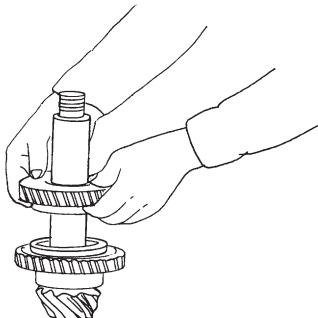
**NOTE:**

Bushing may be installed with either side up.

ST1 499877000 INSTALLER  
 ST2 499277100 INSTALLER

4) Measure outside diameter of 1st driven gear bushing to determine suitable 1st driven gear.

Bushing outside diameter mm (in)	1st driven gear
41.983 — 41.996 (1.6529 — 1.6534)	32231AA320
41.968 — 41.982 (1.6523 — 1.6528)	32231AA330
41.954 — 41.967 (1.6517 — 1.6522)	32231AA340

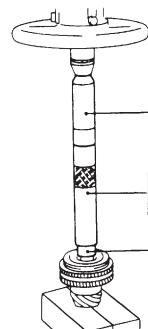


G3M0637

5) Install 1st driven gear, 1st-2nd balk ring and gear and hub assembly (already assembled in previous step) to drive pinion shaft by hand.

**NOTE:**

Align ring groove with insert.

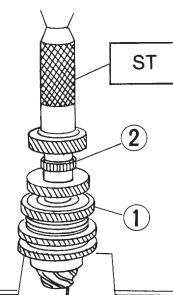


G3M0638

6) Install 1st-2nd driven gear bushing ① to drive pinion shaft using ST1 and ST2.

ST1 499877000 INSTALLER

ST2 499277100 INSTALLER



G3M0639

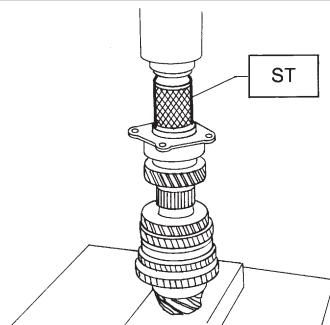
7) Install 2nd driven gear ① and 1st-2nd balk ring to drive pinion shaft by hand.

8) Install key into the groove on drive pinion shaft and install 3rd-4th driven gear.

**NOTE:**

Ball bearing may be installed without using the tool. There should be no problem.

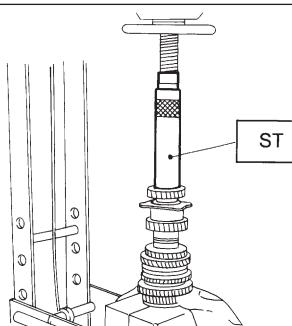
ST 499877000 INSTALLER



G3M0640

9) Install ball bearing (29 x 74 x 38) on drive pinion shaft with ST.

ST 499277100 INSTALLER



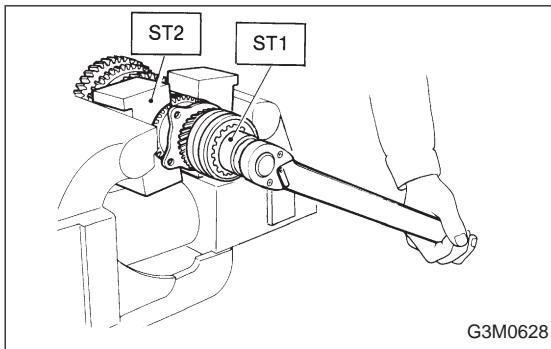
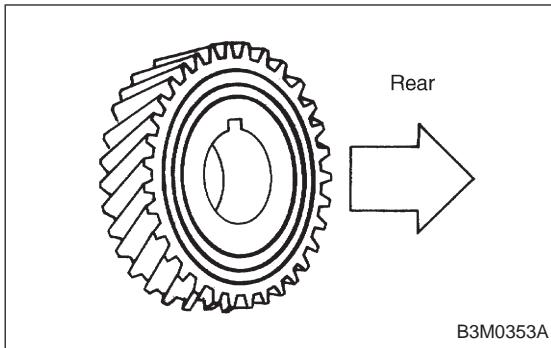
G3M0617

10) Position woodruff key in groove on the rear of drive pinion shaft. Install 5th driven gear onto drive shaft using ST and press.

ST 499277100 INSTALLER

**CAUTION:**

- Face 5th driven gear in the correct direction.
- Be careful not to dislocate woodruff key while installing 5th gear.



11) Install lock washer and tighten lock nut to the specified torque using ST1 and ST2.

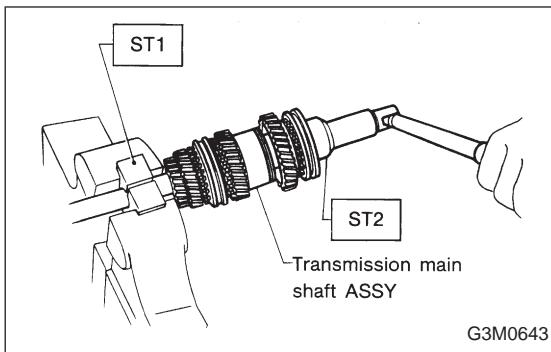
ST1 499987100 or 499987003 or  
899984103 SOCKET WRENCH (35)  
ST2 899884100 HOLDER

**CAUTION:**

- Discard old lock nuts, replace with new ones.
- Secure lock nut in four places.

**Tightening torque:**

$118 \pm 6 \text{ N}\cdot\text{m} (12.0 \pm 0.6 \text{ kg}\cdot\text{m}, 86.8 \pm 4.3 \text{ ft-lb})$



## 8. Main Shaft Assembly (AWD Model)

### A: DISASSEMBLY

1) Put vinyl tape around main shaft splines to protect oil seal from damage. Then pull out oil seal and needle bearing by hand.

