

# General Description

## DIFFERENTIALS

### 1. General Description

#### A: SPECIFICATION

##### 1. REAR DIFFERENTIAL

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

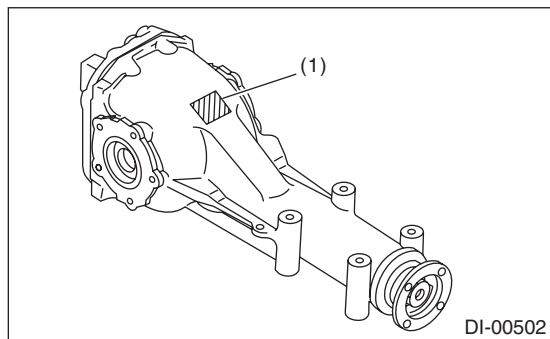
**NOTE:**

Using a different rear differential assembly will cause the drive train and tires to drag or emit abnormal noise.

Model	2.5 L high power turbo	2.5 L turbo
	6MT	5MT
Rear differential type	T-type	
Identification	H3	B2
LSD type	Torsen	—
Type of gear	Hypoid gear	
Gear ratio (Number of gear teeth)	3.545 (39/11)	3.900 (39/10)
Oil capacity	1.0 L (1.1 US qt, 0.9 Imp qt)	0.8 L (0.8 US qt, 0.7 Imp qt)
Rear differential gear oil	GL-5	

##### 2. IDENTIFICATION

Identification positions are shown in the following figures. For details concerning identification, refer to the “ID” section.



(1) Identification

##### 3. REAR DIFFERENTIAL GEAR OIL

**Recommended gear oil:**

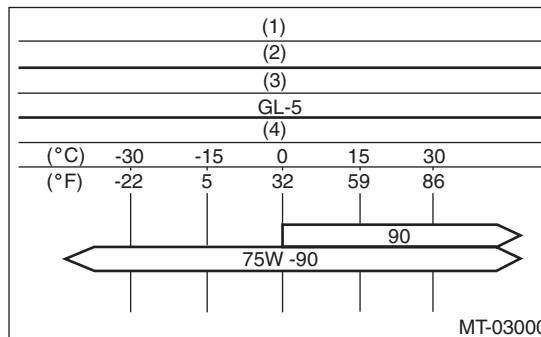
**GL-5 (75W-90)**

**Alternative:**

**Equivalent product**

**CAUTION:**

- If an alternative product is used, you may not have expected functionality and performance.
- 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 applicable temperature

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## 4. SERVICE DATA

Drive pinion bearing preload (For new bearing)	Measured with spring measurement (Measured at companion flange bolt hole) N (kgf, lbf)	T-type (B2)	18.1 — 38.8 (1.8 — 4.0, 4.1 — 8.7)
		T-type (H3)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)
	Measured with torque wrench N·m (kgf·m, ft·lb)	T-type (B2)	0.69 — 1.47 (0.07 — 0.15, 0.51 — 1.08)
		T-type (H3)	0.98 — 1.57 (0.10 — 0.16, 0.72 — 1.16)
Side gear backlash	mm (in)	T-type (B2)	0.10 — 0.20 (0.004 — 0.008)
Side bearing standard width		mm (in)	20.00 (0.7874)
Hypoid driven gear to drive pinion backlash		mm (in)	0.10 — 0.20 (0.004 — 0.008)
Hypoid driven gear runout on its back surface		mm (in)	0.05 (0.002)
Companion flange mating surface runout		mm (in)	0.08 (0.003)
Companion flange runout on its inner surface		mm (in)	0.08 (0.003)
Total preload (Measured from the companion flange bolt hole)	N (kgf, lbf)	T-type (B2)	20.7 — 54.4 (2.1 — 5.5, 4.7 — 12.2)
		T-type (H3)	26.5 — 53 (2.7 — 5.4, 6.0 — 11.9)

## 5. ADJUSTING PARTS

- T-type (B2)

	Part No.	Length mm (in)
Preload adjusting spacer	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)

	Part No.	Thickness mm (in)
Preload adjusting washer	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)

