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DRIVE SHAFT SYSTEM

GENERAL DESCRIPTION

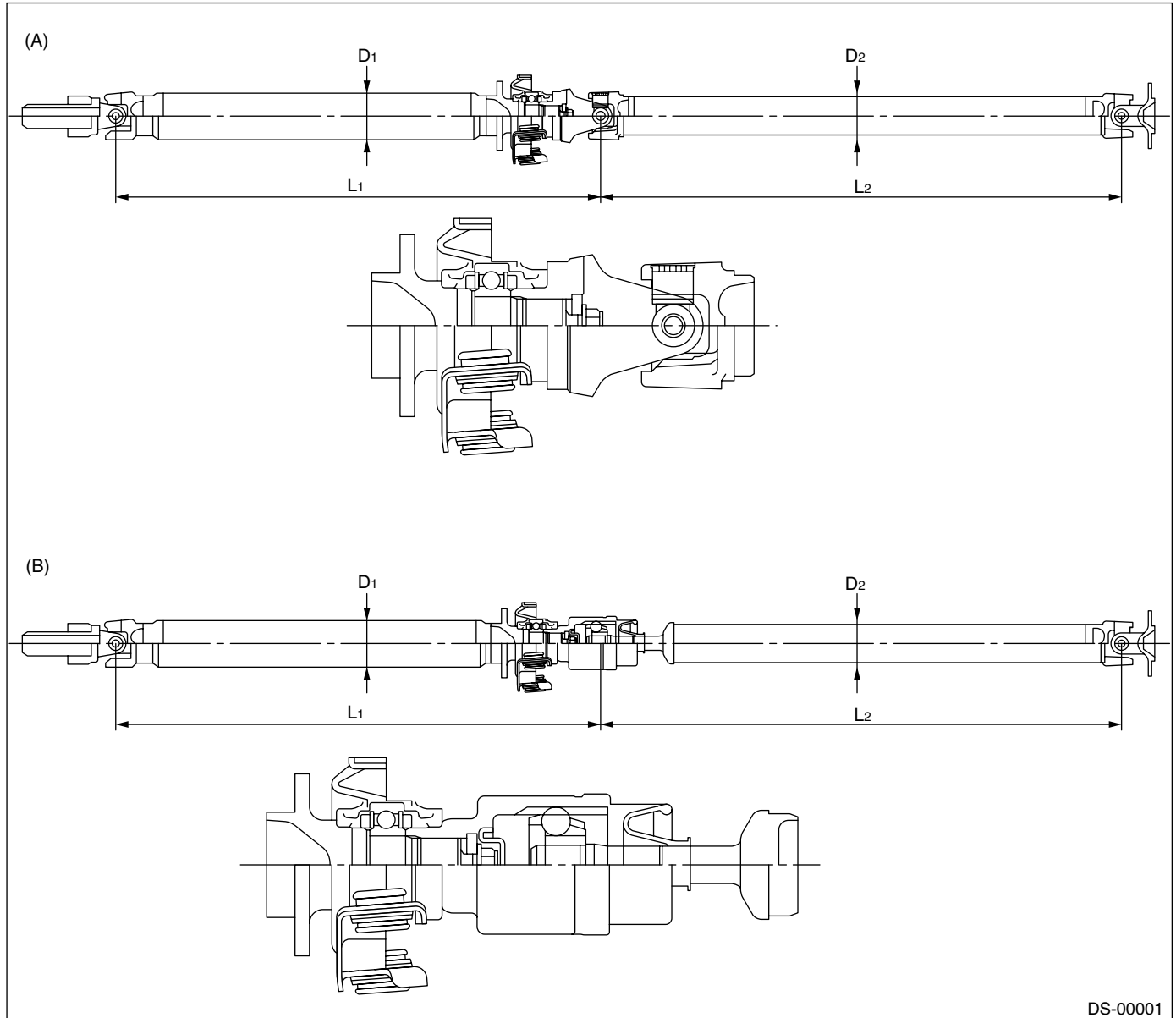
DRIVE SHAFT SYSTEM

1. General Description

A: SPECIFICATIONS

1. PROPELLER SHAFT

Model		Non-turbo	Turbo (except STi)	STi
Propeller shaft type		UJ	DOJ	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)	574 (22.60)
Rear propeller shaft Joint-to-joint length: L ₂ mm (in)		708 (27.87)	713 (28.07)	706 (27.80)
Outer diameter of tube: mm (in)	D ₁	63.5 (2.500)		70 (2.756)
	D ₂	57.0 (2.244)		



(A) UJ type

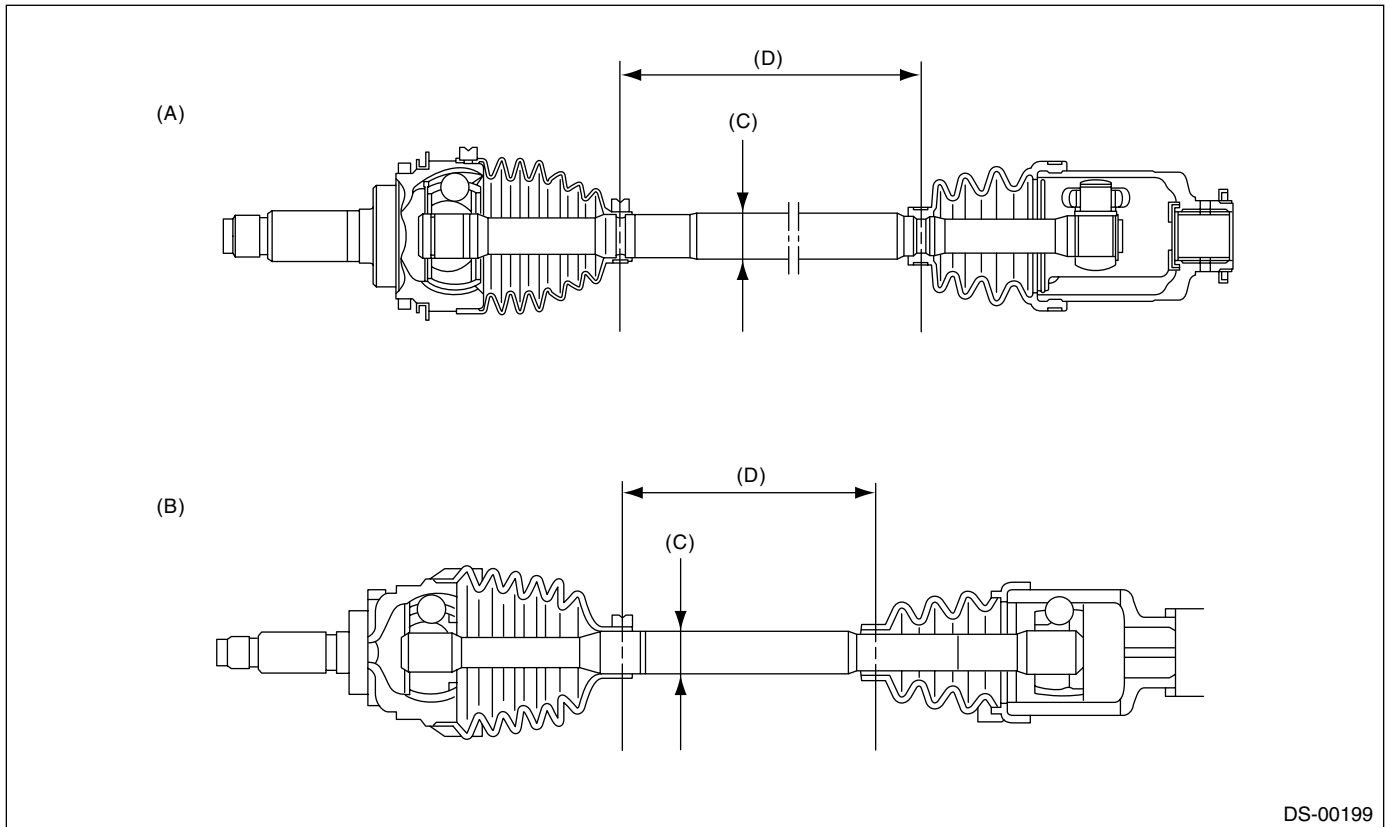
(B) DOJ type

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2. FRONT DRIVE SHAFT ASSEMBLY

Model		Type of drive shaft	Axle diameter ϕ D (mm)	Axle length L (mm)
Sedan	Non-turbo, Turbo AT	EBJ87+SFJ82	26 (1.02)	325
	Turbo MT (except STi)	EBJ87+SFJ82	28 (1.10)	325
	Turbo MT (STi)	BJ92+DOJ87	28 (1.10)	250
Wagon	Non-turbo, Turbo AT	EBJ87+SFJ82	26 (1.02)	314
	Turbo MT	EBJ87+SFJ82	28 (1.10)	314



DS-00199

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

(C) Axle diameter

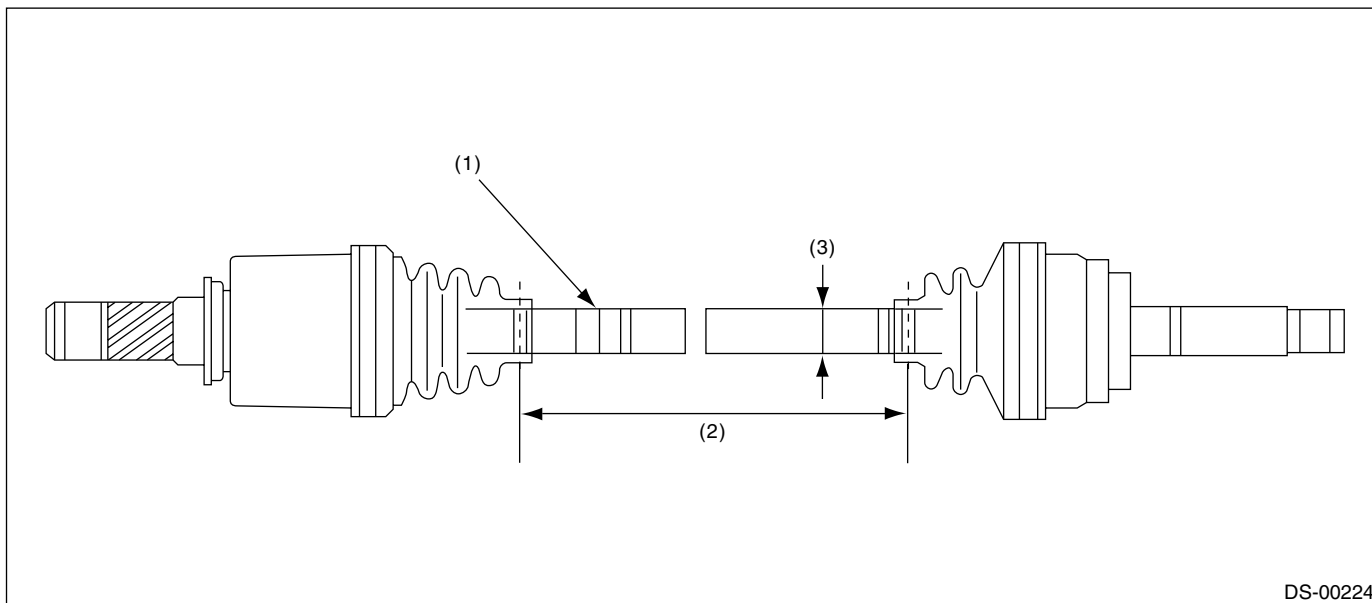
(D) Axle length

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3. REAR DRIVE SHAFT ASSEMBLY

Type of drive shaft assembly	Model	No. of identification protrusion on shaft	Axle length (mm)	Axle diameter (mm)
EBJ82+DOJ82 RH	Sedan turbo	2 (Two)	363	24
EBJ82+DOJ82 LH		1 (One)	353	24
BJ79+DOJ79 RH	Sedan Non-turbo	2 (Two)	368	23
BJ79+DOJ79 LH		1 (One)	358	23
EBJ82+DOJ82 RH	Wagon turbo	2 (Two)	353	24
EBJ82+DOJ82 LH		1 (One)	343	24
BJ79+DOJ79 RH	Wagon Non-turbo	2 (Two)	358	23
BJ79+DOJ79 LH		1 (One)	348	23
BJ87+DOJ87	STi	1 (One)	295.2	25



(1) Identification protrusion

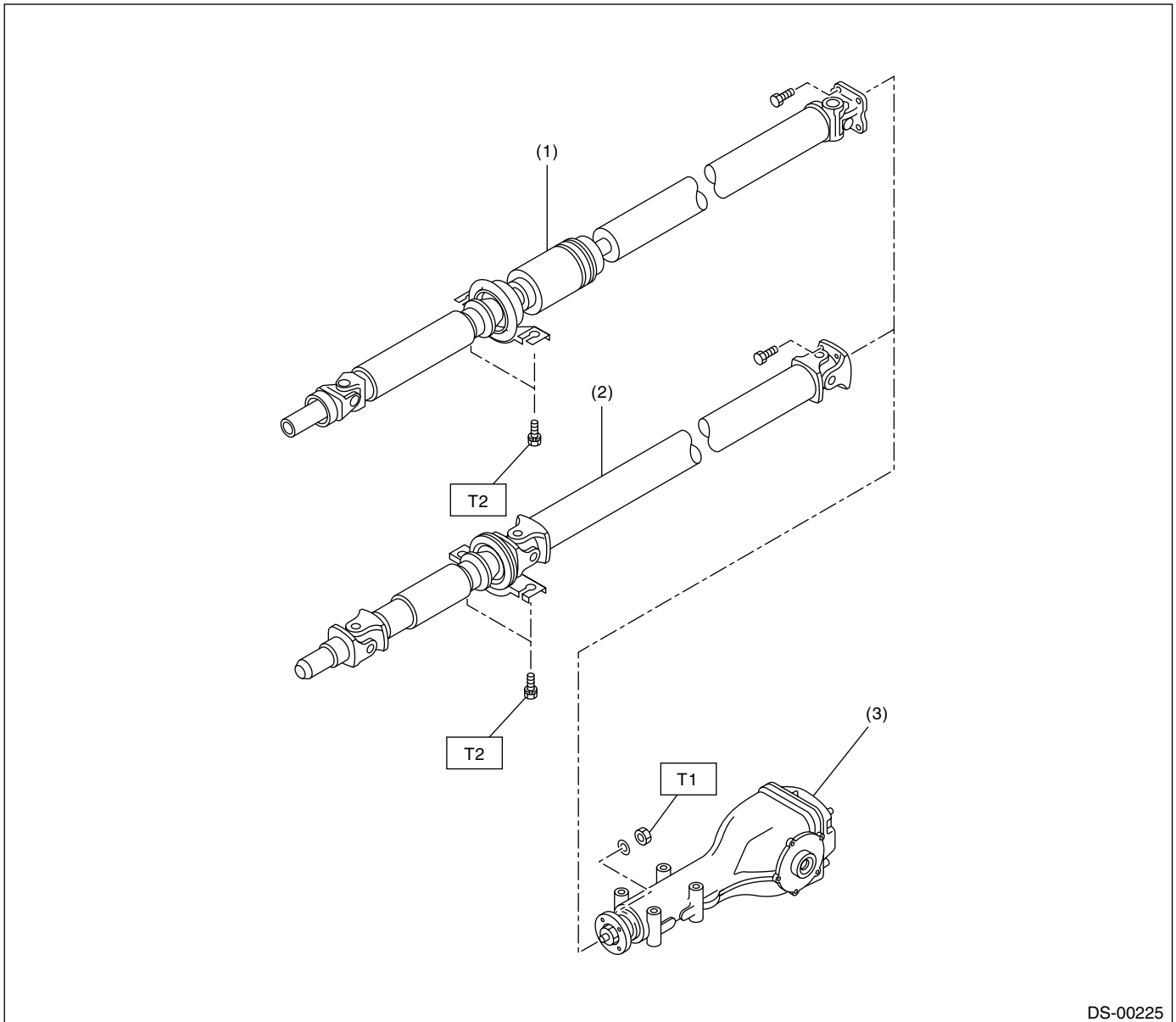
(2) Axle length

(3) Axle diameter

DS-00224

B: COMPONENT

1. PROPELLER SHAFT



DS-00225

(1) Propeller shaft (DOJ type)

