

GENERAL DESCRIPTION

DIFFERENTIALS

1. General Description

A: SPECIFICATIONS

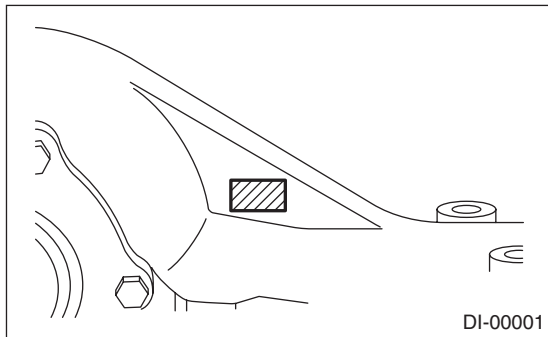
MODEL	Non-Turbo				Turbo	
	MT		AT		MT	AT
	Wagon	Sedan	Wagon	Sedan		
Rear differential type	EG	EH		EL	EF (with LSD)	EJ (with LSD)
Type of gear	Hypoid gear					
Gear ratio (Number of gear teeth)	3.900 (39/10)	4.111 (37/9)		4.444 (40/9)	3.545 (39/11)	4.111 (37/9)
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)					
Rear differential gear oil	GL-5					

• Identification

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

CAUTION:

Using the different rear differential assembly causes the drive line and tires to “drag” or emit abnormal noise.

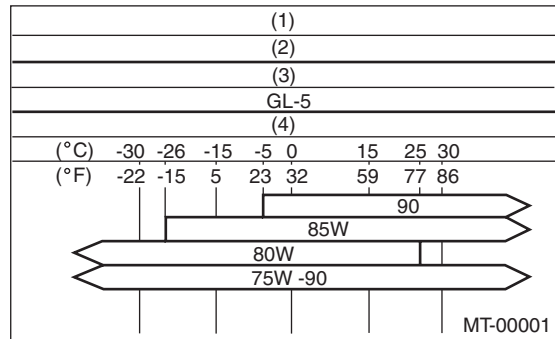


• Rear differential gear oil

Recommended oil

CAUTION:

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



- (1) Item
- (2) Rear differential gear oil
- (3) API classification
- (4) SAE viscosity No. and application temperature

1. SERVICE DATA

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	New bearing	19.6 — 28.4 (2.0 — 2.9, 4.4 — 6.4)
	Used bearing	8.34 — 16.67 (0.85 — 1.7, 1.87 — 3.75)
Side gear backlash mm (in)	0.10 — 0.20 (0.0039 — 0.0079)	
Side bearing standard width mm (in)	20.00 (0.7874)	
Crown gear to drive pinion backlash mm (in)	0.10 — 0.20 (0.0039 — 0.0079)	
Crown gear runout on its back surface mm (in)	Less than 0.05 (0.0020)	

2. ADJUSTING PARTS

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)
	Used bearing	8.34 — 16.67 N (0.85 — 1.7 kgf, 1.87 — 3.75 lb)

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Preload adjusting spacer	Part No.	Length
	383695201	56.2 mm (2.213 in)
	383695202	56.4 mm (2.220 in)
	383695203	56.6 mm (2.228 in)
	383695204	56.8 mm (2.236 in)
	383695205	57.0 mm (2.244 in)
	383695206	57.2 mm (2.252 in)
Preload adjusting washer	Part No.	Length
	383705200	2.59 mm (0.1020 in)
	383715200	2.57 mm (0.1012 in)
	383725200	2.55 mm (0.1004 in)
	383735200	2.53 mm (0.0996 in)
	383745200	2.51 mm (0.0988 in)
	383755200	2.49 mm (0.0980 in)
	383765200	2.47 mm (0.0972 in)
	383775200	2.45 mm (0.0965 in)
	383785200	2.43 mm (0.0957 in)
	383795200	2.41 mm (0.0949 in)
	383805200	2.39 mm (0.0941 in)
	383815200	2.37 mm (0.0933 in)
	383825200	2.35 mm (0.0925 in)
	383835200	2.33 mm (0.0917 in)
383845200	2.31 mm (0.0909 in)	
Pinion height adjusting shim	Part No.	Thickness
	383495200	3.09 mm (0.1217 in)
	383505200	3.12 mm (0.1228 in)
	383515200	3.15 mm (0.1240 in)
	383525200	3.18 mm (0.1252 in)
	383535200	3.21 mm (0.1264 in)
	383545200	3.24 mm (0.1276 in)
	383555200	3.27 mm (0.1287 in)
	383565200	3.30 mm (0.1299 in)
	383575200	3.33 mm (0.1311 in)
	383585200	3.36 mm (0.1323 in)
	383595200	3.39 mm (0.1335 in)
	383605200	3.42 mm (0.1346 in)
	383615200	3.45 mm (0.1358 in)
	383625200	3.48 mm (0.1370 in)
	383635200	3.51 mm (0.1382 in)
	383645200	3.54 mm (0.1394 in)
	383655200	3.57 mm (0.1406 in)
	383665200	3.60 mm (0.1417 in)
	383675200	3.63 mm (0.1429 in)
383685200	3.66 mm (0.1441 in)	
Side gear backlash	0.1 — 0.2 mm (0.0039 — 0.0079 in)	
Side gear thrust washer (Non-Turbo model)	Part No.	Thickness
	383445201	0.75 — 0.80 mm (0.0295 — 0.0315 in)
	383445202	0.80 — 0.85 mm (0.0315 — 0.0335 in)
	383445203	0.85 — 0.90 mm (0.0335 — 0.0354 in)
Side bearing standard width	—	20.00 mm (0.7874 in)

