

DIFFERENTIALS

DI

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GENERAL DESCRIPTION

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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 — 26 (1.9 — 2.6, 4.3 — 5.8)
		VA-type	12.7 — 32.4 (1.3 — 3.3, 2.9 — 7.3)
	Used bearing	T-type	8 — 16 (0.8 — 1.6, 1.8 — 3.6)
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)

2. ADJUSTING PARTS

• T-type

Front and rear bearing preload at companion flange bolt hole N (kgf, lb)	New bearing	19 — 26 (1.9 — 2.6, 4.3 — 5.8)
	Used bearing	8 — 16 (0.8 — 1.6, 1.8 — 3.6)
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)	

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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 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	Limit mm (in)	0.10 — 0.20 (0.0039 — 0.0079)
Crown gear runout on its back surface		0.05 (0.0020)

• VA-type

Front and rear bearing preload at companion flange bolt hole	New bearing	12.7 — 32.4 N (1.3 — 3.3 kgf, 2.9 — 7.3 lb)
Preload adjusting spacer	Part No.	Length mm (in)
	32288AA040	52.3 (2.059)
	32288AA050	52.5 (2.067)
	31454AA100	52.6 (2.071)
	32288AA060	52.7 (2.075)
	31454AA110	52.8 (2.079)
	32288AA070	52.9 (2.083)
	31454AA120	53.0 (2.087)
	32288AA080	53.1 (2.091)
	32288AA090	53.3 (2.098)

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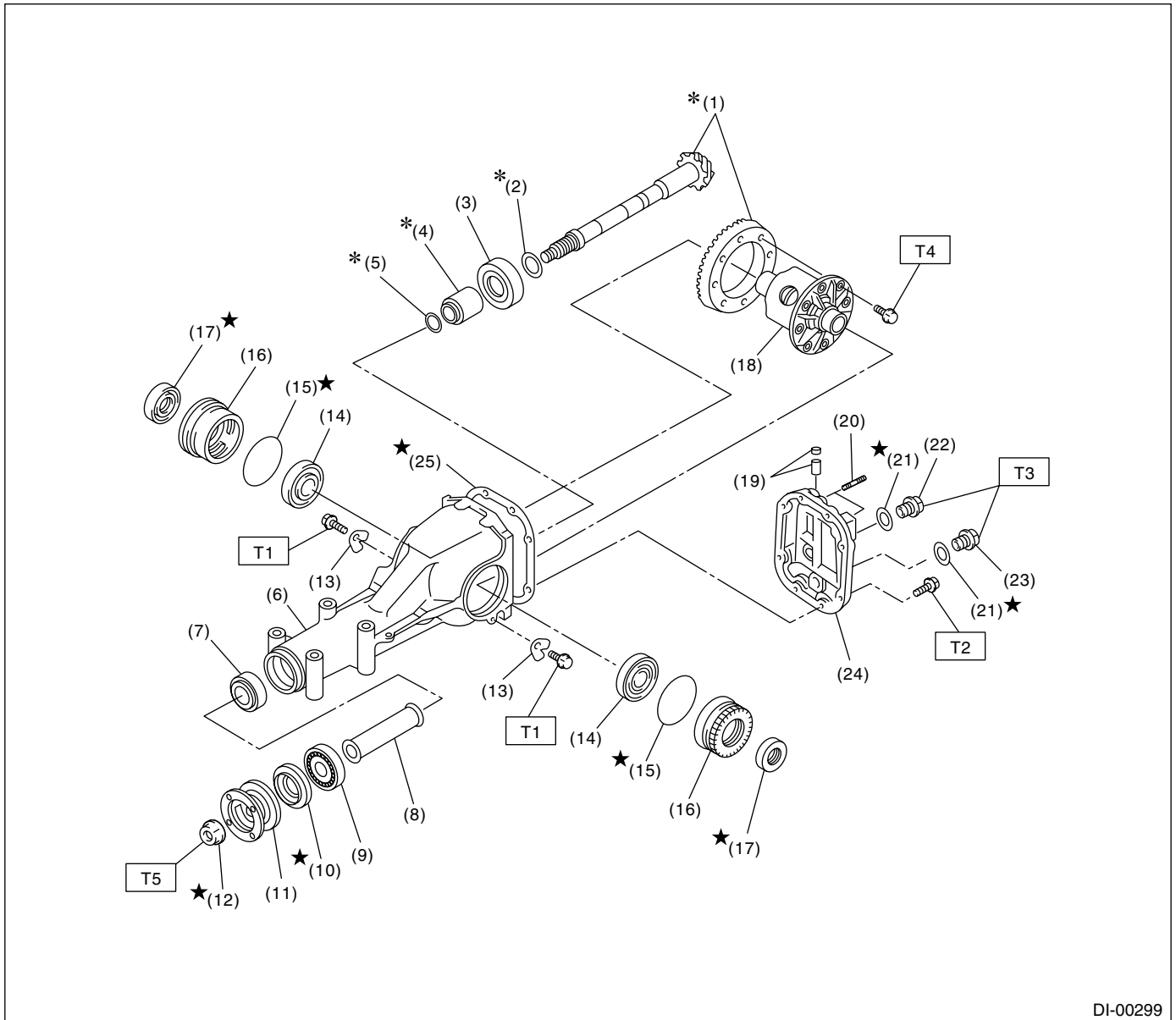
Preload adjusting washer	Part No.	Thickness mm (in)
	38336AA000	1.500 (0.0591)
	38336AA120	1.513 (0.0596)
	38336AA010	1.525 (0.0600)
	38336AA130	1.538 (0.0606)
	38336AA020	1.550 (0.0610)
	38336AA140	1.563 (0.0615)
	38336AA030	1.575 (0.0620)
	38336AA150	1.588 (0.0625)
	38336AA040	1.600 (0.0630)
	38336AA160	1.613 (0.0635)
	38336AA050	1.625 (0.0640)
	38336AA170	1.638 (0.0645)
	38336AA060	1.650 (0.0650)
	38336AA180	1.663 (0.0655)
	38336AA070	1.675 (0.0659)
	38336AA190	1.688 (0.0665)
	38336AA080	1.700 (0.0669)
	38336AA200	1.713 (0.0674)
	38336AA090	1.725 (0.0679)
38336AA210	1.738 (0.0684)	
38336AA100	1.750 (0.0689)	
38336AA220	1.763 (0.0694)	
38336AA110	1.775 (0.0699)	
Pinion height adjusting shim	Part No.	Thickness mm (in)
	32295AA200	0.150 (0.0059)
	32295AA210	0.175 (0.0069)
	32295AA220	0.200 (0.0079)
	32295AA230	0.225 (0.0089)
	32295AA240	0.250 (0.0098)
	32295AA250	0.275 (0.0108)
Side gear thrust washer mm (in)	803135011	0.925 — 0.950 (0.0364 — 0.0374)
	803135012	0.950 — 0.975 (0.0374 — 0.0384)
	803135013	0.975 — 1.000 (0.0384 — 0.0394)
	803135014	1.000 — 1.025 (0.0394 — 0.0404)
	803135015	1.025 — 1.050 (0.0404 — 0.0413)
Crown gear to drive pinion backlash	Limit mm (in)	0.10 — 0.15 (0.0039 — 0.0059)
Crown gear runout on its back surface		0.05 (0.0020)

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B: COMPONENT

1. REAR DIFFERENTIAL FOR VA-TYPE



DI-00299

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

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.5, 18.1)

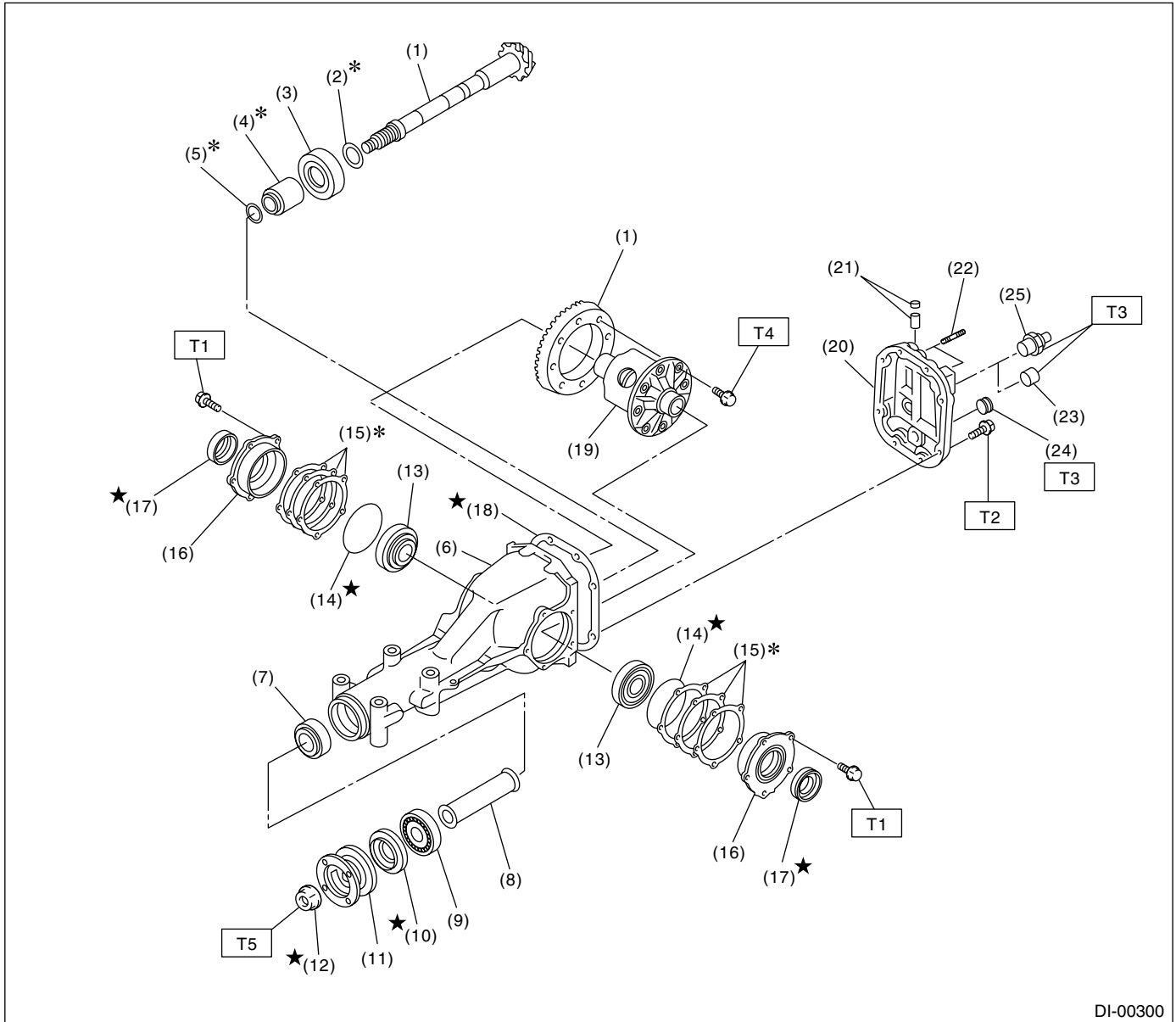
T2: 25 (2.5, 18.1)

T3: 34 (3.5, 25.3)

T4: 62 (6.3, 45.6)

T5: 188 (19.2, 139)

2. REAR DIFFERENTIAL FOR T-TYPE



DI-00300

(1) Pinion crown gear and drive pinion set	(12) Self-locking nut	(23) Oil filler plug (without oil temperature sensor)
(2) Pinion height adjusting shim	(13) Side bearing	(24) Oil drain plug
(3) Rear bearing	(14) O-ring	(25) Oil filler plug (with oil temperature sensor)
(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) Collar	(19) Differential case (Viscous coupling type)	
(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 (1.07, 7.7)

T2: 29 (3.0, 21.7)

T3: 49 (5.0, 36.2)

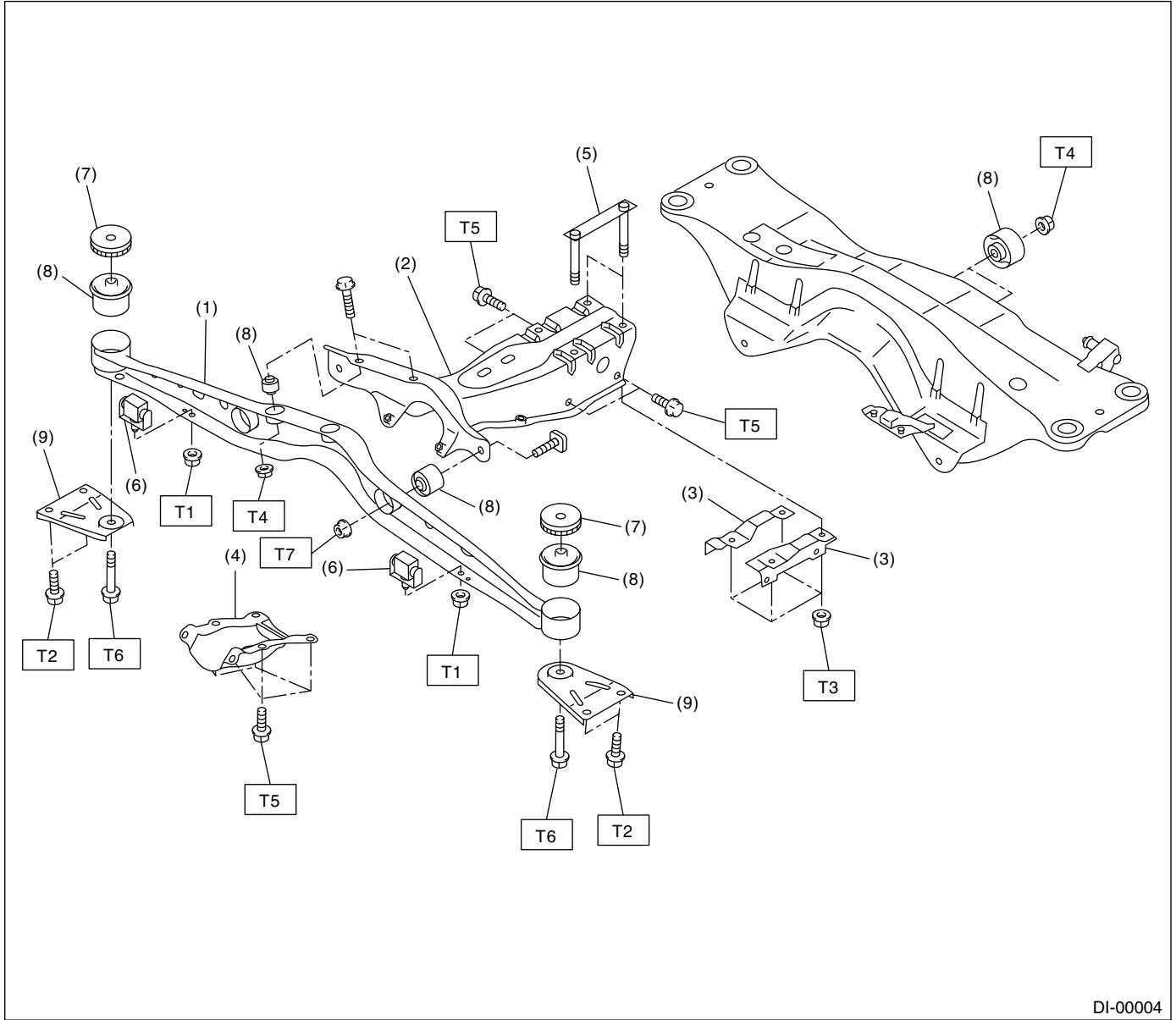
T4: 103 (10.5, 75.9)

T5: 181 (18.5, 134)

GENERAL DESCRIPTION

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3. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00004

- | | |
|-------------------------------------------|--------------------------------|
| (1) Front differential member | (8) Bushing |
| (2) Differential bracket | (9) Differential mount bracket |
| (3) Differential mount lower bracket | |
| (4) Differential mounting front cover | |
| (5) Plate | |
| (6) Dynamic damper (Non-turbo model only) | |
| (7) Stopper | |

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

- T1: 20 (2.0, 14.5)**
T2: 33 (3.4, 24.3)
T3: 65 (6.6, 47.7)
T4: 70 (7.1, 51.6)
T5: 90 (9.2, 66.4)
T6: 100 (10.2, 73.8)
T7: 135 (13.8, 97.6)

C: CAUTION

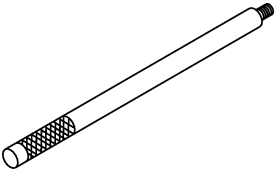
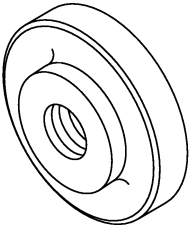
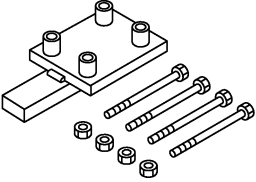
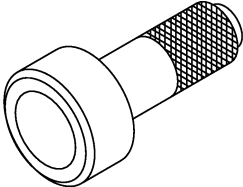
- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation 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.

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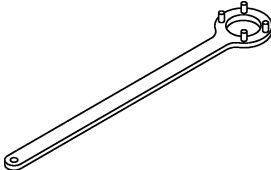
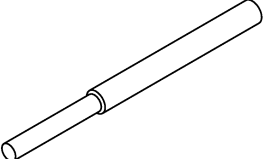
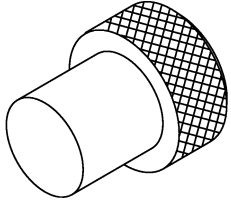
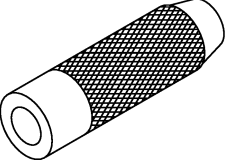
D: PREPARATION TOOL

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 (front).
 <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.

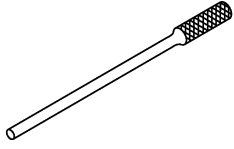
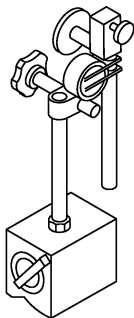
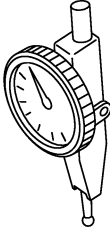
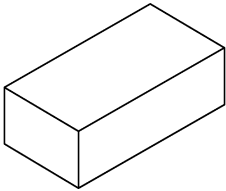
GENERAL DESCRIPTION

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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.

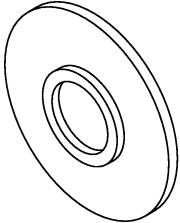
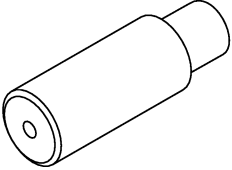
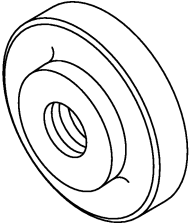
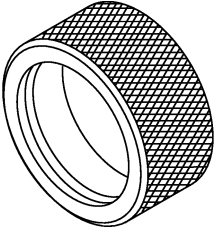
GENERAL DESCRIPTION

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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 measuring backlash between side gear and pinion, hypoid gear. • Used with MAGNET BASE (498247001).
 <p style="text-align: center;">ST-398507704</p>	398507704	BLOCK	Used for adjusting pinion height and preload.

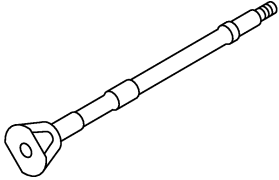
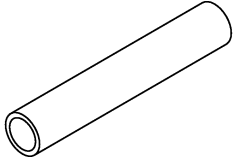
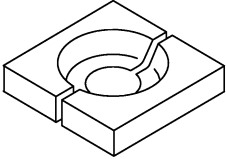
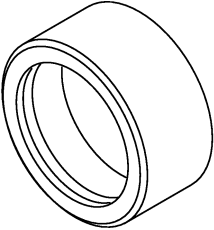
GENERAL DESCRIPTION

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398177700</p>	<p style="text-align: center;">398177700</p>	<p>INSTALLER</p>	<ul style="list-style-type: none"> • Used for installing rear bearing cone. • For T-type.
 <p style="text-align: center;">ST-398457700</p>	<p style="text-align: center;">398457700</p>	<p>ATTACHMENT</p>	<ul style="list-style-type: none"> • Used for removing side bearing retainer. • For T-type.
 <p style="text-align: center;">ST-398477703</p>	<p style="text-align: center;">398477703</p>	<p>DRIFT2</p>	<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>	<p style="text-align: center;">398437700</p>	<p>DRIFT</p>	<ul style="list-style-type: none"> • Used for installing side oil seal. • For T-type.

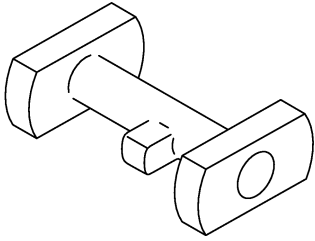
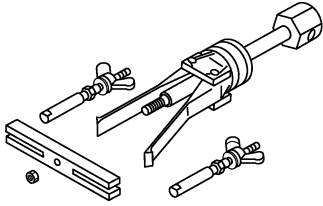
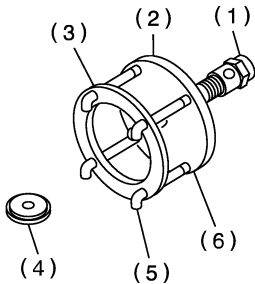
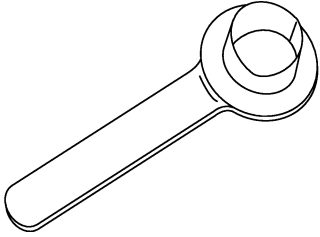
GENERAL DESCRIPTION

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

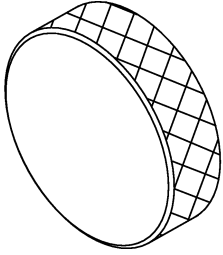
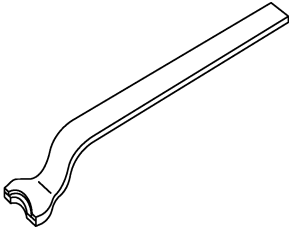
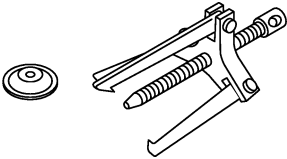
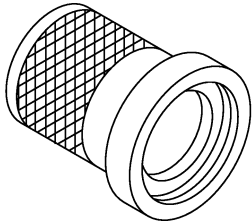
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398507701</p>	398507701	DIFFERENTIAL CARRIER GAUGE	<ul style="list-style-type: none"> • Used for adjusting pinion height. • For T-type.
 <p style="text-align: center;">ST-398527700</p>	398527700	PULLEY ASSY	<ul style="list-style-type: none"> • Used for removing front oil seal. • Used for removing side bearing cup. (T-type)
 <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 PROTECTOR	<ul style="list-style-type: none"> • Used for installing rear drive shaft into rear differential. • For protecting oil seal.

