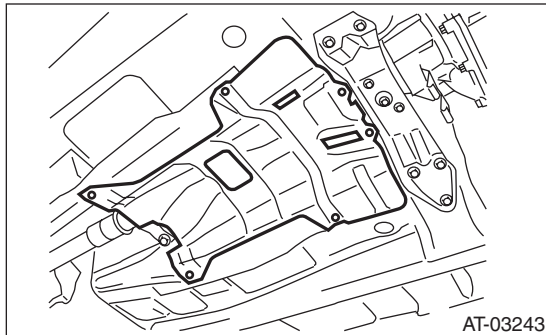


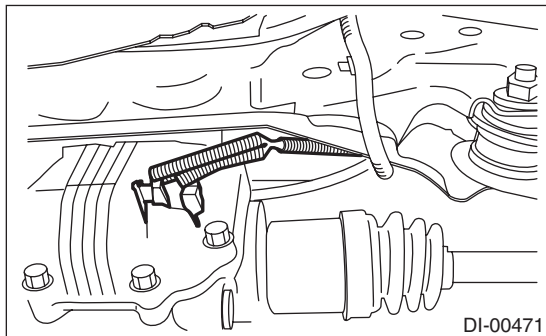
### 4. Rear Differential (VA-type)

#### A: REMOVAL

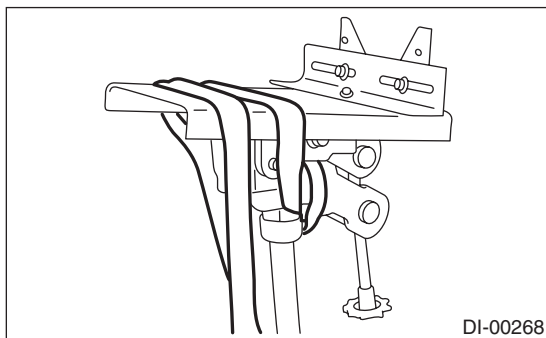
- 1) Disconnect the ground cable from battery.
- 2) Position the select lever to neutral.
- 3) Release the parking brake.
- 4) Loosen the wheel nuts.
- 5) Lift up the vehicle.
- 6) Remove the wheels.
- 7) Remove the rear exhaust pipe and muffler.  
<Ref. to EX(H6DO)-7, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H6DO)-9, REMOVAL, Muffler.>
- 8) Remove the heat shield cover.



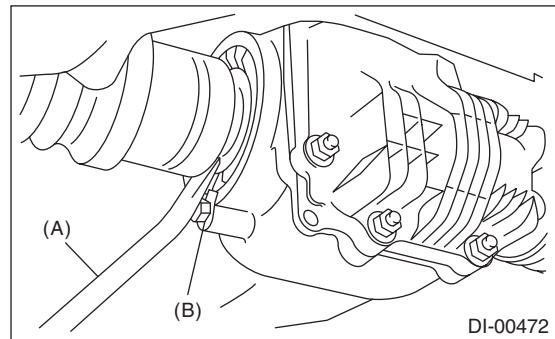
- 9) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>
- 10) Remove the connector from the rear differential oil temperature switch.



- 11) Prepare the transmission jack and band.

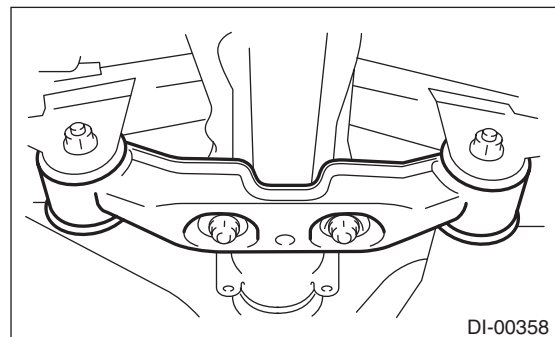


- 12) Remove the DOJ of rear drive shaft from rear differential.

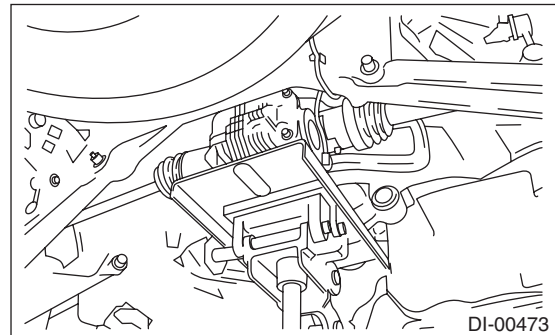


- (A) Tire lever  
(B) Bolt

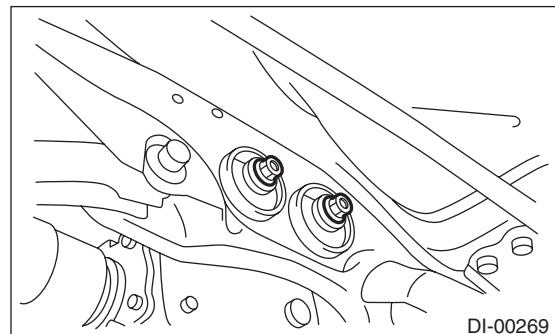
- 13) Remove the nuts which hold the rear differential front member.



- 14) Support the rear differential with the transmission jack.



- 15) Loosen the self-lock nuts which hold the rear differential to rear crossmember.



- 16) Remove the rear differential front member.
- 17) Secure the rear differential using band.

## Rear Differential (VA-type)

### DIFFERENTIALS

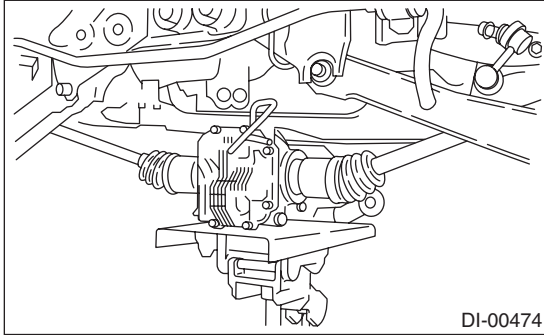
18) Remove the self-lock nuts which hold the rear differential to rear crossmember.

19) Remove the air breather hose from the sub frame.

20) Remove the rear differential stud bolt from rear crossmember bushing.

#### NOTE:

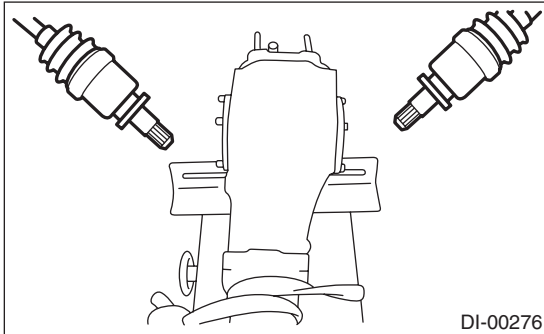
When removing the stud bolt, carefully adjust the angle and location of transmission jack and jack stand, if necessary.



21) Pull out the axle shaft from rear differential.

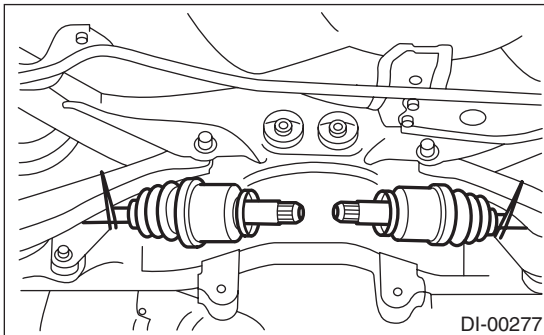
#### NOTE:

If it is difficult to remove the axle shaft from rear differential, remove it using tire lever.

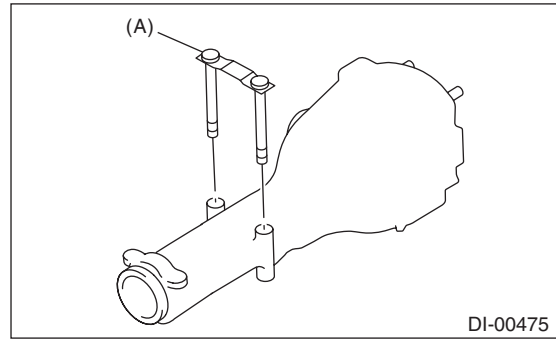


22) Lower the transmission jack.

23) Secure the rear drive shaft to lateral link using wire.



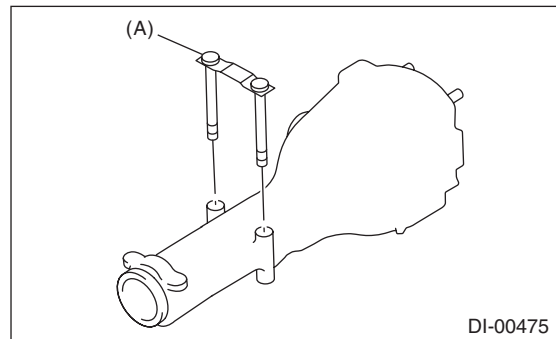
24) Remove the rear differential member plate from rear differential.



(A) Rear differential member plate

## B: INSTALLATION

1) Insert the rear differential member plate into rear differential.



(A) Rear differential member plate

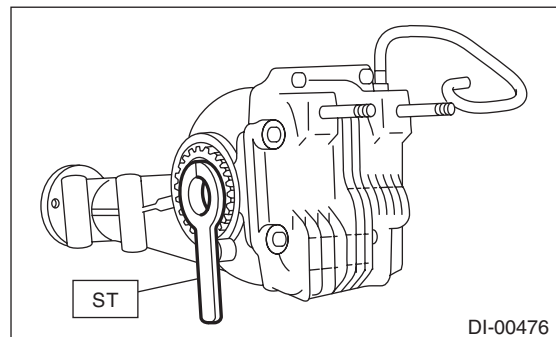
2) Set the rear differential to transmission jack.

