

# DRIVE SHAFT SYSTEM

# *DS*

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# GENERAL DESCRIPTION

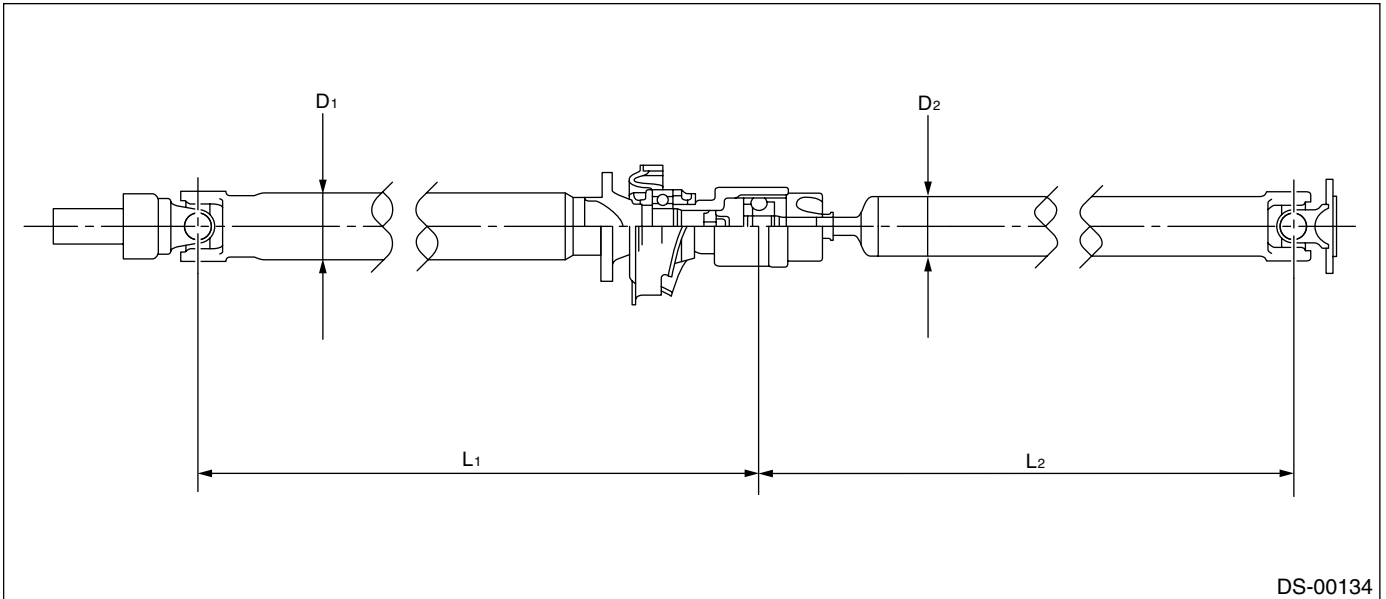
DRIVE SHAFT SYSTEM

## 1. General Description

### A: SPECIFICATIONS

#### 1. PROPELLER SHAFT

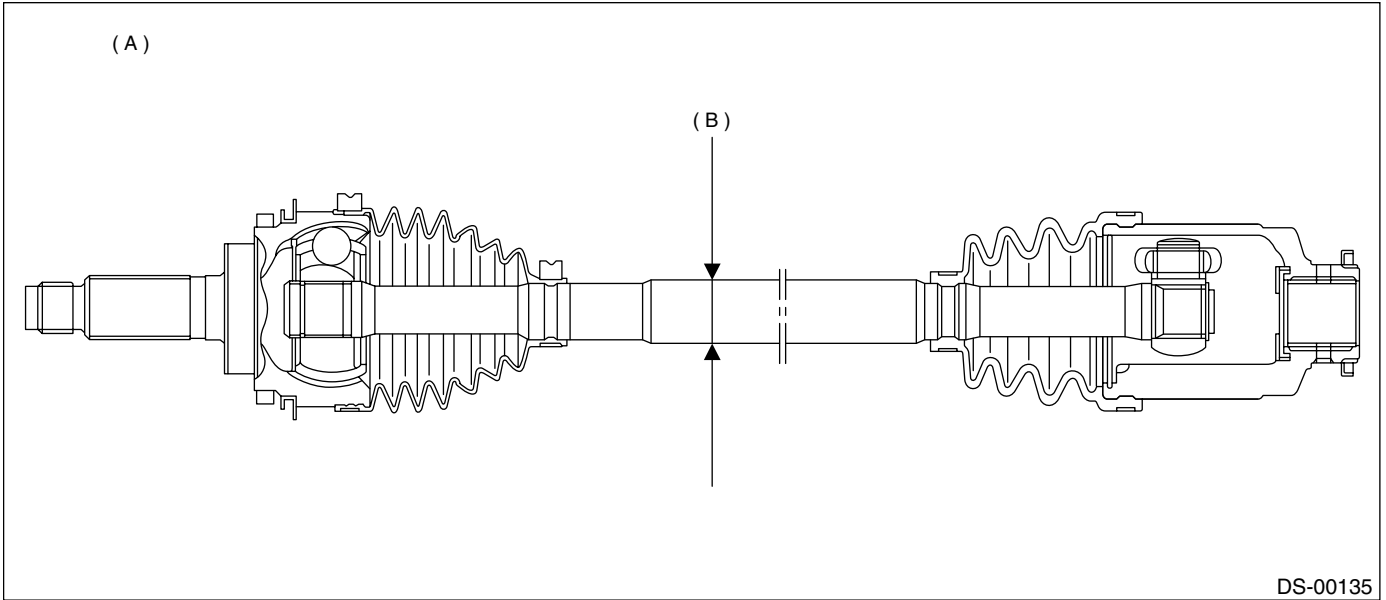
Propeller shaft type		DOJ type
Front propeller shaft Joint-to-joint length: $L_1$ mm (in)	AT	629 (24.76)
	MT	688 (27.09)
Rear propeller shaft Joint-to-joint length: $L_2$ mm (in)		773 (30.43)
Outside diameter of tube: mm (in)	$D_1$	63.5 (2.500)
	$D_2$	57.0 (2.244)



## 2. FRONT DRIVE SHAFT ASSEMBLY

### • Non-TURBO model

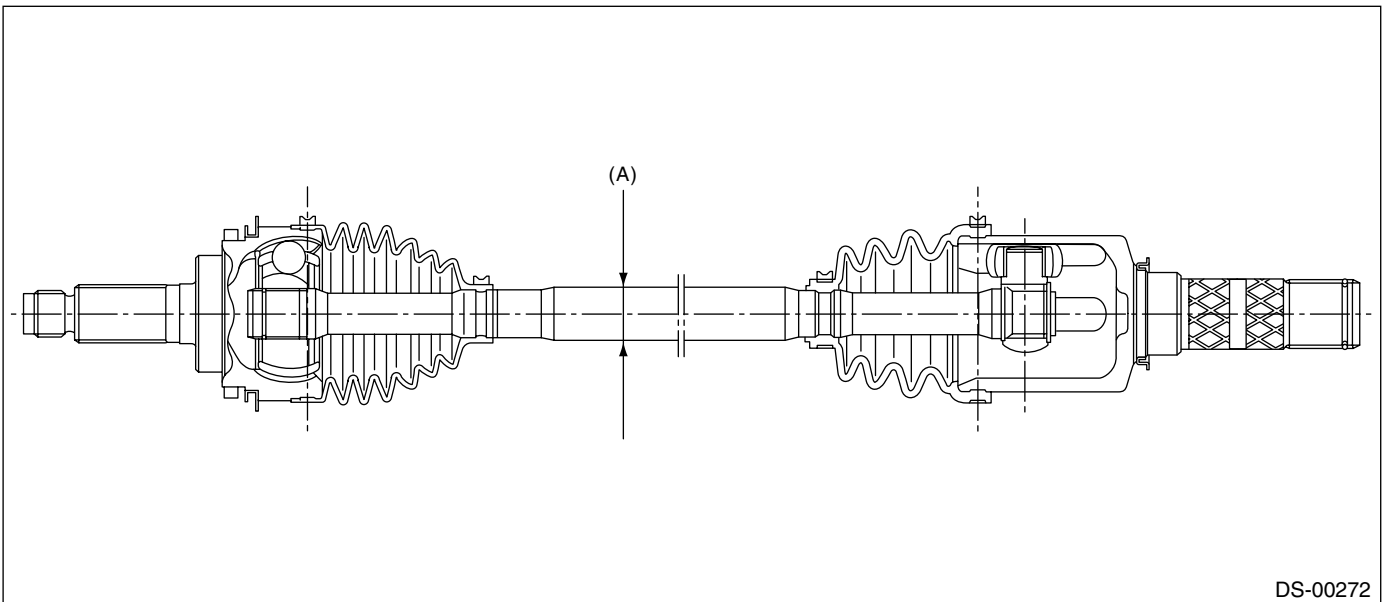
Size	$\phi$ mm (in)
BJ87+SFJ82	26 mm (1.02 in)



- (A) BJ87+SFJ82
- (B) Measuring point

### • TURBO model

Size	mm (in)	$\phi$ D mm (in)
AC2300/AAR2300i	513 (20.2)	24.9 (0.98)

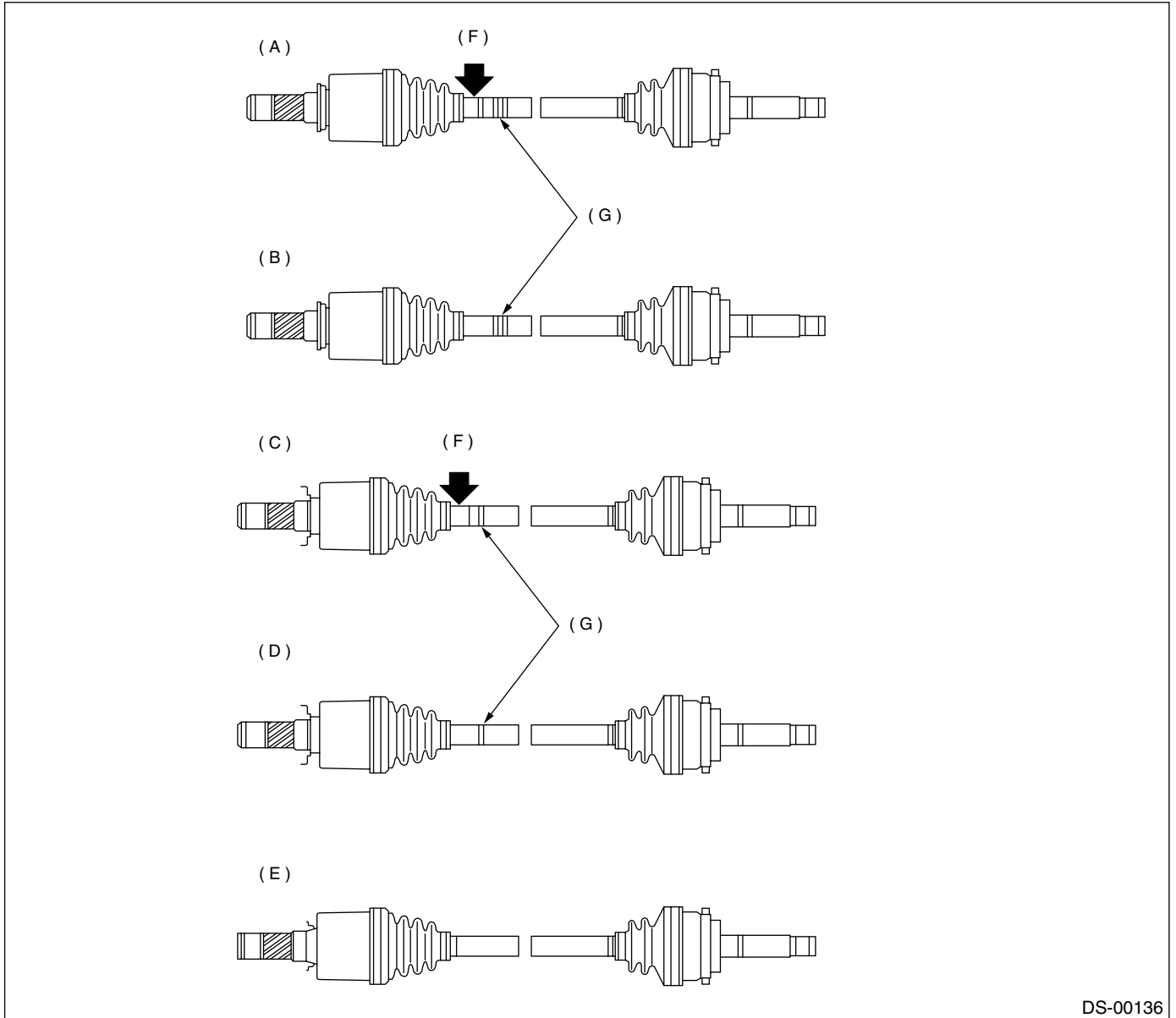


# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

### 3. REAR DRIVE SHAFT ASSEMBLY

Type of axle shaft assembly	SHAFT
	No. of identification, protrusion on shaft
82AC-RH, 82AC-LH	2 (Two)
79AC-RH, 79AC-LH	1 (One)
79AC	None



DS-00136

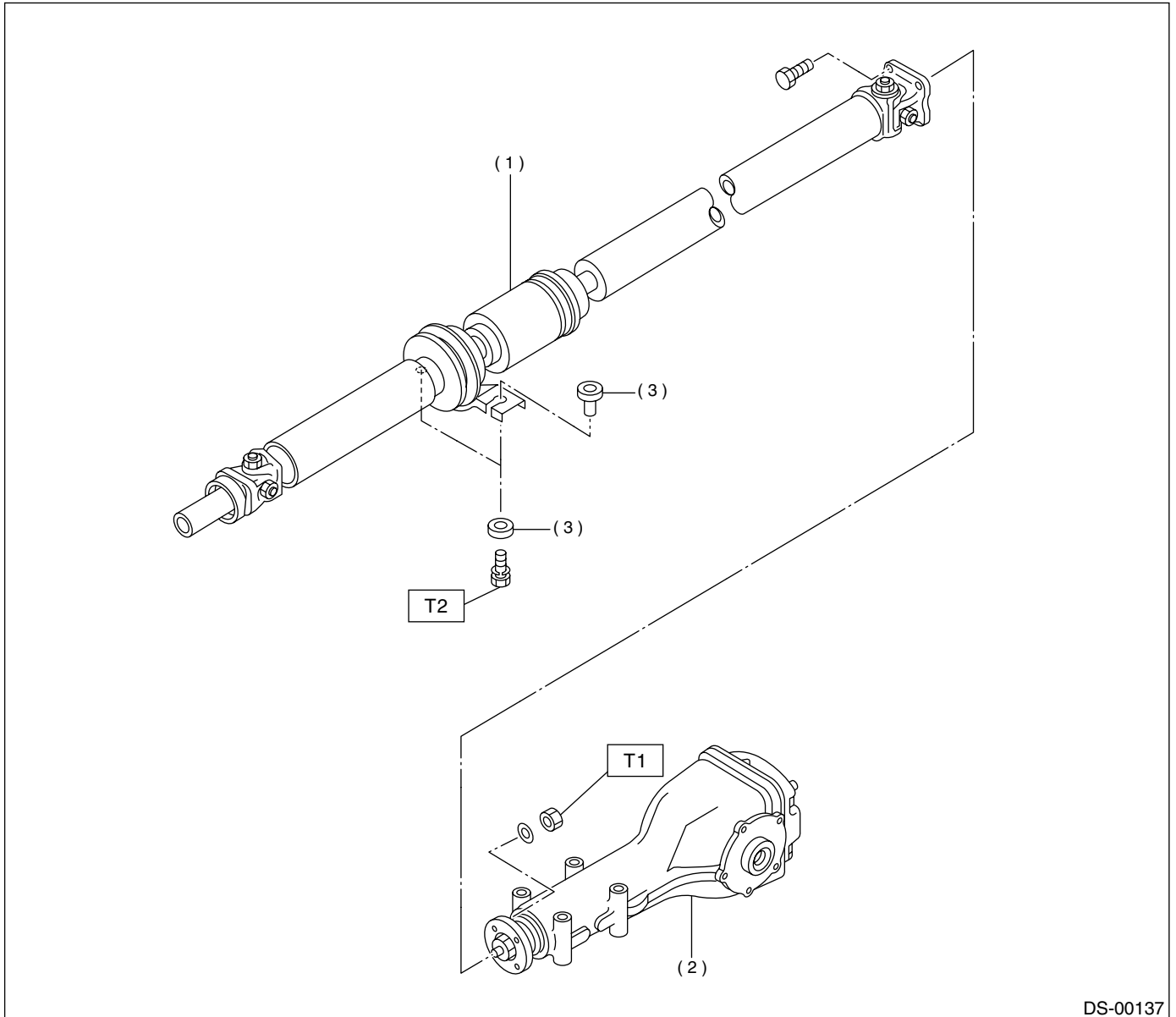
- (A) 82AC-RH
- (B) 82AC-LH
- (C) 79AC-RH

