

CHASSIS SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

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DRIVE SHAFT SYSTEM

DS

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General Description

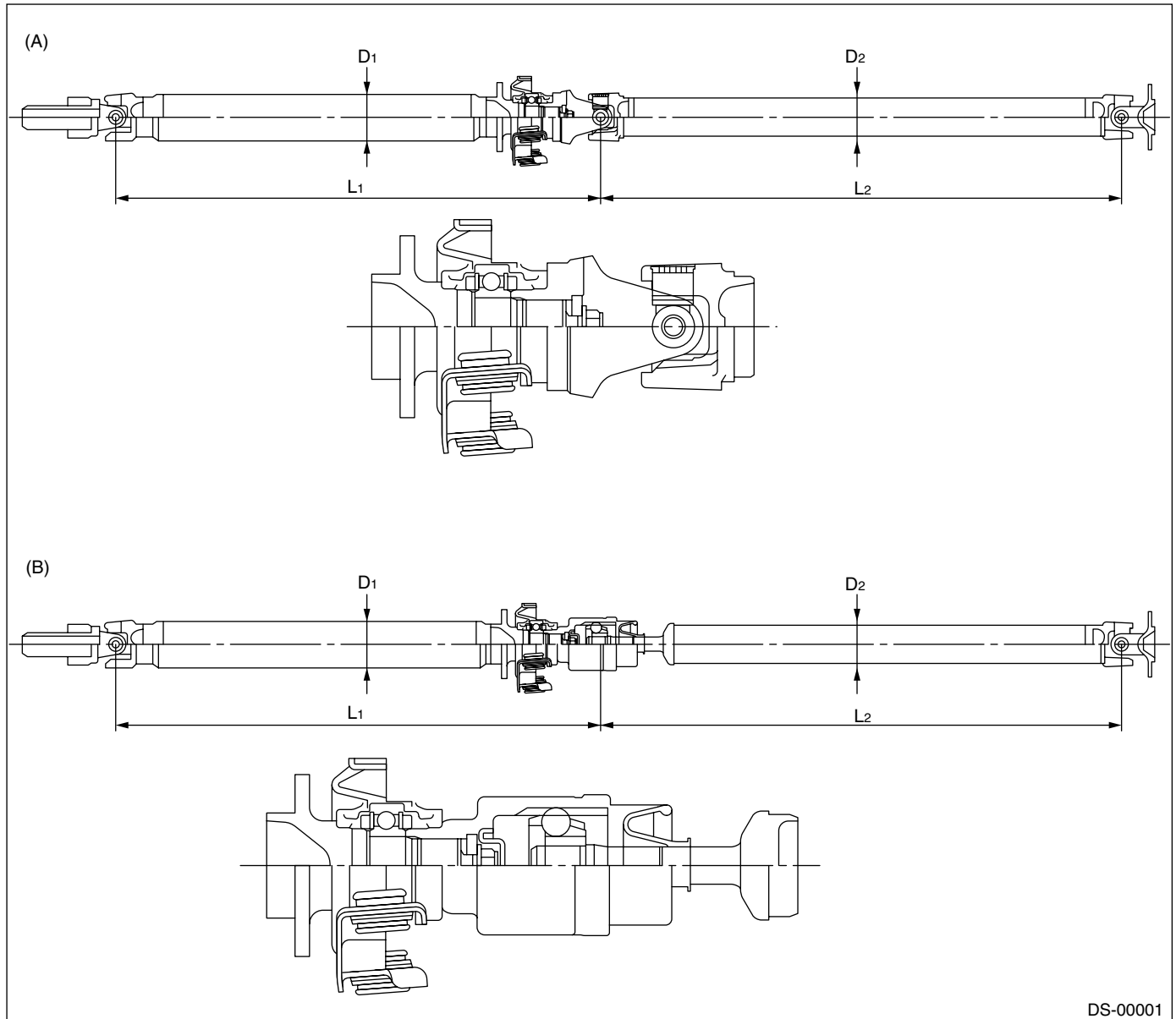
DRIVE SHAFT SYSTEM

1. General Description

A: SPECIFICATIONS

1. PROPELLER SHAFT

Model		Non-turbo	Turbo (except for STi)	STi (model without DCCD)	STi (model with DCCD)
Propeller shaft type		UJ	DOJ	UJ	UJ
Front propeller shaft Joint-to-joint length: L_1	mm (in)			—	
	AT	584 (22.99)	579 (22.79)		
	MT	643 (25.32)	638 (25.12)	584 (22.99)	574 (22.60)
Rear propeller shaft Joint-to-joint length: L_2	mm (in)	708 (27.87)	713 (28.07)	708 (27.87)	706 (27.80)
Outer diameter of tube:	mm (in)	63.5 (2.500)			70 (2.756)
		D_1			
		D_2			57.0 (2.244)



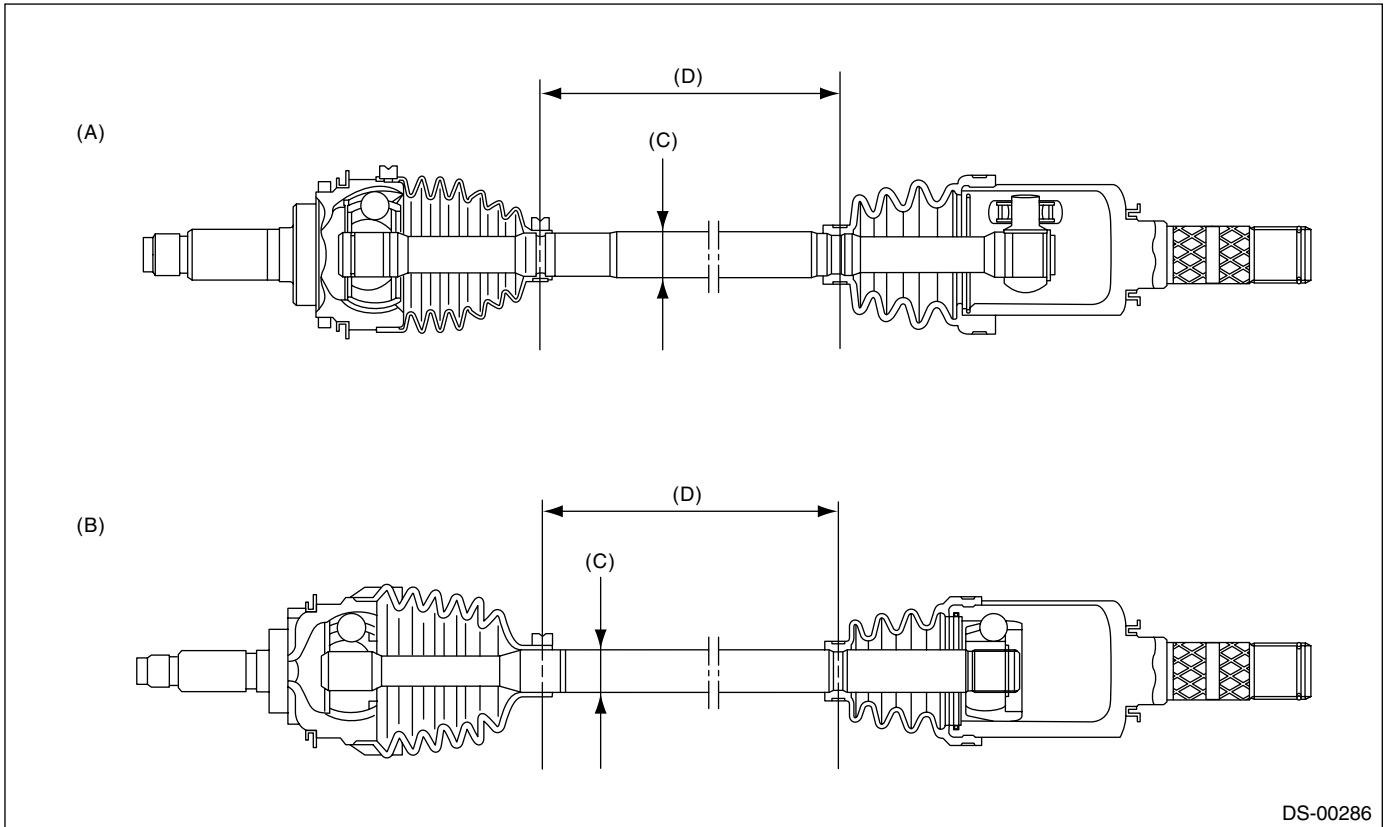
DS-00001

(A) UJ type

(B) DOJ type

2. FRONT DRIVE SHAFT ASSEMBLY

Model		Type of drive shaft	Axle diameter ϕ D mm (in)	Axle length L mm (in)
Sedan	Non-turbo, Turbo AT	EBJ87+PTJ82	26 (1.02)	338.8 (13.34)
	Turbo MT (except STi)	EBJ87+PTJ82	28 (1.10)	338.8 (13.34)
	Turbo MT (STi)	BJ92+DOJ87	28 (1.10)	297.6 (11.72)
Wagon	Non-turbo, Turbo AT	EBJ87+PTJ82	26 (1.02)	329.6 (12.98)
	Turbo MT	EBJ87+PTJ82	28 (1.10)	329.6 (12.98)



DS-00286

- (A) EBJ87+SFJ82
- (B) BJ92+DOJ87

(C) Axle diameter

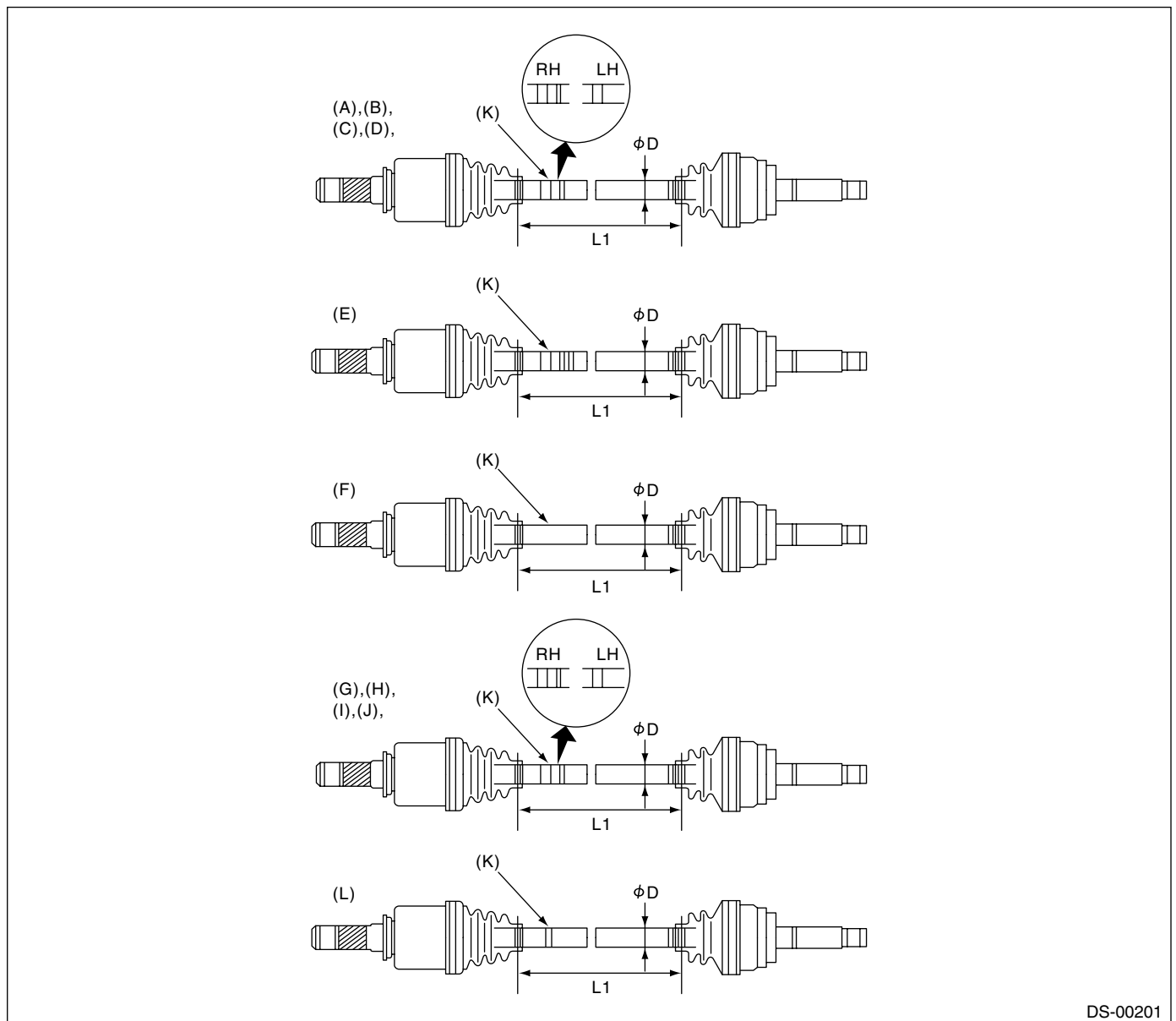
(D) Axle length

General Description

DRIVE SHAFT SYSTEM

3. REAR DRIVE SHAFT ASSEMBLY

Size	Model	No. of identification protrusion on shaft	L1 mm (in)	ϕ D mm (in)
A	EBJ82+DOJ82	Sedan turbo (except for STi)	363 (14.29)	24 (0.94)
B	EBJ82+DOJ82			
C	BJ79+DOJ79	Sedan 2.0 L Non-turbo MT	368 (14.49)	23 (0.91)
D	BJ79+DOJ79			
E	BJ79+DOJ79	Sedan 1.6 L, 2.0 L Non-turbo AT	363 (14.29)	24 (0.94)
F	BJ79+DOJ79	Wagon 1.6 L, 2.0 L Non-turbo AT	None	24 (0.94)
G	EBJ82+DOJ82	Wagon turbo	353 (13.90)	24 (0.94)
H	EBJ82+DOJ82			
I	BJ79+DOJ79	Wagon 2.0 L Non-turbo MT	358 (14.09)	23 (0.91)
J	BJ79+DOJ79			
L	BJ87+DOJ87	STi	295.2 (11.62)	25 (0.98)

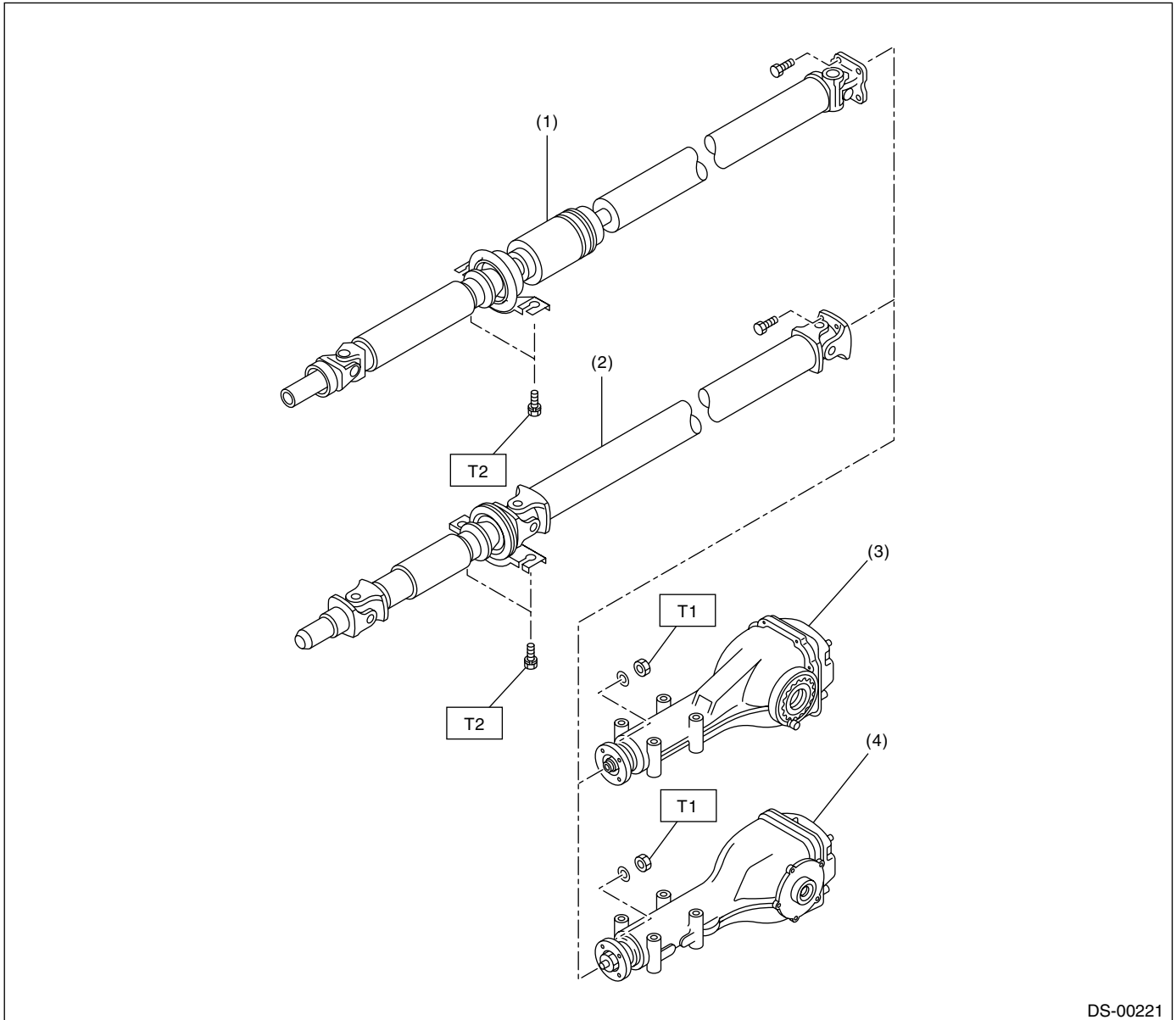


DS-00201

- | | | |
|-----------------------------|------------------------------|-------------------------------|
| (A) EBJ82+DOJ82 sedan RH | (E) BJ79+DOJ79 sedan R152R/L | (I) BJ79+DOJ79 wagon R160RH |
| (B) EBJ82+DOJ82 sedan LH | (F) BJ79+DOJ79 wagon R152R/L | (J) BJ79+DOJ79 wagon R160LH |
| (C) BJ79+DOJ79 sedan R160RH | (G) EBJ82+DOJ82 wagon RH | (K) Identification protrusion |
| (D) BJ79+DOJ79 sedan R160LH | (H) EBJ82+DOJ82 wagon LH | (L) BJ87+DOJ87 R180 RH/LH |

B: COMPONENT

1. PROPELLER SHAFT



DS-00221

- | | |
|---------------------------------|--------------------------------|
| (1) Propeller shaft (DOJ type) | (4) Rear differential (T-type) |
| (2) Propeller shaft (3UJ type) | |
| (3) Rear differential (VA-type) | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 31 (3.2, 22.9)

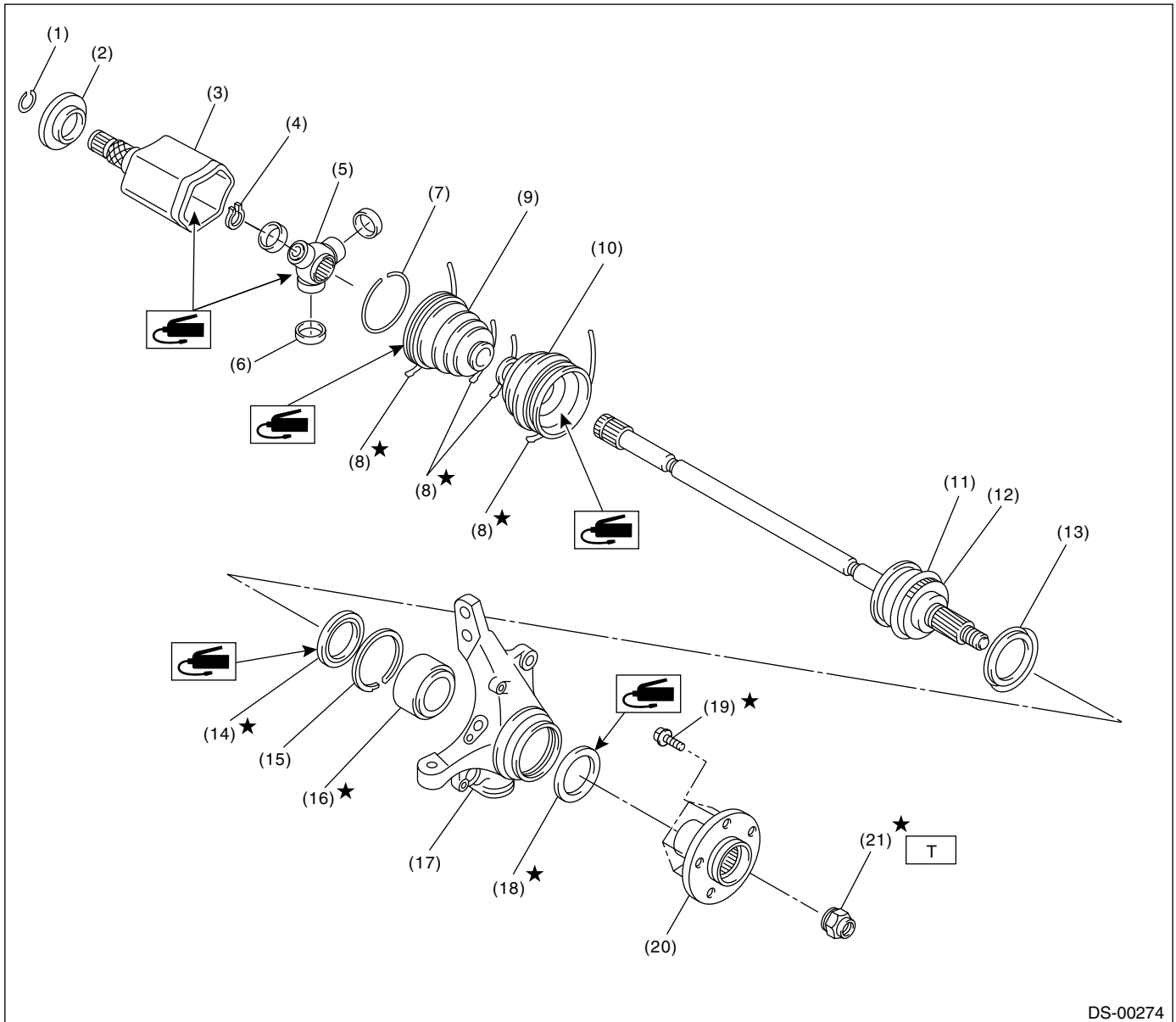
T2: 52 (5.3, 38.3)

