

DRIVE SHAFT SYSTEM

DS

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General Description

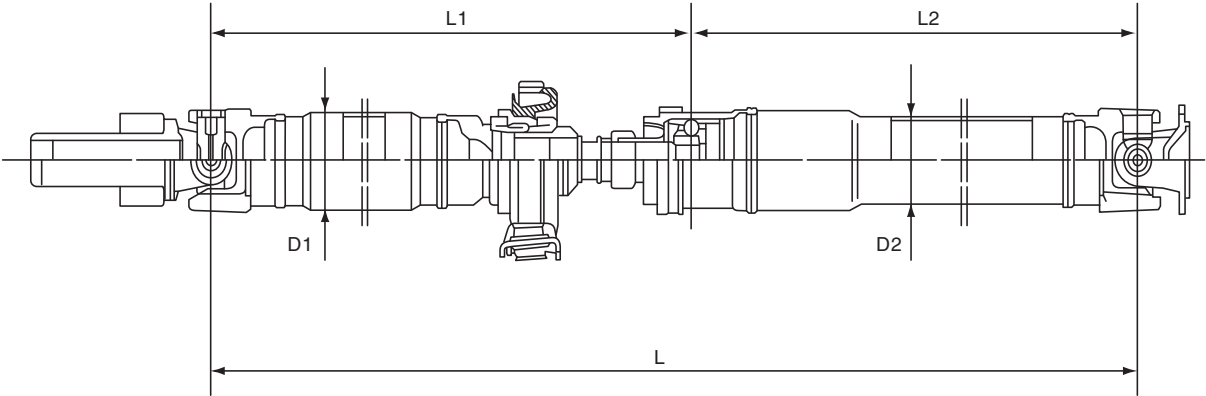
DRIVE SHAFT SYSTEM

1. General Description

A: SPECIFICATION

1. PROPELLER SHAFT

Car line		All models
Propeller shaft type		EDJ
Front propeller shaft joint-to-joint length: L_1	CVT (TR690)	578 mm (22.76 in)
	CVT (TR580)	675.5 mm (26.59 in)
	MT	735.5 mm (28.96 in)
Rear propeller shaft joint-to-joint length: L_2		723 mm (28.46 in)
Outer diameter of tube:	D_1	63.5 mm (2.50 in)
	D_2	57.5 mm (2.26 in)



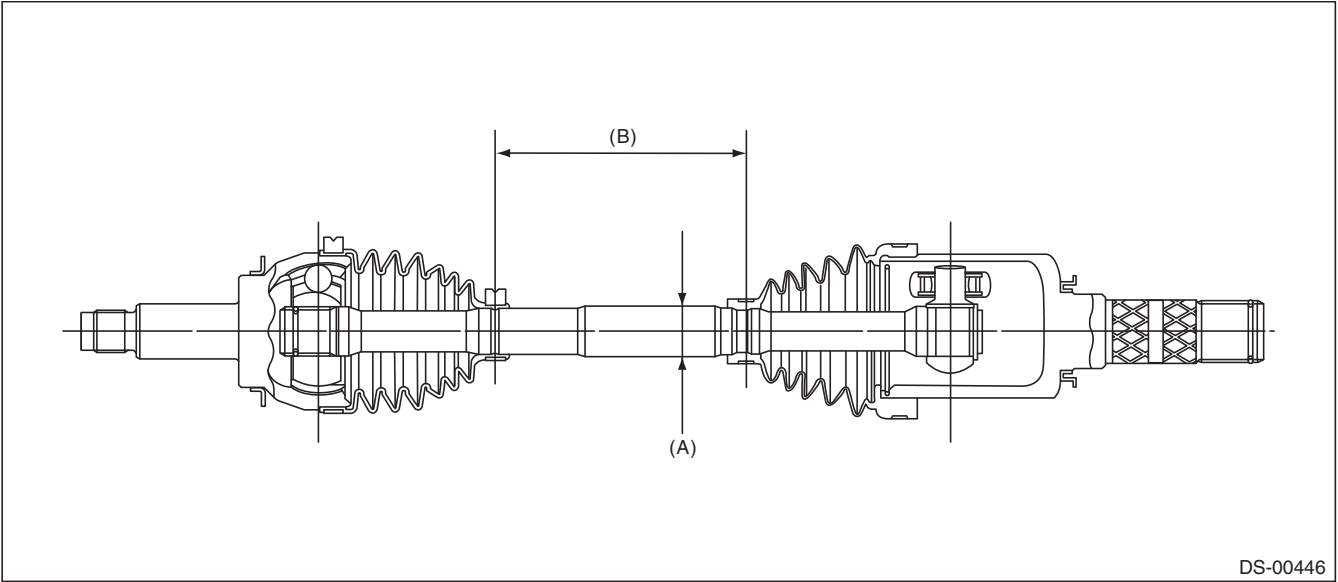
DS-00430

General Description

DRIVE SHAFT SYSTEM

2. FRONT AXLE SHAFT ASSEMBLY

Model	Axle shaft type	Axle diameter ϕ mm (in)	Axle length mm (in)
MT	EBJ + PTJ	22 (0.87)	372.4 (14.66)
CVT	EBJ + PTJ	22 (0.87)	360 (14.17)



DS-00446

(A) Axle diameter

(B) Axle length

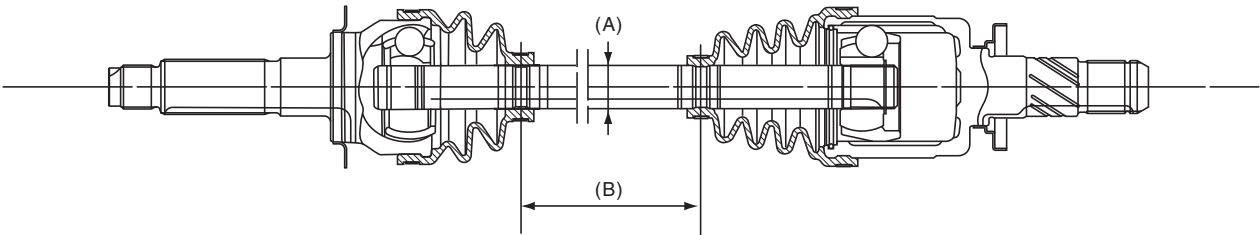
General Description

DRIVE SHAFT SYSTEM

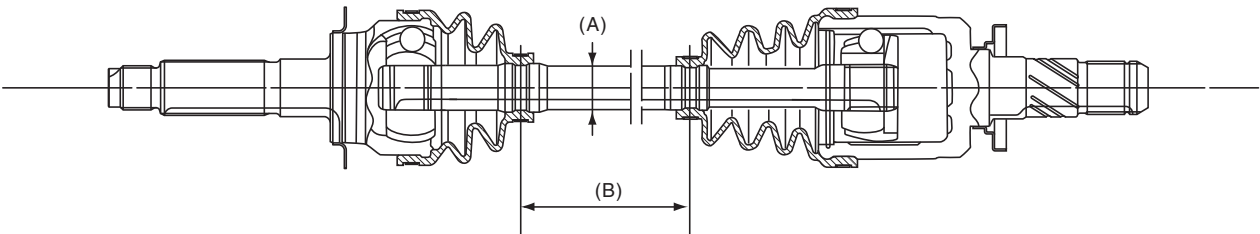
3. REAR AXLE SHAFT ASSEMBLY

T/M type	Axle shaft type	Axle diameter ϕ mm (in)	Axle length mm (in)
MT,TR690	EBJ + EDJ	22 (0.87)	384.4 (15.13)
TR580	BJ + DOJ	22 (0.87)	399.2 (15.72)

(a)



(b)



DS-00541

(a) BJ + DOJ type

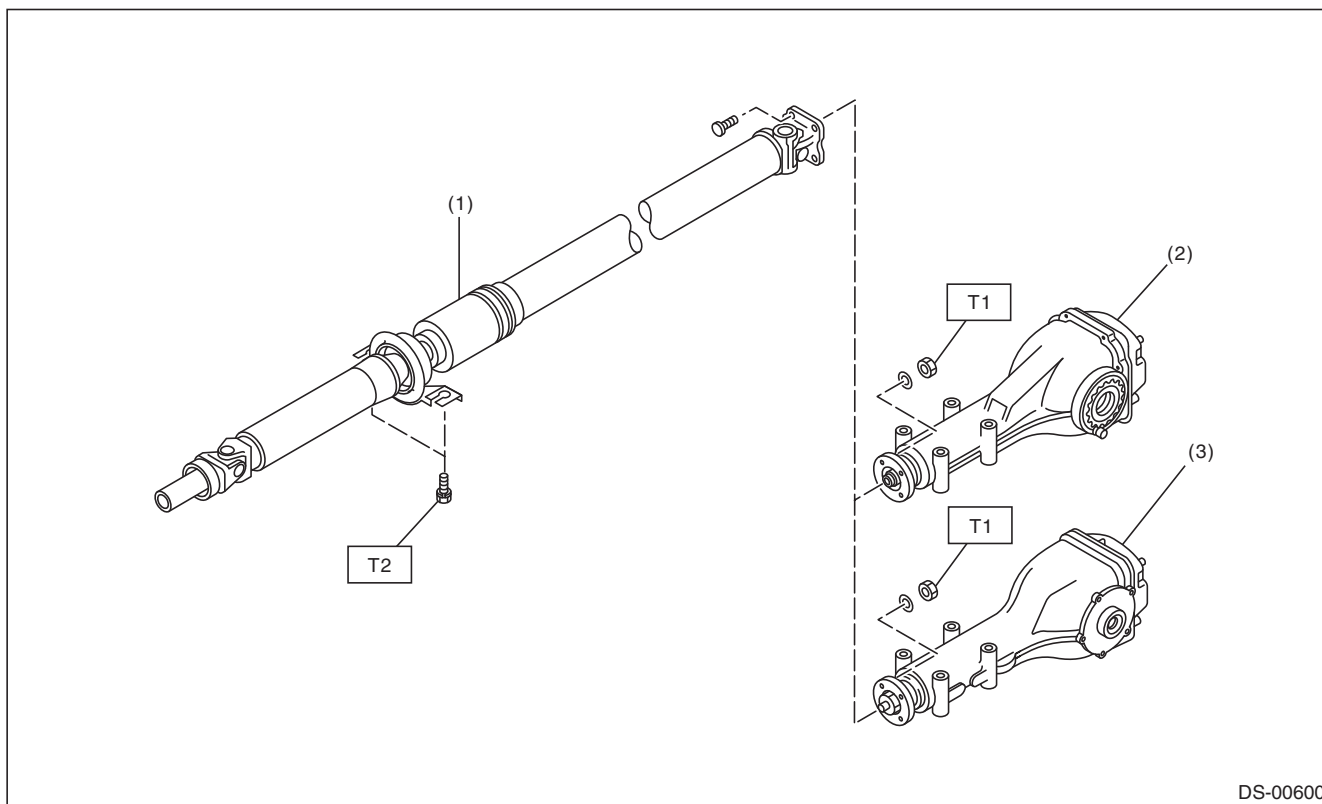
(b) EBJ + EDJ type

(A) Axle diameter

(B) Axle length

B: COMPONENT

1. PROPELLER SHAFT



DS-00600

- (1) Propeller shaft
- (2) Rear differential (VA1-type)
- (3) Rear differential (T-type)

Tightening torque: N·m (kgf-m, ft-lb)

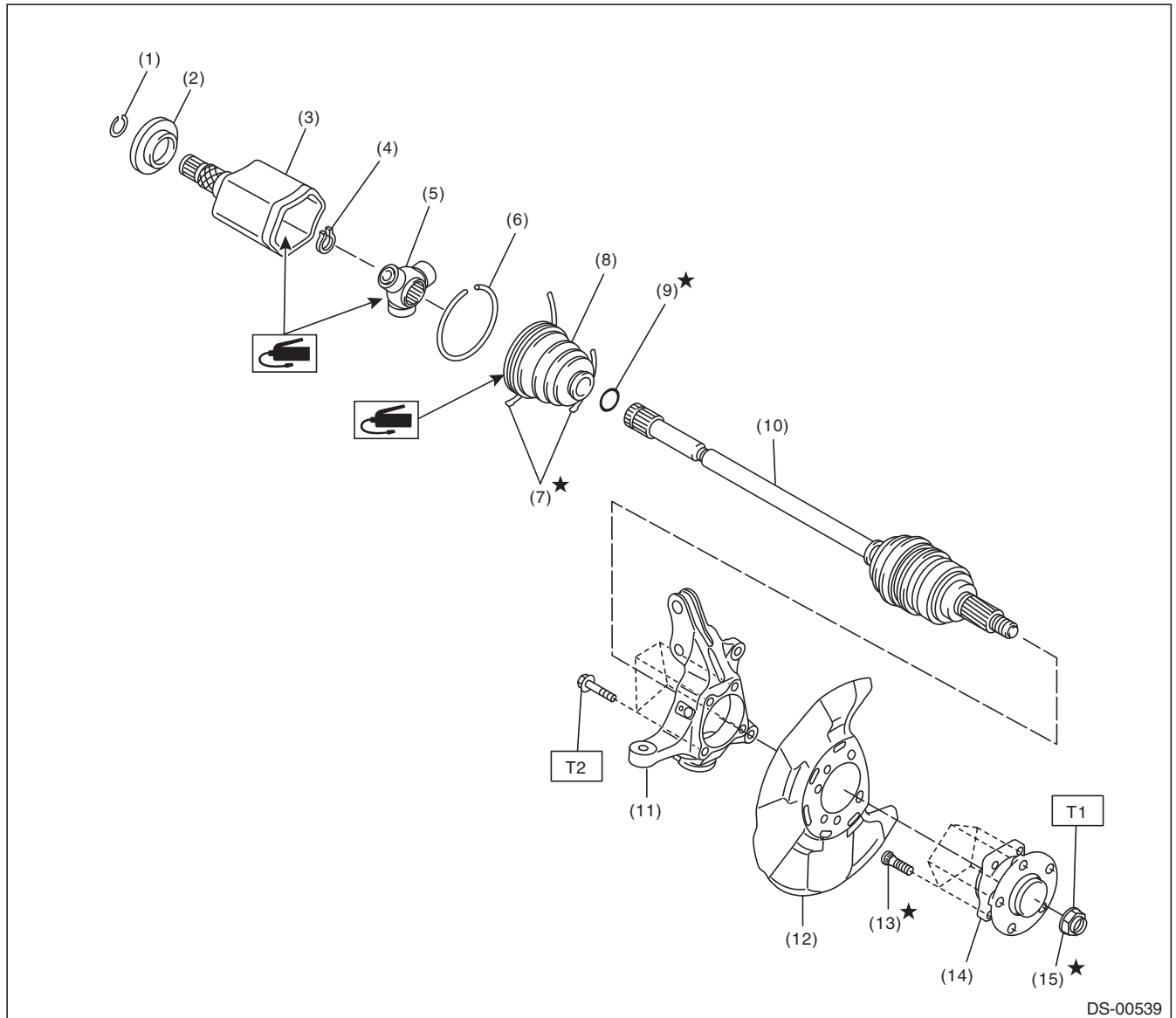
T1: 31 (3.16, 22.9)

T2: 52 (5.30, 38.4)

General Description

DRIVE SHAFT SYSTEM

2. FRONT AXLE



- (1) Circlip
- (2) Baffle plate
- (3) Outer race (PTJ)
- (4) Snap ring
- (5) Trunnion
- (6) Snap ring
- (7) Boot band

- (8) Boot (PTJ)
- (9) O-ring
- (10) EBJ shaft ASSY
- (11) Housing ASSY - front axle
- (12) Back plate - front brake
- (13) Bolt - hub

- (14) Hub unit COMPL - front axle
- (15) Nut - axle

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

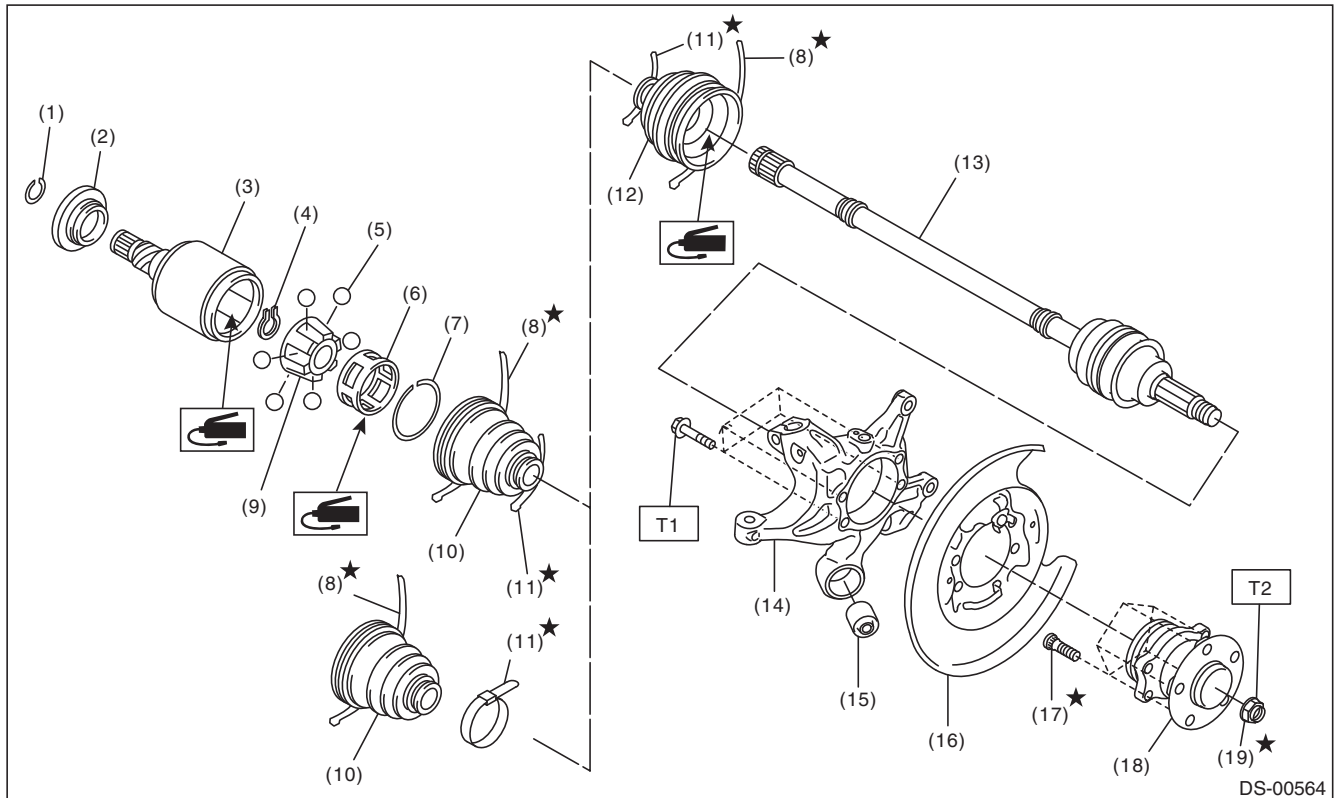
T1: 220 (22.43, 162.3)

T2: 65 (6.63, 47.9)

General Description

DRIVE SHAFT SYSTEM

3. REAR AXLE



- | | | |
|--|---|---------------------------------|
| (1) Circlip A | (9) Inner race | (17) Bolt - hub |
| (2) Baffle plate | (10) Boot - drive shaft (DOJ)
Boot - drive shaft (EDJ) | (18) Hub unit COMPL - rear axle |
| (3) Outer race (DOJ)
Outer race (EDJ) | (11) Band - drive shaft B (locking tab type)
Band - drive shaft B (double loop type) | (19) Nut - axle |
| (4) Snap ring | (12) Boot - drive shaft (BJ)
Boot - drive shaft (EBJ) | |
| (5) Ball | (13) Shaft ASSY (BJ)
Shaft ASSY (EBJ) | |
| (6) Cage | (14) Housing ASSY - rear axle | |
| (7) Circlip B | (15) Bushing - trailing link | |
| (8) Band - drive shaft A | (16) Back plate - rear brake | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 65 (6.63, 47.9)

T2: 190 (19.37, 140.13)

General Description

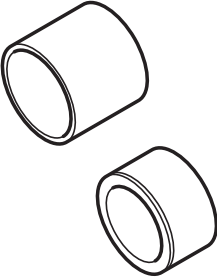
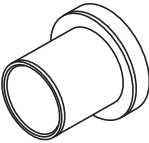
DRIVE SHAFT SYSTEM

C: CAUTION

- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease etc. or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply grease onto sliding or revolving 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 materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- When the suspension-related components have been removed and installed, be sure to adjust the steering sensor. <Ref. to VDC-23, VDC SENSOR MIDPOINT SETTING MODE, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

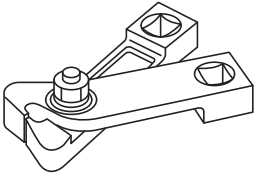
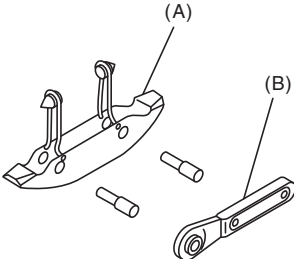
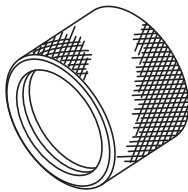
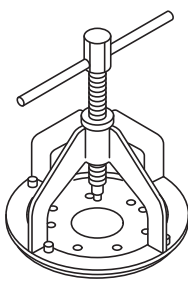
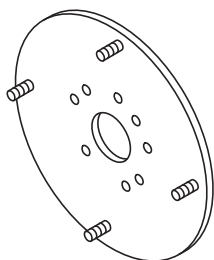
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	Part No.	DESCRIPTION	REMARKS
 ST20099PA010	20099PA010	INSTALLER & REMOVER	• Used for replacing the bushing - trailing link of the housing assembly - rear axle. • Used together with BUSHING REMOVER (20099FG000).
 ST20099FG000	20099FG000	BUSHING REMOVER	• Used for replacing the bushing - trailing link of the housing assembly - rear axle. • Used together with base part of INSTALLER & REMOVER (20099PA010).

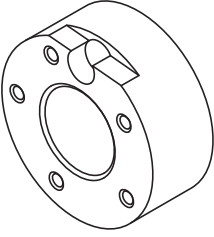
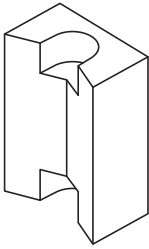
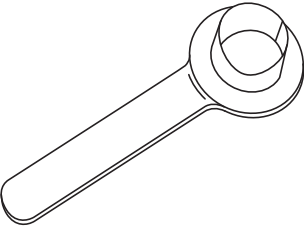
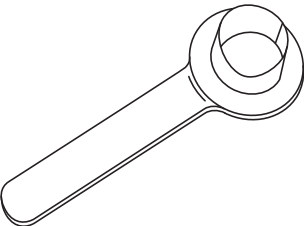
General Description

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ILLUSTRATION	Part No.	DESCRIPTION	REMARKS
 ST28099AC000	28099AC000	BOOT BAND PLIER	Used for tightening the band - boot. (for front axle shaft)
 ST-925091000	925091000	BAND TIGHTENING TOOL	Used for tightening the band - boot. (A) Jig for the band (B) Ratchet wrench
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-926470000	926470000	AXLE SHAFT PULLER	- Used for removing the axle shaft. - Used together with AXLE SHAFT PULLER PLATE (28099PA110).
 ST28099PA110	28099PA110	AXLE SHAFT PULLER PLATE	Exchange with the plate of the AXLE SHAFT PULLER (926470000) to use.

General Description

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ILLUSTRATION	Part No.	DESCRIPTION	REMARKS
 ST-927080000	927080000	HUB STAND	Used for assembling the bolt - hub of the hub.
 ST28399AG000	28399AG000	HUB STAND	Used for extracting the bolt - hub.
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	• Used for installing the front axle shaft into the front differential. • For protecting the oil seal.
 ST28099PA090	28099PA090	OIL SEAL PROTECTOR	• Used for installing the rear axle shaft into the rear differential. • For protecting the oil seal.

2. GENERAL TOOL

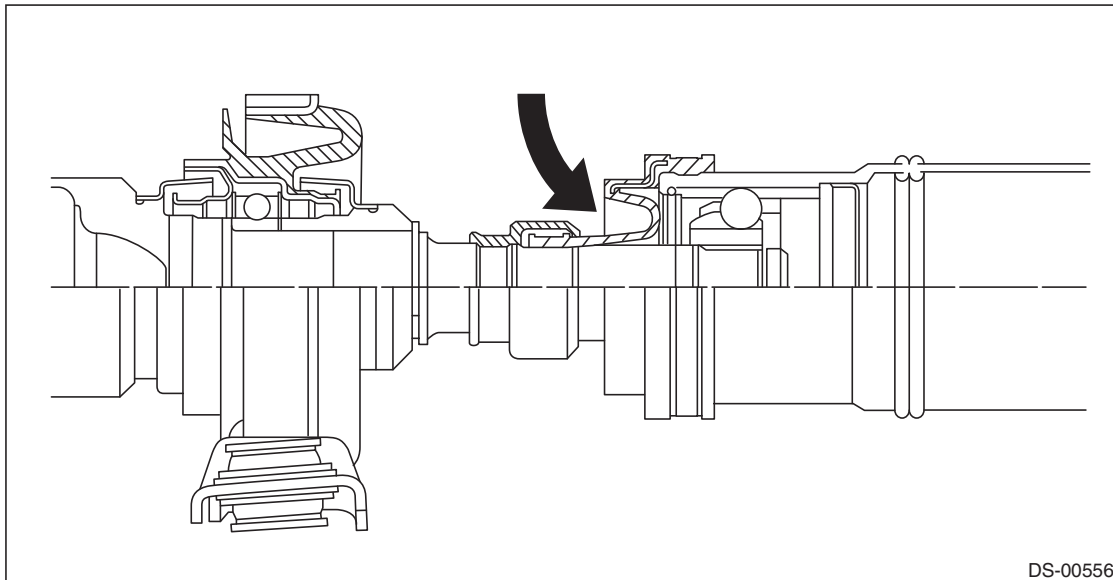
TOOL NAME	REMARKS
Tie-rod ball joint puller	Used for disconnecting joints.
Dial gauge	Used for inspecting the propeller shaft run-out.
Extension cap	Used for preventing leakage of gear oil or ATF.
Crowbar	Used for extracting the axle shaft.
Needle nose pliers	Used for tightening the band - boot of the rear axle shaft. • Snap-on 96BCP Or equivalent.

2. Propeller Shaft

A: REMOVAL

CAUTION:

- Do not disassemble the propeller shaft.
- Before removing propeller shaft, wrap the metal parts attached to the rubber boot of the center joint with a cloth or rubber material, as shown in the figure. The rubber boot may be damaged due to interference with adjacent metal parts while bending the joint during removal.



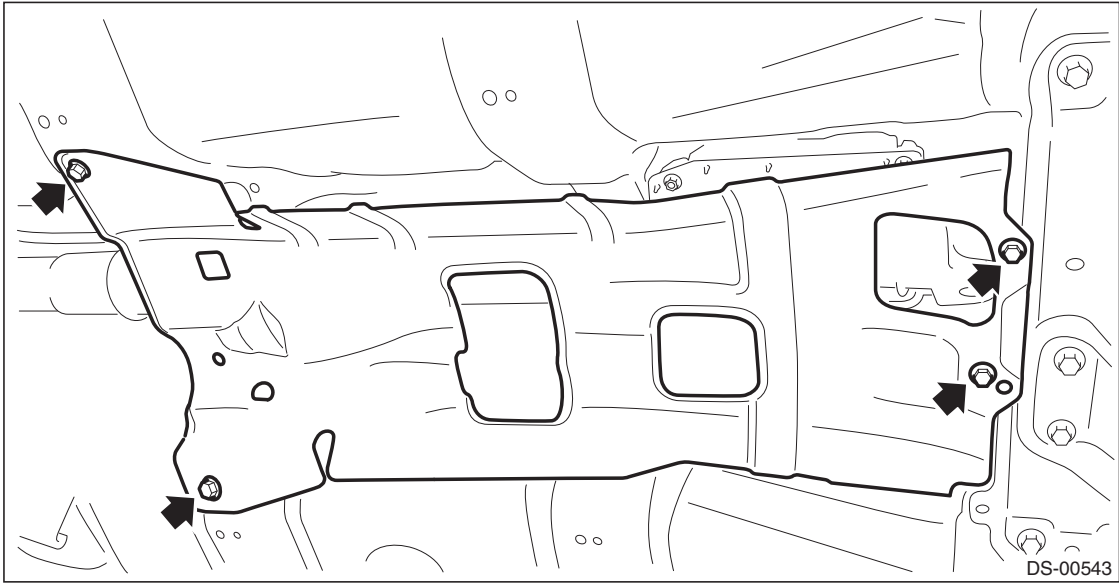
DS-00556

- 1) Shift the select lever or gear shift lever to neutral.
 - 2) Release the parking brake.
 - 3) Lift up the vehicle.
 - 4) Remove the exhaust pipe and muffler.
- Center exhaust pipe:
 - Turbo model: <Ref. to EX(H4DOTC)-30, REMOVAL, Center Exhaust Pipe.>
 - Non-turbo model: <Ref. to EX(H4DO)-14, REMOVAL, Center Exhaust Pipe.>
 - Rear exhaust pipe:
 - Turbo model: <Ref. to EX(H4DOTC)-45, REMOVAL, Rear Exhaust Pipe.>
 - Non-turbo model: <Ref. to EX(H4DO)-18, REMOVAL, Rear Exhaust Pipe.>
 - Muffler:
 - Turbo model: <Ref. to EX(H4DOTC)-48, REMOVAL, Muffler.>
 - Non-turbo model: <Ref. to EX(H4DO)-21, REMOVAL, Muffler.>

Propeller Shaft

DRIVE SHAFT SYSTEM

5) Remove the bolts to remove the front heat shield cover.

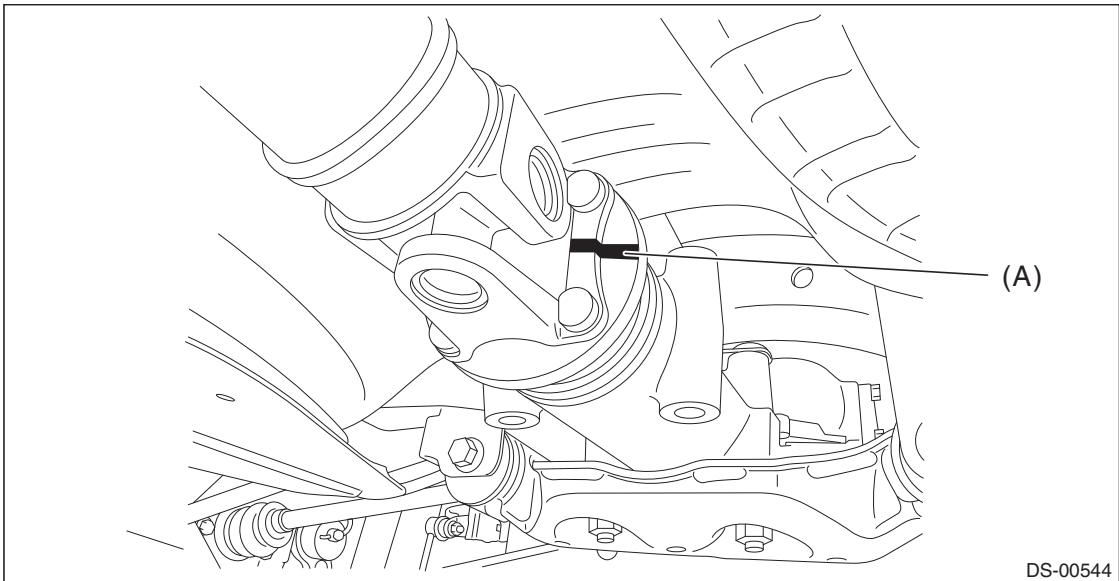


6) Remove the propeller shaft assembly.

CAUTION:

Do not disassemble the propeller shaft.

