

MANUAL TRANSMISSION AND DIFFERENTIAL

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1. Manual Transmission and Differential	

- The descriptions in this section apply to the turbo model.

1. Manual Transmission and Differential

A: SPECIFICATIONS

Item			Model				
			FWD		AWD		
			1600 cc	1800 cc	1600 cc	1800 cc	2000 cc Turbo
Type			5-forward speeds with synchromesh and 1-reverse *1 (5 x 2-forward speeds with synchromesh and 1-reverse)				
Transmission gear ratio		1st	3.636		3.545		3.454
		2nd	2.105		2.111		1.947
		3rd	1.428		1.448		1.366
		4th	1.093		1.088		0.972
		5th	0.825		0.825		0.738
		Reverse	3.583		3.416		3.416
*1 Auxiliary transmission gear ratio		High	—		1.000		—
		Low			1.592		
Front reduction gear	Final	Type of gear	Hypoid				
		Gear ratio	3.900		3.900		
Rear reduction gear	Transfer	Type of gear	—		Helical		
		Gear ratio	—		1.000		1.100
	Final	Type of gear	—		Hypoid		
		Gear ratio	—		3.900		3.545
Front differential	Type and number of gear		Straight bevel gear (Bevel pinion: 2, Bevel gear: 2)				
*2 Center differential	Type and number of gear		—		Straight bevel gear (Bevel pinion: 2, Bevel gear: 2 and viscous coupling)		
Rear differential	Type and number of gear		—		Straight bevel gear (Bevel pinion: 2, Bevel gear: 2)		
Transmission gear oil			GL-5				
Transmission gear oil capacity			2.6 ℓ (2.7 US qt, 2.3 Imp qt)		*2 4.0 ℓ (4.2 US qt, 3.5 Imp qt)		
Rear differential gear oil capacity			—		0.8 ℓ (0.8 US qt, 0.7 Imp qt)		

*1: Dual-range model only

*2: Full-time AWD only

B: SERVICE DATA**10. DRIVE PINION ASSEMBLY (Full-time 4WD)**

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)

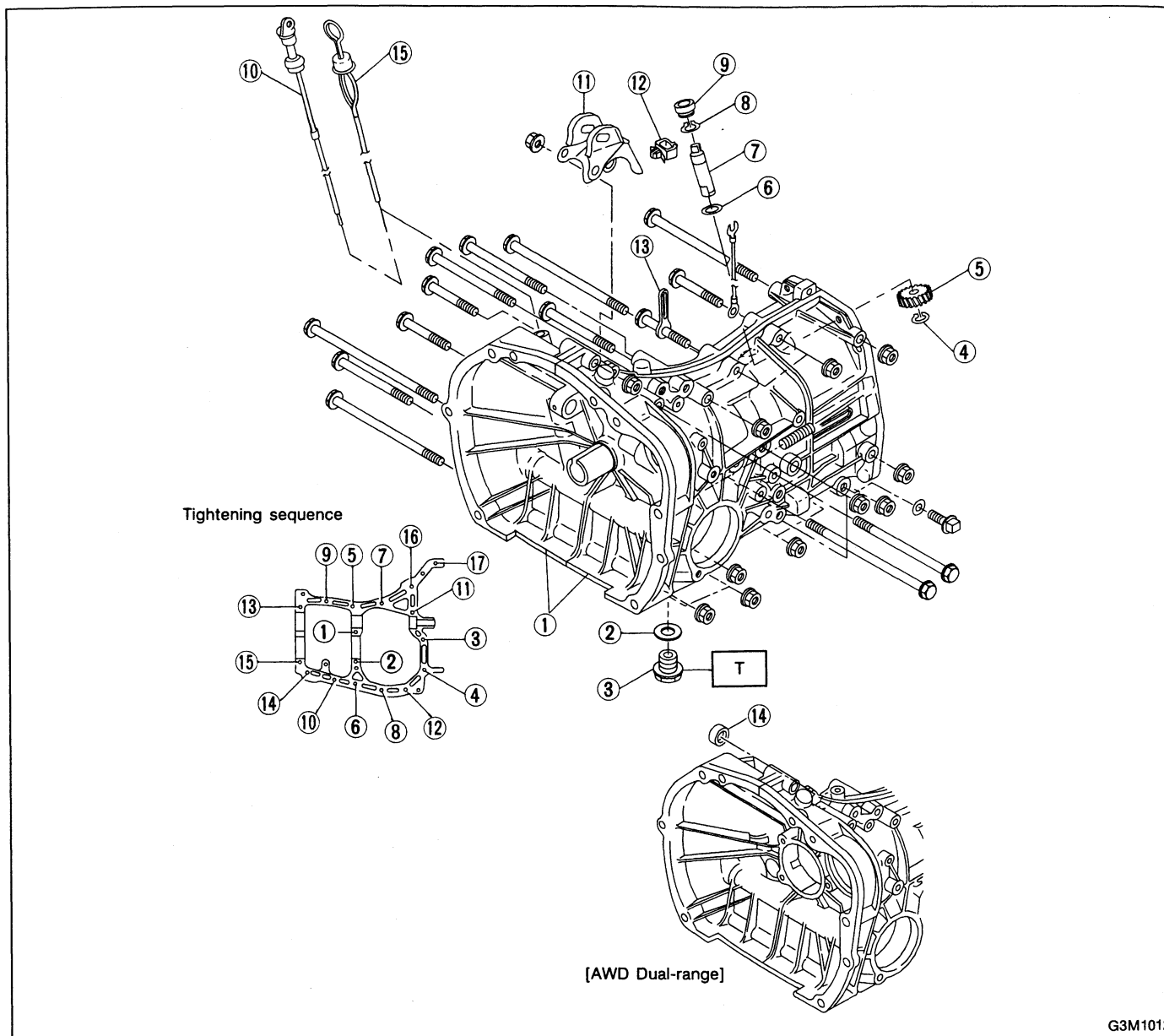
Adjusting washer No. 2	
Part No.	Thickness mm (in)
803025059	3.850 (0.1516)
803025054	4.000 (0.1575)
803025058	4.150 (0.1634)

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.	Spec.
32229AA130	49.959 — 49.966 (1.9669 — 1.9672)	32231AA270	Non-turbo
		32231AA600	Turbo
32229AA120	49.967 — 49.975 (1.9672 — 1.9675)	32231AA260	Non-turbo
		32231AA590	Turbo

COMPONENT PARTS

3. Transmission Case



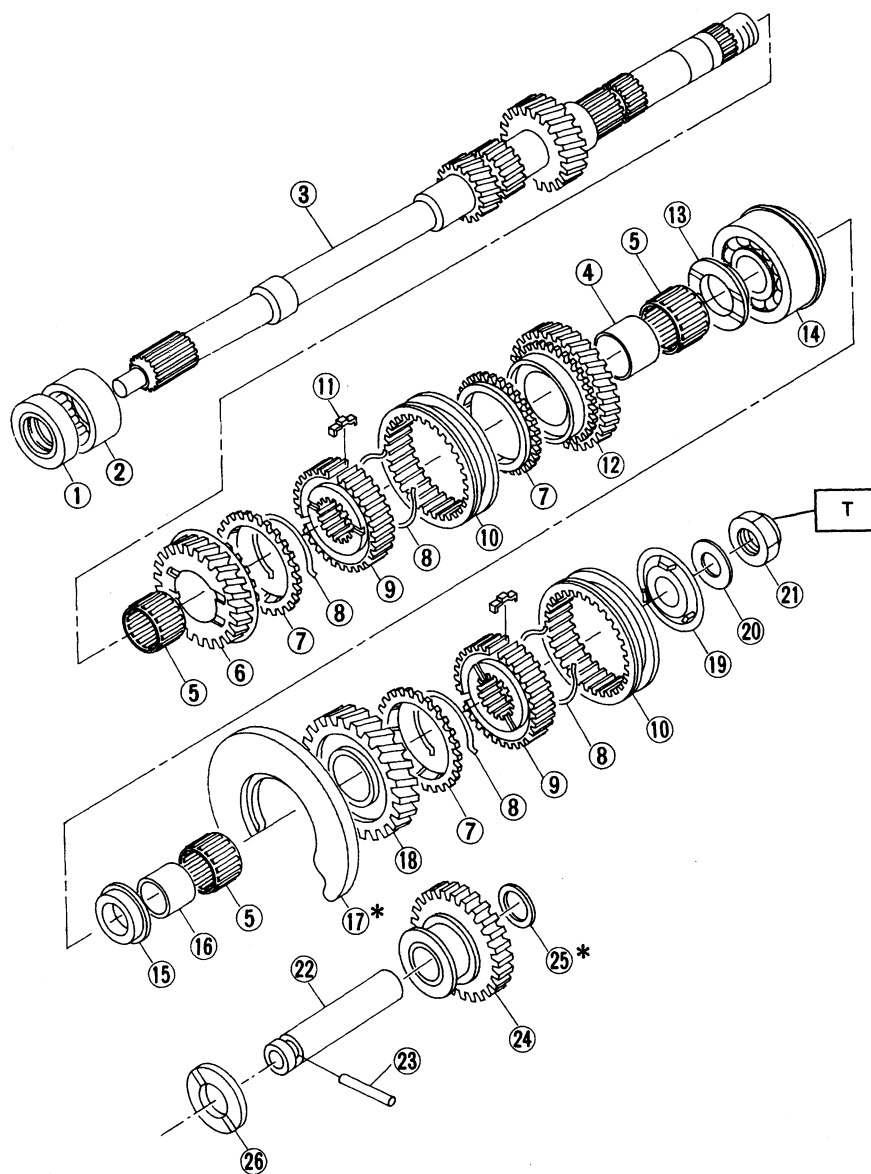
- ① Transmission case ASSY
- ② Gasket
- ③ Drain plug
- ④ Snap ring (Outer)
- ⑤ Speedometer driven gear
- ⑥ Washer
- ⑦ Speedometer shaft
- ⑧ Snap ring (Outer)
- ⑨ Oil seal
- ⑩ Oil level gauge
- ⑪ Pitching stopper bracket
- ⑫ Clamp
- ⑬ Clip
- ⑭ Oil seal (AWD Dual-range)
- ⑮ Oil level gauge (Turbo model)

Tightening torque: N·m (kg-m, ft-lb)
T: 44 ± 3 (4.5 ± 0.3, 32.5 ± 2.2)

Size	All models	Torque
8 mm bolt	⑤ — ⑮	25 ± 2 N·m (2.5 ± 0.2 kg-m, 18.1 ± 1.4 ft-lb)
10 mm bolt	① — ④ ⑬ — ⑰	39 ± 2 N·m (4 ± 0.2 kg-m, 28.9 ± 1.4 ft-lb)

6. Main Shaft Assembly

1. AWD SINGLE-RANGE MODEL



G3M1013

- 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

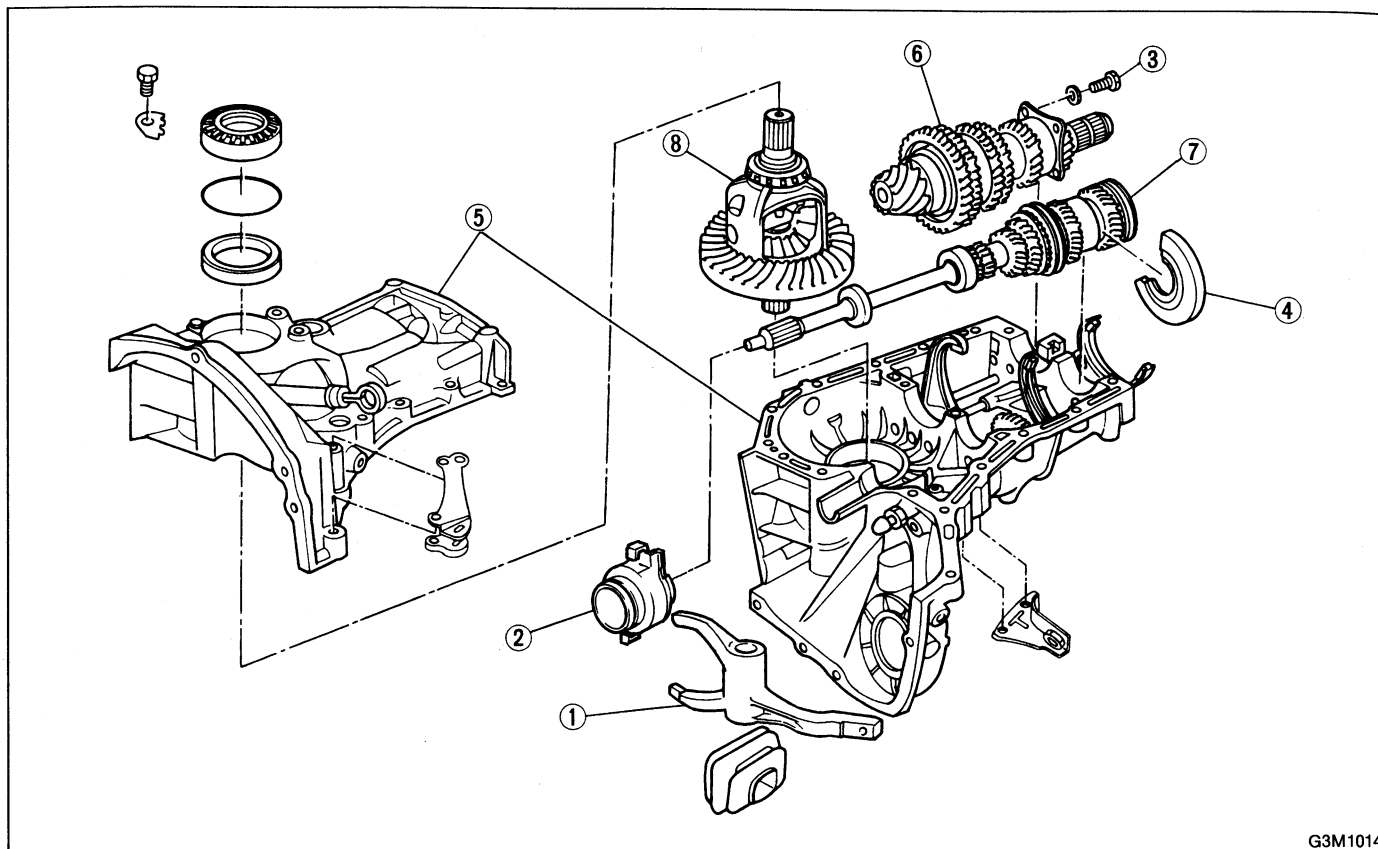
- ㉑ Lock nut
- ㉒ Reverse idler gear shaft
- ㉓ Straight pin
- ㉔ Reverse idler gear
- ㉕ Washer
- ㉖ Washer (Turbo model)

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

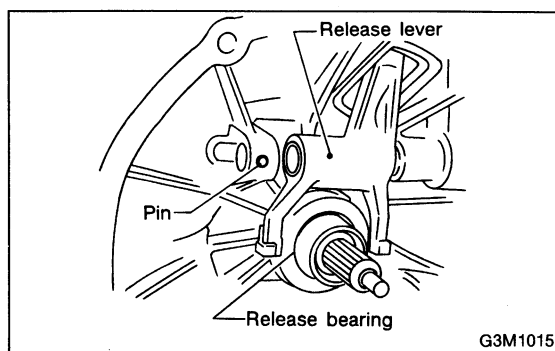
4. Transmission Case (AWD Single-range Model)

A: DISASSEMBLY

3. SEPARATION OF TRANSMISSION CASE (TURBO MODEL)

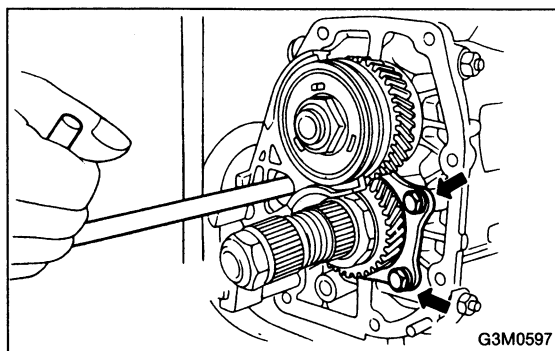


G3M1014



G3M1015

1) Remove clutch release lever ① and bearing ②. (Refer to 2-10 clutch.)



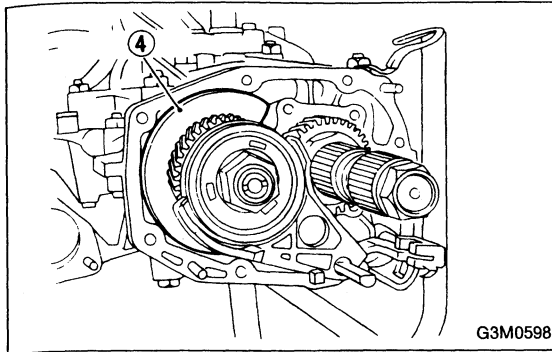
G3M0597

2) Remove bearing mounting bolts.

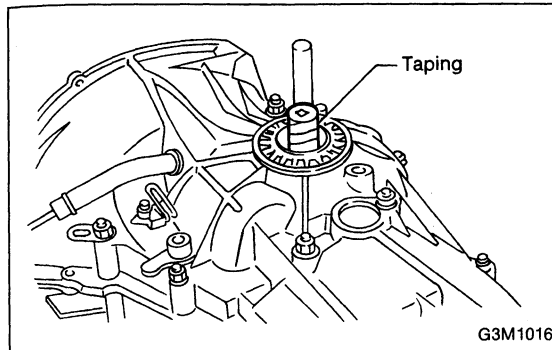
SERVICE PROCEDURE

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4. Transmission Case (AWD Single-range Model)

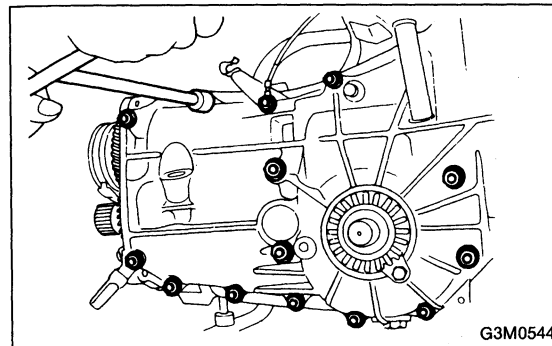


3) Remove main shaft rear plate ④.

