

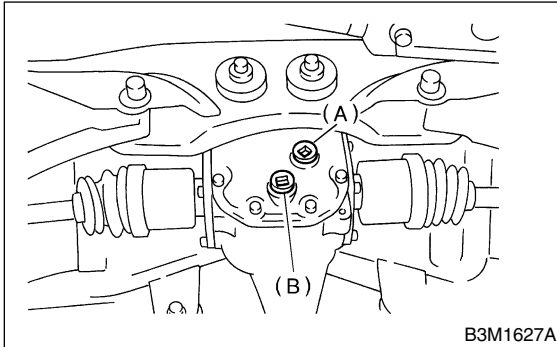
2. Differential Gear Oil S303150

A: REPLACEMENT S303150A20

- 1) Disconnect ground terminal from battery.
- 2) Jack-up vehicle and support it with sturdy racks.
- 3) Remove the oil drain plug and filler plug, and drain the gear oil.

CAUTION:

Be careful not to burn your hands, because gear oil becomes extremely hot after running.



- (A) Filler plug
(B) Drain plug

- 4) Tighten oil drain plug.

CAUTION:

Apply fluid packing to oil drain plug.

Fluid packing:

THREE BOND 1105 or equivalent

Tightening torque:

49.0 N·m (5.0 kgf-m, 36.2 ft-lb)

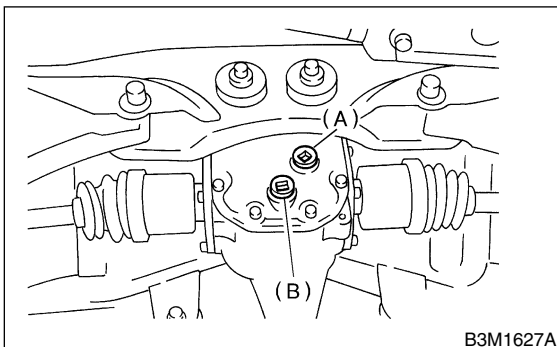
- 5) Fill differential carrier with gear oil to the upper plug level.

CAUTION:

Carefully refill oil while watching the level. Excess or insufficient oil must be avoided.

Oil capacity:

0.8 l (0.8 US qt, 0.7 Imp qt)



- 6) Install filler plug.

CAUTION:

Apply fluid packing to oil drain plug.

Fluid packing:

THREE BOND 1105 or equivalent

Tightening torque:

T-type;

49.0 N·m (5.0 kgf-m, 36.2 ft-lb)

VA-type;

33 N·m (3.4 kgf-m, 24.6 ft-lb)

3. Front Differential S303152

A: NOTE S303152A15

Refer to “AT” section or “MT” section in separate publication for Front Differential.

GENERAL DESCRIPTION

Differentials

1. General Description

S303001

A: SPECIFICATIONS

S303001E49

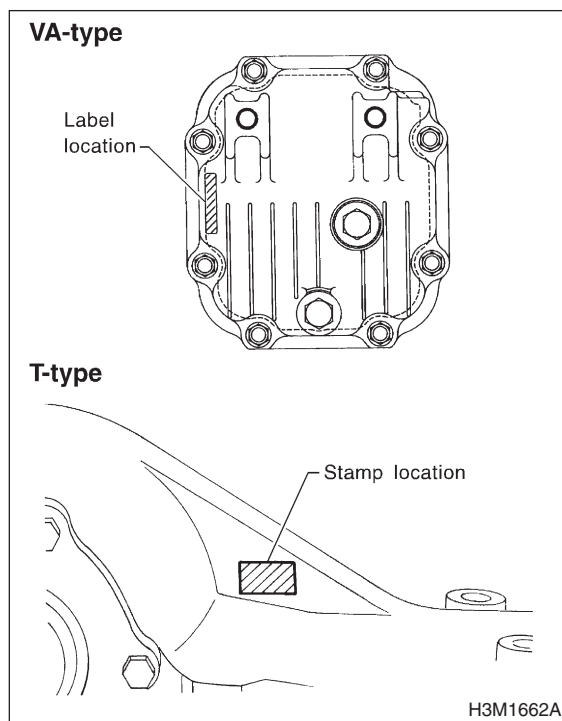
Model	2200 cc		2500 cc	
	MT	AT	MT	AT
Rear differential type	T type T1	VA type VA1REG-XJ	T type BK	T type CF
	Without LSD		With LSD	
Type of gear	Hipoide gear			
Gear train (Number of gear teeth)	3.900 (39/10)	4.111 (37/9)	4.111 (37/9)	4.444 (40/9)
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)			
Rear differential gear oil	GL-5			

● Identification

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.



● Rear Differential Gear Oil

Recommended oil

CAUTION:

Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

ITEM									
• Rear differential gear oil									
API Classification									
GL-5									
SAE Viscosity No. and Application Temperature									
(°C)	-30	-26	-15	-5	0	15	25	30	
(°F)	-22	-15	5	23	32	59	77	86	
H3M1272A									

1. ADJUSTING PARTS S303001E4902

● VA-Type

Front and rear bearing preload at companion flange bolt hole	New bearing	12.7 — 32.4 N (1.3 — 3.3 kgf, 2.9 — 7.3 lb)
Preload adjusting spacer	Part No.	Length mm (in)
	32288AA040	52.3 (2.059)
	32288AA050	52.5 (2.067)
	31454AA100	52.6 (2.071)
	32288AA060	52.7 (2.075)
	31454AA110	52.8 (2.079)
	32288AA070	52.9 (2.083)
	31454AA120	53.0 (2.087)
	32288AA080	53.1 (2.091)
	32288AA090	53.3 (2.098)
Preload adjusting washer	Part No.	Thickness mm (in)
	38336AA000	1.500 (0.0591)
	38336AA120	1.513 (0.0596)
	38336AA010	1.525 (0.0600)
	38336AA130	1.538 (0.0606)
	38336AA020	1.550 (0.0610)
	38336AA140	1.563 (0.0615)
	38336AA030	1.575 (0.0620)
	38336AA150	1.588 (0.0625)
	38336AA040	1.600 (0.0630)
	38336AA160	1.613 (0.0635)
	38336AA050	1.625 (0.0640)
	38336AA170	1.638 (0.0645)
	38336AA060	1.650 (0.0650)
	38336AA180	1.663 (0.0655)
	38336AA070	1.675 (0.0659)
	38336AA190	1.688 (0.0665)
	38336AA080	1.700 (0.0669)
	38336AA200	1.713 (0.0674)
	38336AA090	1.725 (0.0679)
	38336AA210	1.738 (0.0684)
	38336AA100	1.750 (0.0689)
	38336AA220	1.763 (0.0694)
	38336AA110	1.775 (0.0699)
Pinion height adjusting shim	Part No.	Thickness mm (in)
	32295AA200	0.150 (0.0059)
	32295AA210	0.175 (0.0069)
	32295AA220	0.200 (0.0079)
	32295AA230	0.225 (0.0089)
	32295AA240	0.250 (0.0098)
	32295AA250	0.275 (0.0108)
Side gear backlash	0.05 — 0.15 mm (0.0020 — 0.0059 in)	
Side gear thrust washer	Part No.	Thickness mm (in)
	803135011	0.925 — 0.950 (0.0364 — 0.0374)
	803135012	0.950 — 0.975 (0.0374 — 0.0384)
	803135013	0.975 — 1.000 (0.0384 — 0.0394)
	803135014	1.000 — 1.025 (0.0394 — 0.0404)
	803135015	1.025 — 1.050 (0.0404 — 0.0413)
Crown gear to drive pinion backlash	Limit	0.10 — 0.15 (0.0039 — 0.0059)
Crown gear runout on its back surface		0.05 (0.0020)
Oil capacity		0.8 ℓ (0.8 US qt, 0.7 Imp qt)

GENERAL DESCRIPTION

Differentials

● T-Type

Front and rear bearing preload at companion flange bolt hole	New bearing	19.6 — 28.4 N (2.0 — 2.9 kgf, 4.4 — 6.4 lb)
Preload adjusting spacer	Part No.	Length mm (in)
	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)
Preload adjusting washer	Part No.	Thickness mm (in)
	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)
Pinion height adjusting shim	Part No.	Thickness mm (in)
	383495200	3.09 (0.1217)
	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)
Side gear backlash	0.10 — 0.20 mm (0.0039 — 0.0079 in)	

GENERAL DESCRIPTION

Differentials

	Part No.	Thickness mm (in)
Side gear thrust washer	383445201	0.75 — 0.80 (0.0295 — 0.0315)
	383445202	0.80 — 0.85 (0.0315 — 0.0335)
	383445203	0.85 — 0.90 (0.0335 — 0.0354)
	383445204	0.90 — 0.95 (0.0354 — 0.0374)
	383445205	0.95 — 1.00 (0.0374 — 0.0394)
Side bearing retainer shim	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)
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)

GENERAL DESCRIPTION

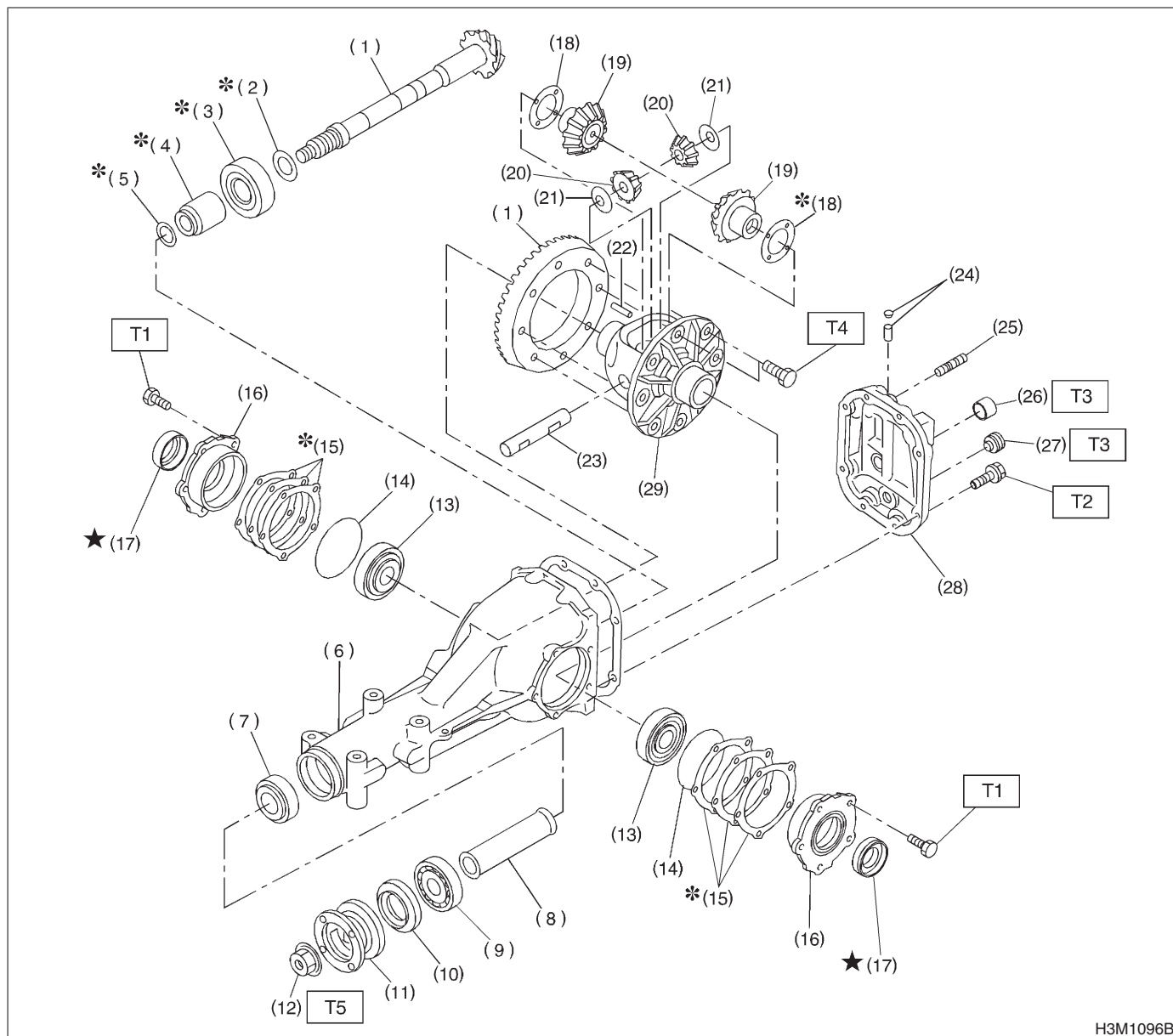
Differentials

B: COMPONENT

S303001A05

1. REAR DIFFERENTIAL FOR T-TYPE WITHOUT LSD

S303001A0501



H3M1096B

- (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) Spacer
- (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) Side gear thrust washer
- (19) Side gear
- (20) Pinion mate gear
- (21) Pinion mate gear washer
- (22) Pinion shaft lock pin
- (23) Pinion mate shaft
- (24) Air breather cap
- (25) Stud bolt

- (26) Oil filler plug
- (27) Oil drain plug
- (28) Rear cover
- (29) Differential case

Tightening torque: N·m (kgf-m, ft-lb)

T1: 10.3 (1.05, 7.6)

T2: 29 (3.0, 21.7)

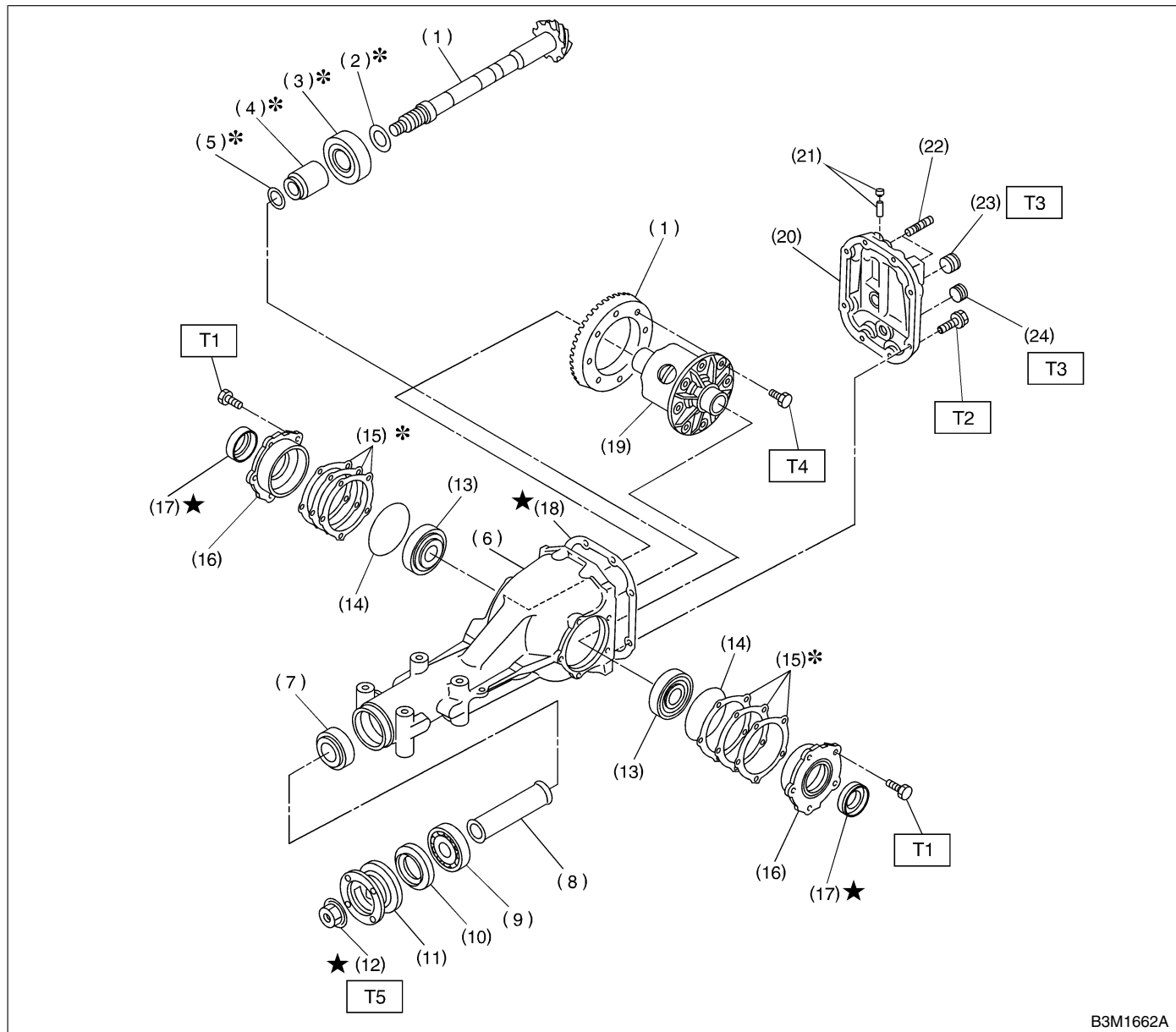
T3: 49.0 (5.0, 36.2)

T4: 103 (10.5, 76)

T5: 181 (18.5, 134)

2. REAR DIFFERENTIAL FOR T-TYPE WITH LSD

S303001A0502



B3M1662A

- (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) Differential case
- (20) Rear cover
- (21) Air breather cap

- (22) Stud bolt
- (23) Oil filler plug
- (24) Oil drain plug

Tightening torque: N·m (kgf-m, ft-lb)

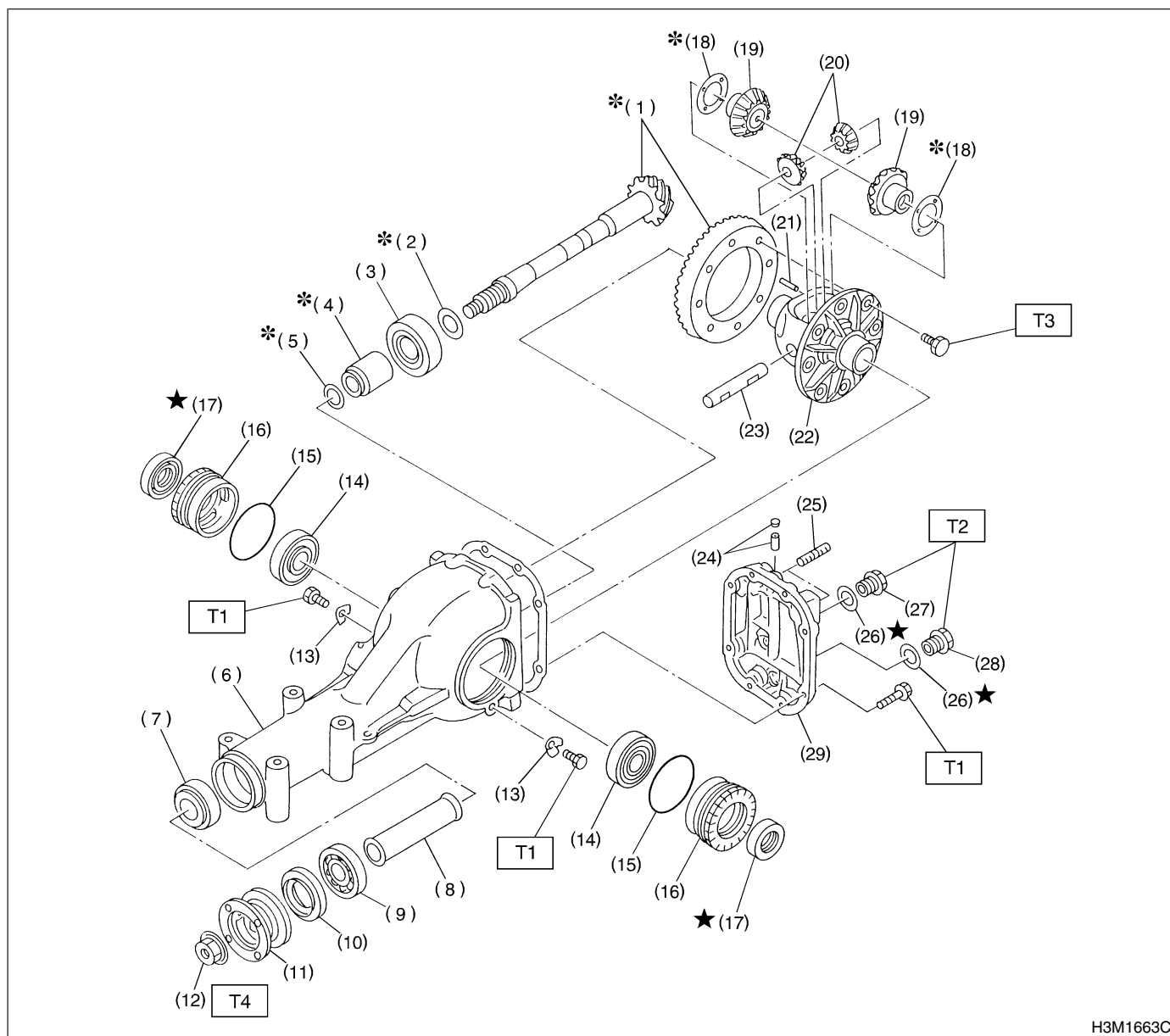
T1: 10.3 (1.05, 7.6)
T2: 29 (3.0, 21.7)
T3: 49.0 (5.0, 36.2)
T4: 103 (10.5, 76)
T5: 181 (18.5, 134)

GENERAL DESCRIPTION

Differentials

3. REAR DIFFERENTIAL FOR VA-TYPE

S303001A0503



- (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) Lock plate
- (14) Side bearing
- (15) O-ring
- (16) Axle shaft holder
- (17) Side oil seal
- (18) Side gear thrust washer
- (19) Side gear
- (20) Pinion mate gear
- (21) Pinion shaft lock pin
- (22) Differential case
- (23) Pinion mate shaft
- (24) Air breather cap
- (25) Stud bolt

- (26) Gasket
- (27) Oil filler plug
- (28) Oil drain plug
- (29) Rear cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.5, 18.1)

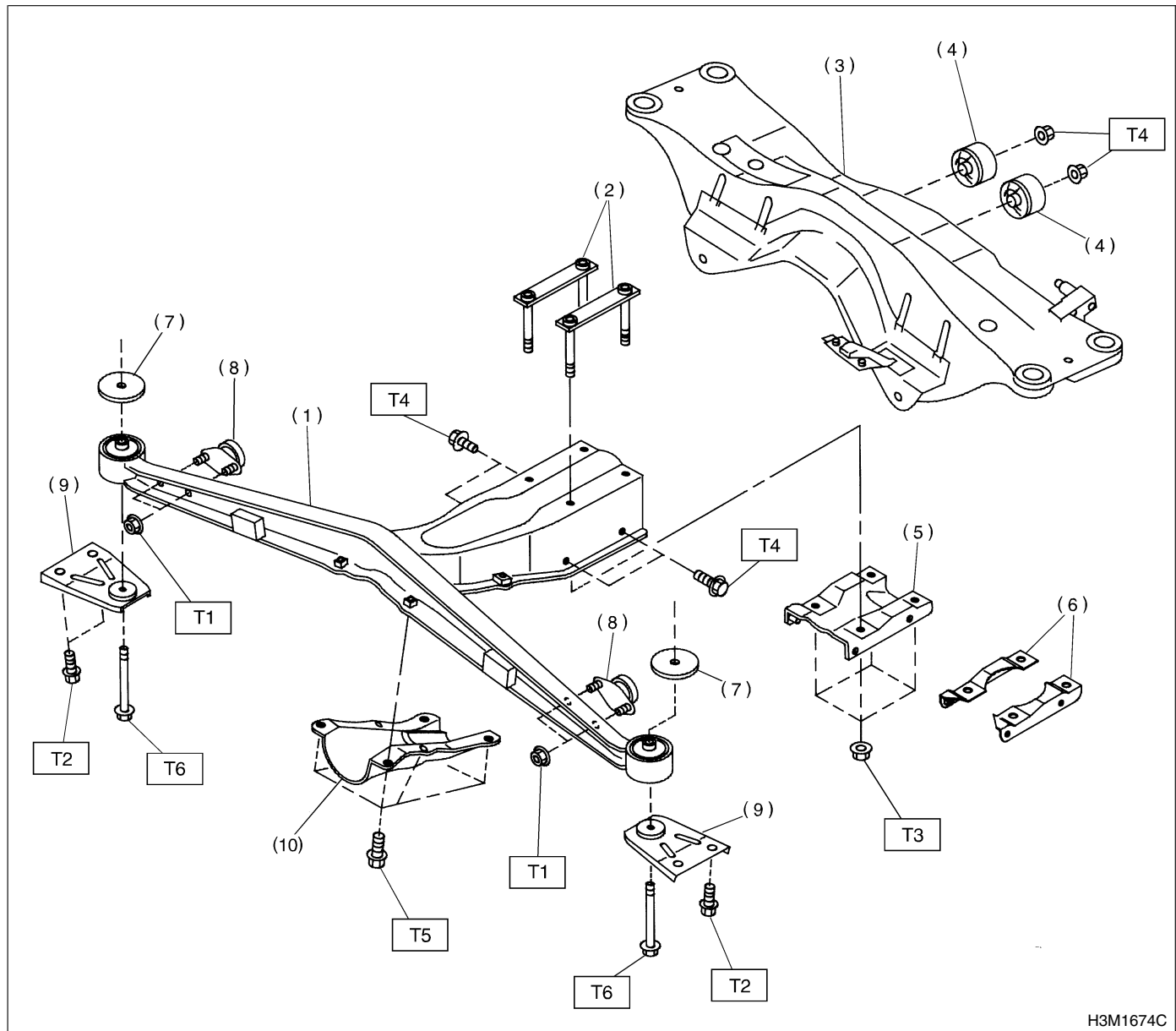
T2: 34 (3.5, 25.3)

T3: 62 (6.3, 45.6)

T4: 188 (19.2, 139)

4. REAR DIFFERENTIAL MOUNTING SYSTEM

S303001A0504



H3M1674C

- | | |
|--|---------------------------------------|
| (1) Differential front member | (7) Stopper |
| (2) Plate | (8) Dynamic damper (2500 cc MT model) |
| (3) Crossmember | (9) Differential mount bracket |
| (4) Rear bushing | (10) Differential mount front cover |
| (5) Differential mount lower bracket (2500 cc model) | |
| (6) Differential mount lower bracket (2200 cc model) | |

Tightening torque: N·m (kgf-m, ft-lb)

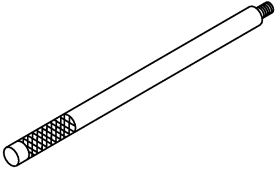
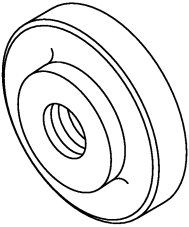
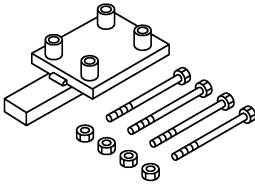
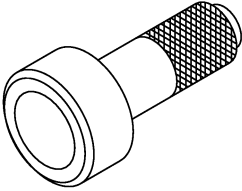
- | |
|----------------------------|
| T1: 20 (2.0, 14.5) |
| T2: 32 (3.3, 23.9) |
| T3: 64 (6.5, 47.0) |
| T4: 69 (7.0, 50.6) |
| T5: 88 (9.0, 65.0) |
| T6: 98 (10.0, 72.0) |

C: CAUTION S303001A03

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine gear oil, grease etc. or the equivalent. Do not mix gear oil, grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply gear oil onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of gear oil to avoid damage and deformation.
- Before securing a part on a vice, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vice.
- Avoid damaging the mating face of the case.

D: PREPARATION TOOL S303001A17

1. SPECIAL TOOL S303001A1701

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1893	398477701	HANDLE	Used for installing front and rear bearing cone.
 B3M1894	398477702	DRIFT	Used press-fitting the bearing cone of differential carrier (rear).
 B3M1895	398217700	ATTACHEMENT SET	Stand for rear differential carrier disassembly and assembly.
 B3M1896	498447120	DRIFT	Used for installing front oil seal.

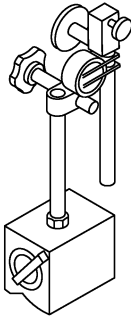
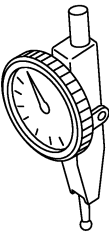
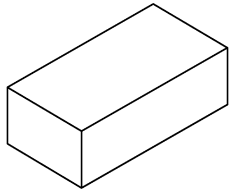
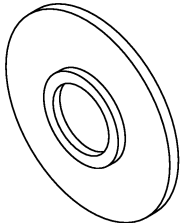
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
B3M1897	498427200	FLANGE WRENCH	Used for stopping rotation of companion flange when loosening and tightening self-lock nut.
B3M1898	398467700	DRIFT	Used for removing pinion, pilot bearing and front bearing cone.
B3M1899	399780104	WEIGHT	Used for installing front bearing cone, pilot bearing companion flange.
B3M1900	899580100	INSTALLER	Used for press-fitting the front bearing cone, pilot bearing.
B3M1901	899904100	STRAIGHT PIN REMOVER	Used for driving out differential pinion shaft lock pin.

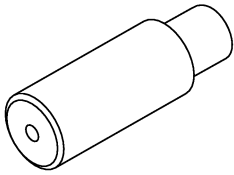
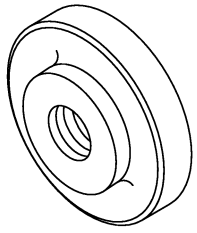
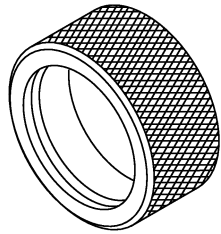
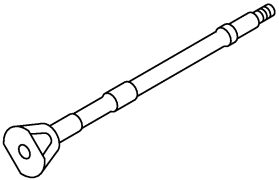
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1902	498247001	MAGENT BASE	- Used for measuring backlash between side gear and pinion, and hypoid gear.. - Used with DIAL GAUGE (498247100).
 B3M1903	498247100	DAIL GAUGE	- Used measurng backlash between side gear and pinion, hypoid gear. - Used with MAGNET BASE (498247001).
 B3M1904	398507704	BLOCK	Used for adjusting pinion height and preload.
 B3M1905	398177700	INSTALLER	- Used for installing rear bearing cone. - For T-type.

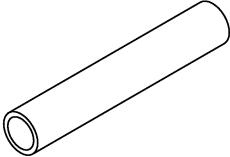
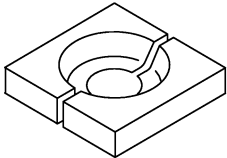
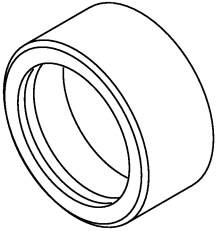
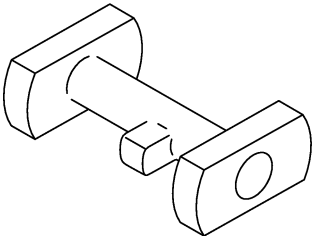
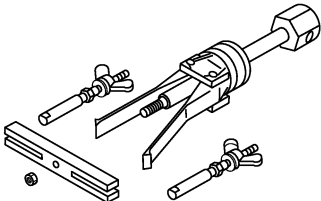
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1906	398457700	ATTACHMENT	- Used for removing side bearing retainer. - For T-type.
 B3M1907	398477703	DRIFT2	- Used for press-fitting the bearing race (rear) of differential carrier. - For T-type.
 B3M1908	398437700	DRIFT	- Used for installing said oil seal. - For T-type.
 B3M1909	398507702	DUMMY SHAFT	- Used for adjusting pinion height and preload. - For T-type.

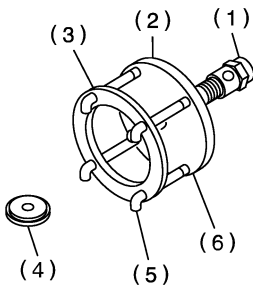
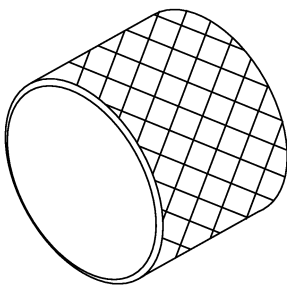
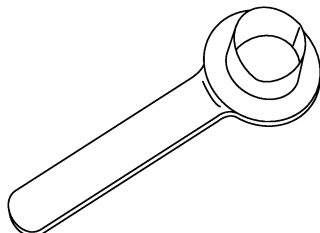
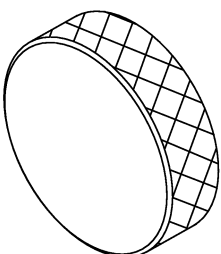
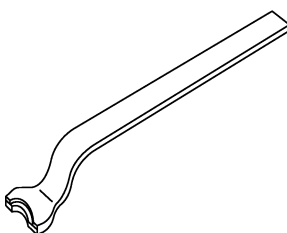
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1910	398507703	DUMMY COLLAR	- Used for adjusting pinion height and preload. - For T-type.
 B3M1911	398517700	REPLACER	- Used for removing rear bearing cone. - For T-type.
 B3M1912	398487700	DRIFT	- Used for press-fitting the side bearing cone. - For T-type.
 B3M1913	398507701	GAUGE	- Used for adjusting pinion height. - For T-type.
 B3M1914	398527700	PULLEY ASSY	- Used for removing oil seal and side bearing cup. - For T-type.

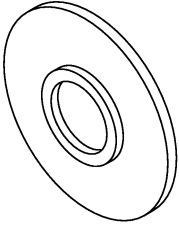
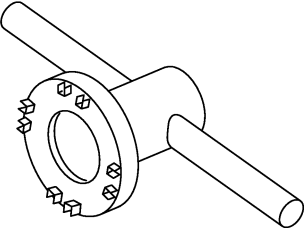
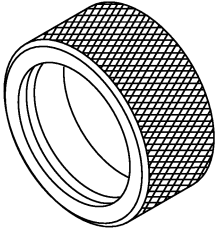
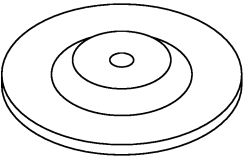
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1915A	398527700	PULLER SET	- Used for extracting side bearing cone. (1) BOLT (899521412) (2) PULLER (399527702) (3) HOLDER (399527703) (4) ADAPTER (398497701) (5) BOLT (899520107) (6) NUT (021008000) - For T-type.
 B3M1916	398227700	WEIGHT	- Used for installing side bearing. - For T-type.
 B3M1917	28099PA090	OIL SEAL PROTECTOR	- Used for installing rear drive shaft into rear differential. - For protecting oil seal. - For T-type.
 B3M1918	398237700	GAUGE	- Used for installing side bearing. - For T-type.
 B3M1919	28099PA100	DRIVE SHAFT REMOVER	- Used for removing rear drive shaft from rear differential. - For T-type.

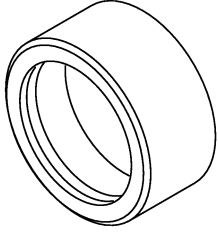
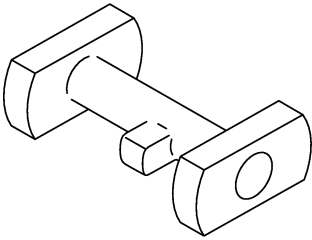
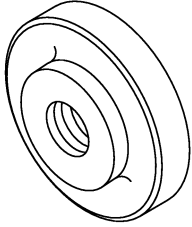
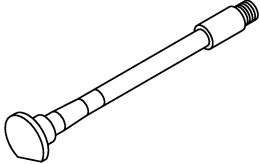
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1920	498175500	INSTALLER	- Used for installing rear bearing cone. - For VA-type.
 B3M1921	499785500	WRENCH ASSY	- Used for removing and installing side oil seal holder. - For VA-type.
 B3M1922	498447100	DRIFT	- Used for installing oil seal. - For VA-type.
 B3M1923	399520105	SEAT	- Used for removing side bearing cone. - Used with PULLER SET (899524100). - For VA-type.

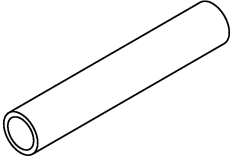
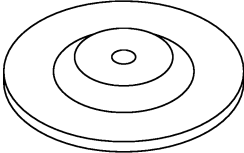
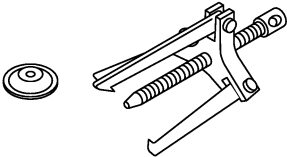
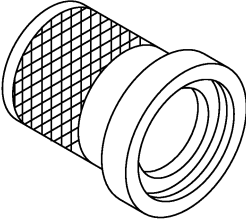
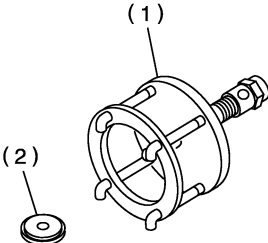
GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1924	498485400	DRIFT	- Used for installing side bearing cone. - For VA-type.
 B3M1925	498505501	GAUGE	- Used for adjusting pinion height. - For VA-type.
 B3M1926	498447110	BEARING OUTER RACE DRIFT	- Used for press-fitting the bearing race (front) of differential carrier. - For VA-type.
 B3M1927	498447150	DUMMY SHAFT	- Used for adjusting pinion height and Pre-load. - For VA-type.

GENERAL DESCRIPTION

Differentials

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B3M1928	32285AA000	DUMMY COLLAR	- Used for adjusting pinion height and Pre-load. - For VA-type.
 B3M1929	499705404	SEAT	- Used for removing side bearing race. - Used with PULLEY ASSY (499705401). - For VA-type.
 B3M1930	499705401	PULLEY ASSY	- Used for removing side bearing race. - Used with SEAT (499705404). - For VA-type.
 B3M1931	899874100	INSTALLER	- Used for installing companion flange. - For VA-type.
 B3M1932A	899524100	DIFFERENTIAL BEARING PULLER SET	- Used for removing side bearing cone of differential. - For VA-type. (1) Puller (2) Cap

GENERAL DESCRIPTION

Differentials

2. GENERAL TOOL S301001A1702

TOOL NAME	REMERKS
Transmission Jack	Used for assembly/disassembly of rear differential.
Puller	Used for removal of side bearing retainer. (T-type)
Thickness Gauge	Used for measuring clearance.
Tire Lever	Used for removal of rear drive shaft. (VA-type)

GENERAL DIAGNOSTIC TABLE

Differentials

9. General Diagnostic Table S303257

A: INSPECTION S303257A10

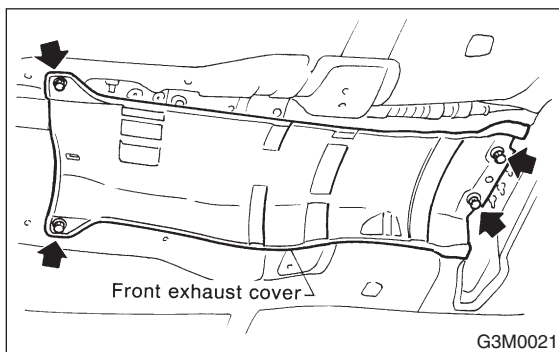
Symptom or trouble	Possible cause	Remedy
1. Oil leakage	(1) Worn, scratched, or incorrectly seated front or side oil seal. Scored, battered, or excessively worn sliding surface of companion flange.	Repair or replace.
	(2) Clogged or damaged air breather.	Clean, repair or replace.
	(3) Loose bolts on differential spindle or side retainer, or incorrectly fitted O-ring.	Tighten bolts to specified torque. Replace O-ring.
	(4) Loose rear cover attaching bolts or damaged gasket.	Tighten bolts to specified torque. Replace gasket and apply liquid packing.
	(5) Loose oil filler or drain plug.	Retighten and apply liquid packing.
	(6) Wear, damage or incorrectly fitting for spindle, side retainer and oil seal.	Repair or replace.
2. Seizure NOTE: Seized or damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Insufficient backlash for hypoid gear.	Readjust or replace.
	(2) Excessive preload for side, rear, or front bearing.	Readjust or replace.
	(3) Insufficient or improper oil used.	Replace seized part and fill with specified oil to specified level.
3. Damage NOTE: Damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Improper backlash for hypoid gear.	Replace.
	(2) Insufficient or excessive preload for side, rear, or front bearing.	Readjust or replace.
	(3) Excessive backlash for differential gear.	Replace gear or thrust washer.
	(4) Loose bolts and nuts such as crown gear bolt.	Retighten.
	(5) Damage due to overloading.	Replace.
4. Noises when starting or shifting gears NOTE: Noises may be caused by differential assembly, universal joint, wheel bearing, etc. Find out what is actually making noise before disassembly.	(1) Excessive backlash for hypoid gear.	Readjust.
	(2) Excessive backlash for differential gear.	Replace gear or thrust washer.
	(3) Insufficient preload for front or rear bearing.	Readjust.
	(4) Loose drive pinion nut.	Tighten to specified torque.
	(5) Loose bolts and nuts such as side bearing retainer attaching bolt.	Tighten to specified torque.
5. Noises when cornering	(1) Damaged differential gear.	Replace.
	(2) Excessive wear or damage of thrust washer.	Replace.
	(3) Broken pinion mate shaft.	Replace.
	(4) Seized or damaged side bearing.	Replace.
6. Gear noises NOTE: Since noises from engine, muffler, transmission, propeller shaft, wheel bearings, tires, and body are sometimes mistaken for noises from differential assembly, be careful in checking them. Inspection methods to locate noises include coasting, accelerating, cruising, and jacking-up all four wheels. Perform these inspections according to condition of trouble. When listening to noises, shift gears into four wheel drive and fourth speed position, trying to pick up only differential noise.	(1) Improper tooth contact of hypoid gear.	Readjust or replace hypoid gear set.
	(2) Improper backlash for hypoid gear.	Readjust.
	(3) Scored or chipped teeth of hypoid gear.	Replace hypoid gear set.
	(4) Seized hypoid gear.	Replace hypoid gear set.
	(5) Improper preload for front or rear bearings.	Readjust.
	(6) Seized, scored, or chipped front or rear bearing.	Replace.
	(7) Seized, scored, or chipped side bearing.	Replace.
	(8) Vibrating differential carrier.	Replace.

