

# GENERAL DESCRIPTION

## DIFFERENTIALS

### 1. General Description

#### A: SPECIFICATIONS

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

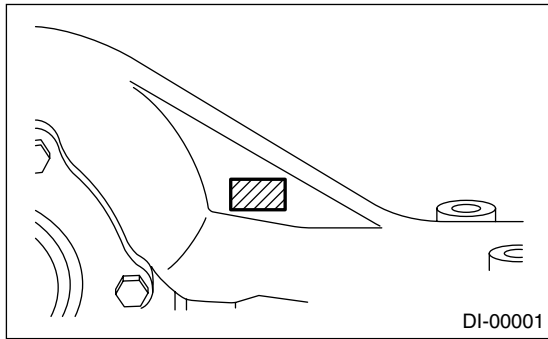
**NOTE:**

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

MODEL	2.5 L				2.0 L Turbo	
	AT		MT		AT	MT
	Wagon	Sedan	Wagon	Sedan		
Rear differential type	T-type model without LSD				T-type model with LSD	
LSD type	—				Viscous coupling	
Identification	EH	EL	EG	EH	EJ	EF
Type of gear	Hypoid gear					
Gear ratio (Number of gear teeth)	4.111 (37/9)	4.444 (37/9)	3.900 (39/10)	4.111 (37/9)	3.545 (39/11)	
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)					
Rear differential gear oil	GL-5					

MODEL	2.5 L Turbo STi
	6MT
Rear differential type	T-type model with LSD
LSD type	Mechanical
Identification	HK
Type of gear	Hypoid gear
Gear ratio (Number of gear teeth)	3.900 (39/10)
Oil capacity	0.9 — 1.1 ℓ (1.0 — 1.2 US qt, 0.8 — 1.0 Imp qt)
Rear differential gear oil	GL-5 (For mechanical LSD)

• **Identification**

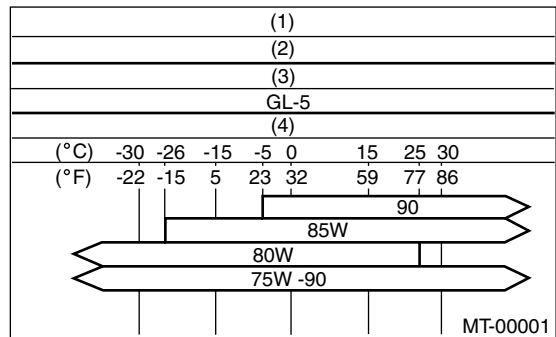


• **Rear differential gear oil**

Recommended oil

**CAUTION:**

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



- (1) Item
- (2) Differential gear oil
- (3) API Classification
- (4) SAE Viscosity NO. and Application Temperature

# GENERAL DESCRIPTION

DIFFERENTIALS

## 1. SERVICE DATA

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	Except STi model	18.1 — 38.8 (1.8 — 4.0, 4.1 — 8.7)
	STi model	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)
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

### • Except STi model

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	18.1 — 38.8 (1.8 — 4.0, 4.1 — 8.7)	
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.	Length 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)	

# GENERAL DESCRIPTION

## DIFFERENTIALS

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 mm (in)	0.1 — 0.2 (0.0039 — 0.0079)	
Side gear thrust washer (Model without LSD)	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)
Side bearing standard width mm (in)	— 20.00 (0.7874)	
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 mm (in)	Limit	0.10 — 0.20 (0.0039 — 0.0079)
Crown gear runout on its back surface mm (in)		0.05 (0.0020)

### • STi model

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)	
Preload adjusting spacer	Part No.	Length mm (in)
	31454AA130	52.2 (2.055)
	31454AA140	52.4 (2.063)
	31454AA150	52.6 (2.071)
	31454AA160	52.8 (2.079)
	31454AA170	53.0 (2.087)
	31454AA180	53.2 (2.094)