#### NOTE:

Secure the rear differential to transmission jack using band.

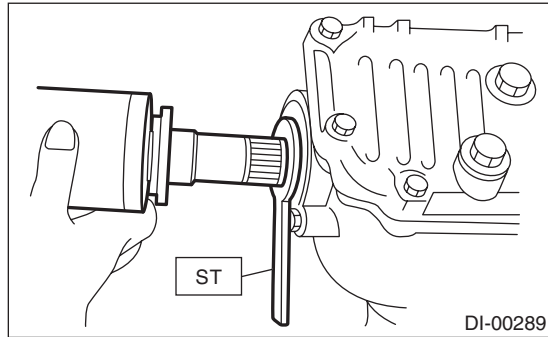
3) Attach the ST to rear differential.

ST 28099PA090 OIL SEAL PROTECTOR



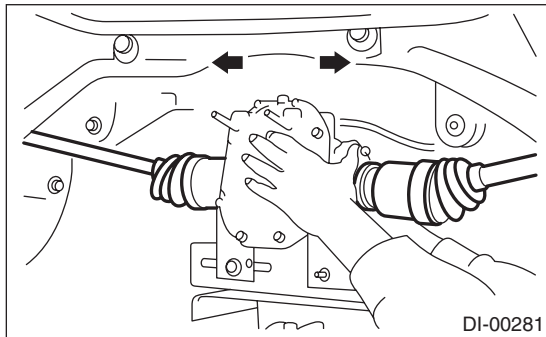
- 4) Insert the spline shaft until the spline portion comes inside the side oil seal.

ST 28099PA090 OIL SEAL PROTECTOR

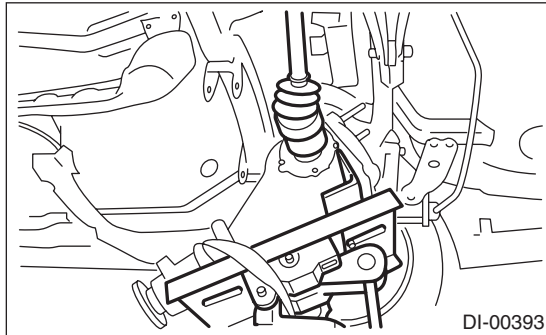


- 5) Remove ST from rear differential.

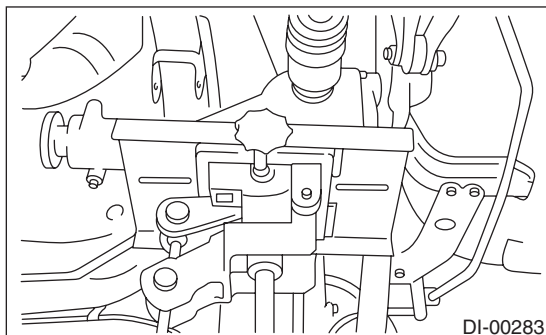
- 6) Push the rear differential to insert the axle shaft into rear differential.



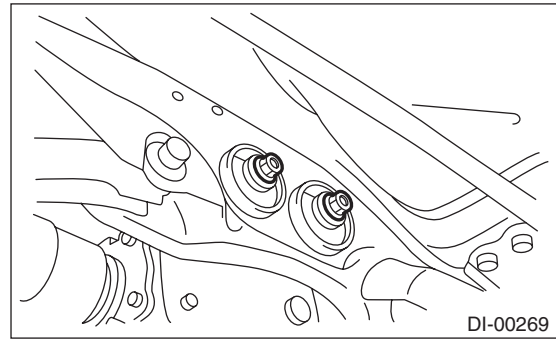
- 7) Adjust the transmission jack, if necessary, and insert the rear differential stud bolt into rear crossmember bushing properly.



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



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



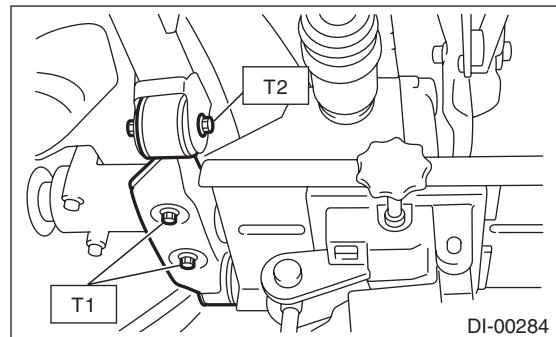
- 10) Remove the band from rear differential. Lift up the rear differential until the rear differential is separated from the transmission jack.

- 11) 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)**

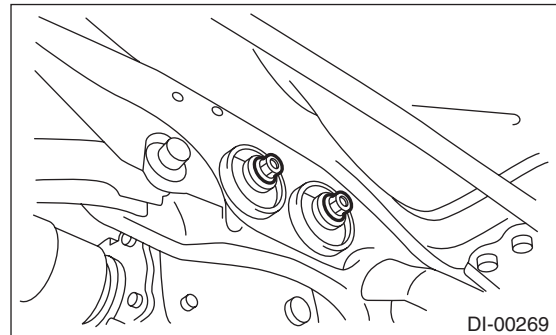
**T2: 110 N·m (11.2 kgf-m, 81.1 ft-lb)**



- 12) Tighten the self-locking nut.

**Tightening torque:**

**70 N·m (7.1 kgf-m, 51.6 ft-lb)**



- 13) Lower the transmission jack.

- 14) Install the air breather hose to the sub frame.

- 15) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>

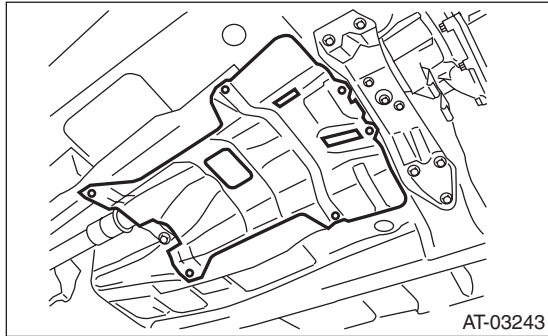
## Rear Differential (VA-type)

### DIFFERENTIALS

16) Install the heat shield cover.

**Tightening torque:**

**18 N·m (1.8 kgf-m, 33.3 ft-lb)**



17) Install the rear exhaust pipe and muffler. <Ref. to EX(H6DO)-7, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(H6DO)-9, INSTALLATION, Muffler.>

18) Install the wheel. <Ref. to WT-5, INSTALLATION, Tire and Wheel.>

### C: DISASSEMBLY

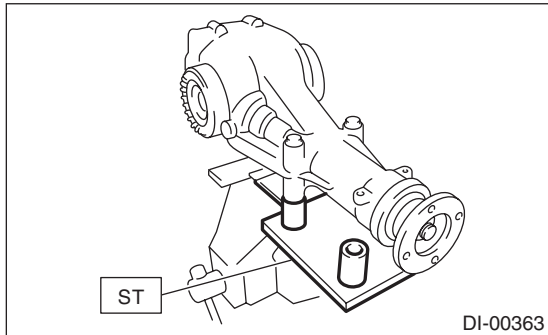
To detect the real cause of trouble, inspect the following items before disassembling.

- Tooth contact and backlash between hypoid driven gear and drive pinion
- Total preload of drive pinion

1) Remove the air breather hose.

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

ST 398217700 ATTACHMENT SET



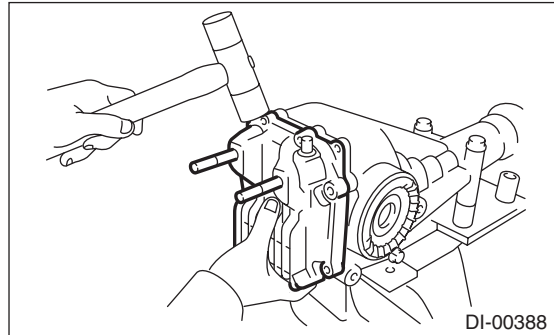
3) Remove the oil drain plug and filler plug.

4) Remove the rear differential oil temperature switch.

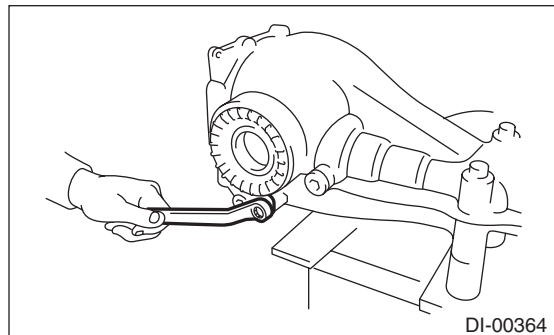
5) Remove the rear cover by removing retaining bolts.

**NOTE:**

Remove it by tapping with a plastic hammer.



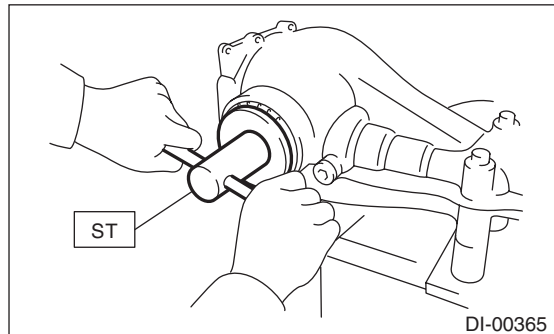
6) Remove the lock plate RH and LH.