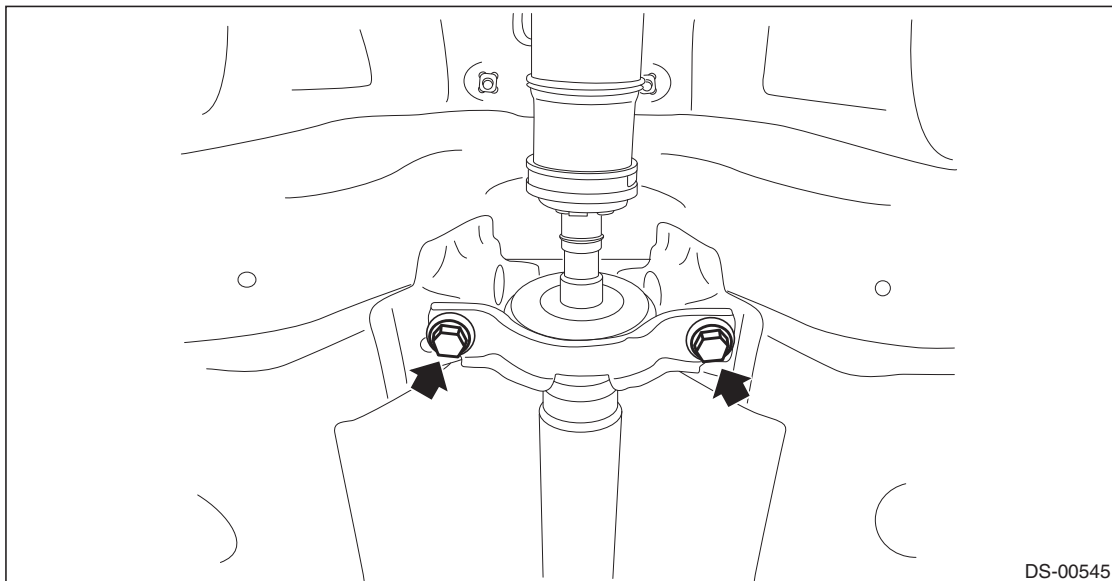
- (1) Place alignment marks (A) on the flange yoke and rear differential.
- (2) Remove four bolts and nuts holding the propeller shaft to the rear differential.



Propeller Shaft

DRIVE SHAFT SYSTEM

(3) Remove the center bearing.



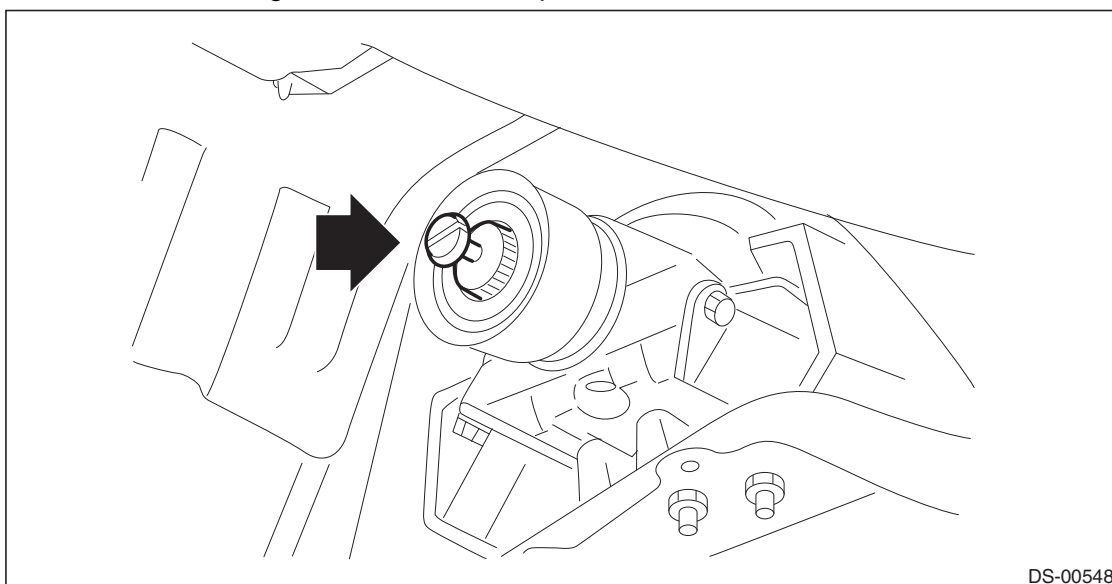
(4) Remove the propeller shaft from transmission.

CAUTION:

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

NOTE:

- Use a container to catch ATF or oil flowing from propeller shaft.
- To prevent ATF from leaking, install extension cap etc. to the transmission.



B: INSTALLATION

1) Before installation, check the following items, and replace the propeller shaft assembly as necessary.

- Dents or cracks on the tube surface
- Splines for deformation or abnormal wear
- Unsmooth joint operation or abnormal noise
- Center bearing for free play, noise or non-smooth operation.
- Oil seals for abnormal wear or damage
- Damaged center bearing

Propeller Shaft

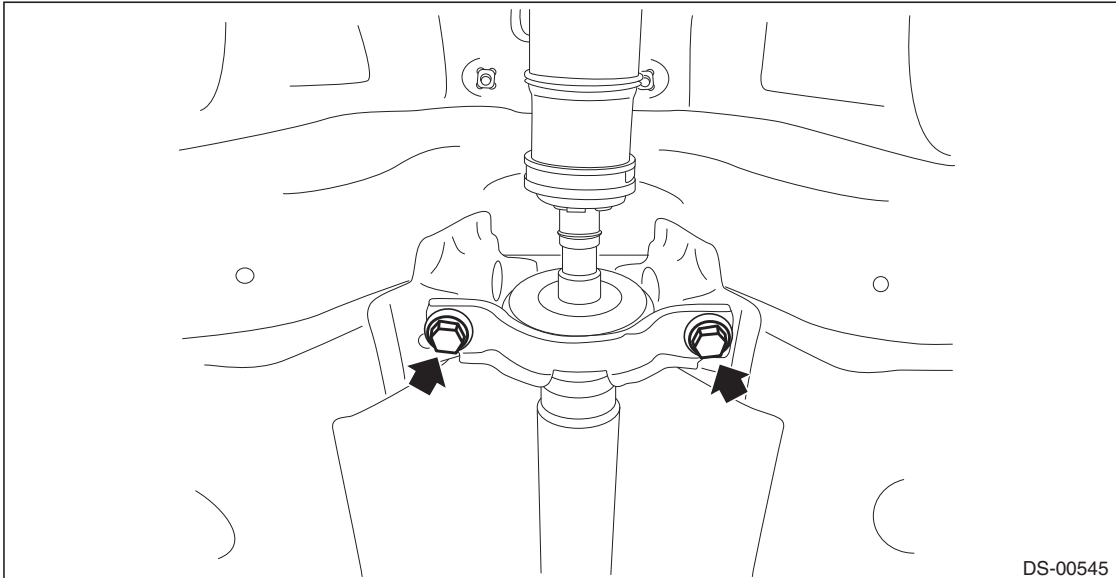
DRIVE SHAFT SYSTEM

2) Apply fluid or gear oil to the oil seal lip and the propeller shaft.

Recommended fluid/gear oil:

Refer to the fluids in the recommended materials section. <Ref. to RM-4, FLUID, RECOMMENDED MATERIALS, Recommended Materials.>

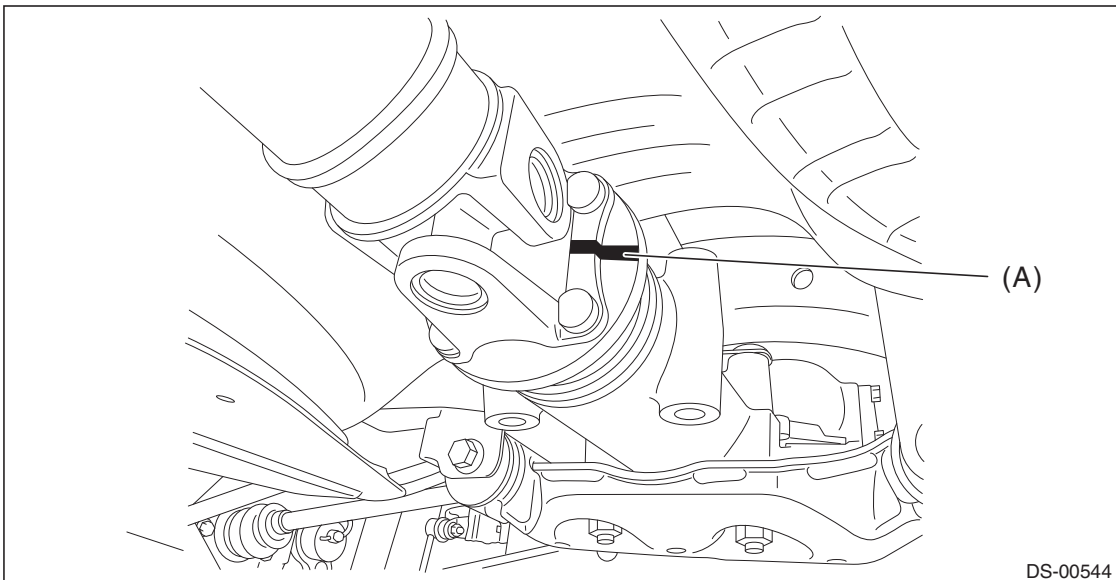
3) Insert the sleeve yoke into the transmission and attach center bearing to body.



Tightening torque:

52 N·m (5.30 kgf-m, 38.4 ft-lb)

4) Align the alignment marks (A), and connect the yoke flange and rear differential.



Tightening torque:

31 N·m (3.16 kgf-m, 22.9 ft-lb)

5) Check the propeller shaft with the propeller shaft installed to the vehicle. <Ref. to DS-15, INSPECTION, Propeller Shaft.>

6) Install the heat shield cover.

Tightening torque:

18 N·m (1.84 kgf-m, 13.3 ft-lb)

7) Install the center exhaust pipe and rear exhaust pipe.

8) Lower the vehicle.

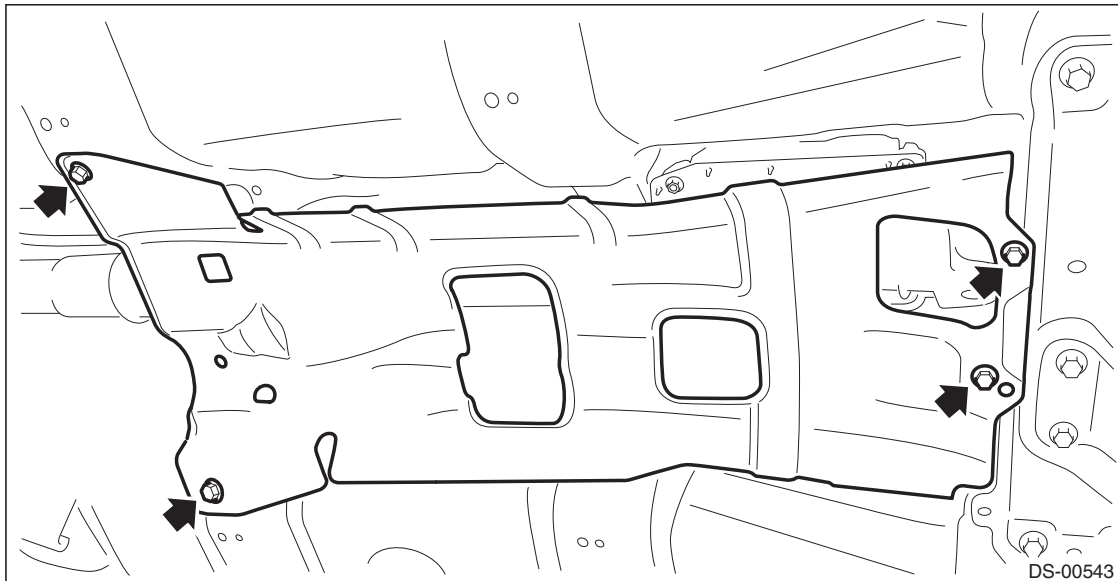
C: INSPECTION

Check the propeller shaft with the propeller shaft installed to the vehicle.

1) Remove the center exhaust pipe, rear exhaust pipe, and muffler.

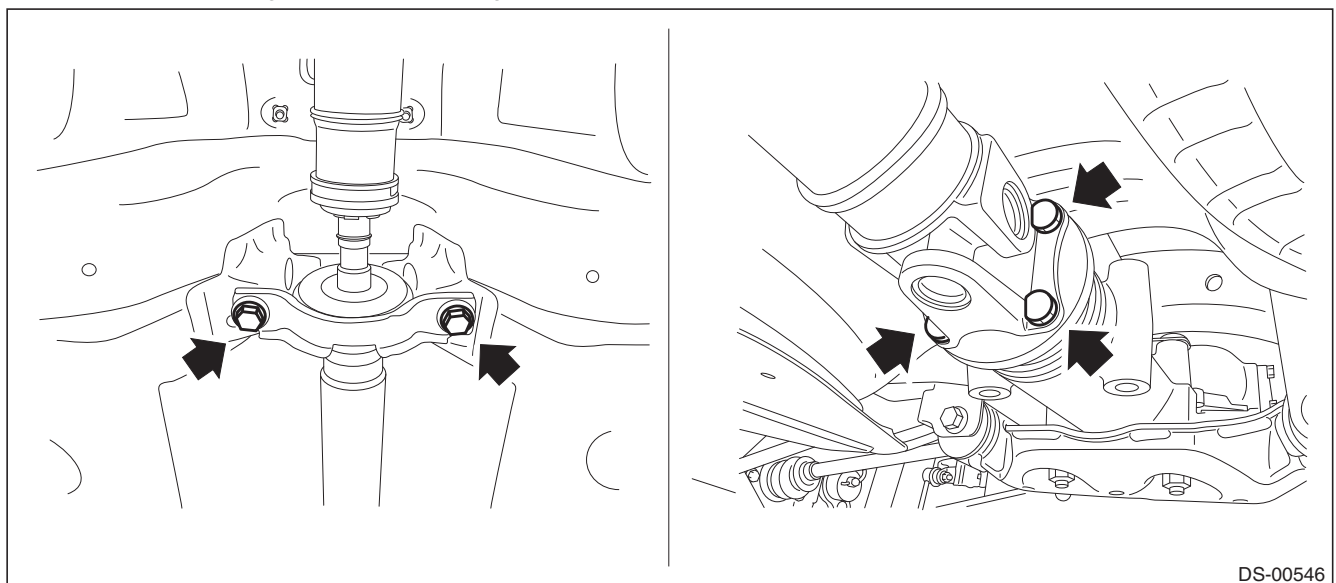
- Center exhaust pipe:
 - Turbo model: <Ref. to EX(H4DOTC)-30, REMOVAL, Center Exhaust Pipe.>
 - Non-turbo model: <Ref. to EX(H4DO)-14, REMOVAL, Center Exhaust Pipe.>
- Rear exhaust pipe:
 - Turbo model: <Ref. to EX(H4DOTC)-45, REMOVAL, Rear Exhaust Pipe.>
 - Non-turbo model: <Ref. to EX(H4DO)-18, REMOVAL, Rear Exhaust Pipe.>
- Muffler:
 - Turbo model: <Ref. to EX(H4DOTC)-48, REMOVAL, Muffler.>
 - Non-turbo model: <Ref. to EX(H4DO)-21, REMOVAL, Muffler.>

2) Remove the bolts to remove the front heat shield cover.



3) Check the propeller shaft mounting bolt for looseness.

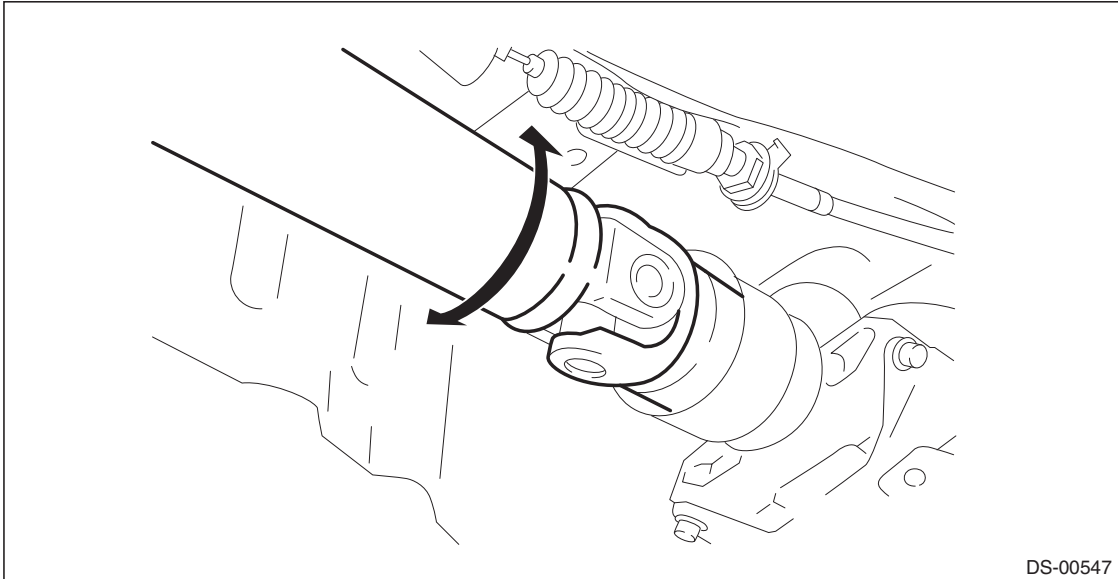
- (1) Yoke flange mounting bolts which connect to the rear differential
- (2) Center bearing bracket mounting bolts



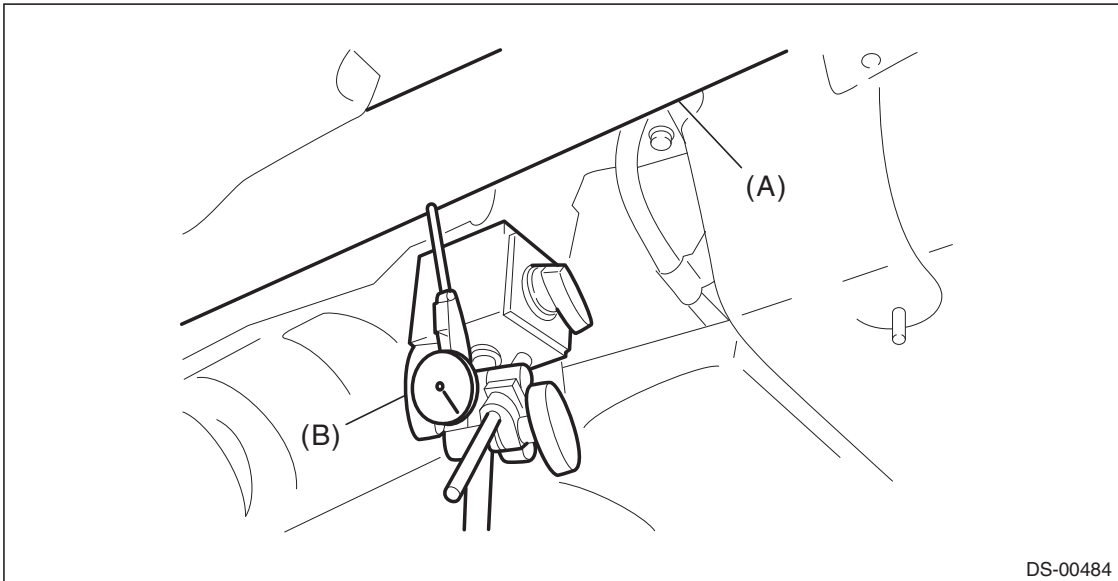
Propeller Shaft

DRIVE SHAFT SYSTEM

- 4) Check the spline and bearing for the propeller shaft.
- (1) Turn the propeller shaft by hand to check if abnormal free play exists at splines.
 - (2) Also move yokes to check if abnormal free play exists at spiders and bearings.



- 5) Measure the deflection of the propeller shaft.
- (1) Set the dial gauge (B) with its indicator stem at the center of the propeller shaft (A).
 - (2) Turn the propeller shaft (A) slowly by hands to check for runout of the propeller shaft.



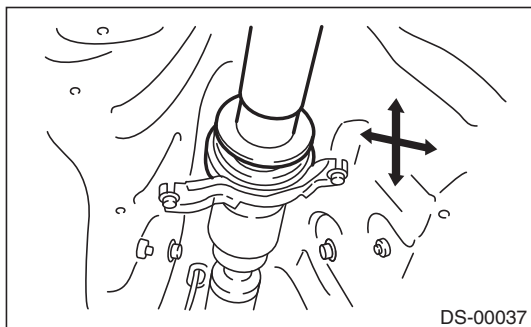
Runout:
Limit: 0.6 mm (0.024 in)

Propeller Shaft

DRIVE SHAFT SYSTEM

6) Check the center bearing for free play.

Move the propeller shaft near the center bearing up, down, left, right by hand, to check for any abnormal free play of the bearings.



7) Replace the propeller shaft assembly if faulty is found in the inspection.



Front Axle

DRIVE SHAFT SYSTEM

3. Front Axle

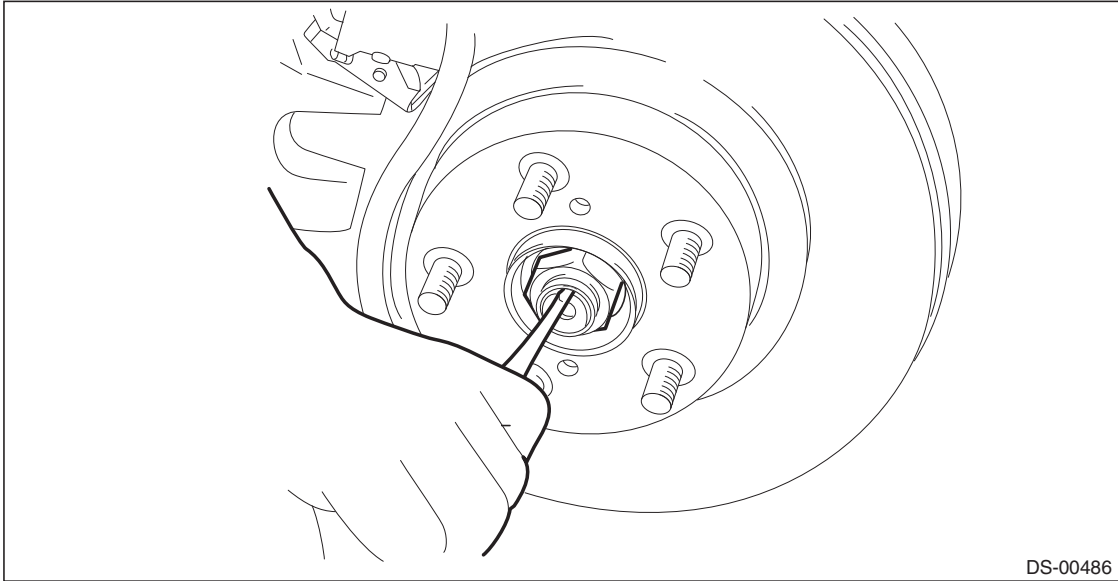
A: REMOVAL

- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the nut - axle.

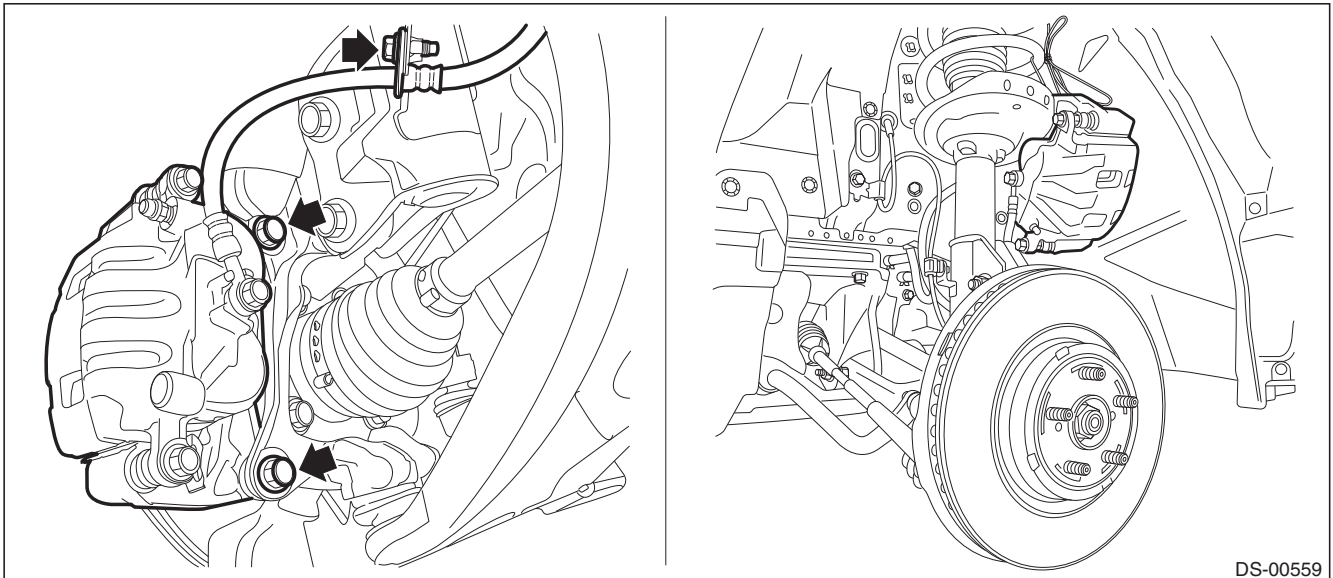
CAUTION:

Do not loosen the nut - axle while the front axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.



- 3) Remove the caliper body assembly from the housing assembly - front axle.
 - (1) Remove the mounting bolts, and then remove the caliper body assembly.
 - (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



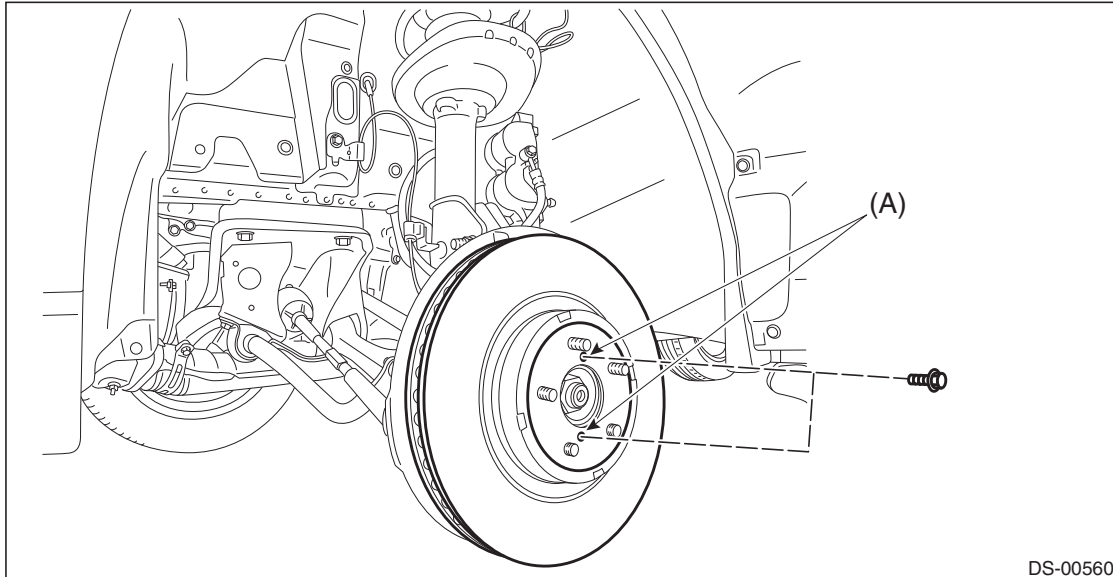
Front Axle

DRIVE SHAFT SYSTEM

4) Remove the disc rotor.

NOTE:

When the disc rotor is difficult to be removed from the hub unit COMPL - front axle, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



5) Disconnect the tie-rod end.

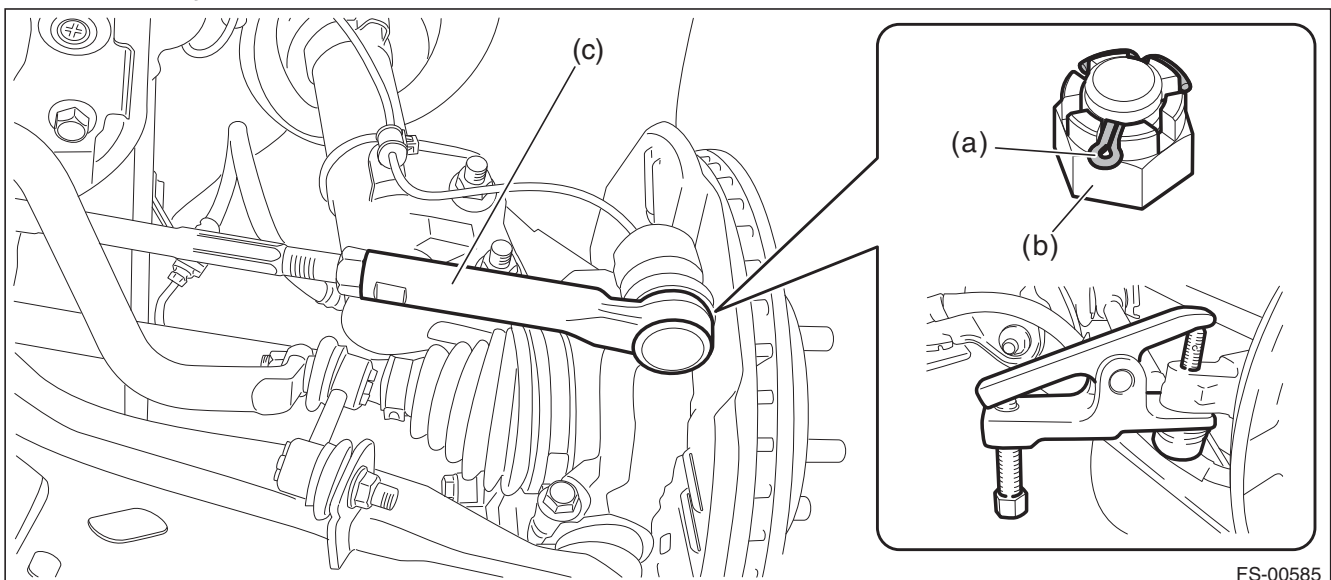
- (1) Pull out the cotter pin (a).
- (2) Remove the castle nut (b).
- (3) Using a tie-rod ball joint puller, remove the tie-rod end (c).

CAUTION:

Be careful not to damage the boot of the joint.