# GENERAL DESCRIPTION

DIFFERENTIALS

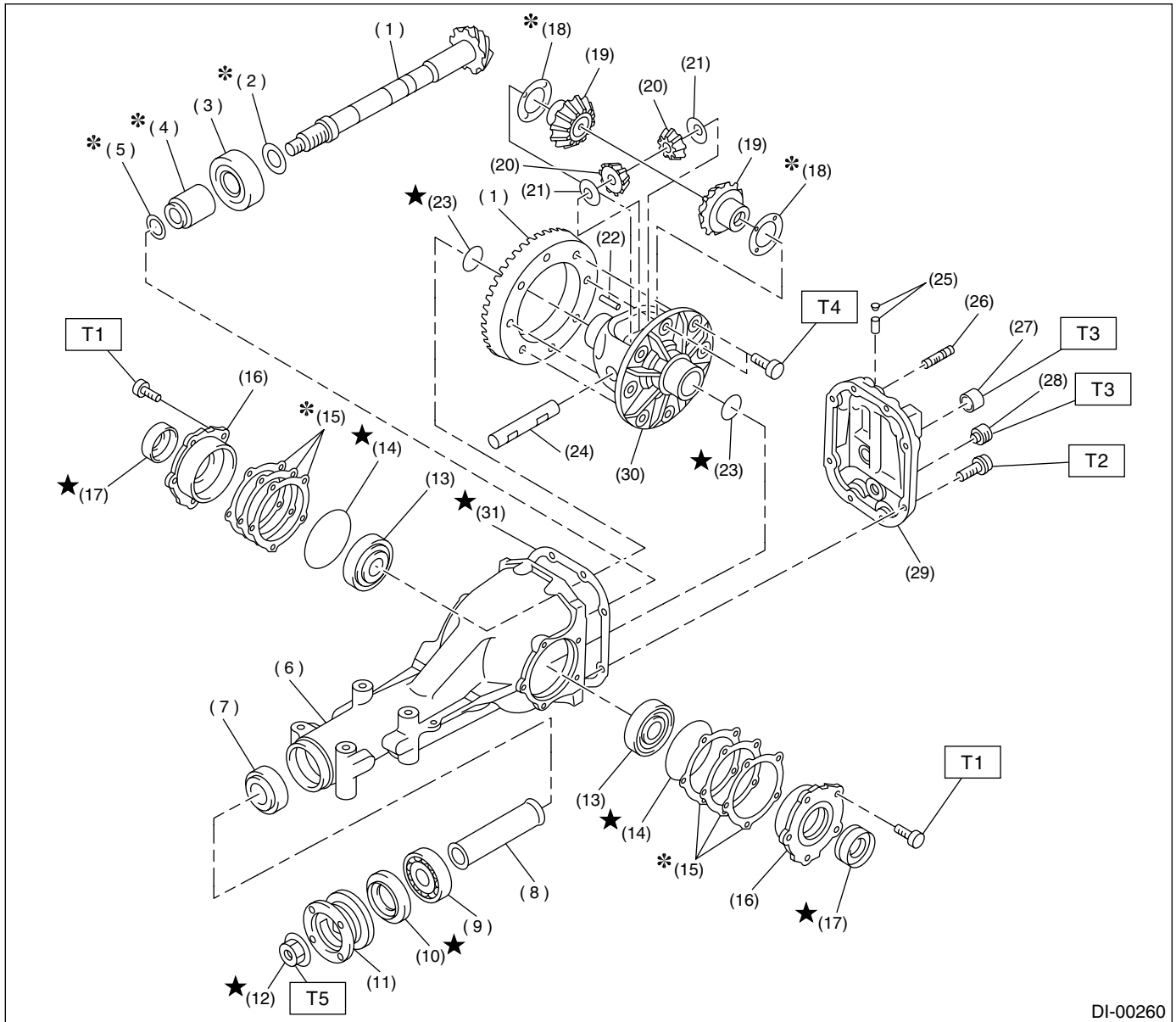
Preload adjusting washer	Part No.	Length mm (in)
	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	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.	Length mm (in)
	38336AA230	3.09 (0.1217)
	38336AA240	3.12 (0.1228)
	38336AA250	3.15 (0.1240)
	38336AA260	3.18 (0.1252)
	38336AA270	3.21 (0.1264)
	38336AA280	3.24 (0.1276)
	38336AA290	3.27 (0.1287)
	38336AA300	3.30 (0.1299)
	38336AA310	3.33 (0.1311)
	38336AA320	3.36 (0.1323)
	38336AA330	3.39 (0.1335)
	38336AA340	3.42 (0.1346)
	38336AA350	3.45 (0.1358)
	38336AA360	3.48 (0.1370)
	38336AA370	3.51 (0.1382)
38336AA380	3.54 (0.1394)	
38336AA390	3.57 (0.1406)	
38336AA400	3.60 (0.1417)	
38336AA410	3.63 (0.1429)	
38336AA420	3.66 (0.1441)	
Side bearing standard width mm (in)	20.00 (0.7874)	
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 mm (in)	Limit	0.10 — 0.20 (0.0039 — 0.0079)
Crown gear runout on its back surface mm (in)		0.05 (0.0020)