7) Remove the side retainer RH and LH with ST.  
ST 18630AA010 WRENCH COMPL RETAINER

**NOTE:**

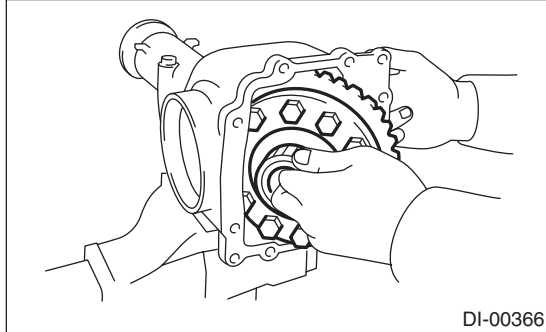
Never mix up the RH and LH retainers.



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

**NOTE:**

Be careful not to hit the teeth of hypoid driven gear against the differential carrier.

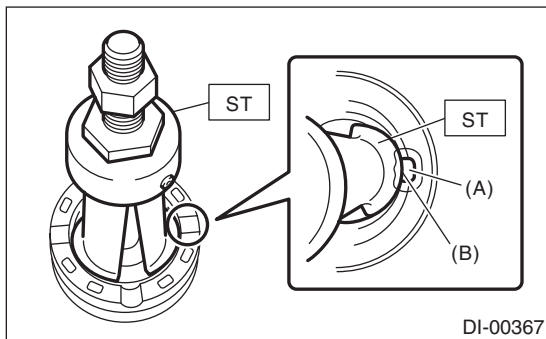


9) Remove the bearing race from the side retainer RH and LH with the ST and a press.

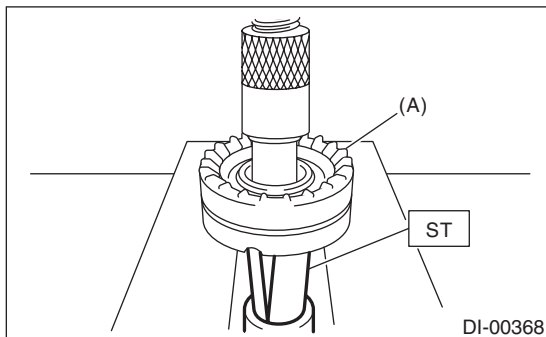
ST 18758AA000 PULLER

**NOTE:**

- Be sure to turn the bolt of puller manually.
- Set the puller so that its claws catch the groove of side retainer.



- (A) Groove  
(B) Claw

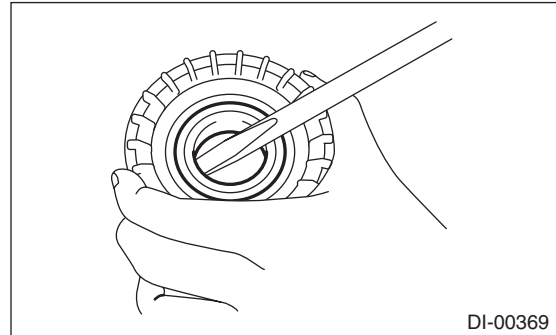


- (A) Side retainer

10) Remove the oil seal from side retainer RH and LH using screwdriver.

**NOTE:**

Perform this operation only when changing oil seal.



11) Extract the bearing cone with ST1, ST2 and ST3.

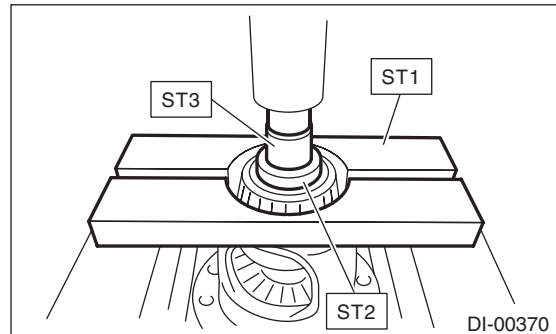
**NOTE:**

- Do not attempt to disassemble the parts unless necessary.
- Never mix up the RH and LH bearing races and cones.

ST1 498077000 REMOVER

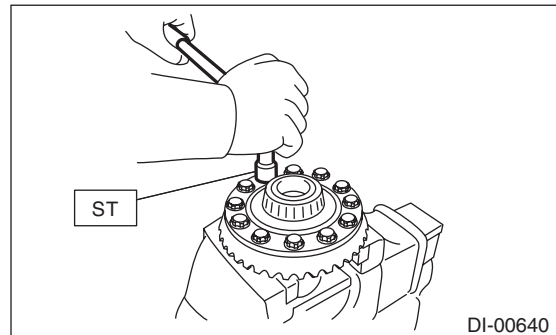
ST2 399520105 SEAT

ST3 899864100 REMOVER



12) Using the ST, loosen the hypoid driven gear bolt and remove the hypoid driven gear.

ST 18270KA020 SOCKET (E20)

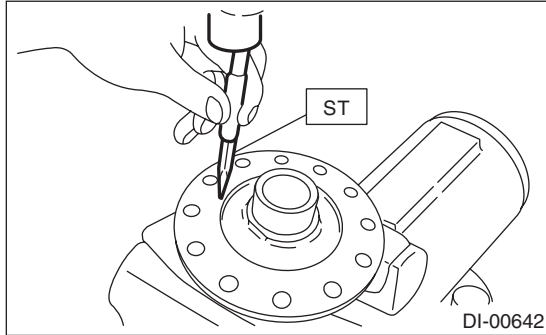


## Rear Differential (VA-type)

### DIFFERENTIALS

13) Remove the spring pin from hypoid driven gear side using ST.

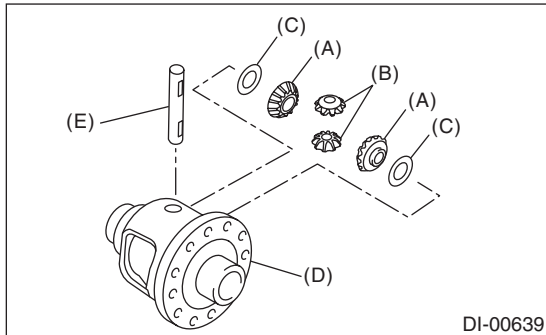
ST 899904100 STRAIGHT PIN REMOVER



14) Draw out the pinion mate shaft and remove pinion mate gears, side gears and thrust washers.

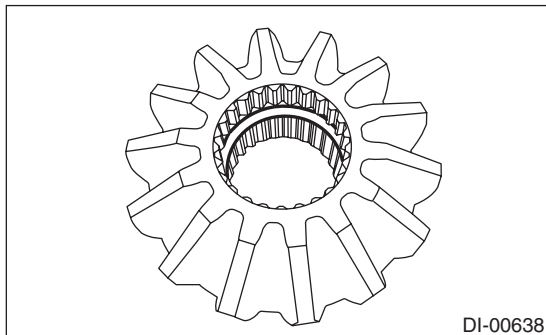
#### NOTE:

The gears should be marked or kept separated right and left, and front and rear as well as thrust washers.



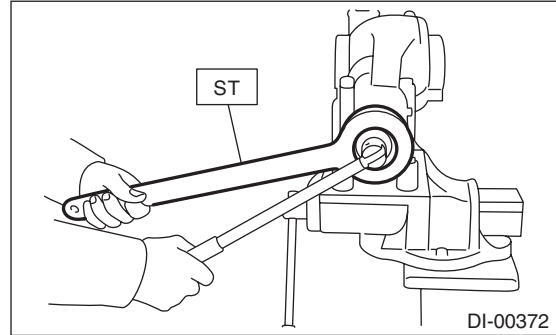
- (A) Side gear
- (B) Pinion mate gear
- (C) Thrust washer
- (D) Differential case
- (E) Pinion mate shaft

15) Remove the circlip from the side gear.



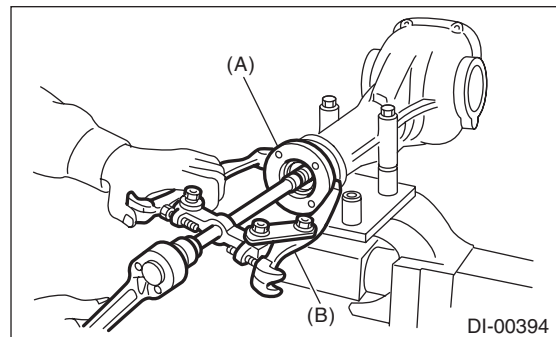
16) Remove the self-locking nut while holding the companion flange with ST.

ST 498427200 FLANGE WRENCH



17) Extract the companion flange with a puller.

ST 399703600 PULLER ASSY



- (A) Companion flange
- (B) PULLER

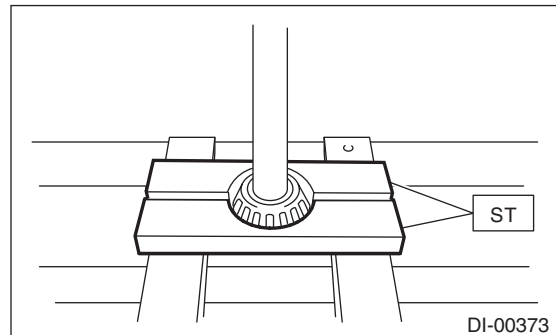
18) Removes the drive pinion shaft.

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

#### NOTE:

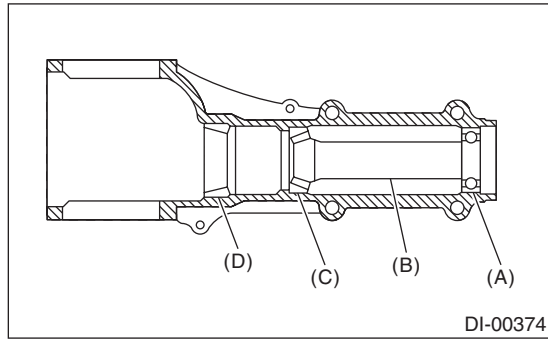
Place the replacer so that its center-recessed side faces the pinion gear.