(3) Rear differential

(2) Propeller shaft (UJ type)

Tightening torque: N·m (kgf·m, ft·lb)

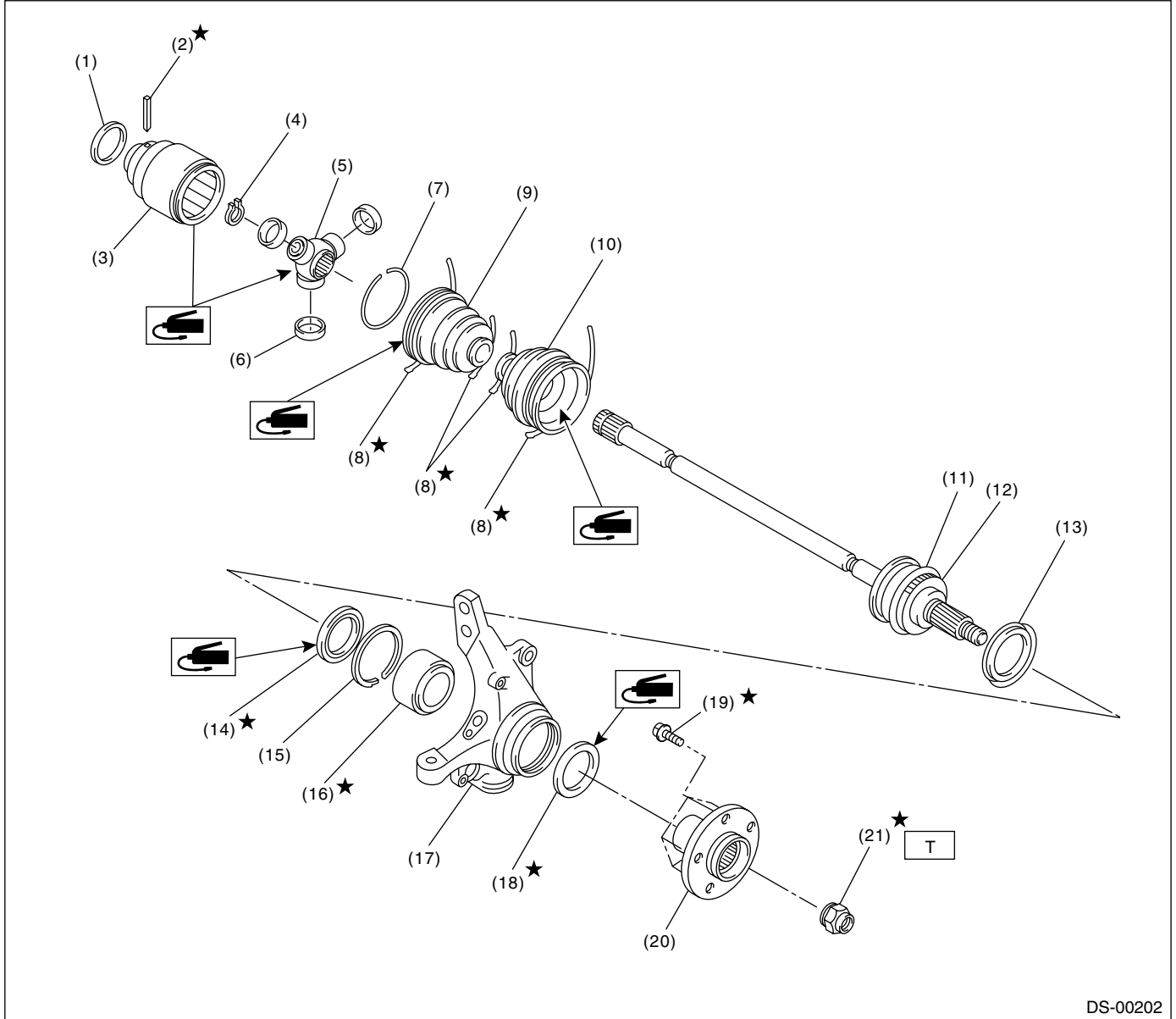
T1: 38 (3.9, 28.3)

T2: 52 (5.3, 38.3)

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2. FRONT AXLE



DS-00202

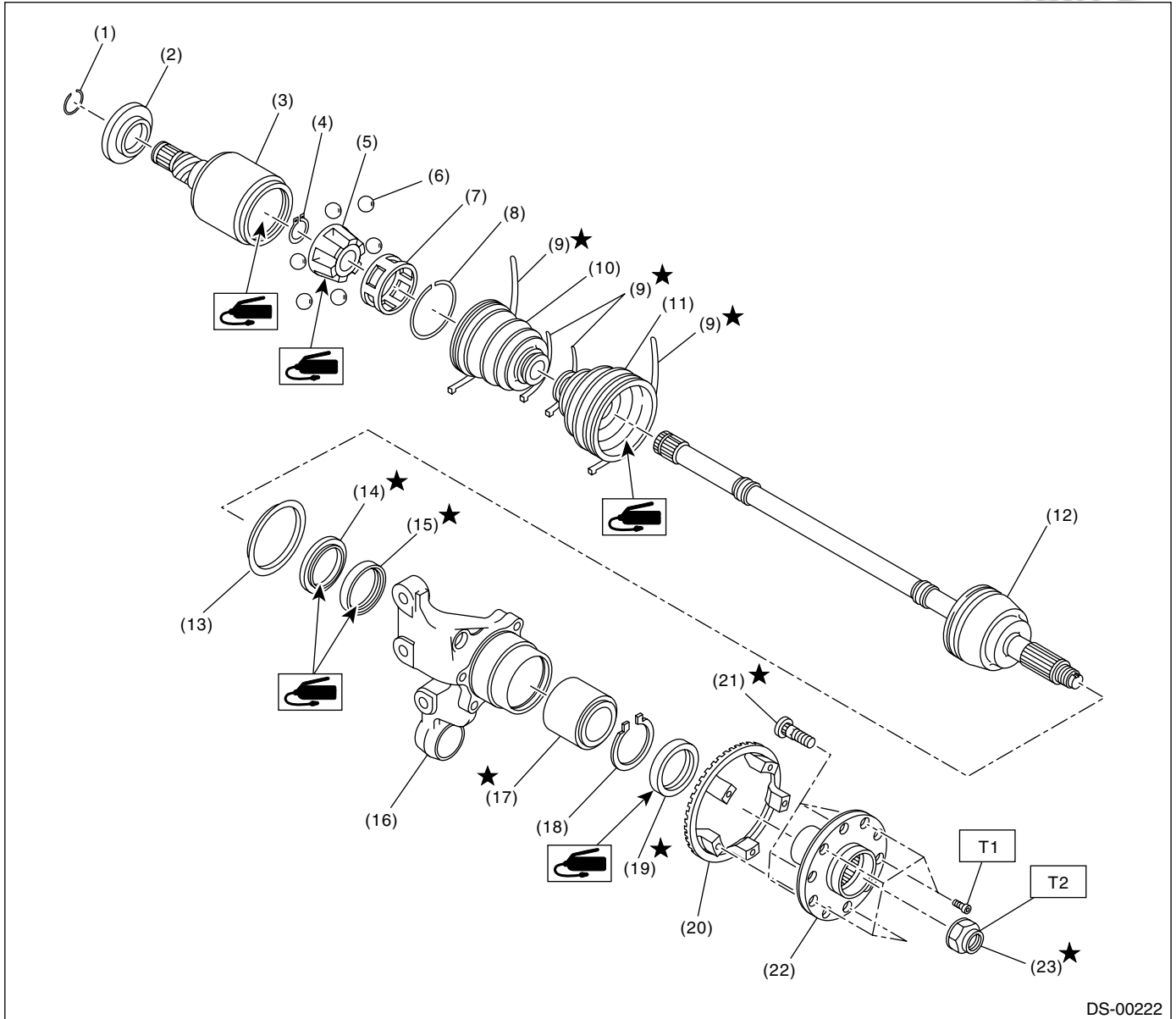
- (1) Baffle plate (SFJ)
- (2) Spring pin ★
- (3) Outer race (SFJ)
- (4) Snap ring
- (5) Trunnion
- (6) Free ring
- (7) Circlip
- (8) Boot band ★

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

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

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

3. REAR AXLE



- | | | |
|------------------------|--------------------------------------------|-----------------|
| (1) Circlip | (11) Boot | (20) Tone wheel |
| (2) Baffle plate (DOJ) | (12) Non-turbo: BJ ASSY
Turbo: EBJ ASSY | (21) Hub bolt |
| (3) Outer race (DOJ) | (13) Baffle plate | (22) Hub |
| (4) Snap ring | (14) Oil seal (IN. No. 2) | (23) Axle nut |
| (5) Inner race | (15) Oil seal (IN.) | |
| (6) Ball | (16) Housing | |
| (7) Cage | (17) Bearing | |
| (8) Circlip | (18) Snap ring | |
| (9) Boot band | (19) Oil seal (OUT) | |
| (10) Boot (DOJ) | | |

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

T1: 13 (1.3, 9.4)

T2: 190 (19.4, 140)

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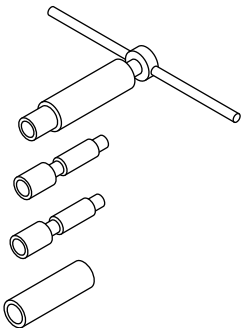
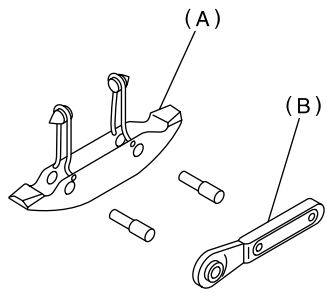
C: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.

- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing 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.

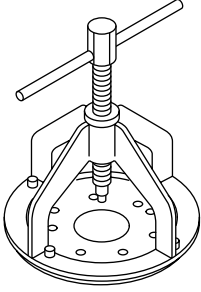
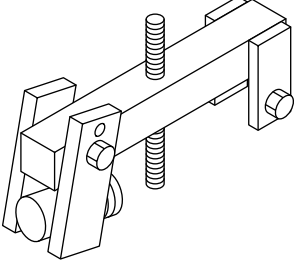
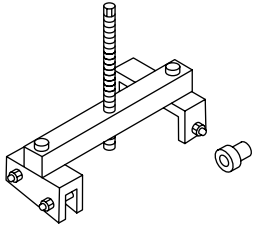
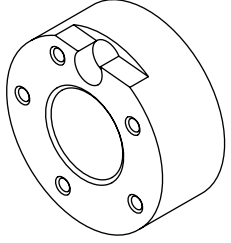
D: PREPARATION TOOL

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

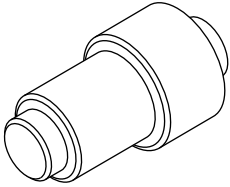
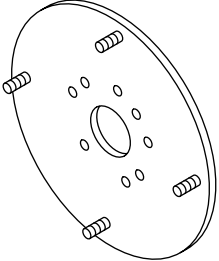
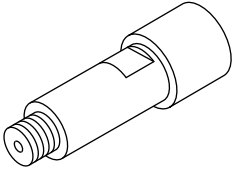
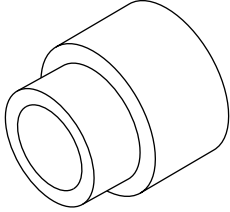
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-926470000</p>	926470000	AXLE SHAFT PULLER	Used for removing axle shaft.
 <p>ST-927060000</p>	927060000	HUB REMOVER	<ul style="list-style-type: none"> • Used for removing front hub. • Used with HUB STAND (927080000).
 <p>ST-927420000</p>	927420000	HUB REMOVER	<ul style="list-style-type: none"> • Used for removing rear hub. • Used with HUB STAND (927080000).
 <p>ST-927080000</p>	927080000	HUB STAND	Used for disassembling and assembling hub bolt in hub.