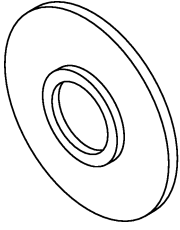
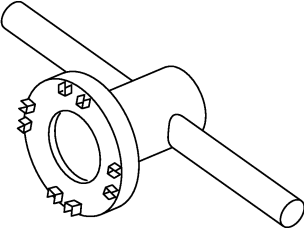
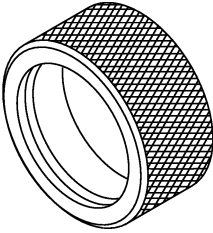
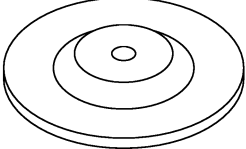
GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398237700</p>	<p style="text-align: center;">398237700</p>	<p>GAUGE</p>	<ul style="list-style-type: none"> • Used for installing side bearing. • For T-type.
 <p style="text-align: center;">ST28099PA100</p>	<p style="text-align: center;">28099PA100</p>	<p>DRIVE SHAFT REMOVER</p>	<ul style="list-style-type: none"> • Used for removing rear drive shaft from rear differential. • For T-type.
 <p style="text-align: center;">ST-399703600</p>	<p style="text-align: center;">399703600</p>	<p>PULLEY ASSY</p>	<ul style="list-style-type: none"> • Used for removing companion flange
 <p style="text-align: center;">ST-899874100</p>	<p style="text-align: center;">899874100</p>	<p>INSTALLER</p>	<ul style="list-style-type: none"> • Used for installing companion flange.

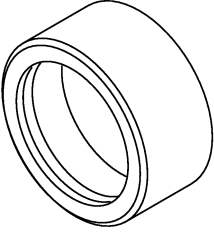
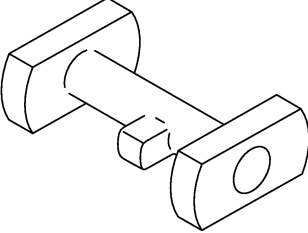
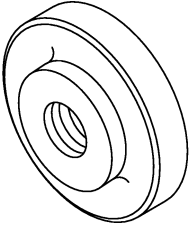
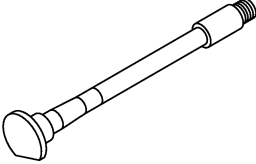
GENERAL DESCRIPTION

DIFFERENTIALS

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

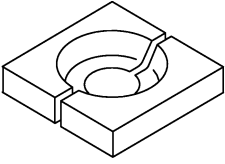
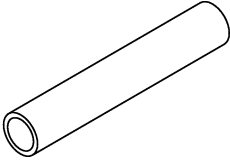
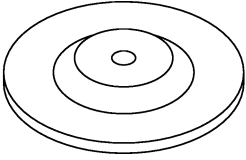
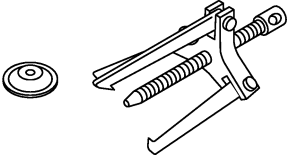
GENERAL DESCRIPTION

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	DIFFERENTIAL CARRIER GAUGE	<ul style="list-style-type: none"> • Used for adjusting pinion height. • For VA-type.
 <p style="text-align: center;">ST-498447110</p>	498447110	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.

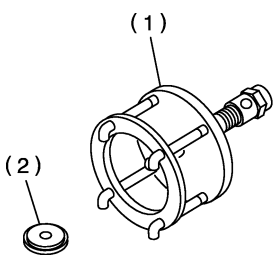
GENERAL DESCRIPTION

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498517700</p>	498515500	REPLACER	<ul style="list-style-type: none"> • Used for removing rear bearing cone. • For VA-type.
 <p style="text-align: center;">ST-32285AA000</p>	32285AA000	DUMMY COLLAR	<ul style="list-style-type: none"> • Used for adjusting pinion height and pre-load. • For VA-type.
 <p style="text-align: center;">ST-499705404</p>	499705404	SEAT	<ul style="list-style-type: none"> • Used for removing side bearing race. • Used with PULLER ASSY (499705401). • For VA-type.
 <p style="text-align: center;">ST-499705401</p>	499705401	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing side bearing race. • Used with SEAT (499705404). • For VA-type.

GENERAL DESCRIPTION

DIFFERENTIALS

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

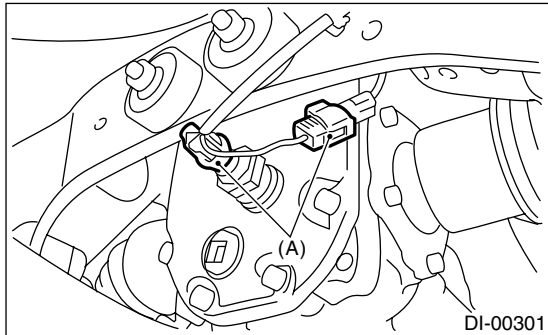
2. GENERAL PURPOSE TOOLS

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)

2. Differential Gear Oil

A: INSPECTION

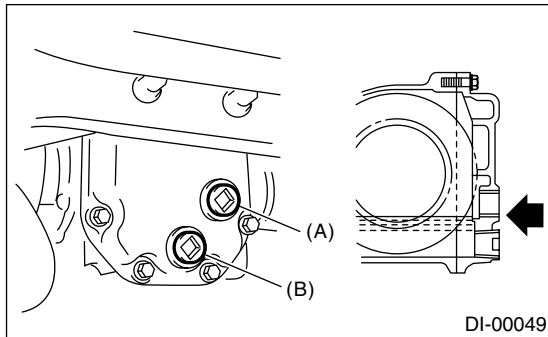
1) Disconnect the oil temperature sensor connector (Turbo model for Europe).



(A) Connector

2) Remove the filler plug or oil temperature sensor, and then check the gear oil. If it is contaminated or deteriorated, replace the gear oil. <Ref. to DI-21, REPLACEMENT, Differential Gear Oil.>

3) Check the gear oil level is up to the bottom part of filler bolt or oil temperature sensor. If the level is low, refill up to the bottom of filler bolt.



(A) Filler plug
(B) Drain plug

4) After the inspection, tighten the filler plug or oil temperature sensor.

NOTE:

- Apply fluid packing to the drain plug for T-type.
- Use a new aluminum gasket for VA-type.

Fluid packing:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

T-type

49 N·m (5.0 kgf·m, 36.2 ft·lb)

VA-type

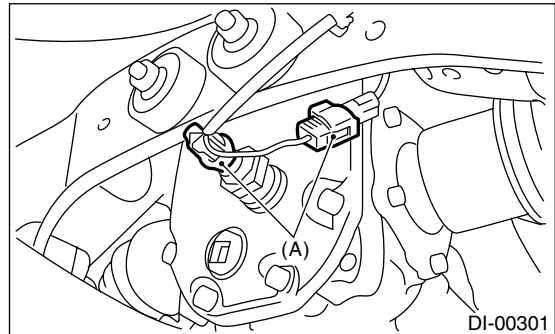
34 N·m (3.5 kgf·m, 25.3 ft·lb)

5) Connect the connector to oil temperature sensor. (Turbo model for Europe)

B: REPLACEMENT

1) Jack-up the vehicle and support it with sturdy racks.

2) Disconnect the oil temperature sensor connector (Turbo model for Europe).

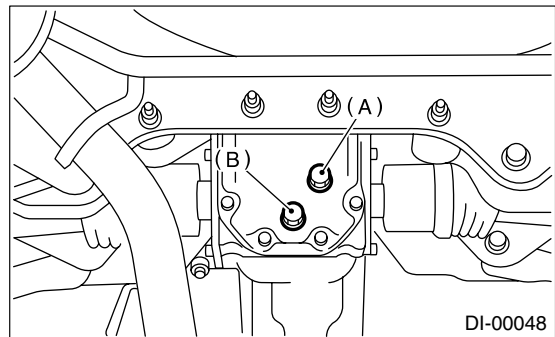


(A) Connector

3) Remove the oil drain plug and filler plug or oil temperature sensor, and drain the gear oil.

CAUTION:

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



(A) Filler plug
(B) Drain plug

4) Tighten the oil drain plug.

NOTE:

- Apply fluid packing to the drain plug for T-type.
- Use a new aluminum gasket for VA-type.

Fluid packing:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

T-type

49 N·m (5.0 kgf·m, 36.2 ft·lb)

VA-type

34 N·m (3.5 kgf·m, 25.3 ft·lb)

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

DIFFERENTIAL GEAR OIL

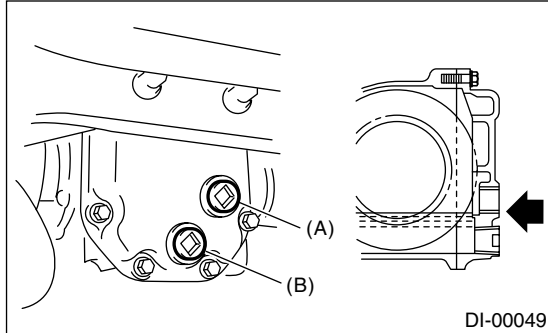
DIFFERENTIALS

NOTE:

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

Oil capacity:

0.8 ℓ (0.8 US qt, 0.7 Imp qt)



- (A) Filler plug
- (B) Drain plug

6) Install the filler plug or oil temperature sensor.

NOTE:

- Apply fluid packing to the filler plug or oil temperature sensor for T-type.
- Use a new aluminum gasket for VA-type.

Fluid packing:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

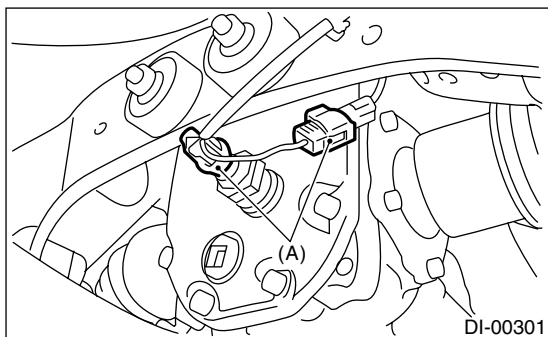
T-type

49 N·m (5.0 kgf-m, 36.2 ft-lb)

VA-type

34 N·m (3.5 kgf-m, 25.3 ft-lb)

7) Connect the oil temperature sensor connector (Turbo model for Europe).



- (A) Connector

3. Front Differential

A: NOTE

1. AT MODEL

For front differential of AUTOMATIC TRANSMISSION, refer to "AT" section. <Ref. to AT-103, Front Differential.>

2. MT MODEL

For front differential of manual transmission, refer to "MT" section. <Ref. to MT-95, Front Differential Assembly.>

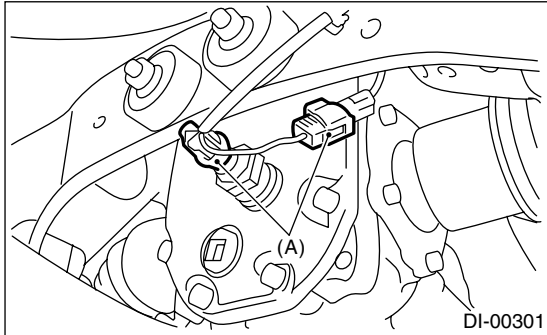
REAR DIFFERENTIAL FOR T-TYPE

DIFFERENTIALS

4. Rear Differential for T-type

A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Move the select lever or gear shift lever to "N".
- 4) Release the parking brake.
- 5) Loosen the wheel nuts.
- 6) Jack-up the vehicle and support it with sturdy racks.
- 7) Remove the wheels.
- 8) Disconnect the connector from oil temperature sensor. (Turbo model for Europe)



(A) Connector

- 9) Remove the rear exhaust pipe and muffler.

Non-turbo model

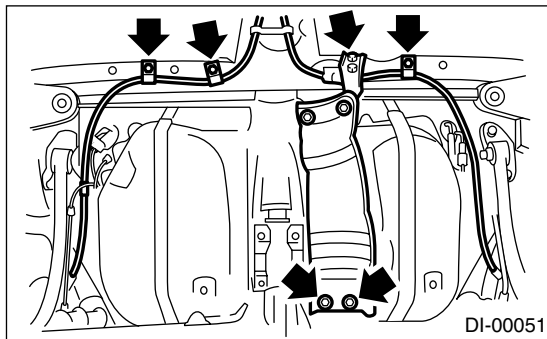
<Ref. to EX(SOHC)-11, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-13, REMOVAL, Muffler.>

Turbo model

<Ref. to EX(TURBO)-12, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(TURBO)-14, REMOVAL, Muffler.>

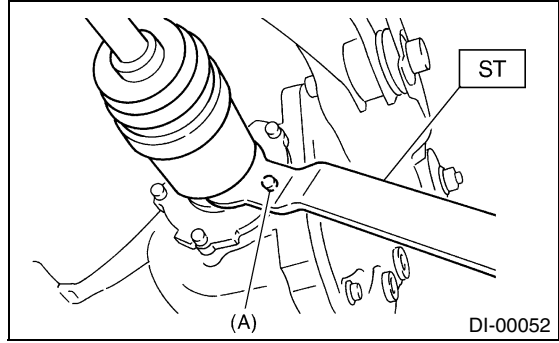
- 10) Remove the propeller shaft. <Ref. to DS-14, REMOVAL, Propeller Shaft.>

- 11) Remove the clamps and bracket of parking brake cable.



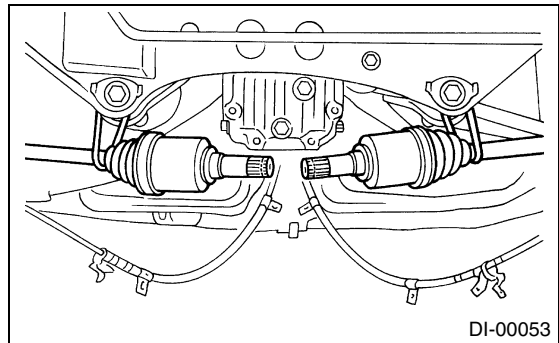
- 12) Remove the DOJ of rear drive shaft from rear differential using ST. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA100 DRIVE SHAFT REMOVER

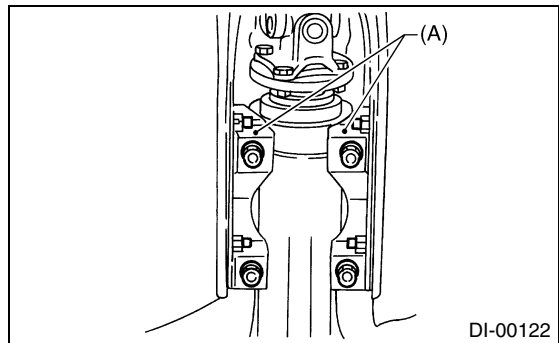


(A) Bolt

- 13) Secure the rear drive shaft to rear crossmember using wire.

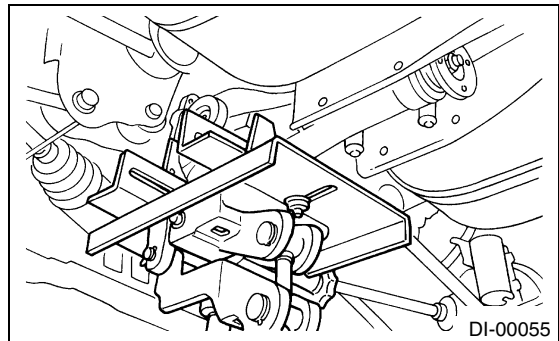


- 14) Remove the lower differential bracket.

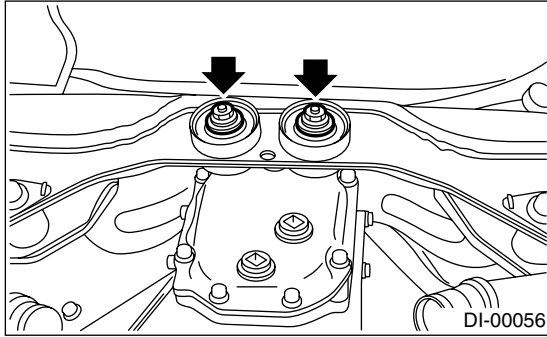


(A) Lower differential bracket

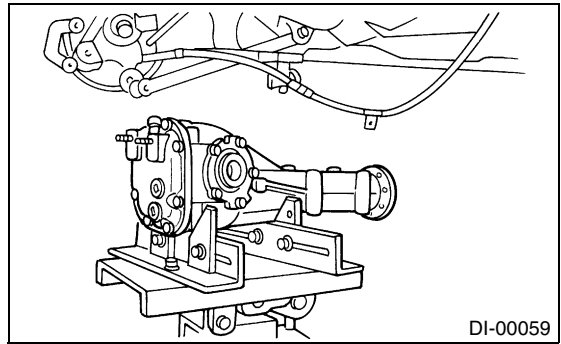
- 15) Support the rear differential with transmission jack.



16) Remove the self-locking nuts and bolts.



20) Remove the rear differential from front member.

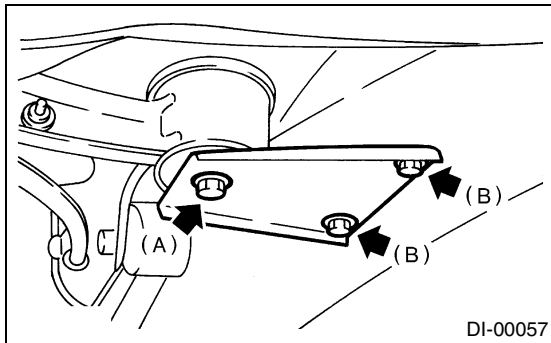


17) Remove the bolts which secure rear differential front member to body.

Loosen the bolt A first, then remove the bolts B.

NOTE:

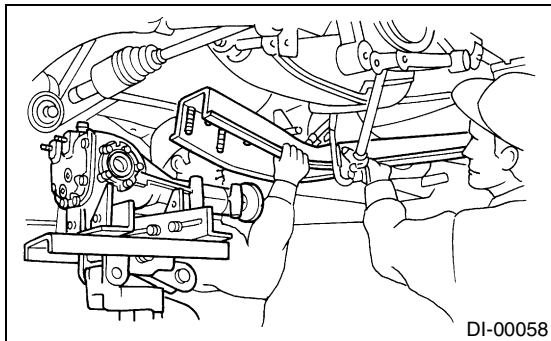
Support the front member with use of a helper to prevent it from dropping.



- (A) Bolt A
- (B) Bolt B

18) Remove the bolt A.

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



REAR DIFFERENTIAL FOR T-TYPE

DIFFERENTIALS

B: INSTALLATION

Install in the reverse order of removal.

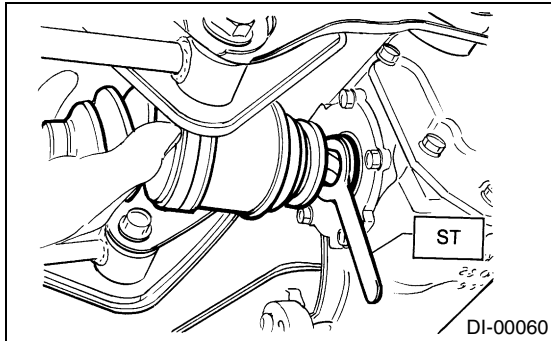
1) Position the front member on body by passing it under the parking brake cable and securing to rear differential.

NOTE:

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

2) Install the DOJ of drive shaft into rear differential. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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

4) After installation, fill the differential carrier with gear oil to the filler plug level. <Ref. to DI-21, Differential Gear Oil.>

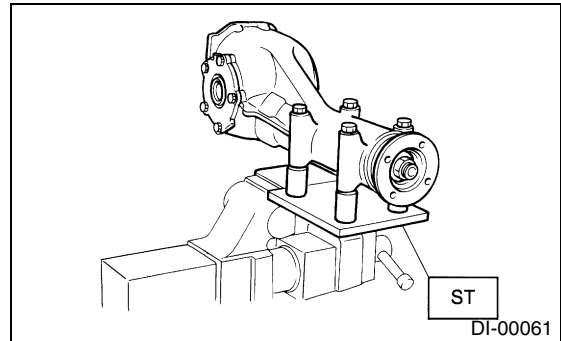
C: DISASSEMBLY

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

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

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

ST 398217700 ATTACHMENT

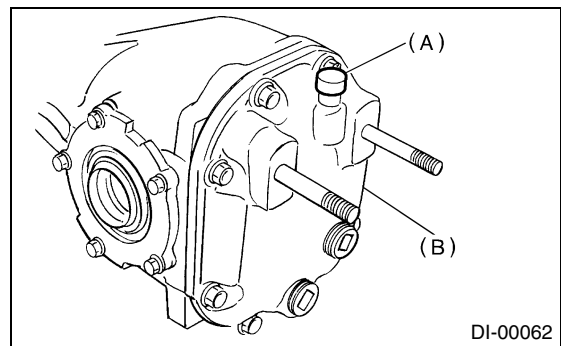


2) Drain the gear oil by removing the plug.

3) Remove the air breather cap.

NOTE:

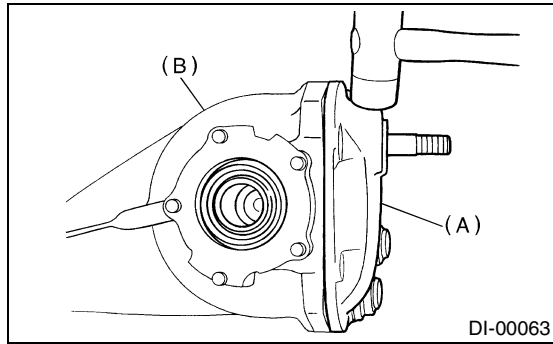
- Do not attempt to remove the air breather cap unless necessary.
- When removing the air breather cap, replace the air breather cap with a new one.



(A) Air breather cap

(B) Rear cover

4) Remove the bolts, and then remove the rear cover.



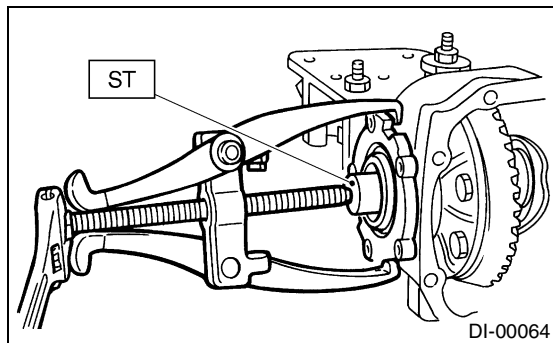
(A) Rear cover
(B) Differential carrier

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

NOTE:

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

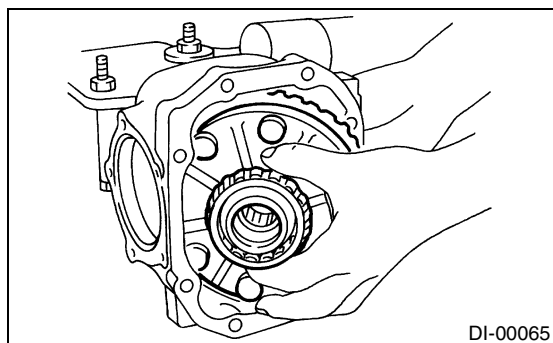
ST 398457700 ATTACHMENT



6) Pull out the differential case assembly from differential carrier.