# GENERAL DESCRIPTION

## DIFFERENTIALS

### B: COMPONENT

#### 1. REAR DIFFERENTIAL WITHOUT LSD



DI-00260

- |  |                                 |                        |
|--|---------------------------------|------------------------|
| (1) Pinion crown gear and drive pinion set | (13) Side bearing               | (26) Stud bolt         |
| (2) Pinion height adjusting shim           | (14) O-ring                     | (27) Oil filler plug   |
| (3) Rear bearing                           | (15) Side bearing retainer shim | (28) Oil drain plug    |
| (4) Bearing preload adjusting spacer       | (16) Side bearing retainer      | (29) Rear cover        |
| (5) Bearing preload adjusting washer       | (17) Side oil seal              | (30) Differential case |
| (6) Differential carrier                   | (18) Side gear thrust washer    | (31) Gasket            |
| (7) Front bearing                          | (19) Side gear                  |                        |
| (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          |                        |
|  | (25) Air breather cap           |                        |

#### **Tightening torque: N-m (kgf-m, ft-lb)**

**T1: 10.3 (1.05, 7.6)**

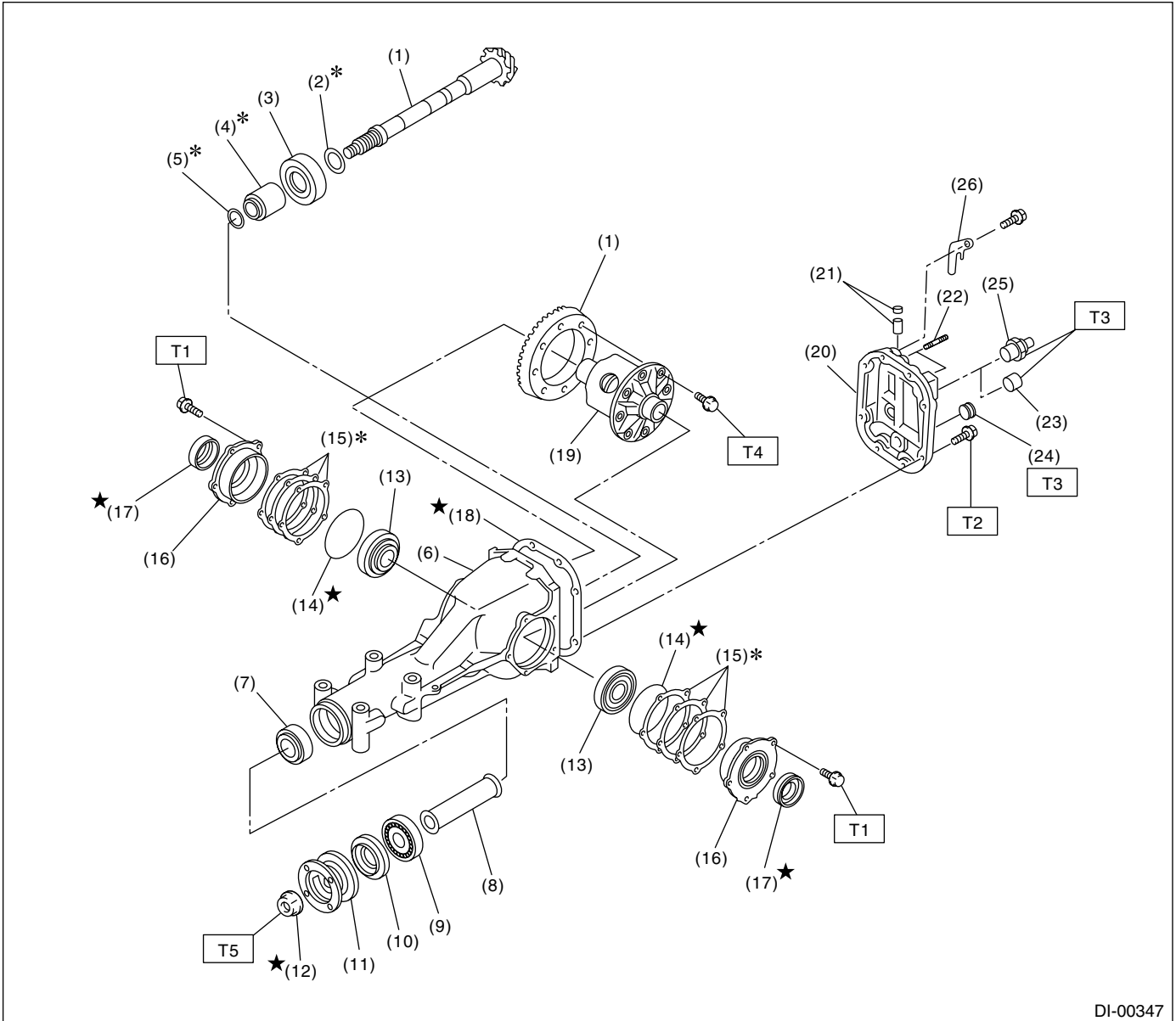