4. Rear Differential for T-type

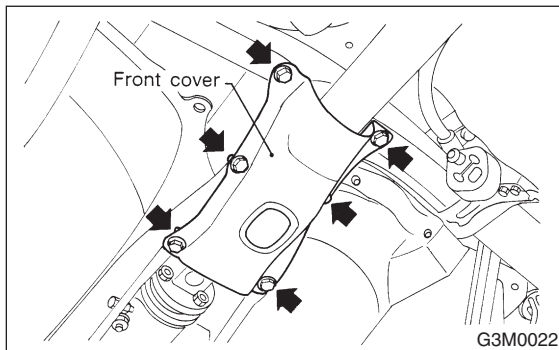
S303145

A: REMOVAL S303145A18

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove front exhaust cover.



- 9) Remove front cover of rear differential mount.



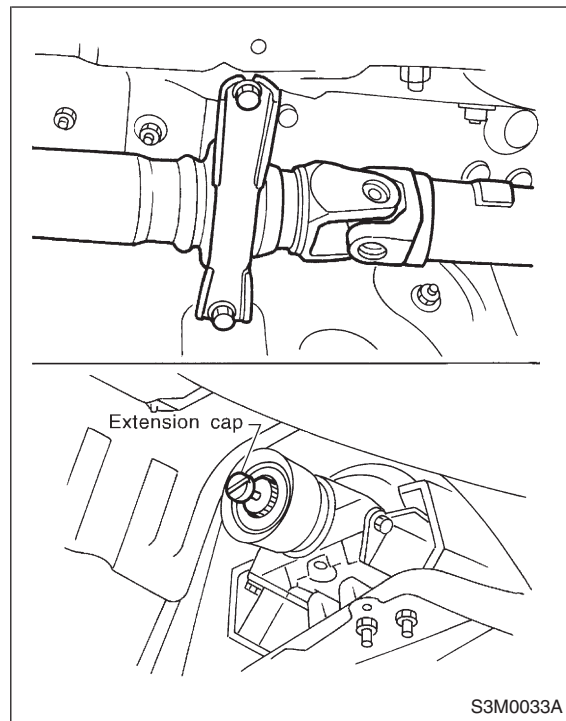
- 10) Remove propeller shaft.

CAUTION:

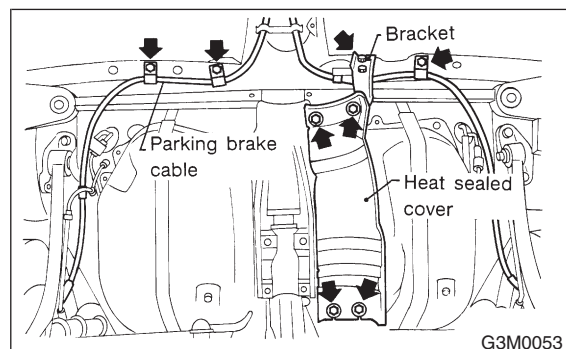
When removing propeller shaft, pay attention not to damage the sliding surfaces of rear drive shaft (extension) spline, oil seal and sleeve yoke.

NOTE:

- Prepare an oil can and cap since the transmission oil flows out from the extension at removing propeller shaft.
- Insert the cap into the extension to prevent transmission oil from flowing out immediately after removing the propeller shaft.
- If extension cap is not available, cover the opening with a vinyl bag in order to prevent transmission gear oil or ATF leakage.



- 11) Remove heat sealed cover.
- 12) Remove clamps and bracket of parking brake cable.

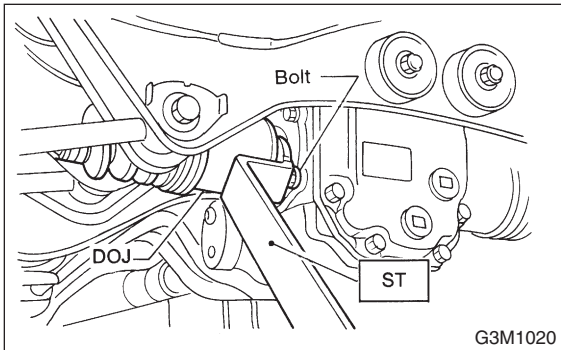


REAR DIFFERENTIAL FOR T-TYPE

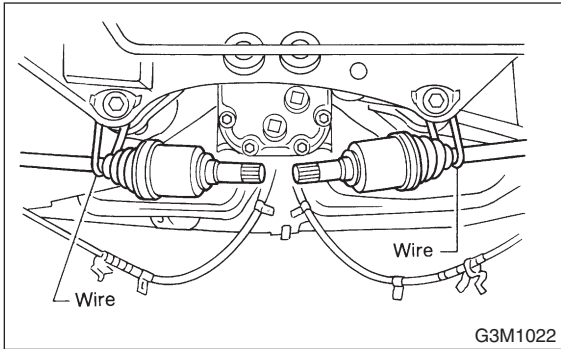
Differentials

13) Remove DOJ of rear drive shaft from rear differential using ST. <Ref. to DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>

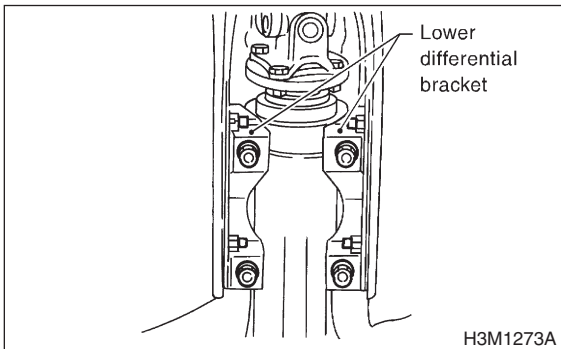
ST 28099PA100 DRIVE SHAFT REMOVER



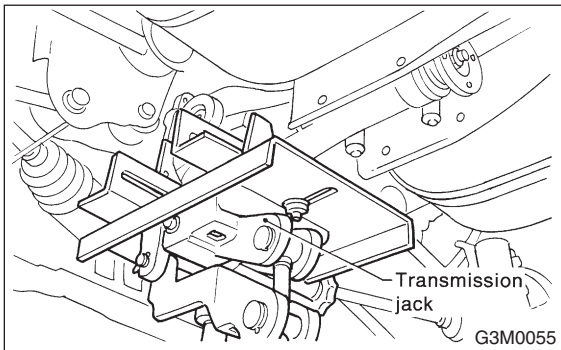
14) Secure rear drive shaft to rear crossmember using wire.



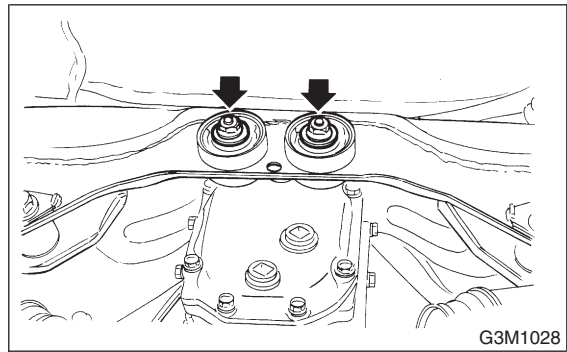
15) Remove lower differential bracket.



16) Support rear differential with transmission jack.



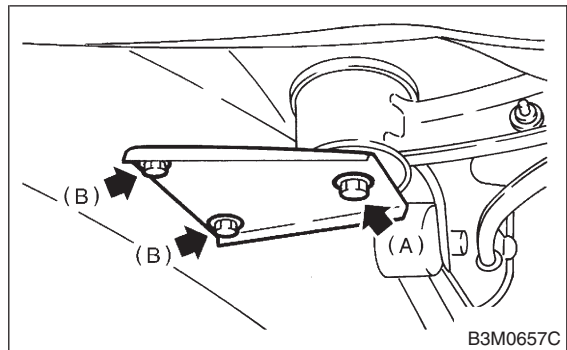
17) Remove self-locking nuts connecting rear differential to rear crossmember.



18) Remove bolts which secure rear differential front member to body. Loosen bolt A first, then remove bolts B.

NOTE:

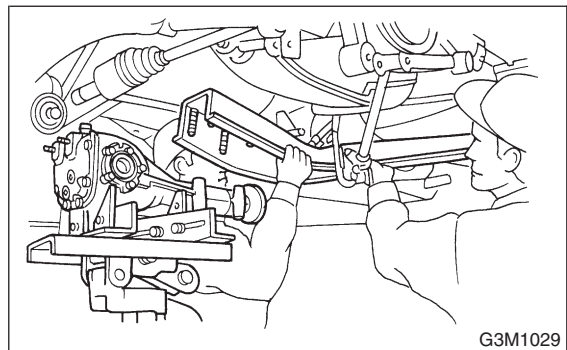
Support front member with the use of a helper to prevent it from dropping.



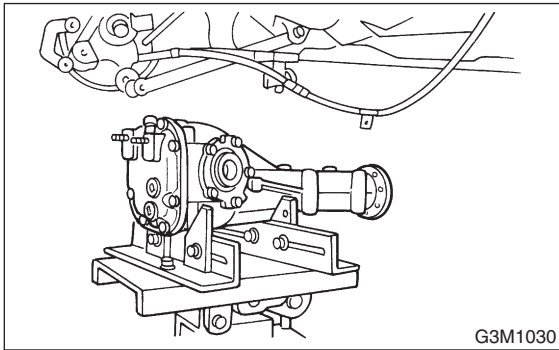
(A) Bolt A
(B) Bolt B

19) Remove bolt A.

20) While slowly lowering transmission jack, move rear differential forward and remove front member and rear differential from body.



21) Remove rear differential from front member.



B: INSTALLATION

S303145A11

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.

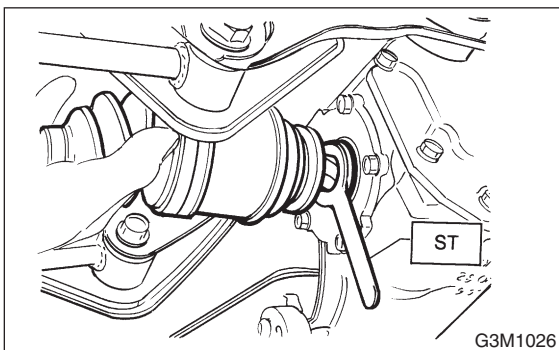
2) Position front member on body by passing it under parking brake cable and securing to rear differential.

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 DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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:

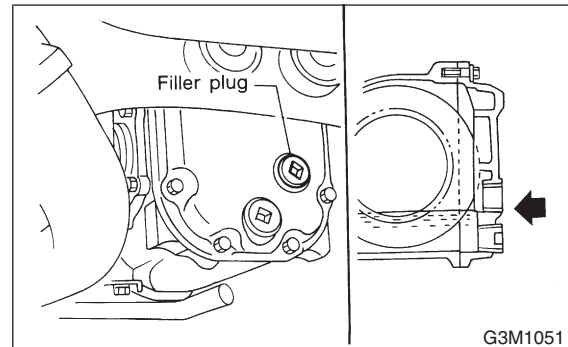
THREE BOND 1105 or equivalent

Oil capacity:

0.8 l (0.8 US qt, 0.7 Imp qt)

Tightening torque:

49.0 N·m (5.0 kgf-m, 36.2 ft-lb)



C: DISASSEMBLY

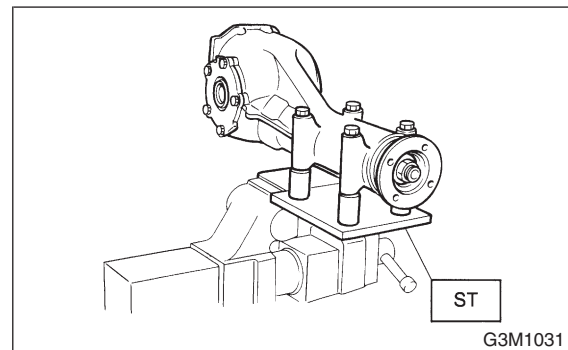
S303145A06

To detect real cause of trouble, inspect the following items before disassembling.

- 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.

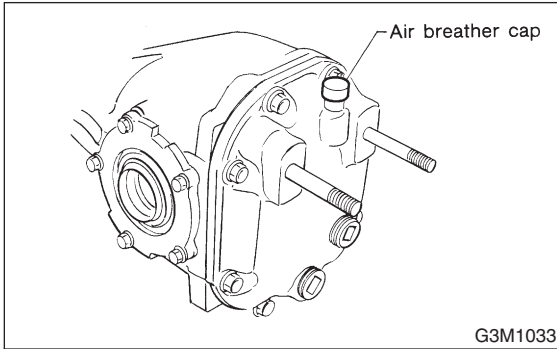
REAR DIFFERENTIAL FOR T-TYPE

Differentials

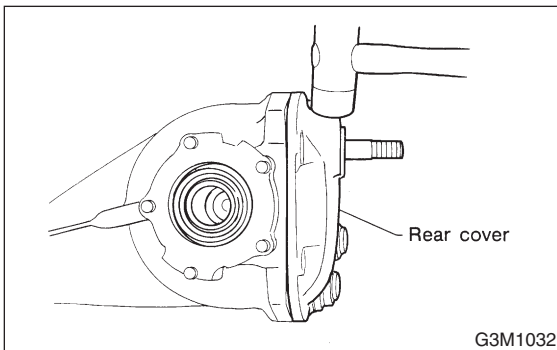
3) Remove the air breather cap.

NOTE:

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



4) Remove rear cover by loosening retaining bolts.

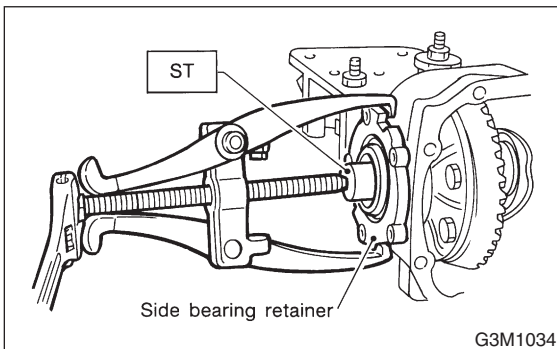


5) Make right and left side bearing retainers in order to identify them at reassembly. Remove side bearing retainer attaching bolts, set ST to differential case, and extract right and left side bearing retainers with a puller.

CAUTION:

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

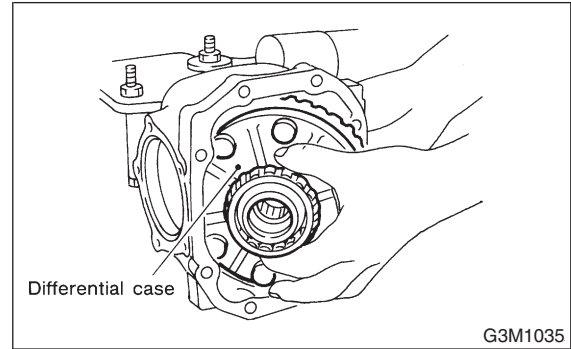
ST 398457700 ATTACHMENT



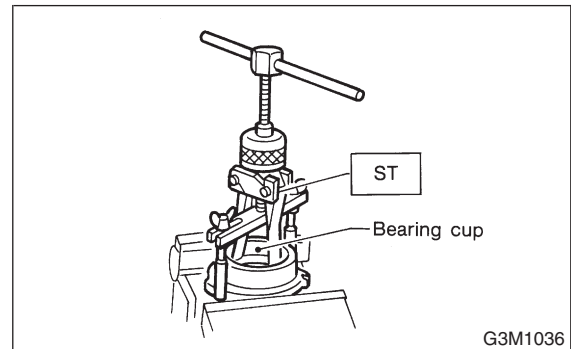
6) Pull out differential assembly from differential carrier.

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.

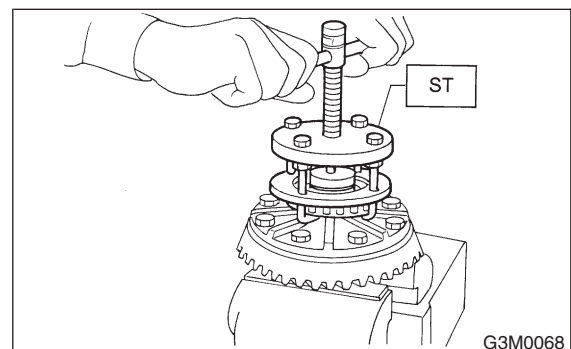
CAUTION:

Do not attempt to disassemble the parts unless necessary.

NOTE:

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

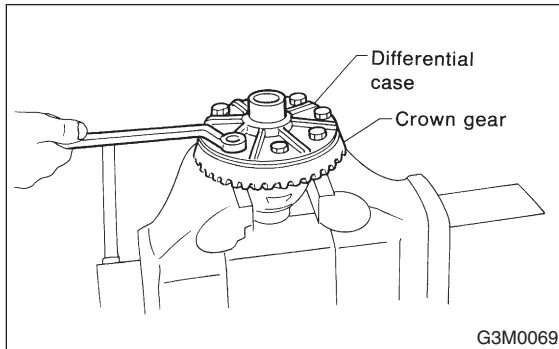
ST 399527700 PULLER SET



9) Remove crown gear by loosening crown gear bolts.

CAUTION:

Further disassembling is not allowed.

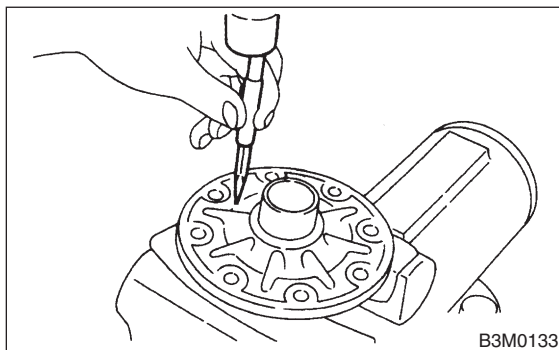


10) Drive out pinion shaft lock pin from crown gear side. (Without LSD)

NOTE:

The lock pin is staked at the pin hole end on the differential carrier; do not drive it out forcibly before unstaking it.

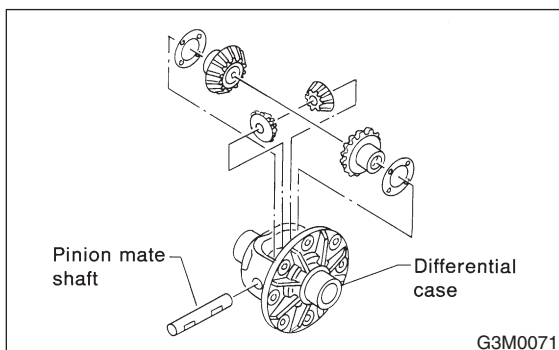
ST 899904100 STRAIGHT PIN REMOVER



11) Draw out pinion mate shaft and remove pinion mate gears, side gears and thrust washers. (Without LSD)

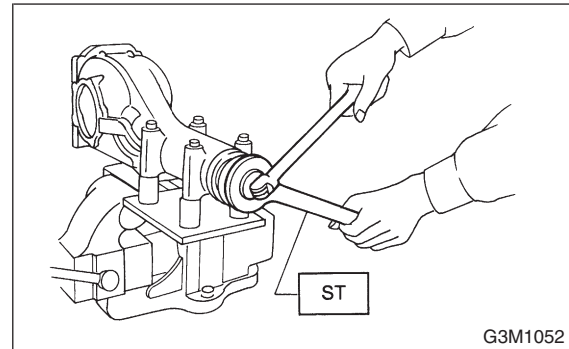
NOTE:

The gears as well as thrust washers should be marked or kept separated left and right, and front and rear.

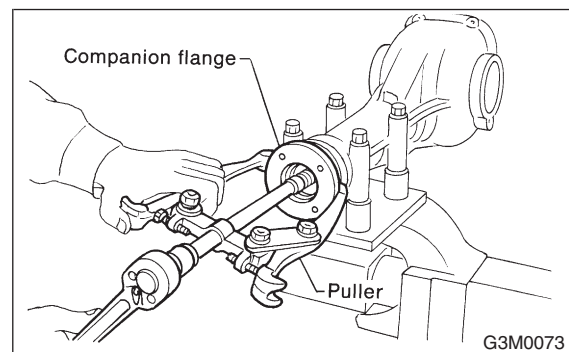


12) Hold companion flange with ST and remove drive pinion nut.

ST 498427200 FLANGE WRENCH



13) Extract the companion flange with a puller.

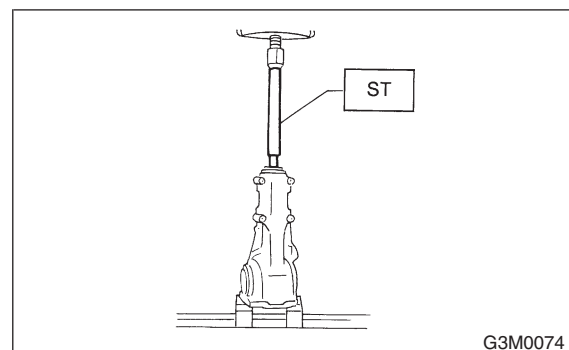


14) Press the end of drive pinion shaft and extract it together with rear bearing cone, preload adjusting spacer and washer.

NOTE:

Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT



REAR DIFFERENTIAL FOR T-TYPE

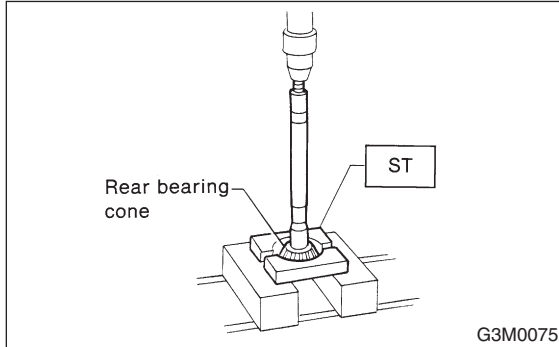
Differentials

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

NOTE:

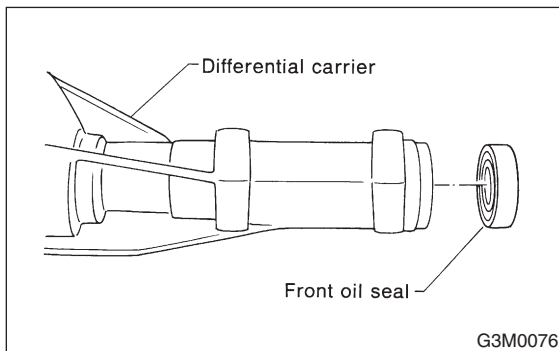
Place the replacer so that its center-recessed side faces the pinion gear.

ST 498515500 REPLACER



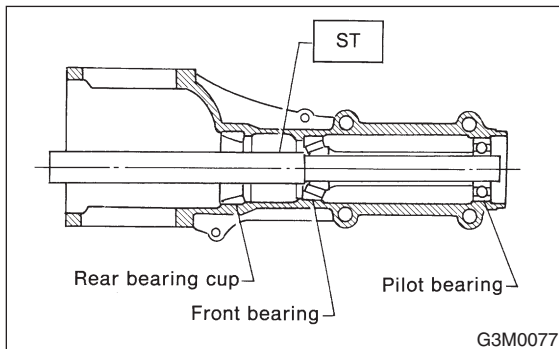
16) Remove front oil seal from differential carrier using ST.

ST 398527700 PULLER ASSY

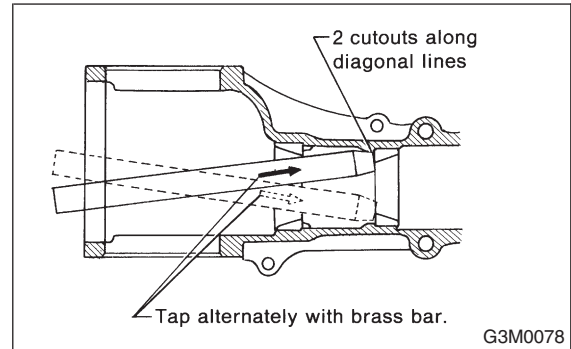


17) Remove pilot bearing together with front bearing cone using ST.

ST 398467700 DRIFT



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

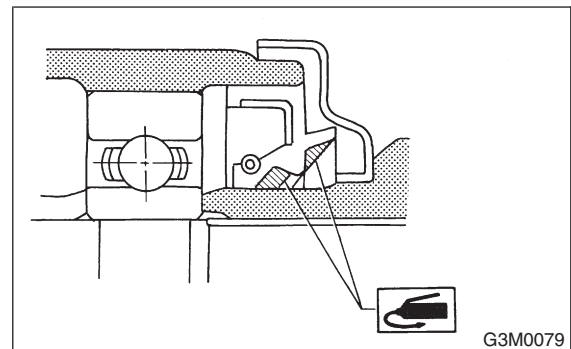


D: ASSEMBLY

S303145A02

1) Precautions for assembling

- Assemble in the reverse order of disassembling.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not misinstalled.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear oil when installing the bearings and thrust washers.
- Be careful not to mix up the right and left hand cups of the bearings.
- Replace the oil seal with new one at every disassembly. Apply chassis grease between the lips when installing the oil seal.

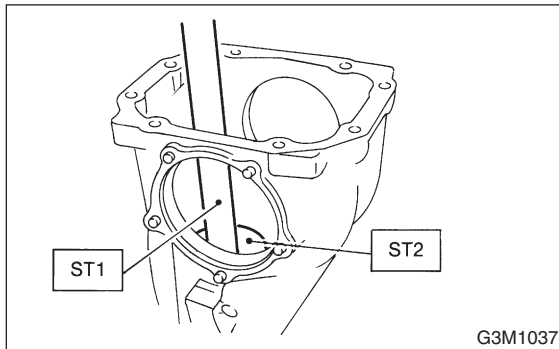


2) Adjusting preload for front and rear bearings
Adjust the bearing preload with spacer and washer between front and rear bearings. Pinion height adjusting washer are not affected by this adjustment. The adjustment must be carried out without oil seal inserted.

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

ST1 398477701 HANDLE

ST2 398477703 DRIFT 2



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

CAUTION:

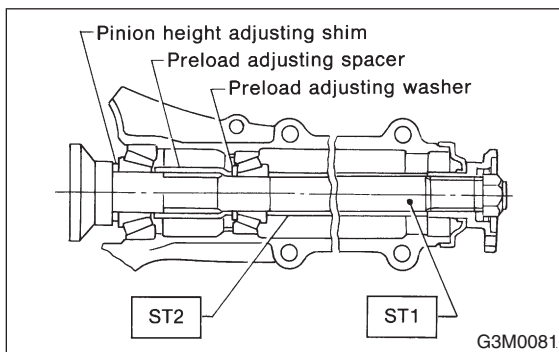
- Re-use the used washer if not deformed.
- Use a new rear bearing cone.

ST 398507702 DUMMY SHAFT

(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 ST3.

CAUTION:

Use a new lock nut.

NOTE:

- Be careful not to give excessive preload.
- When tightening the drive pinion nut, lock ST1 with ST2.

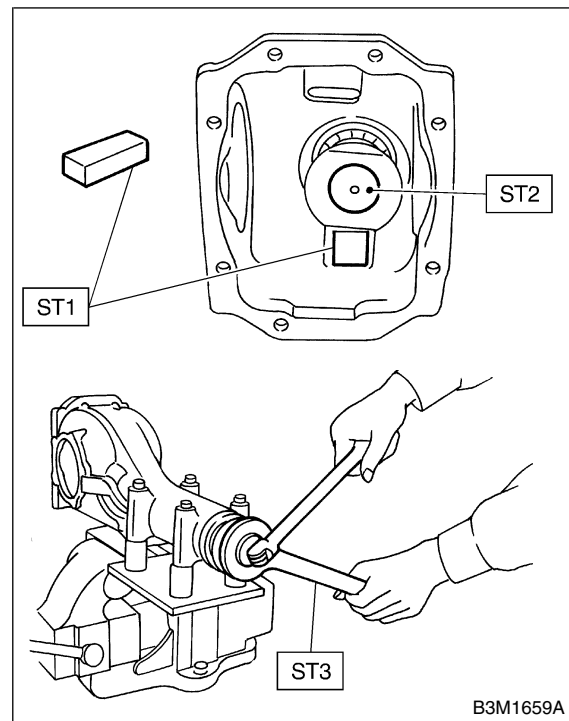
ST1 398507704 BLOCK

ST2 398507702 DUMMY SHAFT

ST3 498427200 FLANGE WRENCH

Tightening torque:

181 N·m (18.5 kgf·m, 134 ft·lb)



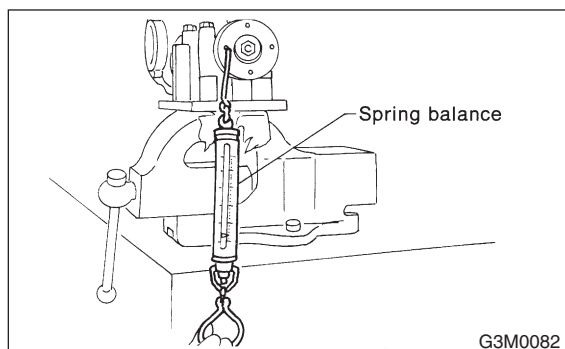
Front and rear bearing preload

For new bearing:

19.6 — 28.4 N (2.0 — 2.9 kgf, 4.4 — 6.4 lb)
at companion flange bolt hole

REAR DIFFERENTIAL FOR T-TYPE

Differentials



● Preload adjusting washer	Part No.	Thickness mm (in)
	383715200	2.59 (0.1020)
	383725200	2.57 (0.1012)
	383735200	2.55 (0.1004)
	383745200	2.53 (0.0996)
	383755200	2.51 (0.0988)
	383765200	2.49 (0.0980)
	383775200	2.47 (0.0972)
	383785200	2.45 (0.0965)
	383795200	2.43 (0.0957)
	383805200	2.41 (0.0949)
	383815200	2.39 (0.0941)
	383825200	2.37 (0.0933)
	383835200	2.35 (0.0925)
	383845200	2.33 (0.0917)
		2.31 (0.0909)
● Preload adjusting spacer	Part No.	Length mm (in)
	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.

Front and rear bearing preload

For new bearing:

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

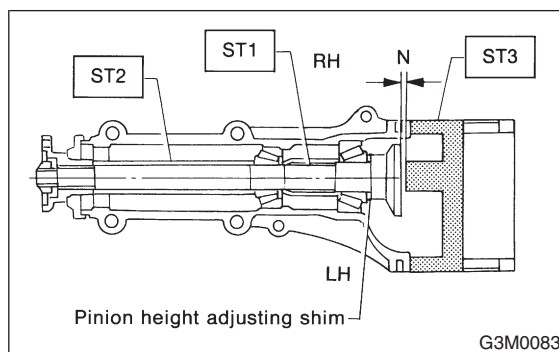
at companion flange bolt hole

Adjust 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.

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

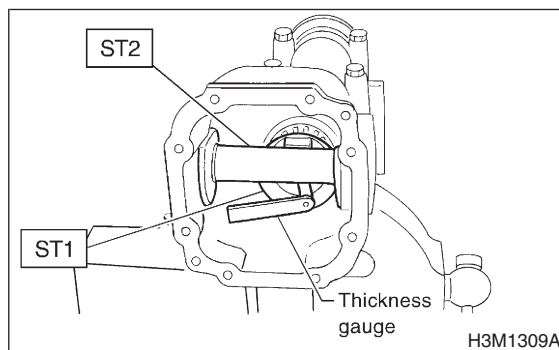


(2) Measure the clearance between the end of ST2 and the end surface of ST1 by using a thickness gauge.

NOTE:

Make sure there is no clearance between ST2 and ST1.

ST1 398507702 DUMMY SHAFT
ST2 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)

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

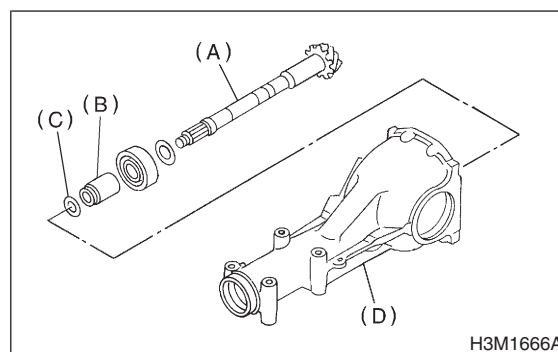
$$N = 0.23 \text{ mm } H = + 1,$$

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

Result: Thickness = 3.42 mm

Therefore use the shim 383605200.

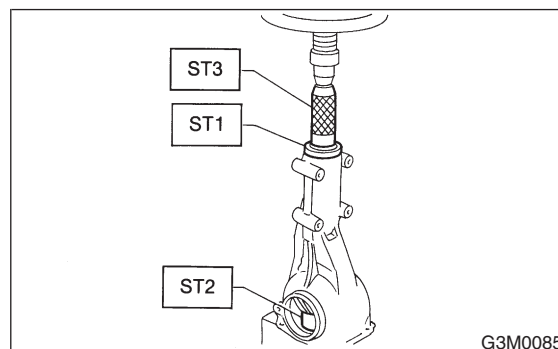
5) Insert drive pinion into differential carrier, install the previously selected bearing preload adjusting spacer and washer.



- (A) Drive pinion
- (B) Bearing preload adjusting spacer
- (C) Bearing preload adjusting washer
- (D) Differential carrier

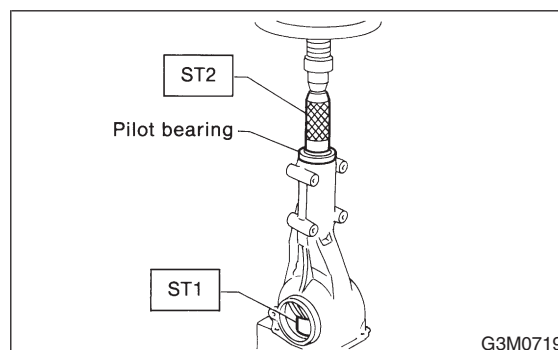
6) Press-fit front bearing cone into case with ST1, ST2 and ST3.

ST1 398507703 DUMMY COLLAR
ST2 399780104 WEIGHT
ST3 899580100 INSTALLER



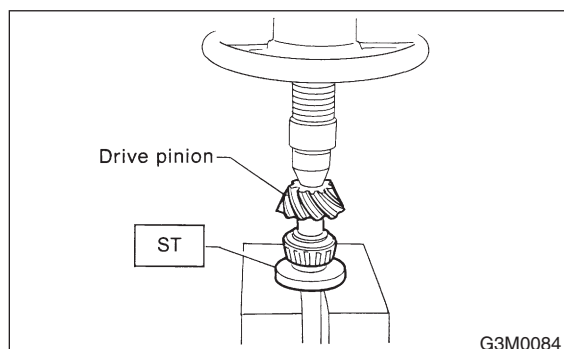
7) Insert spacer, then press-fit pilot bearing with ST1 and ST2.

ST1 399780104 WEIGHT
ST2 899580100 INSTALLER



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

ST 398177700 INSTALLER



REAR DIFFERENTIAL FOR T-TYPE

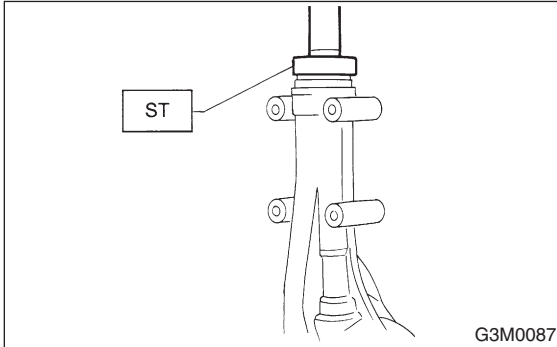
Differentials

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.

ST 498447120 OIL SEAL INSTALLER



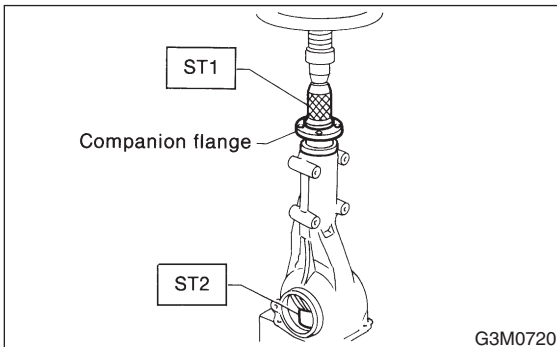
9) Press-fit companion flange with ST1 and ST2.

CAUTION:

Be careful not to damage bearing.

ST1 899874100 INSTALLER

ST2 399780104 WEIGHT

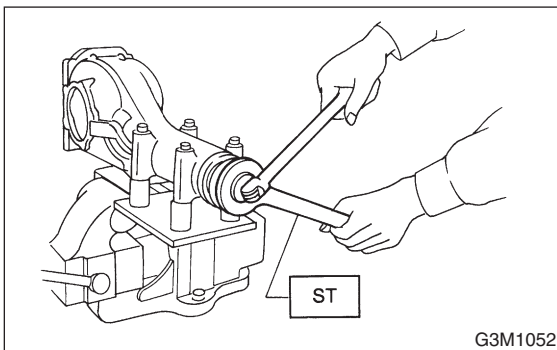


10) Install self-locking nut. Then tighten it with ST.

ST 498427200 FLANGE WRENCH

Tightening torque:

181 N·m (18.5 kgf-m, 134 ft-lb)

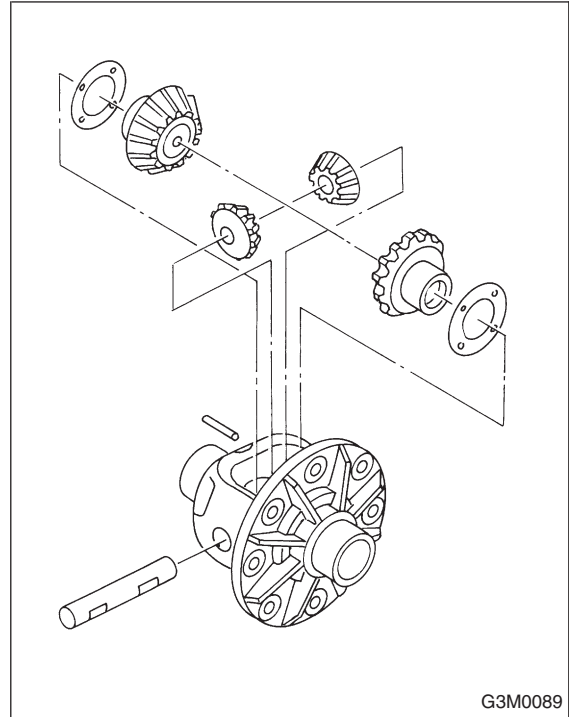


11) Assembling differential case (Without LSD)

- (1) Install side gears and pinion mate gears, with their thrust washers and pinion mate shaft, into differential case.

NOTE:

- Apply gear oil on both sides of the washer and on the side gear shaft before installing.
- Insert the pinion mate shaft into the differential case by aligning the lock pin holes.



(2) Measure the clearance between differential case and the back of side gear.

(3) Adjust the clearance as specified by selecting side gear thrust washer.

Side gear backlash:

0.10 — 0.20 mm (0.0039 — 0.0079 in)

Side gear thrust washer	
Part No.	Thickness mm (in)
383445201	0.75 — 0.80 (0.0295 — 0.0315)
383445202	0.80 — 0.85 (0.0315 — 0.0335)
383445203	0.85 — 0.90 (0.0335 — 0.0354)
383445204	0.90 — 0.95 (0.0354 — 0.0374)
383445205	0.95 — 1.00 (0.0374 — 0.0394)

(4) Check the condition of rotation after applying oil to the gear tooth surfaces and thrust surfaces.

(5) After driving in pinion shaft lock pin, stake the both sides of the hole to prevent pin from falling off.

12) Install crown gear on differential case.

CAUTION:

Before installing bolts, apply Lock Tite to bolt threads.

Lock Tite:

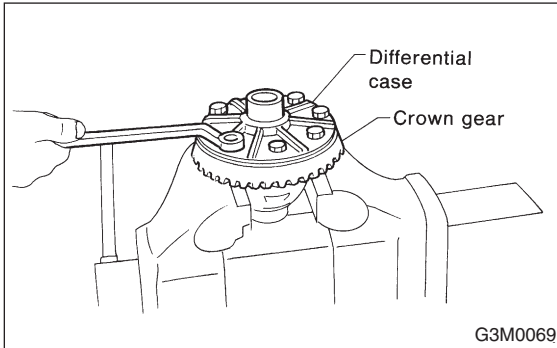
THREE BOND 1324 or equivalent

NOTE:

Tighten diagonally while tapping the bolt heads.