General Description

DRIVE SHAFT SYSTEM

2. FRONT AXLE

- EBJ+PTJ type



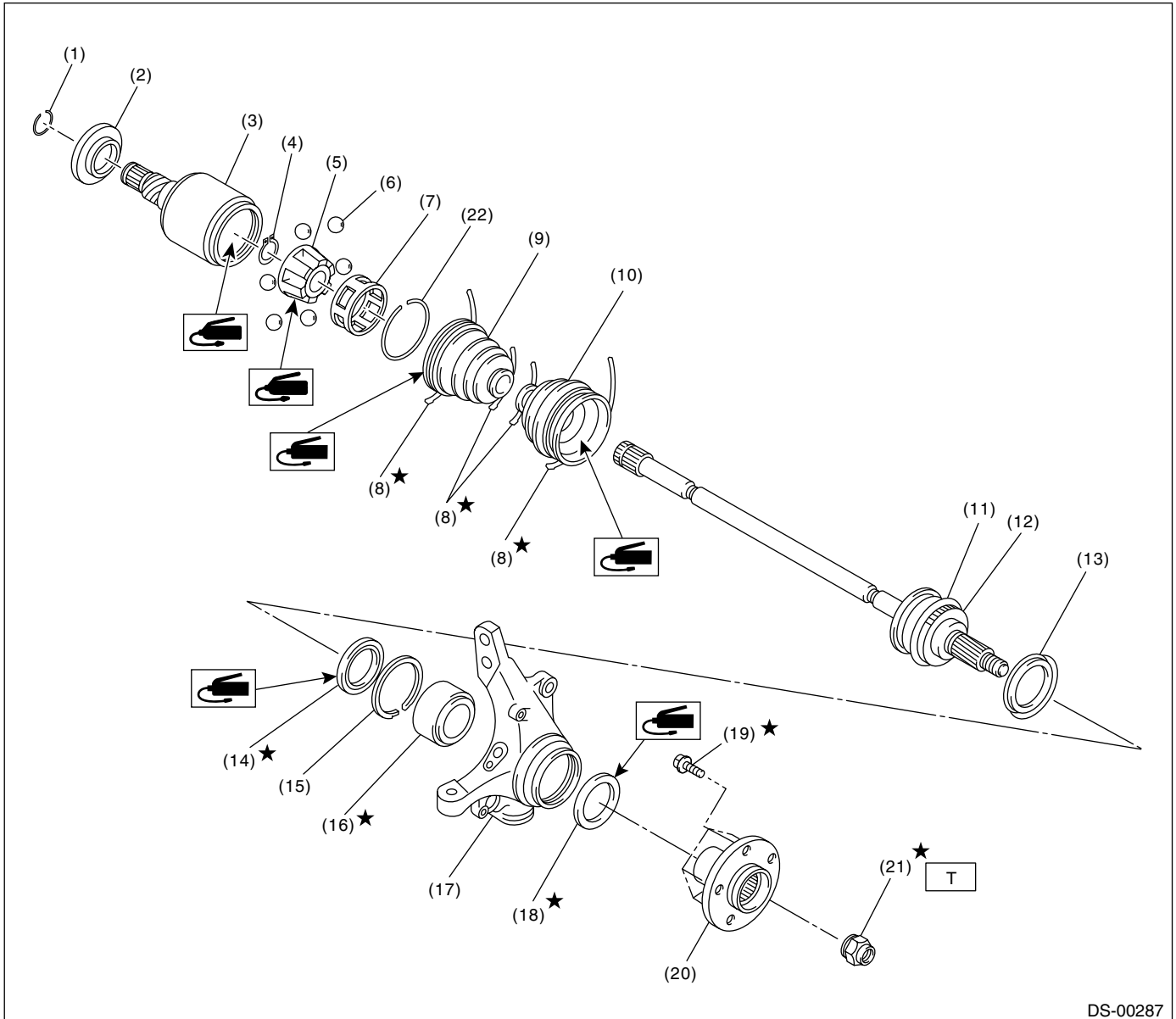
DS-00274

- | | | |
|------------------------|----------------------------|---------------------|
| (1) Circlip | (9) Boot (PTJ) | (17) Housing |
| (2) Baffle plate (PTJ) | (10) Boot (EBJ) | (18) Oil seal (OUT) |
| (3) Outer race (PTJ) | (11) EBJ ASSY | (19) Hub bolt |
| (4) Snap ring | (12) Tone wheel (with ABS) | (20) Hub |
| (5) Trunnion | (13) Baffle plate | (21) Axle nut |
| (6) Free ring | (14) Oil seal (IN) | |
| (7) Circlip | (15) Snap ring | |
| (8) Boot band | (16) Bearing | |

Tightening torque: N·m (kgf·m, ft·lb)
T: 220 (22.4, 162)

General Description

• BJ+DOJ type



DS-00287

- | | | |
|----------------------|----------------------------|----------------|
| (1) Circlip | (10) Boot (EBJ) | (19) Hub bolt |
| (2) Baffle plate | (11) EBJ ASSY | (20) Hub |
| (3) Outer race (PTJ) | (12) Tone wheel (with ABS) | (21) Axle nut |
| (4) Snap ring | (13) Baffle plate | (22) Snap ring |
| (5) Inner race | (14) Oil seal (IN) | |
| (6) Ball | (15) Snap ring | |
| (7) Cage | (16) Bearing | |
| (8) Boot band | (17) Housing | |
| (9) Boot (PTJ) | (18) Oil seal (OUT) | |

Tightening torque: N·m (kgf·m, ft·lb)

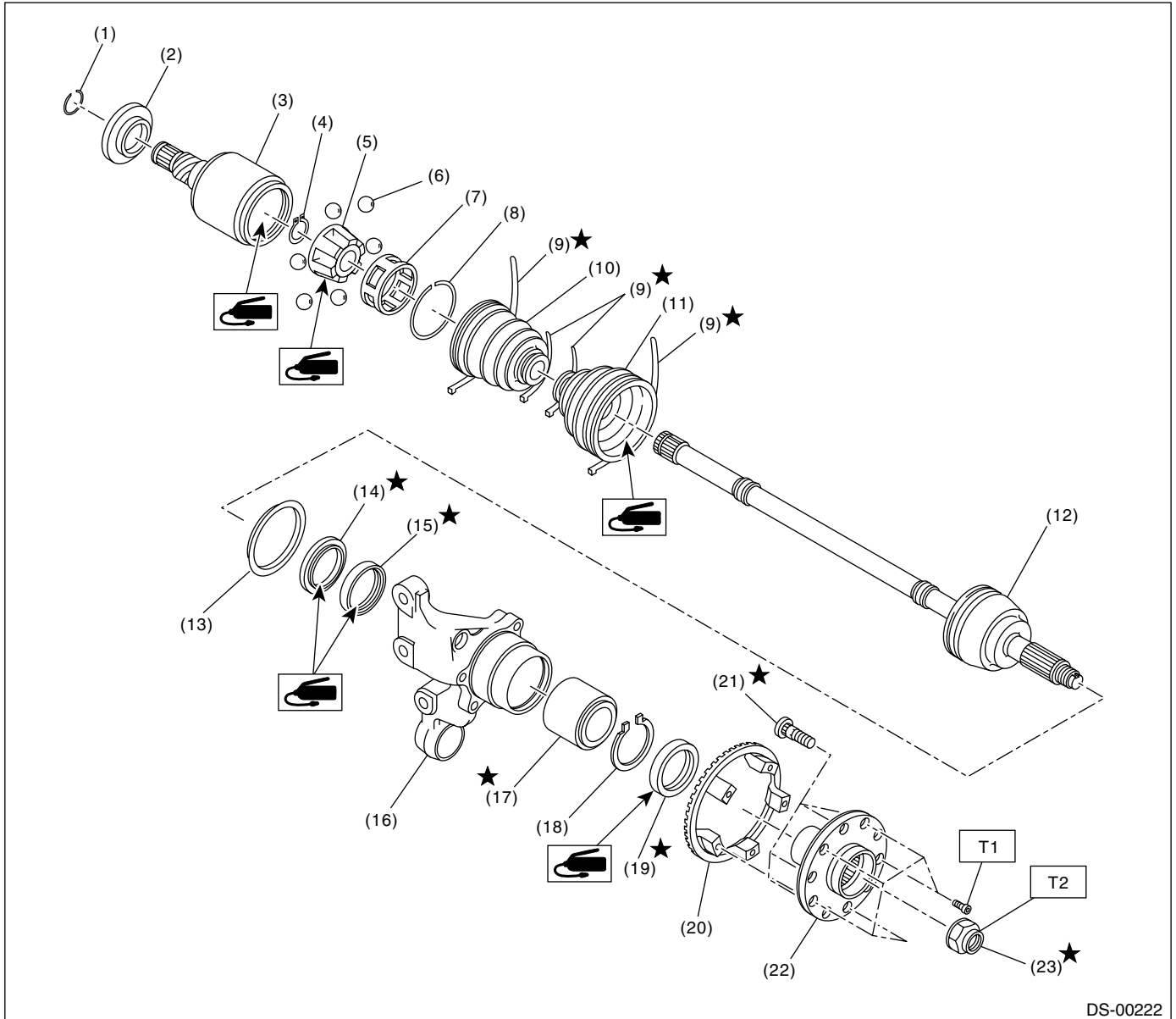
T: 220 (22.4, 162)

General Description

DRIVE SHAFT SYSTEM

3. REAR AXLE

- AWD model



DS-00222

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

- (11) Boot
- (12) Non-turbo: BJ ASSY
Turbo: EBJ ASSY
- (13) Baffle plate
- (14) Oil seal (IN. No. 2)
- (15) Oil seal (IN.)
- (16) Housing
- (17) Bearing
- (18) Snap ring
- (19) Oil seal (OUT)

- (20) Tone wheel
- (21) Hub bolt
- (22) Hub
- (23) Axle nut

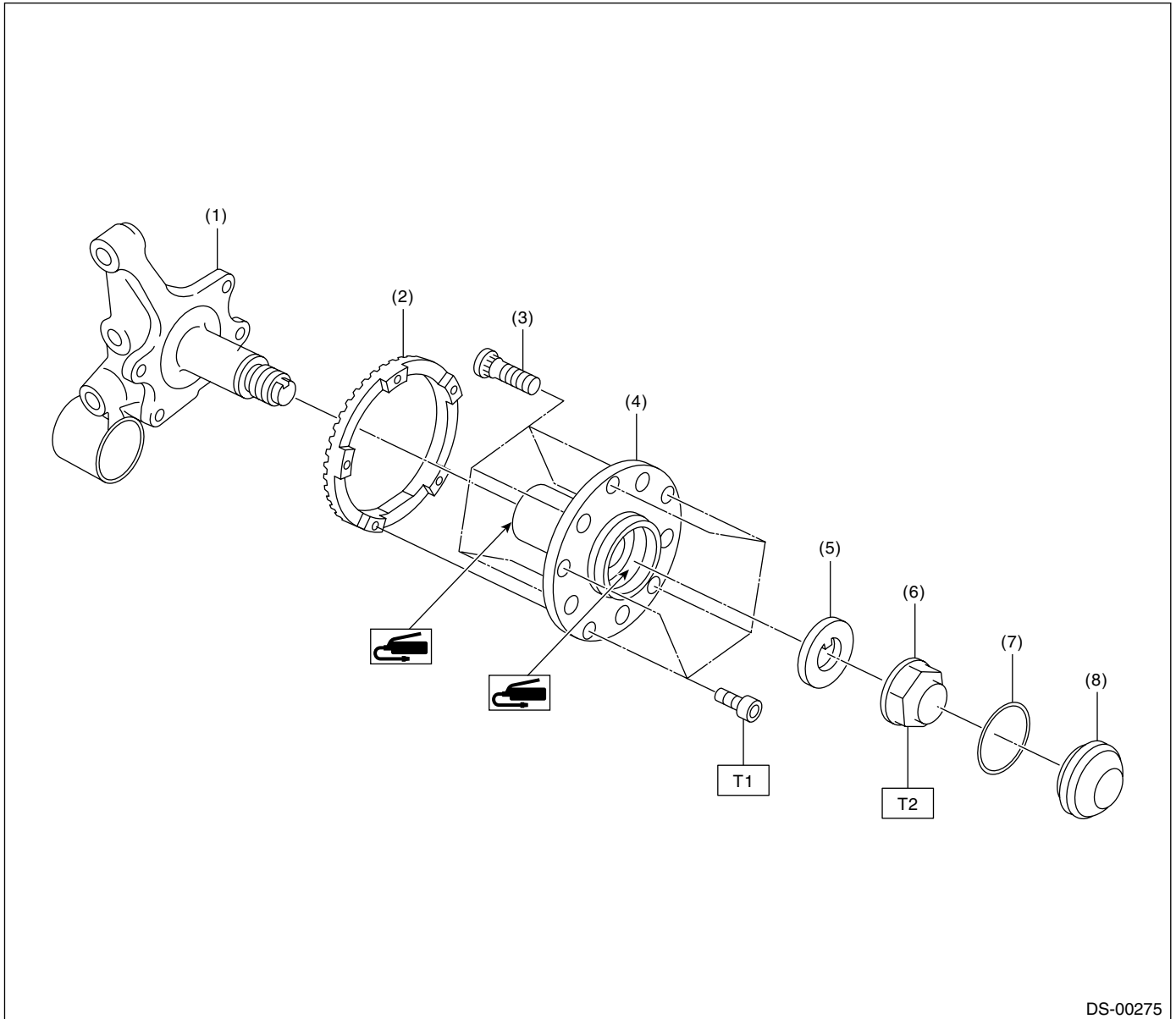
Tightening torque: N-m (kgf-m, ft-lb)

T1: 13 (1.3, 9.4)

T2: 190 (19.4, 140)

General Description

- FWD model



DS-00275

- | | |
|------------------|--------------|
| (1) Rear spindle | (5) Washer |
| (2) Tone wheel | (6) Axle nut |
| (3) Hub bolt | (7) O-ring |
| (4) Hub | (8) Hub cap |

Tightening torque: N·m (kgf·m, ft·lb)
T1: 6 (0.6, 4.4)
T2: 190 (19.4, 140)

General Description

DRIVE SHAFT SYSTEM

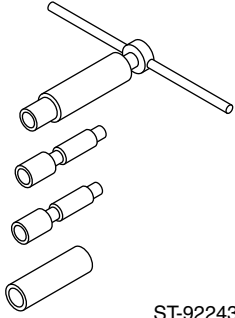
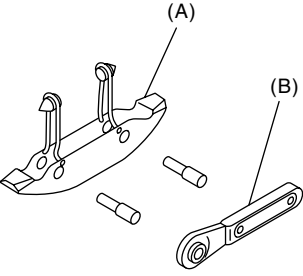
C: CAUTION

- 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 rigid racks at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing 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.

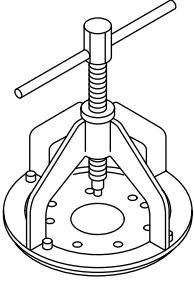
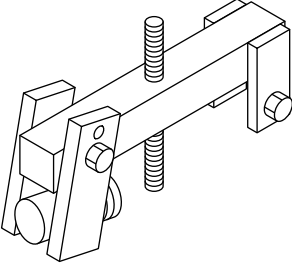
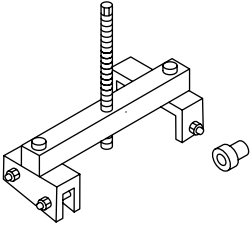
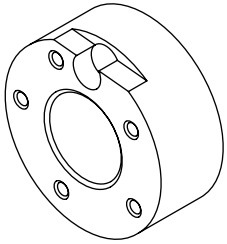
D: PREPARATION TOOL

1. SPECIAL TOOLS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-922431000</p>	922431000	AXLE SHAFT INSTALLER	<ul style="list-style-type: none"> • Used for installing axle shaft into housing. • Used with ADAPTER (927390000).
 <p>ST-925091000</p>	925091000	BAND TIGHTENING TOOL	Used for tightening boot band. (A) Jig for band (B) Ratchet wrench

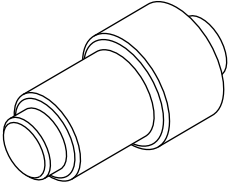
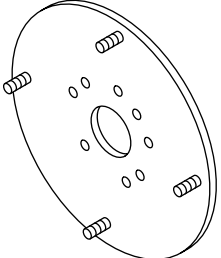
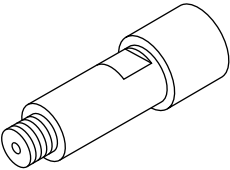
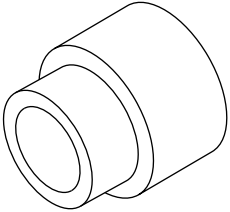
General Description

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <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"> • Used for removing front hub. • Used with HUB STAND (927080000).
 <p style="text-align: center;">ST-927420000</p>	927420000	HUB REMOVER	<ul style="list-style-type: none"> • Used for removing rear hub. • Used with HUB STAND (927080000).
 <p style="text-align: center;">ST-927080000</p>	927080000	HUB STAND	Used for disassembling and assembling hub bolt in hub.

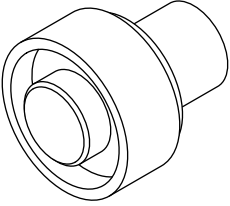
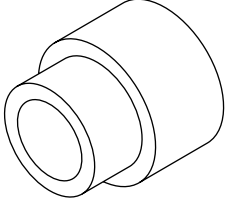
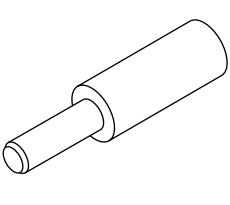
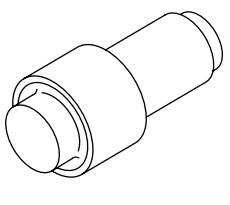
General Description

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927100000</p>	927100000	BEARING PULLER	<ul style="list-style-type: none"> • Used for disassembling and assembling front housing bearing. • Used with HOUSING STAND (927400000).
 <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"> • Used for disassembling and assembling front housing bearing. • Used with BEARING PULLER (927100000).

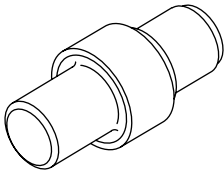
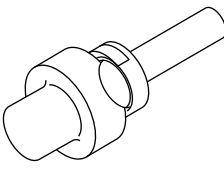
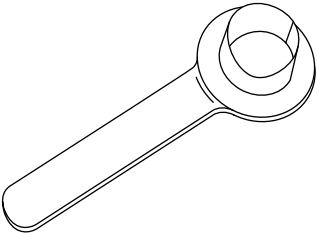
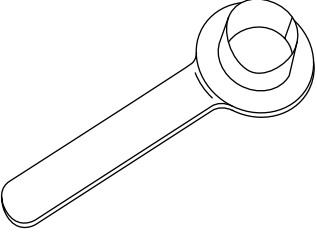
General Description

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"> • Used for installing oil seal into front housing. • Used with HOUSING STAND (927400000).
 <p style="text-align: center;">ST-927430000</p>	<p style="text-align: center;">927430000</p>	<p>HOUSING STAND</p>	<ul style="list-style-type: none"> • Used for disassembling and assembling rear housing bearing. • Used with BEARING PULLER (927440000).
 <p style="text-align: center;">ST-927120000</p>	<p style="text-align: center;">927120000</p>	<p>HUB INSTALLER</p>	<p>Used for installing hub.</p>
 <p style="text-align: center;">ST-927440000</p>	<p style="text-align: center;">927440000</p>	<p>BEARING REMOVER</p>	<ul style="list-style-type: none"> • Used for disassembling and assembling rear wheel bearing. • Used with HOUSING STAND (927430000).

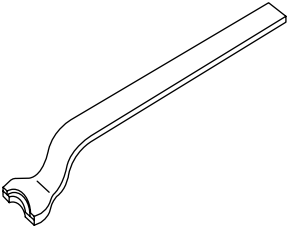
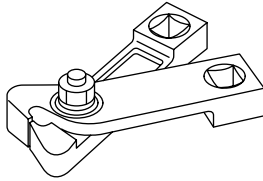
General Description

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927460000</p>	<p style="text-align: center;">927460000</p>	<p>OIL SEAL INSTALLER</p>	<ul style="list-style-type: none"> • Used for installing outer oil seal. • Used with HOUSING STAND (927430000).
 <p style="text-align: center;">ST-927450000</p>	<p style="text-align: center;">927450000</p>	<p>HUB INSTALLER</p>	<ul style="list-style-type: none"> • Used for pressing hub bearing into hub. • Used with HUB STAND (927080000).
 <p style="text-align: center;">ST28099PA090</p>	<p style="text-align: center;">28099PA090</p>	<p>OIL SEAL PROTECTOR</p>	<ul style="list-style-type: none"> • Used for installing rear drive shaft into rear differential. • For protecting oil seal.
 <p style="text-align: center;">ST28399SA010</p>	<p style="text-align: center;">28399SA010</p>	<p>OIL SEAL PROTECTOR</p>	<ul style="list-style-type: none"> • Used for installing front drive shaft to transmission. • For protecting oil seal.