ST 398517700 REPLACER



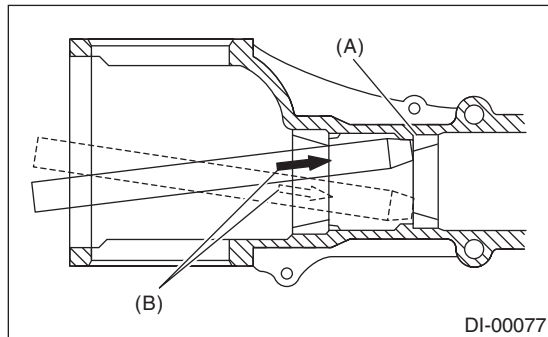
20) Remove the front oil seal from differential carrier using screwdriver.

21) Remove the pilot bearing, front bearing cone and spacer.



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

22) When replacing the bearings, use a brass bar to tap out the front bearing cup and rear bearing cup (in this order).



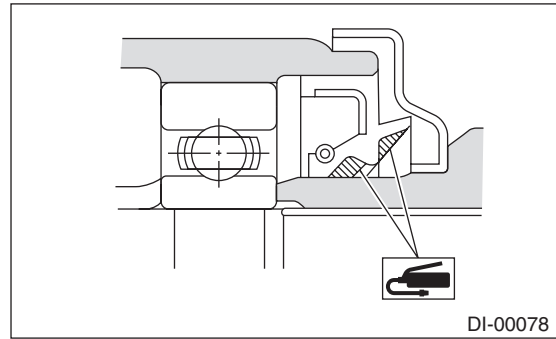
- (A) 2 cutout portions along diagonal lines
- (B) Tap alternately with brass bar.

## D: ASSEMBLY

### NOTE:

- Assemble in the reverse order of disassembly.
- Check and adjust each part during assembly.
- Use new gaskets and O-rings.
- 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 RH and LH bearing races.
- Replace the oil seal and O-ring 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 differential oil seal RH and LH.



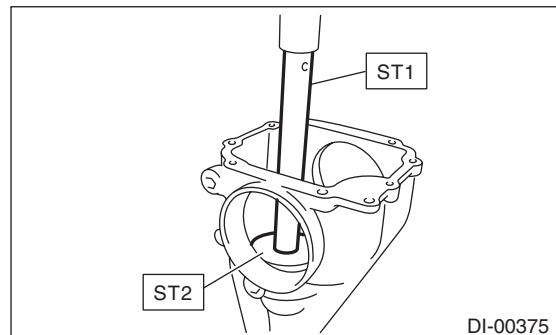
1) Adjusting preload for front and rear bearings.

### 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.

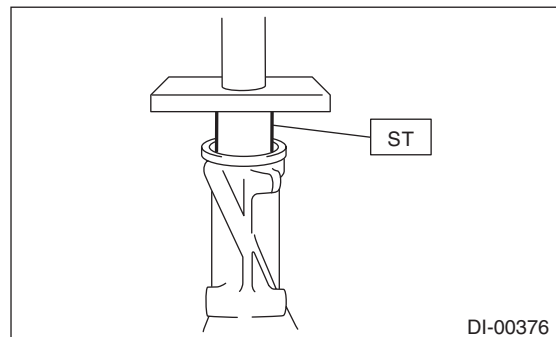
(1) Install the rear bearing race into the differential carrier using ST1 and ST2.

- |     |           |         |
|-----|-----------|---------|
| ST1 | 398477701 | HANDLE  |
| ST2 | 398477703 | DRIFT 2 |



(2) Using the ST, install the front bearing race to the differential carrier.

ST 499277200 INSTALLER



(3) Insert the front bearing cone.

### NOTE:

Use new front bearing cone.

## Rear Differential (VA-type)

### DIFFERENTIALS

- (4) Measure and record the thickness of pinion adjust washer.

#### NOTE:

If tooth contact (drive pinion, hypoid driven gear) is normal in the inspection before disassembling, verify that the washer is not deformed, and then re-use the used washer.

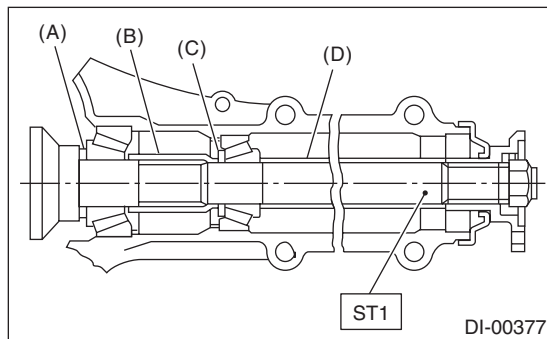
- (5) Insert the ST1 into carrier with the pinion height adjusting washer and rear bearing cone fitted onto it.

#### NOTE:

Use new rear bearing cone.

- (6) Install the preload adjusting spacer & washer, front bearing cone, spacer, companion flange, and washer & self-locking nut.

ST1 18678AA000 DUMMY SHAFT



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

- (7) Turn the ST1 by hand to smooth the bearing, and tighten the self-locking nut while measuring the initial load or initial torque with a spring scale or torque wrench. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.

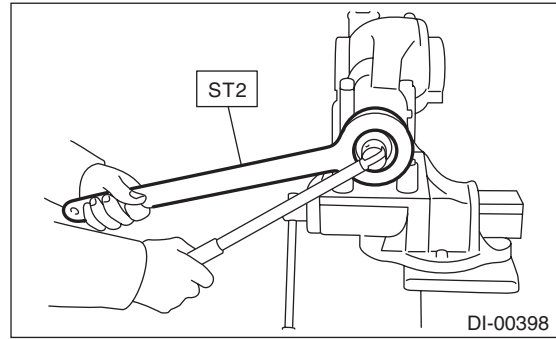
#### NOTE:

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

ST1 18678AA000 DUMMY SHAFT  
ST2 498427200 FLANGE WRENCH

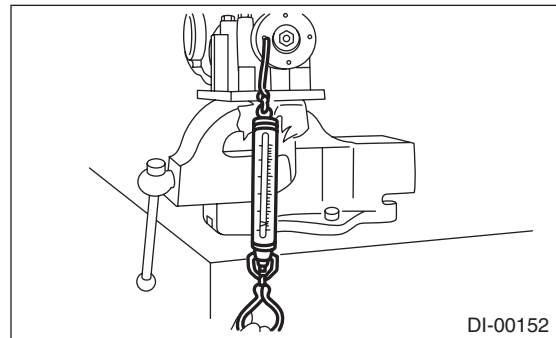
#### Tightening torque:

**191 N·m (19.5 kgf-m, 140.9 ft-lb)**



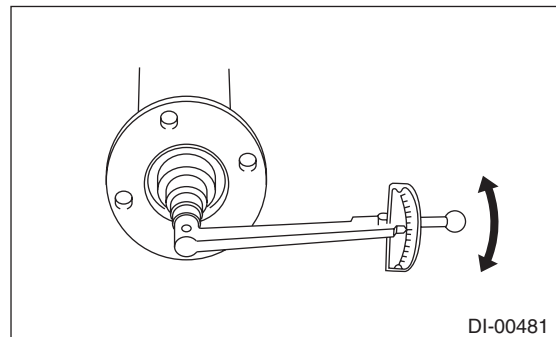
#### Initial load:

**12.7 — 32.2 N (1.3 — 3.3 kgf, 2.9 — 7.2 lb)**



#### Initial torque:

**0.48 — 1.22 N·m (0.05 — 0.12 kgf-m, 0.35 — 0.90 ft-lb)**



| Preload adjusting washer |                   |
|--------------------------|-------------------|
| Part No.                 | Thickness mm (in) |
| 38336AA430               | 1.500 (0.0591)    |
| 38336AA440               | 1.513 (0.0596)    |
| 38336AA450               | 1.525 (0.0600)    |
| 38336AA460               | 1.538 (0.0606)    |
| 38336AA470               | 1.550 (0.0610)    |
| 38336AA480               | 1.563 (0.0615)    |
| 38336AA490               | 1.575 (0.0620)    |
| 38336AA500               | 1.588 (0.0625)    |
| 38336AA510               | 1.600 (0.0630)    |
| 38336AA520               | 1.613 (0.0635)    |
| 38336AA530               | 1.625 (0.0640)    |
| 38336AA540               | 1.638 (0.0645)    |
| 38336AA550               | 1.650 (0.0650)    |
| 38336AA560               | 1.663 (0.0655)    |
| 38336AA570               | 1.675 (0.0659)    |
| 38336AA580               | 1.688 (0.0665)    |
| 38336AA590               | 1.700 (0.0669)    |
| 38336AA600               | 1.713 (0.0674)    |
| 38336AA610               | 1.725 (0.0679)    |
| 38336AA620               | 1.738 (0.0684)    |
| 38336AA630               | 1.750 (0.0689)    |
| 38336AA640               | 1.763 (0.0694)    |
| 38336AA650               | 1.775 (0.0699)    |

| Preload adjusting spacer |                |
|--------------------------|----------------|
| Part No.                 | Length mm (in) |
| 31454AA250               | 51.05 (2.010)  |
| 31454AA260               | 51.25 (2.018)  |
| 31454AA270               | 51.35 (2.022)  |
| 31454AA280               | 51.45 (2.026)  |
| 31454AA290               | 51.55 (2.030)  |
| 31454AA300               | 51.65 (2.033)  |
| 31454AA310               | 51.75 (2.037)  |
| 31454AA320               | 51.85 (2.041)  |
| 31454AA330               | 52.05 (2.049)  |

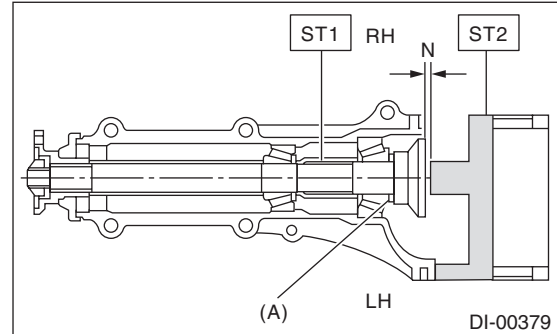
### 2) Adjusting drive pinion height:

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

#### (1) Attach the ST2.

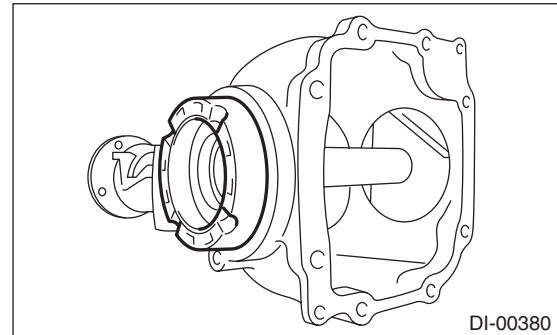
ST1 18678AA000 DUMMY SHAFT

ST2 18831AA010 DIFFERENTIAL CARRIER GAUGE



(A) Pinion height adjusting washer

#### (2) Install the side retainer LH to the left side of the differential carrier in reverse direction.



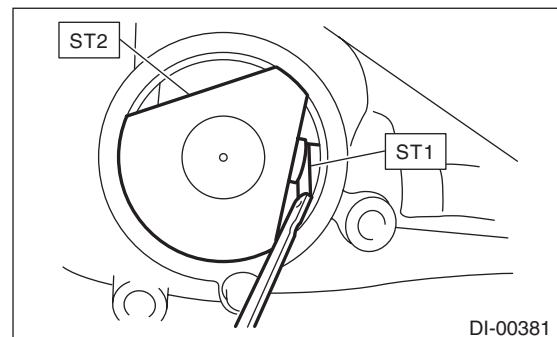
#### (3) Measure the clearance "N" between the end of ST2 and the end surface of ST1 by using a thickness gauge.

### NOTE:

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

ST1 18678AA000 DUMMY SHAFT

ST2 18831AA010 DIFFERENTIAL CARRIER GAUGE



## Rear Differential (VA-type)

### DIFFERENTIALS

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

#### NOTE:

Adjust it using the 0 — 3 washers.

$$T = T_o + N - 0.05 \text{ mm (0.0020 in)}$$

|                |                                                     |  |
|----------------|-----------------------------------------------------|--|
| T              | Thickness of pinion height adjusting washer mm (in) |  |
| T <sub>o</sub> | Thickness of washer temporarily inserted mm (in)    |  |
| N              | Clearance of thickness gauge mm (in)                |  |
| Memo:          |                                                     |  |

(Example of calculation)

$$T_o = 0.15 \text{ mm (0.0059 in)}$$

$$N = 0.1 \text{ mm (0.0039 in)}$$

$$T = 0.15 \text{ mm (0.0059 in)} + 0.1 \text{ mm (0.0039 in)} - 0.05 \text{ mm (0.0020 in)} = 0.2 \text{ mm (0.0079 in)}$$

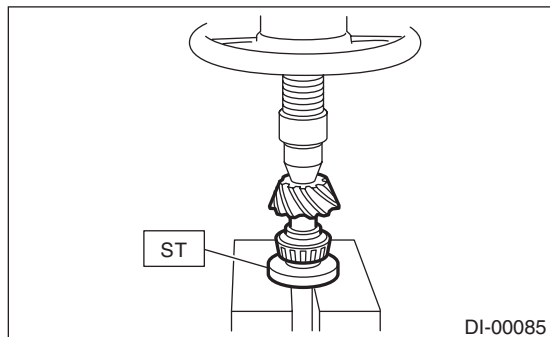
Result: Thickness = 0.2 mm (0.0079 in)

Therefore use part number 32295AA370.

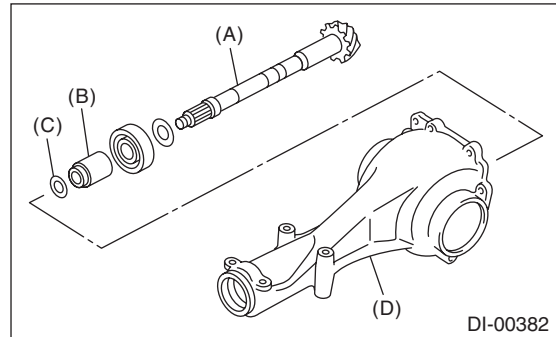
| Pinion height adjusting washer |                   |
|--------------------------------|-------------------|
| Part No.                       | Thickness mm (in) |
| 32295AA350                     | 0.150 (0.0059)    |
| 32295AA360                     | 0.175 (0.0069)    |
| 32295AA370                     | 0.200 (0.0079)    |
| 32295AA380                     | 0.225 (0.0089)    |
| 32295AA390                     | 0.250 (0.0098)    |
| 32295AA400                     | 0.275 (0.0108)    |

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

ST 398177700 INSTALLER



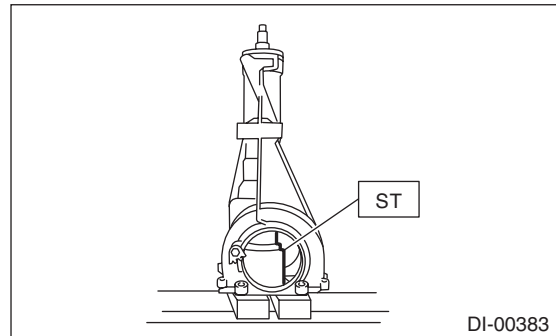
4) Insert the drive pinion into the differential carrier, and install the preselected bearing preload adjusting spacer and washer.



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

5) Set ST and differential carrier to the press and install the front bearing cone.

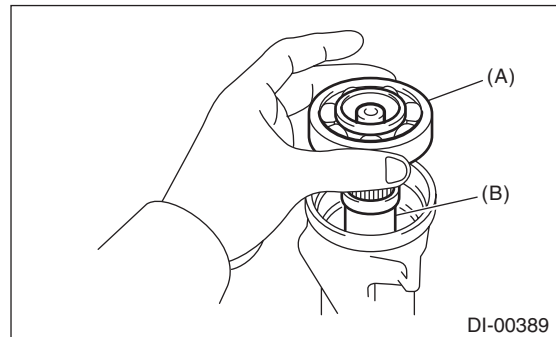
ST 399780104 WEIGHT



#### NOTE:

Set the carrier to the press until the companion flange is installed.

6) Insert the spacer, then install the pilot bearing.



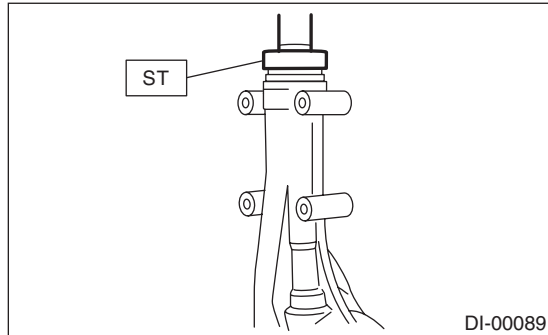
- (A) Pilot bearing
- (B) Spacer

7) Fit a new oil seal with 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 499277200 INSTALLER

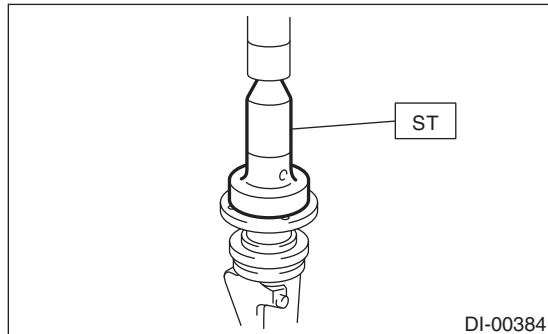


8) Press-fit the companion flange with ST.

NOTE:

Be careful not to damage the bearing.

ST 899874100 INSTALLER



9) Apply seal material to the drive pinion shaft screw threads and on the new self-locking nut seat.

**Seal material:**

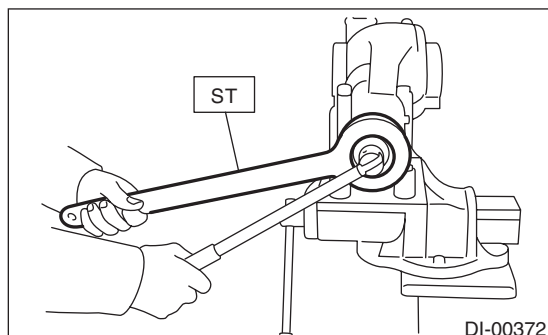
**THREE BOND 1324 (Part No. 004403042) or equivalent**

10) Attach the nut and use the ST to fix the companion flange in place, then tighten.

ST 498427200 FLANGE WRENCH

**Tightening torque:**

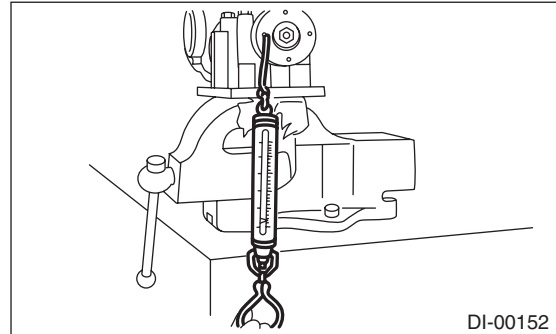
**191 N·m (19.5 kgf·m, 140.9 ft·lb)**



11) Measure the initial torque and initial load.