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	Part No.	Thickness mm (in)
Pinion height adjusting washer	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 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)
Side retainer shim	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)

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- T-type (H3)

	Part No.	Length mm (in)
Preload adjusting spacer	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)

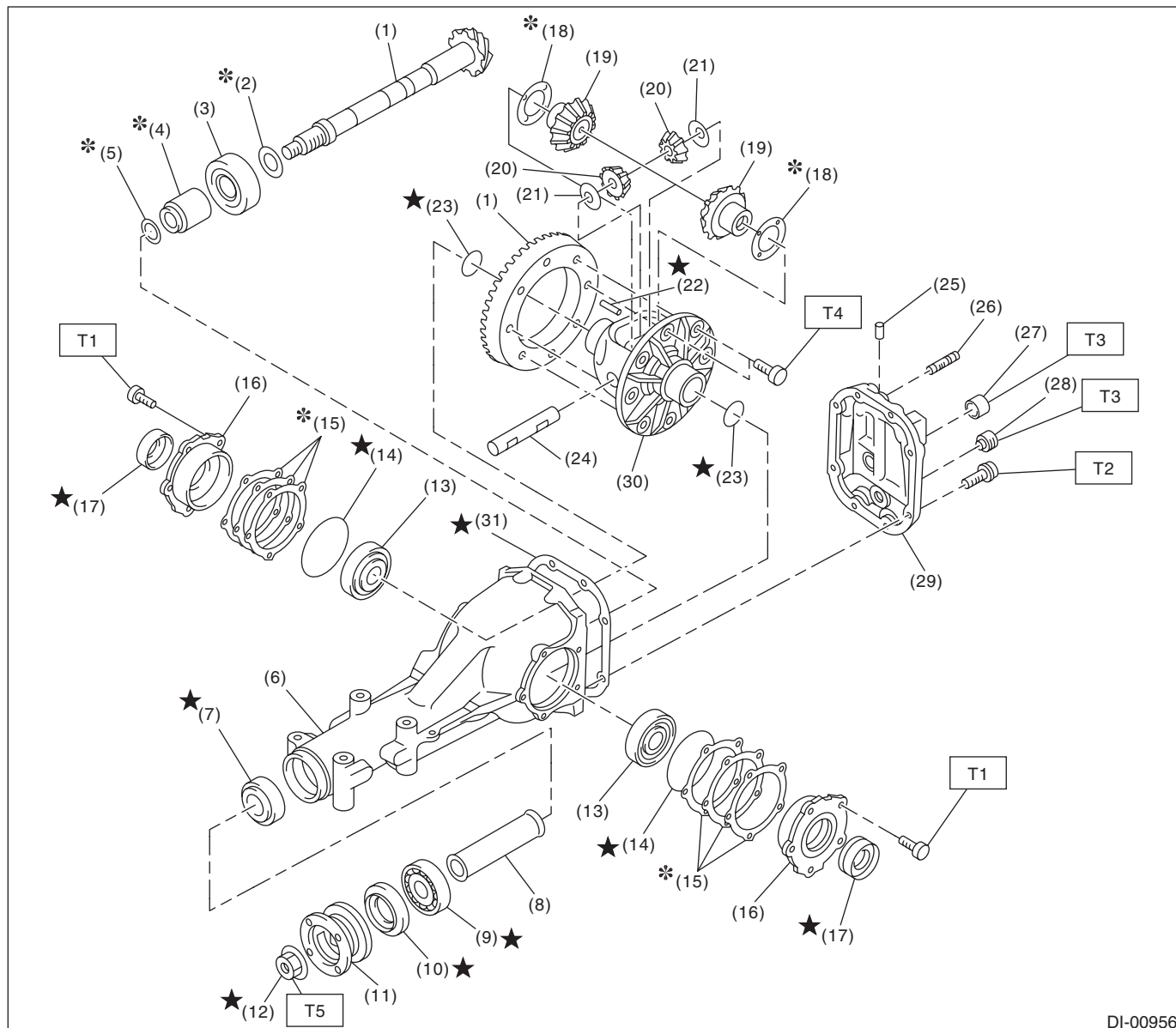
	Part No.	Thickness mm (in)
Preload adjusting washer	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	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 washer	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 retainer shim	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)