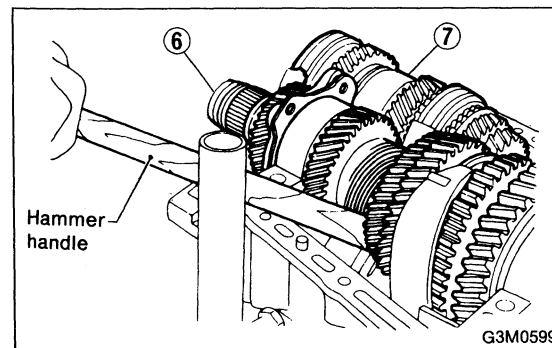


4) Separating transmission case

(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.

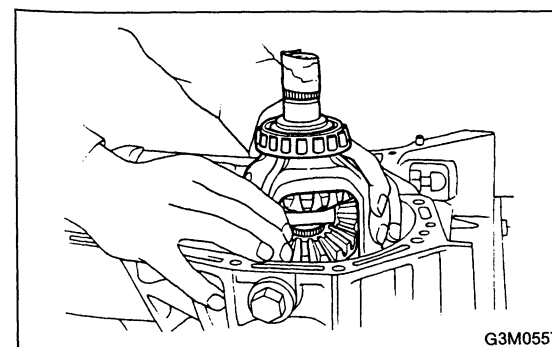


5) Remove drive pinion shaft assembly ⑥ from left side transmission case.

NOTE:

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

6) Remove main shaft assembly ⑦.

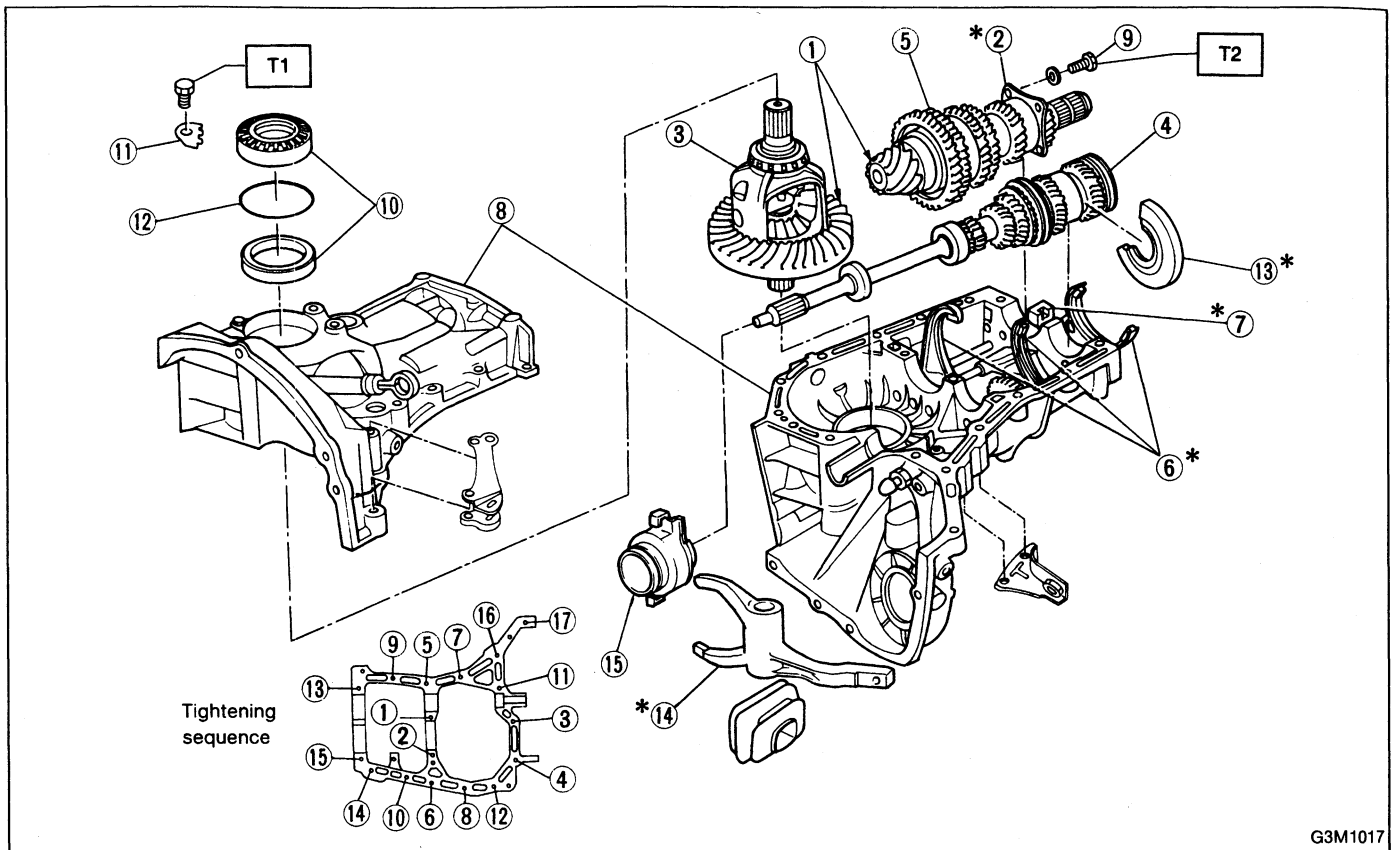


7) Remove differential assembly ⑧.

CAUTION:

● Be careful not to confuse right and left roller bearing outer races.

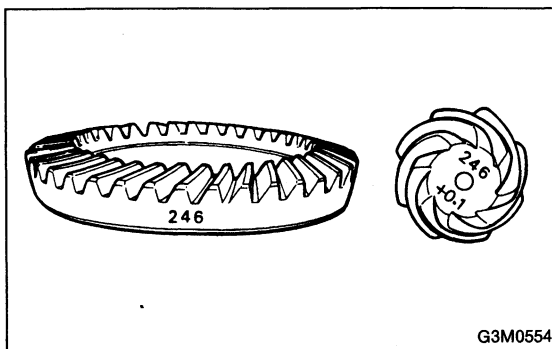
● Be careful not to damage retainer oil seal.

B: ASSEMBLY**3. COMBINATION OF TRANSMISSION CASE (TURBO MODEL)**

Tightening torque: N·m (kg·m, ft·lb)

T1: 25 (2.5, 18)

T2: 29 ± 3 (3.0 ± 0.3, 21.7 ± 2.2)

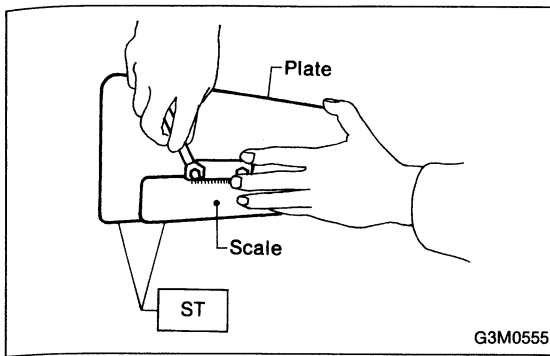


1) Alignment marks/figures on hypoid gear set ①
The upper figure on driven pinion is the match number for combining it with hypoid driven gear. The lower figure is for shim adjustment. If no lower figure is shown, the value is zero. The figure on hypoid driven gear indicates a number for combination with drive pinion.

SERVICE PROCEDURE

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4. Transmission Case (AWD Single-range Model)



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.

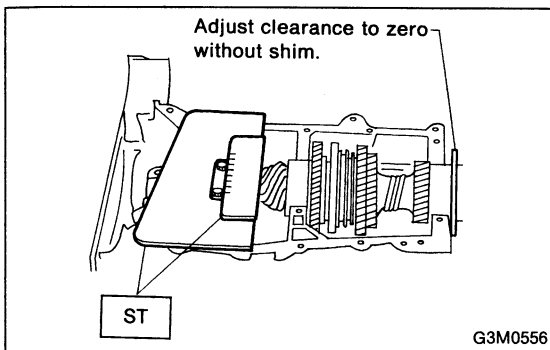
(2) Inspection and adjustment of ST

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



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

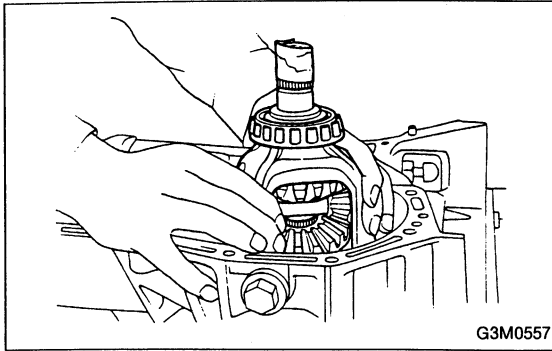
(4) Slide the drive pinion gauge scale with finger tip and read the value at the point where it matches with the end face of drive pinion.

(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)



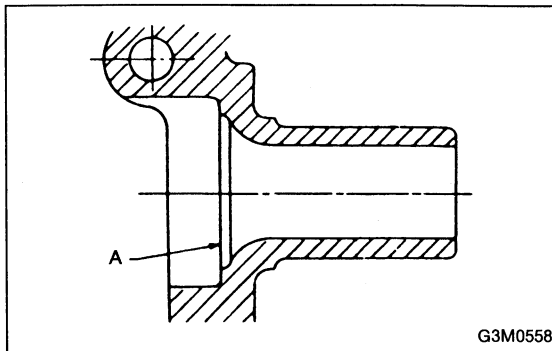
3) Install differential assembly ⑧ on left hand transmission case.

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.**

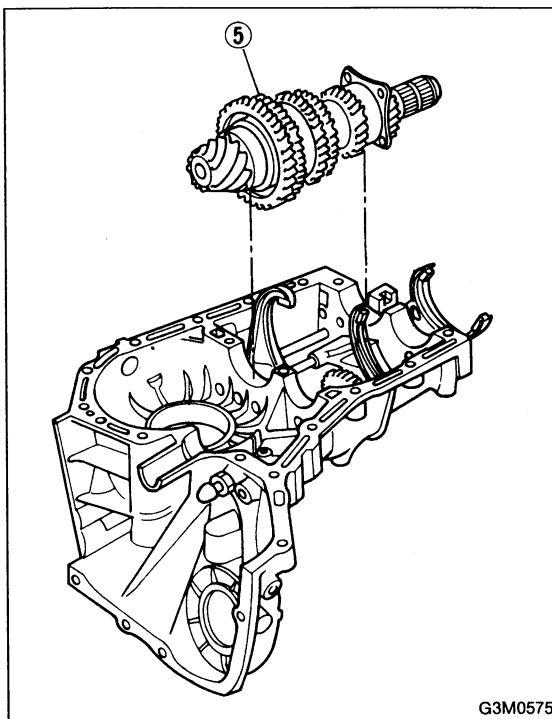
● **Apply grease (Unilube #2 or equivalent) to the sealing lip of oil seal.**

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.

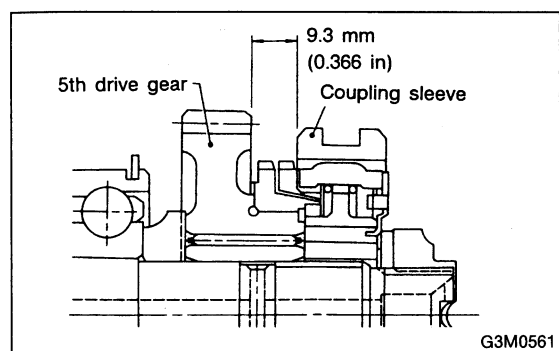
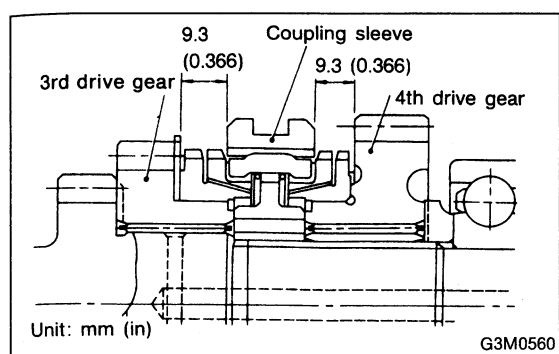
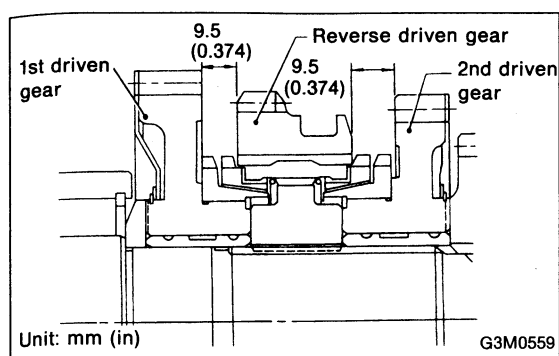
NOTE:

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

SERVICE PROCEDURE

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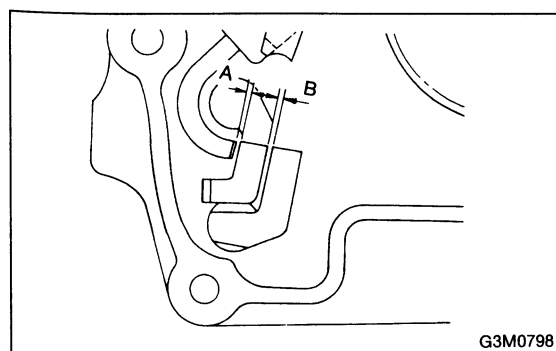
4. Transmission Case (AWD Single-range Model)



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.

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)

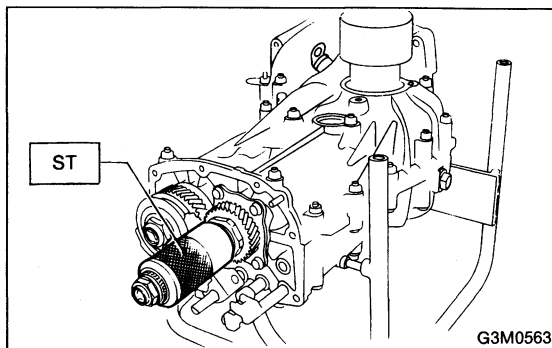
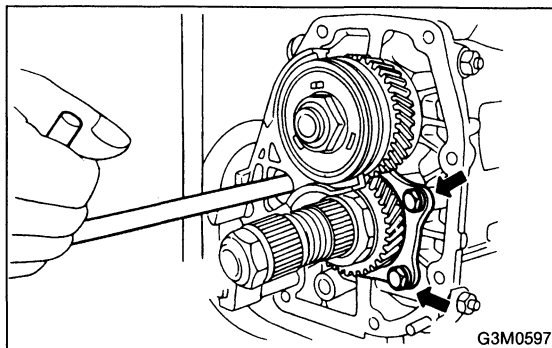
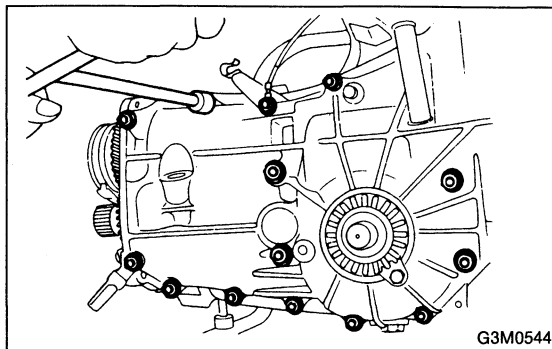
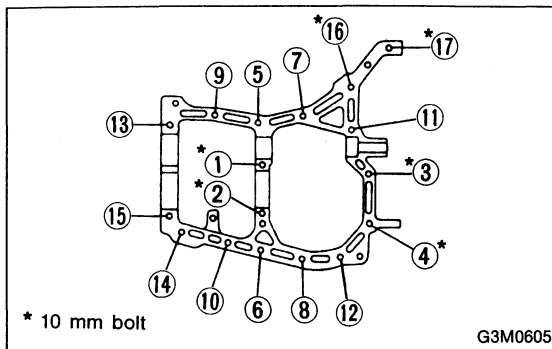


7) Inspection of rod end clearance

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)

4. Transmission Case (AWD Single-range Model)



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

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

10 mm bolt

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

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:

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

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

NOTE:

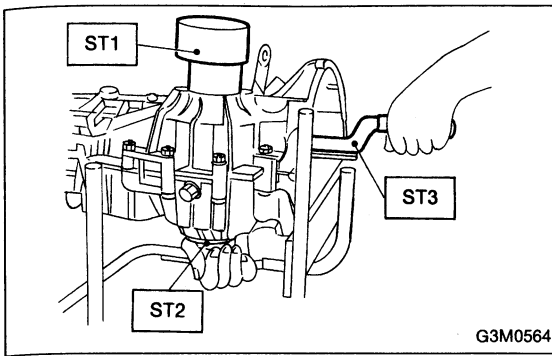
Support drive pinion assembly with ST.

ST 498427100 STOPPER

SERVICE PROCEDURE

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4. Transmission Case (AWD Single-range Model)

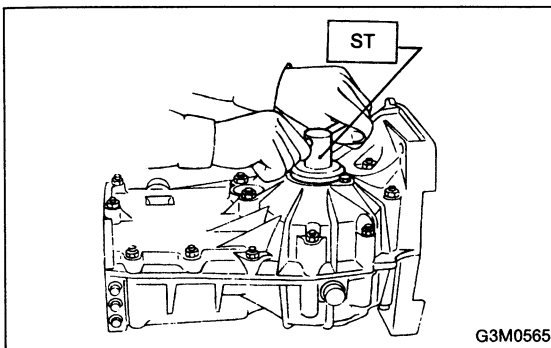


(1) Place the transmission with case left side facing downward and put ST1 on bearing cup.