Preparation tool:

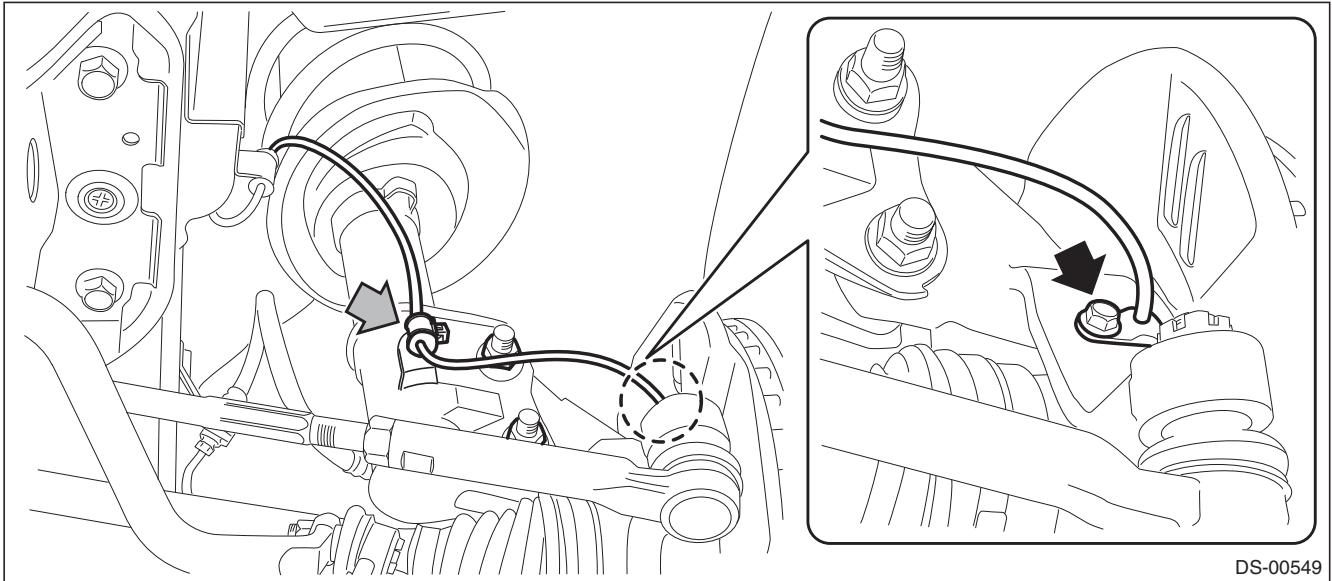
Tie-rod ball joint puller



Front Axle

DRIVE SHAFT SYSTEM

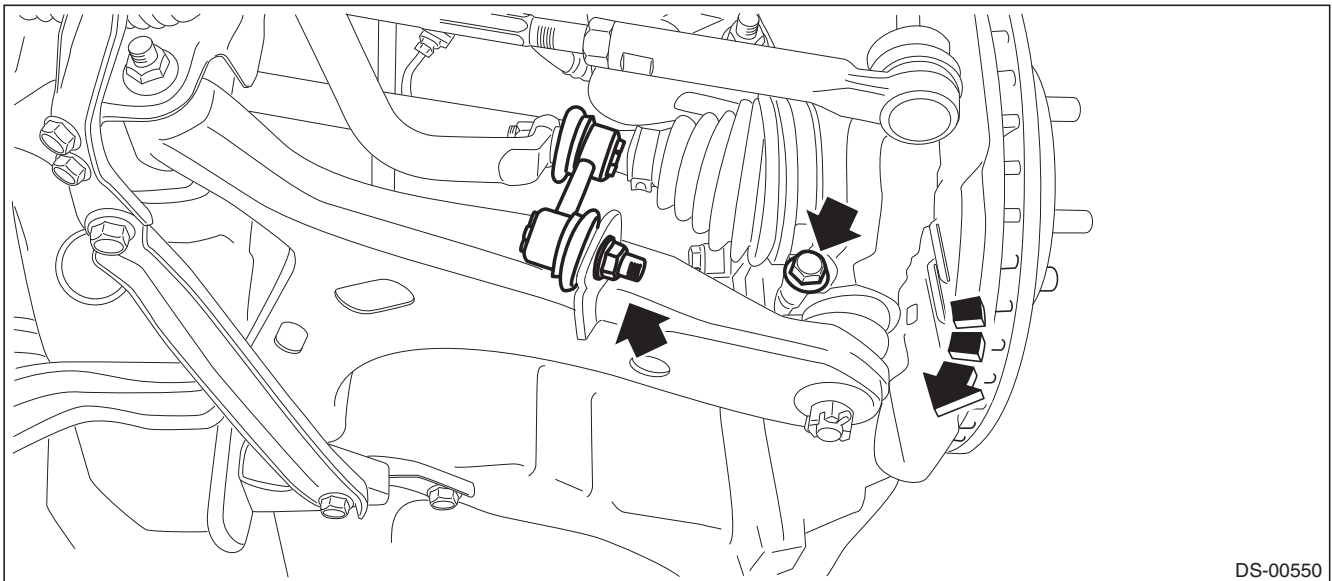
6) Remove the bolts, and remove the front ABS wheel speed sensor.



7) Remove the stabilizer link and ball joint.

CAUTION:

Be careful not to damage the boot of the joint.



8) Using a crowbar, remove the front axle shaft from the transmission.

CAUTION:

Be careful not to allow the bar to damage holder area.

Front Axle

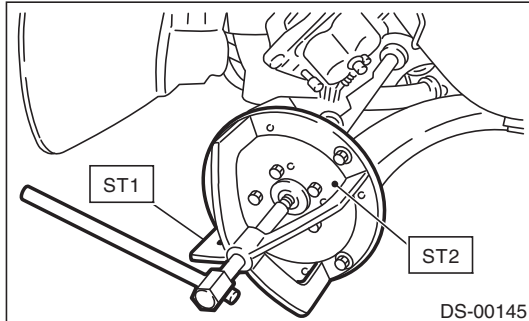
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9) Remove the front axle shaft assembly from the hub unit COMPL - front axle.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



NOTE:

If it is hard to remove, use the ST.

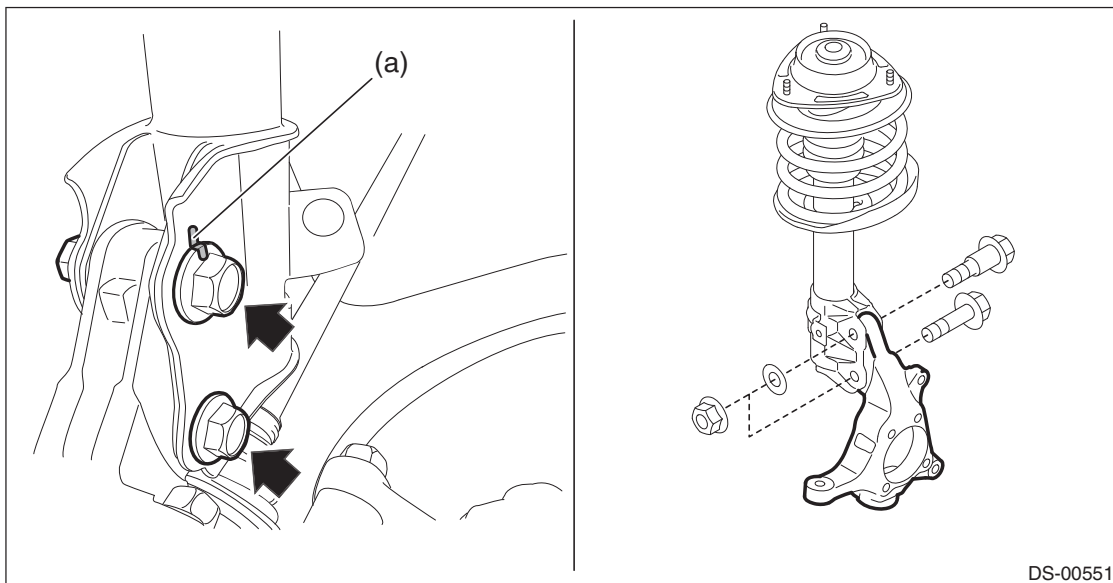
10) Remove the housing assembly - front axle.

(1) Place an alignment mark (a) on the adjusting bolt and the strut.

(2) Remove the adjusting bolts and flange bolts for the strut assembly, and then remove the housing assembly - front axle.

CAUTION:

- While holding the head of the adjusting bolt, loosen the flange nut.
- Be careful of the weight of the housing assembly - front axle.
- Be careful not to damage the spline portion of the axle shaft.



11) For removal of the hub unit COMPL - front axle, refer to "Front Hub Unit Bearing". <Ref. to DS-26, REMOVAL, Front Hub Unit Bearing.>

Front Axle

DRIVE SHAFT SYSTEM

B: INSTALLATION

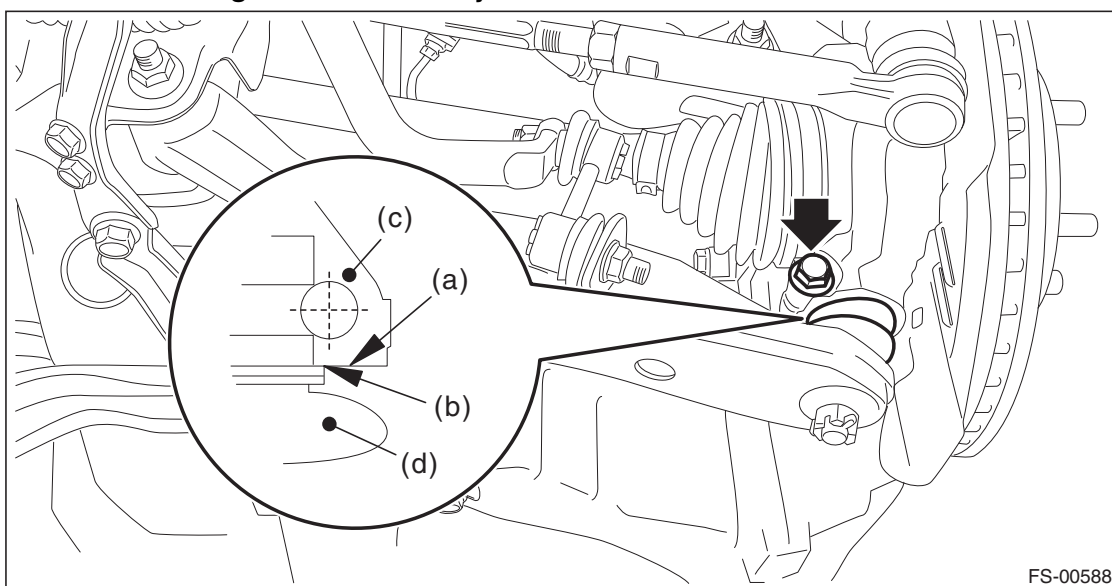
1) Install the front axle shaft assembly.

CAUTION:

- Do not tap the axle shaft using a hammer when installing axle shaft assembly.
 - Use new nut - axle.
 - (1) Insert the axle shaft assembly into the hub spline, and pull in the axle shaft assembly into specified position.
 - (2) Temporarily tighten the nut - axle.
- 2) Install the ball joint assembly to the housing assembly - front axle.

CAUTION:

- Before tightening, make sure the bottom surface of the housing assembly - front axle and the stepped section of ball joint are in contact.
- Be careful not to damage the boot of the joint.



- (a) Bottom surface of housing ASSY - front axle (c) Housing ASSY - front axle (d) Ball joint ASSY
(b) Raised section of ball joint

Tightening torque:

50 N·m (5.10 kgf-m, 36.9 ft-lb)

3) Install the front ABS wheel speed sensor.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

4) Install the disc rotor.

5) Install the caliper body assembly.

Tightening torque:

80 N·m (8.16 kgf-m, 59.0 ft-lb)

6) Install the stabilizer link assembly.

Tightening torque:

60 N·m (6.12 kgf-m, 44.3 ft-lb)

Front Axle

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- 7) Connect the tie-rod ends.
- (1) Connect the tie-rod end (c) to the housing assembly - front axle.
 - (2) Tighten the castle nuts (b) to the specified torque.

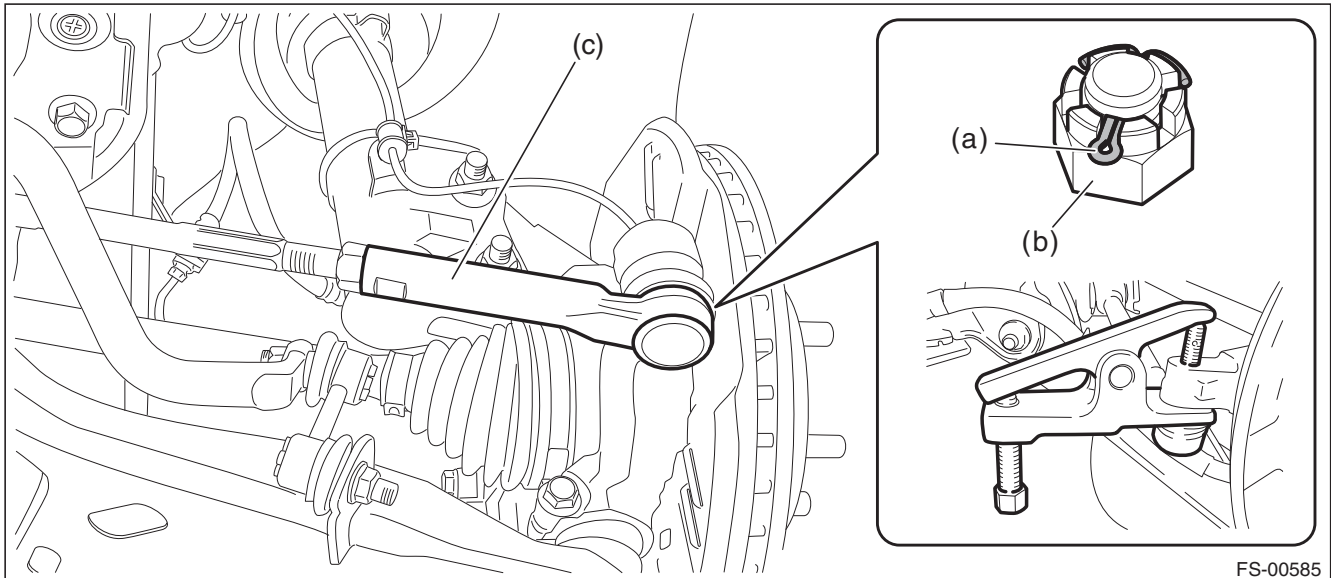
CAUTION:

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

Tightening torque:

27 N·m (2.75 kgf-m, 19.9 ft-lb)

- (3) Tighten the castle nut (b) within the range of 60° so that the cotter pin (a) hole and cutout portion of the castle nut (b) are aligned.
- (4) Insert the cotter pin (a), and bend the tip of the pin to fix it.



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

CAUTION:

Do not load the front axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

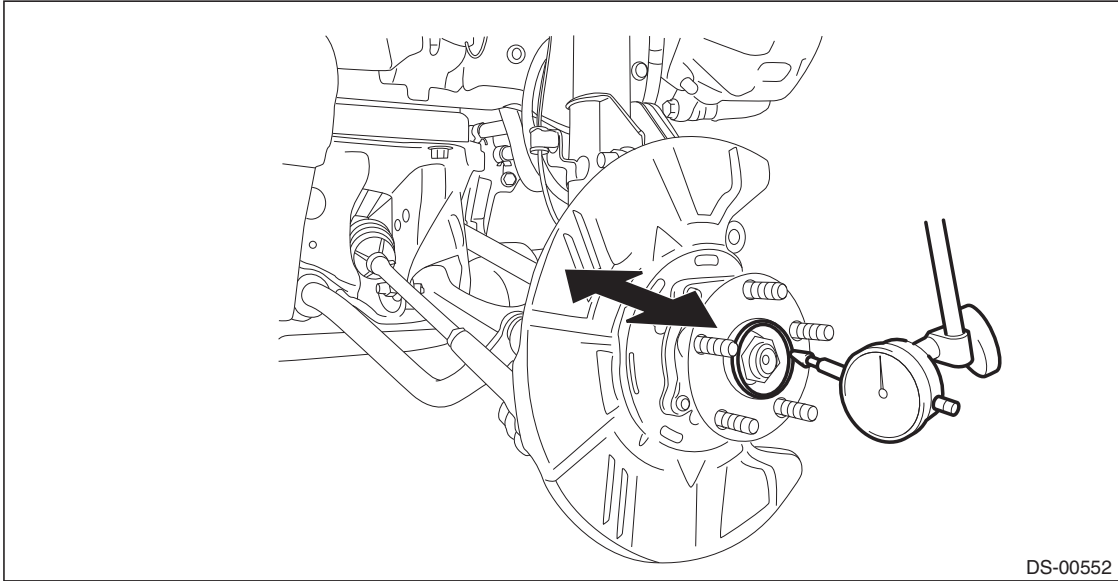
Tightening torque:

220 N·m (22.43 kgf-m, 162.3 ft-lb)

Front Axle

DRIVE SHAFT SYSTEM

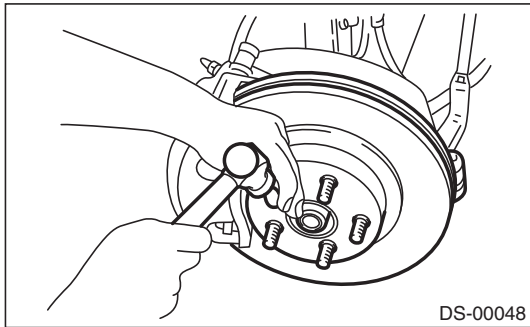
9) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL - front axle if the play exceeds the limit.



Service limit:

Maximum: 0.05 mm (0.0020 in)

10) After tightening the nut - axle, lock it securely.

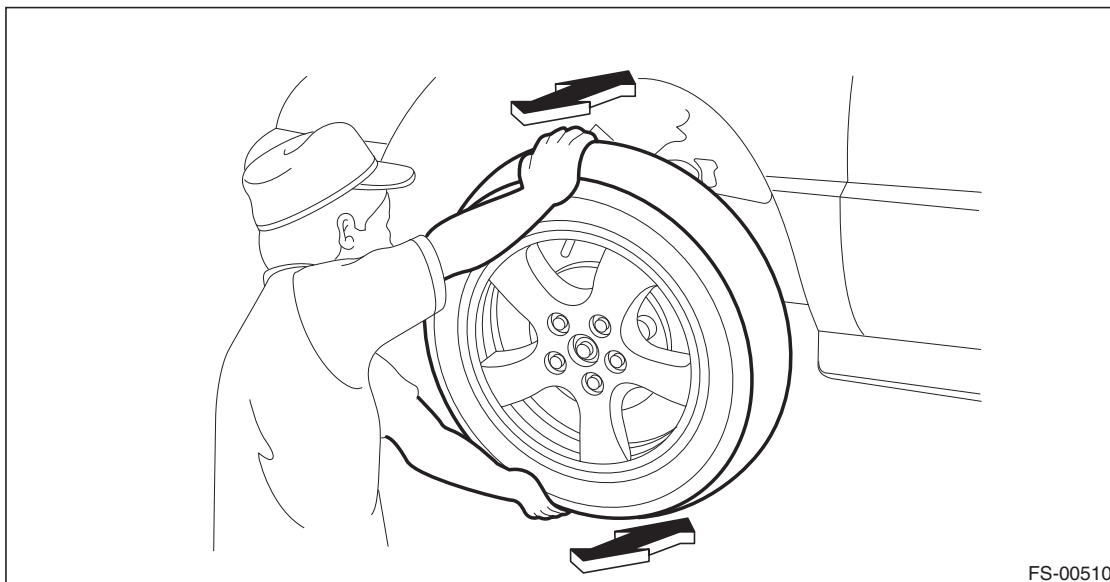


11) Install the front wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no play by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.



FS-00510

- **Play exists** → Check the hub unit COMPL - front axle. <Ref. to DS-33, INSPECTION, Front Hub Unit Bearing.>
3. Check that there is no play by moving the upper and lower portions of front tire in an axial direction with the brake pedal depressed.
- **Play exists** → Replace the ball joint assembly. <Ref. to FS-31, REMOVAL, Front Ball Joint.>
- 12) Inspect the wheel alignment and adjust if necessary.
- Inspection: <Ref. to FS-7, INSPECTION, Wheel Alignment.>
 - Adjustment: <Ref. to FS-11, ADJUSTMENT, Wheel Alignment.>

CAUTION:

When the wheel alignment has been adjusted, perform “VDC sensor midpoint setting mode.”.

13) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-16, PROCEDURE, Auto Headlight Beam Leveler System.>

Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

4. Front Hub Unit Bearing

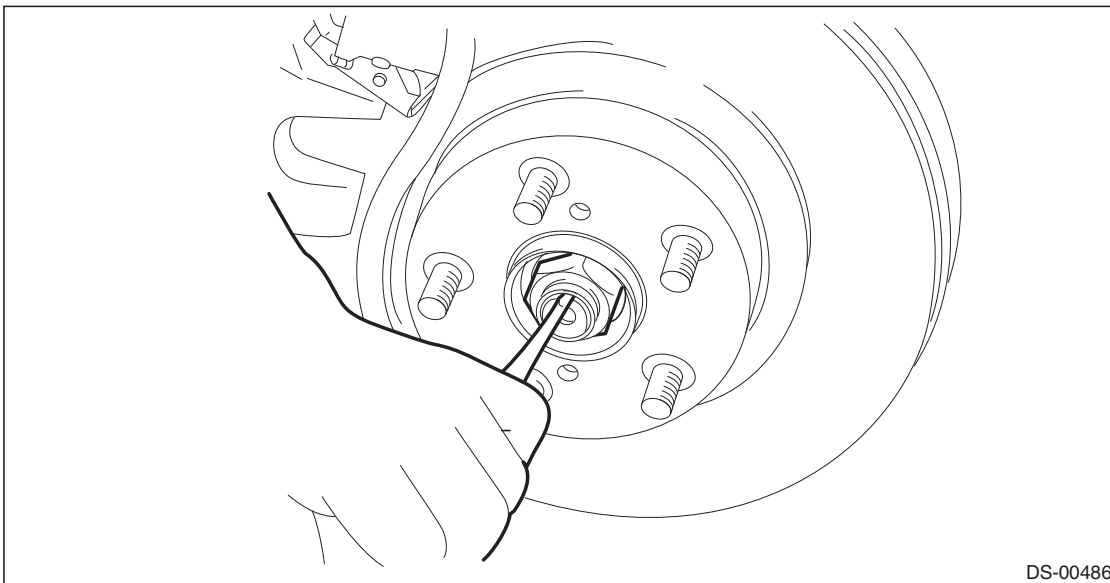
A: REMOVAL

- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the nut - axle.

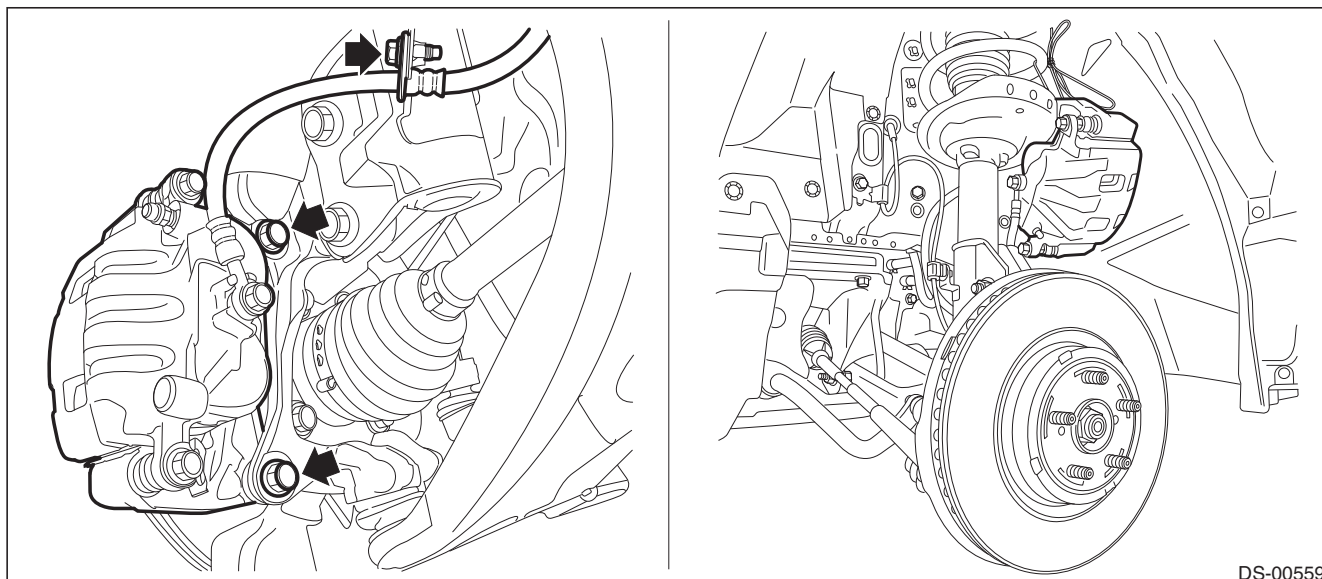
CAUTION:

Do not loosen the nut - axle while the front axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.



- 3) Remove the caliper body assembly from the housing assembly - front axle.
 - (1) Remove the mounting bolts, and then remove the caliper body assembly.
 - (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



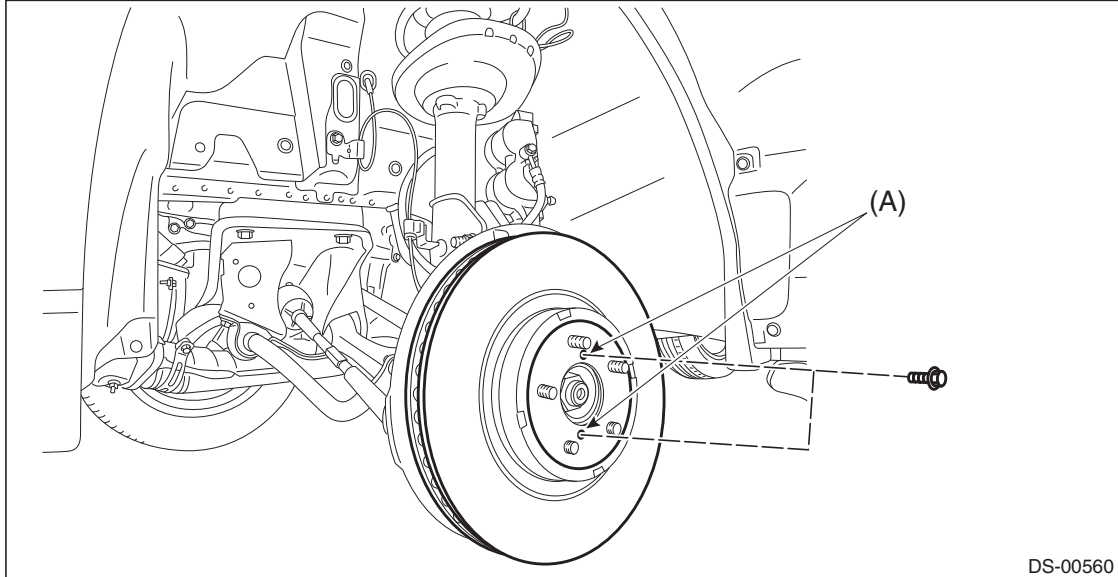
Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

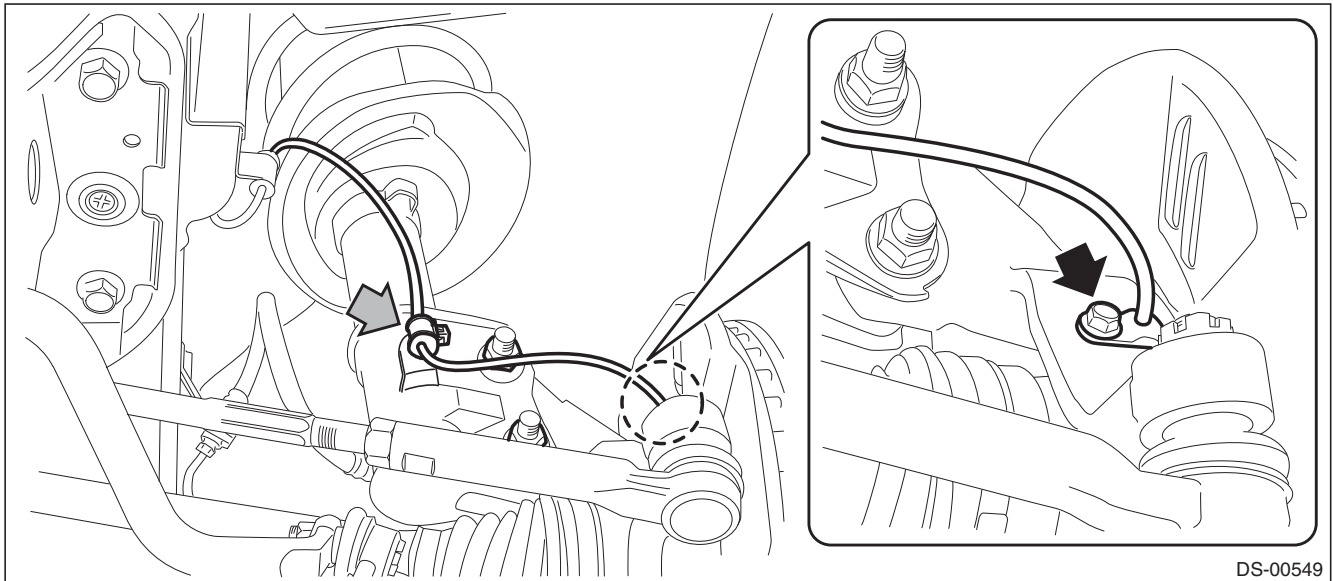
4) Remove the disc rotor.

NOTE:

When the disc rotor is difficult to be removed from the hub unit COMPL - front axle, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



5) Remove the bolts, and remove the front ABS wheel speed sensor.



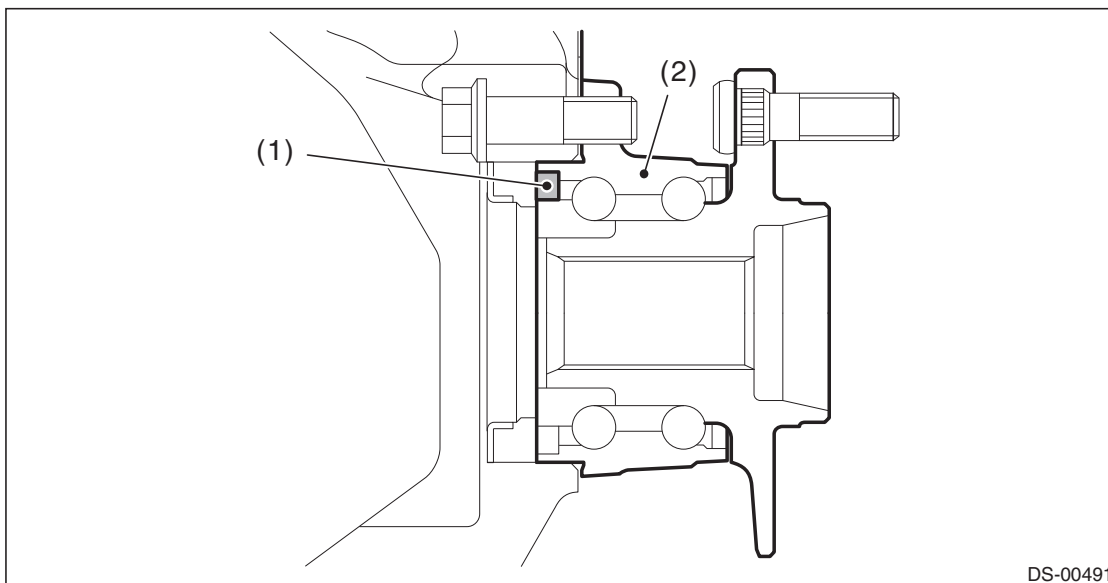
Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

6) Remove the bolts from the housing assembly - front axle, and then remove the hub unit COMPL - front axle.

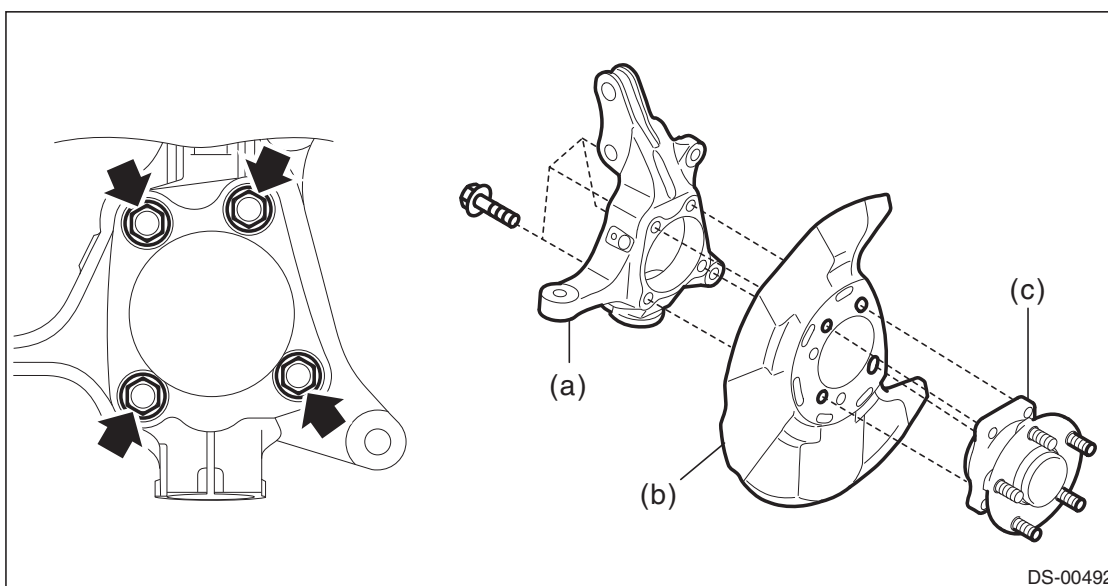
CAUTION:

- Do not get closer the tool which charged magnetism to magnetic encoder.
- Be careful not to damage the magnetic encoder.



(1) Magnetic encoder

(2) Hub unit COMPL - front axle



(a) Housing ASSY - front axle

(b) Back plate - front brake

(c) Hub unit COMPL - front axle

NOTE:

If it is hard to remove, use the ST.

