

Brought to you by Eris Studios  
NOT FOR RESALE

# DIFFERENTIALS

# General Description

## DIFFERENTIALS

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### 1. General Description

#### A: SPECIFICATION

##### 1. REAR DIFFERENTIAL

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

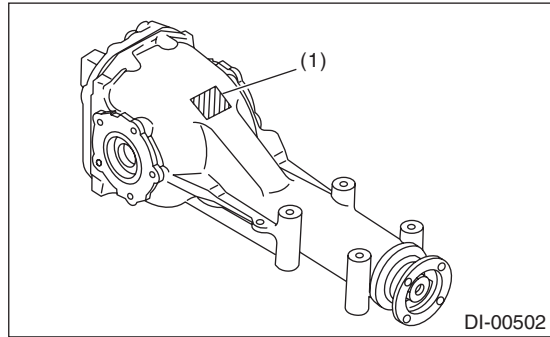
**NOTE:**

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

Model	2.5 L Turbo STI
	6MT
Rear differential type	T-type
Identification	H3
LSD type	Torsen
Type of gear	Hypoid gear
Gear ratio (Number of gear teeth)	3.545 (39/11)
Oil capacity	1.0 $\emptyset$ (1.1 US qt, 0.9 Imp qt)
Rear differential gear oil	GL-5

## 2. IDENTIFICATION

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



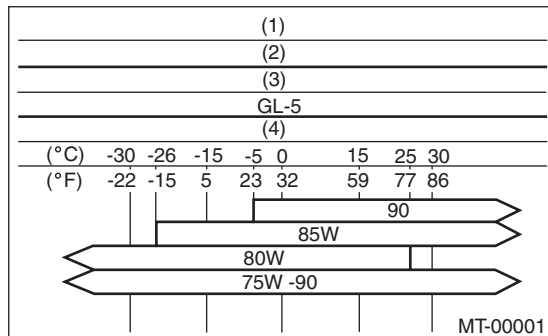
(1) Identification

## 3. REAR DIFFERENTIAL GEAR OIL

**Recommended gear oil:**  
**GL-5 (75W-90)**

**CAUTION:**

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



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

## 4. SERVICE DATA

Drive pinion bearing preload (For new bearing)	Measure with spring measurement. (Measured from the companion flange bolt) N (kgf, lbf)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)
	Measure with torque wrench N·m (kgf·m, ft·lb)	0.98 — 1.57 (0.10 — 0.16, 0.72 — 1.16)
Side bearing standard width	mm (in)	20.00 (0.7874)
Hypoid driven gear to drive pinion backlash	mm (in)	0.10 — 0.20 (0.004 — 0.008)
Hypoid driven gear runout on its back surface	mm (in)	0.05 (0.002)

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## DIFFERENTIALS

### 5. ADJUSTING PARTS

	Part No.	Length mm (in)
Preload adjusting spacer	31454AA130	52.2 (2.055)
	31454AA140	52.4 (2.063)
	31454AA150	52.6 (2.071)
	31454AA160	52.8 (2.079)
	31454AA170	53.0 (2.087)
	31454AA180	53.2 (2.094)

	Part No.	Thickness mm (in)
Preload adjusting washer	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	2.39 (0.0941)
	383815200	2.37 (0.0933)
	383825200	2.35 (0.0925)
	383835200	2.33 (0.0917)
	383845200	2.31 (0.0909)
Pinion height adjusting washer	38336AA230	3.09 (0.1217)
	38336AA240	3.12 (0.1228)
	38336AA250	3.15 (0.1240)
	38336AA260	3.18 (0.1252)
	38336AA270	3.21 (0.1264)
	38336AA280	3.24 (0.1276)
	38336AA290	3.27 (0.1287)
	38336AA300	3.30 (0.1299)
	38336AA310	3.33 (0.1311)
	38336AA320	3.36 (0.1323)
	38336AA330	3.39 (0.1335)
	38336AA340	3.42 (0.1346)
	38336AA350	3.45 (0.1358)
	38336AA360	3.48 (0.1370)
	38336AA370	3.51 (0.1382)
38336AA380	3.54 (0.1394)	
38336AA390	3.57 (0.1406)	
38336AA400	3.60 (0.1417)	
38336AA410	3.63 (0.1429)	
38336AA420	3.66 (0.1441)	
Side retainer shim	383475201	0.20 (0.0079)
	383475202	0.25 (0.0098)
	383475203	0.30 (0.0118)
	383475204	0.40 (0.0157)
	383475205	0.50 (0.0197)

# General Description

DIFFERENTIALS

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Drive pinion bearing preload	Measure with spring measurement. (Measured from the companion flange bolt)	N (kgf, lb)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)
	Measure with torque wrench	N·m (kgf·m, ft·lb)	0.98 — 1.57 (0.10 — 0.16, 0.72 — 1.16)
Hypoid driven gear to drive pinion backlash limit		mm (in)	0.10 — 0.20 (0.004 — 0.008)
Hypoid driven gear runout limit on its back surface		mm (in)	0.05 (0.002)

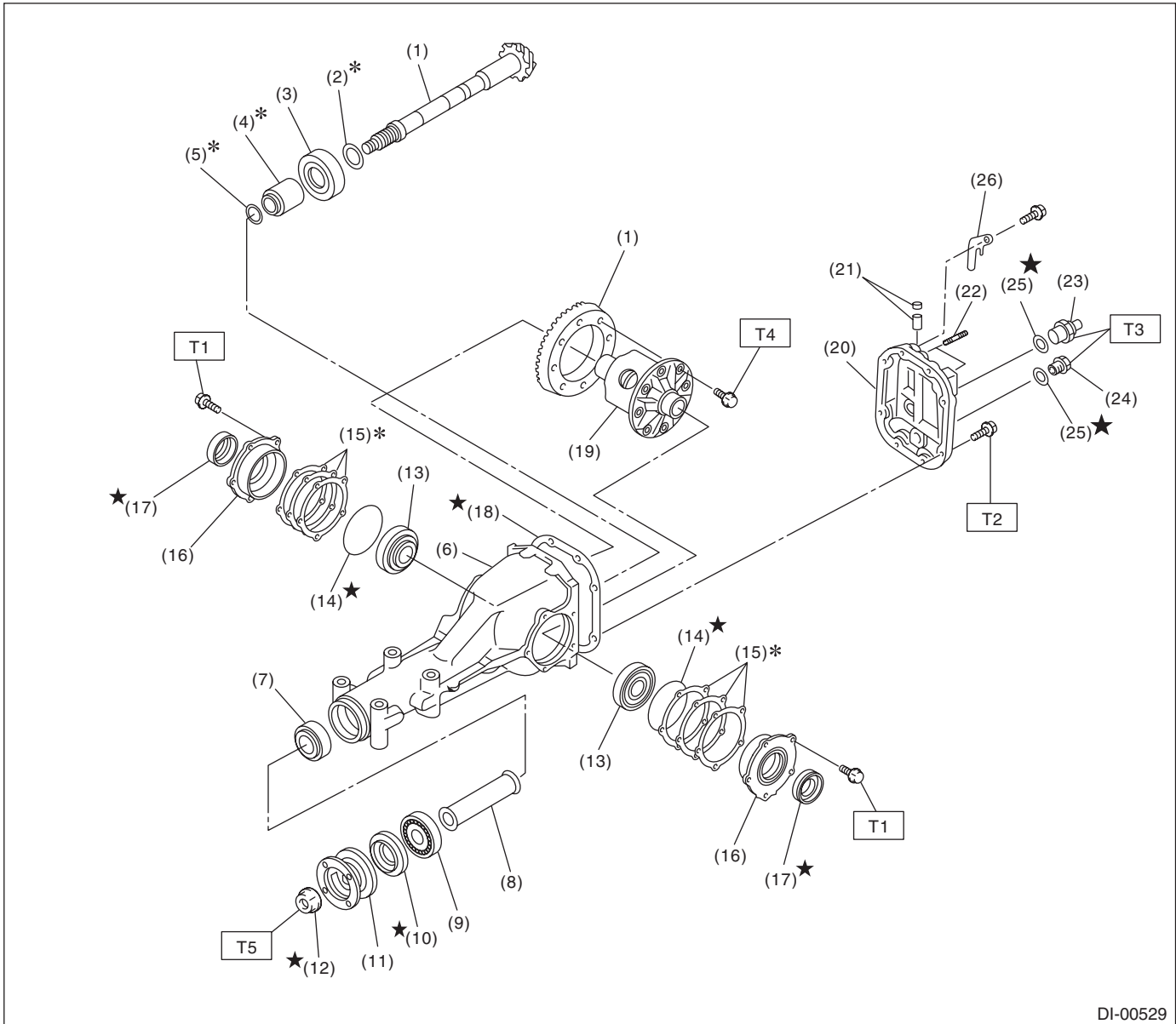
# General Description

## DIFFERENTIALS

### B: COMPONENT

#### 1. REAR DIFFERENTIAL WITH LSD (T-TYPE)

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DI-00529

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

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

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

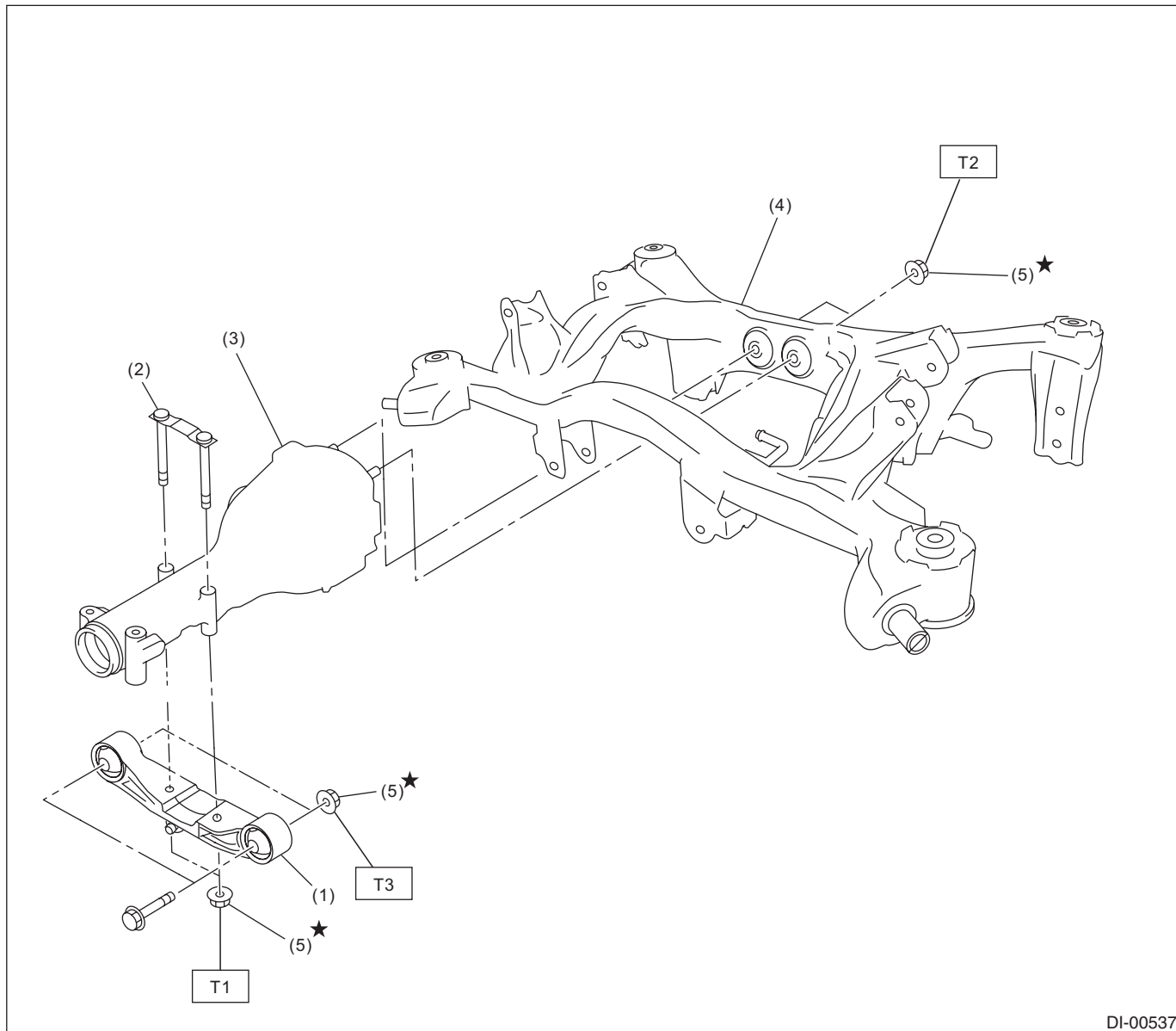
**T2: 44 (4.5, 32.5)**

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

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

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

## 2. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00537

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

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

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

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

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

### **C: CAUTION**

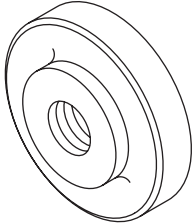
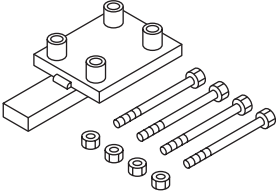
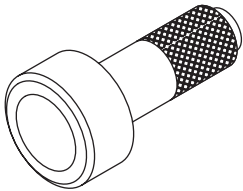
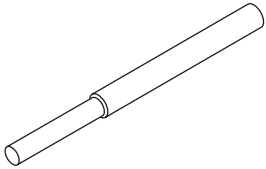
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal,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



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## D: PREPARATION TOOL

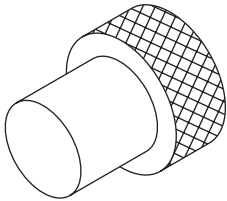
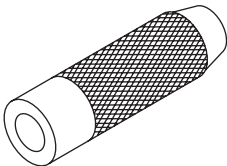
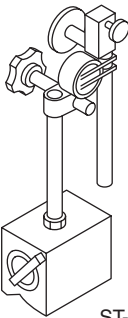
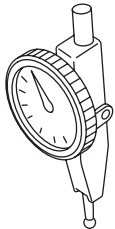
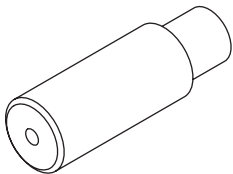
### 1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398477702</p>	398477702	DRIFT	Used for press-fitting the bearing race (front) of the differential carrier.
 <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 the front oil seal.
 <p style="text-align: center;">ST-398467700</p>	398467700	DRIFT	Used for removing pinion, pilot bearing and front bearing cone.