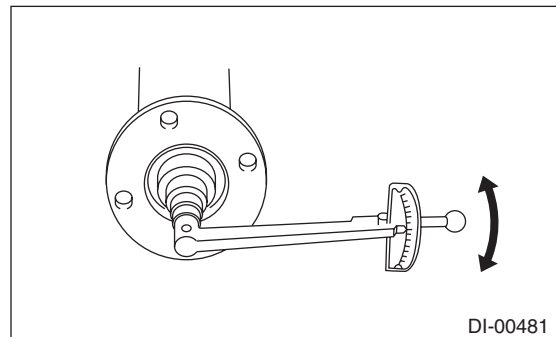
**Initial load:**

**12.7 — 32.2 N (1.3 — 3.3 kgf, 2.9 — 7.2 lb)**



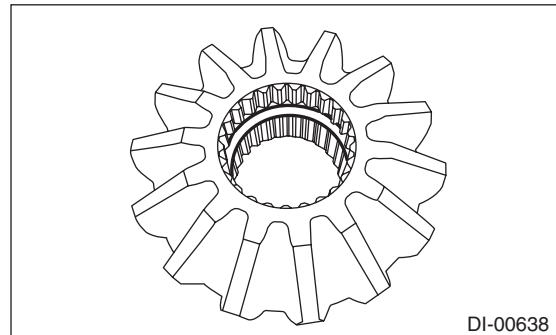
**Initial torque:**

**0.48 — 1.22 N·m (0.05 — 0.12 kgf·m, 0.35 — 0.90 ft·lb)**



12) Assembling differential case

(1) Attach the circlip to the side gear.



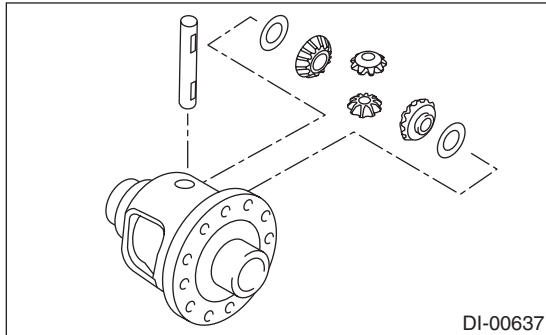
## Rear Differential (VA-type)

### DIFFERENTIALS

- (2) Install the side gears and pinion mate gears, with their thrust washers and pinion mate shaft, into the differential case.

#### NOTE:

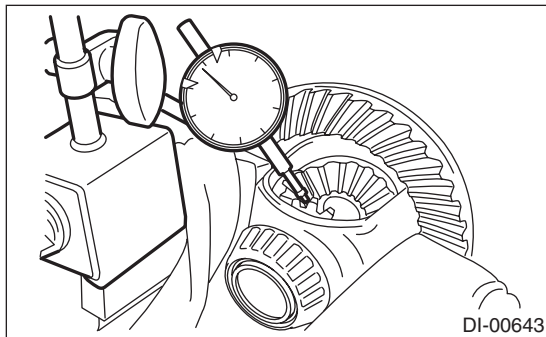
- Apply gear oil on both sides of the washer and on the side gear shaft before installing.
- Install the pinion mate shaft to the differential case by aligning the spring pin holes.



- (3) Measure the side gear backlash.

#### Side gear backlash:

**0.13 — 0.18 mm (0.005 — 0.007 in)**



- (4) Adjust the side gear backlash by selecting side gear thrust washer.

| Side gear thrust washer |                   |
|-------------------------|-------------------|
| Part No.                | Thickness mm (in) |
| 803138021               | 0.950 (0.0374)    |
| 803138022               | 1.000 (0.0394)    |
| 803135023               | 1.050 (0.0413)    |

- (5) Check the condition of rotation after applying oil to the gear tooth surfaces and thrust washer surfaces.

- (6) Attach the spring pin to the differential case.

#### NOTE:

Use new spring pin.

- 13) Install the hypoid driven gear to differential case.

#### NOTE:

- Set a cushioning such as wooden block, aluminum plate or shop cloth between vise and differential case if the side gear comes into contact with vise.
- Before installing bolts, apply seal material to bolt threads.

#### Seal material:

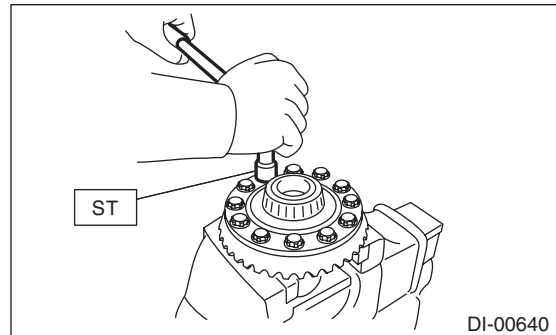
**THREE BOND 1324 (Part No. 004403042) or equivalent**

- Tighten opposing bolts in order.  
(1) Tighten the hypoid driven gear mounting bolts to the specified torque using the ST.

ST 18270KA020 SOCKET (E20)

#### Tightening torque:

**20 N·m (2.0 kgf-m, 14.8 ft-lb)**

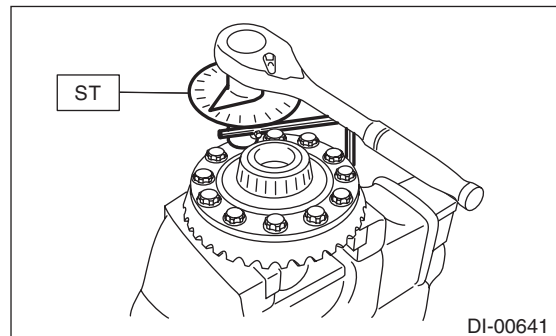


- (2) While checking the tightening angle with the ST, further tighten the hypoid driven gear mounting bolts.

#### Tightening angle:

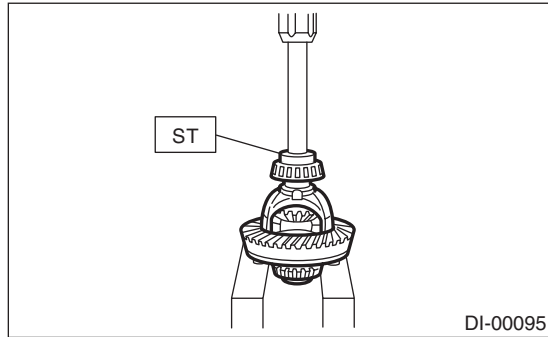
**33° ± 2°**

ST 18554AA000 ANGLE GAUGE



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

ST 398487700 DRIFT



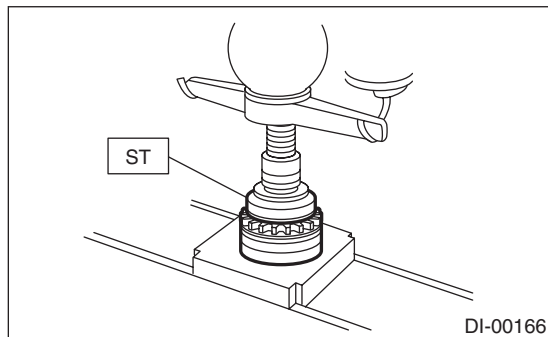
15) Assemble the side retainer.

(1) Install the new oil seal into side retainer RH and LH.

### CAUTION:

**Make sure that the oil seals and side retainers are properly assembled.**

ST 498447100 INSTALLER

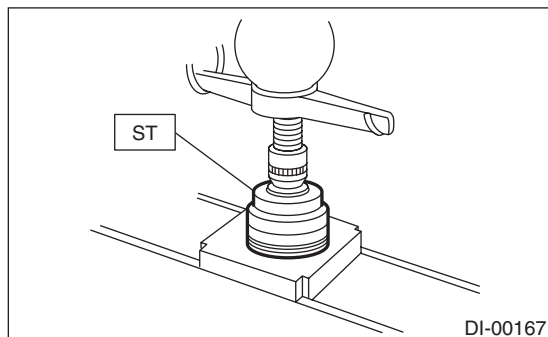


(2) Install the bearing race into side retainer RH and LH.

ST 398417700 DRIFT

### CAUTION:

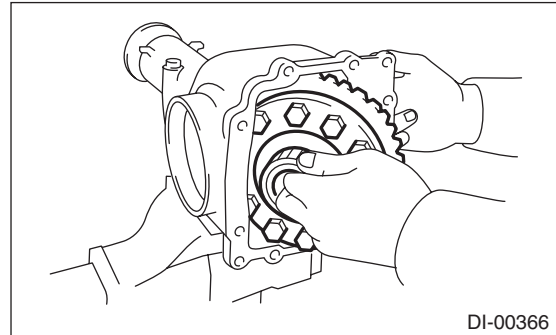
**Make sure that the bearing outer races and cones are properly assembled.**



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

### NOTE:

Be careful not to hit the teeth of hypoid driven gear against the case.

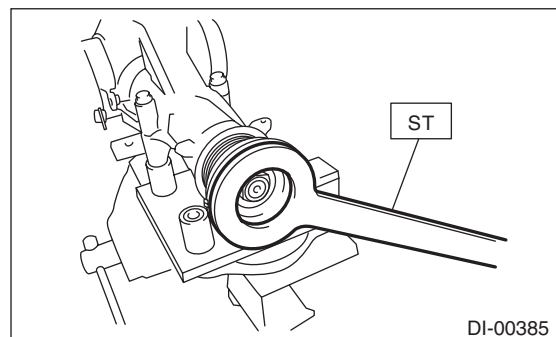


(4) Temporarily tighten the side retainers RH and LH in differential carrier to install.

16) Perform the backlash adjustment between the hypoid driven gear and drive pinion, and preload adjustment of differential side bearing.