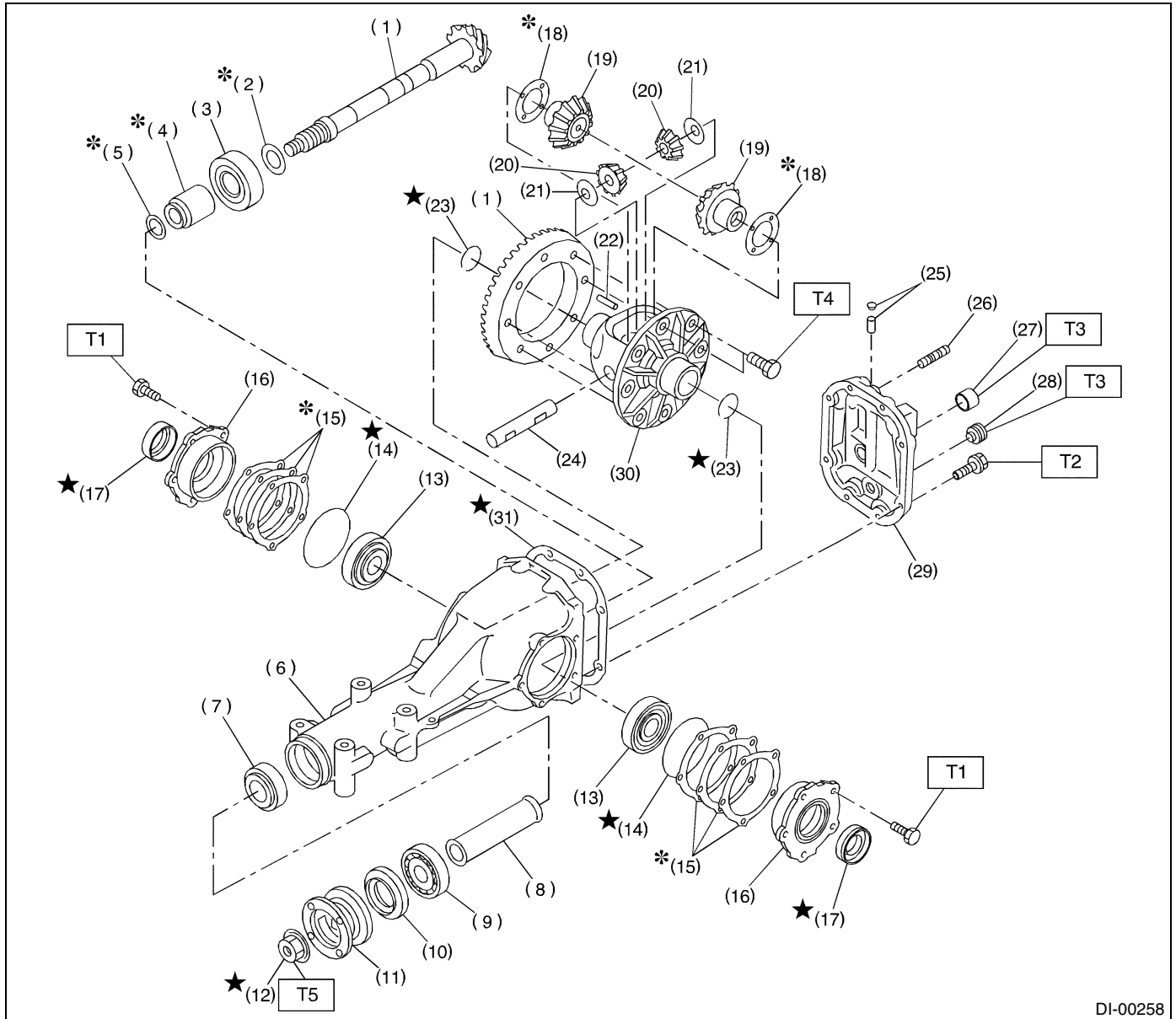
GENERAL DESCRIPTION

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	Part No.	Thickness
Side bearing retainer shim	383475201	0.20 mm (0.0079 in)
	383475202	0.25 mm (0.0098 in)
	383475203	0.30 mm (0.0118 in)
	383475204	0.40 mm (0.0157 in)
	383475205	0.50 mm (0.0197 in)
Crown gear to drive pinion backlash	Limit	0.10 — 0.20 mm (0.0039 — 0.0079 in)
Crown gear runout on its back surface		0.05 mm (0.0020 in)

B: COMPONENT

1. REAR DIFFERENTIAL WITHOUT LSD



DI-00258

- | | | |
|--------------------------------------|---------------------------------|------------------------|
| (1) Pinion crown gear set | (13) Side bearing | (25) Air breather cap |
| (2) Pinion height adjusting washer | (14) O-ring | (26) Stud bolt |
| (3) Rear bearing | (15) Side bearing retainer shim | (27) Oil filler plug |
| (4) Bearing preload adjusting spacer | (16) Side bearing retainer | (28) Oil drain plug |
| (5) Bearing preload adjusting washer | (17) Side oil seal | (29) Rear cover |
| (6) Differential carrier | (18) Side gear thrust washer | (30) Differential case |
| (7) Front bearing | (19) Side gear | (31) Gasket |
| (8) Spacer | (20) Pinion mate gear | |
| (9) Pilot bearing | (21) Pinion mate gear washer | |
| (10) Front oil seal | (22) Pinion shaft lock pin | |
| (11) Companion flange | (23) Circlip | |
| (12) Self-locking nut | (24) Pinion mate shaft | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 10.3 (1.05, 7.6)

T2: 29.4 (3.00, 21.7)

T3: 49.0 (5.0, 36.2)