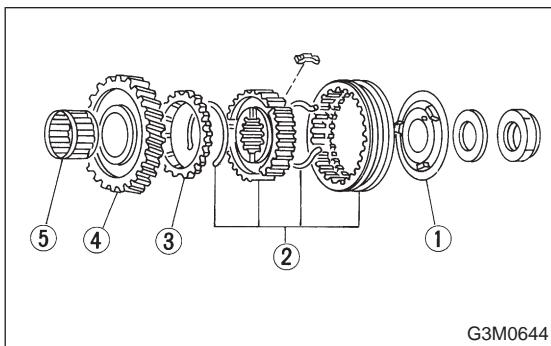
2) Remove lock nut with ST1 and ST2.

ST1 498937000 TRANSMISSION HOLDER

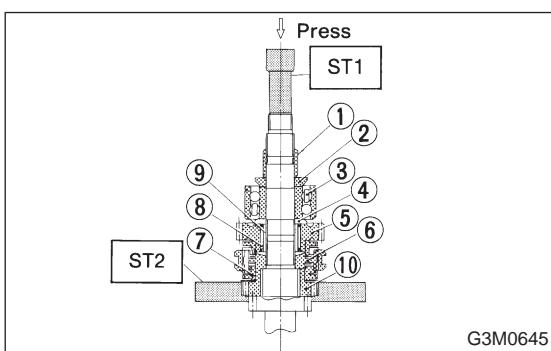
ST2 499987003 SOCKET WRENCH (35)

#### NOTE:

Remove caulking before taking off lock nut.



3) Remove insert stopper plate, sleeve and hub assembly No. 2, balk ring, 5th drive gear, and needle bearing (32 x 36 x 25.7).



4) Using ST1, ST2 and a press, remove:

- ① 5th needle bearing inner race
- ② 5th gear thrust washer
- ③ Ball bearing (25.5 x 65 x 31)
- ④ 4th gear thrust washer
- ⑤ 4th drive gear
- ⑥ Sleeve and hub assembly
- ⑦ Balk ring
- ⑧ 4th needle bearing
- ⑨ 4th needle bearing inner race
- ⑩ 3rd drive gear

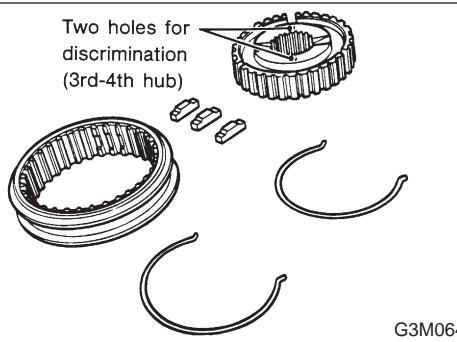
ST1 899864100 REMOVER

ST2 899714110 REMOVER

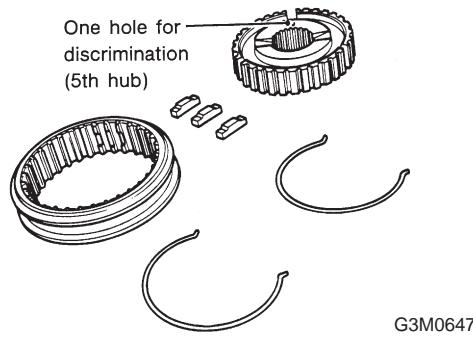
#### NOTE:

Replace sleeve and hub with new ones. Do not attempt to disassemble because they must engage at a specified point. If they should be disassemble, mark engagement point on splines beforehand.

Two holes for discrimination  
(3rd-4th hub)



One hole for discrimination  
(5th hub)



## B: ASSEMBLY

- Assemble sleeve and hub assembly for 3rd-4th, 5th and high-low synchronizing.

NOTE:

Position open ends of spring 120° apart.

- Install 3rd drive gear, balk ring, sleeve and hub assembly for 3rd-4th needle bearing (32 x 36 x 25.7) on transmission main shaft.

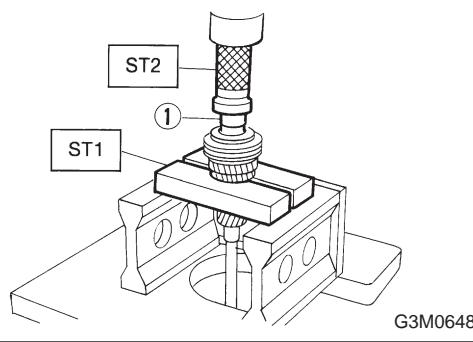
NOTE:

Align groove in balk ring with shifting insert.

ST2

ST1

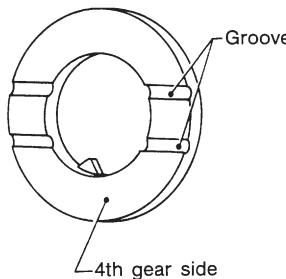
①



- Install 4th needle bearing race ① onto transmission main shaft using ST1, ST2 and a press.

ST1 899714110 REMOVER

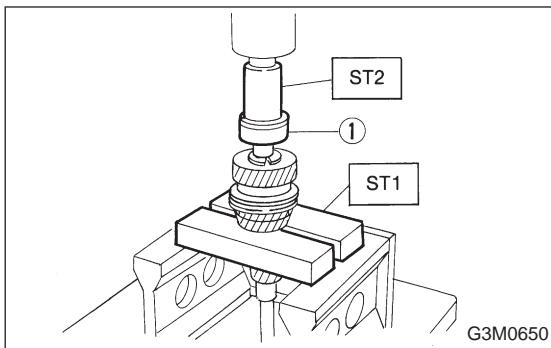
ST2 499877000 RACE 4-5 INSTALLER



- Install balk ring, needle bearing (32 x 30 x 25.7), 4th drive gear and 4th gear thrust washer to transmission main shaft.

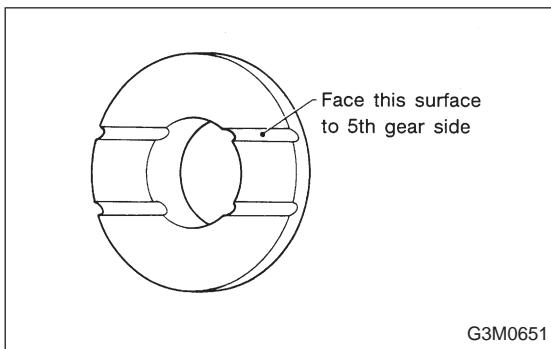
NOTE:

Face thrust washer in the correct direction.