# General Description

## DIFFERENTIALS

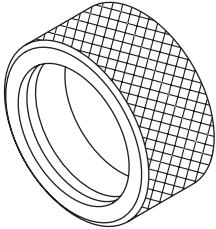
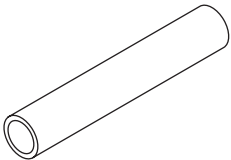
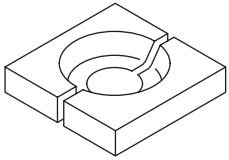
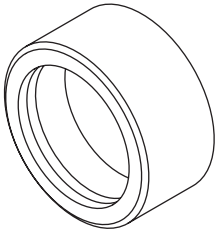
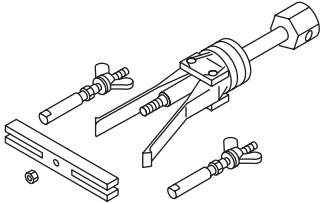
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-399780104</p>	399780104	WEIGHT	Used for installing the front bearing cone and the pilot bearing companion flange.
 <p style="text-align: center;">ST-899580100</p>	899580100	INSTALLER	Used for press-fitting the front bearing cone and pilot bearing.
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> <li>• Used for measuring backlash between side gear and pinion, and hypoid gear.</li> <li>• Used together with the DIAL GAUGE (498247100).</li> </ul>
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> <li>• Used for measuring backlash between side gear and pinion, and hypoid gear.</li> <li>• Used together with the MAGNET BASE (498247001).</li> </ul>
 <p style="text-align: center;">ST-398457700</p>	398457700	ATTACHMENT	<ul style="list-style-type: none"> <li>• Used for removing the side retainer.</li> <li>• For T-type</li> </ul>

# General Description

DIFFERENTIALS

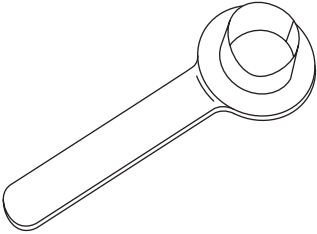
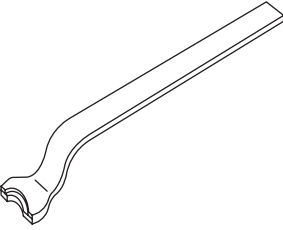
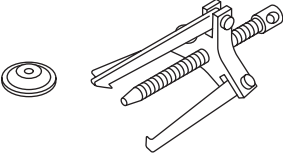
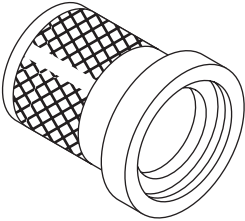
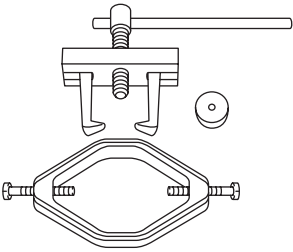
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398437700</p>	398437700	DRIFT	<ul style="list-style-type: none"> <li>• Used for installing the side oil seal.</li> <li>• For T-type</li> </ul>
 <p>ST-398507703</p>	398507703	DUMMY COLLAR	<ul style="list-style-type: none"> <li>• Used for adjusting pinion height and preload.</li> <li>• For T-type</li> </ul>
 <p>ST-398517700</p>	398517700	REPLACER	<ul style="list-style-type: none"> <li>• Used for removing rear bearing cone.</li> <li>• For T-type</li> </ul>
 <p>ST-398487700</p>	398487700	DRIFT	<ul style="list-style-type: none"> <li>• Used for press-fitting side bearing cone.</li> <li>• For T-type</li> </ul>
 <p>ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> <li>• Used for removing front oil seal.</li> <li>• Used for removing side bearing cup.</li> <li>• For T-type</li> </ul>

# General Description

## DIFFERENTIALS

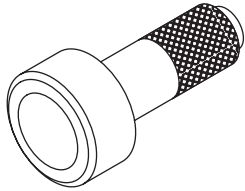
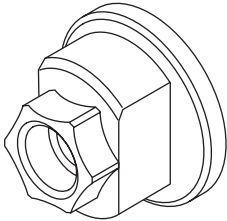
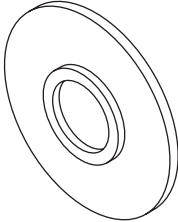
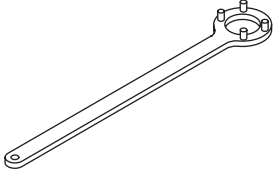
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST28099PA090</p>	28099PA090	OIL SEAL PROTECTOR	<ul style="list-style-type: none"> <li>• Used for installing the rear drive shaft to the rear differential.</li> <li>• For oil seal protection</li> </ul>
 <p style="text-align: center;">ST28099PA100</p>	28099PA100	DRIVE SHAFT REMOVER	<ul style="list-style-type: none"> <li>• Used for removing the rear drive shaft from rear differential.</li> <li>• For T-type</li> </ul>
 <p style="text-align: center;">ST-399703600</p>	399703600	PULLER ASSY	<ul style="list-style-type: none"> <li>• Used for removing companion flange.</li> </ul>
 <p style="text-align: center;">ST-899874100</p>	899874100	INSTALLER	<ul style="list-style-type: none"> <li>• Used for installing the companion flange.</li> </ul>
 <p style="text-align: center;">ST18759AA000</p>	18759AA000	PULLER ASSY	<ul style="list-style-type: none"> <li>• Used for removing the differential side bearing cone.</li> <li>• For T-type</li> </ul>

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DIFFERENTIALS

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398417700	398417700	DRIFT	Used for installing side bearing race.
 ST-498937110	498937110	HOLDER DRIVE PINION	<ul style="list-style-type: none"> <li>• Used for installing the pilot bearing.</li> <li>• T-type</li> </ul>
 ST18674AA000	18674AA000	INSTALLER	<ul style="list-style-type: none"> <li>• Used for installing the rear bearing cone.</li> <li>• T-type</li> </ul>
 ST18633AA000	18633AA000	WRENCH COMPL	<ul style="list-style-type: none"> <li>• Used for preventing rotation of companion flange when loosening and tightening self-lock nut.</li> <li>• T-type</li> </ul>

## 2. GENERAL TOOL

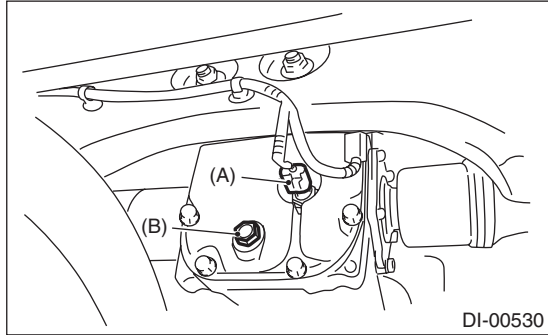
TOOL NAME	REMARKS
Transmission jack	Used for assembly/disassembly of the rear differential.
Puller	Used for removing the side retainer.
Thickness gauge	Used for measuring clearance.

## DIFFERENTIALS

### 2. Differential Gear Oil

#### A: INSPECTION

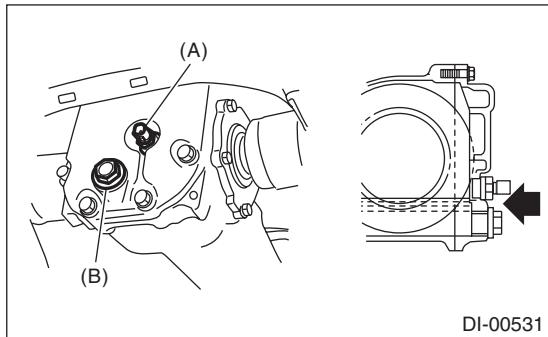
- 1) Disconnect the oil temperature switch connector.



- (A) Oil temperature switch connector
- (B) Oil drain plug

- 2) Remove the oil temperature switch and check the gear oil. Replace the gear oil if it is contaminated or deteriorated. <Ref. to DI-14, REPLACEMENT, Differential Gear Oil.>

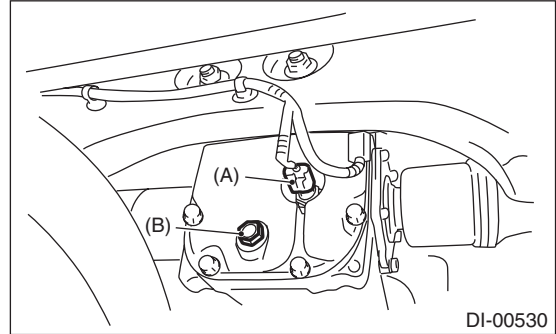
- 3) Check that the gear oil level is up to the bottom of the oil temperature switch hole. If the level is low, make sure that there is no leakage, and refill up to the bottom of the oil temperature switch hole.



- (A) Oil temperature switch
- (B) Oil drain plug

#### B: REPLACEMENT

- 1) Lift up the vehicle.
- 2) Disconnect the oil temperature switch connector.

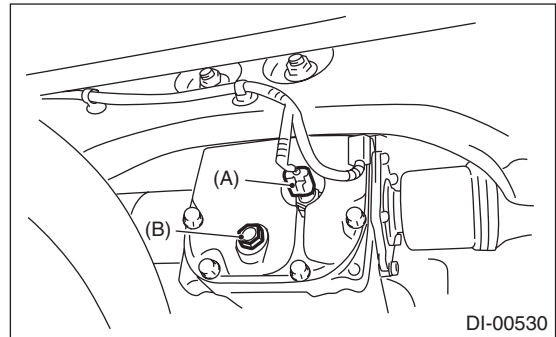


- (A) Oil temperature switch connector
- (B) Oil drain plug

- 3) Remove the oil drain plug and oil temperature switch, and drain the gear oil.

#### CAUTION:

**Gear oil is extremely hot just after driving. Be wary of receiving burns.**



- (A) Oil temperature switch
- (B) Oil drain plug

- 4) Tighten the oil drain plug.

#### NOTE:

Use a new gasket.

#### Tightening torque:

**60 N·m (6.1 kgf·m, 44.3 ft·lb)**

5) Fill the differential carrier with gear oil to the bottom of oil temperature switch hole.

**NOTE:**

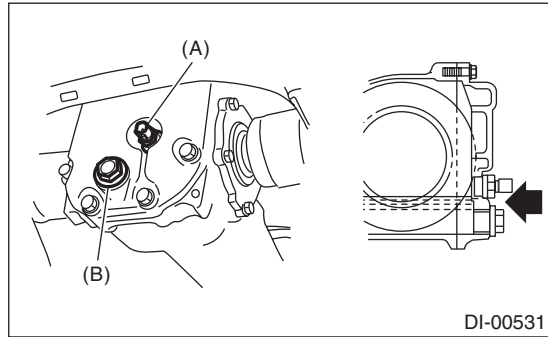
Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.

**Recommended gear oil:**

<Ref. to DI-2, SPECIFICATION, General Description.>

**Oil capacity:**

**1.0 ℓ (1.1 US qt, 0.9 Imp qt)**



- (A) Oil temperature switch
- (B) Oil drain plug

6) Install the oil temperature switch.

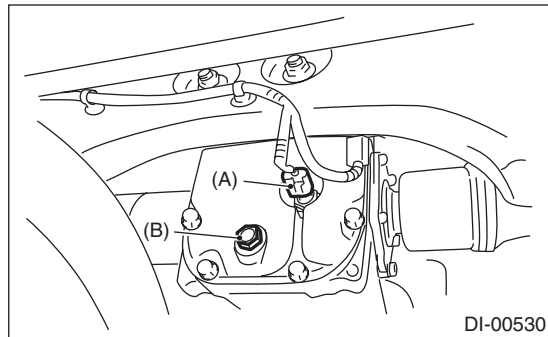
**NOTE:**

Use a new gasket.

**Tightening torque:**

**60 N·m (6.1 kgf·m, 44.3 ft·lb)**

7) Connect the oil temperature switch connector.



- (A) Oil temperature switch connector
- (B) Oil drain plug

## 3. Front Differential Assembly

### A: NOTE

For the front differential of the manual transmission, refer to “6MT” section. <Ref. to 6MT-102, Front Differential Assembly.>

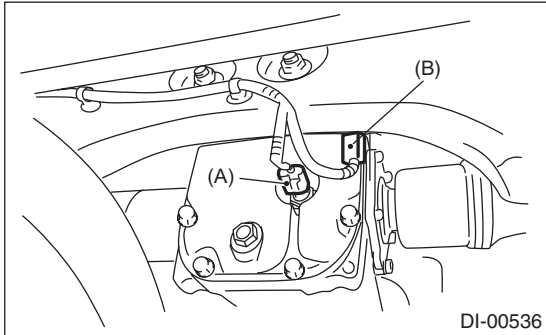


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## 4. Rear Differential (T-type)

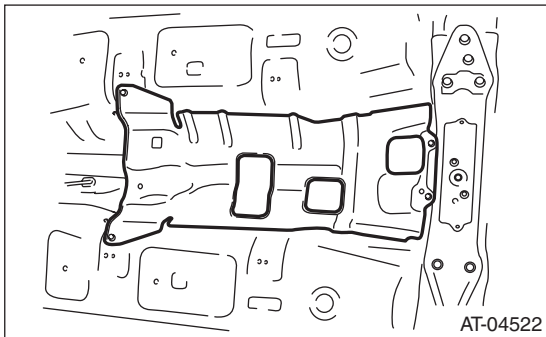
### A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from the battery.
- 3) Place the gear shift lever in neutral.
- 4) Release the parking brake.
- 5) Loosen the wheel nuts.
- 6) Lift up the vehicle.
- 7) Remove the wheels.
- 8) Disconnect the oil temperature switch connector and ground connector.

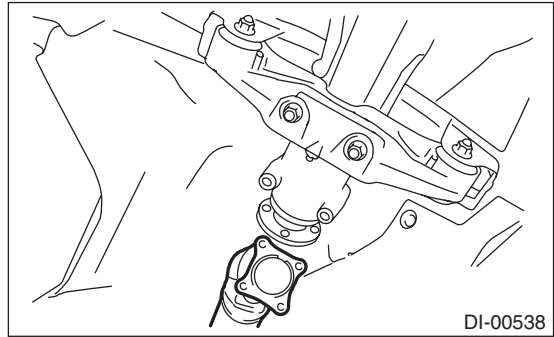


- (A) Oil temperature switch connector
- (B) Ground connector

- 9) Remove the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.>  
<Ref. to EX(STI)-14, REMOVAL, Muffler.>
- 10) Remove the heat shield cover.

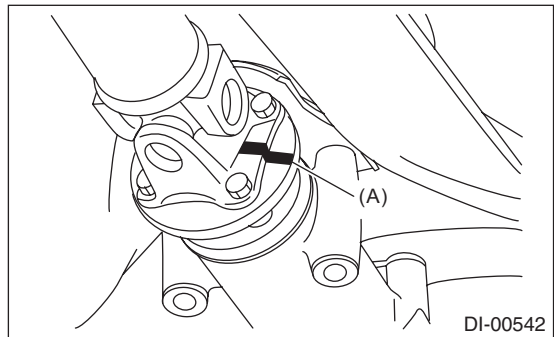


- 11) Separate the rear differential side of the propeller shaft.



#### NOTE:

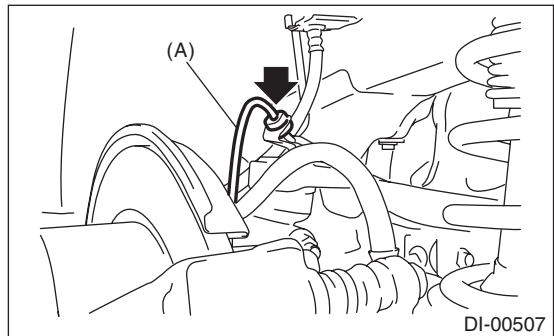
Make alignment marks on the flange yoke and rear differential before separating it.



- (A) Alignment mark

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

- (1) Remove the ABS wheel speed sensor cable from the clamp.