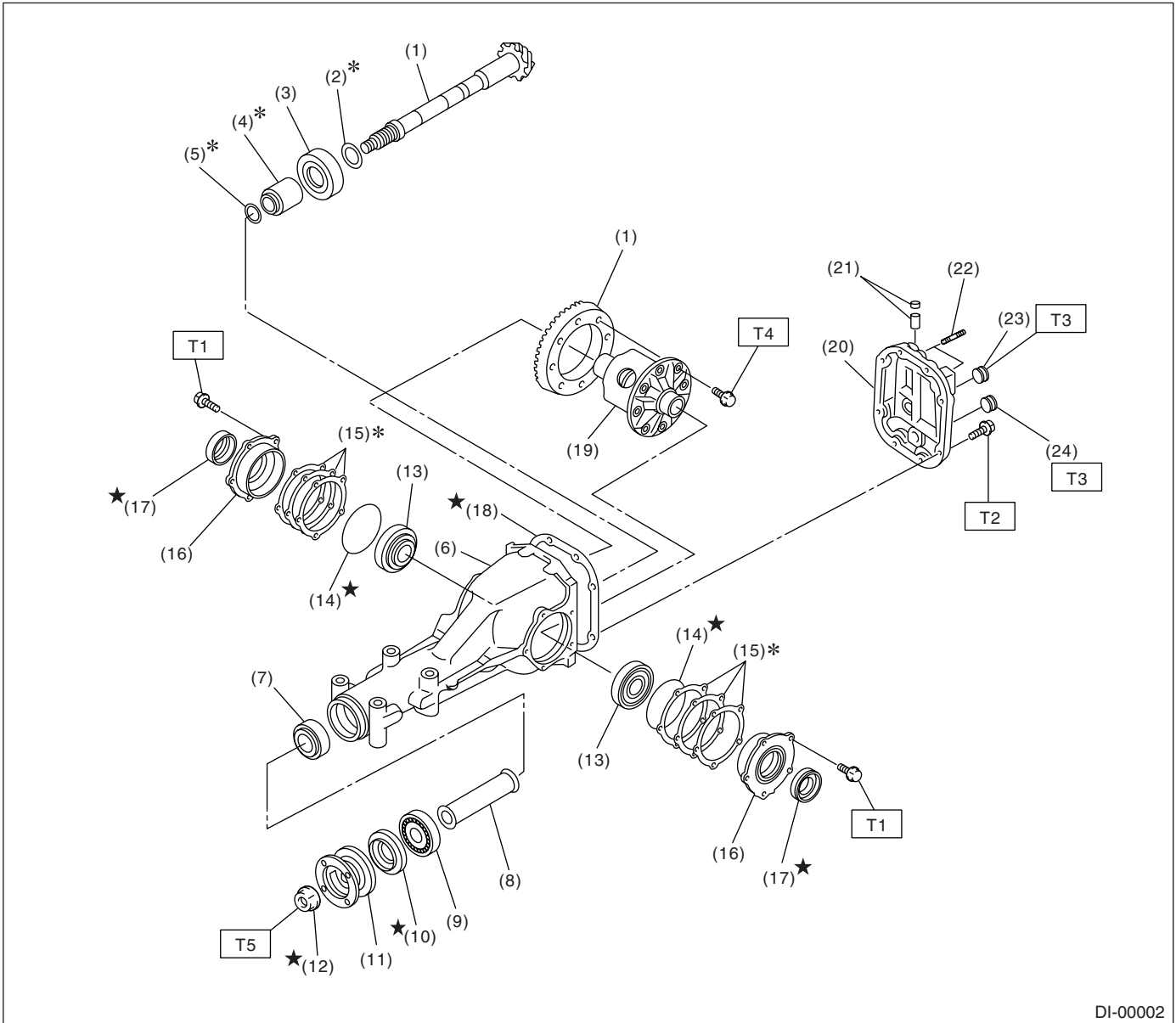
T4: 103.0 (10.50, 75.9)

T5: 181.4 (18.50, 133.8)

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2. REAR DIFFERENTIAL WITH LSD



