

GENERAL DESCRIPTION

DIFFERENTIALS

1. General Description

A: SPECIFICATIONS

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

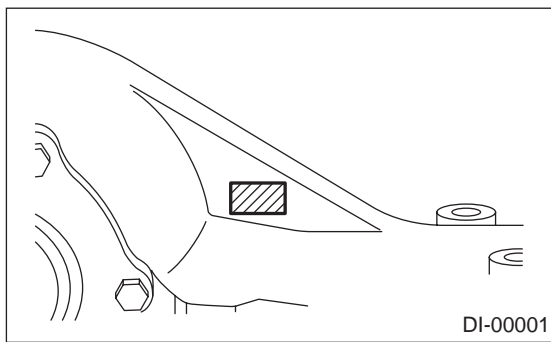
NOTE:

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

MODEL	2.5 L			
	BRIGHTON and L		Except BRIGHTON and L	
	MT	AT	MT	AT
	T-type	VA-type	T-type	
Rear differential type	T1	XK	JE (with LSD)	CD (with LSD)
Gear	Hypoid gear			
Gear ratio (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)	0.9 ℓ (1.0 US qt, 0.8 Imp qt)	0.8 ℓ (0.8 US qt, 0.7 Imp qt)	
Rear differential gear oil	GL-5			

MODEL	3.0 L	
	OUTBACK SEDAN, OUTBACK	
	With VDC	Without VDC
	T-type	
Rear differential type	T2	JE (with LSD)
Gear	Hypoid gear	
Gear ratio (Number of gear teeth)	4.111 (37/9)	
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)	
Rear differential gear oil	GL-5	

• Identification

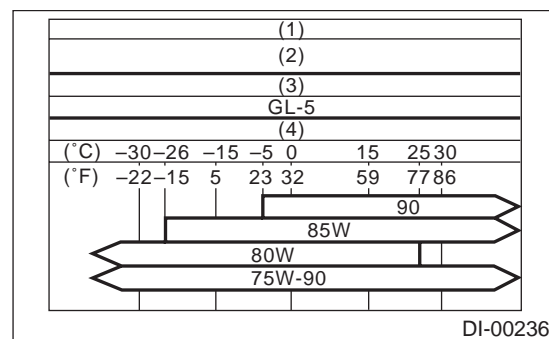


• Rear differential gear oil

Recommended oil

NOTE:

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

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1. SERVICE DATA

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	New bearing	T-type	19.6 — 28.4 (2.0 — 2.9, 4.4 — 6.4)
		VA-type	12.7 — 32.4 (1.3 — 3.3, 2.9 — 7.3)
Side gear backlash mm (in)	Used bearing	T-type	8.34 — 16.67 (0.85 — 1.7, 1.87 — 3.75)
		VA-type	0.10 — 0.20 (0.0039 — 0.0079)
Side bearing standard width mm (in)			0.05 — 0.15 (0.0020 — 0.0059)
Side bearing standard width mm (in)			20.00 (0.7874)
Crown gear to drive pinion backlash mm (in)		T-type	0.10 — 0.20 (0.0039 — 0.0079)
		VA-type	0.10 — 0.15 (0.0039 — 0.0059)
Crown gear runout on its back surface mm (in)			Less than 0.05 (0.0020)