NOTE:

Be careful not to hit the teeth against the case.

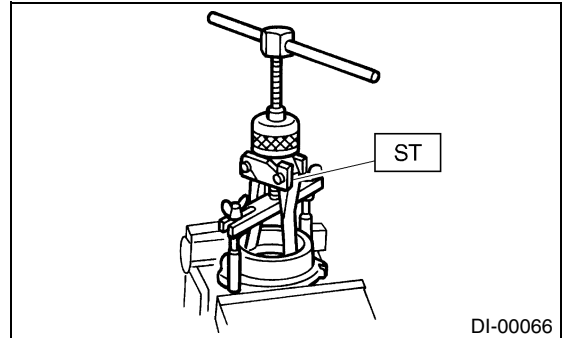


7) Remove the O-ring from side bearing retainer.

8) Remove the oil seal from side bearing retainer. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

9) Pull the bearing cup from side bearing retainer using ST.

ST 398527700 PULLER ASSY

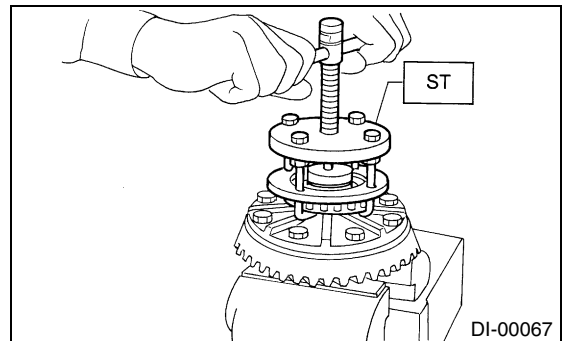


10) Extract the bearing cone with ST.

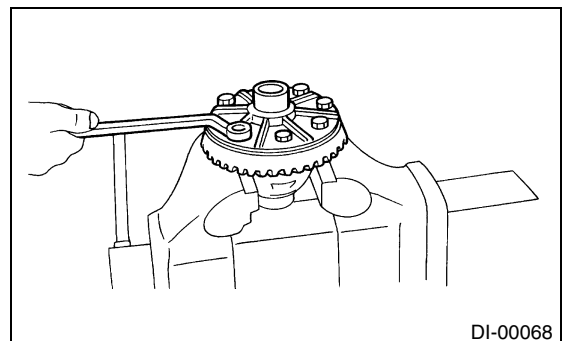
NOTE:

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

ST 399527700 PULLER SET



11) Remove the crown gear by loosening the crown gear bolts.

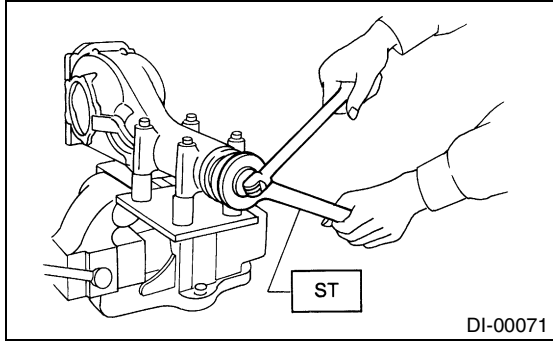


REAR DIFFERENTIAL FOR T-TYPE

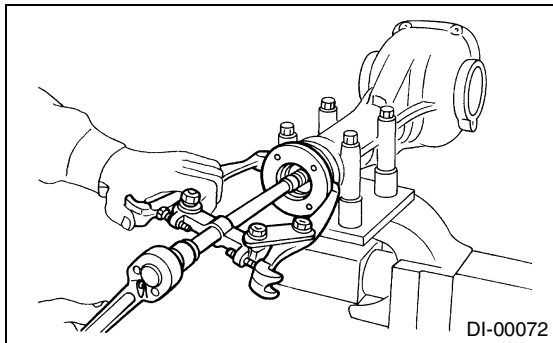
DIFFERENTIALS

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

ST 498427200 FLANGE WRENCH



13) Extract the companion flange with a puller.

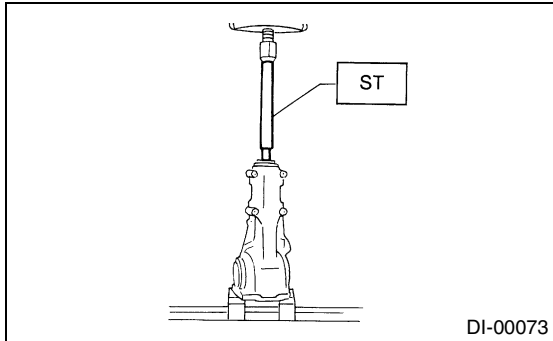


14) Press the end of drive pinion shaft and extract it together with the rear bearing cone, preload adjusting spacer and washer.

NOTE:

Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT

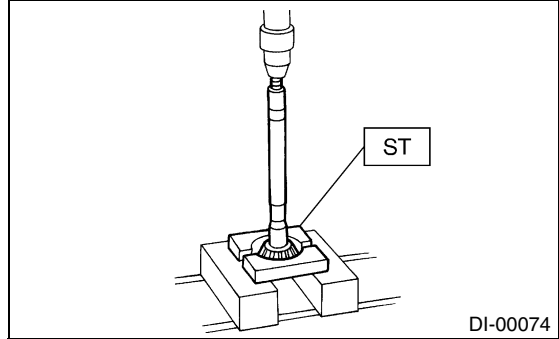


15) Remove the rear bearing cone from drive pinion by supporting the cone with ST.

NOTE:

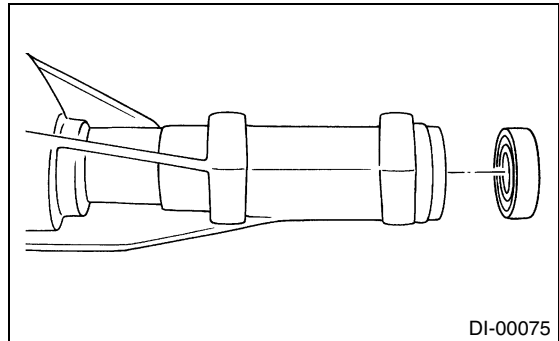
Place the replacer so that its center-recessed side faces the pinion gear.

ST 398517700 REPLACER



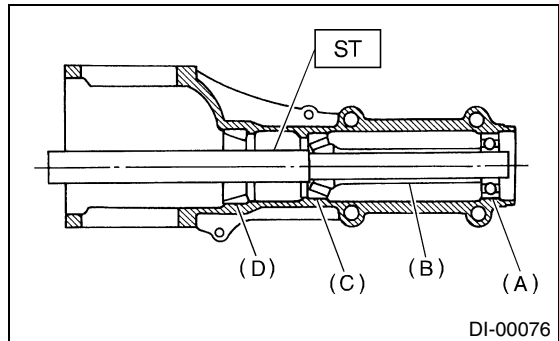
16) Remove the front oil seal from differential carrier using ST.

ST 398527700 PULLER ASSY



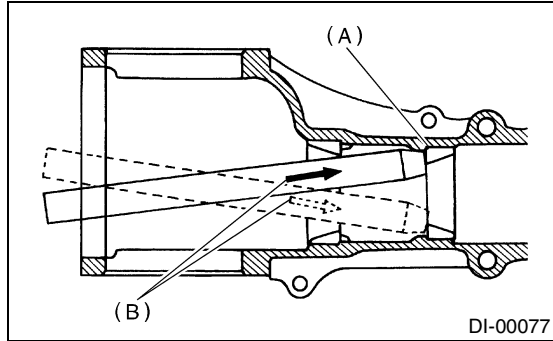
17) Remove the pilot bearing together with front bearing cone using ST.

ST 398467700 DRIFT



- (A) Pilot bearing
- (B) Spacer
- (C) Front bearing
- (D) Rear bearing cup

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

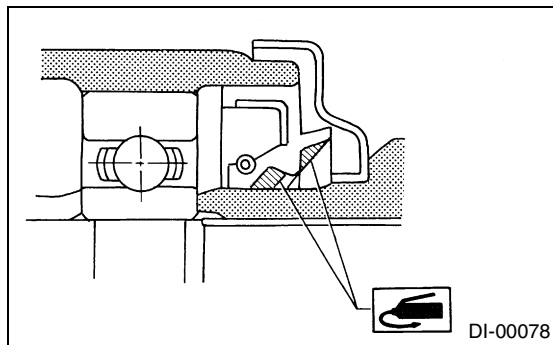


- (A) 2 cutouts along diagonal lines
- (B) Hit out alternately with brass bar.

D: ASSEMBLY

NOTE:

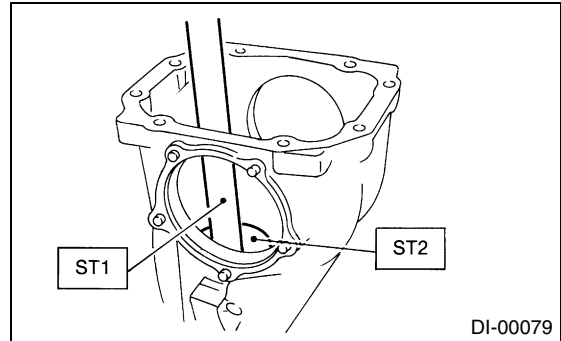
- Assemble in the reverse order of disassembling.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not improperly installed.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear oil when installing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



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

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

- ST1 398477701 HANDLE
- ST2 398477703 DRIFT 2



(2) Using ST1 and ST2, install the rear bearing race (front) to differential carrier.

- ST1 398477701 HANDLE
- ST2 398477702 DRIFT

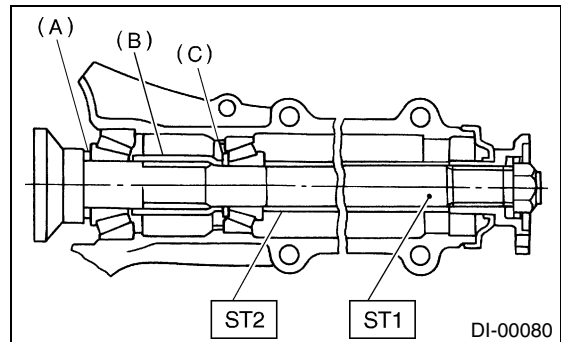
(3) Insert the ST1 into carrier with pinion height adjusting washer and rear bearing cone fitted onto it.

NOTE:

- If tooth contact is normal in the inspection before disassembling, verify that the washer is not deformed, and then re-use the used washer.
- Use a new rear bearing cone.

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

- ST1 398507702 DUMMY SHAFT
- ST2 398507703 DUMMY COLLAR



- (A) Pinion height adjusting shim
- (B) Preload adjusting spacer
- (C) Preload adjusting washer

REAR DIFFERENTIAL FOR T-TYPE

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(5) Turn the ST1 with hand to make it seated, and tighten the drive pinion nut while measuring the preload with spring balance. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.

NOTE:

Use a new lock nut.

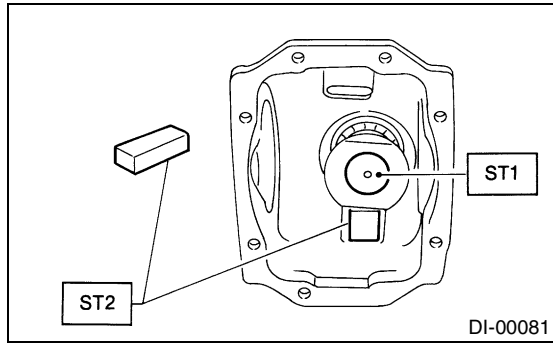
NOTE:

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

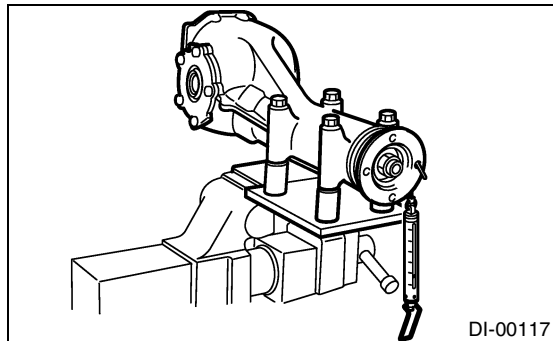
ST1 398507704 BLOCK
ST2 398507702 DUMMY SHAFT

Tightening torque:

181 N·m (18.5 kgf·m, 134 ft·lb)



Front and rear bearing preload
For new bearing: 19 — 26 N (1.9 — 2.6 kgf, 4.3 — 5.8 lb) at companion flange bolt hole
For used bearing: 8 — 16 N (0.8 — 1.6 kgf, 1.8 — 3.6 lb) at companion flange bolt hole



Preload adjusting washer	Part No.	Thickness mm (in)
	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	2.39 (0.0941)
	383815200	2.37 (0.0933)
	383825200	2.35 (0.0925)
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)

2) Adjusting drive pinion height

Adjust the drive pinion height with shim installed between the rear bearing cone and back of pinion gear.

- (1) Do not remove the ST1, ST2 and ST3 out of position after adjusting pinion bearing preload in previous step.

Front and rear bearing preload
For new bearing: 19 — 26 N (1.9 — 2.6 kgf, 4.3 — 5.8 lb) at companion flange bolt hole
For used bearing: 8 — 16 N (0.8 — 1.6 kgf, 1.8 — 3.6 lb) at companion flange bolt hole

Adjusting preload for front and rear bearings

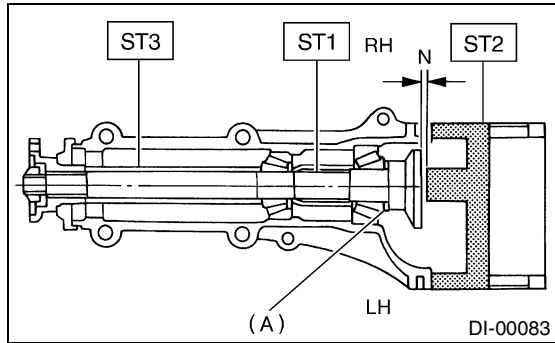
NOTE:

At this time, install a pinion height adjusting shim which is temporarily selected or the same as that used before. Measure and record the thickness.

REAR DIFFERENTIAL FOR T-TYPE

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

(Example of calculation)
 $T_o = 2.20 + 1.20 = 3.40 \text{ mm}$
 $N = 0.23 \text{ mm } H = + 1,$
 $T = 3.40 + 0.23 - 0.01 - 0.20 = 3.42$
 Result: Thickness = 3.42 mm
 Therefore use the shim 383605200.

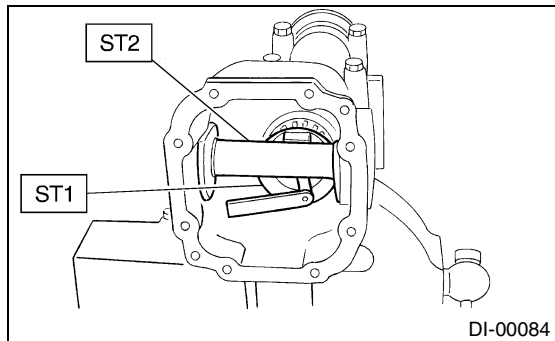


(A) Pinion height adjusting shim

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

NOTE:
 Make sure there is no clearance between the case and ST2.

- ST1 398507702 DUMMY SHAFT
- ST2 398507701 DIFFERENTIAL CARRIER GAUGE



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

$$T = T_o + N - (H \times 0.01) - 0.20 \text{ mm (0.0079 in)}$$

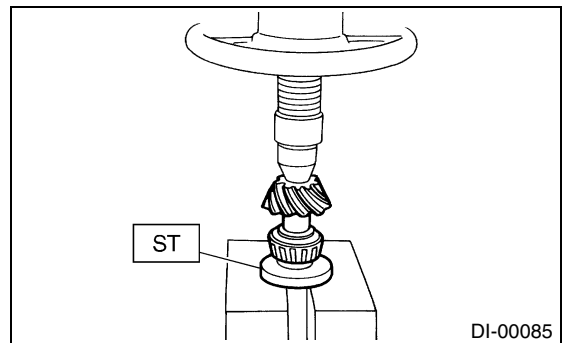
NOTE:
 Use copies of this page.

T	Thickness of pinion height adjusting shim mm (in)	
T _o	Thickness of shim temporarily inserted mm (in)	
N	Reading of thickness gauge mm (in)	
H	Figure marked on drive pinion head	
Memo:		

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)

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

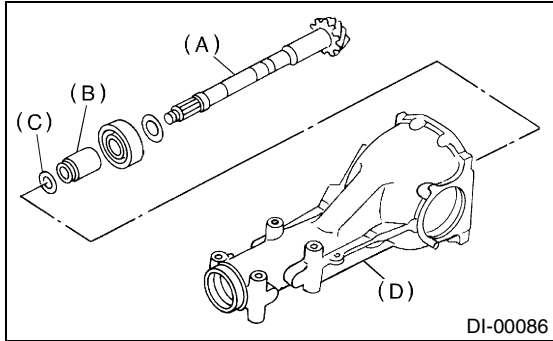
ST 398177700 INSTALLER



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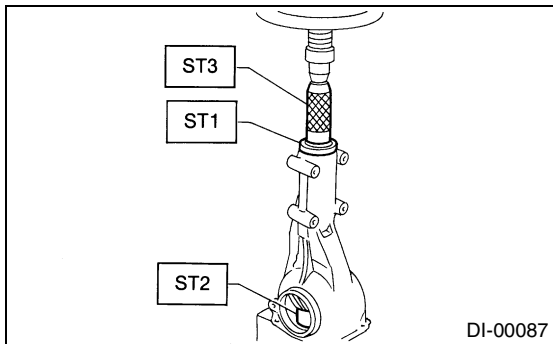
4) Insert the drive pinion into differential carrier, install the previously selected bearing preload adjusting spacer and washer.



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

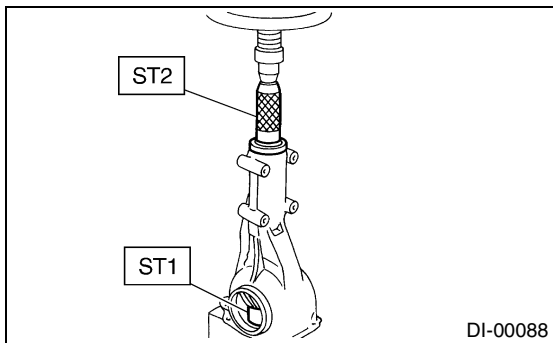
5) Press-fit the front bearing cone into case with ST1, ST2 and ST3.

- ST1 398507703 DUMMY COLLAR
- ST2 399780104 WEIGHT
- ST3 899580100 INSTALLER



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

- ST1 399780104 WEIGHT
- ST2 899580100 INSTALLER

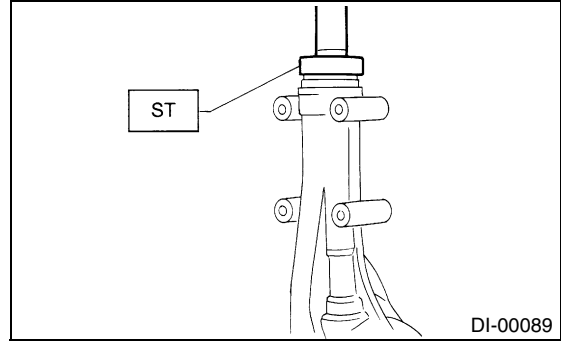


7) Fit a new oil seal with ST.

NOTE:

- Press-fit until the end of oil seal is 1 mm (0.04 in) inward from end of carrier.
- Apply grease between the oil seal lips.

- ST 498447120 INSTALLER

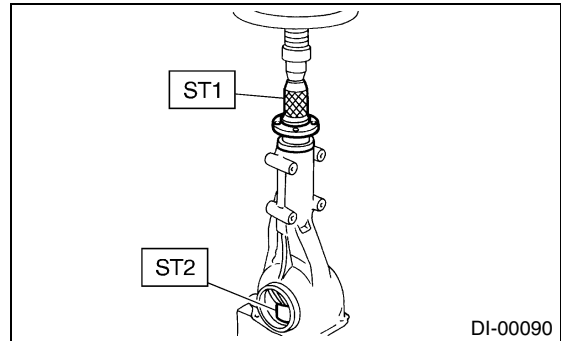


8) Press-fit the companion flange with ST1 and ST2.

NOTE:

Be careful not to damage the bearing.

- ST1 899874100 INSTALLER
- ST2 399780104 WEIGHT

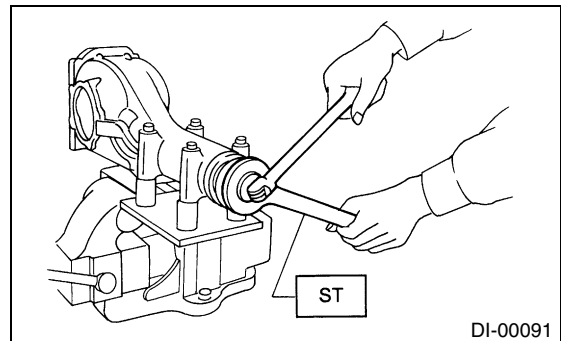


9) Install a new self-locking nut. Then tighten it with the ST.

- ST 498427200 FLANGE WRENCH

Tightening torque:

181 N·m (18.5 kgf·m, 134 ft·lb)



10) Install the crown gear on differential case.

NOTE:

Before installing the bolts, apply Lock Tite to bolt threads.

Lock Tite:

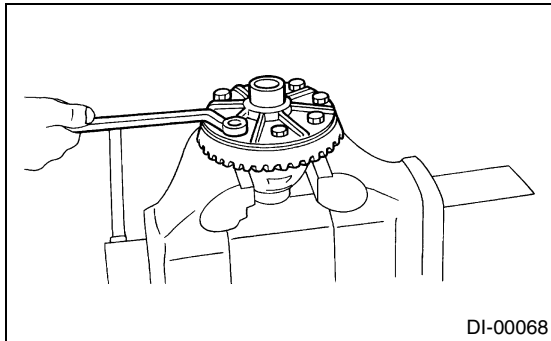
THREE BOND 1324 (Part No. 004403042) or equivalent

NOTE:

Tighten diagonally while tapping the bolt heads.

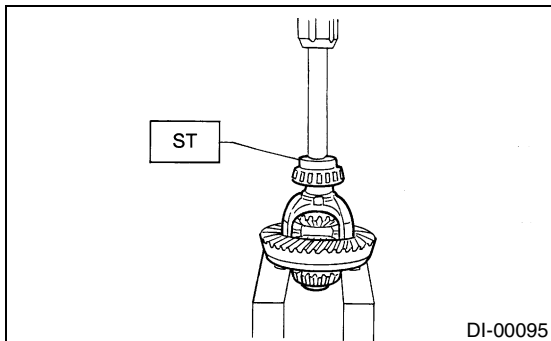
Tightening torque:

103 N·m (10.5 kgf·m, 75.9 ft·lb)



11) Press the side bearing onto differential case with ST.