**T2: 29 (3.0, 21.7)**

**T3: 49 (5.0, 36.2)**

**T4: 105 (10.7, 77.4)**

**T5: 181 (18.5, 134)**

### 2. REAR DIFFERENTIAL WITH LSD



DI-00347

- |  |   |   |
|--|---|---|
| (1) Pinion crown gear and drive pinion set | (14) O-ring   | (25) Oil filler plug (Rear differential oil temperature switch) (STi model) |
| (2) Pinion height adjusting shim           | (15) Side bearing retainer shim                                       | (26) Stay ground (STi model)  |
| (3) Rear bearing                           | (16) Side bearing retainer  |   |
| (4) Bearing preload adjusting spacer       | (17) Side oil seal  |   |
| (5) Bearing preload adjusting washer       | (18) Gasket   |   |
| (6) Differential carrier                   | (19) Differential case (Viscous coupling type) (Except for STi model) |   |
| (7) Front bearing                          | Differential case (Mechanical type) (STi model)                       |   |
| (8) Collar                                 | (20) Rear cover   |   |
| (9) Pilot bearing                          | (21) Air breather cap   |   |
| (10) Front oil seal                        | (22) Stud bolt  |   |
| (11) Companion flange                      | (23) Oil filler plug  |   |
| (12) Self-locking nut                      | (24) Oil drain plug   |   |
| (13) Side bearing                          |   |   |