5) Drive ball bearing ① onto the rear section of transmission main shaft using ST1, ST2 and a press.

ST1 899714110 REMOVER  
ST2 499877000 INSTALLER



6) Using the same tools as in step 5) above, install the following parts onto the rear section of transmission main shaft.

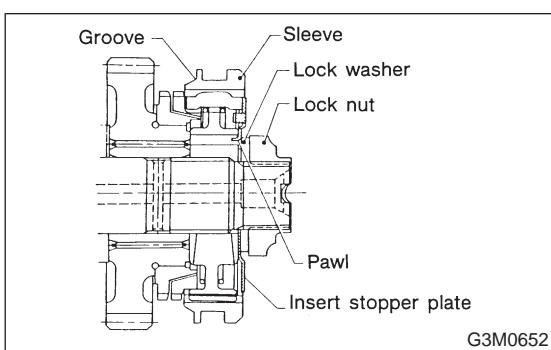
- 5th gear thrust washer

NOTE:

Face thrust washer in the correct direction.

ST1 899714110 REMOVER  
ST2 499877000 RACE 4-5 INSTALLER

- 5th needle bearing race



7) Install the following parts to the rear section of transmission main shaft.

- Needle bearing (32 x 36 x 25.7)
- 5th drive gear
- Balk ring
- Sleeve and hub assembly
- Insert stopper plate
- Lock washer (22 x 38 x 2)
- Tighten lock nuts (22 x 13) to the specified torque using ST1 and ST2.

ST1 499987003 SOCKET WRENCH

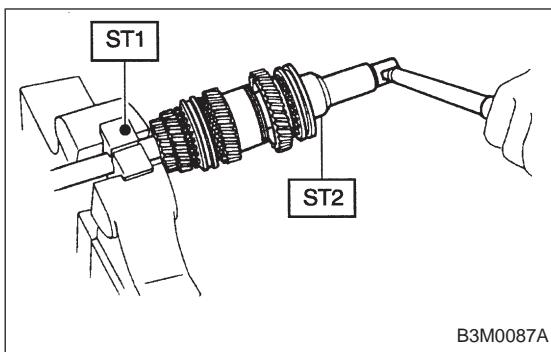
ST2 498937000 TRANSMISSION HOLDER

NOTE:

- Align groove in balk ring with shifting insert.
- Be sure to fit pawl of insert stopper plate into 4 mm (0.16 in) dia. hole in the boss section of synchronizer hub.
- Secure lock nuts in two places after tightening.

**Tightening torque:**

**$118\pm6 \text{ N}\cdot\text{m} (12.0\pm0.6 \text{ kg}\cdot\text{m}, 86.8\pm4.3 \text{ ft-lb})$**



## 9. Main Shaft Assembly (FWD Model)

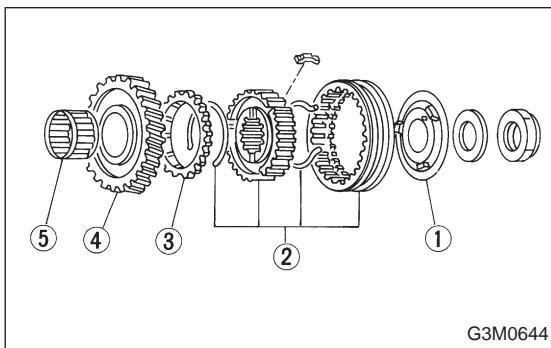
### A: DISASSEMBLY

- 1) Put vinyl tape around main shaft splines to protect oil seal from damage. Then pull out oil seal and needle bearing by hand.
- 2) Remove lock nut from transmission main shaft assembly.

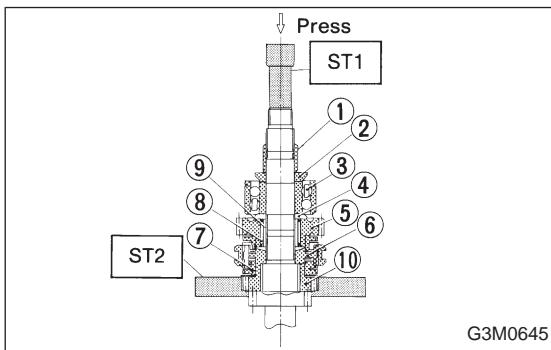
#### NOTE:

Remove caulking before taking off lock nut.

ST1 498937000 TRANSMISSION HOLDER  
ST2 499987003 SOCKET WRENCH (35)



- 3) Remove insert stopper plate (1), sleeve and hub assembly No. 2, baulk ring (3), 5th drive gear (4), and needle bearing (5) (32 x 36 x 25.7).



- 4) Using ST1, ST2 and a press, remove:

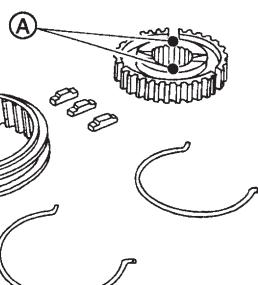
- 5th needle bearing inner race (1)
- 5th gear thrust washer (2)
- Ball bearing (3) (25.5 x 65 x 31)
- 4th gear thrust washer (4)
- 4th drive gear (5)
- Sleeve and hub assembly (6)
- Baulk ring (7)
- 4th needle bearing (8)
- 4th needle bearing inner race (9)
- 3rd drive gear (10)

ST1 899864100 REMOVER

ST2 899714110 REMOVER

#### NOTE:

Replace sleeve and hub with new ones. Do not attempt to disassemble because they must engage at a specified point. If they should be disassembled, mark engagement point on splines beforehand.



B3M0088A

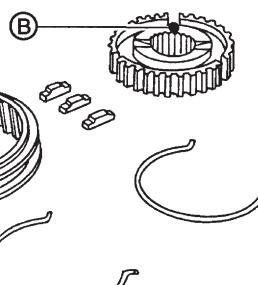
**B: ASSEMBLY**

- 1) Assemble sleeve and hub assembly for 3rd-4th and, 5th and high-low synchronizing.