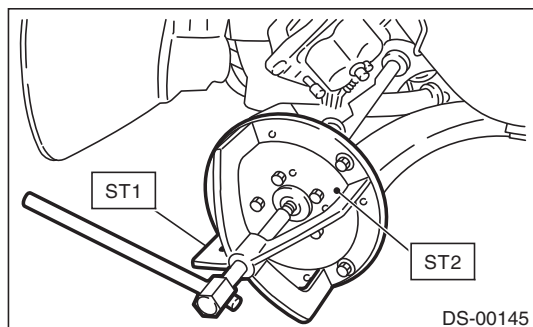
Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)

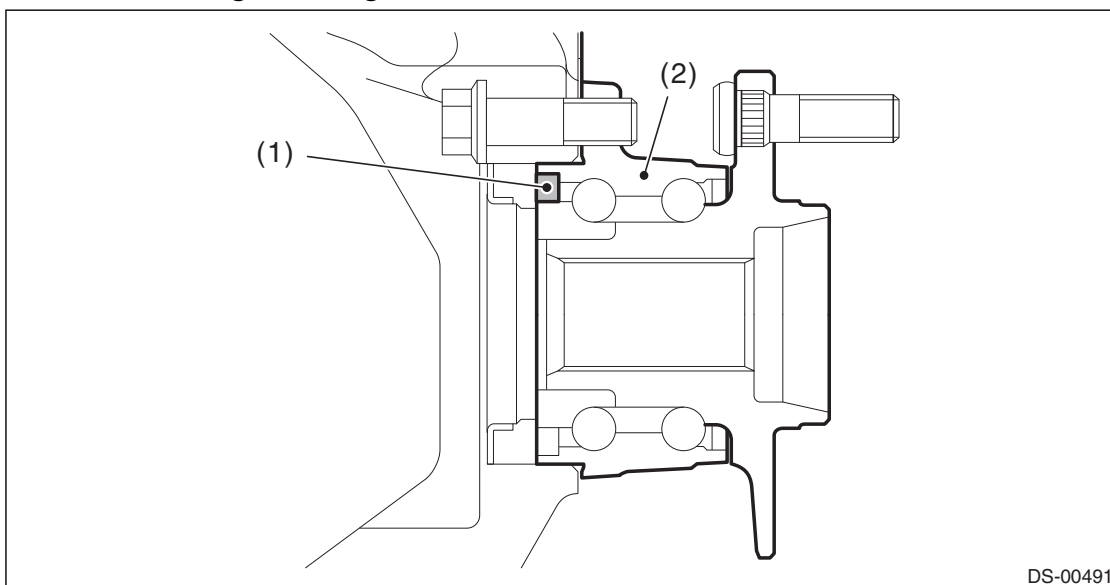


B: INSTALLATION

1) Place the back plate - front brake between the housing assembly - front axle and the hub unit COMPL - front axle, and tighten the bolt.

CAUTION:

- Do not get closer the tool which charged magnetism to magnetic encoder.
- Be careful not to damage the magnetic encoder.

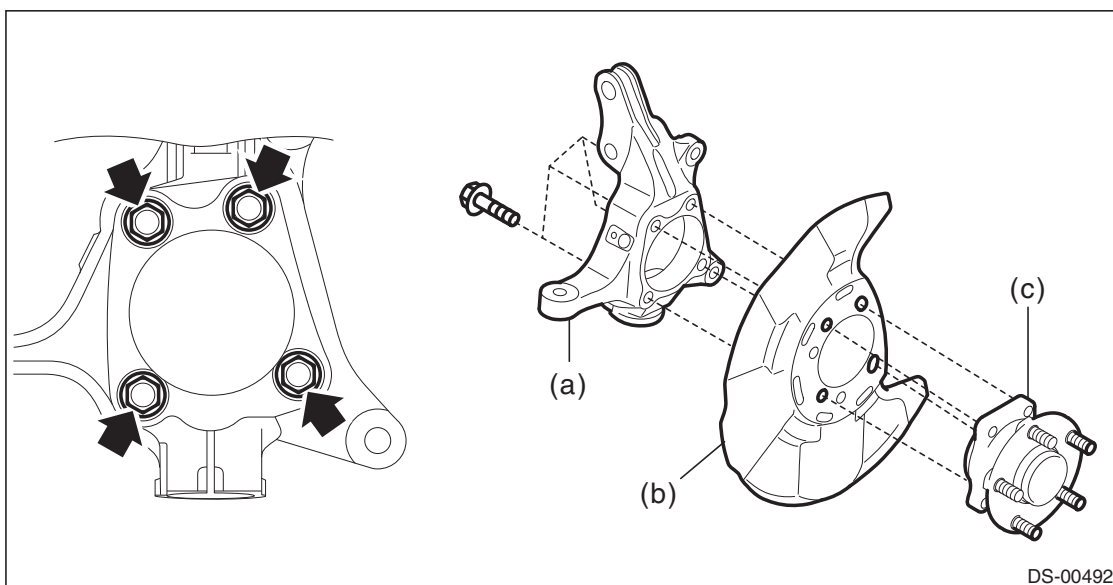


(1) Magnetic encoder

(2) Hub unit COMPL - front axle

Front Hub Unit Bearing

DRIVE SHAFT SYSTEM



(a) Housing ASSY - front axle

(b) Back plate - front brake

(c) Hub unit COMPL - front axle

Tightening torque:

65 N·m (6.63 kgf-m, 47.9 ft-lb)

2) Install the front axle shaft assembly.

CAUTION:

- Do not tap the axle shaft using a hammer when installing axle shaft assembly.
- Use new nut - axle.

(1) Insert the axle shaft assembly into the hub spline, and pull in the axle shaft assembly into specified position.

(2) Temporarily tighten the nut - axle.

3) Install the disc rotor to the hub unit COMPL - front axle.

4) Install the caliper body assembly to the housing assembly - front axle.

Tightening torque:

80 N·m (8.16 kgf-m, 59.0 ft-lb)

5) Install the front ABS wheel speed sensor.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

6) While depressing the brake pedal, tighten new nuts - axle to the specified torque.

CAUTION:

Do not load the front axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

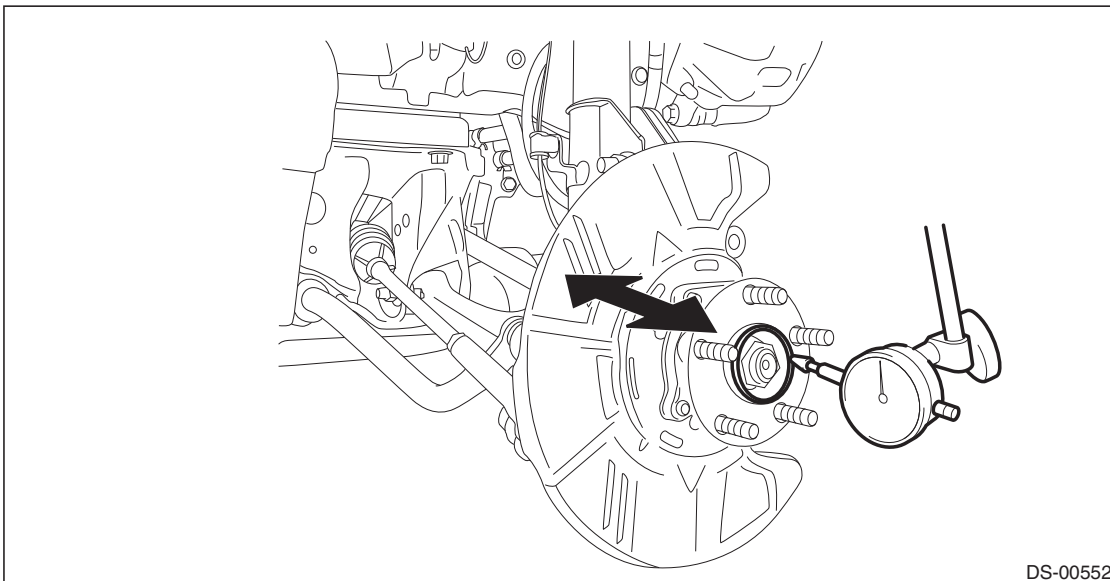
Tightening torque:

220 N·m (22.43 kgf-m, 162.3 ft-lb)

Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

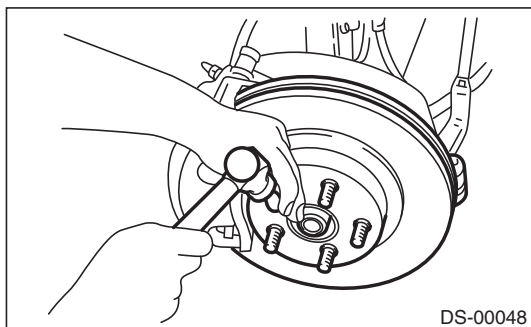
7) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL - front axle if the play exceeds the limit.



Service limit:

Maximum: 0.05 mm (0.0020 in)

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



9) Install the front wheels, and perform the following inspections.

Tightening torque:

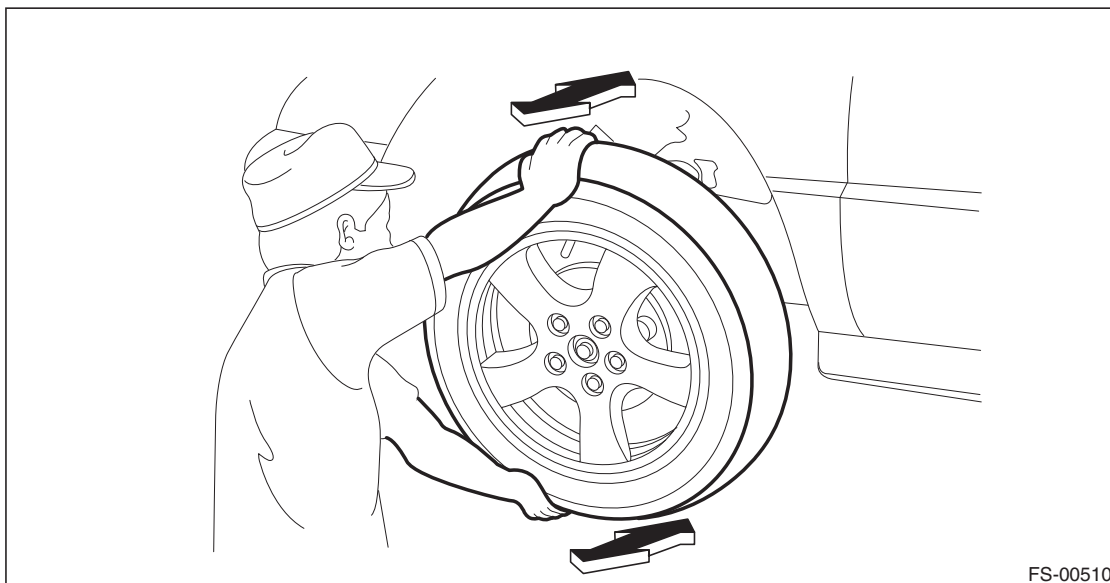
120 N·m (12.24 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.

Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

2. Check that there is no play by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.



- **Play exists** → Check the hub unit COMPL - front axle. <Ref. to DS-33, INSPECTION, Front Hub Unit Bearing.>

3. Check that there is no play by moving the upper and lower portions of front tire in an axial direction with the brake pedal depressed.

- **Play exists** → Replace the ball joint assembly. <Ref. to FS-31, REMOVAL, Front Ball Joint.>

C: DISASSEMBLY

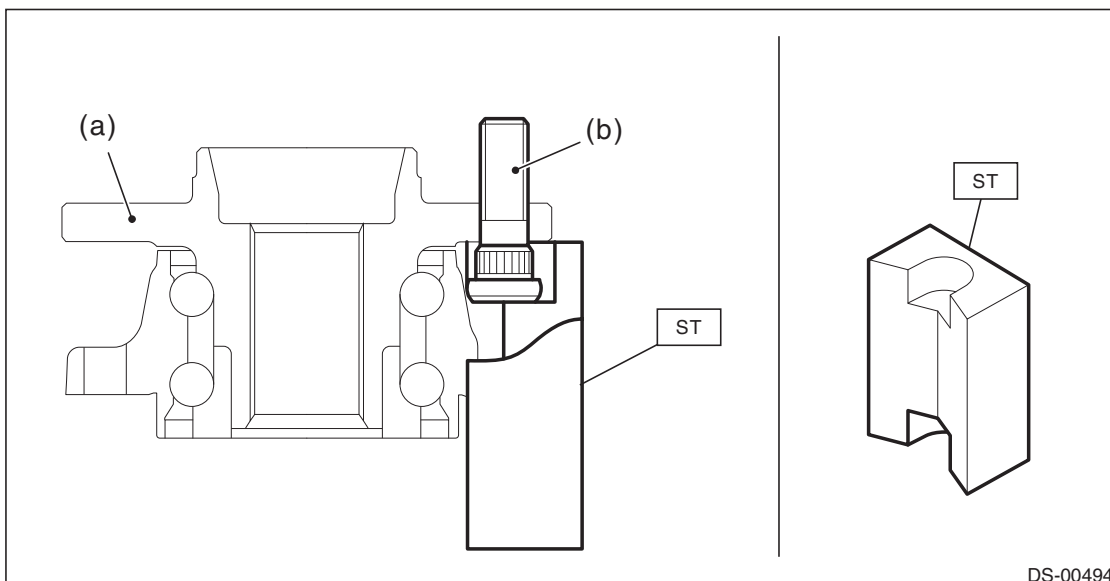
Using the ST or a hydraulic press, push out the bolt - hub (b) from the hub unit COMPL - front axle (a).

CAUTION:

- Be careful not to hammer the bolts - hub. This may deform the hub unit COMPL.
- Do not reuse the bolt - hub.

PREPARATION TOOL:

ST: HUB STAND (28399AG000)



NOTE:

Since the hub unit COMPL can not be disassembled, only bolts - hub can be removed.

Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

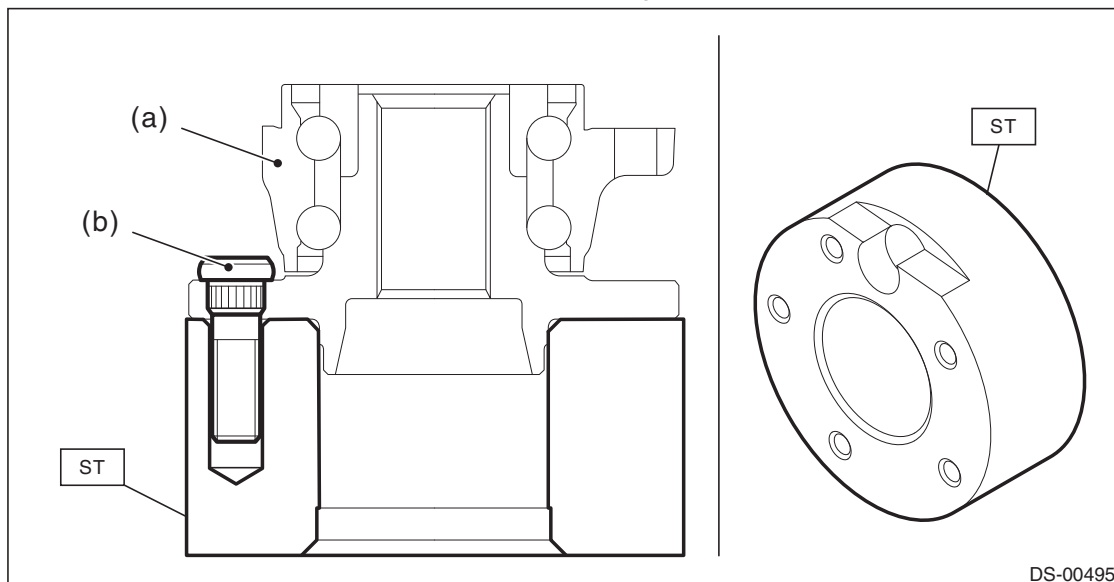
D: ASSEMBLY

1) Install the hub unit COMPL to the ST securely.

PREPARATION TOOL:

ST: HUB STAND (927080000)

2) Using a press, press new bolts - hub (b) until their seating surfaces contact the hub unit COMPL (a).



NOTE:

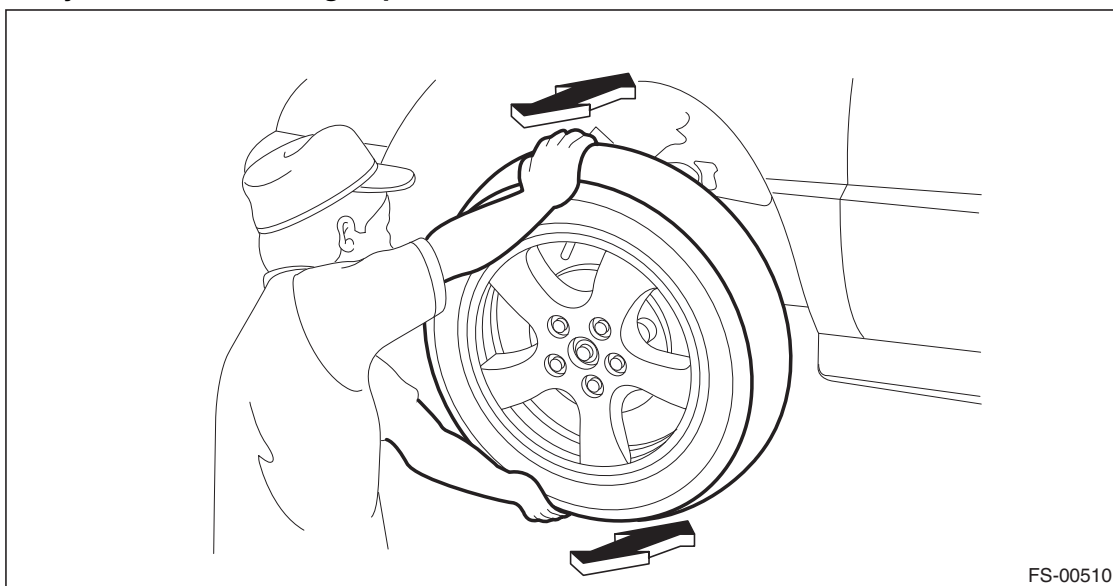
Use the 12 mm (0.47 in) dia. holes in the HUB STAND to prevent bolts from tilting.

E: INSPECTION

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

CAUTION:

If there is any fault in the bearing, replace the hub unit COMPL.



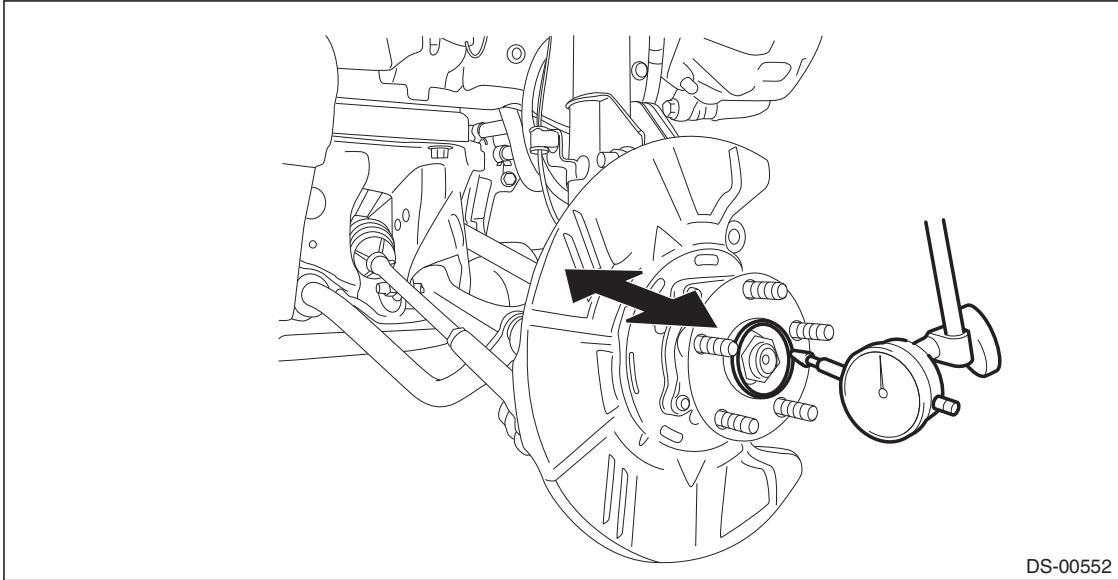
Front Hub Unit Bearing

DRIVE SHAFT SYSTEM

2) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL if the play exceeds the limit.

Service limit:

Maximum: 0.05 mm (0.0020 in)



5. Rear Axle

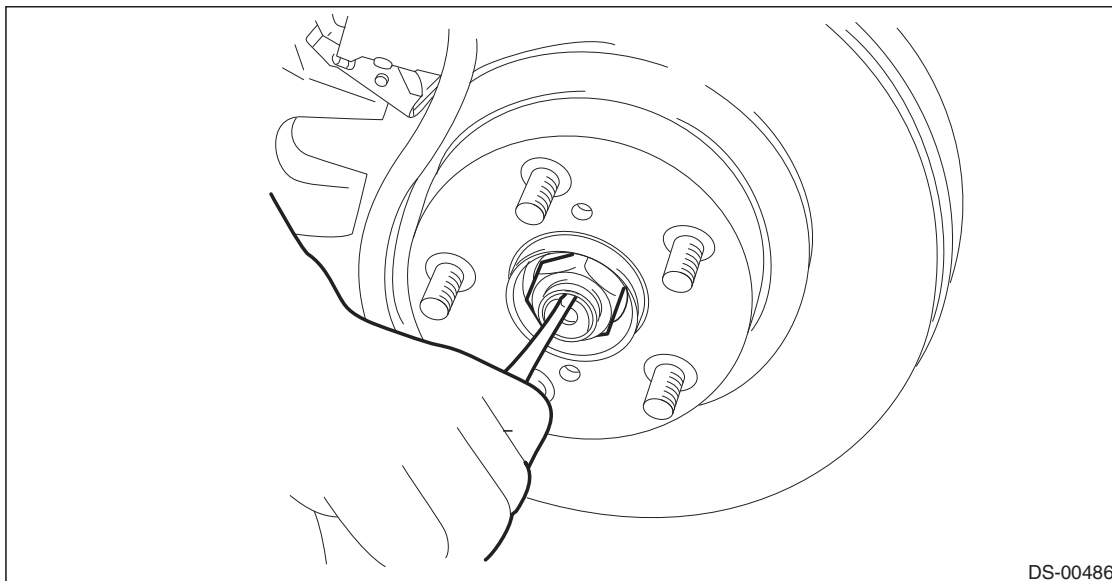
A: REMOVAL

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

CAUTION:

Do not loosen the nut - axle while the rear axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.



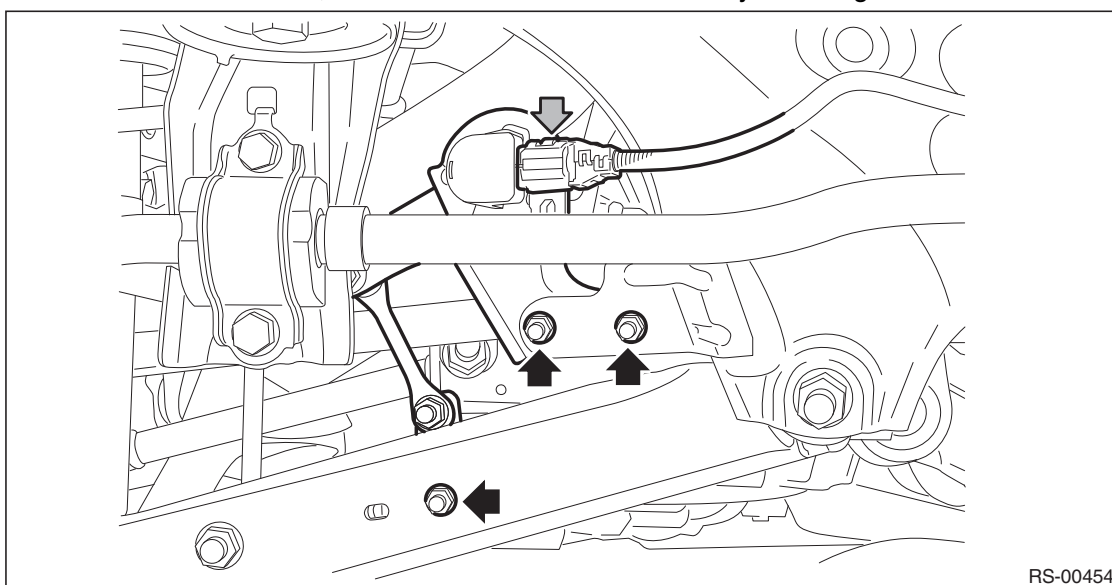
DS-00486

- 4) Disconnect the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

CAUTION:

Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

- (1) Disconnect the connector of the sensor assembly - headlight beam leveler.
- (2) Remove the bolts and nuts, and remove the sensor assembly - headlight beam leveler.

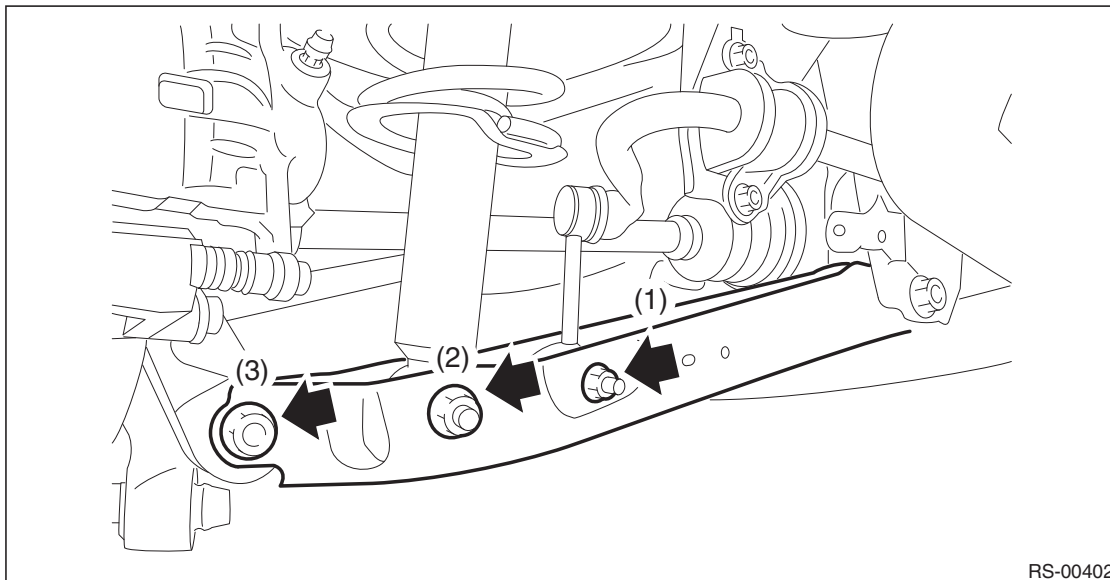


RS-00454

Rear Axle

DRIVE SHAFT SYSTEM

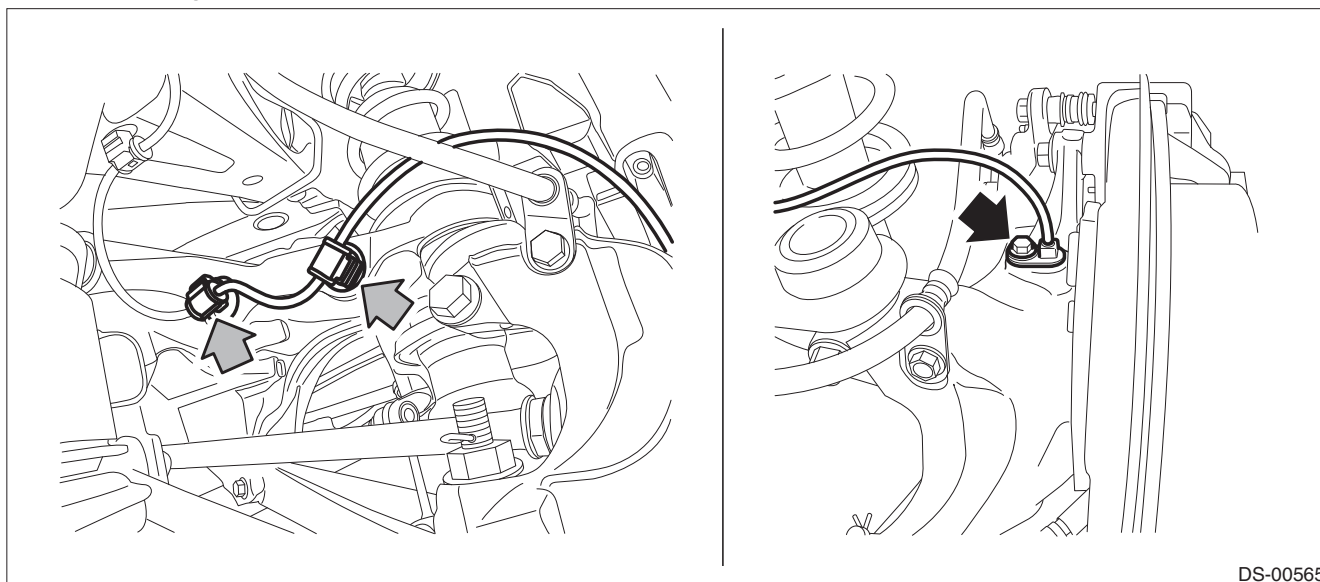
- 5) Remove the bolts and nuts, and lower the lateral link assembly - rear.
- (1) Remove the nut and disconnect the rear stabilizer link assembly. (Model with rear stabilizer)
 - (2) Remove the bolts at the bottom of rear strut assembly.
 - (3) Disconnect the housing assembly - rear axle from the lateral link assembly - rear.



- 6) Remove the caliper body assembly from the housing assembly - rear axle.
- (1) Remove the bolts, and remove the brake hose bracket and ABS wheel speed sensor.
 - (2) Remove the mounting bolts, and then remove the caliper body assembly.

CAUTION:

- Be careful not to damage the sensor.
- Do not apply excessive force to the sensor harness.

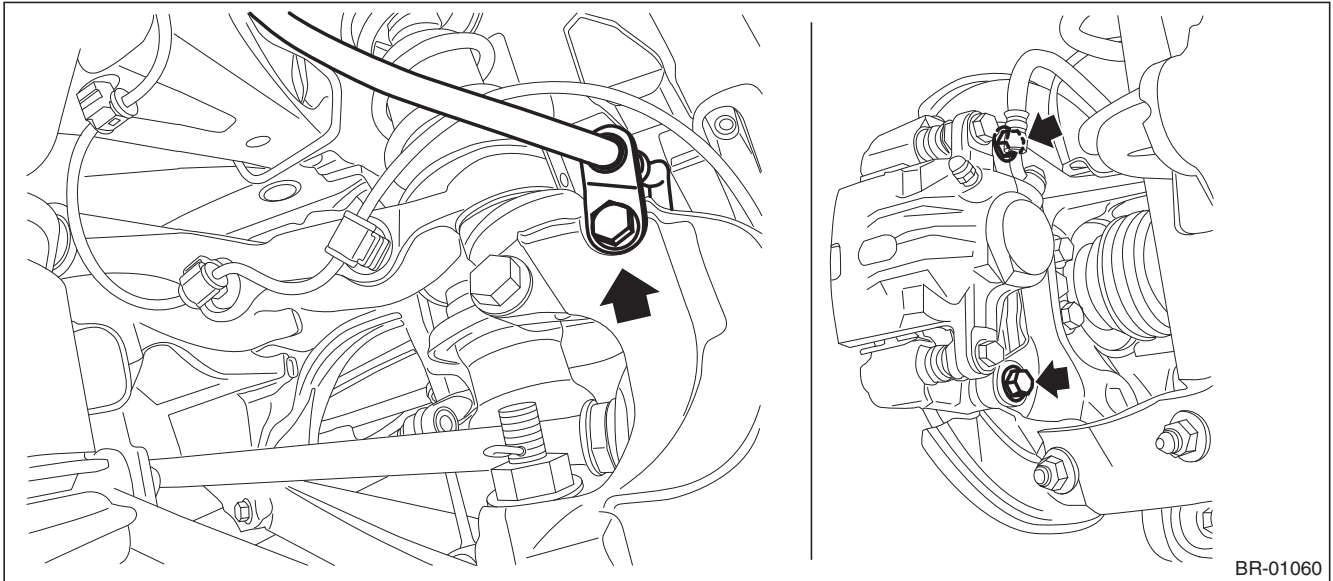


Rear Axle

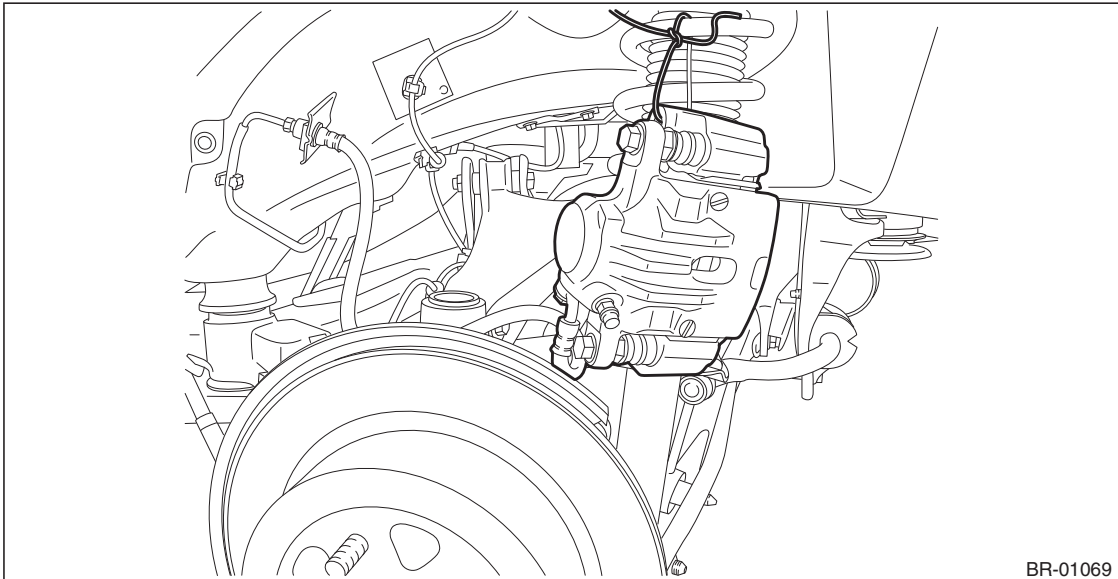
DRIVE SHAFT SYSTEM

7) Remove the caliper body assembly from the housing assembly - rear axle.