DI-3

GENERAL DESCRIPTION

DIFFERENTIALS

2. ADJUSTING PARTS

• VA-type

Item	Part No.	Length or thickness
Preload adjusting spacer	32288AA040	52.3 mm (2.059 in)
	32288AA050	52.5 mm (2.067 in)
	31454AA100	52.6 mm (2.071 in)
	32288AA060	52.7 mm (2.075 in)
	31454AA110	52.8 mm (2.079 in)
	32288AA070	52.9 mm (2.083 in)
	31454AA120	53.0 mm (2.087 in)
	32288AA080	53.1 mm (2.091 in)
	32288AA090	53.3 mm (2.098 in)
Preload adjusting washer	38336AA000	1.500 mm (0.0591 in)
	38336AA120	1.513 mm (0.0596 in)
	38336AA010	1.525 mm (0.0600 in)
	38336AA130	1.538 mm (0.0606 in)
	38336AA020	1.550 mm (0.0610 in)
	38336AA140	1.563 mm (0.0615 in)
	38336AA030	1.575 mm (0.0620 in)
	38336AA150	1.588 mm (0.0625 in)
	38336AA040	1.600 mm (0.0630 in)
	38336AA160	1.613 mm (0.0635 in)
	38336AA050	1.625 mm (0.0640 in)
	38336AA170	1.638 mm (0.0645 in)
	38336AA060	1.650 mm (0.0650 in)
	38336AA180	1.663 mm (0.0655 in)
	38336AA070	1.675 mm (0.0659 in)
	38336AA190	1.688 mm (0.0665 in)
	38336AA080	1.700 mm (0.0669 in)
	38336AA200	1.713 mm (0.0674 in)
	38336AA090	1.725 mm (0.0679 in)
	38336AA210	1.738 mm (0.0684 in)
38336AA100	1.750 mm (0.0689 in)	
38336AA220	1.763 mm (0.0694 in)	
38336AA110	1.775 mm (0.0699 in)	
Pinion height adjusting shim	32295AA200	0.150 mm (0.0059 in)
	32295AA210	0.175 mm (0.0069 in)
	32295AA220	0.200 mm (0.0079 in)
	32295AA230	0.225 mm (0.0089 in)
	32295AA240	0.250 mm (0.0098 in)
	32295AA250	0.275 mm (0.0108 in)
Side gear thrust washer	803135011	0.925 — 0.950 mm (0.0364 — 0.0374 in)
	803135012	0.950 — 0.975 mm (0.0374 — 0.0384 in)
	803135013	0.975 — 1.000 mm (0.0384 — 0.0394 in)
	803135014	1.000 — 1.025 mm (0.0394 — 0.0404 in)
	803135015	1.025 — 1.050 mm (0.0404 — 0.0413 in)

DI-4

GENERAL DESCRIPTION

DIFFERENTIALS

• T-type

Item	Part No.	Length or thickness
Preload adjusting spacer	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	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	383495200
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 thrust washer (Without LSD)	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 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)