- (D) 79AC-LH
- (E) 79AC
- (F) Indication mark of RH

- (G) Identification protrusion

## B: COMPONENT

### 1. PROPELLER SHAFT



DS-00137

- (1) Propeller shaft
- (2) Rear differential
- (3) Bushing

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

**T1: 31 (3.2, 23.1)**

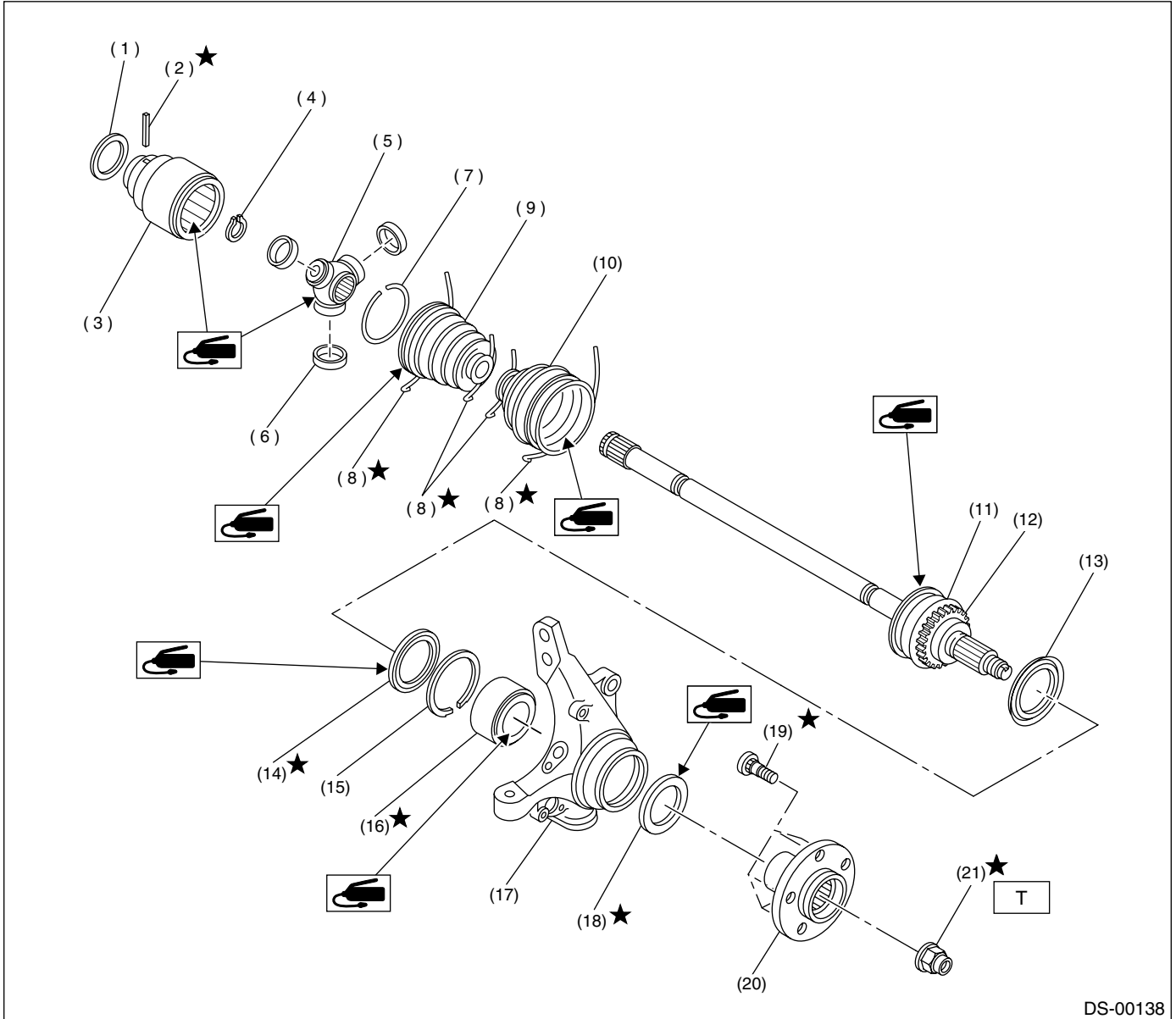
**T2: 52 (5.3, 38.3)**

# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

### 2. FRONT AXEL

#### • Non-TURBO model



DS-00138

- (1) Baffle plate (SFJ)
- (2) Spring pin
- (3) Outer race (SFJ)
- (4) Snap ring
- (5) Trunnion
- (6) Free ring
- (7) Circlip
- (8) Boot band
- (9) Boot (SFJ)

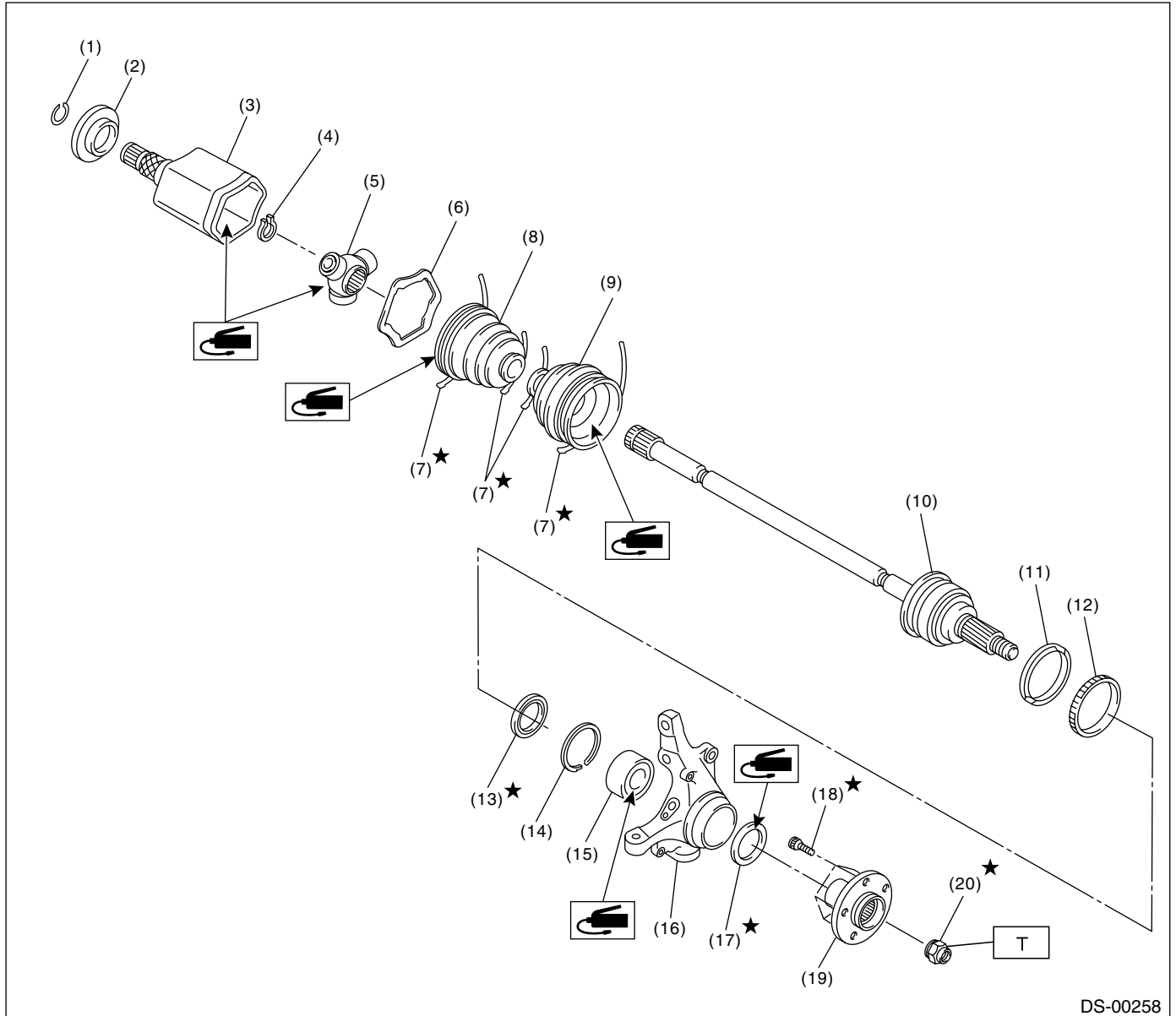
- (10) Boot (BJ)
- (11) BJ ASSY
- (12) Tone wheel
- (13) Baffle plate
- (14) Oil seal (IN)
- (15) Snap ring
- (16) Bearing
- (17) Housing
- (18) Oil seal (OUT)

- (19) Hub bolt
- (20) Hub
- (21) Axle nut (Olive color)

**Tightening torque: N-m (kgf-m, ft-lb)**  
**T: 216 (22, 159)**

# GENERAL DESCRIPTION

• **TURBO model**



DS-00258

- (1) Spring pin
- (2) Baffle plate (AAR)
- (3) Outer race (AAR)
- (4) Snap ring
- (5) Trunnion
- (6) Retainer
- (7) Boot band
- (8) Boot (AAR)

- (9) Boot (AC)
- (10) AC ASSY
- (11) Tone wheel
- (12) Baffle plate
- (13) Oil seal (IN)
- (14) Snap ring
- (15) Bearing
- (16) Housing

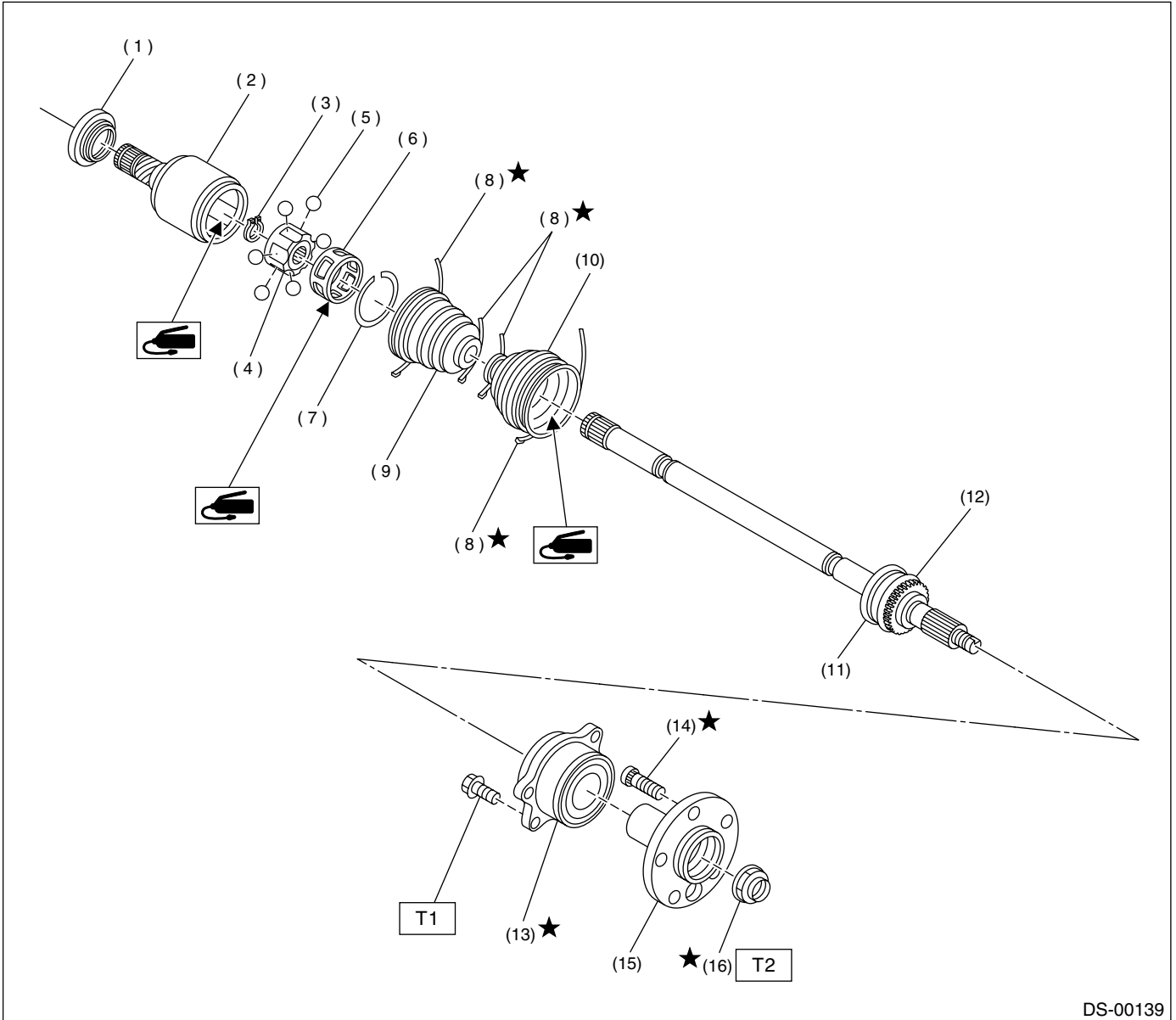
- (17) Oil seal (OUT)
- (18) Hub bolt
- (19) Hub
- (20) Axle nut

**Tightening torque: N-m (kgf-m, ft-lb)**  
**T: 216 (22, 159)**

# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

### 3. REAR AXLE



DS-00139

- (1) Baffle plate (DOJ)
- (2) Outer race (DOJ)
- (3) Snap ring
- (4) Inner race
- (5) Ball
- (6) Cage
- (7) Circlip

- (8) Boot band
- (9) Boot (DOJ)
- (10) Boot (BJ)
- (11) BJ ASSY
- (13) Hub unit bearing
- (14) Hub bolt

- (15) Hub
- (16) Axle nut (Olive color)

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

**T1: 66 (6.7, 48.5)**

**T2: 235 (24, 174)**



### **C: CAUTION**

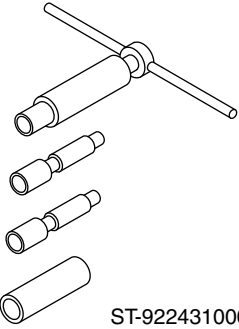
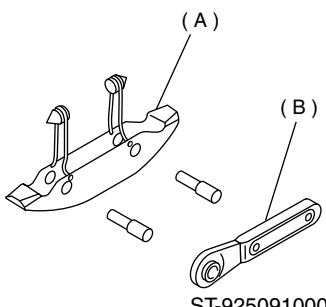
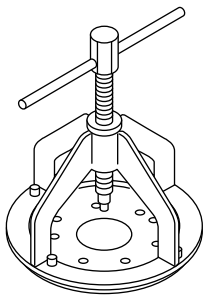
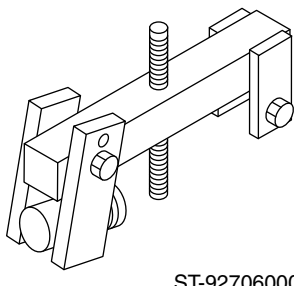
- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of grease to avoid damage and deformation.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vise.

# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

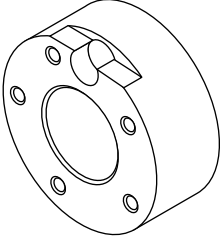
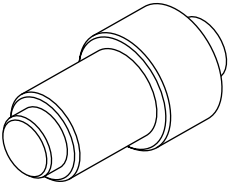
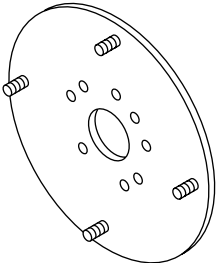
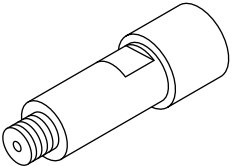
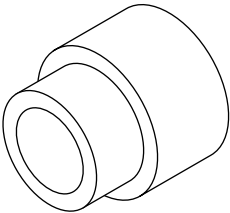
### D: PREPARATION TOOL

#### 1. SPECIAL TOOLS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-922431000</p>	922431000	AXLE SHAFT INSTALLER	<ul style="list-style-type: none"> <li>• Used for installing axle shaft into housing.</li> <li>• Used with ADAPTER (927390000).</li> </ul>
 <p style="text-align: center;">ST-925091000</p>	925091000	BAND TIGHTENING TOOL	<ul style="list-style-type: none"> <li>• Used for tightening boot band.</li> <li>(A) Jig for band</li> <li>(B) Ratchet wrench</li> </ul>
 <p style="text-align: center;">ST-926470000</p>	926470000	AXLE SHAFT PULLER	Used for removing axle shaft.
 <p style="text-align: center;">ST-927060000</p>	927060000	HUB REMOVER	<ul style="list-style-type: none"> <li>• Used for removing front hub.</li> <li>• Used with HUB STAND (927080000).</li> </ul>

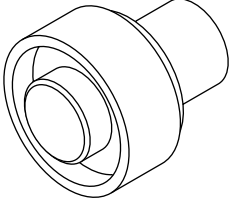
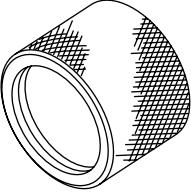
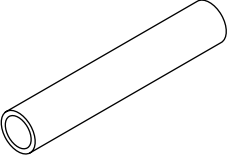
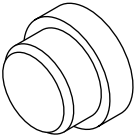
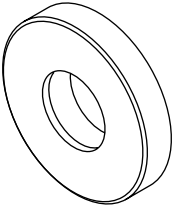
# GENERAL DESCRIPTION

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927080000</p>	927080000	HUB STAND	Used for disassembling and assembling hub bolt in hub.
 <p style="text-align: center;">ST-927100000</p>	927100000	BEARING PULLER	<ul style="list-style-type: none"> <li>• Used for disassembling and assembling front housing bearing.</li> <li>• Used with HOUSING STAND (927400000).</li> </ul>
 <p style="text-align: center;">ST-927140000</p>	927140000	AXLE SHAFT PULLER PLATE	Same as plate 2 included in AXLE SHAFT PULLER (926470000).
 <p style="text-align: center;">ST-927390000</p>	927390000	ADAPTER	Used as an adapter for AXLE SHAFT INSTALLER (922431000).
 <p style="text-align: center;">ST-927400000</p>	927400000	HOUSING STAND	<ul style="list-style-type: none"> <li>• Used for disassembling and assembling front housing bearing.</li> <li>• Used with BEARING PULLER (927100000).</li> </ul>

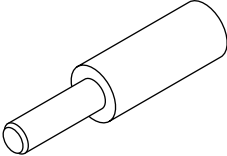
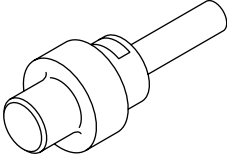
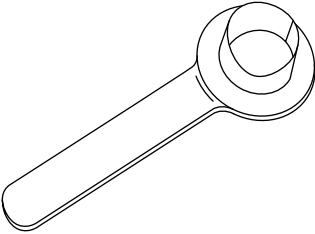
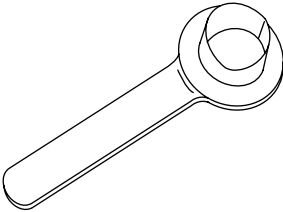
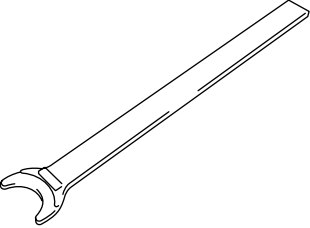
# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927410000</p>	<p style="text-align: center;">927410000</p>	<p>OIL SEAL INSTALLER</p>	<ul style="list-style-type: none"> <li>• Used for installing oil seal into front housing.</li> <li>• Used with HOUSING STAND (927400000).</li> </ul>
 <p style="text-align: center;">ST18675AA000</p>	<p style="text-align: center;">18675AA000</p>	<p>DIFFERENTIAL SIDE OIL SEAL INSTALLER</p>	<p>Used for installing differential side retainer oil seal.</p>
 <p style="text-align: center;">ST-398507703</p>	<p style="text-align: center;">398507703</p>	<p>DUMMY COLLAR</p>	<p>Used for removing hub ASSY from hub unit.</p>
 <p style="text-align: center;">ST-399520105</p>	<p style="text-align: center;">399520105</p>	<p>SEAT</p>	<p>Used for removing inner race from hub ASSY.</p>
 <p style="text-align: center;">ST28499AE000</p>	<p style="text-align: center;">28499AE000</p>	<p>BEARING SPACER</p>	<p>Used for installing hub unit into hub ASSY.</p>

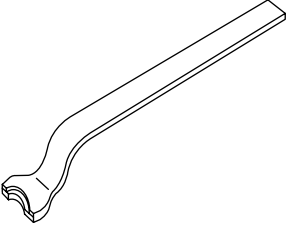
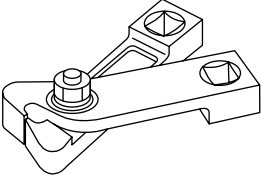
# GENERAL DESCRIPTION

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927120000</p>	927120000	HUB INSTALLER	Used for installing hub.
 <p style="text-align: center;">ST-927450000</p>	927450000	HUB INSTALLER	<ul style="list-style-type: none"> <li>• Used for installing hub unit into hub ASSY.</li> <li>• Used with BEARING SPACER (28499AE000) and HUB STAND (927080000).</li> </ul>
 <p style="text-align: center;">ST28399SA010</p>	28399SA010	OIL SEAL PRO- TECTOR	<ul style="list-style-type: none"> <li>• Used for installing front drive shaft into front differential.</li> <li>• For protecting oil seal.</li> </ul>
 <p style="text-align: center;">ST28099PA090</p>	28099PA090	OIL SEAL PRO- TECTOR	<ul style="list-style-type: none"> <li>• Used for installing rear drive shaft into rear differential.</li> <li>• For protecting oil seal.</li> </ul>
 <p style="text-align: center;">ST28399SA000</p>	28399SA000	DRIVE SHAFT REMOVER	Used for removing front drive shaft from front differential.

# GENERAL DESCRIPTION

## DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST28099PA100</p>	28099PA100	DRIVE SHAFT REMOVER	Used for removing rear drive shaft from rear differential.
 <p style="text-align: center;">ST28099AC000</p>	28099AC000	BOOT BAND PLIERS	Used for tightening front BJ boot band.

## 2. GENERAL PURPOSE TOOLS

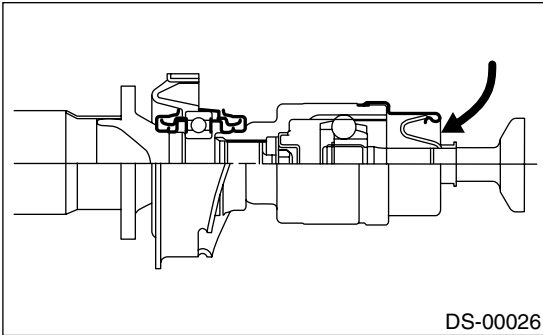
TOOL NAME	REMARKS
Puller	Used for removing ball joint from knuckle arm.
Dial Gauge	Used for inspecting propeller shaft run-out.
Snap Ring Pliers	Used for installing and removing snap ring.

## 2. Propeller Shaft

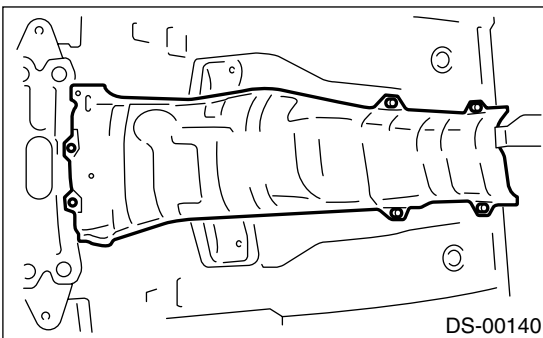
### A: REMOVAL

**NOTE:**

- Before removing propeller shaft, wrap metal parts with a cloth or rubber material.
- In case of DOJ type, before removing propeller shaft, wrap metal parts (installed at the rubber boot of center DOJ) with a cloth or rubber material, as shown in the figure. Rubber boot may be damaged due to interference with adjacent metal parts while bending the DOJ during removal.



- 1) Disconnect ground cable from battery.
- 2) Move select lever or gear shift lever to "N".
- 3) Release the parking brake.
- 4) Jack-up vehicle and support it with safety stands.
- 5) Remove center exhaust pipes.
- 6) Remove rear exhaust pipe and muffler.
- 7) Remove heat shield cover.

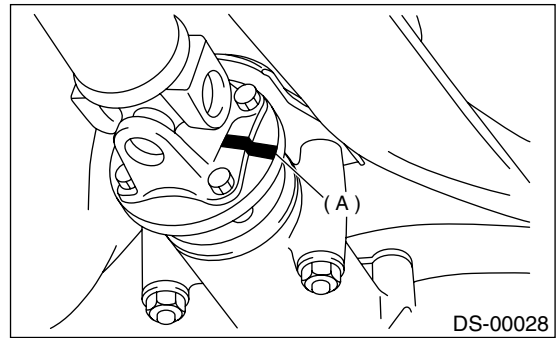


- 8) Put matching marks on propeller shaft and rear differential.

- 9) Remove the four bolts which hold propeller shaft to rear differential.

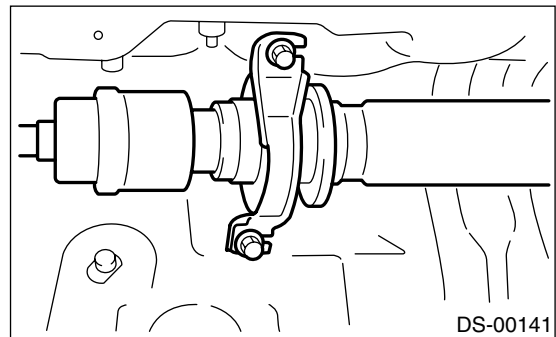
**NOTE:**

Remove all but one bolt.



(A) Matching mark

- 10) Remove the two bolts which hold center bearing to vehicle body.



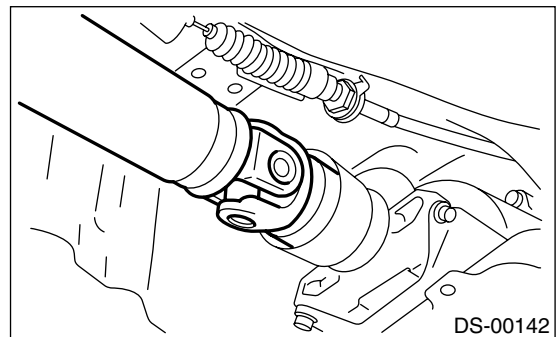
- 11) Remove propeller shaft from transmission.

**CAUTION:**

Be careful not to damage oil seals and the mating surface of sleeve yoke.

**NOTE:**

- Be sure to use an empty oil can to catch oil flowing out when removing propeller shaft.
- Be sure to plug the opening in transmission after removal of propeller shaft.



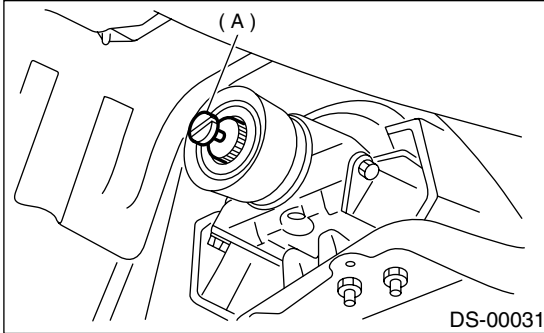
# PROPELLER SHAFT

## DRIVE SHAFT SYSTEM

12) Install the extension cap to transmission.

### NOTE:

If extension cap is not available, cover the opening with a vinyl etc. and hold it with tape or code. Be careful not to spill gear oil or ATF leakage on the floor.



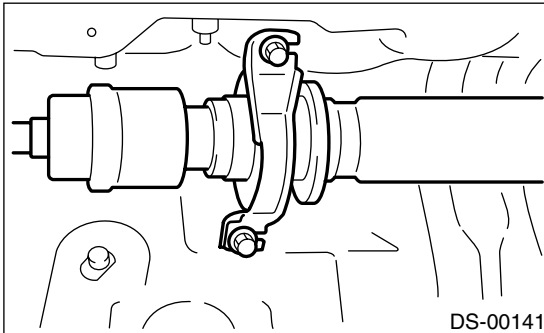
(A) Extension cap

## B: INSTALLATION

1) Insert sleeve yoke into transmission and attach center bearing to vehicle body.

### Tightening torque:

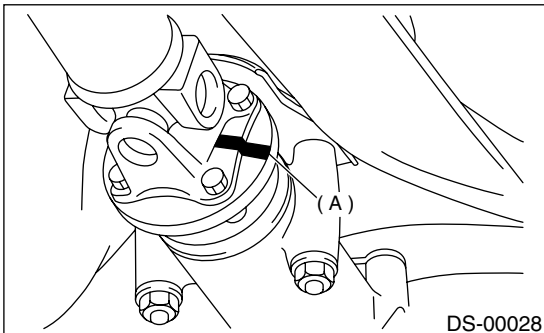
**52 N·m (5.3 kgf-m, 38.3 ft-lb)**



2) Align matching marks and connect flange yoke and rear differential.

### Tightening torque:

**31 N·m (3.2 kgf-m, 23.1 ft-lb)**



(A) Matching mark

3) Install heat shield cover.

4) Install center exhaust pipes.

5) Install rear exhaust pipe and muffler.

## C: INSPECTION

### NOTE:

Do not disassemble propeller shaft. Check the following and replace if defective.

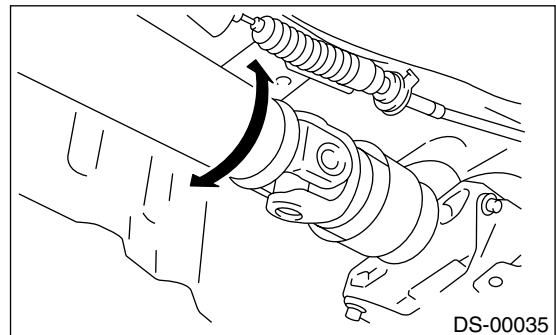
- 1) Tube surfaces for dents or cracks
  - 2) Splines for deformation or abnormal wear
  - 3) Joints for non-smooth operation or abnormal noise
  - 4) Center bearing for free play, noise or non-smooth operation
  - 5) Oil seals for abnormal wear or damage
  - 6) Center bearing for breakage
- Check the following points with propeller shaft installed in vehicle.

## 1. JOINTS AND CONNECTIONS

- 1) Remove center exhaust pipes.
- 2) Remove heat shield cover.
- 3) Check for any looseness of yoke flange connecting bolts and center bearing retaining bolts.

## 2. SPLINES AND BEARING LOCATIONS

- 1) Remove center exhaust pipes.
- 2) Remove rear exhaust pipe and muffler.
- 3) Remove heat shield cover.
- 4) Turn propeller shaft by hand to see if abnormal free play exists at splines. Also move yokes to check if abnormal free play exists at spiders and bearings.





## 3. RUNOUT OF PROPELLER SHAFT

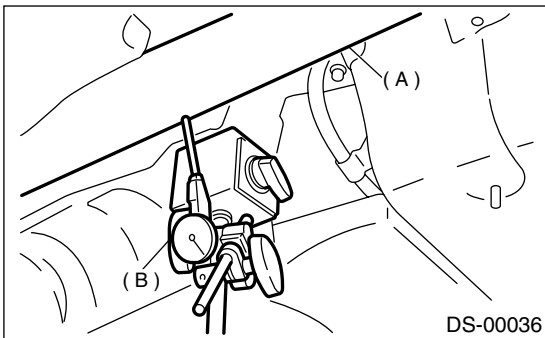
- 1) Remove center exhaust pipes.
- 2) Remove rear exhaust pipe and muffler.
- 3) Remove heat shield cover.
- 4) Turn rear wheels by hand to check for “runout” of propeller shaft.

**NOTE:**

Measure runout with a dial gauge at the center of front and rear propeller shaft tubes.

**Runout:**

**Limit 0.6 mm (0.024 in)**

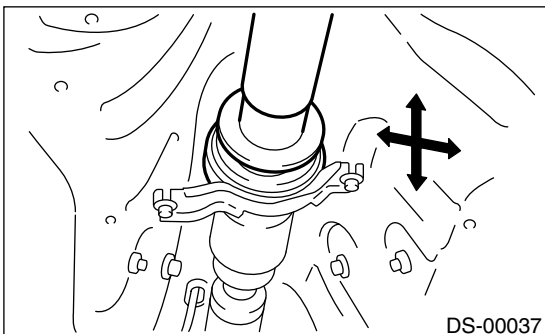


(A) Propeller shaft

(B) Dial gauge

## 4. CENTER BEARING FREE PLAY

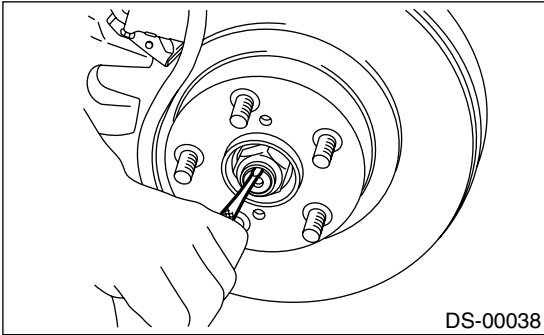
- 1) Remove front and center exhaust pipes.
- 2) Remove rear exhaust pipe and muffler.
- 3) Remove heat shield cover.
- 4) While holding propeller shaft near center bearing with your hand, move it up and down, and left and right to check for any abnormal bearing free play.