ST 398237700 DRIFT



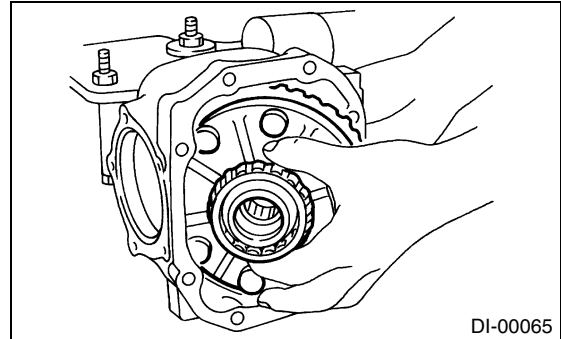
12) Press the side bearing cone into side bearing retainer using ST.

ST 398487700 DRIFT

13) Adjusting side bearing retainer shims

(1) The driven gear backlash and side bearing preload can be determined by the side bearing retainer shim thickness.

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



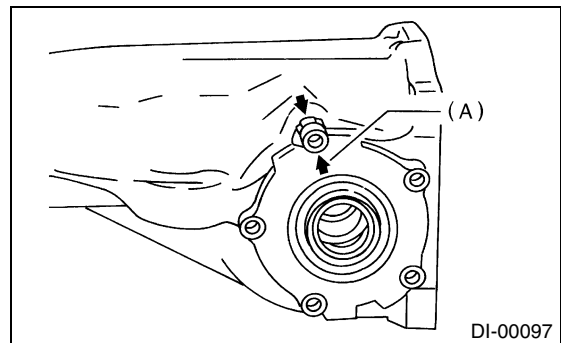
(3) Install the side retainer shims to the right and left retainers from which they were removed.

NOTE:

- Replace the broken or corroded side retainer shim with a new one of same thickness.

Side bearing retainer shim	
Part No.	Thickness mm (in)
383475201	0.20 (0.0079)
383475202	0.25 (0.0098)
383475203	0.30 (0.0118)
383475204	0.40 (0.0157)
383475205	0.50 (0.0197)

(4) Align the arrow mark on differential carrier with the mark on side retainer during installation.



(A) Arrow mark

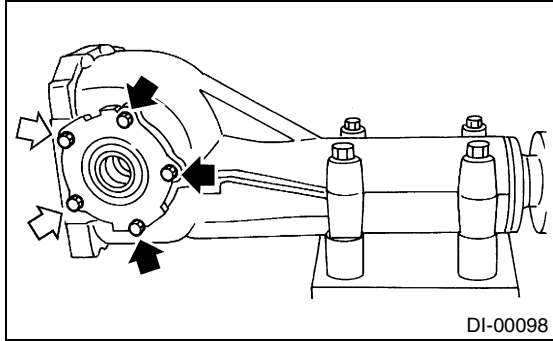
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(5) Tighten the side bearing retainer bolts.

Tightening torque:

10.5 N·m (1.07 kgf·m, 7.7 ft·lb)



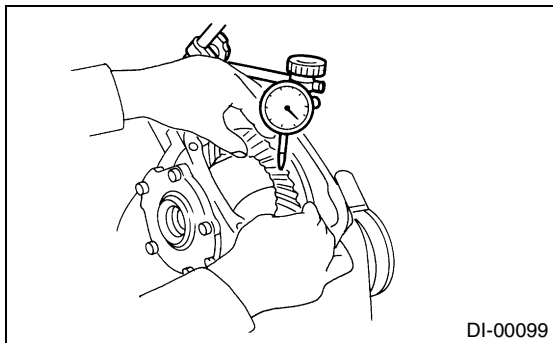
(6) Measure the crown gear-to-drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with tooth face of crown gear, and move the crown gear while holding drive pinion still. Read the value indicated on dial gauge.

If the backlash is not within specification, adjust the side bearing retainer shim as follows.

- When backlash is more than 0.2 mm (0.0079 in): Reduce shim thickness of behind crown gear, and increase shim thickness of crown gear side.
- When backlash is less than 0.1 mm (0.0039 in): Increase shim thickness of behind crown gear, and reduce shim thickness of crown gear side.

Backlash:

0.10 — 0.20 mm (0.0039 — 0.0079 in)



(7) At the same time, measure the turning resistance increase of drive pinion. Compared with the resistance when differential case is not installed, if the total preload is not within specification, adjust the thickness of side bearing retainer shims, increasing/reducing by an even amount at a time.

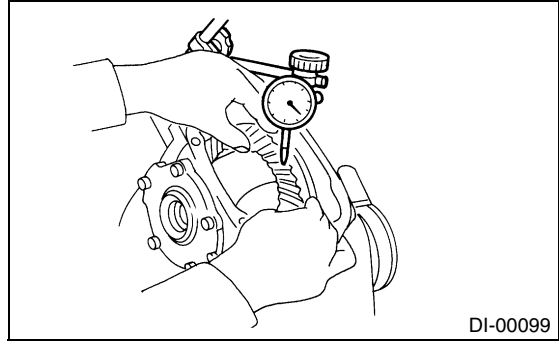
Turning resistance increase:

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

14) Re-check the crown gear-to-pinion backlash.

Backlash:

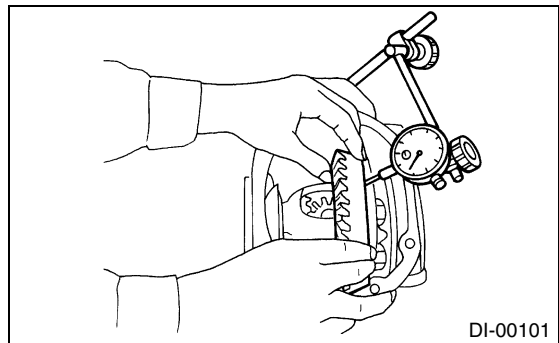
0.10 — 0.20 mm (0.0039 — 0.0079 in)



15) Check the crown gear runout on its back surface, and make sure that pinion and crown gear rotate smoothly.

Limit of runout:

Less than 0.05 mm (0.0020 in)



16) Checking and adjusting tooth contact of crown gear

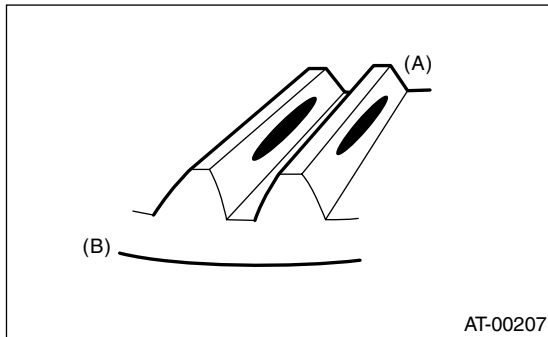
- (1) Apply an even coat of red lead on both sides of three or four teeth on the crown gear. Check the contact pattern after rotating the crown gear several revolutions back and forth until a definite contact pattern appears on the crown gear.
- (2) When the contact pattern is incorrect, readjust according to the instructions given in "TOOTH CONTACT PATTERN".

NOTE:

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

- Correct tooth contact

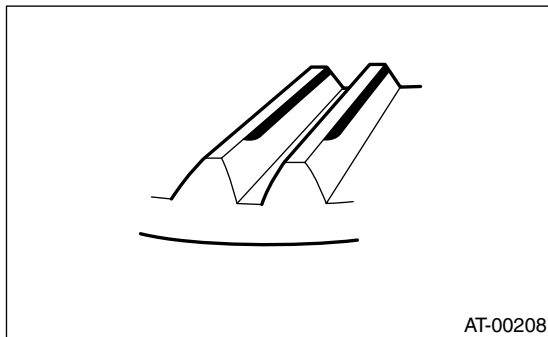
Checking item: Tooth contact pattern is slightly shifted toward to toe side under no-load rotation. (When loaded, contact pattern moves toward heel)



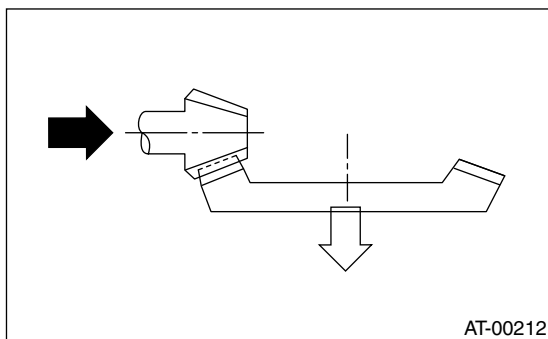
- (A) Toe side
- (B) Heel side

- Face contact

Checking item: Backlash is too large.
Contact pattern

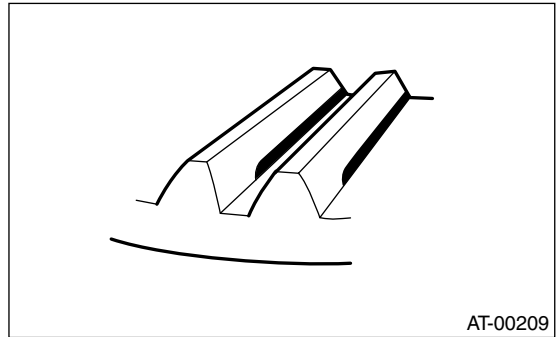


Corrective action: Increase thickness of drive pinion height adjusting shim in order to bring drive pinion close to crown gear.

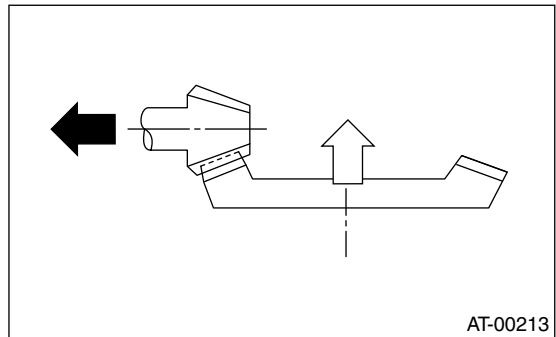


- Flank contact

Checking item: Backlash is too small.
Contact pattern

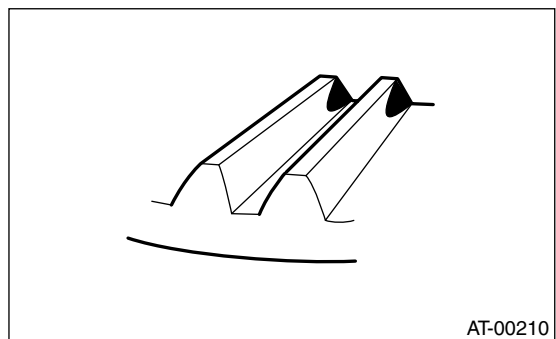


Corrective action: Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.



- Toe contact (Inside end contact)

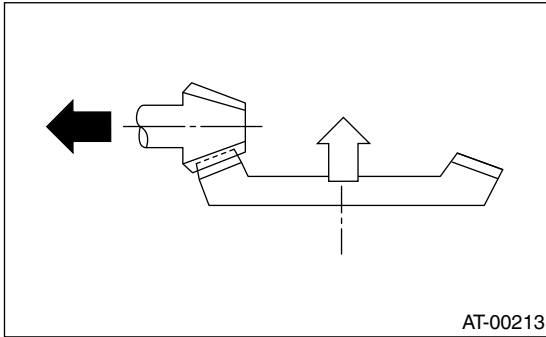
Checking item: Contact area is small.
Contact pattern



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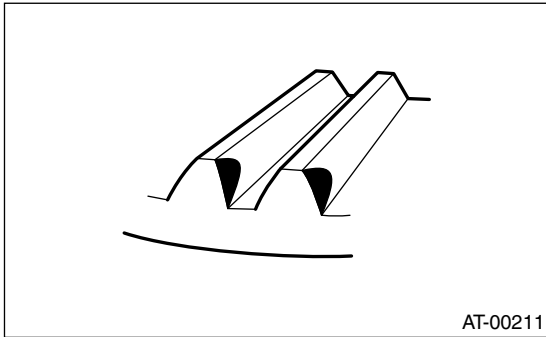
Corrective action: Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.



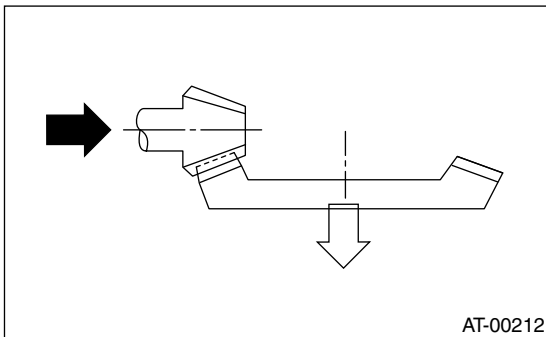
- Heel contact (Outside end contact)

Checking item: Contact area is small.

Contact pattern



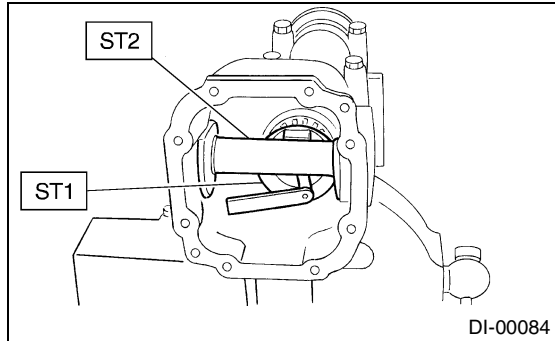
Corrective action: Increase thickness of drive pinion height adjusting shim in order to bring drive pinion close to crown gear.



17) If proper tooth contact is not obtained, once again adjust the drive pinion height by changing RH and LH side bearing retainer shims and the hypoid gear backlash.

(1) Drive pinion height

ST1 398507702 DUMMY SHAFT
 ST2 398507701 DIFFERENTIAL CARRIER GAUGE



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

Where:

T = Thickness of pinion height adjusting shim (mm)

To = Thickness of shim temporarily inserted (mm)

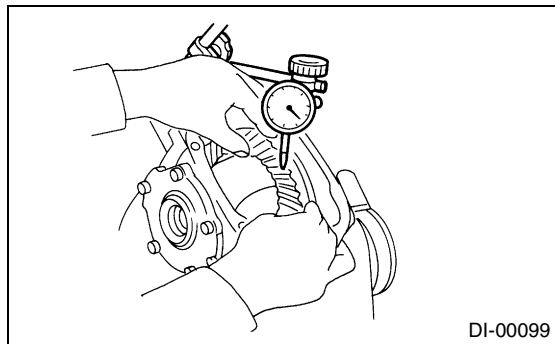
N = Reading of thickness gauge (mm)

H = Figure marked on drive pinion head

(2) Hypoid gear backlash

Backlash:

0.10 — 0.20 mm (0.0039 — 0.0079 in)

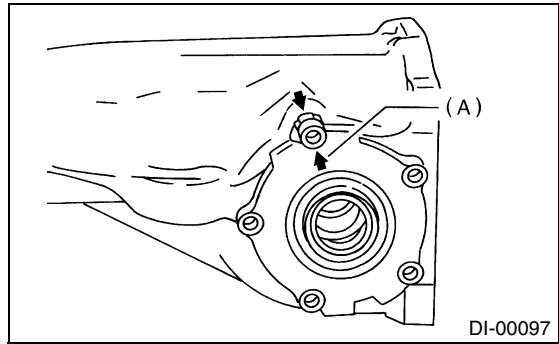


18) Remove the right and left side bearing retainers.

19) Install the right and left side bearing retainer, O-rings and side bearing retainer shims.

20) Install the oil seals to the right and left side bearing retainers.

21) Align the arrow mark on differential carrier with the mark on side retainer during installation.



(A) Arrow mark

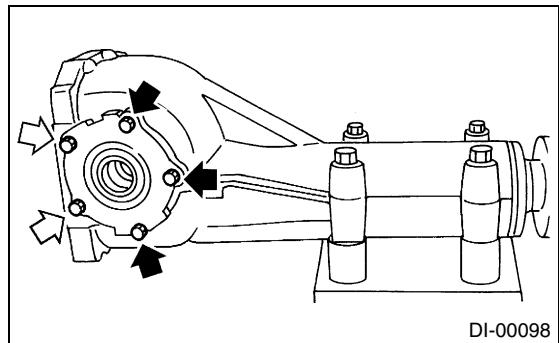
22) Tighten the side bearing retainer bolts.

Lock Tite:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

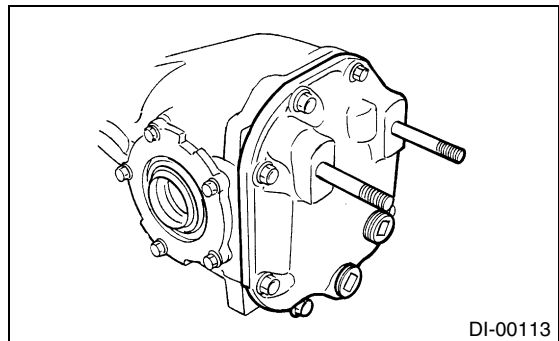
10.5 N-m (1.07 kgf-m, 7.7 ft-lb)



23) Install the new gasket and rear cover and tighten the bolts to specified torque.

Tightening torque:

29 N-m (3.0 kgf-m, 21.7 ft-lb)



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E: INSPECTION

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

1) Crown gear and drive pinion

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

2) Bearing

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

3) Oil seal

Replace if deformed or damaged, and at every disassembling.

4) Differential carrier

Replace if the bearing bores are worn or damaged.

5) Differential case

Replace if its sliding surfaces are worn or cracked.

6) Companion flange

Replace if the oil seal lip contacting surfaces have flaws.

7) Rear differential oil temperature sensor (Turbo model for Europe).

If the results of the following inspections are not satisfactory, replace rear differential temperature sensor.

(1) At room temperature, check for continuity between the sensor terminal and body.

(2) Soak the sensor in oil, then raise the oil temperature. Check that the continuity is cut off when the oil temperature is between 144°C (291°F) and 156°C (313°F). Then, check that the continuity resumes by the time the oil temperature drops to 135°C (275°F).

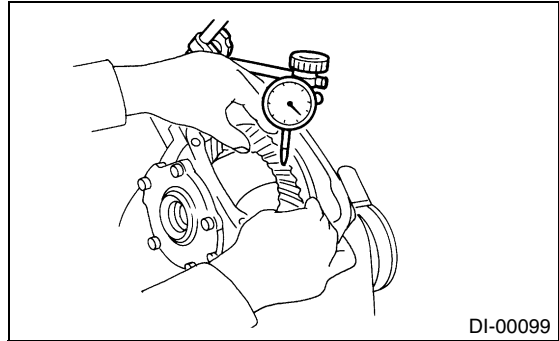
1. CROWN GEAR BACKLASH

Using a dial gauge, check the backlash of the crown gear.

Crown gear backlash:

0.1 — 0.2 mm (0.004 — 0.008 in)

If the crown gear backlash is not within the specification, adjust the side bearing preload or repair if necessary.



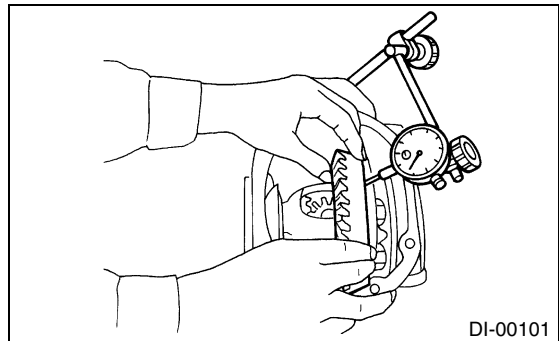
2. CROWN GEAR RUNOUT

Using a dial gauge, check the crown gear runout.

Crown gear runout:

Less than 0.05 mm (0.0020 in)

If the crown gear runout exceeds 0.05 mm (0.0020 in), replace the crown gear.



3. TOOTH CONTACT BETWEEN CROWN GEAR AND DRIVE PINION

Inspect the tooth contact between crown gear and driven pinion. <Ref. to DI-29, ASSEMBLY, Rear Differential for T-type.>

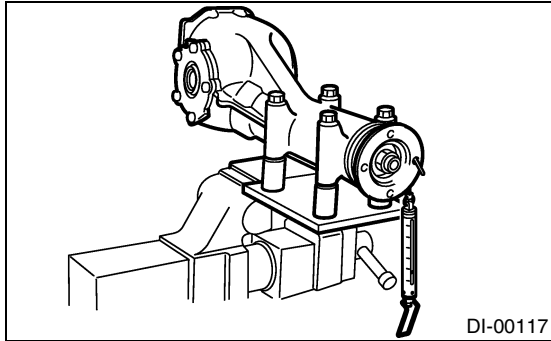
4. TOTAL PRELOAD

Using a gauge, check the turning resistance increase.

Turning resistance increase:

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

If the turning resistance increase is not within the specification, adjust the side bearing retainer shims.



F: ADJUSTMENT

1. CROWN GEAR BACKLASH

Adjust the crown gear backlash. <Ref. to DI-29, ASSEMBLY, Rear Differential for T-type.>

2. TOOTH CONTACT BETWEEN CROWN GEAR AND DRIVE PINION

Adjust the tooth contact between crown gear and drive pinion gear. <Ref. to DI-29, ASSEMBLY, Rear Differential for T-type.>

3. TOTAL PRELOAD

Adjust the side bearing shim. <Ref. to DI-29, ASSEMBLY, Rear Differential for T-type.>

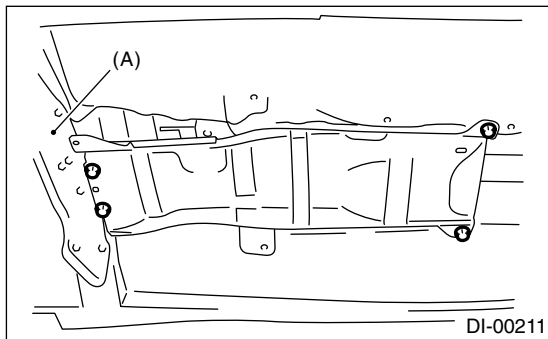
REAR DIFFERENTIAL FOR VA-TYPE

DIFFERENTIALS

5. Rear Differential for VA-type

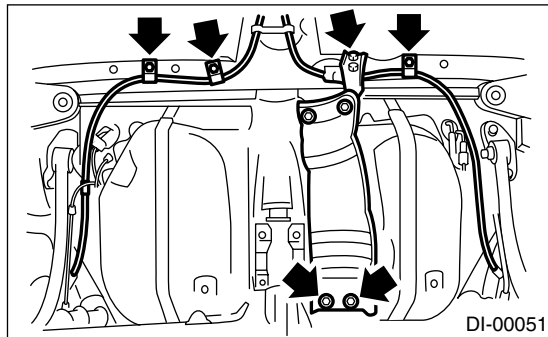
A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Move the select lever or gear shift lever to "N".
- 4) Release the parking brake.
- 5) Loosen the wheel nuts.
- 6) Jack-up the vehicle and support it with sturdy racks.
- 7) Remove the wheels.
- 8) Remove the rear exhaust pipe and muffler.
<Ref. to EX(SOHC)-11, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-13, REMOVAL, Muffler.>
- 9) Remove the heat shield cover. (if equipped)

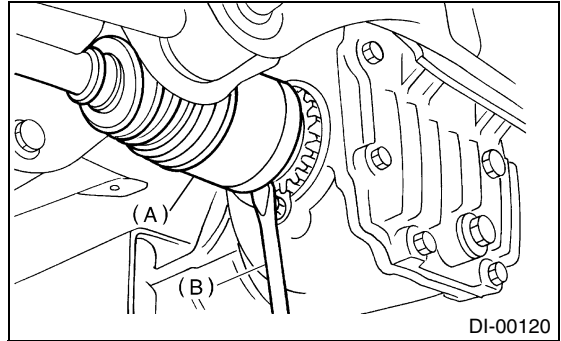


(A) Transmission mounting

- 10) Remove the propeller shaft. <Ref. to DS-14, REMOVAL, Propeller Shaft.>
- 11) Remove the clamps and bracket of parking brake cable.