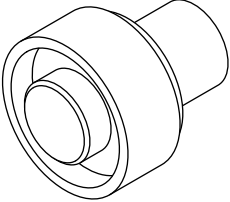
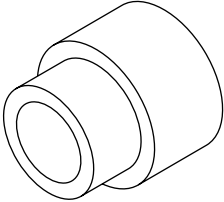
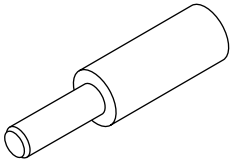
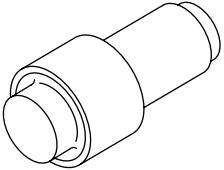
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927100000</p>	927100000	BEARING PULLER	<ul style="list-style-type: none"> • Used for disassembling and assembling front housing bearing. • Used with HOUSING STAND (927400000).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

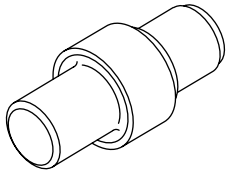
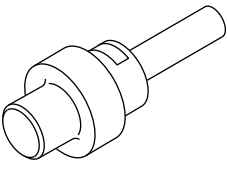
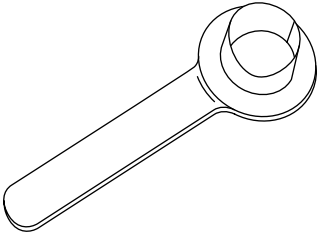
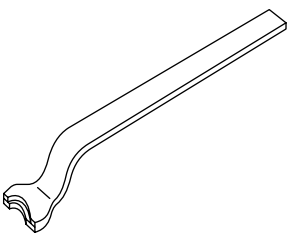
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927410000</p>	<p style="text-align: center;">927410000</p>	<p>OIL SEAL INSTALLER</p>	<ul style="list-style-type: none"> • Used for installing oil seal into front housing. • 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).

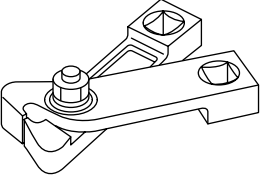
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-927460000</p>	<p style="text-align: center;">927460000</p>	<p>OIL SEAL INSTALLER</p>	<ul style="list-style-type: none"> • Used for installing outer oil seal. • Used with 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;">ST28099PA100</p>	<p style="text-align: center;">28099PA100</p>	<p>DRIVE SHAFT REMOVER</p>	<p>Used for removing rear drive shaft from rear differential.</p>

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="331 579 474 600">ST28099AC000</p>	28099AC000	BOOT BAND PLIERS	Used for tightening front BJ boot band.

2. GENERAL PURPOSE TOOLS

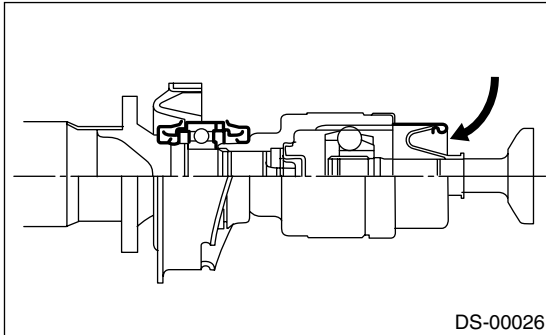
TOOL NAME	REMERKS
Puller	Used for removing ball joint from knuckle arm.
Dial gauge	Used for inspecting propeller shaft run-out.
Snap ring pliers	Used for installing and removing snap ring.

2. Propeller Shaft

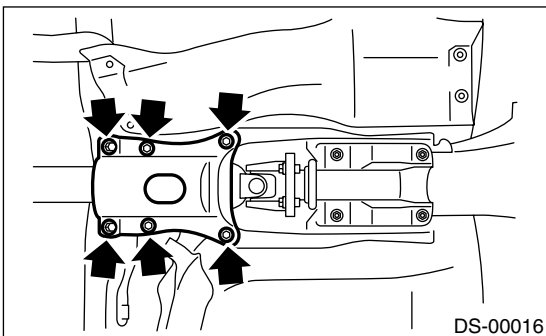
A: REMOVAL

NOTE:

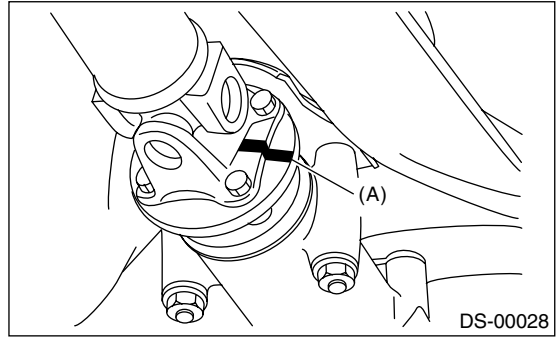
- Before removing the propeller shaft, wrap the metal parts with a cloth or rubber material.
- In case of DOJ type, before removing the propeller shaft, wrap the metal parts (installed at the rubber boot of center DOJ) with a cloth or rubber material, as shown in the figure. Rubber boot may be damaged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

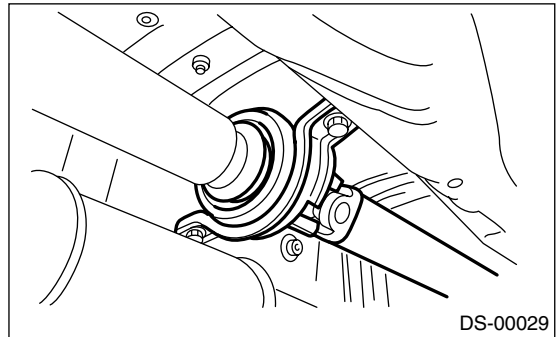


- 8) Make matching marks on affected parts before removal.



(A) Matching mark

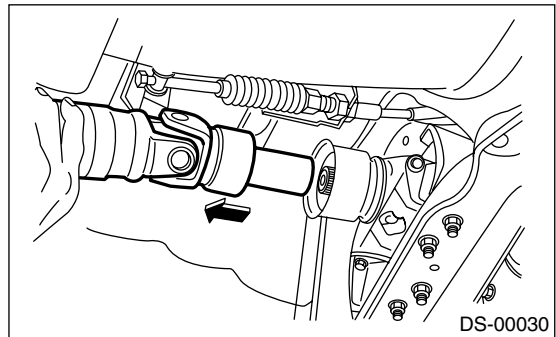
- 9) Remove the three bolts which hold the propeller shaft to rear differential.
- 10) Remove the remaining bolt.
- 11) Remove the two bolts which hold the center bearing to vehicle body.



- 12) Remove the propeller shaft from transmission.

CAUTION:

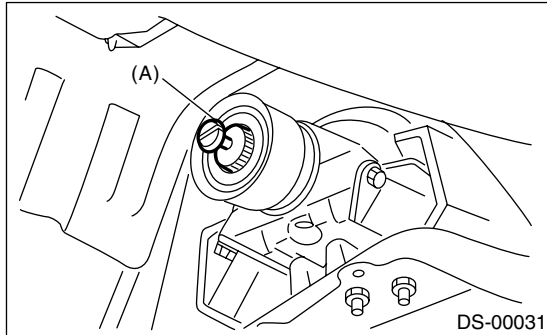
- Be careful not to damage the oil seals and frictional surface of sleeve yoke.
- Cover the center exhaust pipe with a cloth to keep off any ATF or oil spilled from transmission when removing the propeller shaft.



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.



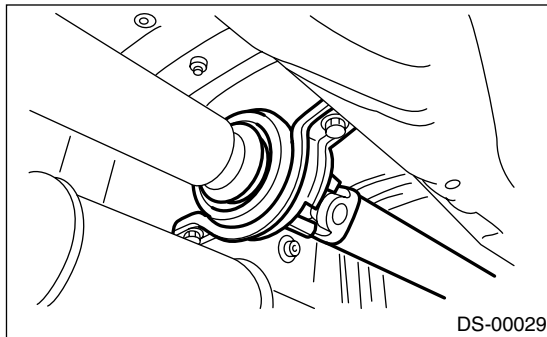
(A) Extension cap

B: INSTALLATION

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

Tightening torque:

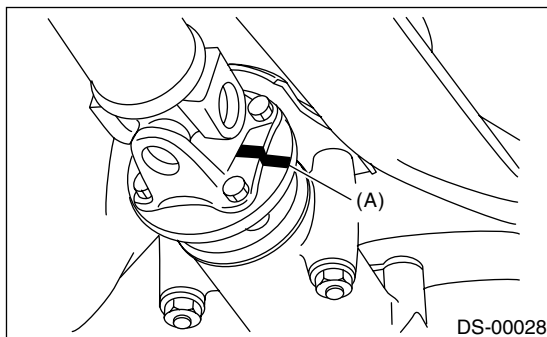
52 N·m (5.3 kgf·m, 38.3 ft-lb)



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

Tightening torque:

38 N·m (3.9 kgf·m, 28.3 ft-lb)



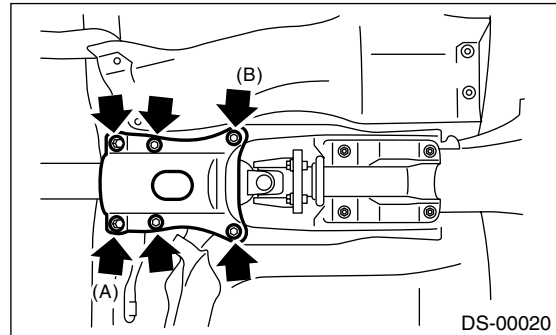
(A) Matching mark

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

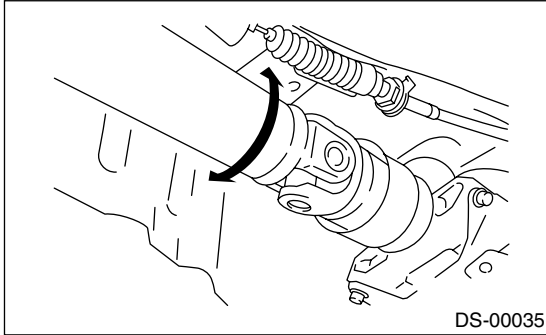
- 1) Remove the center exhaust pipes.
- 2) Remove the heat shield cover.
- 3) Check for any looseness of the yoke flange mounting bolts which connect to rear differential and center bearing bracket mounting bolts.

PROPELLER SHAFT

DRIVE SHAFT SYSTEM

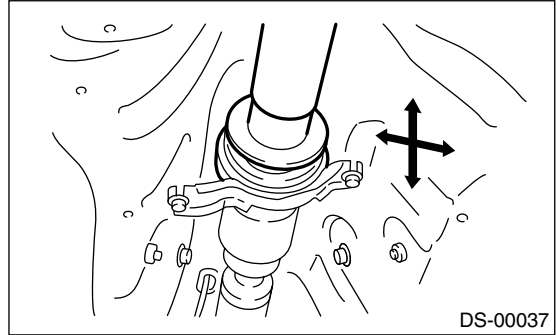
2. SPLINES AND BEARING LOCATIONS

- 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.

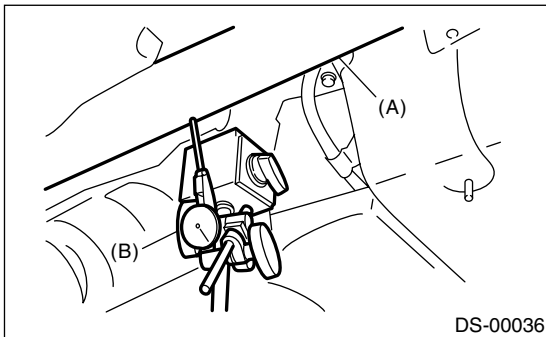


3. RUNOUT OF PROPELLER SHAFT

- 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)

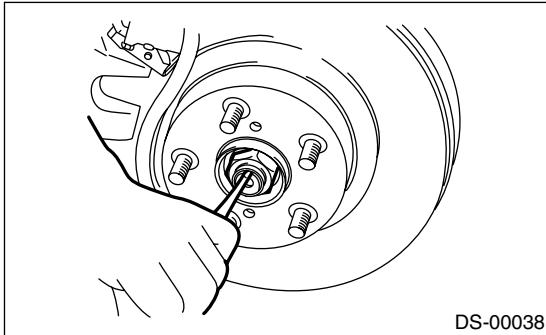


- (A) Propeller shaft
- (B) Dial gauge

3. Front Axle

A: REMOVAL

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



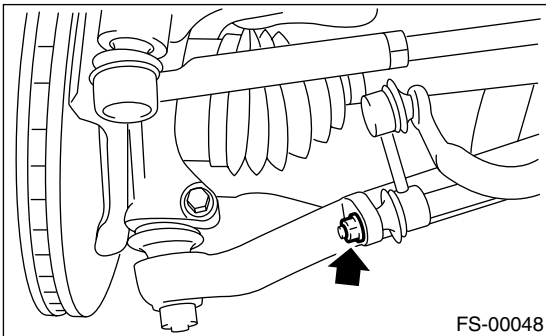
- 3) Remove the axle nut using a socket wrench while depressing the brake pedal.

CAUTION:

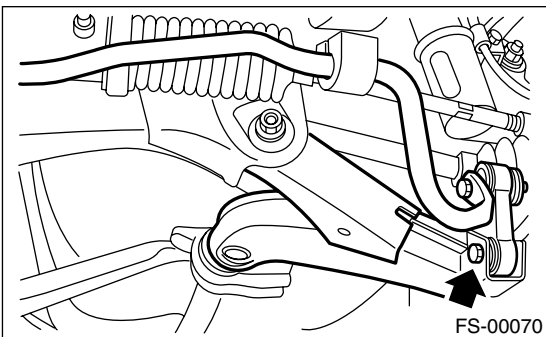
Remove the axle nut with vehicle weight not applied on axle. Failure to follow this rule may damage the wheel bearings.

- 4) Remove the stabilizer link.

SEDAN:



WAGON:

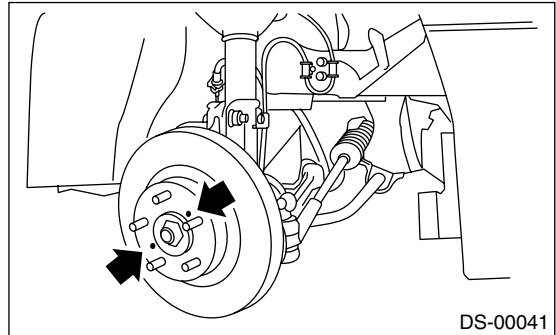


- 5) Remove the disc brake caliper from housing, and suspend it from strut using a wire.

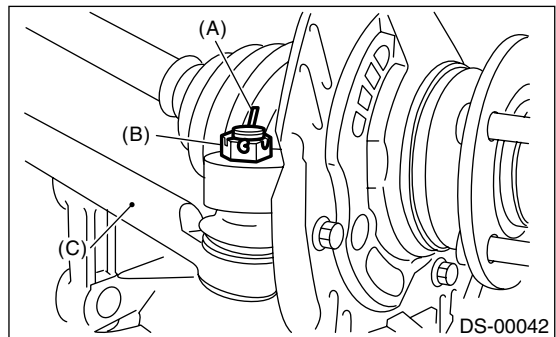
- 6) Remove the disc rotor from hub.