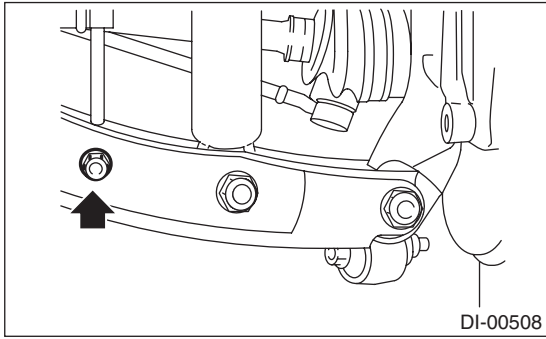
- (A) ABS wheel speed sensor cable

# Rear Differential (T-type)

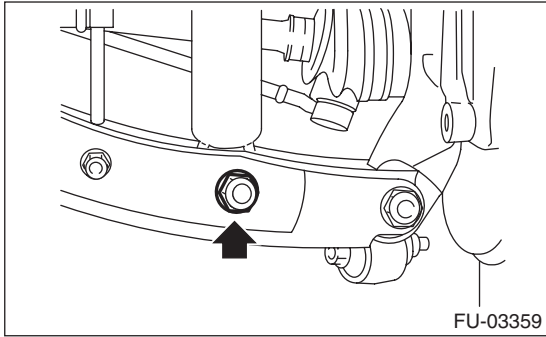
## DIFFERENTIALS

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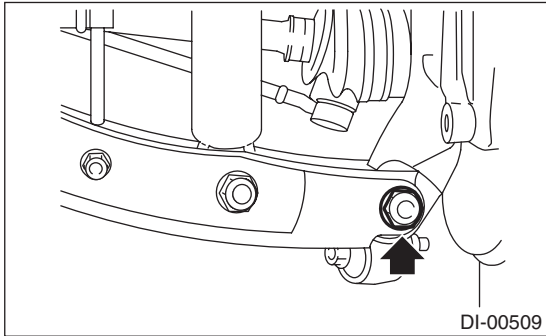
(2) Remove the bolts which secure the rear stabilizer link to the rear lateral link.



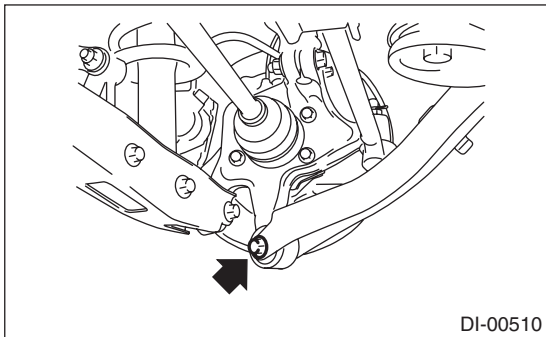
(3) Remove the bolts which secure the shock absorber to the rear lateral link.



(4) Remove the bolts which secure the rear lateral link to the housing.



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

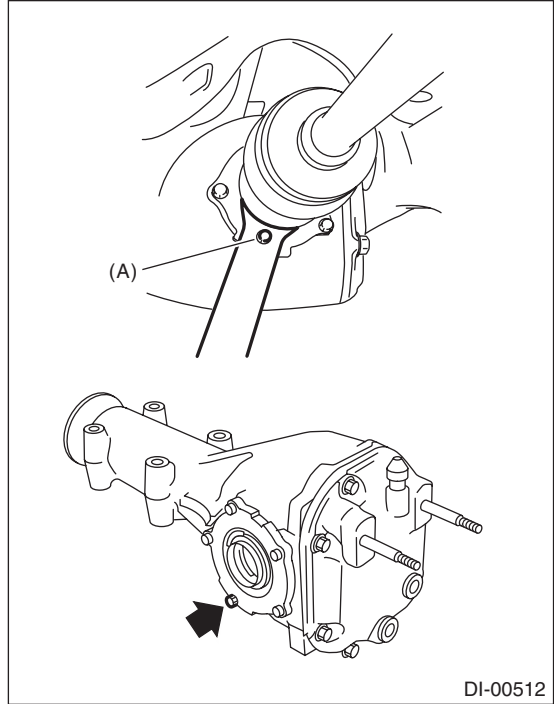


(6) Remove the DOJ from the rear differential by using ST.

### NOTE:

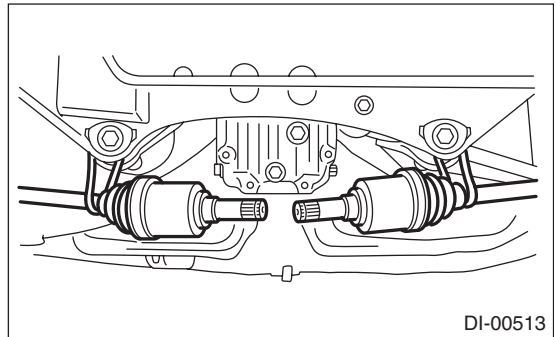
When removing the DOJ from the rear differential, fit the ST to the bolts as shown in the figure so as not to damage the side retainer.

ST 28099PA100 DRIVE SHAFT REMOVER

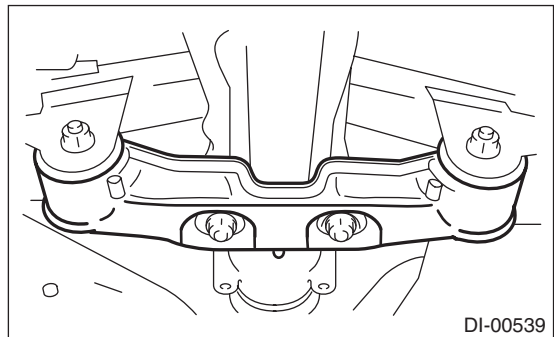


(A) Bolt

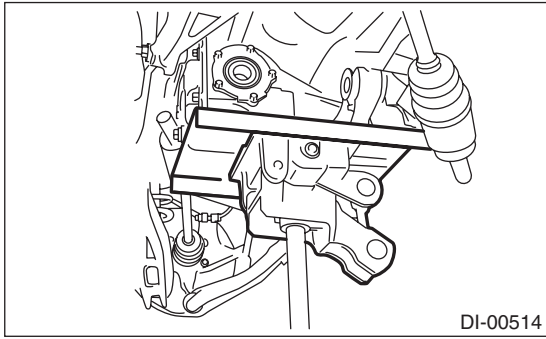
13) Suspend the rear drive shaft to the rear cross-member using wire.



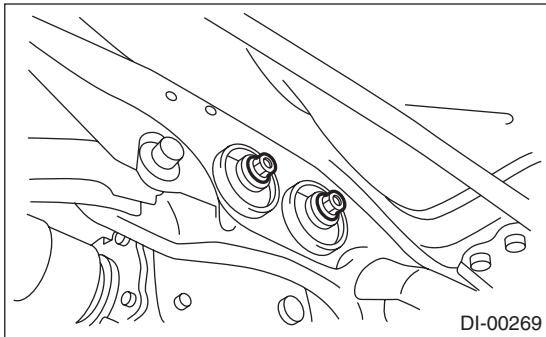
14) Remove the rear differential front member.



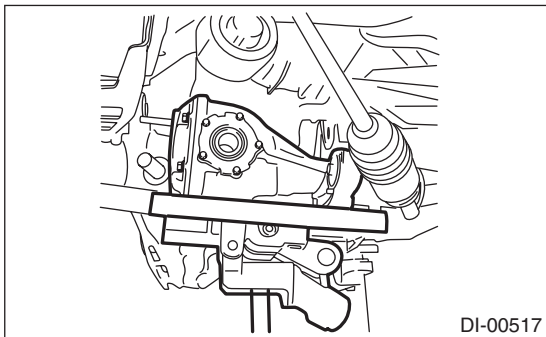
15) Support the rear differential with the transmission jack.



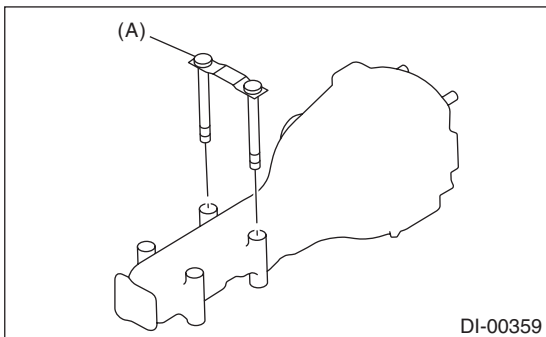
16) Remove the self-lock nuts which hold the rear differential to the rear crossmember.



17) While slowly lowering the transmission jack, move the rear differential forward, and remove the rear differential from vehicle.



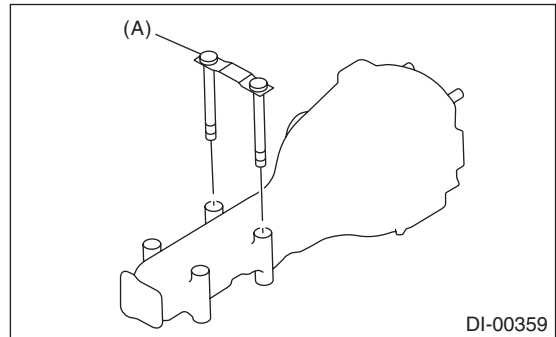
18) Remove the rear differential member plate from rear differential.



(A) Rear differential member plate

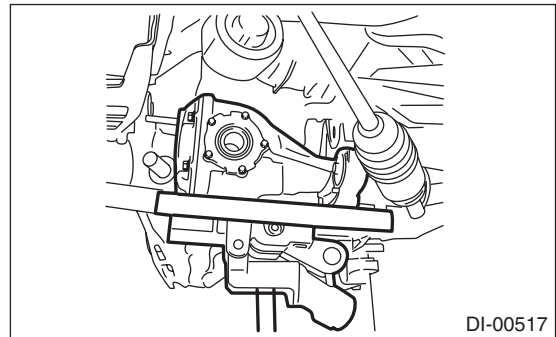
## B: INSTALLATION

1) Install the rear differential member plate to the rear differential.

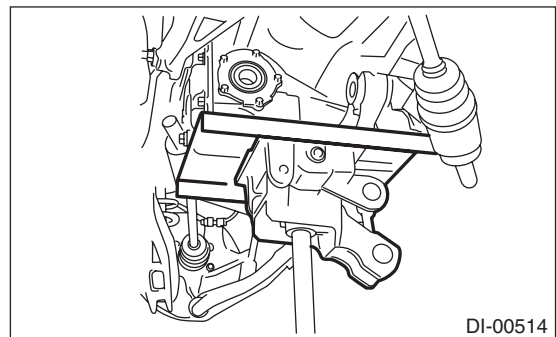


(A) Rear differential member plate

2) Set the rear differential to transmission jack.  
3) Adjust the transmission jack, and insert the rear differential stud bolt into rear crossmember bushing properly.



4) After inserting the rear differential stud bolt into the rear crossmember bushing, lift up the transmission jack and align the rear differential to its attachment position.

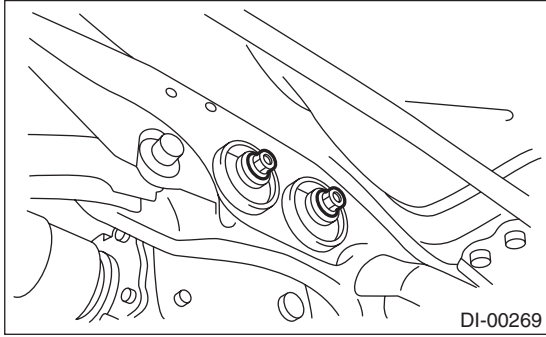


# Rear Differential (T-type)

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## DIFFERENTIALS

5) Tighten a new self-locking nut temporarily to rear crossmember.

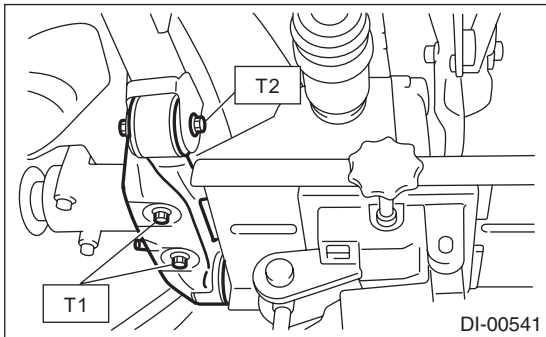


6) Install the rear differential front member with a new self-locking nut.

**Tightening torque:**

**T1: 50 N·m (5.1 kgf·m, 36.9 ft·lb)**

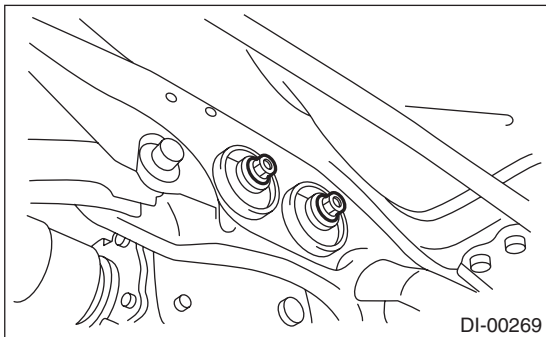
**T2: 110 N·m (11.2 kgf·m, 81.1 ft·lb)**



7) Tighten the self-locking nut.

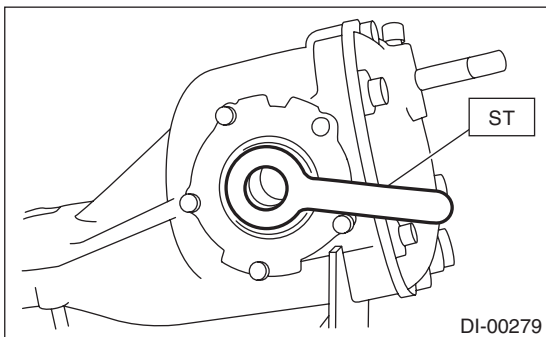
**Tightening torque:**

**70 N·m (7.1 kgf·m, 51.6 ft·lb)**

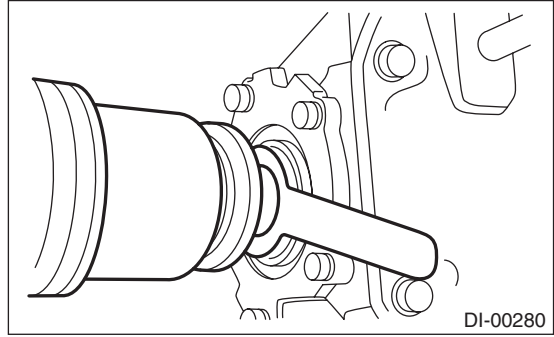


8) Attach the ST to rear differential.

ST 28099PA090 OIL SEAL PROTECTOR



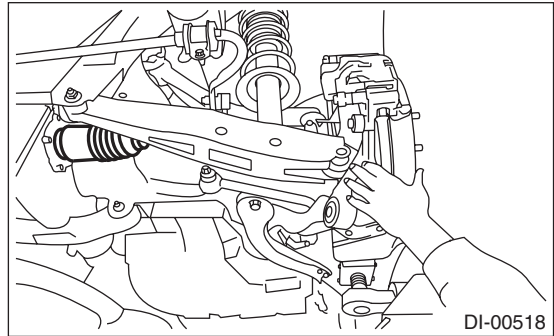
9) Insert the spline shaft until the spline portion comes inside the side oil seal.



