

CLUTCH SYSTEM

CL

	Page
1. General Description	2
2. Clutch Disc and Cover	10
3. Flywheel	13
4. Release Bearing and Lever	14
5. Operating Cylinder	16
6. Master Cylinder	18
7. Clutch Pipe and Hose	21
8. Clutch Fluid	23
9. Clutch Fluid Air Bleeding	24
10. Clutch Pedal	25
11. Clutch Switch	29
12. General Diagnostic Table	33

General Description

CLUTCH SYSTEM

1. General Description

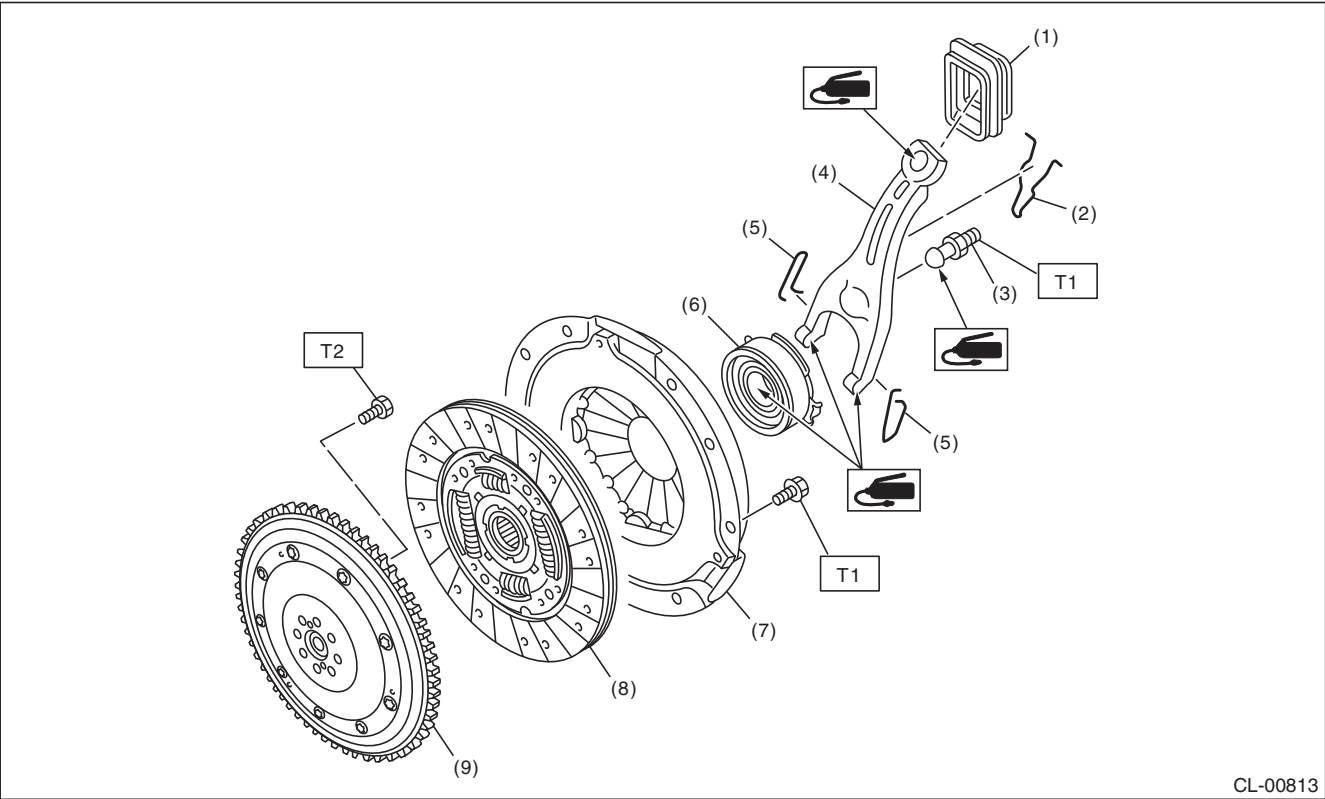
A: SPECIFICATION

Model			2.5 L		
Transmission type			6MT		
Clutch cover	Type		Push type		
	Diaphragm set load N (kgf, lbf)		5,688 (580, 1,279)		
Clutch disc	Facing material		Woven (non-asbestos)		
	O.D. × I.D. × Thickness mm (in)	Flywheel side	230 × 155 × 3.2 (9.06 × 6.10 × 0.126)		
		Clutch cover side	230 × 155 × 3.5 (9.06 × 6.10 × 0.138)		
	Spline outer diameter mm (in)		25.2 (0.992), (number of teeth: 24)		
	Depth of rivet head mm (in)	Flywheel side	1.35 — 1.95 (0.053 — 0.077)		
		Clutch cover side	1.65 — 2.25 (0.065 — 0.089)		
		Limit of sinking	0.8 (0.031)		
	Deflection limit mm (in)		0.7 (0.028) at R = 110 (4.33)		
Clutch release lever ratio			1.6		
Release bearing			Grease-packed self-aligning		
Clutch pedal	Full stroke mm (in)		130 — 135 (5.12 — 5.31)		
	Free play mm (in)		4 — 11 (0.16 — 0.43)		
Flywheel	Type		Flexible		