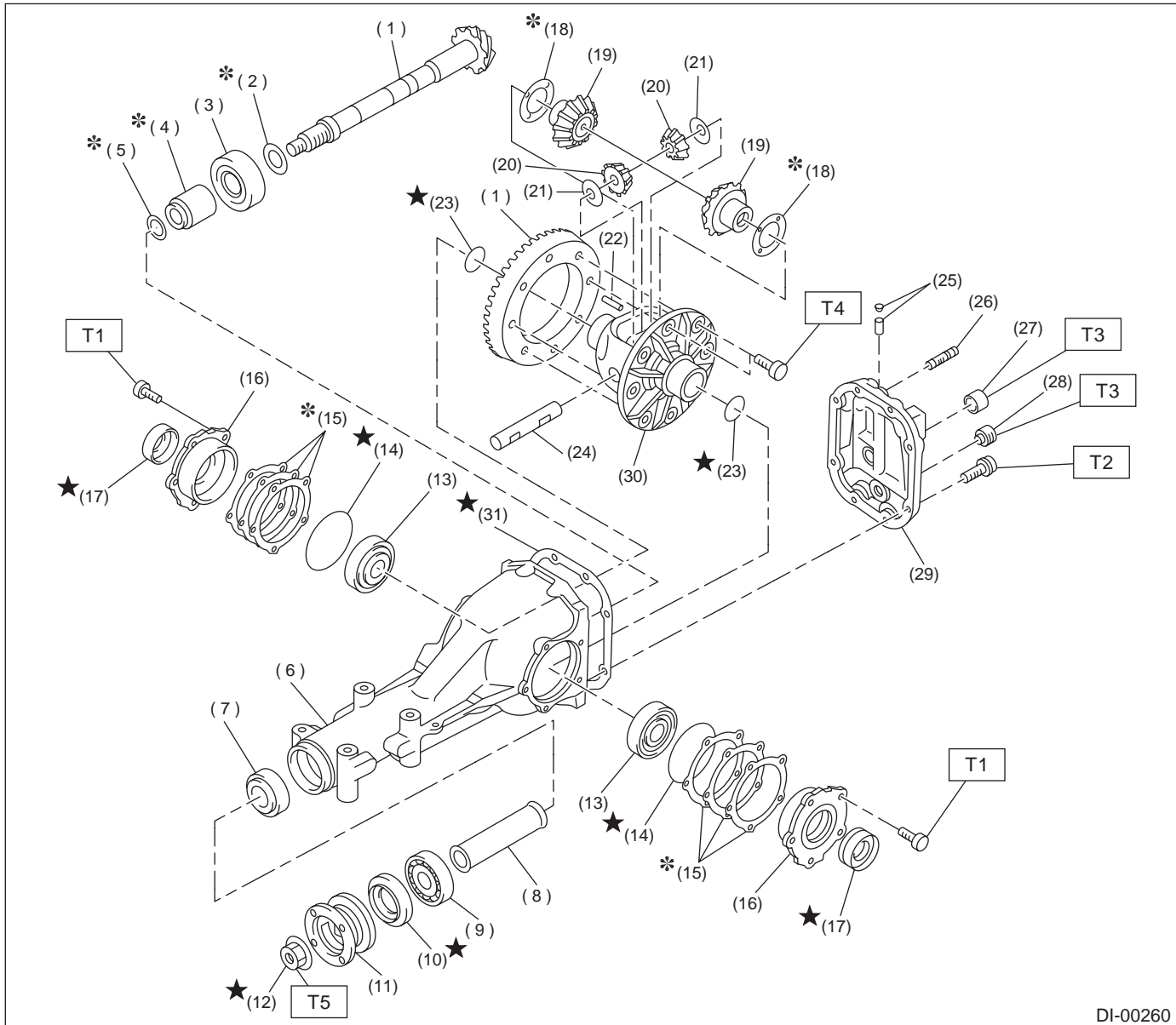
DI-5

GENERAL DESCRIPTION

DIFFERENTIALS

B: COMPONENT

1. REAR DIFFERENTIAL FOR T-TYPE WITHOUT LSD



DI-00260

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

Tightening torque: N·m (kgf·m, ft·lb)

T1: 10.5 (1.07, 7.7)

T2: 29.4 (3.00, 21.7)

T3: 49.0 (5.0, 36.2)

T4: 103.0 (10.50, 75.9)

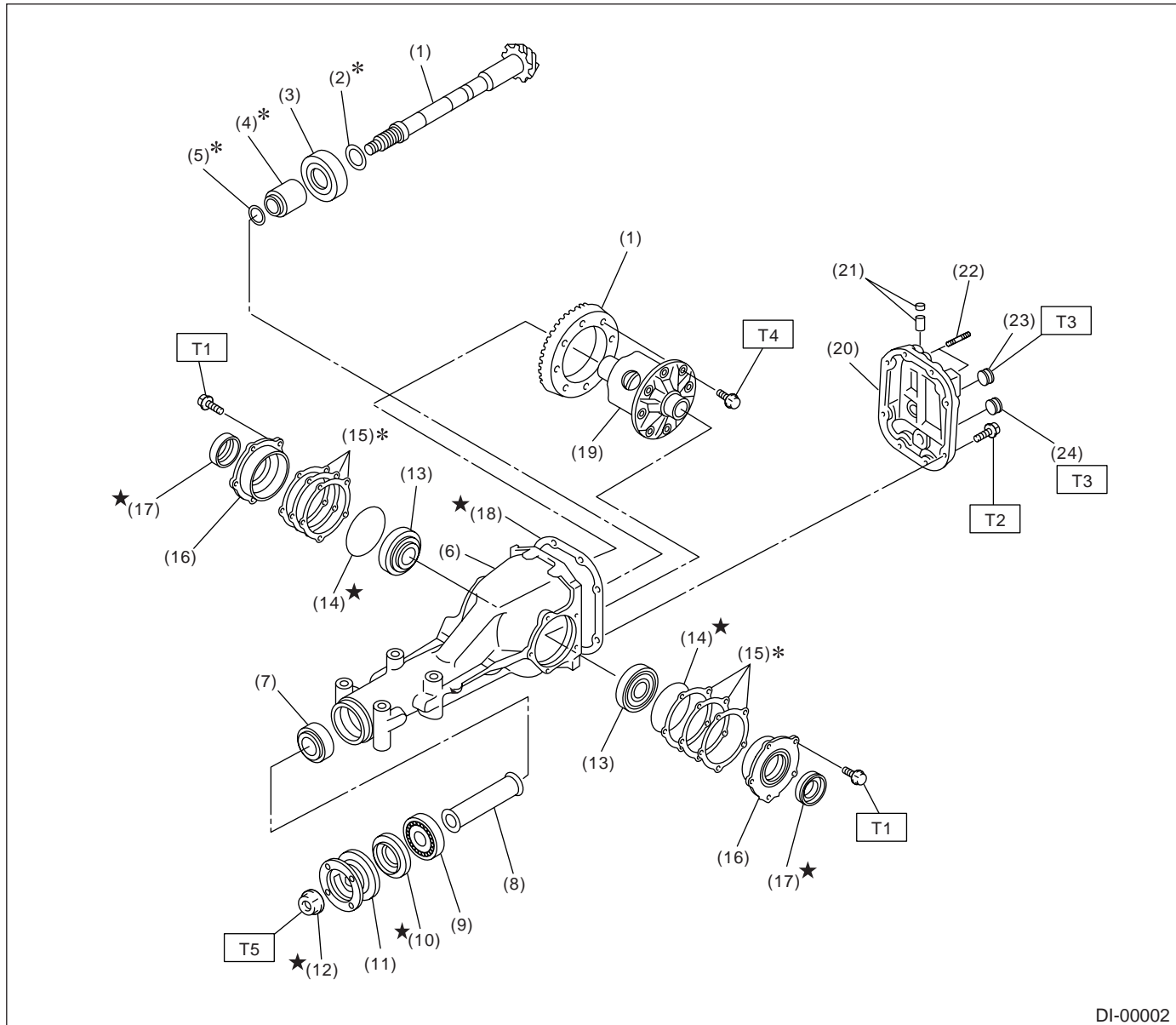
T5: 181.4 (18.50, 133.8)