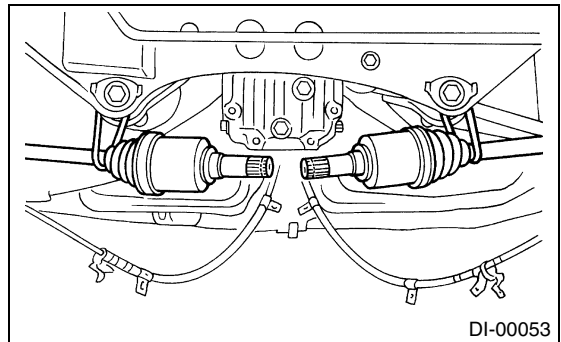


- 12) Remove the DOJ of rear drive shaft from rear differential. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

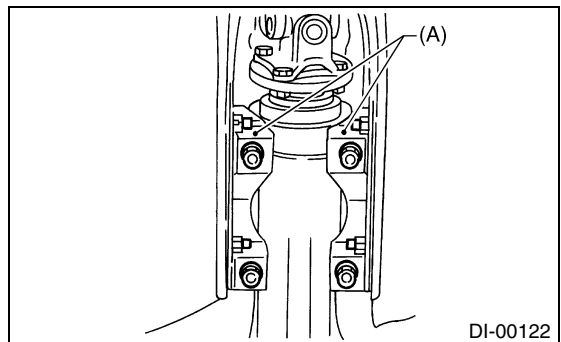


(A) DOJ
(B) Tire lever

- 13) Secure the rear drive shaft to rear crossmember using wire.

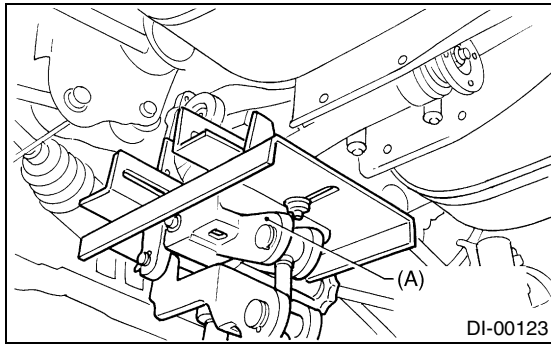


- 14) Remove the lower differential bracket.



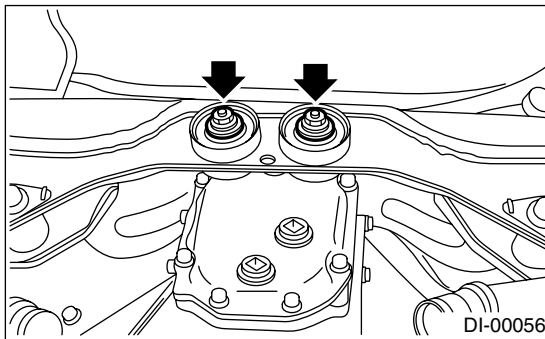
(A) Lower differential bracket

15) Support the rear differential with transmission jack.



(A) Transmission jack

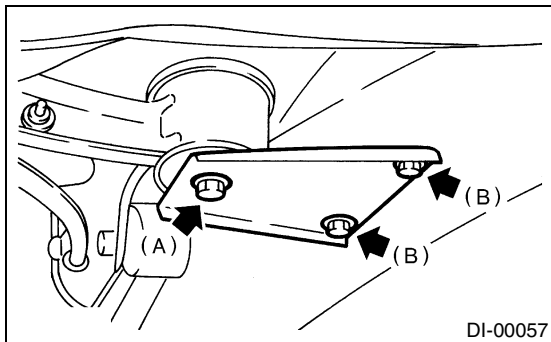
16) Remove the self-locking nuts and bolts.



17) Remove the bolts which secure rear differential front member to bolts B.

NOTE:

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

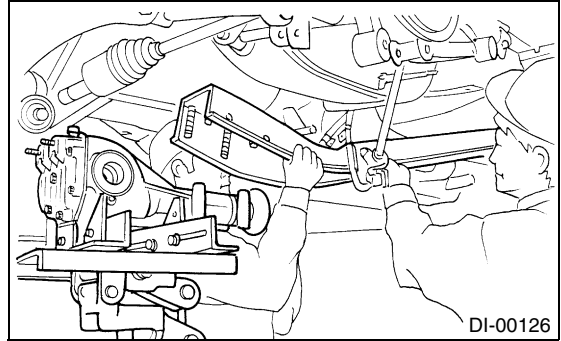


(A) Bolt A
(B) Bolt B

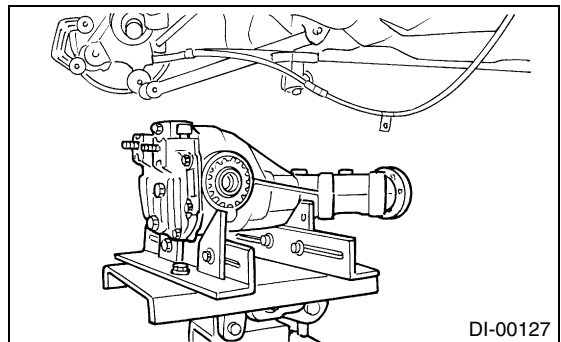
18) Remove the bolt A.

19) While slowly lowering the transmission jack, move the rear differential forward and remove bolts from front member.

20) Remove the front member from body.



21) Remove the rear differential from front member.



REAR DIFFERENTIAL FOR VA-TYPE

DIFFERENTIALS

B: INSTALLATION

Install in the reverse order of removal.

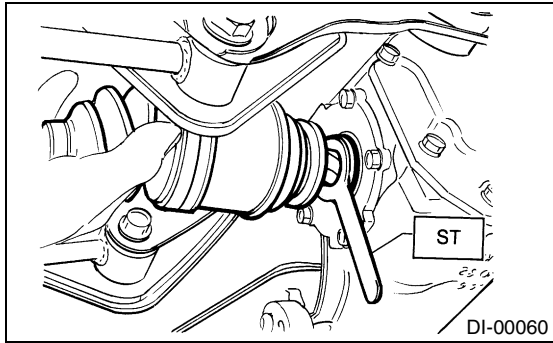
1) Position the front member on body by passing it under the parking brake cable and securing to rear differential.

NOTE:

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

2) Install the DOJ of rear drive shaft into rear differential. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA090 SIDE OIL SEAL PROTECTOR



3) Install in the reverse order of removal.

4) After installation, fill the differential carrier with gear oil to the upper plug level. <Ref. to DI-23, Front Differential.>

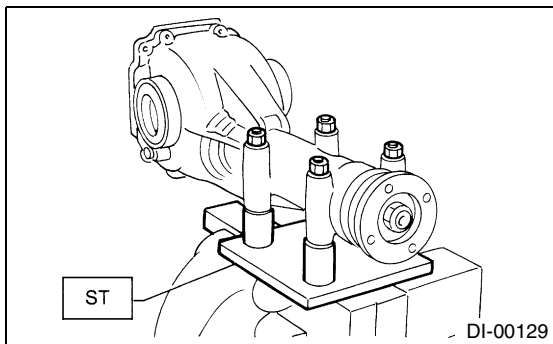
C: DISASSEMBLY

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

- Tooth contact of crown gear and pinion, and backlash
- Turning resistance of drive pinion

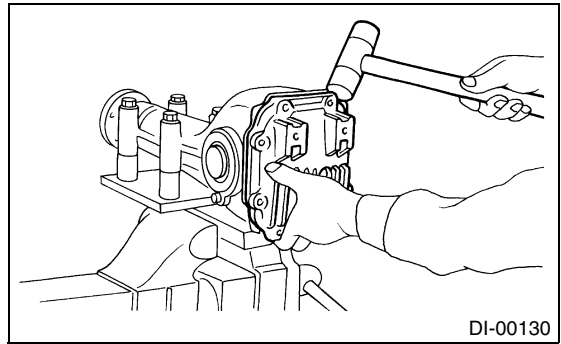
1) Set the ST on vise and install the differential assembly to ST.

ST 398217700 ATTACHMENT



2) Drain the gear oil by removing the plug.

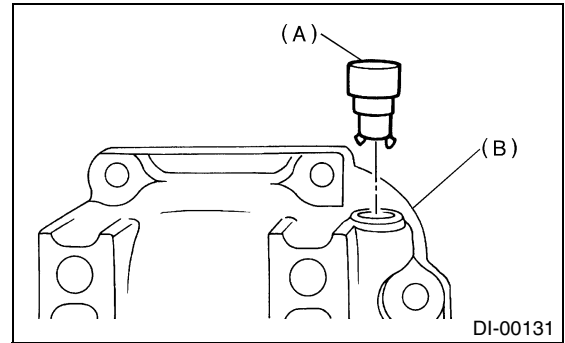
3) Remove the rear cover by loosening the retaining bolts.



4) Replace the air breather cap.

NOTE:

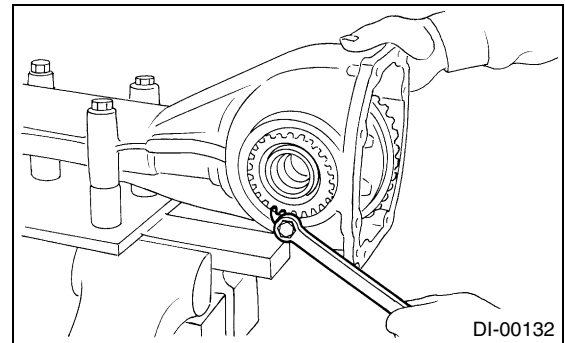
Do not attempt to replace the air breather cap unless necessary.



(A) Air breather cap

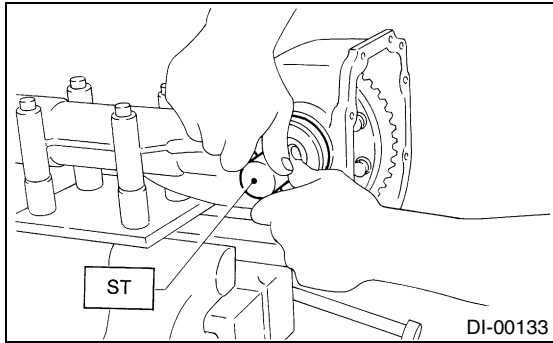
(B) Rear cover

5) Remove the right and left lock plates.



REAR DIFFERENTIAL FOR VA-TYPE

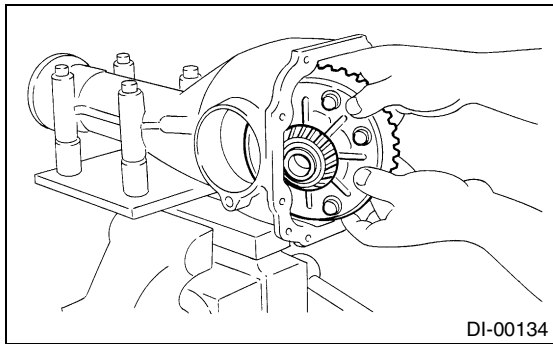
6) Remove the right and left holders with ST.
ST 399780111 OIL SEAL HOLDER
WRENCH



7) Pull out the differential assembly from differential case.

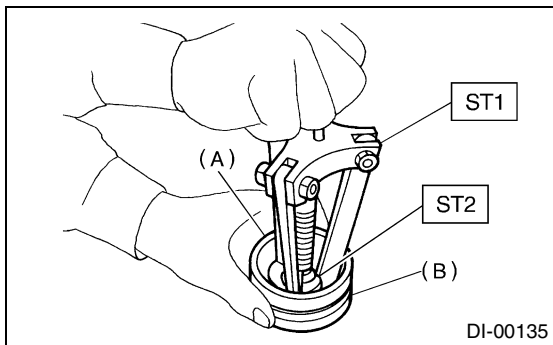
NOTE:

Be careful not to hit the teeth against the case.



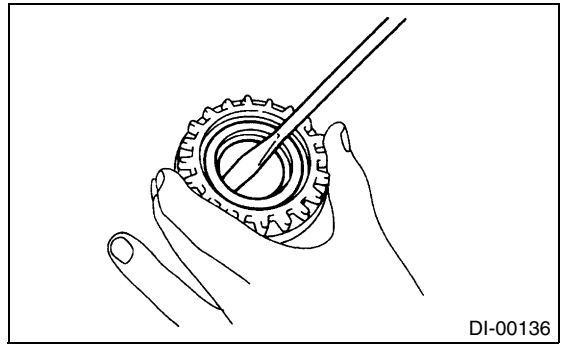
8) Remove the bearing race from right and left holders with ST1 and ST2.

ST1 499705401 PULLER ASSY
ST2 499705404 SEAT



- (A) Bearing race
- (B) Holder

9) Remove the oil seal from right and left holders using screwdriver.

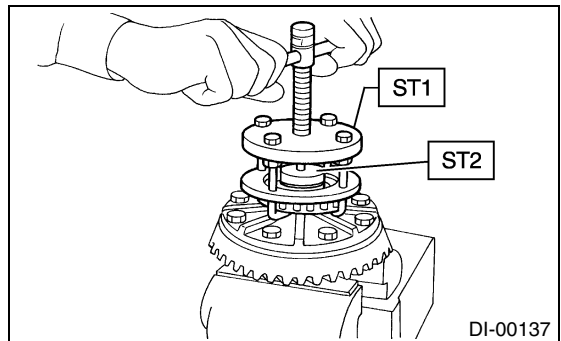


10) Extract the bearing cone with ST1 and ST2.

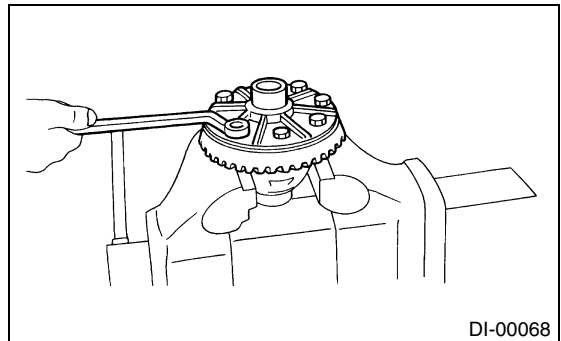
NOTE:

- Do not attempt to disassemble the parts unless necessary.
- Set the Puller so that its claws catch the edge of bearing cone.
- Never mix up the right and left hand bearing races and cones.

ST1 899524100 PULLER SET
ST2 399520105 SEAT



11) Remove the crown gear by loosening the crown gear bolts.

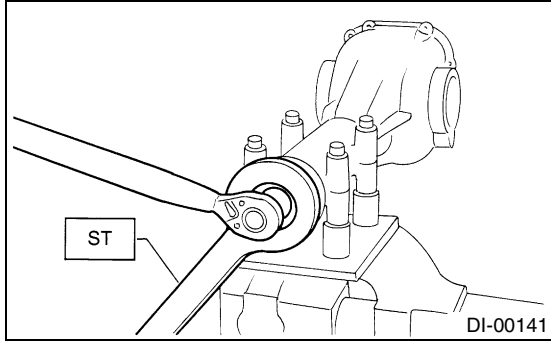


REAR DIFFERENTIAL FOR VA-TYPE

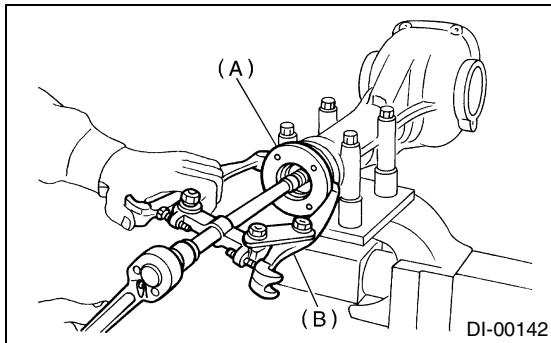
DIFFERENTIALS

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

ST 498427200 FLANGE WRENCH



13) Extract the companion flange with a puller.



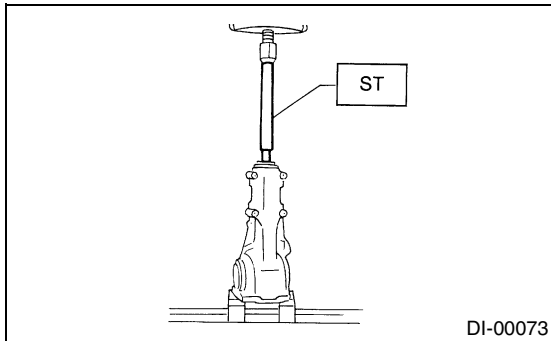
- (A) Companion
- (B) Puller

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

NOTE:

Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT

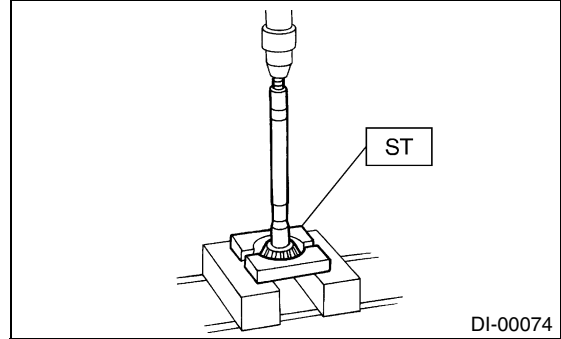


15) Remove the rear bearing cone from drive pinion by supporting the cone with ST.

NOTE:

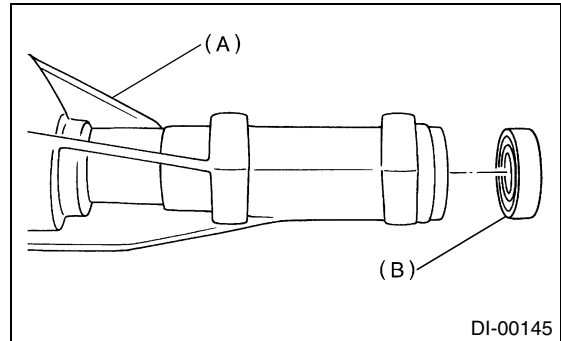
Place the replacer so that its center-recessed side faces the pinion gear.

ST 498515500 REPLACER



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

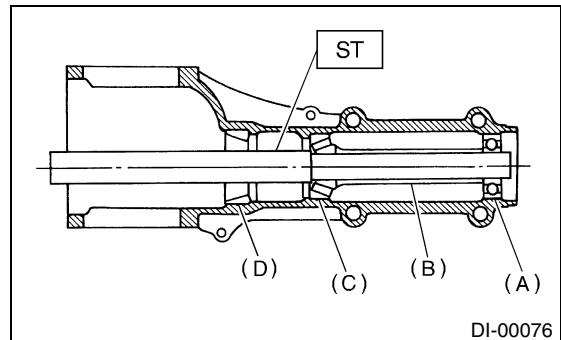
ST 398527700 PULLER SET



- (A) Differential carrier
- (B) Front oil seal

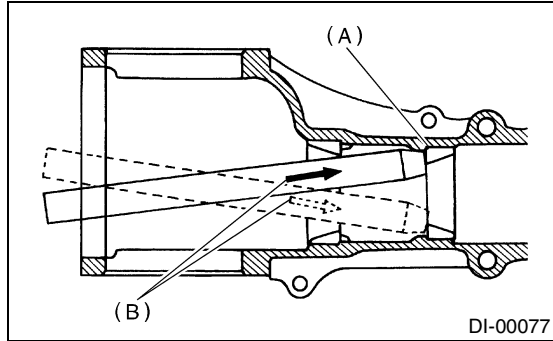
17) Remove the pilot bearing together with front bearing cone and spacer using ST.

ST 398467700 DRIFT



- (A) Pilot bearing
- (B) Spacer
- (C) Front bearing
- (D) Rear bearing cup

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



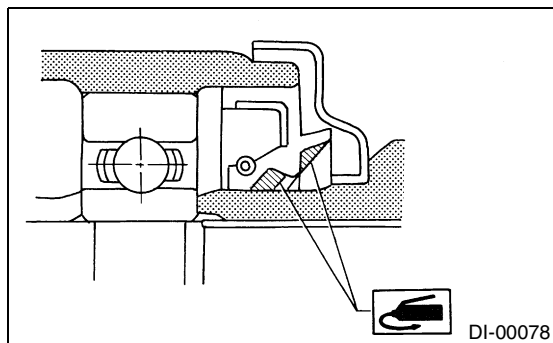
- (A) 2 cutouts along diagonal lines
- (B) Tap alternately with brass bar.

D: ASSEMBLY

NOTE:

Precautions for assembling

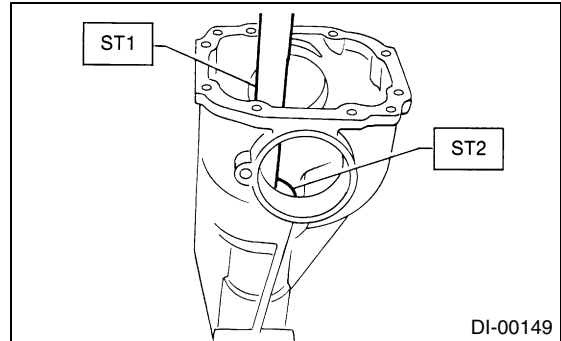
- Assemble in the reverse order of disassembly.
- Use a new gasket.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not improperly installed.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear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



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

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

- ST1 398477701 HANDLE
- ST2 398477702 DRIFT



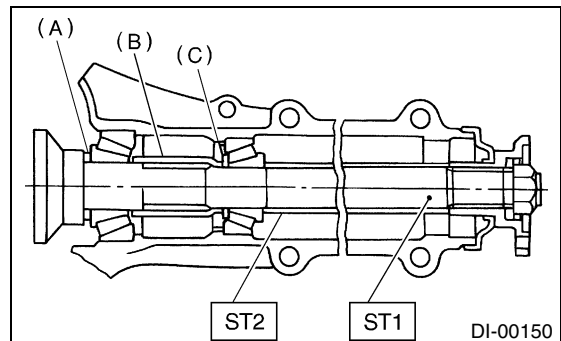
(2) Insert the ST1 into case with pinion height adjusting shim and rear bearing cone fitted onto it.