(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

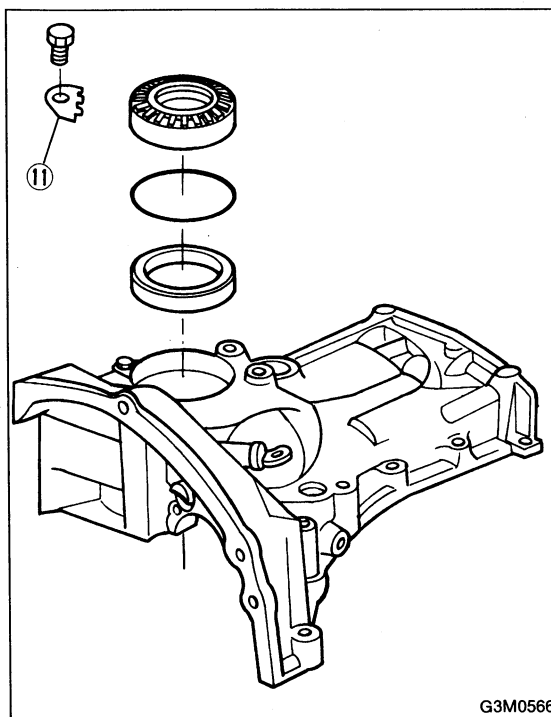


(3) Remove weight and screw in retainer without O-ring on the upper side and stop at the point where slight resistance is felt.

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.

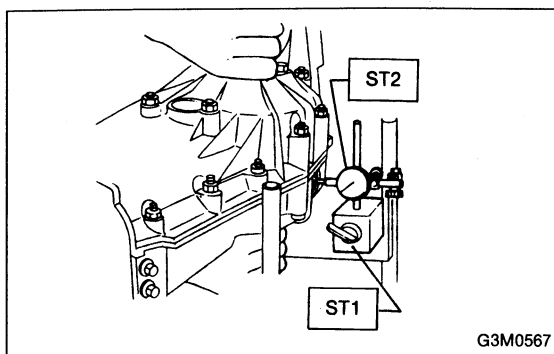
(7) Turn transmission main shaft several times while tapping around retainer lightly with plastic hammer.

(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.

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SERVICE PROCEDURE

4. Transmission Case (AWD Single-range Model)



ST1 498247001 MAGNET BASE

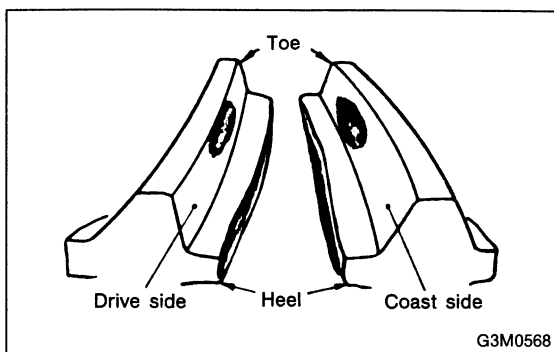
ST2 498247100 DIAL GAUGE

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).

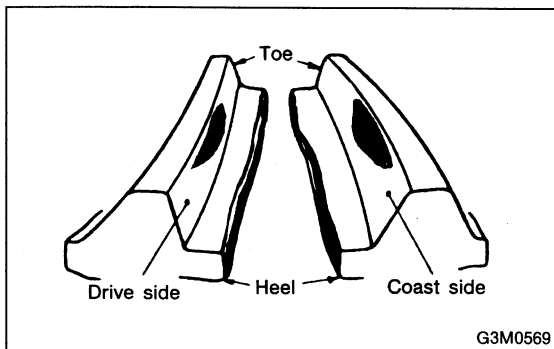


(9) Check tooth contact of hypoid gear as follows: Apply a uniform thin coat of red lead on both tooth surfaces of 3 or 4 teeth of the hypoid gear. Move the hypoid gear back and forth by turning the transmission main shaft until a definite contact pattern is developed on hypoid gear, and judge whether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

- Tooth contact is correct.

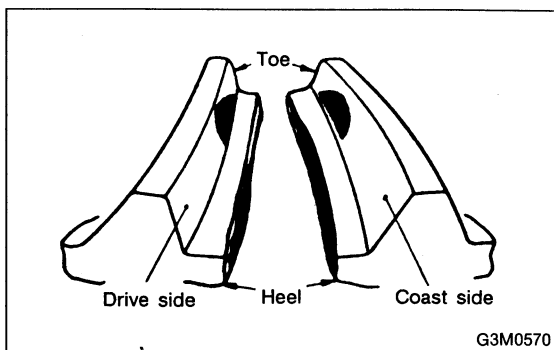
NOTE:

If it is incorrect, make the following correction.



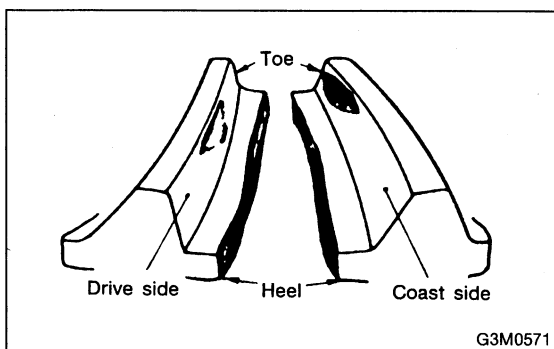
- Backlash is excessive.

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.

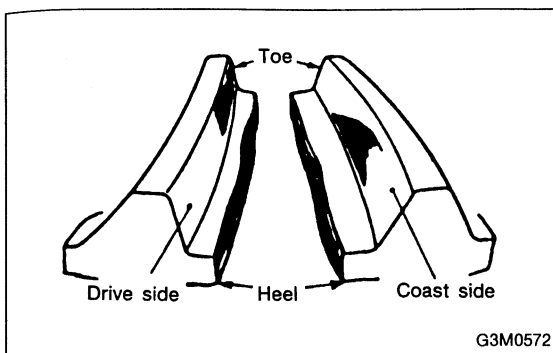


- The drive pinion shim selected before is too thick. Reduce its thickness.

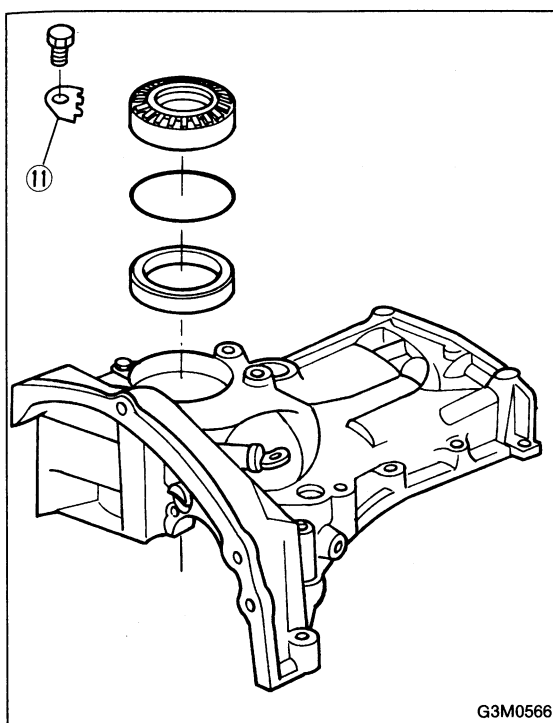
SERVICE PROCEDURE

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4. Transmission Case (AWD Single-range Model)



- 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.

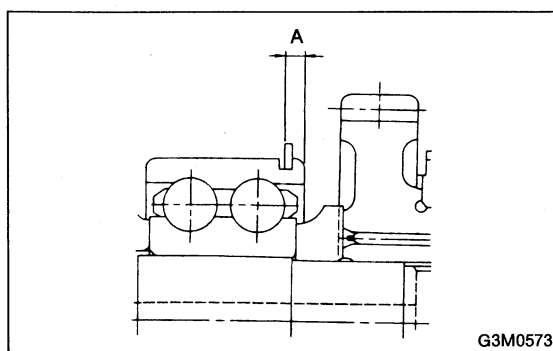
Tighten lock plate ⑪.

Tightening torque:

$25 \pm 3 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.3 \text{ kg}\cdot\text{m}$, $18.1 \pm 2.2 \text{ ft}\cdot\text{lb}$)

NOTE:

Carry out this job on both upper and lower retainers.



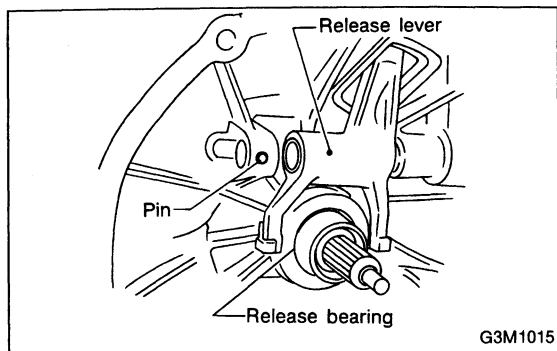
12) Selecting of main shaft rear plate
Using ST, measure the amount A of ball bearing protrusion from transmission main case surface and select the proper plate in the following table:

ST 498147000 DEPTH GAUGE

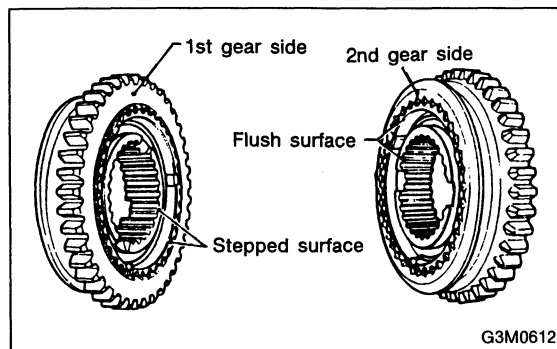
Dimension "A" mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA040	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA050	2

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 and bearing .



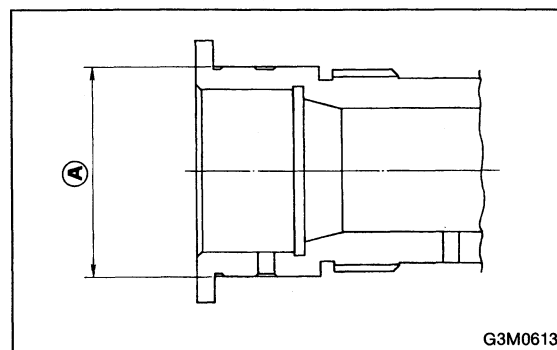
7. Drive Pinion Assembly (AWD Model)

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.	Spec.
32229AA130	49.959 — 49.966 (1.9669 — 1.9672)	32231AA270	Non-turbo
		32231AA600	Turbo
32229AA120	49.967 — 49.975 (1.9672 — 1.9675)	32231AA260	Non-turbo
		32231AA590	Turbo

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

NOTE:

Take care to install gear hub in proper direction.

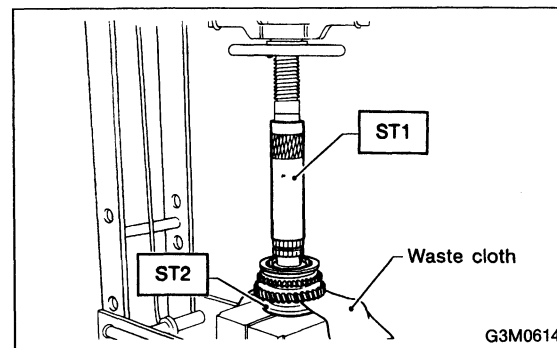
2) Install 2nd driven gear bushing onto driven shaft using ST1, ST2 and press.

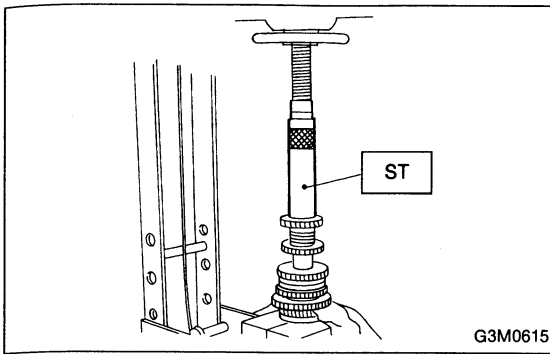
ST1 499277200 INSTALLER

ST2 499587000 INSTALLER

CAUTION:

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



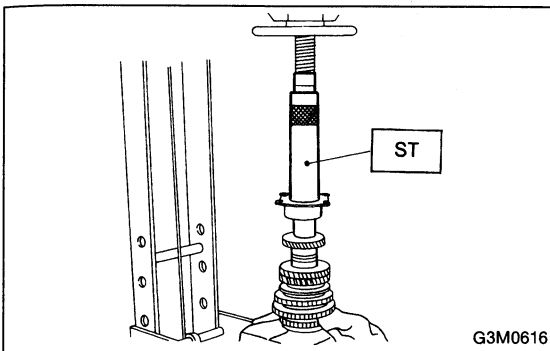


3) Install 2nd driven gear, 1st-2nd baulk ring and insert onto driven shaft. After installing key on driven shaft, install 3rd-4th driven gear using ST and press.

ST 499277200 INSTALLER

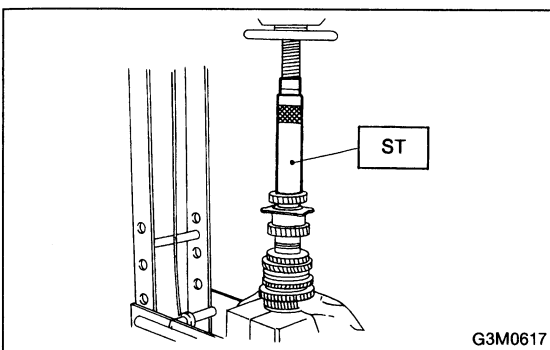
CAUTION:

Align groove in baulk ring with insert.



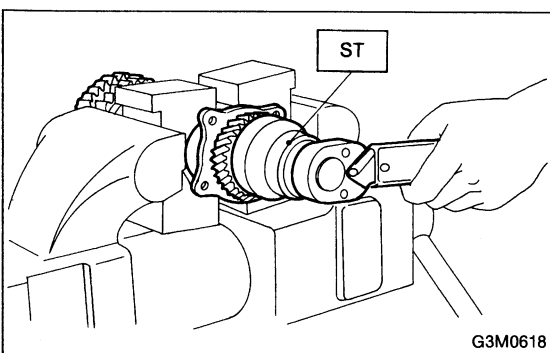
4) Install a set of roller bearings (42 x 74 x 40) onto the driven shaft using ST and press.

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

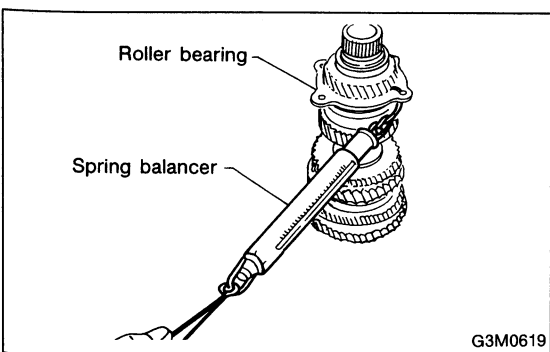


6) Install lock washer (42 x 53 x 2). Install lock nut (42 x 13) and tighten to the specified torque using ST.

ST 499987300 SOCKET WRENCH (50)

Tightening torque:

245 ± 10 N·m (25 ± 1 kg-m, 181 ± 7 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).

AUTOMATIC TRANSMISSION AND DIFFERENTIAL

3-2

Page

S SPECIFICATIONS AND SERVICE DATA

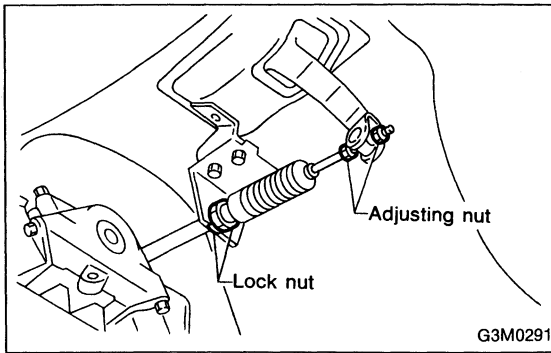
1. Automatic Transmission and Differential

C COMPONENT PARTS

1. Torque Converter Clutch and Case
2. Differential Case
3. Oil Pump
4. Control Valve and Harness Routing
5. Transmission Case, Transmission Cover and Control Device
6. Reverse Clutch and Band Brake
7. High Clutch and Planetary Gear
8. Forward Clutch and Low & Reverse Brake
9. Reduction Gear
10. Transfer and Extension

W SERVICE PROCEDURE.....2

1. Precaution
2. On-Car Service2
3. Performance Test
4. Overall Transmission
5. Reduction Drive Gear Assembly
6. Control Valve Body
7. Oil Pump Assembly
8. Drive Pinion Shaft
9. Reverse Clutch
10. High Clutch
11. Forward Clutch Drum
12. One-way Clutch Outer Race
13. Servo Piston
14. Differential Case Assembly
15. Transfer Clutch
16. Transfer Valve Body



2. On-Car Service

B: ADJUSTMENT

2. INHIBITOR SWITCH

The inhibitor switch allows the back-up lights to turn on when the select lever is in the R range and the starter motor to start when the lever is in the N or P range. It also monitors the input signal electronically controlled for each range and turns on the corresponding range light on the instrument panel.

When light operation, driving condition or starter motor operation is erroneous, first check the shift linkage for improper operation. If the shift linkage is functioning properly, check the inhibitor switch.

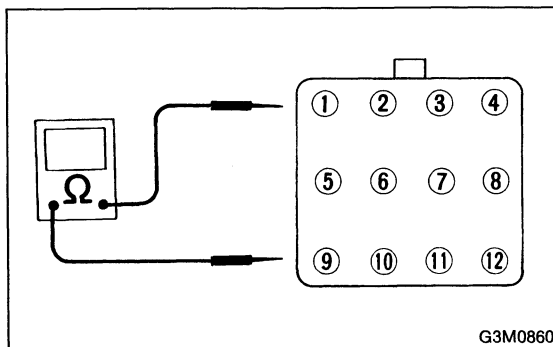
< Inspection >

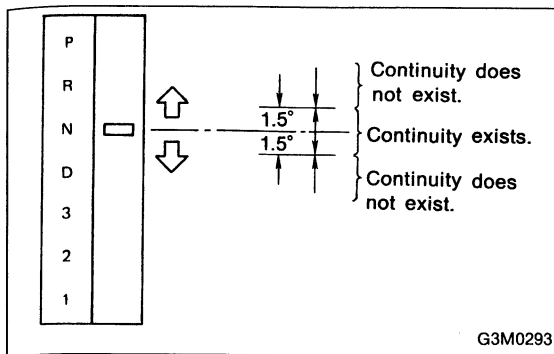
- (1) Disconnect cable end from select lever.
- (2) Disconnect inhibitor switch connector.
- (3) Check continuity in inhibitor switch circuits with select lever moved to each position.