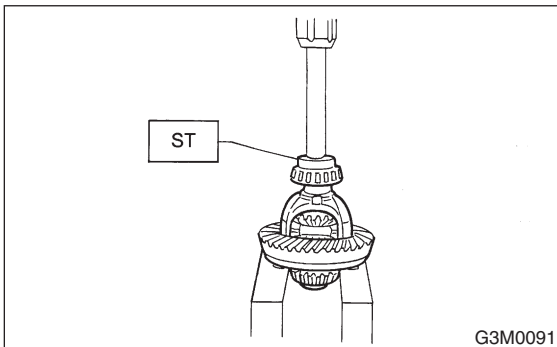
Tightening torque:

103 N·m (10.5 kgf-m, 76 ft-lb)



13) Press side bearing cone onto differential case with ST.

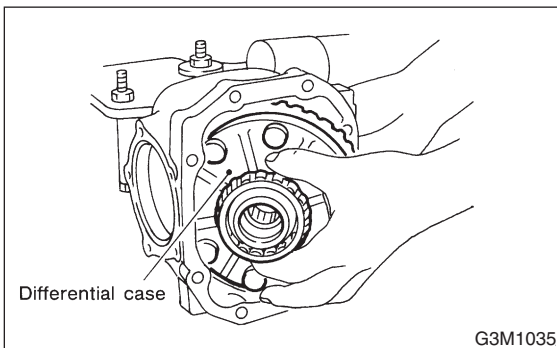
ST 398487700 DRIFT



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



(3) Install side retainer shims and O-rings to the left and right retainers from which they were removed.

NOTE:

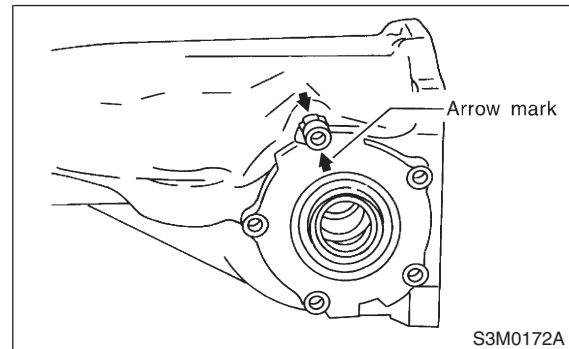
- Replace broken or cracked O-ring with new one.
- Replace broken or corroded side retainer shim with new one of same thickness.

Side bearing retainer shim	
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)

(4) Align arrow marked on differential carrier with that marked on side retainer during installation.

CAUTION:

Be careful that side bearing outer race is not damaged by bearing roller.



(5) Tighten side bearing retainer bolts.

CAUTION:

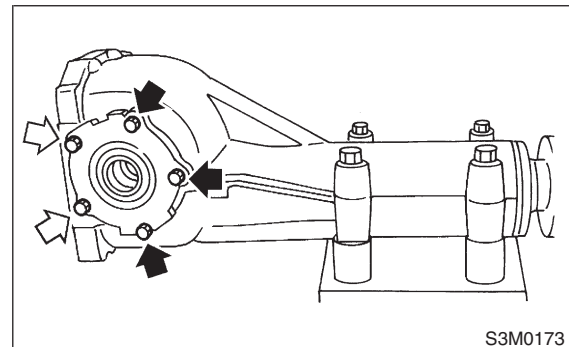
Before tightening the two side bearing retainer bolts, apply Lock Tite to bolt threads.

⇒ Lock Tite:

THREE BOND 1105 or equivalent

Tightening torque:

10.3 N·m (1.05 kgf-m, 7.6 ft-lb)



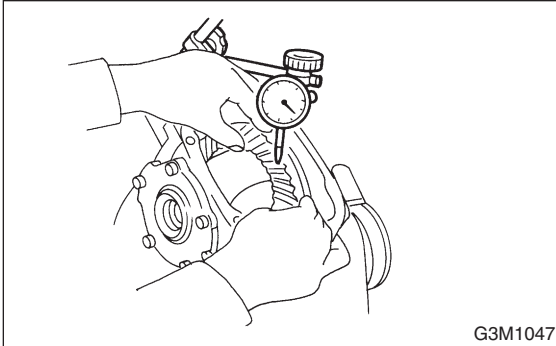
REAR DIFFERENTIAL FOR T-TYPE

Differentials

(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 mm (0.0039 — 0.0079 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.

NOTE:

If measured backlash is not within specified range, repeat procedure for side bearing retainer shims adjustment.

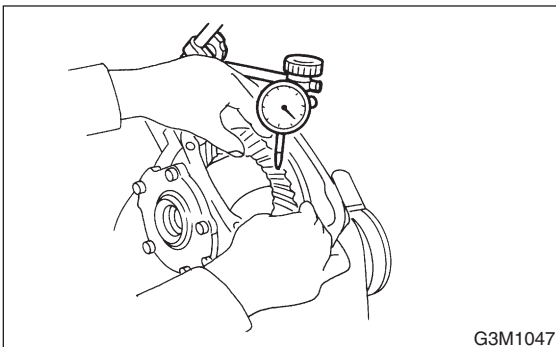
Turning resistance increase:

2.9 — 10.8 N (0.3 — 1.1 kgf, 0.7 — 2.4 lb)

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

Backlash:

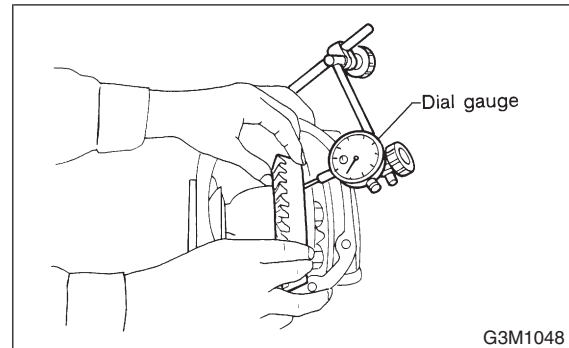
0.10 — 0.20 mm (0.0039 — 0.0079 in)



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".

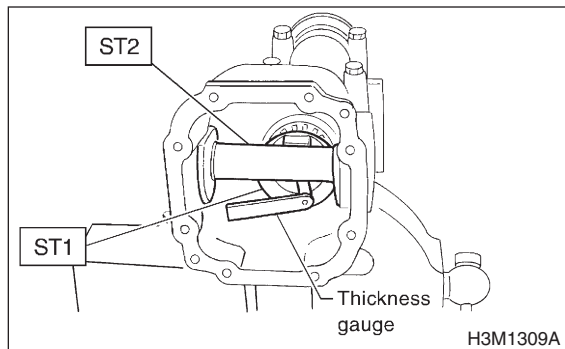
NOTE:

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, changing RH and LH side bearing retainer shims and the hypoid gear backlash.

(1) Drive pinion height

ST1 398507702 DUMMY SHAFT
ST2 398507701 DIFFERENTIAL CARRIER
GAUGE



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

Where:

T = Thickness of pinion height adjusting shim (mm)

T_o = Thickness of shim temporarily inserted (mm)

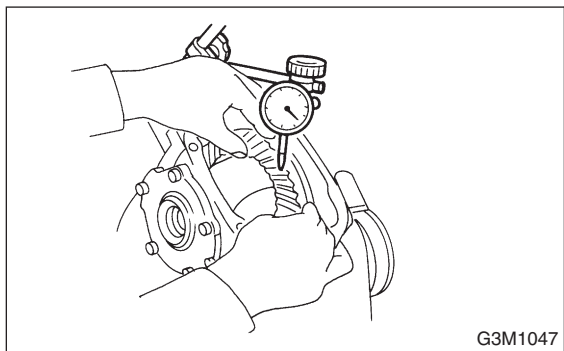
N = Reading of thickness gauge (mm)

H = Figure marked on drive pinion head

(2) Hypoid gear backlash

Backlash:

0.10 — 0.20 mm (0.0039 — 0.0079 in)

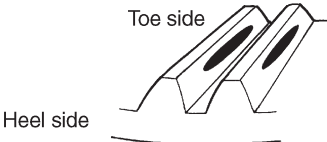
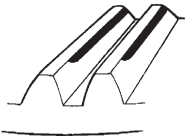
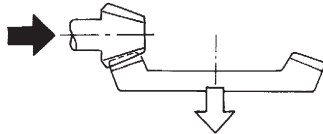
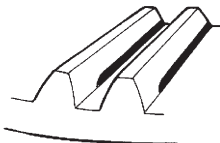
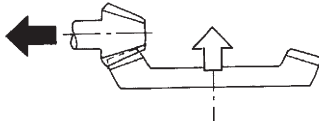
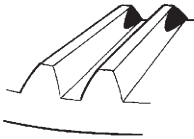
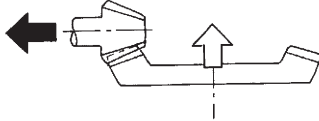
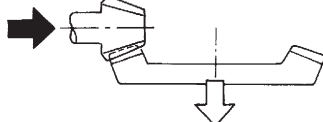


REAR DIFFERENTIAL FOR T-TYPE

Differentials

➡ Adjusting direction of drive pinion

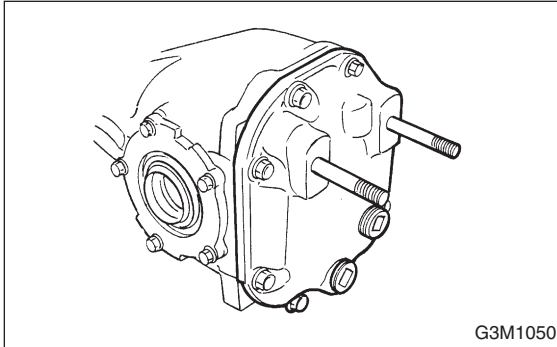
⇨ Adjusting direction of crown gear

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.)	 B3M0317A	
Face contact Backlash is too large.	 B3M0319	Increase thickness of drive pinion height adjusting shim in order to bring drive pinion closer to crown gear center.  B3M0323
Flank contact Backlash is too small.	 B3M0320	Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.  B3M0324
Toe contact Contact area is small.	 B3M0321	Adjust as for flank contact.  B3M0324
Heel contact Contact area is small.	 B3M0322	Adjust as for face contact.  B3M0323

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

Tightening torque:

29 N·m (3.0 kgf-m, 21.7 ft-lb)



E: INSPECTION

S303145A10

Wash all the disassembled parts clean, and examine them for wear, damage, or other defects. Repair or replace defective parts as necessary.

1) Crown gear and drive pinion

- If abnormal tooth contact is evident, find out the cause and adjust to give correct tooth contact at assembly. Replace the gear if excessively worn or incapable of adjustment.
- If crack, score, or seizure is evident, replace as a set. Slight damage of tooth can be corrected by oil stone or the like.

2) Side gear and pinion mate gear

- Replace if crack, score, or other defects are evident on tooth surface.
- Replace if thrust washer contacting surface is worn or seized. Slight damage of the surface can be corrected by oil stone or the like.

3) Bearing

Replace if seizure, peeling, wear, rust, dragging during rotation, abnormal noise or other defect is evident.

4) Thrust washers of side gear and pinion mate gear

Replace if seizure, flaw, abnormal wear or other defect is evident.

5) Oil seal

Replace if deformed or damaged, and at every disassembling.

6) Differential carrier

Replace if the bearing bores are worn or damaged.

7) Differential case

Replace if its sliding surfaces are worn or cracked.

8) Companion flange

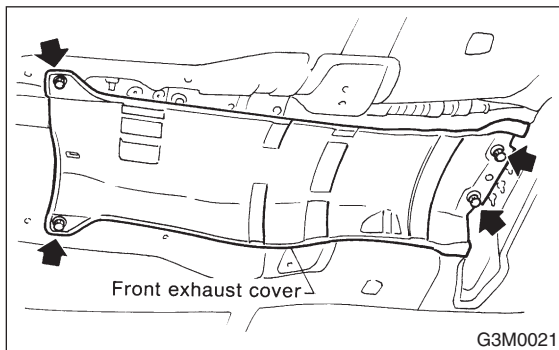
Replace if the oil seal lip contacting surfaces have flaws.

5. Rear Differential for VA-type

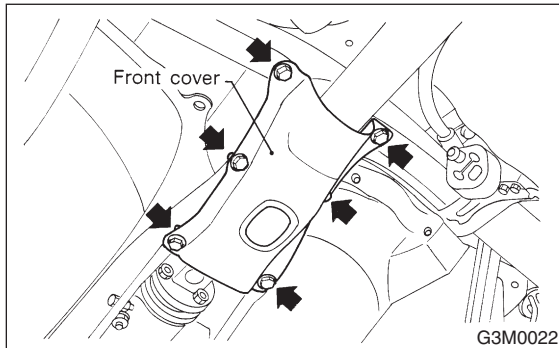
S303151

A: REMOVAL S303151A18

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove front exhaust cover.



- 9) Remove front cover of rear differential mount.



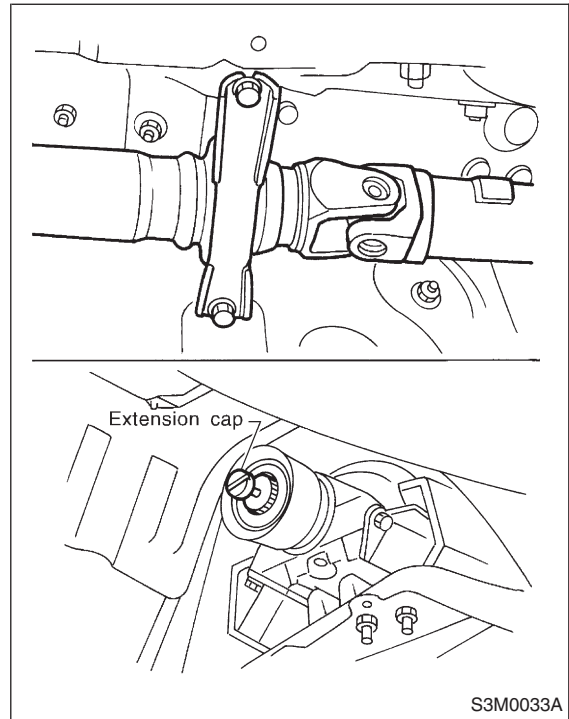
- 10) Remove propeller shaft.

CAUTION:

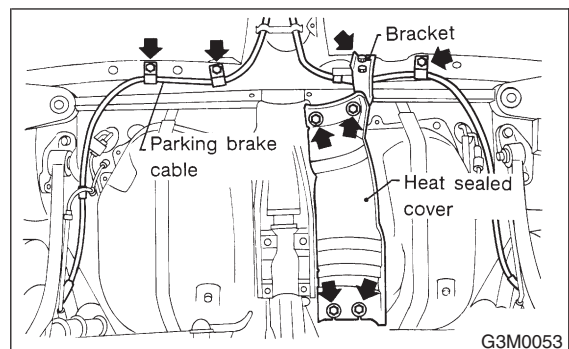
When removing propeller shaft, pay attention not to damage the sliding surfaces of rear drive shaft (extension) spline, oil seal and sleeve yoke.

NOTE:

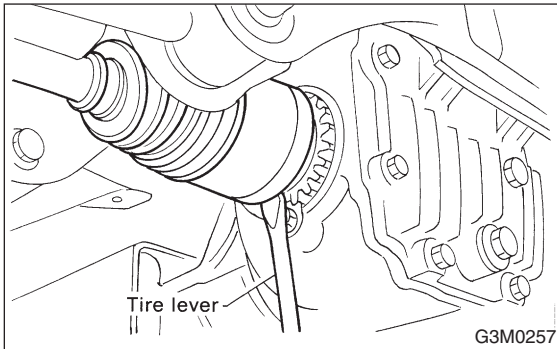
- Prepare an oil can and cap since the transmission oil flows out from the extension at removing propeller shaft.
- Insert the cap into the extension to prevent transmission oil from flowing out immediately after removing the propeller shaft.



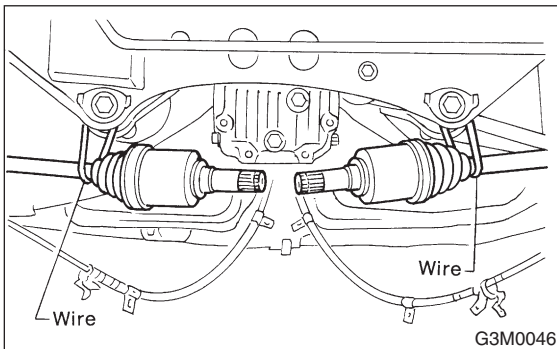
- 11) Remove heat sealed cover.
- 12) Remove clamps and bracket of parking brake cable.



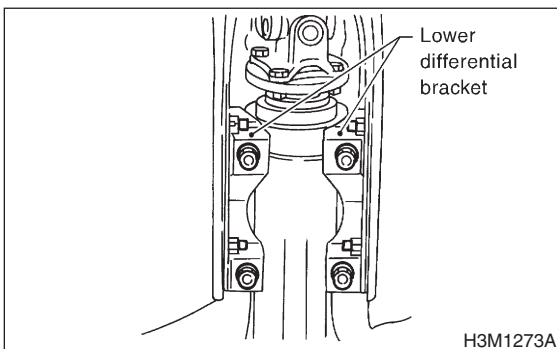
13) Remove DOJ of rear drive shaft from rear differential. <Ref. to DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>



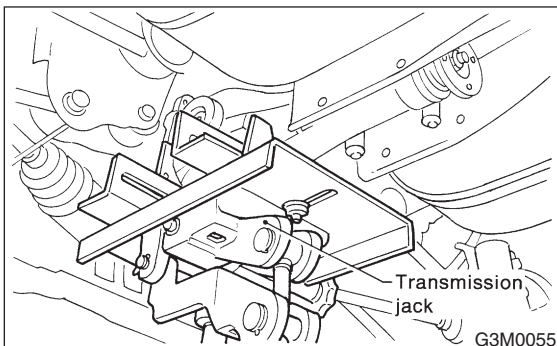
14) Secure rear drive shaft to rear crossmember using wire.



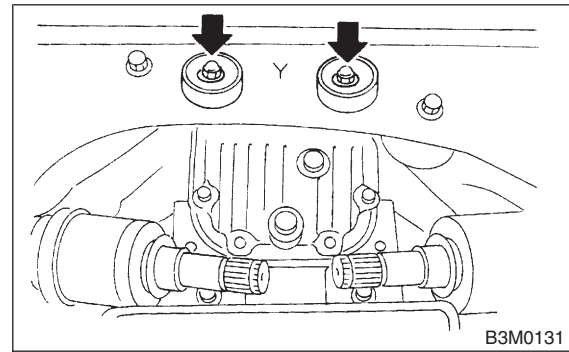
15) Remove lower differential bracket.



16) Support rear differential with transmission jack.



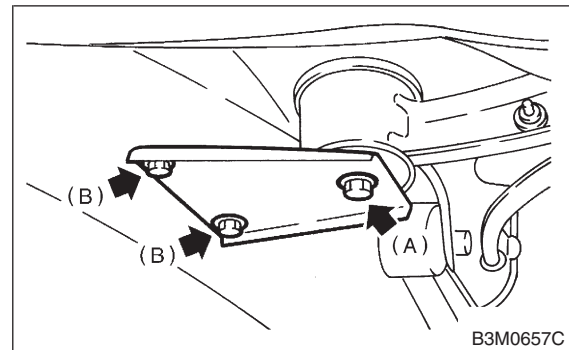
17) Remove self-locking nuts connecting rear differential to rear crossmember.



18) Remove bolts which secure rear differential front member to body. Loosen bolt A first, then removal bolts B.

NOTE:

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

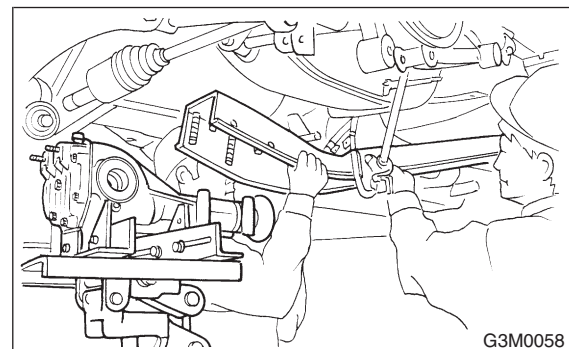


(A) Bolt A
(B) Bolt B

19) Remove bolt A.

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

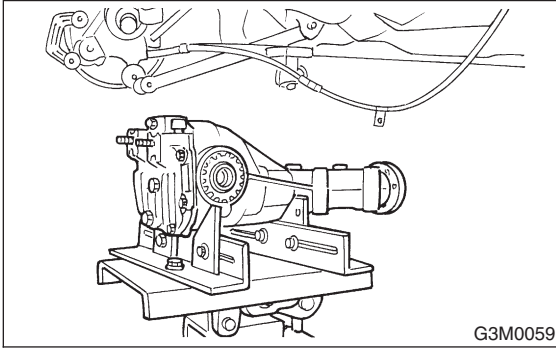
21) Remove front member from body.



REAR DIFFERENTIAL FOR VA-TYPE

Differentials

22) Remove rear differential from body.



B: INSTALLATION

S303151A11

To install, reverse the removal sequence.

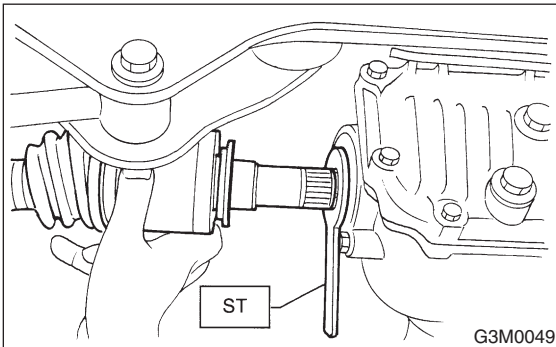
1) Position front member on body by passing it under parking brake cable and securing to rear differential.

NOTE:

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

2) Install DOJ of rear drive shaft into rear differential. <Ref. to DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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

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

CAUTION:

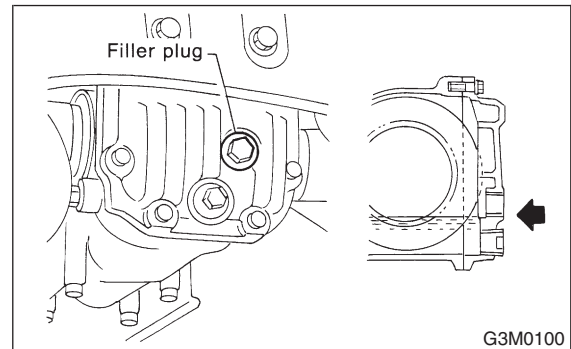
Use a new aluminum gasket when installing the plug.

Oil capacity:

0.8 ℓ (0.8 US qt, 0.7 Imp qt)

Tightening torque:

34 N·m (3.5 kgf·m, 25.3 ft·lb)



C: DISASSEMBLY

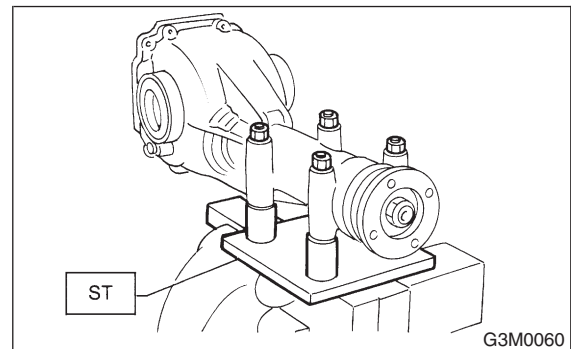
S303151A06

To detect real cause of trouble, inspect the following items before disassembling.

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

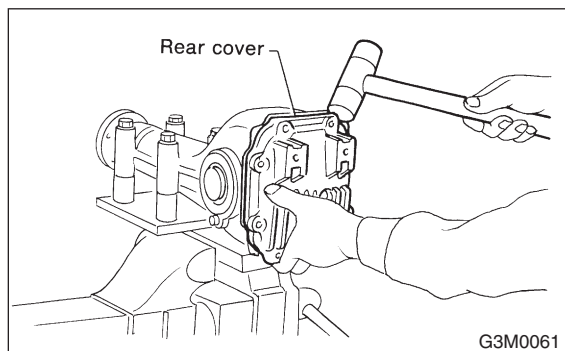
1) Set ST on vise and install the differential assembly to ST.

ST 398217700 ATTACHMENT



2) Drain gear oil by removing plug.

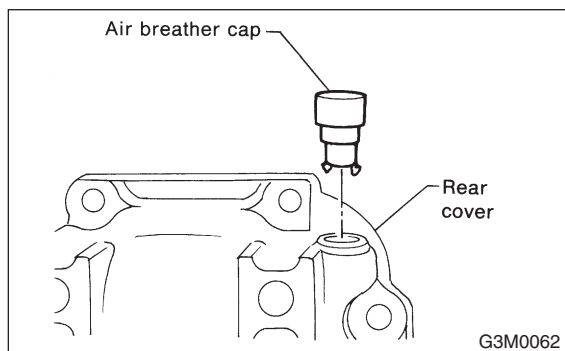
- 3) Remove rear cover by loosening retaining bolts.



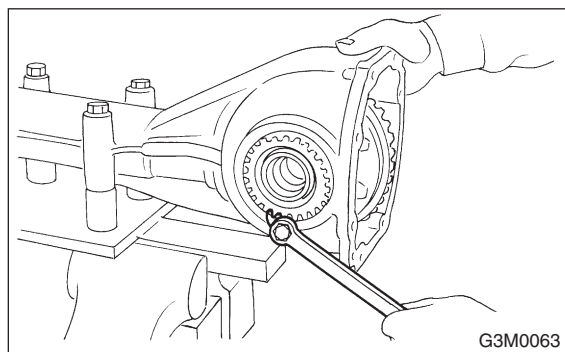
- 4) Replace air breather cap.

NOTE:

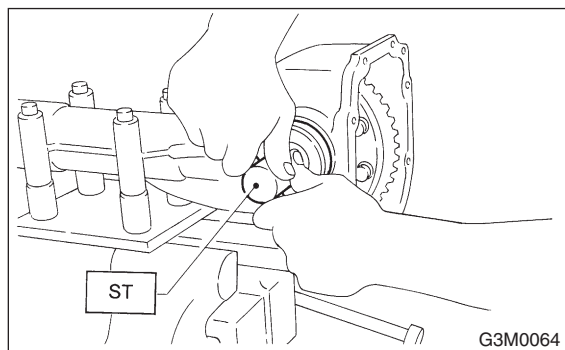
Do not attempt to replace the air breather cap unless necessary.



- 5) Remove right and left lock plates.



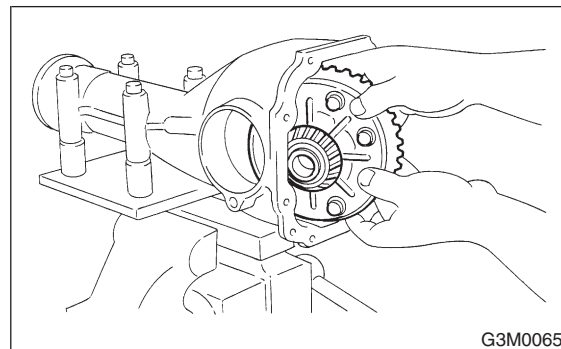
- 6) Remove right and left holders with ST.
ST 399780111 WRENCH



- 7) Pull out differential assembly from differential carrier.

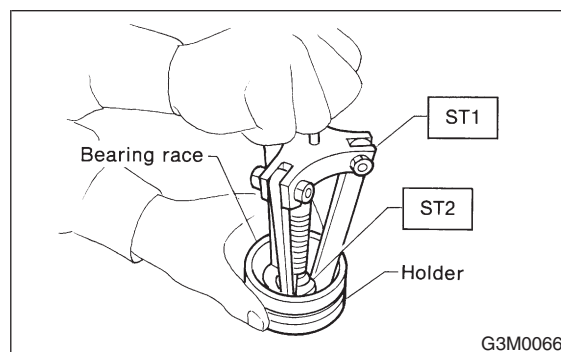
CAUTION:

Be careful not to hit the teeth against the case.



- 8) Remove bearing race from right and left holders with ST1 and ST2.

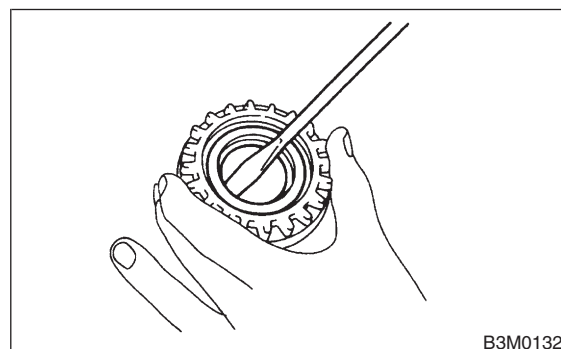
ST1 499705401 BEARING OUTER RACE PULLER ASSY
ST2 499705404 OUTER RACE PULLER SEAT



- 9) Remove oil seal from right and left holders with screwdriver.

CAUTION:

Perform this operation only when changing oil seal.



REAR DIFFERENTIAL FOR VA-TYPE

Differentials

10) Extract bearing cone with ST1 and ST2.

CAUTION:

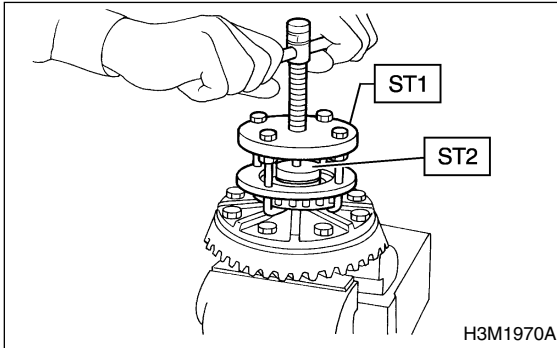
Do not attempt to disassemble the parts unless necessary.

NOTE:

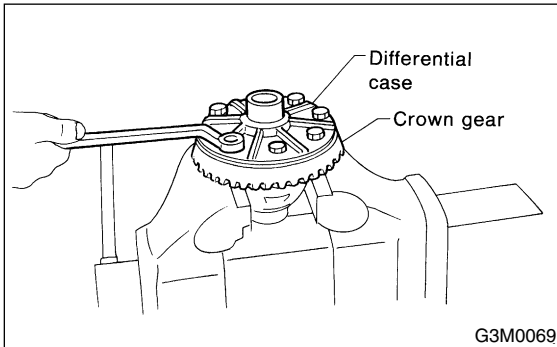
- Set Puller so that its claws catch the edge of the bearing cone.
- Never mix up the right and left hand bearing cups and cones.

ST1 899524100 PULLER SET

ST2 399520105 SEAT



11) Remove crown gear by loosening crown gear bolts.

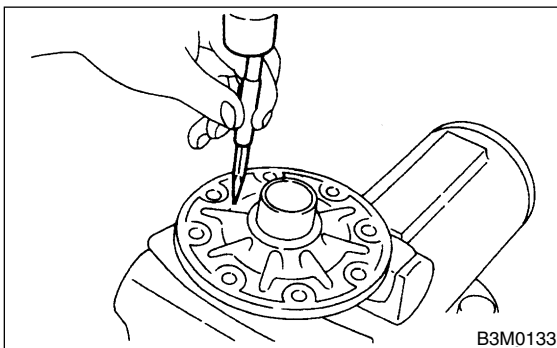


12) Drive out pinion shaft lock pin from crown gear side.

NOTE:

The lock pin is staked at the pin hole end on the differential carrier; do not drive it out forcibly before unstaking it.

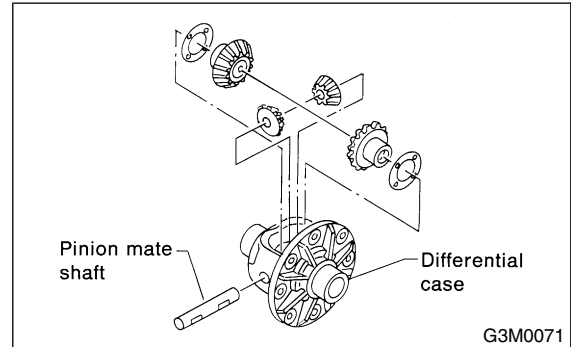
ST 899904100 STRAIGHT PIN REMOVER



13) Draw out pinion mate shaft and remove pinion mate gears, side gears and thrust washers.

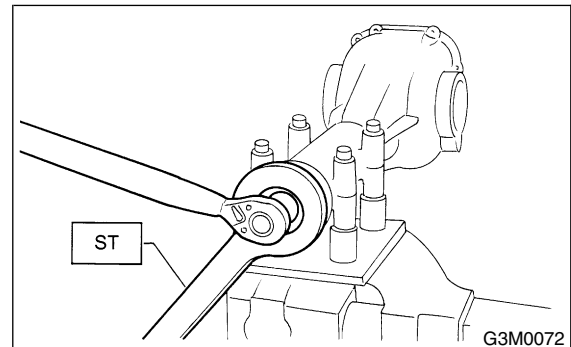
NOTE:

The gears as well as thrust washers should be marked or kept separated left and right, and front and rear.

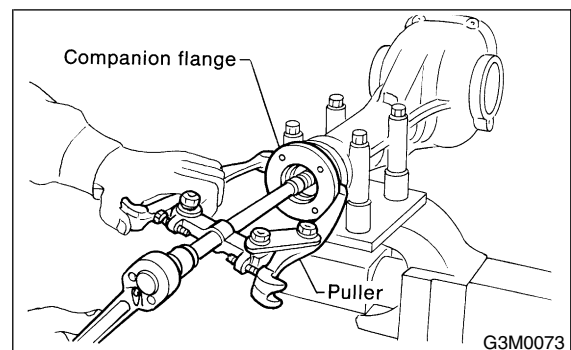


14) Hold companion flange with ST and remove self-locking nut.

ST 498427200 FLANGE WRENCH



15) Extract the companion flange with a puller.

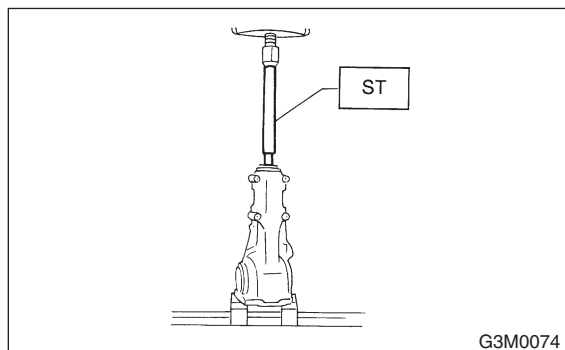


16) Press the end of drive pinion shaft and extract it together with rear bearing cone, preload adjusting spacer and washer.

NOTE:

Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT

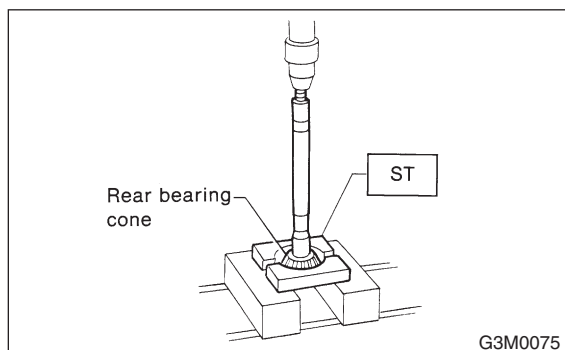


17) Remove rear bearing cone from drive pinion by supporting cone with ST.

NOTE:

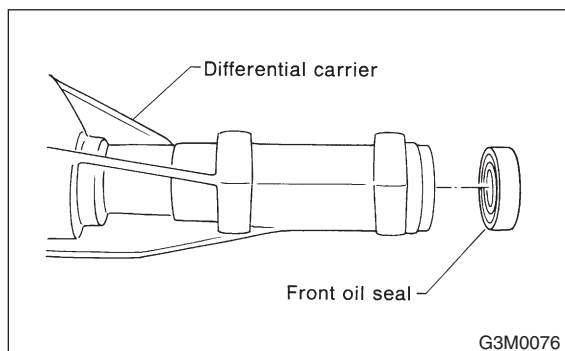
Place the replacer so that its center-recessed side faces the pinion gear.

ST 498515500 REPLACER



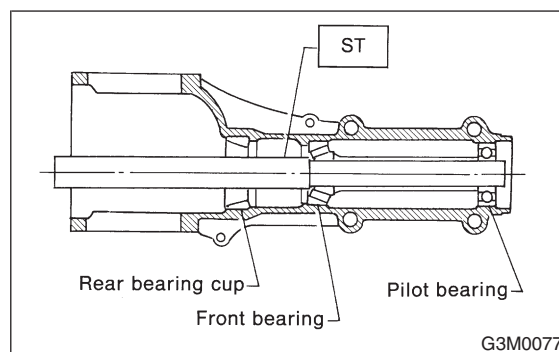
18) Remove front oil seal from differential carrier using ST.

ST 398527700 PULLER ASSY

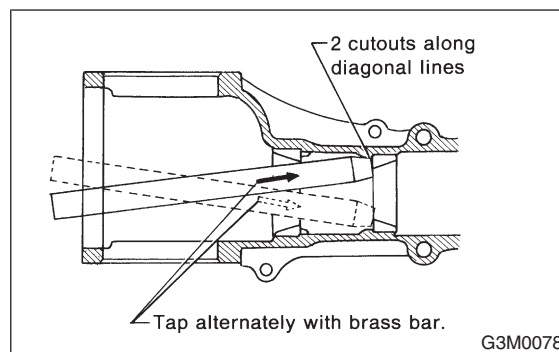


19) Remove pilot bearing together with front bearing cone using ST.

ST 398467700 DRIFT



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



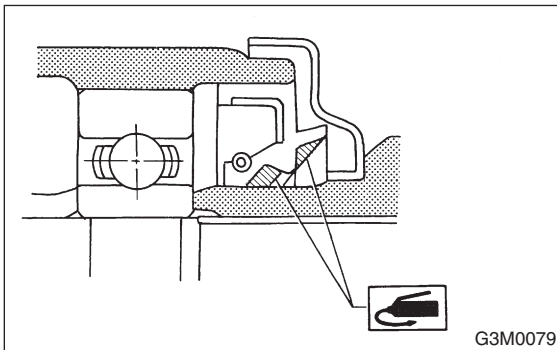
REAR DIFFERENTIAL FOR VA-TYPE

Differentials

D: ASSEMBLY S303151A02

1) Precautions for assembling

- Assemble in the reverse order of disassembling.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not misinstalled.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear oil when installing the bearings and thrust washers.
- Be careful not to mix up the right and left hand cups of the bearings.
- Replace the oil seal with new one at every disassembly. Apply chassis grease between the lips when installing the oil seal.



2) Adjust 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.

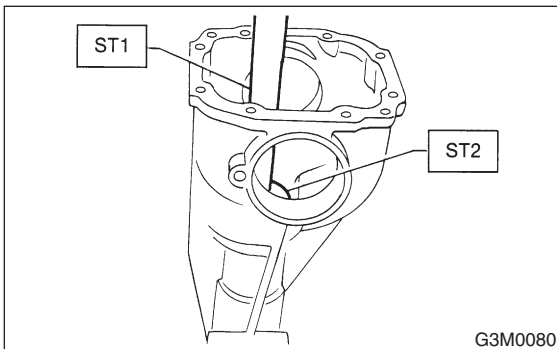
ST1 398477701 HANDLE

ST2 398477702 DRIFT

(2) Press front bearing race into differential carrier with ST1 and ST2.

ST1 398477701 HANDLE

ST2 498447110 DRIFT



(3) Insert front bearing cone.

CAUTION:

Use a new front bearing cone.

(4) Insert ST into case with pinion height adjusting shim and rear bearing cone fitted onto it.

CAUTION:

● **Re-use the used washer if not deformed.**

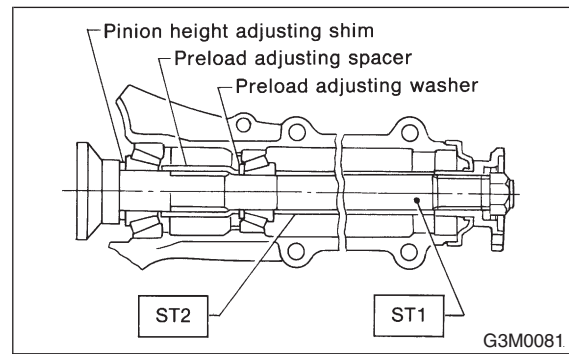
● **Use a new rear bearing cone.**

ST 498447150 DUMMY SHAFT

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

ST1 498447150 DUMMY SHAFT

ST2 32285AA000 DUMMY COLLAR



(6) 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 ST3.

CAUTION:

Use a new lock nut.