(1) Remove the bolts and then remove the brake hose bracket and caliper body assembly.



(2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



Rear Axle

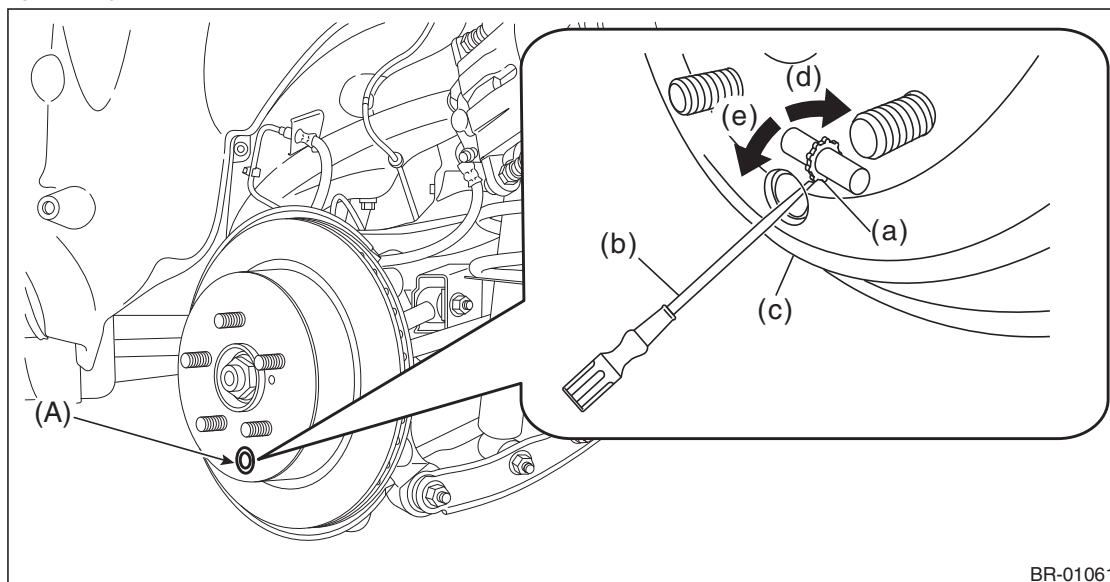
DRIVE SHAFT SYSTEM

8) Remove the rear disc rotor.

NOTE:

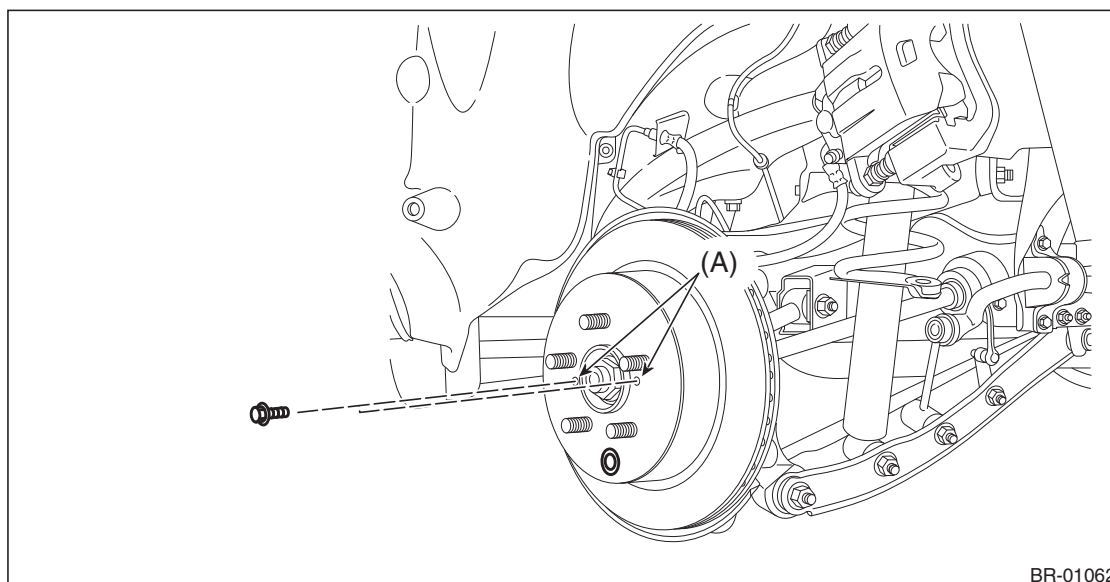
If the disc rotor is difficult to remove, proceed as follows.

1. Remove the adjusting hole cover (A) of the rear disc rotor.
2. Turn the adjuster assembly - rear brake using a flat tip screwdriver until the parking brake shoes get further enough away from the rear disc rotor surface.



- | | | |
|--------------------------------|---|--|
| (a) Adjuster ASSY - rear brake | (c) Disc rotor | (e) Shorten the adjuster ASSY - rear brake |
| (b) Flat tip screwdriver | (d) Extend the adjuster ASSY - rear brake | |

3. If the disc rotor is not removed after performing above step, screw in an 8 mm (0.31 in) bolt to the threaded part (A) of the disc rotor, and remove the disc rotor.



Rear Axle

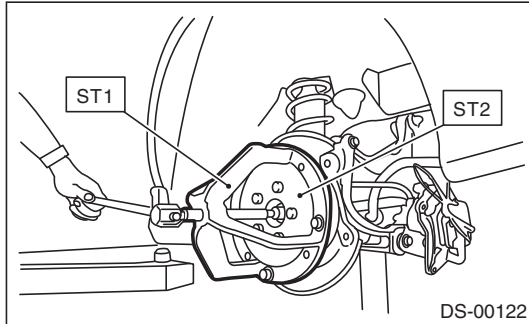
DRIVE SHAFT SYSTEM

9) Remove the rear axle shaft assembly from the hub unit COMPL - rear axle.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



NOTE:

If it is hard to remove, use the ST.

10) Remove the lateral link assembly - front.

(1) Remove the snap pin (a) and nut (b).

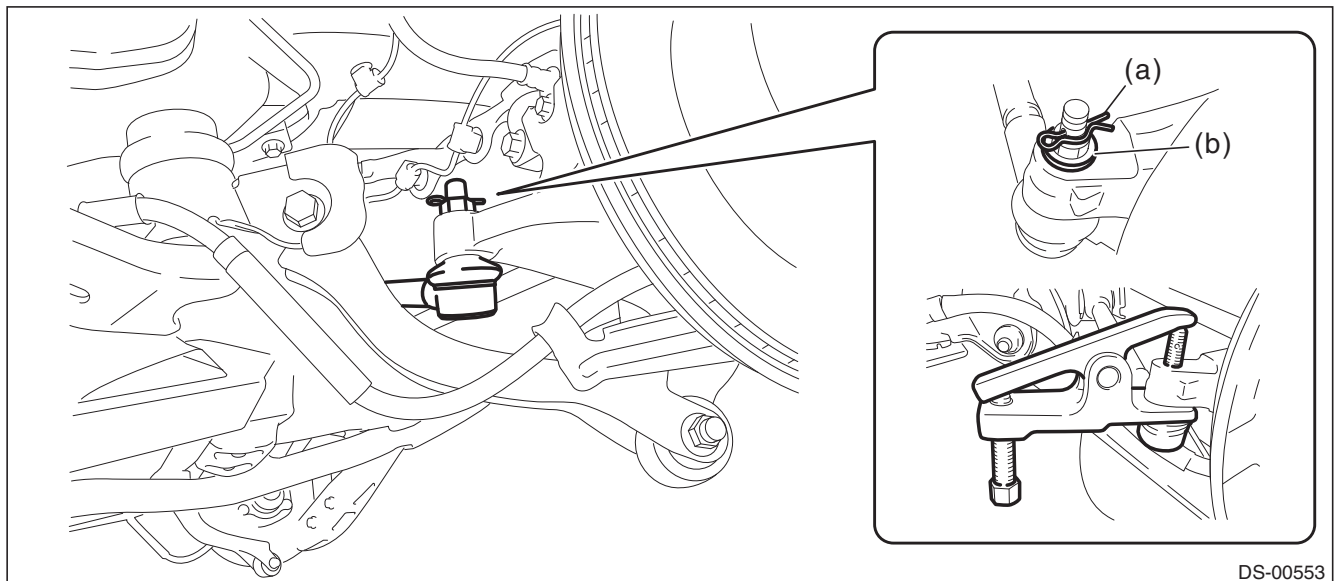
(2) Remove the ball joint from the housing assembly - rear axle.

CAUTION:

Be careful not to damage the boot of the joint.

Preparation tool:

Tie-rod ball joint puller



Rear Axle

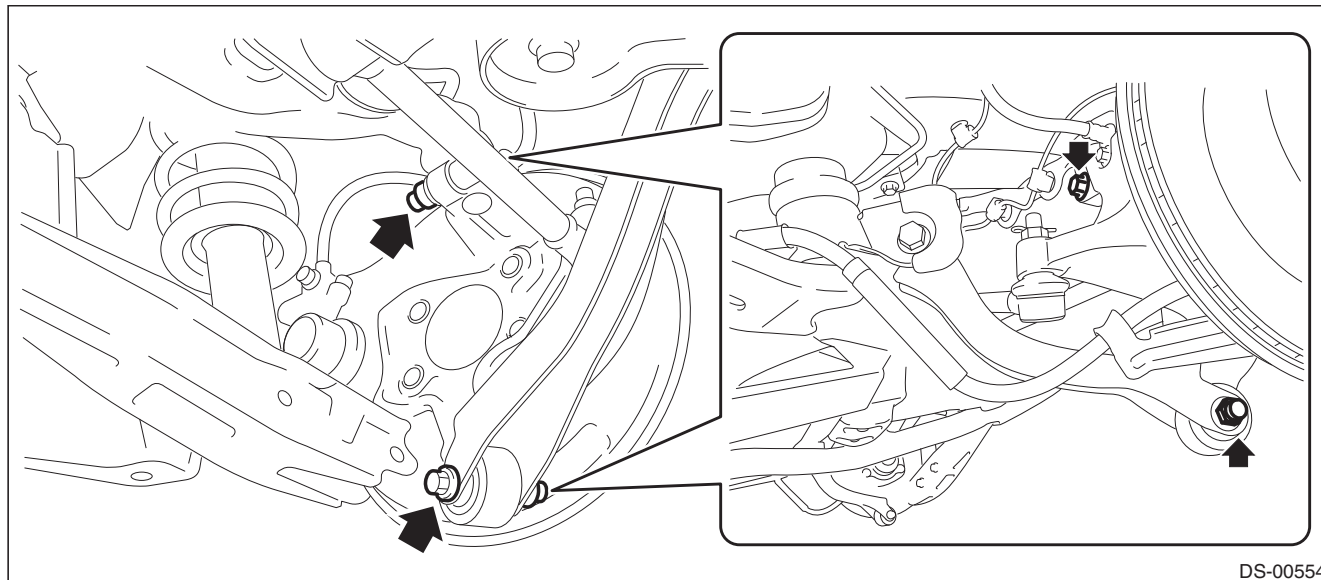
DRIVE SHAFT SYSTEM

11) Remove the housing assembly - rear axle.

(1) Remove the bolts for the upper arm, the trailing link, and the lateral link assembly - rear, and then separate the housing assembly - rear axle.

CAUTION:

Be careful not to damage the boot of the joint.



(2) Remove the housing assembly - rear axle.

CAUTION:

- **Be careful of the weight of the housing assembly - rear axle.**
- **Be careful not to damage the spline portion of the axle shaft.**

12) Refer to "Rear Hub Unit Bearing" for removal of the hub unit COMPL - rear axle. <Ref. to DS-45, REMOVAL, Rear Hub Unit Bearing.>

B: INSTALLATION

1) Temporarily tighten the housing assembly - rear axle to the upper arm assembly.

2) Install the rear axle shaft assembly.

CAUTION:

- **Do not tap the axle shaft using a hammer when installing axle shaft assembly.**
- **Use new nut - axle.**

(1) Insert the axle shaft assembly into the hub spline, and pull in the axle shaft assembly into specified position.

(2) Temporarily tighten the nut - axle.

3) Tighten the rear strut assembly, rear stabilizer link assembly and other links to the specified torque.

Tightening torque:

Rear suspension: <Ref. to RS-3, REAR SUSPENSION, COMPONENT, General Description.>

Rear strut: <Ref. to RS-5, REAR STRUT, COMPONENT, General Description.>

4) Install the rear disc rotor.

5) Install the caliper body assembly.

Tightening torque:

66 N·m (6.73 kgf-m, 48.7 ft-lb)

6) Install the brake hose bracket and rear ABS wheel speed sensor.

Tightening torque:

Brake hose bracket: 33 N·m (3.36 kgf-m, 24.3 ft-lb)

Rear ABS wheel speed sensor: 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

Rear Axle

DRIVE SHAFT SYSTEM

7) Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

8) While depressing the brake pedal, tighten new nuts - axle to the specified torque.

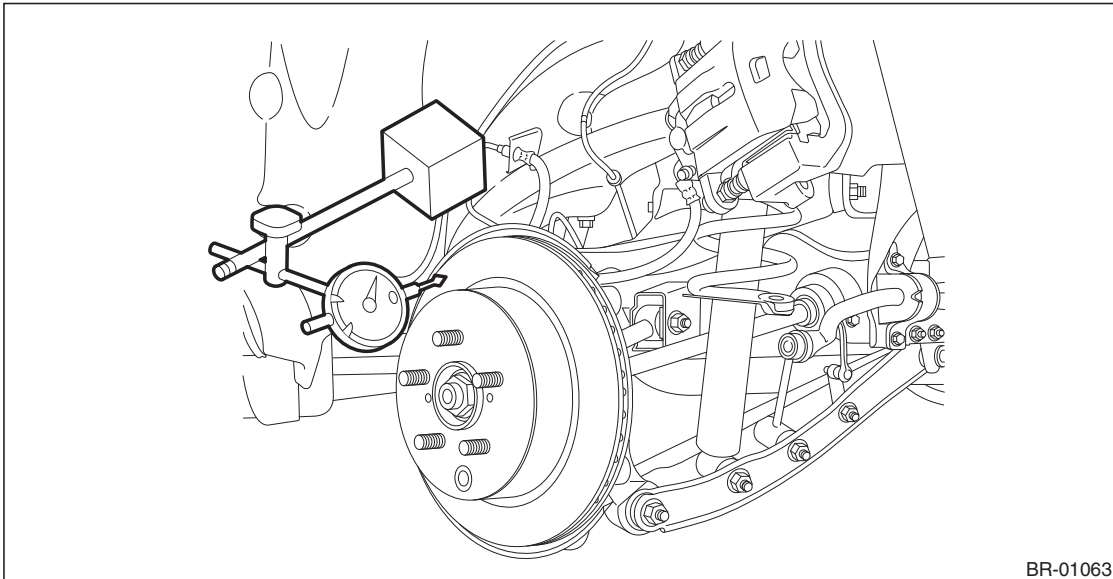
CAUTION:

Do not load the rear axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

Tightening torque:

190 N·m (19.37 kgf-m, 140.1 ft-lb)

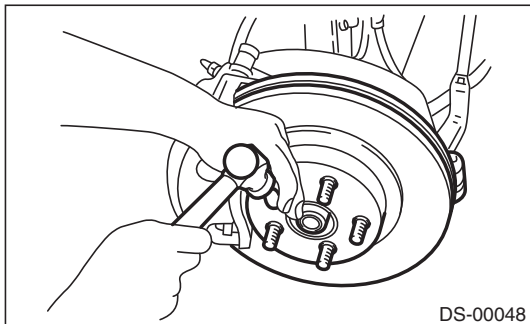
9) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL - rear axle if the play exceeds the limit.



Service limit:

Maximum: 0.05 mm (0.0020 in)

10) After tightening the nut - axle, lock it securely.



Rear Axle

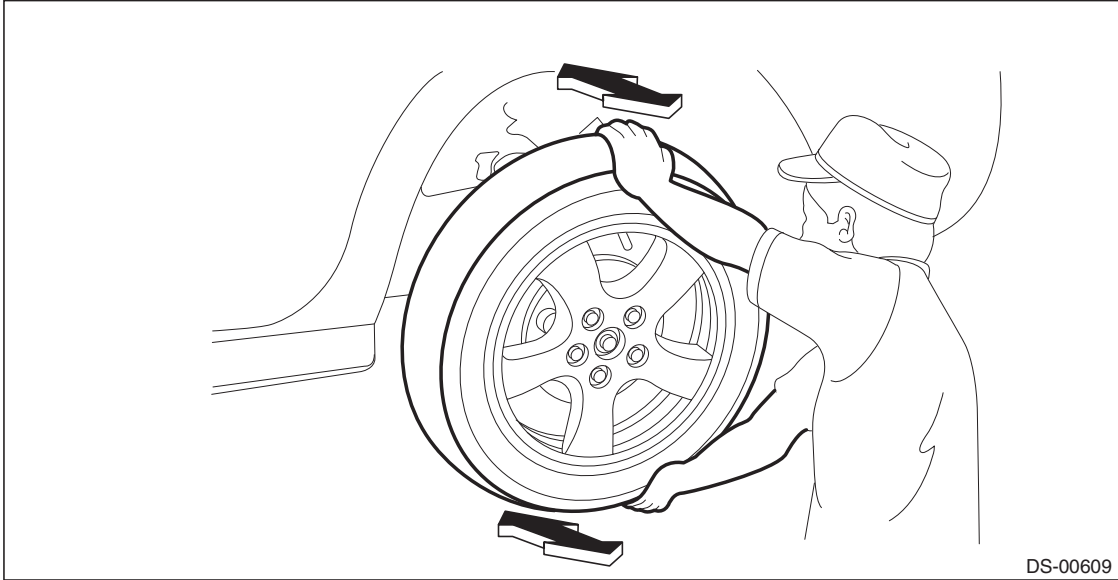
DRIVE SHAFT SYSTEM

11) Install the rear wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no play by moving the upper and lower portions of rear tire in an axial direction with the brake pedal released.



DS-00609

- **Play exists** → Check the hub unit COMPL - rear axle. <Ref. to DS-54, INSPECTION, Rear Hub Unit Bearing.>
- 12) Inspect the wheel alignment and adjust if necessary.
- Inspection: <Ref. to FS-7, INSPECTION, Wheel Alignment.>
 - Adjustment: <Ref. to FS-11, ADJUSTMENT, Wheel Alignment.>
- 13) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-16, PROCEDURE, Auto Headlight Beam Leveler System.>

C: DISASSEMBLY

1. BUSHING - PILLOW BALL

Do not remove the bushing - pillow ball from the housing assembly - rear axle because the bushing cannot be replaced when once removed. If it is removed, replace the housing assembly - rear axle.

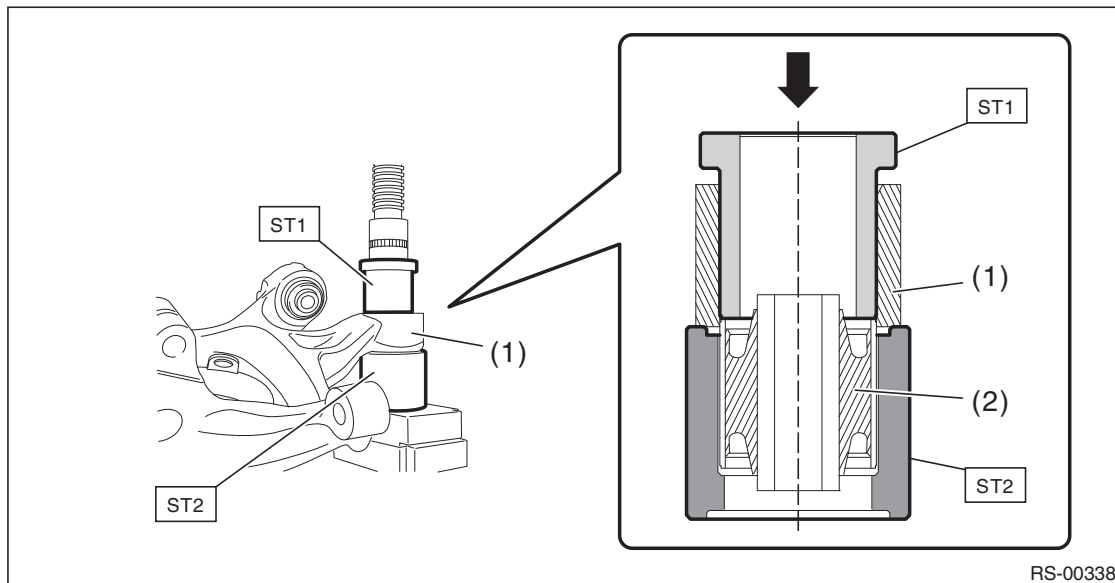
2. BUSHING - TRAILING LINK

- 1) Remove the housing assembly - rear axle. <Ref. to DS-35, REMOVAL, Rear Axle.>
- 2) Using the ST and a hydraulic press, push out the bushing.

Preparation tool:

ST1: BUSHING REMOVER (20099FG000)

ST2: INSTALLER & REMOVER (BASE) (20099PA010)



(1) Housing ASSY - rear axle

(2) Bushing - trailing link

Rear Axle

DRIVE SHAFT SYSTEM

D: ASSEMBLY

1. BUSHING - PILLOW BALL

Do not remove the bushing - pillow ball from the housing assembly - rear axle because the bushing cannot be replaced when once removed. If it is removed, replace the housing assembly - rear axle.

2. BUSHING - TRAILING LINK

1) Before assembly, inspect the following items and replace any faulty part with a new one.

- Perform visual check for damage or bend on the trailing link.
- Visually check the bushing for abnormal cracks, fatigue or damage.

2) Press-fit the bushing using ST and the hydraulic press.

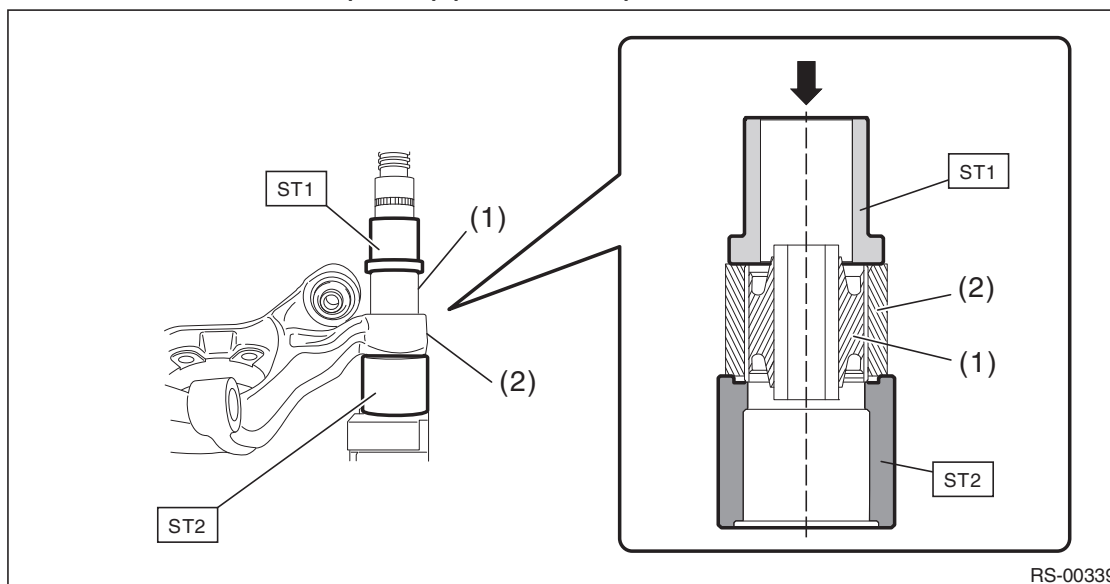
CAUTION:

Make sure to press the bushing straight in.

Preparation tool:

ST1: BUSHING REMOVER (20099FG000)

ST2: INSTALLER & REMOVER (BASE) (20099PA010)



(1) Bushing

(2) Housing ASSY - rear axle

6. Rear Hub Unit Bearing

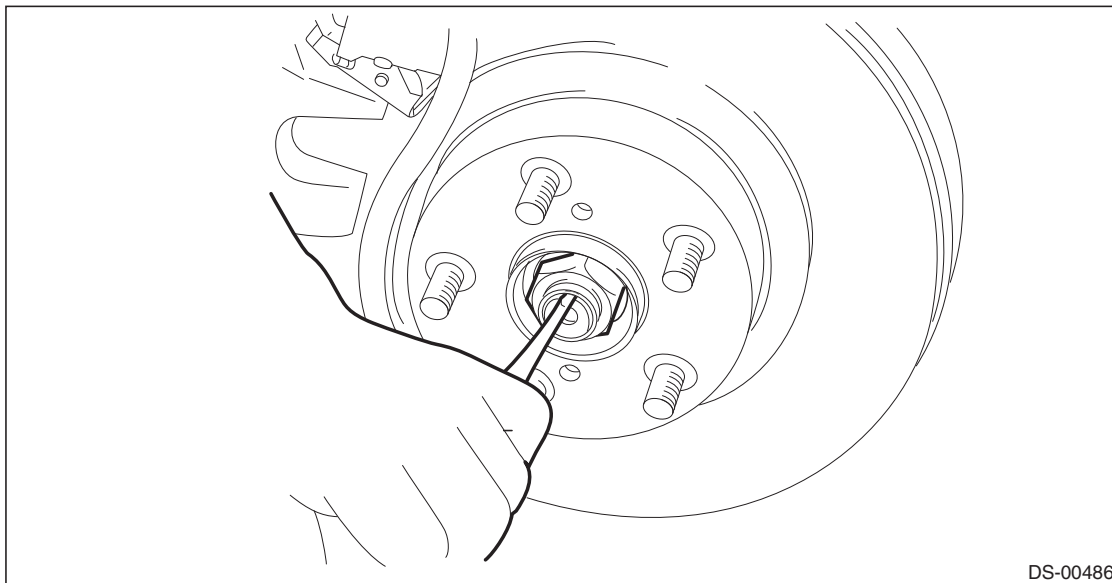
A: REMOVAL

- 1) Lift up the vehicle, and then remove the rear wheels.
- 2) Remove the nut - axle.

CAUTION:

Do not loosen the nut - axle while the rear axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.

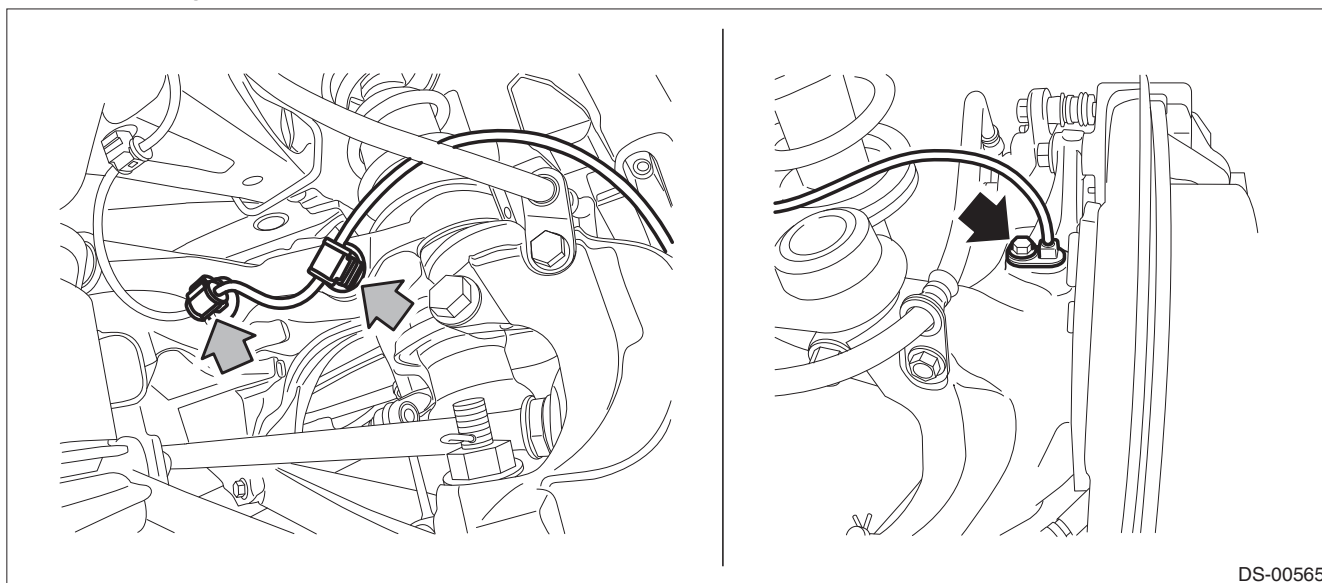


DS-00486

- 3) Remove the rear ABS wheel speed sensor from the rear axle housing.
 - (1) Remove the bolts, and remove the rear ABS wheel speed sensor.
 - (2) Remove the rear ABS wheel speed sensor harness from the upper arm.

CAUTION:

- Be careful not to damage the sensor.
- Do not apply excessive force to the sensor harness.