CAUTION:

Also check that continuity in ignition circuit does not exist when selector lever is in R, D, 3, 2 and 1 ranges.

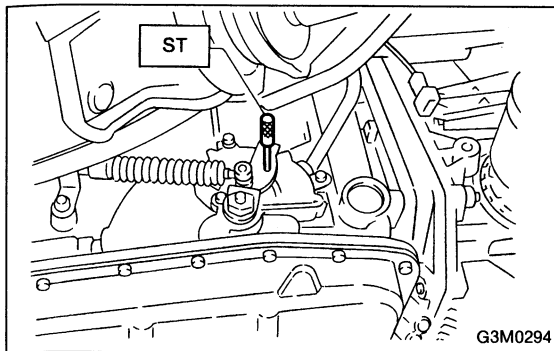
Pin No.	4	3	2	1	8	7	6	5	12	11	10	9
Lead color	B	Y	Br	YG	W	BY	R	GW	BY	BW	BW	RW
Position												
P	○	○							○	○		
R	○		○								○	○
N	○			○					○	○		
D	○				○							
3	○					○						
2	○						○					
1	○							○				
	Signal sent to AT control unit								Ignition circuit		Back-up light circuit	





(4) Check if there is continuity at equal points when the select lever is turned 1.5° in both directions from the N range.

If there is continuity in one direction and the continuity in the other or if there is continuity at unequal points, adjust the inhibitor switch.



<Adjustment>

- (1) Loosen the three inhibitor switch securing bolts.
- (2) Shift the select lever to the N range.
- (3) Insert ST as vertical as possible into the holes in the inhibitor switch lever and switch body.

ST 499267300 STOPPER PIN

- (4) Tighten the three inhibitor switch bolts.

Tightening torque:

3.4 ± 0.5 N·m (0.35 ± 0.05 kg-m, 2.5 ± 0.4 ft-lb)

- (5) Repeat the above checks. If the inhibitor switch is determined to be "faulty", replace it.

AWD SYSTEM

3-4

	Page
S SPECIFICATIONS AND SERVICE DATA	2
1. AWD System	2
C COMPONENT PARTS	4
1. Rear Differential Mounting System	4
2. Propeller Shaft.....	5
3. Rear Differential Assembly	6
W SERVICE PROCEDURE	7
1. Propeller Shaft	
2. Rear Differential	7
3. Rear Differential Front Member	
T DIAGNOSTICS	
1. Rear Differential	
2. Propeller Shaft	

SPECIFICATIONS AND SERVICE DATA

1. AWD System

A: SPECIFICATIONS

1. REAR FINAL REDUCTION GEAR RATIO

Type of gear	Hypoid		
	MT	AT	TURBO*
Gear ratio (Number of gear teeth)	3.900 (39/10)	4.111 (37/9)	3.545 (39/11)
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)		
Rear differential gear oil	GL-5		

*: With VC type LSD

B: SERVICE DATA

2. REAR DIFFERENTIAL (TURBO MODEL)

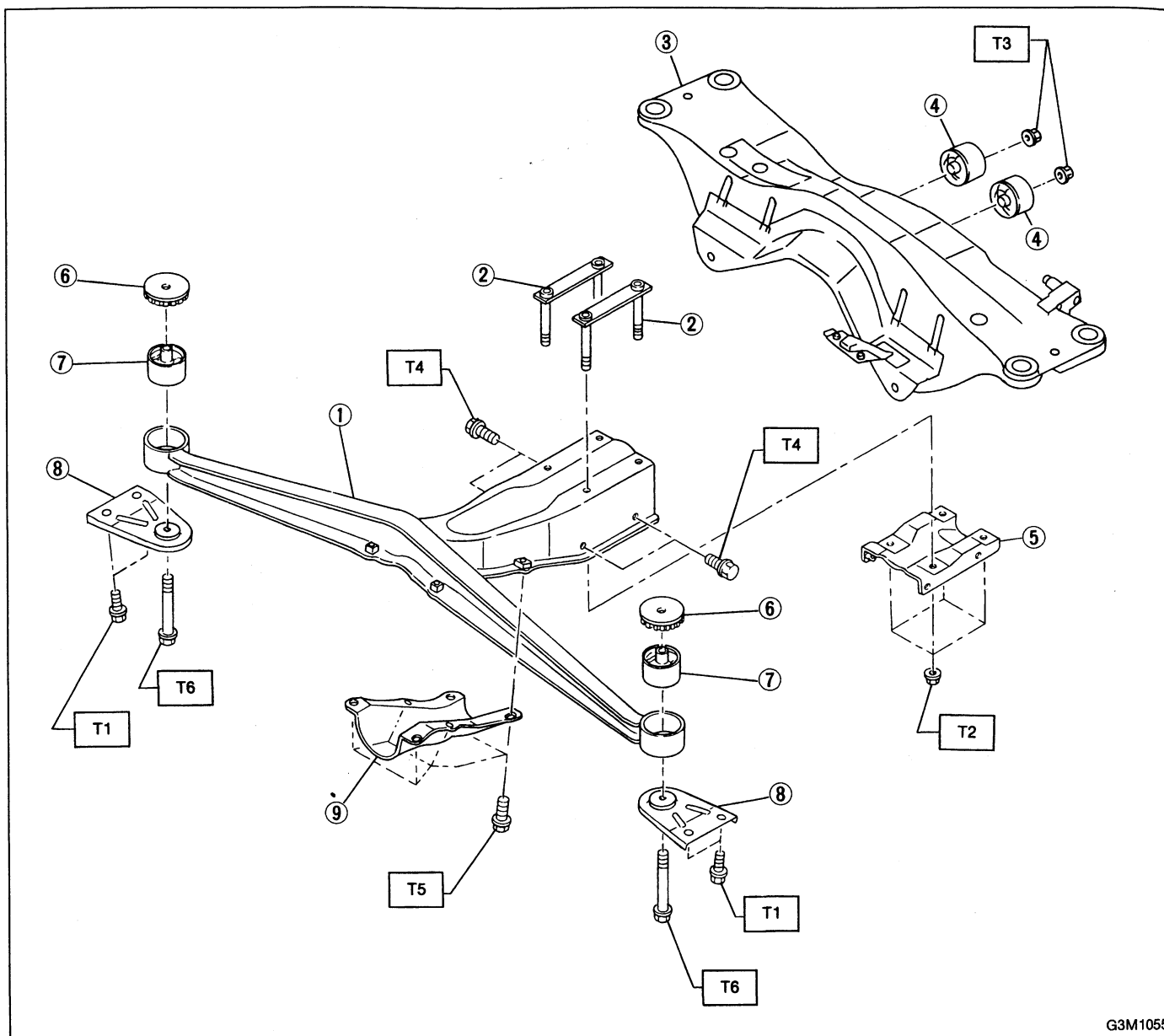
Front and rear bearing preload at companion flange bolt hole	New bearing	19.6 — 28.4 N (2.0 — 2.9 kg, 4.4 — 6.4 lb)
	Used bearing	8.34 — 16.67 N (0.85 — 1.7 kg, 1.87 — 3.75 lb)
Preload adjusting washer length	Part No.	Length
	383705200	2.59 mm (0.1020 in)
	383715200	2.57 mm (0.1012 in)
	383725200	2.55 mm (0.1004 in)
	383735200	2.53 mm (0.0996 in)
	383745200	2.51 mm (0.0988 in)
	383755200	2.49 mm (0.0980 in)
	383765200	2.47 mm (0.0972 in)
	383775200	2.45 mm (0.0965 in)
	383785200	2.43 mm (0.0957 in)
	383795200	2.41 mm (0.0949 in)
	383805200	2.39 mm (0.0941 in)
	383815200	2.37 mm (0.0933 in)
	383825200	2.35 mm (0.0925 in)
	383835200	2.33 mm (0.0917 in)
	383845200	2.31 mm (0.0909 in)
Preload adjusting spacer length	Part No.	Length
	383695201	56.2 mm (2.213 in)
	383695202	56.4 mm (2.220 in)
	383695203	56.6 mm (2.228 in)
	383695204	56.8 mm (2.236 in)
	383695205	57.0 mm (2.244 in)
	383695206	57.2 mm (2.252 in)

SPECIFICATIONS AND SERVICE DATA

[S1B2] 3-4
1. AWD System

Pinion height adjusting shim thickness	Part No.	Thickness
	383495200	3.09 mm (0.1217 in)
	383505200	3.12 mm (0.1228 in)
	383515200	3.15 mm (0.1240 in)
	383525200	3.18 mm (0.1252 in)
	383535200	3.21 mm (0.1264 in)
	383545200	3.24 mm (0.1276 in)
	383555200	3.27 mm (0.1287 in)
	383565200	3.30 mm (0.1299 in)
	383575200	3.33 mm (0.1311 in)
	383585200	3.36 mm (0.1323 in)
	383595200	3.39 mm (0.1335 in)
	383605200	3.42 mm (0.1346 in)
	383615200	3.45 mm (0.1358 in)
	383625200	3.48 mm (0.1370 in)
	383635200	3.51 mm (0.1382 in)
	383645200	3.54 mm (0.1394 in)
	383655200	3.57 mm (0.1406 in)
	383665200	3.60 mm (0.1417 in)
	383675200	3.63 mm (0.1429 in)
	383685200	3.66 mm (0.1441 in)
Side bearing standard width	—	20.00 mm (0.7874 in)
Side bearing retainer shim thickness	Part No.	Thickness
	383475201	0.20 mm (0.0079 in)
	383475202	0.25 mm (0.0098 in)
	383475203	0.30 mm (0.0118 in)
	383475204	0.40 mm (0.0157 in)
	383475205	0.50 mm (0.0197 in)
Crown gear to drive pinion backlash	Limit	0.10 — 0.20 mm (0.0039 — 0.0079 in)
Crown gear runout on its back surface		0.05 mm (0.0020 in)
Oil capacity		0.8 ℓ (0.8 US qt, 0.7 Imp qt)

1. Rear Differential Mounting System



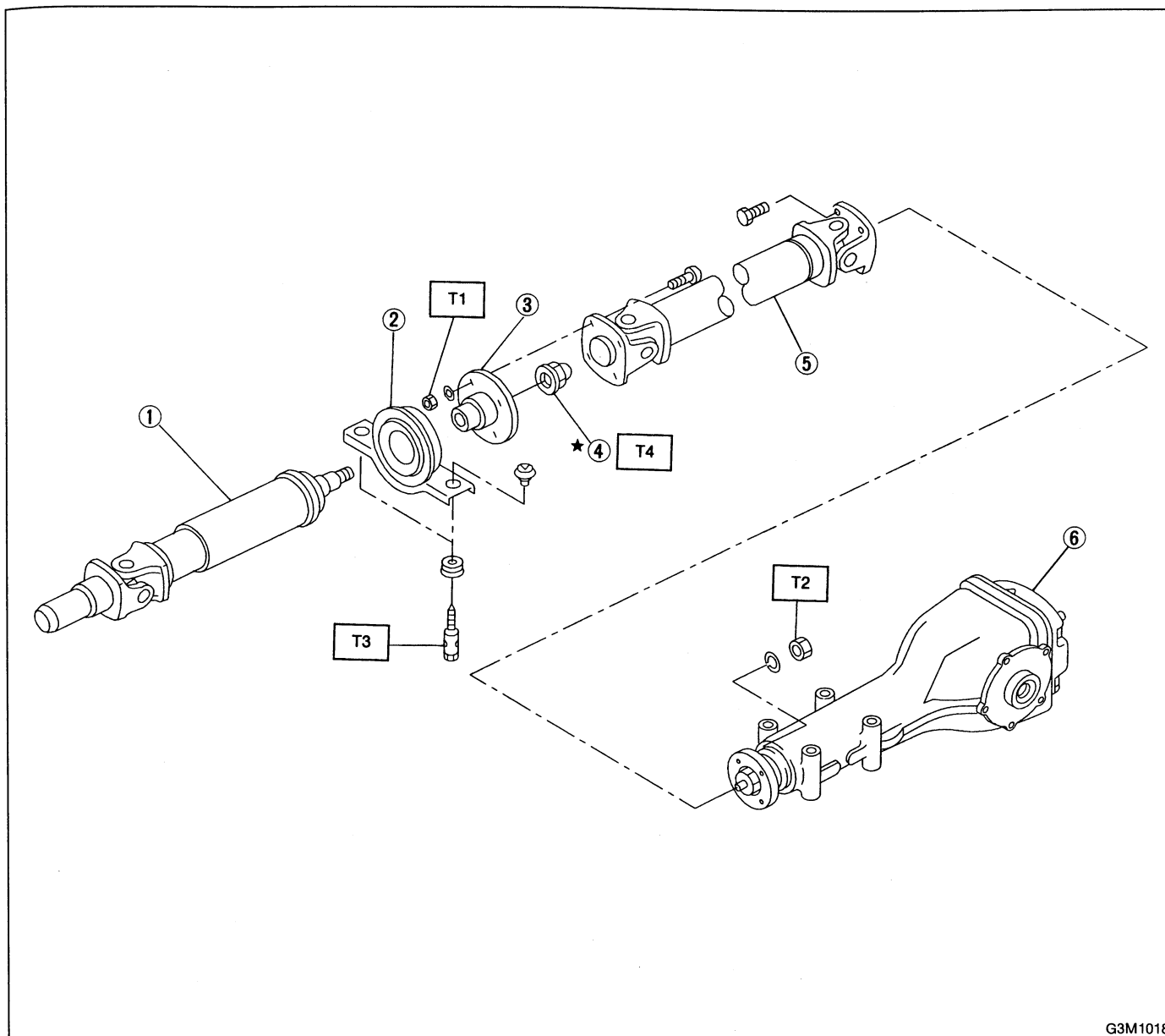
G3M1055

- ① Differential front member
- ② Plate
- ③ Crossmember
- ④ Rear bushing
- ⑤ Differential mount lower bracket
- ⑥ Stopper
- ⑦ Front bushing
- ⑧ Differential mount bracket
- ⑨ Differential mount front cover

Tightening torque: N·m (kg·m, ft·lb)**T1: 32 ± 8 (3.3 ± 0.8, 23.9 ± 5.8)****T2: 64 ± 8 (6.5 ± 0.8, 47.0 ± 5.8)****T3: 69 ± 8 (7.0 ± 0.8, 50.6 ± 5.8)****T4: 69 ± 10 (7.0 ± 1.0, 51.0 ± 7.2)****T5: 88 ± 10 (9.0 ± 1.0, 65.0 ± 7.2)****T6: 98 ± 10 (10.0 ± 1.0, 72.0 ± 7.2)**

2. Propeller Shaft

2. TURBO MODEL



G3M1018

- ① Front propeller shaft
- ② Center bearing
- ③ Companion flange
- ④ Stake nut
- ⑤ Rear propeller shaft
- ⑥ Rear differential (LSD)

Tightening torque: N·m (kg-m, ft-lb)

T1: 27.9 ± 4.4 (2.85 ± 0.45 , 20.6 ± 3.3)

T2: 31 ± 8 (3.2 ± 0.8 , 23.1 ± 5.8)

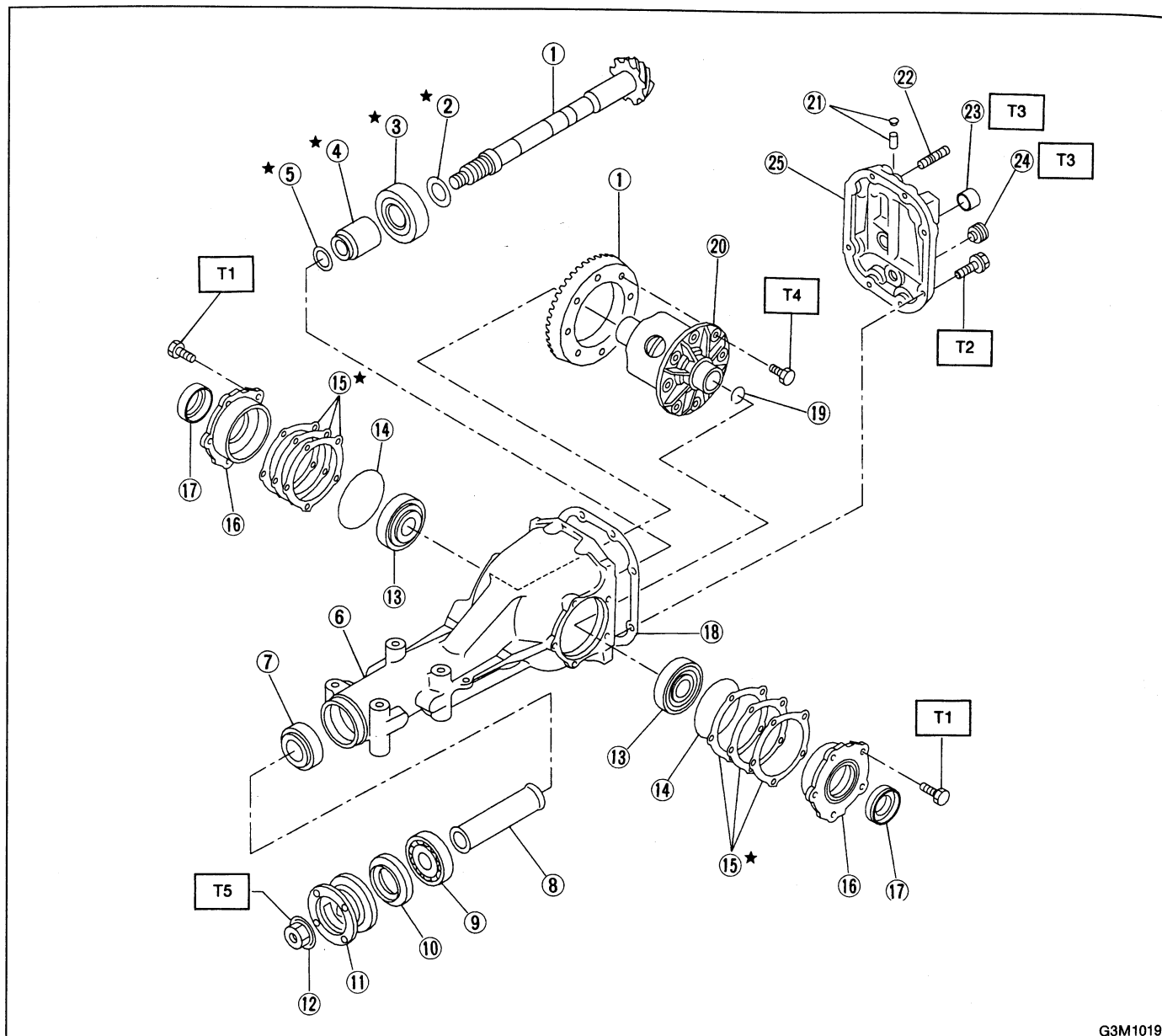
T3: 52 ± 5 (5.3 ± 0.5 , 38.3 ± 3.6)