### 3. Front Axle

#### A: REMOVAL

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, support it with safety stands, and remove front wheels.
- 3) Unlock axle nut.

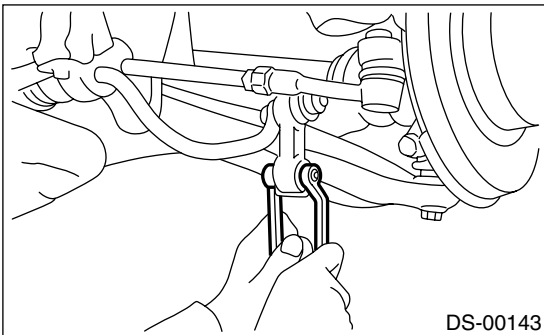


- 4) Remove axle nut while depressing brake pedal to prevent front drive shaft from turning.

#### CAUTION:

**Be sure to loose and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.**

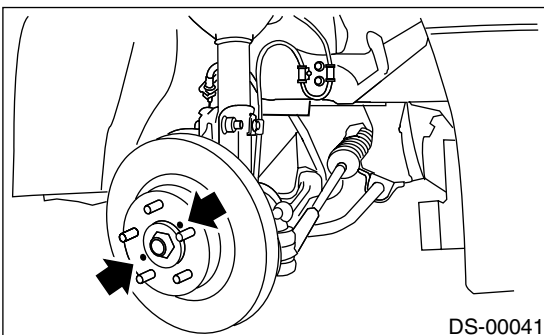
- 5) Remove stabilizer link.



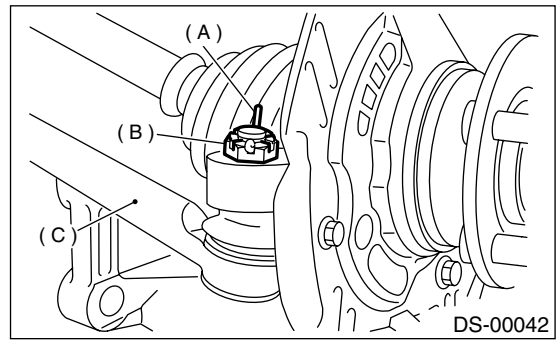
- 6) Remove disc brake caliper from housing, and suspend it from strut using a wire.

- 7) Remove disc rotor from hub.

If disc rotor seizes up within hub, drive disc rotor out by installing an 8-mm bolt in screw hole on the rotor.

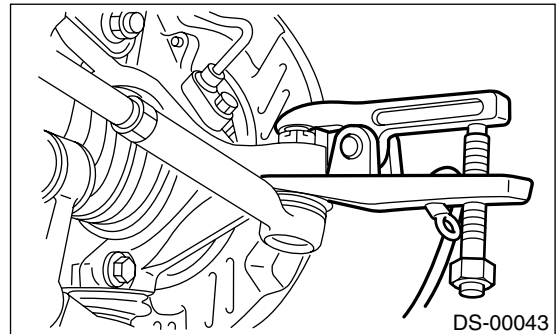


- 8) Remove cotter pin and castle nut which secure tie-rod end to housing knuckle arm.

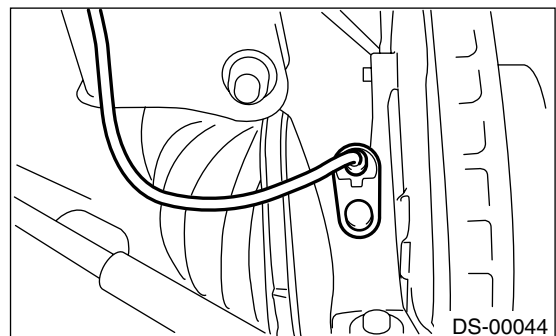


- (A) Cotter pin
- (B) Castle nut
- (C) Tie-rod

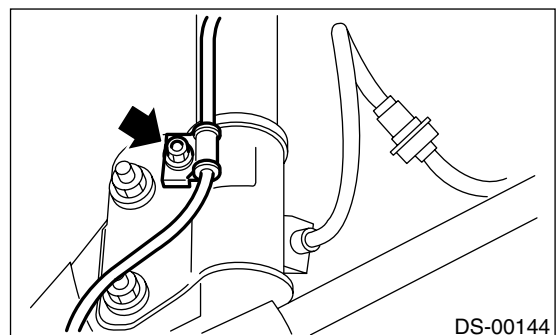
- 9) Using a puller, remove tie-rod ball joint from knuckle arm.



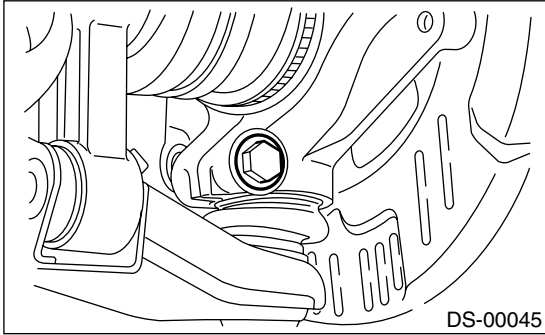
- 10) Remove ABS sensor assembly and harness.



- 11) Remove bolt which secures sensor harness to strut.



12) Remove transverse link ball joint from housing.



13) Remove inner joint from transmission spindle.

**CAUTION:**

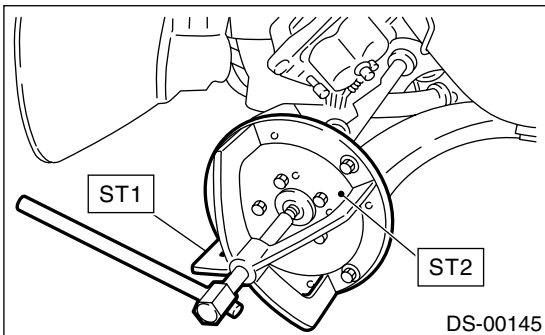
**Do not pull inner joint when removing front drive shaft.**

14) Remove front drive shaft assembly from hub. If it is hard to remove, use STs.

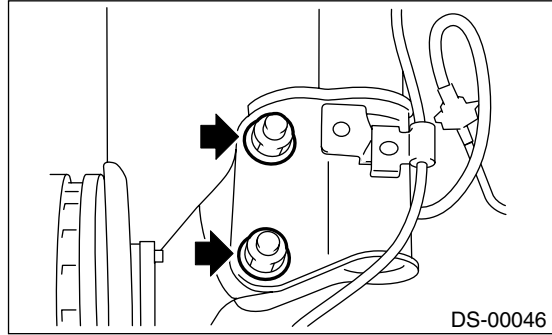
ST1 926470000 AXLE SHAFT PULLER  
ST2 927140000 PLATE

**CAUTION:**

- Be careful not to damage oil seal lip and tone wheel when removing front drive shaft.
- If front drive shaft is removed, replace inner oil seal with new one.



15) After scribing an alignment mark on camber adjusting bolt head, remove bolts which connect housing and strut, and disconnect housing from strut.



### B: INSTALLATION

1) While aligning alignment mark on camber adjusting bolt head, connect housing and strut.

**CAUTION:**

**When self-locking nut is removed, replace it with new one.**

**Tightening torque:**

**177 N·m (18.0 kgf-m, 130 ft-lb)**

2) Install front drive shaft. <Ref. to DS-31, INSTALLATION, Front Drive Shaft.>

3) Install transverse link ball joint to housing.

**Tightening torque:**

**49 N·m (5.0 kgf-m, 36 ft-lb)**

4) Install ABS sensor harness on strut.

5) Install ABS sensor on housing.

**Tightening torque:**

**32 N·m (3.3 kgf-m, 23.9 ft-lb)**

6) Install disc rotor on hub.

7) Install disc brake caliper on housing.

**Tightening torque:**

**78 N·m (8 kgf-m, 57.9 ft-lb)**

# FRONT AXLE

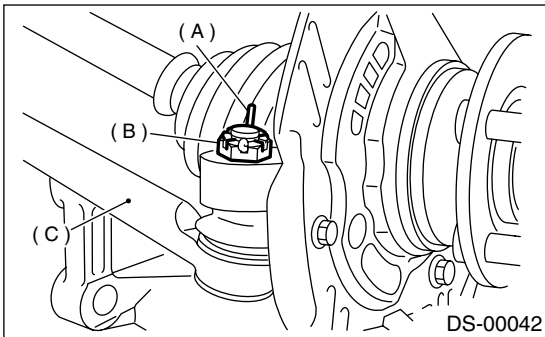
## DRIVE SHAFT SYSTEM

- 8) Connect stabilizer link.
- 9) Install tie-rod end.

**Tightening torque:**  
**27.0 N·m (2.75 kgf·m, 19.9 ft·lb)**

**CAUTION:**  
**Do not hammer the bottom of tie-rod end when installing it.**

10) After tightening castle nut to specified torque, retighten it further within 60° until a slot in castle nut is aligned with the ball joint hole. Insert cotter pin, and then bend the cotter pin around castle nut to secure it.



- (A) Cotter pin
- (B) Castle nut
- (C) Tie-rod

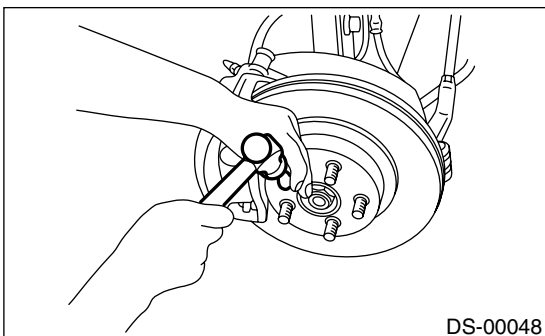
11) While depressing brake pedal to prevent front drive shaft from turning, tighten axle nut to specified torque .

**Tightening torque:**  
**216 N·m (22 kgf·m, 159 ft·lb)**

**CAUTION:**

- When axle nut is removed, replace it with new one. (3.0 L model: Olive color, 2.5 L model: Gold color).
- Always tighten axle nut before installing wheel on vehicle.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

12) After tightening axle nut, lock it securely.

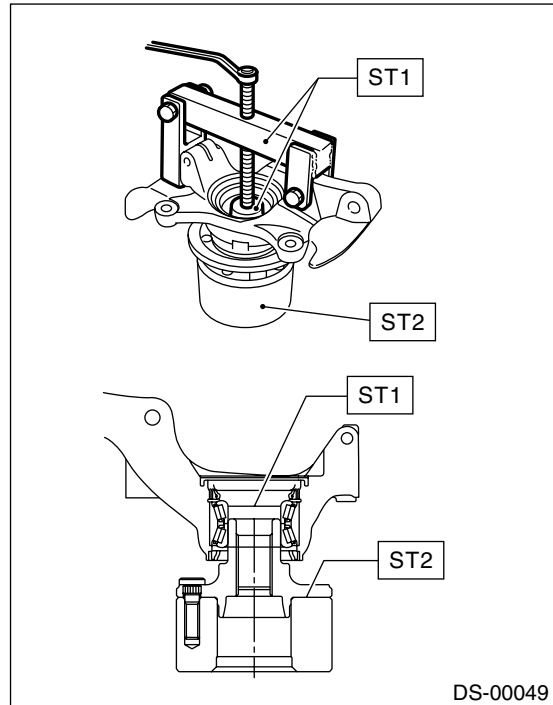


13) Install wheel and tighten wheel nuts to specified torque.

**Tightening torque:**  
**88 N·m (9 kgf·m, 65 ft·lb)**

## C: DISASSEMBLY

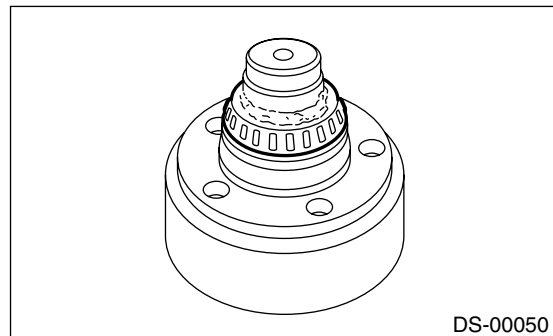
- 1) Using ST1, support housing and hub securely.
  - 2) Attach ST2 to housing and drive hub out.
- ST1 927060000 HUB REMOVER  
ST2 927080000 HUB STAND



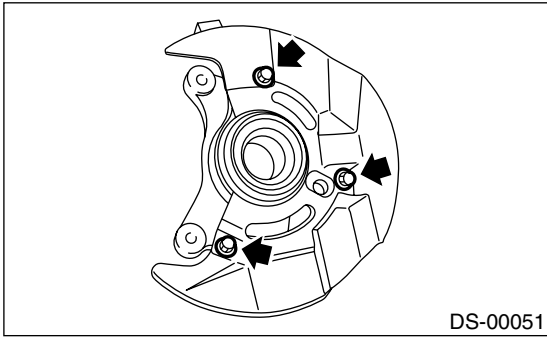
If inner bearing race remains in the hub, remove it with a suitable tool (commercially available).

**CAUTION:**

- Be careful not to scratch polished area of hub.
- Be sure to install inner race on the side of outer race from which it was removed.
- Replace the removed hub with new one.



3) Remove disc cover from housing.

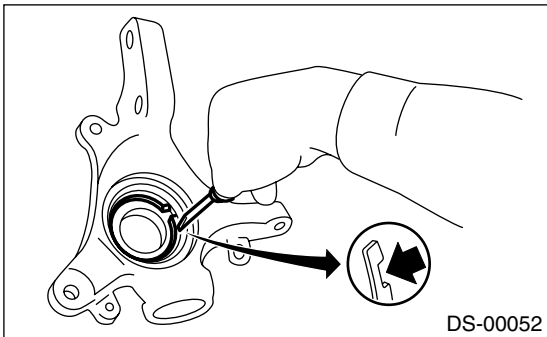


4) Using a screwdriver, remove outer and inner oil seals.

**CAUTION:**

**Replace the removed oil seal with new one.**

5) Using flat-bladed screwdriver, remove snap ring.



6) Using ST1, support housing securely.

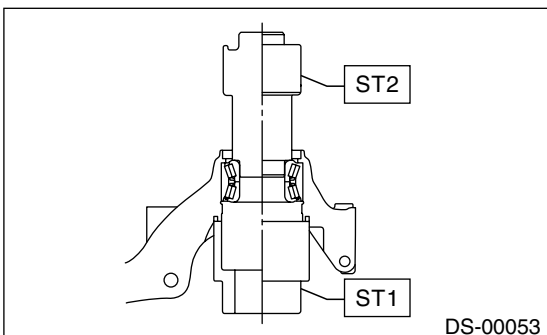
7) Using ST2, press inner race to drive out outer bearing.

ST1 927400000 HOUSING STAND

ST2 927100000 BEARING REMOVER

**CAUTION:**

- Do not remove outer race unless it is faulty.
- Replace the removed outer race with new one.
- Do not replace inner or outer race separately; always replace as a unit.

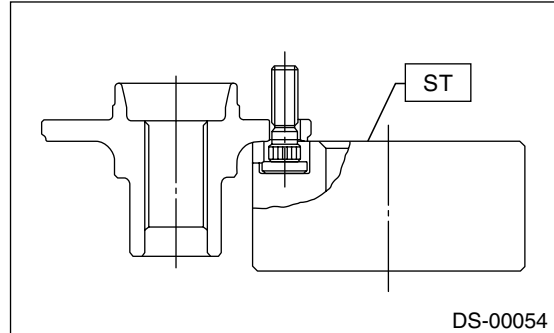


8) Using ST and a hydraulic press, drive hub bolts out.

ST 927080000 HUB STAND

**CAUTION:**

**Be careful not to hammer hub bolts. This may deform hub.**



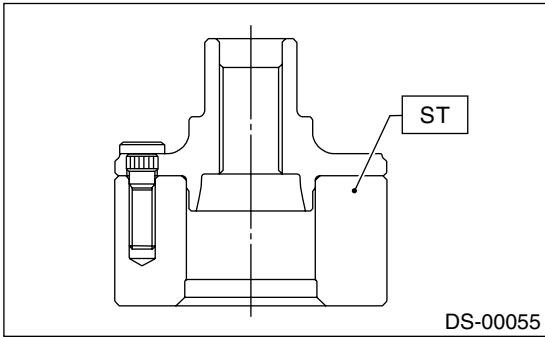
# FRONT AXLE

## DRIVE SHAFT SYSTEM

### D: ASSEMBLY

1) Attach hub to ST securely.

ST 927080000 HUB STAND



2) Using a hydraulic press, press new hub bolts into place.

#### CAUTION:

**Be sure to press hub bolts until their seating surfaces contact the hub.**

#### NOTE:

Use 12 mm (0.47 in) dia. holes in HUB STAND to prevent bolts from tilting.

3) Clean dust or foreign particles from inside the housing.

4) Using ST1 and ST2, press a new bearing into place.