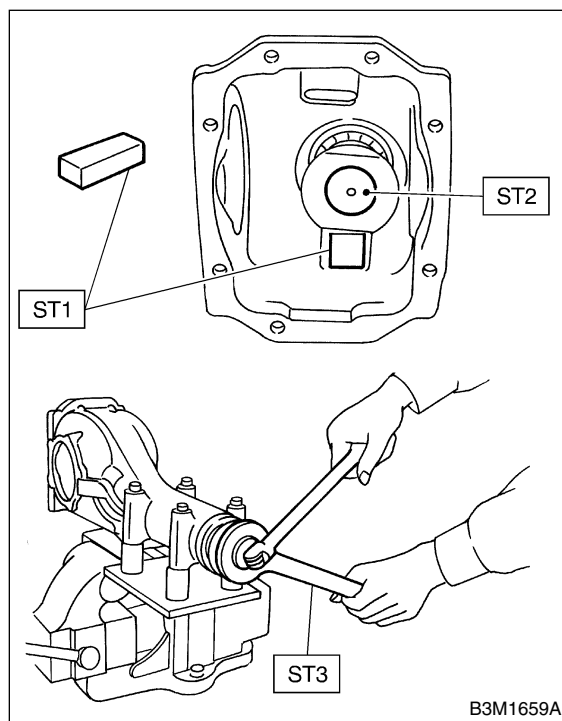
NOTE:

- Be careful not to give excessive preload.
- When tightening the drive pinion nut, lock ST1 with ST2 as shown in the figure.

ST1 398507704 BLOCK
ST2 498447150 DUMMY SHAFT
ST3 498427200 FLANGE WRENCH

Tightening torque:

188 N·m (19.2 kgf-m, 139 ft-lb)

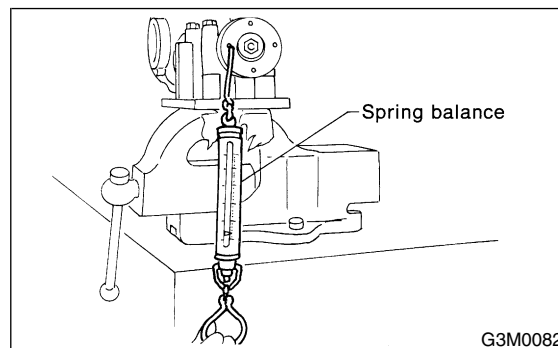


Front and rear bearing preload

For new bearing:

12.7 — 32.4 N (1.3 — 3.3 kgf, 2.9 — 7.3 lb)

at companion flange bolt hole



	Part No.	Thickness mm (in)
	38336AA000	1.500 (0.0591)
● Preload adjusting washer	38336AA120	1.513 (0.0596)
	38336AA010	1.525 (0.0600)
	38336AA130	1.538 (0.0606)
	38336AA020	1.550 (0.0610)
	38336AA140	1.563 (0.0615)
	38336AA030	1.575 (0.0620)
	38336AA150	1.588 (0.0625)
	38336AA040	1.600 (0.0630)
	38336AA160	1.613 (0.0635)
	38336AA050	1.625 (0.0640)
	38336AA170	1.638 (0.0645)
	38336AA060	1.650 (0.0650)
	38336AA180	1.663 (0.0655)
	38336AA070	1.675 (0.0659)
	38336AA190	1.688 (0.0665)
	38336AA080	1.700 (0.0669)
	38336AA200	1.713 (0.0674)
	38336AA090	1.725 (0.0679)
	38336AA210	1.738 (0.0684)
	38336AA100	1.750 (0.0689)
	38336AA220	1.763 (0.0694)
	38336AA110	1.775 (0.0699)
● Preload adjusting spacer	Part No.	Length mm (in)
	32288AA040	52.3 (2.059)
	32288AA050	52.5 (2.067)
	31454AA100	52.6 (2.071)
	32288AA060	52.7 (2.075)
	31454AA110	52.8 (2.079)
	32288AA070	52.9 (2.083)
	31454AA120	53.0 (2.087)
	32288AA080	53.1 (2.091)
	32288AA090	53.3 (2.098)

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.

For new bearing:

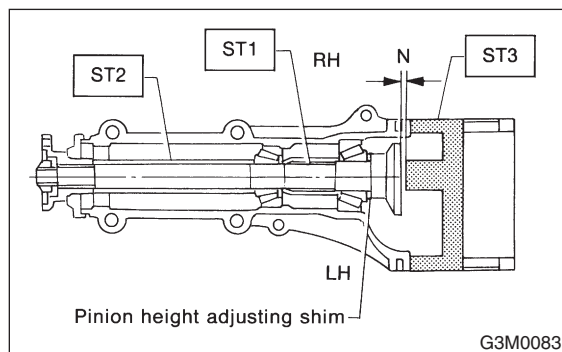
12.7 — 32.4 N (1.3 — 3.3 kgf, 2.9 — 7.3 lb)

at companion flange bolt hole

Adjust preload for front and rear bearings.

At this time, install an original pinion height adjusting shim.

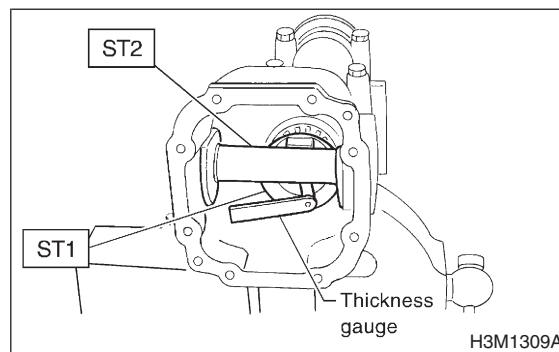
ST1 498447150 DUMMY SHAFT
ST2 32285AA000 DUMMY COLLAR
ST3 498505501 DIFFERENTIAL CARRIER GAUGE



(2) Measure the clearance N between the end of ST2 and the end surface of ST1 by using a thickness gauge.

Make sure there is no clearance between ST2 and ST1.

ST1 498447150 DUMMY SHAFT
ST2 498505501 DIFFERENTIAL CARRIER GAUGE



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

Use 1 to 3 shims as required for adjustment.

$$T = T_o + N - 0.05 \text{ (mm)}$$

where

T = Thickness of pinion height adjusting shim (mm)

T_o = Thickness of shim originally installed (mm)

N = Reading of thickness gauge (mm)

(Example of calculation)

T_o = 0.15 mm

N = 0.1 mm

$$T = 0.15 + 0.1 - 0.05 = 0.2 \text{ mm}$$

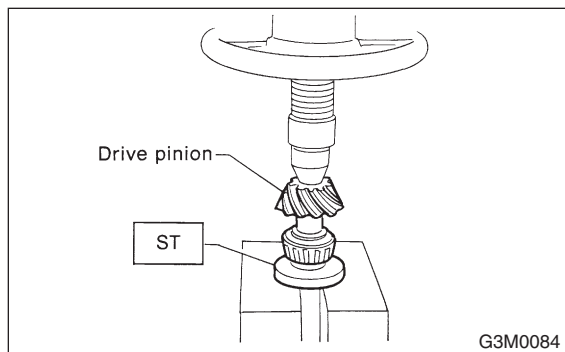
Result: Thickness = 0.2 mm

Therefore use the 32295AA220.

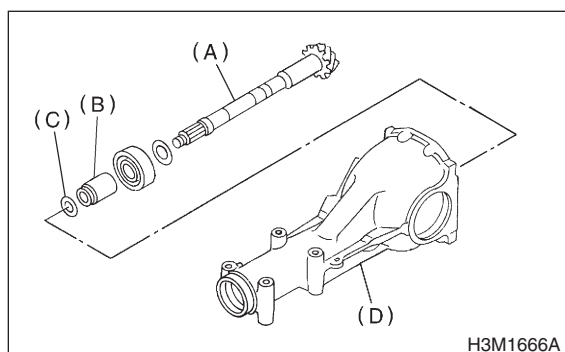
Pinion height adjusting shim	
Part No.	Thikness mm (in)
32295AA200	0.150 (0.0059)
32295AA210	0.175 (0.0069)
32295AA220	0.200 (0.0079)
32295AA230	0.225 (0.0089)
32295AA240	0.250 (0.0098)
32295AA250	0.275 (0.0108)

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

ST 498175500 INSTALLER



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



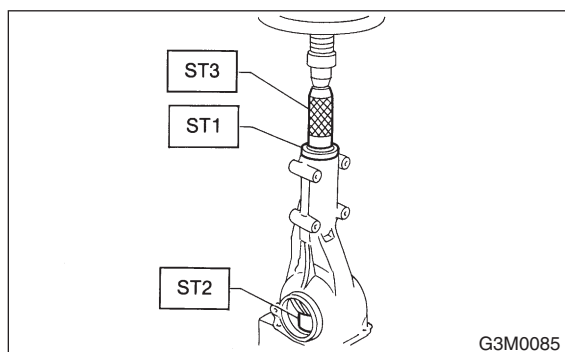
- (A) Drive pinion
- (B) Bearing preload adjusting spacer
- (C) Bearing preload adjusting washer
- (D) Differential carrier

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

ST1 32285AA000 DUMMY COLLAR

ST2 399780104 WEIGHT

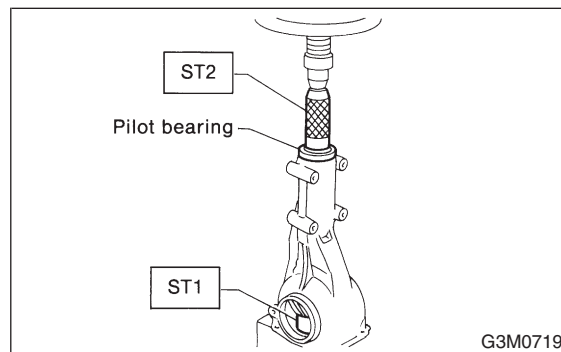
ST3 899580100 INSTALLER



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

ST1 399780104 WEIGHT

ST2 899580100 INSTALLER

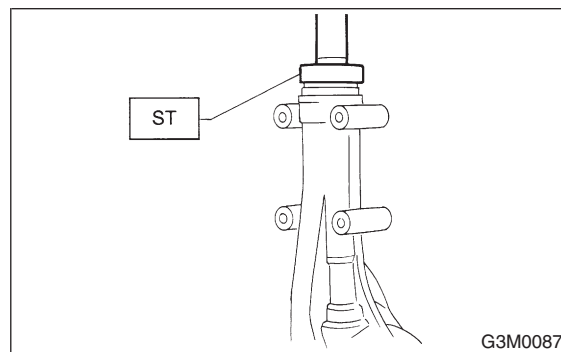


8) Fit a new oil seal with ST.

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.

ST 498447120 OIL SEAL INSTALLER



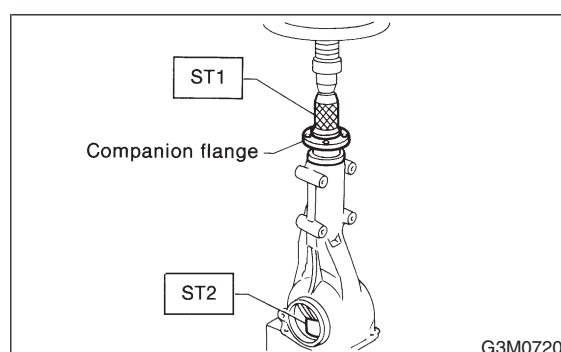
9) Press-fit companion flange with ST1 and ST2.

CAUTION:

Be careful not to damage bearing.

ST1 899874100 INSTALLER

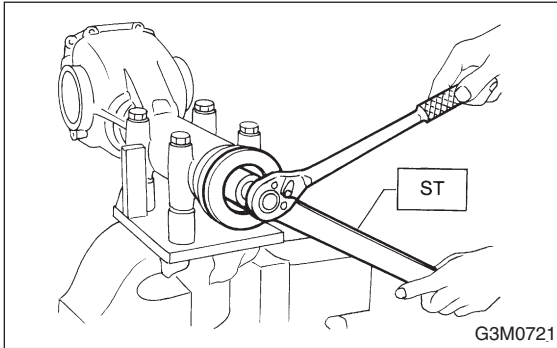
ST2 399780104 WEIGHT



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

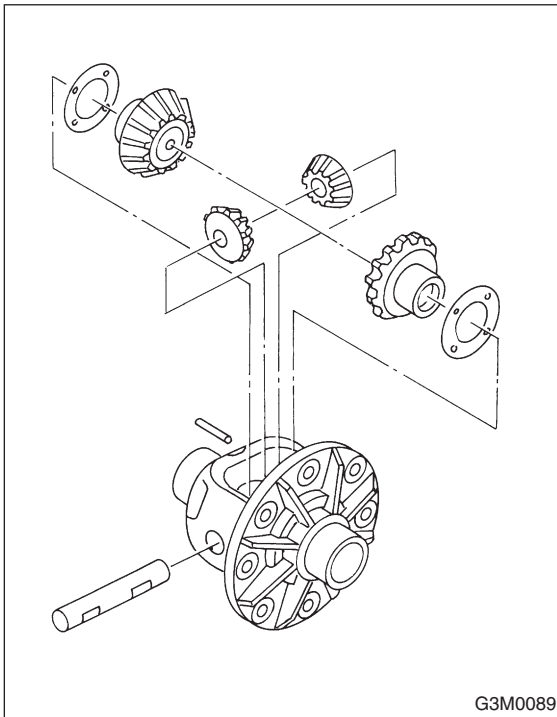
ST 498427200 FLANGE WRENCH

188 N·m (19.2 kgf-m, 139 ft-lb)



(1) Install side gears and pinion mate gears, with their thrust washers and pinion mate shaft, into differential case.

- Apply gear oil on both sides of the washer and on the side gear shaft before installing.
- Insert the pinion mate shaft into the differential case by aligning the lock pin holes.



(2) Measure the clearance between differential case and the back of side gear.

(3) Adjust the clearance as specified by selecting side gear thrust washer.

0.05 — 0.15 mm (0.0020 — 0.0059 in)

Side gear thrust washer	
Part No.	Thickness mm (in)
803135011	0.925 — 0.950 (0.0364 — 0.0374)
803135012	0.950 — 0.975 (0.0374 — 0.0384)
803135013	0.975 — 1.000 (0.0384 — 0.0394)
803135014	1.000 — 1.025 (0.0394 — 0.0404)
803135015	1.025 — 1.050 (0.0404 — 0.0413)

(4) Check the condition of rotation after applying oil to the gear tooth surfaces and thrust surfaces.

(5) After driving in pinion shaft lock pin, stake the both sides of the hole to prevent pin from falling off.

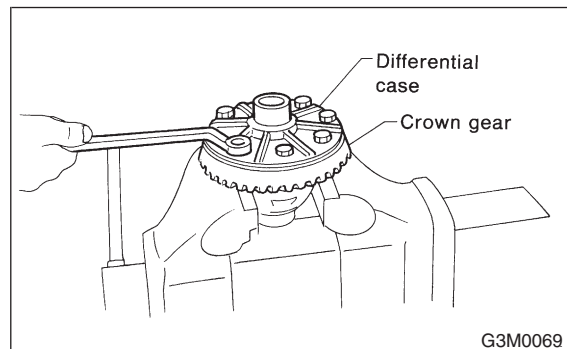
(6) Install crown gear on differential case.

Before installing bolts, apply Lock Tite to bolt threads.

THREE BOND 1324 or equivalent

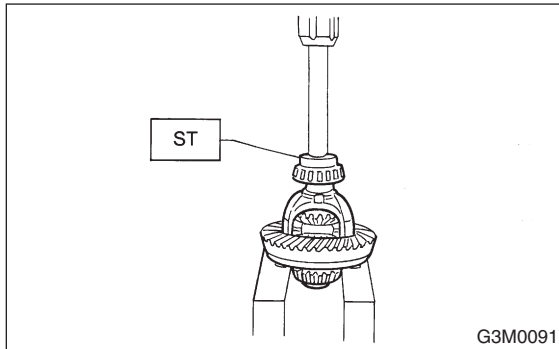
Tighten diagonally while tapping the bolt heads.

62 N·m (6.3 kgf-m, 45.6 ft-lb)



12) Press side bearing cone onto differential case with ST.

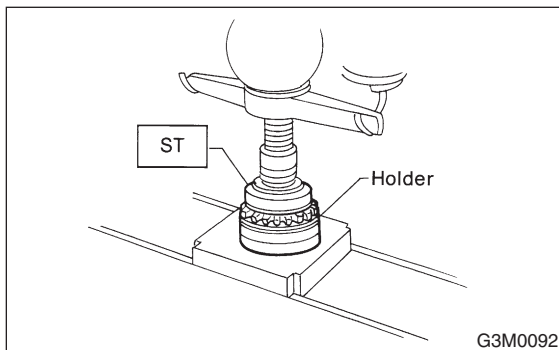
ST 498485400 DRIFT



13) Assemble holders.

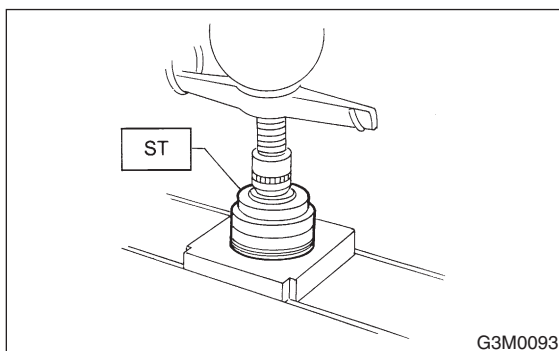
(1) Install oil seal into right and left holders.

ST 498447100 AXLE SHAFT OIL SEAL
INSTALLER

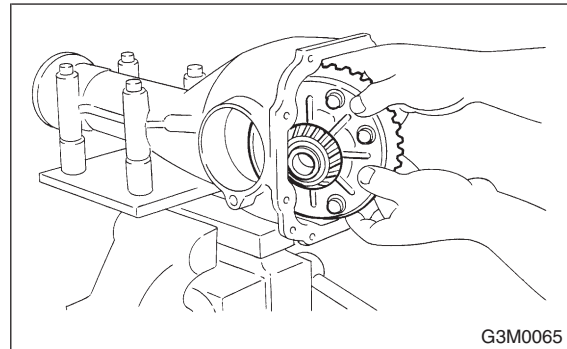


(2) Install bearing race into right and left holders.

ST 398477702 BEARING OUTER RACE
DRIFT



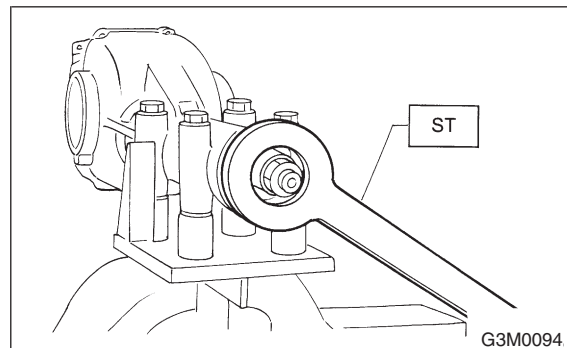
(3) Install the differential case assembly into differential carrier in the reverse order of disassembly.



14) Perform adjustment of backlash of pinion crown gear set and adjustment of preload of differential side bearing.

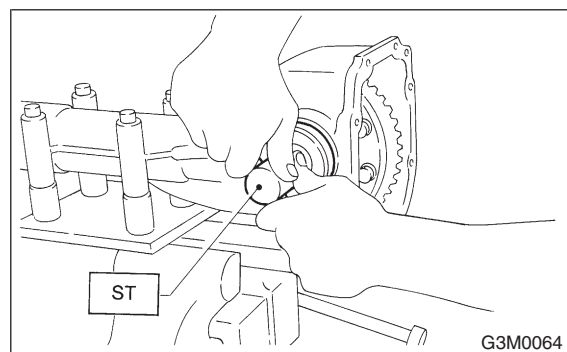
(1) Turn drive pinion with ST for better fitting of differential side bearing.

ST 498427200 FLANGE WRENCH



(2) Screw in left-side holder until light contact is made with ST.

ST 399780111 WRENCH



(3) Back off side (left-side) holder approximately 1 1/2 teeth of holder, and tighten left-side holder by approximately 2 teeth (approximately 1 1/2 + 1/2 teeth) [Back off amount of side (left-side) holder + 1/2 tooth].

This + 1/2 tooth gives preload.

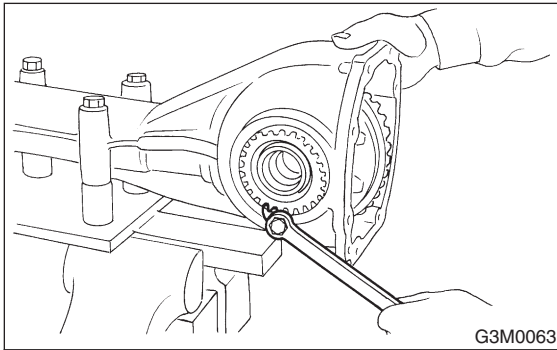
REAR DIFFERENTIAL FOR VA-TYPE

Differentials

- (4) Temporarily tighten lock plate.

NOTE:

Turn over lock plate to displace holder 1/2 tooth.



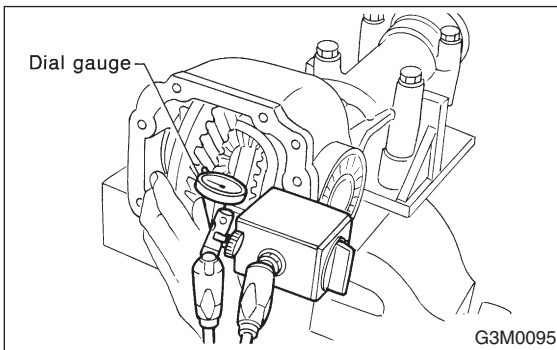
- (5) Measure the crown gear-to-drive pinion backlash. Set magnet base on differential carrier. Align contact point of dial gauge with tooth face of crown gear, and move crown gear while holding drive pinion still. Read value indicated on dial gauge.

NOTE:

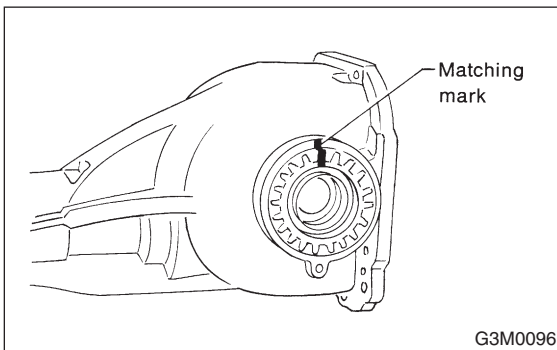
If measured backlash is not within specified range, repeat procedures for pinion crown gear set backlash adjustment and differential side bearing preload adjustment.

Backlash:

0.10 — 0.15 mm (0.0039 — 0.0059 in)



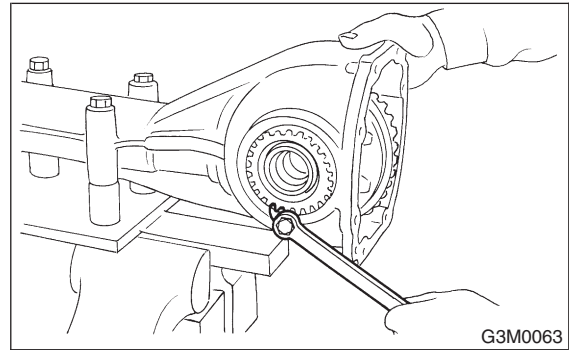
- 15) Draw a matching mark on both differential carrier and holder. Remove holder one side at a time. Replace in the original position after inserting an O-ring and applying grease to threaded portion.



- 16) Tighten bolt of lock plate to specified torque.

Tightening torque:

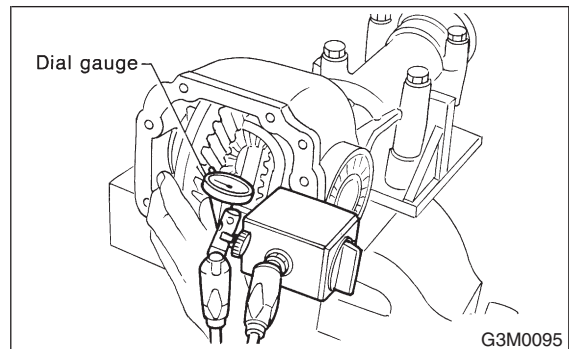
25 N·m (2.5 kgf·m, 18.1 ft-lb)



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

Backlash:

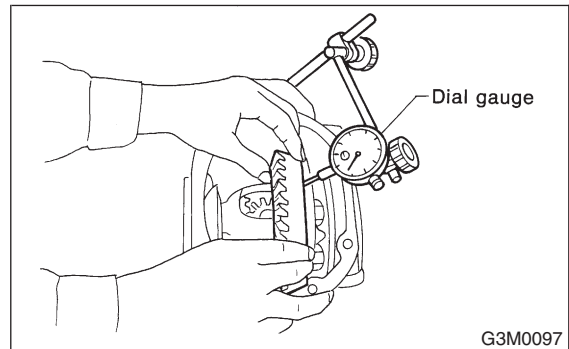
0.10 — 0.15 mm (0.0039 — 0.0059 in)



- 18) 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)



19) 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".

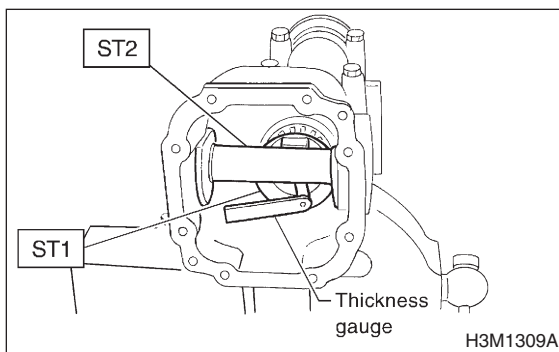
NOTE:

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

20) 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.

(1) Drive pinion height

ST1 498447150 DUMMY SHAFT
ST2 498505501 DIFFERENTIAL CARRIER GAUGE



$$T = T_o + N - 0.05 \text{ (mm)}$$

where

T = Thickness of pinion height adjusting shim (mm)

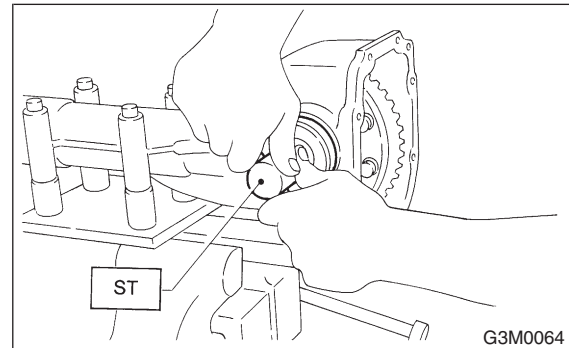
T_o = Thickness of shim originally installed (mm)

N = Reading of thickness gauge (mm)

(2) Differential side bearing preload
Back off side (left-side) holder approximately 1 1/2 teeth of holder, and tighten left-side holder by approximately 2 teeth (approximately 1 1/2 + 1/2 teeth) [Back off amount of side (left-side) holder + 1/2 tooth].

This + 1/2 tooth gives preload.

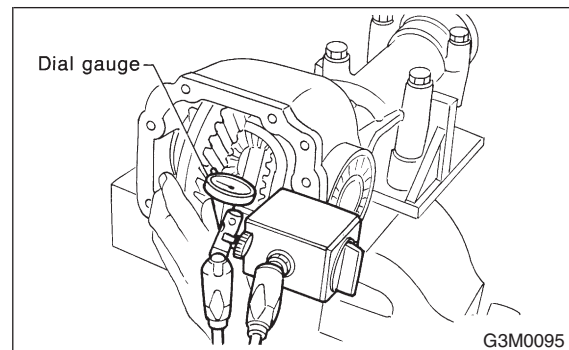
ST 399780111 WRENCH



(3) Hypoid gear backlash

Backlash:

0.10 — 0.15 mm (0.0039 — 0.0059 in)

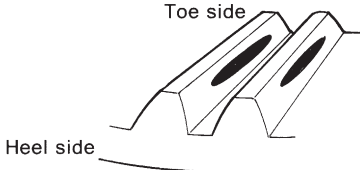
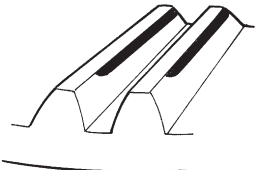
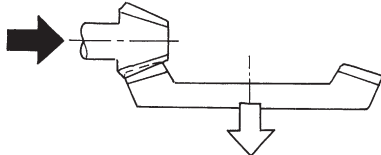
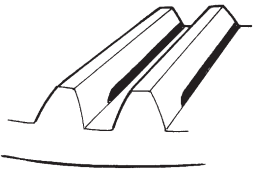
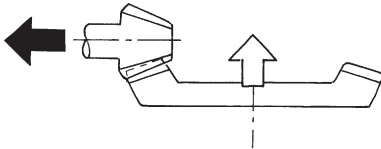
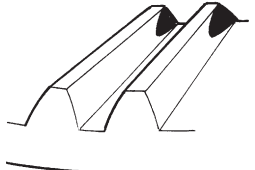
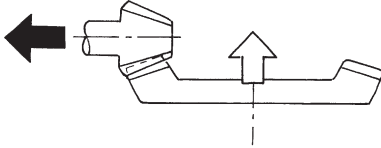
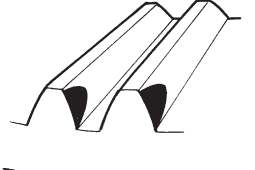
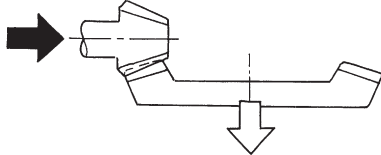


REAR DIFFERENTIAL FOR VA-TYPE

Differentials

➡ Adjusting direction of drive pinion

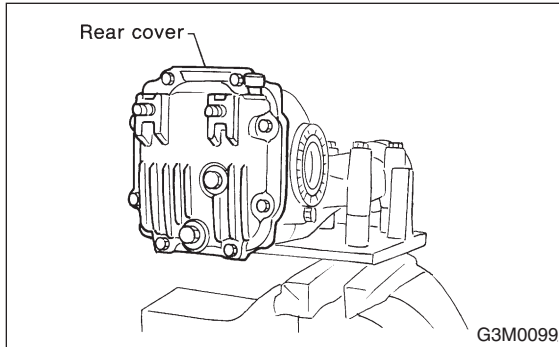
⇨ Adjusting direction of crown gear

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 washer 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 washer 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

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

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)



E: INSPECTION

S303151A10

Wash all the disassembled parts clean, and examine them for wear, damage, or other defects. Repair or replace defective parts as necessary.

1) Crown gear and drive pinion

- If abnormal tooth contact is evident, find out the cause and adjust to give correct tooth contact at assembly. Replace the gear if excessively worn or incapable of adjustment.
- If crack, score, or seizure is evident, replace as a set. Slight damage of tooth can be corrected by oil stone or the like.

2) Side gear and pinion mate gear

- Replace if crack, score, or other defects are evident on tooth surface.
- Replace if thrust washer contacting surface is worn or seized. Slight damage of the surface can be corrected by oil stone or the like.

3) Bearing

Replace if seizure, peeling, wear, rust, dragging during rotation, abnormal noise or other defect is evident.

4) Thrust washers of side gear and pinion mate gear

Replace if seizure, flaw, abnormal wear or other defect is evident.

5) Oil seal

Replace if deformed or damaged, and at every disassembling.

6) Differential carrier

Replace if the bearing bores are worn or damaged.

7) Differential case

Replace if its sliding surfaces are worn or cracked.

8) Companion flange

Replace if the oil seal lip contacting surfaces have flaws.

REAR DIFFERENTIAL FRONT OIL SEAL

Differentials

6. Rear Differential Front Oil Seal

S303139

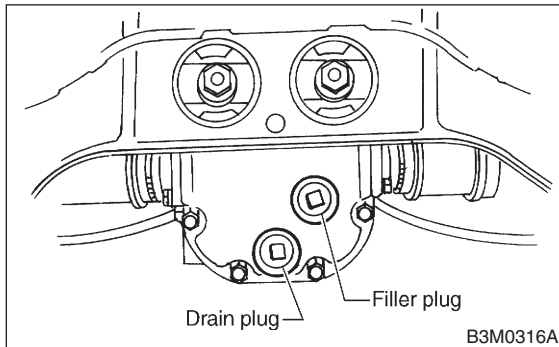
A: REPLACEMENT

S303139A20

1. T-TYPE

S303139A2001

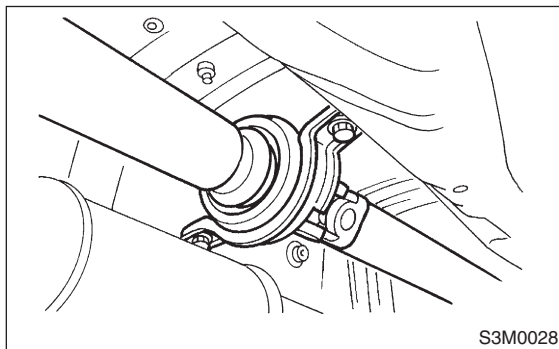
- 1) Disconnect ground terminal from battery.
- 2) Move selector lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Remove oil drain plug, and drain gear oil.



- 5) Jack-up rear wheels and support the vehicle body with sturdy racks.
- 6) Remove propeller shaft from body. <Ref. to DS-13 REMOVAL, Propeller Shaft.>

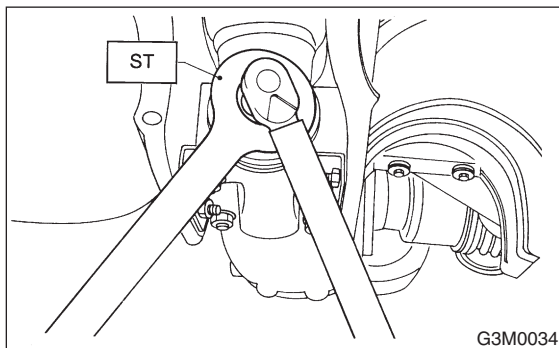
CAUTION:

Wrap metal parts with a cloth or rubber material to prevent damage from adjacent metal parts.

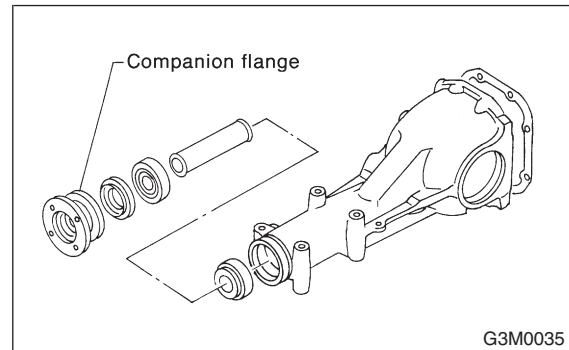


- 7) Remove self-locking nut while holding companion flange with ST.

ST 498427200 FLANGE WRENCH

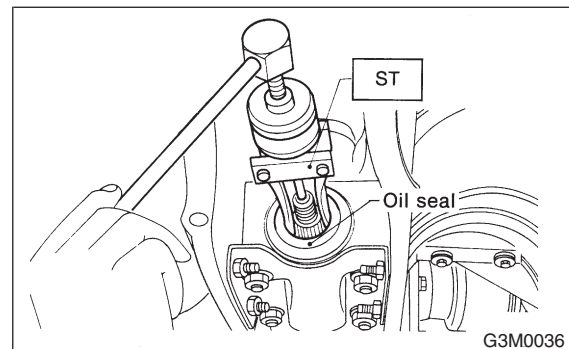


- 8) Extract companion flange with a puller.



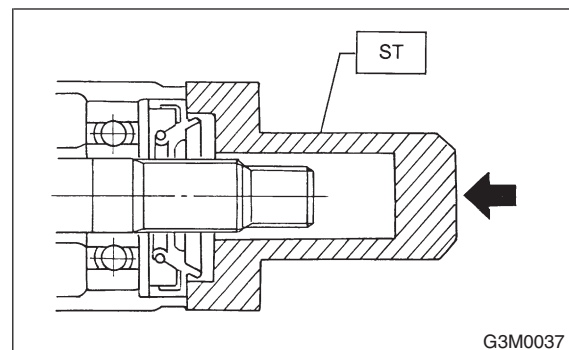
- 9) Remove oil seal using ST.

ST 398527700 PULLER ASSY



- 10) Fit a new oil seal using ST.

ST 498447120 OIL SEAL INSTALLER



- 11) Install companion flange.

12) Tighten self-locking nut within the specified torque range so that the turning resistance of companion flange becomes the same as that before replacing oil seal.

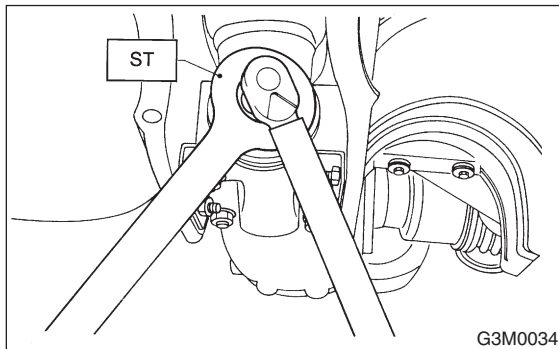
CAUTION:

Use a new self-locking nut.

ST 498427200 FLANGE WRENCH

Tightening torque:

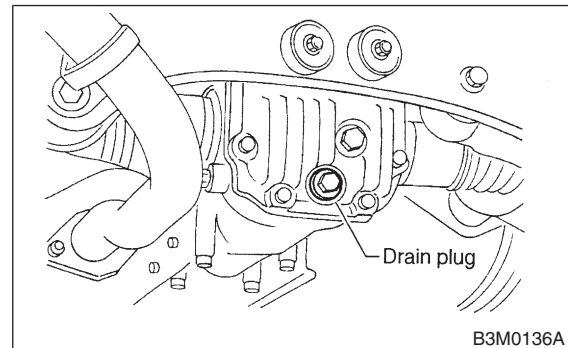
181 N·m (18.5 kgf-m, 134 ft-lb)



13) Reassembling procedure hereafter is the reverse of the disassembling.

2. VA-TYPE S303139A2002

- 1) Disconnect ground terminal from battery.
- 2) Move selector lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Remove oil drain plug, and drain gear oil.

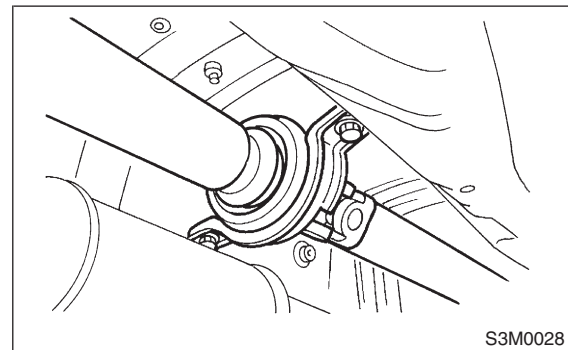


5) Jack-up rear wheels and support the vehicle body with sturdy racks.

6) Remove propeller shaft from body. <Ref. to DS-13 REMOVAL, Propeller Shaft.>

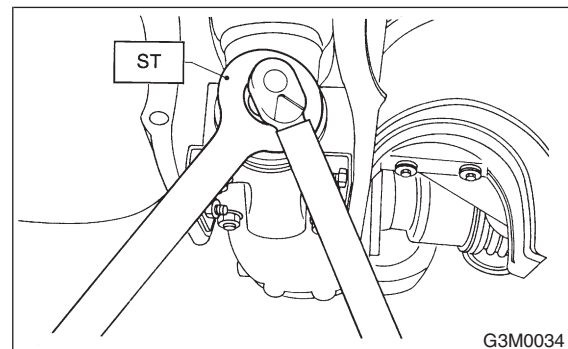
CAUTION:

Wrap metal parts with a cloth or rubber material to prevent damage from adjacent metal parts.



7) Remove self-locking nut while holding companion flange with ST.

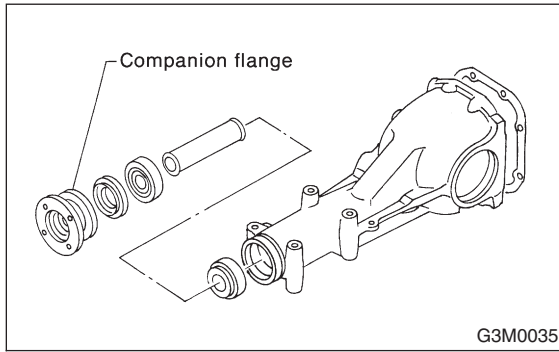
ST 498427200 FLANGE WRENCH



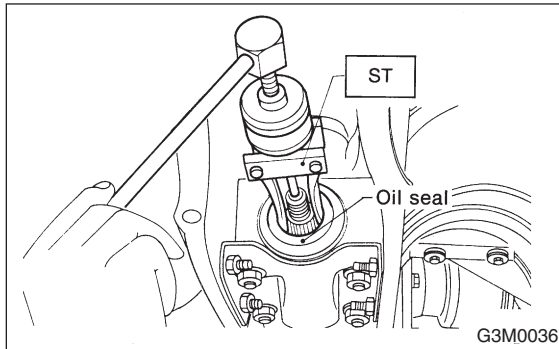
REAR DIFFERENTIAL FRONT OIL SEAL

Differentials

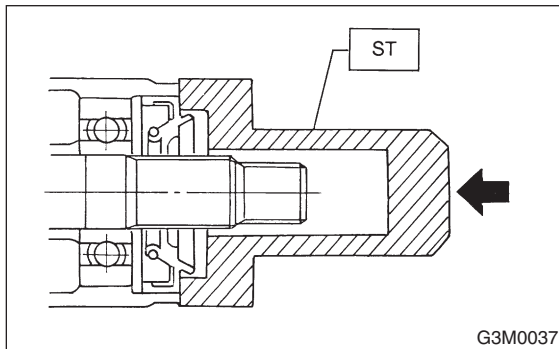
- 8) Extract companion flange with a puller.