NOTE:

- If the tooth contact (drive pinion, driven gear) is not wrong at inspection before disassembly, re-use the used washer after confirming that the washer is not damaged.
- Use a new rear bearing cone.

(3) Then install the preload adjusting spacer and washer, front bearing cone, ST2, companion flange, and washer and self-locking nut.

- ST1 498447150 DUMMY SHAFT
- ST2 32285AA000 DUMMY COLLAR

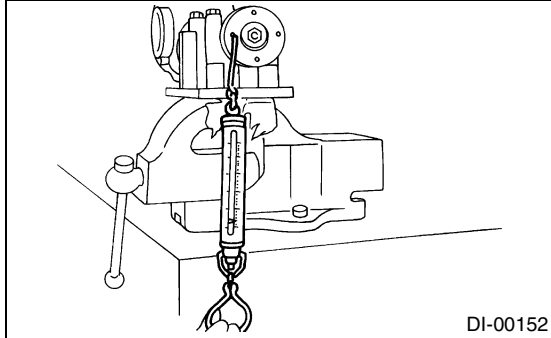


- (A) Pinion height adjusting shim
- (B) Preload adjusting spacer
- (C) Preload adjusting washer

REAR DIFFERENTIAL FOR VA-TYPE

DIFFERENTIALS

(4) Turn the ST1 with hand to make it seated, and tighten the drive pinion nut while measuring the preload with spring balance. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.



NOTE:

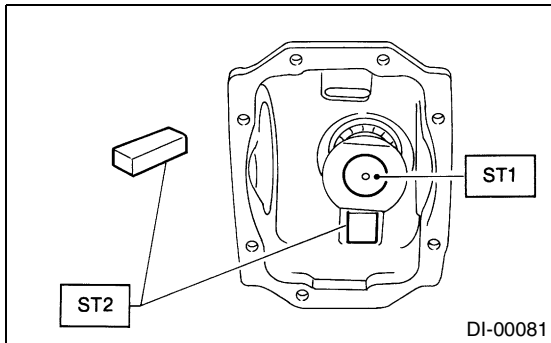
- Use a new self-locking nut.
- Be careful not to give excessive preload.
- Measure the preload in direction of tangent to flange.
- When tightening the drive pinion nut, lock ST1 with ST2 as shown in the figure.

ST1 398507704 BLOCK

ST2 498447150 DUMMY SHAFT

Tightening torque:

188 N·m (19.2 kgf·m, 139 ft·lb)



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

Front and rear bearing preload
For new bearing: 12.7 — 32.2 N (1.3 — 3.3 kgf, 2.9 — 7.3 lb) at companion flange bolt hole

2) Adjusting drive pinion height

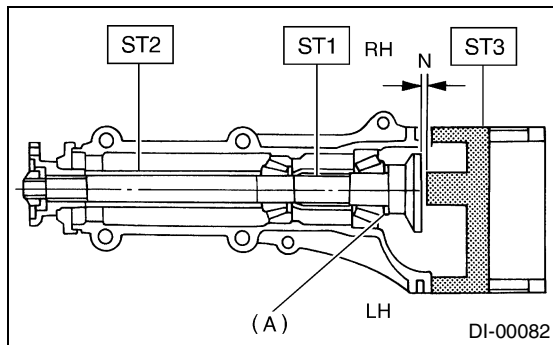
Adjust the drive pinion height with shim installed between the rear bearing cone and back of pinion gear.

- (1) Do not remove the ST1, ST2 and ST3 out of position after adjusting pinion bearing preload in previous step.

NOTE:

At this time, install the pinion height adjusting shim which is temporarily selected or same as that used before.

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



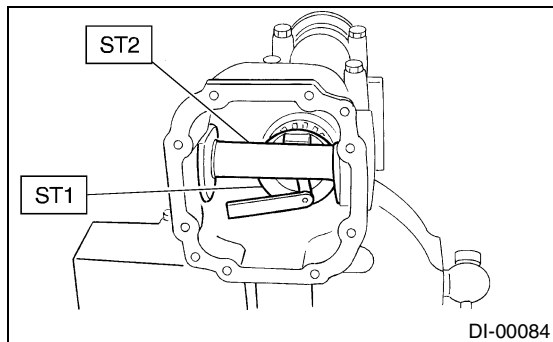
(A) Pinion height adjusting shim

- (2) Measure the clearance N between the end of ST3 and end surface of ST1 by using a thickness gauge.

NOTE:

Make sure there is no clearance between the case and ST3.

- ST1 498447150 DUMMY SHAFT
- ST2 498505501 DIFFERENTIAL CARRIER GAUGE



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

NOTE:

Use 1 to 3 shims as required for adjustment.

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

where

T = Thickness of pinion height adjusting shim (mm)

T_o = Thickness of shim originally installed (mm)

N = Reading of thickness gauge (mm)

H = Figure marked on drive pinion head

(Example of calculation)

$$T_o = 0.15 \text{ mm}$$

$$N = 0.1 \text{ mm}$$

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

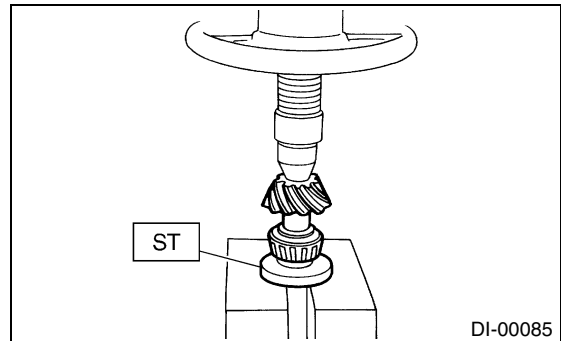
Result: Thickness = 0.2 mm

Therefore use the 32295AA220.

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

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

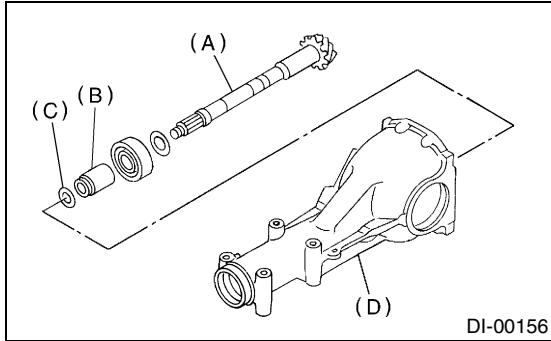
ST 498175500 INSTALLER



REAR DIFFERENTIAL FOR VA-TYPE

DIFFERENTIALS

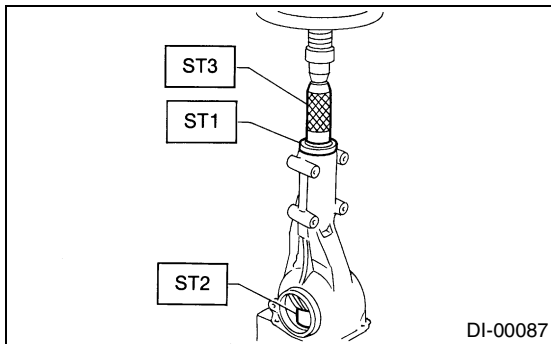
4) Insert the drive pinion into differential carrier, install the previously selected bearing preload adjusting spacer and washer.



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

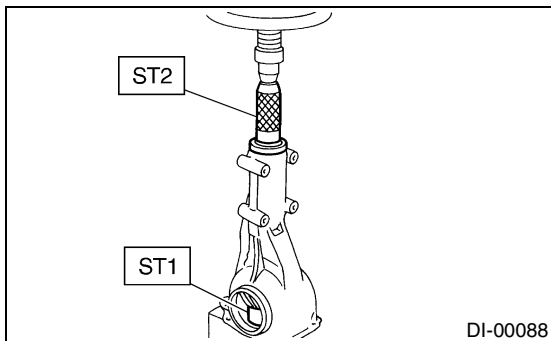
5) Press-fit the front bearing cone into carrier with ST1, ST2 and ST3.

- ST1 32285AA000 DUMMY COLLAR
- ST2 399780104 WEIGHT
- ST3 899580100 INSTALLER



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

- ST1 399780104 WEIGHT
- ST2 899580100 INSTALLER

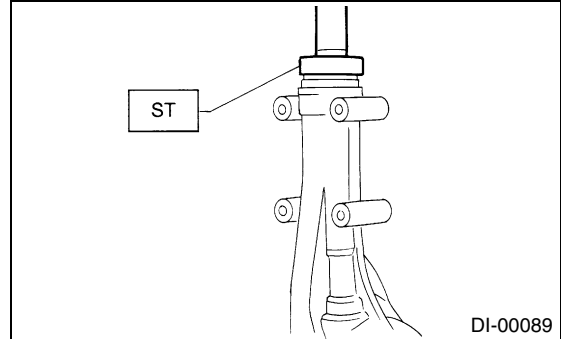


7) Fit a new oil seal with ST.

NOTE:

- Press-fit until the end of oil seal is 1 mm (0.04 in) inward from end of carrier.
- Apply grease between the oil seal lips.

- ST 498447120 INSTALLER

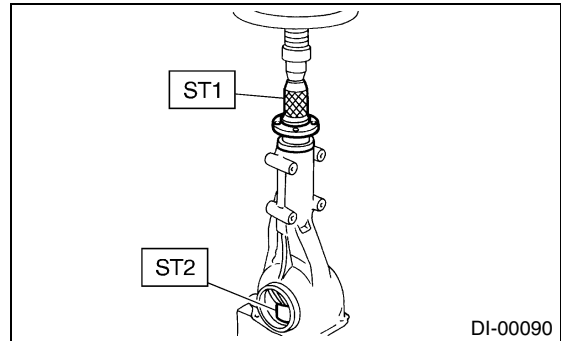


8) Press-fit the companion flange with ST1 and ST2.

NOTE:

Be careful not to damage the bearing.

- ST1 899874100 INSTALLER
- ST2 399780104 WEIGHT

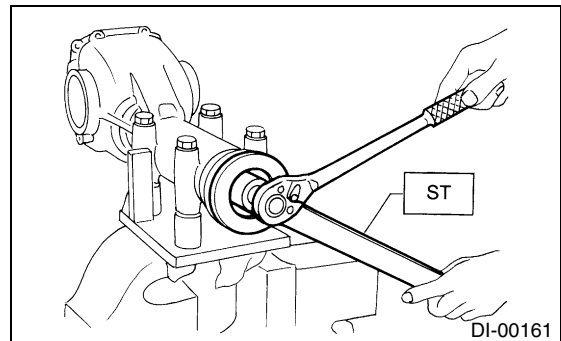


9) Install the self-locking nut. Then tighten it with the ST.

- ST 498427200 FLANGE WRENCH

Tightening torque:

188 N·m (19.2 kgf·m, 139 ft·lb)



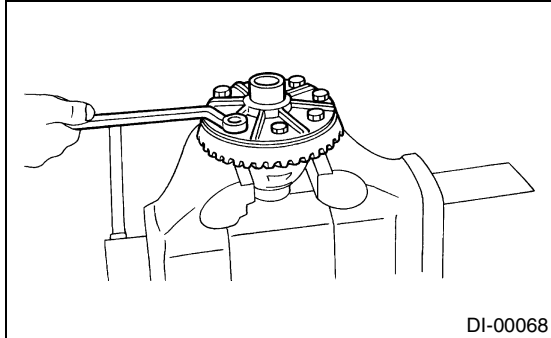
10) Install the crown gear on differential case.

NOTE:

Tighten diagonally while tapping the bolt heads.

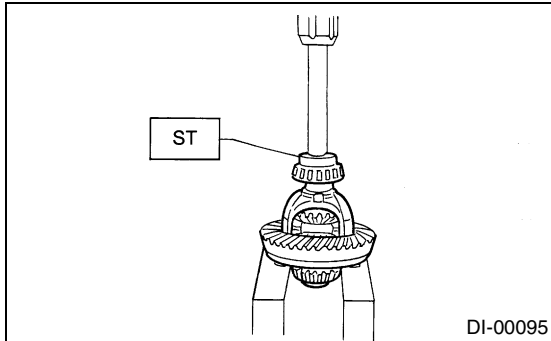
Tightening torque:

62 N·m (6.3 kgf·m, 45.6 ft-lb)



11) Press the side bearing cone onto differential case with ST.

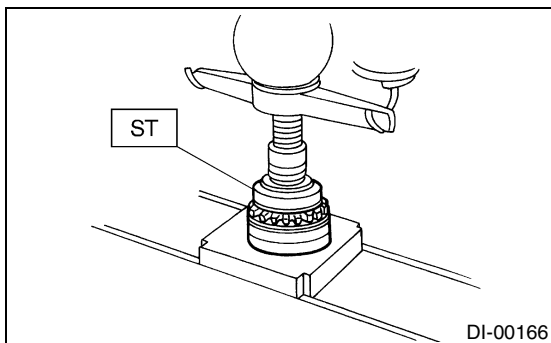
ST 498485400 DRIFT



12) Assemble holders.

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

ST 498447100 INSTALLER

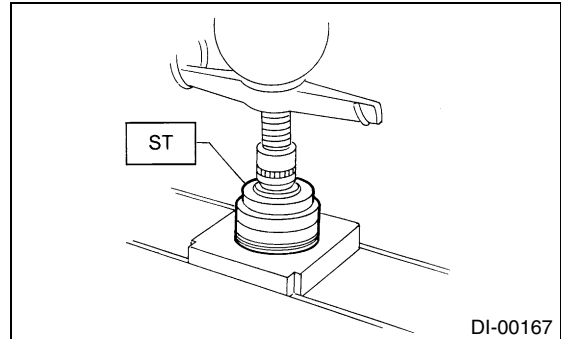


(2) Install the bearing race into right and left holders.

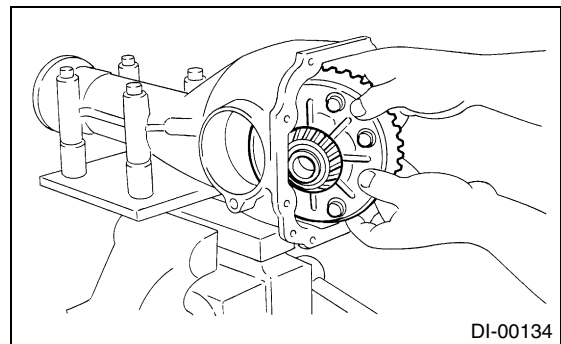
ST 398477702 BEARING OUTER RACE DRIFT

CAUTION:

Make sure that the oil seal, bearing outer race and cone are properly assembled.



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

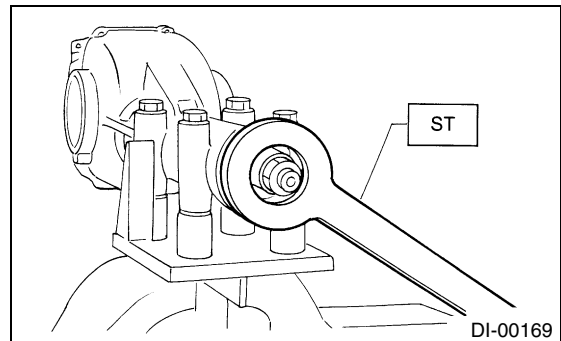


(4) Temporarily tighten the side holders.

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

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

ST 498427200 FLANGE WRENCH



REAR DIFFERENTIAL FOR VA-TYPE

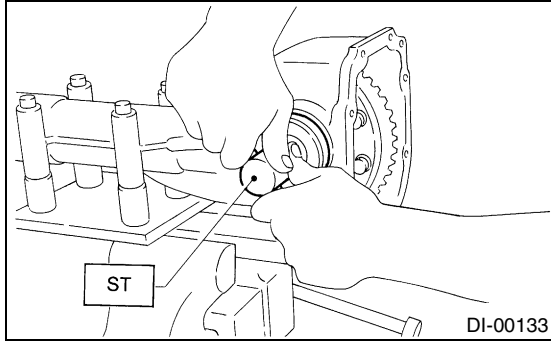
DIFFERENTIALS

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

ST 399780111OIL SEAL HOLDER WRENCH

NOTE:

- Be careful to install the differential oil seal to proper side.
- Do not install the O-ring.

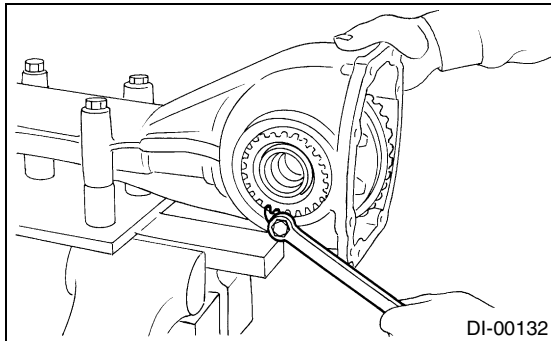


(3) Back off the driven gear side holder approx. 1 1/2 teeth of holder, and tighten the opposite side holder by approx. 2 teeth (approx. 1 1/2 + 1/2 teeth). [Back off amount of driven gear side holder (approx. 1 1/2 teeth) + 1/2 tooth.] This + 2 tooth gives preload.

(4) Temporarily tighten the lock plate.

NOTE:

If the positions of lock plate and tooth are not aligned, turn over the lock plate to displace the holder 1/2 tooth.



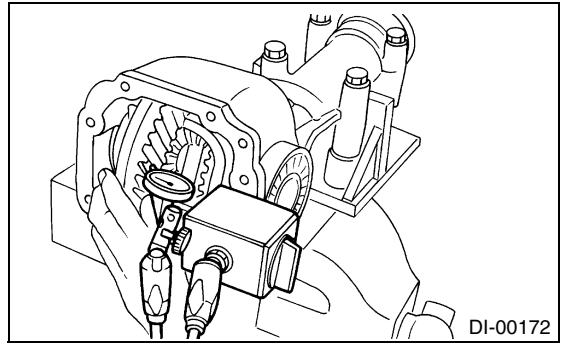
(5) Measure the crown gear-to-drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with tooth face of crown gear, and move the crown gear while holding drive pinion still. Read the value indicated on dial gauge.

NOTE:

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

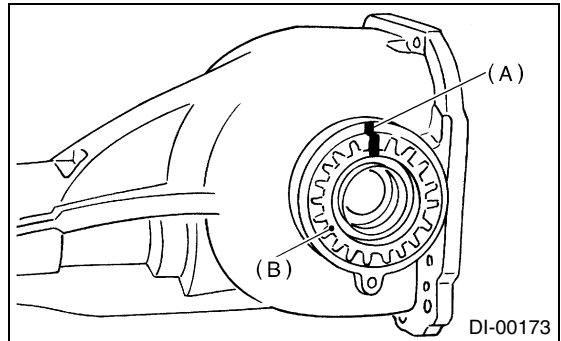
Backlash:

0.10 — 0.15 mm (0.0039 — 0.0059 in)



14) Draw a matching mark on both differential carrier and holder. Remove the holder one side at a time.

Replace in the original position after inserting an O-ring and applying grease to threaded portion.



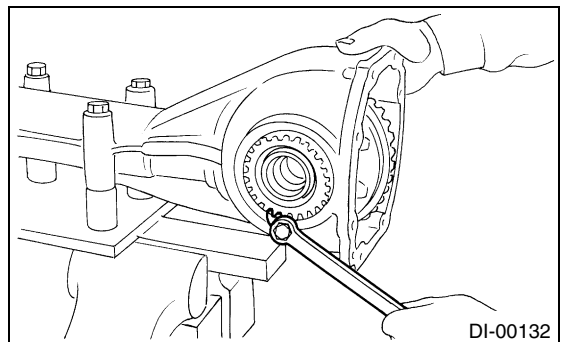
(A) Matching mark

(B) Holder

15) Tighten the bolt of lock plate to specified torque.

Tightening torque:

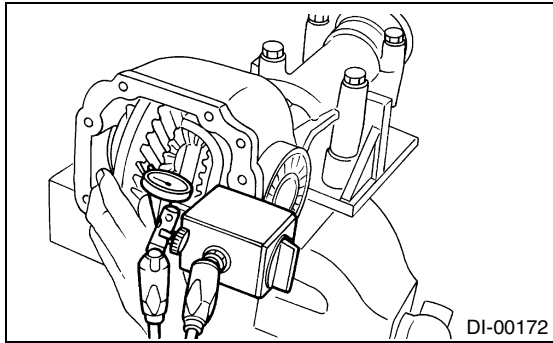
25 N·m (2.5 kgf·m, 18.1 ft·lb)



16) Re-check the crown gear-to-pinion backlash.

Backlash:

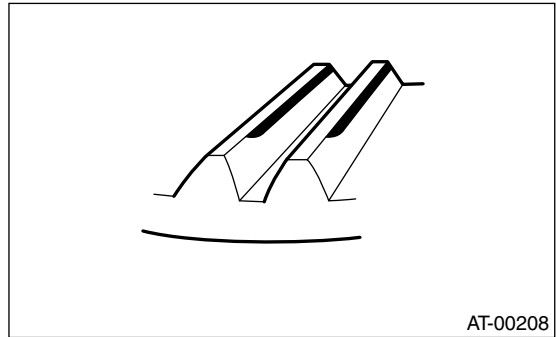
0.10 — 0.15 mm (0.0039 — 0.0059 in)



- Face contact

Checking item: Backlash is too large.

Contact pattern



17) Checking and adjusting tooth contact of crown gear.

(1) Apply an even coat of red lead on both sides of three or four teeth on the crown gear. Check the contact pattern after rotating the crown gear several revolutions back and forth until a definite contact pattern appears on the crown gear.

(2) When the contact pattern is incorrect, readjust according to the instructions given in "TOOTH CONTACT PATTERN".

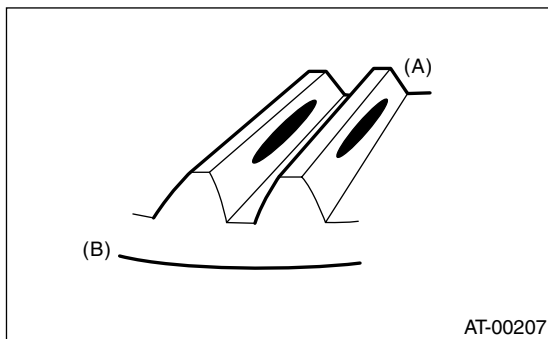
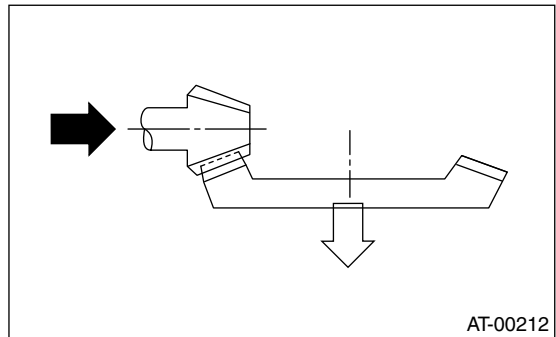
NOTE:

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

- Correct tooth contact

Checking item: Tooth contact pattern is slightly shifted toward to under no-load rotation. (When loaded, contact pattern moves toward heel.)