T4: 270 ± 25 (27.5 ± 2.5 , 199 ± 18)

COMPONENT PARTS

3. Rear Differential Assembly

2. TURBO MODEL



G3M1019

- ① Pinion crown gear set
- ② Pinion height adjusting shim
- ③ Rear bearing
- ④ Bearing preload adjusting spacer
- ⑤ Bearing preload adjusting washer
- ⑥ Differential carrier
- ⑦ Front bearing
- ⑧ Collar
- ⑨ Pilot bearing
- ⑩ Front oil seal
- ⑪ Companion flange
- ⑫ Self-locking nut
- ⑬ Side bearing
- ⑭ O-ring
- ⑮ Side bearing retainer shim
- ⑯ Side bearing retainer

- ⑰ Side oil seal
- ⑱ Gasket
- ⑲ Circlip
- ⑳ Differential case
- ㉑ Air breather cap
- ㉒ Stud bolt
- ㉓ Oil filler plug
- ㉔ Oil drain plug
- ㉕ Rear cover

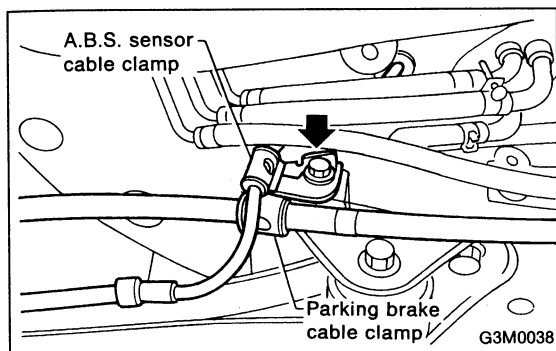
Tightening torque: N·m (kg-m, ft-lb)T1: 10.3 ± 1.5 (1.05 ± 0.15 , 7.6 ± 1.1)T2: 29.4 ± 4.9 (3.00 ± 0.50 , 21.7 ± 3.6)T3: 49.0 ± 9.8 (5.00 ± 1.00 , 36.2 ± 7.23)T4: 103.0 ± 9.8 (10.50 ± 1.00 , 75.9 ± 7.23)T5: 181.4 ± 14.7 (18.50 ± 1.50 , 133.8 ± 10.8)

2. Rear Differential

A: ON-CAR SERVICE

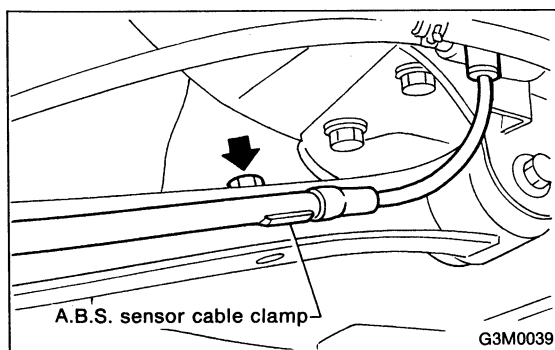
3. SIDE OIL SEAL (TURBO MODEL)

- 1) Disconnect ground cable from battery.
- 2) Move selector lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Loosen both wheel nuts.
- 5) Jack-up the vehicle and support it with rigid racks.
- 6) Remove wheels.
- 7) Remove rear exhaust pipe and muffler.
<Ref. to G170GE2, 2-9 [W2A0, W3A0].>

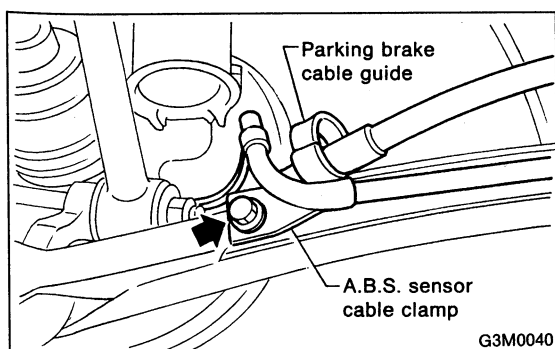


- 8) Remove the DOJ of rear drive shaft from rear differential.

- (1) Remove the A.B.S. sensor cable clamp and parking brake cable clamp from bracket.



- (2) Remove the A.B.S. sensor cable clamp from the trailing link.

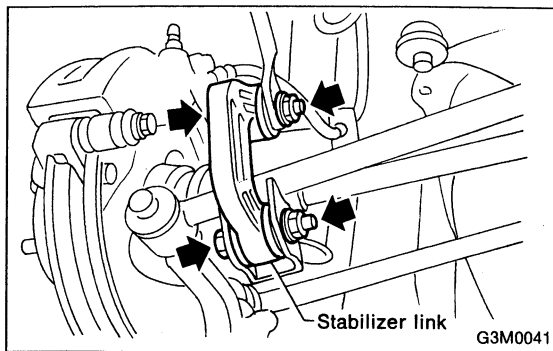


- (3) Remove the A.B.S. sensor cable clamp and parking brake cable guide from the trailing link.

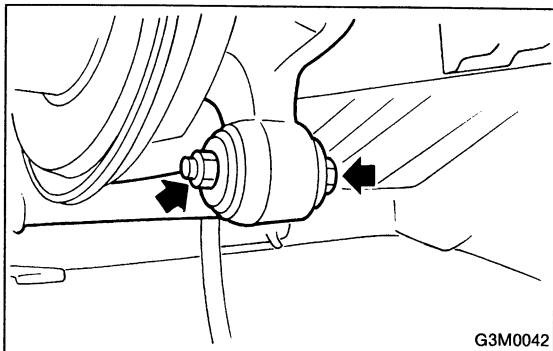
3-4 [W2A3]

2. Rear Differential

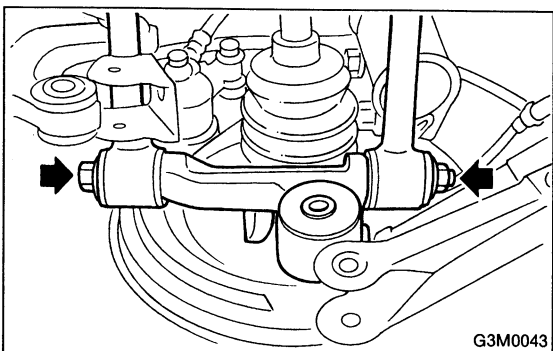
SERVICE PROCEDURE



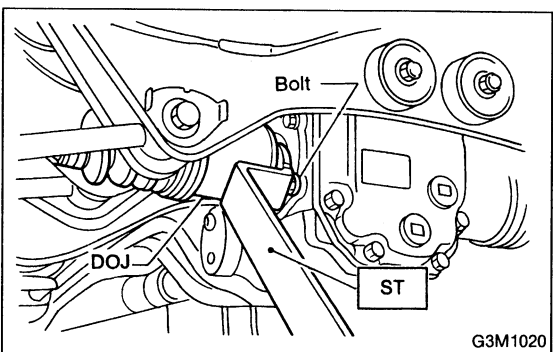
(4) Remove the rear stabilizer link.



(5) Remove the bolts which secure the trailing link to the rear housing.

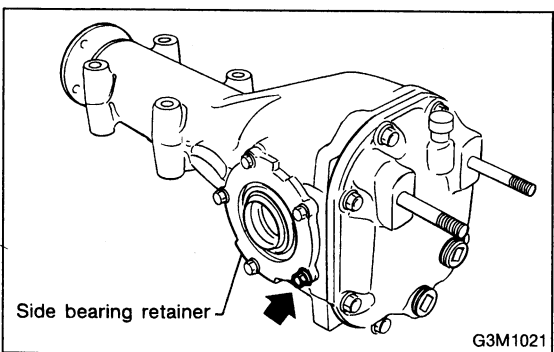


(6) Remove the bolts which secure the front and rear lateral link to the rear housing.



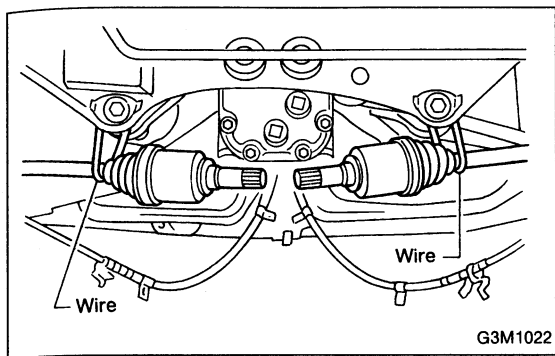
(7) Remove the DOJ from the rear differential by using ST.

ST 208099PA100 DRIVE SHAFT REMOVER

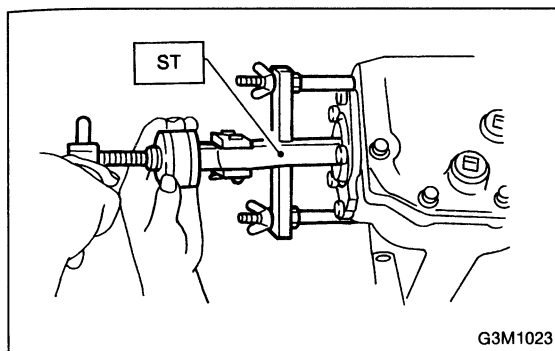


CAUTION:

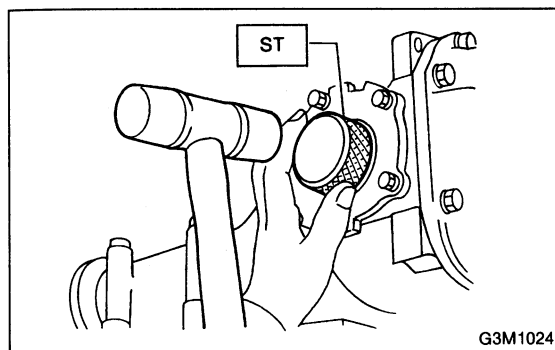
When removing the DOJ from the rear differential, fit tire lever to the bolt as shown in figure so as not to damage the side bearing retainer.



9) Secure rear drive shaft to rear crossmember using wire.



10) Remove side oil seal with ST.
ST 398527700 PULLER ASSY

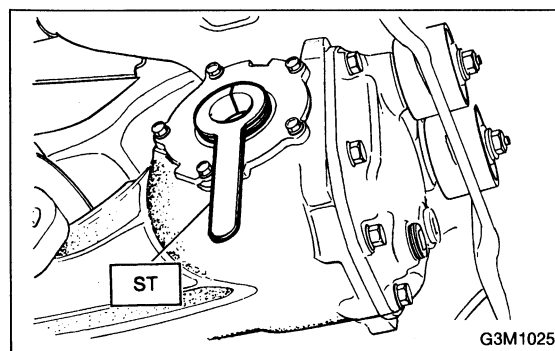


11) Drive in a new side oil seal with ST.

CAUTION:

Apply chassis grease between the oil seal lips.

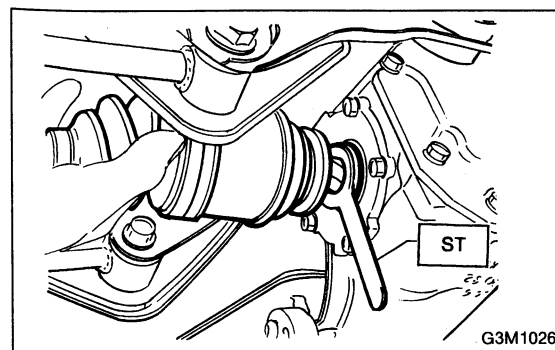
ST 398437700 DRIFT



12) Insert the DOJ into rear differential.

(1) Install ST to rear differential.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

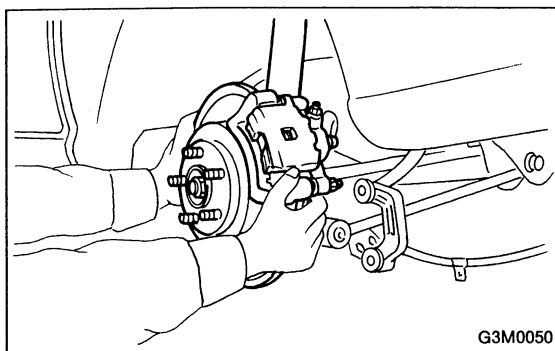


(2) Insert the spline shaft until the spline portion is inside the side oil seal.

(3) Remove ST.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

SERVICE PROCEDURE

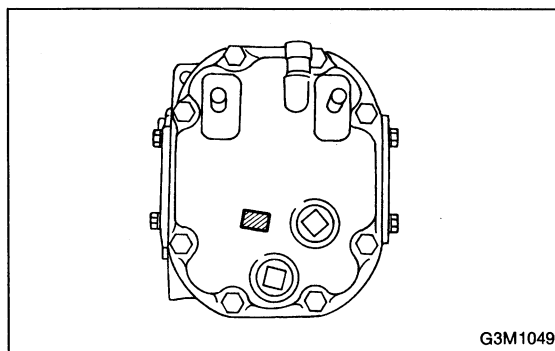


(4) Completely insert DOJ into rear differential by pressing rear housing.

NOTE:

Make sure that oil seal lip is not folded over inward.

13) Hereafter, re-assemble in reverse order of disassembly.

**B: IDENTIFICATION****2. TURBO MODEL**

When replacing a rear differential assembly, select the correct one according to the following table.

CAUTION:

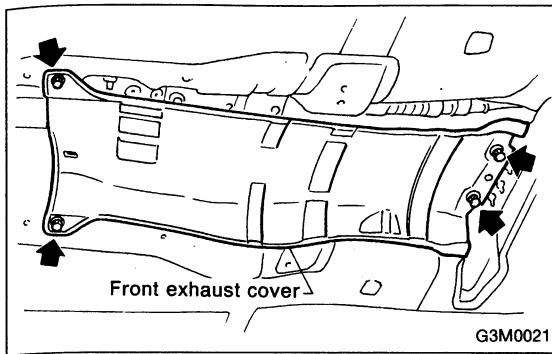
Using the different rear differential assembly causes the drive line and tires to "drag" or emit abnormal noise when AWD is selected.

Gear ratio	Part number	Label stuck on rear differential
3.545	27011AA400	W T

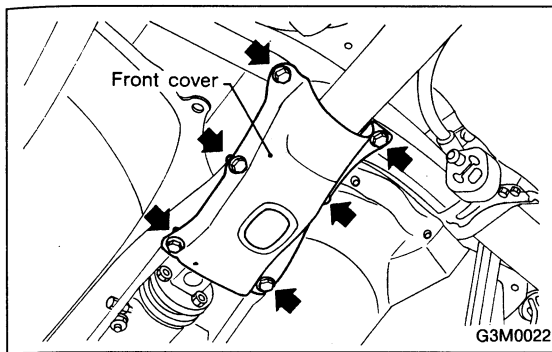
G3M1027

C: REMOVAL**2. TURBO MODEL**

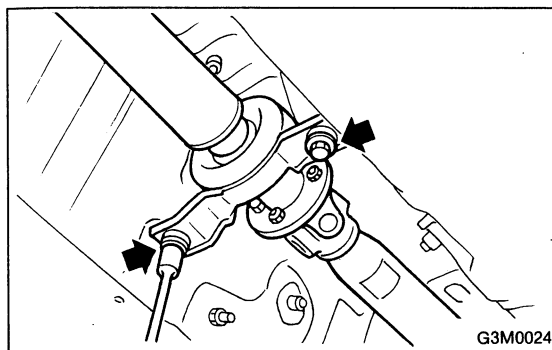
- 1) Disconnect ground cable from battery.
 - 2) Move selector lever or gear shift lever to "N".
 - 3) Release the parking brake.
 - 4) Loosen wheel nuts.
 - 5) Jack-up vehicle and support it with sturdy racks.
 - 6) Remove wheels.
 - 7) Remove rear exhaust pipe and muffler.
- <Ref. to G170GE2, 2-9 [W2A0, W3A0].>



8) Remove front exhaust cover.



9) Remove front cover of rear differential mount.



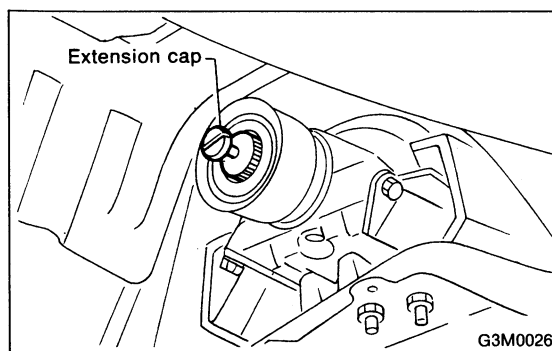
10) Remove propeller shaft.

CAUTION:

When removing propeller shaft, pay attention not to damage the sliding surfaces of rear drive shaft (extension) spline, oil seal and sleeve yoke.