DI-6

GENERAL DESCRIPTION

DIFFERENTIALS

2. REAR DIFFERENTIAL FOR T-TYPE WITH LSD



DI-00002

- | | |
|--|---------------------------------|
| (1) Pinion crown gear and drive pinion set | (11) Companion flange |
| (2) Pinion height adjusting shim | (12) Self-locking nut |
| (3) Rear bearing | (13) Side bearing |
| (4) Bearing preload adjusting spacer | (14) O-ring |
| (5) Bearing preload adjusting washer | (15) Side bearing retainer shim |
| (6) Differential carrier | (16) Side bearing retainer |
| (7) Front bearing | (17) Side oil seal |
| (8) Collar | (18) Gasket |
| (9) Pilot bearing | (19) Differential case |
| (10) Front oil seal | (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: 10.5 (1.07, 7.7)

T2: 29.0 (3.00, 21.7)

T3: 49.0 (5.00, 36.2)

T4: 103.0 (10.50, 75.9)

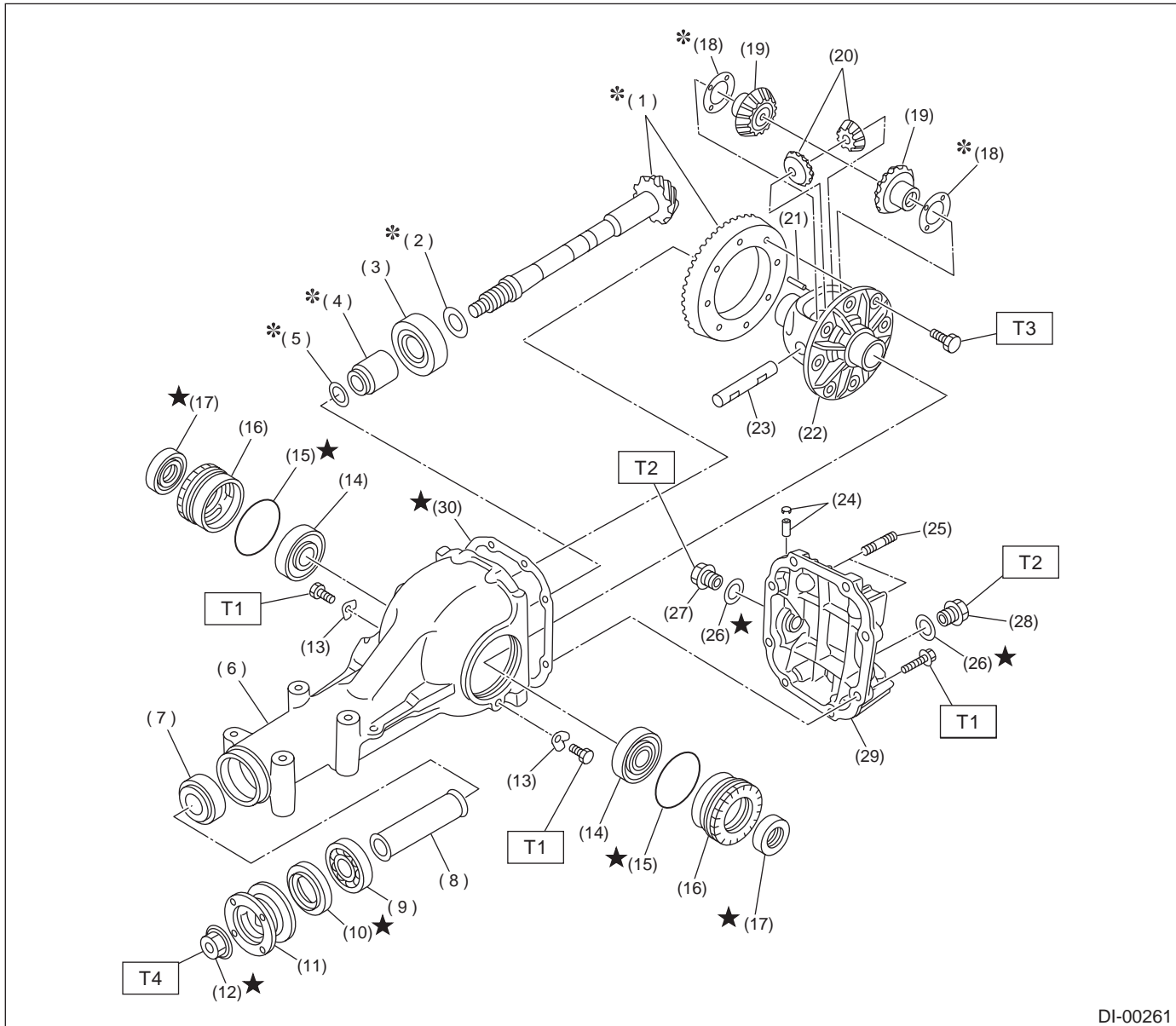
T5: 181.4 (18.50, 133.8)