10) Remove ST from rear differential.

ST 28099PA090 OIL SEAL PROTECTOR

11) Push the housing to insert the DOJ completely into rear differential.



12) Lower the transmission jack.

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

14) After installing, fill the differential carrier with gear oil up to the bottom of the oil temperature switch hole. <Ref. to DI-14, Differential Gear Oil.>

15) Inspect the wheel alignment and adjust if necessary.

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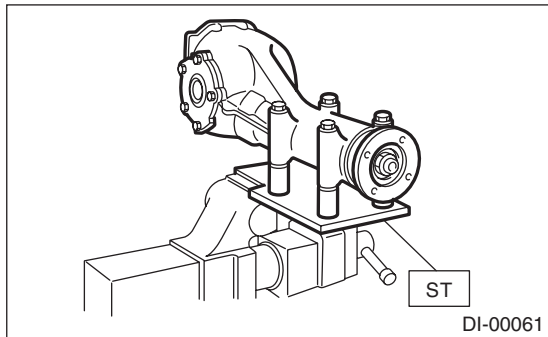
## C: DISASSEMBLY

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

- Tooth contact and backlash between hypoid driven gear and drive pinion
- Hypoid driven gear runout on the back surface
- Total preload of drive pinion

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

ST 398217700 ATTACHMENT SET

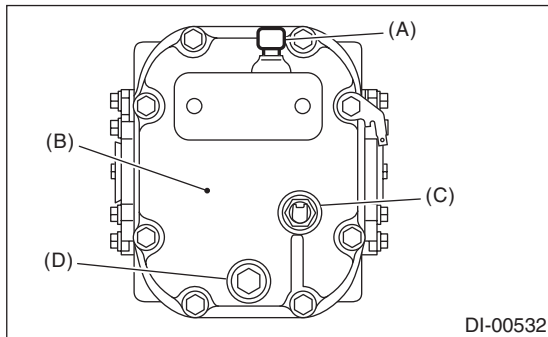


2) Remove the oil drain plug and oil temperature switch, and drain the gear oil.

3) Remove the air breather cap.

**NOTE:**

- Do not attempt to replace the air breather cap unless necessary.
- Whenever the air breather cap is removed, replace it with a new part.



- (A) Air breather cap
- (B) Rear cover
- (C) Oil temperature switch
- (D) Oil drain plug

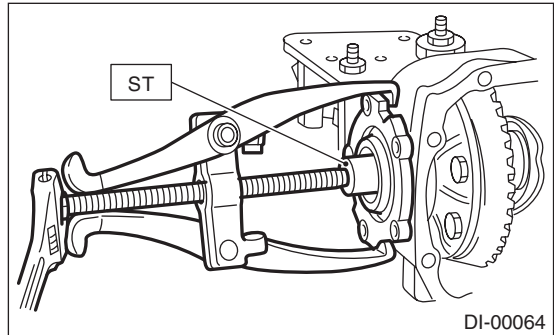
4) Remove the bolts, and then remove the rear cover.

5) Keep the side retainers separate in order to easily identify RH and LH sides. Remove the side retainer mounting bolts, set the ST to differential case, and extract the side retainers RH and LH with a puller.

**NOTE:**

Side retainer shim of each side should be kept together with its mating retainer.

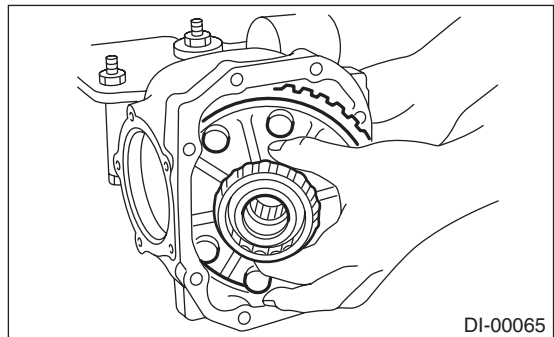
ST 398457700 ATTACHMENT



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

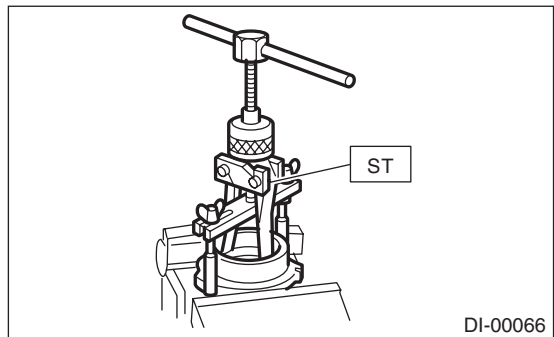
**NOTE:**

Be careful so that the teeth do not hit against the case.



7) When replacing the side bearing, remove the bearing cup from the side retainer using ST.

ST 398527700 PULLER ASSY



# Rear Differential (T-type)

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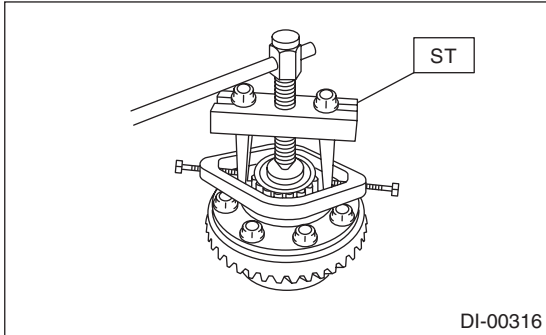
## DIFFERENTIALS

8) Remove the bearing cone with ST.

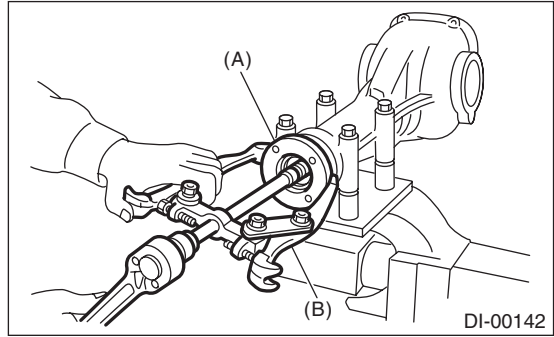
### NOTE:

- Do not attempt to disassemble the parts unless necessary.
- Set the puller so that its claws catch the edge of the bearing cone.
- Never mix up the RH and LH bearing races and cones.

ST 18759AA000 PULLER ASSY



11) Extract the companion flange with a puller.

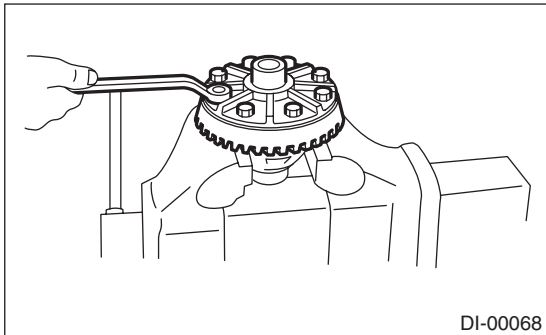


- (A) Companion flange
- (B) Puller

9) Loosen the driven gear bolts to remove the driven gear.

### NOTE:

Do not disassemble the differential case assembly.

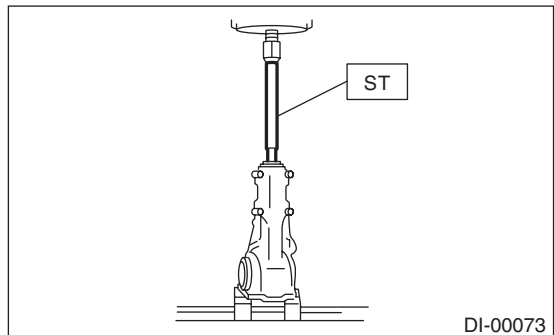


12) Press the end of drive pinion shaft and extract it together with rear bearing cone, pinion height adjusting washer and washer.

### NOTE:

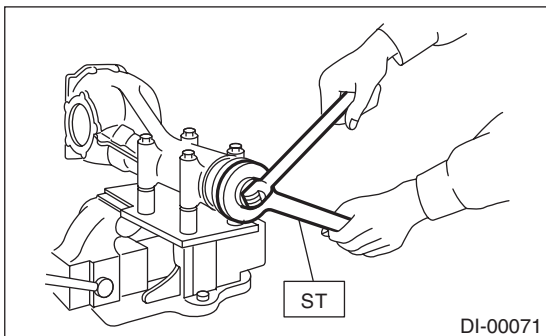
Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT



10) Remove the self-locking nut while holding the companion flange with ST.

ST 18633AA000 WRENCH COMPL

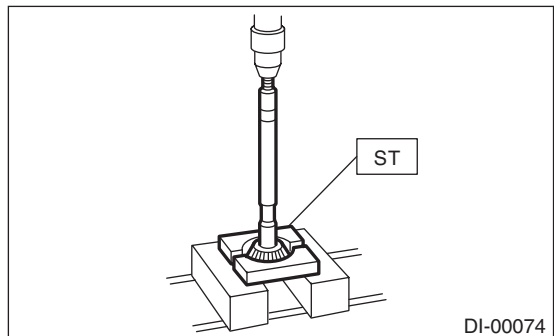


13) Remove the rear bearing cone from the drive pinion.

### NOTE:

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

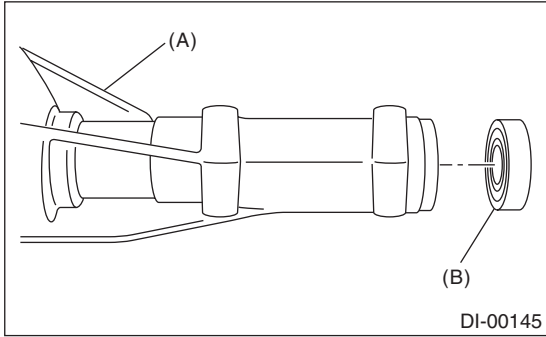
ST 398517700 REPLACER



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

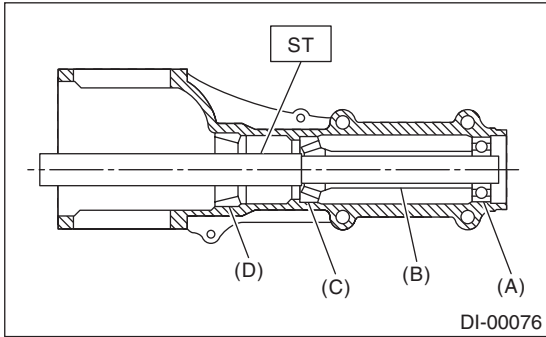
ST 398527700 PULLER ASSY



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

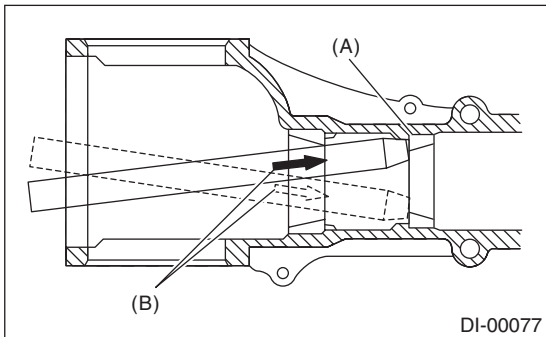
15) Remove the pilot bearing together with the front bearing cone using the ST.

ST 398467700 DRIFT



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

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

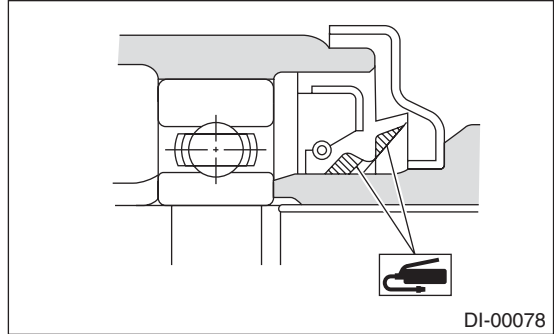


- (A) 2 cutout portions along diagonal lines
- (B) Tap alternately with brass bar.

## D: ASSEMBLY

NOTE:

- Assemble in the reverse order of disassembly.
- 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.
- Be careful not to mix up the RH and LH bearing races.
- Use a new O-ring and gasket.
- Replace the oil seal with a new part at every disassembly.
- Apply differential gear oil to the lips when installing the oil seal.
- Be careful not to mix up the oil seal RH and LH.



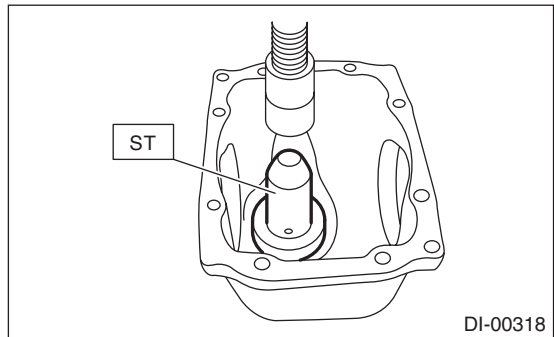
1) Adjusting preload for front and rear bearings

NOTE:

Adjust the bearing preload between front and rear bearings with spacer and washer. Pinion height adjusting washer is not affected by this adjustment. The adjustment must not be carried out with oil seal inserted.

2) Press the rear bearing race into the differential carrier using ST.

ST 398417700 DRIFT



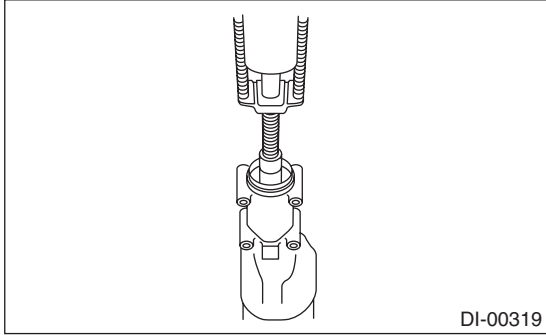
# Rear Differential (T-type)

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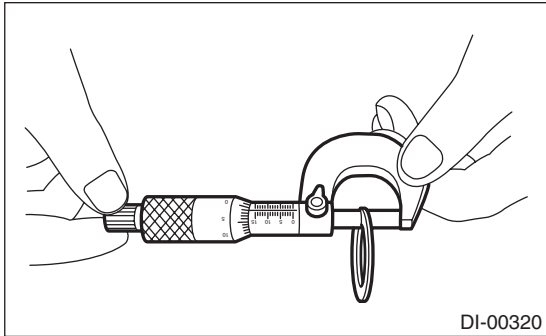
## DIFFERENTIALS

3) Press the front bearing race into the differential carrier using ST.

ST 398477702 DRIFT



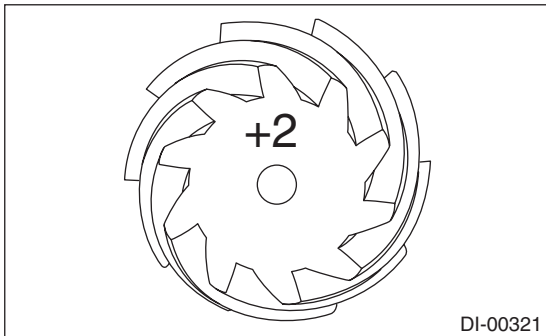
4) Selecting the pinion height adjusting washer  
(1) Measure the thickness of pinion height adjusting washer that is currently being used.



(2) Read the markings on both the current drive pinion gear and the new pinion gear.