# General Description

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### B: COMPONENT

#### 1. REAR DIFFERENTIAL (T-TYPE (B2))



DI-00956

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

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

**T1: 10.5 (1.1, 7.7)**

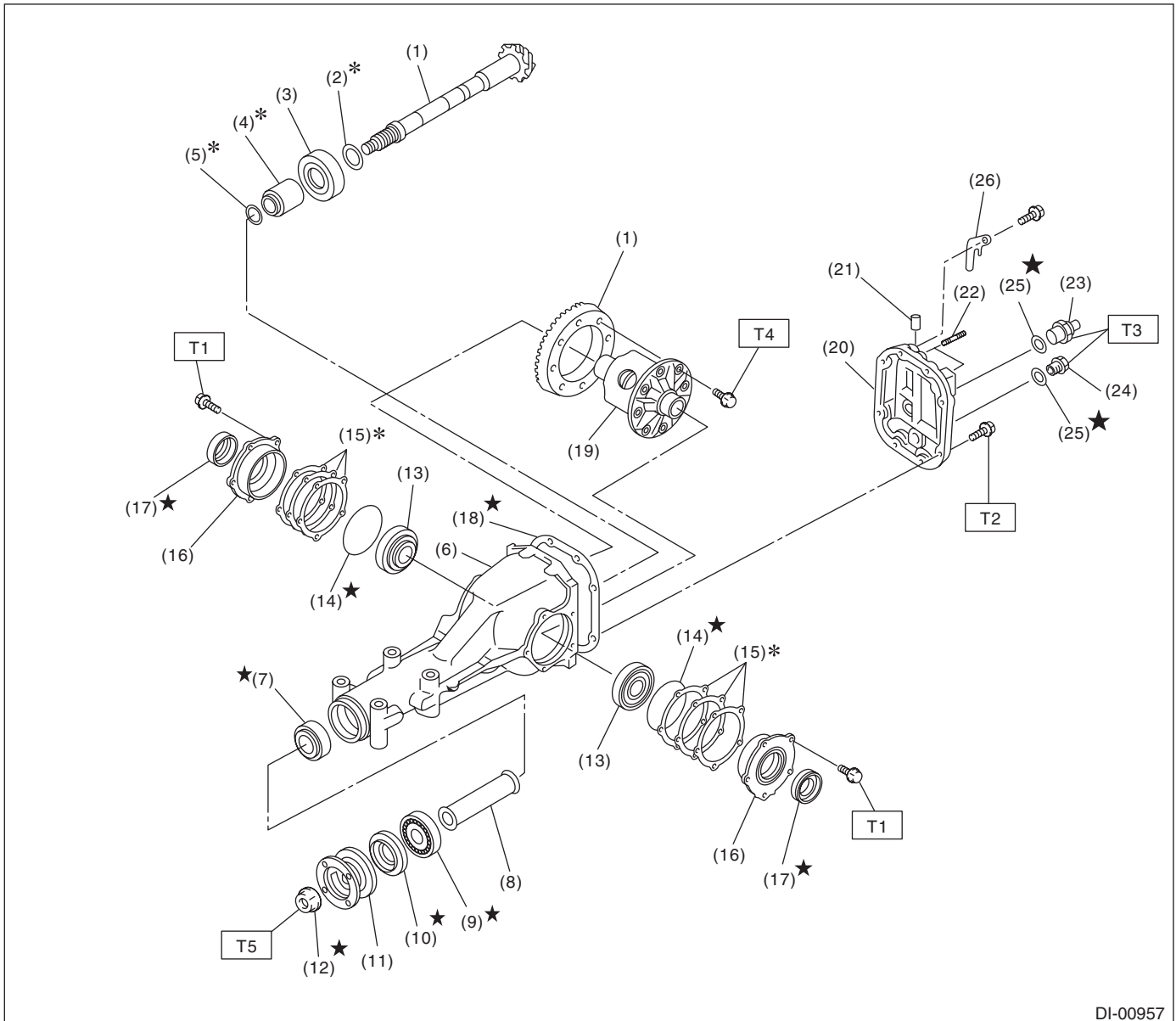
**T2: 29.5 (3.0, 21.8)**

**T3: 49 (5.0, 36.1)**

**T4: 103 (10.5, 76.0)**

**T5: 181.5 (18.5, 133.9)**

### 2. REAR DIFFERENTIAL (T-TYPE (H3))



DI-00957

- |   |                             |                             |
|---|-----------------------------|-----------------------------|
| (1) Hypoid driven gear and drive pinion set | (12) Self-locking nut       | (23) Oil temperature switch |
| (2) Pinion height adjusting washer          | (13) Side bearing           | (24) Drain plug             |
| (3) Rear bearing                            | (14) O-ring                 | (25) Gasket                 |
| (4) Preload adjusting spacer                | (15) Side retainer shim     | (26) Stay ground            |
| (5) Preload adjusting washer                | (16) Side retainer          |                             |
| (6) Differential carrier                    | (17) Side oil seal          |                             |
| (7) Front bearing                           | (18) Gasket                 |                             |
| (8) Spacer                                  | (19) Differential case ASSY |                             |
| (9) Pilot bearing                           | (20) Rear cover             |                             |
| (10) Front oil seal                         | (21) Air breather cap       |                             |
| (11) Companion flange                       | (22) Stud bolt              |                             |