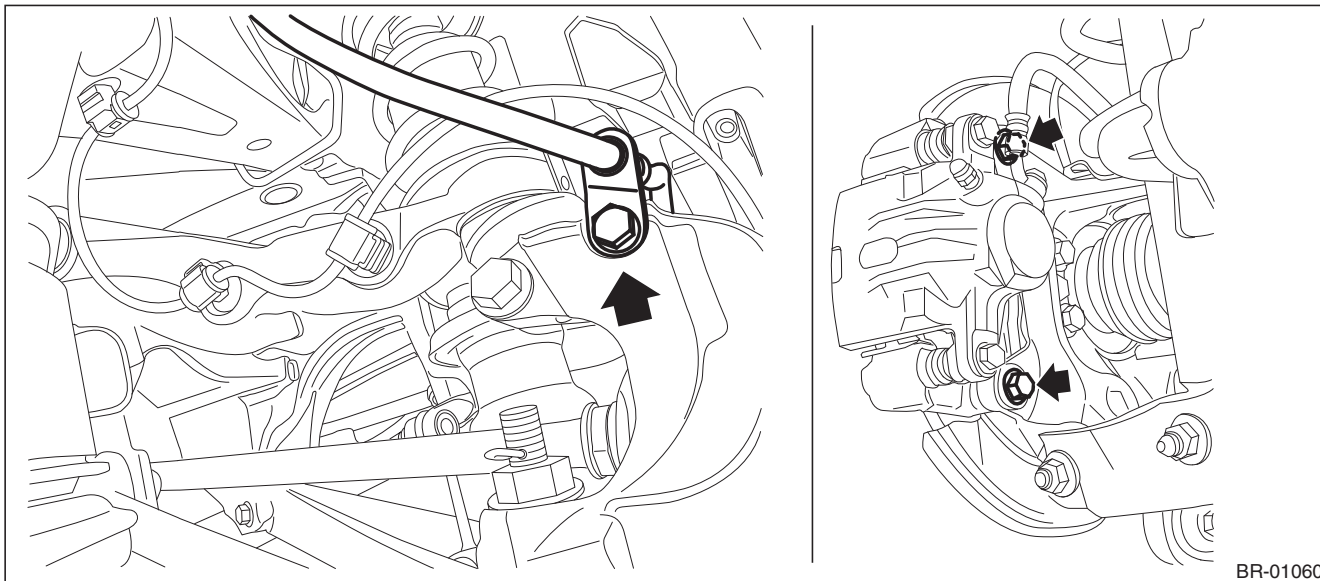


DS-00565

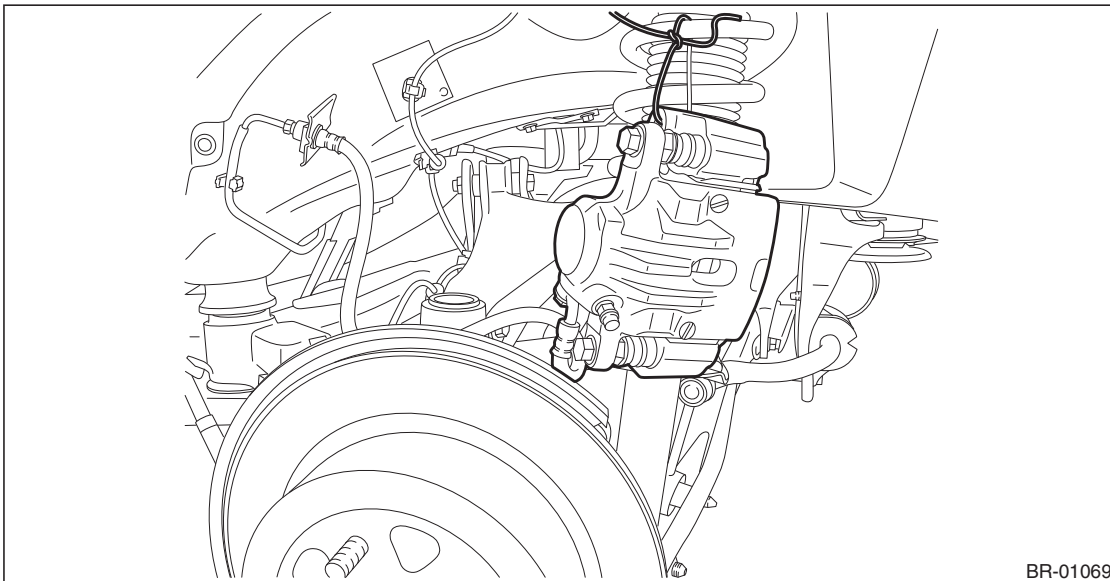
Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM

- 4) Remove the caliper body assembly from the housing assembly - rear axle.
(1) Remove the bolts and then remove the brake hose bracket and caliper body assembly.



- (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



Rear Hub Unit Bearing

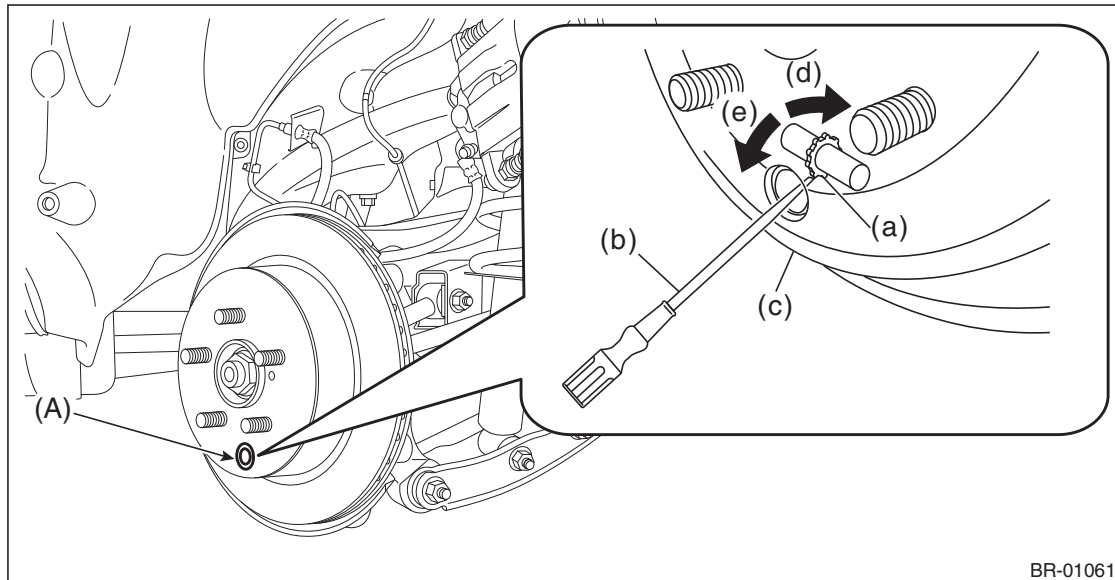
DRIVE SHAFT SYSTEM

5) Remove the rear disc rotor.

NOTE:

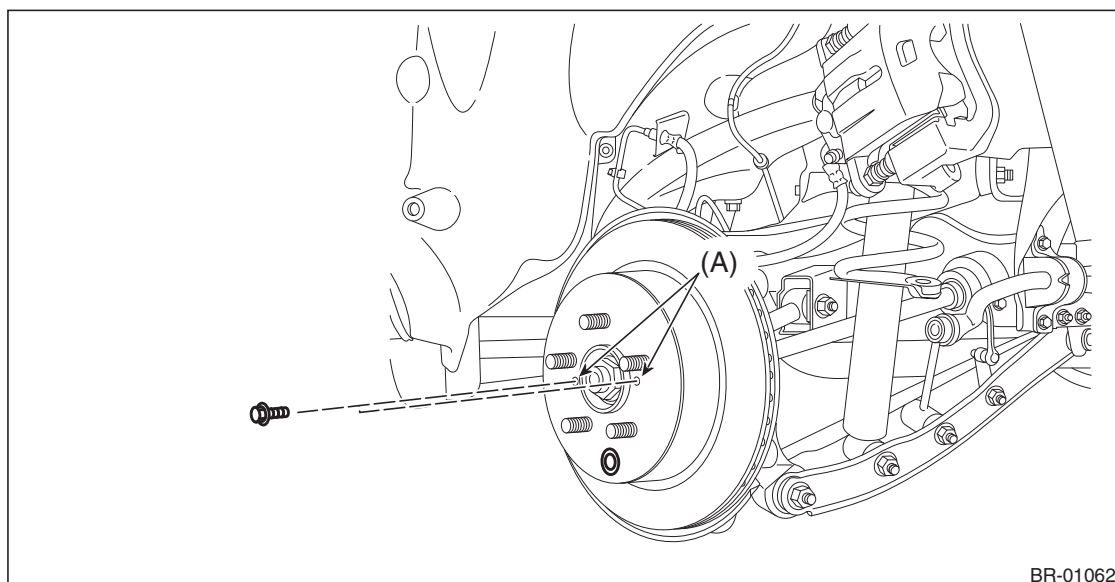
If the disc rotor is difficult to remove, proceed as follows.

1. Remove the adjusting hole cover (A) of the rear disc rotor.
2. Turn the adjuster assembly - rear brake using a flat tip screwdriver until the parking brake shoes get further enough away from the rear disc rotor surface.



- | | | |
|--------------------------------|---|--|
| (a) Adjuster ASSY - rear brake | (c) Disc rotor | (e) Shorten the adjuster ASSY - rear brake |
| (b) Flat tip screwdriver | (d) Extend the adjuster ASSY - rear brake | |

3. If the disc rotor is not removed after performing above step, screw in an 8 mm (0.31 in) bolt to the threaded part (A) of the disc rotor, and remove the disc rotor.



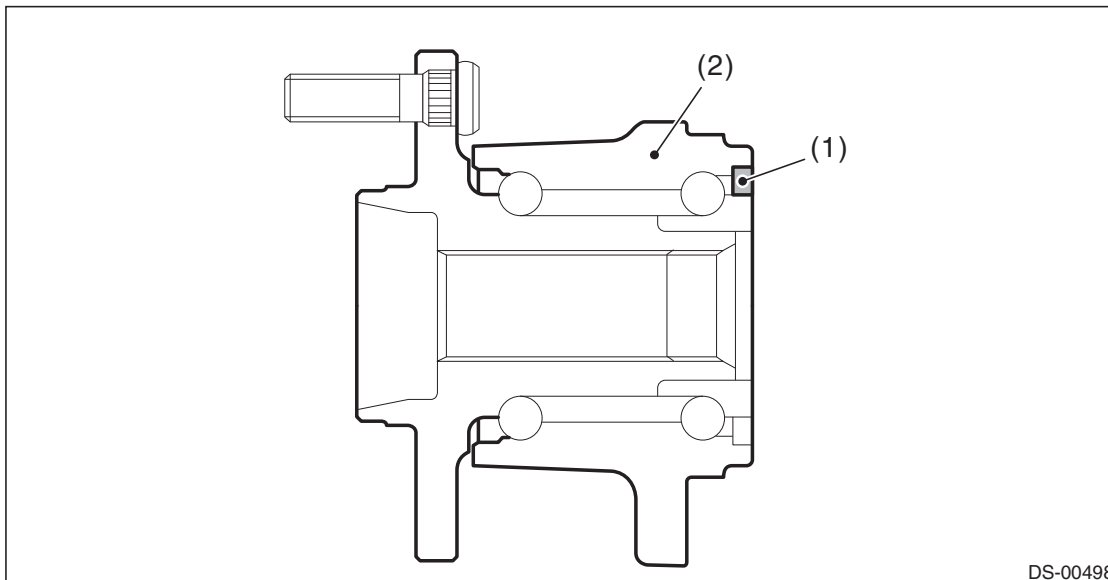
Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM

6) Remove the bolts from the housing assembly - rear axle, and then remove the hub unit COMPL - rear axle.

CAUTION:

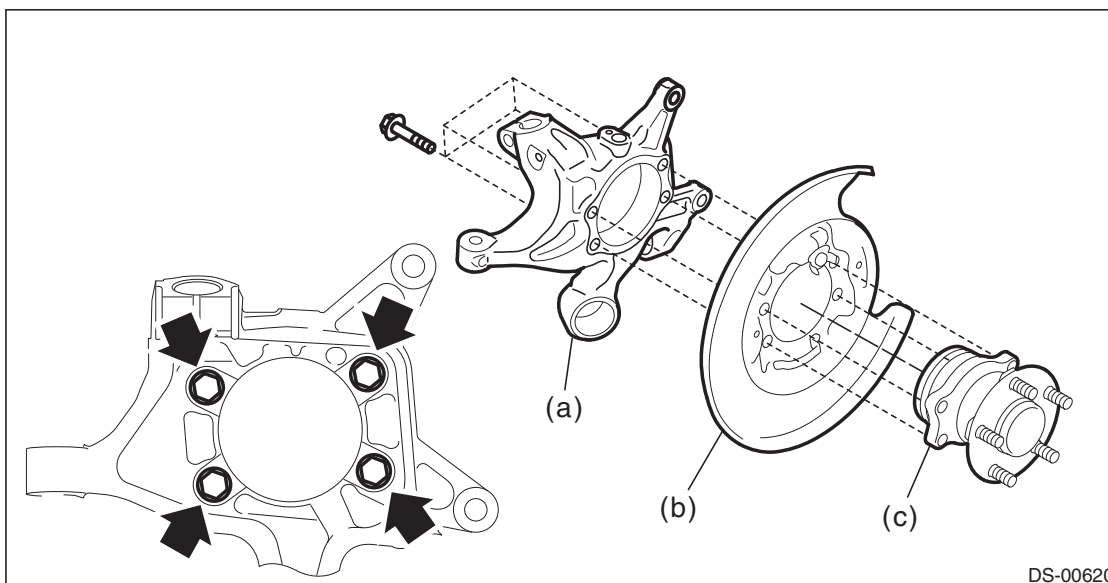
- Be careful not to damage the magnetic encoder.
- Do not get closer the tool which charged magnetism to magnetic encoder.



DS-00498

(1) Magnetic encoder

(2) Hub unit COMPL - rear axle



DS-00620

(a) Housing ASSY - rear axle

(b) Back plate - rear brake

(c) Hub unit COMPL - rear axle

Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM

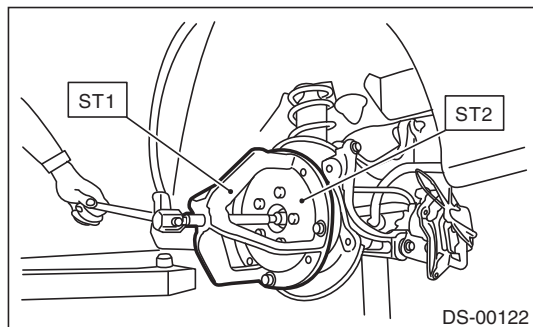
NOTE:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)

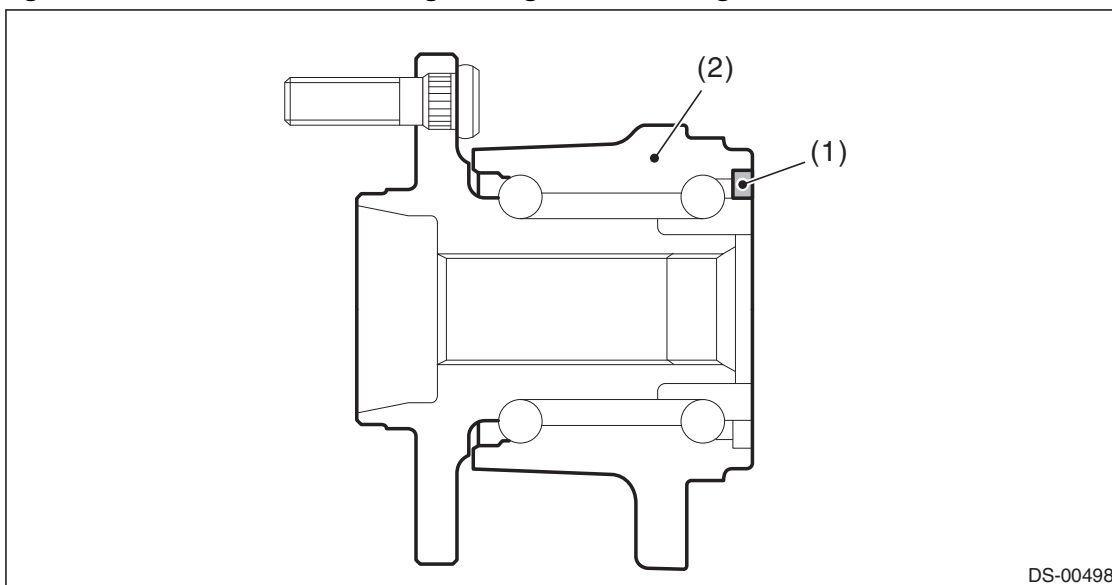


B: INSTALLATION

1) Place the back plate - rear brake between the housing assembly - rear axle and the hub unit COMPL - rear axle, and tighten the bolt.

CAUTION:

- Be careful not to damage the magnetic encoder.
- Do not get closer the tool which charged magnetism to magnetic encoder.

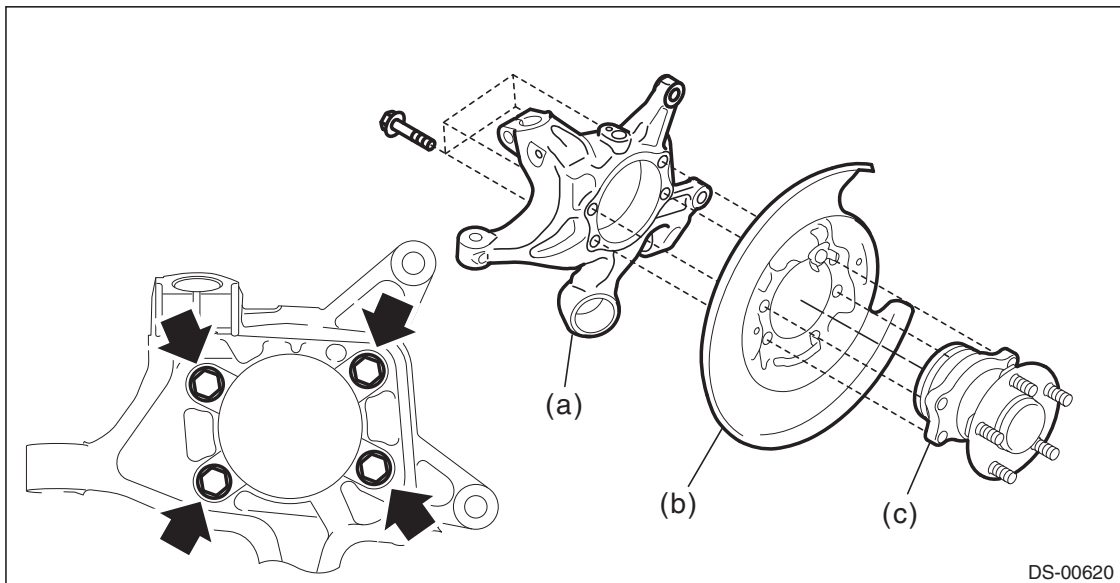


(1) Magnetic encoder

(2) Hub unit COMPL - rear axle

Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM



(a) Housing ASSY - rear axle

(b) Back plate - rear brake

(c) Hub unit COMPL - rear axle

Tightening torque:

65 N·m (6.63 kgf-m, 47.9 ft-lb)

2) Install the rear axle shaft assembly.

CAUTION:

- Do not tap the axle shaft using a hammer when installing axle shaft assembly.
- Use new nut - axle.

(1) Insert the axle shaft assembly into the hub spline, and pull in the axle shaft assembly into specified position.

(2) Temporarily tighten the nut - axle.

3) Install the disc rotor to the hub unit COMPL - rear axle.

4) Install the caliper body assembly to the housing assembly - rear axle.

Tightening torque:

66 N·m (6.73 kgf-m, 48.7 ft-lb)

5) Install the rear ABS wheel speed sensor.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

6) While depressing the brake pedal, tighten new nuts - axle to the specified torque.

CAUTION:

Do not load the rear axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

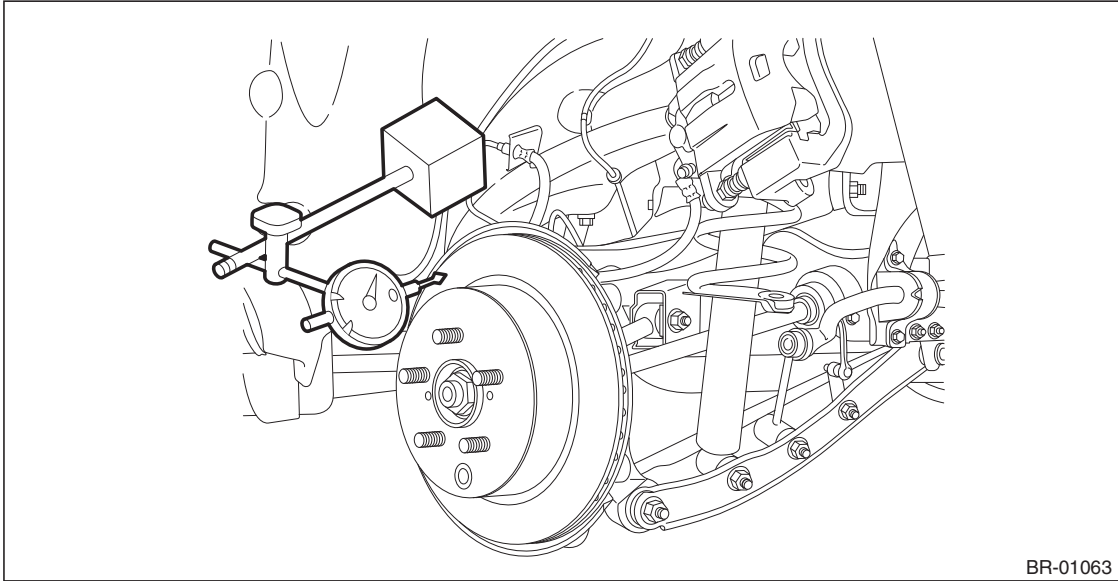
Tightening torque:

190 N·m (19.37 kgf-m, 140.1 ft-lb)

Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM

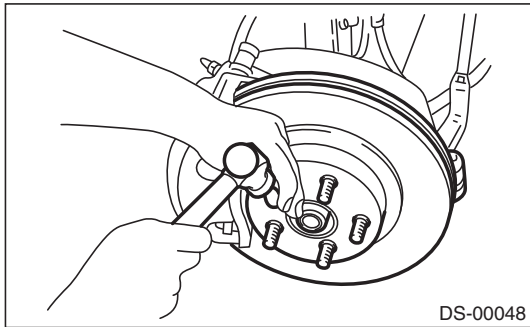
7) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL - rear axle if the play exceeds the limit.



Service limit:

Maximum: 0.05 mm (0.0020 in)

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



9) Install the rear wheels, and perform the following inspections.

Tightening torque:

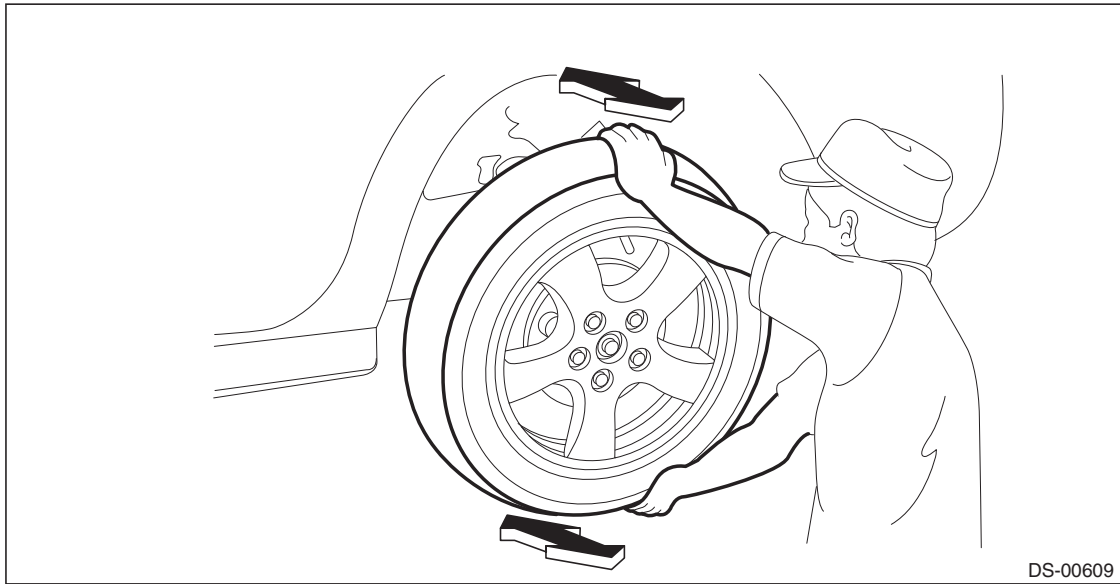
120 N·m (12.24 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.

Rear Hub Unit Bearing

DRIVE SHAFT SYSTEM

2. Check that there is no play by moving the upper and lower portions of rear tire in an axial direction with the brake pedal released.



- **Play exists** → Check the hub unit COMPL - rear axle. <Ref. to DS-54, INSPECTION, Rear Hub Unit Bearing.>

C: DISASSEMBLY

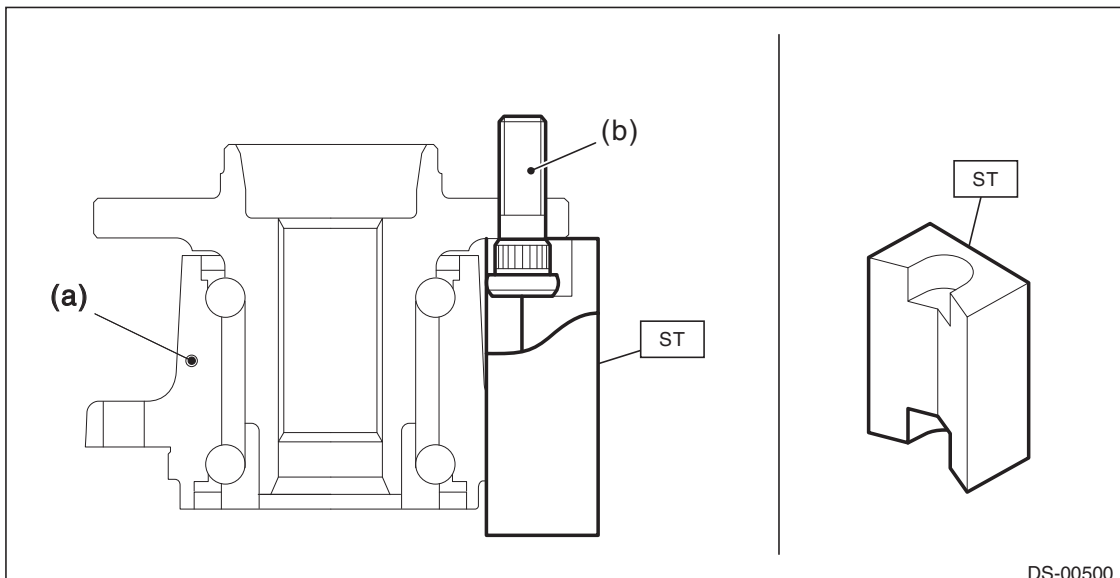
Using the ST or a hydraulic press, push out the bolt - hub (b) from the hub unit COMPL - rear axle (a).

CAUTION:

- Be careful not to hammer the bolts - hub. This may deform the hub unit COMPL.
- Do not reuse the bolt - hub.

PREPARATION TOOL:

ST: HUB STAND (28399AG000)



NOTE:

Since the hub unit COMPL - rear axle cannot be disassembled, only bolts - hub can be removed.

Rear Hub Unit Bearing

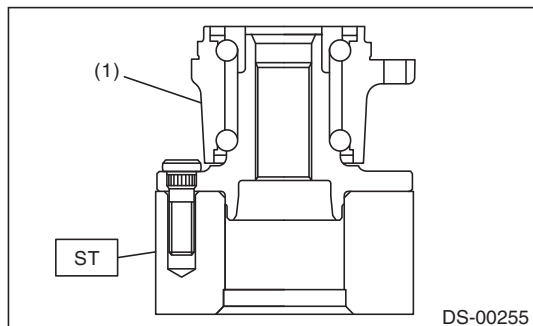
DRIVE SHAFT SYSTEM

D: ASSEMBLY

1) Install the hub unit COMPL - rear axle to the ST securely.

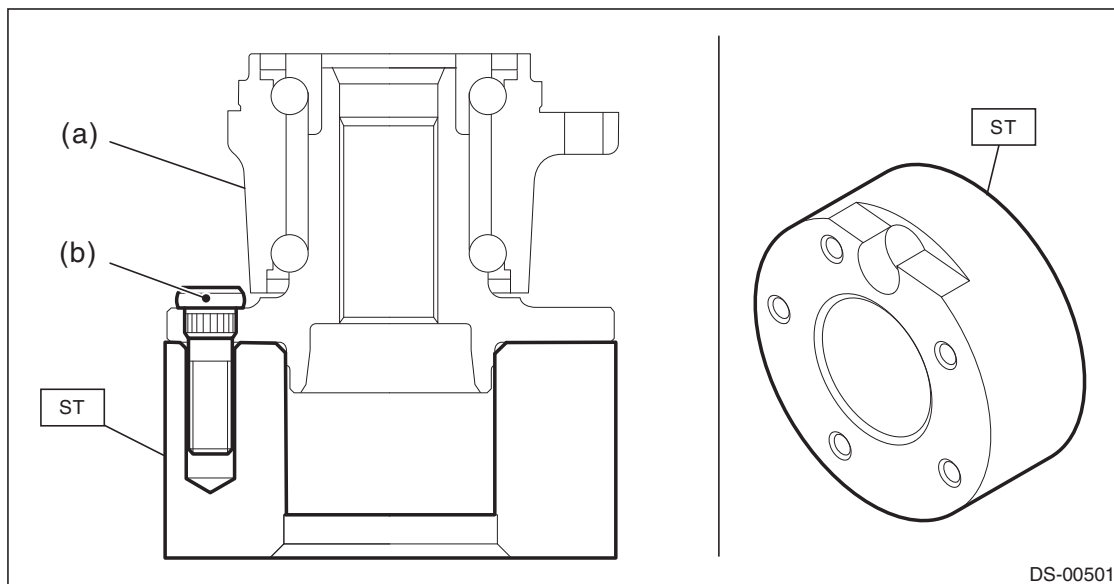
Preparation tool:

ST: HUB STAND (927080000)



(1) Hub unit COMPL - rear axle

2) Using a press, press new bolts - hub (b) until their seating surfaces contact the hub unit COMPL - rear axle (a).



NOTE:

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

Rear Hub Unit Bearing

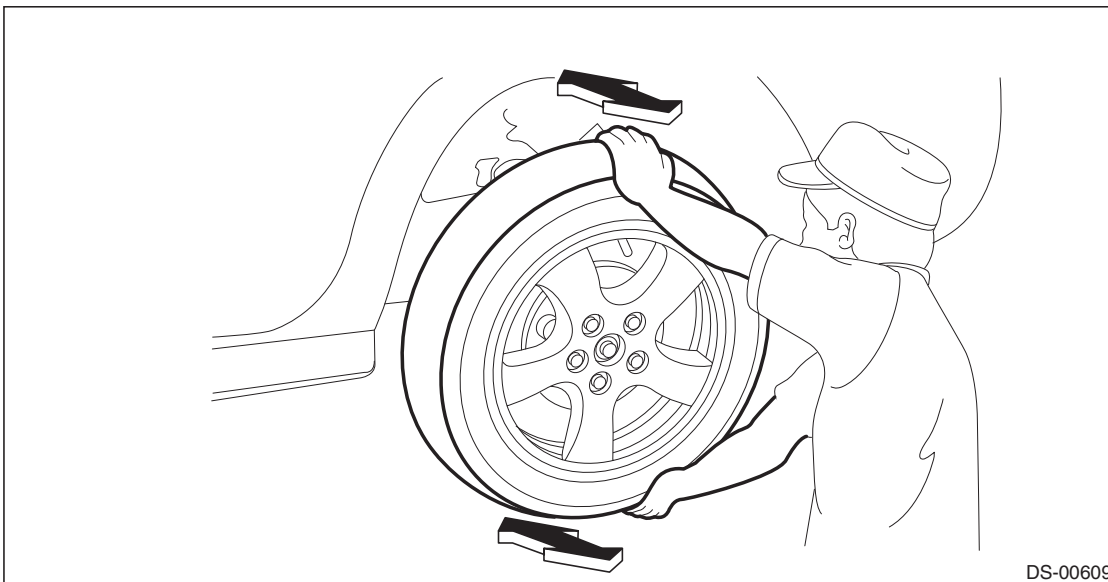
DRIVE SHAFT SYSTEM

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.

CAUTION:

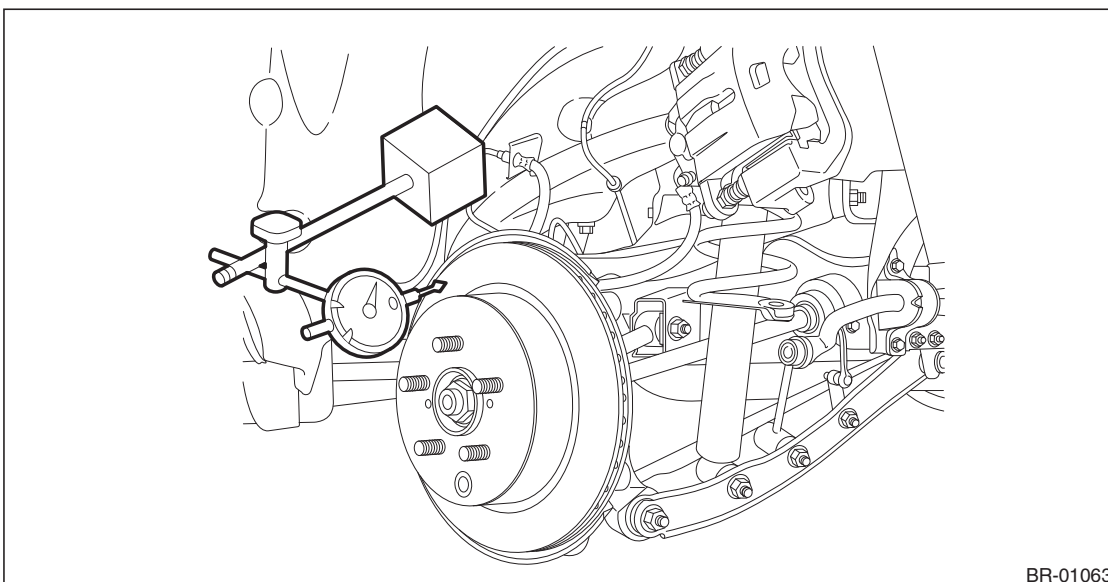
If there is any fault in the bearing, replace the hub unit COMPL - rear axle.