DI-7

GENERAL DESCRIPTION

DIFFERENTIALS

3. REAR DIFFERENTIAL FOR VA-TYPE



DI-00261

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

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)

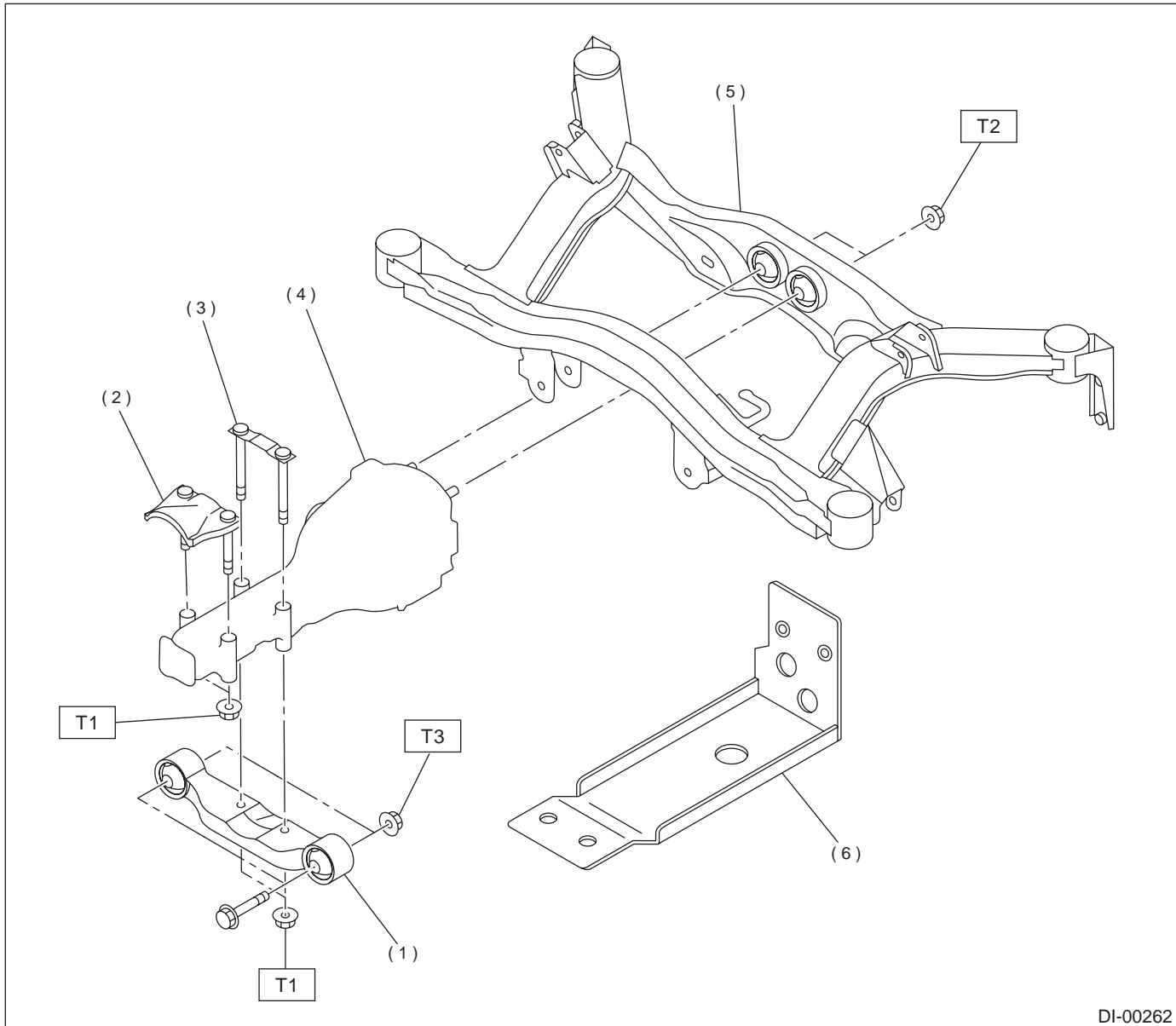
T4: 188 (19.2, 139)