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

**T1: 10.5 (1.1, 7.7)**

**T2: 44 (4.5, 32.5)**

**T3: 60 (6.1, 44.3)**

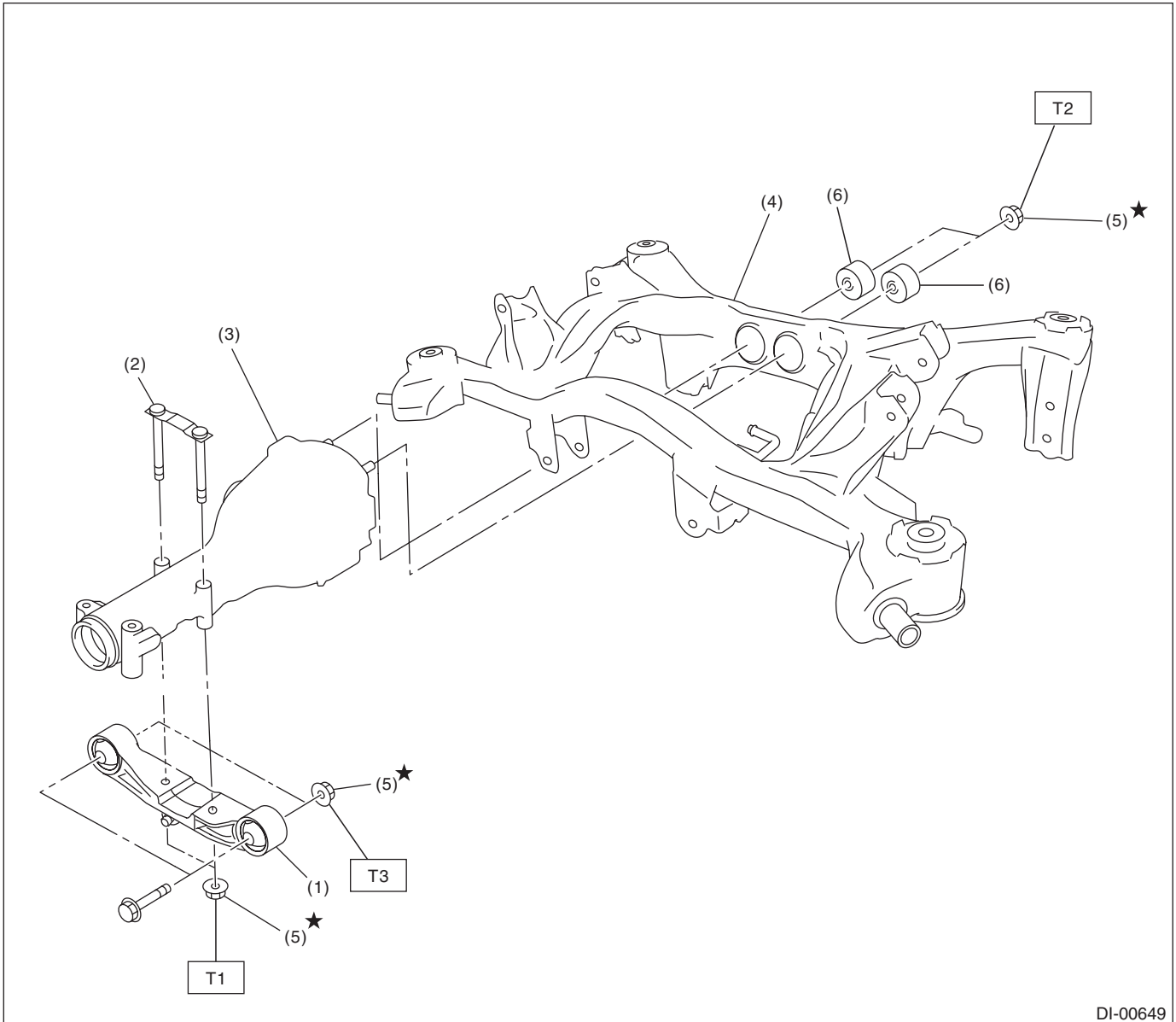
**T4: 103 (10.5, 76.0)**

**T5: 181.5 (18.5, 133.9)**

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### 3. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00649

- |                                    |  |
|------------------------------------|--|
| (1) Rear differential front member | (4) Sub frame                          |
| (2) Rear differential member plate | (5) Self-locking nut                   |
| (3) Rear differential ASSY         | (6) Rear differential mounting bushing |

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

**T1: 50 (5.1, 36.9)**

**T2: 70 (7.1, 51.6)**

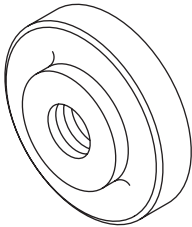
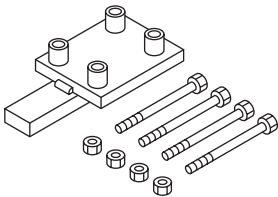
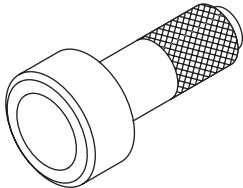