Corrective action: Increase thickness of drive pinion height adjusting shim in order to bring drive pinion close to crown gear.

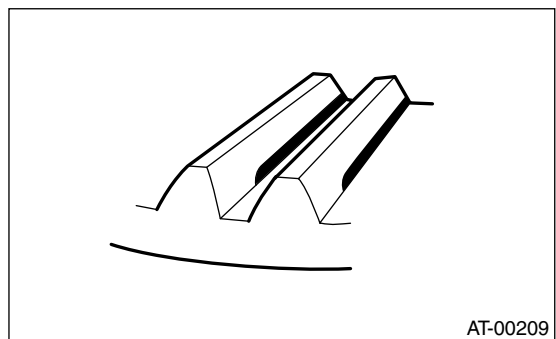


- (A) Toe side
- (B) Heel side

- Flank contact

Checking item: Backlash is too small.

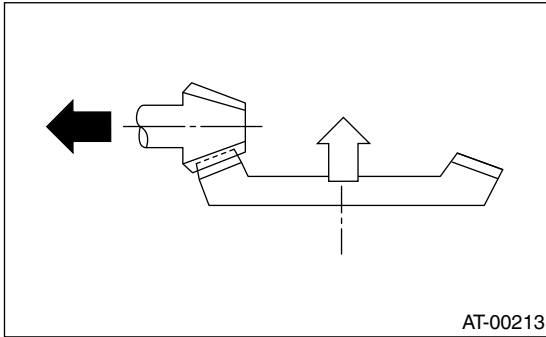
Contact pattern



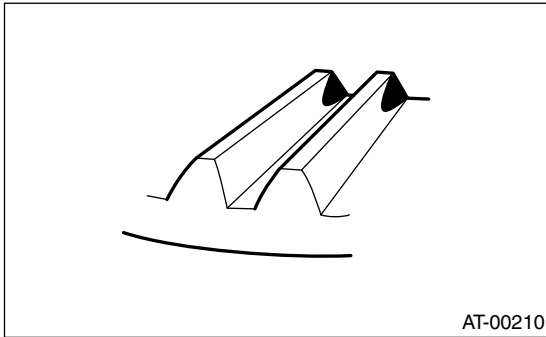
REAR DIFFERENTIAL FOR VA-TYPE

DIFFERENTIALS

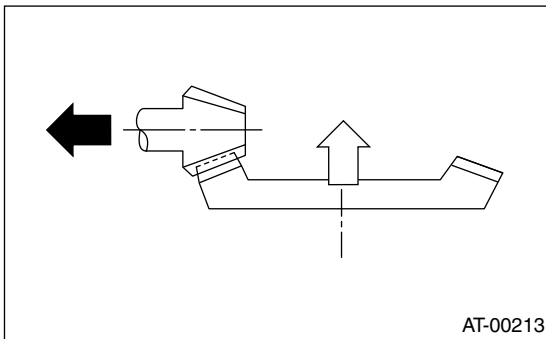
Corrective action: Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.



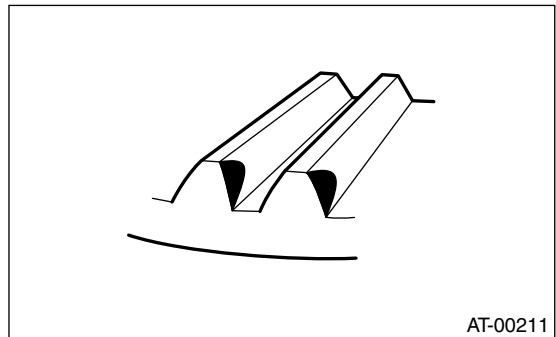
• Toe contact (Inside end contact)
Checking item: Contact area is small.
 Contact pattern



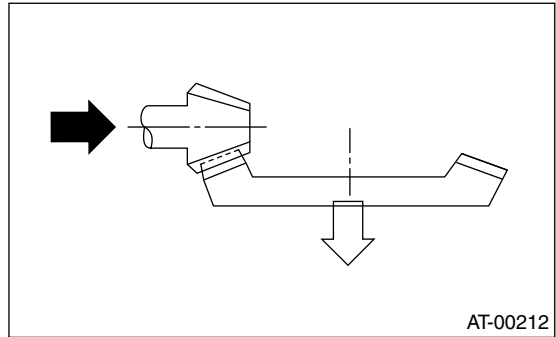
Corrective action: Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.



• Heel contact (Outside end contact)
Checking item: Contact area is small.
 Contact pattern



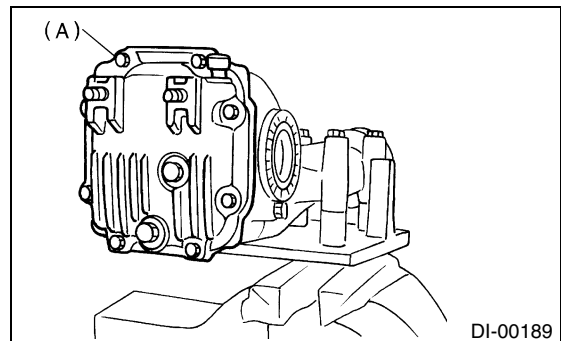
Corrective action: Increase thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.



18) If proper tooth contact is not obtained, once again adjust the drive pinion height and the differential side bearing preload (already mentioned) and the hypoid gear backlash.

19) Install a new gasket and rear cover to differential carrier, and tighten the bolts to specified torque.

Tightening torque:
 25 N·m (2.5 kgf-m, 18.1 ft-lb)



(A) Rear cover

E: INSPECTION

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

1) Crown gear and drive pinion

- If abnormal tooth contact is evident, find out the cause and adjust to give correct tooth contact at assembly. Replace the gear if excessively worn or incapable of adjustment.

- If crack, score, or seizure is evident, replace as a set. Slight damage of tooth can be corrected by oil stone or the like.

2) Bearing

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

3) Oil seal

Replace if deformed or damaged, and at every disassembling.

4) Differential carrier

Replace if the bearing bores are worn or damaged.

5) Differential case

Replace if its sliding surfaces are worn or cracked.

6) Companion flange

Replace if the oil seal lip contacting surfaces have flaws.

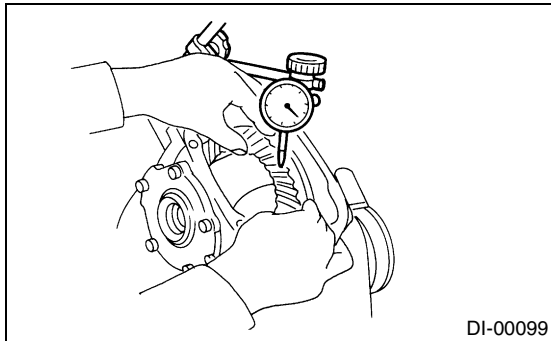
1. CROWN GEAR BACKLASH

Using a dial gauge, check the backlash of the crown gear.

Crown gear backlash:

0.10 — 0.15 mm (0.0039 — 0.0059 in)

If the crown gear backlash is not within the specification, adjust the side bearing preload or repair if necessary.



2. TOOTH CONTACT BETWEEN CROWN GEAR AND DRIVE PINION

Inspect the tooth contact between crown gear and drive pinion.

<Ref. to DI-45, ASSEMBLY, Rear Differential for VA-type.>

F: ADJUSTMENT

1. CROWN GEAR BACKLASH

Adjust the crown gear backlash. <Ref. to DI-45, ASSEMBLY, Rear Differential for VA-type.>

2. TOOTH CONTACT BETWEEN CROWN GEAR AND DRIVE PINION

Adjust the tooth contact between crown gear and drive pinion gear. <Ref. to DI-45, ASSEMBLY, Rear Differential for VA-type.>

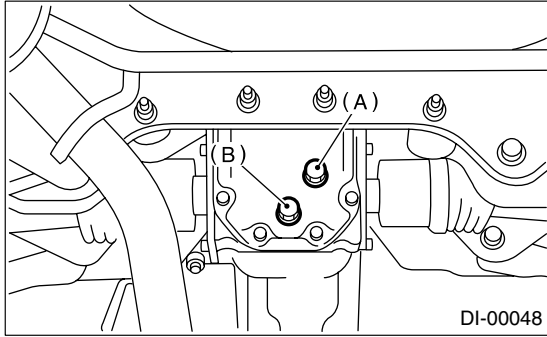
REAR DIFFERENTIAL FRONT OIL SEAL

DIFFERENTIALS

6. Rear Differential Front Oil Seal

A: REPLACEMENT

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Move the select lever or gear shift lever to "N".
- 4) Release the parking brake.
- 5) Remove the oil drain plug, and drain the gear oil.



- (A) Filler plug
- (B) Drain plug

- 6) Install the oil drain plug.

NOTE:

- Apply fluid packing to the drain plug for T-type.
- Use a new aluminum gasket for VA-type.

Fluid packing:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

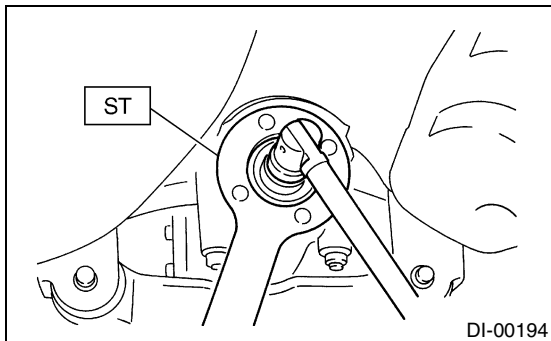
T-type

49 N·m (5.0 kgf·m, 36.2 ft·lb)

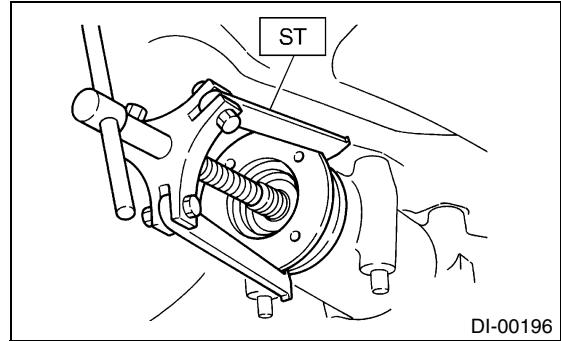
VA-type

34 N·m (3.5 kgf·m, 25.3 ft·lb)

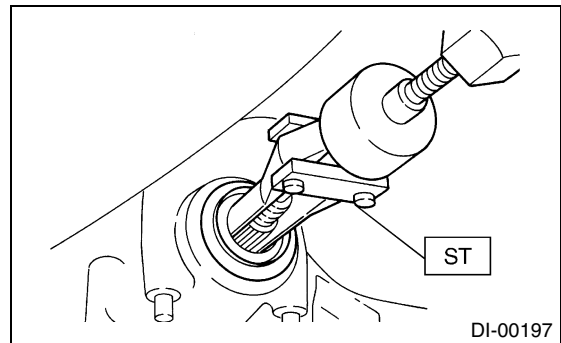
- 7) Jack-up the rear wheels and support the vehicle body with sturdy racks.
- 8) Remove the rear exhaust pipe and muffler.
- 9) Remove the propeller shaft from body. <Ref. to DS-14, REMOVAL, Propeller Shaft.>
- 10) Remove the self-locking nut while holding the companion flange with ST.
ST 498427200 FLANGE WRENCH



- 11) Extract the companion flange using ST.
ST 399703600 PULLEY ASSY



- 12) Remove the oil seal using ST.
ST 398527700 PULLER ASSY

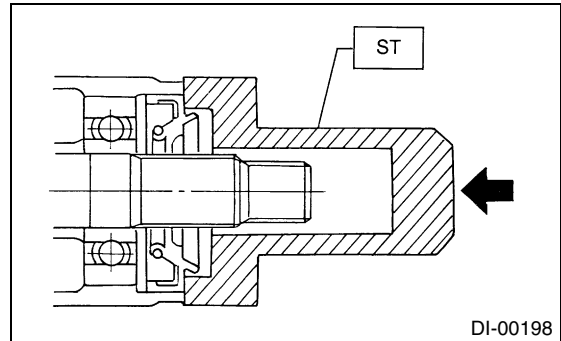


- 13) Fit a new oil seal using ST.

NOTE:

Apply oil to the outer surface of oil seal.

ST 498447120 INSTALLER



- 14) Install the companion flange.

NOTE:

Use a plastic hammer to install the companion flange.

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

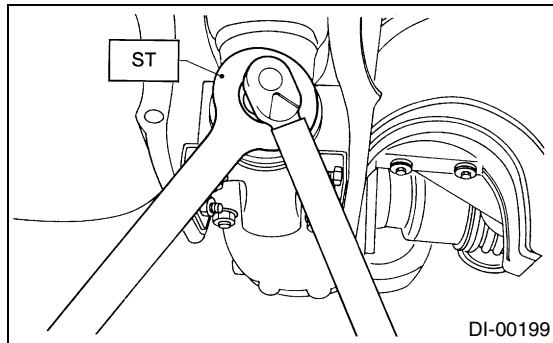
ST 498427200 FLANGE WRENCH

NOTE:

Use a new self-locking nut.

Tightening torque:

181 N·m (18.5 kgf-m, 134 ft-lb)



16) Hereafter, reassemble in the reverse order of disassembly.

REAR DIFFERENTIAL SIDE OIL SEAL

DIFFERENTIALS

7. Rear Differential Side Oil Seal

A: INSPECTION

Make sure that there is no oil leakage from side oil seal.

If there is any oil leakage, replace the oil seal.

B: REPLACEMENT

1. T-TYPE

- 1) Disconnect the ground cable from battery.
- 2) Move the select lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Loosen both wheel nuts.
- 5) Jack-up the vehicle and support it with rigid racks.
- 6) Remove the wheels.
- 7) Remove the rear exhaust pipe and muffler.

Non-turbo model

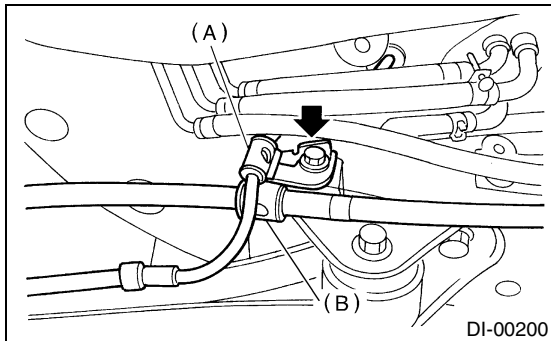
<Ref. to EX(SOHC)-11, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-13, REMOVAL, Muffler.>

Turbo model

<Ref. to EX(TURBO)-12, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(TURBO)-14, REMOVAL, Muffler.>

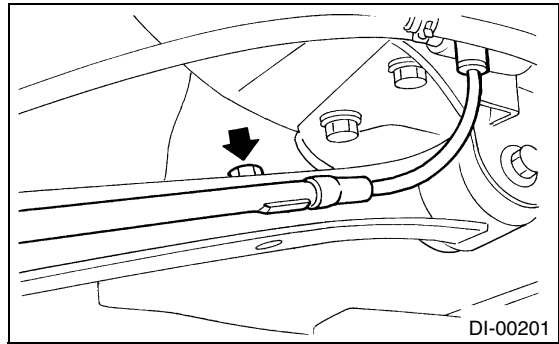
- 8) Remove the DOJ of rear drive shaft from rear differential.

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

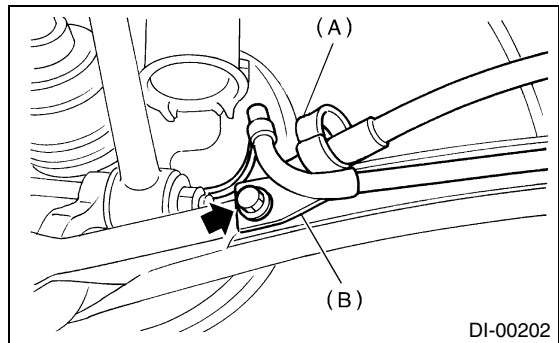


- (A) ABS sensor cable clamp
(B) Parking brake cable clamp

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

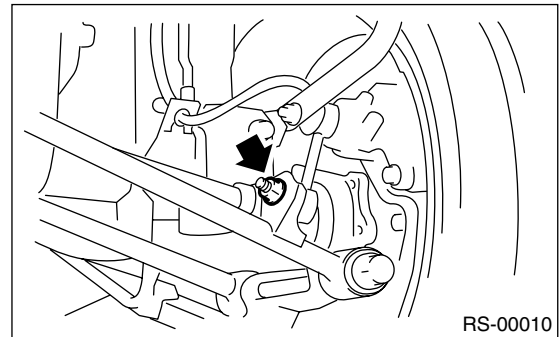


- (3) Remove the ABS sensor cable clamp and parking brake cable guide from trailing link.

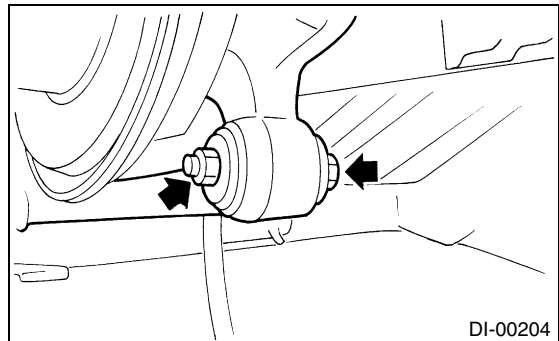


- (A) Parking brake cable guide
(B) ABS sensor cable clamp

- (4) Remove the rear stabilizer link.

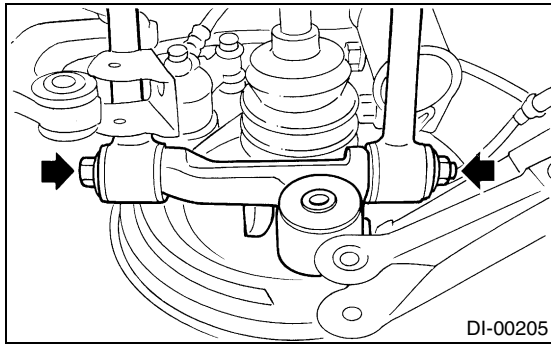


- (5) Remove the bolts which secure trailing link to housing.



REAR DIFFERENTIAL SIDE OIL SEAL

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

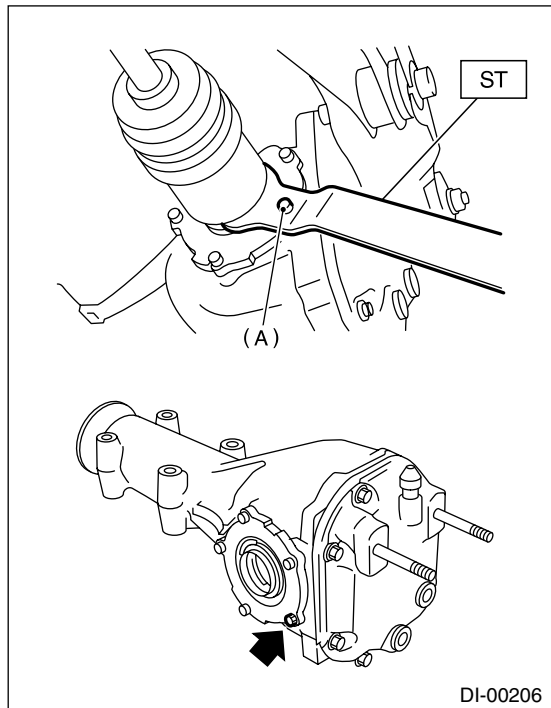


(7) Remove the DOJ from the rear differential by using ST.

NOTE:

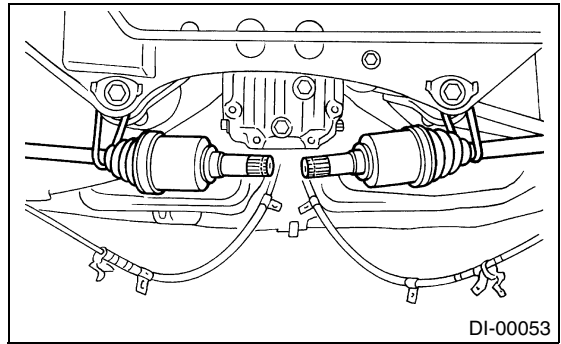
When removing the DOJ from rear differential, fit ST to the bolts as shown in the figure so as not to damage the side bearing retainer.

ST 28099PA100 DRIVE SHAFT REMOVER

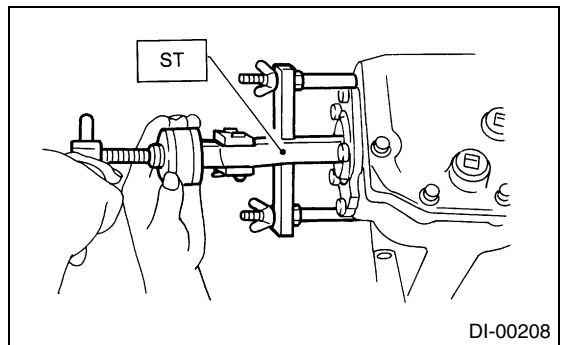


(A) Bolt

9) Remove the rear drive shaft to the rear cross-member using wire.



10) Using the ST, remove the oil seal.
ST 398527700 PULLER ASSY

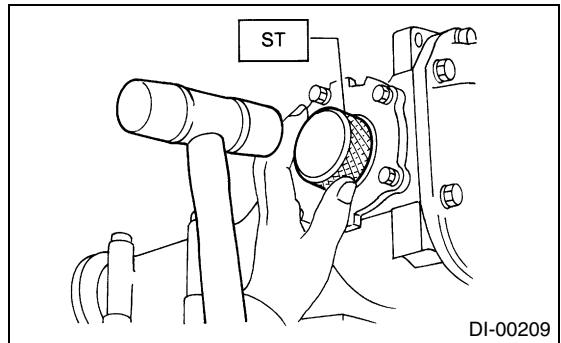


11) Drive in a new side oil seal using ST.

NOTE:

Apply chassis grease between the oil seal lips.

ST 398437700 DRIFT

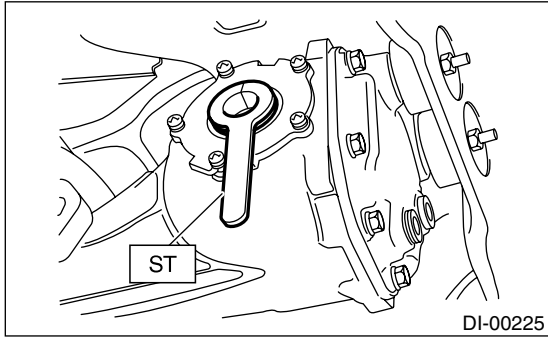


12) Insert the DOJ into rear differential.
(1) Install the ST to rear differential.