General Description

DRIVE SHAFT SYSTEM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28099PA100	28099PA100	DRIVE SHAFT REMOVER	Used for removing rear drive shaft from rear differential.
 ST28099AC000	28099AC000	BOOT BAND PLI- ERS	Used for tightening front BJ boot band.

2. GENERAL PURPOSE TOOLS

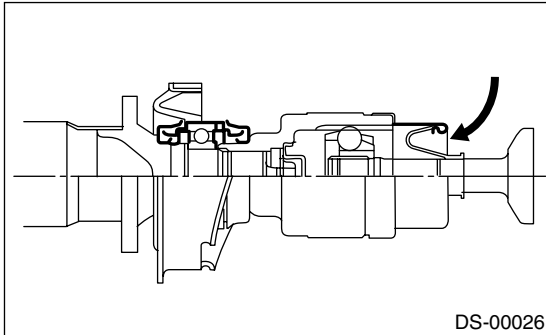
TOOL NAME	REMARKS
Puller	Used for removing ball joint from knuckle arm.
Dial gauge	Used for inspecting propeller shaft run-out.
Snap ring pliers	Used for installing and removing snap ring.
Bar	Used for removing drive shaft.

2. Propeller Shaft

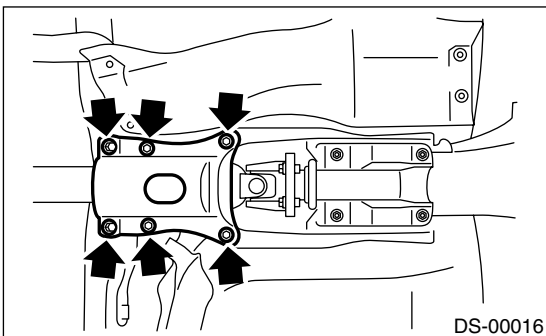
A: REMOVAL

NOTE:

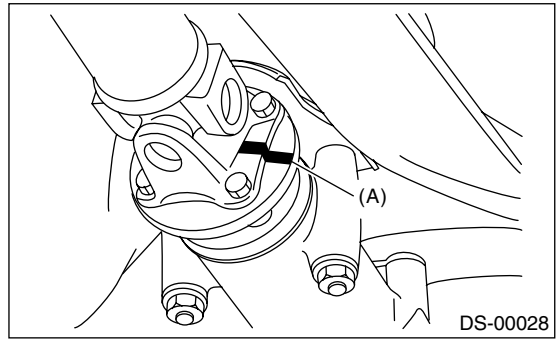
- Before removing the propeller shaft, wrap the metal parts with a cloth or rubber material.
- In case of DOJ type, before removing the propeller shaft, wrap the metal parts (installed at the rubber boot of center DOJ) with a cloth or rubber material, as shown in the figure. Rubber boot may be damaged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



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

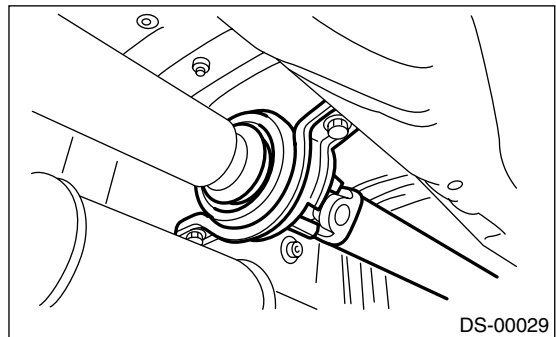


- 8) Make matching marks on affected parts before removal.



(A) Matching mark

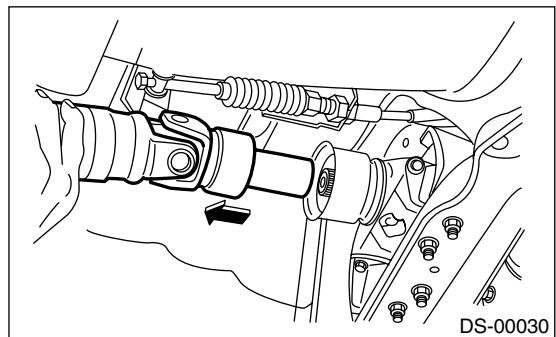
- 9) Remove the three bolts which hold the propeller shaft to rear differential.
- 10) Remove the remaining bolt.
- 11) Remove the two bolts which hold the center bearing to vehicle body.



- 12) Remove the propeller shaft from transmission.

CAUTION:

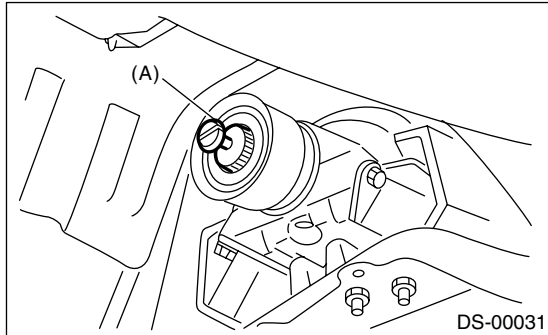
- Be careful not to damage the oil seals and frictional surface of sleeve yoke.
- Cover the center exhaust pipe with a cloth to keep off any ATF or oil spilled from transmission when removing the propeller shaft.



13) Install the extension cap to transmission.

NOTE:

If the extension cap is not available, place a vinyl bag over opening and fasten it with string to prevent gear oil or ATF from leaking.



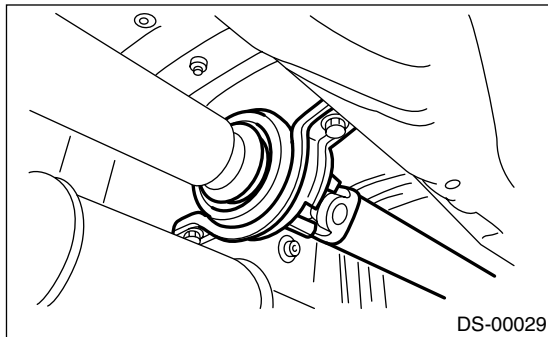
(A) Extension cap

B: INSTALLATION

1) Insert the sleeve yoke into transmission, and then attach the center bearing to body.

Tightening torque:

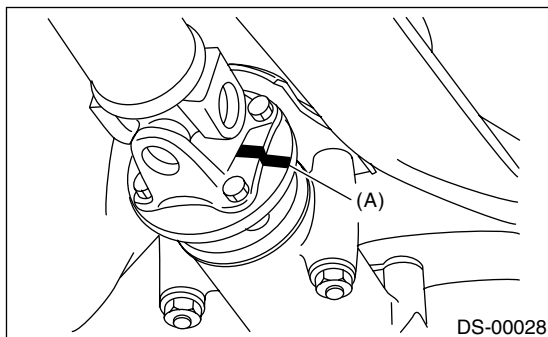
52 N·m (5.3 kgf·m, 38.3 ft-lb)



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

Tightening torque:

31 N·m (3.2 kgf·m, 22.9 ft-lb)



(A) Matching mark

3) Using new bolts, install the differential mount front cover.

(1) Temporarily tighten the bolt (A) while pushing cover forward.

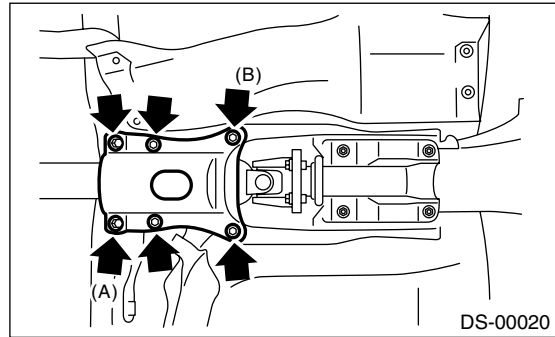
(2) Tighten the bolt (B) to specified torque.

(3) Tighten the bolt (A) to specified torque.

(4) Tighten the remaining bolts to specified torque.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft-lb)



4) Install the center exhaust pipes.

5) Install the rear exhaust pipe and muffler.

C: INSPECTION

NOTE:

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

- 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

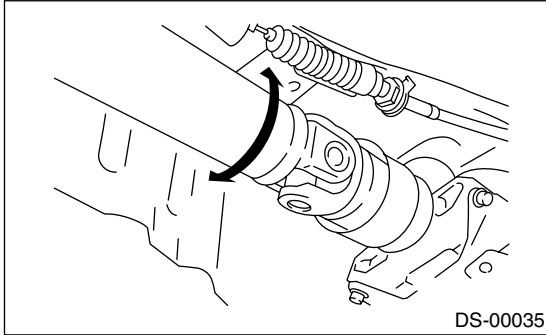
- 1) Remove the center exhaust pipes.
- 2) Remove the heat shield cover.
- 3) Check for any looseness of the yoke flange mounting bolts which connect to rear differential and center bearing bracket mounting bolts.

Propeller Shaft

DRIVE SHAFT SYSTEM

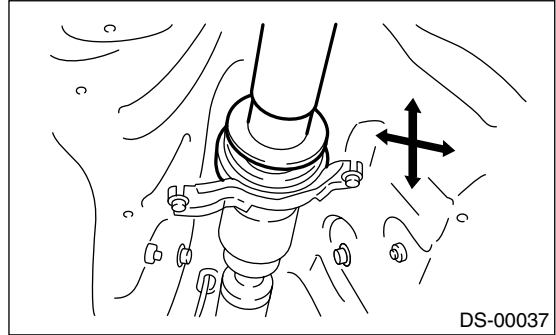
2. SPLINES AND BEARING LOCATIONS

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



4. CENTER BEARING FREE PLAY

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

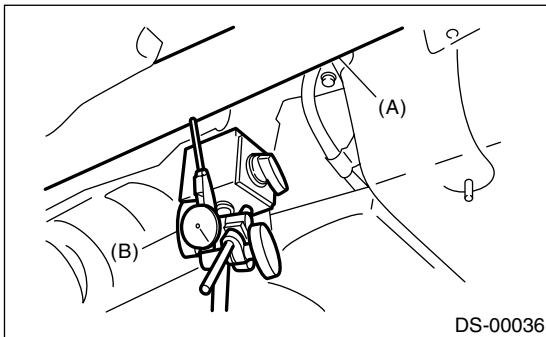


3. RUNOUT OF PROPELLER SHAFT

- 1) Remove the center exhaust pipes.
- 2) Remove the rear exhaust pipe and muffler.
- 3) Remove the heat shield cover.
- 4) Set the dial gauge with its indicator stem at center of propeller shaft tube.
- 5) Turn the propeller shaft slowly by hands to check for "runout" of propeller shaft.

Runout:

Limit 0.6 mm (0.024 in)

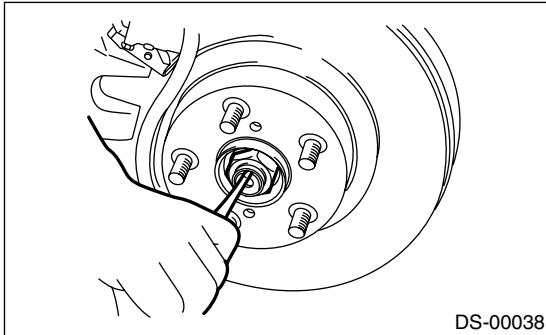


- (A) Propeller shaft
- (B) Dial gauge

3. Front Axle

A: REMOVAL

- 1) Lift-up the vehicle and remove the front wheels.
- 2) Unlock the axle nut.



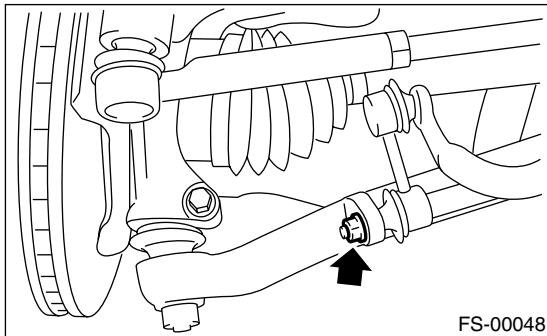
- 3) Remove the axle nut using a socket wrench while depressing the brake pedal.

CAUTION:

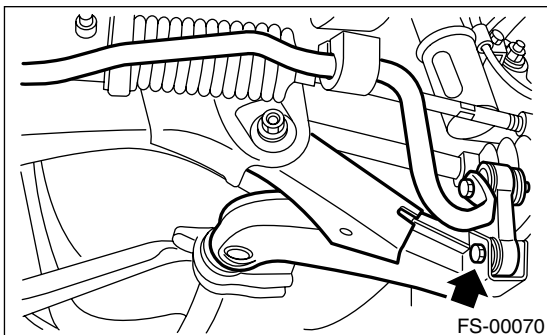
Remove the axle nut with vehicle weight not applied on axle. Failure to follow this rule may damage the wheel bearings.

- 4) Remove the stabilizer link.

SEDAN:



WAGON:

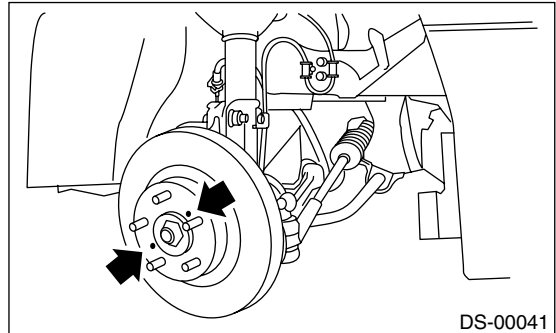


- 5) Remove the disc brake caliper from housing, and suspend it from strut using a wire.

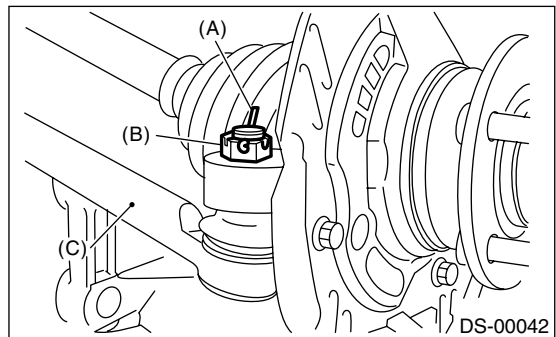
- 6) Remove the disc rotor from hub.

NOTE:

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

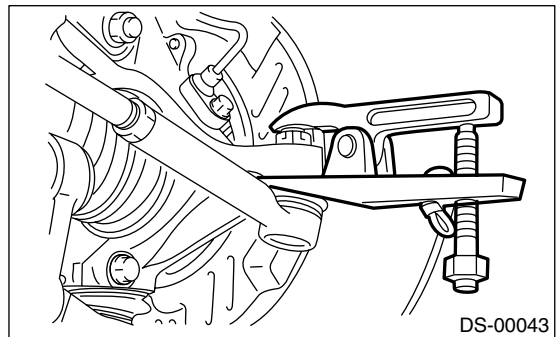


- 7) Remove the cotter pin and castle nut which secure tie-rod end to housing knuckle arm.



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

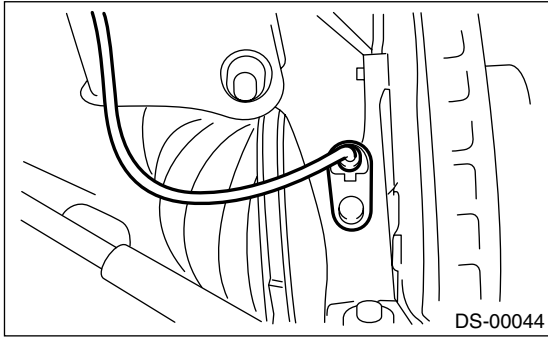
- 8) Using a puller, remove the tie-rod ball joint from knuckle arm.



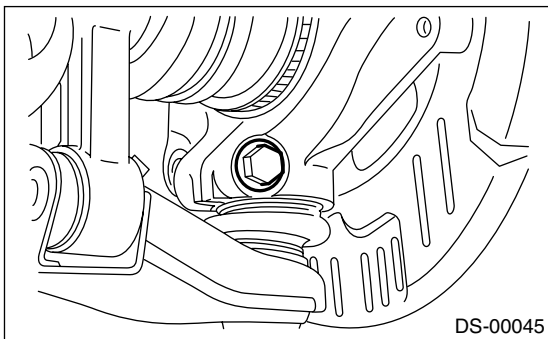
Front Axle

DRIVE SHAFT SYSTEM

9) Remove the ABS wheel speed sensor assembly and harness.



10) Remove the transverse link ball joint from housing.

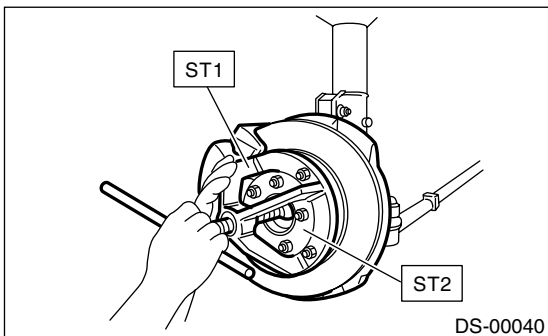


11) Remove the front drive shaft assembly from hub. If it is hard to remove, use the STs.

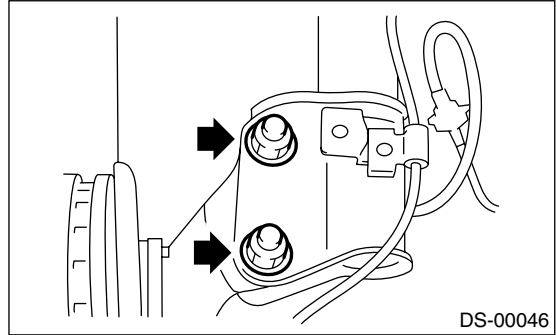
ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 AXLE SHAFT PULLER
PLATE

CAUTION:

- Be sure to replace the differential side retainer oil seal at transmission side with a new one when removing the front drive shaft.
- Suspend the front drive shaft to vehicle body using a wire.



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



B: INSTALLATION

- 1) Temporarily tighten the front axle to front strut.
- 2) Insert the front drive shaft into front axle.
- 3) Temporarily tighten the axle nut.
- 4) Install the transverse link ball joint to housing.

Tightening torque:

50 N·m (5.1 kgf-m, 37 ft-lb)

5) While aligning the alignment mark on the camber adjusting bolt head, tighten the housing and strut using a new self-locking nut.

Tightening torque:

175 N·m (17.8 kgf-m, 129 ft-lb)

6) Connect the tie-rod end ball joint to the knuckle arm with a castle nut.

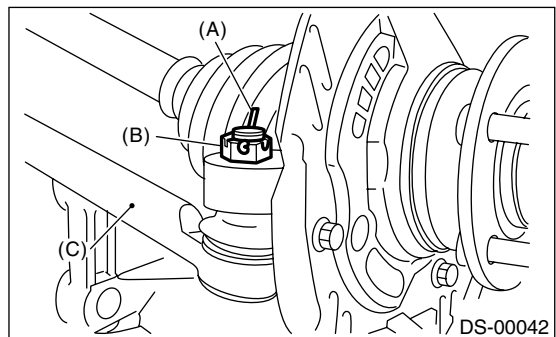
Tightening torque:

27.0 N·m (2.75 kgf-m, 19.9 ft-lb)

CAUTION:

When connecting, do not hit the cap at bottom of tie-rod with hammer.

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



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

8) Install the disc rotor on hub.

9) Install the disc brake caliper on housing.

Tightening torque:

80 N·m (8.2 kgf·m, 59 ft·lb)

10) Connect the stabilizer link.

Tightening torque:

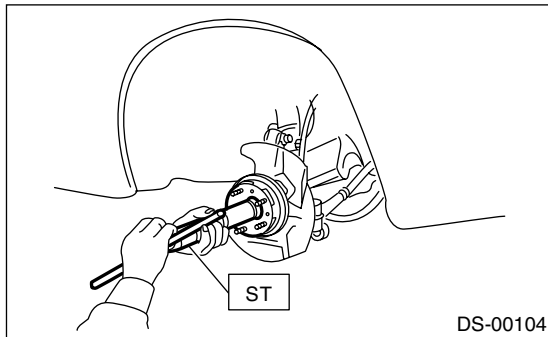
45 N·m (4.6 kgf·m, 33 ft·lb)

CAUTION:

Use a new self-locking nut.

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

ST1 922431000 AXLE SHAFT INSTALLER
ST2 927390000 ADAPTER



12) While depressing the brake pedal, tighten a new axle nut to specified torque and lock it securely.

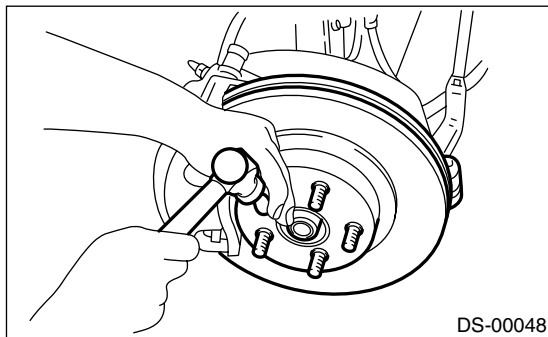
Tightening torque:

220 N·m (22.4 kgf·m, 162 ft·lb)

CAUTION:

Be sure to tighten the axle nut to specified torque. Do not overtighten it as this may damage the wheel bearing.

13) After tightening the axle nut, lock it securely.



14) Install the ABS wheel speed sensor on housing.