ST1 927400000 HOUSING STAND

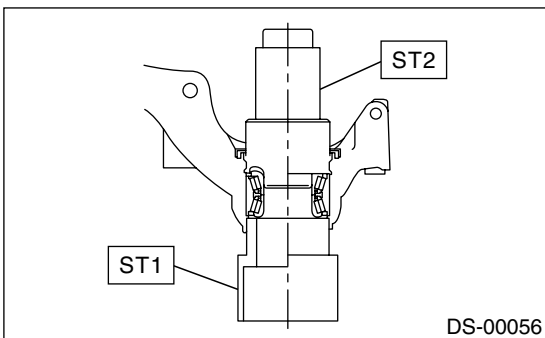
ST2 927100000 BEARING REMOVER

#### CAUTION:

- Always press outer race when installing bearing.
- Be careful not to remove plastic lock from inner race when installing bearing.
- Charge bearing with new grease when outer race is not removed.

#### Specified grease:

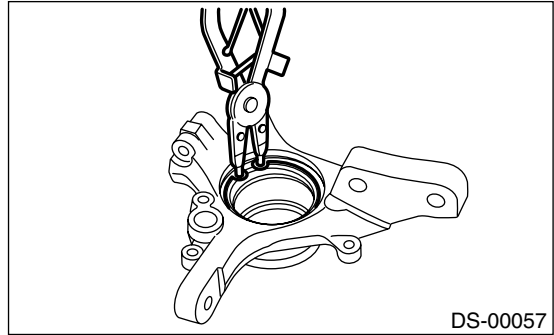
**SHELL 6459N**



5) Using snap ring pliers, install snap ring in its groove.

#### CAUTION:

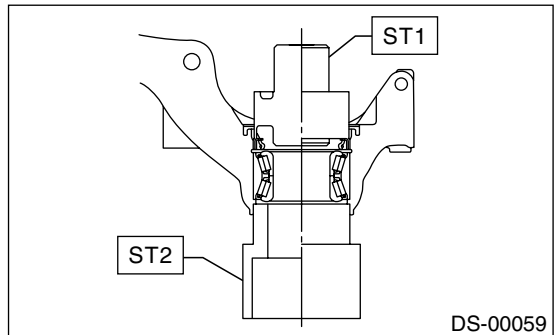
**Make sure to install it firmly to groove.**



6) Using ST1 and ST2, press inner oil seal until it contacts circlip.

ST1 927410000 OIL SEAL INSTALLER

ST2 927400000 HOUSING STAND



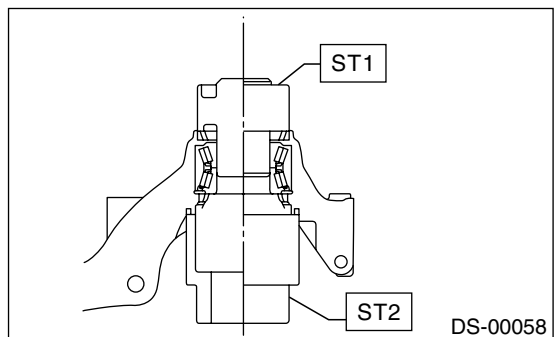
7) Invert ST and housing.

ST 927400000 HOUSING STAND

8) Using ST1 and ST2, press outer oil seal until it contacts the bottom of housing.

ST1 927410000 OIL SEAL INSTALLER

ST2 927400000 HOUSING STAND



9) Apply sufficient grease to oil seal lip portion.

**Specified grease**  
**SHELL 6459N**

**CAUTION:**

- If specified grease is not available, remove bearing grease and apply Auto Rex A instead.
- Do not mix different types of grease.

10) Install disc cover to housing the three bolts.

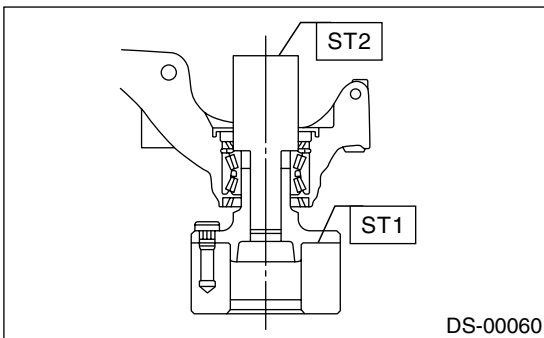
**Tightening torque:**  
**18 N·m (1.8 kgf-m, 13.0 ft-lb)**

11) Attach hub to ST1 securely.

12) Clean dust or foreign particles from the polished surface of hub.

13) Using ST2, press bearing into hub by driving inner race.

ST1 927080000 HUB STAND  
ST2 927120000 HUB INSTALLER



## E: INSPECTION

When hub is removed, replace bearing with new one.

**CAUTION:**

- If bearing is faulty, replace it as a set with new bearing set.
- Replace the removed oil seal with new one.

# HUB UNIT BEARING

## DRIVE SHAFT SYSTEM

### 4. Hub Unit Bearing

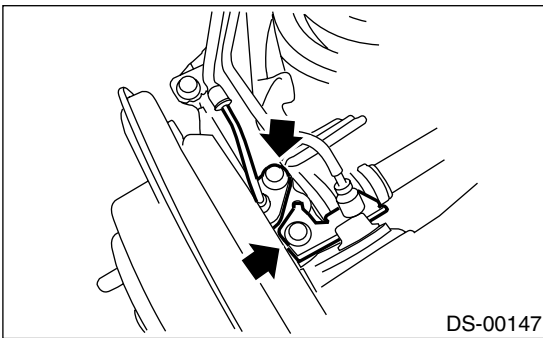
#### A: REMOVAL

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, and remove rear wheel while supporting with safety stands.

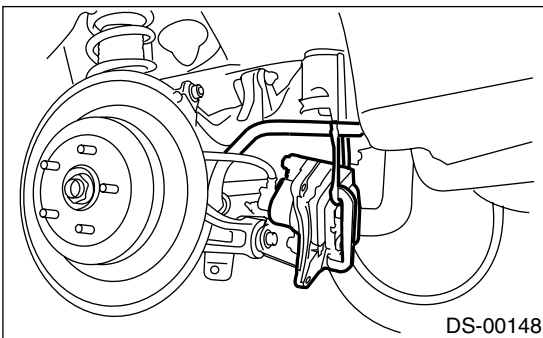
#### CAUTION:

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 3) Unlock axle nut.
- 4) Remove axle nut while depressing brake pedal to prevent front drive shaft from turning.
- 5) Return parking brake lever.
- 6) Remove ABS sensor.



- 7) Remove brake caliper from back plate and suspend it from stabilizer using a piece of wire.

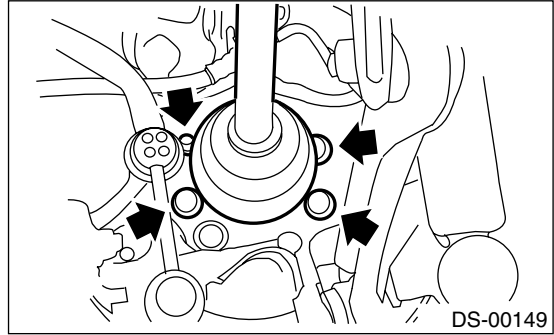


- 8) Remove disc rotor from hub.

#### NOTE:

- Mark matching marks on hub and disc rotor, before removing.
- If disc rotor seizes up within hub, drive it out by installing an 8 mm bolt into disc rotor bolt hole.

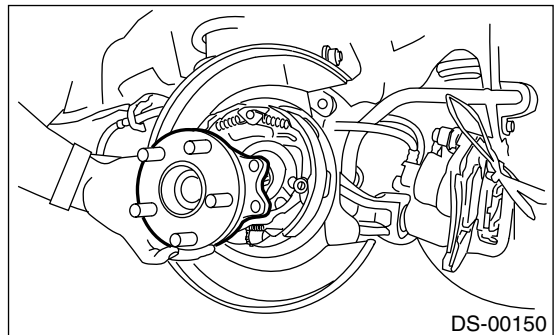
- 9) Remove four bolts from rear arm.



- 10) Remove hub unit bearing.

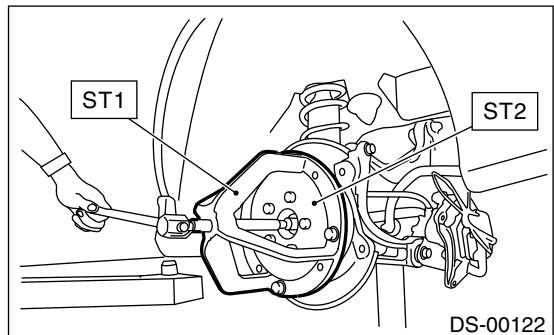
#### CAUTION:

Be careful not to damage tone wheel.



If it is hard to remove, use STs.

- ST1 926470000 AXLE SHAFT PULLER  
ST2 927140000 PLATE



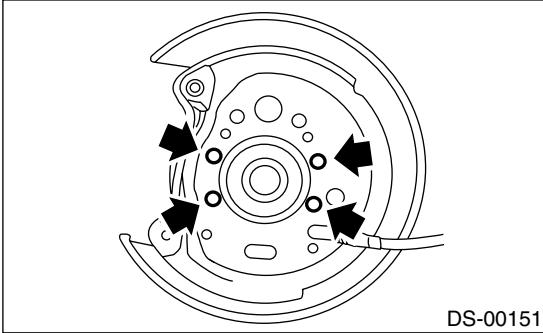


## B: INSTALLATION

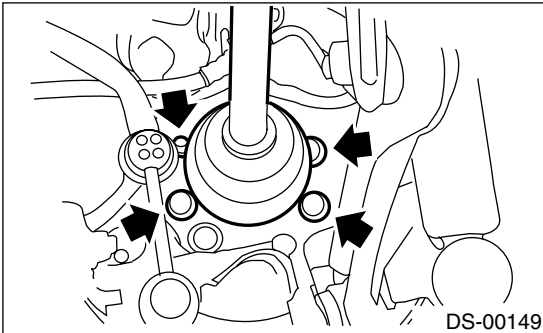
1) Align hub unit bearing with back plate at mounting holes and install hub unit assembly and back plate. Temporarily tighten axle nuts.

### CAUTION:

Be careful not to damage tone wheel.



2) Tighten four bolts to back plate.

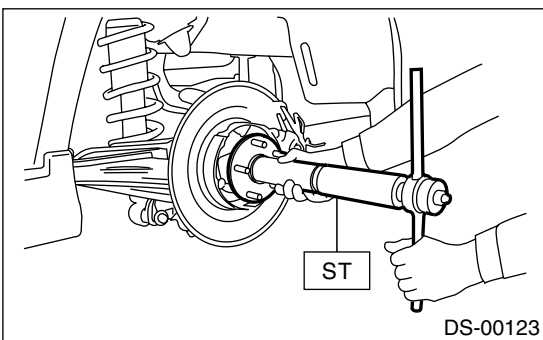


3) Remove axle nut.

4) Using ST1 and ST2, pull axle shaft into place.

ST1 922431000 AXLE SHAFT INSTALLER

ST2 927390000 ADAPTER



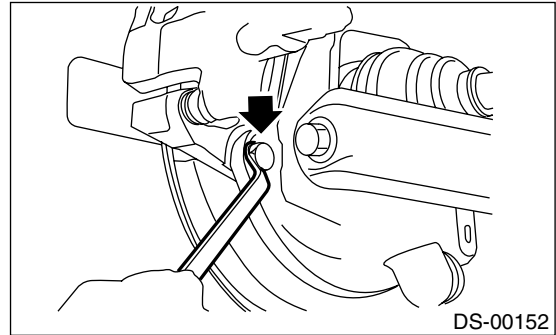
5) Temporarily tighten axle nuts.

6) Install disc rotor on hub.

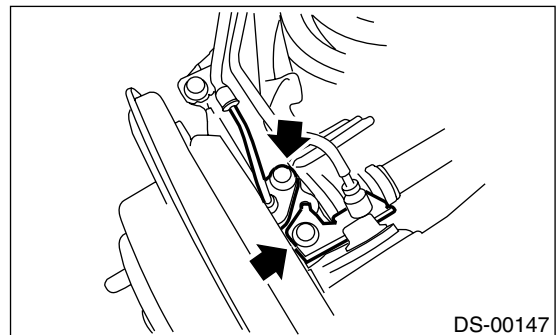
7) Install disc brake caliper on back plate.

### Tightening torque:

**52 N·m (5.3 kgf·m, 38.3 ft·lb)**



8) Install rear ABS sensor and brake cable bracket.



9) Adjust parking brake lever stroke by turning adjuster. <Ref. to PB-5, ADJUSTMENT, Parking Brake Lever.>

# HUB UNIT BEARING

## DRIVE SHAFT SYSTEM

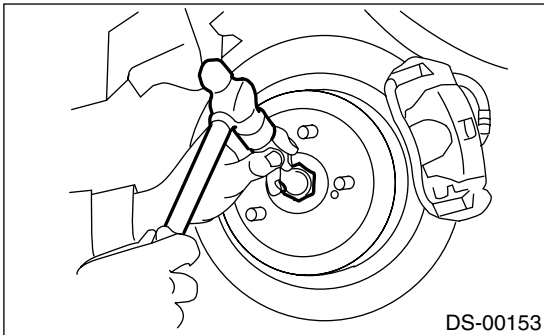
- 10) Move brake lever back to apply brakes. While depressing brake pedal to prevent axle shaft from turning, tighten axle nut.
- 11) Securely lock axle nut after tightening.

**Tightening torque:**

**235 N·m (24 kgf-m, 174 ft-lb)**

**CAUTION:**

- Replace the removed axle nuts with new one. Use an axle nut for rear use only (Olive color).
- Always tighten axle nut before installing wheel on vehicle.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.



- 12) Install rear wheel and tighten wheel nuts to specified torque.

**Tightening torque:**

**88 N·m (9 kgf-m, 65 ft-lb)**

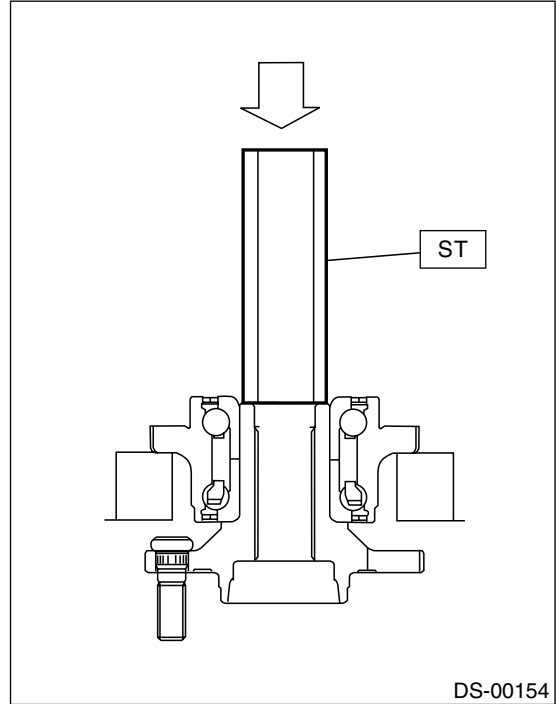
## C: DISASSEMBLY

- 1) Using ST, remove hub unit from hub assembly.

**CAUTION:**

**Securely set hub assembly so that it does not lean.**

ST 398507703 DUMMY COLLAR

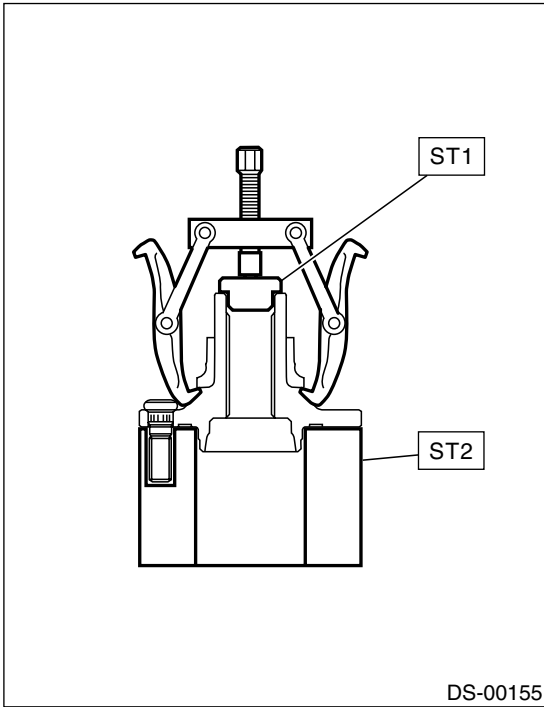


2) Using ST and a puller (common hand tool), remove bearing inner race.

ST1 399520105 SEAT  
ST2 927080000 HUB STAND

**CAUTION:**

- Do not remove hub unit bearing unless damaged.
- Replace the removed hub unit bearing with new one.