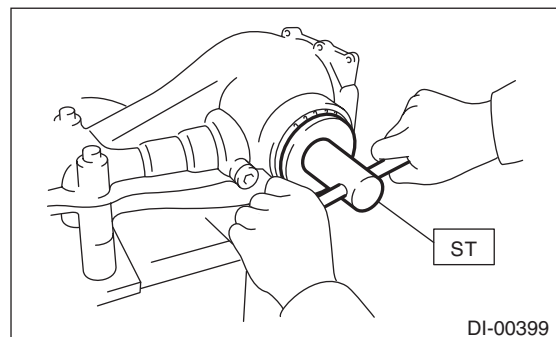
(1) Turn the drive pinion with ST for better fitting of differential side bearing.

ST 498427200 FLANGE WRENCH



(2) Using the ST, tighten the side retainer RH, and then tighten the side retainer LH until there is no backlash.

ST 18630AA010 WRENCH COMPL RETAINER



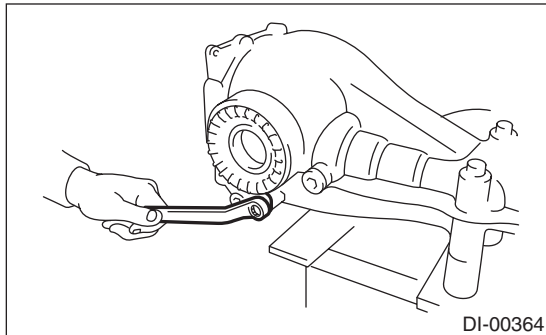
## Rear Differential (VA-type)

### DIFFERENTIALS

- (3) Loosen the side retainer LH by approx. 1 and 1/2 teeth, and tighten the side retainer RH by approx. 2 teeth [amount that the side retainer LH is turned back (1 and 1/2) + approx. 0.5 teeth]. Difference between [amount that the side retainer LH is turned back (approx. 1 and 1/2 teeth)] and [amount that the side retainer RH is tightened (approx. 2 teeth)] gives preload.
- (4) Temporarily tighten the lock plate.

#### NOTE:

Turn over the lock plate to shift the holder by 1/2 tooth.



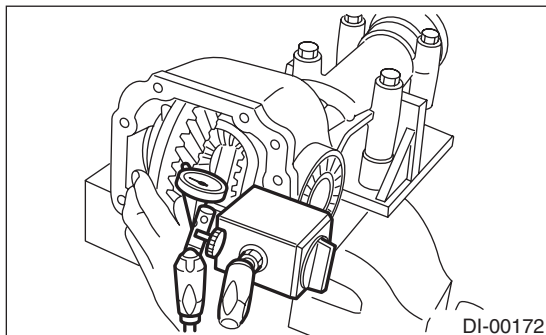
- (5) Measure the hypoid driven gear-to-drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with tooth face of hypoid driven gear, and move hypoid driven gear while holding drive pinion still. Read the value indicated on dial gauge.

#### NOTE:

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

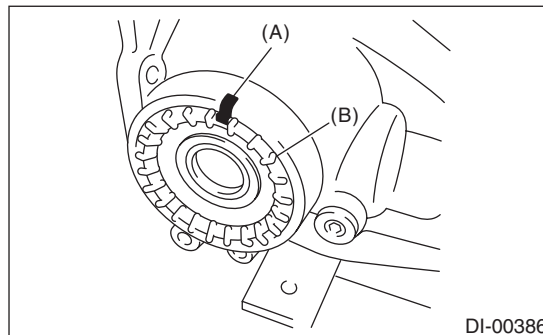
#### **Backlash:**

**0.10 — 0.15 mm (0.004 — 0.006 in)**



- 17) Put alignment marks on both the differential carrier and side retainer. Remove the side retainer side at a time.

Replace them in the original position after inserting an O-ring and applying differential gear oil to the threaded portion.



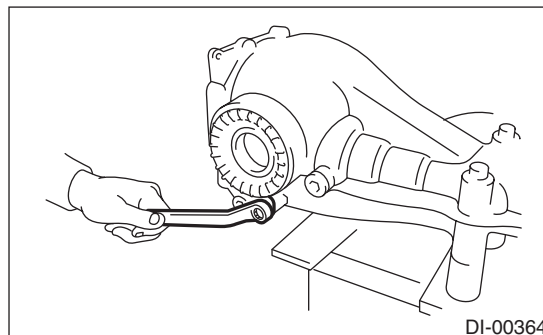
(A) Alignment mark

(B) Side retainer

- 18) Tighten the bolt of lock plate to specified torque.

#### **Tightening torque:**

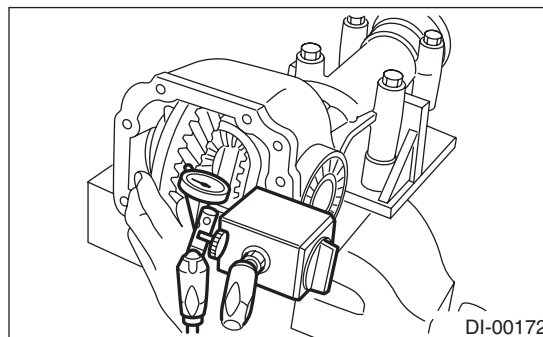
**25 N·m (2.5 kgf-m, 18.4 ft-lb)**



- 19) Recheck the hypoid driven gear to pinion backlash.

#### **Backlash:**

**0.10 — 0.15 mm (0.004 — 0.006 in)**



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

(1) Apply lead-free red dye evenly on the both sides of three to four teeth of the hypoid driven gear. Check the contact pattern after rotating the hypoid driven gear several revolutions back and forth until a definite contact pattern appears on the hypoid driven gear.

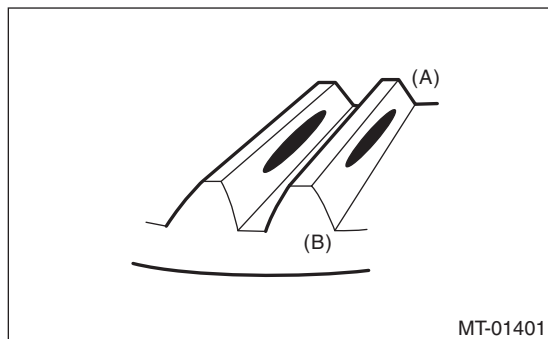
(2) When the contact pattern is not correct, re-adjust.

#### NOTE:

Be sure to wipe off the lead-free red dye completely 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.)**

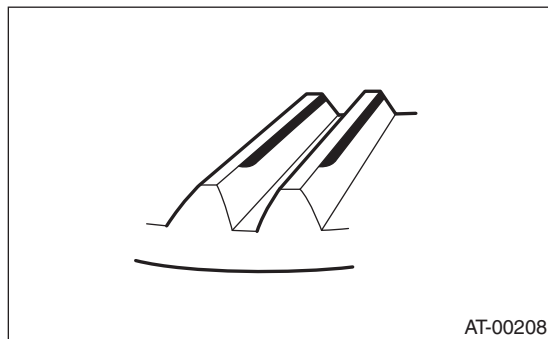


- (A) Toe side  
(B) Heel side

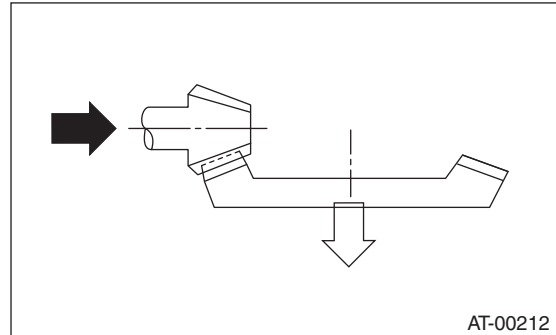
- Face contact

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

Contact pattern



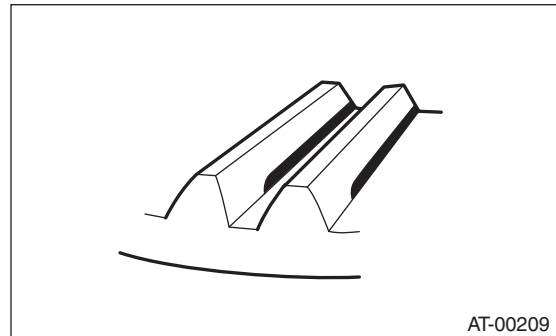
Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.



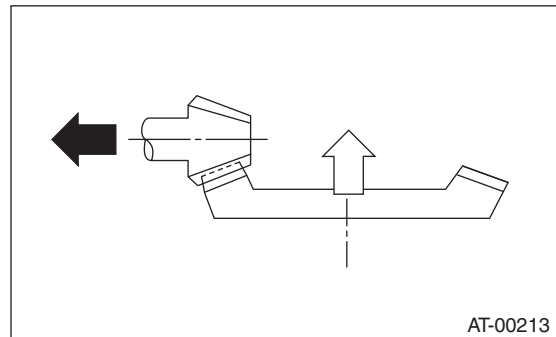
- Flank contact

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

Contact pattern



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



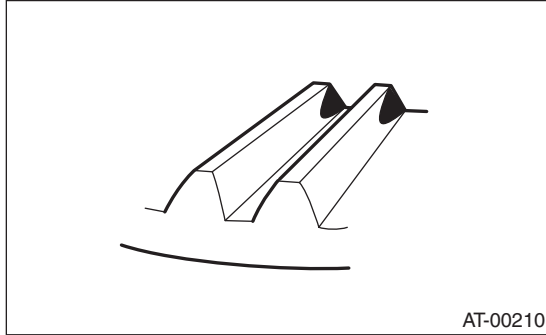
## Rear Differential (VA-type)

### DIFFERENTIALS

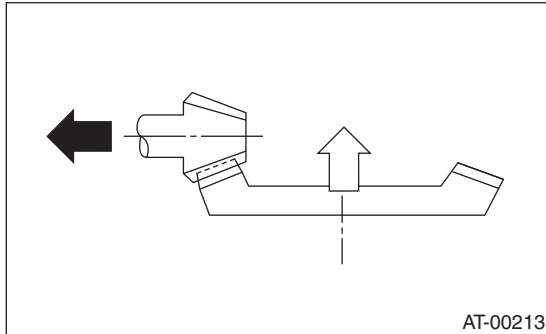
- Toe contact (inside contact)