DI-8

GENERAL DESCRIPTION

DIFFERENTIALS

4. REAR DIFFERENTIAL MOUNTING SYSTEM



- | | |
|------------------------------------|---|
| (1) Rear differential front member | (5) Sub frame |
| (2) Protector | (6) Rear differential protector (if equipped) |
| (3) Rear differential member plate | |
| (4) Rear differential ASSY | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 65 (6.6, 48)

T2: 70 (7.1, 51)

T3: 110 (11.2, 81)

DI-9

GENERAL DESCRIPTION

DIFFERENTIALS

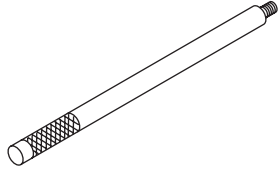
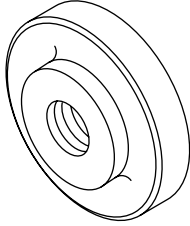
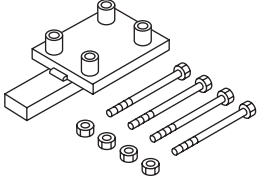
C: CAUTION

- 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.

D: PREPARATION TOOL

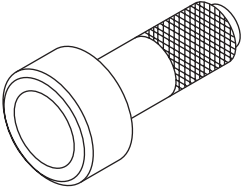
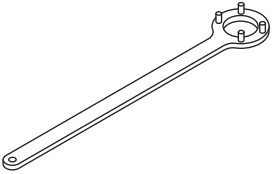
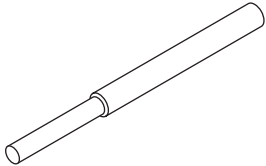
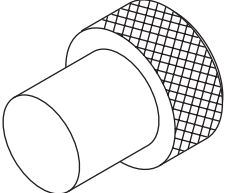
1. SPECIAL TOOLS

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 press-fitting the bearing cone of differential carrier (front).
 <p>ST-398217700</p>	398217700	ATTACHMENT SET	Stand for rear differential carrier disassembly and assembly.

DI-10

GENERAL DESCRIPTION

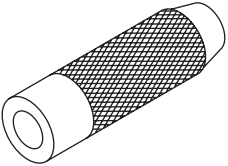
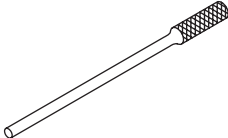
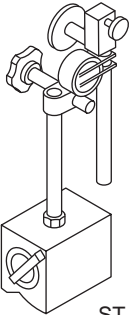
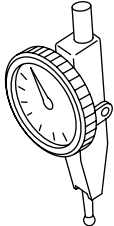
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498447120</p>	498447120	INSTALLER	Used for installing front oil seal.
 <p>ST-498427200</p>	498427200	FLANGE WRENCH	Used for stopping rotation of companion flange when loosening and tightening self-lock nut.
 <p>ST-398467700</p>	398467700	DRIFT	Used for removing pinion, pilot bearing and front bearing cone.
 <p>ST-399780104</p>	399780104	WEIGHT	Used for installing front bearing cone, pilot bearing companion flange.