NOTE:

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

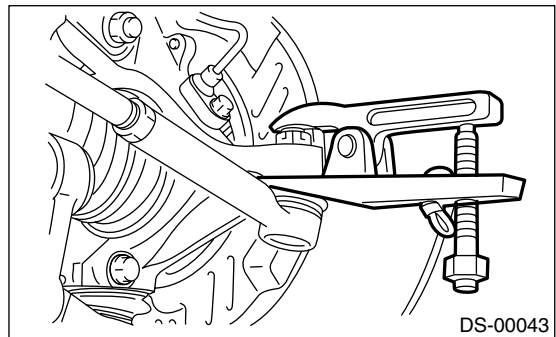


- 7) Remove the cotter pin and castle nut which secure tie-rod end to housing knuckle arm.



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

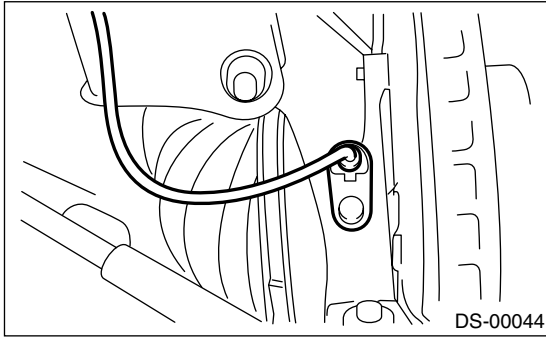
- 8) Using a puller, remove the tie-rod ball joint from knuckle arm.



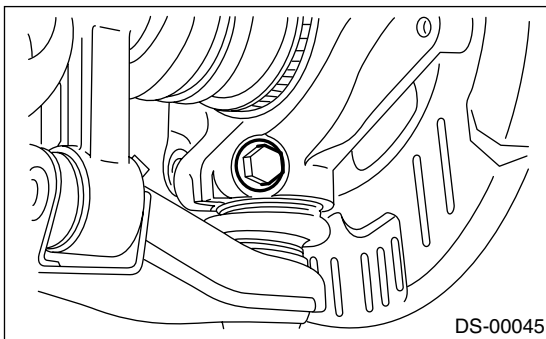
FRONT AXLE

DRIVE SHAFT SYSTEM

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



10) Remove the transverse link ball joint from housing.

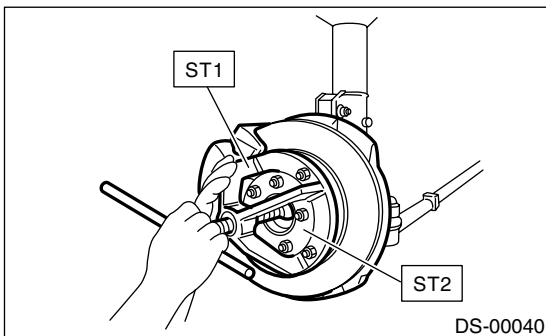


11) Remove the front drive shaft assembly from hub. If it is hard to remove, use the STs.

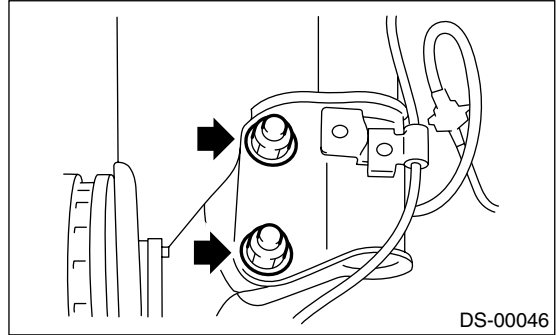
- ST1 926470000 AXLE SHAFT PULLER
- ST2 927140000 AXLE SHAFT PULLER PLATE

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.

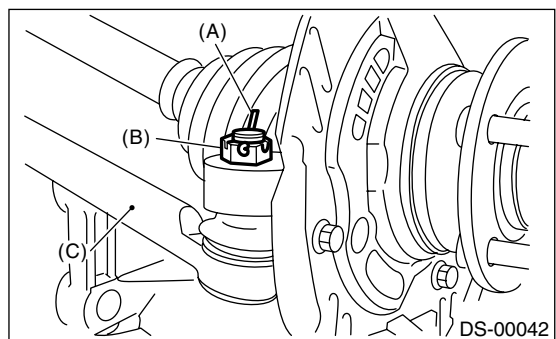
Tightening torque:

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:

Except STi model

80 N·m (8.2 kgf·m, 59 ft·lb)

STi model

155 N·m (15.8 kgf·m, 114.3 ft·lb)

10) Connect the stabilizer link.

Tightening torque:

Except STi model

30 N·m (3.1 kgf·m, 22 ft·lb)

STi model

45 N·m (4.6 kgf·m, 33 ft·lb)

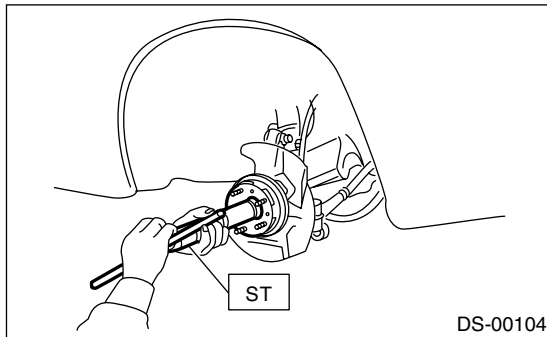
CAUTION:

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.

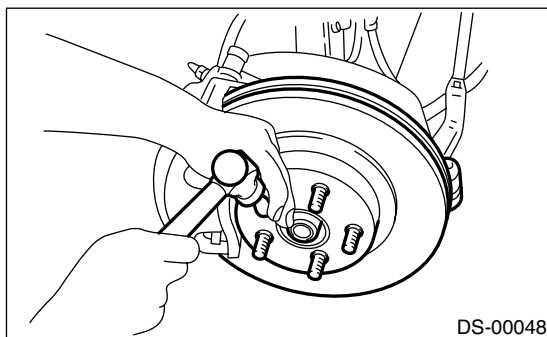
Tightening torque:

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:

33 N·m (3.4 kgf·m, 24.3 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)

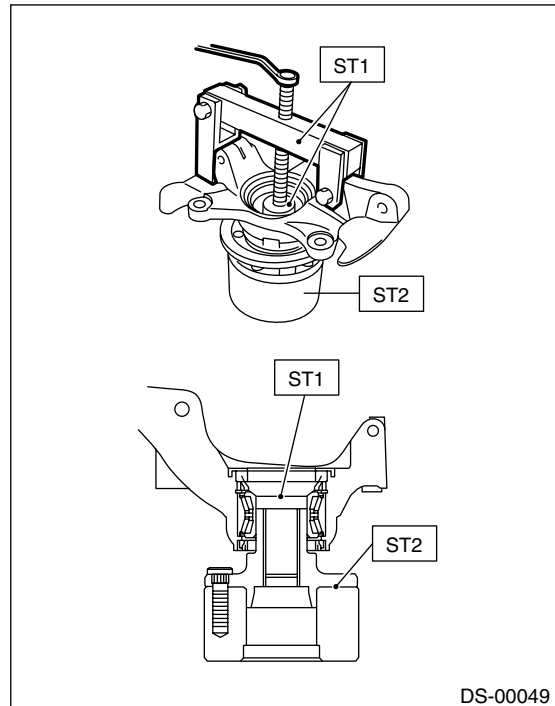
C: DISASSEMBLY

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

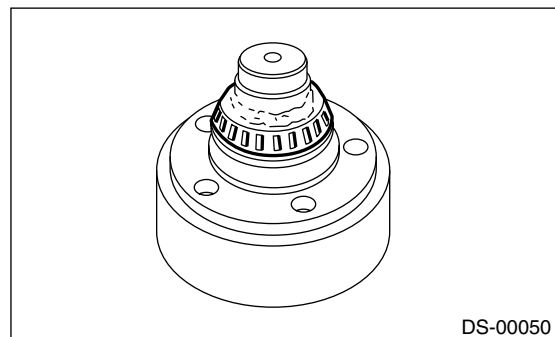
ST2 927080000 HUB STAND



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.



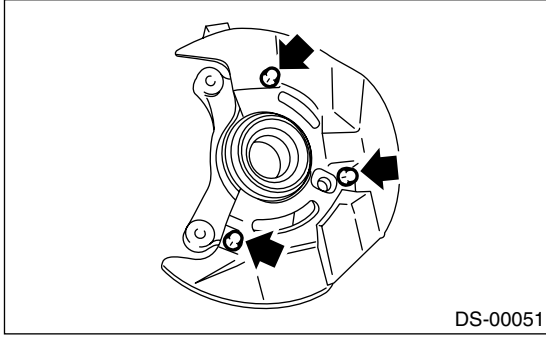
CAUTION:

Do not reuse the bearing if the hub was removed.

FRONT AXLE

DRIVE SHAFT SYSTEM

3) Remove the disc cover from housing.

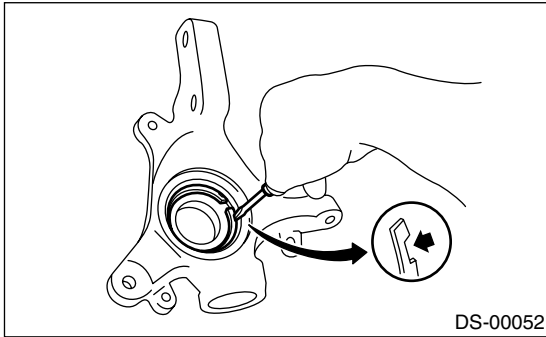


4) Using a standard screwdriver, remove the outer and inner oil seals.

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

NOTE:

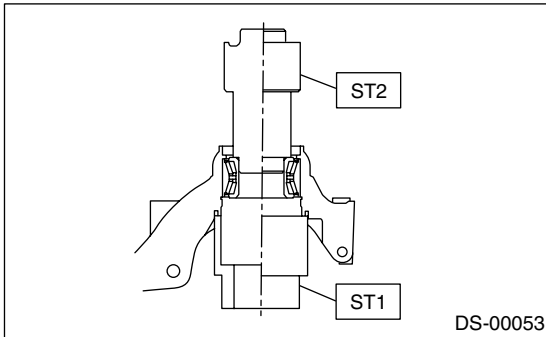
Be careful not to damage the housing at removal.



6) Using the ST1, support the housing securely.

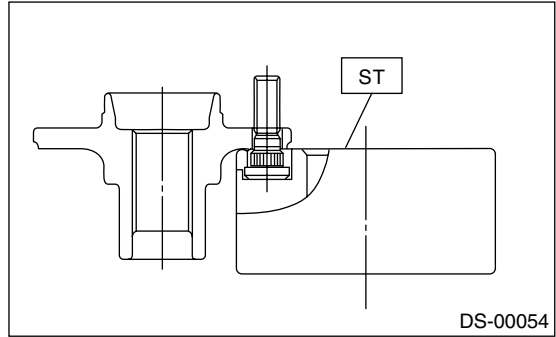
7) Using the ST2, hold the inner race to drive out the outer race of bearing.

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



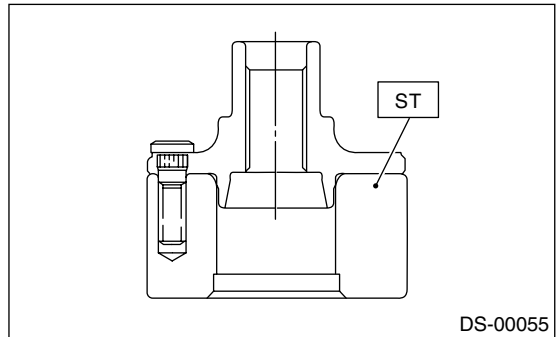
D: ASSEMBLY

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.

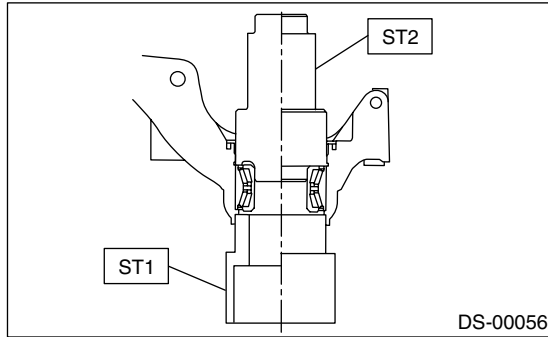
3) Clean dust or foreign particles from inside of housing.

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

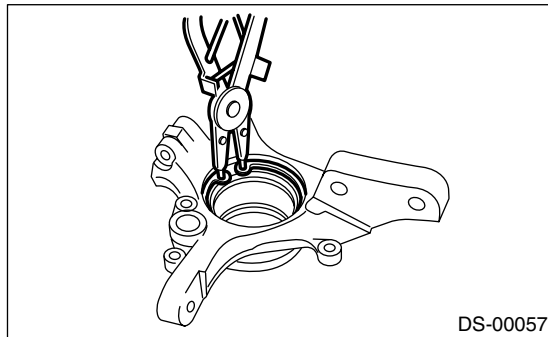
ST1 927400000 HOUSING STAND
ST2 927100000 BEARING PULLER

NOTE:

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

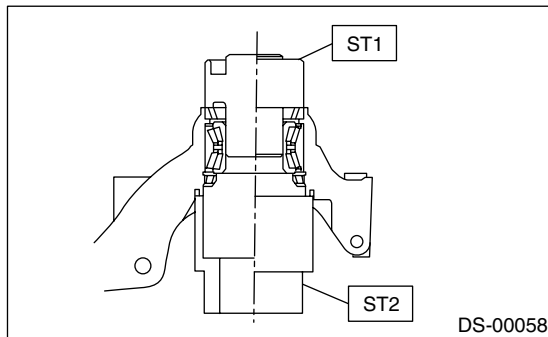


5) Using pliers, install the snap ring firmly.



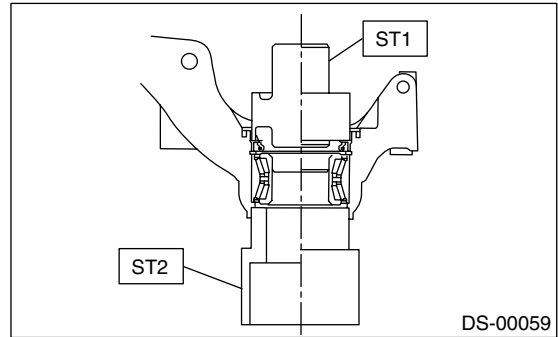
6) Using the ST1 and ST2, press the outer oil seal until it contacts the bottom of housing.