Tightening torque:

32 N·m (3.3 kgf·m, 23.9 ft·lb)

15) Install the wheel and tighten the wheel nuts to specified torque.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

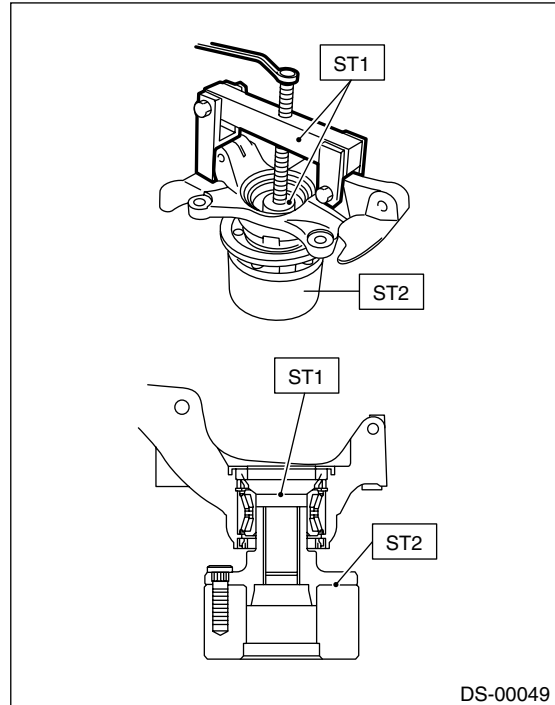
C: DISASSEMBLY

1) Using the ST1, support the housing and hub securely.

2) Attach the ST2 to housing and drive the hub out.

ST1 927060000 HUB REMOVER

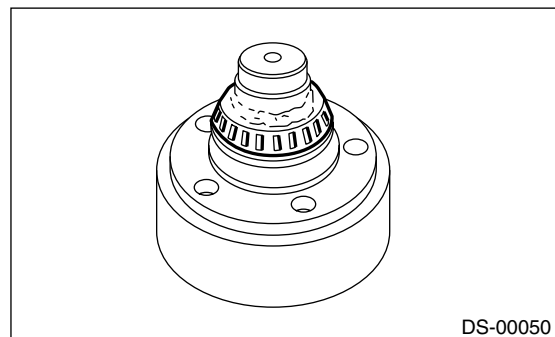
ST2 927080000 HUB STAND



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

NOTE:

Be careful not to scratch the polished area of hub.



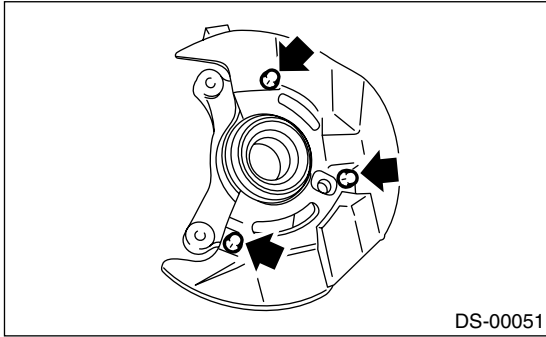
CAUTION:

Do not reuse the bearing if the hub was removed.

Front Axle

DRIVE SHAFT SYSTEM

3) Remove the disc cover from housing.

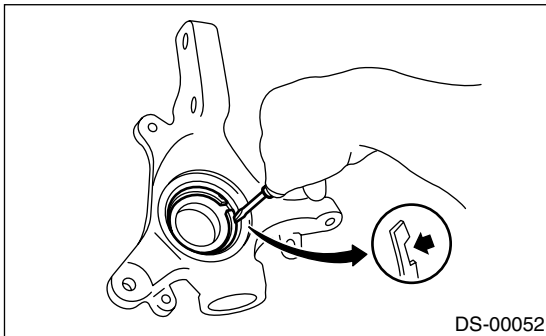


4) Using a standard screwdriver, remove the outer and inner oil seals.

5) Using a flat tip screwdriver, remove the snap ring.

NOTE:

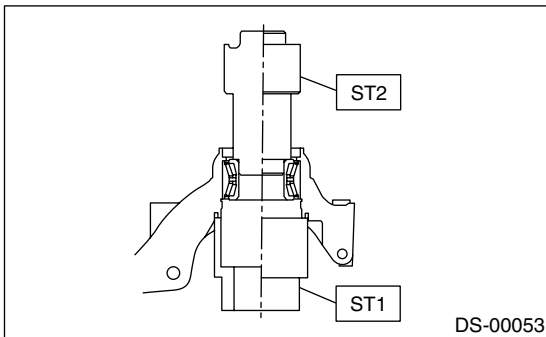
Be careful not to damage the housing at removal.



6) Using the ST1, support the housing securely.

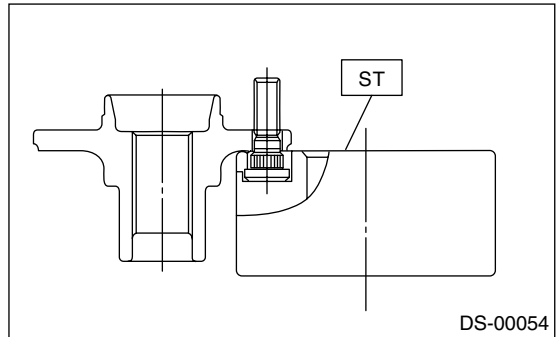
7) Using the ST2, hold the inner race to drive out the outer race of bearing.

ST1 927400000 HOUSING STAND
ST2 927100000 BEARING PULLER



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

ST 927080000 HUB STAND



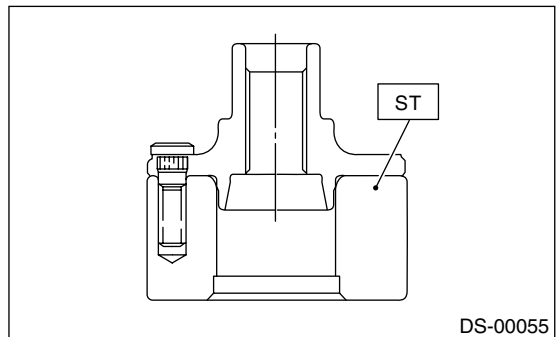
D: ASSEMBLY

NOTE:

When the hub is to be removed from housing, replace the bearing set and oil seal with new ones.

1) Attach the hub to ST securely.

ST 927080000 HUB STAND



2) Using a hydraulic press, press new 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 of housing.

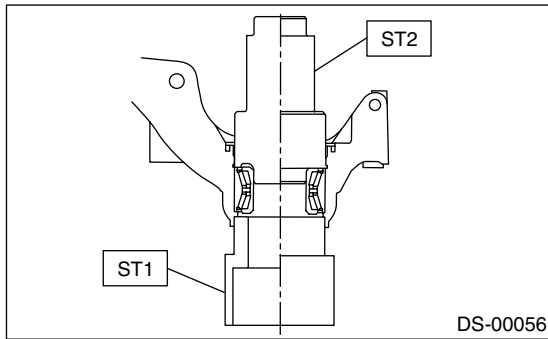
4) Using the ST1 and ST2, press a new bearing into place.

ST1 927400000 HOUSING STAND
ST2 927100000 BEARING PULLER

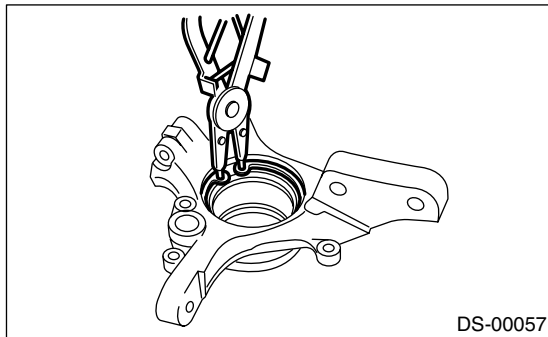
NOTE:

- Always press the outer race when installing the bearing.

- Be careful not to remove the plastic lock from inner race when installing the bearing.

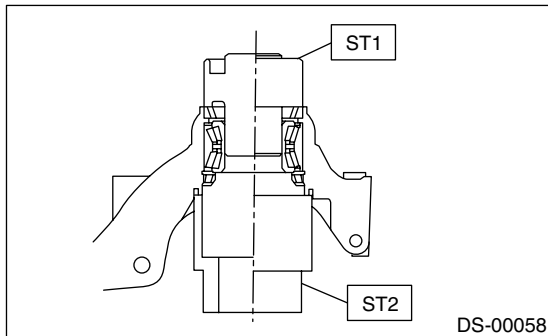


- 5) Using pliers, install the snap ring firmly.



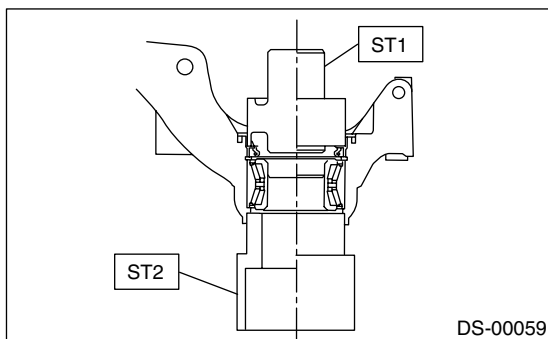
- 6) Using the ST1 and ST2, press the outer oil seal until it contacts the bottom of housing.

- ST1 927410000 OIL SEAL INSTALLER
ST2 927400000 HOUSING STAND



- 7) Using the ST1 and ST2, press the inner oil seal until it contacts the circlip.

- ST1 927410000 OIL SEAL INSTALLER
ST2 927400000 HOUSING STAND



- 8) Invert the ST and housing.
ST 927400000 HOUSING STAND
9) Apply sufficient grease to the oil seal lip.

Specified grease:
SHELL 6459N

NOTE:

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

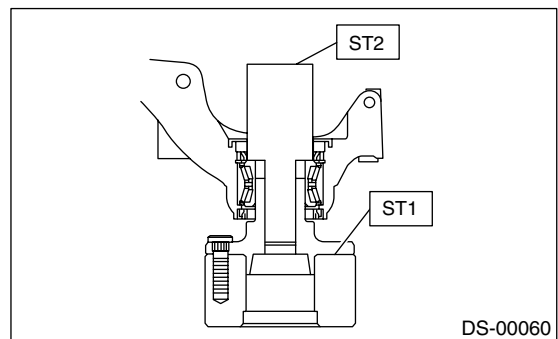
- 10) Install the disc cover to housing with three bolts.

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

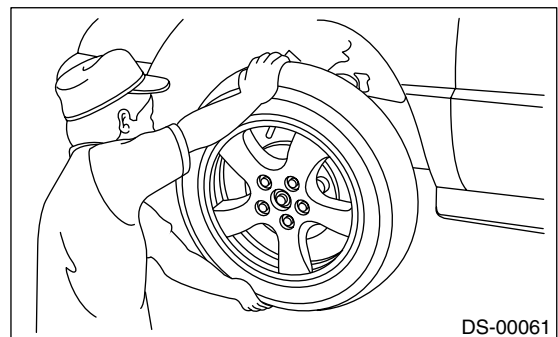
- 11) Attach the hub to ST1 securely.
12) Clean dust or foreign particles from the polished surface of hub.
13) Using the ST2, press the bearing into hub by driving the inner race.

- ST1 927080000 HUB STAND
ST2 927120000 HUB INSTALLER



E: INSPECTION

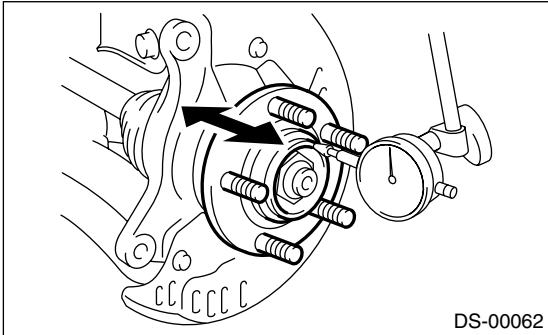
- 1) Moving the front tire up and down by hand, check there is no backlash in bearing, and check the wheel rotates smoothly.



- 2) Inspect the lean of axis direction using a dial gauge. Replace the hub bearing if the load range exceeds the limitation.

Limit:

Maximum: 0.05 mm (0.0020 in)



4. Rear Axle [AWD Model]

A: REMOVAL

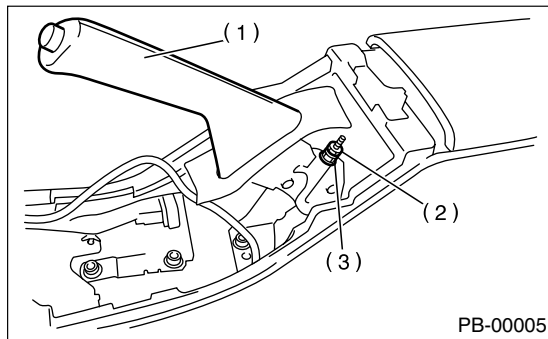
1. DISC BRAKE

- 1) Disconnect the ground cable from battery.
- 2) Lift-up the vehicle, and remove the rear wheel.
- 3) Unlock the axle nut.
- 4) Remove the axle nut using a socket wrench with parking brake applied.

CAUTION:

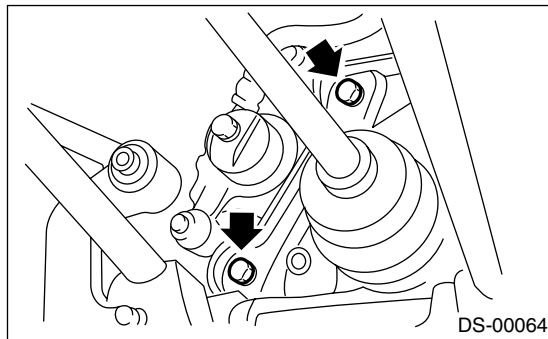
Remove the axle nut with vehicle weight not applied on axle. Failure to follow this rule may damage the wheel bearings.

- 5) Return the parking brake lever and loosen the adjusting nut.



- (1) Parking brake lever
- (2) Lock nut
- (3) Adjusting nut

- 6) Remove the disc brake caliper from back plate, and suspend it from strut using a piece of wire.

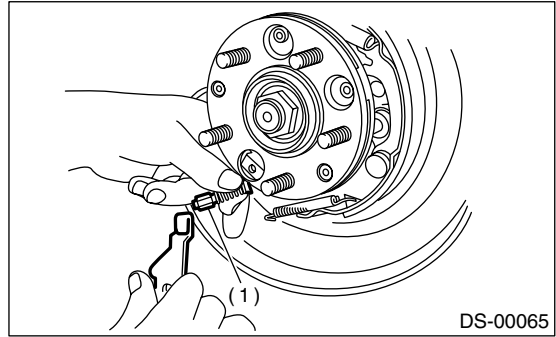


- 7) Remove the disc rotor from hub.

NOTE:

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

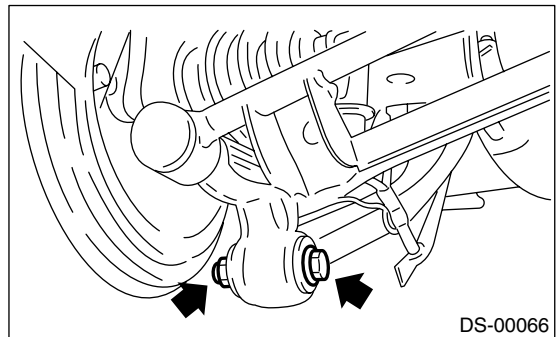
- 8) Disconnect the parking brake cable end.



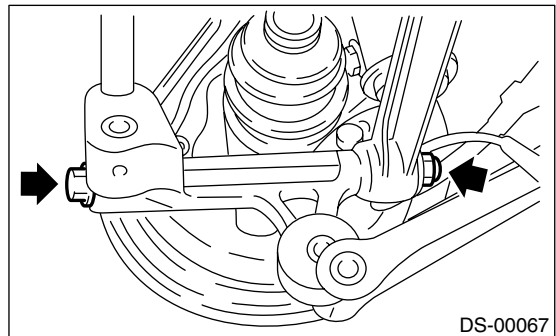
- (1) Cable end

- 9) Disconnect the rear stabilizer from rear lateral link.

- 10) Remove the bolts which secure the trailing link assembly to rear housing.



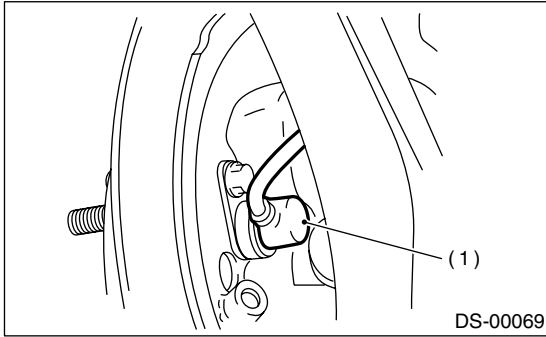
- 11) Remove the bolts which secure the lateral assembly to rear housing.



Rear Axle [AWD Model]

DRIVE SHAFT SYSTEM

12) Remove the rear ABS wheel speed sensor from back plate.



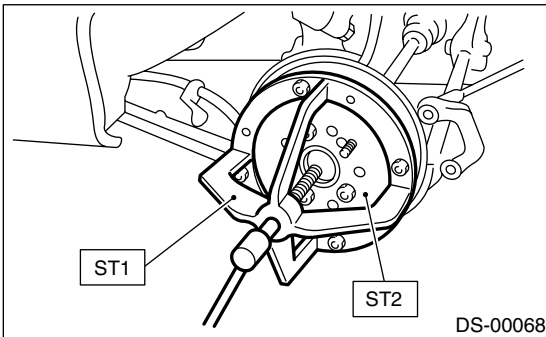
(1) ABS wheel speed sensor

13) Disengage the BJ from housing splines, and then remove the rear drive shaft assembly. If it is hard to remove, use the STs.

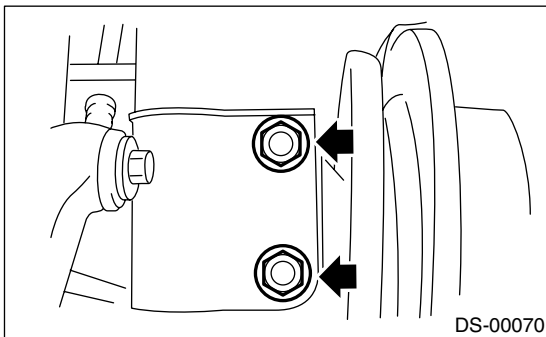
ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 AXLE SHAFT PULLER PLATE

NOTE:

- Be careful not to damage the oil seal lip when removing the rear drive shaft.
- When the rear drive shaft is to be replaced, also replace the inner oil seal with a new one.



14) Remove the bolts which secure the rear housing to strut, and separate the two.



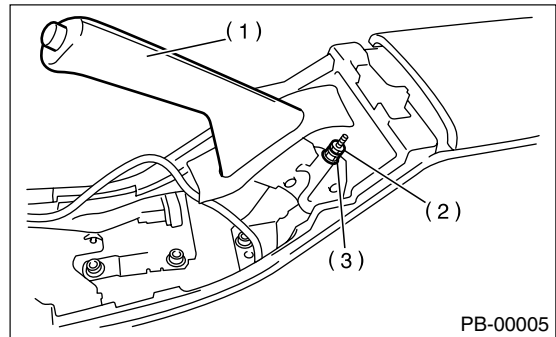
2. DRUM BRAKE

- 1) Disconnect the ground cable from battery.
- 2) Lift-up the vehicle, and remove the rear wheel cap and wheels.
- 3) Unlock the axle nut.
- 4) Remove the axle nut using a socket wrench.

CAUTION:

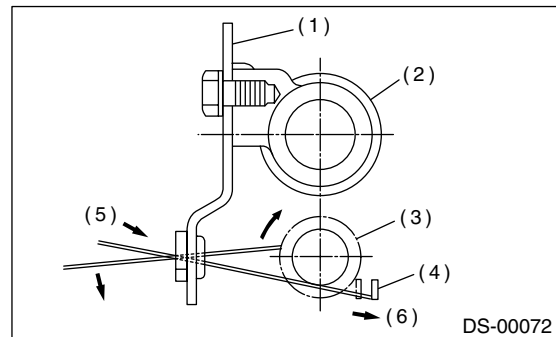
Be sure to loosen and retighten the axle nut after removing the wheel from vehicle. Failure to follow this rule may damage the wheel bearings.

- 5) Return the parking brake lever and loosen the adjusting nut.



- (1) Parking brake lever
- (2) Lock nut
- (3) Adjusting nut

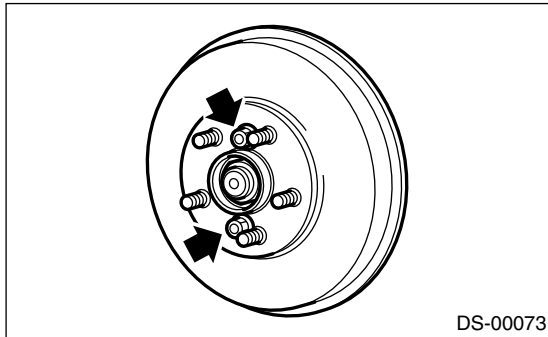
- 6) Remove the brake drum from hub.
- 7) If it is difficult to remove the brake drum, remove the adjusting hole cover from back plate, and then turn the adjusting screw using a flat tip screwdriver until the brake shoe separates from drum.



- (1) Back plate
- (2) Wheel cylinder
- (3) Adjuster ASSY pawls
- (4) Adjusting lever
- (5) Tightening direction
- (6) Push

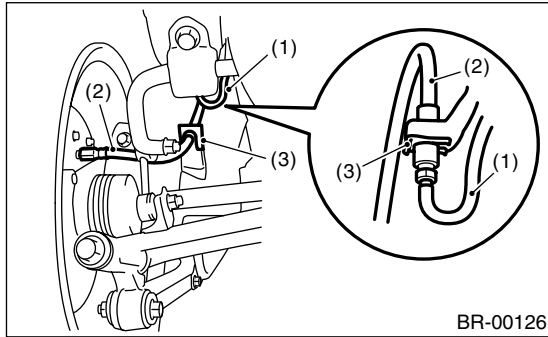
NOTE:

If the brake drum is difficult to remove, drive it out by installing two 8-mm bolts into bolt hole in brake drum.