- 9) Remove oil seal using ST.
ST 398527700 PULLER ASSY



- 10) Fit a new oil seal using ST.
ST 498447120 OIL SEAL INSTALLER

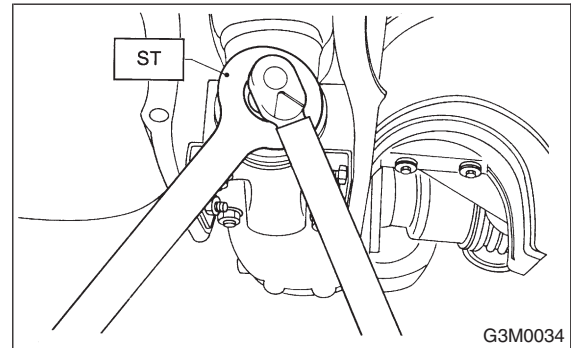


- 11) Install companion flange.
12) Tighten self-locking nut within the specified torque range so that the turning resistance of companion flange becomes the same as that before replacing oil seal.

ST 498427200 FLANGE WRENCH

CAUTION:
Use a new self-locking nut.

Tightening torque:
188 N·m (19.2 kgf-m, 139 ft-lb)



- 13) Reassembling procedure hereafter is the reverse of the disassembling.

8. Rear Differential Member

S303135

A: REMOVAL

S303135A18

1. T-TYPE

S303135A1802

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove rear differential front member.

NOTE:

When removing rear differential front member, work the removal procedure as rear differential. <Ref. to DI-23 REMOVAL, Rear Differential for T-type.>

2. VA-TYPE

S303135A1803

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove rear differential front member.

NOTE:

When removing rear differential front member, work the removal procedure as rear differential. <Ref. to DI-38 REMOVAL, Rear Differential for VA-type.>

B: INSTALLATION

S303135A11

1. T-TYPE

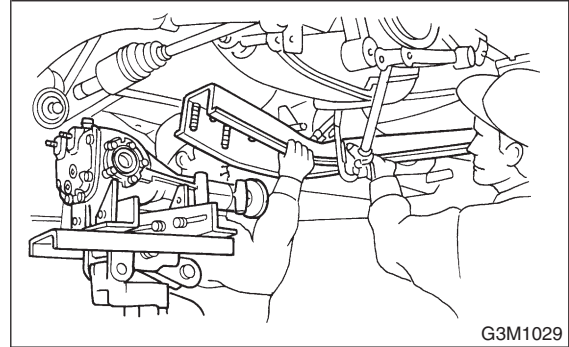
S303135A1102

To install, reverse the removal sequence.

- 1) 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 stopper.



G3M1029

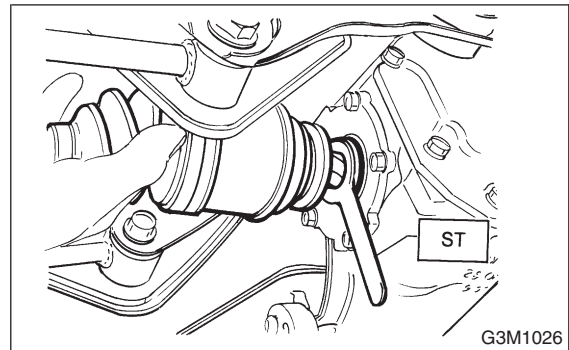
- 2) Insert DOJ of rear drive shaft into rear differential.

<Ref. to DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>

CAUTION:

Before inserting, replace the differential side oil seal with a new one.

ST 28099PA090 SIDE OIL SEAL PROTECTOR



G3M1026

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

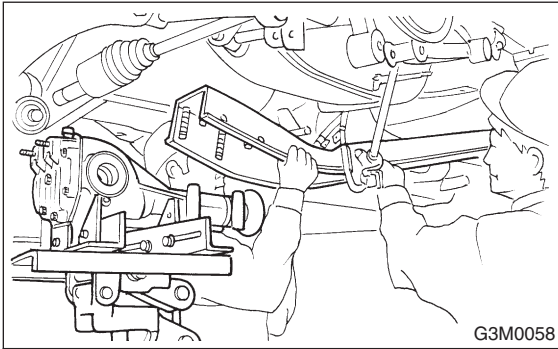
2. VA-TYPE S303135A1103

To install, reverse the removal sequence.

- 1) 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 stopper.



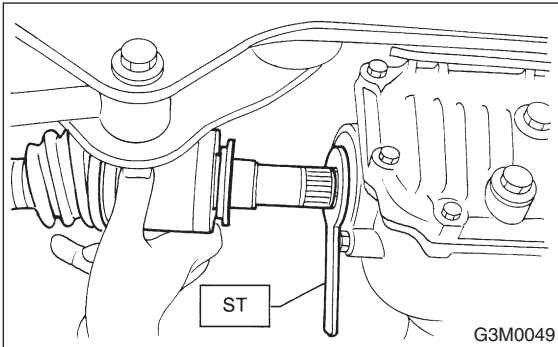
- 2) Insert DOJ of rear drive shaft into rear differential.

<Ref. to DI-57 REPLACEMENT, Rear Differential Side Oil Seal.>

CAUTION:

Before inserting, replace the differential side oil seal with a new one.

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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

7. Rear Differential Side Oil Seal

S303137

A: REPLACEMENT

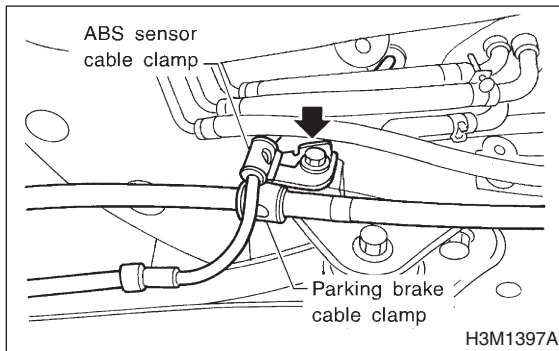
S303137A20

1. T-TYPE

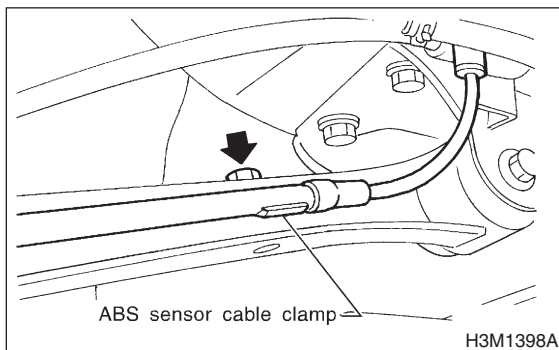
S303137A2001

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove the DOJ of rear drive shaft from rear differential.

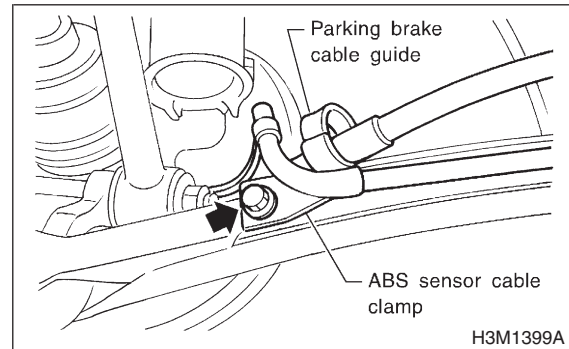
- (1) Remove the ABS sensor cable clamp and parking brake cable clamp from bracket.



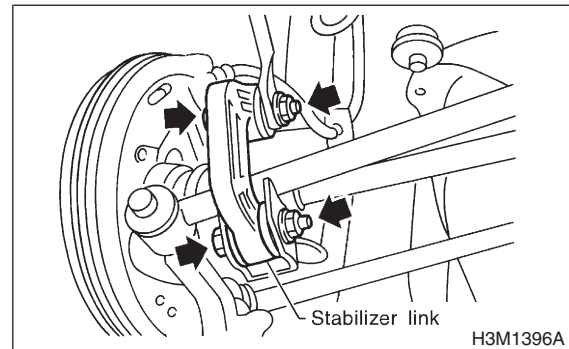
- (2) Remove the ABS sensor cable clamp from the trailing link.



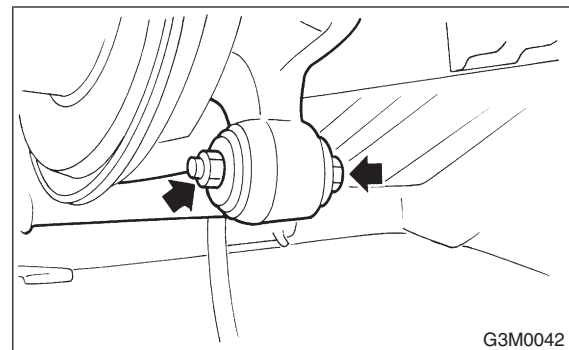
- (3) Remove the ABS sensor cable clamp and parking brake cable guide from the trailing link.



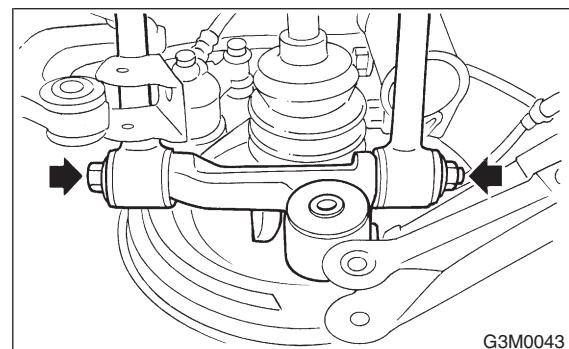
- (4) Remove the rear stabilizer link.



- (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.



REAR DIFFERENTIAL SIDE OIL SEAL

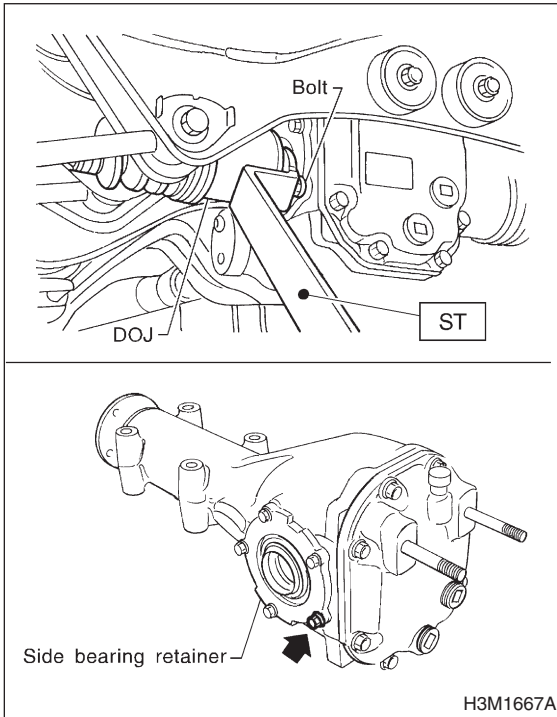
Differentials

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

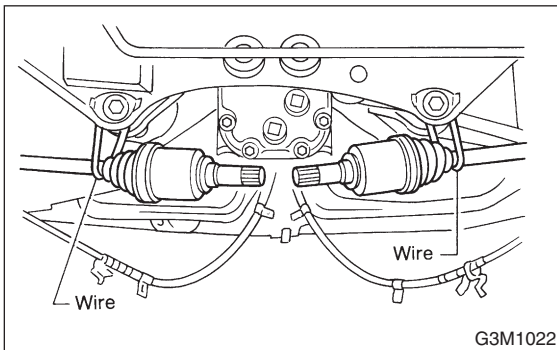
CAUTION:

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

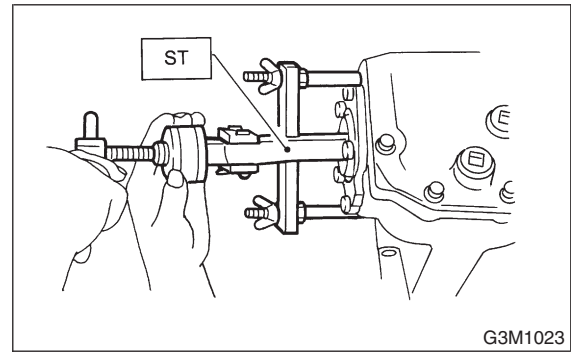
ST 208099PA100 DRIVE SHAFT REMOVER



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



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

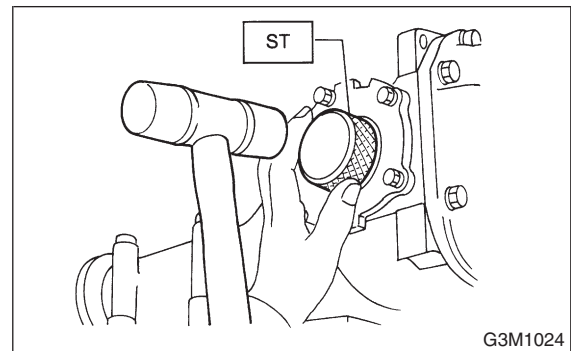


- 11) Drive in a new side oil seal with ST.

CAUTION:

Apply chassis grease between the oil seal lips.

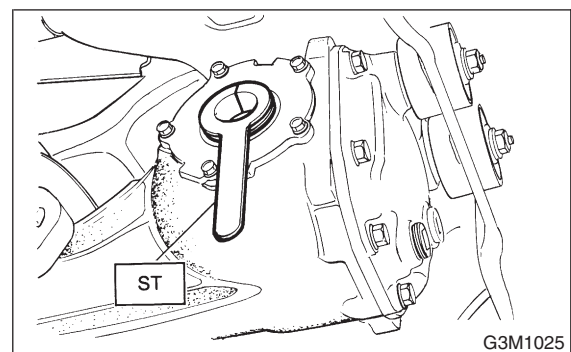
ST 398437700 DRIFT



- 12) Insert the DOJ into rear differential.

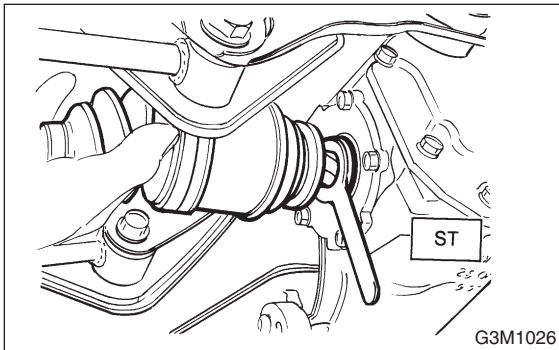
(1) Install ST to rear differential.

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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

ST 28099PA090 SIDE OIL SEAL PROTECTOR



- (3) Remove ST.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

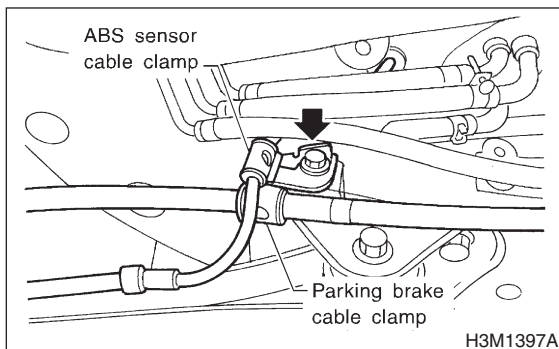
13) Hereafter, re-assemble in reverse order of disassembly.

2. VA-TYPE

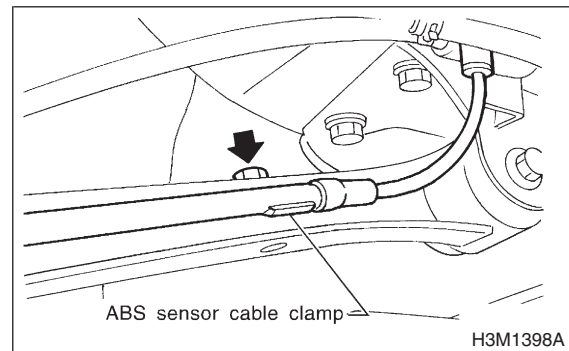
S303137A2002

- 1) Disconnect ground terminal 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 <Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.> and muffler. <Ref. to EX-12 REMOVAL, Muffler.>
- 8) Remove the DOJ of rear drive shaft from rear differential.

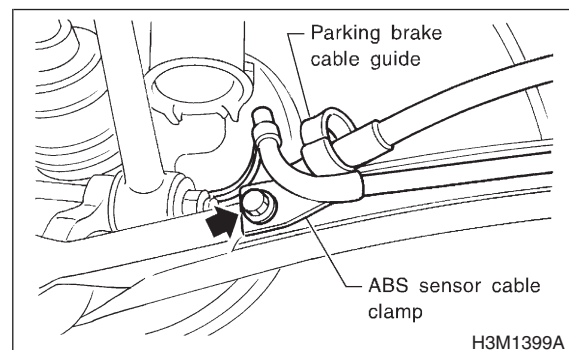
- (1) Remove the ABS sensor cable clamp and parking brake cable clamp from bracket.



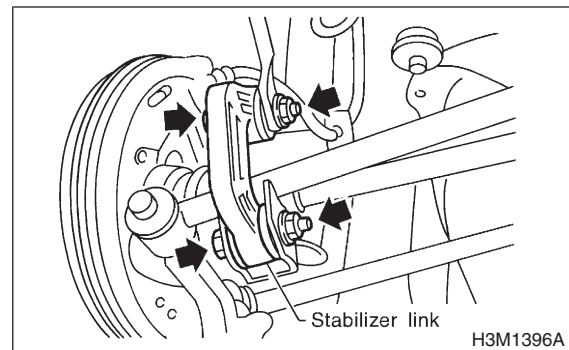
- (2) Remove the ABS sensor cable clamp from the trailing link.



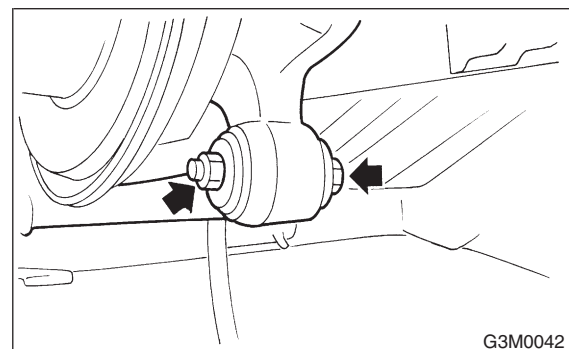
- (3) Remove the ABS sensor cable clamp and parking brake cable guide from the trailing link.



- (4) Remove the rear stabilizer link.



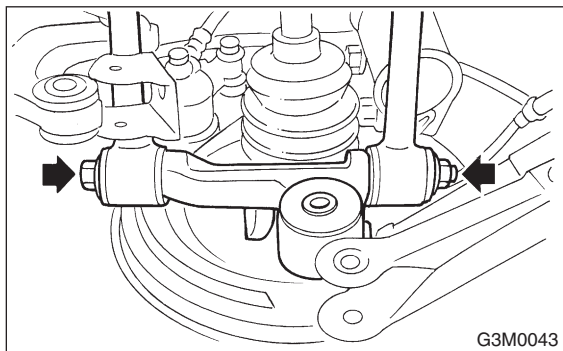
- (5) Remove the bolts which secure the trailing link to the rear housing.



REAR DIFFERENTIAL SIDE OIL SEAL

Differentials

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



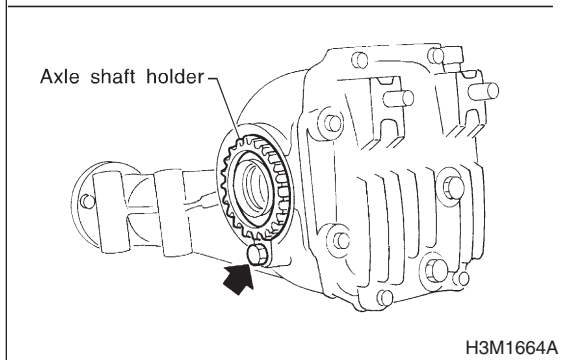
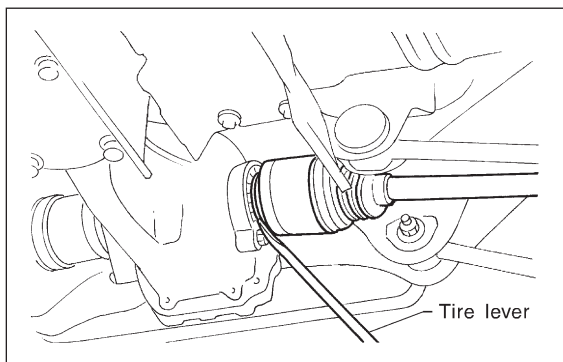
- (7) Remove the DOJ from the rear differential with tire lever.

CAUTION:

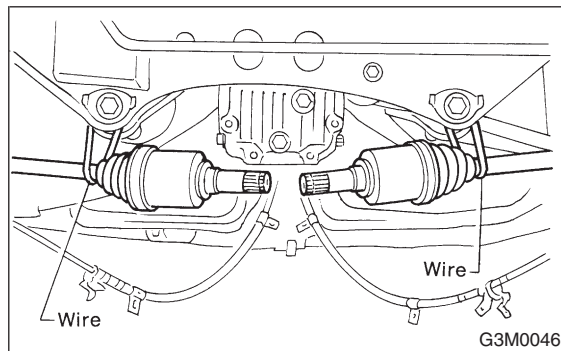
When removing the DOJ from the rear differential, fit tire lever to the bolt as shown in figure so as not to damage the axle shaft holder.

NOTE:

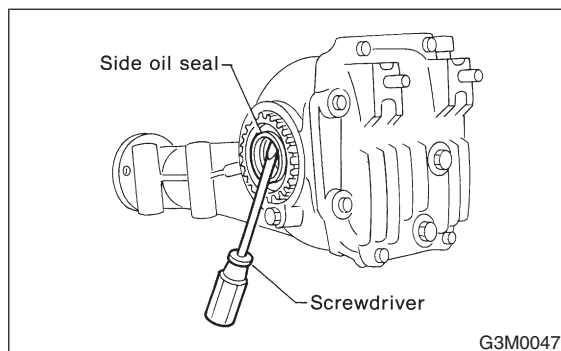
The side spline shaft circlip comes out together with the shaft.



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



- 10) Remove oil seal with screwdriver.

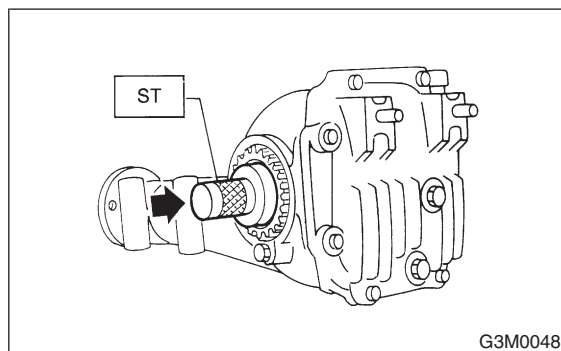


- 11) Drive in a new side oil seal with ST.

CAUTION:

Apply chassis grease between the oil seal lips.

ST 498447100 OIL SEAL INSTALLER



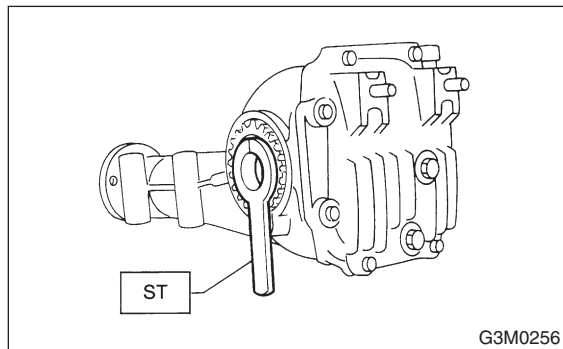
12) Insert the DOJ into rear differential.

CAUTION:

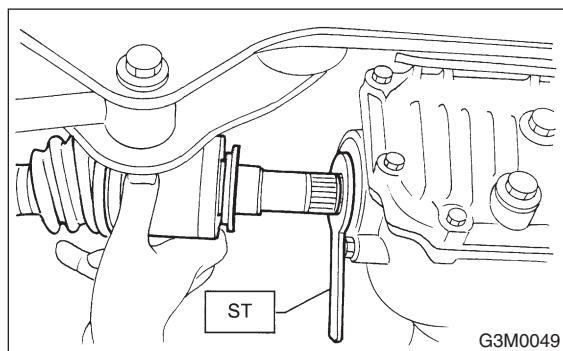
Before inserting, replace the circlip at the end of the spline shaft with a new one.

(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.



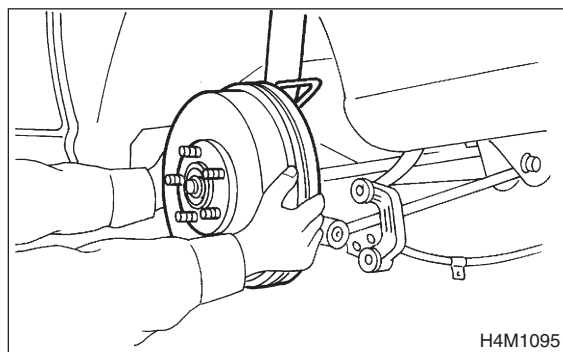
(3) Remove ST.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

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

NOTE:

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

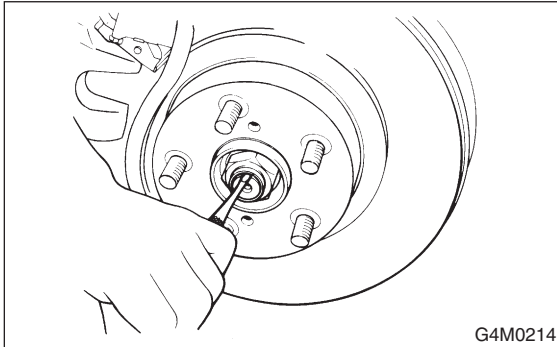


13) Hereafter, re-assemble in reverse order of disassembly.

3. Front Axle S301148

A: REMOVAL S301148A18

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, support it with safety stands, and remove front wheels.
- 3) Unlock axle nut.

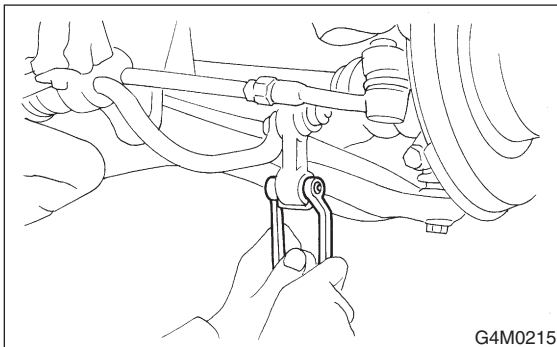


- 4) Remove axle nut using a socket wrench.

CAUTION:

Be sure to loose and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 5) Remove stabilizer link.



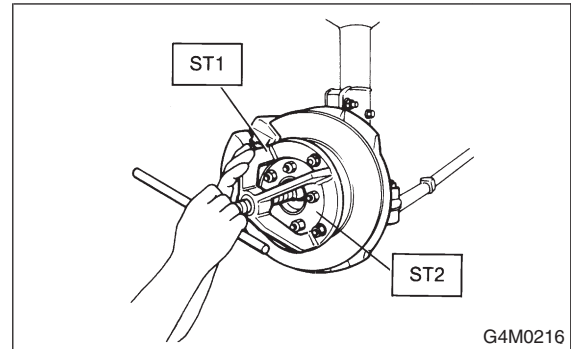
- 6) Remove disc brake caliper from housing, and suspend it from strut using a wire.

- 7) Remove front drive shaft assembly from hub. If it is hard to remove, use STs.

ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 PLATE

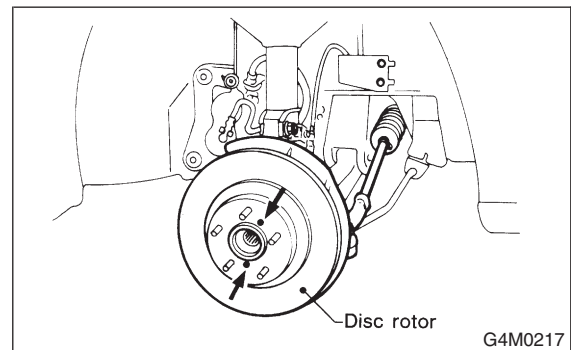
CAUTION:

- Be careful not to damage oil seal lip when removing front drive shaft.
- When replacing front drive shaft, also replace inner oil seal.

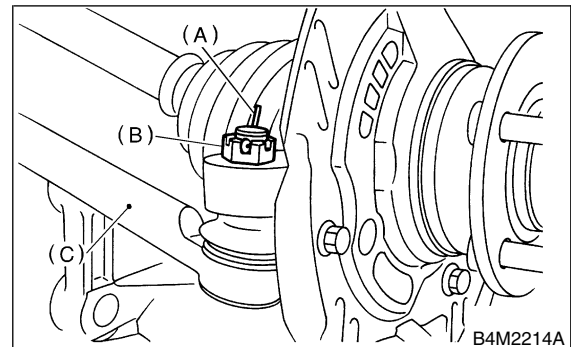


- 8) Remove disc rotor from hub.

If disc rotor seizes up within hub, drive disc rotor out by installing an 8-mm bolt in screw hole on the rotor.

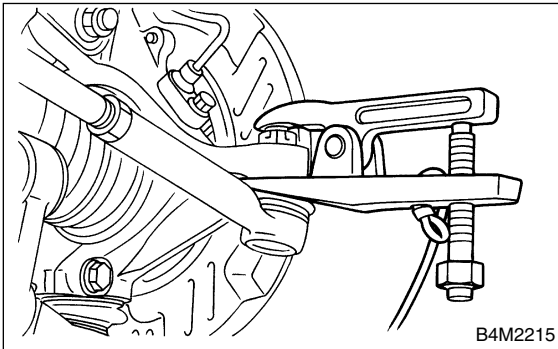


- 9) Remove cotter pin and castle nut which secure tie-rod end to housing knuckle arm.

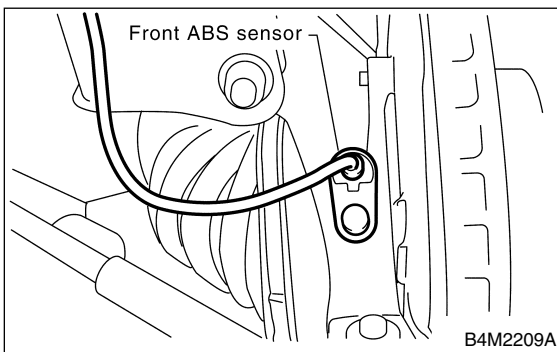


- (A) Cotter pin
(B) Castle nut
(C) Tie-rod

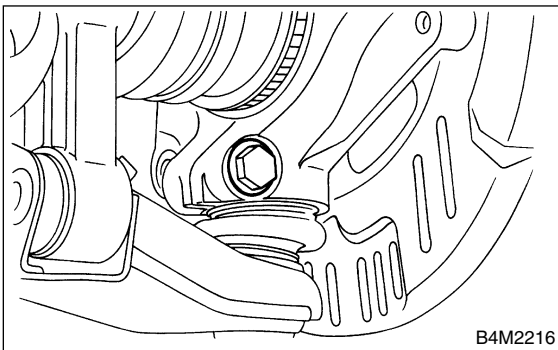
- 10) Using a puller, remove tie rod ball joint from knuckle arm.



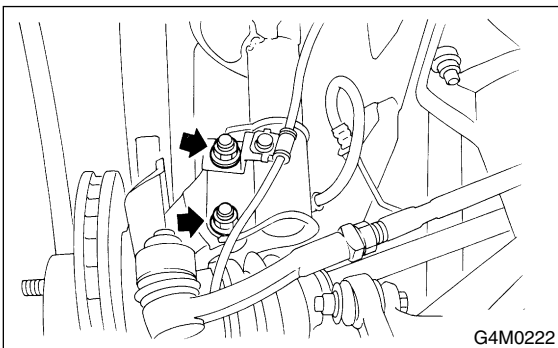
- 11) On ABS equipped models, remove ABS sensor assembly and harness in advance.



- 12) Remove transverse link ball joint from housing.



- 13) After scribing an alignment mark on camber adjusting bolt head, remove bolts which connect housing and strut, and disconnect housing from strut.



B: INSTALLATION S301148A11

- 1) Install transverse link ball joint to housing.

Tightening torque:

49 N·m (5 kgf-m, 36 ft-lb)

- 2) While aligning alignment mark on camber adjusting bolt head, connect housing and strut.

CAUTION:

Use a new self-locking nut.

Tightening torque:

152 N·m (15.5 kgf-m, 112 ft-lb)

- 3) Install speed sensor and harness on housing (only vehicle equipped with ABS).
4) Install disc rotor on hub.
5) Install disc brake caliper on housing.

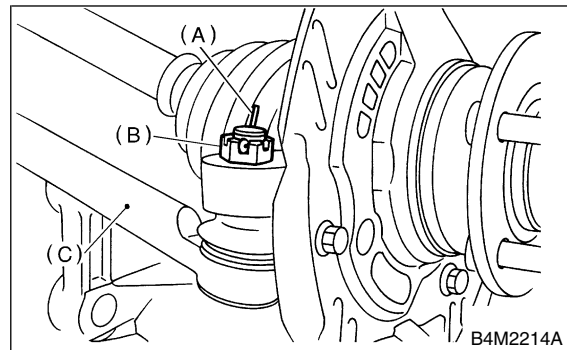
Tightening torque:

78 N·m (8 kgf-m, 58 ft-lb)

- 6) Install front drive shaft. <Ref. to DS-30 INSTALLATION, Front Drive Shaft.>
7) Connect stabilizer link.
8) Install tie-rod end ball joint on housing knuckle arm.

Tightening torque:

27.0 N·m (2.75 kgf-m, 19.9 ft-lb)



- (A) Cotter pin
(B) Castle nut
(C) Tie-rod

FRONT AXLE

Drive Shaft System

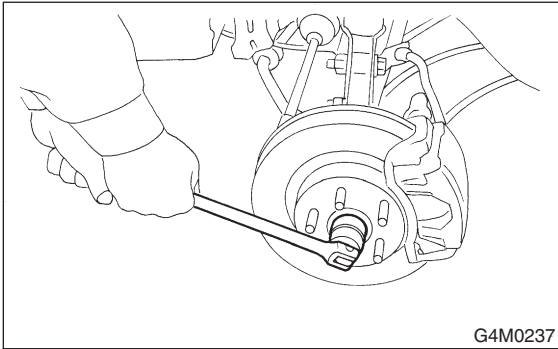
9) While depressing brake pedal, tighten axle nut and lock it securely.

CAUTION:

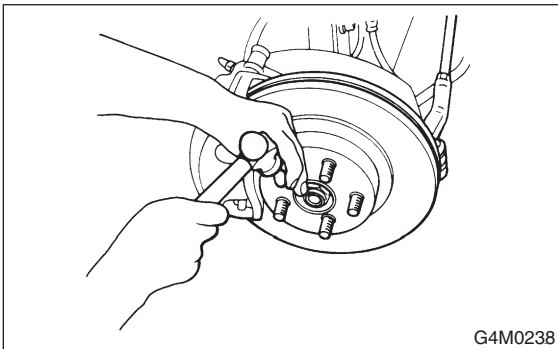
- Use a new axle nut.
- Always tighten axle nut before installing wheel on vehicle. If wheel is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

Tightening torque:

186 N·m (19 kgf-m, 137 ft-lb)



10) After tightening axle nut, lock it securely.



11) Install wheel and tighten wheel nuts to specified torque.

Tightening torque:

88 N·m (9 kgf-m, 65 ft-lb)

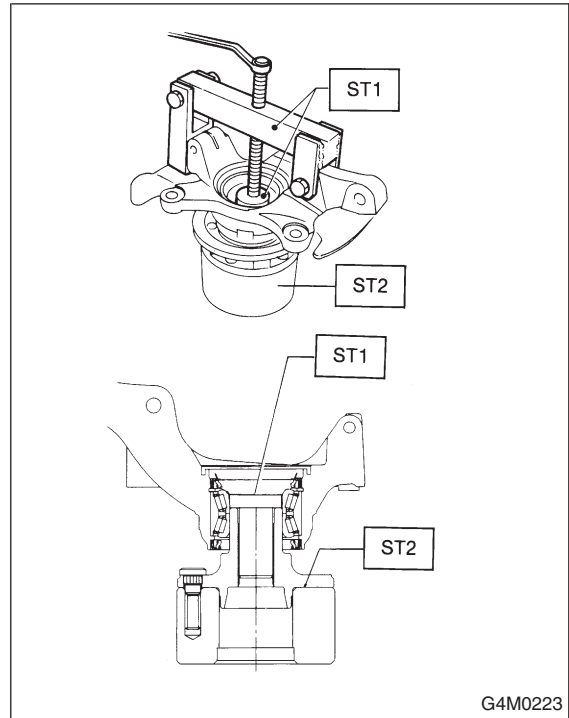
C: DISASSEMBLY

S301148A06

- 1) Using ST1, support housing and hub securely.
- 2) Attach ST2 to housing and drive hub out.

ST1 927060000 HUB REMOVER

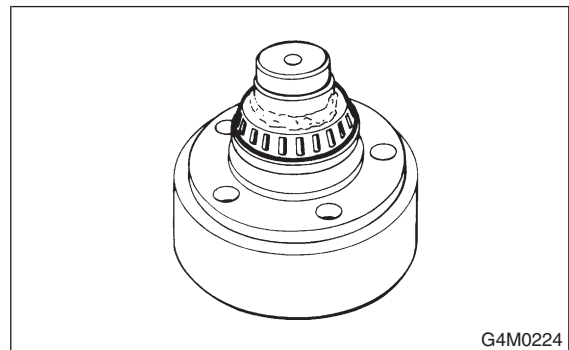
ST2 927080000 HUB STAND



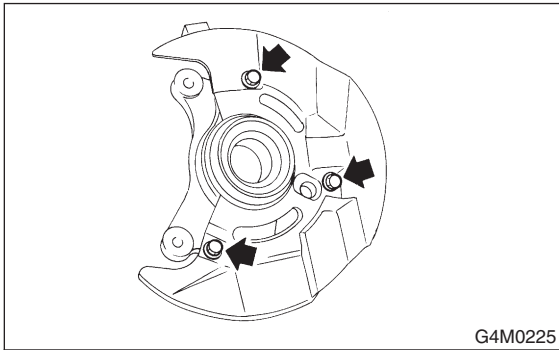
If inner bearing race remains in the hub, remove it with a suitable tool (commercially available).

CAUTION:

- Be careful not to scratch polished area of hub.
- Be sure to install inner race on the side of outer race from which it was removed.



3) Remove disc cover from housing.

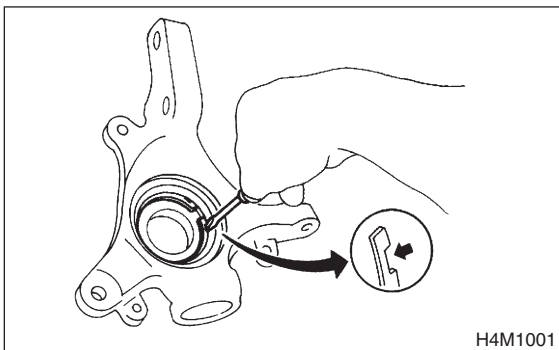


4) Using a standard screwdriver, remove outer and inner oil seals.

CAUTION:

Do not use old oil seals.

5) Using flat bladed screwdriver, remove snap ring.



6) Using ST1, support housing securely.

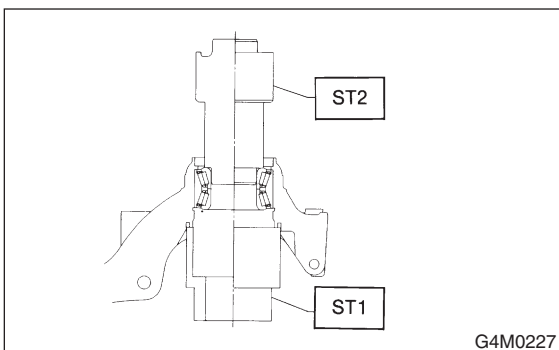
7) Using ST2, press inner race to drive out outer bearing.

ST1 927400000 HOUSING STAND

ST2 927100000 BEARING REMOVER

CAUTION:

- Do not remove outer race unless it is faulty.
- Discard outer race after removal.
- Do not replace inner or outer race separately; always replace as a unit.

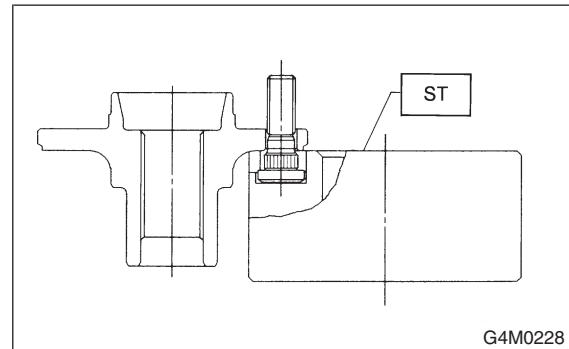


8) Using ST and a hydraulic press, drive hub bolts out.

ST 927080000 HUB STAND

CAUTION:

Be careful not to hammer hub bolts. This may deform hub.