**T3: 110 (11.2, 81.1)**

## C: CAUTION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine gear oil, grease. Do not mix gear oil, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolving surfaces before installation.
- Before installing the O-ring or snap ring, apply a 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 cloth between the part and the vise.
- Avoid damaging the mating surface of the case.

## D: PREPARATION TOOL

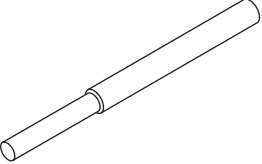
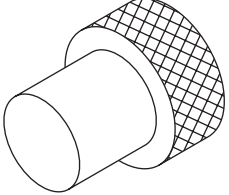
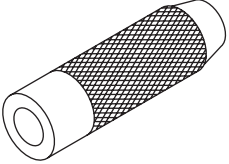
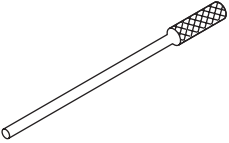
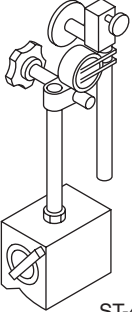
### 1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398477702	398477702	DRIFT	Used for installing the front bearing race.
 ST-398217700	398217700	ATTACHMENT SET	Stand for rear differential carrier disassembly and assembly.
 ST-498447120	498447120	INSTALLER	Used for installing the front oil seal.