DS-00073

8) Remove the brake hose clamp from the rear strut portion, and separate the brake hose.

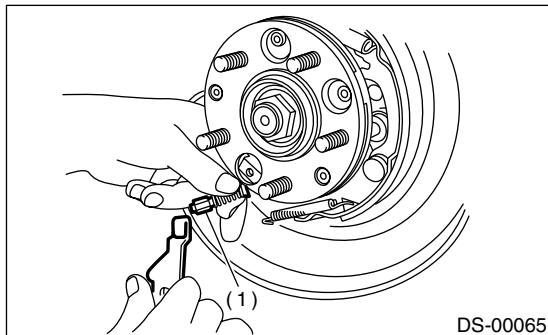


BR-00126

- (1) Brake pipe
- (2) Brake hose
- (3) Brake hose clamp

9) Cover the open end of brake pipe with vinyl sheet or equivalent to prevent brake fluid from spilling.

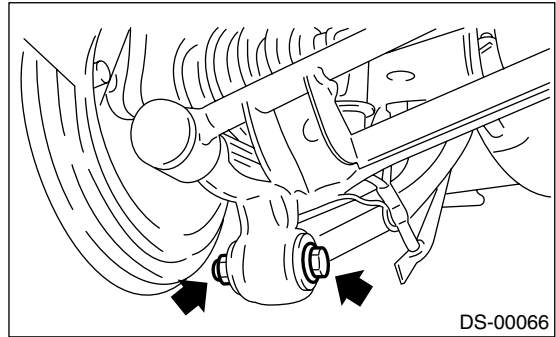
10) Disconnect the parking brake cable end.



DS-00065

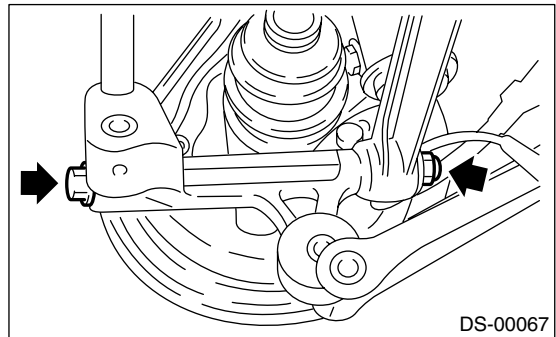
- (1) Cable end

11) Disconnect the rear stabilizer from rear lateral link. Remove the bolts which secure the trailing link assembly to rear housing.



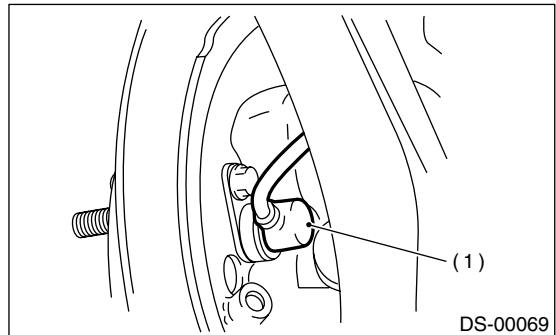
DS-00066

12) Remove the bolts which secure the lateral link assembly to rear housing.



DS-00067

13) Remove the rear ABS wheel speed sensor from back plate.



DS-00069

- (1) ABS wheel speed sensor

14) Disengage the BJ from housing splines, and remove the rear drive shaft assembly.

If it is hard to remove, use the STs.

- ST1 926470000 AXLE SHAFT PULLER
- ST2 927140000 AXLE SHAFT PULLER PLATE

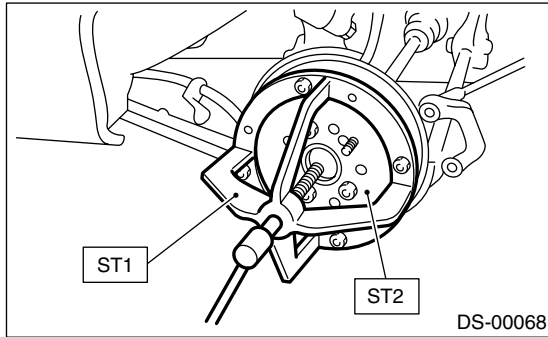
CAUTION:

- Be careful not to damage the oil seal lip when removing the rear drive shaft.

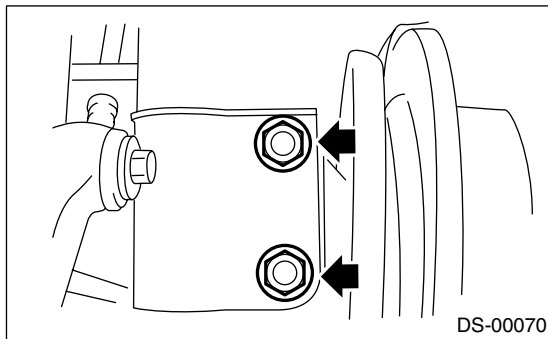
Rear Axle [AWD Model]

DRIVE SHAFT SYSTEM

- When the rear drive shaft is to be replaced, also replace the inner oil seal with a new one.



- 15) Remove the bolts which secure the rear housing to strut, and separate the two.



B: INSTALLATION

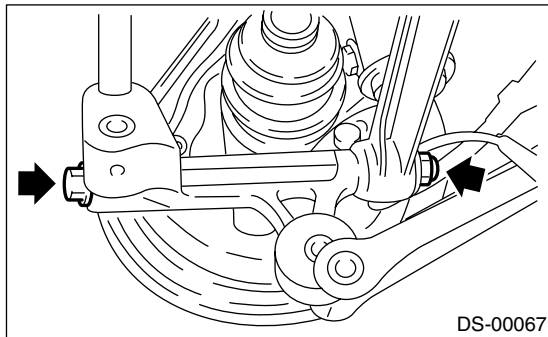
1. DISC BRAKE

- 1) Temporarily tighten the rear axle to strut.
- 2) Insert the rear drive shaft into rear axle.

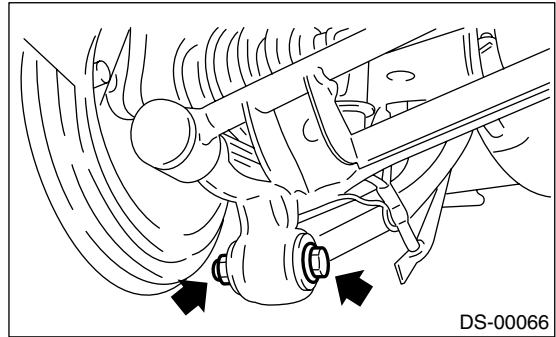
NOTE:

Be careful not to damage the inner oil seal lip.

- 3) Temporarily tighten the axle nut.
- 4) Using a new self-locking nut, temporarily tighten the rear housing assembly and lateral link assembly.



- 5) Using a new self-locking nut, temporarily tighten the rear housing assembly and trailing link assembly.



- 6) Tighten the rear housing assembly and strut assembly using a new self-locking nut.

Tightening torque:

196 N·m (20 kgf·m, 145 ft·lb)

- 7) Using a new self-locking nut, install the rear stabilizer and rear lateral link.

Tightening torque:

44 N·m (4.5 kgf·m, 32.5 ft·lb)

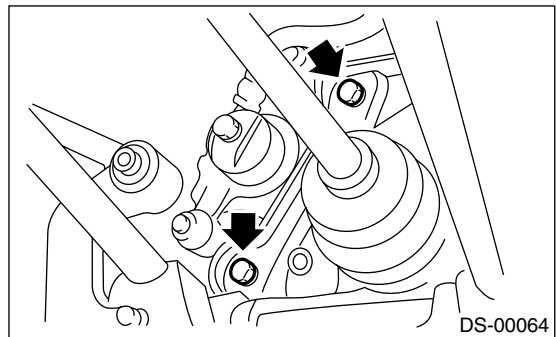
- 8) Connect the parking brake cable to parking brake.

- 9) Install the disc rotor on rear housing assembly.

- 10) Install the disc brake caliper on back plate.

Tightening torque:

52 N·m (5.3 kgf·m, 38.3 ft·lb)



- 11) Adjust the parking brake lever stroke by turning the adjuster.

- 12) While applying the parking brake, tighten a new axle nut using a socket wrench. Lock the axle nut after tightening.

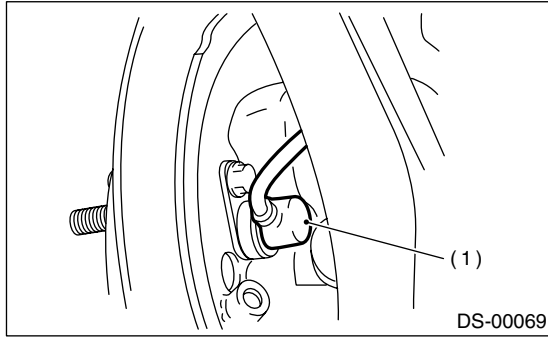
Tightening torque:

190 N·m (19.4 kgf·m, 140 ft·lb)

CAUTION:

Do not overtighten it as this may damage the wheel bearing.

13) Install rear ABS wheel speed sensor.



(1) ABS wheel speed sensor

14) Install the wheel and tighten the wheel nuts to specified torque.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

15) Make the tires contact the ground fully.

CAUTION:

Make the tires contact the ground fully and the vehicle be in curb weight whenever carrying out the tightening of bush portions.

16) Tighten the installation bolt of rear housing assembly and lateral link assembly.

Tightening torque:

137 N·m (14 kgf·m, 101 ft·lb)

17) Tighten the installation bolt of rear housing assembly and trailing link assembly.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

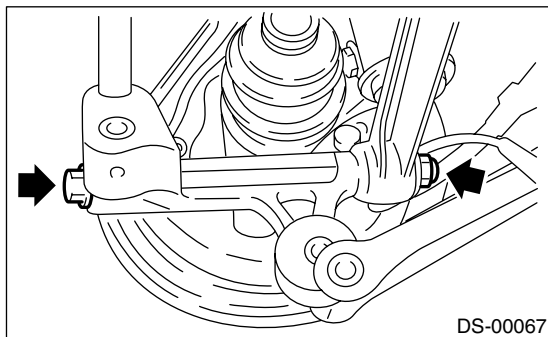
2. DRUM BRAKE

- 1) Temporarily tighten the rear axle to strut.
- 2) Insert the rear drive shaft to rear axle.

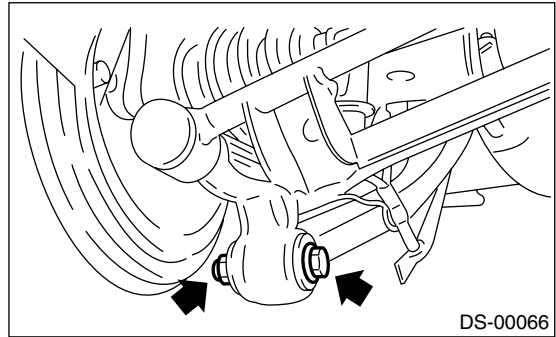
NOTE:

Be careful not to damage the inner oil seal lip.

- 3) Temporarily tighten the axle nut.
- 4) Using a new self-locking nut, temporarily tighten the rear housing assembly and lateral link assembly.



5) Using a new self-locking nut, temporarily tighten the rear housing assembly and trailing link assembly.



6) Tighten the rear housing assembly and strut assembly using a new self-locking nut.

Tightening torque:

196 N·m (20 kgf·m, 145 ft·lb)

7) Using a new self-locking nut, install the rear stabilizer and rear lateral link.

Tightening torque:

44 N·m (4.5 kgf·m, 32.5 ft·lb)

8) Connect the parking brake cable to parking brake.

9) Clean the brake pipe connection. Using a flare-nut wrench, connect the brake pipe to wheel cylinder.

10) Connect the parking brake cable to lever.

11) Install the brake drum on rear housing assembly.

12) Bleed the air from brake system. <Ref. to BR-60, REPLACEMENT, Brake Fluid.>

13) Adjust the parking brake lever stroke by turning the adjuster.

14) Move the brake lever back to apply brakes. While depressing the brake pedal, tighten the axle nut using a socket wrench. Lock the axle nut after tightening.

Tightening torque:

190 N·m (19.4 kgf·m, 140 ft·lb)

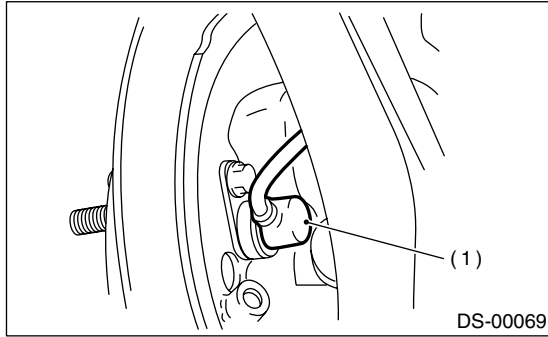
CAUTION:

Do not overtighten it as this may damage the wheel bearing.

Rear Axle [AWD Model]

DRIVE SHAFT SYSTEM

15) Connect the rear ABS wheel speed sensor to back plate.



(1) ABS wheel speed sensor

16) Install the wheel and tighten the wheel nuts to specified torque.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

17) Make the tires contact the ground fully.

CAUTION:

Make the tires contact the ground fully and the vehicle be in curb weight whenever carrying out the tightening of bush portions.

18) Tighten the installation bolt of rear housing assembly and lateral link assembly.

Tightening torque:

137 N·m (14 kgf·m, 101 ft·lb)

19) Tighten the installation bolt of rear housing assembly and trailing link assembly.

Tightening torque:

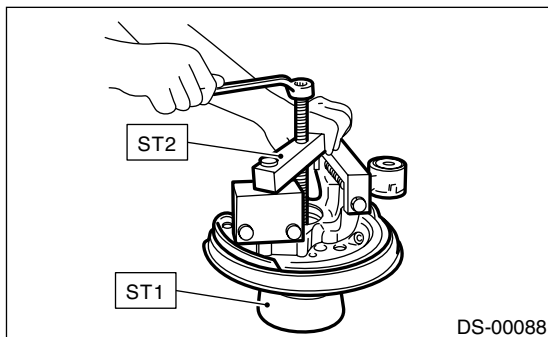
90 N·m (9.2 kgf·m, 66 ft·lb)

C: DISASSEMBLY

1) Using the ST1 and ST2, remove the hub from rear housing.

ST1 927080000 HUB STAND

ST2 927420000 HUB REMOVER



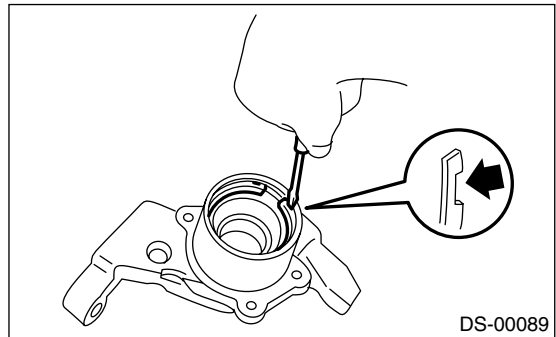
2) Remove the back plate from rear housing.

3) Using a standard screwdriver, remove the outer and inner oil seals.

4) Using a flat tip screwdriver, remove the snap ring.

NOTE:

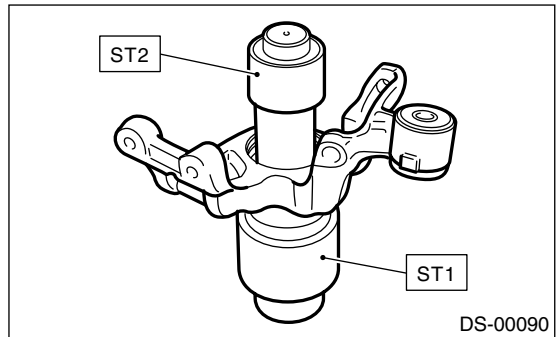
Be careful not to damage the housing at removal.



5) Using the ST1 and ST2, remove the bearing by pressing the inner race.

ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER



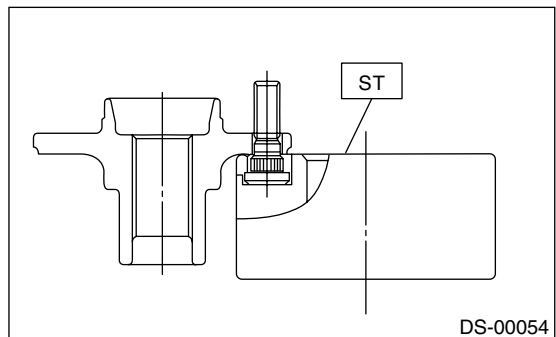
6) Remove the tone wheel bolts, and then remove the tone wheel from hub (Model with ABS).

7) Using the ST, press the hub bolt out.

ST 927080000 HUB STAND

CAUTION:

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



D: ASSEMBLY

NOTE:

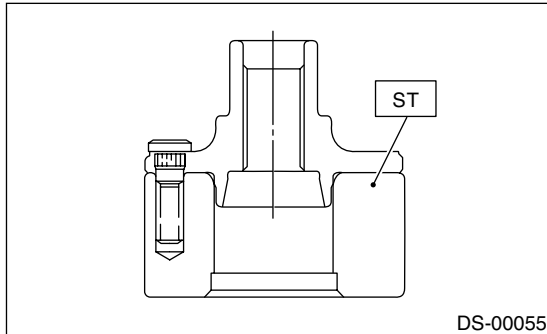
When the hub is to be removed from housing, replace the bearing set and oil seal with new ones.

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

NOTE:

- Ensure the hub bolt closely contacts the hub.
- Use a 12 mm (0.47 in) hole in the ST to prevent the hub bolt from tilting during installation.

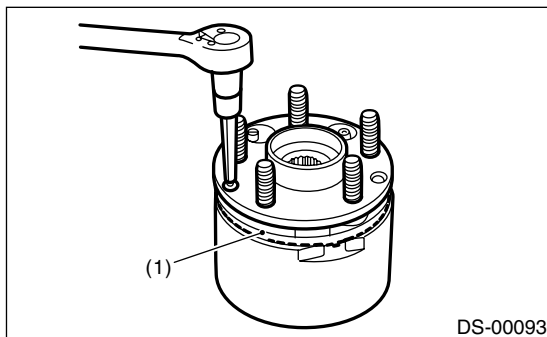
ST 927080000 HUB STAND



2) Remove foreign particles (dust, rust, etc.) from mating surfaces of the hub tone wheel, and then install the tone wheel to hub (Model with ABS).

NOTE:

- Ensure the tone wheel closely contacts the hub.
- Be careful not to damage the tone wheel teeth.



(1) Tone wheel

3) Clean the housing interior completely. Using the ST1 and ST2, press the bearing into housing.

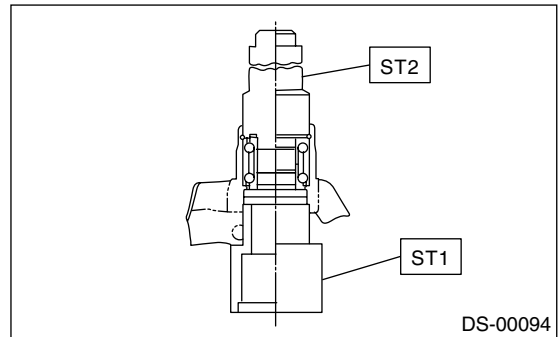
ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER

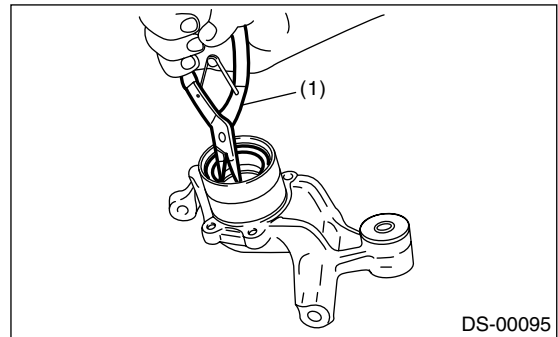
NOTE:

- Always press the outer race when installing the bearing.

- Be careful not to remove the plastic lock from inner race when installing the bearing.



4) Using pliers, install the snap ring firmly.

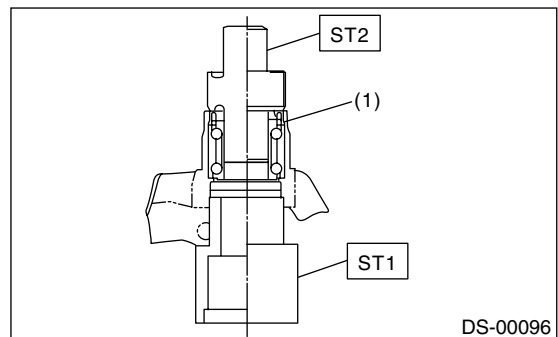


(1) Pliers

5) Using the ST1 and ST2, press the outer oil seal until it comes in contact with snap ring.

ST1 927430000 HOUSING STAND

ST2 927460000 OIL SEAL INSTALLER



(1) Snap ring

6) Invert both ST1 and housing.

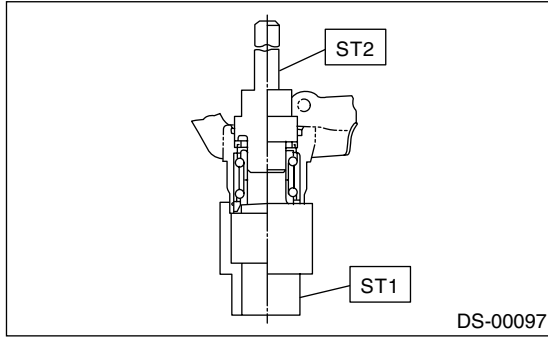
7) Using the ST2, press the inner oil seal into housing until it touches the bottom.