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

**T1: 10.3 (1.05, 7.6)**

**T2: 29 (3.0, 21.7) (Except for STi model)**

**44 (4.5, 32.5) (STi model)**

**T3: 49 (5.0, 36.2)**

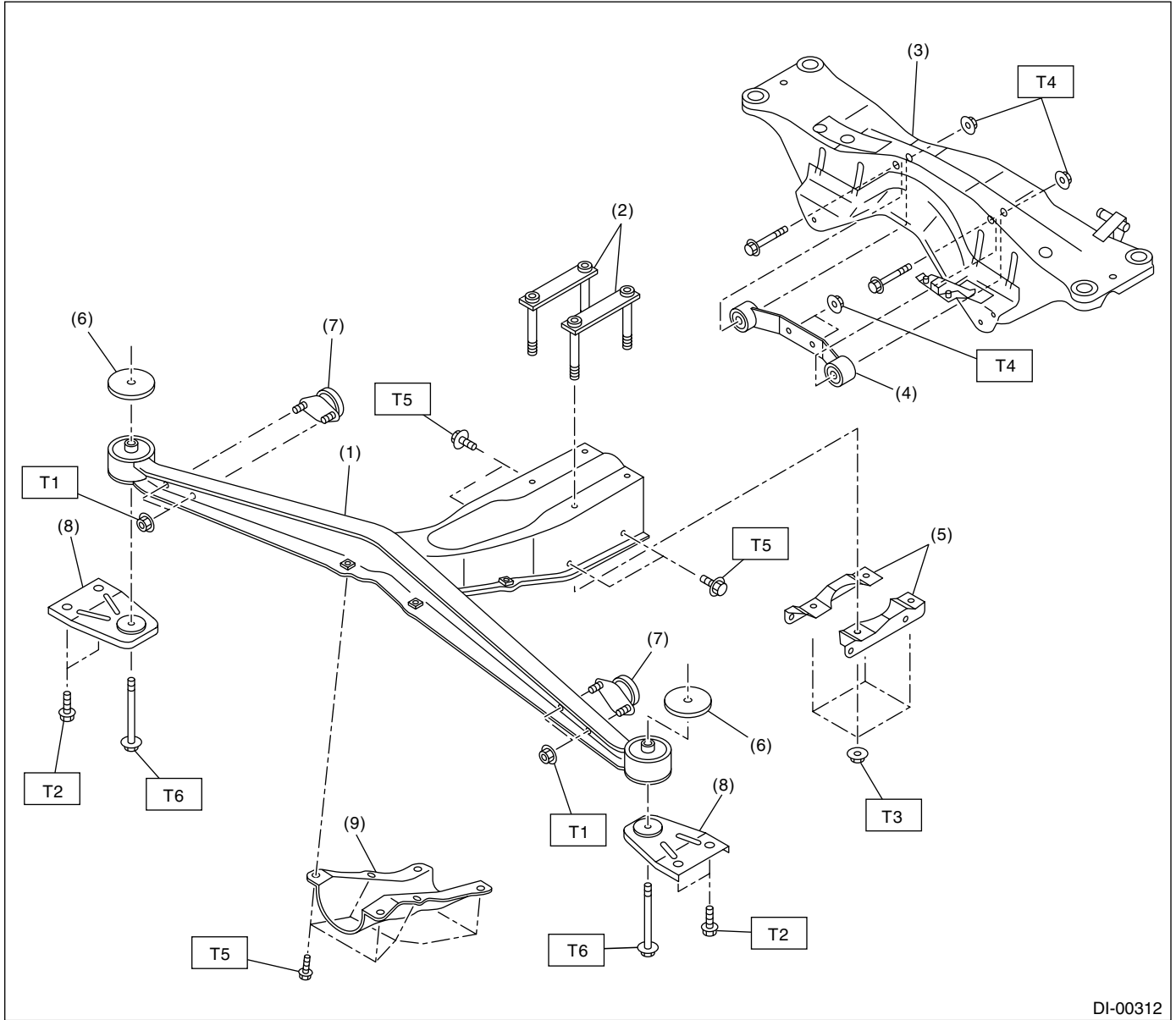
**T4: 105 (10.7, 77.4)**

**T5: 181 (18.5, 134)**

# GENERAL DESCRIPTION

## DIFFERENTIALS

### 3. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00312

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| (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 vise, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vise.
- Avoid damaging the mating face of the case.