2) Inspect the lean of axis direction using a dial gauge. Replace the hub unit COMPL - rear axle if the play exceeds the limit.

Service limit:

Maximum: 0.05 mm (0.0020 in)



7. Front Drive Shaft

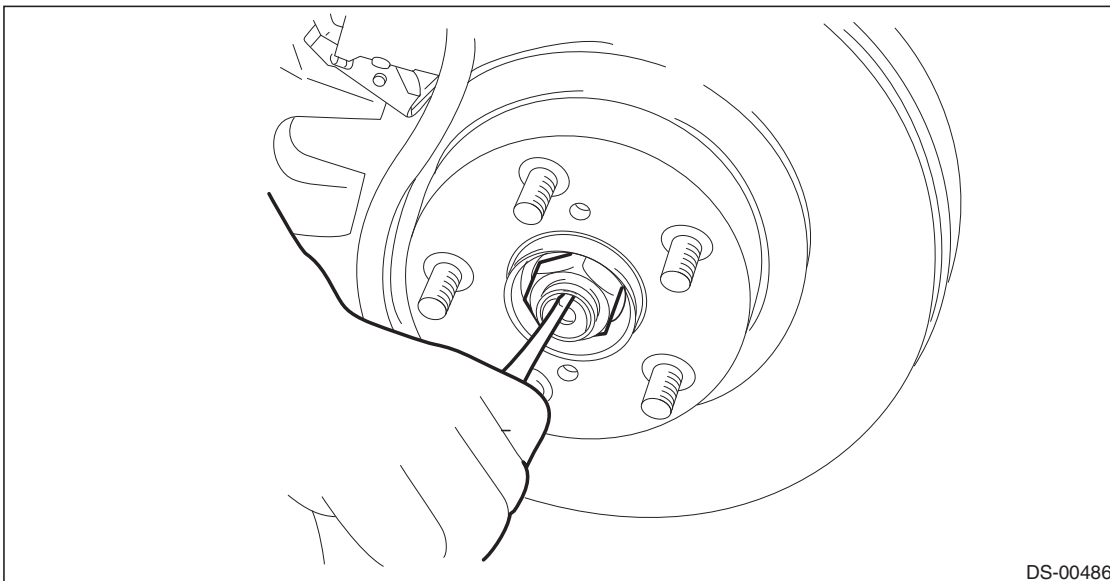
A: REMOVAL

- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the nut - axle.

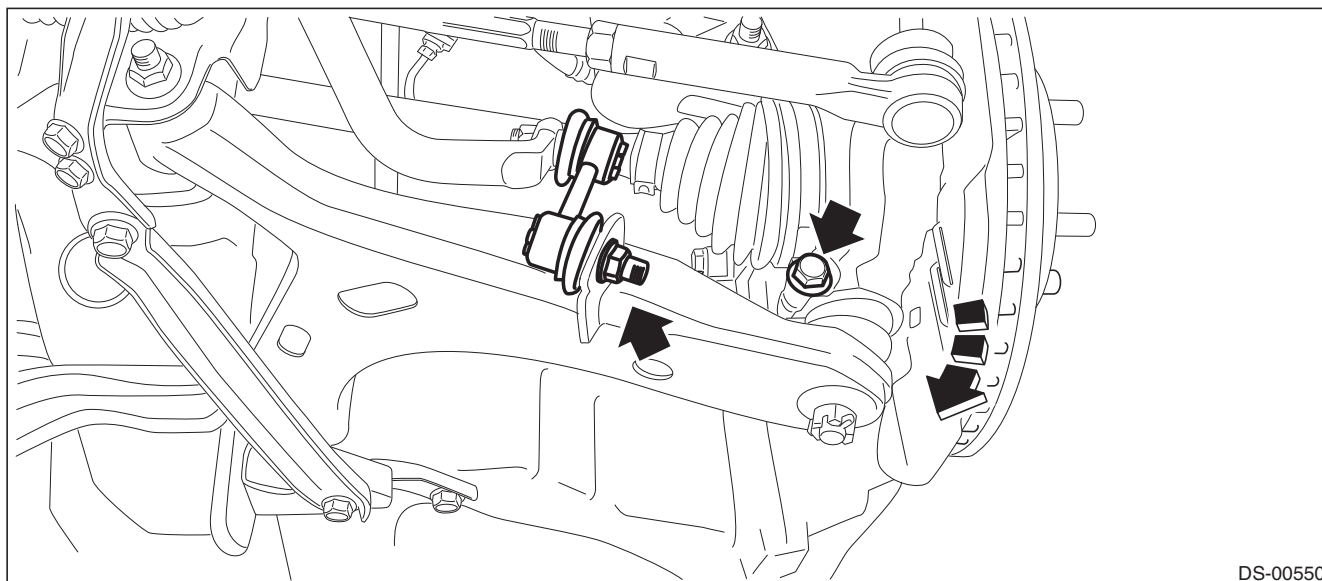
CAUTION:

Do not loosen the nut - axle while the front axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.



- 3) Drain the transmission gear oil. (MT model)
- 4) Drain differential gear oil. (CVT model)
- 5) Disconnect the ball joint assembly.
 - (1) Remove the nut and disconnect the front stabilizer link.
 - (2) Remove the bolts, disconnect the front arm ball joint, and lower the front arm assembly.



Front Drive Shaft

DRIVE SHAFT SYSTEM

6) Remove the front axle shaft assembly from the housing assembly - front axle.

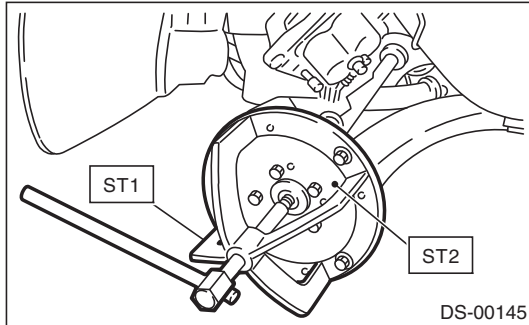
NOTE:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



7) Using a crowbar, remove the front axle shaft assembly from the transmission.

CAUTION:

Be careful not to allow the bar to damage holder area.

B: INSTALLATION

1) Before installation, check the axle shaft assembly. <Ref. to DS-65, INSPECTION, Front Drive Shaft.>

2) Replace the differential side retainer oil seal with a new part.

- MT model: <Ref. to 6MT-38, REPLACEMENT, Differential Side Retainer Oil Seal.>
- CVT (TR580) model: <Ref. to CVT(TR580)-87, REPLACEMENT, Differential Side Retainer Oil Seal.>
- CVT (TR690) model: <Ref. to CVT(TR690)-88, REPLACEMENT, Differential Side Retainer Oil Seal.>

NOTE:

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

3) Insert the axle shaft assembly into the hub spline, and pull in the axle shaft assembly into specified position.

CAUTION:

Do not tap the axle shaft using a hammer when installing axle shaft assembly.

4) Temporarily tighten the nut - axle.

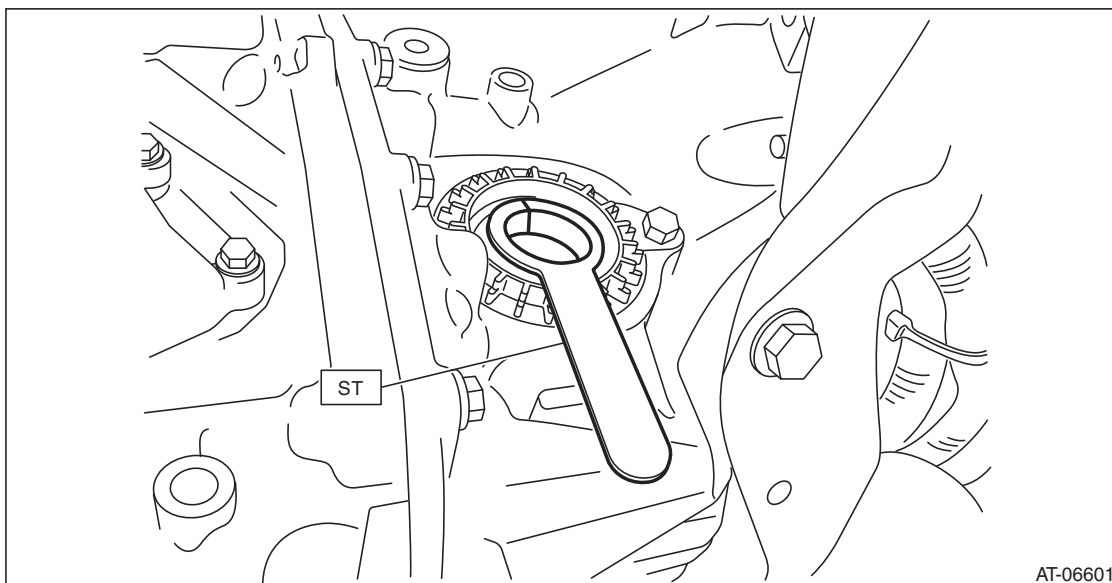
Front Drive Shaft

DRIVE SHAFT SYSTEM

5) Using the ST, install the front axle shaft assembly to the transmission.

Preparation tool:

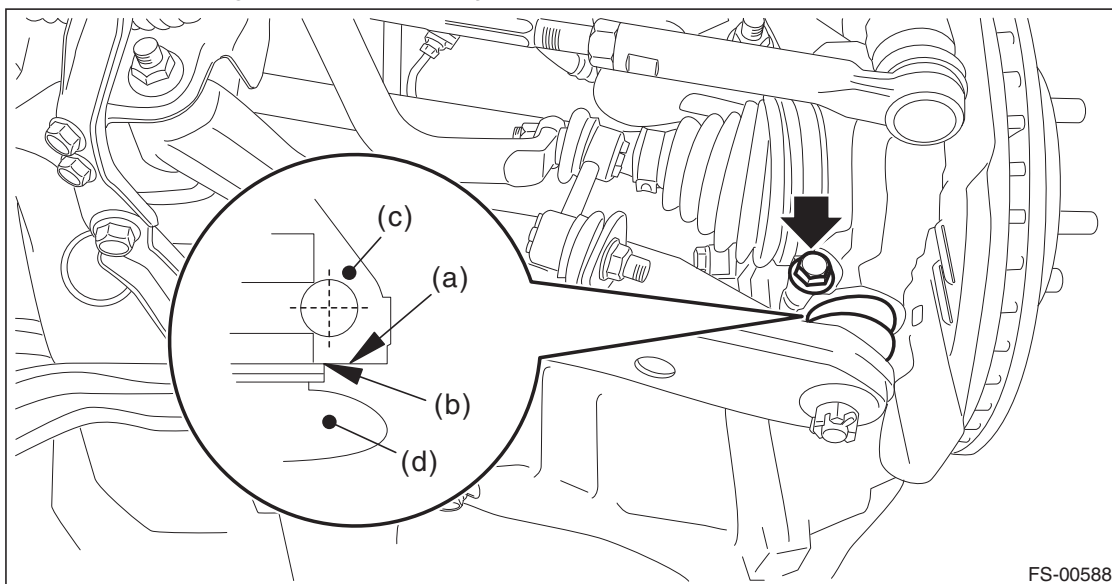
ST: OIL SEAL PROTECTOR (28399SA010)



6) Install the ball joint assembly to the housing assembly - front axle.

CAUTION:

- Before tightening, make sure the bottom surface of the housing assembly - front axle and the stepped section of ball joint are in contact.
- Be careful not to damage the boot of the joint.



- (a) Bottom surface of housing ASSY - front axle (c) Housing ASSY - front axle (d) Ball joint
(b) Raised section of ball joint

Tightening torque:

50 N·m (5.10 kgf-m, 36.9 ft-lb)

7) Install the stabilizer link.

Tightening torque:

60 N·m (6.12 kgf-m, 44.3 ft-lb)

Front Drive Shaft

DRIVE SHAFT SYSTEM

8) While depressing the brake pedal, tighten new nuts - axle to the specified torque.

CAUTION:

Do not load the front axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

Tightening torque:

220 N·m (22.43 kgf-m, 162.3 ft-lb)

- 9) After tightening the nut - axle, lock it securely.
- 10) Fill transmission gear oil. (MT model)
- 11) Fill differential gear oil. (CVT model)
- 12) Install the front wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

- 13) Inspect the wheel alignment and adjust if necessary.
 - Inspection: <Ref. to FS-7, INSPECTION, Wheel Alignment.>
 - Adjustment: <Ref. to FS-11, ADJUSTMENT, Wheel Alignment.>

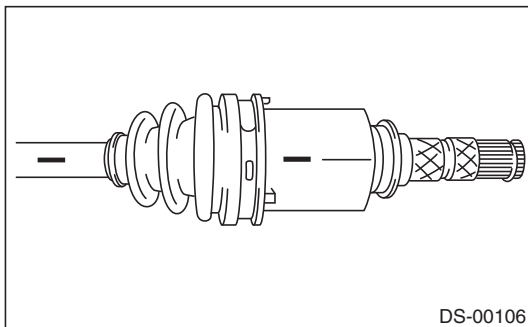
CAUTION:

When the wheel alignment has been adjusted, perform “VDC sensor midpoint setting mode.”

- 14) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-16, PROCEDURE, Auto Headlight Beam Leveler System.>

C: DISASSEMBLY

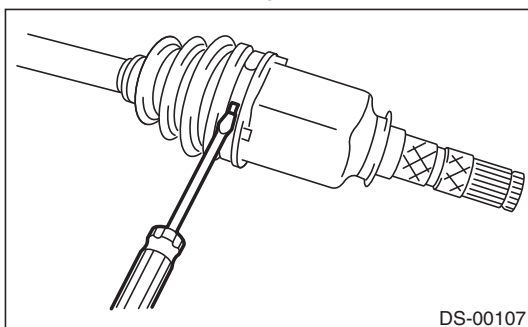
- 1) Place alignment marks on the shaft and outer race.



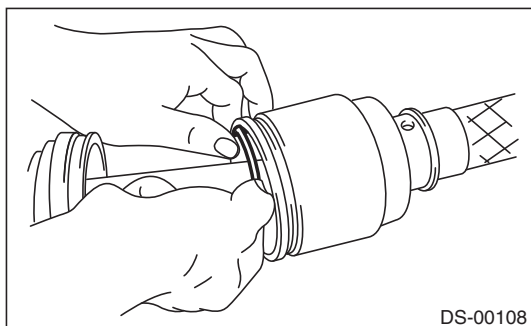
- 2) Remove the PTJ boot band and boot.

CAUTION:

Be careful not to damage the boot.



- 3) Remove the snap ring from PTJ outer race.



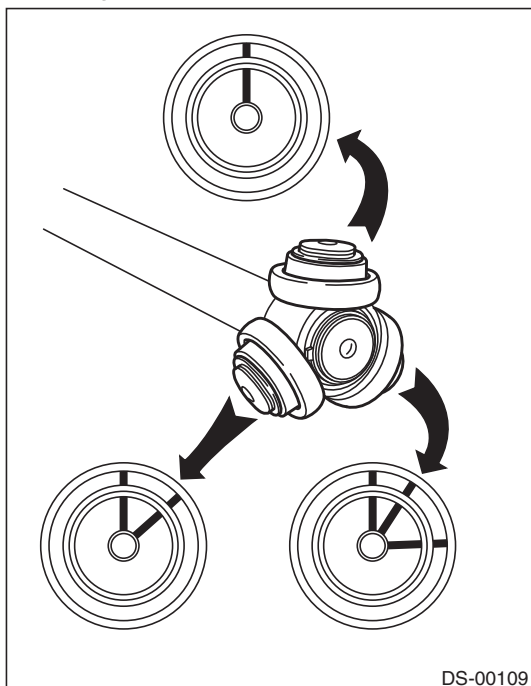
- 4) Remove the PTJ outer race from shaft assembly.

- 5) Wipe off grease.

CAUTION:

The grease is a special type of grease. Do not mix with other grease.

- 6) Place alignment marks on the roller kit and trunnion.

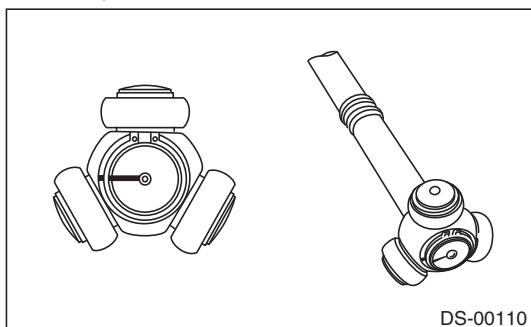


- 7) Remove the roller kit from trunnion.

CAUTION:

Be careful with the roller kit position.

- 8) Place alignment marks on the trunnion and shaft.



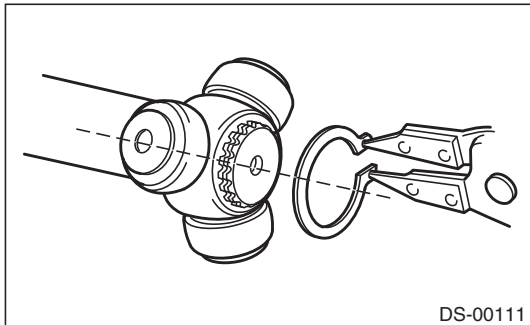
Front Drive Shaft

DRIVE SHAFT SYSTEM

9) Remove the snap ring and trunnion.

CAUTION:

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



10) Remove the PTJ boot.

11) Remove the O-ring from the groove of the shaft.

NOTE:

The EBJ is a non-disassembly part, so the axle disassembly stops here.

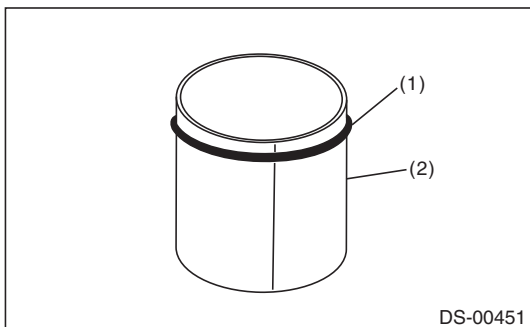
D: ASSEMBLY

1) Roll up a thick piece of paper to a size where the shaft can pass through, and affix with tape to form a cylinder.

2) Attach a new O-ring on this cylinder.

CAUTION:

- Always use a new O-ring.
- Be careful that the O-ring does not become scratched and that there are no foreign objects attached to it.
- Make sure to install the O-ring so that it does not twist as much as possible.
- Do not stretch the O-ring to 30 mm (1.18 in) inner diameter or more.



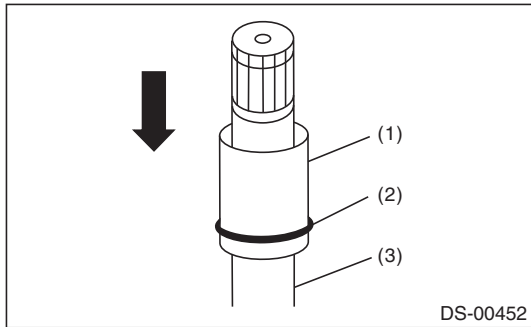
(1) O-ring

(2) Cylinder made with thick paper, etc.

Front Drive Shaft

DRIVE SHAFT SYSTEM

3) Pass the cylinder material onto the shaft, and slide in the direction of the shaft axis.



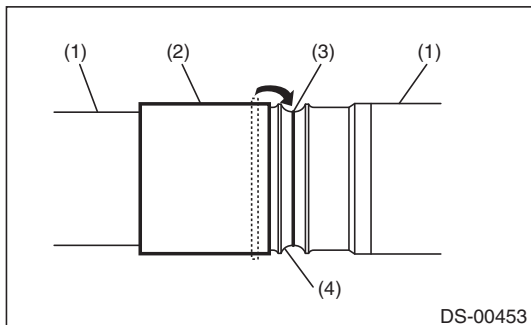
- (1) Cylinder material
- (2) O-ring
- (3) Shaft

4) Clean the shaft boot groove, and wipe off the grease.

5) Slide the cylinder material near the shaft boot groove, and move the O-ring from the cylinder material onto the shaft boot groove.

CAUTION:

- Attach the O-ring to the shaft boot groove center.
- Be careful that the O-ring does not become scratched and that there are no foreign objects attached to it.
- Make sure to install the O-ring so that it does not twist as much as possible.
- With the O-ring attached, do not wash with kerosene, gasoline, etc.



- (1) Shaft
- (2) Cylinder material
- (3) O-ring
- (4) Boot groove

6) Pass the PTJ small diameter boot band through the shaft.

7) Wrap vinyl tape around the splines of the shaft.

CAUTION:

To prevent damage to the boots, make sure to always wrap with vinyl tape for protection.

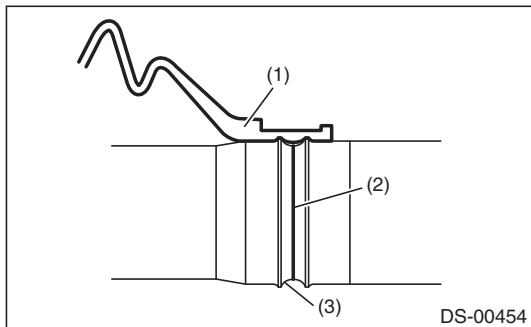
Front Drive Shaft

DRIVE SHAFT SYSTEM

8) Install a new PTJ boot.

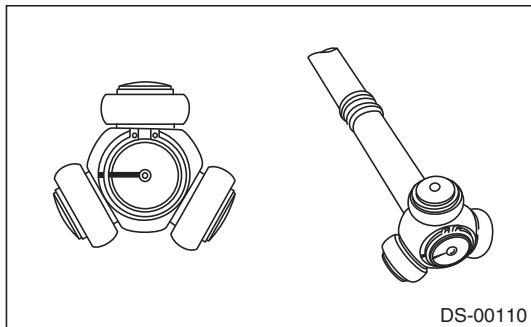
CAUTION:

Make sure to fit securely on the boot groove of the shaft.



- (1) PTJ boot
- (2) O-ring
- (3) Boot groove

9) Match the alignment marks, and attach the trunnion onto the shaft.



10) Attach the snap ring to the shaft.

CAUTION:

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

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

Grease:

NKG302

12) Apply a thin coat of specified grease to the roller kit and trunnion.

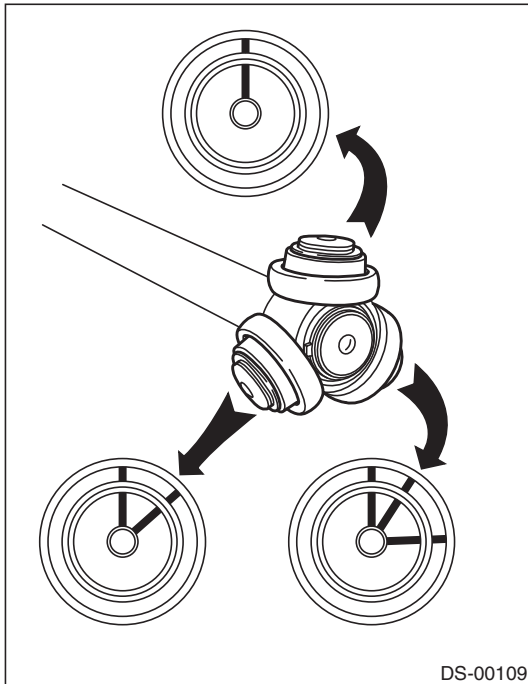
Front Drive Shaft

DRIVE SHAFT SYSTEM

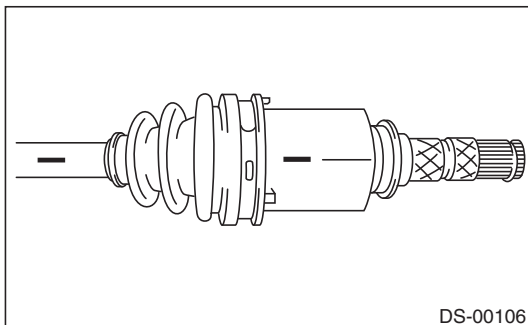
13) Match the alignment marks of the roller kit and trunnion, and attach the roller kit.

CAUTION:

Be careful with the roller kit position.



14) Match the alignment marks of the shaft and outer race, and attach the outer race.



15) Install the snap ring in the groove of the PTJ outer race.

CAUTION:

Pull the shaft lightly and make sure that the snap ring is completely fitted in the groove.

16) 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.

17) Attach the PTJ boot taking care not to twist it.

CAUTION:

- Clean the large end of PTJ boot and the boot groove well, and remove the grease and other substances.
- When installing the PTJ boot, position the outer race of the PTJ at center of the stroke.

18) Set the new boot band at the specified position.

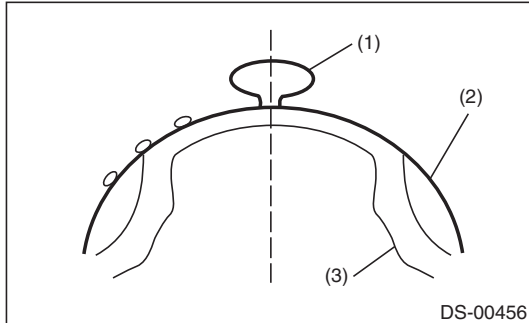
Front Drive Shaft

DRIVE SHAFT SYSTEM

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

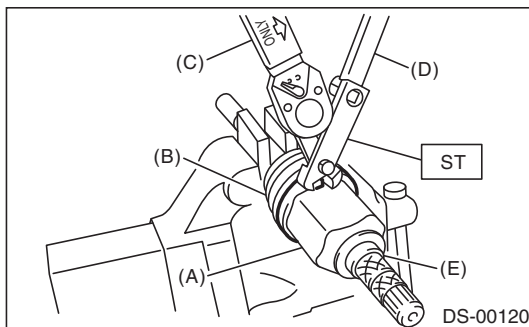
CAUTION:

The large boot band is to be tightened so that the omega shaped part is at the position indicated in the figure below.



- (1) Omega shaped part
- (2) Boot band
- (3) Outer race

ST 28099AC000 BOOT BAND PLIER



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

Tightening torque:

Large boot band

178 N·m (18.15 kgf-m, 131.3 ft-lb)

Small boot band

145 N·m (14.79 kgf-m, 106.9 ft-lb)

20) Extend and retract the PTJ repeatedly so that grease is spread evenly.

E: INSPECTION

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

- **PTJ (pillow tripod joint)**

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

- **EBJ (high-efficiency compact ball fixed joint)**

Check for seizure, corrosion, damage and excessive play.

- **Shaft:**

Check for excessive bending, twisting, damage and wear.

- **Boot:**

Check for wear, warping, breakage and scratches.

- **Grease:**

Check for discoloration and fluidity.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

8. Rear Drive Shaft

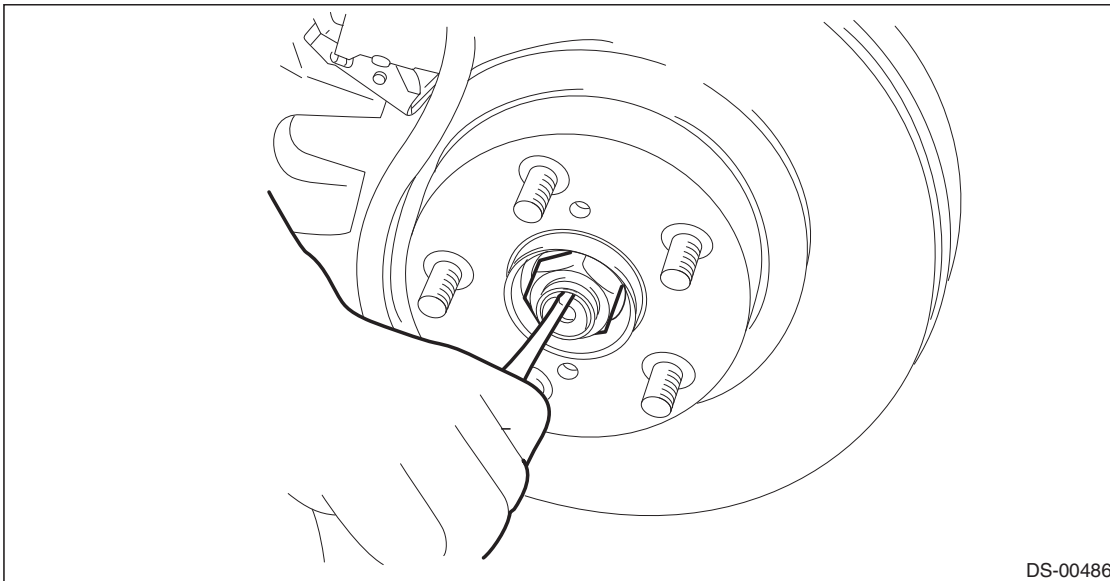
A: REMOVAL

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

CAUTION:

Do not loosen the nut - axle while the rear axle is loaded. Doing so may damage the hub unit COMPL.

- (1) Lift the crimped section of the nut - axle.
- (2) Remove the nut - axle using a socket wrench while depressing the brake pedal.

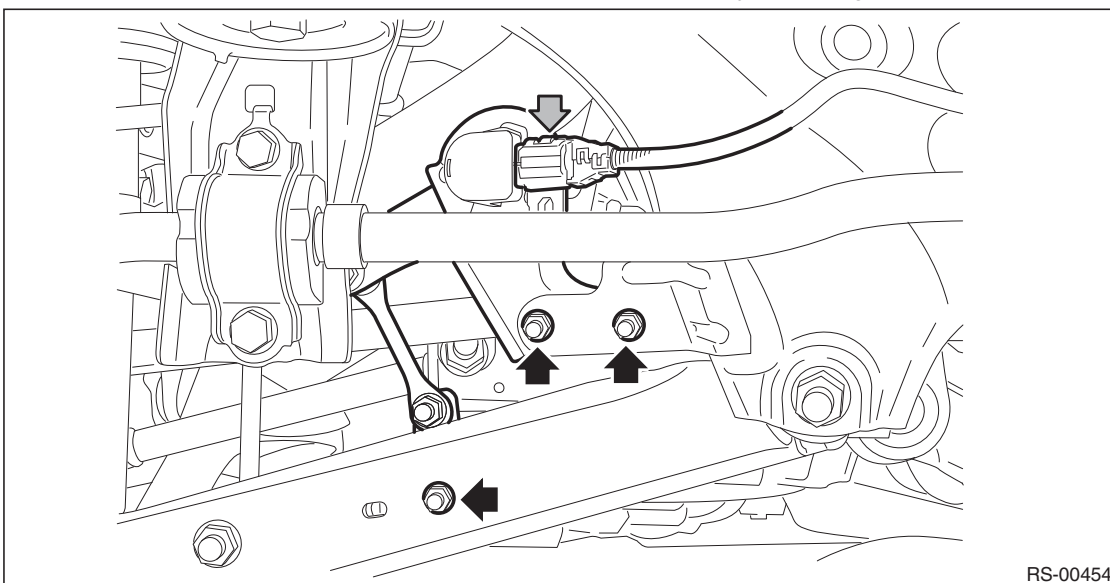


- 4) Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

CAUTION:

Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

- (1) Disconnect the connector of the sensor assembly - headlight beam leveler.
- (2) Remove the bolts and nuts, and remove the sensor assembly - headlight beam leveler.



- 5) Drain differential gear oil.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

6) Remove the propeller shaft. <Ref. to DS-11, REMOVAL, Propeller Shaft.>

7) Remove the rear axle shaft assembly from the rear differential assembly.