ST1 927430000 HOUSING STAND

Rear Axle [AWD Model]

DRIVE SHAFT SYSTEM

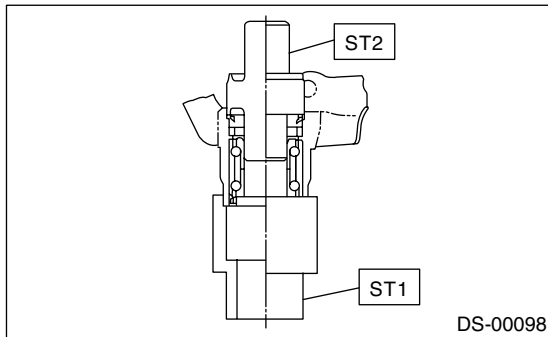
ST2 927460000 OIL SEAL INSTALLER



8) Using the ST1 and ST2, press the sub seal into place.

ST1 927430000 HOUSING STAND

ST2 927460000 OIL SEAL INSTALLER



9) Apply sufficient grease to oil seal lip.

Specified grease:
SHELL 6459N

NOTE:

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

10) Install the back plate to rear housing.

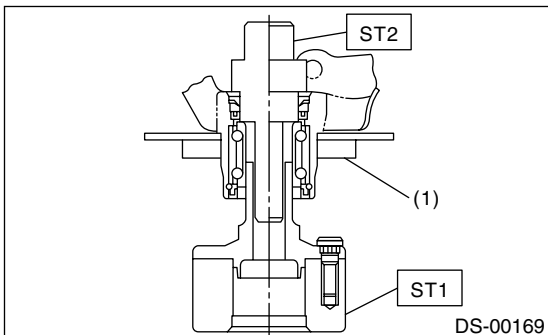
Tightening torque:

52 N·m (5.3 kgf·m, 38.3 ft·lb)

11) Using the ST1 and ST2, press the bearing into hub.

ST1 927080000 HUB STAND

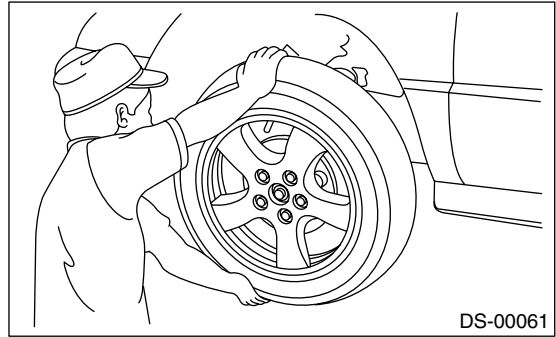
ST2 927450000 HUB INSTALLER



(1) Back plate

E: INSPECTION

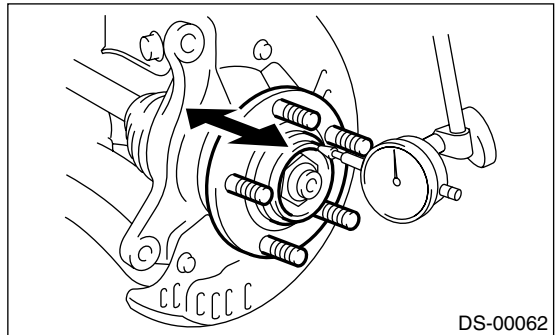
1) Moving the rear tire up and down by hand, check there is no backlash in bearing, and check the wheel rotates smoothly.



2) Inspect the lean of axis direction using a dial gauge. Replace the hub bearing if the load range exceeds the limitation.

Limit:

Maximum: 0.05mm (0.0020 in)



5. Rear Axle [FWD Model]

A: REMOVAL

CAUTION:

Remove the axle nut with vehicle weight not applied on axle. Failure to follow this rule may damage the wheel bearings.

- 1) Apply the parking brake.
- 2) Lift-up the vehicle and remove the rear wheel.

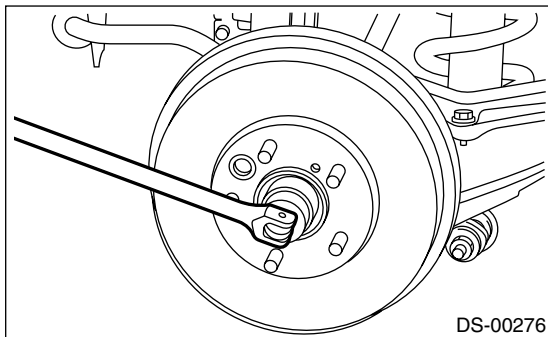
CAUTION:

In case of model with aluminum wheels, be care not to damage them.

- 3) Release the caulking of axle nut.
- 4) Remove the axle nut by socket wrench of 32 mm.

CAUTION:

Remove the axle nut with wheel removed.



- 5) Release the parking brake, loosen the adjuster.
- 6) Remove the drum brake from hub. <Ref. to BR-49, REMOVAL, Rear Drum Brake Drum.>
- 7) Using a flare nut wrench, disconnect the brake pipe from wheel cylinder.

CAUTION:

Cover the brake pipe connection to protect it from dust.

- 8) Separate the rear spindle from lateral link assembly.

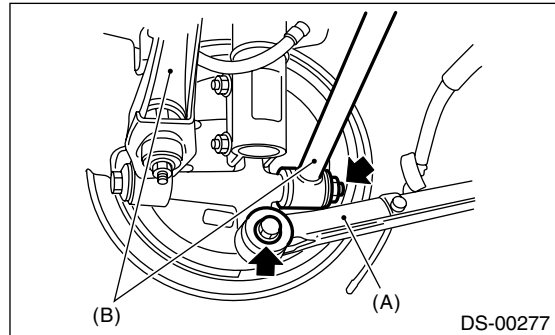
CAUTION:

Do not reuse the self-locking nut.

- 9) Separate the rear spindle from trailing link assembly.

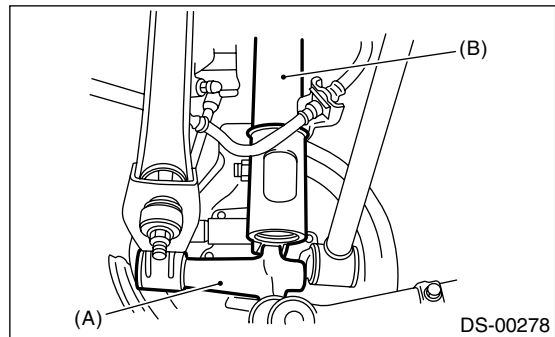
CAUTION:

Do not reuse the self-locking nut.



- (A) Trailing link
- (B) Lateral link

- 10) Remove the bolt which combines the rear spindle and strut assembly, and then remove the rear spindle, back plate and hub unit as a unit.



- (A) Rear spindle
- (B) Strut ASSY

B: INSTALLATION

- 1) Combine the rear spindle assembly and strut assembly.

Tightening torque:

196 N·m (20 kgf-m, 145 ft-lb)

CAUTION:

Use a new self-locking nut.

- 2) Combine the rear spindle assembly and trailing link assembly.

Tightening torque:

90 N·m (9.2 kgf-m, 66 ft-lb)

CAUTION:

Use a new self-locking nut.

- 3) Combine the rear spindle assembly and lateral link assembly.

Tightening torque:

140 N·m (14.3 kgf-m, 103 ft-lb)

Rear Axle [FWD Model]

DRIVE SHAFT SYSTEM

4) Clean the brake pipe connection, and then connect the brake pipe to wheel cylinder using a flare nut wrench.

Tightening torque:

15 N·m (1.5 kgf·m, 10.8 ft·lb)

5) Connect the cable end of parking brake cable. <Ref. to PB-5, INSTALLATION, Parking Brake Cable.>

6) Install the drum brake to rear spindle.

7) Tighten the axle nut using a socket wrench of 32 mm, then caulk the axle nut.

Tightening torque:

200 N·m (20.0 kgf·m, 145 ft·lb)

8) Install the O-ring to cap flange portion, and then tap the hub cap by plastic hammer to install it.

CAUTION:

- Do not tap directly by copper hammer.
- If O-ring has scratches, replace it with a new one.
- If hub cap has deformed flange, replace it.

9) Install the wheel and wheel cap.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

10) Connect the battery ground cable to battery.

11) Bleed air from brake system. <Ref. to BR-62, PROCEDURE, Air Bleeding.>

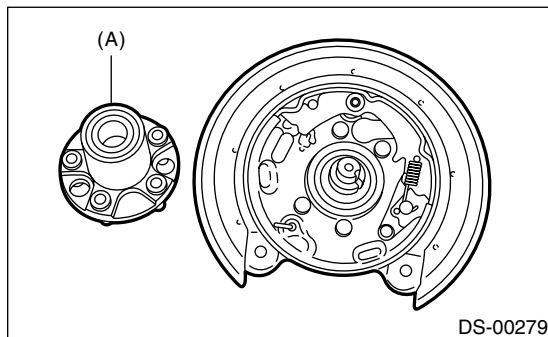
12) Adjust the stroke of parking brake lever. <Ref. to PB-4, ADJUSTMENT, Parking Brake Lever.>

C: DISASSEMBLY

CAUTION:

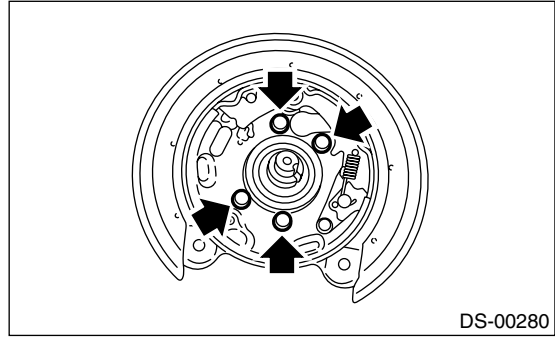
Disassembly the rear axle only when rattling, dragging, noise or etc. are found on bearing.

1) Remove the hub unit from rear spindle.



(A) Hub unit

2) Remove the drum brake assembly or parking brake assembly from rear spindle.



D: ASSEMBLY

1) Completely remove away dust and foreign material on polished surface and mounting surface of rear spindle to drum brake assembly

2) Install the drum brake assembly or parking brake assembly to rear spindle.

Tightening torque:

53 N·m (5.3 kgf·m, 39.1 ft·lb)

3) Fill grease to oil seal at rear side of hub unit.

Grease:

Shell 6459N

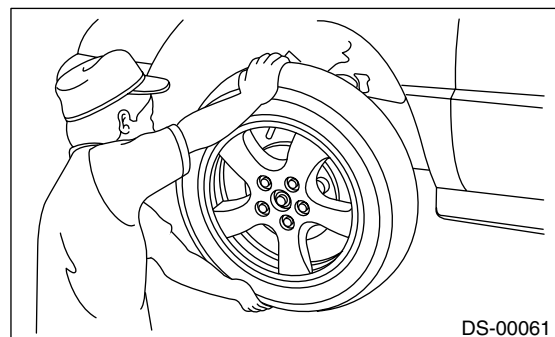
4) Install the hub unit to rear spindle and hold them with washer and axle nut temporarily.

CAUTION:

Use a new axle nut.

E: INSPECTION

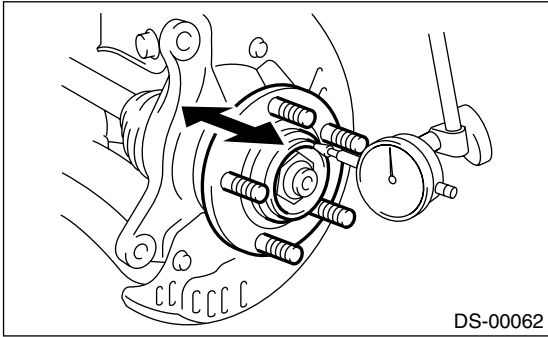
1) Moving the rear tire up and down by hand, check there is no backlash in bearing, and check the wheel rotates smoothly.



2) Inspect the lean of axis direction using a dial gauge. Replace the hub bearing if the load range exceeds the limitation.

Limit:

Maximum: 0.05 mm (0.0020 in)



Front Drive Shaft

DRIVE SHAFT SYSTEM

6. Front Drive Shaft

A: REMOVAL

- 1) Jack-up the vehicle, support it with rigid racks, and then remove the front wheel cap and wheels.
- 2) Raise the caulking portion of axle nut.
- 3) Depress the brake pedal and remove the axle nut using a socket wrench.

CAUTION:

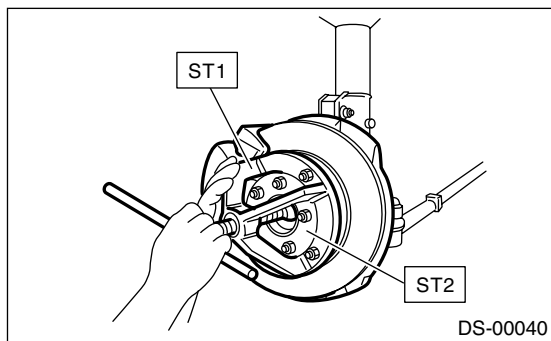
Be sure to loosen the axle nut after removing the wheel from vehicle. Failure to follow this rule may damage the wheel bearings.

- 4) Remove the stabilizer link from transverse link.
- 5) Disconnect the transverse link from housing.
- 6) Remove the front drive shaft assembly. If it is hard to remove, use the ST1 and ST2.

ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 AXLE SHAFT PULLER PLATE

CAUTION:

- Be careful not to damage the oil seal lip and tone wheel when removing the front drive shaft.
- When the front drive shaft is to be replaced, also replace the inner oil seal.



- 7) Remove the front drive shaft from transmission using bar.

CAUTION:

Be careful not to damage the holder portion.

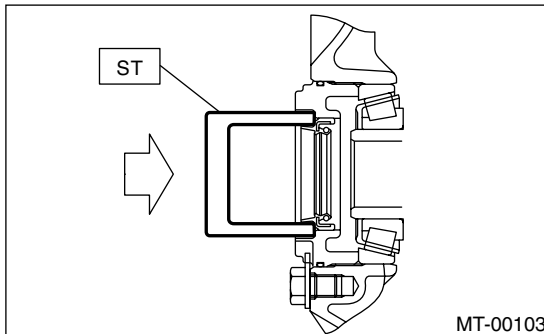
B: INSTALLATION

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

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

NOTE:

After pulling out the drive shaft, be sure to replace with a new oil seal.



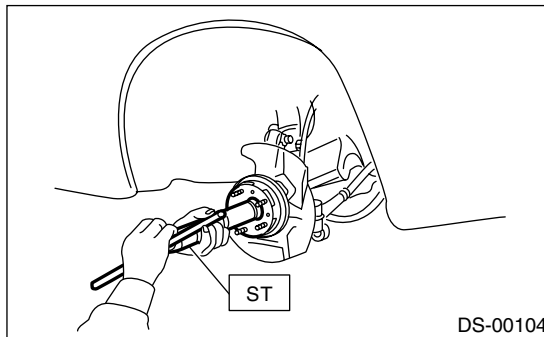
- 2) Insert the EBJ into hub splines.

CAUTION:

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

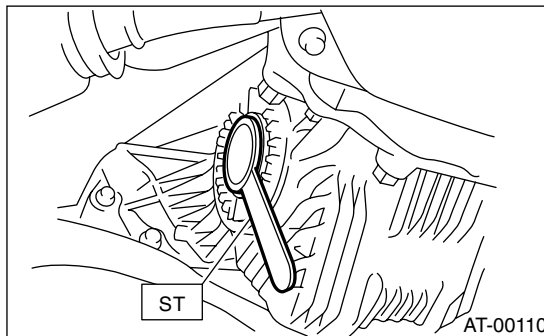
- 3) Using the ST1 and ST2, pull the drive shaft into place.

ST1 922431000 AXLE SHAFT INSTALLER
ST2 927390000 ADAPTER



- 4) Tighten the axle nut temporarily.
- 5) Using the ST, install the front drive shaft to transmission.

ST 28399SA010 OIL SEAL PROTECTOR



- 6) Connect the transverse link to housing.

Tightening torque:

49 N·m (5.0 kgf·m, 36 ft·lb)

- 7) Install the stabilizer bracket.
- 8) While depressing the brake pedal, tighten the axle nut to specified torque.

Tightening torque:

220 N·m (22.4 kgf·m, 162 ft·lb)

CAUTION:

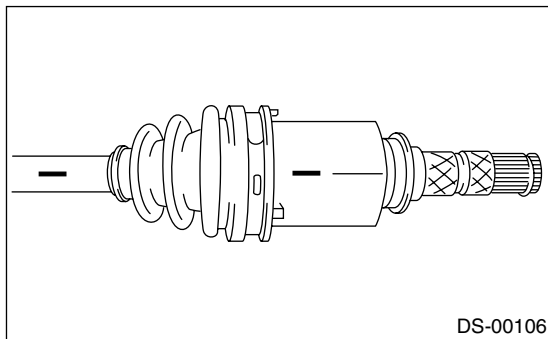
- Always tighten the axle nut before installing wheel on vehicle. If the tire is installed and comes in contact with ground when axle nut is loose, wheel bearings may be damaged.
- Be sure to tighten the axle nut to specified torque. Do not overtighten it as this may damage the wheel bearing.

9) After tightening the axle nut, caulk and lock it.

C: DISASSEMBLY

1. EBJ+PTJ TYPE

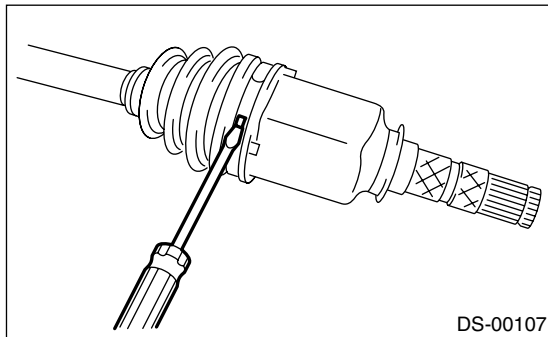
1) Place alignment marks on shaft and outer race.



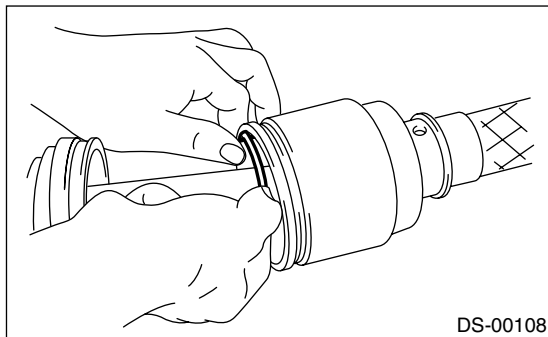
2) Remove the PTJ boot band and boot.

CAUTION:

Be careful not to damage the boot.



3) Remove the circlip from PTJ outer race using a screwdriver.



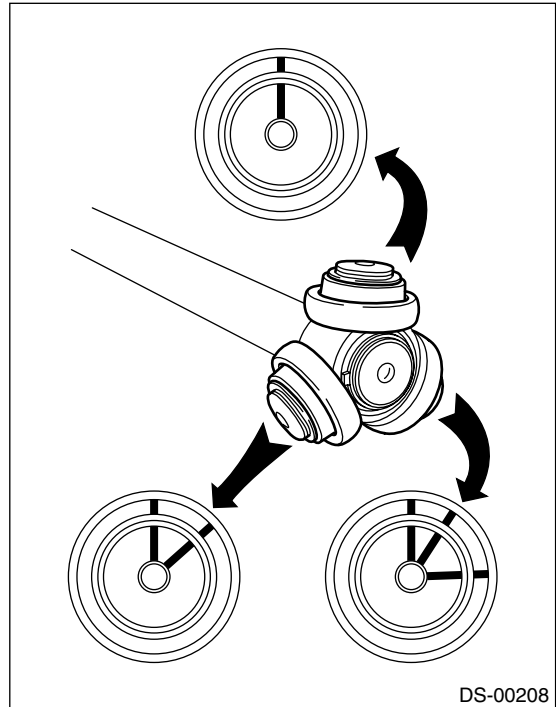
4) Remove the PTJ outer race from shaft assembly.

5) Wipe off the grease.

CAUTION:

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

6) Place alignment marks on free ring and trunnion.

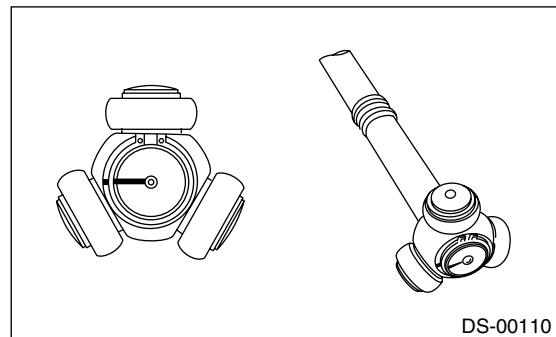


7) Remove the free ring from trunnion.

CAUTION:

Be careful with the free ring position.

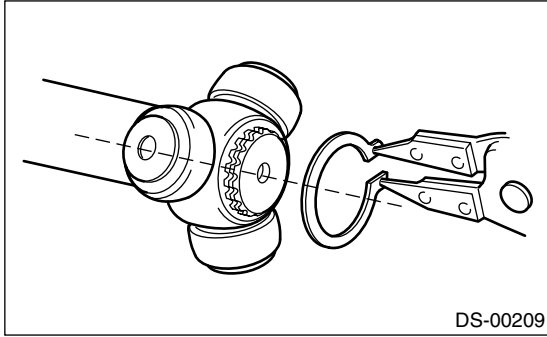
8) Place an alignment mark on trunnion and shaft.



Front Drive Shaft

DRIVE SHAFT SYSTEM

9) Remove the snap ring and trunnion.