DI-11

GENERAL DESCRIPTION

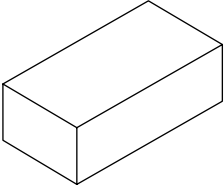
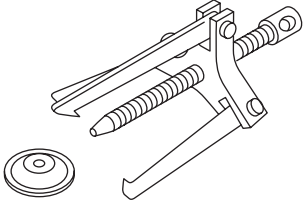
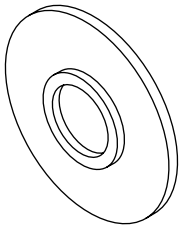
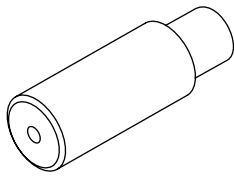
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-899580100</p>	899580100	INSTALLER	Used for press-fitting the front bearing cone, pilot bearing.
 <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 measuring backlash between side gear and pinion, hypoid gear. • Used with MAGNET BASE (498247001).

DI-12

GENERAL DESCRIPTION

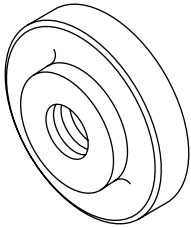
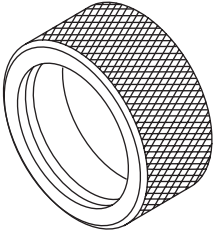
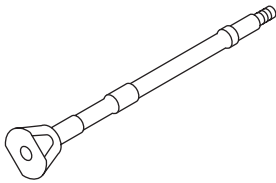
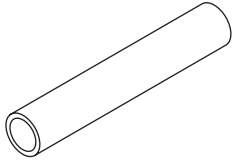
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398507704	398507704	BLOCK	Used for adjusting pinion height and preload.
 ST-399703600	399703600	PULLER ASSY	Use for removing companion flange.
 ST-398177700	398177700	INSTALLER	<ul style="list-style-type: none"> • Used for installing rear bearing cone. • For T-type.
 ST-398457700	398457700	ATTACHMENT	<ul style="list-style-type: none"> • Used for removing side bearing retainer. • For T-type.

DI-13

GENERAL DESCRIPTION

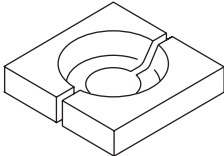
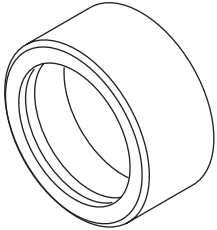
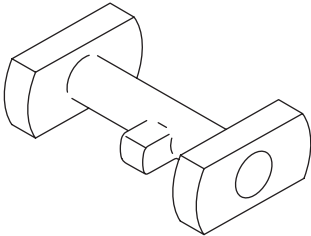
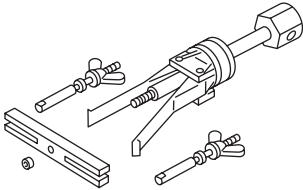
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398477703</p>	398477703	DRIFT 2	<ul style="list-style-type: none"> • Used for press-fitting the bearing race (rear) of differential carrier. • For T-type.
 <p style="text-align: center;">ST-398437700</p>	398437700	DRIFT	<ul style="list-style-type: none"> • Used for installing side oil seal. • For T-type.
 <p style="text-align: center;">ST-398507702</p>	398507702	DUMMY SHAFT	<ul style="list-style-type: none"> • Used for adjusting pinion height and preload. • For T-type.
 <p style="text-align: center;">ST-398507703</p>	398507703	DUMMY COLLAR	<ul style="list-style-type: none"> • Used for adjusting pinion height and preload. • For T-type.

DI-14

GENERAL DESCRIPTION

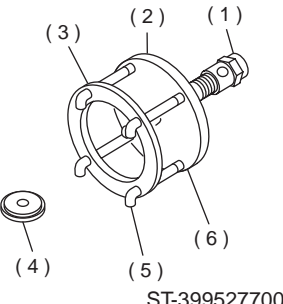
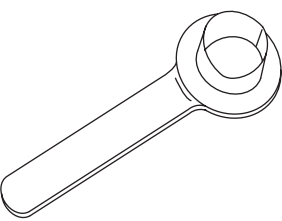
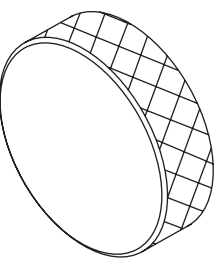
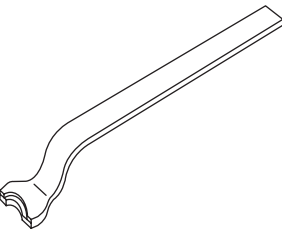
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398517700</p>	398517700	REPLACER	<ul style="list-style-type: none"> Used for removing rear bearing cone. For T-type.
 <p>ST-398487700</p>	398487700	DRIFT	<ul style="list-style-type: none"> Used for press-fitting the side bearing cone. For T-type.
 <p>ST-398507701</p>	398507701	GAUGE	<ul style="list-style-type: none"> Used for adjusting pinion height. For T-type.
 <p>ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> Used for removing oil seal and side bearing cup. For T-type.