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:

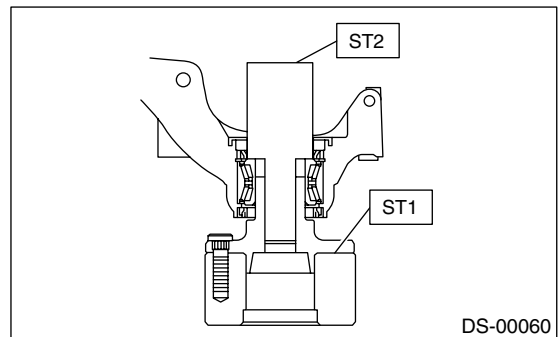
18 N·m (1.8 kgf-m, 13.0 ft-lb)

11) Attach the hub to ST1 securely.

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

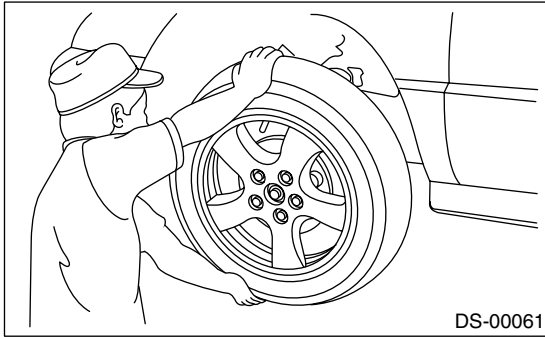
13) Using the ST2, press the bearing into hub by driving the inner race.

ST1 927080000 HUB STAND
ST2 927120000 HUB INSTALLER



E: INSPECTION

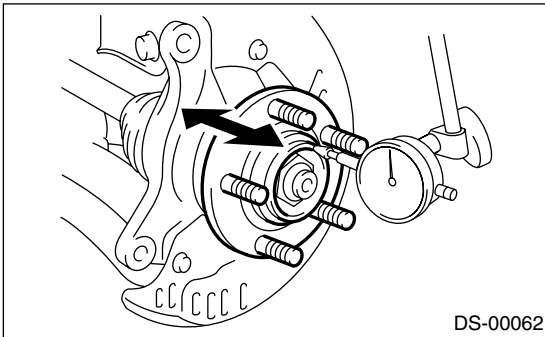
1) Moving the front tire up and down by hand, check there is no backlash in bearing, and check the wheel rotates smoothly.



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

Limit:

Maximum: 0.05mm (0.0020 in)



4. Rear Axle

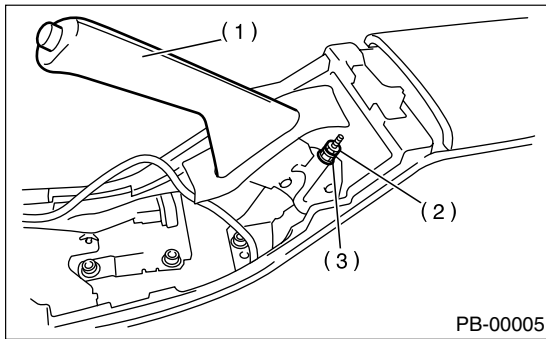
A: REMOVAL

- 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:

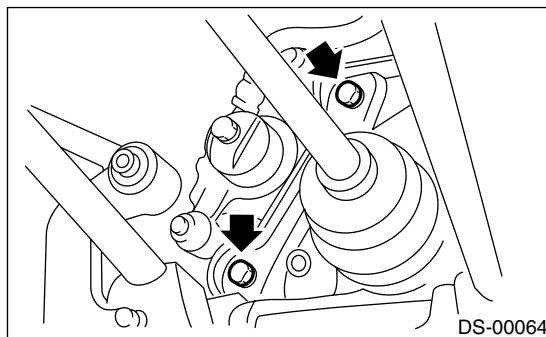
Remove the axle nut with vehicle weight not applied on axle. Failure to follow this rule may damage the wheel bearings.

- 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.

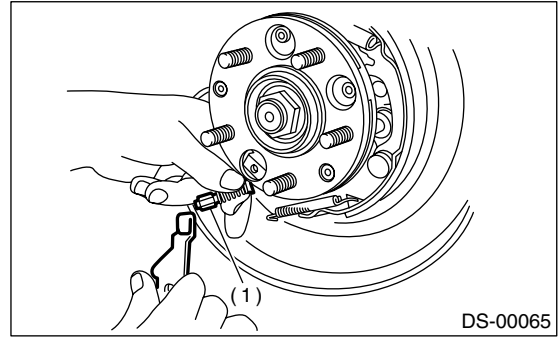


- 7) Remove the disc rotor from hub.

NOTE:

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

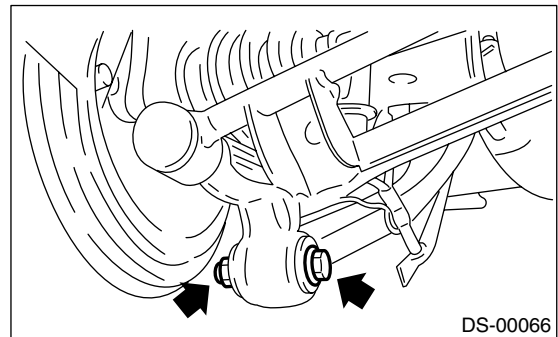
- 8) Disconnect the parking brake cable end.



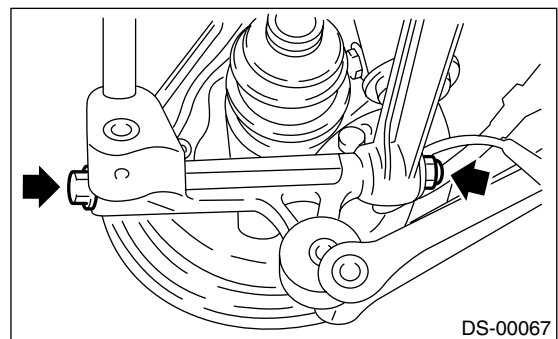
- (1) Cable end

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

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



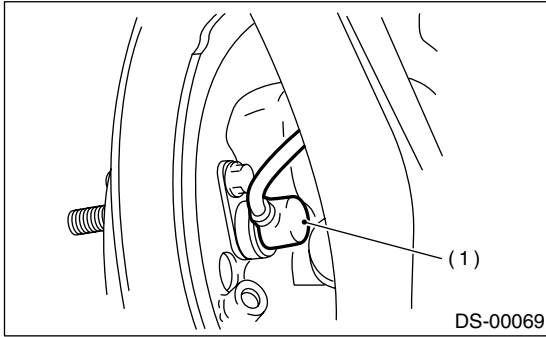
- 11) Remove the bolts which secure the lateral assembly to rear housing.



REAR AXLE

DRIVE SHAFT SYSTEM

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



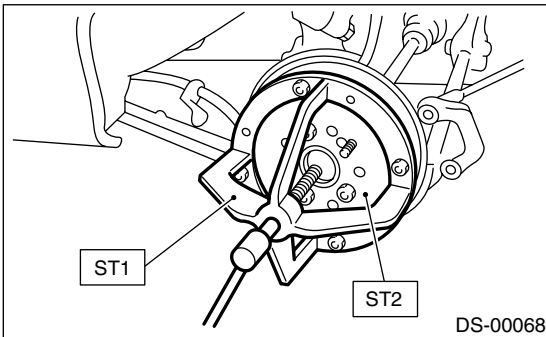
(1) ABS wheel speed sensor

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

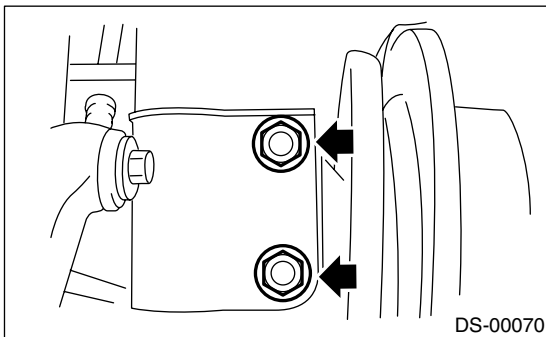
ST1 926470000 AXLE SHAFT PULLER
ST2 927140000 AXLE SHAFT PULLER PLATE

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.



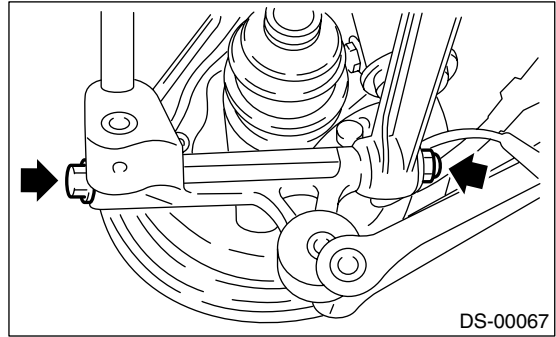
B: INSTALLATION

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

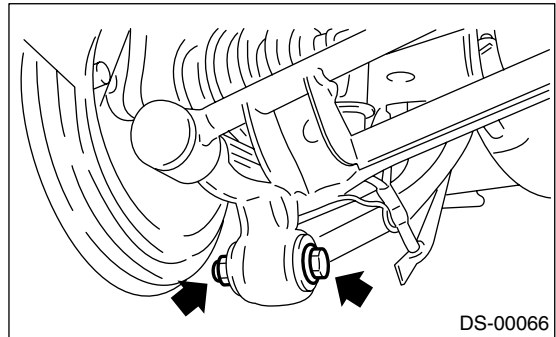
NOTE:

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:

200 N·m (20.4 kgf-m, 148 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.

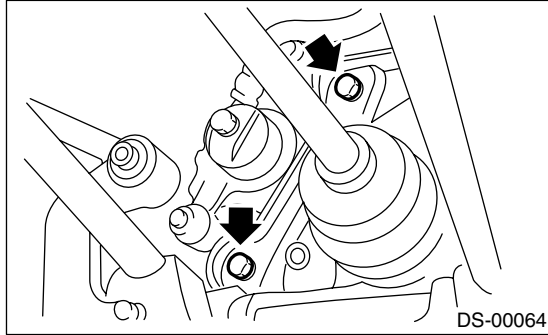
Tightening torque:

Except STi model

52 N·m (5.3 kgf·m, 38.3 ft·lb)

STi model

65 N·m (6.6 kgf·m, 47.9 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.

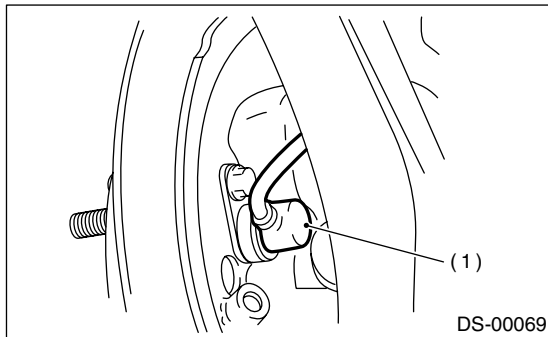
Tightening torque:

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:

140 N·m (14.3 kgf·m, 103 ft·lb)

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

Tightening torque:

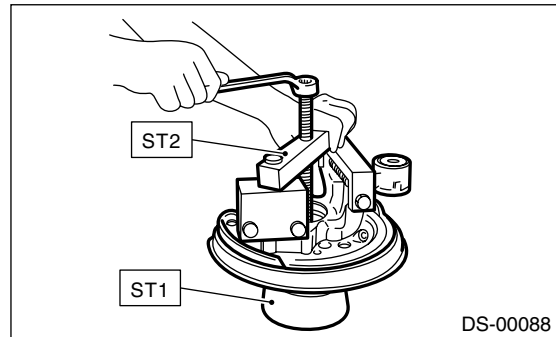
90 N·m (9.2 kgf·m, 66 ft·lb)

C: DISASSEMBLY

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

ST1 927080000 HUB STAND

ST2 927420000 HUB REMOVER



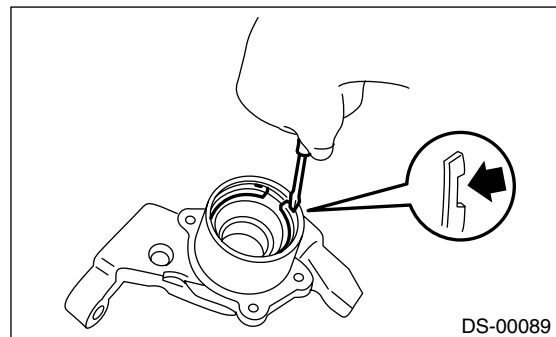
2) Remove the back plate from rear housing.

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.



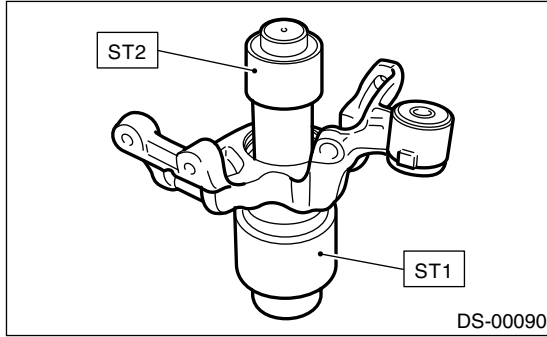
REAR AXLE

DRIVE SHAFT SYSTEM

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

ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER



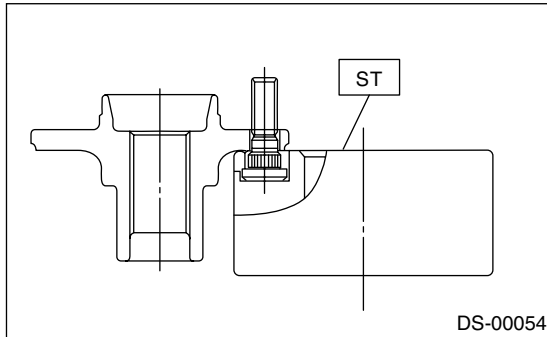
6) Remove the tone wheel bolts, and then remove the tone wheel from hub.

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.

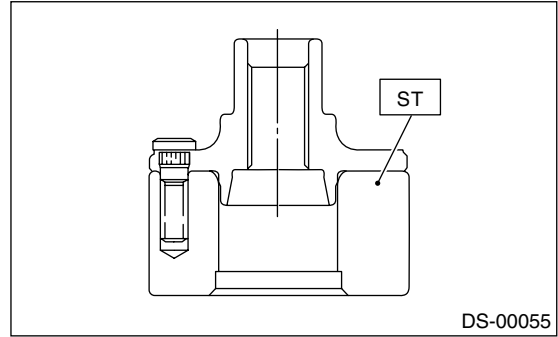
1) Using the ST, press the new hub bolt into place.