CAUTION:

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

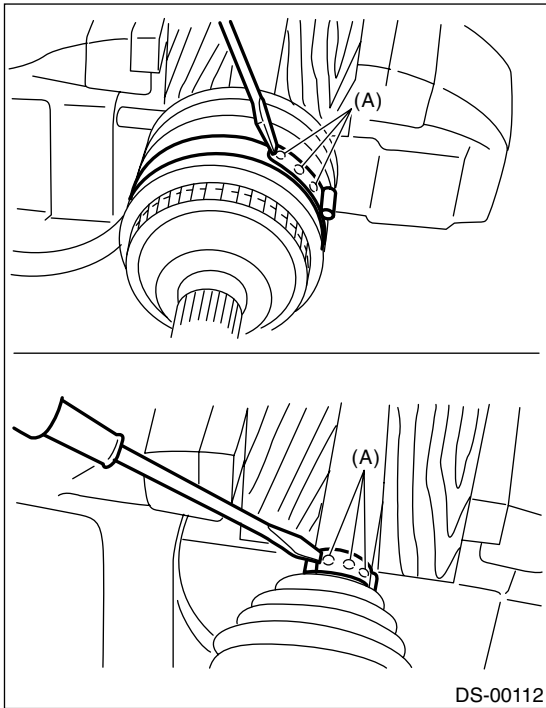
10) Remove the PTJ boot.

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

CAUTION:

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

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

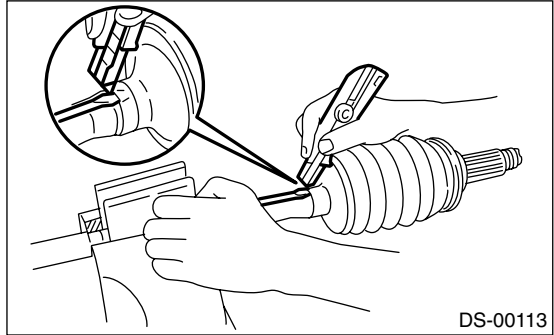


(A) Boot band claws

13) Cut and remove the boot.

CAUTION:

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



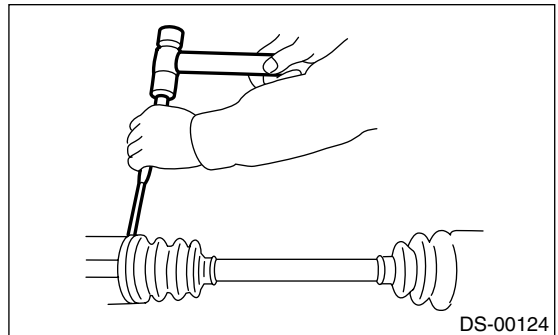
NOTE:

Further disassembly of axle is impossible because the EBJ cannot be disassembled.

2. BJ+DOJ TYPE

1) Straighten the bent claw of larger end of DOJ boot.

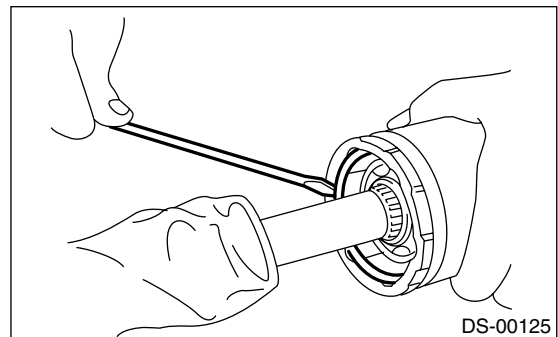
2) Loosen the band by means of screwdriver or pliers with care of not damaging boot.



3) Remove the boot band on the small end of DOJ boot in the same manner.

4) Remove the larger end of DOJ boot from DOJ outer race.

5) Pry and remove the round circlip located at neck of DOJ outer race with a screwdriver.

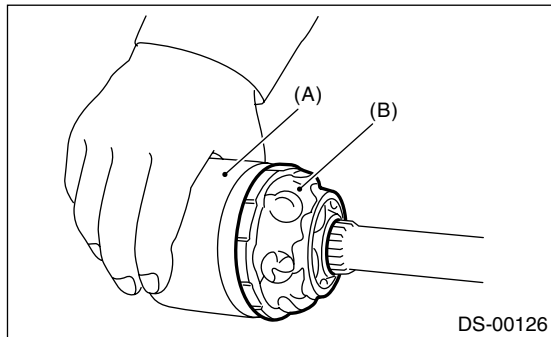


6) Take out the DOJ outer race from shaft assembly.

7) Wipe off the grease, and then take out the balls.

NOTE:

- The grease is a special grease (grease for constant velocity joint). Do not confuse with other greases.
- Disassemble with exercising care not to lose balls (6 pcs).



(A) Outer race
(B) Grease

- 8) To remove the cage from inner race, turn the cage by a half pitch to the track groove of inner race, and shift the cage.
- 9) Remove the snap ring, which fixes the inner race to shaft, by using pliers.
- 10) Take out the DOJ inner race.
- 11) Take off the DOJ cage from shaft and remove the DOJ boot.
- 12) Wrap the shaft splines with vinyl tape.
- 13) Remove the BJ boot in the same procedure as DOJ boot.

NOTE:

Further disassembly of axle is impossible because the BJ cannot be disassembled.

D: ASSEMBLY

1. EBJ+PTJ TYPE

NOTE:

Use specified grease.

EBJ side:

NTG2218-M (Part No. 28395AG010)

PTJ side:

NSG301 (Part No. 28395AG020)

- 1) Place the EBJ boot and small boot band on EBJ side of shaft.

CAUTION:

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

- 2) Place the drive shaft in a vise.

CAUTION:

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

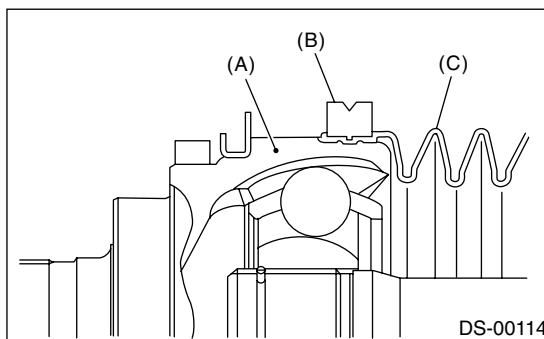
- 3) Apply a coat of specified grease [60 to 70 g (2.12 to 2.47 oz)] to EBJ.

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

NOTE:

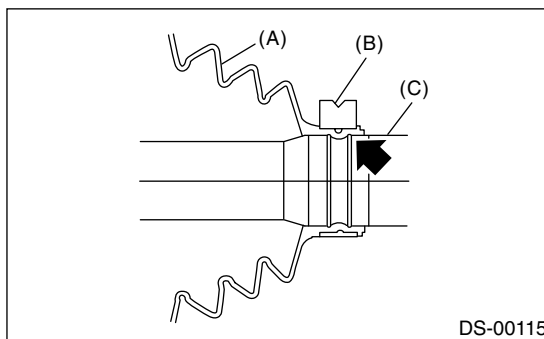
EBJ installation surface of EBJ boot shall be cleaned so as to be free from grease and other substances.

- 5) Install the boot projecting portion to EBJ groove.



(A) EBJ
(B) Large boot band
(C) Boot

- 6) Set the large boot band in place.
- 7) Install the boot projecting portion to shaft groove.



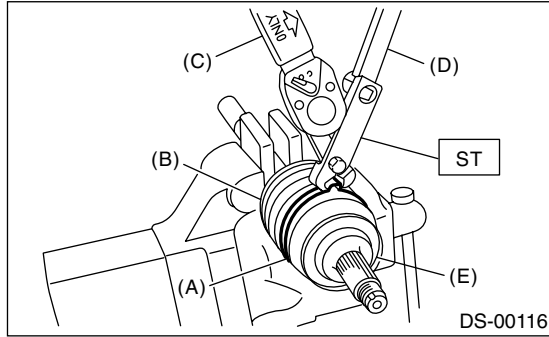
(A) Boot
(B) Small boot band
(C) Shaft

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

Front Drive Shaft

DRIVE SHAFT SYSTEM

ST 28099AC000 BOOT BAND PLIER



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

Tightening torque:

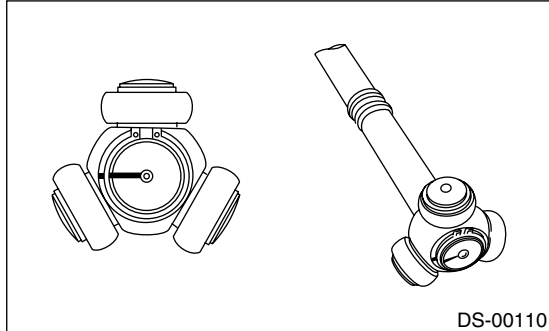
Large boot band

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 the PTJ boot at the center of shaft.
- 10) Align the alignment marks, and then install the trunnion on shaft.



- 11) Install the snap ring to shaft.

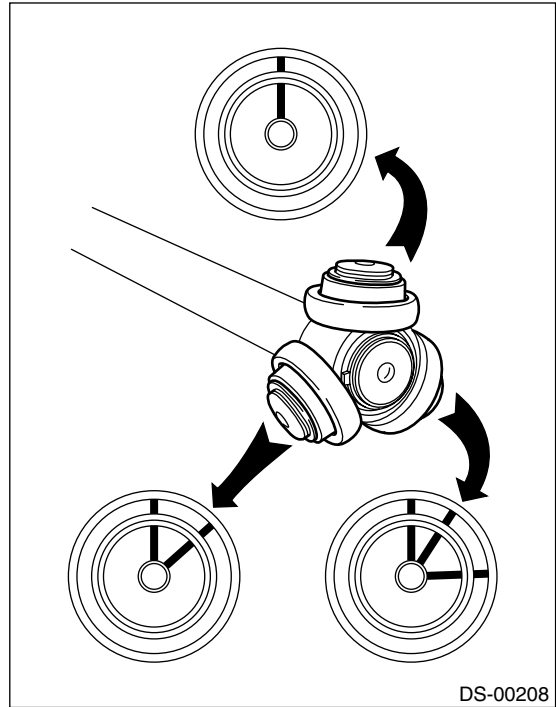
CAUTION:

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

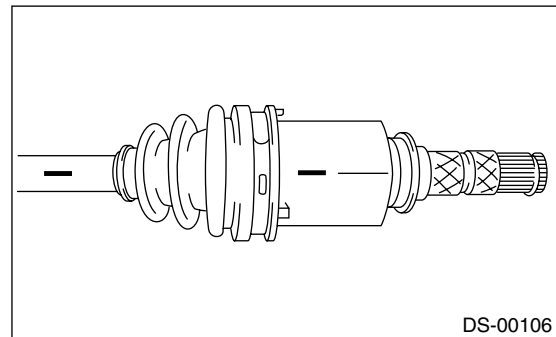
- 12) Fill 100 to 110 g (3.53 to 3.88 oz) of specified grease into the interior of PTJ outer race.
- 13) Apply a coat of specified grease to free ring and trunnion.
- 14) Align the alignment marks on free ring and trunnion, and then install the free ring.

CAUTION:

Be careful with the free ring position.



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



- 16) Install the circlip in the groove on PTJ outer race.

CAUTION:

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

- 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 the PTJ boot taking care not to twist it.

CAUTION:

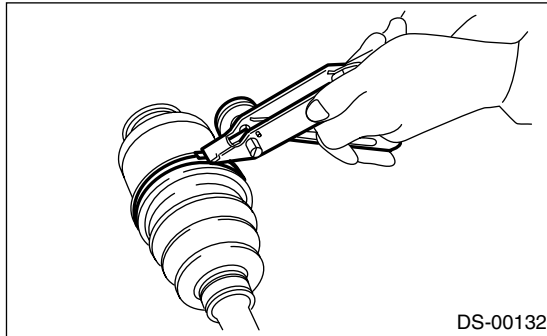
• PTJ installation surface of PTJ boot shall be cleaned so as to be free from grease and other substances.

• When installing the PTJ boot, position the outer race of PTJ at center of its travel.

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

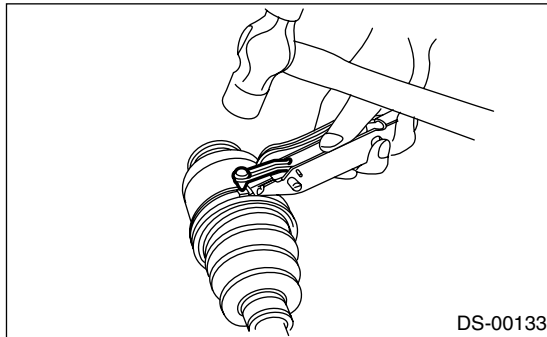
20) Tighten the band by using the ST.
ST 925091000 BAND TIGHTENING TOOL

NOTE:
Tighten the band until it cannot be moved by hand.



21) Tap on the clip with 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 the band with an allowance of about 10 mm (0.39 in) left from clip, and bend this allowance over clip.

CAUTION:
Be careful so that the end of band is in close contact with clip.

23) Extend and retract the SFJ to provide equal grease coating.

2. BJ+DOJ TYPE

NOTE:
Use specified grease.

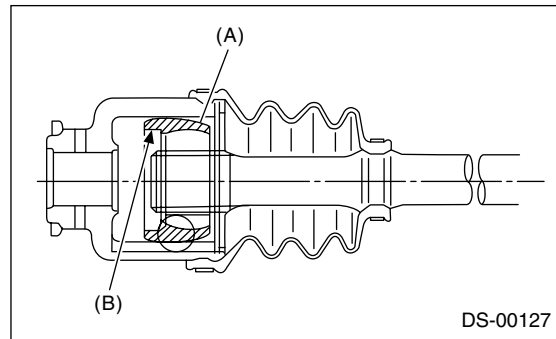
BJ side:
NTG2218-M (Part No. 28395FE010)

DOJ side:
NKG205 (Part No. 28395FE020)

- 1) Install the BJ boot in specified position, and fill it with 60 to 70 g (2.12 to 2.47 oz) of specified grease.
- 2) Place the DOJ boot at the center of shaft.
- 3) Wrap the shaft splines with vinyl tape.

4) Insert the DOJ cage onto shaft.

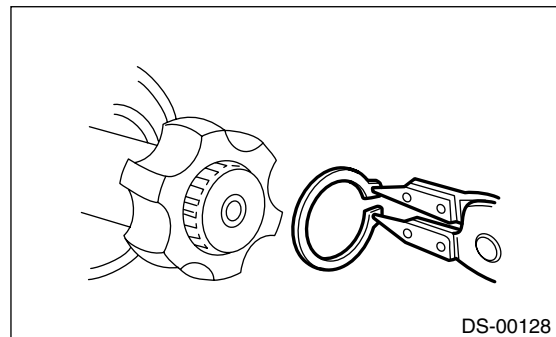
NOTE:
Insert the cage with cut-out portion facing the shaft end, since the cage has an orientation.



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

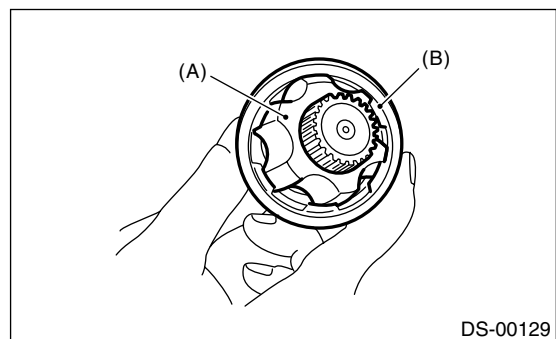
5) Install the DOJ inner race on shaft, and fit the snap ring with pliers.

NOTE:
Confirm the snap ring is completely fitted in shaft groove.



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

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

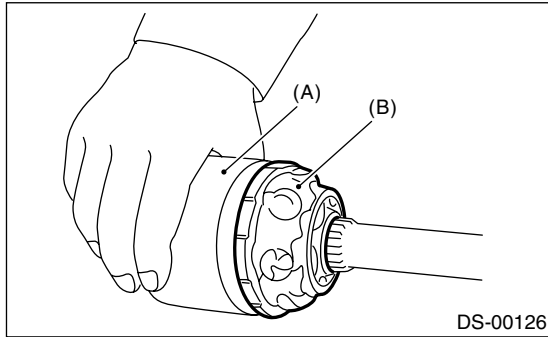


- (A) Inner race
- (B) Cage

Front Drive Shaft

DRIVE SHAFT SYSTEM

- 7) Fill 80 to 90 g (2.82 to 3.17 oz) of specified grease into the interior of DOJ outer race.
- 8) Apply a coat of specified grease to cage pocket and six balls.
- 9) Insert six balls into cage pocket.
- 10) 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 the outer race.

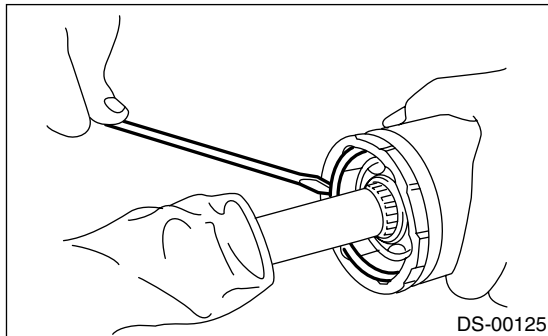


- (A) Outer race
- (B) Grease

- 11) Install the circlip in the groove on DOJ outer race.

NOTE:

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



- 12) 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.
- 13) Install the DOJ boot taking care not to twist it.

NOTE:

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

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

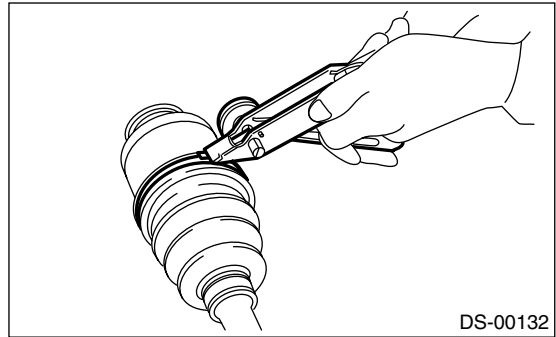
NOTE:

When tightening the boot, exercise care so that air within boot is appropriate.

- 15) Tighten the band using the ST.
ST 925091000 BAND TIGHTENING TOOL

NOTE:

Tighten the band until it cannot be moved by hand.

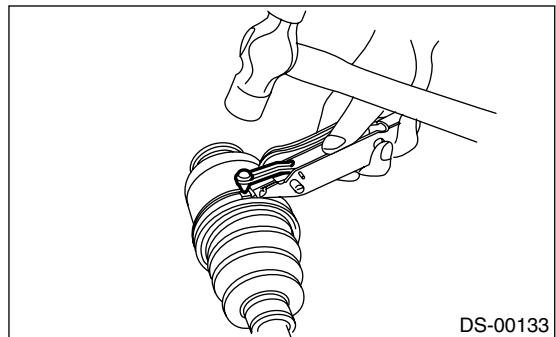


- 16) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

NOTE:

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



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

NOTE:

Be careful so that the end of band is in close contact with clip.

- 18) Fix up the boot on BJ in the same manner.
- 19) Extend and retract the DOJ to provide equal grease coating.

E: INSPECTION

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

1) DOJ (Double Offset Joint)

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

2) PTJ (Pillow tripod Joint)

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) EBJ (High-efficiency compact ball fixed joint)

Check seizure, corrosion, damage and excessive play.

5) Boot

Check for wear, warping, breakage or scratches.

6) Grease

Check for discoloration or fluidity.

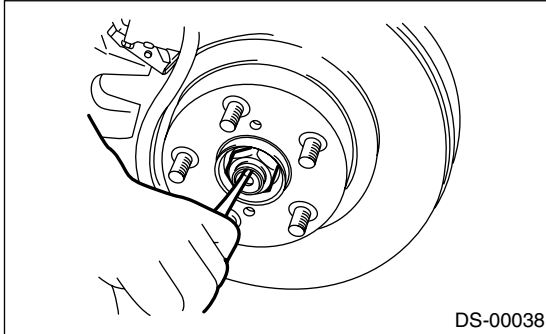
Rear Drive Shaft

DRIVE SHAFT SYSTEM

7. Rear Drive Shaft

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Lift-up the vehicle, and remove the rear wheel.
- 3) Unlock the axle nut.

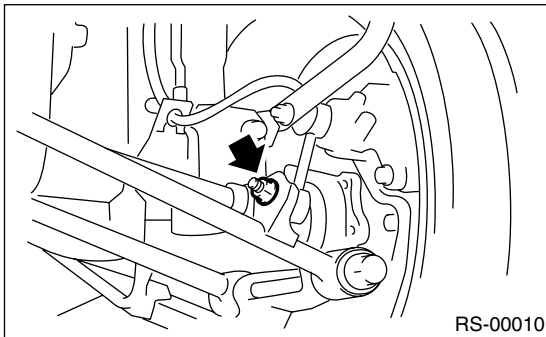


- 4) Remove the axle nut using a socket wrench with parking brake applied.

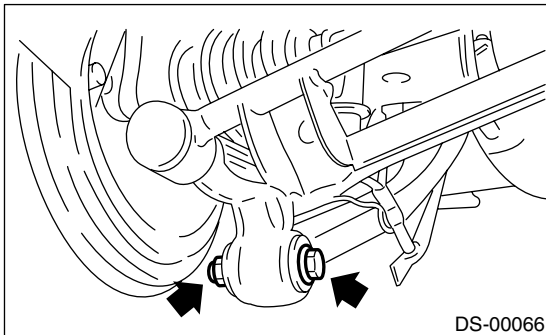
CAUTION:

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

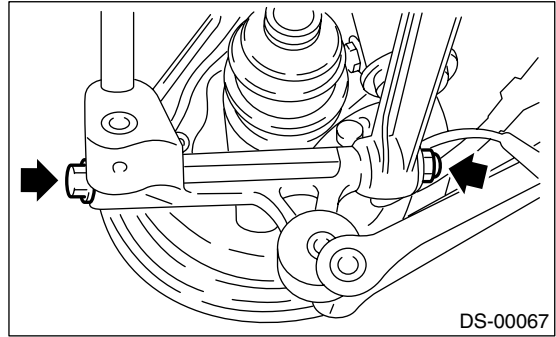
- 5) Disconnect the stabilizer link.