DI-00002

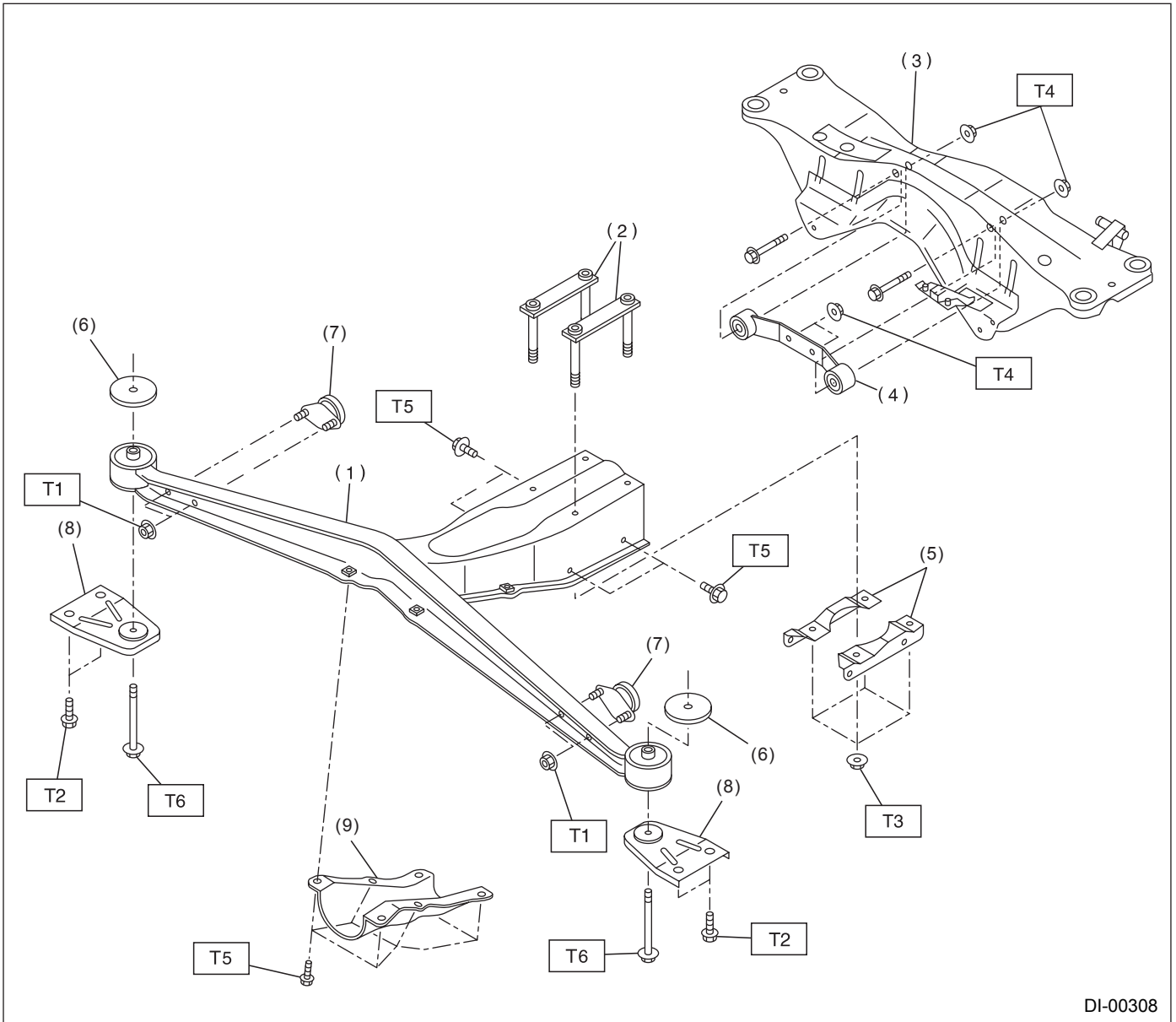
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|--------------------------------------|---------------------------------|
| (1) Pinion crown gear set | (12) Self-locking nut |
| (2) Pinion height adjusting shim | (13) Side bearing |
| (3) Rear bearing | (14) O-ring |
| (4) Bearing preload adjusting spacer | (15) Side bearing retainer shim |
| (5) Bearing preload adjusting washer | (16) Side bearing retainer |
| (6) Differential carrier | (17) Side oil seal |
| (7) Front bearing | (18) Gasket |
| (8) Spacer | (19) Differential case |
| (9) Pilot bearing | (20) Rear cover |
| (10) Front oil seal | (21) Air breather cap |
| (11) Companion flange | (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: 29.4 (3.00, 21.7) |
| T3: 49.0 (5.00, 36.2) |
| T4: 103.0 (10.50, 75.9) |
| T5: 181.4 (18.50, 133.8) |

3. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00308

- | | |
|--------------------------------------|------------------------------------|
| (1) Differential front member | (8) Differential mount bracket |
| (2) Plate | (9) Differential mount front cover |
| (3) Crossmember | |
| (4) Differential rear member | |
| (5) Differential mount lower bracket | |
| (6) Stopper | |
| (7) Dynamic damper | |

Tightening torque: N·m (kgf·m, ft·lb)

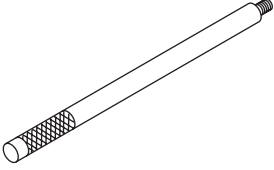
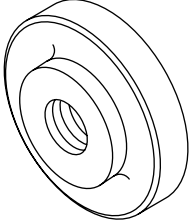
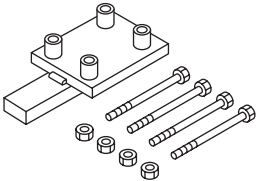
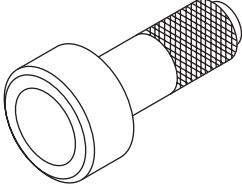
- | |
|-----------------------------|
| T1: 20 (2.0, 14.5) |
| T2: 33 (3.4, 24.3) |
| T3: 65 (6.6, 47.9) |
| T4: 70 (7.1, 51.6) |
| T5: 90 (9.2, 66.4) |
| T6: 100 (10.2, 73.8) |

C: CAUTION

- 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.