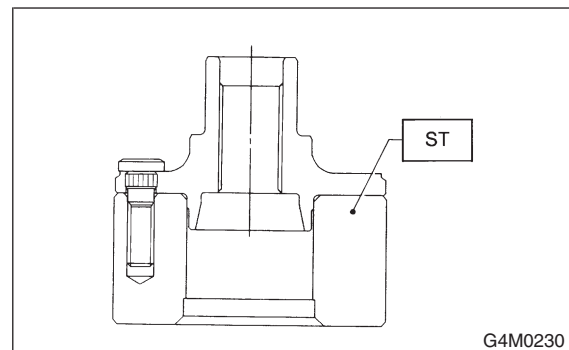


D: ASSEMBLY

S301148A02

1) Attach hub to ST securely.

ST 927080000 HUB STAND



2) Using a hydraulic press, press new hub bolts into place.

CAUTION:

Be sure to press hub bolts until their seating surfaces contact the hub.

NOTE:

Use 12 mm (0.47 in) dia. holes in HUB STAND to prevent bolts from tilting.

3) Clean dust or foreign particles from inside the housing.

FRONT AXLE

Drive Shaft System

4) Using ST1 and ST2, press a new bearing into place.

ST1 927400000 HOUSING STAND

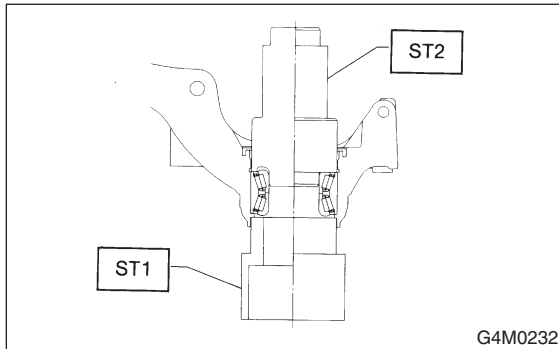
ST2 927100000 BEARING REMOVER

CAUTION:

- Always press outer race when installing bearing.
- Be careful not to remove plastic lock from inner race when installing bearing.
- Charge bearing with new grease when outer race is not removed.

Specified grease:

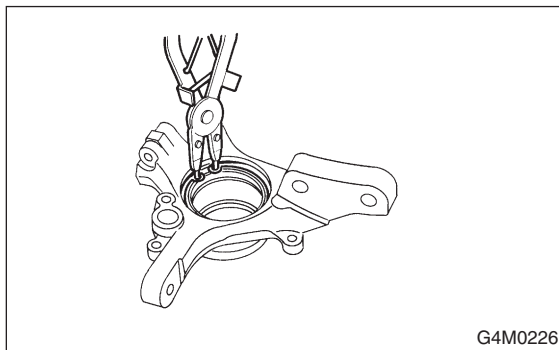
SHELL 6459N



5) Using pliers, install snap ring in its groove.

CAUTION:

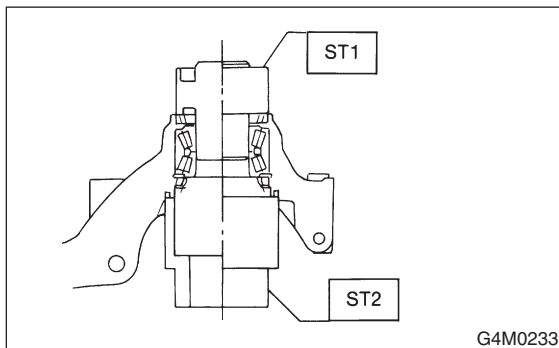
Make sure to install it firmly to groove.



6) Using ST1 and ST2, press outer oil seal until it contacts the bottom of housing.

ST1 927410000 OIL SEAL INSTALLER

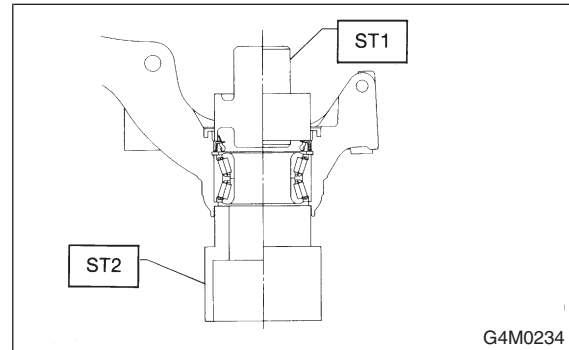
ST2 927400000 HOUSING STAND



7) Using ST1 and ST2, press inner oil seal until it contacts circlip.

ST1 927410000 OIL SEAL INSTALLER

ST2 927400000 HOUSING STAND



8) Invert ST and housing.

ST 927400000 HOUSING STAND

9) Apply sufficient grease to oil seal lip.

Specified grease:

SHELL 6459N

CAUTION:

- If specified grease is not available, remove bearing grease and apply Auto Rex A instead.
- Do not mix different types of grease.

10) Install disc cover to housing the three bolts.

Tightening torque:

18 N·m (1.8 kgf·m, 13 ft·lb)

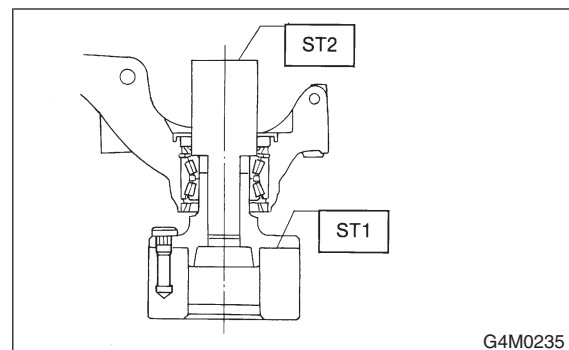
11) Attach hub to ST1 securely.

12) Clean dust or foreign particles from the polished surface of hub.

13) Using ST2, press bearing into hub by driving inner race.

ST1 927080000 HUB STAND

ST2 927120000 HUB INSTALLER



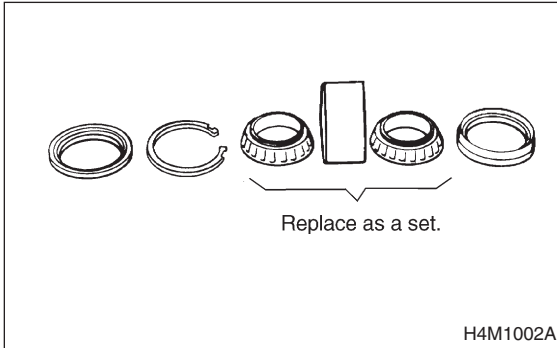
E: INSPECTION

S301148A10

Check the removed parts for wear and damage. If defective, replace with a new one.

CAUTION:

- If bearing is faulty, replace it as the bearing set.
- Be sure to replace oil seal at every overhaul.



5. Front Drive Shaft S301153

A: REMOVAL S301153A18

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, support it with safety stands (rigid rocks), and remove front wheel cap and wheels.
- 3) Unlock axle nut.
- 4) Remove axle nut using a socket wrench.

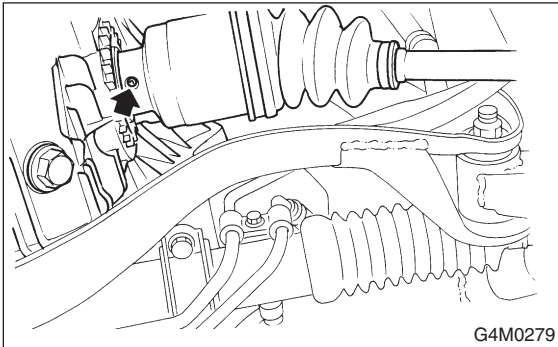
CAUTION:

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 5) Disconnect transverse link from housing.
- 6) Remove spring pin which secures transmission spindle to SFJ.

CAUTION:

Use a new spring pin.

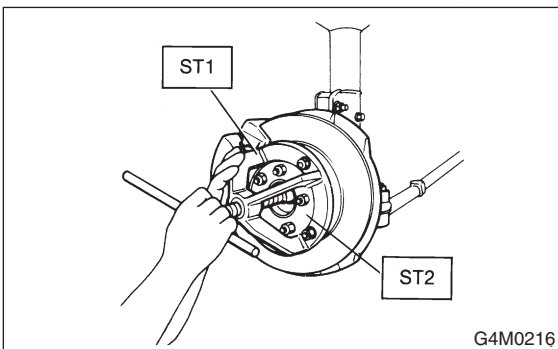


- 7) Remove front drive shaft assembly. If it is hard to remove, use ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 PLATE

CAUTION:

- Be careful not to damage oil seal lip when removing front drive shaft.
- When front drive shaft is to be replaced, also replace inner oil seal.



B: INSTALLATION S301153A11

- 1) Insert BJ into hub splines.

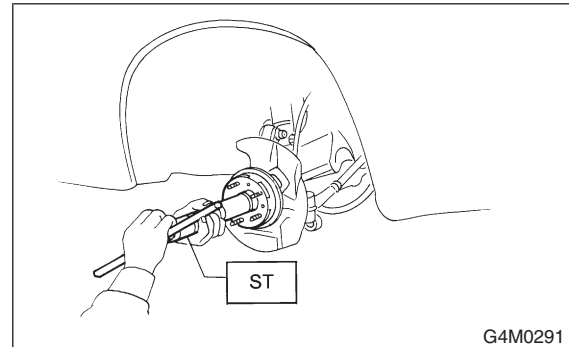
CAUTION:

Be careful not to damage inner oil seal lip.

- 2) Using ST1 and ST2, pull drive shaft into place.
ST1 922431000 AXLE SHAFT INSTALLER
ST2 927390000 ADAPTER

CAUTION:

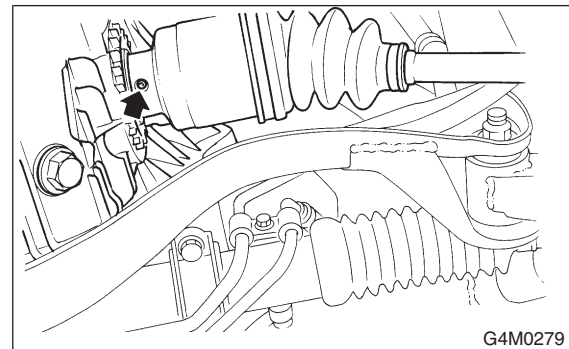
Do not hammer drive shaft when installing it.



- 3) Tighten axle nut temporarily.
- 4) Install SFJ on transmission spindle and drive spring pin into place.

CAUTION:

Always use a new spring pin.



- 5) Connect transverse link to housing.

Tightening torque (self-locking nut):
49 N·m (5.0 kgf-m, 36 ft-lb)

CAUTION:

Use a new self-locking nut.

- 6) Install stabilizer bracket.
- 7) While depressing brake pedal, tighten axle nut to the specified torque.

Tightening torque:
186 N·m (19 kgf-m, 137 ft-lb)

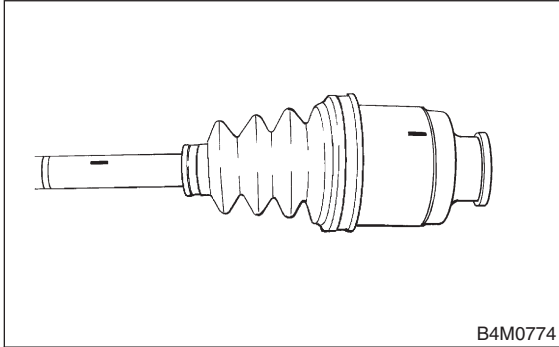
CAUTION:

- Use a new axle nut.
- Always tighten axle nut before installing wheel on vehicle. If wheel is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

C: DISASSEMBLY

S301153A06

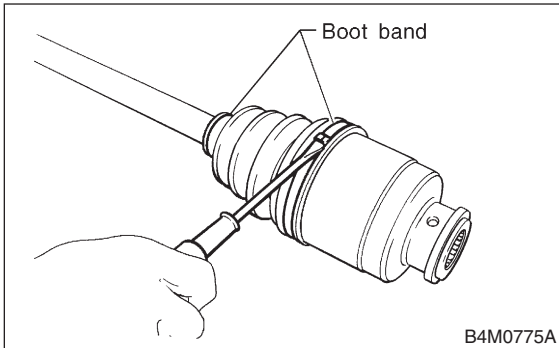
- 1) Place alignment marks on shaft and outer race.



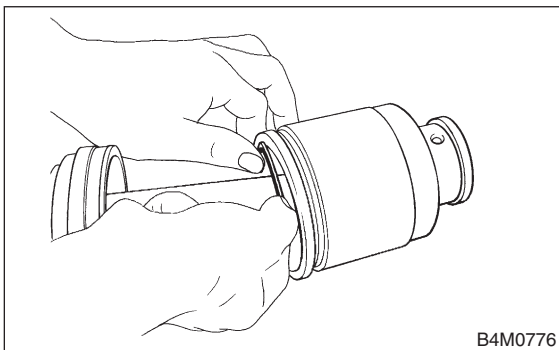
- 2) Remove SFJ boot band and boot.

CAUTION:

Be careful not to damage boot.



- 3) Remove circlip from SFJ outer race using screwdriver.

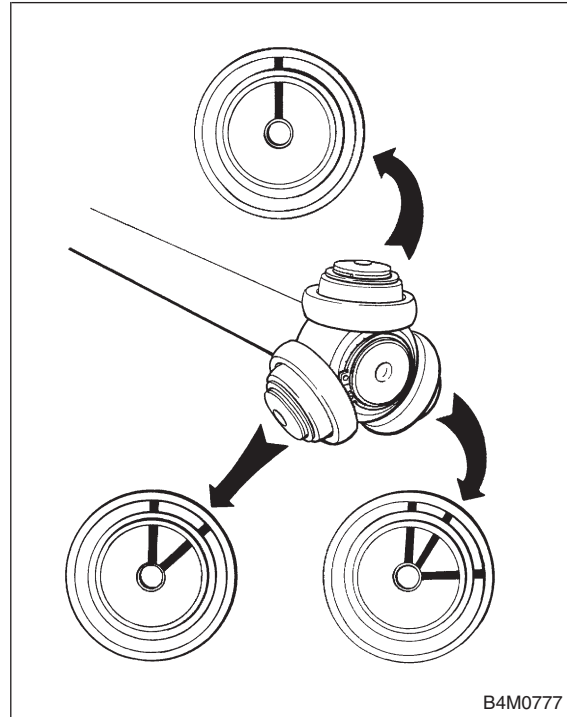


- 4) Remove SFJ outer race from shaft assembly.
- 5) Wipe off grease.

CAUTION:

The grease is a special grease. Do not confuse with other greases.

- 6) Place alignment mark on free ring and trunnion.

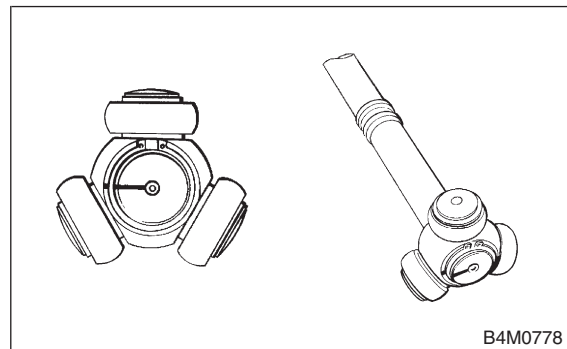


- 7) Remove free ring from trunnion.

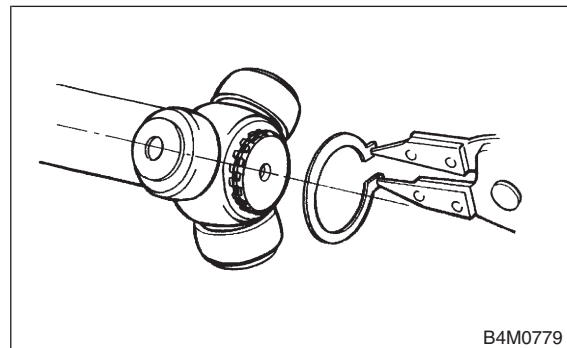
CAUTION:

Be careful with the free ring position.

- 8) Place alignment mark on trunnion and shaft.



- 9) Remove snap ring and trunnion.



FRONT DRIVE SHAFT

Drive Shaft System

CAUTION:

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

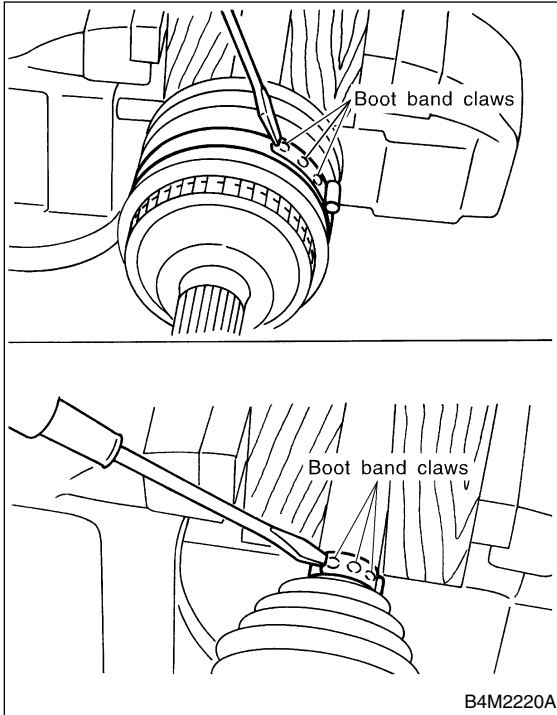
10) Remove SFJ boot.

11) Place drive shaft in a vise between wooden blocks.

CAUTION:

Do not place drive shaft directly in the vise; use wooden block.

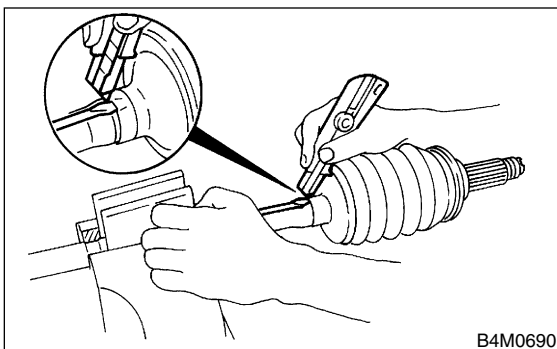
12) Raise boot band claws by means of screwdriver and hammer.



13) Cut and remove the boot.

CAUTION:

The boot must be replaced with a new one whenever it is removed.



14) Thus, disassembly of axle is completed, but BJ cannot be disassembled.

D: ASSEMBLY

S301153A02

CAUTION:

Use specified grease.

BJ side:

NTG2218 (Part No. 28093AA000)

SFJ side:

SSG-6003 (Part No. 28093TA000)

1) Place BJ boot and small boot band on BJ side of shaft.

CAUTION:

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

2) Place drive shaft in a vise.

CAUTION:

Do not place drive shaft directly in the vise; use wooden blocks.

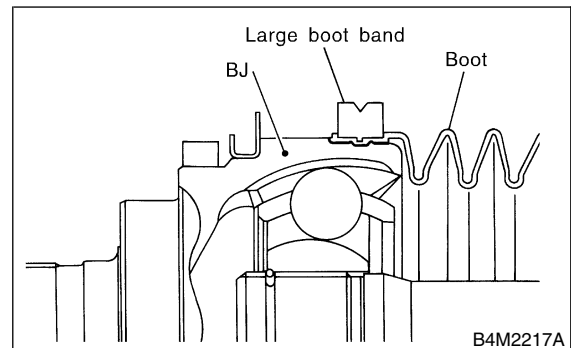
3) Apply a coat of specified grease [60 to 70 g (2.12 to 2.47 oz)] to BJ.

4) Apply an even coat of specified grease [20 to 30 g (0.71 to 1.06 oz)] to the entire inner surface of boot. Also apply grease to shaft.

NOTE:

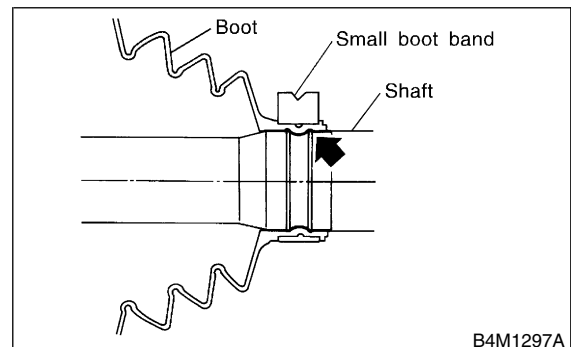
The inside of the larger end of BJ boot and the boot groove shall be cleaned so as to be free from grease and other substances.

5) Install boot projecting portion to BJ groove.



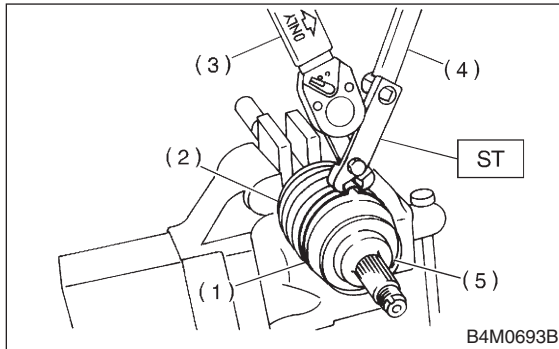
6) Set large boot band in place.

7) Install boot projecting portion to shaft groove.



8) Tighten boot bands using ST, torque wrench and socket flex handle.

ST 28099AC000 BOOT BAND PLIER



- (1) Large boot band
- (2) Boot
- (3) Torque wrench
- (4) Socket flex handle
- (5) BJ

Tightening torque:

Large boot band

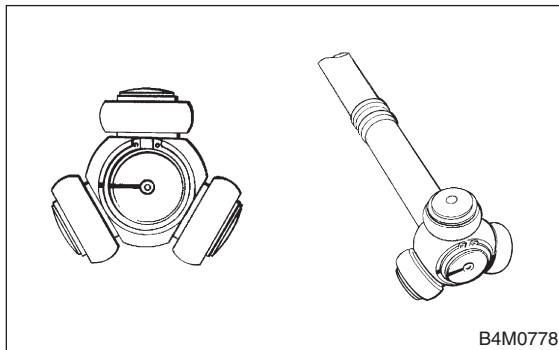
157 N·m (16.0 kgf-m, 116 ft-lb) or more

Small boot band

133 N·m (13.6 kgf-m, 98 ft-lb) or more

9) Place SFJ boot at the center of shaft.

10) Align alignment marks and install trunnion on shaft.



11) Install snap ring to shaft.

CAUTION:

Confirm that the snap ring is completely fitted in the shaft groove.

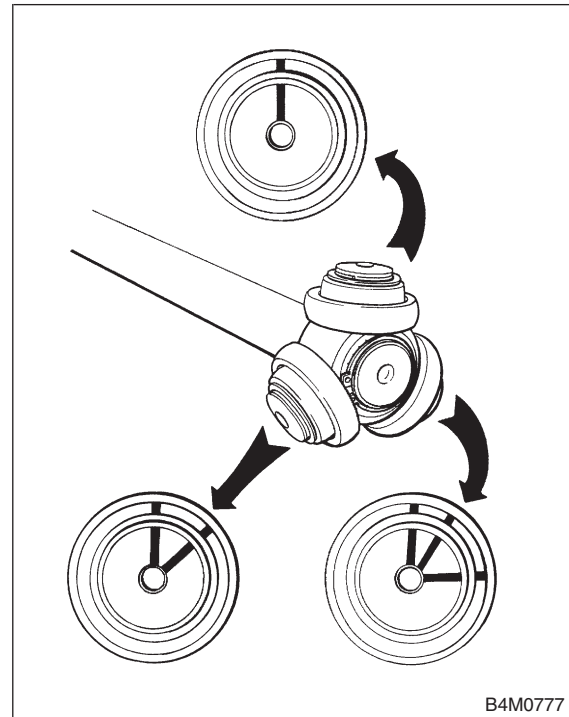
12) Fill 100 to 110 g (3.53 to 3.88 oz) of specified grease into the interior of SFJ outer race.

13) Apply a coat of specified grease to free ring and trunnion.

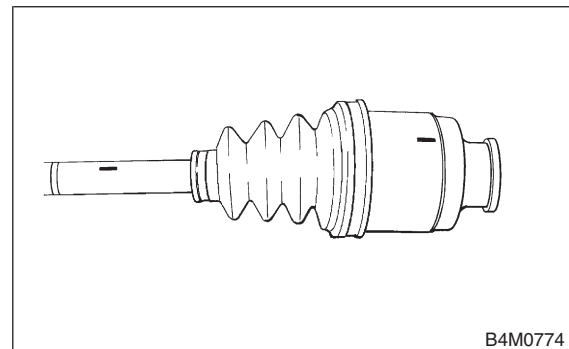
14) Align alignment marks on free ring and trunnion and install free ring.

CAUTION:

Be careful with the free ring position.



15) Align alignment marks on shaft and outer race, and install outer race.



16) Install circlip in the groove on SFJ outer race.

CAUTION:

Pull the shaft lightly and assure that the circlip is completely fitted in the groove.

17) Apply an even coat of the specified grease 30 to 40 g (1.06 to 1.41 oz) to the entire inner surface of boot.

18) Install SFJ boot taking care not to twist it.

CAUTION:

● The inside of the larger end of SFJ boot and the boot groove shall be cleaned so as to be free from grease and other substances.

● When installing SFJ boot, position outer race of SFJ at center of its travel.

FRONT DRIVE SHAFT

Drive Shaft System

19) Put a band through the clip and wind twice in alignment with band groove of boot.

CAUTION:

Use a new band.

20) Pinch the end of band with pliers. Hold the clip and tighten securely.

NOTE:

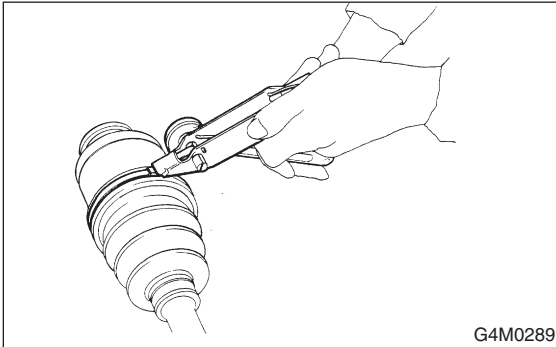
When tightening boot, exercise care so that the air within the boot is appropriate.

21) Tighten band by using ST.

ST 925091000 BAND TIGHTENING TOOL

NOTE:

Tighten band until it cannot be moved by hand.

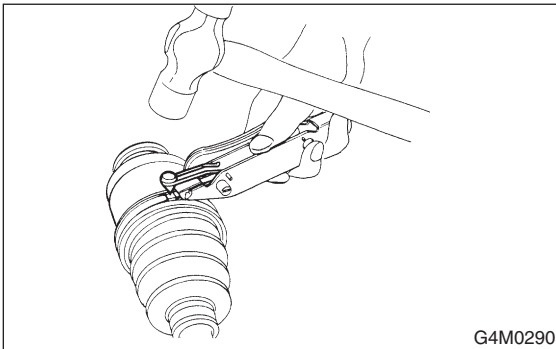


22) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

CAUTION:

Tap to an extent that the boot underneath is not damaged.



23) Cut off band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.

CAUTION:

Be careful so that the end of the band is in close contact with clip.

24) Fix up boot on BJ in the same manner.

NOTE:

Extend and retract SFJ to provide equal grease coating.

E: INSPECTION

S301153A10

Check the removed parts for damage, wear, corrosion etc. If faulty, repair or replace.

1) DOJ (Double Offset Joint)

Check seizure, corrosion, damage, wear and excessive play.

2) SFJ (Shudder-less Freering tripod Joint)

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) BJ (Bell Joint)

Check seizure, corrosion, damage and excessive play.

5) Boot

Check for wear, warping, breakage or scratches.

6) Grease

Check for discoloration or fluidity.

GENERAL DESCRIPTION

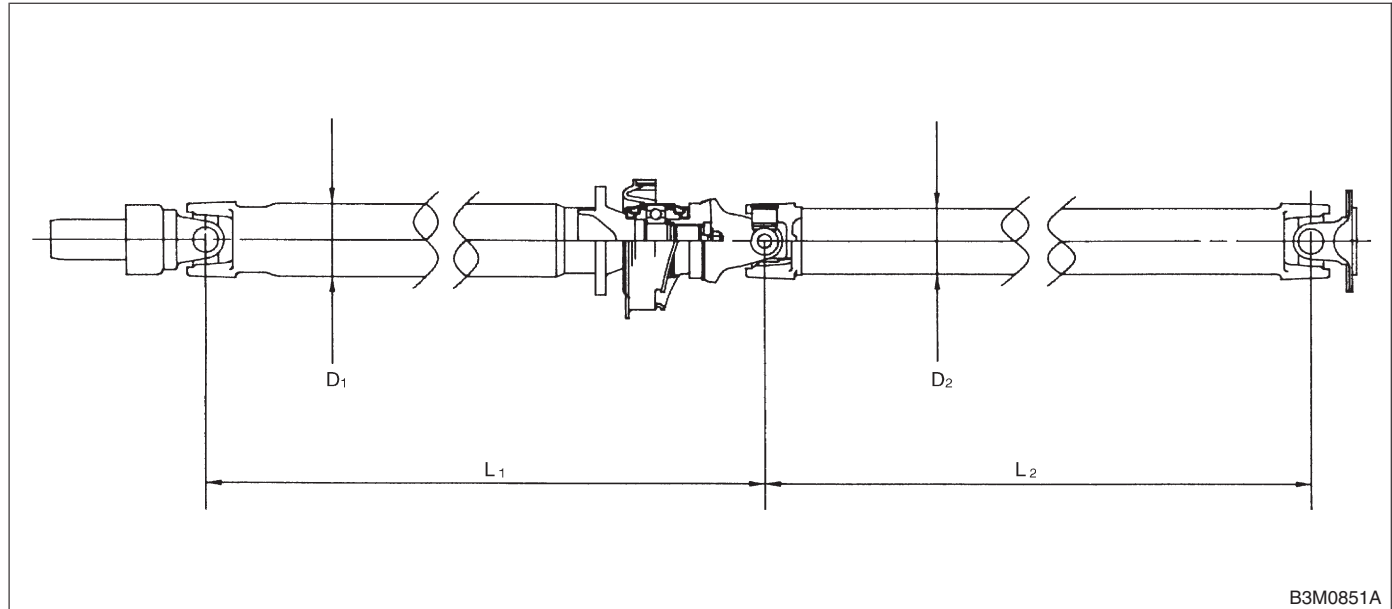
Drive Shaft System

1. General Description S301001

A: SPECIFICATIONS S301001E49

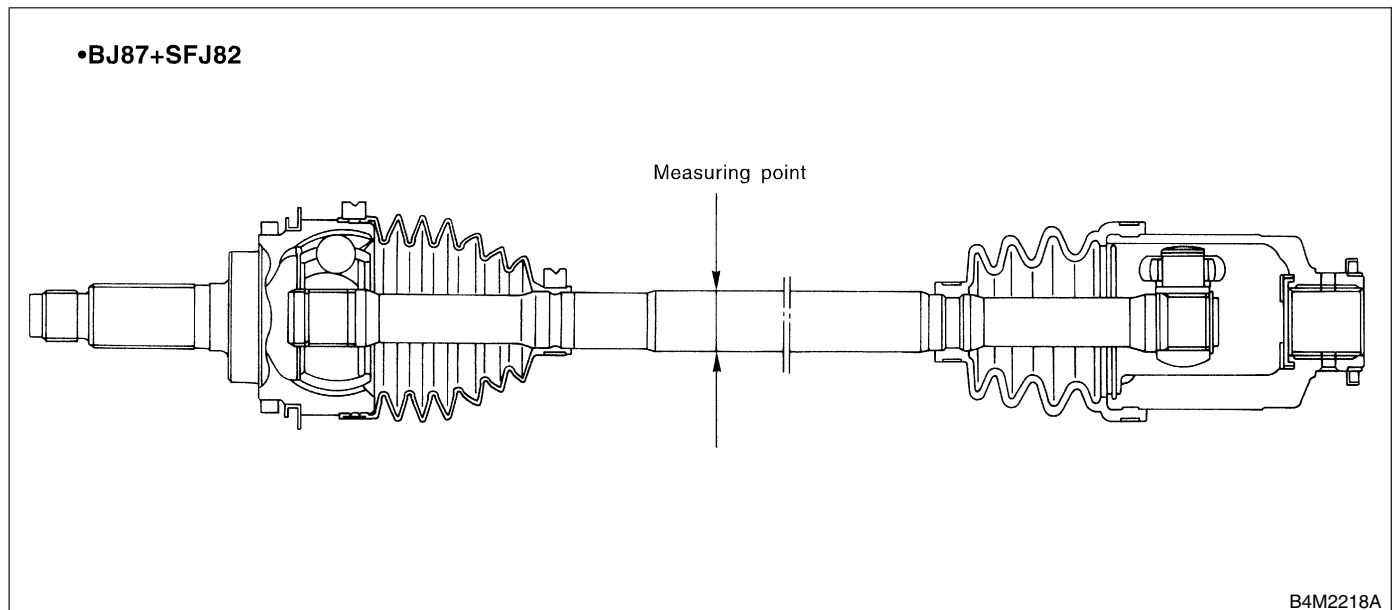
1. PROPELLER SHAFT S301001E4901

Front propeller shaft Joint-to-joint length: L_1 mm (in)	AT	584 (22.99)
	MT	643 (25.31)
Rear propeller shaft Joint-to-joint length: L_2 mm (in)		708 (27.87)
Outside dia. of tube mm (in)	D_1	63.5 (2.500)
	D_2	57.0 (2.244)



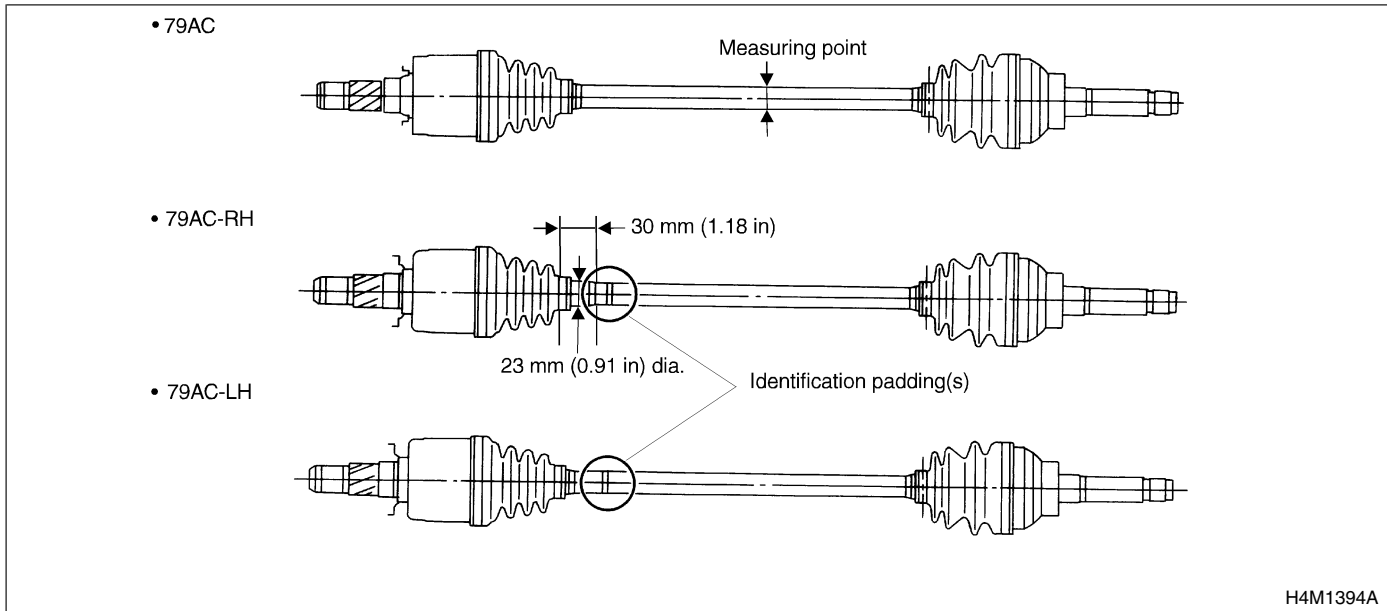
2. FRONT DRIVE SHAFT ASSEMBLY S301001E4902

Model	Type of drive shaft assembly	SHAFT
		Shaft diameter
All models	BJ87L+SFJ82	26 mm (1.02 in)



3. REAR DRIVE SHAFT ASSEMBLY S301001E4903

Type of axle shaft assembly	SHAFT	
	No. of identification paddings on shaft	Shaft diameter
79AC	None	23 mm (0.91 in)
79AC-RH	2 (Two)	
79AC-LH	1 (One)	



4. APPLICATION TABLE OF DRIVE SHAFT ASSEMBLY S301001E4904

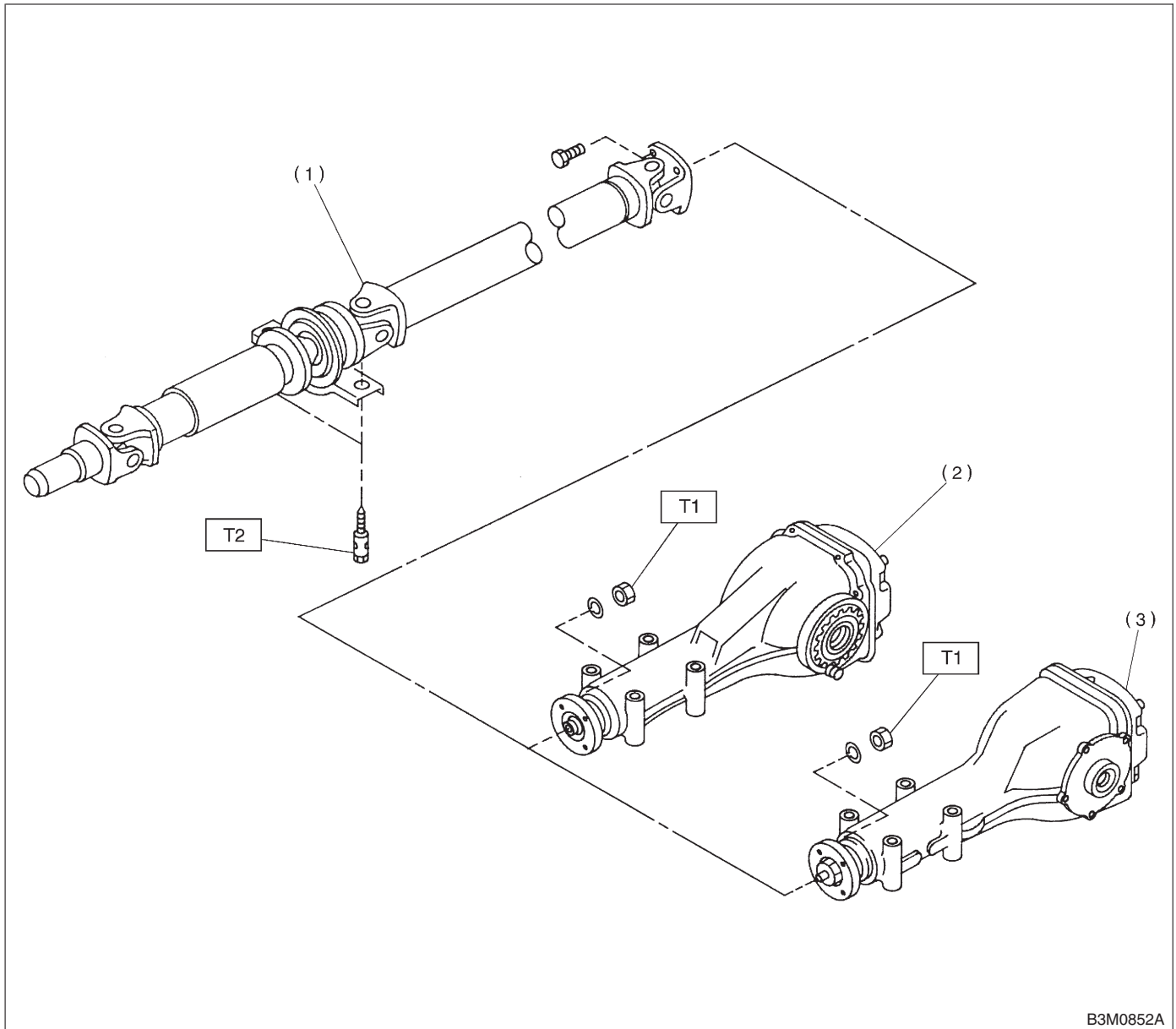
Power unit	Front drive shaft	Rear drive shaft	
		5MT	4AT
2200 cc	BJ87L + SFJ82	79AC-RH	79AC
		79AC-LH	
2500 cc	BJ87L + SFJ82	79AC-RH	79AC-RH
		79AC-LH	79AC-LH