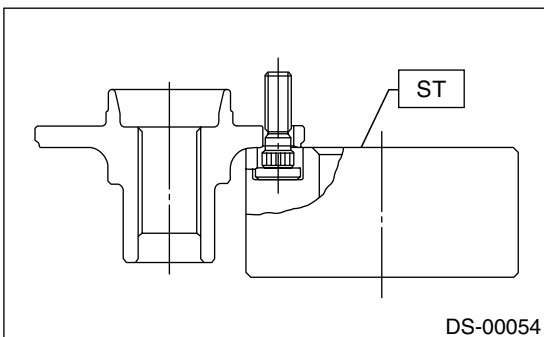


3) Using ST, press hub bolt out.

ST 927080000 HUB STAND

**CAUTION:**

Be careful not to hammer hub bolts. This may deform hub.



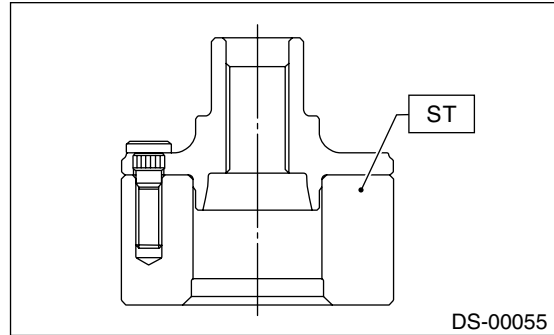
**D: ASSEMBLY**

1) Using ST, press new hub bolt into place.

**CAUTION:**

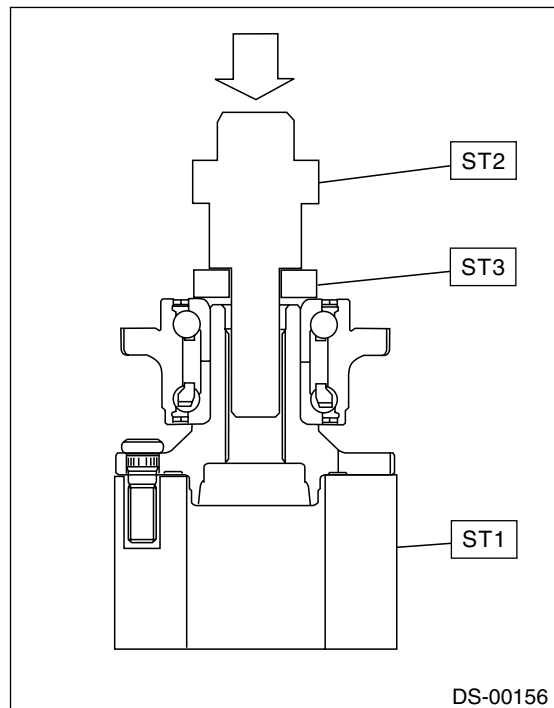
- Be sure to press hub bolt until their seating surfaces contact the hub.
- Using a 12 mm (0.47 in) hole in the ST, be careful not to tilt hub bolt during installation.

ST 927080000 HUB STAND



2) Using ST1, ST2 and ST3, press hub unit bearing into hub.

ST1 927080000 HUB STAND  
ST2 927450000 HUB INSTALLER  
ST3 28499AE000 SPACER



**CAUTION:**

- Always press inner race when installing hub unit bearing.
- Replace the removed hub unit bearing with new one.

## HUB UNIT BEARING

DRIVE SHAFT SYSTEM

---

### **E: INSPECTION**

Check the removed parts for wear and damage. If defective, replace with new ones.

### **CAUTION:**

**If a bearing is faulty, replace bearing and races as a set with new ones.**

## 5. Front Drive Shaft

### A: REMOVAL

#### 1. NON-TURBO MODEL

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, and remove front wheel while supporting with safety stands.
- 3) Unlock axle nut.
- 4) Depress brake pedal to prevent front drive shaft from turning and remove axle nut.

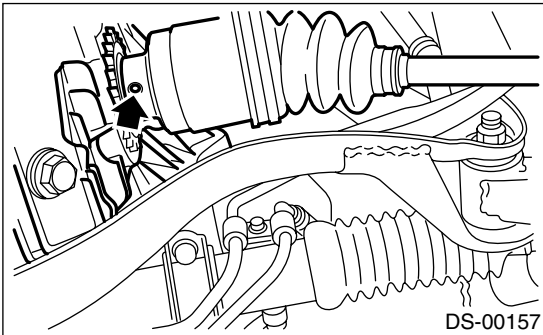
**CAUTION:**

Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.

- 5) Remove stabilizer link from transverse link.
- 6) Disconnect transverse link from housing.
- 7) Remove spring pin which secures transmission spindle to inner joint.

**CAUTION:**

When drive shaft is removed, replace spring pin with new one.



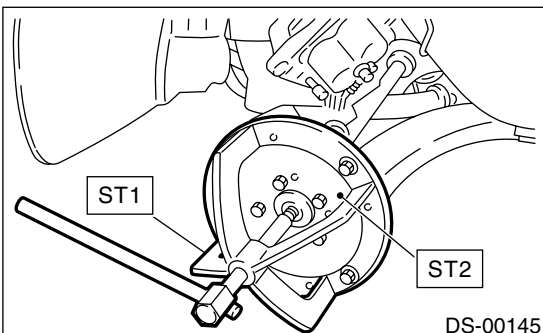
- 8) Remove front drive shaft assembly. If it is hard to remove, use ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER

ST2 927140000 PLATE

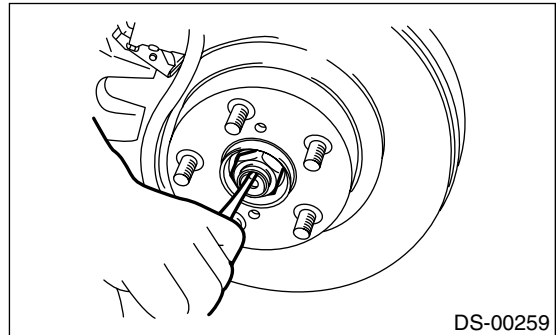
**CAUTION:**

- Be careful not to damage oil seal lip and tone wheel when removing front drive shaft.
- When front drive shaft is removed, also replace inner oil seal with new one.



#### 2. TURBO-MODEL

- 1) Lift-up the vehicle, and then remove the front wheels while supporting with safety stands.
- 2) Drain the transmission oil.
- 3) Unlock the axle nut.

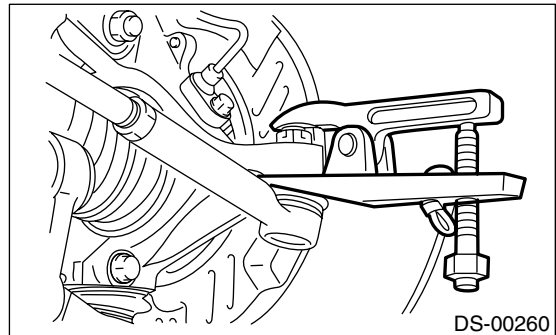


- 4) Remove the axle nut with brake pedal depressed to prevent front drive shaft from turning.

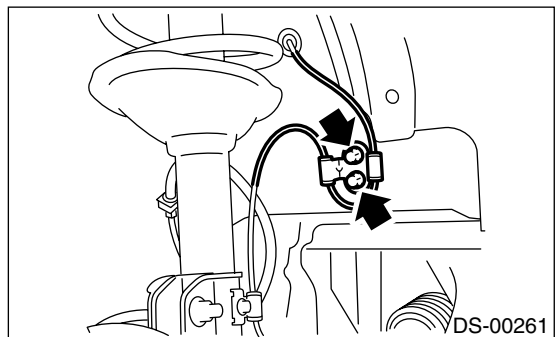
**CAUTION:**

Remove the axle nut with vehicle weight not applied on axle.

- 5) Remove the cotter pin and castle nut. Remove the tie-rod end using a puller.



- 6) Remove the ABS sensor bracket.

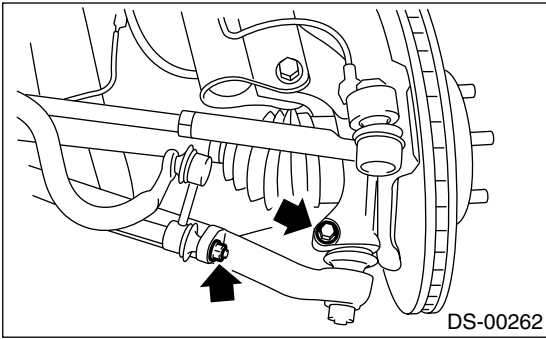


- 7) Remove the front stabilizer link from transverse link.

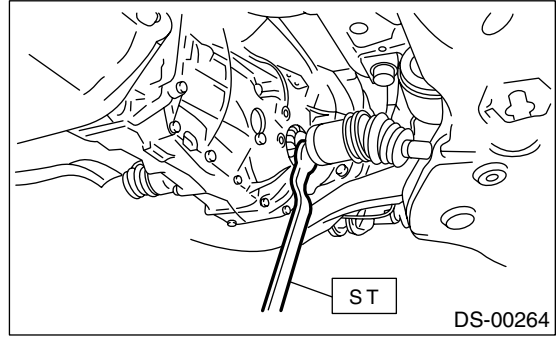
# FRONT DRIVE SHAFT

## DRIVE SHAFT SYSTEM

8) Remove the bolt securing ball joint, and then remove the transverse link from front housing.



- Do not contact the ST to holder area.

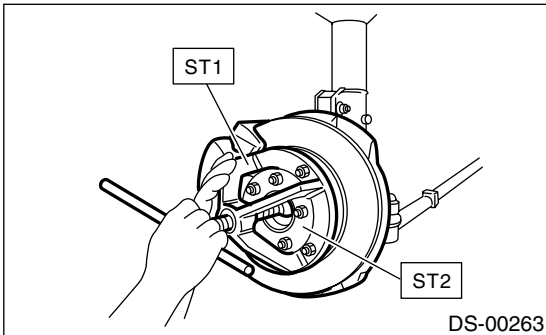


9) Remove the front drive shaft from front axle. If it is hard to remove, remove the brake disk rotor using the ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER  
ST2 927140000 AXLE SHAFT PULLER  
PLATE

### CAUTION:

- Do not pull inner joint when removing front drive shaft.
- Do not hammer the drive shaft when removing.
- Be careful not damage the oil seal and tone wheel.



10) Remove the front drive shaft from transmission using ST.

ST 28399SA000 DRIVE SHAFT REMOVER

### NOTE:

- ST usage is different depending on type of transmission equipped.
- For AT vehicles, face the "AT" letter stamped on ST to transmission side. For MT vehicles, face the "MT" letter stamped on ST to transmission side.

## B: INSTALLATION

### 1. NON-TURBO MODEL

- 1) Insert outer joint into hub splines.

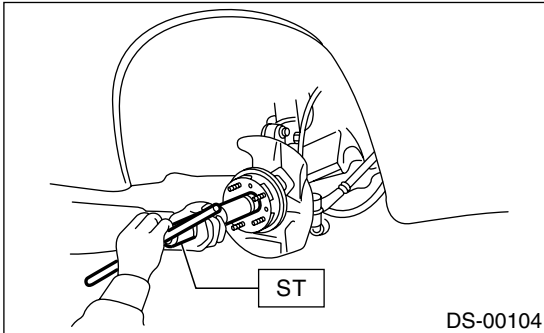
**CAUTION:**

Be careful not to damage inner oil seal lip and tone wheel.

- 2) Using ST1 and ST2, pull drive shaft into place.  
ST1 922431000 AXLE SHAFT INSTALLER  
ST2 927390000 ADAPTER

**CAUTION:**

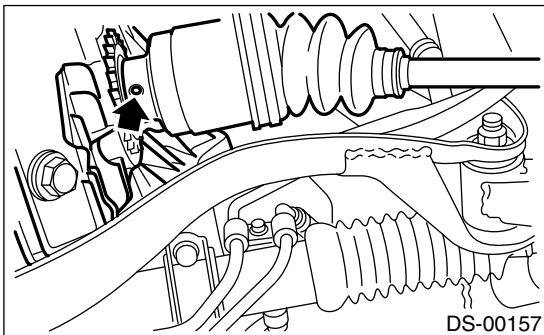
Do not hammer drive shaft when installing it.



- 3) Tighten axle nut temporarily.
- 4) Install inner joint on transmission spindle and drive spring pin into place.

**CAUTION:**

When front drive shaft is removed, replace spring pin with new one.



- 5) Connect transverse link to housing.

**Tightening torque (self-locking nut):**  
49 N·m (5.0 kgf-m, 36 ft-lb)

**CAUTION:**

Replace the removed self-locking nut with new one.

- 6) Install stabilizer bracket.

- 7) While depressing brake pedal to prevent front drive shaft from turning, tighten axle nut.

**Tightening torque:**

216 N·m (22 kgf-m, 159 ft-lb)

**CAUTION:**

- Replace the removed axle nut with new one. (3.0 L model: Olive color, 2.5 L model: Gold color).
- Always tighten axle nut before installing wheel on vehicle.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

- 8) After tightening axle nut, lock it securely.

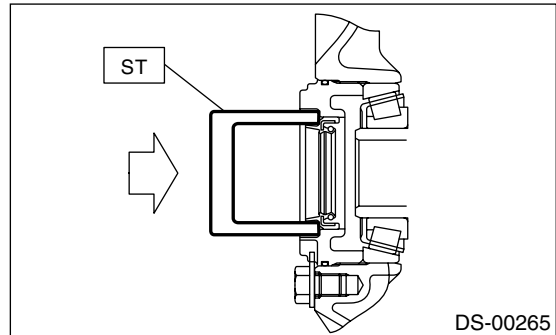
### 2. TURBO MODEL

- 1) Using the ST, replace the differential side retainer oil seal with a new one.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

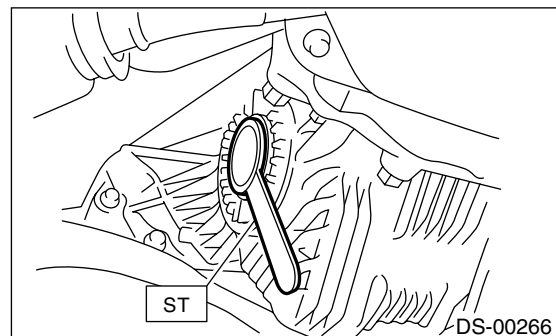
**CAUTION:**

Be sure to replace the oil seal with a new one when removing drive shaft.



- 2) Insert the front drive shaft into front axle.
- 3) Temporarily tighten the axle nut.
- 4) Install the front drive shaft to transmission using ST.

ST 28399SA010 OIL SEAL PROTECTOR



- 5) Install the ball joint to front axle.

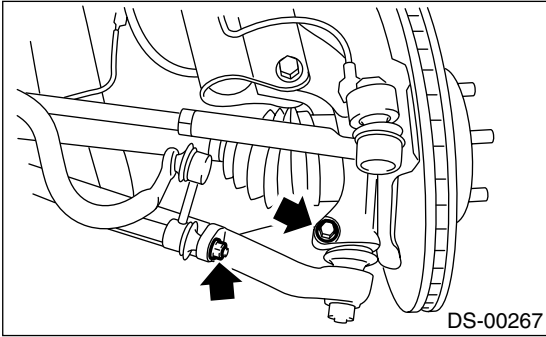
**Tightening torque (self-locking nut):**  
50 N·m (5.1 kgf-m, 37 ft-lb)

# FRONT DRIVE SHAFT

## DRIVE SHAFT SYSTEM

6) Install the stabilizer link.

**Tightening torque (self-locking nut):**  
**45 N·m (4.6 kgf-m, 33 ft-lb)**



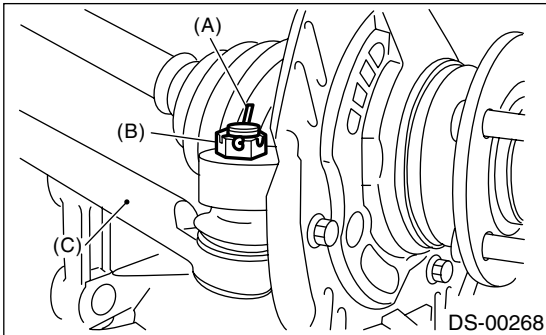
7) Install the tie-rod end.

**Tightening torque (self-locking nut):**  
**27.0 N·m (2.75 kgf-m, 19.9 ft-lb)**

**CAUTION:**

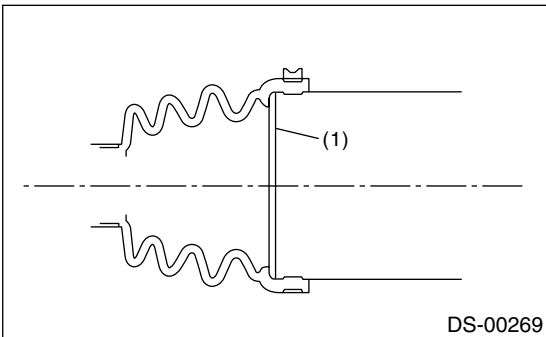
**When installing, do not hit the bottom of tie-rod with hammer.**

8) Tighten the castle nut to the specified torque and tighten further within 60° until pin hole is aligned with the slot in nut. Bend the cotter pin to lock.