## NOTE:

Position open ends of spring 120° apart.

Ⓐ: Two holes for discrimination (3rd-4th hub)



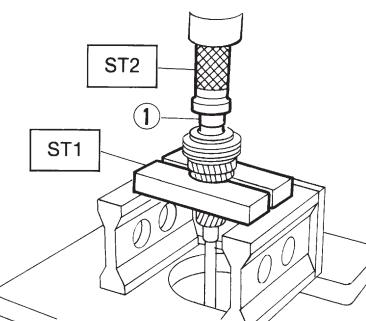
B3M0089A

Ⓑ: One hole for discrimination (5th hub)

- 2) Install 3rd drive gear, baulk ring, and sleeve and hub assembly for 3rd-4th needle bearing (32 x 36 x 25.7) on transmission main shaft.

## NOTE:

Align groove in baulk ring with shifting insert.

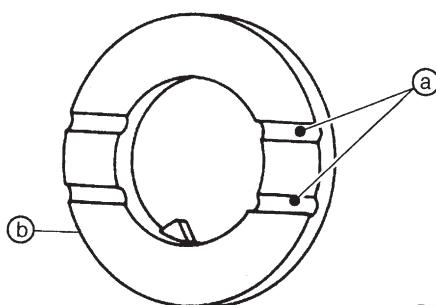


G3M0648

- 3) Install 4th needle bearing race ① onto transmission main shaft using ST1, ST2 and a press.

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



B3M0090A

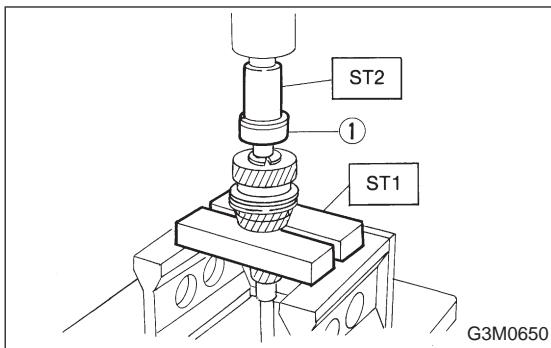
- 4) Install baulk ring, needle bearing (32 x 30 x 25.7), 4th drive gear and 4th gear thrust washer to transmission main shaft.

## NOTE:

Face thrust washer in the correct direction.

Ⓐ: Groove

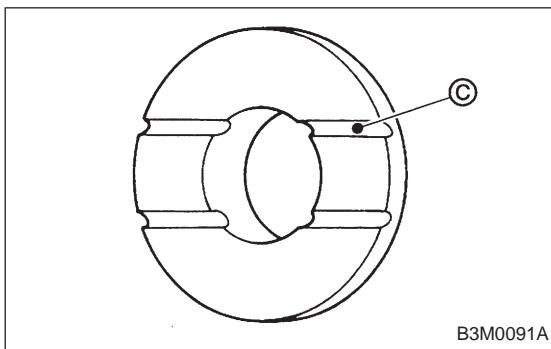
Ⓑ: 4th gear side



5) Drive ball bearing ① onto the rear section of transmission main shaft using ST1, ST2 and a press.

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



6) Using the same tools as in step 5) above, install the following parts onto the rear section of transmission main shaft.

- 5th gear thrust washer

NOTE:

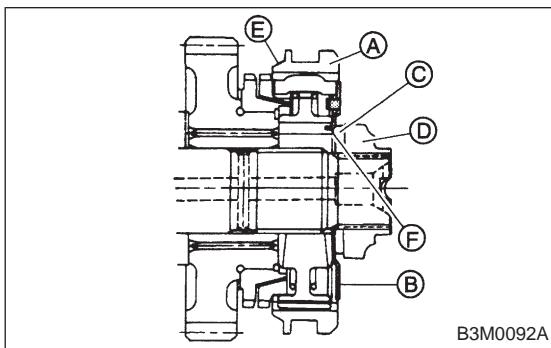
Face thrust washer in the correct direction.

(c): Face this surface to 5th gear side.

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER

- 5th needle bearing race



7) Install the following parts to the rear section of transmission main shaft.

- Needle bearing (32 x 36 x 25.7)
- 5th drive gear
- Baulk ring
- Sleeve A and hub assembly
- Insert stopper plate B
- Lock washer C (22 x 38 x 2)
- Tighten lock nuts D (22 x 13) to the specified torque using ST1 and ST2.

ST1 499987003 SOCKET WRENCH (35)

ST2 498937000 TRANSMISSION HOLDER

NOTE:

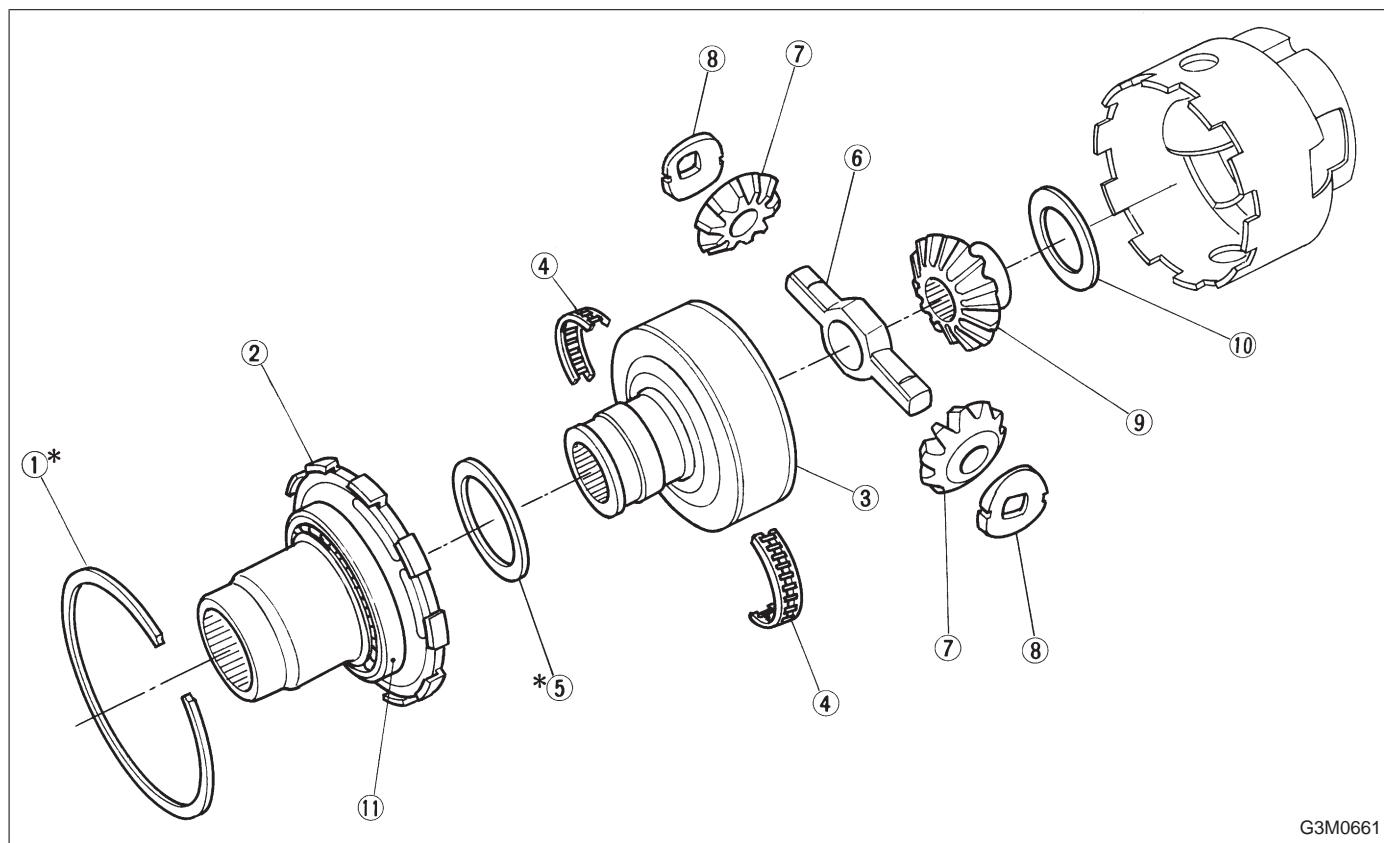
- Align groove E in baulk ring with shifting insert.
- Be sure to fit pawl F of insert stopper plate into 4 mm (0.16 in) dia. hole in the boss section of synchronizer hub.
- Secure lock nuts in two places after tightening.

**Tightening torque:**

**$118\pm6 \text{ N}\cdot\text{m} (12.0\pm0.6 \text{ kg}\cdot\text{m}, 86.8\pm4.3 \text{ ft-lb})$**

## 10. Center Differential (AWD Model)

### A: DISASSEMBLY



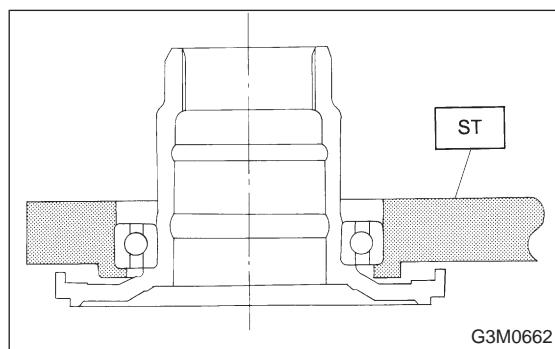
G3M0661

- 1) Remove snap ring (Inner-110) ① using flat bladed screw driver.
- 2) Remove center differential cover ②.
- 3) Remove viscous coupling ③.
- 4) Remove needle bearings ④.
- 5) Remove adjusting washer (45 x 62 x t) ⑤.
- 6) Remove pinion shaft ⑥, bevel pinions ⑦ and retainers ⑧.
- 7) Remove side gear ⑨.
- 8) Remove thrust washer ⑩.

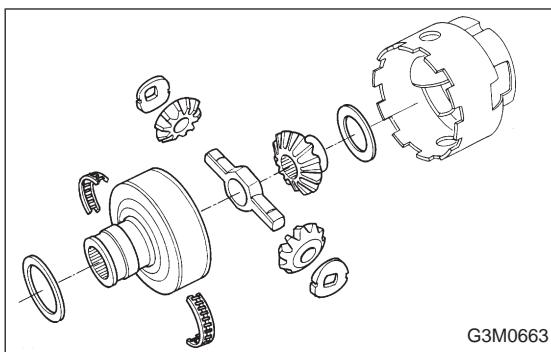
- 9) Remove ball bearing ⑪ using ST.

ST 498077300 CENTER DIFFERENTIAL BEARING  
REMOVER

**CAUTION:**  
**Do not reuse ball bearing.**



G3M0662

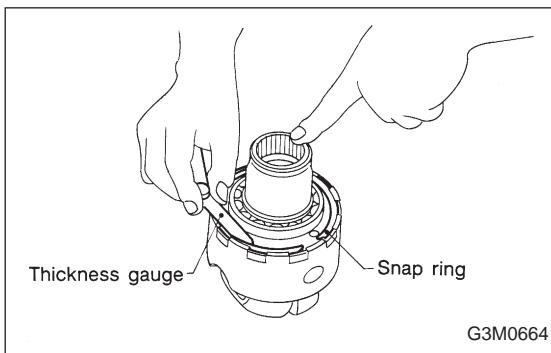


## B: ASSEMBLY

Assembly is in the reverse order of disassembly.

Observe the following;

- Install thrust washer with chamfered side of inner perimeter facing the side gear.
- Install adjusting washer with chamfered side of inner perimeter facing the viscous coupling.