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

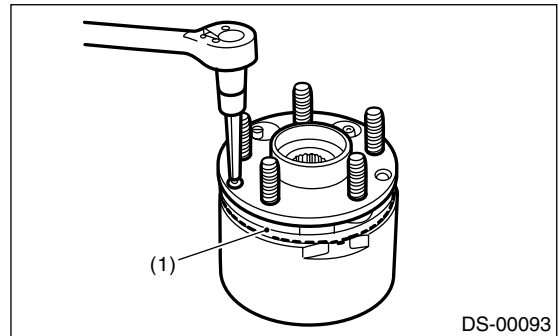
HUB STAND



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

NOTE:

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



(1) Tone wheel

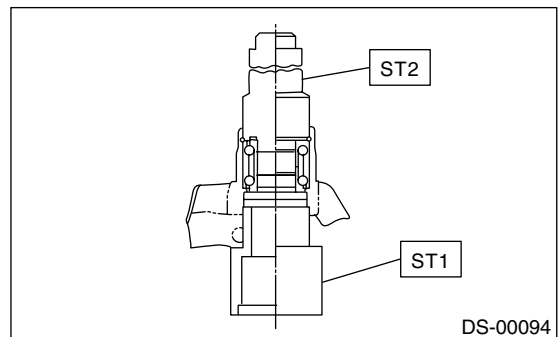
3) Clean the housing interior completely. Using the ST1 and ST2, press the bearing into housing.

ST1 927430000 HOUSING STAND

ST2 927440000 BEARING REMOVER

NOTE:

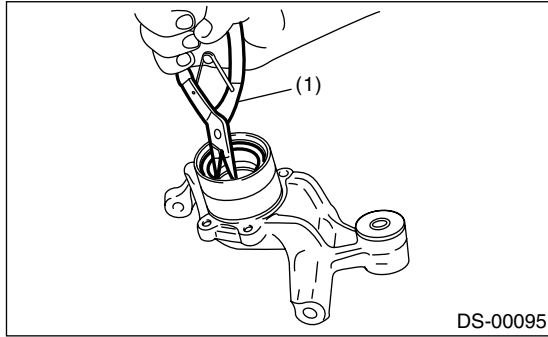
Be careful not to remove the plastic lock from inner race when installing the bearing.



REAR AXLE

DRIVE SHAFT SYSTEM

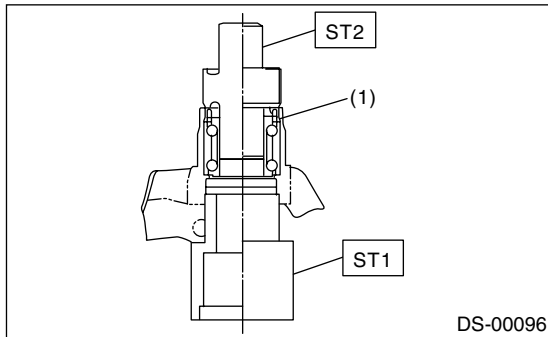
4) Using pliers, install the snap ring firmly.



(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

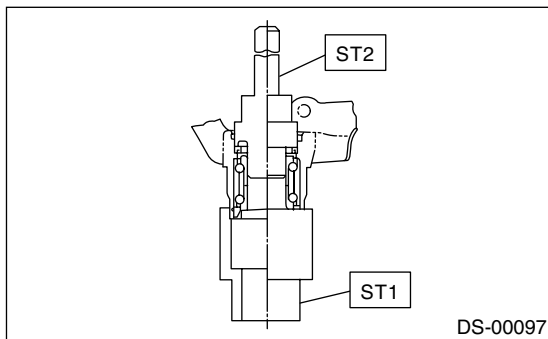


(1) Snap ring

6) Invert both ST1 and housing.

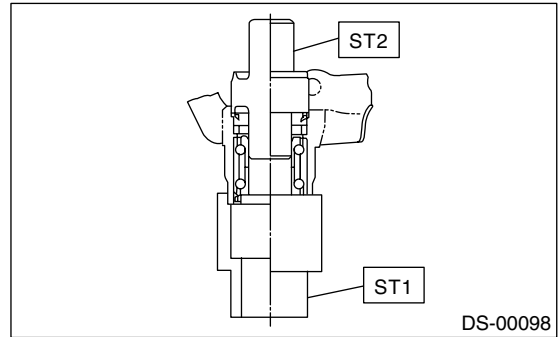
7) Using the ST2, press the inner oil seal into housing until it touches the bottom.

ST1 927430000 HOUSING STAND
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.

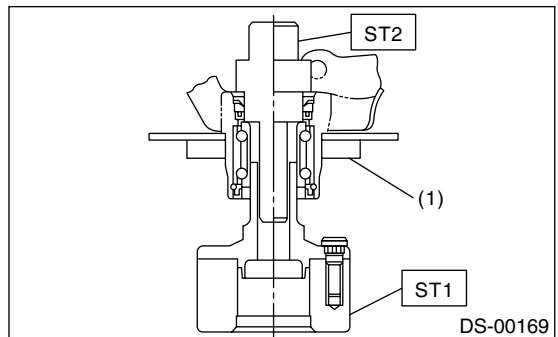
10) Install the back plate to rear housing.

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

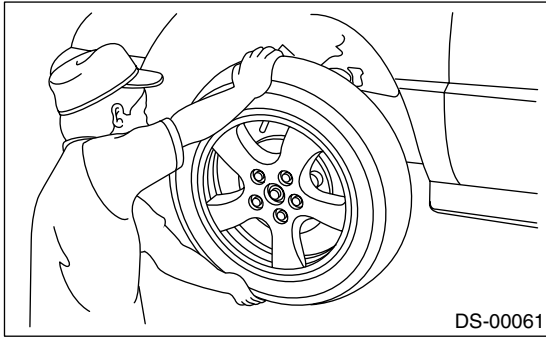


(1) Back plate

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E: INSPECTION

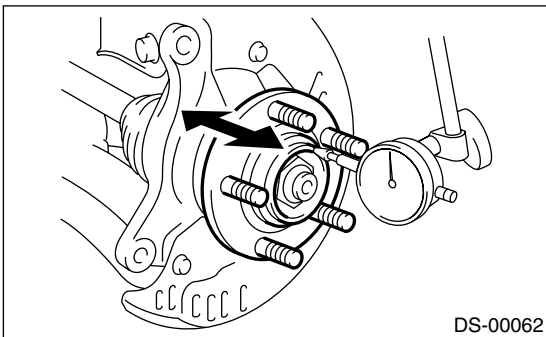
1) Moving the front tire up and down by hand, check there is no backlash in bearing, and check the wheel rotates smoothly.



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

Limit:

Maximum: 0.05mm (0.0020 in)



5. Front Drive Shaft

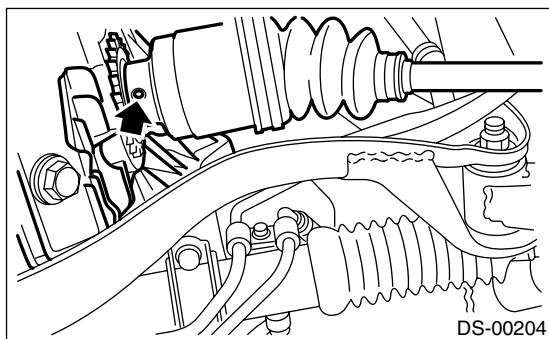
A: REMOVAL

- 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 spring pin which secures the transmission spindle to SFJ.

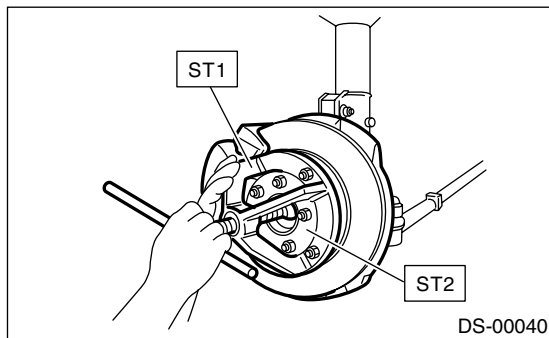


- 7) Remove the front drive shaft assembly. If it is hard to remove, use the ST1 and ST2.

- | | | |
|-----|-----------|-------------------------|
| 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.



B: INSTALLATION

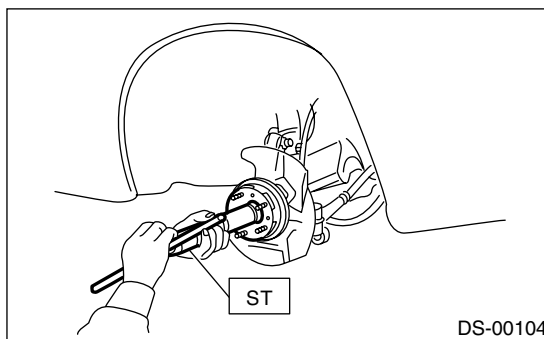
- 1) Insert the BJ into hub splines.

CAUTION:

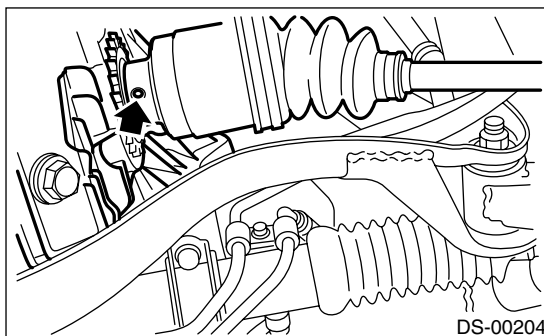
Be careful not to damage the inner oil seal lip and tone wheel.

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

- | | | |
|-----|-----------|----------------------|
| ST1 | 922431000 | AXLE SHAFT INSTALLER |
| ST2 | 927390000 | ADAPTER |



- 3) Tighten the axle nut temporarily.
- 4) Install the SFJ on transmission spindle and drive a new spring pin into place.



- 5) Connect the transverse link to housing.

Tightening torque:

50 N·m (5.1 kgf-m, 37 ft-lb)

- 6) Install the stabilizer bracket.
- 7) 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.

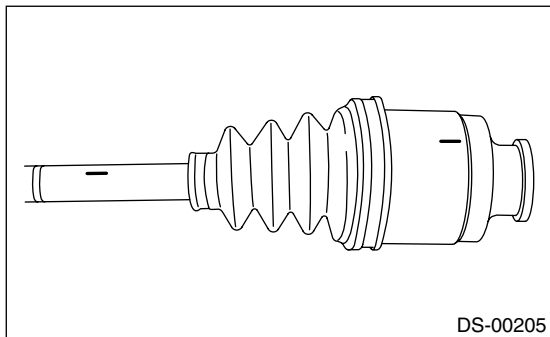
- 8) After tightening the axle nut, caulk and lock it.

FRONT DRIVE SHAFT

DRIVE SHAFT SYSTEM

C: DISASSEMBLY

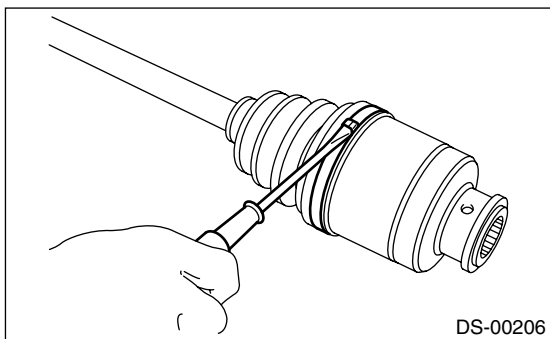
1) Place alignment marks on shaft and outer race.



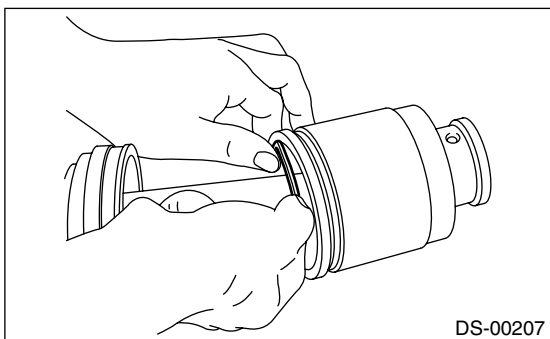
2) Remove the SFJ boot band and boot.

CAUTION:

Be careful not to damage the boot.



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



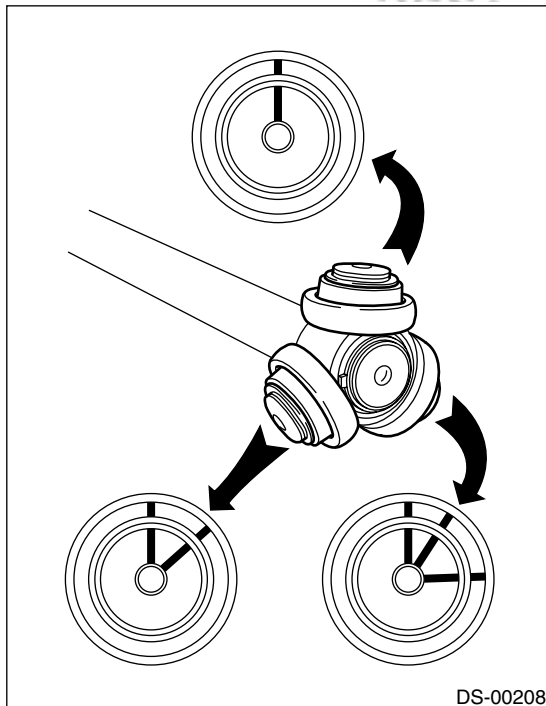
4) Remove the SFJ outer race from shaft assembly.

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.

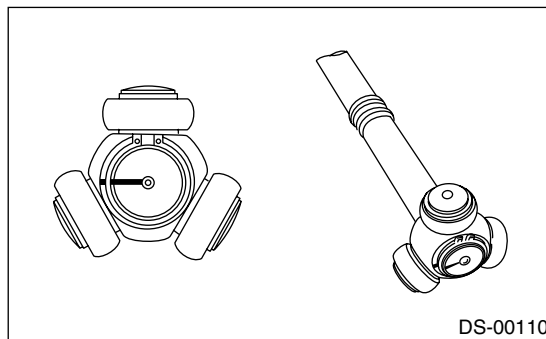


7) Remove the free ring from trunnion.