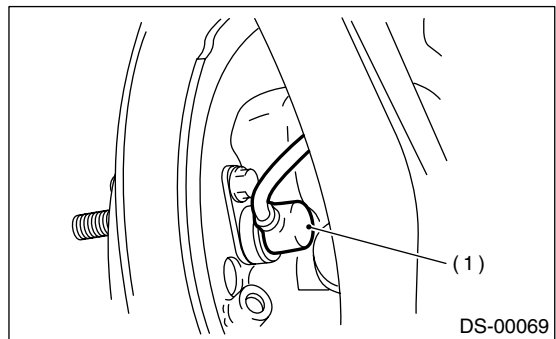
- 6) Remove the bolt which secures the trailing link to housing.



- 7) Remove the bolts which secure the front lateral link and rear lateral link to housing.



- 8) Remove the rear ABS wheel speed sensor from back plate.



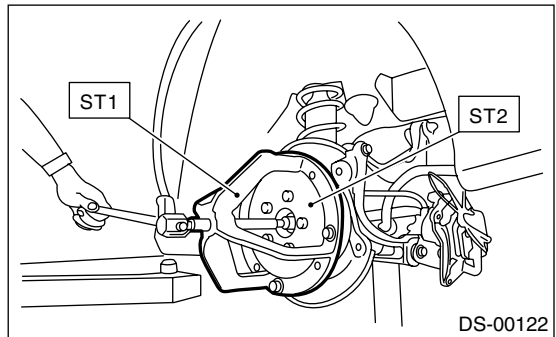
(1) ABS wheel speed sensor

- 9) Remove the rear drive shaft from rear 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 hammer the drive shaft when removing.
- Do not damage the oil seal and tone wheel.

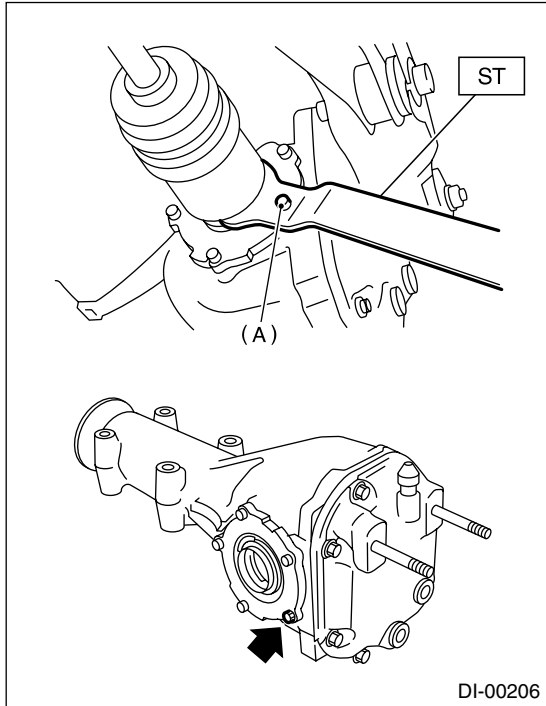


- 10) Remove the rear drive shaft from rear differential using the ST.

ST 208099PA100 DRIVE SHAFT REMOVER

NOTE:

Fit the ST to the bolt (A) as shown in the figure to avoid damage on the side bearing retainer.

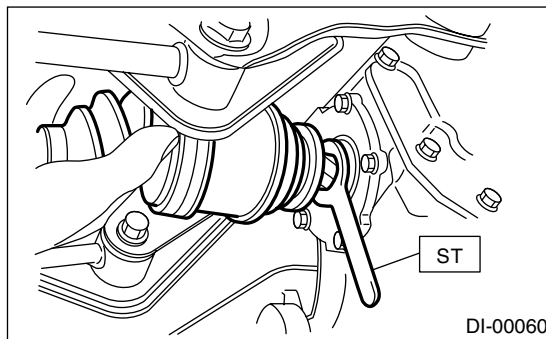


(A) Bolt

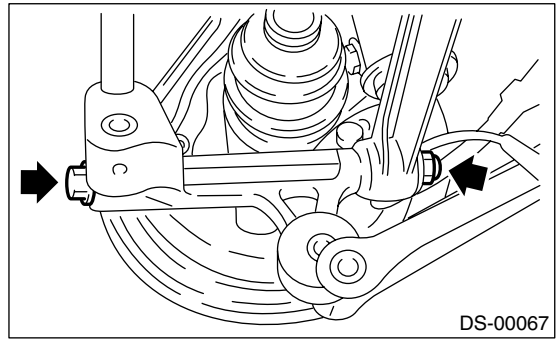
B: INSTALLATION

- 1) Insert the rear drive shaft into rear axle.
- 2) Temporarily tighten the axle nut.
- 3) Install the rear drive shaft to rear differential using the ST.

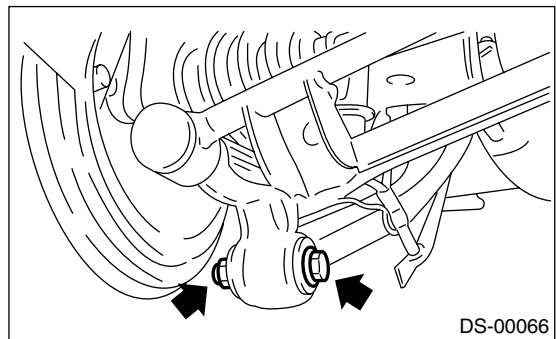
ST 28099PA090 OIL SEAL PROTECTOR



- 4) Temporarily tighten the front lateral link and rear lateral link to housing using a new self-locking nuts.



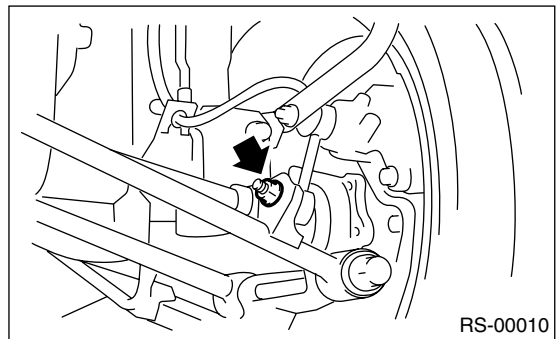
- 5) Temporarily tighten the trailing link to housing using a new self-locking nut.



- 6) Install the stabilizer link.

Tightening torque:

45 N·m (4.6 kgf-m, 33 ft-lb)



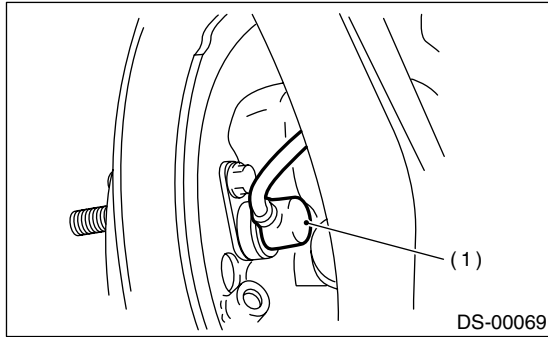
- 7) Install the ABS wheel speed sensor.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

Tightening torque:

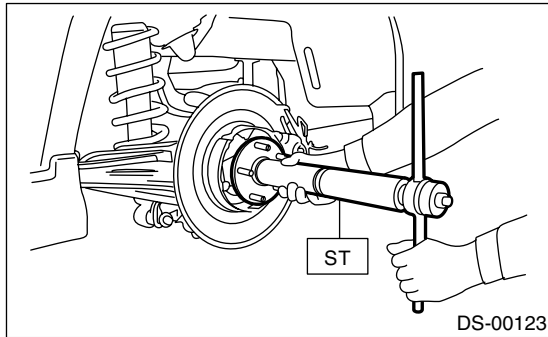
32 N·m (3.3 kgf·m, 24 ft·lb)



(1) ABS wheel speed sensor

8) Using the ST1 and ST2, pull the rear drive shaft into place.

ST1 922431000 AXLE SHAFT INSTALLER
ST2 927390000 ADAPTER

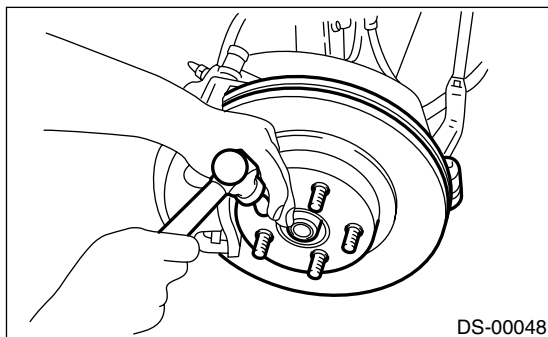


9) Tighten a new axle nut to the specified torque with parking brake applied.

Tightening torque:

186 N·m (19 kgf·m, 137 ft·lb)

10) Lock the axle nut.



11) Install the wheel.

Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

12) Make the tires contact the ground fully.

CAUTION:

Make the tires contact the ground fully and the vehicle be in curb weight whenever carrying out the tightening of bush portions.

13) Tighten the installation bolt of rear housing assembly and lateral link assembly.

Tightening torque:

137 N·m (14 kgf·m, 101 ft·lb)

14) Tighten the installation bolt of rear housing assembly and trailing link assembly.

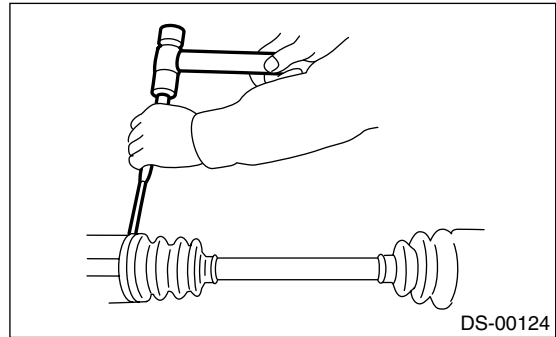
Tightening torque:

90 N·m (9.2 kgf·m, 66 ft·lb)

C: DISASSEMBLY

1) Straighten the bent claw of larger end of DOJ boot.

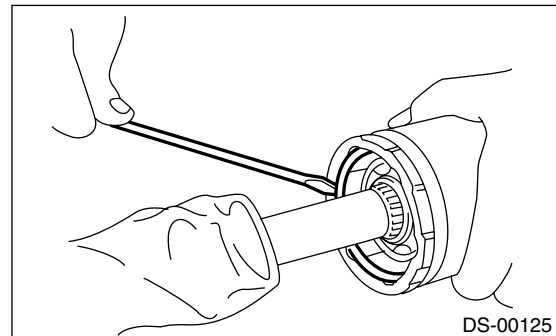
2) Loosen the band by means of screwdriver or pliers with care of not damaging boot.



3) Remove the boot band on the small end of DOJ boot in the same manner.

4) Remove the larger end of DOJ boot from DOJ outer race.

5) Pry and remove the round circlip located at neck of DOJ outer race with a screwdriver.



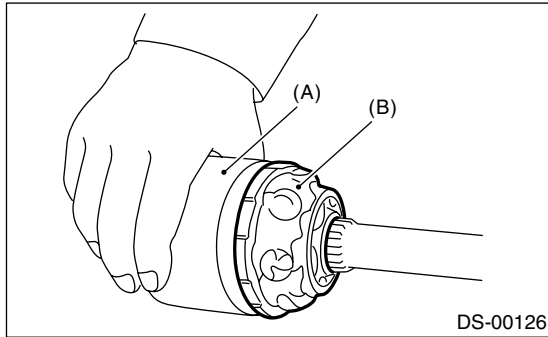
6) Take out the DOJ outer race from shaft assembly.

7) Wipe off the grease, and then take out the balls.

NOTE:

- The grease is a special grease (grease for constant velocity joint). Do not confuse with other greases.

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



(A) Outer race
(B) Grease

- 8) To remove the cage from inner race, turn the cage by a half pitch to the track groove of inner race, and shift the cage.
- 9) Remove the snap ring, which fixes the inner race to shaft, by using pliers.
- 10) Take out the DOJ inner race.
- 11) Take off the DOJ cage from shaft and remove the DOJ boot.
- 12) Wrap the shaft splines with vinyl tape.
- 13) Remove the BJ boot or EBJ boot in the same procedure as DOJ boot.

NOTE:

Further disassembly of axle is impossible because the BJ and EBJ cannot be disassembled.

D: ASSEMBLY

NOTE:

Use specified grease.

EBJ side:

NTG2218-M (Part No. 28395AG000)

BJ side:

NTG2218-M (Part No. 28395FE010)

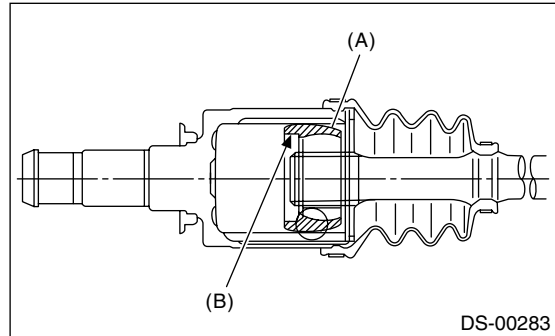
DOJ side:

NKG205 (Part No. 28395FE020)

- 1) Install the BJ boot or EBJ boot in specified position, and fill it with 60 to 70 g (2.12 to 2.47 oz) of specified grease.
- 2) Place the DOJ boot at the center of shaft.
- 3) Wrap the shaft splines with vinyl tape.
- 4) Insert the DOJ cage onto shaft.

NOTE:

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

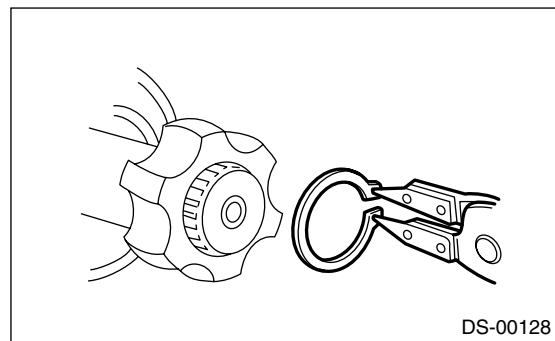


(A) Cage
(B) Cut-out portion

- 5) Install the DOJ inner race on shaft, and fit the snap ring with pliers.

NOTE:

Confirm the snap ring is completely fitted in shaft groove.

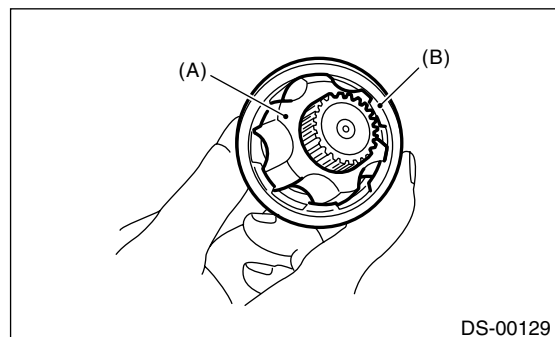


DS-00128

- 6) Install the cage, which was previously fitted, to inner race fixed upon shaft.

NOTE:

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

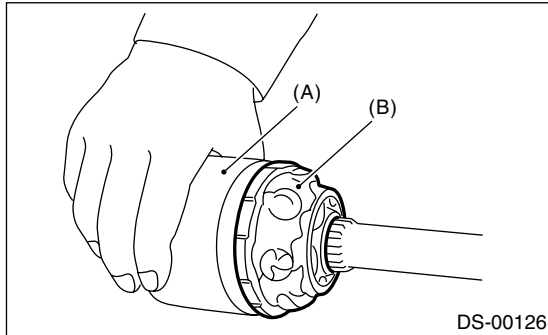


(A) Inner race
(B) Cage

Rear Drive Shaft

DRIVE SHAFT SYSTEM

- 7) Fill 80 to 90 g (2.82 to 3.17 oz) of specified grease into the interior of DOJ outer race.
- 8) Apply a coat of specified grease to cage pocket and six balls.
- 9) Insert six balls into cage pocket.
- 10) 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 the outer race.

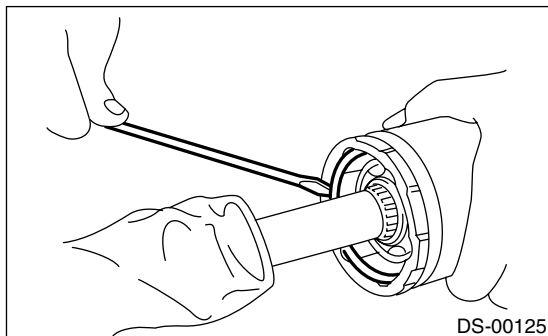


- (A) Outer race
- (B) Grease

- 11) Install the circlip in the groove on DOJ outer race.

NOTE:

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



- 12) 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.
- 13) Install the DOJ boot taking care not to twist it.

NOTE:

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

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

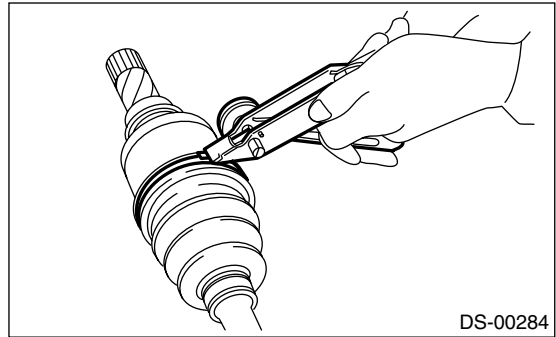
NOTE:

When tightening the boot, exercise care so that air within boot is appropriate.

- 15) Tighten the band using the ST.
ST 925091000 BAND TIGHTENING TOOL

NOTE:

Tighten the band until it cannot be moved by hand.

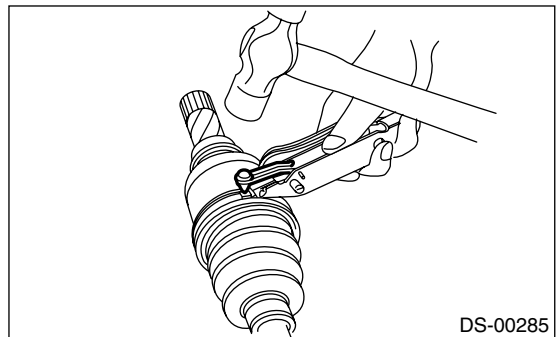


- 16) Tap on the clip with the punch provided at the end of ST.

ST 925091000 BAND TIGHTENING TOOL

NOTE:

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



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

NOTE:

Be careful so that the end of band is in close contact with clip.

- 18) Fix up the boot on BJ in the same manner.
- 19) Extend and retract the DOJ to provide equal grease coating.

E: INSPECTION

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

1) DOJ (Double Offset Joint)

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

2) Shaft

Check excessive bending, twisting, damage and wear.

3) BJ (Bell Joint)

Check seizure, corrosion, damage and excessive play.

4) EBJ (High-efficiency compact ball fixed joint)

Check seizure, corrosion, damage and excessive play.

5) Boot

Check for wear, warping, breakage or scratches.

6) Grease

Check for discoloration or fluidity.

General Diagnostic Table

DRIVE SHAFT SYSTEM

8. 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	Corrective action
Noise or vibration from propeller shaft	Center bearing	Check the center bearing. <Ref. to DS-18, CENTER BEARING FREE PLAY, INSPECTION, Propeller Shaft.>
	Runout of propeller shaft	Check the vibration of propeller shaft. <Ref. to DS-18, RUNOUT OF PROPELLER SHAFT, INSPECTION, Propeller Shaft.>
	Loose or free play of connection	Check joint and connector. <Ref. to DS-17, JOINTS AND CONNECTIONS, INSPECTION, Propeller Shaft.> Check splines and bearing. <Ref. to DS-18, SPLINES AND BEARING LOCATIONS, INSPECTION, Propeller Shaft.>
Abnormal wheel vibration	Wheel is out of balance.	Check the wheel balance. <Ref. to WT-7, INSPECTION, Wheel Balancing.>
	Front wheel alignment	Check the front wheel alignment. <Ref. to FS-6, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignment. <Ref. to RS-10, INSPECTION, Wheel Alignment.>
	Front strut	Check the front strut. <Ref. to FS-21, INSPECTION, Front Strut.>
	Rear strut	Check the rear strut. <Ref. to RS-16, INSPECTION, Rear Strut.>
	Front drive shaft	Check the front drive shaft. <Ref. to DS-43, INSPECTION, Front Drive Shaft.>
	Rear drive shaft	Check the rear drive shaft. <Ref. to DS-49, INSPECTION, Rear Drive Shaft.>
	Front axle	Check the front axle. <Ref. to DS-23, INSPECTION, Front Axle.>
	Rear axle	Check the rear axle. <Ref. to DS-32, INSPECTION, Rear Axle [AWD Model].> <Ref. to DS-34, INSPECTION, Rear Axle [FWD Model].>
Noise from the underbody	Wheel is out of balance.	Check the wheel balance. <Ref. to WT-7, INSPECTION, Wheel Balancing.>
	Front wheel alignment	Check the front wheel alignment. <Ref. to FS-6, INSPECTION, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignment. <Ref. to RS-10, INSPECTION, Wheel Alignment.>
	Front strut	Check the front strut. <Ref. to FS-21, INSPECTION, Front Strut.>
	Rear strut	Check the rear strut. <Ref. to RS-16, INSPECTION, Rear Strut.>