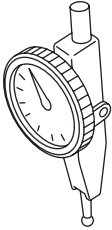
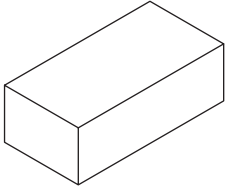
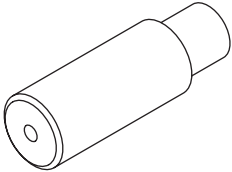
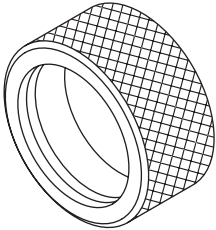
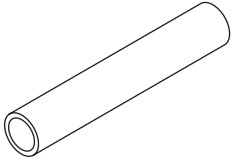
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398467700</p>	398467700	DRIFT	Used for removing drive pinion shaft, pilot bearing and front bearing cone.
 <p style="text-align: center;">ST-399780104</p>	399780104	WEIGHT	<ul style="list-style-type: none"> <li>• Used for installing the pilot bearing companion flange.</li> <li>• Used for installing the front bearing cone. (T-type (B2))</li> </ul>
 <p style="text-align: center;">ST-899580100</p>	899580100	INSTALLER	<ul style="list-style-type: none"> <li>• Used for installing the pilot bearing.</li> <li>• Used for installing the front bearing cone. (T-type (B2))</li> </ul>
 <p style="text-align: center;">ST-899904100</p>	899904100	STRAIGHT PIN REMOVER	Used for removing and installing the pinion mate shaft lock pin. (T-type (B2))
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> <li>• Used for measuring the backlash of hypoid gear.</li> <li>• Used together with DIAL GAUGE (498247100).</li> </ul>

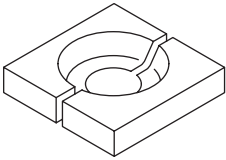
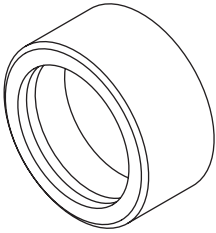
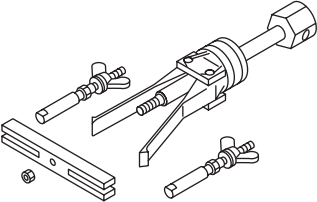
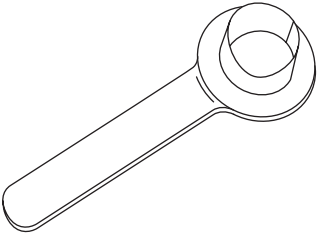
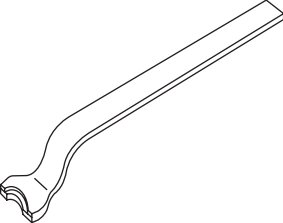
# General Description

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> <li>• Used for measuring the backlash of hypoid gear.</li> <li>• Used together with MAGNET BASE (498247001).</li> </ul>
 <p style="text-align: center;">ST-398507704</p>	398507704	BLOCK	Used for adjusting pinion height and preload. (T-type (B2))
 <p style="text-align: center;">ST-398457700</p>	398457700	ATTACHMENT	Used for removing the side retainer.
 <p style="text-align: center;">ST-398437700</p>	398437700	DRIFT	Used for installing the side oil seal.
 <p style="text-align: center;">ST-398507703</p>	398507703	DUMMY COLLAR	<ul style="list-style-type: none"> <li>• Used for adjusting pinion height and preload.</li> <li>• Used for installing the front bearing cone.</li> </ul>

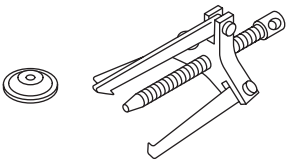
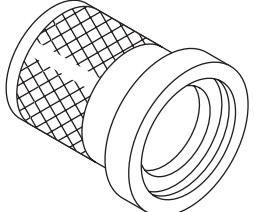
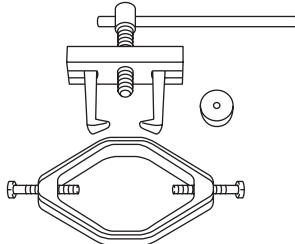
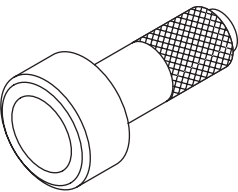
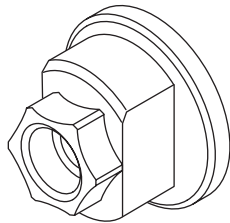
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398517700</p>	398517700	REPLACER	Used for removing rear bearing cone.
 <p style="text-align: center;">ST-398487700</p>	398487700	DRIFT	Used for installing side bearing cone.
 <p style="text-align: center;">ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> <li>• Used for removing front oil seal.</li> <li>• Used for removing the side bearing race.</li> </ul>
 <p style="text-align: center;">ST28099PA090</p>	28099PA090	OIL SEAL PROTECTOR	Used for installing the rear drive shaft to the rear differential. (For oil seal protection)
 <p style="text-align: center;">ST28099PA100</p>	28099PA100	DRIVE SHAFT REMOVER	Used for removing the rear drive shaft from rear differential.