- (A) Cotter pin
- (B) Castle nut
- (C) Tie-rod end

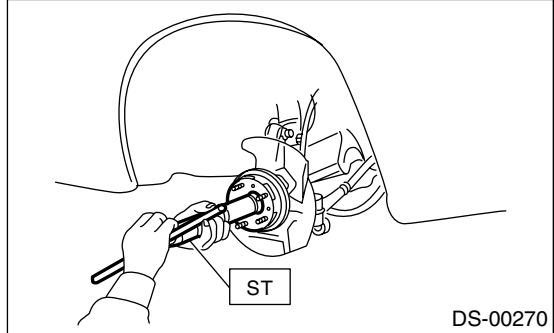
9) Make sure the inner joint retainer is in proper position.



- (1) Retainer

10) Using the ST1 and ST2, pull the front drive shaft into place.

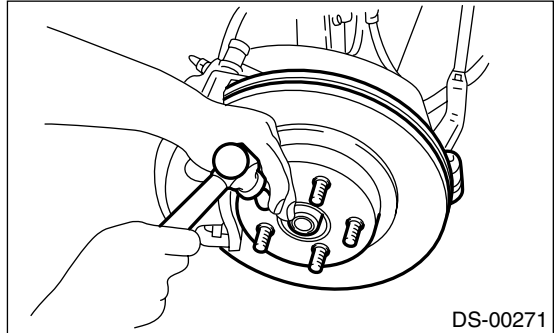
ST1 922431000 AXLE SHAFT INSTALLER  
ST2 927390000 ADAPTER



11) Tighten a new axle nut with brake pedal depressed to prevent front drive shaft from turning.

**Tightening torque:**  
**216 N·m (22 kgf-m, 159 ft-lb)**

12) Tighten the axle nut and lock securely.



13) Install the ABS sensor bracket.

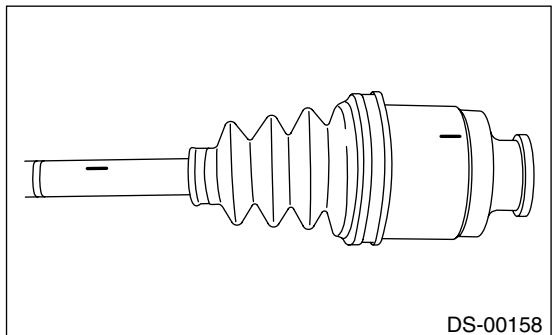
**Tightening torque:**  
**32 N·m (3.3 kgf-m, 24 ft-lb)**

14) Add the transmission oil.

15) Install the front wheel and tighten wheel nut to the specified torque.

## C: DISASSEMBLY

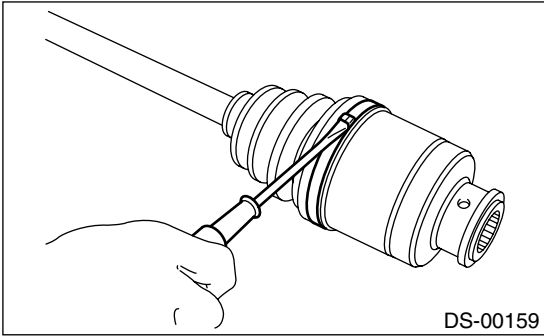
1) Place alignment marks on shaft and outer race.



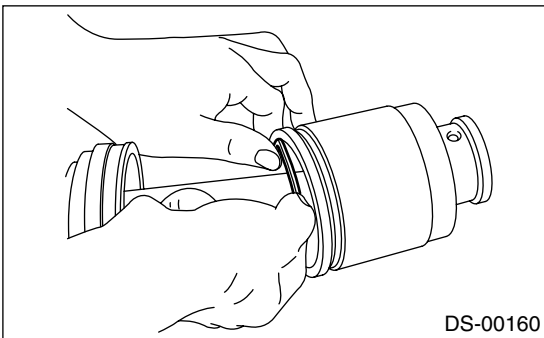
2) Remove inner joint boot band and boot.



**CAUTION:**  
Be careful not to damage boot.



3) Remove circlip from inner joint outer race using screwdriver.

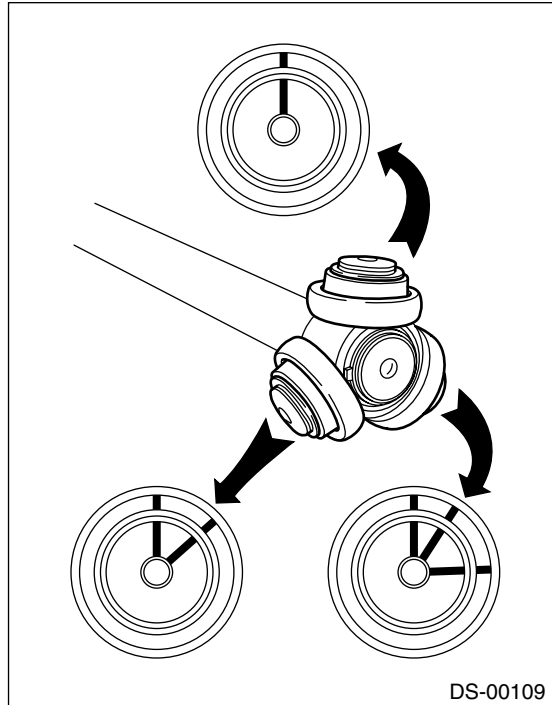


4) Remove inner joint outer race from shaft assembly.

5) Wipe off grease.

**CAUTION:**  
The grease is a special grease. Do not confuse with other greases.

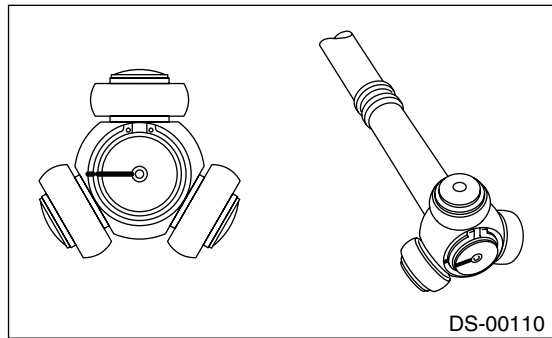
6) Place alignment mark on free ring and trunnion.



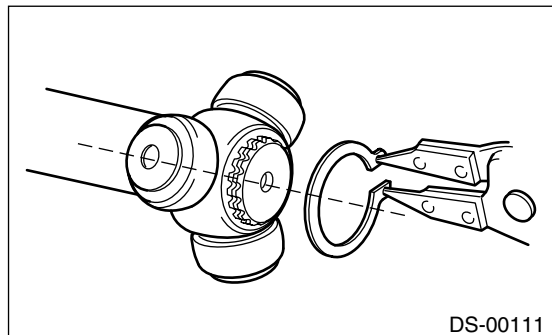
7) Remove free ring from trunnion.

**CAUTION:**  
Be careful with the free ring position.

8) Place alignment mark on trunnion and shaft.



9) Remove snap ring and trunnion.



**CAUTION:**  
Be careful not to damage boot by wrapping shaft splines with vinyl tape.

10) Remove inner joint boot.

# FRONT DRIVE SHAFT

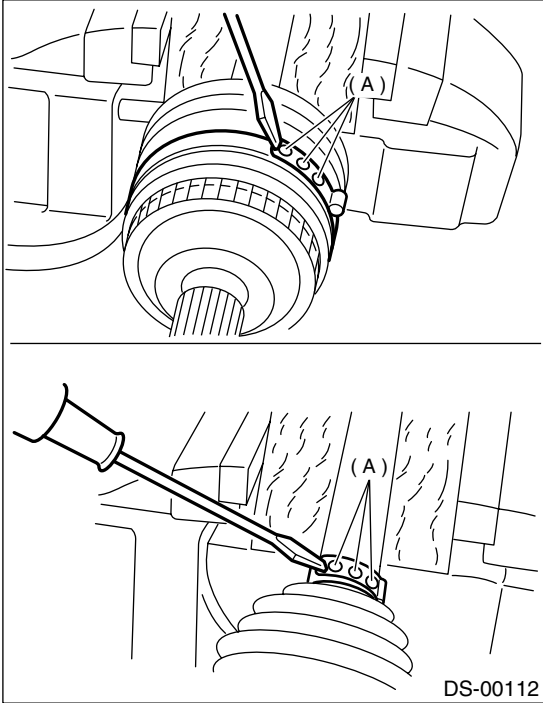
## DRIVE SHAFT SYSTEM

11) Place drive shaft in a vise between wooden blocks.

### CAUTION:

**Do not place drive shaft directly in the vise; use wooden block.**

12) Raise boot band claws by means of screwdriver and hammer.

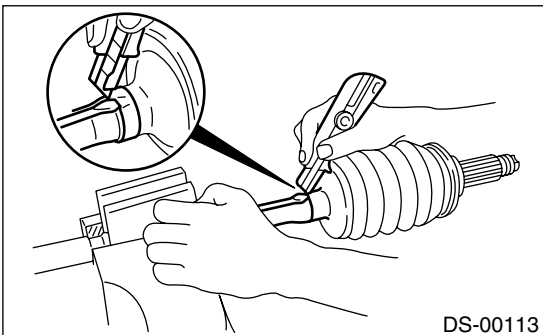


(A) Boot band claws

13) Cut and remove the boot.

### CAUTION:

**Replace the removed boot with a new one.**



14) Thus, disassembly of axle is completed, but outer joint cannot be disassembled.

## D: ASSEMBLY

### CAUTION:

Use specified grease.

*BJ side (Non-TURBO model, outside):  
NTG2218 (Part No. 28093AA000)*

*SFJ side (Non-TURBO model, inside):  
SSG6003 (Part No. 28093TA000)*

*AC side (TURBO model, outside):  
HTBJ (Part No. 28395SA010)*

*AAR side (TURBO model, inside):  
One luber C (Part No. 28395SA000)*

1) Place outer joint boot and small boot band on outer joint side of shaft.

### CAUTION:

**Be careful not to damaged boot by wrapping shaft splines with vinyl tape.**

2) Place drive shaft in a vise.

### CAUTION:

**Do not place drive shaft directly in the vise; use wooden blocks.**

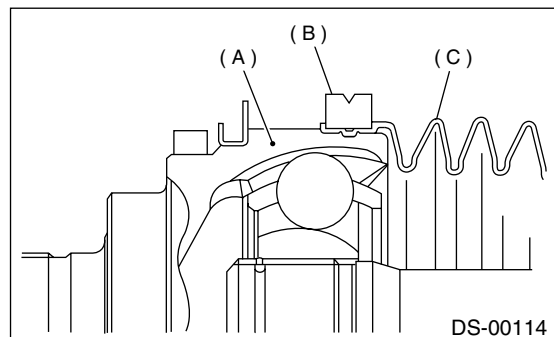
3) Apply a coat of specified grease [60 to 70 g (2.12 to 2.47 oz)] to outer joint.

4) Apply an even coat of specified grease [20 to 30 g (0.71 to 1.06 oz)] to the entire inner surface of boot. Also apply grease to shaft.

### NOTE:

The inside of the larger end of outer joint boot and the boot groove shall be cleaned so as to be free from grease and other substances.

5) Install boot projecting portion to outer joint groove.



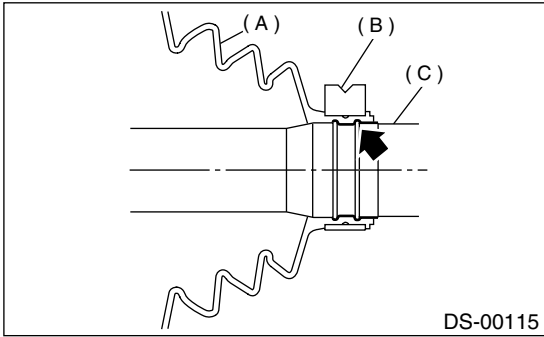
(A) Outer joint

(B) Large boot band

(C) Boot

6) Set large boot band in place.

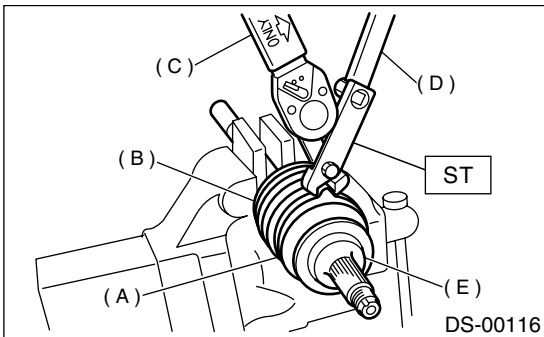
7) Install boot projecting portion to shaft groove.



- (A) Boot
- (B) Small boot band
- (C) Shaft

8) Tighten boot bands using ST, torque wrench and socket flex handle.

ST 28099AC000 BOOT BAND PLIER



- (A) Large boot band
- (B) Boot
- (C) Torque wrench
- (D) Socket flex handle
- (E) Outer joint

**Tightening torque:**

**Large boot band**

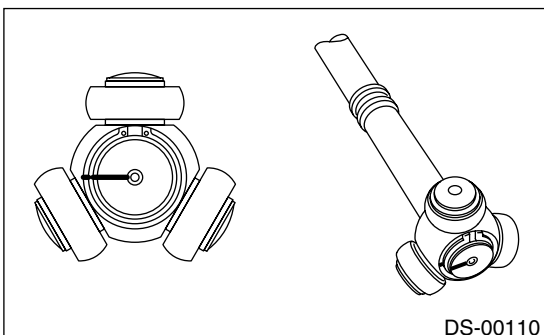
**157 N·m (16.0 kgf·m, 116 ft·lb) or more**

**Small boot band**

**133 N·m (13.6 kgf·m, 98 ft·lb) or more**

9) Place inner joint boot at the center of shaft.

10) Align alignment marks and install trunnion on shaft.



11) Install snap ring to shaft.

**CAUTION:**

**Confirm that the snap ring is completely fitted in the shaft groove.**

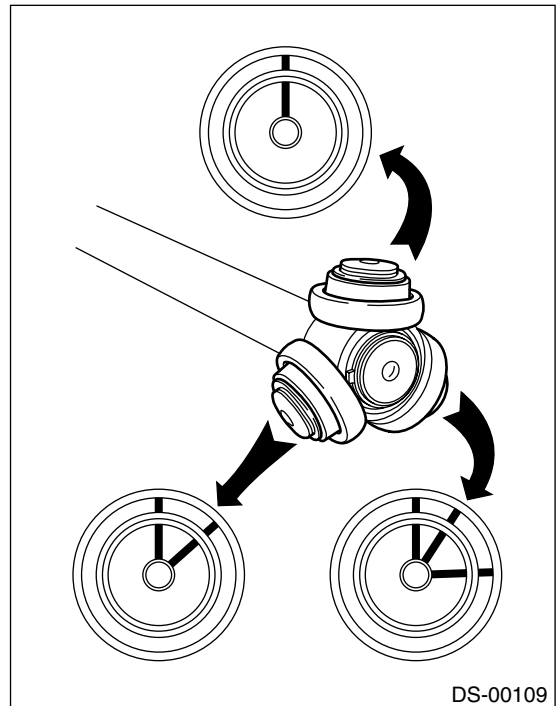
12) Fill 100 to 110 g (3.53 to 3.88 oz) of specified grease into the interior of inner joint outer race.

13) Apply a coat of specified grease to free ring and trunnion.

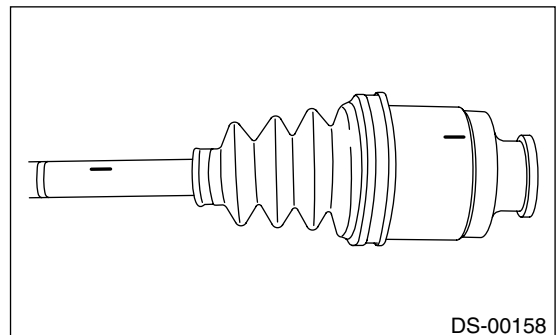
14) Align alignment marks on free ring and trunnion and install free ring.

**CAUTION:**

**Be careful with the free ring position.**



15) Align alignment marks on shaft and outer race, and install outer race.



16) Install circlip in the groove on inner joint outer race.

**CAUTION:**

**Pull the shaft lightly and assure that the circlip is completely fitted in the groove.**

# FRONT DRIVE SHAFT

## DRIVE SHAFT SYSTEM

17) Apply an even coat of the specified grease 30 to 40 g (1.06 to 1.41 oz) to the entire inner surface of boot.

18) Install inner joint boot taking care not to twist it.

### CAUTION:

- The inside of the larger end of inner joint boot and the boot groove shall be cleaned so as to be free from grease and other substances.
- When installing inner joint boot, position outer race of inner joint at center of its travel.