REAR DIFFERENTIAL SIDE OIL SEAL

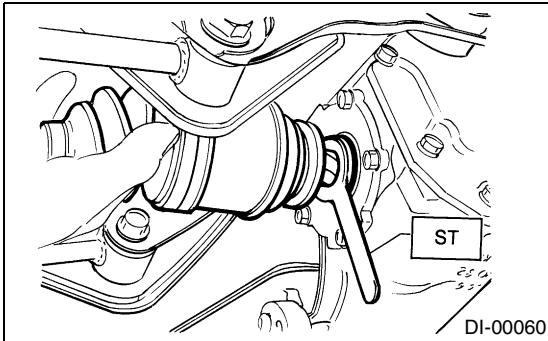
DIFFERENTIALS

ST 28099PA090 SIDE OIL SEAL PROTECTOR



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

ST 28099PA090 SIDE OIL SEAL PROTECTOR



(3) Remove the ST.

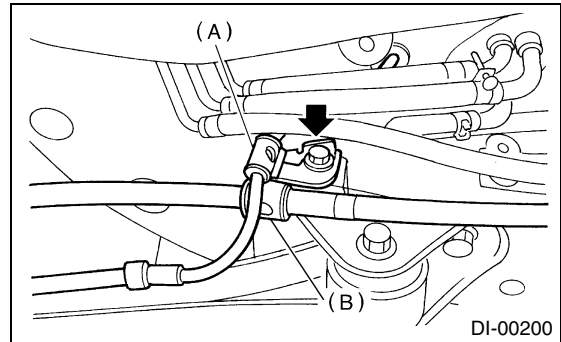
ST 28099PA090 SIDE OIL SEAL PROTECTOR

13) Hereafter, reassemble in the reverse order of disassembly.

2. VA-TYPE

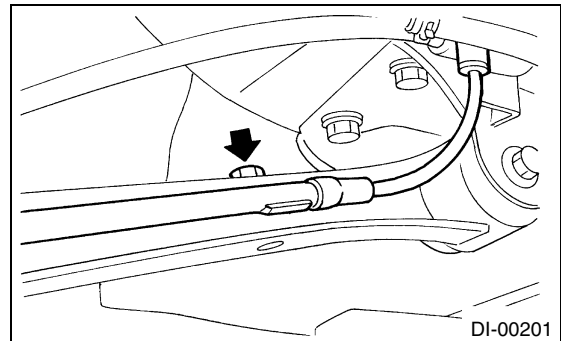
- 1) Disconnect the ground cable from battery.
- 2) Move the select lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Loosen both wheel nuts.
- 5) Jack-up the vehicle and support it with rigid racks.
- 6) Remove the wheels.
- 7) Remove the rear exhaust pipe and muffler.
<Ref. to EX(SOHC)-11, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-13, REMOVAL, Muffler.>
- 8) Remove the DOJ of rear drive shaft from rear differential.

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

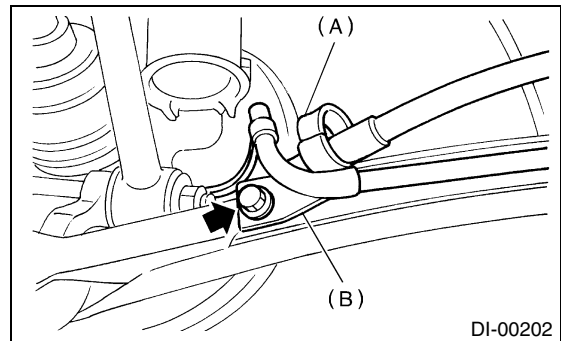


- (A) ABS sensor cable clamp
(B) Parking brake cable clamp

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

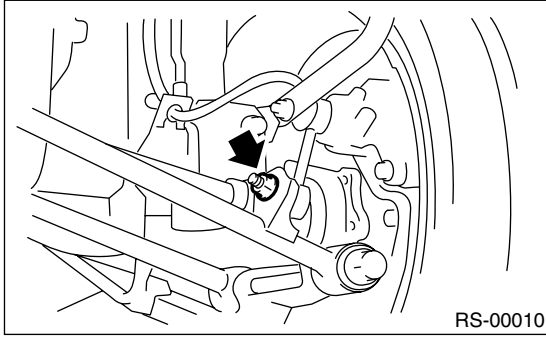


(3) Remove the ABS sensor cable clamp and parking brake cable guide from trailing link.

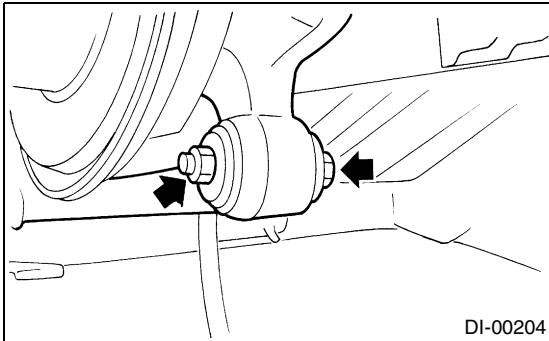


- (A) Parking brake cable guide
(B) ABS sensor cable clamp

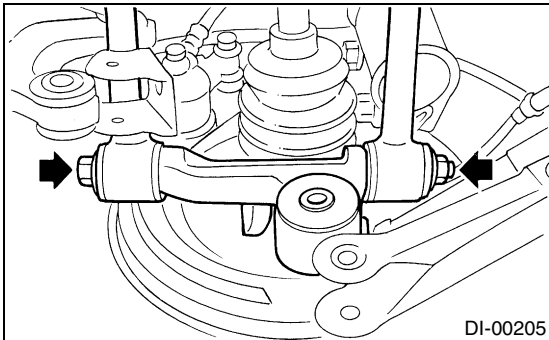
(4) Remove the rear stabilizer link.



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



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



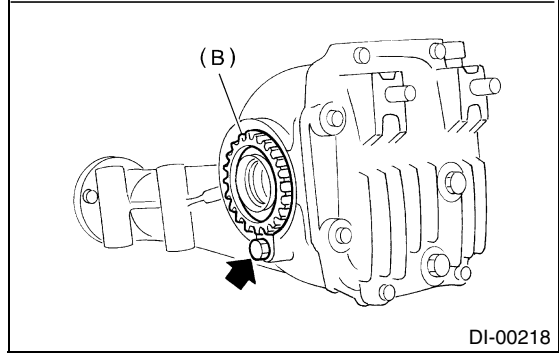
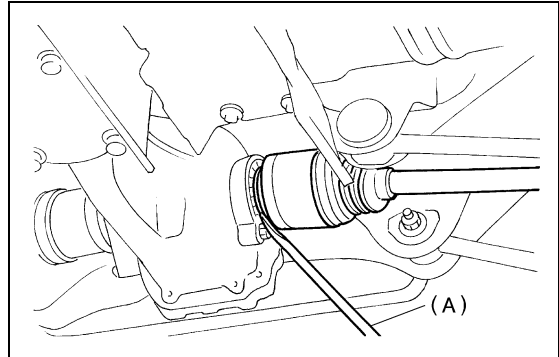
(7) Remove the DOJ from the rear differential using tire lever.

NOTE:

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

NOTE:

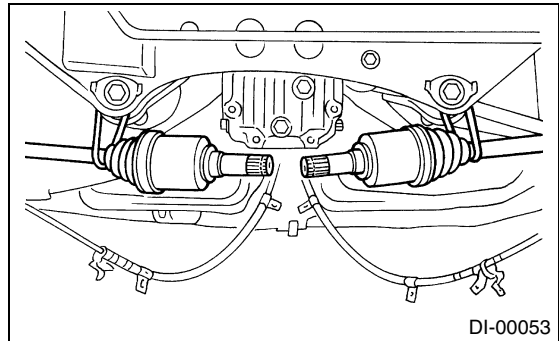
The side spline shaft circlip comes out together with the shaft.



(A) Tire lever

(B) Axle shaft holder

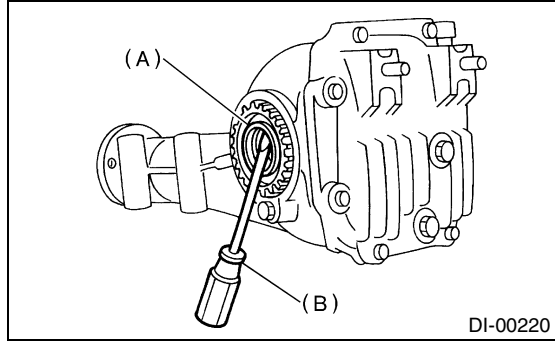
9) Secure the rear drive shaft to rear crossmember using wire.



REAR DIFFERENTIAL SIDE OIL SEAL

DIFFERENTIALS

10) Remove the oil seal with screwdriver.



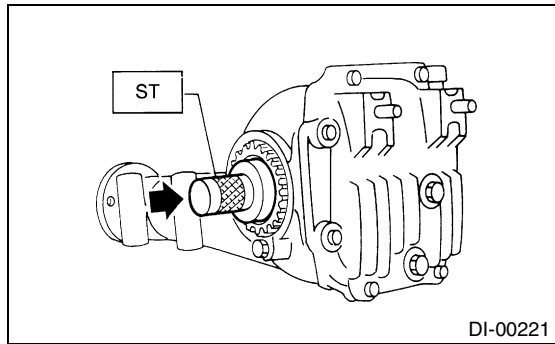
- (A) Side oil seal
- (B) Screwdriver

11) Drive in a new side oil seal using ST.

NOTE:

Apply chassis grease between the oil seal lips.

ST 498447100 OIL SEAL INSTALLER



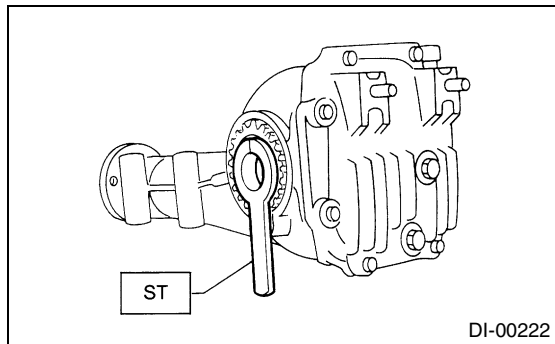
12) Insert the DOJ into rear differential.

NOTE:

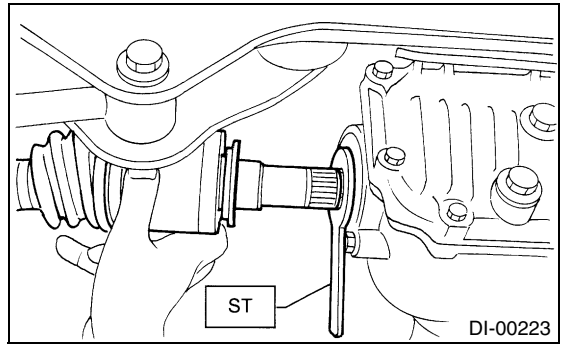
Before inserting, replace the circlip at the end of spline shaft with a new one.

(1) Install the ST to rear differential.

ST 28099PA090 SIDE OIL SEAL PROTECTOR



(2) Install the spline shaft until the spline portion is inside the side oil seal.



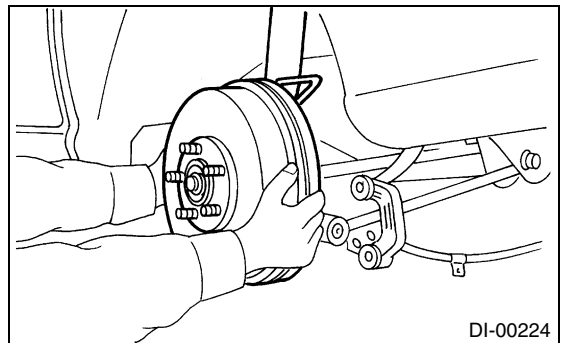
(3) Remove the ST.

ST 28099PA090 SIDE OIL SEAL PROTECTOR

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

NOTE:

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



13) Hereafter, reassemble in the reverse order of disassembly.

8. Rear Differential Member

A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Move the selector lever or gear shift lever to "N".
- 4) Release the parking brake.
- 5) Loosen the wheel nuts.
- 6) Jack-up the vehicle and support it with study racks.
- 7) Remove the wheels.
- 8) Remove the rear exhaust pipe and muffler.

Non-turbo model

<Ref. to EX(SOHC)-11, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(SOHC)-13, REMOVAL, Muffler.>

Turbo model

<Ref. to EX(TURBO)-12, REMOVAL, Rear Exhaust Pipe.> and <Ref. to EX(TURBO)-14, REMOVAL, Muffler.>

- 9) Remove the rear differential front member.

NOTE:

When removing the rear differential front member, work the removal procedure as rear differential.

T-type

<Ref. to DI-24, REMOVAL, Rear Differential for T-type.>

VA-type

<Ref. to DI-40, REMOVAL, Rear Differential for VA-type.>

- 10) Remove the differential rear member.

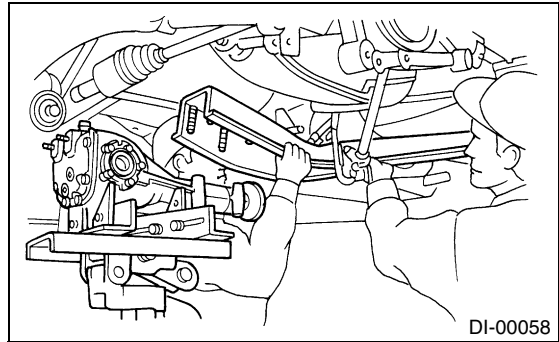
B: INSTALLATION

Install in the reverse order of removal.

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

NOTE:

When installing the rear differential front member, do not confuse the installation sequence of the stopper.

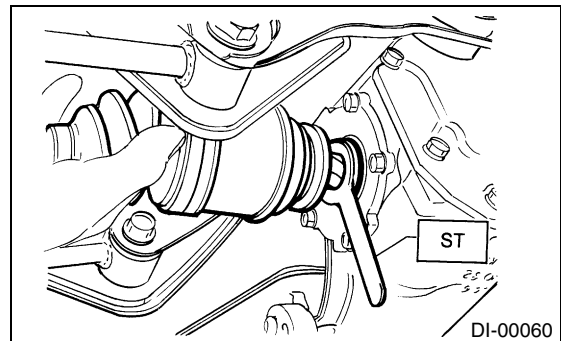


- 2) Insert the DOJ of rear drive shaft into rear differential. <Ref. to DI-56, REPLACEMENT, Rear Differential Side Oil Seal.>

NOTE:

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

ST 28099PA090 SIDE OIL SEAL PROTECTOR



- 3) Hereafter, install in the reverse order of removal.

REAR DIFFERENTIAL MEMBER

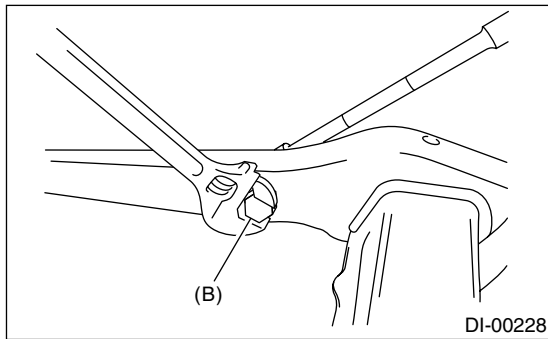
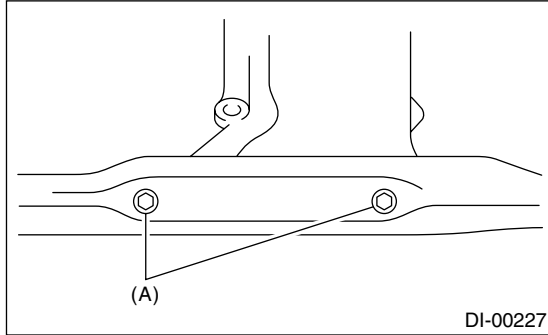
DIFFERENTIALS

C: DISASSEMBLY

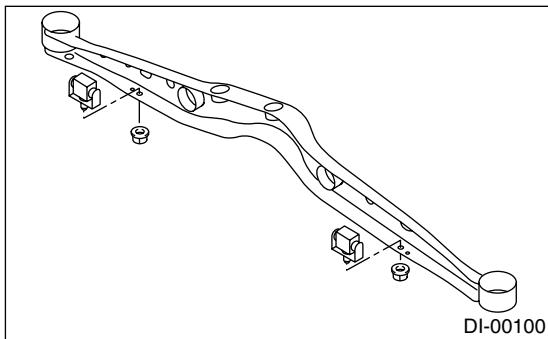
NOTE:

Clean the rear differential member before disassembly.

1) Remove the bolt A and B which connect front differential member and differential mounting bracket.



2) Remove the dynamic damper from front differential member. (Non-turbo model)



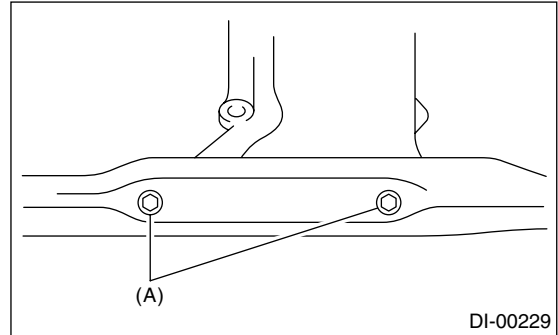
D: ASSEMBLY

1) Install the dynamic damper to front differential member. (Non-turbo model)

Tightening torque:

20 N·m (2.0 kgf-m, 14.5 ft-lb)

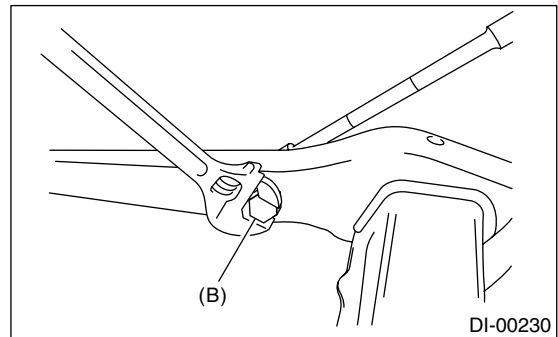
2) Temporarily tighten the connecting bolt (A) which secures front differential to differential mount.



3) Tighten the nut of connecting bolt (B).

Tightening torque:

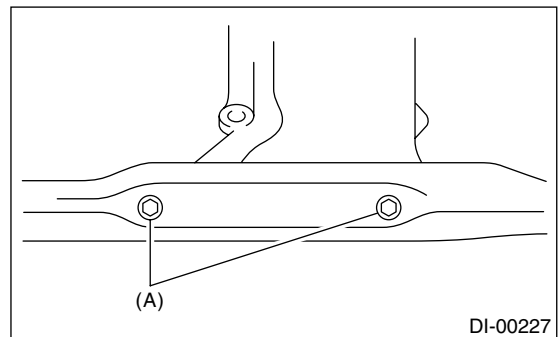
125 N·m (12.7 kgf-m, 92.2 ft-lb)



4) Tighten the nut of connecting bolt (A).

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)



E: INSPECTION

1) Check the rear differential member for damage, bend, or corrosion.

If damage, bend, or corrosion is excessive, replace the rear differential member.

2) Check the bushings of rear differential member for cracking, hardening, or damage.

If cracking, hardening, or damage is excessive, replace the rear differential member.

GENERAL DIAGNOSTIC TABLE

DIFFERENTIALS

9. General Diagnostic Table

A: INSPECTION

Symptom or trouble	Possible cause	Remedy
1. Oil leakage	(1) Worn, scratched, or incorrectly seated front or side oil seal. Scored, battered, or excessively worn sliding surface of companion flange.	Repair or replace.
	(2) Clogged or damaged air breather.	Clean, repair or replace.
	(3) Loose bolts on side retainer or incorrectly fitted O-ring.	Tighten the bolts to specified torque. Replace the O-ring.
	(4) Loose rear cover attaching bolts or damaged gasket.	Tighten the bolts to specified torque. Replace the gasket and apply liquid packing.
	(5) Loose oil filler or drain plug.	Retighten and apply liquid packing.
	(6) Wear, damage or incorrectly fitting for side retainer and oil seal.	Repair or replace.
2. Seizure NOTE: Seized or damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Insufficient backlash for hypoid gear.	Readjust or replace.
	(2) Excessive preload for side, rear, or front bearing.	Readjust or replace.
	(3) Insufficient or improper oil used.	Replace the seized part and fill with specified oil to specified level.
3. Damage NOTE: Damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Improper backlash for hypoid gear.	Replace.
	(2) Insufficient or excessive preload for side, rear, or front bearing.	Readjust or replace.
	(3) Excessive backlash for differential gear.	Replace the gear or thrust washer.
	(4) Loose bolts and nuts such as crown gear bolt.	Retighten.
	(5) Damage due to overloading.	Replace.
4. Noises when starting or shifting gears NOTE: Noises may be caused by differential assembly, universal joint, wheel bearing, etc. Find out what is actually making noise before disassembly.	(1) Excessive backlash for hypoid gear.	Readjust.
	(2) Excessive backlash for differential gear.	Replace the gear or thrust washer.
	(3) Insufficient preload for front or rear bearing.	Readjust.
	(4) Loose drive pinion nut.	Tighten to specified torque.
	(5) Loose bolts and nuts such as side bearing retainer attaching bolt.	Tighten to specified torque.
5. Noises when cornering	(1) Damaged differential gear.	Replace.
	(2) Excessive wear or damage of thrust washer.	Replace.
	(3) Broken pinion mate shaft.	Replace.
	(4) Seized or damaged side bearing.	Replace.

GENERAL DIAGNOSTIC TABLE

DIFFERENTIALS

Symptom or trouble	Possible cause	Remedy
6. Gear noises NOTE: Since noises from engine, muffler, transmission, propeller shaft, wheel bearings, tires, and body are sometimes mistaken for noises from differential assembly, be careful in checking them. Inspection methods to locate noises include coasting, accelerating, cruising, and jacking-up all four wheels. Perform these inspections according to condition of trouble. When listening to noises, shift gears into four wheel drive and fourth speed position, trying to pick up only differential noise.	(1) Improper tooth contact of hypoid gear.	Readjust or replace the hypoid gear set.
	(2) Improper backlash for hypoid gear.	Readjust.
	(3) Scored or chipped teeth of hypoid gear.	Replace the hypoid gear set.
	(4) Seized hypoid gear.	Replace the hypoid gear set.
	(5) Improper preload for front or rear bearings.	Readjust.
	(6) Seized, scored, or chipped front or rear bearing.	Replace.
	(7) Seized, scored, or chipped side bearing.	Replace.
	(8) Vibrating differential carrier.	Replace.

GENERAL DIAGNOSTIC TABLE

DIFFERENTIALS