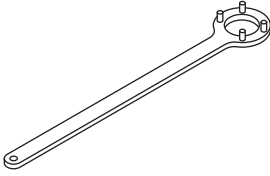
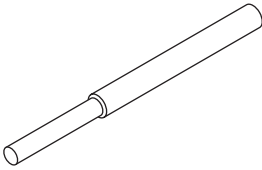
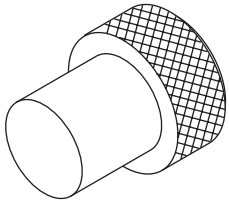
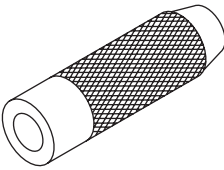
D: PREPARATION TOOL

1. SPECIAL TOOLS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398477701</p>	398477701	HANDLE	Used for installing front and rear bearing cone.
 <p>ST-398477702</p>	398477702	DRIFT	Used for press-fitting the bearing cone of differential carrier (front).
 <p>ST-398217700</p>	398217700	ATTACHMENT SET	Stand for rear differential carrier disassembly and assembly.
 <p>ST-498447120</p>	498447120	INSTALLER	Used for installing front oil seal.

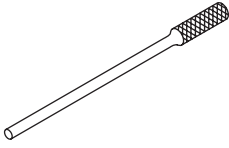
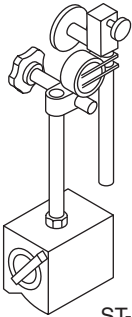
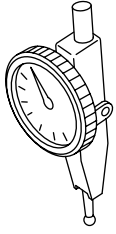
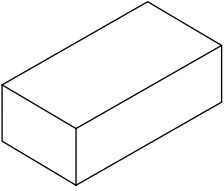
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498427200</p>	498427200	FLANGE WRENCH	Used for stopping rotation of companion flange when loosening and tightening self-lock nut.
 <p style="text-align: center;">ST-398467700</p>	398467700	DRIFT	Used for removing pinion, pilot bearing and front bearing cone.
 <p style="text-align: center;">ST-399780104</p>	399780104	WEIGHT	Used for installing front bearing cone, pilot bearing companion flange.
 <p style="text-align: center;">ST-899580100</p>	899580100	INSTALLER	Used for press-fitting the front bearing cone, pilot bearing.

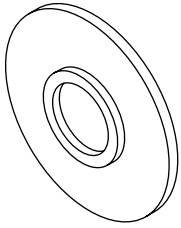
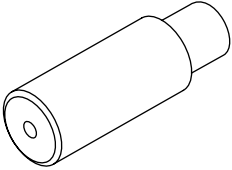
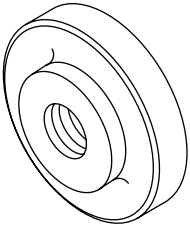
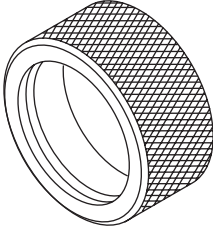
GENERAL DESCRIPTION

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-899904100</p>	899904100	STRAIGHT PIN REMOVER	Used for driving out differential pinion shaft lock pin.
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used with DIAL GAUGE (498247100).
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used with MAGNET BASE (498247001).
 <p style="text-align: center;">ST-398507704</p>	398507704	BLOCK	Used for adjusting pinion height and preload.

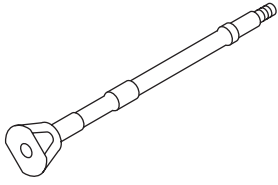
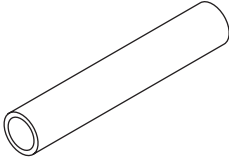
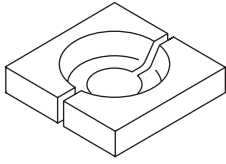
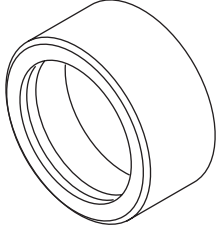
GENERAL DESCRIPTION

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398177700</p>	398177700	INSTALLER	<ul style="list-style-type: none"> Used for installing rear bearing cone.
 <p style="text-align: center;">ST-398457700</p>	398457700	ATTACHMENT	<ul style="list-style-type: none"> Used for removing side bearing retainer.
 <p style="text-align: center;">ST-398477703</p>	398477703	DRIFT2	<ul style="list-style-type: none"> Used for press-fitting the bearing race (rear) of differential carrier.
 <p style="text-align: center;">ST-398437700</p>	398437700	DRIFT	<ul style="list-style-type: none"> Used for installing side oil seal.