### 1) Selection of snap ring (Inner-110)

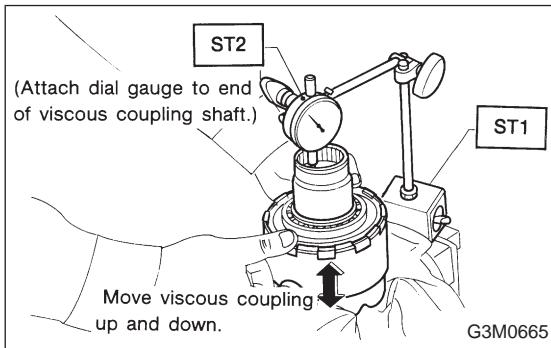
- (1) After assembling, measure clearance between snap ring and center differential case.

#### Clearance:

**0 — 0.15 mm (0 — 0.0059 in)**

- (2) If the measurement is not within the specification, select suitable snap ring.

• Snap ring (Inner-110)	Part No.	Thickness mm (in)
	805100061	2.10 (0.0827)
	805100062	2.21 (0.0870)
	805100063	2.32 (0.0913)



### 2) Selection of adjusting washer (Backlash adjustment)

- (1) After assembling, set up a ST1 and ST2 as shown in figure, and measure backlash in the axial direction.

ST1 498247001 MAGNET BASE

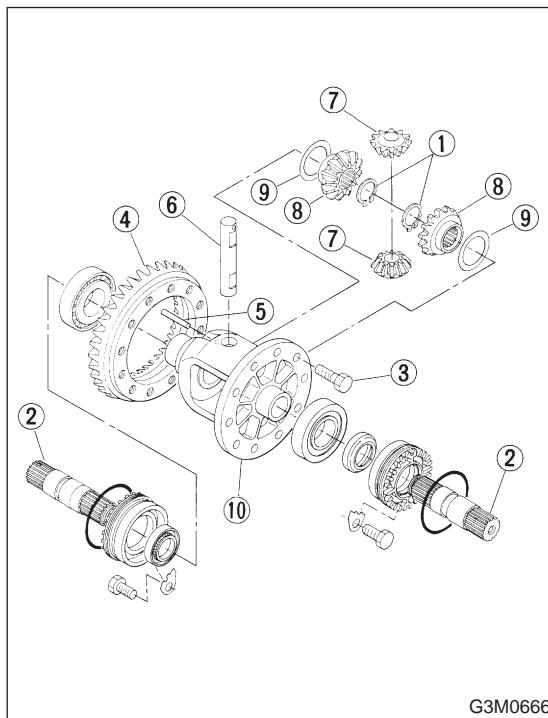
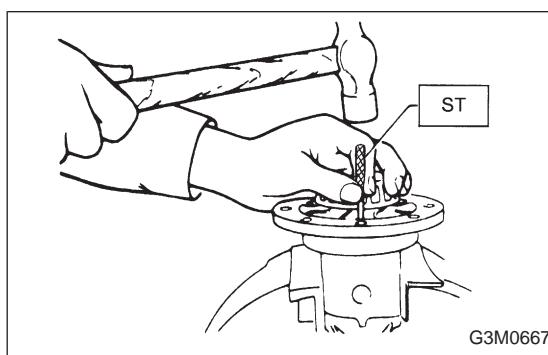
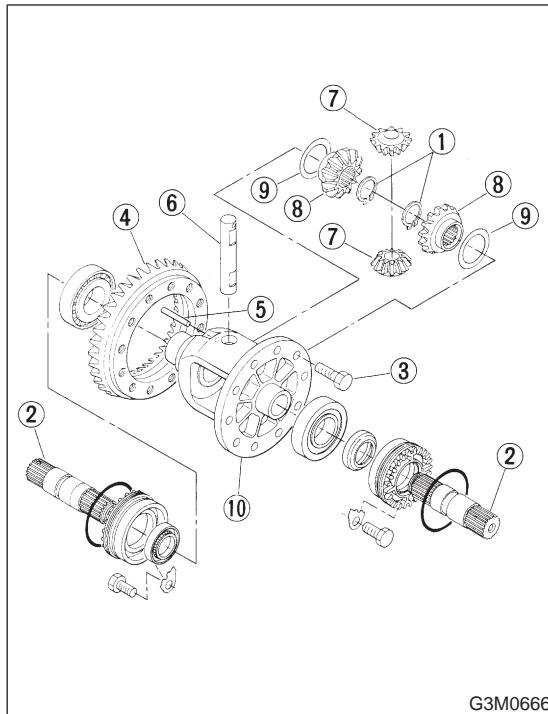
ST2 498247100 DIAL GAUGE

#### Backlash:

**0.62 — 0.86 mm (0.0244 — 0.0339 in)**

- (2) If the measurement is not within the specification, select suitable washer.

• Adjusting washer (45 x 62 x t)	Part No.	Thickness mm (in)
	803045041	1.60 (0.0630)
	803045042	1.80 (0.0709)
	803045043	2.00 (0.0787)
	803045044	2.20 (0.0866)
	803045045	2.40 (0.0945)



## 11. Front Differential

### A: DISASSEMBLY

- 1) Remove right and left snap rings ① from differential, and then remove two axle drive shafts ②.

#### NOTE:

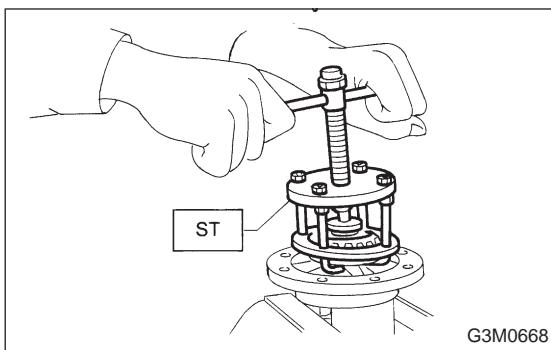
During reassembly, reinstall each axle drive shaft in the same place from which it was removed.

- 2) Loosen twelve bolts ③ and remove hypoid driven gear ④.

- 3) Drive out straight pin ⑤ from differential assembly toward hypoid driven gear.