**NOTE:**

No marking means 0 (zero).



(3) Calculate the thickness of pinion height adjusting washer to be inserted from the following formula, and replace the installed washer with a new washer of the calculated thickness.

$$T = T1 + (T2 \times 0.01 - T3 \times 0.01)$$

T mm	Thickness of a selected pinion height adjusting washer
T1 mm	Thickness of the installed pinion height adjusting washer
T2 mm	Number of the installed drive pinion gear marking
T3 mm	Number of a new drive pinion gear marking

(Example of calculation)

$$T1 = 3.30, T2 = +2, T3 = -1$$

$$T = 3.30 + \{(2 \times 0.01) - (-1 \times 0.01)\} = 3.33$$

Calculated result: Thickness = 3.33 mm

The washer with part number 38336AA310 is used.

Pinion height adjusting washer	
Part No.	Thickness mm (in)
38336AA230	3.09 (0.1217)
38336AA240	3.12 (0.1228)
38336AA250	3.15 (0.1240)
38336AA260	3.18 (0.1252)
38336AA270	3.21 (0.1264)
38336AA280	3.24 (0.1276)
38336AA290	3.27 (0.1287)
38336AA300	3.30 (0.1299)
38336AA310	3.33 (0.1311)
38336AA320	3.36 (0.1323)
38336AA330	3.39 (0.1335)
38336AA340	3.42 (0.1346)
38336AA350	3.45 (0.1358)
38336AA360	3.48 (0.1370)
38336AA370	3.51 (0.1382)
38336AA380	3.54 (0.1394)
38336AA390	3.57 (0.1406)
38336AA400	3.60 (0.1417)
38336AA410	3.63 (0.1429)
38336AA420	3.66 (0.1441)



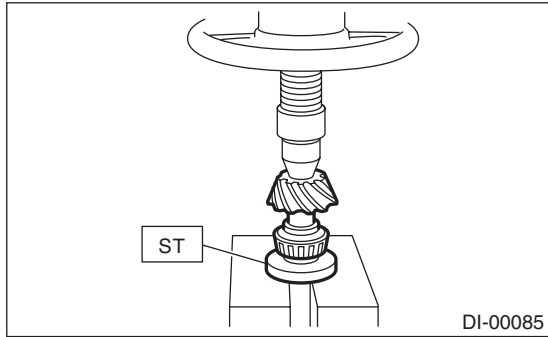
# Rear Differential (T-type)

DIFFERENTIALS

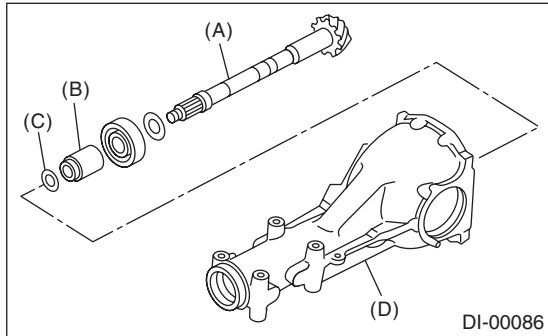
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5) Install the selected pinion height adjusting washer on drive pinion, and press the rear bearing cone into position with ST.

ST 18674AA000 INSTALLER



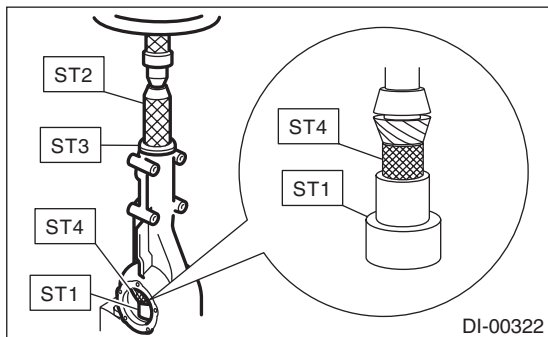
6) Insert the drive pinion into the differential carrier, and install the bearing preload adjusting spacer and washer that were originally installed.



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

7) Insert the spacer and press-fit the pilot bearing with ST.

ST1 399780104 WEIGHT  
 ST2 899580100 INSTALLER  
 ST3 398507703 DUMMY COLLAR  
 ST4 498937110 HOLDER DRIVE PINION

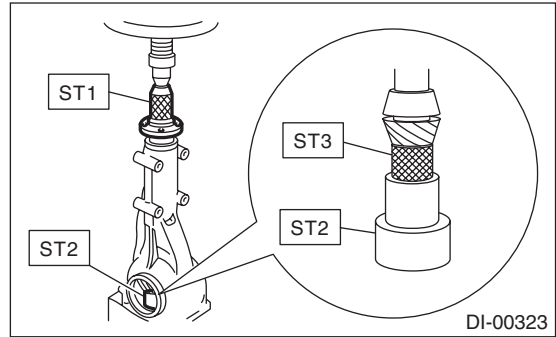


8) Press-fit the companion flange with ST1, ST2 and ST3.

NOTE:

Be careful not to damage the bearing.

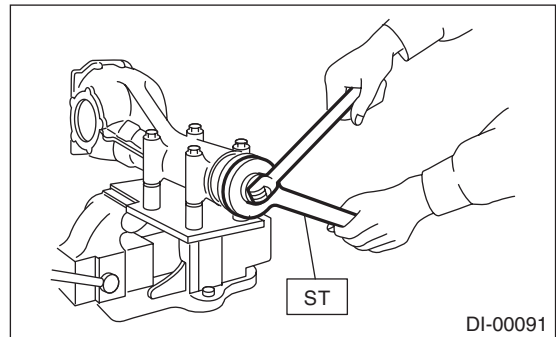
ST1 899874100 INSTALLER  
 ST2 399780104 WEIGHT  
 ST3 498937110 HOLDER DRIVE PINION



9) Install the self-locking nut. Tighten with the ST.  
 ST 18633AA000 WRENCH COMPL

**Tightening torque:**

**181.5 N-m (18.5 kgf-m, 133.9 ft-lb)**



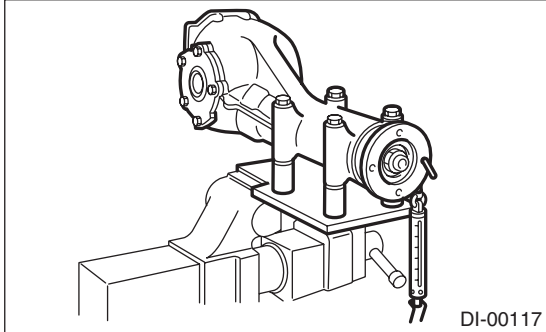
# Rear Differential (T-type)

## DIFFERENTIALS

10) Rotate the drive pinion shaft 10 times or more to fit it in the respective taper roller bearing, and then measure the initial load or initial torque.

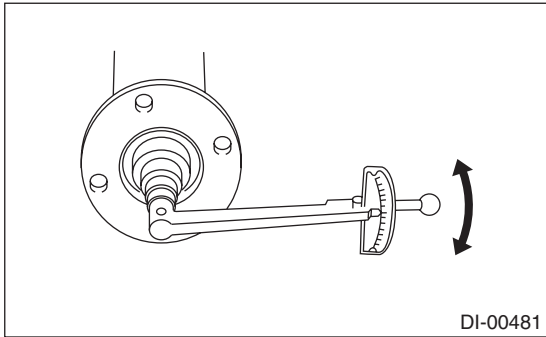
**Initial load:**

**24.1 — 38.6 N (2.5 — 3.9 kgf, 5.4 — 8.7 lb)**



**Initial torque:**

**0.98 — 1.57 N·m (0.10 — 0.16 kgf·m,  
0.72 — 1.16 ft·lb)**

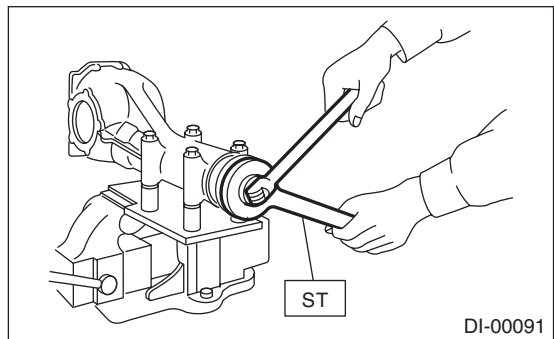


11) If the bearing preload exceeds specifications, select the appropriate preload adjusting washer and spacer to adjust the preload to be within the specifications.

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)
383835200	2.33 (0.0917)	
383845200	2.31 (0.0909)	
Preload adjusting spacer	Part No.	Length mm (in)
	31454AA130	52.2 (2.055)
	31454AA140	52.4 (2.063)
	31454AA150	52.6 (2.071)
	31454AA160	52.8 (2.079)
	31454AA170	53.0 (2.087)
31454AA180	53.2 (2.094)	

12) Remove the self-locking nut while holding the companion flange with ST.

ST 18633AA000 WRENCH COMPL

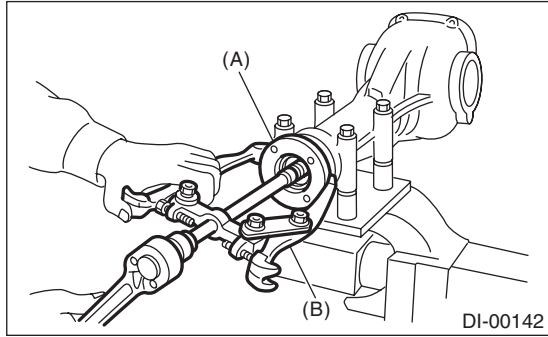


# Rear Differential (T-type)

DIFFERENTIALS

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13) Extract the companion flange with a puller.



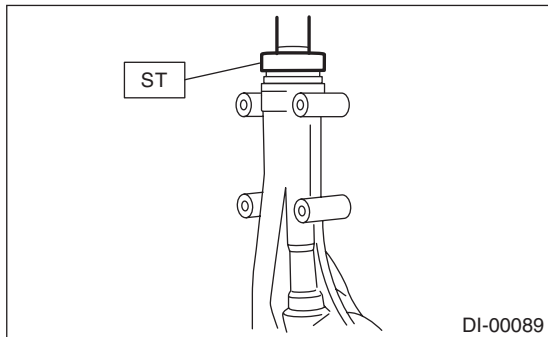
- (A) Companion flange
- (B) Puller

14) Install a new oil seal using ST.

NOTE:

- Press-fit until the oil seal end comes 1 mm (0.04 in) inward from end of carrier.
- Apply differential gear oil to the oil seal lips.

ST 498447120 INSTALLER

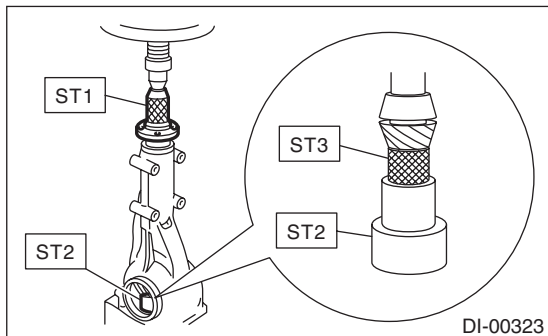


15) Press-fit the companion flange with ST1, ST2 and ST3.

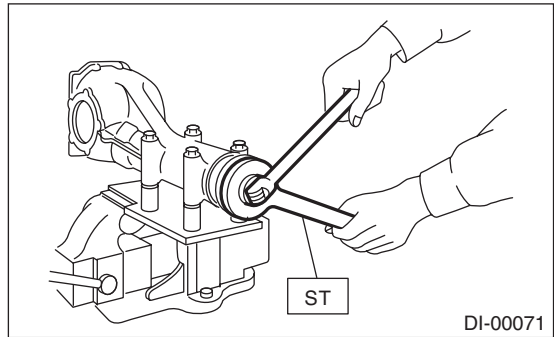
ST1 899874100 INSTALLER  
ST2 399780104 WEIGHT  
ST3 498937110 HOLDER DRIVE PINION

NOTE:

Be careful not to damage the bearing.



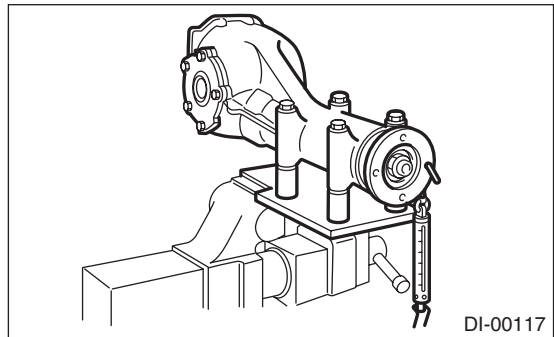
16) Install the self-locking nut. Tighten with the ST.  
ST 18633AA000 WRENCH COMPL



17) Check the initial torque or initial load.

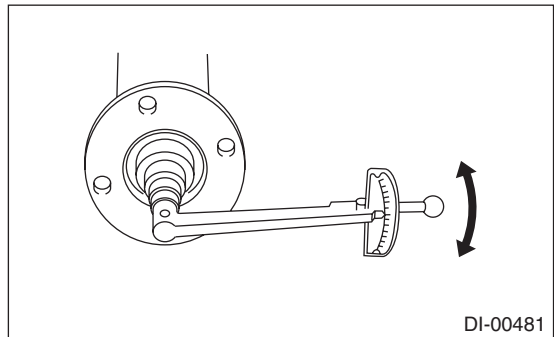
**Initial load:**

**24.1 — 38.6 N (2.5 — 3.9 kgf, 5.4 — 8.7 lb)**



**Initial torque:**

**0.98 — 1.57 N·m (0.10 — 0.16 kgf·m,  
0.72 — 1.16 ft·lb)**



# Rear Differential (T-type)

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## DIFFERENTIALS

18) Install the driven gear to the differential case.

**NOTE:**

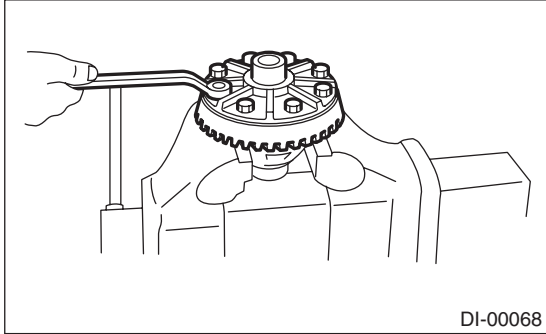
- Before installing bolts, apply seal material to bolt threads.
- Tighten the bolts diagonally.

**Sealant:**

**THREE BOND 1324 (Part No. 004403042) or equivalent**

**Tightening torque:**

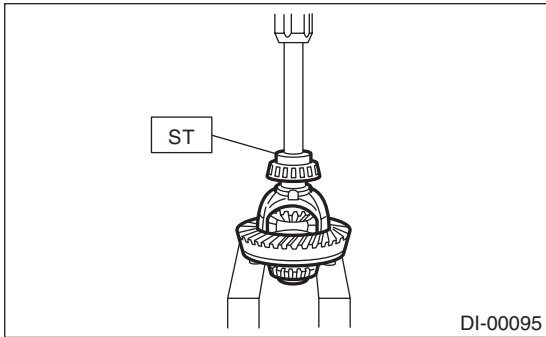
**103 N·m (10.5 kgf·m, 76.0 ft·lb)**



19) Press the side bearing into differential case using ST.