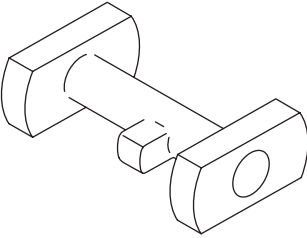
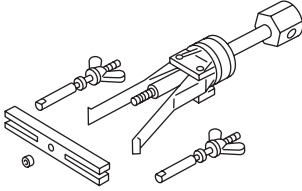
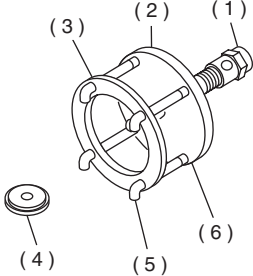
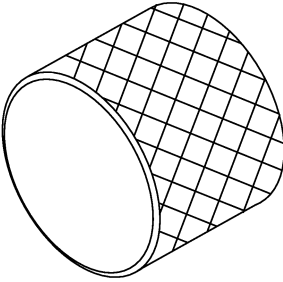
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398507702</p>	398507702	DUMMY SHAFT	<ul style="list-style-type: none"> Used for adjusting pinion height and preload.
 <p style="text-align: center;">ST-398507703</p>	398507703	DUMMY COLLAR	<ul style="list-style-type: none"> Used for adjusting pinion height and preload.
 <p style="text-align: center;">ST-398517700</p>	398517700	REPLACER	<ul style="list-style-type: none"> Used for removing rear bearing cone.
 <p style="text-align: center;">ST-398487700</p>	398487700	DRIFT	<ul style="list-style-type: none"> Used for press-fitting the side bearing cone.

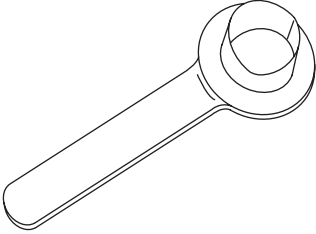
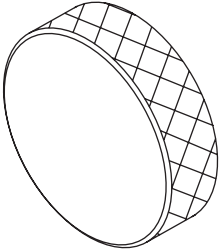
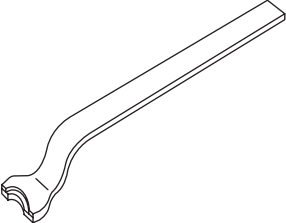
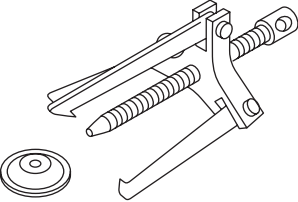
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 <p style="text-align: center;">ST-398507701</p>	398507701	DIFFERENTIAL CARRIER GAUGE	<ul style="list-style-type: none"> Used for adjusting pinion height.
 <p style="text-align: center;">ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> Used for removing front oil seal. Used for removing side bearing cup.
 <p style="text-align: center;">ST-399527700</p>	399527700	PULLER SET	<ul style="list-style-type: none"> Used for extracting side bearing cone. <p>(1) BOLT (899521412) (2) PULLER (399527702) (3) HOLDER (399527703) (4) ADAPTER (398497701) (5) BOLT (899520107) (6) NUT (021008000)</p>
 <p style="text-align: center;">ST-398227700</p>	398227700	WEIGHT	<ul style="list-style-type: none"> Used for installing side bearing.

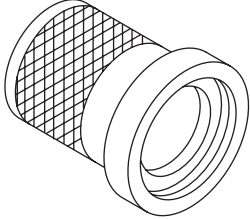
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 <p style="text-align: center;">ST28099PA090</p>	28099PA090	OIL SEAL PROTECTOR	<ul style="list-style-type: none"> • Used for installing rear drive shaft into rear differential. • For protecting oil seal.
 <p style="text-align: center;">ST-398237700</p>	398237700	GAUGE	<ul style="list-style-type: none"> • Used for installing side bearing.
 <p style="text-align: center;">ST28099PA100</p>	28099PA100	DRIVE SHAFT REMOVER	<ul style="list-style-type: none"> • Used for removing rear drive shaft from rear differential.
 <p style="text-align: center;">ST-399703600</p>	399703600	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing companion flange

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-899874100</p>	899874100	INSTALLER	<ul style="list-style-type: none"><li>• Used for installing companion flange.

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2. GENERAL PURPOSE TOOLS

TOOL NAME	REMARKS
Transmission jack	Used for assembly/disassembly of rear differential.
Puller	Used for removal of side bearing retainer.
Thickness gauge	Used for measuring clearance.