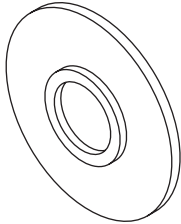
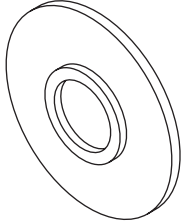
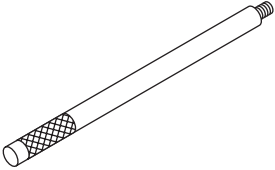
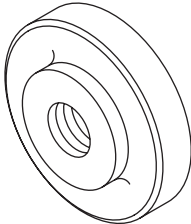
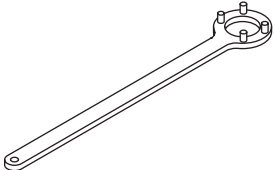
# General Description

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="337 520 467 541">ST-399703600</p>	399703600	PULLER ASSY	Used for removing companion flange.
 <p data-bbox="337 871 467 892">ST-899874100</p>	899874100	INSTALLER	Used for installing the companion flange.
 <p data-bbox="324 1222 467 1243">ST18759AA000</p>	18759AA000	PULLER ASSY	Used for removing the side bearing cone.
 <p data-bbox="337 1572 467 1593">ST-398417700</p>	398417700	DRIFT	Used for installing side bearing race.
 <p data-bbox="337 1925 467 1946">ST-498937110</p>	498937110	HOLDER DRIVE PINION	Used for installing the pilot bearing and the companion flange. (T-type (H3))

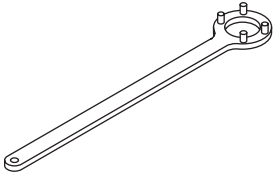
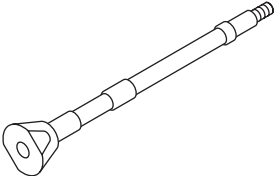
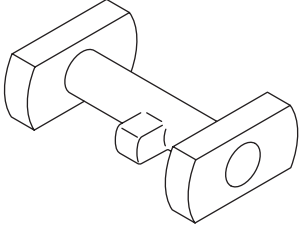
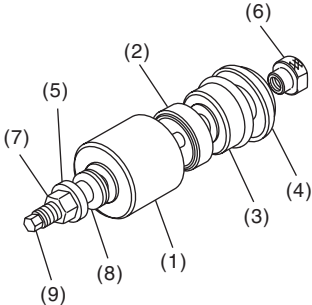
# General Description

## DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST18674AA000</p>	18674AA000	INSTALLER	Used for installing the rear bearing cone. (T-type (H3))
 <p style="text-align: center;">ST-398177700</p>	398177700	INSTALLER	Used for installing the rear bearing cone. (T-type (B2))
 <p style="text-align: center;">ST-398477701</p>	398477701	HANDLE	Used for installing the front and rear bearing races. (T-type (B2))
 <p style="text-align: center;">ST-398477703</p>	398477703	DRIFT 2	Used for installing the rear bearing race. (T-type (B2))
 <p style="text-align: center;">ST-498427200</p>	498427200	FLANGE WRENCH	Used for preventing rotation of companion flange when loosening and tightening self-lock nut. (T-type (B2))