DI-15

GENERAL DESCRIPTION

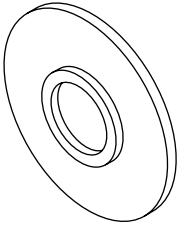
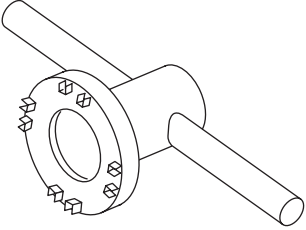
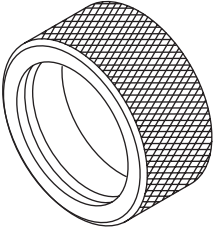
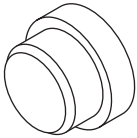
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-399527700</p>	399527700	PULLER SET	<ul style="list-style-type: none"> • 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.
 <p style="text-align: center;">ST28099PA090</p>	28099PA090	OIL SEAL PRO- TECTOR	<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. • For T-type.
 <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. • For T-type.

DI-16

GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498175500	498175500	INSTALLER	<ul style="list-style-type: none"> Used for installing rear bearing cone. For VA-type.
 ST-499785500	499785500	WRENCH ASSY	<ul style="list-style-type: none"> Used for removing and installing side oil seal holder. For VA-type.
 ST-498447100	498447100	INSTALLER	<ul style="list-style-type: none"> Used for installing oil seal. For VA-type.
 ST-399520105	399520105	SEAT	<ul style="list-style-type: none"> Used for removing side bearing cone. Used with PULLER SET (899524100). For VA-type.

DI-17

GENERAL DESCRIPTION

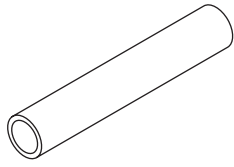
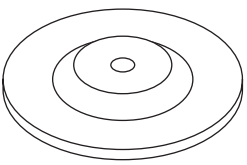
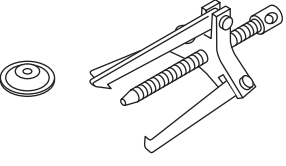
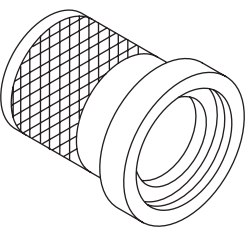
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
<p style="text-align: center;">ST-498485400</p>	498485400	DRIFT	<ul style="list-style-type: none"> • Used for installing side bearing cone. • For VA-type.
<p style="text-align: center;">ST-498505501</p>	498505501	GAUGE	<ul style="list-style-type: none"> • Used for adjusting pinion height. • For VA-type.
<p style="text-align: center;">ST-498447110</p>	498447110	BEARING OUTER RACE DRIFT	<ul style="list-style-type: none"> • Used for press-fitting the bearing race (front) of differential carrier. • For VA-type.
<p style="text-align: center;">ST-498447150</p>	498447150	DUMMY SHAFT	<ul style="list-style-type: none"> • Used for adjusting pinion height and pre-load. • For VA-type.

DI-18

GENERAL DESCRIPTION

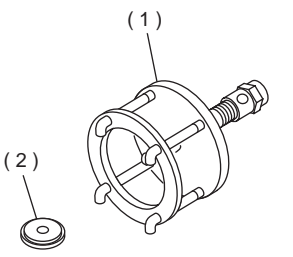
DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST32285AA000	32285AA000	DUMMY COLLAR	<ul style="list-style-type: none"> • Used for adjusting pinion height and pre-load. • For VA-type.
 ST-499705404	499705404	SEAT	<ul style="list-style-type: none"> • Used for removing side bearing race. • Used with PULLER ASSY (499705401). • For VA-type.
 ST-499705401	499705401	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing side bearing race. • Used with SEAT (499705404). • For VA-type.
 ST-899874100	899874100	INSTALLER	<ul style="list-style-type: none"> • Used for installing companion flange. • For VA-type.

DI-19

GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-899524100</p>	899524100	DIFFERENTIAL BEARING PULLER SET	<ul style="list-style-type: none"> • Used for removing side bearing cone of differential. • For VA-type. (1) Puller (2) Cap

2. GENERAL PURPOSE TOOLS

TOOL NAME	REMARKS
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)

DI-20