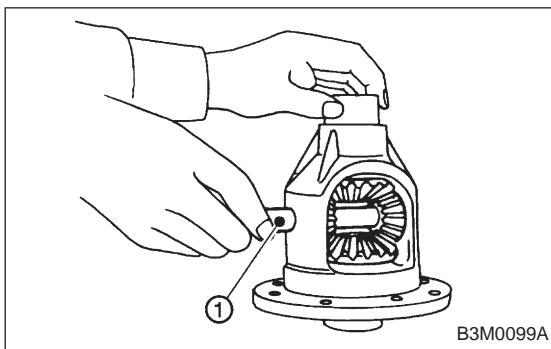
ST 899904100 REMOVER

- 4) Pull out pinion shaft ⑥, and remove differential bevel pinion ⑦ and gear ⑧ and washer ⑨.



5) Remove roller bearing using ST.

ST 399527700 PULLER SET

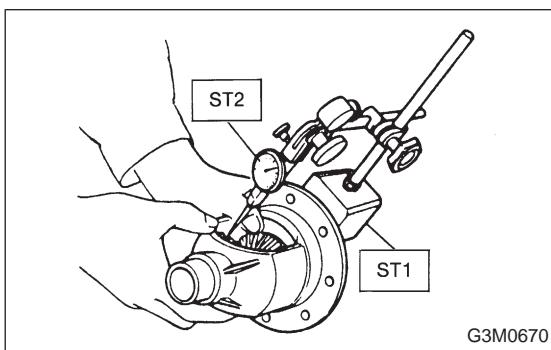


## B: ASSEMBLY

1) Install bevel gear and bevel pinion together with washers, and insert pinion shaft ①.

NOTE:

Face the chamfered side of washer toward gear.



2) Measure backlash between bevel gear and pinion. If it is not within specifications, install a suitable washer to adjust it.

**Standard backlash:**

**0.13 — 0.18 mm (0.0051 — 0.0071 in)**

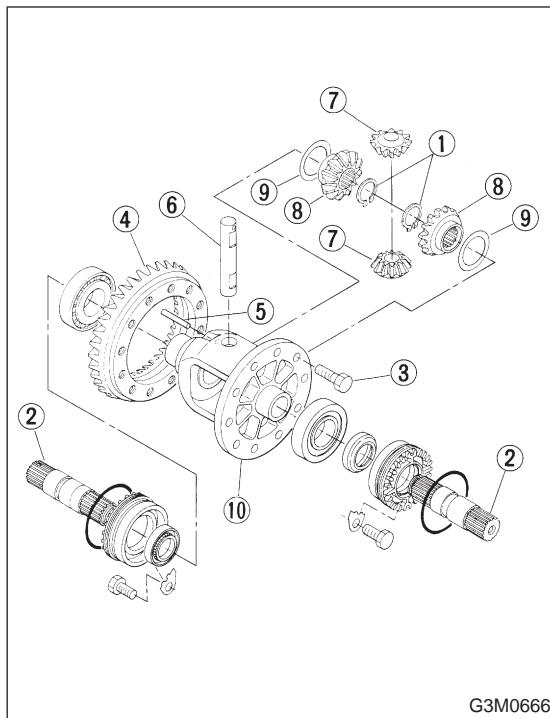
ST1 498247001 MAGNET BASE

ST2 498247100 DIAL GAUGE

NOTE:

Be sure the pinion gear tooth contacts adjacent gear teeth during measurement.

Washer (38.1 x 50 x t)	
Part No.	Thickness mm (in)
803038021	0.925 — 0.950 (0.0364 — 0.0374)
803038022	0.975 — 1.000 (0.0384 — 0.0394)
803038023	1.025 — 1.050 (0.0404 — 0.0413)

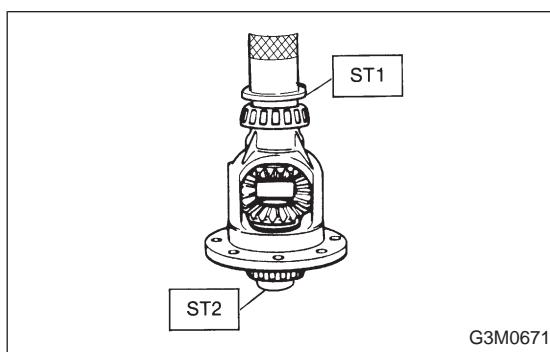


3) Align pinion shaft and differential case at their holes, and drive straight pin ⑤ into holes from the hypoid driven gear side, using ST.

ST 899904100 REMOVER

NOTE:

Lock straight pin after installing.



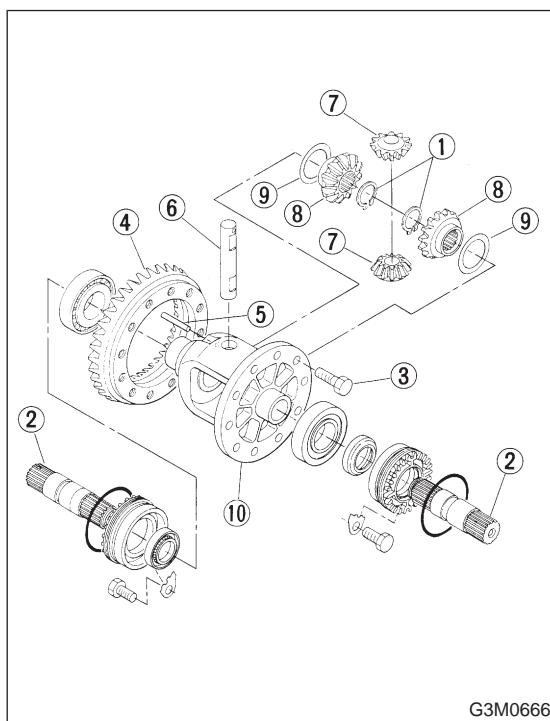
4) Install roller bearing (40 x 80 x 19.75) to differential case.

NOTE:

Be careful because roller bearing outer races are used as a set.