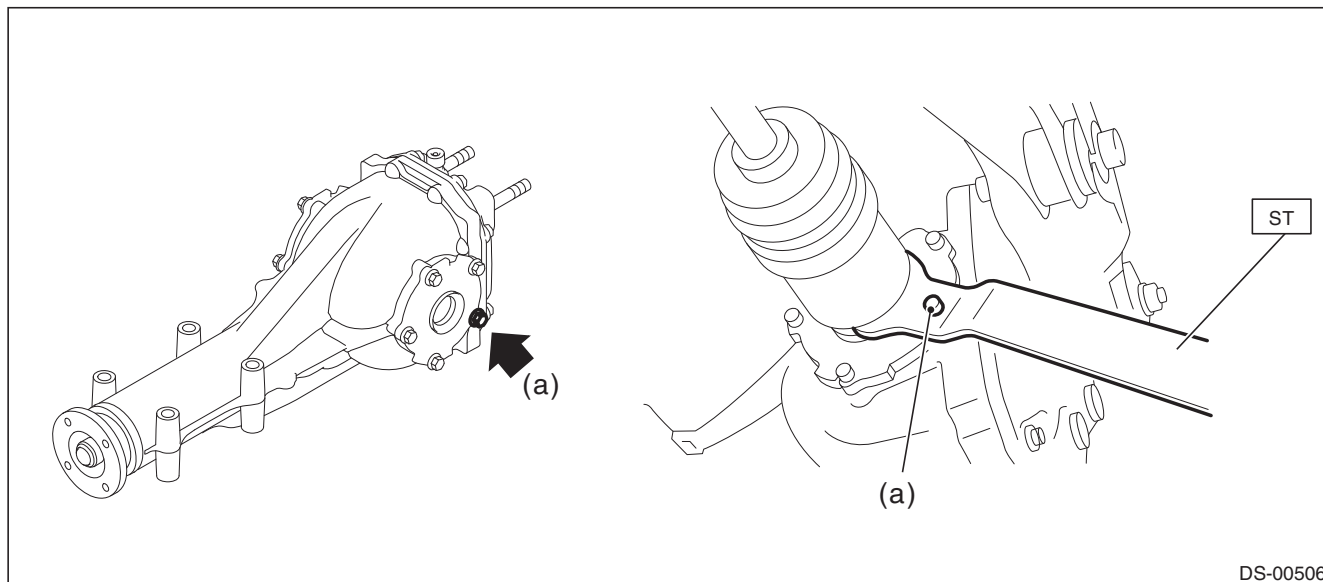
- T type: Pull out the rear axle shaft assembly by fitting the ST to the bolt (a) as shown in the figure.

CAUTION:

Fit the ST to the bolts as shown in the figure to prevent damage of the side bearing retainer.

Preparation tool:

ST: DRIVE SHAFT REMOVER (28099PA100)



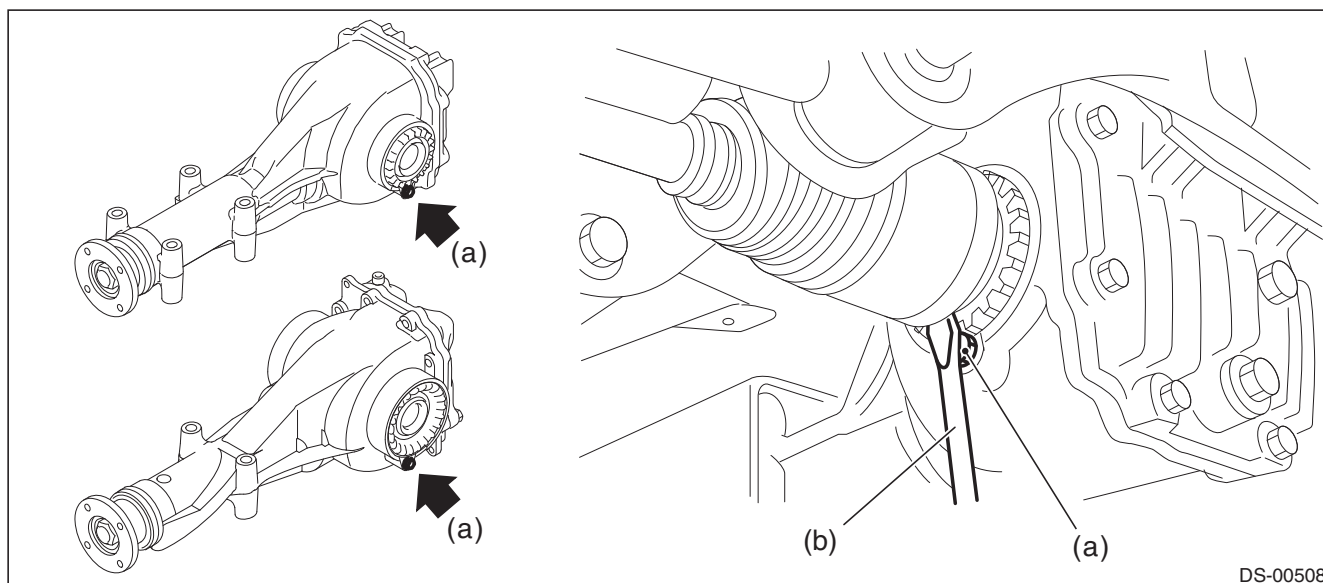
- VA type: Pull out the rear axle shaft assembly by fitting the tire lever (b) to the bolt (a) as shown in the figure.

CAUTION:

To prevent damage to the side bearing retainer, use by placing the tire lever against the bolt as shown in the figure.

Preparation tool:

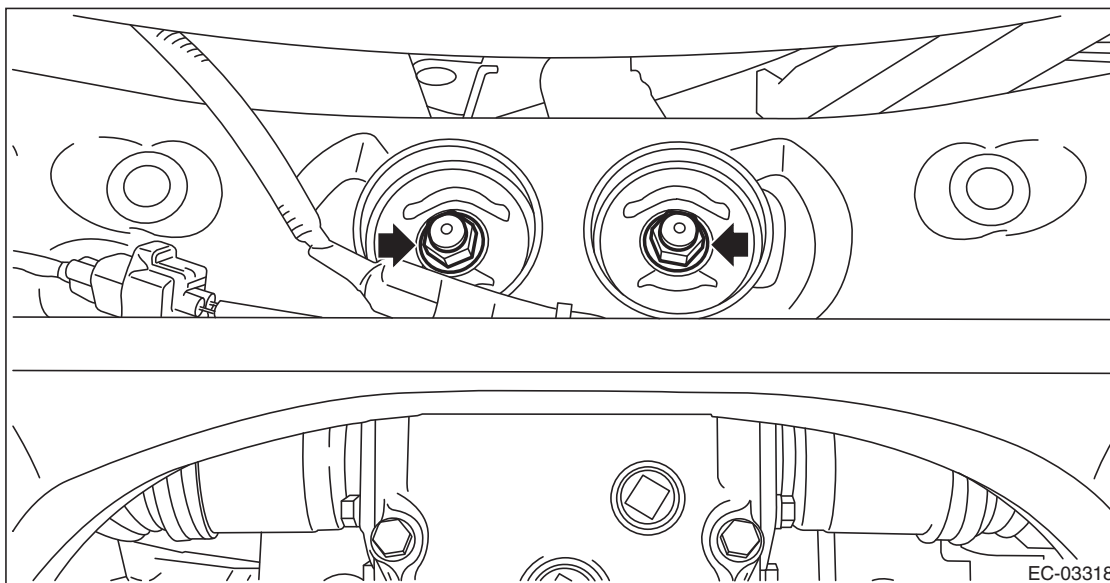
Tire lever



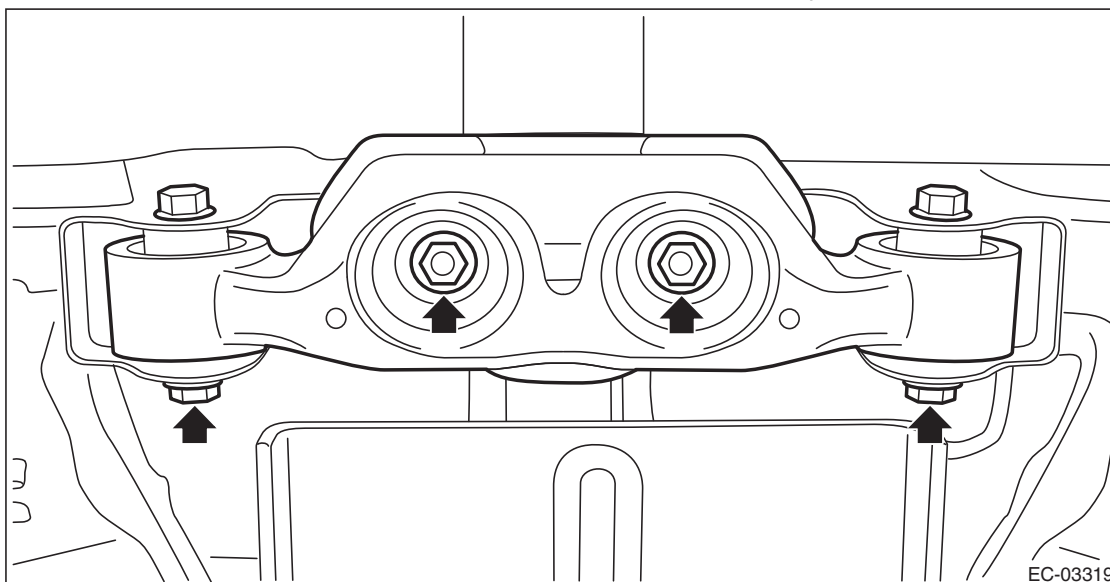
Rear Drive Shaft

DRIVE SHAFT SYSTEM

- 8) Remove the self-locking nuts which hold the rear differential to the rear sub frame assembly.



- 9) Remove the rear differential member from the rear sub frame assembly and the rear differential.



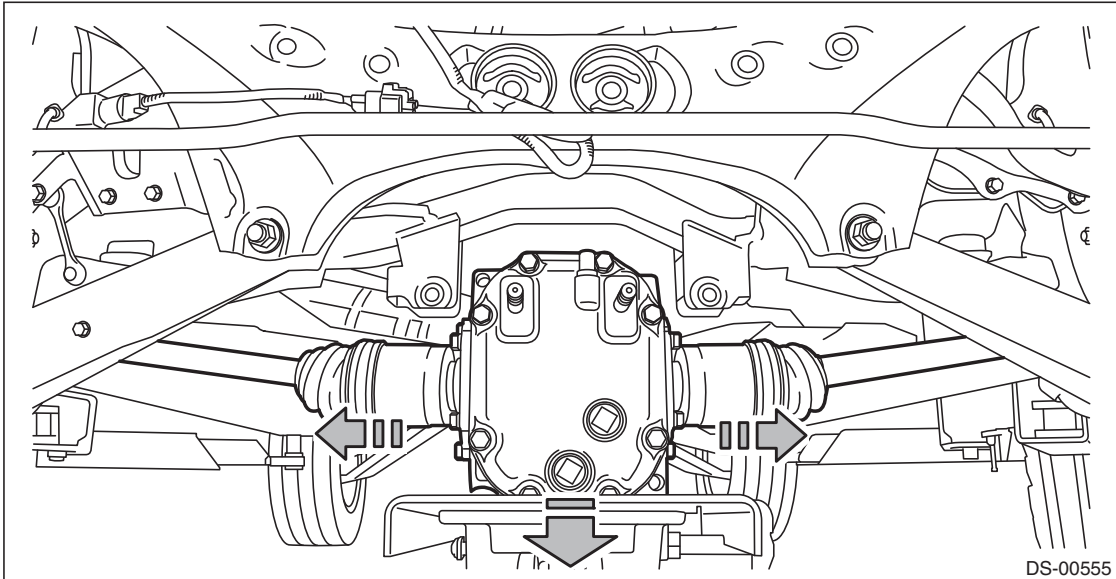
Rear Drive Shaft

DRIVE SHAFT SYSTEM

10) Completely pull out the rear axle shaft assembly while lowering the rear differential.

CAUTION:

Pay attention to avoid damaging the boot of axle shaft.



11) Remove the rear axle shaft assembly from the housing assembly - rear axle.

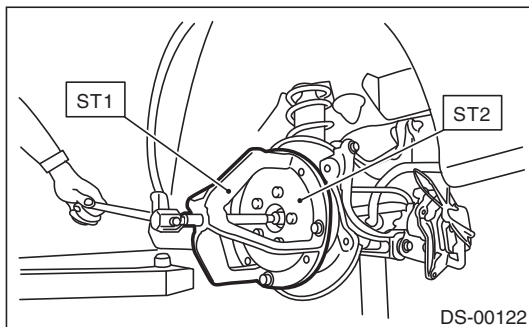
NOTE:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



Rear Drive Shaft

DRIVE SHAFT SYSTEM

B: INSTALLATION

1) Replace the rear differential side oil seal. <Ref. to DI-60, REPLACEMENT, Rear Differential Side Oil Seal.>

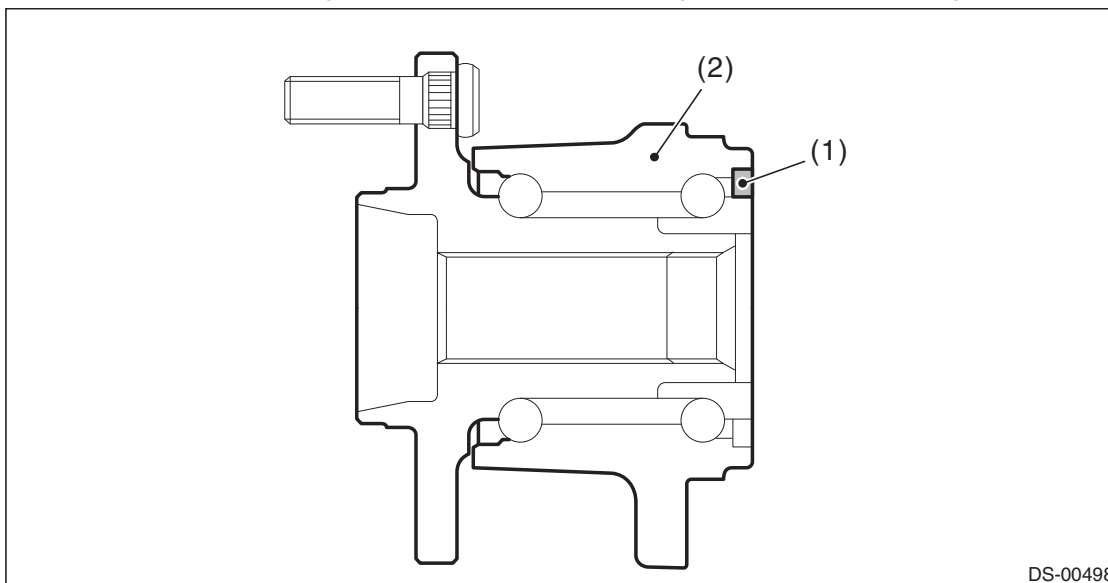
NOTE:

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

2) Insert the axle shaft assembly into the rear hub spline, and pull in the axle shaft assembly into specified position.

CAUTION:

- Be careful not to damage the magnetic encoder.
- Do not get closer the tool which charged magnetism to magnetic encoder.
- Do not tap the axle shaft using a hammer when installing axle shaft assembly.



(1) Magnetic encoder

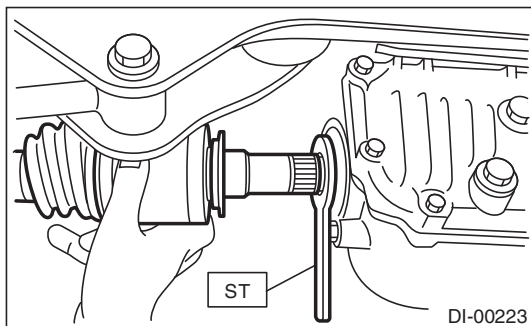
(2) Hub unit COMPL - rear axle

3) Temporarily tighten the nut - axle.

4) Using the ST, install the rear axle shaft assembly to the rear differential.

Preparation tool:

ST: OIL SEAL PROTECTOR (28099PA090)



5) Install the rear differential assembly to the rear sub frame assembly.

For installation of VA type and T type, refer to the differential section. <Ref. to DI-24, INSTALLATION, Rear Differential (T-type).>

CAUTION:

Be sure to use a new self-locking nut.

6) Install the sensor assembly - headlight beam leveler.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

7) While pressing the brake pedal, tighten the new axle nuts to the specified torque.

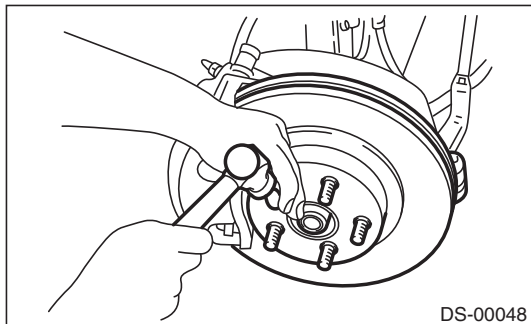
CAUTION:

Do not load the rear axle before tightening the nut - axle. Doing so may damage the hub unit COMPL.

Tightening torque:

190 N·m (19.37 kgf-m, 140.1 ft-lb)

8) Lock the nut - axle securely.



9) Fill differential gear oil.

10) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

11) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-16, PROCEDURE, Auto Headlight Beam Leveler System.>

C: DISASSEMBLY

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

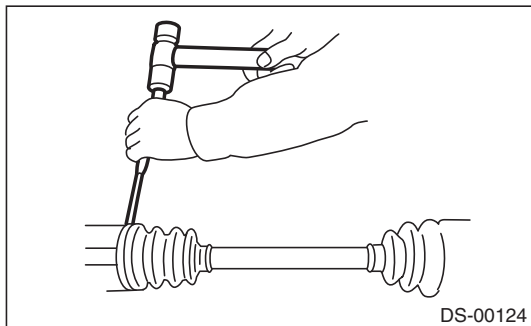
CAUTION:

Be careful not to damage the boot.

(1) Using a flat tip screwdriver or plier, loosen the boot band on the large end of DOJ boot.

CAUTION:

Be careful not to damage the boot.



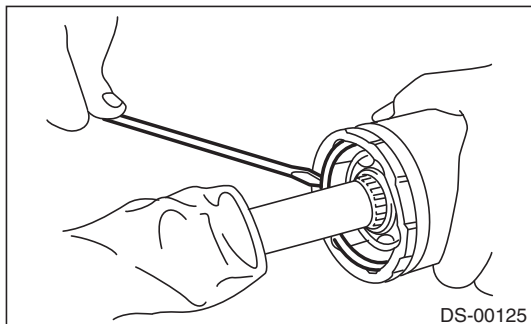
(2) Remove the boot band on the small end of DOJ boot in the same manner.

(3) Remove the large end of DOJ boot from DOJ outer race.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

- (4) Remove the round snap ring at the neck of DOJ outer race with a flat tip screwdriver.



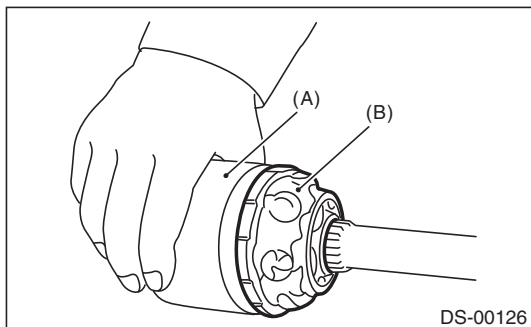
- (5) Take out the DOJ outer race from the shaft assembly.
(6) Wipe off the grease and take out the ball bearings.

CAUTION:

The grease is a special grease (grease for constant velocity joints). Do not mix with other greases.

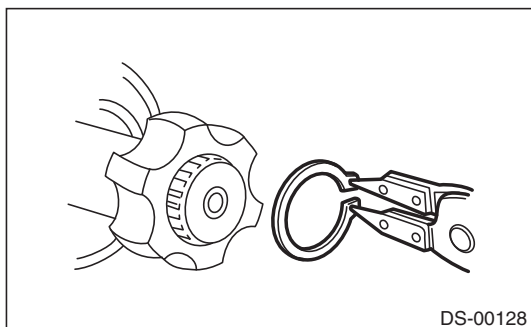
NOTE:

Disassemble the parts taking care not to lose balls.



- (A) Outer race
(B) Grease

- 2) Remove the cage from the inner race.
(1) Turn the cage by a half pitch to the track groove of inner race and shift the cage.
(2) Using pliers, remove the snap ring fixing the inner race to the shaft.



- (3) Take out the DOJ inner race.
(4) Take off the DOJ cage from shaft and remove the DOJ boot.

CAUTION:

Wrap shaft splines with vinyl tape to protect the boot from scratches.

- 3) Remove the BJ boot or EBJ boot in the same procedure as the DOJ boot.

NOTE:

The BJ is a non-disassembly part, so the axle shaft disassembly stops here.

D: ASSEMBLY

CAUTION:

Wrap shaft splines with vinyl tape to protect the boot from scratches.

NOTE:

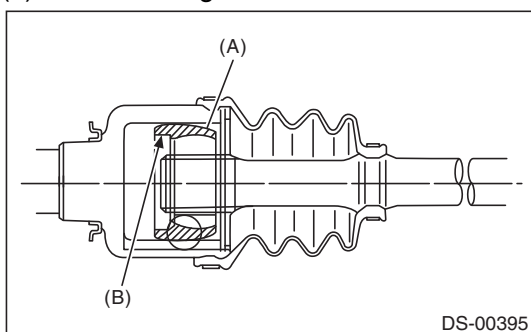
Use specified grease.

Grease:

EDJ, DOJ side: NKG814

BJ side, DOJ side: NKG814

- 1) Install the BJ or EBJ boot in specified position on the shaft assembly, and fill it with 50 to 60 g (1.76 to 2.12 oz) of specified grease.
- 2) Install the DOJ inner race to the shaft.
 - (1) Install the DOJ or EDJ boot onto shaft.
 - (2) Insert the cage onto shaft.



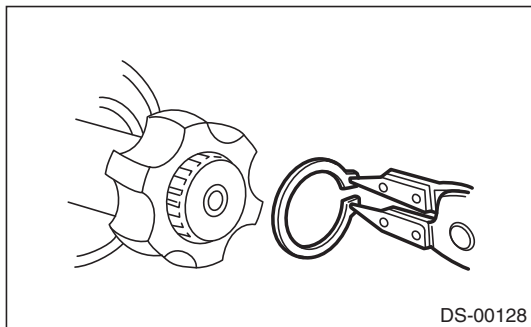
(A) Cage

(B) Cutout portion

NOTE:

Insert the cage with the cutout portion facing the shaft end, since the cage has an orientation.

- (3) Install the inner race on shaft and fix the snap ring in place with pliers.



NOTE:

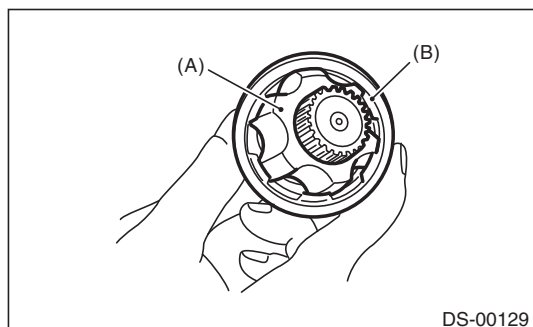
Confirm that the snap ring is completely fitted in the shaft groove.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

3) Install the cage, which is already inserted into the shaft assembly to the inner race.

(1) Install the cage (B) with the protruding section aligned with the track on the inner race (A), and turn by a half pitch.



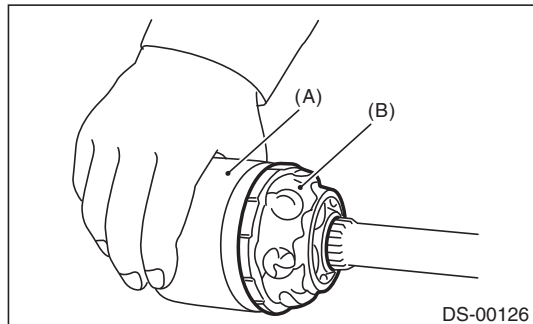
(2) Fill 80 to 90 g (2.82 to 3.17 oz) of specified grease into the inner side of the DOJ or EDJ outer race.

(3) Apply a thin coat of specified grease to the cage pocket and ball.

(4) Insert the ball bearings into the cage pocket.

4) Connect the outer race to the shaft assembly.

(1) Align the outer race track and ball positions, and place the shaft, inner race, cage and ball bearings in the original positions, and then fix outer race in place.



(A) Outer race

(B) Grease

(2) Install the snap ring in the groove on the DOJ outer race.

CAUTION:

Be careful of the following items during installation:

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

(3) 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 the shaft.

(4) Install the DOJ boot and EDJ boot taking care not to twist it.

NOTE:

- The inside of the large end of DOJ or EDJ boot and the boot groove shall be cleaned so as to be free from grease and other substances.
- When installing the DOJ or EDJ boot, position the outer race of DOJ or EDJ boot at center of the stroke.

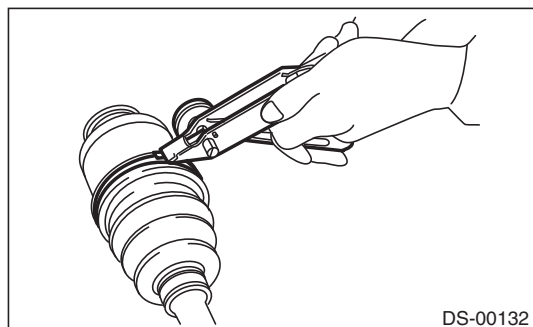
5) Tighten the boot band. (double loop type)

CAUTION:

- Be careful not to damage the boot.
- When tightening boot, use care so that the air within the boot is appropriate.
- Once assembled, extend and retract the DOJ repeatedly to provide an equal coating of grease.
 - (1) Put a new band through the clip and wind twice in the band groove of the boot.
 - (2) Pinch the end of band with pliers. Hold the clip and tighten securely.
 - (3) Tighten the band using the ST.

Preparation tool:

ST: BAND TIGHTENING TOOL (925091000)



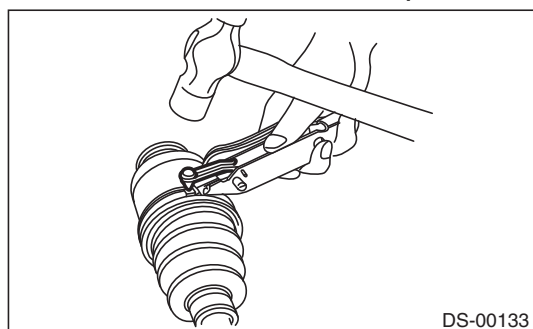
NOTE:

Tighten the band until it cannot be moved by hand.

- (4) Tap the clip with the punch provided at the end of the ST.

Preparation tool:

ST: BAND TIGHTENING TOOL (925091000)



NOTE:

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

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

CAUTION:

Make sure that the end of the band is in close contact with clip.

6) Tighten the boot band. (locking tab type)

CAUTION:

- Be careful not to damage the boot.
- When tightening boot, use care so that the air within the boot is appropriate.
- Once assembled, extend and retract the DOJ repeatedly to provide an equal coating of grease.

Preparation tool:

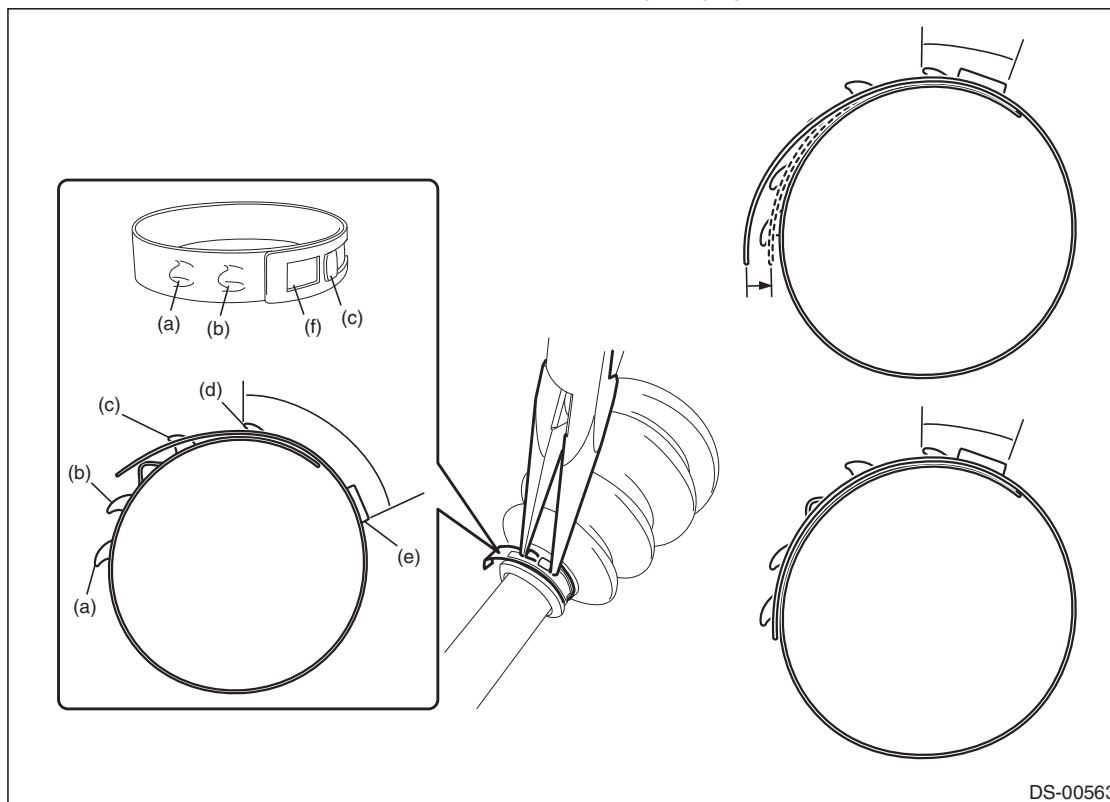
Needle nose pliers

- (1) Place a new band onto the groove of the boot.
- (2) Pinch (e) and (d) of the band with needle nose pliers, and align with the convex claw (c) for temporarily tightening position.

Rear Drive Shaft

DRIVE SHAFT SYSTEM

- (3) Keep tightening until claw (a) is seen through the claw window (f) and hold.
- (4) While holding the end of the band, hook the claw (a) with the claw window (f).
- (5) Make sure the claw (a) and claw (b) are both securely engage to the claw window.



- | | | |
|----------|---|----------------------------------|
| (a) Claw | (c) Convex claw for temporarily tightening position | (e) Holding portion using pliers |
| (b) Claw | (d) Holding portion using pliers | (f) Claw window |

7) Extend and retract the DOJ or EDJ repeatedly to provide an equal coating of grease.

E: INSPECTION

Check the removed parts for damage, wear, corrosion etc. Repair or replace if defective.

- **DOJ (Double Offset Joint):**

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

- **BJ (Bell Joint):**

Check for seizure, corrosion, damage and excessive play.

- **EBJ (High-Efficiency Compact Ball fixed Joint)**

Check for seizure, corrosion, damage and excessive play.

- **Shaft:**

Check for excessive bending, twisting, damage and wear.

- **Boot:**

Check for wear, warping, breakage and scratches.

- **Grease:**

Check for discoloration and fluidity.

General Diagnostic Table

DRIVE SHAFT SYSTEM

9. General Diagnostic Table

A: INSPECTION

NOTE:

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

Symptoms	Possible cause	Corrective action
Noise or vibration from propeller shaft	- Center bearing - Runout of propeller shaft - Loose or gap at connections	Inspect the propeller shaft. <Ref. to DS-15, INSPECTION, Propeller Shaft.>
Abnormal wheel vibration	Wheel is out of balance.	Check the wheel balance. <Ref. to WT-7, WHEEL BALANCING, INSPECTION, Tire and Wheel.>
	Front wheel alignment	Check the front wheel alignment. <Ref. to FS-7, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignment. <Ref. to RS-8, INSPECTION, Wheel Alignment.>
	Front strut	Check the front strut. <Ref. to FS-45, INSPECTION, Front Strut.>
	Rear shock absorber	Check the rear shock absorber. <Ref. to RS-30, INSPECTION, Rear Shock Absorber.>
	Front axle shaft	Check the front axle shaft. <Ref. to DS-65, INSPECTION, Front Drive Shaft.>
	Rear axle shaft	Check the rear axle shaft. <Ref. to DS-76, INSPECTION, Rear Drive Shaft.>
	Hub unit COMPL - front axle	Check the hub unit COMPL - front axle. <Ref. to DS-33, INSPECTION, Front Hub Unit Bearing.>
	Hub unit COMPL - rear axle	Check the hub unit COMPL - rear axle. <Ref. to DS-54, INSPECTION, Rear Hub Unit Bearing.>
Noise from the underbody	Wheel is out of balance.	Check the wheel balance. <Ref. to WT-7, WHEEL BALANCING, INSPECTION, Tire and Wheel.>
	Front wheel alignment	Check the front wheel alignment. <Ref. to FS-7, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignment. <Ref. to RS-8, INSPECTION, Wheel Alignment.>
	Front strut	Check the front strut. <Ref. to FS-45, INSPECTION, Front Strut.>
	Rear shock absorber	Check the rear shock absorber. <Ref. to RS-30, INSPECTION, Rear Shock Absorber.>



General Diagnostic Table

DRIVE SHAFT SYSTEM

Provided Exclusively on Ebay
by Seller "ySubaruManuals"