19) Put a band through the clip and wind twice in alignment with band groove of boot.

### CAUTION:

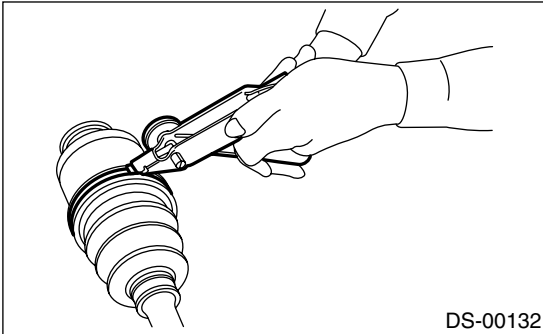
**Replace the removed boot band with a new one.**

20) Tighten band by using ST.

ST 925091000 BAND TIGHTENING TOOL

### NOTE:

Tighten band until it cannot be moved by hand.

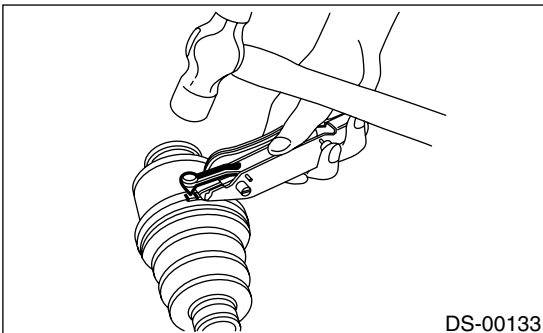


21) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

### CAUTION:

**Tap to an extent that the boot underneath is not damaged.**



22) Cut off band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.

### CAUTION:

**Bend the band so that its end is in close contact with clip.**

23) Fix up boot on outer joint in the same manner.

24) Extend and retract inner joint to provide equal grease coating.

## E: INSPECTION

Check the removed parts for damage, wear, corrosion etc. If faulty, repair or replace.

1) Inner joint

Check seizure, corrosion, damage, wear and excessive play.

2) Outer joint

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) Boot

Check for wear, warping, breakage or scratches.

5) Grease

Check for discoloration or dilution.

## 6. Rear Drive Shaft

### A: REMOVAL

- 1) Disconnect ground cable from battery.
- 2) Jack-up vehicle, support it with safety stands, and remove rear wheels.

**CAUTION:**

**Be sure to loosen and retighten axle nut after removing wheel from vehicle. Failure to follow this rule may damage wheel bearings.**

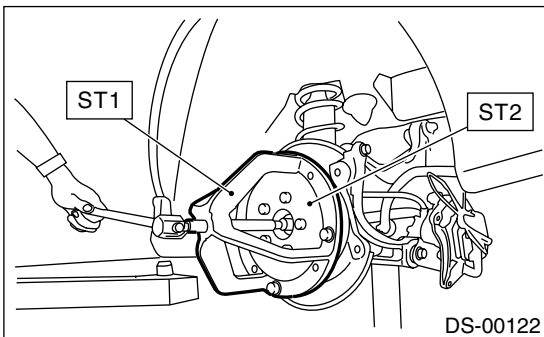
- 3) Unlock axle nut.
- 4) Have another technician depress brake pedal so that rear drive shaft does not rotate, while removing axle nut.
- 5) Remove rear differential assembly.  
With T-type  
<Ref. to DI-25, REMOVAL, Rear Differential for T-type.>  
With VA-type  
<Ref. to DI-42, REMOVAL, Rear Differential for VA-type.>

- 6) Remove axle nut and drive shaft. If it is hard to remove, use ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER  
ST2 927140000 PLATE

**CAUTION:**

**Be careful not to damage tone wheel when removing rear drive shaft.**



### B: INSTALLATION

- 1) Insert outer joint into rear hub splines.

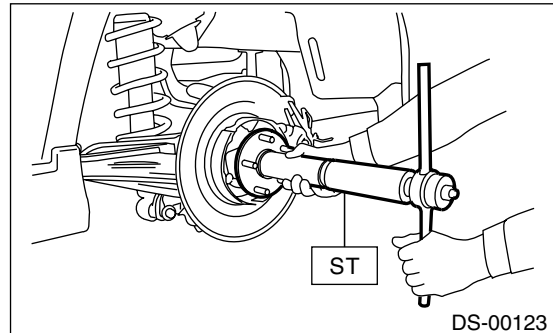
**CAUTION:**

**Be careful not to damage tone wheel.**

- 2) Using ST1 and ST2, pull drive shaft into place.  
ST1 922431000 AXLE SHAFT INSTALLER  
ST2 927390000 ADAPTER

**CAUTION:**

**Do not hammer drive shaft when installing it.**



- 3) Tighten axle nut temporarily.

- 4) Install rear differential.

With T-type

<Ref. to DI-26, INSTALLATION, Rear Differential for T-type.>

With VA-type

<Ref. to DI-43, INSTALLATION, Rear Differential for VA-type.>

- 5) Have another technician depress brake pedal so that rear drive shaft does not rotate, while tightening axle nut.

**Tightening torque:**

**235 N·m (24 kgf-m, 174 ft-lb)**

**CAUTION:**

- Replace the removed axle nut with a new one. Use an axle nut for rear use only (Olive color).
- Always tighten axle nut before installing wheel on vehicle.
- Be sure to tighten axle nut to specified torque. Do not overtighten it as this may damage wheel bearing.

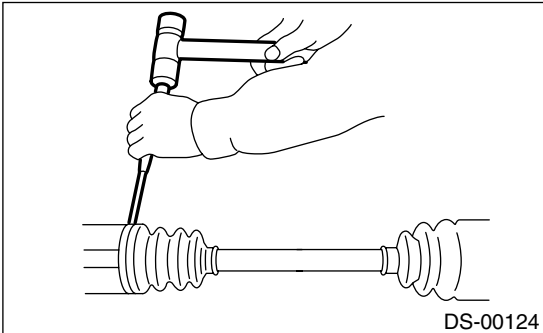
- 6) After tightening axle nut, lock it securely.

# REAR DRIVE SHAFT

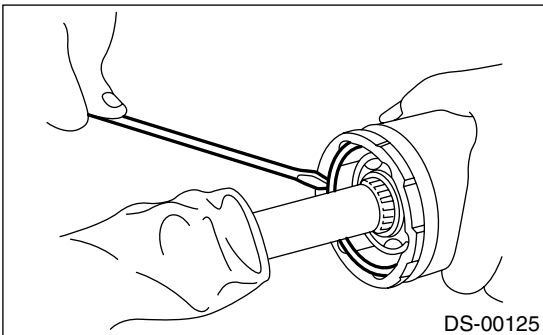
## DRIVE SHAFT SYSTEM

### C: DISASSEMBLY

- 1) Straighten bent claw of large band which is installed on inner joint boot.
- 2) Loosen band by means of screwdriver or pliers, being careful not to damage the boot.



- 3) Remove small band which is installed on inner joint boot in the same manner.
- 4) Remove larger end of inner joint boot from outer race of inner joint.
- 5) Remove inner snap ring of inner joint outer race.



- 6) Take out inner joint outer race from shaft assembly.

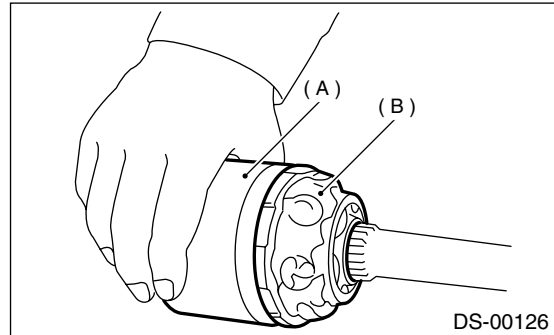
- 7) Wipe off grease and take out balls.

#### CAUTION:

**The grease is a special grease. Do not confuse with other greases.**

#### NOTE:

Disassemble exercising care not to lose balls (6 pcs).



- (A) Outer race
- (B) Grease

- 8) To remove the cage from the inner race, turn the cage by a half pitch to the track groove of the inner race and shift the cage.
- 9) Remove snap ring, which fixes inner race to shaft, by using pliers.
- 10) Take out inner joint inner race.
- 11) Take off inner joint cage from shaft and remove inner joint boot.

#### CAUTION:

**Be careful not to damage boot by wrapping shaft splines with vinyl tape.**

- 12) Remove outer joint boot in the same procedure as inner joint boot.
- 13) Thus, disassembly of axle is completed, but outer joint is unable to be disassembled.

## D: ASSEMBLY

### CAUTION:

Use specified grease.

#### BJ side (outer joint):

**Molylex No. 2 (Part No. 723223010)**

#### DOJ side (inner joint):

**VU-3A702 (Yellow) (Part No. 23223GA050)**

1) Install outer joint boot in specified position, and fill it with 60 to 70 g (2.12 to 2.47 oz) of specified grease.

2) Place inner joint boot at the center of shaft.

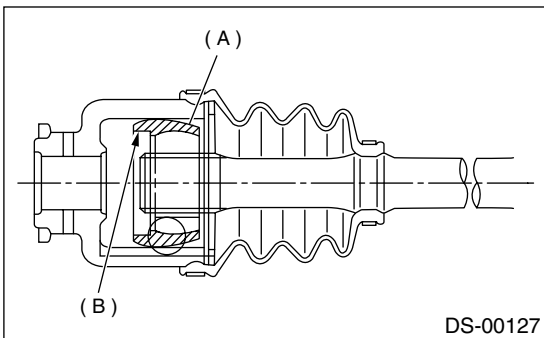
### CAUTION:

**Be sure to wrap shaft splines with vinyl tape to prevent boot from scratches.**

3) Insert inner joint cage onto shaft.

### NOTE:

Insert the cage with the cut-out portion facing the shaft end, since the cage has an orientation.

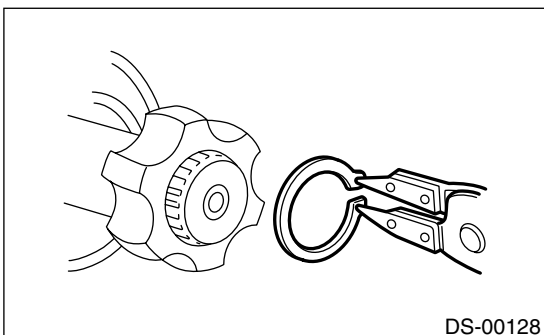


- (A) Cage
- (B) Cut-out portion

4) Install inner joint inner race on shaft and fit snap ring with snap ring pliers.

### NOTE:

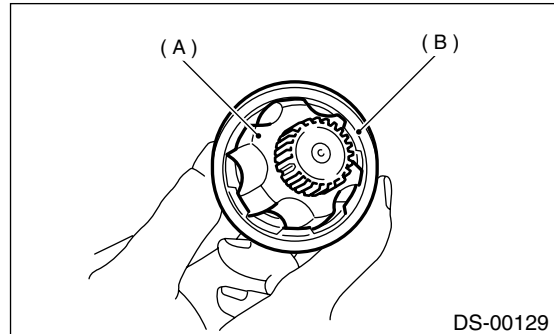
Confirm that the snap ring is completely fitted in the shaft groove.



5) Install cage, which was previously fitted, to inner race fixed upon shaft.

### NOTE:

Fit the cage with the protruded part aligned with the track on the inner race and then turn by a half pitch.



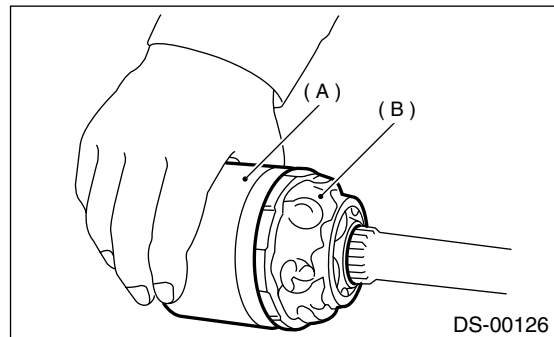
- (A) Inner race
- (B) Cage

6) Fill 80 to 90 g (2.82 to 3.17 oz) of specified grease into the interior of inner joint outer race.

7) Apply a coat of specified grease to the cage pocket and six balls.

8) Insert six balls into the cage pocket.

9) Align the outer race track and ball positions and place in the part where shaft, inner race, cage and balls are previously installed, and then fit outer race.



- (A) Outer race
- (B) Grease

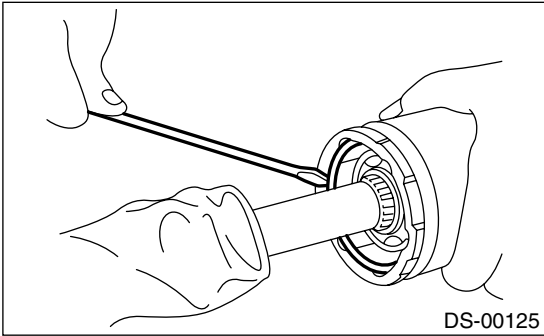
# REAR DRIVE SHAFT

## DRIVE SHAFT SYSTEM

10) Install circlip in the groove on inner joint outer race.

### NOTE:

- Assure that the balls, cage and inner race are completely fitted in the outer race of inner joint.
- Exercise care not to place the matched position of circlip in the ball groove of outer race.
- Pull the shaft lightly and assure that the circlip is completely fitted in the groove.



11) Apply an even coat of the specified grease [20 to 30 g (0.71 to 1.06 oz)] to the entire inner surface of boot. Also apply grease to shaft.

12) Install inner joint boot taking care not to twist it.

### CAUTION:

- **The inside of the larger end of inner joint boot and the boot groove shall be cleaned so as to be free from grease and other substances.**
- **When installing inner joint boot, position outer race of inner joint at center of its stroke.**

13) Put a band through the clip and wind twice in alignment with band groove of boot.

### CAUTION:

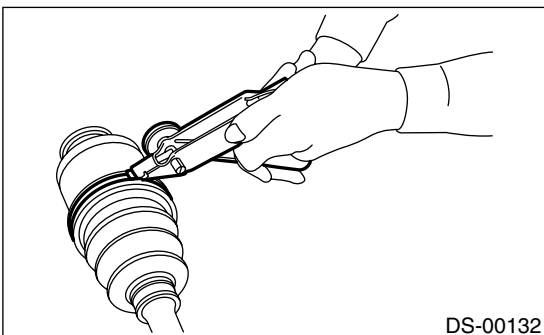
**The boot must be replaced with a new one whenever it is removed.**

14) Tighten band by using ST.

ST 925091000 BAND TIGHTENING TOOL

### NOTE:

Tighten band until it cannot be moved by hand.

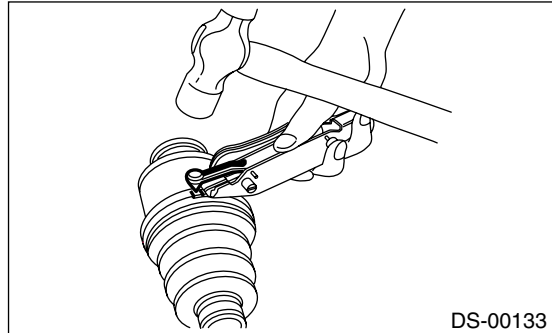


15) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

### CAUTION:

**Tap to an extent that the boot underneath is not damaged.**



16) Cut off band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.

### CAUTION:

**Bend the band so that its end is in close contact with clip.**

17) Fix up boot on outer joint in the same manner.

18) Extend and retract inner joint so that the grease in inner joint may spread equally.

## E: INSPECTION

Check the removed parts for damage, wear, corrosion etc. If faulty, repair or replace.

1) Inner joint

Check seizure, corrosion, damage, wear and excessive play.

2) Outer joint

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) Boot

Check for wear, warping, breakage or scratches.

5) Grease

Check for discoloration or dilution.



## 7. General Diagnostic Table

### A: INSPECTION

**NOTE:**

Vibration while cruising may be caused by an unbalanced tire, improper tire inflation pressure, improper wheel alignment, etc.

Symptom	Possible cause	Remedy
<b>1. Vibration of propeller shaft</b> NOTE: Vibration is caused by propeller shaft during operation and is transferred to vehicle body. Generally vibration increases in proportion to vehicle speed.	(1) Worn or damaged universal joint.	Replace.
	(2) Unbalanced propeller shaft due to bend or dent.	Replace.
	(3) Loose installation of propeller shaft.	Retighten.
	(4) Worn or damaged center bearing and damaged center mounting rubber.	Replace.
<b>2. Tapping when starting and noise while cruising, caused by propeller shaft.</b>	(1) Worn or damaged universal joint.	Replace.
	(2) Worn spline of sleeve yoke.	Replace.
	(3) Loose installation of propeller shaft.	Retighten.
	(4) Loose installation of joint.	Replace.
	(5) Worn or damaged center bearing and damaged center mounting rubber.	Replace.

# GENERAL DIAGNOSTIC TABLE

DRIVE SHAFT SYSTEM

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**MEMO:**