ST1 499277100 BUSH 1-2 INSTALLER

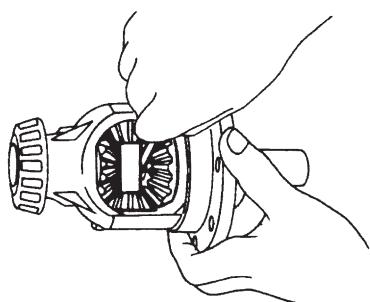
ST2 398497701 ADAPTER



5) Install hypoid driven gear ④ to differential case ⑩ using twelve bolts ③.

**Tightening torque:**

**$62\pm5\text{ N}\cdot\text{m (6.3}\pm0.5\text{ kg}\cdot\text{m, 45.6}\pm3.6\text{ ft}\cdot\text{lb)}$**



B3M0100

6) Position drive axle shaft in differential case and hold it with outer snap ring (28). Using a thickness gauge, measure clearance between the shaft and case is within specifications.

**Clearance:**

***0 — 0.2 mm (0 — 0.008 in)***

If it is not within specifications, replace snap ring with a suitable one.

Snap ring (Outer-28)	
Part No.	Thickness mm (in)
805028011	1.05 (0.0413)
805028012	1.20 (0.0472)

## 1. Manual Transmission and Differential

Symptom and possible cause	Remedy
<b>1. Gears are difficult to intermesh.</b>	
<p>The cause for difficulty in shifting gears can be classified into two kinds: one is malfunction of the gear shift system and the other is malfunction of the transmission. However, if the operation is heavy and engagement of the gears is difficult, defective clutch disengagement may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.</p>	
<ul style="list-style-type: none"> <li>(a) Worn, damaged or burred chamfer of internal spline of sleeve and reverse driven gear.</li> <li>(b) Worn, damaged or burred chamfer of spline of gears.</li> <li>(c) Worn or scratched bushings.</li> <li>(d) Incorrect contact between synchronizer ring and gear cone or wear.</li> </ul>	<ul style="list-style-type: none"> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Correct or replace.</li> </ul>
<b>2. Gear slips out.</b>	
<ul style="list-style-type: none"> <li>(1) Gear slips out when coasting on rough road.</li> <li>(2) Gear slips out during acceleration.</li> </ul>	
<ul style="list-style-type: none"> <li>(a) Defective pitching stopper adjustment.</li> <li>(b) Loose engine mounting bolts.</li> <li>(c) Worn fork shifter, broken shifter fork rail spring.</li> <li>(d) Worn or damaged ball bearing.</li> <li>(e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve.</li> <li>(f) Worn tooth step of synchronizer hub (responsible for slip-out of 3rd gear).</li> <li>(g) Worn 1st driven gear, needle bearing and race.</li> <li>(h) Worn 2nd driven gear, needle bearing and race.</li> <li>(i) Worn 3rd drive gear and bushing.</li> <li>(j) Worn 4th drive gear and bushing.</li> <li>(k) Worn reverse idler gear and bushing.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust.</li> <li>Tighten or replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> <li>Replace.</li> </ul>
<b>3. Unusual noise from transmission.</b>	
<p>If an unusual noise is heard when the car is parked with its engine idling and if the noise ceases when the clutch is disengaged, it may be considered that the noise comes from the transmission.</p>	
<ul style="list-style-type: none"> <li>(a) Insufficient or improper lubrication.</li> <li>(b) Worn or damaged gears and bearings.</li> </ul>	<ul style="list-style-type: none"> <li>Lubricate or replace with specified oil.</li> <li>Replace.</li> </ul>
<p>NOTE: If the trouble is only wear of the tooth surfaces, merely a high roaring noise will occur at high speeds, but if any part is broken, rhythmical knocking sound will be heard even at low speeds.</p>	

Symptom and possible cause	Remedy
<b>4. Broken differential (case, gear, bearing, etc.)</b> Abnormal noise will develop and finally it will become impossible to continue to run due to broken pieces obstructing the gear revolution.	
<ul style="list-style-type: none"> <li>(a) Insufficient or improper oil.</li> <li>(b) Use of vehicle under severe conditions such as excessive load and improper use of clutch.</li> <li>(c) Improper adjustment of taper roller bearing.</li> <li>(d) Improper adjustment of drive pinion and hypoid driven gear.</li> <li>(e) Excessive backlash due to worn differential side gear, washer or differential pinion.</li> <li>(f) Loose hypoid driven gear clamping bolts.</li> </ul>	<p>Disassemble differential and replace broken components and at the same time check other components for any trouble, and replace if necessary.</p> <p>Readjust bearing preload and backlash and face contact of gears.</p> <p>Add recommended oil to specified level. Do not use vehicle under severe operating conditions.</p>
<b>5. Differential and hypoid gear noises.</b> Troubles of the differential and hypoid gear always appear as noise problems. Therefore noise is the first indication of the trouble. However noises from the engine, muffler, tire, exhaust gas, bearing, body, etc. are easily mistaken for the differential noise. Pay special attention to the hypoid gear noise because it is easily confused with other gear noises. There are following four kinds of noises. <ul style="list-style-type: none"> <li>(1) Gear noise when driving: If noise increases as vehicle speed increases it may be due to insufficient gear oil, incorrect gear engagement, damaged gears, etc.</li> <li>(2) Gear noise when coasting: Damaged gears due to maladjusted bearings and incorrect shim adjustment.</li> <li>(3) Bearing noise when driving or when coasting: Cracked, broken or damaged bearings.</li> <li>(4) Noise which mainly occurs when turning: Unusual noise from differential side gear, differential pinion, differential pinion shaft, etc.</li> </ul>	
<ul style="list-style-type: none"> <li>(a) Insufficient oil</li> <li>(b) Improper adjustment of hypoid driven gear and drive pinion.</li> <li>(c) Worn teeth of hypoid driven gear and drive pinion.</li> <li>(d) Loose roller bearing.</li> <li>(e) Distorted hypoid driven gear or differential case.</li> <li>(f) Worn washer and differential pinion shaft.</li> </ul>	<ul style="list-style-type: none"> <li>Lubricate.</li> <li>Check tooth contact.</li> <li>Replace as a set. Readjust bearing preload.</li> <li>Readjust hypoid driven gear to drive pinion backlash and check tooth contact.</li> <li>Replace.</li> <li>Replace.</li> </ul>