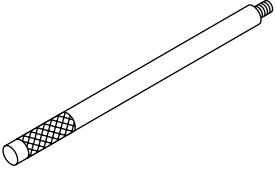
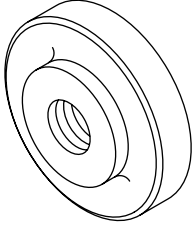
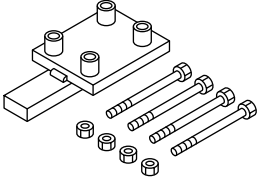
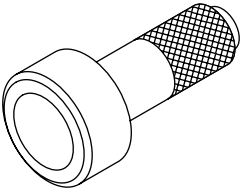


# GENERAL DESCRIPTION

DIFFERENTIALS

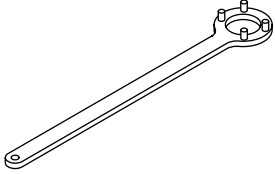
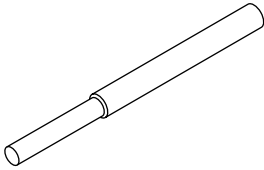
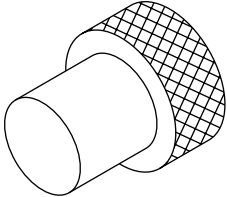
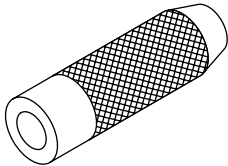
## D: PREPARATION TOOL

### 1. SPECIAL TOOLS

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

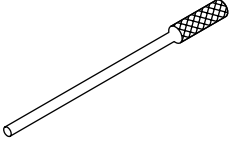
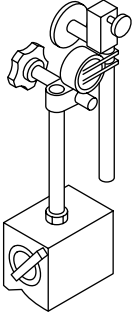
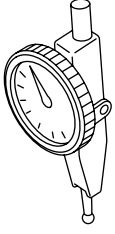
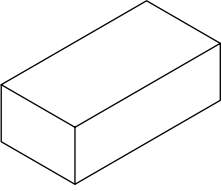
# GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498427200</p>	<p style="text-align: center;">498427200</p>	<p>FLANGE WRENCH</p>	<ul style="list-style-type: none"> <li>• Used for stopping rotation of companion flange when loosening and tightening self-lock nut.</li> <li>• For except STi model.</li> </ul>
 <p style="text-align: center;">ST-398467700</p>	<p style="text-align: center;">398467700</p>	<p>DRIFT</p>	<p>Used for removing pinion, pilot bearing and front bearing cone.</p>
 <p style="text-align: center;">ST-399780104</p>	<p style="text-align: center;">399780104</p>	<p>WEIGHT</p>	<p>Used for installing front bearing cone, pilot bearing companion flange.</p>
 <p style="text-align: center;">ST-899580100</p>	<p style="text-align: center;">899580100</p>	<p>INSTALLER</p>	<p>Used for press-fitting the front bearing cone, pilot bearing.</p>

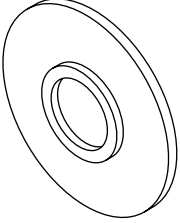
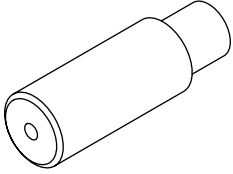
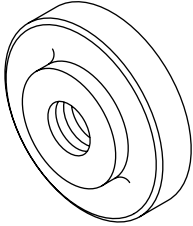
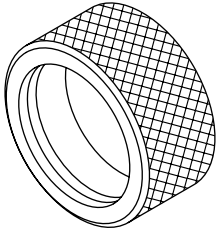
# GENERAL DESCRIPTION

## DIFFERENTIALS

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"> <li>• Used for measuring backlash between side gear and pinion, and hypoid gear.</li> <li>• Used with DIAL GAUGE (498247100).</li> </ul>
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> <li>• Used measuring backlash between side gear and pinion, hypoid gear.</li> <li>• Used with MAGNET BASE (498247001).</li> </ul>
 <p style="text-align: center;">ST-398507704</p>	398507704	BLOCK	Used for adjusting pinion height and preload.