GENERAL DESCRIPTION

Drive Shaft System

B: COMPONENT S301001A05

1. PROPELLER SHAFT S301001A0501



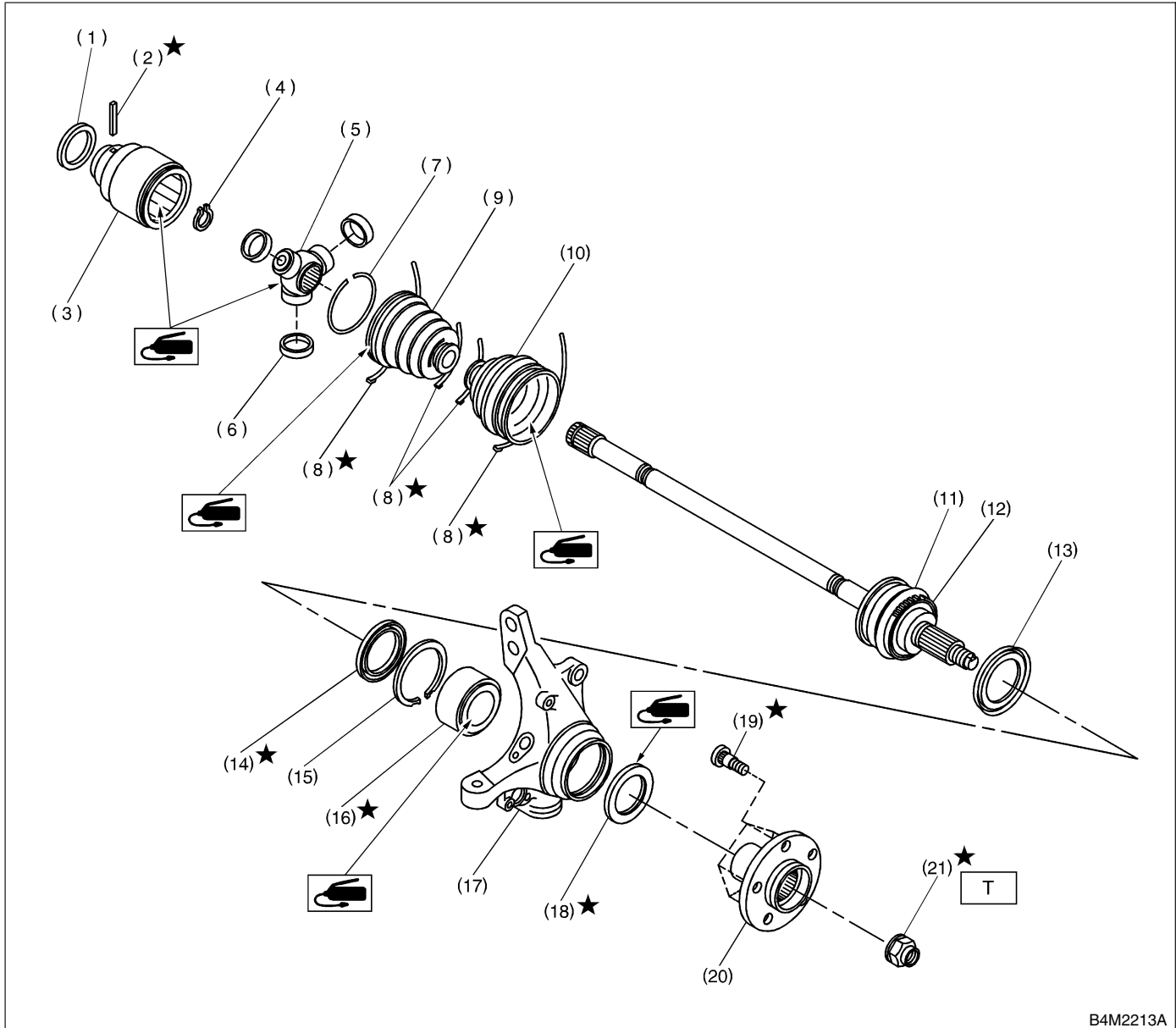
- (1) Propeller shaft
- (2) Rear differential (VA-type)
- (3) Rear differential (T-type)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 31 (3.2, 23.1)

T2: 52 (5.3, 38.3)

2. FRONT AXLE S301001A0502



B4M2213A

- (1) Baffle plate (SFJ)
- (2) Spring pin
- (3) Outer race (SFJ)
- (4) Snap ring
- (5) Trunnion
- (6) Free ring
- (7) Circlip
- (8) Boot band
- (9) Boot (SFJ)

- (10) Boot (BJ)
- (11) BJ ASSY
- (12) Tone wheel
- (13) Baffle plate
- (14) Oil seal (IN)
- (15) Snap ring
- (16) Bearing
- (17) Housing
- (18) Oil seal (OUT)

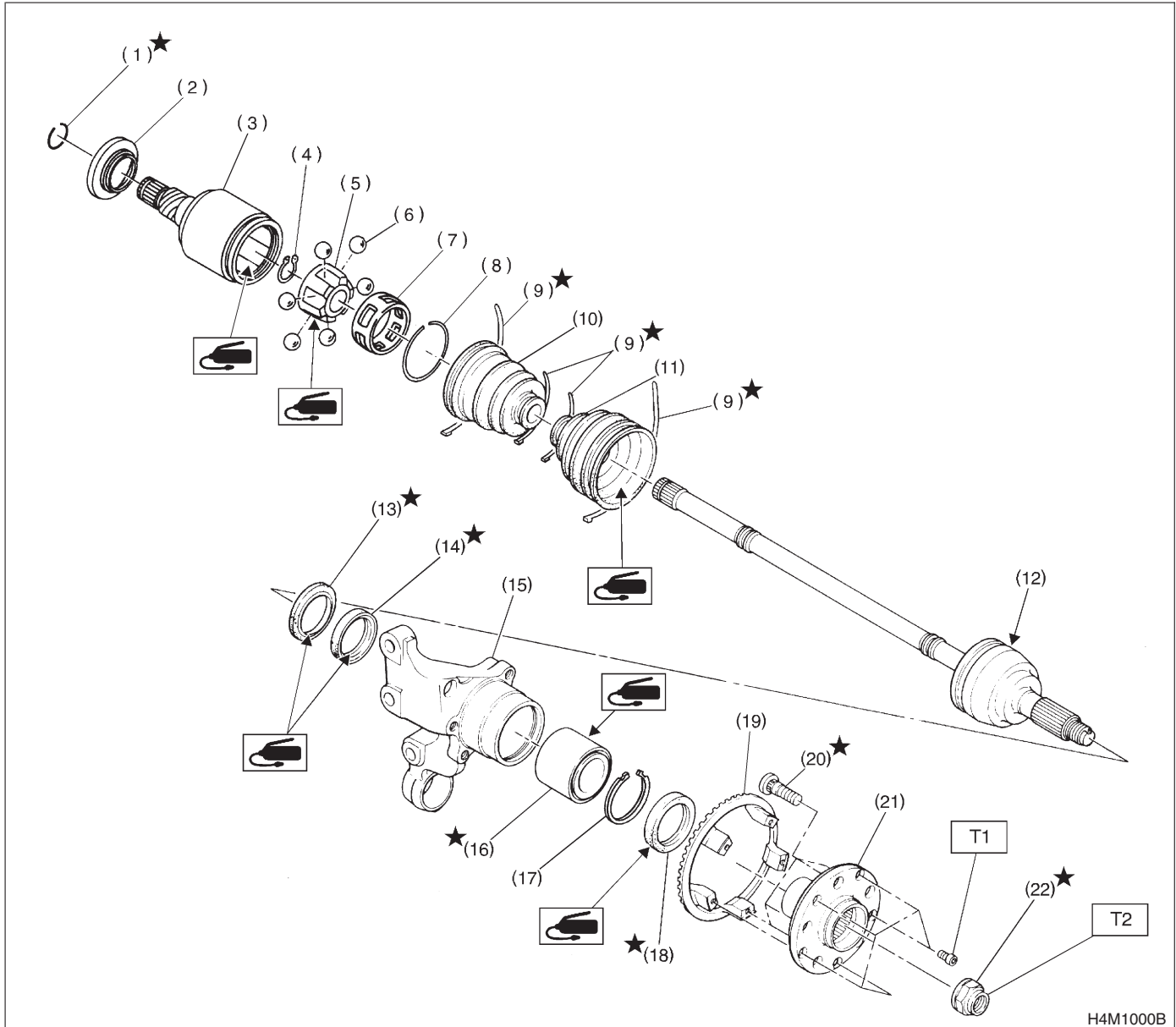
- (19) Hub bolt
- (20) Hub
- (21) Axle nut

Tightening torque: N·m (kgf-m, ft-lb)
T: 186 (19, 137)

GENERAL DESCRIPTION

Drive Shaft System

3. REAR AXLE S301001A0503



- (1) Circlip (2200 cc AT model)
- (2) Baffle plate (DOJ)
- (3) Outer race (DOJ)
- (4) Snap ring
- (5) Inner race
- (6) Ball
- (7) Cage
- (8) Circlip
- (9) Boot band

- (10) Boot (DOJ)
- (11) Boot (BJ)
- (12) BJ ASSY
- (13) Oil seal (IN. No. 2)
- (14) Oil seal (IN. No. 3)
- (15) Housing
- (16) Bearing
- (17) Snap ring
- (18) Oil seal (OUT)

- (19) Tone wheel
- (20) Hub bolt
- (21) Hub
- (22) Axle nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 13 (1.3, 9.4)

T2: 186 (19, 137)

C: CAUTION S301001A03

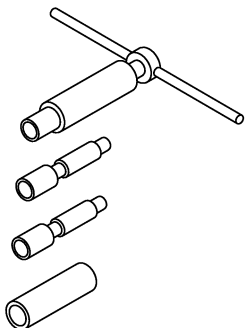
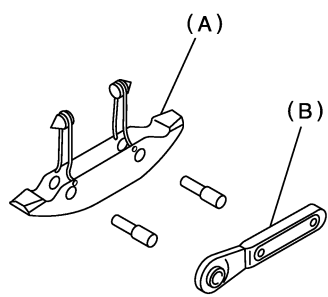
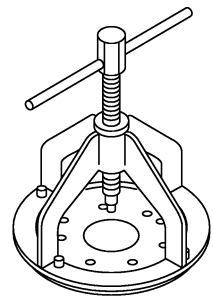
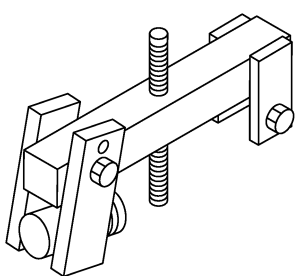
- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of grease to avoid damage and deformation.
- Before securing a part on a vice, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vice.

GENERAL DESCRIPTION

Drive Shaft System

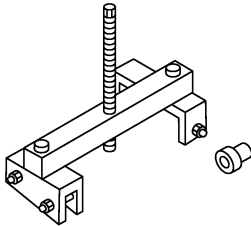
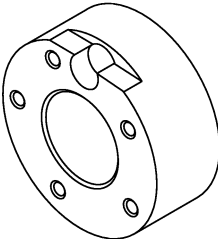
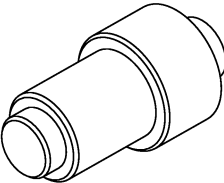
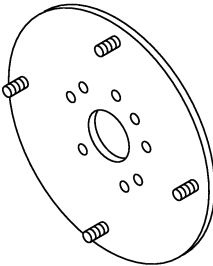
D: PREPARATION TOOL S301001A17

1. SPECIAL TOOL S301001A1703

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B4M2386	922431000	AXLE SHAFT INSTALLER	- Used for installing axle shaft into housing. - Used with ADAPTER (927390000).
 B4M2387A	925091000	BAND TIGHTENING TOOL	- Used for tightening boot band. (A) Jig for band (B) Ratchet wrench
 B4M2388	926470000	AXLE SHAFT PULLER	Used for removing axle shaft.
 B4M2389	927060000	HUB REMOVER	- Used for removing front hub. - Used with HUB STAND (927080000).

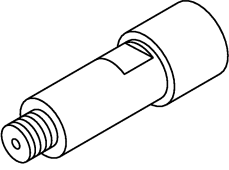
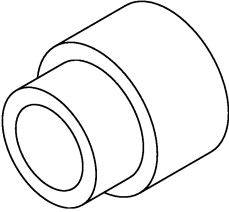
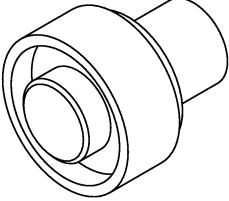
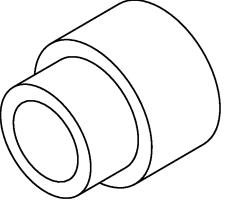
GENERAL DESCRIPTION

Drive Shaft System

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 H5M0981	927420000	HUB REMOVER	- Used for removing rear hub. - Used with HUB STAND (927080000).
 B4M2390	927080000	HUB STAND	Used for disassembling and assembling hub bolt in hub.
 B4M2391	927100000	BEARING PULLER	- Used for disassembling and assembling front housing bearing. - Used with HOUSING STAND (927400000).
 B4M2392	927140000	AXLE SHAFT PULLER PLATE	Same as plate 2 included in AXLE SHAFT PULLER (926470000).

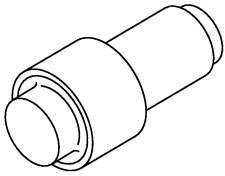
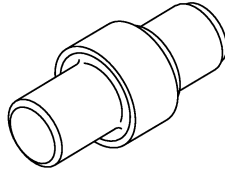
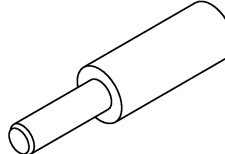
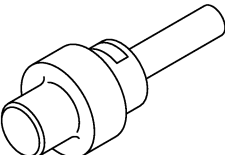
GENERAL DESCRIPTION

Drive Shaft System

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B4M2393	927390000	ADAPTER	Used as an adapter for AXLE SHAFT INSTALLER (922431000).
 B4M2394	927400000	HOUSING STAND	- Used for disassembling and assembling front housing bearing. - Used with BEARING PULLER (927100000).
 B4M2395	927410000	OIL SEAL INSTALLER	- Used for installing oil seal into front housing. - Used with HOUSING STAND (927400000).
 H5M0982	927430000	HOUSING STAND	- Used for disassembling and assembling rear housing bearing. - Used with BEARING PULLER (927440000).

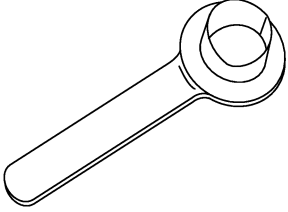
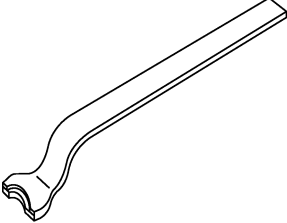
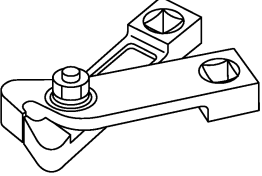
GENERAL DESCRIPTION

Drive Shaft System

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 H5M0983	927440000	BEARING REMOVER	- Used for disassembling and assembling rear housing bearing. - Used with HOUSING STAND (927430000).
 H5M0984	927460000	OIL SEAL INSTALLER	- Used for installing outer bearing and sub bearing into housing. - Used with HOUSING STAND (927430000).
 B4M2399	927120000	HUB INSTALLER	- Used for installing hub. - Used with HUB STAND (927080000).
 B4M2400	927450000	HUB INSTALLER	- Used for pressing rear hub unit into housing assembly. - Used with HUB STAND (927080000).

GENERAL DESCRIPTION

Drive Shaft System

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B4M2401	28099PA090	OIL SEAL PROTECTOR	- Used for installing rear drive shaft into rear differential. - For potecting oil seal.
 B4M2402	28099PA100	DRIVE SHAFT REMOVER	Used for removing rear drive shaft from rear differential.
 B4M2403	28099AC000	BOOT BAND PLIERS	Used for tightening front BJ boot band.

2. GENERAL TOOL S301001A1704

TOOL NAME	REMERKS
Puller	Used for removing ball joint from knuckle arm.
Dial Gauge	Used for inspecting propeller shaft run-out.
Snap Ring Pliers	Used for installing and removing snap ring.

7. General Diagnostic Table S301257

A: INSPECTION S301257A10

NOTE:

Vibration while cruising may be caused by an unbalanced tire, improper tire inflation pressure, improper wheel alignment, etc.

Symptom	Possible cause	Remedy
1. Vibration of propeller shaft NOTE: Vibration is caused by propeller shaft during operation and is transferred to vehicle body. Generally vibration increase in proportion to vehicle speed.	(1) Worn or damaged universal joint.	Replace.
	(2) Unbalanced propeller shaft due to bend or dent.	Replace.
	(3) Loose installation of propeller shaft.	Retighten.
	(4) Worn or damaged center bearing and damaged center mounting rubber.	Replace.
2. Tapping when starting and noise while cruising, caused by propeller shaft.	(1) Worn or damaged universal joint.	Replace.
	(2) Worn spline of sleeve yoke.	Replace.
	(3) Loose installation of propeller shaft.	Retighten.
	(4) Loose installation of joint.	Replace.
	(5) Worn or damaged center bearing and damaged center mounting rubber.	Replace.

GENERAL DIAGNOSTIC TABLE

Drive Shaft System

MEMO:

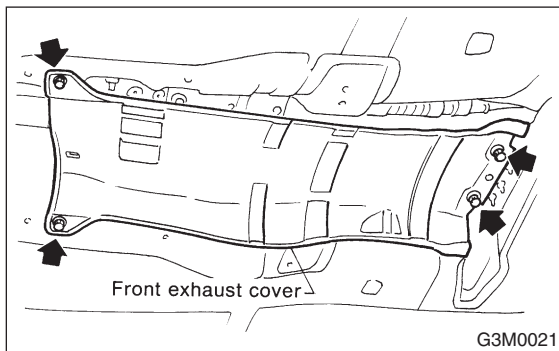
2. Propeller Shaft S301160

A: REMOVAL S301160A18

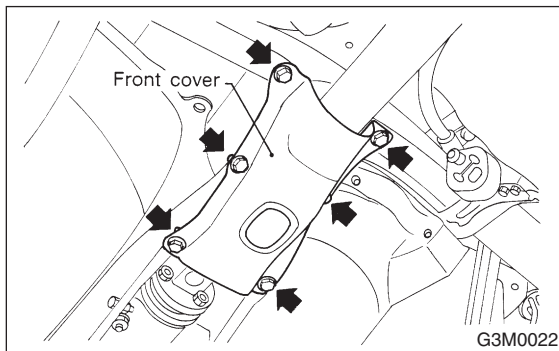
NOTE:

Before removing propeller shaft, wrap metal parts with a cloth or rubber material.

- 1) Disconnect ground terminal from battery.
- 2) Move selector lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Jack-up vehicle and support it with sturdy racks.
- 5) Remove rear exhaust pipe and muffler.
<Ref. to EX-10 REMOVAL, Rear Exhaust Pipe.>
and <Ref. to EX-12 REMOVAL, Muffler.>
- 6) Remove front exhaust cover.



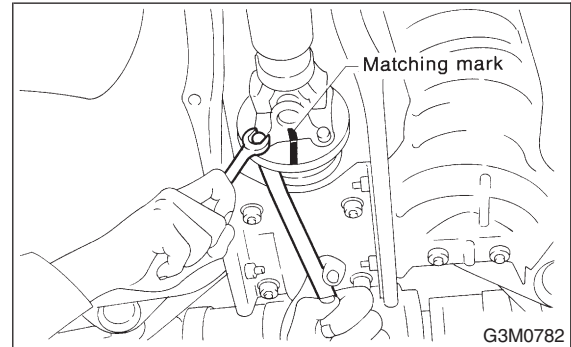
- 7) Remove differential mount front cover.



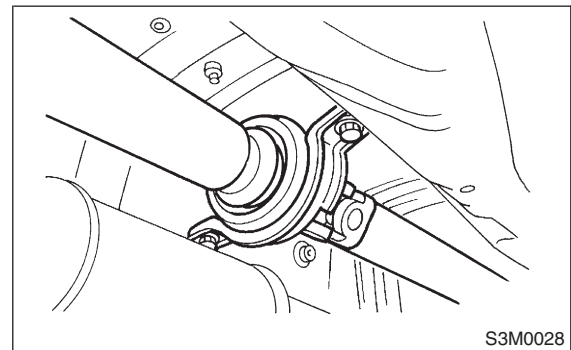
- 8) Remove the four bolts which hold propeller shaft to rear differential.

NOTE:

- Put matching mark on affected parts before removal.
- Remove all but one bolt.



- 9) Remove the two bolts which hold center bearing to vehicle body.



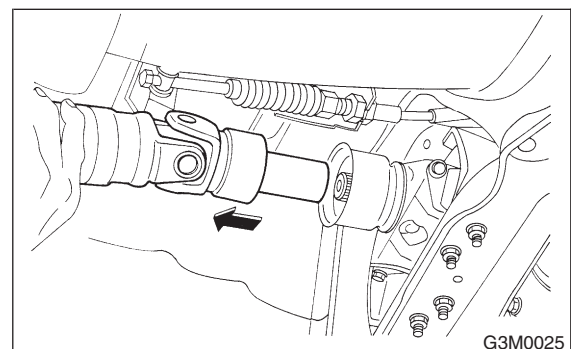
- 10) Remove propeller shaft from transmission.

CAUTION:

Be sure not to damage oil seals and the frictional surface of sleeve yoke.

NOTE:

- Be sure to use an empty oil can to catch oil flowing out when removing propeller shaft.
- Be sure to plug the opening in transmission after removal of propeller shaft.



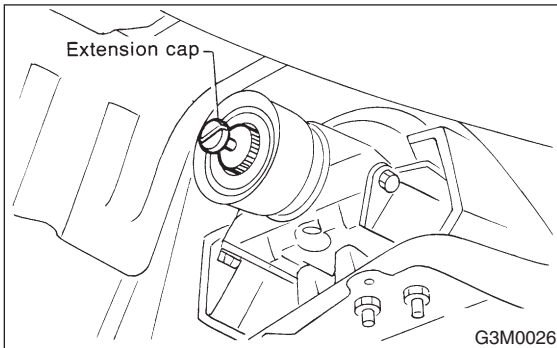
PROPELLER SHAFT

Drive Shaft System

11) Install the extension cap to transmission.

NOTE:

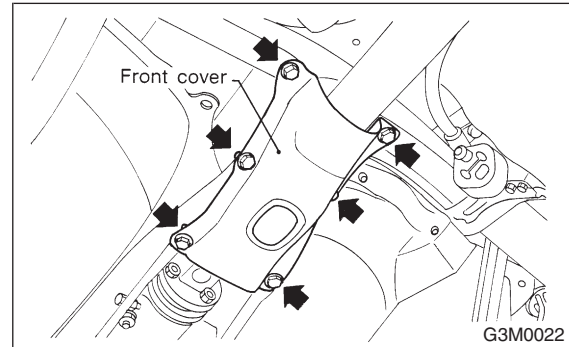
If extension cap is not available, cover the opening with a vinyl bag in order to prevent transmission gear oil or ATF leakage.



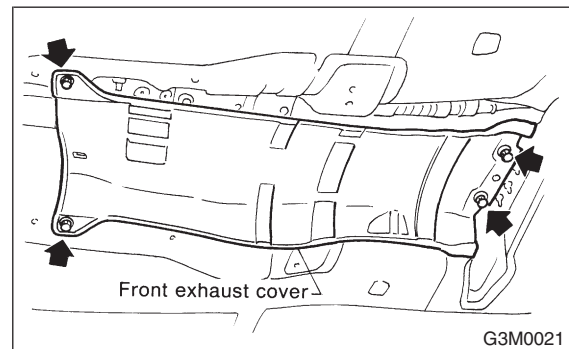
3) Install differential mount front cover.

Tightening torque:

88 N·m (9.0 kgf-m, 65 ft-lb)



4) Install front exhaust cover.



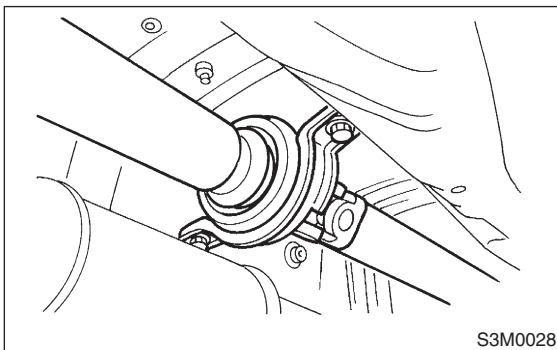
B: INSTALLATION

S301160A11

1) Insert sleeve yoke into transmission and attach center bearing to vehicle body.

Tightening torque:

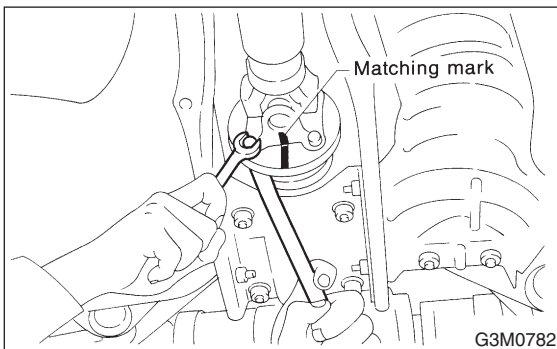
52 N·m (5.3 kgf-m, 38.3 ft-lb)



2) Align matching marks and connect flange yoke and rear differential.

Tightening torque:

31 N·m (3.2 kgf-m, 23.1 ft-lb)



5) Install rear exhaust pipe and muffler.

C: DISASSEMBLY

S301160A06

NOTE:

Do not disassemble propeller shaft. It is a single unit.

D: ASSEMBLY

S301160A02

NOTE:

Do not disassemble propeller shaft. It is a single unit.

E: INSPECTION S301160A10

NOTE:

Do not disassemble propeller shaft. Check the following and replace if necessary.

- 1) Tube surfaces for dents or cracks
- 2) Splines for deformation or abnormal wear
- 3) Joints for non-smooth operation or abnormal noise
- 4) Center bearing for free play, noise or non-smooth operation
- 5) Oil seals for abnormal wear or damage
- 6) Center bearing for breakage

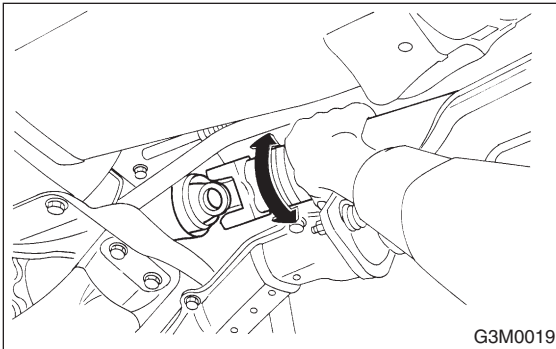
Check the following points with propeller shaft installed in vehicle.

- 7) Joints and connections

Check for any looseness of yoke flange connecting bolts and center bearing retaining bolts.

- 8) Splines and bearing locations

Turn propeller shaft by hand to see if abnormal free play exists at splines. Also move yokes to see if abnormal free play exists at spiders and bearings.



- 9) Runout of propeller shaft

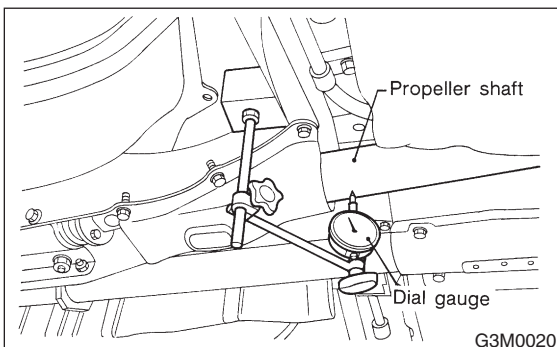
Turn rear wheels by hand to check for "runout" of propeller shaft.

NOTE:

Measure runout with a dial gauge at the center of front and rear propeller shaft tubes.

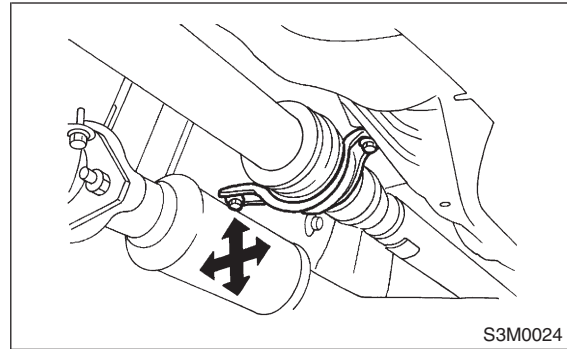
Runout:

Limit 0.6 mm (0.024 in)



- 10) Center bearing free play

While holding propeller shaft near center bearing with your hand, move it up and down, and left and right to check for any abnormal bearing free play.



4. Rear Axle S301154

A: REMOVAL S301154A18

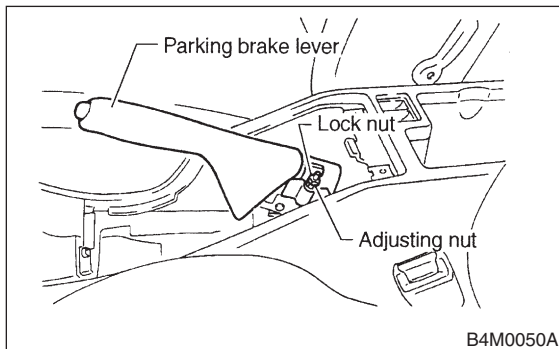
1. DISC BRAKE S301154A1802

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, and remove rear wheel cap and wheels.

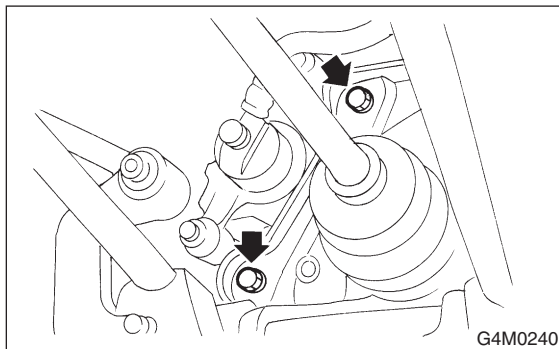
CAUTION:

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 3) Unlock axle nut.
- 4) Remove axle nut using a socket wrench.
- 5) Return parking brake lever and loosen adjusting nut.



- 6) Remove disc brake caliper from back plate, and suspend it from strut using a piece of wire.

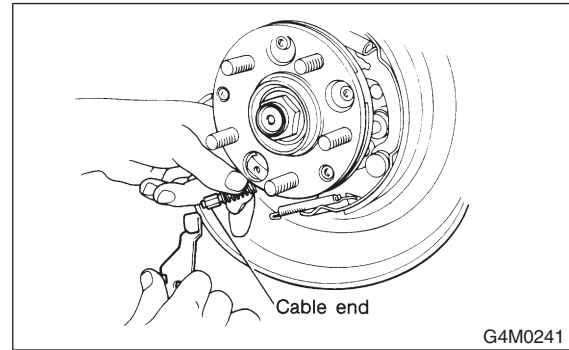


- 7) Remove disc rotor from hub.

NOTE:

If disc rotor seizes up within hub, drive it out by installing an 8-mm bolt into bolt hole in disc rotor.

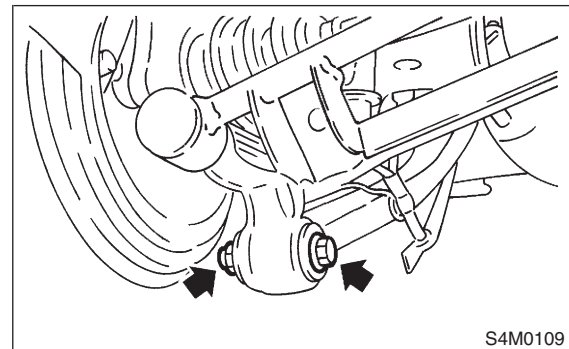
- 8) Disconnect parking brake cable end.



- 9) Disconnect rear stabilizer from rear lateral link.
- 10) Remove bolts which secure trailing link assembly to rear housing.

CAUTION:

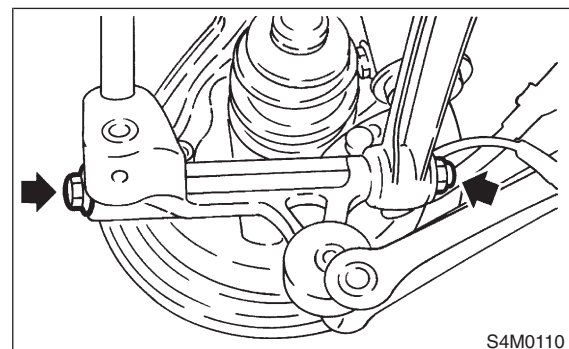
Discard old self-locking nut. Replace with a new one.



- 11) Remove bolts which secure lateral link assembly to rear housing.

CAUTION:

Discard old self-locking nut. Replace with a new one.



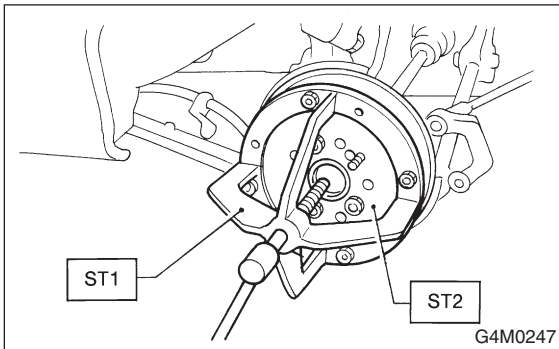
12) Disengage BJ from housing splines, and remove rear drive shaft assembly. If it is hard to remove, use STs.

ST1 926470000 AXLE SHAFT PULLER

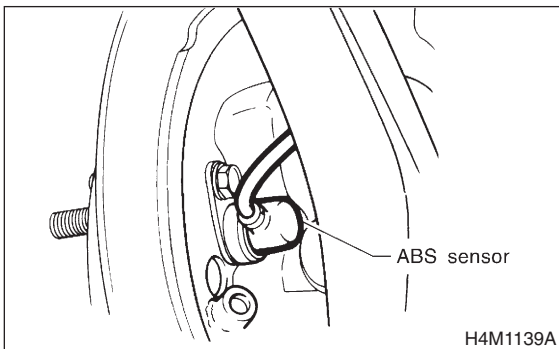
ST2 927140000 PLATE

CAUTION:

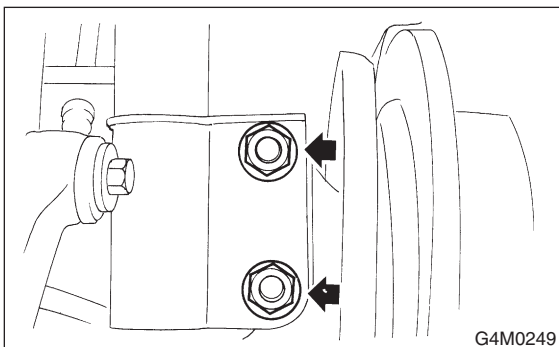
- Be careful not to damage oil seal lip when removing rear drive shaft.
- When rear drive shaft is to be replaced, also replace inner oil seal with a new one.



13) Remove rear ABS sensor from back plate (only vehicle equipped with ABS).



14) Remove bolts which secure rear housing to strut, and separate the two.



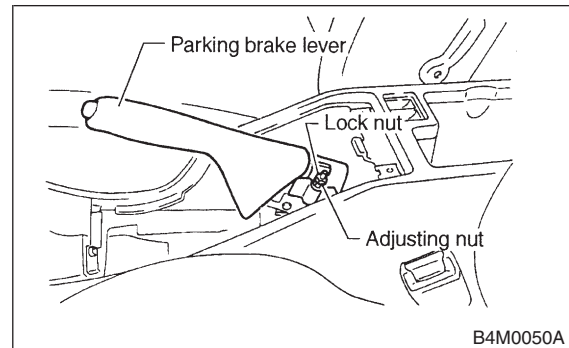
2. DRUM BRAKE S301154A1803

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, and remove rear wheel cap and wheels.

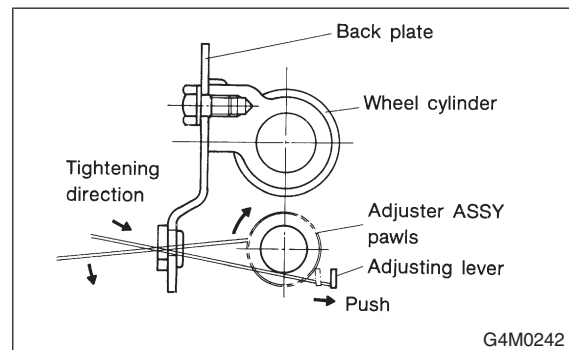
CAUTION:

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 3) Unlock axle nut.
- 4) Remove axle nut using a socket wrench.
- 5) Return parking brake lever and loosen adjusting nut.

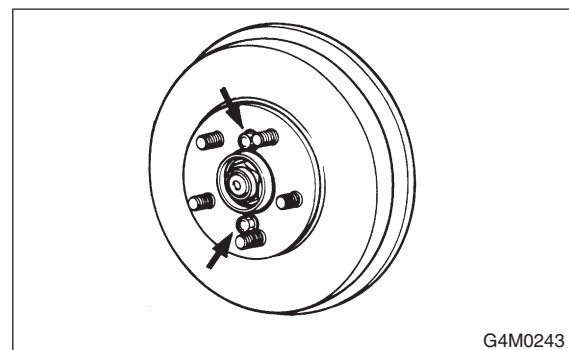


- 6) Remove brake drum from hub.
- 7) If it is difficult to remove brake drum, remove adjusting hole cover from back plate, and then turn adjusting screw using a slot-type screwdriver until brake shoe separates from the drum.



NOTE:

If brake drum is difficult to remove, drive it out by installing an 8-mm bolt into bolt hole in brake drum.



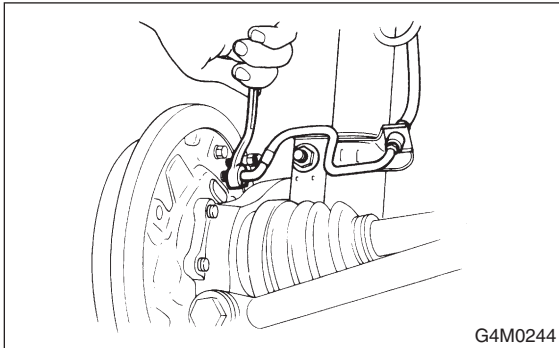
REAR AXLE

Drive Shaft System

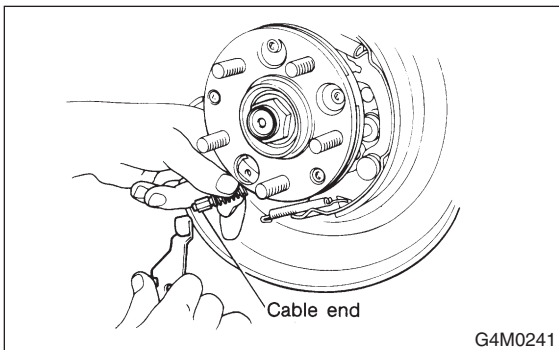
8) Using a flare-nut wrench, disconnect brake pipe from wheel cylinder.

CAUTION:

Cover open end of wheel cylinder to prevent entry of foreign particles.



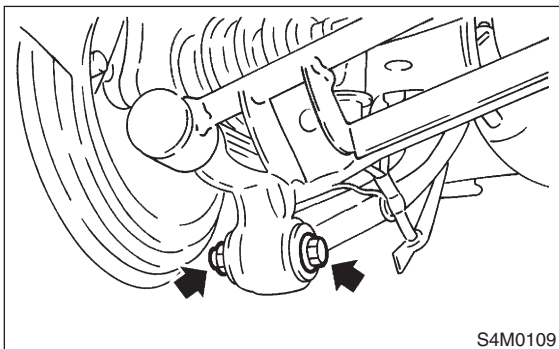
9) Disconnect parking brake cable end.



10) Disconnect rear stabilizer from rear lateral link.
11) Remove bolts which secure trailing link assembly to rear housing.

CAUTION:

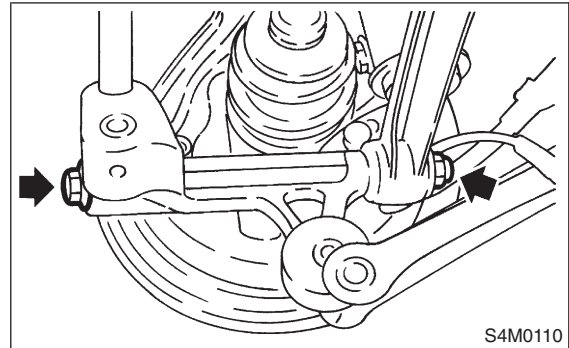
Discard old self-locking nut. Replace with a new one.



12) Remove bolts which secure lateral link assembly to rear housing.

CAUTION:

Discard old self-locking nut. Replace with a new one.



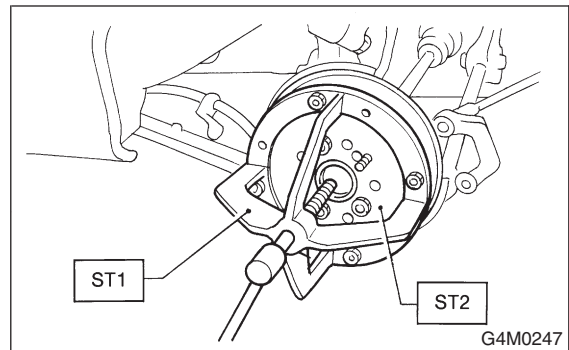
13) Disengage BJ from housing splines, and remove rear drive shaft assembly. If it is hard to remove, use STs.