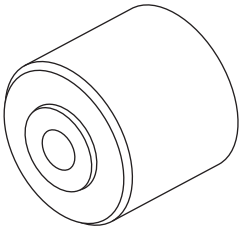
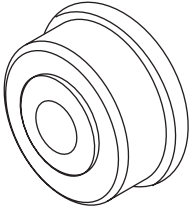
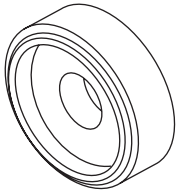
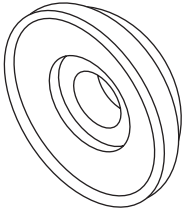
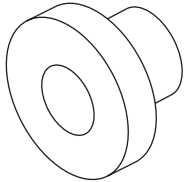
# General Description

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18633AA000</p>	18633AA000	WRENCH COMPL	Used for preventing rotation of companion flange when loosening and tightening self-lock nut. (T-type (H3))
 <p>ST-398507702</p>	398507702	DUMMY SHAFT	Used for adjusting pinion height and preload. (T-type (B2))
 <p>ST-398507701</p>	398507701	DIFFERENTIAL CARRIER GAUGE	Used for adjusting pinion height. (T-type (B2))
 <p>ST41399FG001</p>	41399FG001	SPECIAL TOOL ASSY	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• Use (1), (3), (5), (6), (7), (8) and (9) for removal.</li> <li>• Use (2), (4), (5), (6), (7), (8) and (9) for installation.</li> </ul> <p>(1) SPECIAL TOOL A (41399FG010)            (2) SPECIAL TOOL B (41399FG020)            (3) SPECIAL TOOL C (41399FG031)            (4) SPECIAL TOOL D (41399FG041)            (5) SPECIAL TOOL SLEEVE (41399FG050)            (6) SPECIAL TOOL RING (41399FG061)            (7) SPECIAL TOOL NUT (41399FG070)            (8) SPECIAL TOOL BEARING (41399FG080)            (9) SPECIAL TOOL SHAFT (41399FG091)</p>

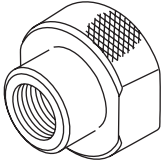
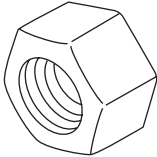
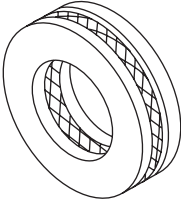
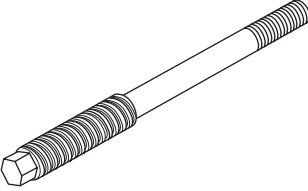
# General Description

## DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST41399FG010</p>	41399FG010	SPECIAL TOOL A	<ul style="list-style-type: none"> <li>• Used for removing the rear differential mount bushing.</li> <li>• For combination of tools for removal, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 <p style="text-align: center;">ST41399FG020</p>	41399FG020	SPECIAL TOOL B	<ul style="list-style-type: none"> <li>• Used for installing the rear differential mount bushing.</li> <li>• For combination of tools for installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 <p style="text-align: center;">ST41399FG031</p>	41399FG031	SPECIAL TOOL C	<ul style="list-style-type: none"> <li>• Used for removing the rear differential mount bushing.</li> <li>• For combination of tools for removal, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 <p style="text-align: center;">ST41399FG041</p>	41399FG041	SPECIAL TOOL D	<ul style="list-style-type: none"> <li>• Used for installing the rear differential mount bushing.</li> <li>• For combination of tools for installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 <p style="text-align: center;">ST41399FG050</p>	41399FG050	SPECIAL TOOL SLEEVE	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>

# General Description

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41399FG061	41399FG061	SPECIAL TOOL RING	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 ST41399FG070	41399FG070	SPECIAL TOOL NUT	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 ST41399FG080	41399FG080	SPECIAL TOOL BEARING	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>
 ST41399FG091	41399FG091	SPECIAL TOOL SHAFT	<ul style="list-style-type: none"> <li>• Used for removing and installing the rear differential mount bushing.</li> <li>• For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".</li> </ul>

## 2. GENERAL TOOL

TOOL NAME	REMARKS
Transmission jack	Used for removing and installing the rear differential.
Puller	Used for removing the side retainer.
Thickness gauge	Used for measuring clearance.