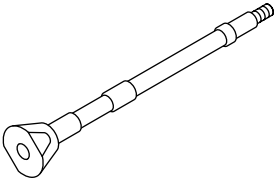
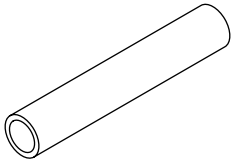
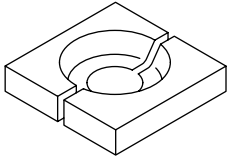
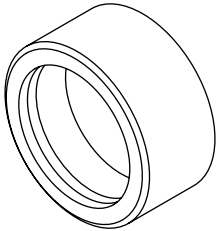
# GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398177700</p>	<p style="text-align: center;">398177700</p>	<p style="text-align: center;">INSTALLER</p>	<p>Used for installing rear bearing cone.</p>
 <p style="text-align: center;">ST-398457700</p>	<p style="text-align: center;">398457700</p>	<p style="text-align: center;">ATTACHMENT</p>	<p>Used for removing side bearing retainer.</p>
 <p style="text-align: center;">ST-398477703</p>	<p style="text-align: center;">398477703</p>	<p style="text-align: center;">DRIFT2</p>	<p>Used for press-fitting the bearing race (rear) of differential carrier.</p>
 <p style="text-align: center;">ST-398437700</p>	<p style="text-align: center;">398437700</p>	<p style="text-align: center;">DRIFT</p>	<p>Used for installing side oil seal.</p>

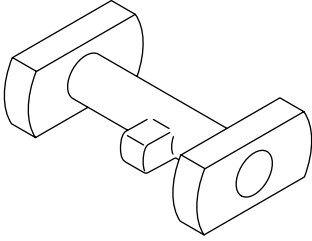
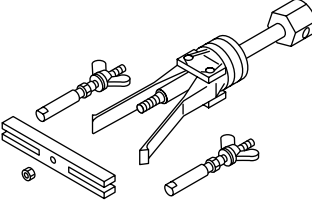
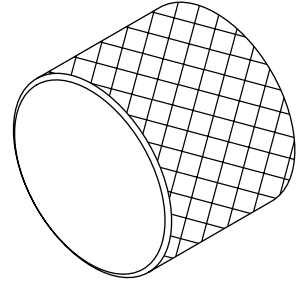
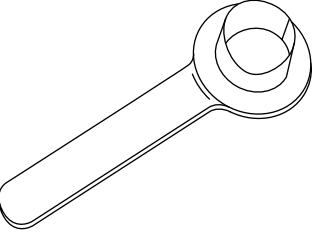
# GENERAL DESCRIPTION

## DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398507702</p>	<p style="text-align: center;">398507702</p>	<p style="text-align: center;">DUMMY SHAFT</p>	<p>Used for adjusting pinion height and preload.</p>
 <p style="text-align: center;">ST-398507703</p>	<p style="text-align: center;">398507703</p>	<p style="text-align: center;">DUMMY COLLAR</p>	<p>Used for adjusting pinion height and preload.</p>
 <p style="text-align: center;">ST-398517700</p>	<p style="text-align: center;">398517700</p>	<p style="text-align: center;">REPLACER</p>	<p>Used for removing rear bearing cone.</p>
 <p style="text-align: center;">ST-398487700</p>	<p style="text-align: center;">398487700</p>	<p style="text-align: center;">DRIFT</p>	<p>Used for press-fitting the side bearing cone.</p>

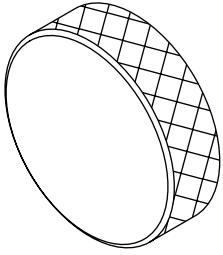
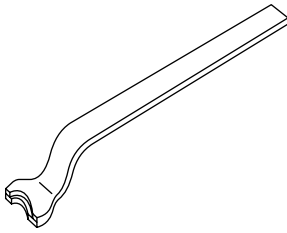
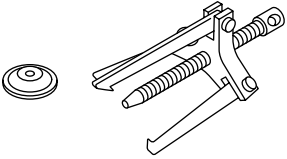
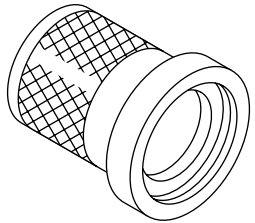
# GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398507701</p>	<p style="text-align: center;">398507701</p>	<p>DIFFERENTIAL CARRIER GAUGE</p>	<p>Used for adjusting pinion height.</p>
 <p style="text-align: center;">ST-398527700</p>	<p style="text-align: center;">398527700</p>	<p>PULLER ASSY</p>	<ul style="list-style-type: none"> <li>• Used for removing front oil seal.</li> <li>• Used for removing side bearing cup.</li> </ul>
 <p style="text-align: center;">ST-398227700</p>	<p style="text-align: center;">398227700</p>	<p>WEIGHT</p>	<p>Used for installing side bearing.</p>
 <p style="text-align: center;">ST28099PA090</p>	<p style="text-align: center;">28099PA090</p>	<p>OIL SEAL PROTEC- TOR</p>	<ul style="list-style-type: none"> <li>• Used for installing rear drive shaft into rear differential.</li> <li>• For protecting oil seal.</li> </ul>