**Check item: Teeth contact area is too small.**

Contact pattern



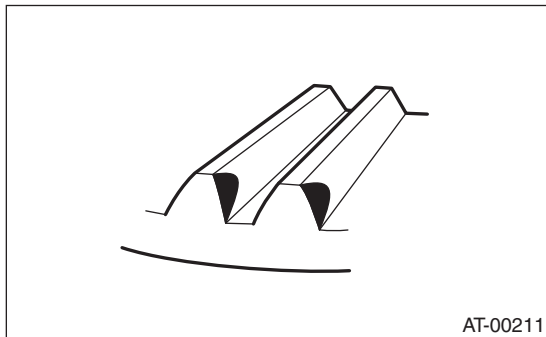
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



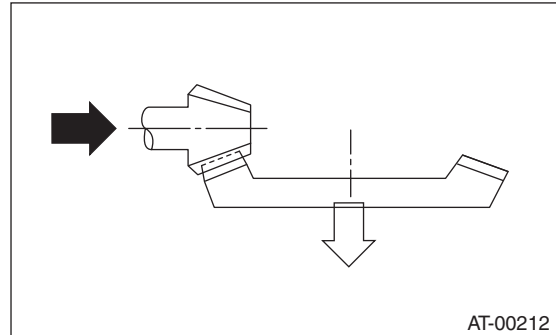
- Heel contact (outside end contact)

**Check item: Teeth contact area is too small.**

Contact pattern



Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.

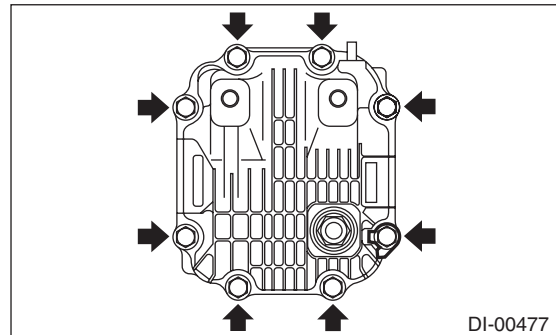


21) If correct tooth contact is not obtained, readjust the drive pinion height and the differential side bearing preload (already mentioned) and the hypoid gear backlash.

22) Install the new gasket, rear cover and ground stay to the differential carrier, and tighten the bolts to the specified torque.

**Tightening torque:**

**34 N·m (3.5 kgf-m, 25.1 ft-lb)**

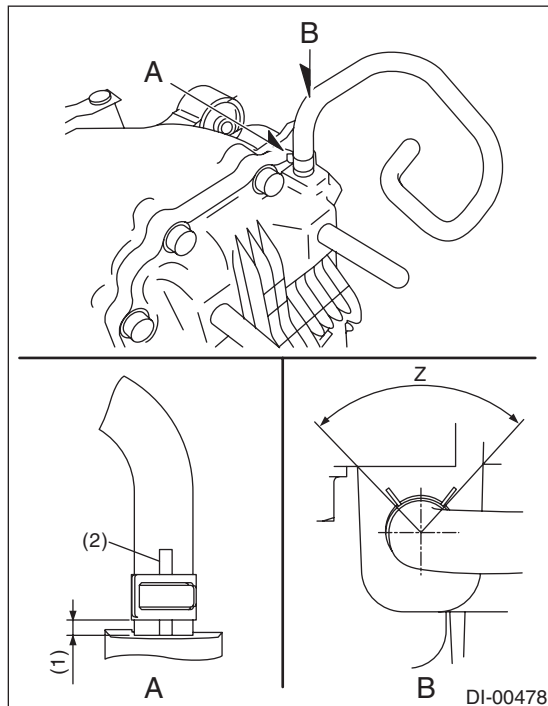


23) Using new gaskets, install the rear differential oil temperature switch.

**Tightening torque:**

**60 N·m (6.1 kgf-m, 44.3 ft-lb)**

24) Affix with the attachment clip so that the white marking of the hose is within the range of Z (87°).



- (1) 0 — 1 mm (0 — 0.04 in)
- (2) Marking

25) Install a new gasket and a new oil drain plug.

### **Tightening torque:**

**50 N·m (5.1 kgf·m, 36.9 ft·lb)**

26) Install the filler plug.

## **E: INSPECTION**

Wash all the disassembled parts clean, and examine them for wear, damage or 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) Thrust washer of side gear and pinion mate gear  
Replace if seizure, cracking, abnormal wear or other defect is evident.

4) Bearing

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

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, seized or cracked.

8) Companion flange

Replace if the oil seal lip contact surface shows cracking.

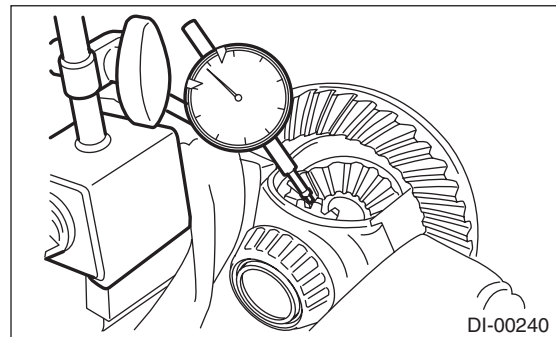
### **1. SIDE GEAR BACKLASH**

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

#### **Side gear backlash:**

**0.13 — 0.18 mm (0.005 — 0.007 in)**

If the side gear backlash is not within the specification, select the side gear thrust washer and adjust the side gear backlash as specified.



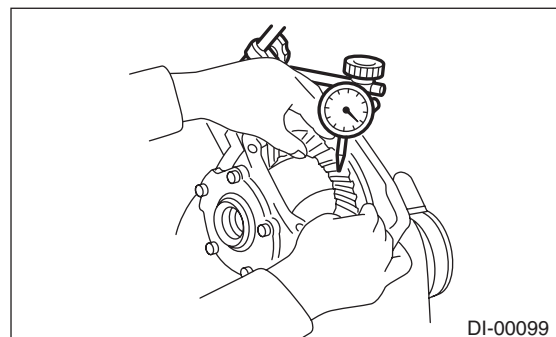
### **2. HYPOID DRIVEN GEAR BACKLASH**

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

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

**0.10 — 0.15 mm (0.004 — 0.006 in)**

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



## Rear Differential (VA-type)

### DIFFERENTIALS

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

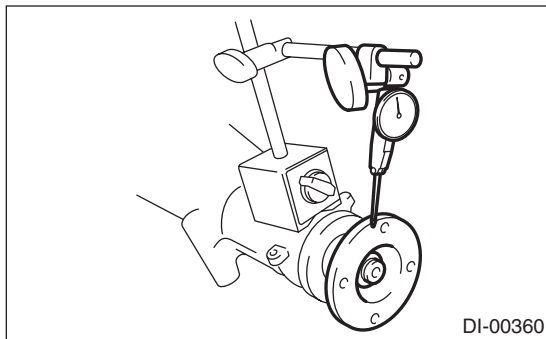
Inspect the tooth contact between the hypoid driven gear and the drive pinion. <Ref. to DI-25, ASSEMBLY, Rear Differential (VA-type).>

#### 4. 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:**

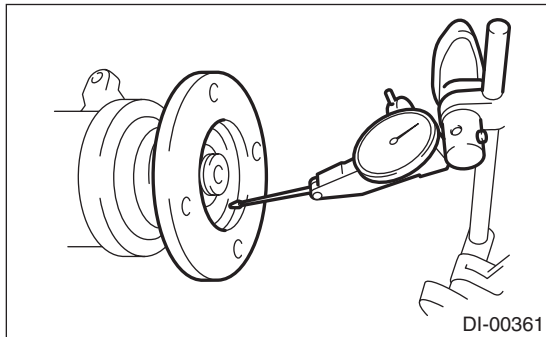
**0.08 mm (0.003 in)**



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

**Limit of runout:**

**0.08 mm (0.003 in)**

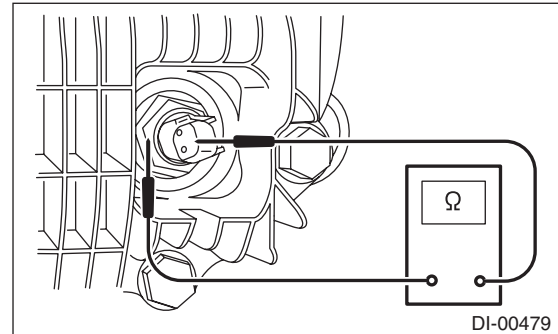


- 4) If either runout exceeds the limit, move the phase of companion flange and drive pinion 90° each, and find the point where the runout will be within the limit.
- 5) If the runout exceeds the limit when changing the phase, replace the companion flange and re-check the runout.
- 6) If the runout exceeds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

#### 5. REAR DIFFERENTIAL OIL TEMPERATURE SWITCH

Inspect the continuity of the rear differential oil temperature switch.

| Specified resistance | Criteria    |
|----------------------|-------------|
| Less than 1 $\Omega$ | Normal      |
| 1 M $\Omega$ or more | Replacement |



#### F: ADJUSTMENT

##### 1. SIDE GEAR BACKLASH

Adjust the side gear backlash. <Ref. to DI-25, ASSEMBLY, Rear Differential (VA-type).>

##### 2. HYPOID DRIVEN GEAR BACKLASH

Adjust hypoid driven gear backlash. <Ref. to DI-25, ASSEMBLY, Rear Differential (VA-type).>

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

Adjust the tooth contact between hypoid driven gear and drive pinion gear. <Ref. to DI-25, ASSEMBLY, Rear Differential (VA-type).>