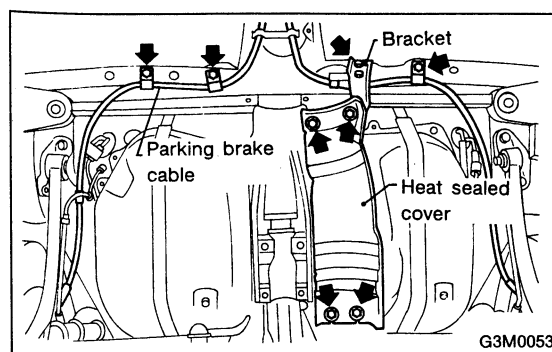
NOTE:

Prepare an oil can and cap since the transmission oil flows out from the extension at removing propeller shaft.



NOTE:

Insert the cap into the extension to prevent transmission oil from flowing out immediately after removing the propeller shaft.



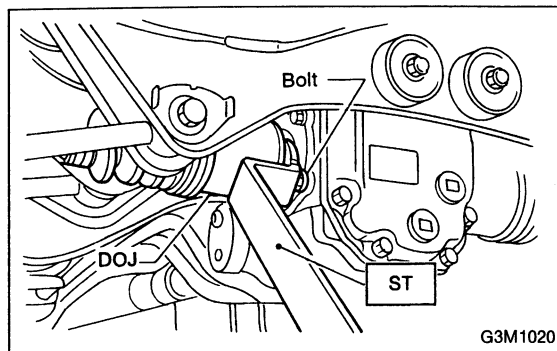
11) Remove heat sealed cover.

12) Remove clamps and bracket of parking brake cable.

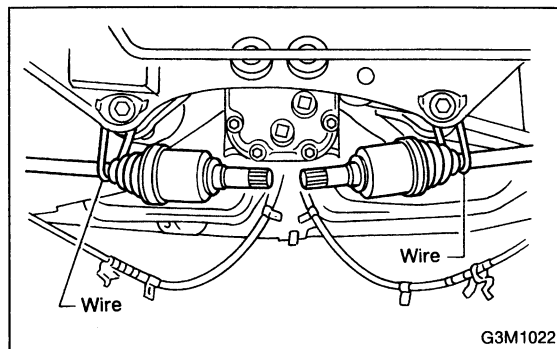
3-4 [W2C2]

2. Rear Differential

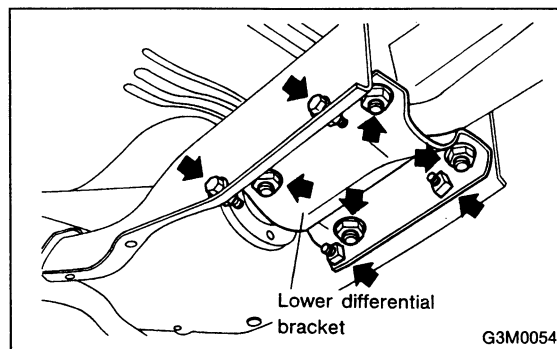
SERVICE PROCEDURE



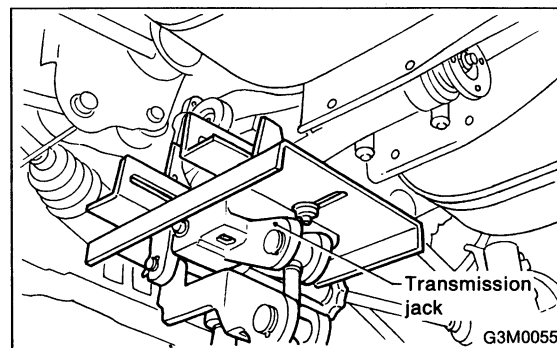
- 13) Remove DOJ of rear drive shaft from rear differential using ST. <Ref. to G173GE2, 3-4 [W2A3].>
ST 28099PA100 DRIVE SHAFT REMOVER



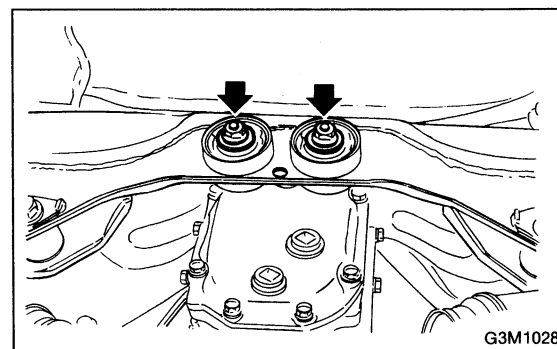
- 14) Secure rear drive shaft to rear crossmember using wire.



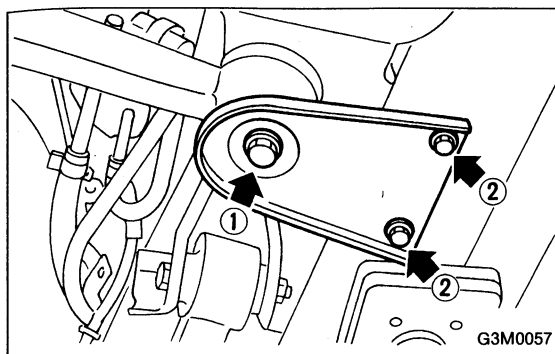
- 15) Remove lower differential bracket.



- 16) Support rear differential with transmission jack.



- 17) Remove self-locking nuts connecting rear differential to rear crossmember.

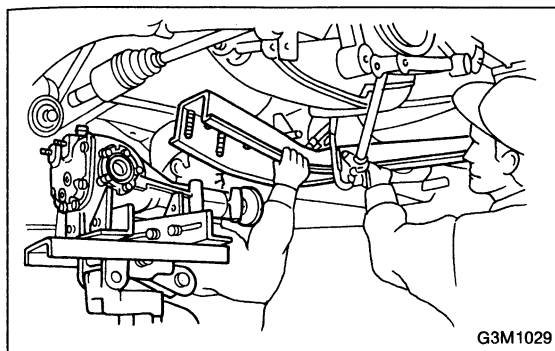


18) Remove bolts which secure rear differential front member to body.

Loosen bolt ① first, then remove bolts ②.

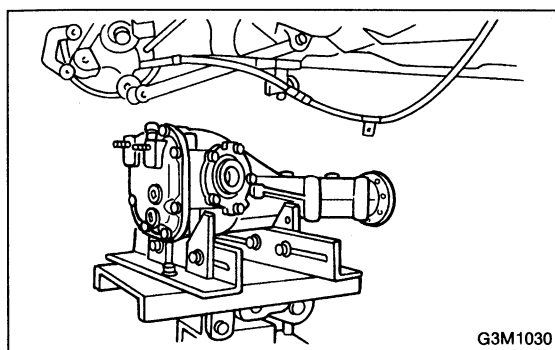
NOTE:

Support front member with the use of a helper to prevent it from dropping.



19) While slowly lowering transmission jack, move rear differential forward and remove bolts from rear crossmember.

20) Remove front member from body.



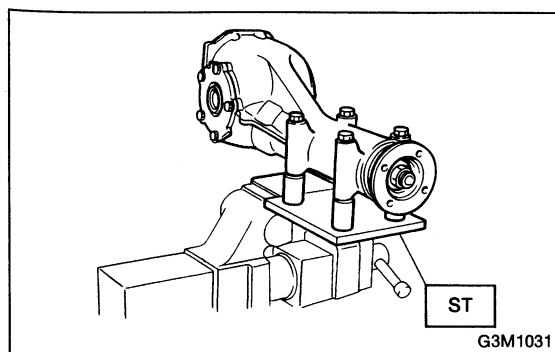
21) Remove rear differential from body.

D: DISASSEMBLY

2. TURBO MODEL

To detect real cause of trouble, inspect the following items before disassembling. <Ref. to G173GE2, 3-4 [W2F2].>

- Tooth contact of crown gear and pinion, and backlash
- Runout of crown gear at its back surface
- Turning resistance of drive pinion



1) Set ST on vise and install the differential assembly to ST.

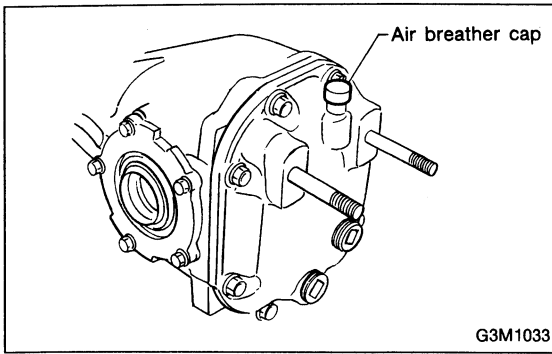
ST 398217700 ATTACHMENT

2) Drain gear oil by removing plug.

3-4 [W2D2]

2. Rear Differential

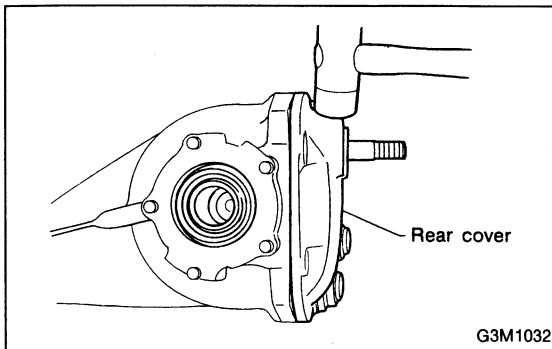
SERVICE PROCEDURE



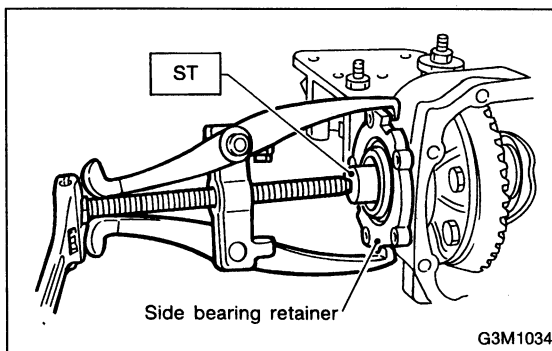
3) Remove the air breather cap.

NOTE:

Do not attempt to replace the air breather cap, unless necessary.



4) Remove rear cover by loosening retaining bolts.

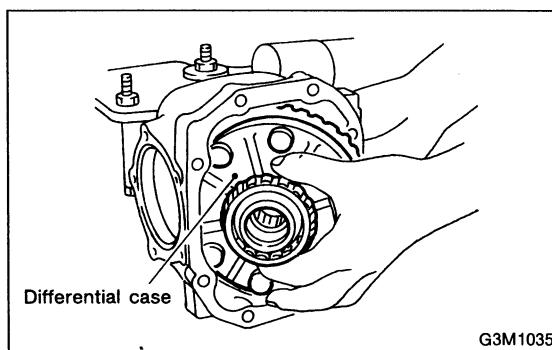


5) Make right and left side bearing retainers in order to identify them at reassembly. Remove side bearing retainer attaching bolts, set ST to differential case, and extract right and left side bearing retainers with a puller.

ST 398457700 ATTACHMENT

CAUTION:

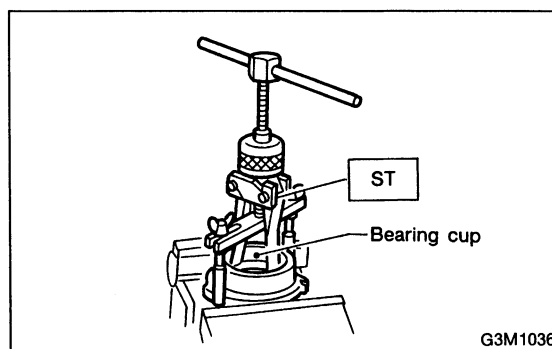
Each shim, which is installed to adjust the side bearing preload, should be kept together with its mating retainer.



6) Pull out differential assembly from differential carrier.

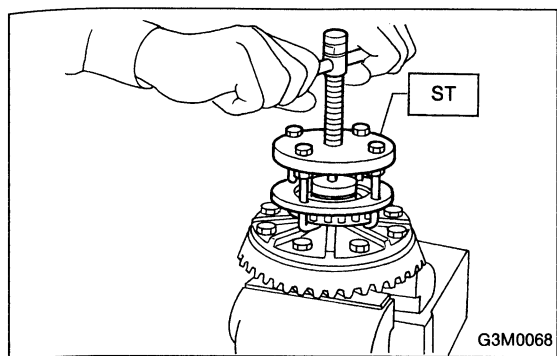
CAUTION:

Be careful not to hit the teeth against the case.



7) When replacing side bearing, pull bearing cup from side bearing retainer using ST.

ST 398527700 PULLER ASSY



8) Extract bearing cone with ST.

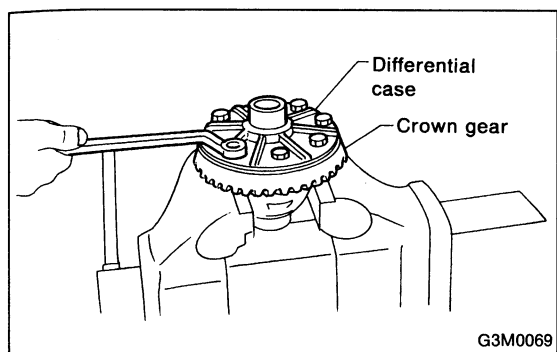
CAUTION:

Do not attempt to disassemble the parts unless necessary.

NOTE:

- Set puller so that its claws catch the edge of the bearing cone.
- Never mix up the right and left hand bearing cups and cones.

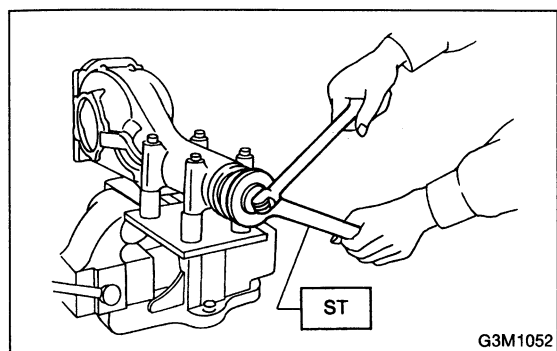
ST 399527700 PULLER SET



9) Remove crown gear by loosening crown gear bolts.

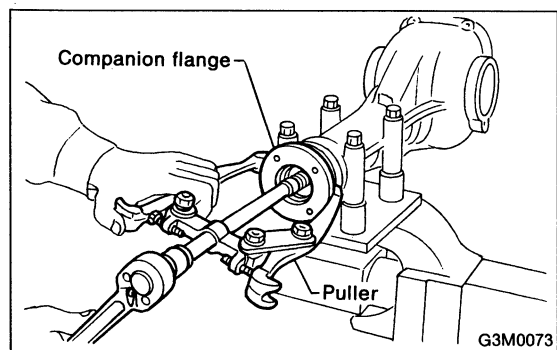
CAUTION:

Further disassembling is not allowed.

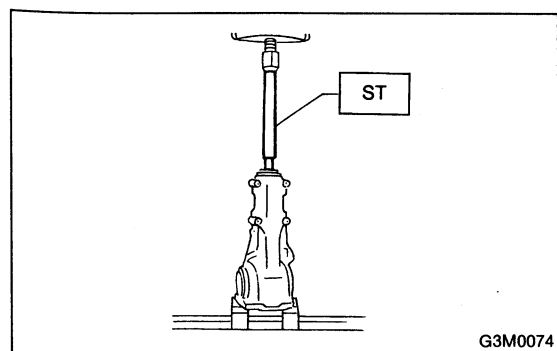


10) Hold companion flange with ST and remove drive pinion nut.

ST 498427200 FLANGE WRENCH



11) Extract the companion flange with a puller.



12) Press the end of drive pinion shaft and extract it together with rear bearing cone, preload adjusting spacer and washer.

NOTE:

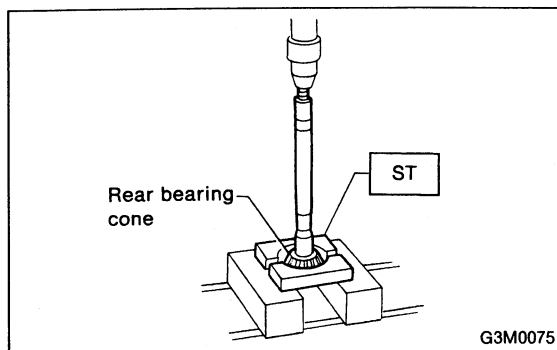
Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT

3-4 [W2F2]

2. Rear Differential

SERVICE PROCEDURE

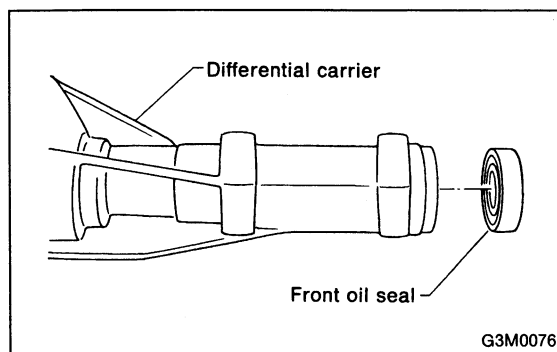


13) Remove rear bearing cone from drive pinion by supporting cone with ST.

NOTE:

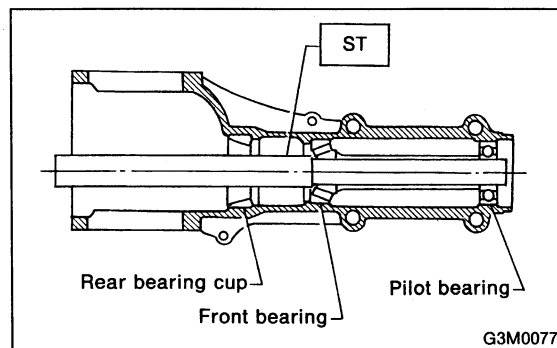
Place the replacer so that its center-recessed side faces the pinion gear.

ST 398517700 REPLACER



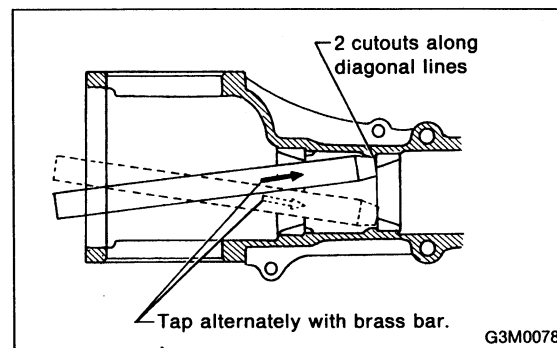
14) Remove front oil seal from differential carrier using ST.