ST 398487700

DRIFT

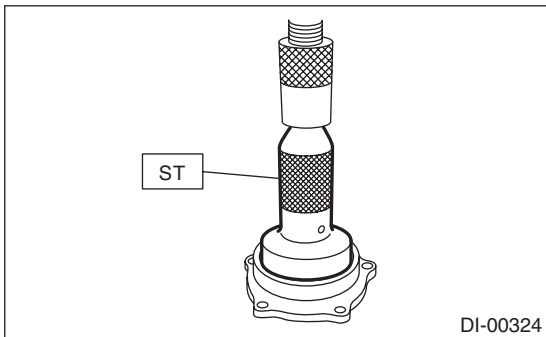


20) Assembling side retainer

(1) Press-fit the side bearing outer race using ST and the press.

ST 398417700

DRIFT



(2) Install the oil seal. <Ref. to DI-37, REPLACEMENT, Rear Differential Side Oil Seal.>

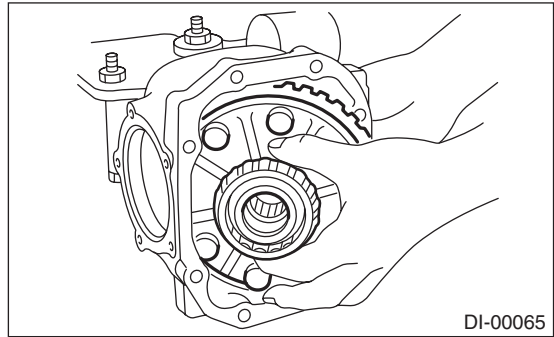
21) Adjusting side retainer shims

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

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

**NOTE:**

Be careful so that the teeth do not hit against the case.



(3) Install the side retainer shims and O-rings to the side retainers RH and LH on which they were originally installed.

**NOTE:**

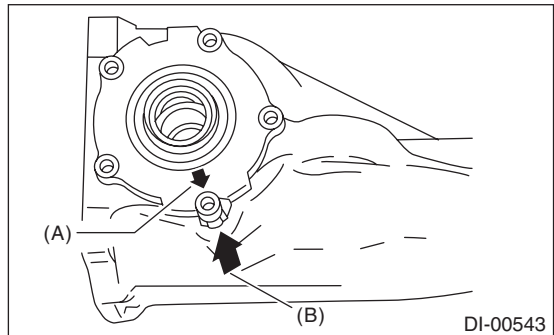
- Replace the O-ring with a new part.
- Replace broken or corroded side retainer shims with a new part of the same thickness.

Side 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 the differential carrier with the mark on the side retainer during installation.

**NOTE:**

Be careful that side bearing outer race is not damaged by the bearing roller.



(A) Arrow mark (on the side retainer)

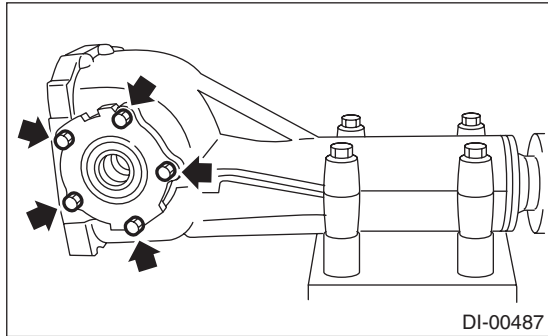
(B) Arrow mark (on the differential carrier)

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(5) Tighten the side retainer bolts.

**Tightening torque:**

**10.5 N·m (1.1 kgf-m, 7.7 ft-lb)**



(6) Measure the backlash between the driven gear and drive pinion. Set the magnet base on differential carrier. Align the contact point of dial gauge with the tooth surface of driven gear, and move the driven gear while securing the drive pinion. Read the value indicated on dial gauge. If the backlash is not within the range of the specifications, adjust the side retainer shim using the following procedures.

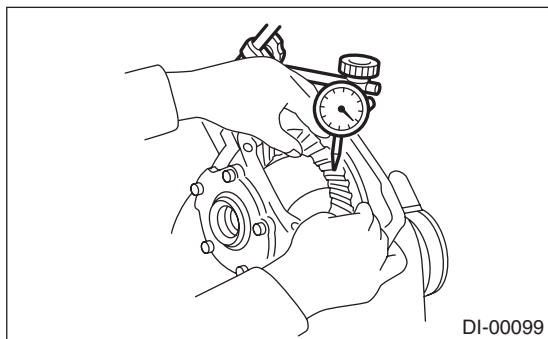
- **When backlash is less than 0.1 mm (0.004 in):**

Reduce the hypoid driven gear rear face shim thickness and increase the hypoid driven gear tooth surface side shim thickness.

- **When backlash exceeds 0.2 mm (0.008 in):** Increase the shim thickness on the hypoid driven gear rear face and reduce the thickness on the tooth surface side.

**Backlash:**

**0.10 — 0.20 mm (0.004 — 0.008 in)**



(7) At the same time, measure the total preload of the drive pinion. If the total preload compared to when the differential case is not installed exceeds the specifications, adjust by increasing or reducing the thickness of side retainer shims to the same amount on both sides.

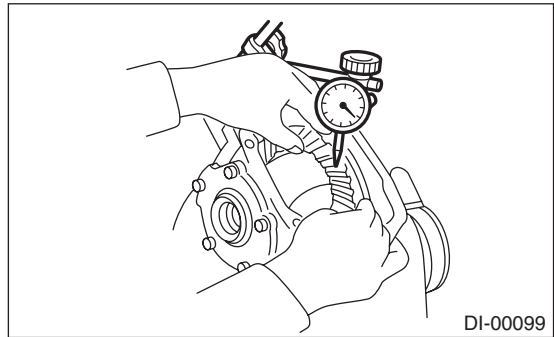
**Total preload:**

**27.0 — 54.0 N (2.8 — 5.5 kgf, 6.1 — 12.1 lb)**

22) Recheck the backlash between the hypoid driven gear and drive pinion.

**Backlash:**

**0.10 — 0.20 mm (0.004 — 0.008 in)**

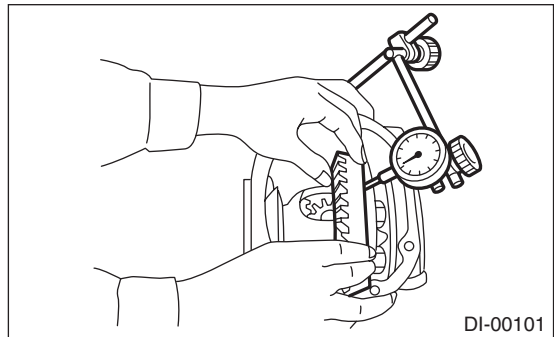


23) Check the driven gear runout on its back surface, and make sure that the pinion and driven gear rotate smoothly.

If the hypoid driven gear runout on its back surface exceeds the specification, check for any foreign matter between the hypoid driven gear and differential case, and for any deformation of the case or gear.

**Hypoid driven gear back surface runout:**

**0.05 mm (0.002 in)**



# Rear Differential (T-type)

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## DIFFERENTIALS

### 24) Checking and adjusting the tooth contact of hypoid driven gear

(1) Apply red lead evenly to both sides of three or four teeth on the hypoid driven gear. Rotate the driven gear several revolutions back and forth until a definite contact pattern appears on the driven gear, and check the contact pattern.

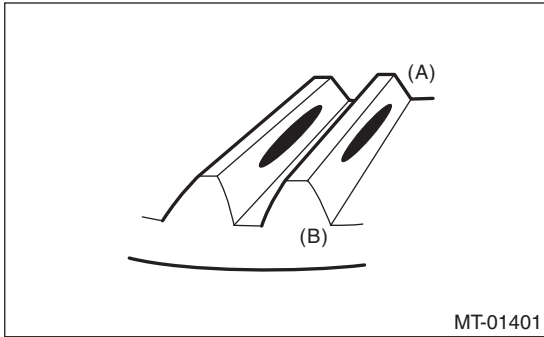
(2) When the contact pattern is not correct, re-adjust.

#### NOTE:

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

- Correct tooth contact

**Check item: Tooth contact pattern is slightly shifted toward toe side under no-load rotation. (When driving, it moves towards the heel side.)**

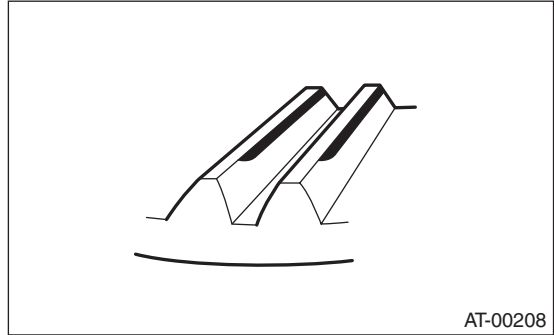


- (A) Toe side
- (B) Heel side

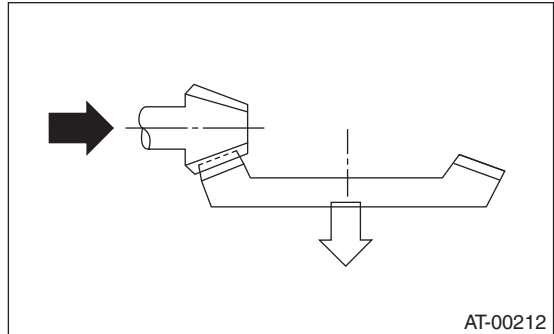
- Face contact

**Check item: Backlash is too large.**

Contact pattern



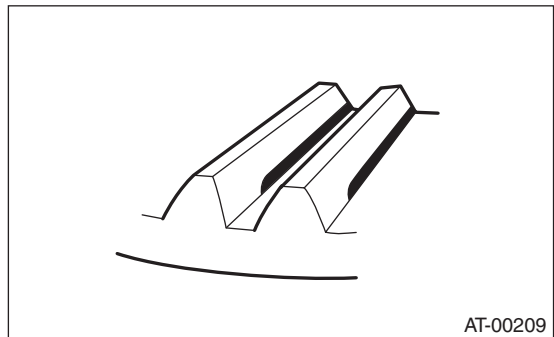
Corrective action: Increase thickness of drive pinion height adjusting washer in order to bring drive pinion close to hypoid driven gear.



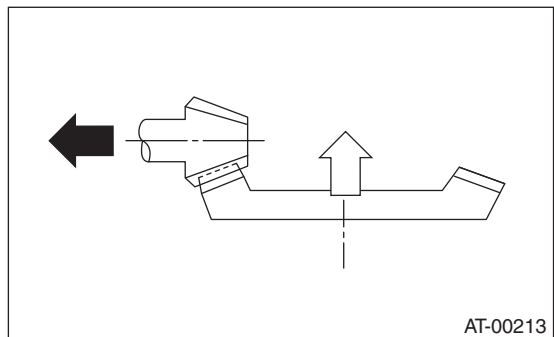
- Flank contact

**Check item: Backlash is too small.**

Contact pattern

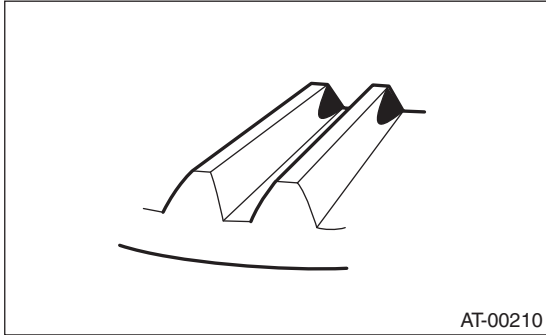


Adjustment: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing the drive pinion away from hypoid driven gear.

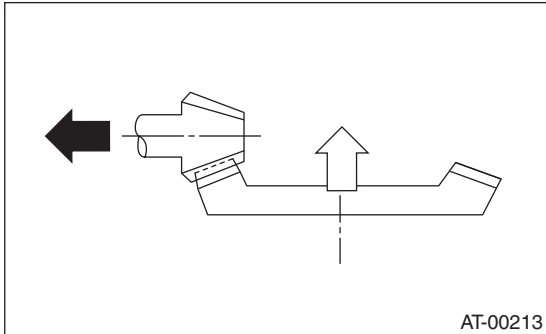


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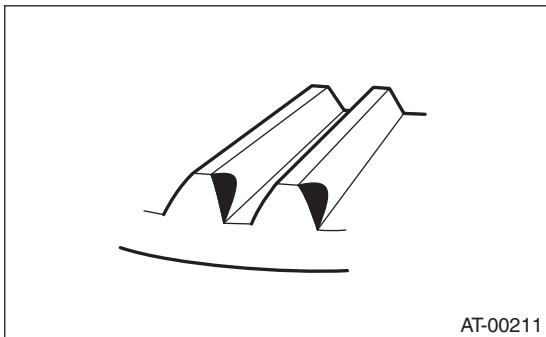
- Toe contact (inside contact)  
**Check item: Teeth contact area is too small.**  
Contact pattern



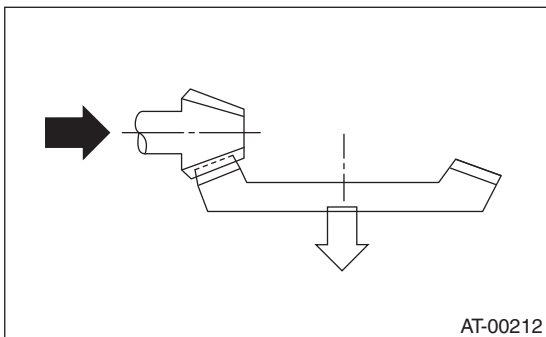
Adjustment: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing the drive pinion away from hypoid driven gear.



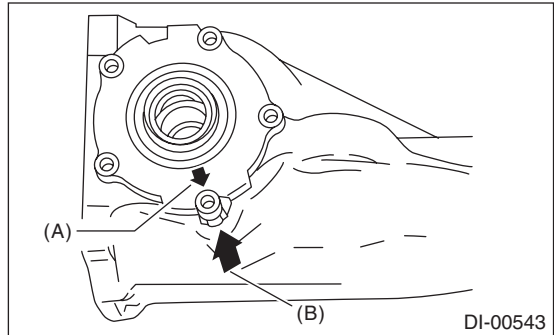
- Heel contact (outside end contact)  
**Check item: Teeth contact area is too small.**  
Contact pattern



Corrective action: Increase thickness of drive pinion height adjusting washer in order to bring drive pinion close to hypoid driven gear.



- 25) If proper tooth contact is not obtained, readjust the drive pinion height by changing the RH and LH side retainer shims and the hypoid gear backlash.
- 26) Install oil seals to the side retainers on both sides. <Ref. to DI-37, REPLACEMENT, Rear Differential Side Oil Seal.>
- 27) When installing, align the arrow mark on the differential carrier with the mark on the side retainer.

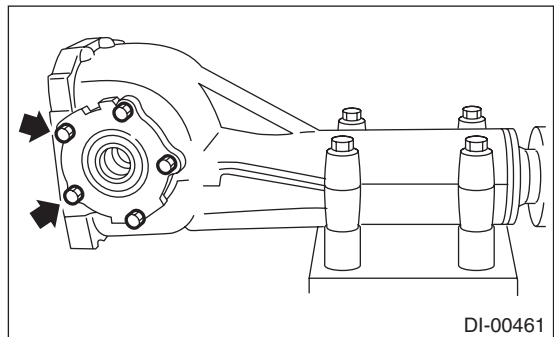


- (A) Arrow mark (on the side retainer)
- (B) Arrow mark (on the differential carrier)

- 28) Apply liquid gasket to the bolt with arrow marks and install the side retainer bolt.