ST1 926470000 AXLE SHAFT PULLER

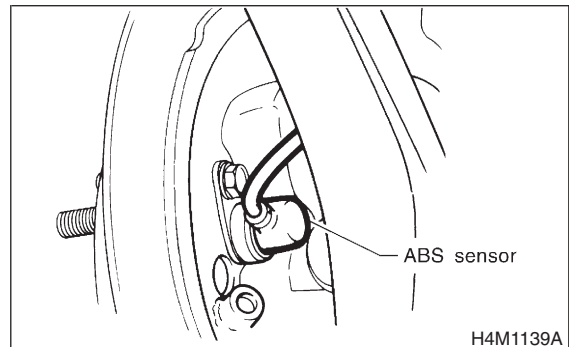
ST2 927140000 PLATE

CAUTION:

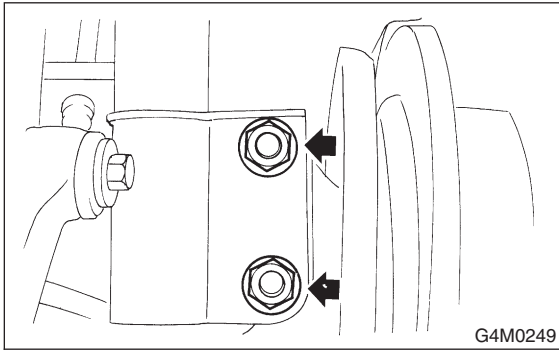
- Be careful not to damage oil seal lip when removing rear drive shaft.
- When rear drive shaft is to be replaced, also replace inner oil seal with a new one.



14) Remove rear ABS sensor from back plate (only vehicle equipped with ABS).



- 15) Remove bolts which secure rear housing to strut, and separate the two.



B: INSTALLATION

S301154A11

1. DISC BRAKE

S301154A1102

- 1) Connect rear housing assembly and strut assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

196 N·m (20 kgf-m, 145 ft-lb)

- 2) Fit BJ (bell joint) to rear housing splines.

CAUTION:

Be careful not to damage inner oil seal lip.

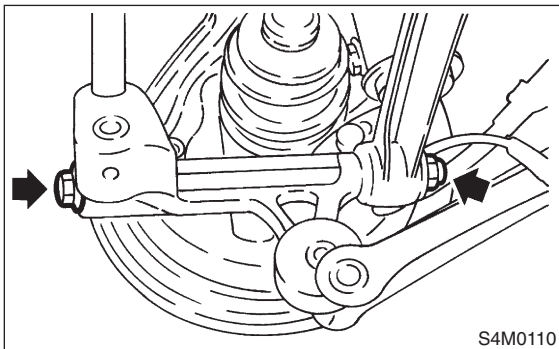
- 3) Connect rear housing assembly to lateral link assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

137 N·m (14 kgf-m, 101 ft-lb)



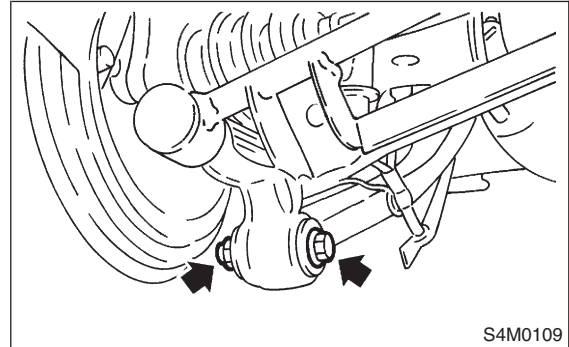
- 4) Connect rear housing assembly to trailing link assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

113 N·m (11.5 kgf-m, 83 ft-lb)



- 5) Connect rear stabilizer to rear lateral link.

CAUTION:

Use a new self-locking nut.

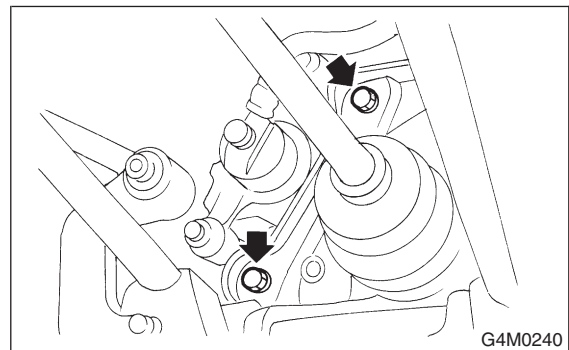
Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

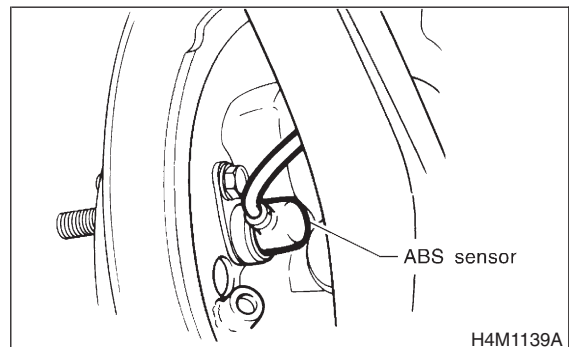
- 6) Connect parking brake cable to parking brake.
7) Install disc rotor on rear housing assembly.
8) Install disc brake caliper on back plate.

Tightening torque:

52 N·m (5.3 kgf-m, 38.3 ft-lb)



- 9) Install rear ABS sensor to back plate (only vehicle equipped with ABS).



REAR AXLE

Drive Shaft System

10) Bleed air from brake system. <Ref. to BR-48 REPLACEMENT, Brake Fluid.>

11) Adjust parking brake lever stroke by turning adjuster.

12) Move brake lever back to apply brakes. While depressing brake pedal, tighten axle nut using a socket wrench. Lock axle nut after tightening.

Tightening torque:

186 N·m (19 kgf-m, 137 ft-lb)

CAUTION:

- Use a new axle nut.
- Always tighten axle nut before installing wheel on vehicle. If wheel is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

13) Install wheel and tighten wheel nuts to specified torque.

Tightening torque:

88 N·m (9 kgf-m, 65 ft-lb)

2. DRUM BRAKE

S301154A1103

1) Connect rear housing assembly and strut assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

196 N·m (20 kgf-m, 145 ft-lb)

2) Fit BJ (bell joint) to rear housing splines.

CAUTION:

Be careful not to damage inner oil seal lip.

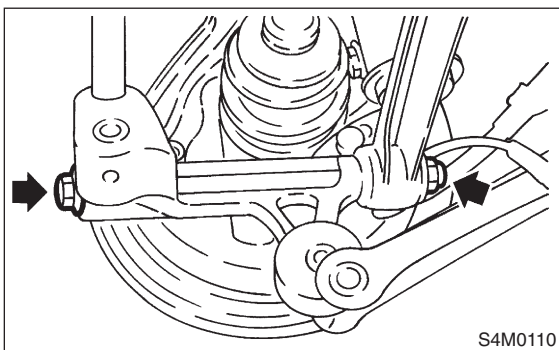
3) Connect rear housing assembly to lateral link assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

137 N·m (14 kgf-m, 101 ft-lb)



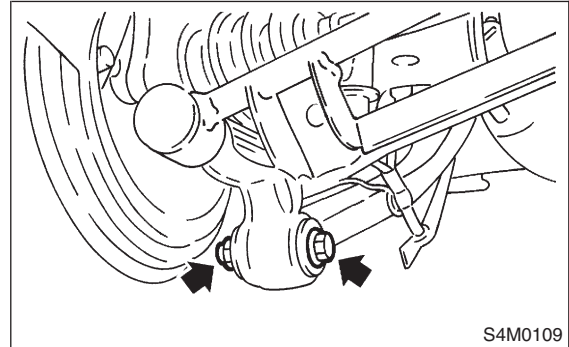
4) Connect rear housing assembly to trailing link assembly.

CAUTION:

Use a new self-locking nut.

Tightening torque:

113 N·m (11.5 kgf-m, 83 ft-lb)



5) Connect rear stabilizer to rear lateral link.

CAUTION:

Use a new self-locking nut.

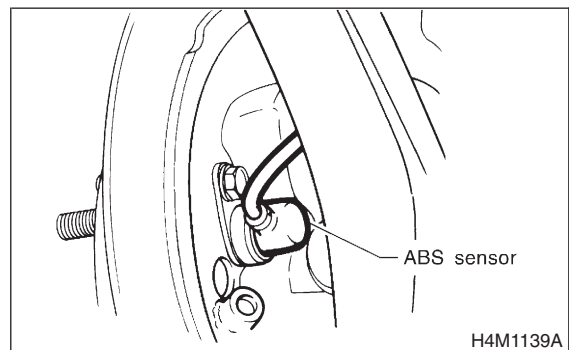
Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

6) Connect parking brake cable to parking brake.

7) Clean brake pipe connection. Using a flare-nut wrench, connect brake pipe to wheel cylinder.

8) Connect rear ABS sensor to back plate (only vehicle equipped with ABS).



9) Connect parking brake cable to lever.

10) Install brake drum on rear housing assembly.

11) Bleed air from brake system. <Ref. to BR-48 REPLACEMENT, Brake Fluid.>

12) Adjust parking brake lever stroke by turning adjuster.

13) Move brake lever back to apply brakes. While depressing brake pedal, tighten axle nut using a socket wrench. Lock axle nut after tightening.

Tightening torque:

186 N·m (19 kgf-m, 137 ft-lb)

CAUTION:

- Use a new axle nut.
- Always tighten axle nut before installing wheel on vehicle. If wheel is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

14) Install wheel and tighten wheel nuts to specified torque.

Tightening torque:

88 N·m (9 kgf-m, 65 ft-lb)

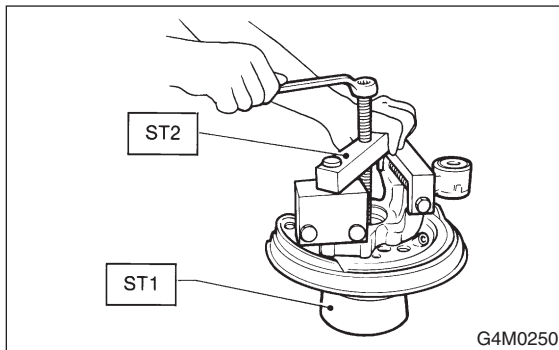
C: DISASSEMBLY

S301154A06

1) Using ST1 and ST2, remove hub from rear housing.

ST1 927080000 HUB STAND

ST2 927420000 HUB REMOVER



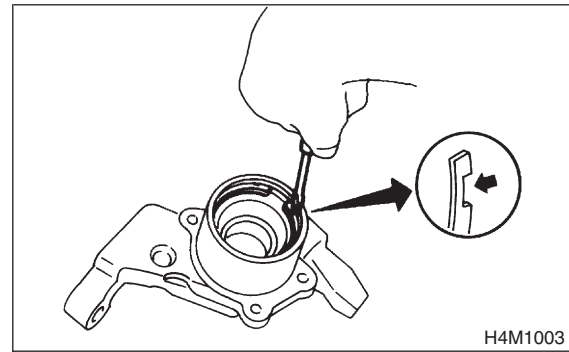
2) Remove back plate from rear housing.

3) Using a standard screwdriver, remove outer and inner oil seals.

CAUTION:

Use new oil seals.

4) Using flat bladed screwdriver, remove snap ring.



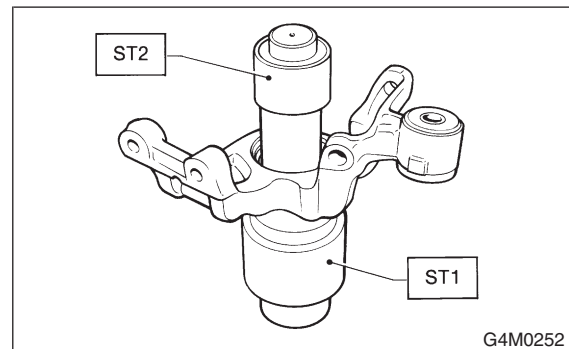
5) Using ST1 and ST2, remove bearing by pressing inner race.

ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER

CAUTION:

- Do not remove bearing unless damaged.
- Do not re-use bearing after removal.



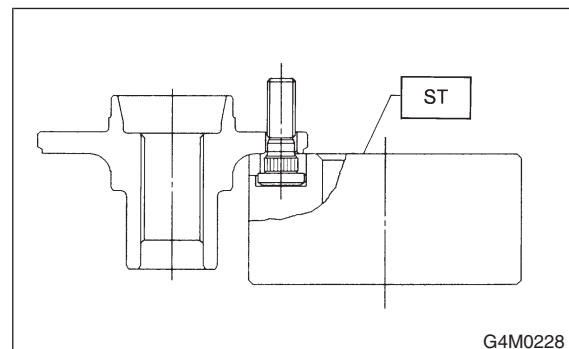
6) Remove tone wheel bolts and remove tone wheel from hub (only vehicle equipped with ABS).

7) Using ST, press hub bolt out.

ST 927080000 HUB STAND

CAUTION:

Be careful not to hammer hub bolts. This may deform hub.



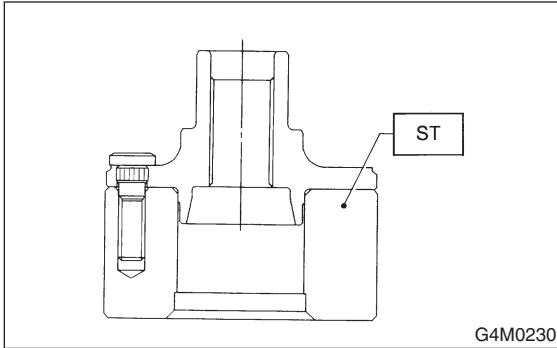
D: ASSEMBLY S301154A02

1) Using ST, press new hub bolt into place.

CAUTION:

- Ensure hub bolt closely contacts hub.
- Use a 12 mm (0.47 in) hole in the ST to prevent hub bolt from tilting during installation.

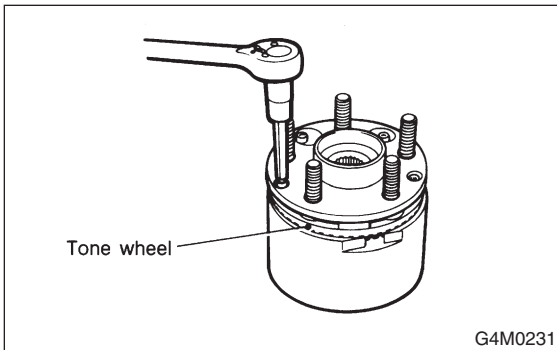
ST 927080000 HUB STAND



2) Remove foreign particles (dust, rust, etc.) from mating surfaces of hub and tone wheel, and install tone wheel to hub (only vehicle equipped with ABS).

CAUTION:

- Ensure tone wheel closely contacts hub.
- Be careful not to damage tone wheel teeth.



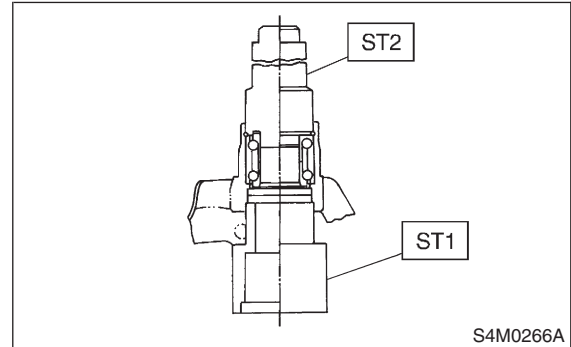
3) Clean housing interior completely. Using ST1 and ST2, press bearing into housing.

ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER

CAUTION:

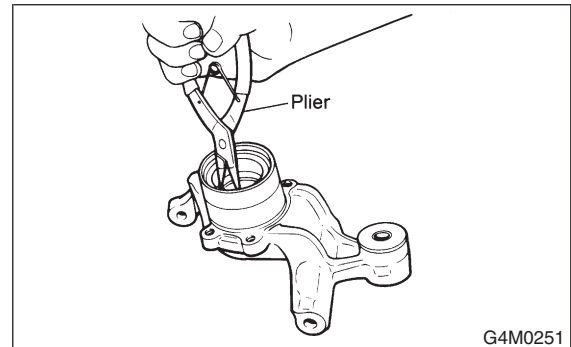
- Always press outer race when installing bearing.
- Be careful not to remove plastic lock from inner race when installing bearing.
- Charge bearing with new grease when outer race is not removed.



4) Using plier, install snap ring.

CAUTION:

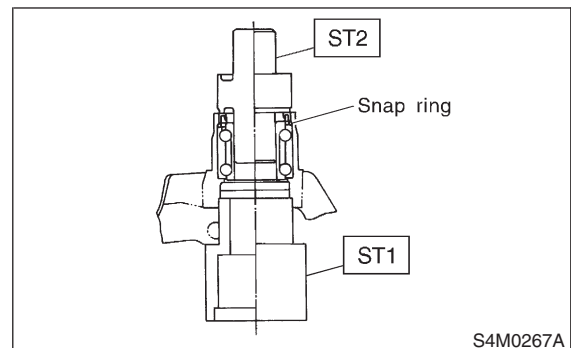
Ensure snap ring fits in groove properly.



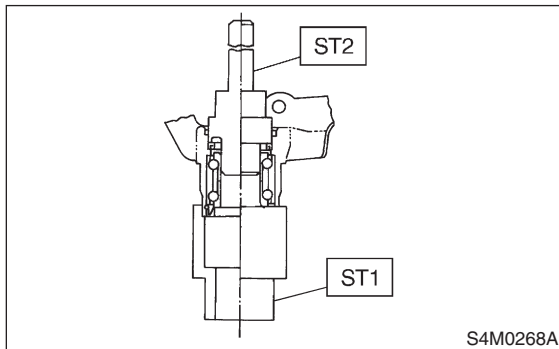
5) Using ST1 and ST2, press outer oil seal until it comes in contact with snap ring.

ST1 927430000 HOUSING STAND

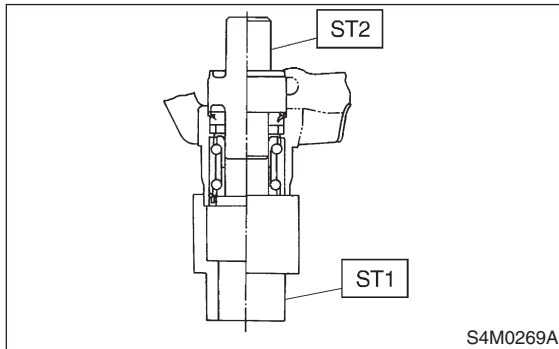
ST2 927460000 OIL SEAL INSTALLER



- 6) Invert both ST1 and housing.
 7) Using ST2, press inner oil seal into housing until it touches bottom.
 ST1 927430000 HOUSING STAND
 ST2 927460000 OIL SEAL INSTALLER



- 8) Using ST1 and ST2, press sub seal into place.
 ST1 927430000 HOUSING STAND
 ST2 927460000 OIL SEAL INSTALLER



- 9) Apply sufficient grease to oil seal lip.

Specified grease:
SHELL 6459N

CAUTION:

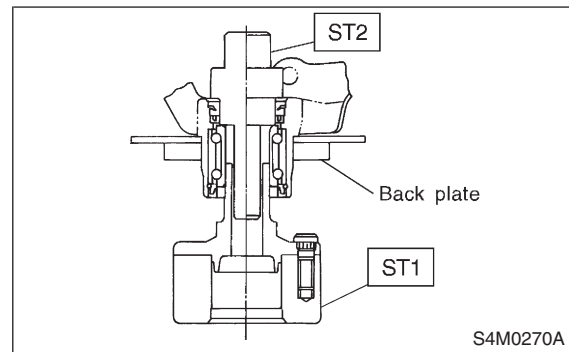
- If specified grease is not available, remove bearing grease and apply Auto Rex A instead.
- Do not mix different types of grease.

- 10) Install back plate to rear housing.

Tightening torque:

52 N·m (5.3 kgf-m, 38 ft-lb)

- 11) Using ST1 and ST2, press bearing into hub.
 ST1 927080000 HUB STAND
 ST2 927450000 HUB INSTALLER



E: INSPECTION

S301154A10

Check the removed parts for wear and damage. If defective, replace with a new one.

CAUTION:

- If a bearing is faulty, replace it as the bearing set.
- Be sure to replace oil seal at every overhaul.

6. Rear Drive Shaft S301156

A: REMOVAL S301156A18

- 1) Disconnect ground cable from battery.
- 2) Lift-up vehicle, and remove rear wheel cap and wheels.

CAUTION:

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 3) Unlock axle nut.
- 4) Loosen axle nut using a socket wrench.

CAUTION:

Do not remove axle nut.

- 5) Remove ABS sensor clamps and parking brake cable bracket.
- 6) Remove bolts which secure lateral link assembly to rear housing.

CAUTION:

Discard old self-locking nut. Replace with a new one.

- 7) Remove bolts which secure trailing link assembly to rear housing.

CAUTION:

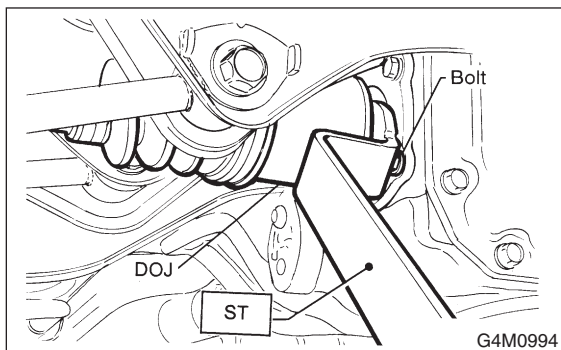
Discard old self-locking nut. Replace with a new one.

- 8) Remove DOJ from rear differential using ST. (Except 2200 cc AT vehicles)

ST 28099PA100 DRIVE SHAFT REMOVER

CAUTION:

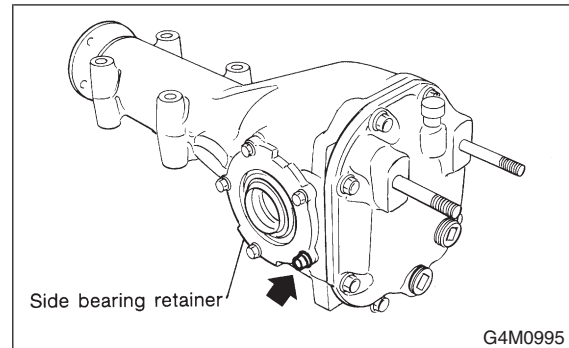
Do not remove circlip attached to inside of differential.



CAUTION:

Be careful not to damage side bearing retainer. Always use bolt as shown in figure, as supporting point for ST during removal.

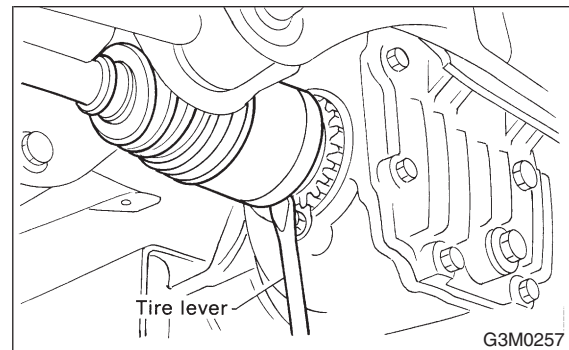
ST 28099PA100 DRIVE SHAFT REMOVER



- 9) Remove DOJ from rear differential using tire lever. (2200 cc AT vehicles)

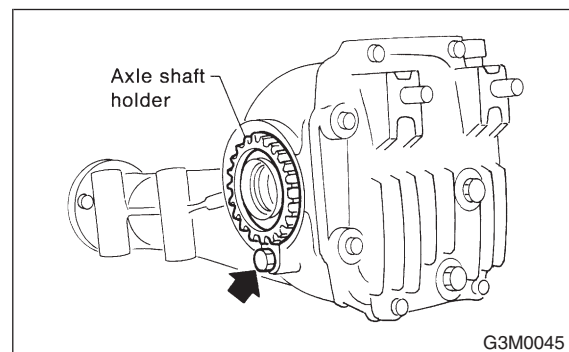
NOTE:

The side spline shaft circlip comes out together with the shaft.



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 axle shaft holder.



REAR DRIVE SHAFT

Drive Shaft System

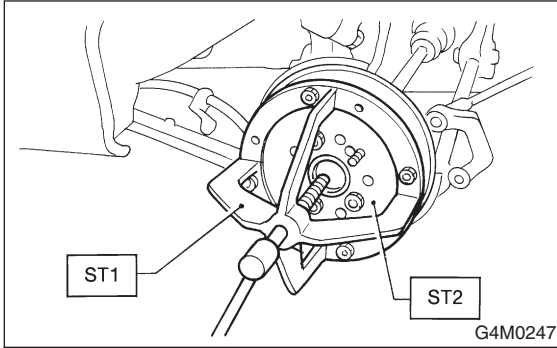
10) Remove axle nut and drive shaft. If it is hard to remove, use ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER

ST2 927140000 PLATE

CAUTION:

- Be careful not to damage oil seal lip when removing rear drive shaft.
- When rear drive shaft is to be replaced, also replace inner oil seal with a new one.



B: INSTALLATION S301156A11

1) Insert BJ into rear housing splines.

CAUTION:

Be careful not to damage inner oil seal lip.

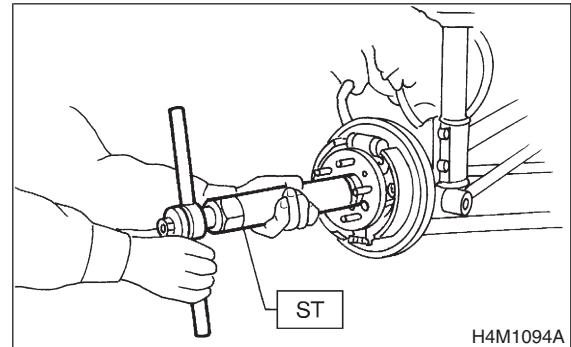
2) Using ST1 and ST2, pull drive shaft into place.

ST1 922431000 AXLE SHAFT INSTALLER

ST2 927390000 ADAPTER

CAUTION:

Do not hammer drive shaft when installing it.

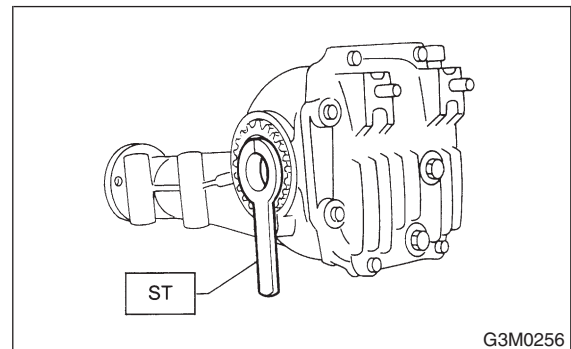


3) Tighten axle nut temporarily.

4) Replace circlips from DOJ spline with new one. (2200 cc AT model only)

5) Using ST, install DOJ into differential.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

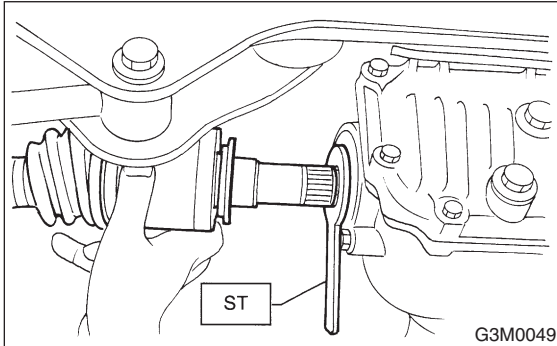


6) Insert DOJ spline end into bore of side oil seal, and remove ST.

CAUTION:

Do not allow DOJ splines to damage side oil seal.

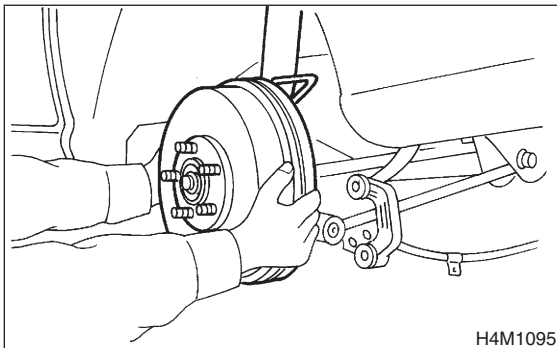
ST 28099PA090 SIDE OIL SEAL PROTECTOR



- 7) Align DOJ and differential splines.
- 8) Push housing to insert DOJ into differential.

NOTE:

Make sure DOJ is inserted properly.



- 9) Connect rear housing assembly to trailing link assembly, and tighten self-locking nut.

Tightening torque:

113 N·m (11.5 kgf-m, 83 ft-lb)

- 10) Connect rear housing assembly to lateral link assembly, and tighten self-locking nut.

Tightening torque:

137 N·m (14 kgf-m, 101 ft-lb)

- 11) Install stabilizer bracket.
- 12) While depressing brake pedal, tighten axle nut using a socket wrench.

Tightening torque:

186 N·m (19 kgf-m, 137 ft-lb)

CAUTION:

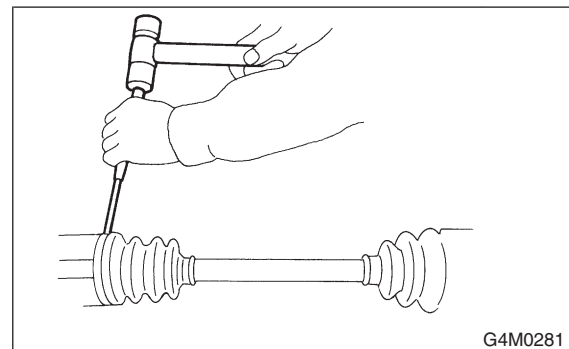
- Use a new axle nut.
- Always tighten axle nut before installing wheel on vehicle. If wheel is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

- 13) After tightening axle nut, lock it securely.

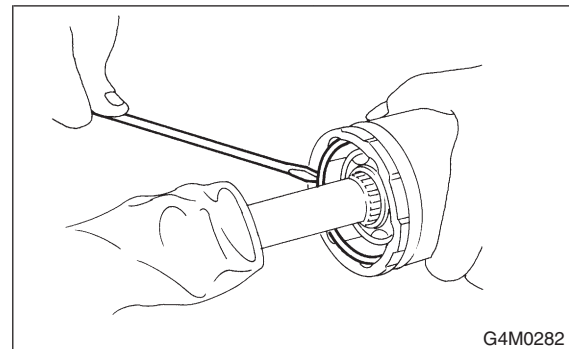
C: DISASSEMBLY

S301156A06

- 1) Straighten bent claw of larger end of DOJ boot.
- 2) Loosen band by means of screwdriver or pliers with care of not damaging boot.



- 3) Remove boot band on the small end of DOJ boot in the same manner.
- 4) Remove the larger end of DOJ boot from DOJ outer race.
- 5) Pry and remove round circlip located at the neck of DOJ outer race with a screwdriver.



REAR DRIVE SHAFT

Drive Shaft System

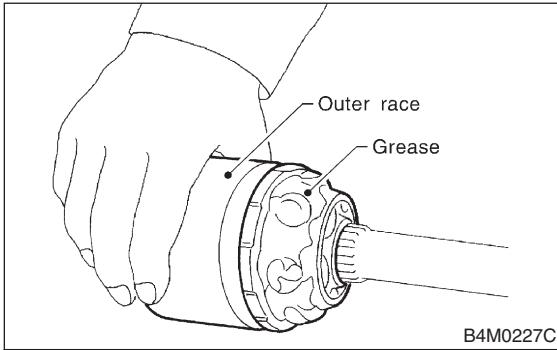
- 6) Take out DOJ outer race from shaft assembly.
- 7) Wipe off grease and take out balls.

CAUTION:

The grease is a special grease (grease for constant velocity joint). Do not confuse with other greases.

NOTE:

Disassemble exercising care not to lose balls (6 pcs).



- 8) To remove the cage from the inner race, turn the cage by a half pitch to the track groove of the inner race and shift the cage.
- 9) Remove snap ring, which fixes inner race to shaft, by using pliers.
- 10) Take out DOJ inner race.
- 11) Take off DOJ cage from shaft and remove DOJ boot.

CAUTION:

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

- 12) Remove BJ boot in the same procedure as DOJ boot.
- 13) Thus, disassembly of axle is completed, but BJ is unable to be disassembled.

D: ASSEMBLY S301156A02

CAUTION:

Use specified grease.

BJ side:

Molylex No. 2 (Part No. 723223010) or Sunlight TB2-A

DOJ side:

VU-3A702 (Yellow) (Part No. 23223GA050)

- 1) Install BJ boot in specified position, and fill it with 60 to 70 g (2.12 to 2.47 oz) of specified grease.
- 2) Place DOJ boot at the center of shaft.

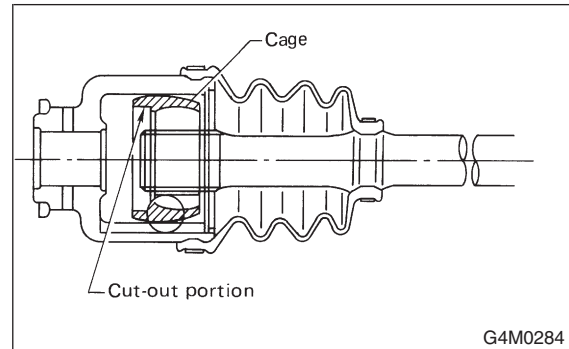
CAUTION:

Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.

- 3) Insert DOJ cage onto shaft.

NOTE:

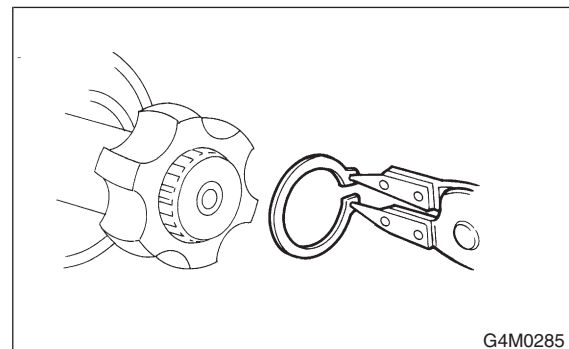
Insert the cage with the cut-out portion facing the shaft end, since the cage has an orientation.



- 4) Install DOJ inner race on shaft and fit snap ring with pliers.

NOTE:

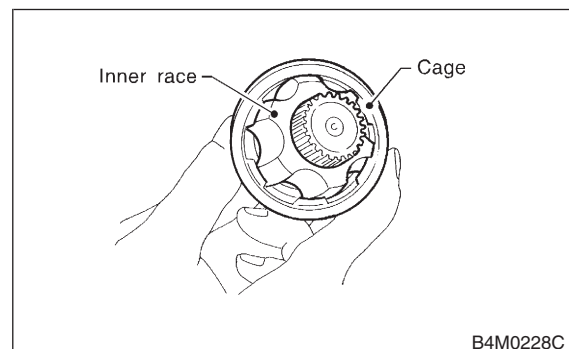
Confirm that the snap ring is completely fitted in the shaft groove.



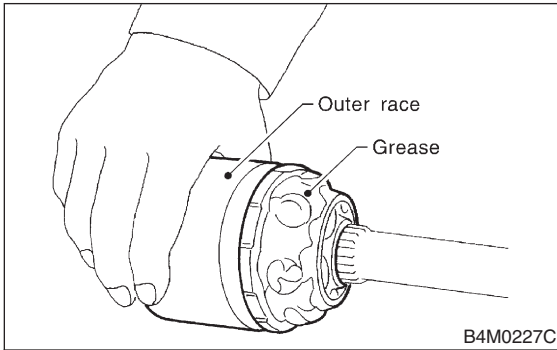
- 5) Install cage, which was previously fitted, to inner race fixed upon shaft.

NOTE:

Fit the cage with the protruded part aligned with the track on the inner race and then turn by a half pitch.



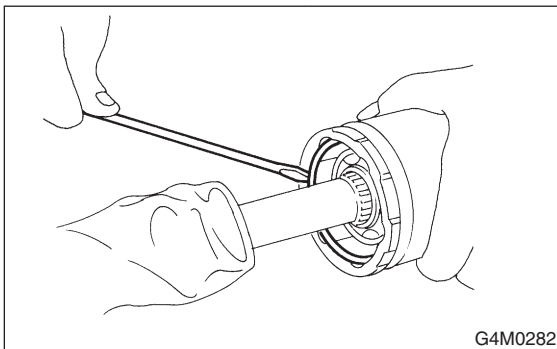
- 6) Fill 80 to 90 g (2.82 to 3.17 oz) of specified grease into the interior of DOJ outer race.
- 7) Apply a coat of specified grease to the cage pocket and six balls.
- 8) Insert six balls into the cage pocket.
- 9) Align the outer race track and ball positions and place in the part where shaft, inner race, cage and balls are previously installed, and then fit outer race.



- 10) Install circlip in the groove on DOJ outer race.

NOTE:

- Assure that the balls, cage and inner race are completely fitted in the outer race of DOJ.
- Exercise care not to place the matched position of circlip in the ball groove of outer race.
- Pull the shaft lightly and assure that the circlip is completely fitted in the groove.



- 11) Apply an even coat of the specified grease [20 to 30 g (0.71 to 1.06 oz)] to the entire inner surface of boot. Also apply grease to shaft.
- 12) Install DOJ boot taking care not to twist it.

NOTE:

- The inside of the larger end of DOJ boot and the boot groove shall be cleaned so as to be free from grease and other substances.
- When installing DOJ boot, position outer race of DOJ at center of its travel.

- 13) Put a band through the clip and wind twice in alignment with band groove of boot.

CAUTION:

Use a new band.

- 14) Pinch the end of band with pliers. Hold the clip and tighten securely.

NOTE:

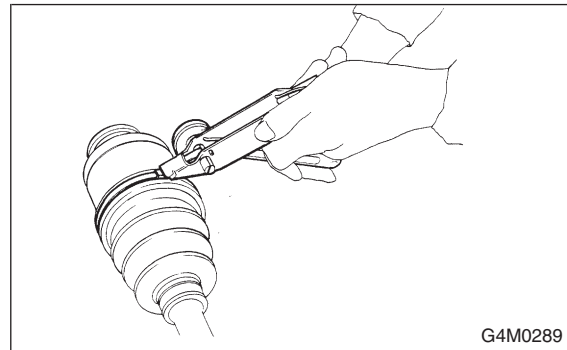
When tightening boot, exercise care so that the air within the boot is appropriate.

- 15) Tighten band by using ST.

ST 925091000 BAND TIGHTENING TOOL

NOTE:

Tighten band until it cannot be moved by hand.

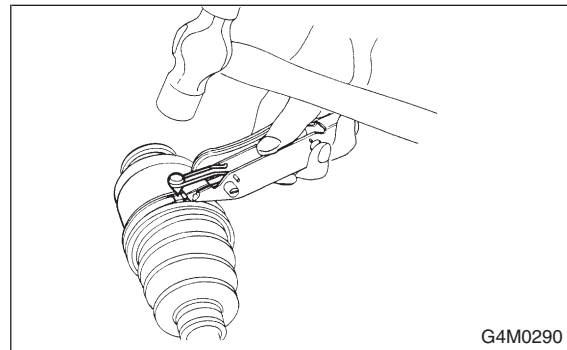


- 16) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

CAUTION:

Tap to an extent that the boot underneath is not damaged.



- 17) Cut off band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.

CAUTION:

Be careful so that the end of the band is in close contact with clip.

- 18) Fix up boot on BJ in the same manner.

NOTE:

Extend and retract DOJ to provide equal grease coating.

E: INSPECTION S301156A10

Check the removed parts for damage, wear, corrosion etc. If faulty, repair or replace.

1) DOJ (Double Offset Joint)

Check seizure, corrosion, damage, wear and excessive play.

2) SFJ (Shudder-less Freering tripod Joint)

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) BJ (Bell Joint)

Check seizure, corrosion, damage and excessive play.

5) Boot

Check for wear, warping, breakage or scratches.

6) Grease

Check for discoloration or fluidity.

7. Center Differential S302158

A: NOTE S302158A15

For removal, installation, and inspection work, refer to “AT” section or “MT” section, a separate publication.

GENERAL DESCRIPTION

Transfer Case

1. General Description S302001

A: NOTE S302001A15

Refer to “AT” section or “MT” section, a separate publications.

4. Oil Seal S302143

A: NOTE S302143A15

For removal, installation, and inspection work, refer to “AT” section or “MT” section, a separate publication.

2. Transfer Case and Extension for MT S302138

A: NOTE S302138A15

For removal, installation, and inspection work,
refer to “MT” section, a separate publication.

3. Transfer Clutch and Extension for AT

S302142

A: NOTE

S302142A15

For removal, installation, and inspection work, refer to “AT” section, a separate publication.

8. Transfer Clutch Pressure Test S302159

A: NOTE S302159A15

For removal, installation, and inspection work, refer to “AT” section, a separate publication.

5. Transfer Drive Gear (M/T) S302146

A: NOTE S302146A15

For removal, installation, and inspection work, refer to “MT” section, a separate publication.

6. Transfer Driven Gear (M/T)

S302141

A: NOTE S302141A15

For removal, installation, and inspection work, refer to “MT” section, a separate publication.

9. Transfer Duty Solenoid and Valve Body S302161

A: NOTE S302161A15

For removal, installation, and inspection work, refer to “AT” section, a separate publication.