ST 398527700 PULLER ASSY



15) Remove pilot bearing together with front bearing cone using ST.

ST 398467700 DRIFT



16) When replacing bearings, tap front bearing cup and rear bearing cup in this order out of case by using a brass bar.

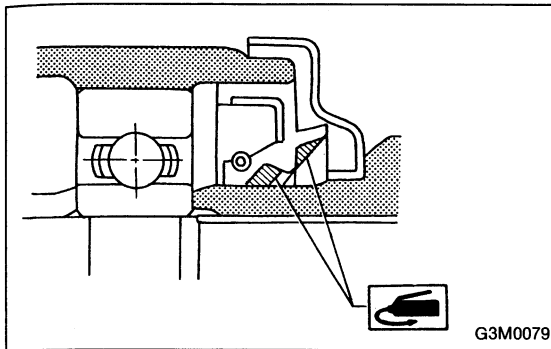
F: ASSEMBLY

2. TURBO MODEL

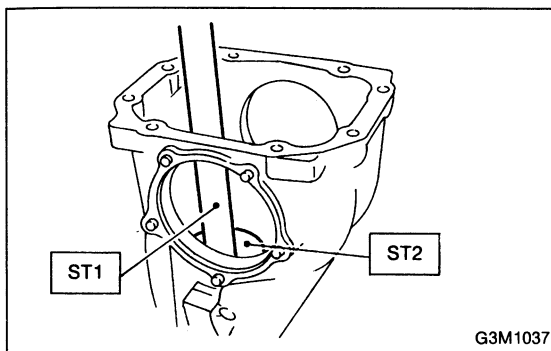
1) Precautions for assembling

- (1) Assemble in the reverse order of disassembling.
- (2) Check and adjust each part during assembly.
- (3) Keep the shims and washers in order, so that they are not misinstalled.
- (4) Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.

- (5) Apply gear oil when installing the bearings and thrust washers.
- (6) Be careful not to mix up the right and left hand cups of the bearings.



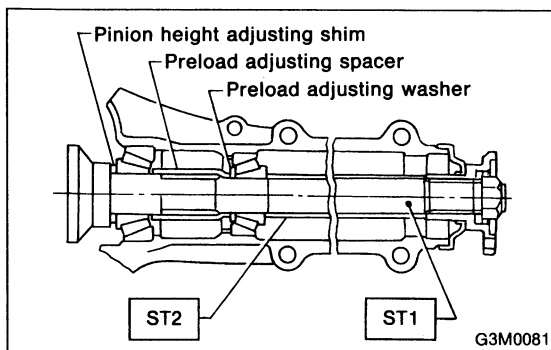
- (7) Replace the oil seal with new one at every disassembly. Apply chassis grease between the lips when installing the oil seal.



- 2) Adjusting preload for front and rear bearings
Adjust the bearing preload with spacer and washer between front and rear bearings. Pinion height adjusting washer are not affected by this adjustment. The adjustment must be carried out without oil seal inserted.

- (1) Press rear bearing race into differential carrier with ST1 and ST2.

ST1 398477701 HANDLE
ST2 398427703 DRIFT 2



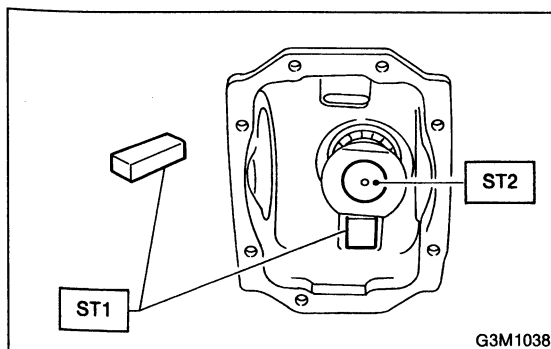
- (2) Insert ST1 into case with pinion height adjusting washer and rear bearing cone fitted onto it.

CAUTION:

- Re-use the used washer if not deformed.
- Use a new rear bearing cone.

- (3) Then install preload adjusting spacer and washer, front bearing cone, ST2, companion flange, and washer and drive pinion nut.

ST1 398507702 DUMMY SHAFT
ST2 398507703 DUMMY COLLAR



- (4) Turn ST1 with hand to make it seated, and tighten drive pinion nut while measuring the preload with spring balance. Select preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque with ST2.

CAUTION:

- Use a new lock nut.

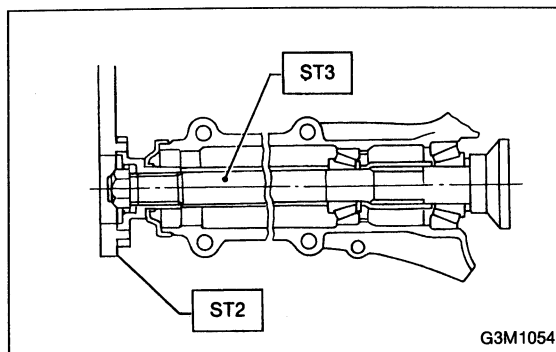
NOTE:

- Be careful not to give excessive preload.

3-4 [W2F2]

2. Rear Differential

SERVICE PROCEDURE



- When tightening the drive pinion nut, lock ST1 with ST2 as shown in the figure.

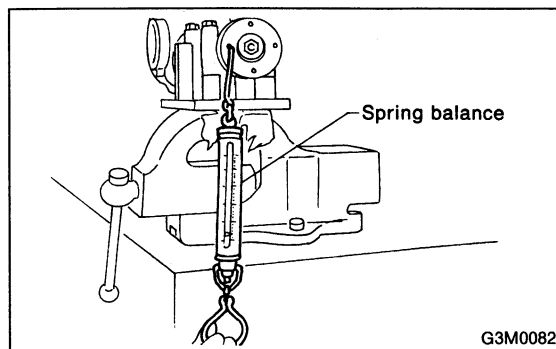
ST1 398507704 BLOCK

ST2 398507702 DUMMY SHAFT

ST3 498427200 FLANGE WRENCH

Tightening Torque:

$181 \pm 15 \text{ N}\cdot\text{m}$ ($18.5 \pm 1.5 \text{ kg}\cdot\text{m}$, $134 \pm 11 \text{ ft}\cdot\text{lb}$)



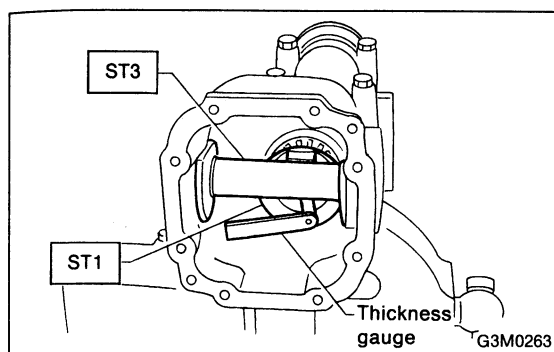
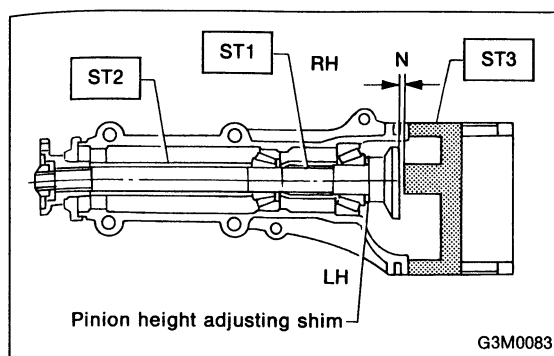
Front and rear bearing preload

For new bearing:

19.6 — 28.4 N (2.0 — 2.9 kg, 4.4 — 6.4 lb)

at companion flange bolt hole

	Part No.	Length mm (in)
● Preload adjusting washer length	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	2.39 (0.0941)
	383815200	2.37 (0.0933)
	383825200	2.35 (0.0925)
	383835200	2.33 (0.0917)
	383845200	2.31 (0.0909)
● Preload adjusting spacer length	383695201	56.2 (2.213)
	383695202	56.4 (2.220)
	383695203	56.6 (2.228)
	383695204	56.8 (2.236)
	383695205	57.0 (2.244)
	383695206	57.2 (2.252)



3) Adjusting drive pinion height

Adjust drive pinion height with shim installed between rear bearing cone and the back of pinion gear.

- (1) Install ST1, ST2 and ST3, as shown in the figure, and apply the specified preload on the bearings.
<Ref. to 2).> "Adjusting preload for front and rear bearings"

NOTE:

At this time, install a pinion height adjusting shim which is temporarily selected or the same as that used before.

- (2) Measure the clearance N between the end of ST3 and the end surface of ST1 by using a thickness gauge.

NOTE:

Make sure there is no clearance between the case and ST3.

- ST1 398507702 DUMMY SHAFT
ST2 398507703 DUMMY COLLAR
ST3 398507701 DIFFERENTIAL CARRIER GAUGE

- (3) Obtain the thickness of pinion height adjusting shim to be inserted from the following formula, and replace the temporarily installed shim with this one.

$$T = T_o + N - (H \times 0.01) - 0.20 \text{ (mm)}$$

Where:

- T = Thickness of pinion height adjusting shim (mm)
T_o = Thickness of shim temporarily inserted (mm)
N = Reading of thickness gauge (mm)
H = Figure marked on drive pinion head

(Example of calculation)

$$T_o = 2.20 + 1.20 = 3.40 \text{ mm}$$

$$N = 0.23 \text{ mm } H = + 1,$$

$$T = 3.40 + 0.23 - 0.01 - 0.20 = 3.42$$

$$\text{Result: Thickness} = 3.42 \text{ mm}$$

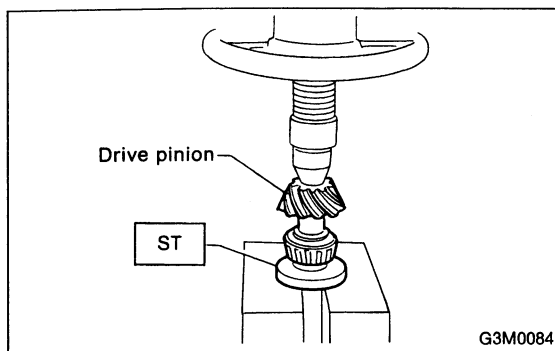
Therefore use the shim 383605200.

	Part No.	Thickness mm (in)
	383495200	3.09 (0.1217)
● Pinion height adjusting shim thickness	383505200	3.12 (0.1228)
	383515200	3.15 (0.1240)
	383525200	3.18 (0.1252)
	383535200	3.21 (0.1264)
	383545200	3.24 (0.1276)
	383555200	3.27 (0.1287)
	383565200	3.30 (0.1299)
	383575200	3.33 (0.1311)
	383585200	3.36 (0.1323)
	383595200	3.39 (0.1335)
	383605200	3.42 (0.1346)
	383615200	3.45 (0.1358)
	383625200	3.48 (0.1370)
	383635200	3.51 (0.1382)
	383645200	3.54 (0.1394)
	383655200	3.57 (0.1406)
	383665200	3.60 (0.1417)
	383675200	3.63 (0.1429)
	383685200	3.66 (0.1441)

3-4 [W2F2]

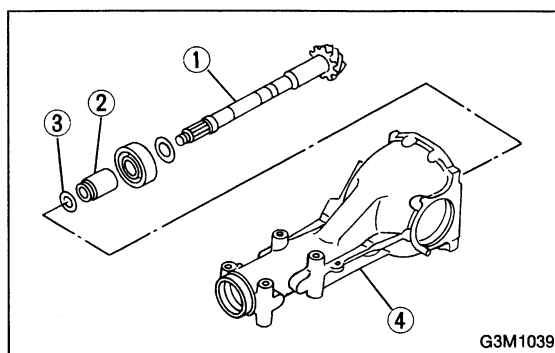
2. Rear Differential

SERVICE PROCEDURE

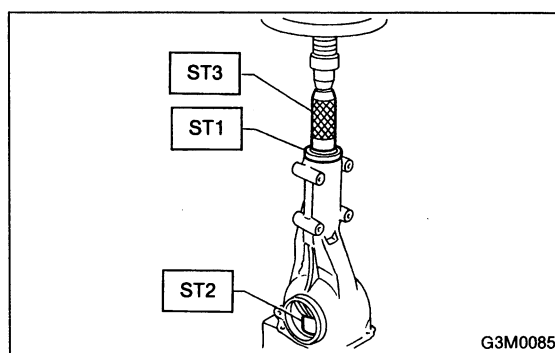


4) Install the selected pinion height adjusting shim on drive pinion, and press the rear bearing cone into position with ST.

ST 398177700 INSTALLER



5) Insert drive pinion ① into differential carrier ④, install the previously selected bearing preload adjusting spacer ② and washer ③.

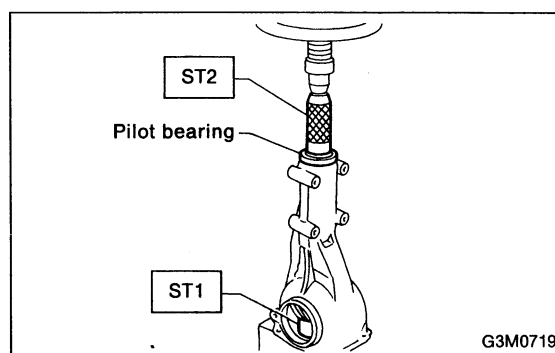


6) Press-fit front bearing cone into case with ST1, ST2 and ST3.

ST1 398507703 DUMMY COLLAR

ST2 399780104 WEIGHT

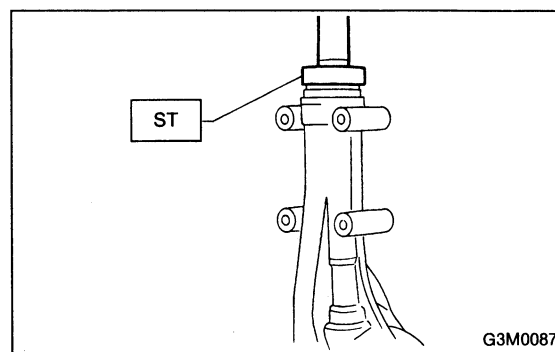
ST3 899580100 INSTALLER



7) Insert spacer, then press-fit pilot bearing with ST1 and ST2.

ST1 399780104 WEIGHT

ST2 899580100 INSTALLER



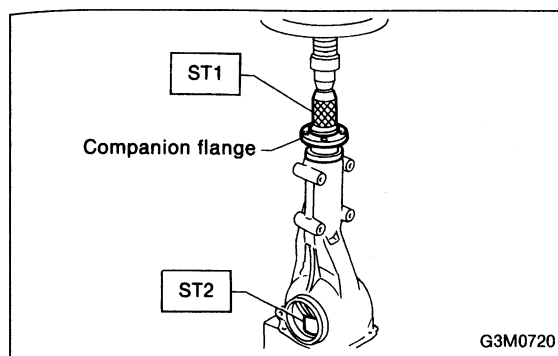
8) Fit a new oil seal with ST.

NOTE:

- Press-fit until end of oil seal is 1 mm (0.04 in) inward from end of carrier.

- Apply grease between the oil seal lips. <Ref. to 1).> "Precautions for assembling"

ST 498447120 OIL SEAL INSTALLER



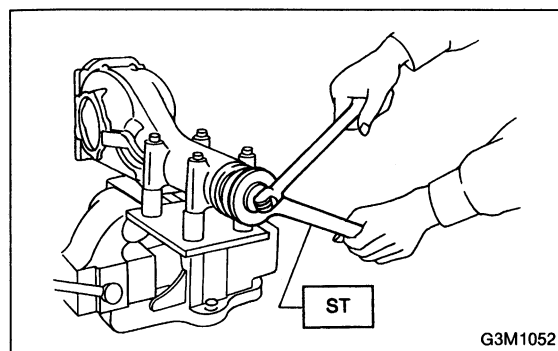
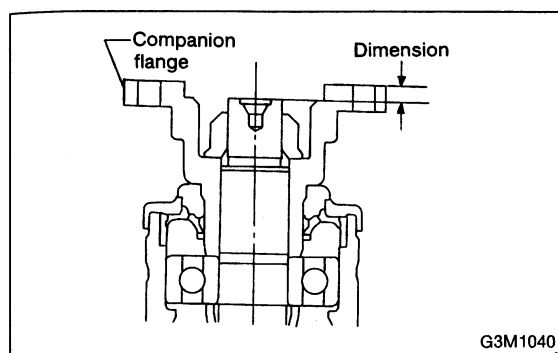
9) Press-fit companion flange with ST1 and ST2 until flange protrudes 0 to 5 mm (0 to 0.20 in) beyond shaft.

CAUTION:

Be careful not to damage bearing.

ST1 899874100 INSTALLER

ST2 399780104 WEIGHT

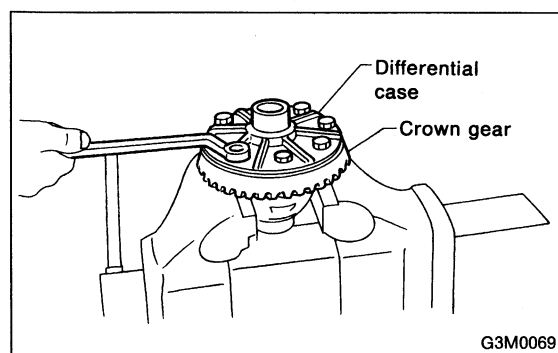


10) Install self-locking nut. Then tighten it with ST.

ST 498427200 FLANGE WRENCH

Tightening torque:

$181 \pm 15 \text{ N}\cdot\text{m}$ ($18.5 \pm 1.5 \text{ kg}\cdot\text{m}$, $134 \pm 11 \text{ ft}\cdot\text{lb}$)



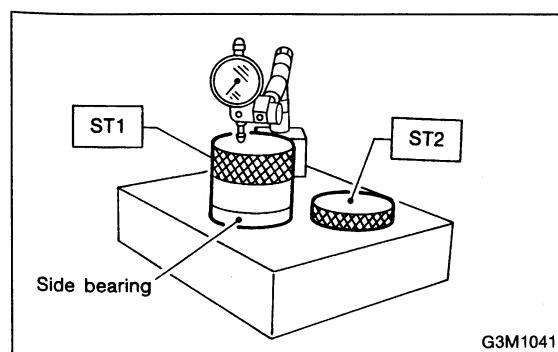
11) Install crown gear on differential case.