**Liquid gasket:**  
**THREE BOND 1105 (Part No. 004403010) or equivalent**

**Tightening torque:**  
**10.5 N·m (1.1 kgf-m, 7.7 ft-lb)**



# Rear Differential (T-type)

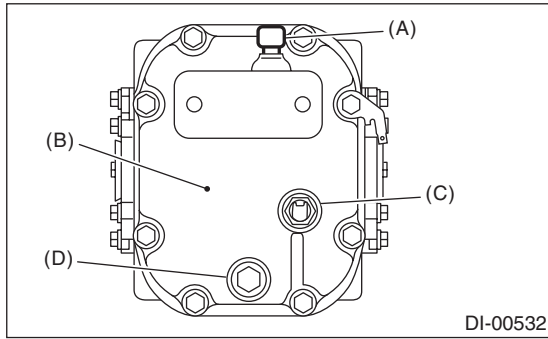
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## DIFFERENTIALS

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

**Tightening torque:**

**44 N·m (4.5 kgf·m, 32.5 ft·lb)**



- (A) Air breather cap
- (B) Rear cover
- (C) Oil temperature switch
- (D) Oil drain plug

30) Install the air breather cap.

31) Install the oil temperature switch and the oil drain plug.

**Tightening torque:**

**60 N·m (6.1 kgf·m, 44.3 ft·lb)**

## E: INSPECTION

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

- 1) Hypoid driven gear and drive pinion
  - If there is evidently an abnormal tooth contact, find out the cause and adjust until the teeth contact correctly. Replace the gear if there is an excessive worn or an incapable adjustment.
  - If crack, cutout or seizure is found, replace the parts as a set. Slight damage of some teeth can be corrected by oil stone or the like.
- 2) Side gear and pinion mate gear
  - Replace if cracks, scoring or other defects are evident on the tooth surface.
  - Replace if thrust washer contact surface is worn or seized. Slight damages of the surface can be corrected by oil stones or equivalent.
- 3) Bearing
 

Replace if seizure, peeling, wear, rust, dragging during rotation, abnormal noise or other defect is evident.
- 4) Thrust washer of the side gear and pinion mate gear
 

Replace if seized, flawed, abnormally worn or having other defects.
- 5) Oil seal
 

Replace if deformed or damaged, and at every disassembling.
- 6) Differential carrier
 

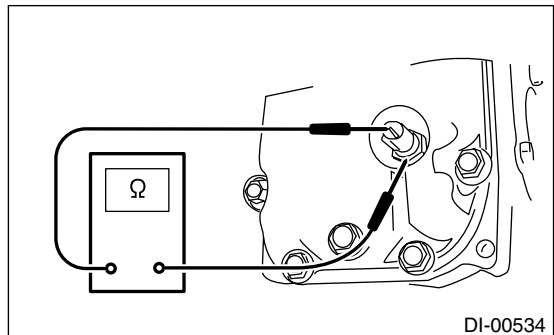
Replace if the bearing bores are worn or damaged.
- 7) Differential case
 

Replace if sliding surfaces are abnormally worn, burned, or cracked.
- 8) Companion flange
 

Replace if the oil seal lip contact surface shows cracking.
- 9) Rear differential oil temperature switch
 

Check the rear differential oil temperature switch for continuity.

Resistance	Criteria
Less than 1 Ω	Normal operation
1 MΩ or more	Replace





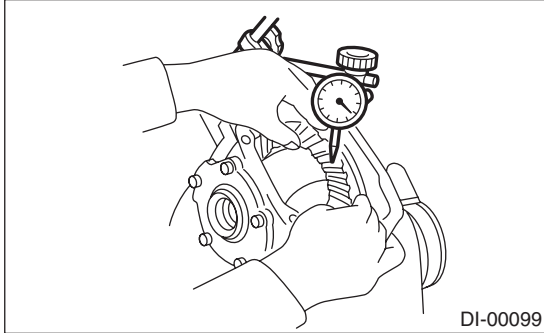
## 1. HYPOID DRIVEN GEAR BACKLASH

Using a dial gauge, check the backlash of hypoid driven gear.

### **Hypoid driven gear backlash:**

**0.10 — 0.20 mm (0.004 — 0.008 in)**

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



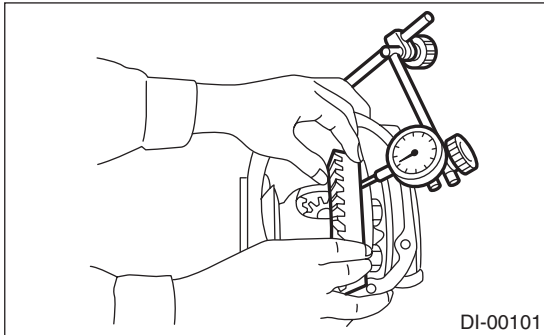
## 2. HYPOID DRIVEN GEAR RUNOUT ON THE BACK SURFACE

Using a dial gauge, check the hypoid driven gear back surface runout.

### **Hypoid driven gear back surface runout:**

**0.05 mm (0.002 in)**

If the hypoid driven gear runout exceeds 0.05 mm (0.002 in), replace the hypoid driven gear.



## 3. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Inspect the tooth contact between the hypoid driven gear and drive pinion. <Ref. to DI-23, ASSEMBLY, Rear Differential (T-type).>

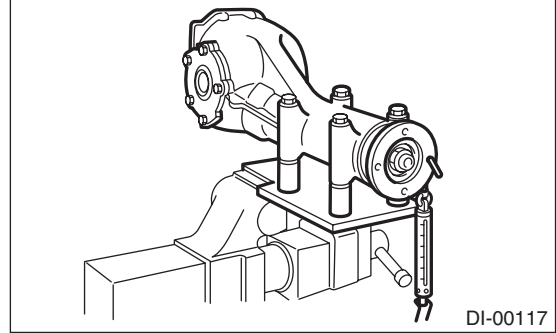
## 4. TOTAL PRELOAD

Using a spring scale, check the total preload.

### **Total preload:**

**27.0 — 54.0 N (2.8 — 5.5 kgf, 6.1 — 12.1 lbf)**

If the total preload is not within the specifications, adjust the side retainer shims.



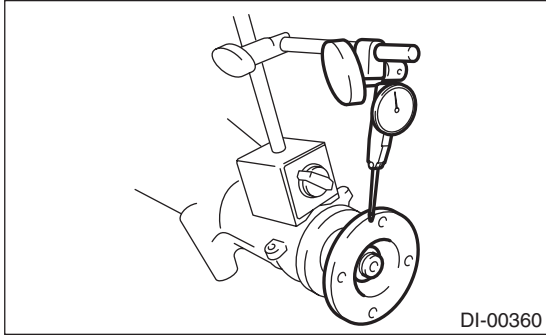
## DIFFERENTIALS

### 5. COMPANION FLANGE

- 1) If rust or dirt is attached to the companion flange, remove them.
- 2) Set a dial gauge at a companion flange surface (mating surface of propeller shaft and companion flange), and then measure the companion flange runout.

**Limit of runout:**

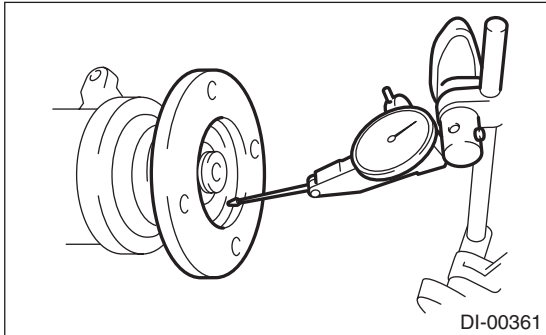
**0.08 mm (0.003 in)**



- 3) Set the gauge inside of the companion flange, and measure the runout.

**Limit of runout:**

**0.08 mm (0.003 in)**



- 4) If either runout exceeds the limit, move the phase of companion flange and drive pinion 90° each, and find the point where the runout is within the limit.
- 5) If the runout exceeds the limit after changing the phase, replace the companion flange and recheck the runout.
- 6) If the runout exceeds the limit after replacing the companion flange, the drive pinion may be assembled incorrectly or bearing is faulty.

### F: ADJUSTMENT

#### 1. HYPOID DRIVEN GEAR BACKLASH

Adjust hypoid driven gear backlash. <Ref. to DI-23, ASSEMBLY, Rear Differential (T-type).>

#### 2. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Adjust the tooth contact between hypoid driven gear and drive pinion gear. <Ref. to DI-23, ASSEMBLY, Rear Differential (T-type).>

#### 3. TOTAL PRELOAD

Adjust the side retainer shim. <Ref. to DI-23, ASSEMBLY, Rear Differential (T-type).>

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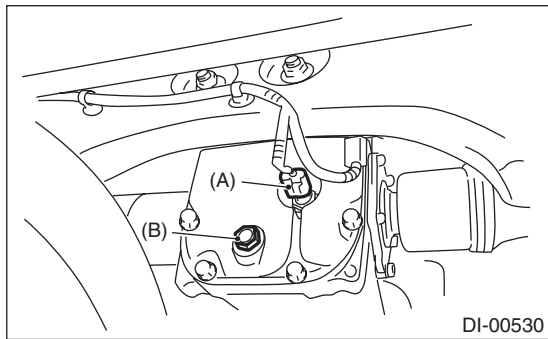
## 5. Rear Differential Front Oil Seal

### A: INSPECTION

Check that there is no leakage from front oil seal portion. If there is any leakage replace the oil seal and inspect the propeller shaft.

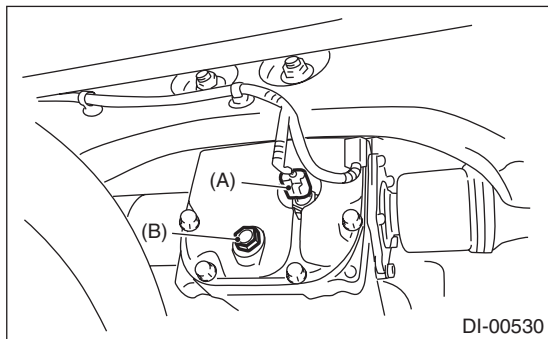
### B: REPLACEMENT

- 1) Disconnect the ground cable from the battery.
- 2) Place the gear shift lever in neutral.
- 3) Release the parking brake.
- 4) Lift up the vehicle.
- 5) Disconnect the oil temperature switch connector.



(A) Oil temperature switch connector  
 (B) Oil drain plug

- 6) Remove the oil drain plug and oil temperature switch, and drain the gear oil.



(A) Oil temperature switch  
 (B) Oil drain plug

- 7) Install the oil drain plug.

**NOTE:**

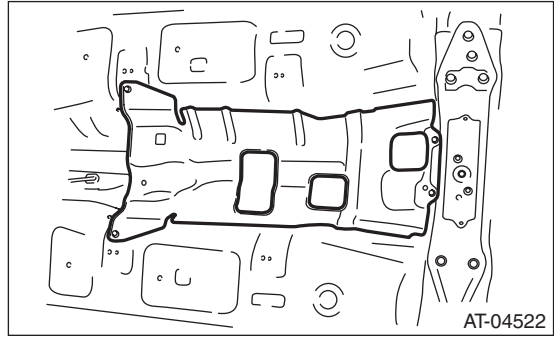
Use a new gasket.

**Tightening torque:**

**60 N·m (6.1 kgf-m, 44.3 ft-lb)**

- 8) Remove the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.>  
 <Ref. to EX(STI)-14, REMOVAL, Muffler.>

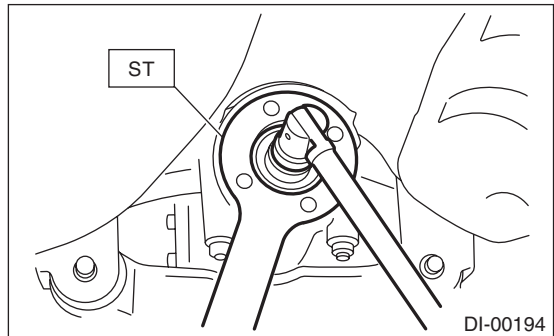
- 9) Remove the heat shield cover.



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

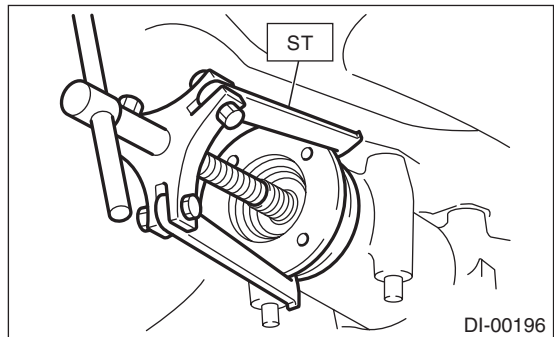
- 11) Remove the self-locking nut while holding the companion flange with ST.

ST 18633AA000 WRENCH COMPL



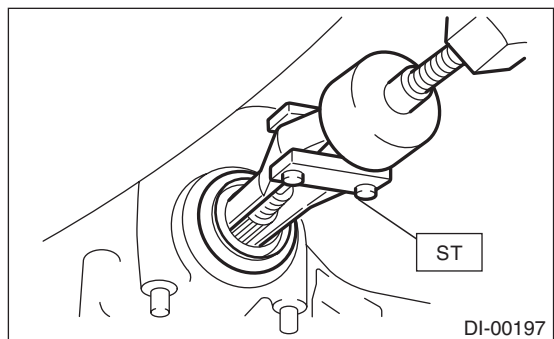
- 12) Remove the companion flange using ST.

ST 399703600 PULLER ASSY



- 13) Remove the oil seal using ST or screwdriver.

ST 398527700 PULLER ASSY

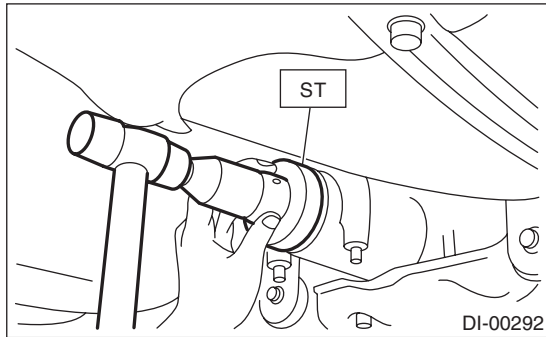


## Rear Differential Front Oil Seal

### DIFFERENTIALS

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- 14) Install a new oil seal using ST.  
ST 498447120      INSTALLER



- 15) Install the companion flange.

#### NOTE:

Use a plastic hammer to install companion flange.

- 16) Tighten the self-locking nut to the specified torque so that rotating resistance of the companion flange becomes the same value as that before replacing the oil seal.

ST 18633AA000      WRENCH COMPL

#### NOTE:

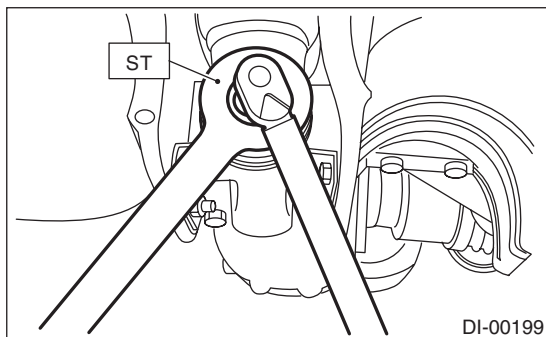
- Use a new self-locking nut.
- Before installing the self-locking nut, apply seal material to self-locking nut threads.