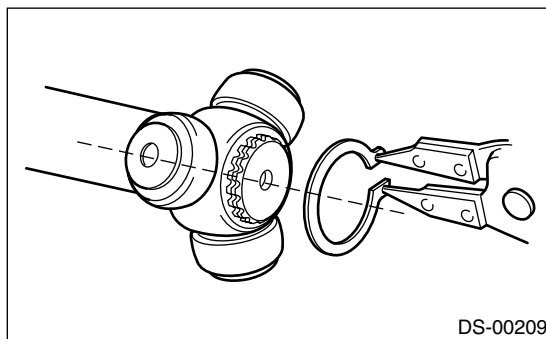
CAUTION:

Be careful with the free ring position.

8) Place an alignment mark on trunnion and shaft.



9) Remove the snap ring and trunnion.



CAUTION:

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

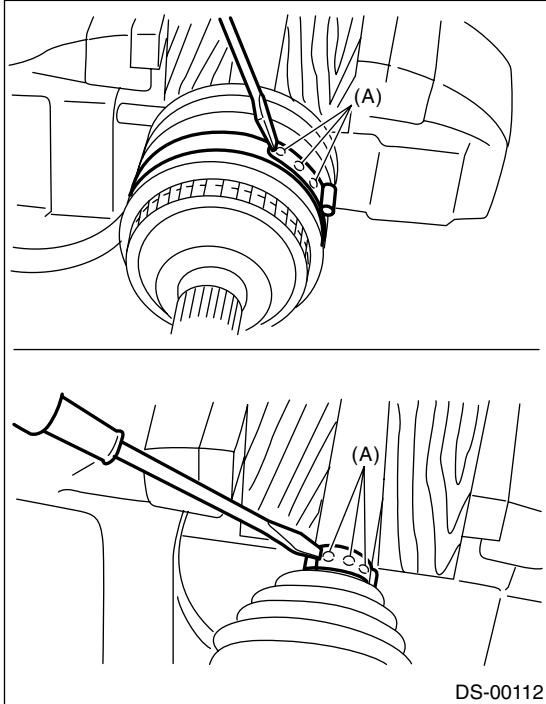
10) Remove the SFJ boot.

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.

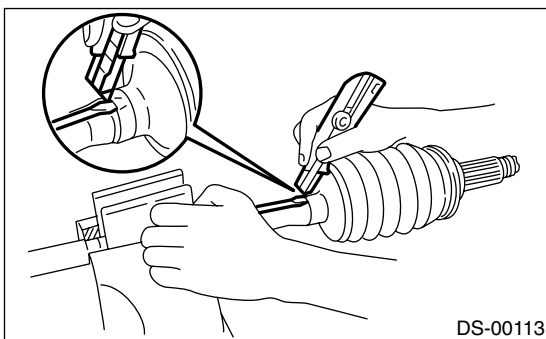


(A) Boot band claws

13) Cut and remove the boot.

CAUTION:

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



DS-00113

NOTE:

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

D: ASSEMBLY

NOTE:

Use specified grease.

BJ side:

NTG2218 (Part No. 28093AA000)

SFJ side:

SSG6003 (Part No. 28093TA000)

DOJ side:

VU-3A702 (Part No. 23223GA050)

1) Place the BJ boot and small boot band on BJ 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.

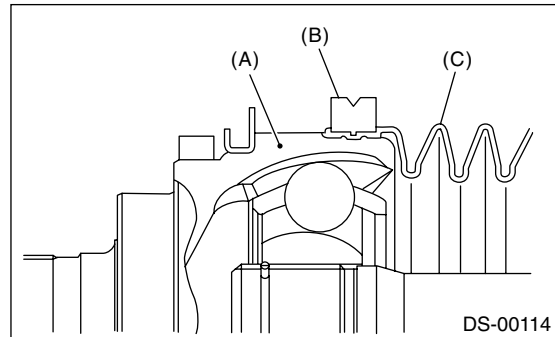
3) Apply a coat of specified grease [60 to 70 g (2.12 to 2.47 oz)] to BJ.

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:

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

5) Install the boot projecting portion to BJ groove.



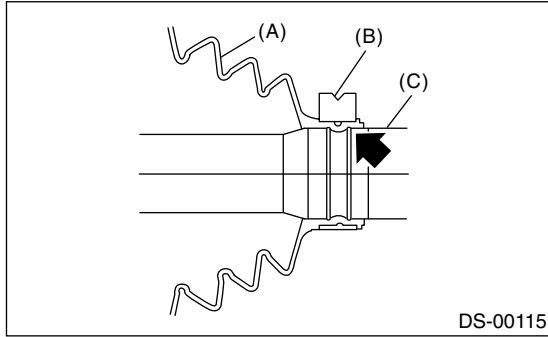
(A) BJ
(B) Large boot band
(C) Boot

6) Set the large boot band in place.

FRONT DRIVE SHAFT

DRIVE SHAFT SYSTEM

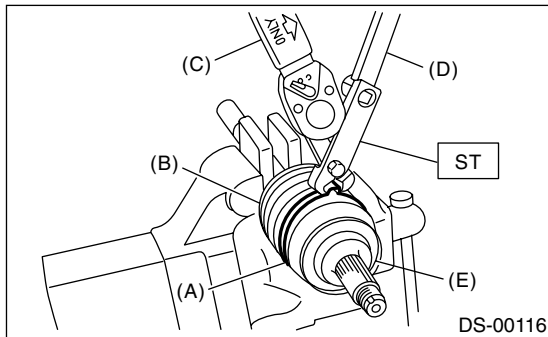
7) Install the boot projecting portion to shaft groove.



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

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

ST 28099AC000 BOOT BAND PLIER



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

Tightening torque:

Large boot band

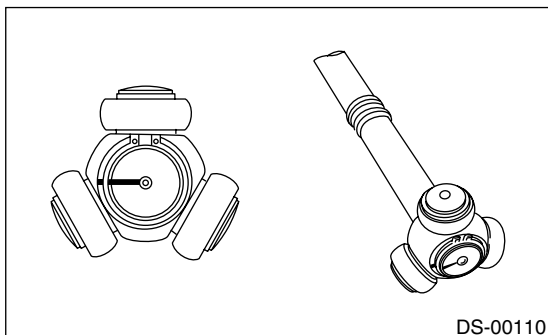
157 N·m (16.0 kgf·m, 116 ft·lb) or more

Small boot band

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

9) Place the SFJ 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.

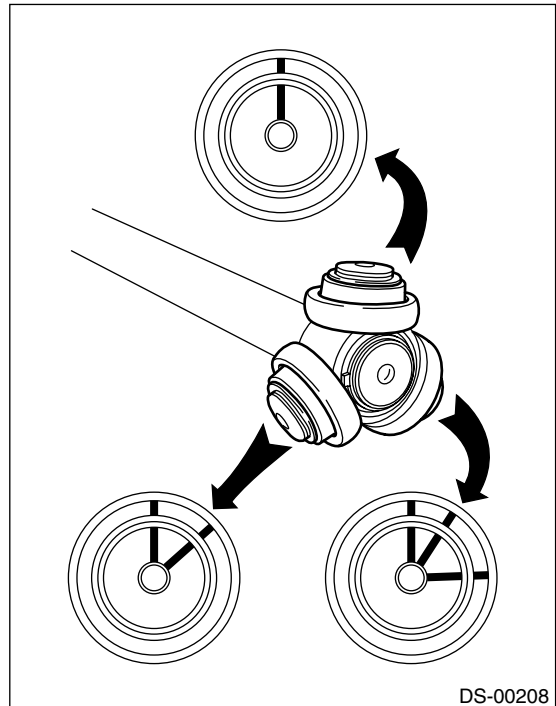
12) Fill 100 to 110 g (3.53 to 3.88 oz) of specified grease into the interior of SFJ outer race.

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

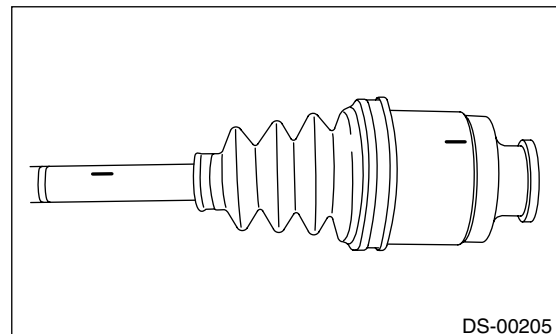
14) Align the alignment marks on free ring and trunnion, and then install the free ring.

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 SFJ 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 SFJ boot taking care not to twist it.

CAUTION:

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

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

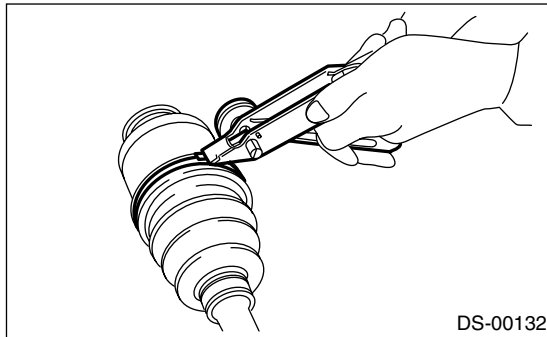
19) Put a new band through the clip and wind twice in alignment with band groove of boot.

20) Tighten the band by using the ST.

ST 925091000 BAND TIGHTENING TOOL

NOTE:

Tighten the band until it cannot be moved by hand.



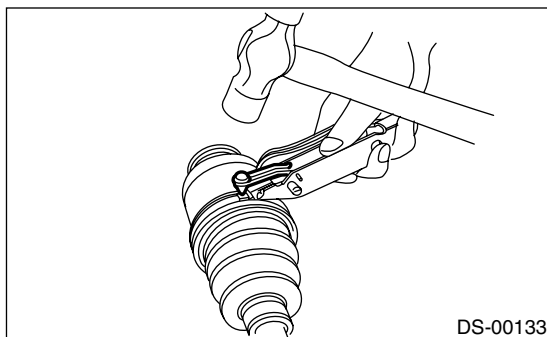
DS-00132

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.



DS-00133

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.

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) SFJ (Shudder-less Freering tripod Joint)

Check seizure, corrosion, damage and excessive play.

3) Shaft

Check excessive bending, twisting, damage and wear.

4) BJ (Bell Joint)

Check seizure, corrosion, damage and excessive play.

5) Boot

Check for wear, warping, breakage or scratches.

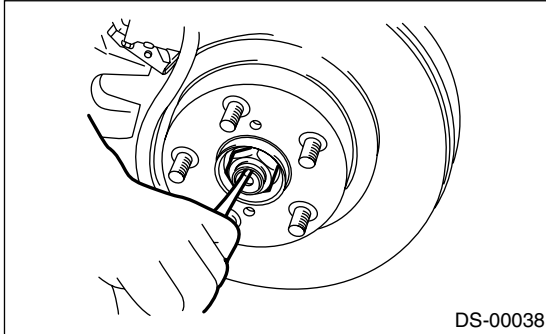
6) Grease

Check for discoloration or fluidity.

6. Rear Drive Shaft

A: REMOVAL

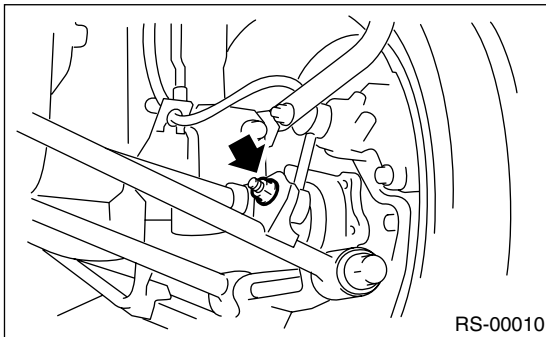
- 1) Disconnect the ground cable from battery.
- 2) Lift-up the vehicle, and remove the rear wheel.
- 3) Unlock the axle nut.



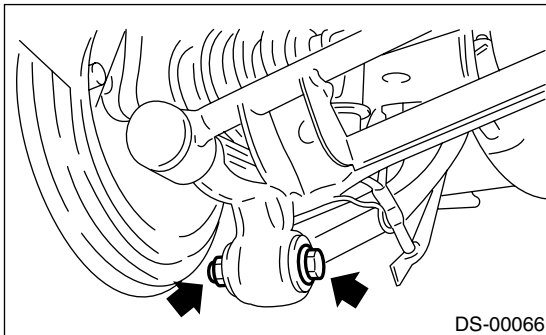
- 4) Remove the axle nut using a socket wrench with parking brake applied.

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

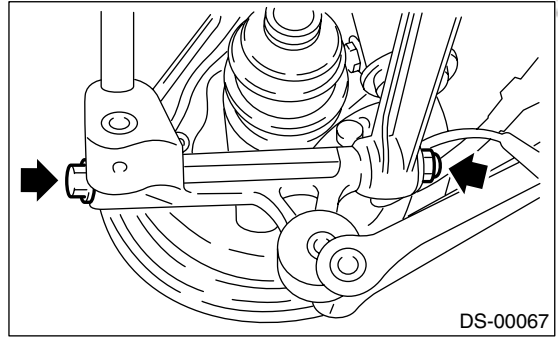
- 5) Disconnect the stabilizer link.



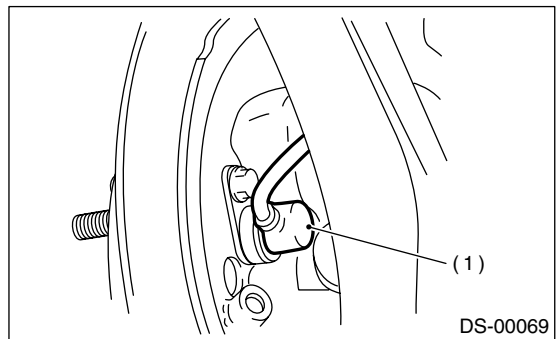
- 6) Remove the bolt which secures the trailing link to housing.



- 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.



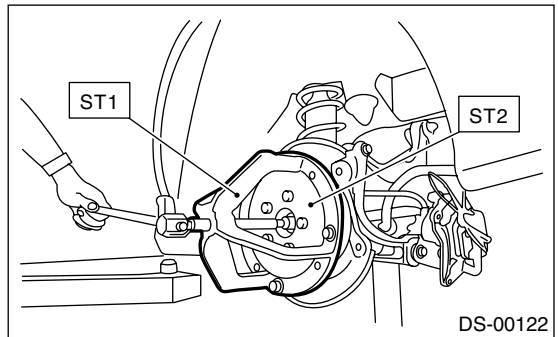
(1) ABS wheel speed sensor

- 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.