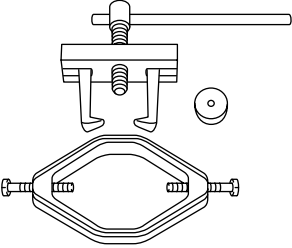
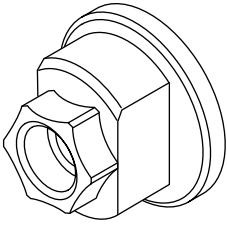
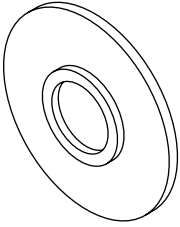
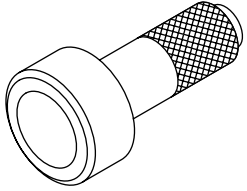
# GENERAL DESCRIPTION

## DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398237700</p>	<p style="text-align: center;">398237700</p>	<p style="text-align: center;">GAUGE</p>	<p>Used for installing side bearing.</p>
 <p style="text-align: center;">ST28099PA100</p>	<p style="text-align: center;">28099PA100</p>	<p style="text-align: center;">DRIVE SHAFT REMOVER</p>	<p>Used for removing rear drive shaft from rear differential.</p>
 <p style="text-align: center;">ST-399703600</p>	<p style="text-align: center;">399703600</p>	<p style="text-align: center;">PULLER ASSY</p>	<p>Used for removing companion flange.</p>
 <p style="text-align: center;">ST-899874100</p>	<p style="text-align: center;">899874100</p>	<p style="text-align: center;">INSTALLER</p>	<p>Used for installing companion flange.</p>

# GENERAL DESCRIPTION

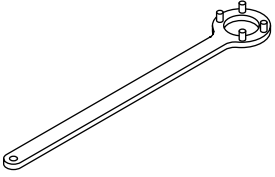
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST18759AA000</p>	<p style="text-align: center;">18759AA000 (Newly adopted tool)</p>	<p>PULLER ASSY</p>	<p>Used for removing side bearing cone of differential.</p>
 <p style="text-align: center;">ST-498937110</p>	<p style="text-align: center;">498937110</p>	<p>HOLDER DRIVE PINION (This special tool is used for current automatic transmission.)</p>	<ul style="list-style-type: none"> <li>• Used for installing pilot bearing.</li> <li>• For STi model.</li> </ul>
 <p style="text-align: center;">ST18674AA000</p>	<p style="text-align: center;">18674AA000 (Newly adopted tool)</p>	<p>INSTALLER</p>	<ul style="list-style-type: none"> <li>• Used for installing rear bearing cone.</li> <li>• For STi model.</li> </ul>
 <p style="text-align: center;">ST-398417700</p>	<p style="text-align: center;">398417700</p>	<p>DRIFT (This special tool was prepared for the vehicles of 92MY and before.)</p>	<ul style="list-style-type: none"> <li>• Used for installing side bearing race.</li> <li>• For STi model.</li> </ul>



# GENERAL DESCRIPTION

## DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST18633AA000</p>	<p>18633AA000 (Newly adopted tool)</p>	<p>WRENCH COMPL</p>	<ul style="list-style-type: none"> <li>• Used for stopping rotating of companion flange when loosening and tightening self-locking nut.</li> <li>• For STi model.</li> </ul>

## 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.