#### Sealant:

**THREE BOND 1324 (Part No. 004403042) or equivalent**

#### Tightening torque:

**181.5 N·m (18.5 kgf·m, 133.9 ft·lb)**



- 17) Hereafter, reassemble in the reverse order of disassembly.

- 18) After installing, fill the differential carrier with gear oil up to the bottom of the oil temperature switch hole.  
<Ref. to DI-14, Differential Gear Oil.>

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## 6. Rear Differential Side Oil Seal

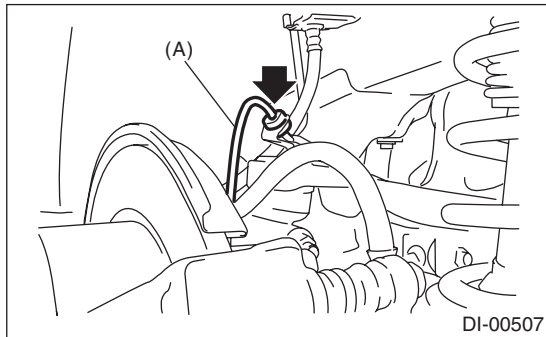
### A: INSPECTION

Inspect for oil leakage from the side oil seal.  
 If there is oil leakage, replace the oil seal.

### B: REPLACEMENT

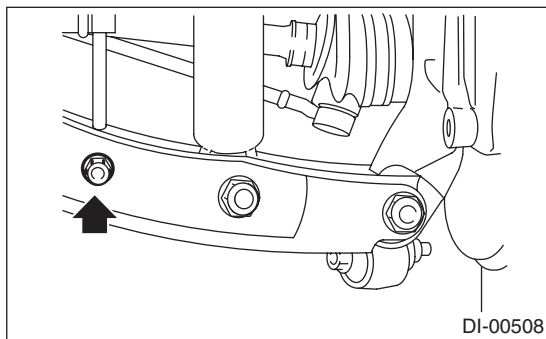
- 1) Place the gear shift lever in neutral.
- 2) Release the parking brake.
- 3) Loosen the wheel nuts.
- 4) Lift up the vehicle.
- 5) Remove the wheels.
- 6) Remove the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.>  
 <Ref. to EX(STI)-14, REMOVAL, Muffler.>
- 7) Remove the DOJ of the rear drive shaft from the rear differential.

- (1) Remove the ABS wheel speed sensor cable from the clamp.

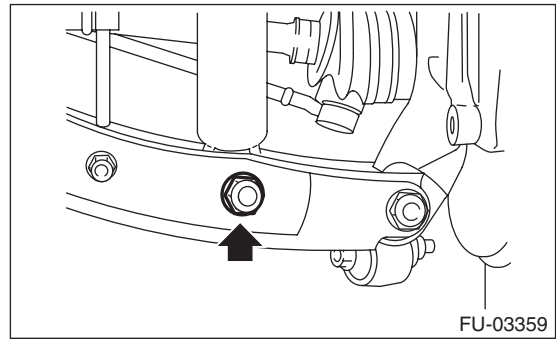


(A) ABS wheel speed sensor cable

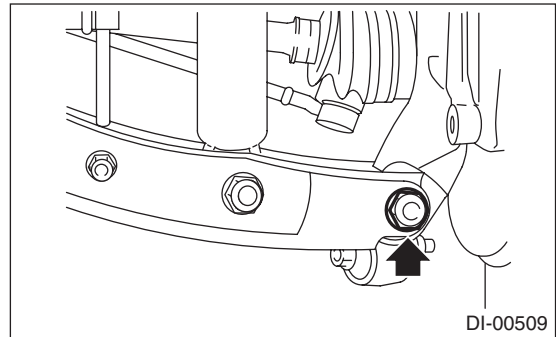
- (2) Remove the bolts which secure the rear stabilizer link to the rear lateral link.



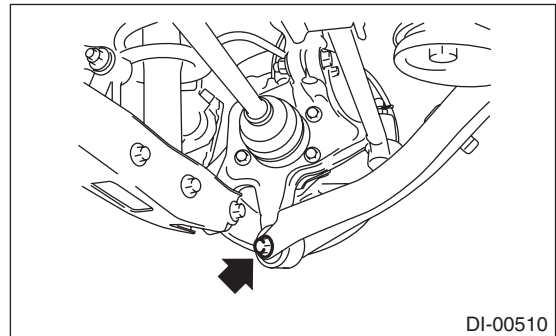
- (3) Remove the bolts which secure the shock absorber to the rear lateral link.



- (4) Remove the bolts which secure the rear lateral link to the housing.



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



# Rear Differential Side Oil Seal

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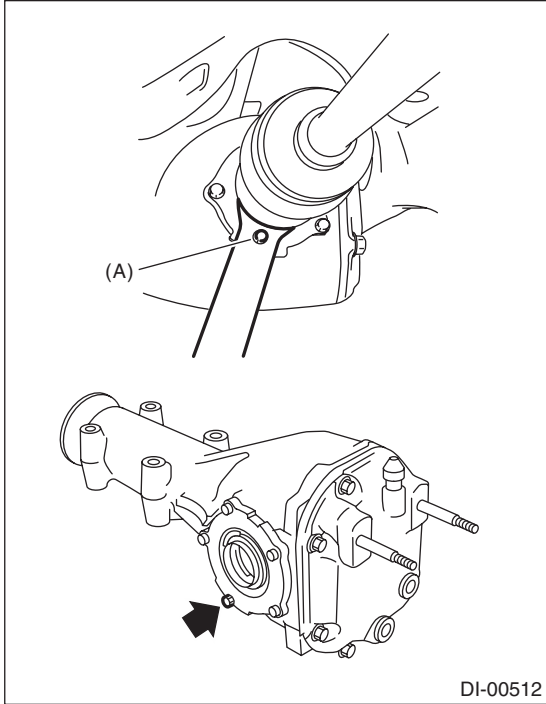
## DIFFERENTIALS

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

### NOTE:

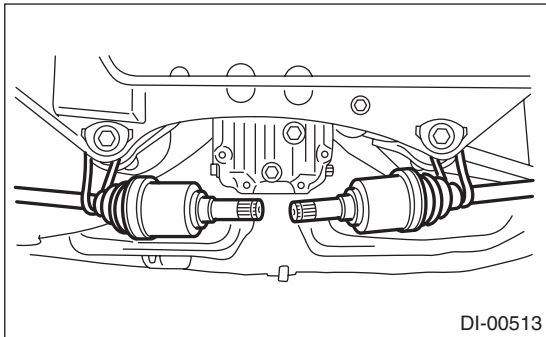
When removing the DOJ from the rear differential, fit the ST to the bolts as shown in the figure so as not to damage the side retainer.

ST 28099PA100 DRIVE SHAFT REMOVER

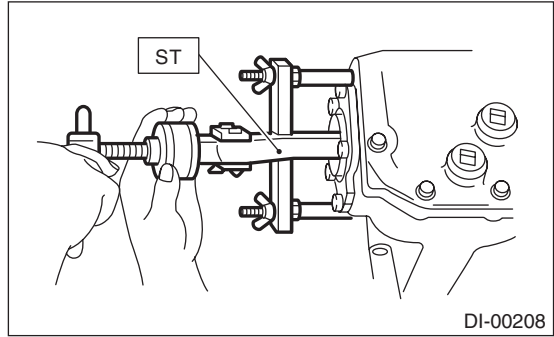


(A) Bolt

8) Suspend the rear drive shaft to the rear crossmember using wire.



9) Remove the oil seal using ST.  
ST 398527700 PULLER ASSY

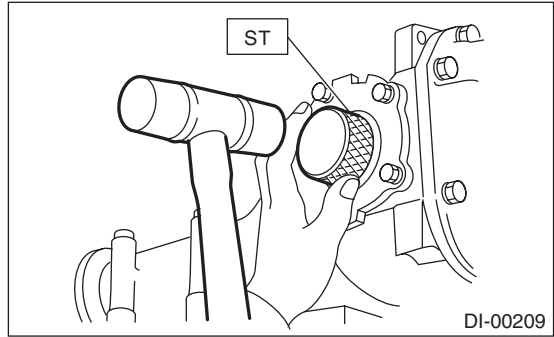


10) Install a new side oil seal using the ST.

### NOTE:

Apply differential gear oil to the oil seal lips.

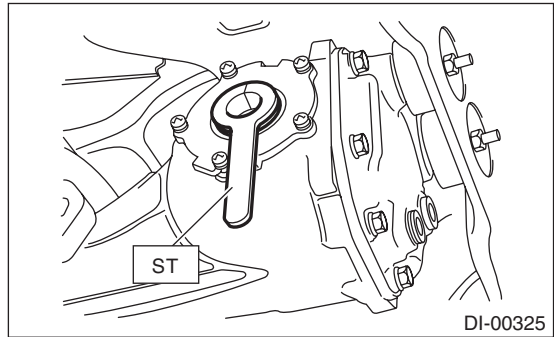
ST 398437700 DRIFT



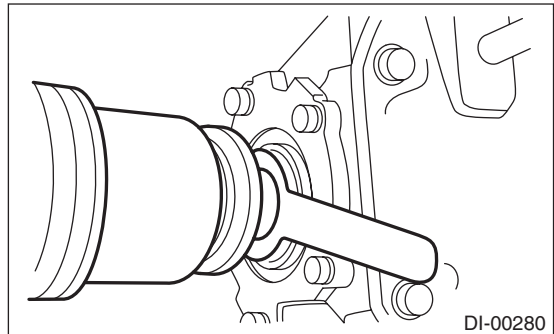
11) Insert the DOJ into rear differential.

(1) Attach the ST to rear differential.

ST 28099PA090 OIL SEAL PROTECTOR



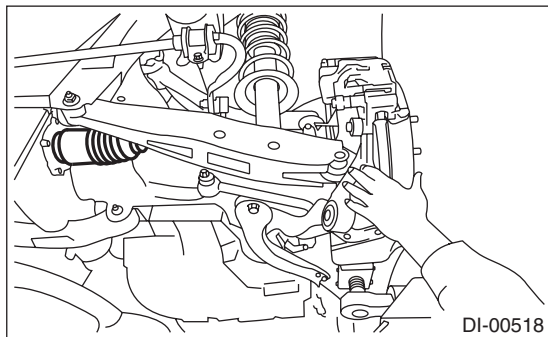
(2) Insert the spline shaft until the spline portion comes inside the side oil seal.



## Rear Differential Side Oil Seal

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- (3) Remove ST from rear differential.  
ST 28099PA090 OIL SEAL PROTECTOR
- (4) Push the housing to insert the DOJ completely into rear differential.

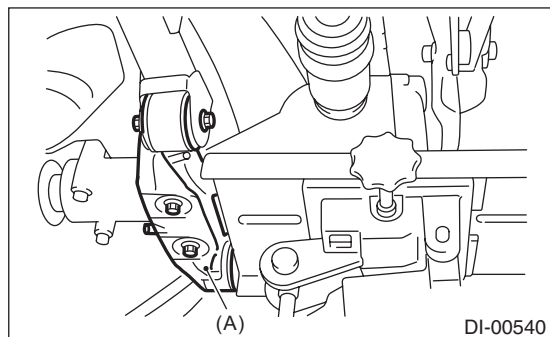


- 12) Installing procedure hereafter is in the reverse order of removal.
- 13) Inspect the wheel alignment and adjust if necessary.

## 7. Rear Differential Front Member

### A: REMOVAL

- 1) Disconnect the ground cable from the battery.
- 2) Lift up the vehicle.
- 3) Support the rear differential using transmission jack, and then remove the rear differential front member.



(A) Rear differential front member

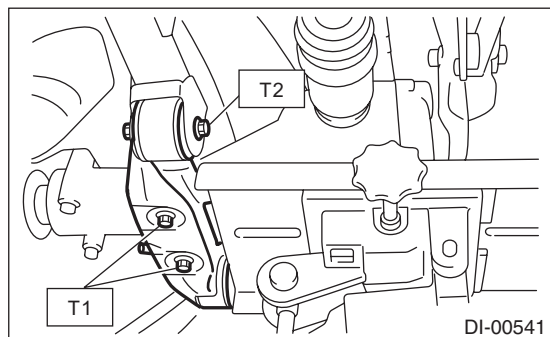
### B: INSTALLATION

Using new self-locking nuts, install the rear differential front member.

#### *Tightening torque:*

**T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)**

**T2: 110 N·m (11.2 kgf-m, 81.1 ft-lb)**



### C: INSPECTION

- 1) Check the rear differential front member for damage, bend and corrosion.  
If damage, bend or corrosion is excessive, replace the rear differential front member.
- 2) Check the bushings of rear differential member for cracking, hardening and damage.  
If cracking, hardening or damage is excessive, replace rear differential front member.



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## 8. General Diagnostic Table

### A: INSPECTION

Symptom or trouble	Possible cause	Remedy
<b>1. Oil leakage</b>	(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 cap	Clean, repair or replace.
	(3) Loose bolts on the differential spindle or 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 gasket and apply liquid gasket.
	(5) Loose oil filler or drain plug	Retighten and apply liquid gasket.
	(6) Wear, damage or incorrect fitting of drive shaft, side retainer or oil seal	Repair or replace.
<b>2. Seizure</b> 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	Add the recommended oil to the specified level.
<b>3. Damage</b> 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) Differential gear has excessive play or resistance.	Replace the differential case assembly.
	(4) Loose bolts and nuts such as hypoid driven gear bolt	Retighten.
	(5) Damage due to overloading	Replace.
<b>4. Noises when starting or shifting gears</b> NOTE: Noises may be caused by differential assembly, universal joint, wheel bearing, etc. Find out what is actually making noise before disassembling.	(1) Improper tooth contact of hypoid gear	Readjust. (Drive pinion shim adjustment, backlash adjustment)
	(2) Differential gear has excessive play.	Replace the differential case assembly.
	(3) Hypoid gear has excessive backlash.	Readjust or replace the hypoid gear set.
	(4) Insufficient preload for front or rear bearing	Readjust.
	(5) Loose drive pinion nut	Tighten to the specified torque.
	(6) Loose bolts and nuts such as the side retainer attaching bolt and similar parts	Tighten to the specified torque.
<b>5. Noises when cornering</b>	(1) Damaged differential gear	Replace the differential case assembly.
	(2) Seized or damaged side bearing	Replace.
<b>6. Gear noise</b> 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 lift-up all four wheels. Perform these inspections according to the condition of trouble. When listening to noises, shift the gear 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 hypoid gear set.
	(2) Improper backlash of the hypoid gear	Readjust.
	(3) Scored or chipped teeth of hypoid gear	Replace hypoid gear set.
	(4) Seized hypoid gear	Replace hypoid gear set.
	(5) Improper preload for front or rear bearings	Readjust.
	(6) Seized, cut-away or chipped front or rear bearing	Replace.
	(7) Seized, cut-away or chipped side bearing	Replace.
	(8) Vibrating differential gear	Replace the differential case assembly.

# General Diagnostic Table

DIFFERENTIALS

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