REAR DRIVE SHAFT

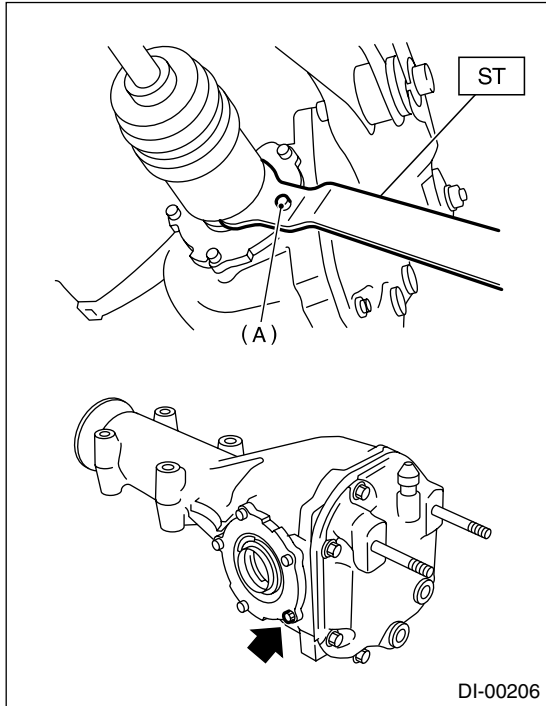
DRIVE SHAFT SYSTEM

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.

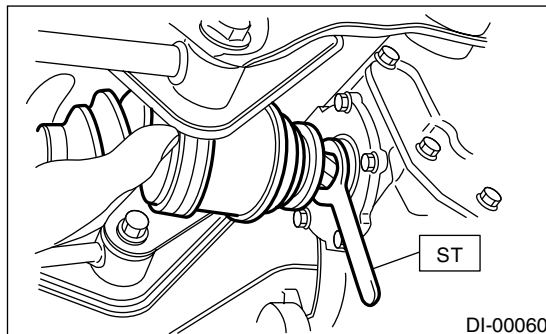


(A) Bolt

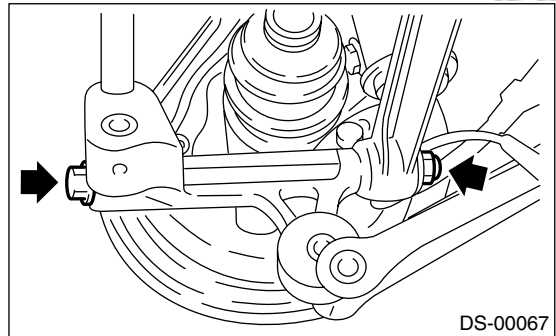
B: INSTALLATION

- 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.

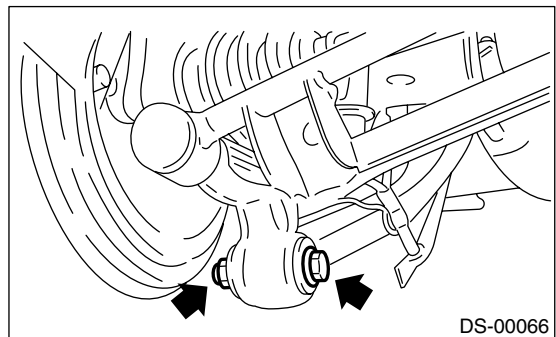
ST 28099PA090 OIL SEAL PROTECTOR



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.

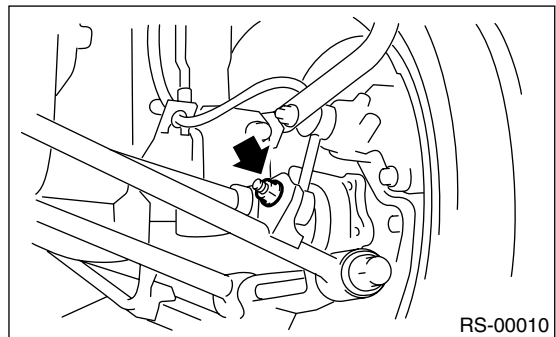
Tightening torque:

Except STi model

30 N·m (3.1 kgf-m, 22 ft-lb)

STi model

45 N·m (4.6 kgf-m, 33 ft-lb)



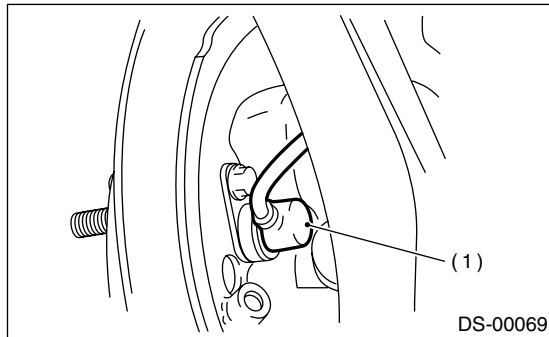
REAR DRIVE SHAFT

DRIVE SHAFT SYSTEM

7) Install the ABS wheel speed sensor.

Tightening torque:

32 N-m (3.3 kgf-m, 24 ft-lb)

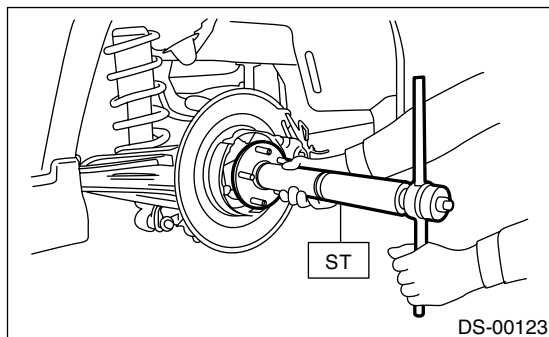


(1) ABS wheel speed sensor

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

ST1 922431000 AXLE SHAFT INSTALLER

ST2 927390000 ADAPTER

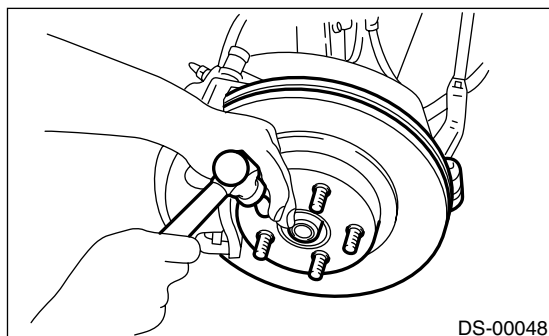


9) Tighten a new axle nut to the specified torque with parking brake applied.

Tightening torque:

190 N-m (19.4 kgf-m, 140 ft-lb)

10) Lock the axle nut.



11) Install the wheel.

Tightening torque:

88 N-m (9.0 kgf-m, 65 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:

140 N-m (14.3 kgf-m, 103 ft-lb)

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

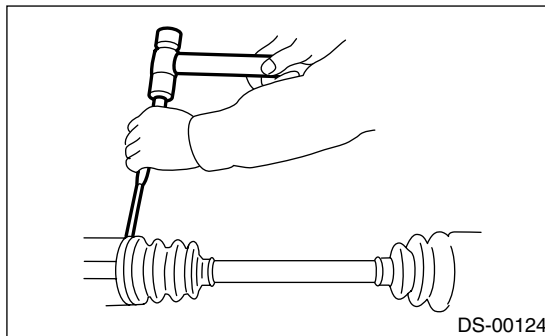
Tightening torque:

90 N-m (9.2 kgf-m, 66 ft-lb)

C: DISASSEMBLY

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

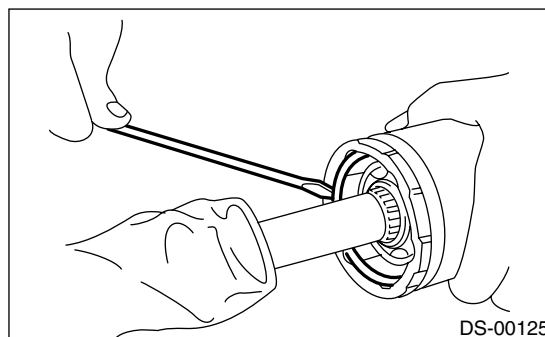
2) Loosen the band by means of screwdriver or pliers with care of not damaging boot.



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.

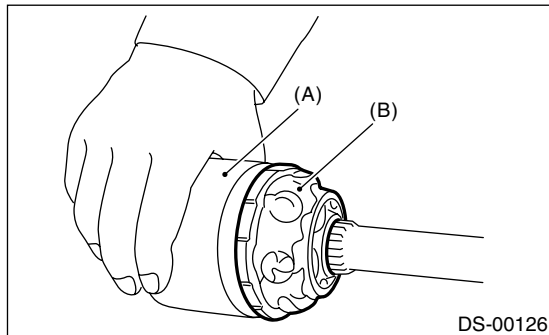


6) Take out the DOJ outer race from shaft assembly.

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 in the same procedure as DOJ boot.

NOTE:

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

D: ASSEMBLY

NOTE:

Use specified grease.

BJ side:

Except STi model:

Molylex No. 2 (Part No. 723223010)

STi model:

NTG2218-M (Part No. 28395FE010)

DOJ side:

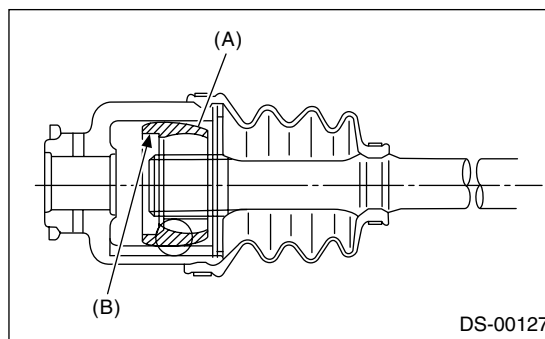
VU-3A702 (Yellow) (Part No. 23223GA050)

- 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.

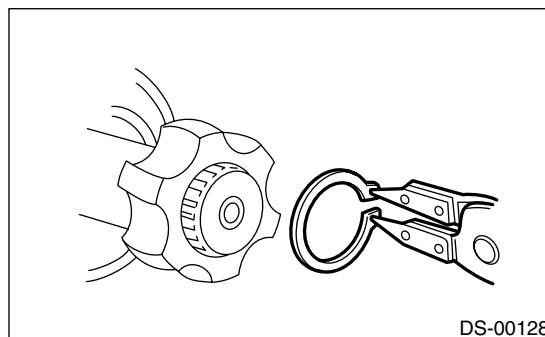


- (A) Cage
(B) Cut-out portion

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

NOTE:

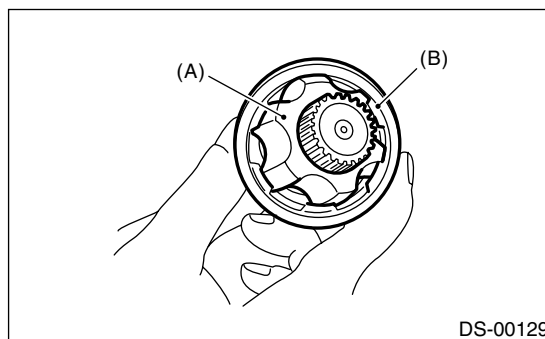
Confirm the snap ring is completely fitted in shaft groove.



- 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.

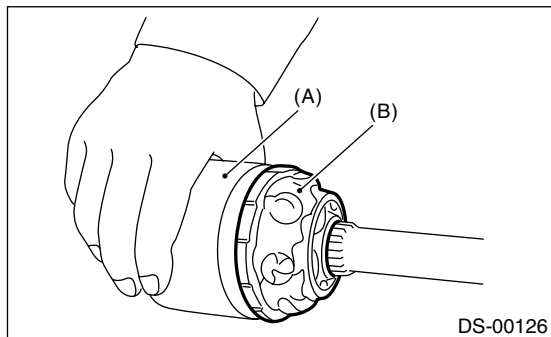


- (A) Inner race
(B) Cage

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.

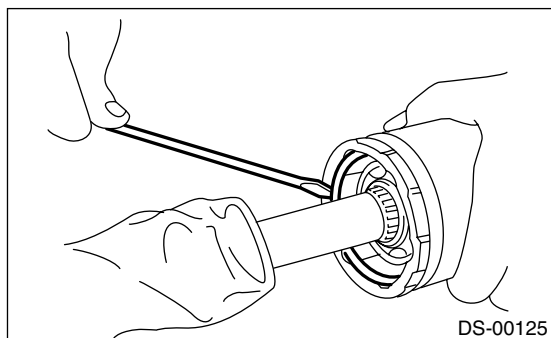


- (A) Outer race
- (B) Grease

- 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.

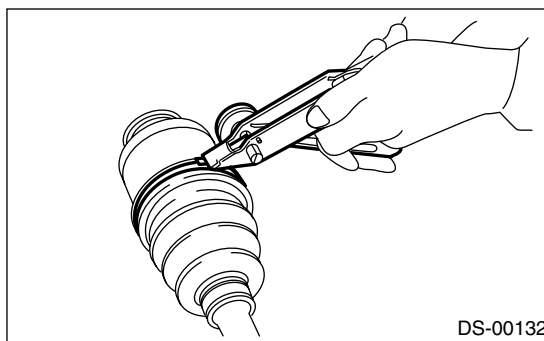
NOTE:

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.

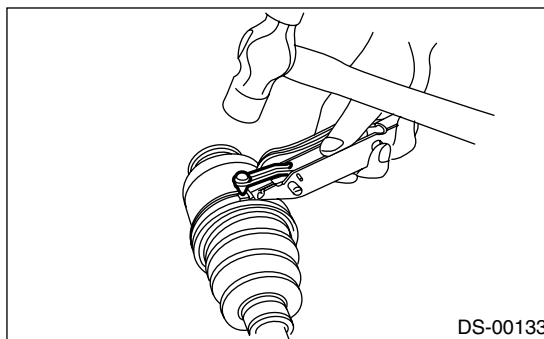


- 16) Tap on the clip with the punch provided at the end of ST.

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) Boot

Check for wear, warping, breakage or scratches.

5) Grease

Check for discoloration or fluidity.

GENERAL DIAGNOSTIC TABLE

DRIVE SHAFT SYSTEM

7. General Diagnostic Table

A: INSPECTION

NOTE:

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

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