Tightening Torque:

$103 \pm 10 \text{ N}\cdot\text{m}$ ($10.5 \pm 1.0 \text{ kg}\cdot\text{m}$, $76 \pm 7 \text{ ft}\cdot\text{lb}$)

NOTE:

Tighten diagonally while tapping the bolt heads.



12) Before installing side bearing, measure the bearing width by using a dial gauge, ST1 and ST2.

Standard bearing width:

20.00 mm (0.7874 in)

NOTE:

Set the dial gauge needle to zero, using a standard bearing or block of specified height in advance.

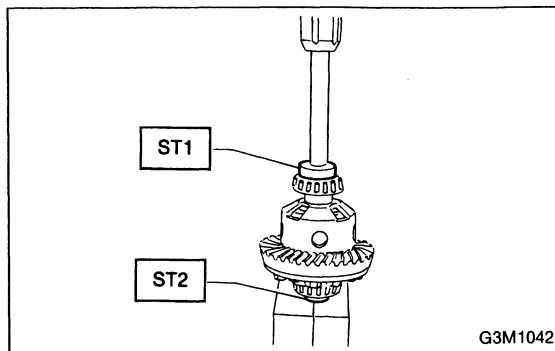
ST1 398227700 WEIGHT

ST2 398237700 GAUGE

3-4 [W2F2]

2. Rear Differential

SERVICE PROCEDURE

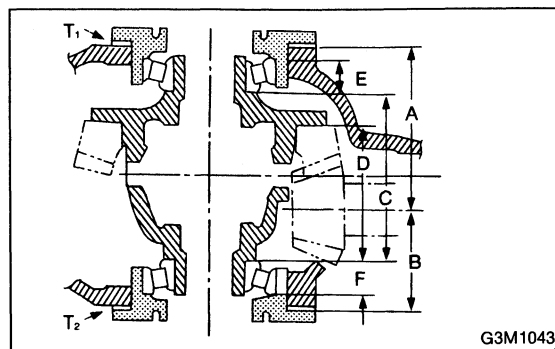


13) Press side bearing cone onto differential case with ST1 and ST2 included in ST3.

ST1 398487700 DRIFT

ST2 398497701 ADAPTER

ST3 399527700 PULLER SET



14) Adjusting side bearing retainer shims

(1) The drive gear backlash and side bearing preload can be determined by the side bearing retainer shim thickness.

(2) When replacing differential case, differential carrier, side bearing and side bearing retainer, obtain the right and left retainer shim thickness from the following formulas.

$$T_1 \text{ (Left)} = (A + C + G_1 - D) \times 0.01 + 0.76 - E \text{ (mm)}$$

$$T_2 \text{ (Right)} = (B + D + G_2) \times 0.01 + 0.76 - F \text{ (mm)}$$

T_1 & T_2 : Thickness of left and right side bearing retainer shim (mm)

A & B : Number marked on differential carrier

C & D : Number marked on differential case

E & F : Difference of width of left and right side bearing from standard width 20.0 mm, expressed in a unit of 0.01 mm. For example, if the bearing measured width is 19.89 mm, value of E or F is as follows.
 $20.00 - 19.89 = 0.11$ (E or F)

G_1 & G_2 : Number marked on side bearing retainer

If a number is not marked, regard it as zero.

NOTE:

Use several shims to obtain the calculated thickness.

● Side bearing retainer shim thickness	Part No.	Thickness mm (in)
	383475201	0.20 (0.0079)
	383475202	0.25 (0.0098)
	383475203	0.30 (0.0118)
	383475204	0.40 (0.0157)
	383475205	0.50 (0.0197)

Example of calculation

Ex. 1

$$A = 5, B = 5, C = 3, D = 3, G_1 = 4, G_2 = 1, \\ E = 0.10 \text{ mm}, F = 0.15 \text{ mm}$$

Left side

$$T_1 = (A + C + G_1 - D) \times 0.01 + 0.76 - E \\ = (5 + 3 + 4 - 3) \times 0.01 + 0.76 - 0.10 \\ = 0.09 + 0.76 - 0.10 = 0.75 \text{ mm}$$

The correct shims are as follows:

Thickness	Q'ty	
0.25	x 1	= 0.25
0.50	x 1	= 0.50
<hr/>		
Total shim thickness = 0.75 mm		

Right side

$$T_2 = (B + D + G_2) \times 0.01 + 0.76 - F \\ = (5 + 3 + 1) \times 0.01 + 0.76 - 0.15 \\ = 0.09 + 0.76 - 0.15 \\ = 0.70 \text{ mm}$$

The correct shims are as follows:

Thickness	Q'ty	
0.20	x 1	= 0.20
0.50	x 1	= 0.50
<hr/>		
Total shim thickness = 0.70 mm		

Ex. 2

$$A = 2, B = 3, C = 0, D = 3, G_1 = 2, G_2 = 3, \\ E = 0.22 \text{ mm}, F = 0.10 \text{ mm}$$

Left side

$$T_1 = (A + C + G_1 - D) \times 0.01 + 0.76 - E \\ = (2 + 0 + 2 - 3) \times 0.01 + 0.76 - 0.22 \\ = 0.01 + 0.76 - 0.22 \\ = 0.55 \text{ mm}$$

The correct shims are as follows:

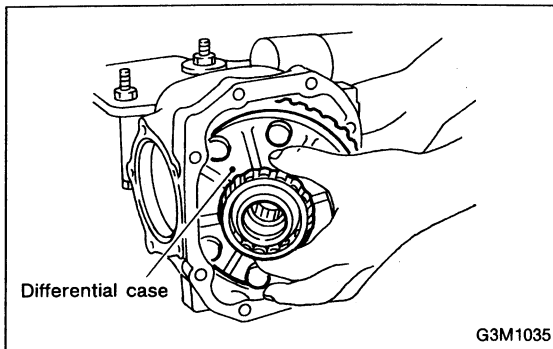
Thickness	Q'ty	
0.25	x 1	= 0.25
0.30	x 1	= 0.30
<hr/>		
Total shim thickness = 0.55 mm		

Right side

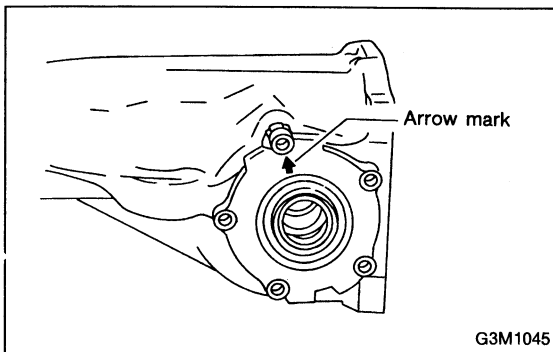
$$T_2 = (B + D + G_2) \times 0.01 + 0.76 - F \\ = (3 + 3 + 3) \times 0.01 + 0.76 - 0.10 \\ = 0.09 + 0.76 - 0.10 \\ = 0.75 \text{ mm}$$

The correct shims are as follows:

Thickness	Q'ty	
0.25	x 1	= 0.25
0.50	x 1	= 0.50
<hr/>		
Total shim thickness = 0.75 mm		



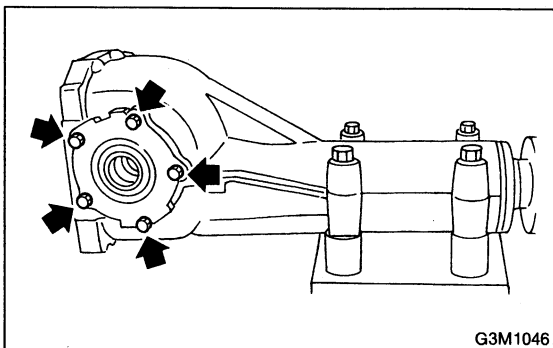
(3) Install the differential case assembly into differential carrier in the reverse order of disassembly.



(4) Fit the selected shims and O-ring on side bearing retainer and install them on differential carrier with the arrow mark on the retainer directed as shown in figure.

CAUTION:

Be careful that side bearing cup is not damaged by bearing roller.



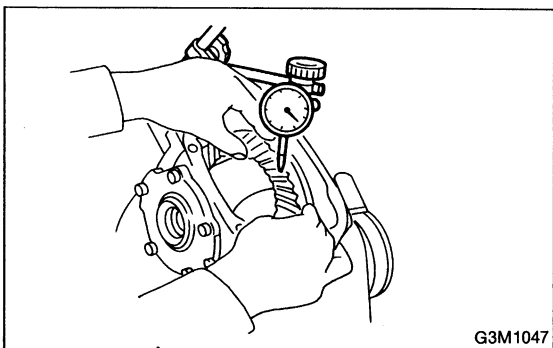
(5) Tighten side bearing retainer bolts.

Tightening Torque:

$10.3 \pm 1.5 \text{ N}\cdot\text{m}$ ($1.05 \pm 0.15 \text{ kg}\cdot\text{m}$, $7.6 \pm 1.1 \text{ ft}\cdot\text{lb}$)

NOTE:

On vehicles with LSD, apply a coat of THREE BOND 1215 (Part No. 004403007) to threads.



(6) Measure the crown gear-to-drive pinion backlash. Set magnet base on differential carrier. Align contact point of dial gauge with tooth face of crown gear, and move crown gear while holding drive pinion still. Read value indicated on dial gauge.

Backlash:

$0.10 - 0.20 \text{ mm}$ ($0.0039 - 0.0079 \text{ in}$)

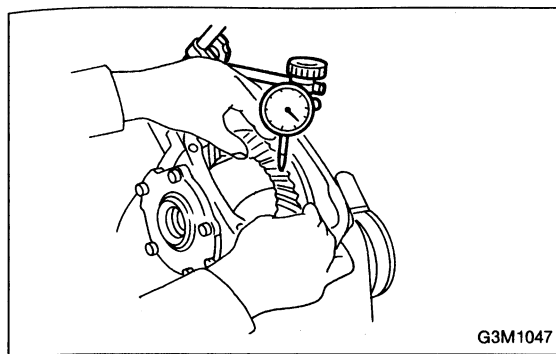
(7) At the same time, measure the turning resistance of drive pinion. Compared with the resistance when differential case is not installed, if the increase of the resistance is not within the specified range, readjust side bearing retainer shims.

Turning resistance increase:

$0.1 - 0.6 \text{ N}\cdot\text{m}$ ($1 - 6 \text{ kg}\cdot\text{cm}$, $0.9 - 5.2 \text{ in}\cdot\text{lb}$)

NOTE:

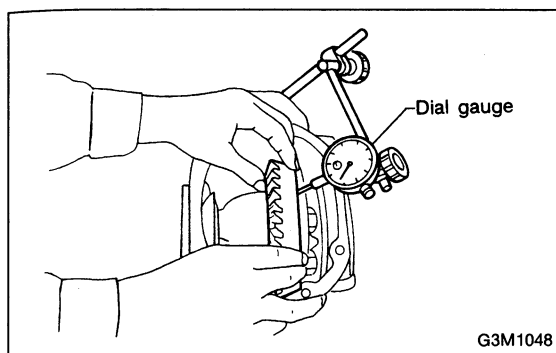
If measured backlash is not within specified range, repeat steps (1) thru (7).



15) Re-check crown gear-to-pinion backlash.

Backlash:

0.10 — 0.20 mm (0.0039 — 0.0079 in)



16) Check the crown gear runout on its back surface, and make sure pinion and crown gear rotate smoothly.

Limit of runout:

0.05 mm (0.0020 in)

- 17) Checking and adjusting tooth contact of crown gear
- (1) Apply an even coat of red lead on both sides of three or four teeth on the crown gear. Check the contact pattern after rotating crown gear several revolutions back and forth until a definite contact pattern appears on the crown gear.
 - (2) When the contact pattern is incorrect, readjust according to the instructions given in "TOOTH CONTACT PATTERN".

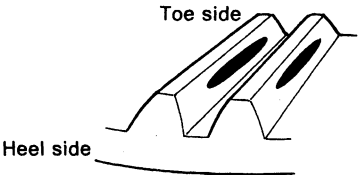

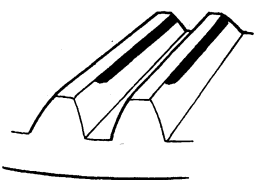
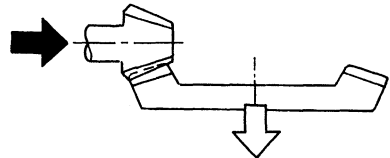
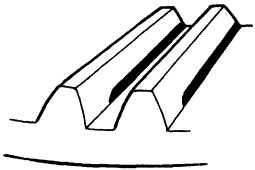
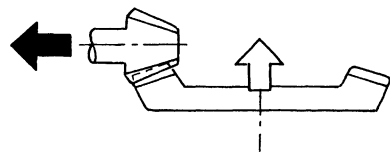
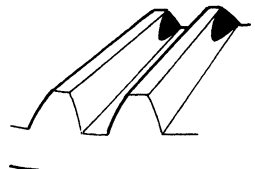
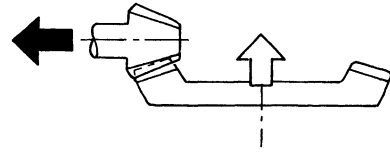
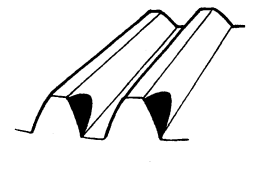
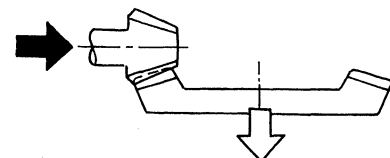
NOTE:

Be sure to wipe off red lead completely after adjustment is completed.

18) If proper tooth contact is not obtained, once again adjust the drive pinion height and the differential side bearing preload (mentioned above) and the hypoid gear backlash.

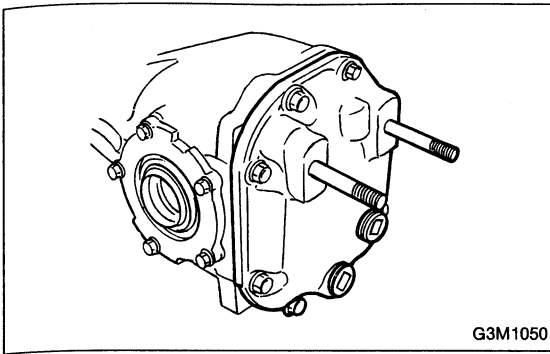
SERVICE PROCEDURE

TOOTH CONTACT PATTERN

Condition	Contact pattern	Adjustment
Correct tooth contact Tooth contact pattern slightly shifted towards toe under no load rotation. (When loaded, contact pattern moves toward heel.)	 G3M0098A	
Face contact Backlash is too large.	This may cause noise and chipping at tooth ends.  G3M0098B	Increase thickness of drive pinion height adjusting shim in order to bring drive pinion closer to crown gear center.  G3M0098F
Flank contact Backlash is too small.	This may cause noise and stepped wear on surfaces.  G3M0098C	Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.  G3M0098G
Toe contact Contact area is small.	This may cause chipping at toe ends.  G3M0098D	Adjust as for flank contact.  G3M0098G
Heel contact Contact area is small.	This may cause chipping at heel ends.  G3M0098E	Adjust as for face contact.  G3M0098F

➡ : Adjusting direction of drive pinion

⇨ : Adjusting direction of crown gear



19) Install rear cover and tighten bolts to specified torque.

Tightening torque:

$29 \pm 5 \text{ N}\cdot\text{m}$ ($3.0 \pm 0.5 \text{ kg}\cdot\text{m}$, $21.7 \pm 3.6 \text{ ft}\cdot\text{lb}$)

G: INSTALLATION

2. TURBO MODEL

To install, reverse the removal sequence.

1) Install the air breather cap tapping with a plastic hammer.

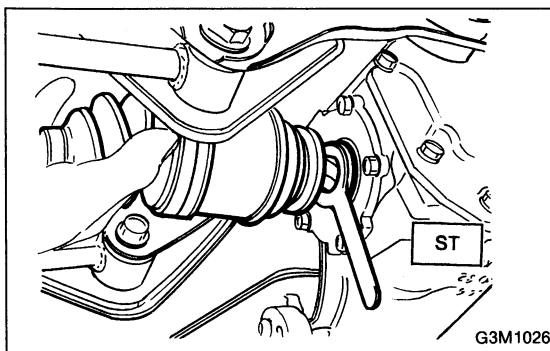
CAUTION:

Be sure to install new air breather cap.

2) Position front member on body by passing it under parking brake cable and securing to rear differential.

NOTE:

When installing rear differential front member, do not confuse the installation sequence of the upper and lower stoppers.



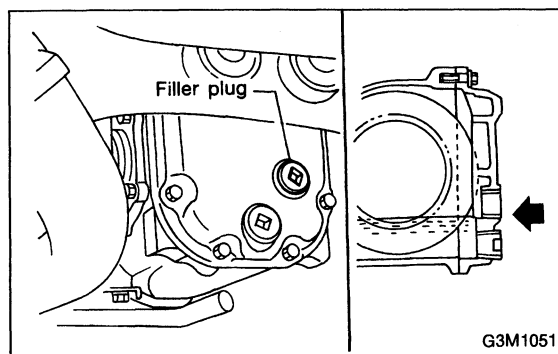
3) Install DOJ of rear drive shaft into rear differential.
<Ref. to 3-4 [W2A3].>

ST 28099PA090 SIDE OIL SEAL PROTECTOR

3-4 [W2G2]

2. Rear Differential

SERVICE PROCEDURE



4) Installing procedure hereafter is in the reverse order of removal.

5) After installation, fill differential carrier with gear oil to the upper plug level.

CAUTION:

Apply fluid packing to plug.

Fluid packing:

THREE BOND 1205 or equivalent

Oil capacity:

0.8 l (0.8 US qt, 0.7 Imp qt)

Tightening torque:

44 ± 4 N·m (4.5 ± 0.4 kg-m, 32.5 ± 2.9 ft-lb)