B: COMPONENT

1. CLUTCH ASSEMBLY



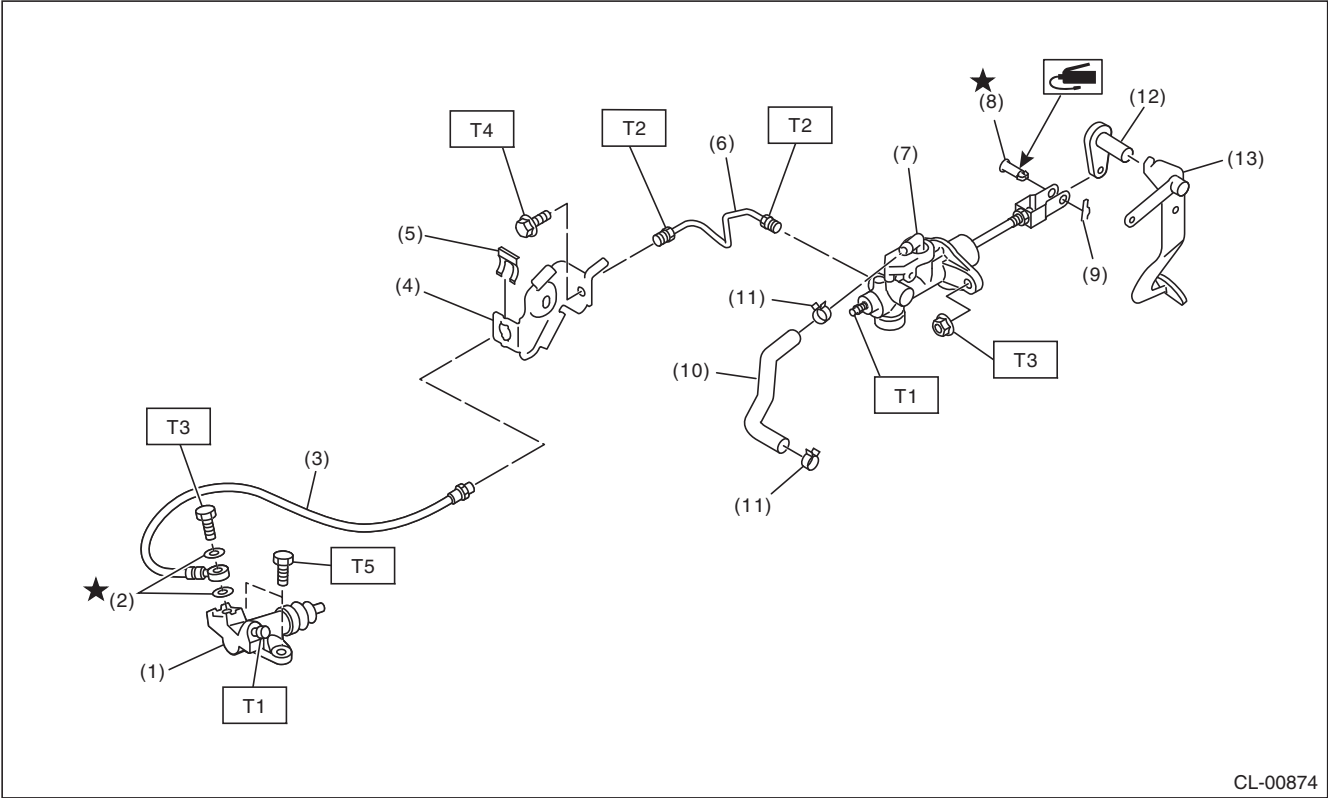
- | | |
|-------------------|-----------------------|
| (1) Dust cover | (6) Release bearing |
| (2) Lever spring | (7) Clutch cover |
| (3) Pivot | (8) Clutch disc |
| (4) Release lever | (9) Flexible flywheel |
| (5) Clip | |

Tightening torque: N·m (kgf-m, ft-lb)
T1: 16 (1.6, 11.8)
T2: <Ref. to CL-13, INSTALLATION, Flywheel.>

General Description

CLUTCH SYSTEM

2. CLUTCH PIPE AND HOSE



CL-00874

- (1) Operating cylinder
- (2) Gasket
- (3) Clutch hose
- (4) Bracket
- (5) Clamp
- (6) Clutch pipe
- (7) Master cylinder ASSY

- (8) Clevis pin
- (9) Snap pin
- (10) Tank hose
- (11) Clamp
- (12) Lever
- (13) Pedal

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

T1: 7.8 (0.8, 5.8)

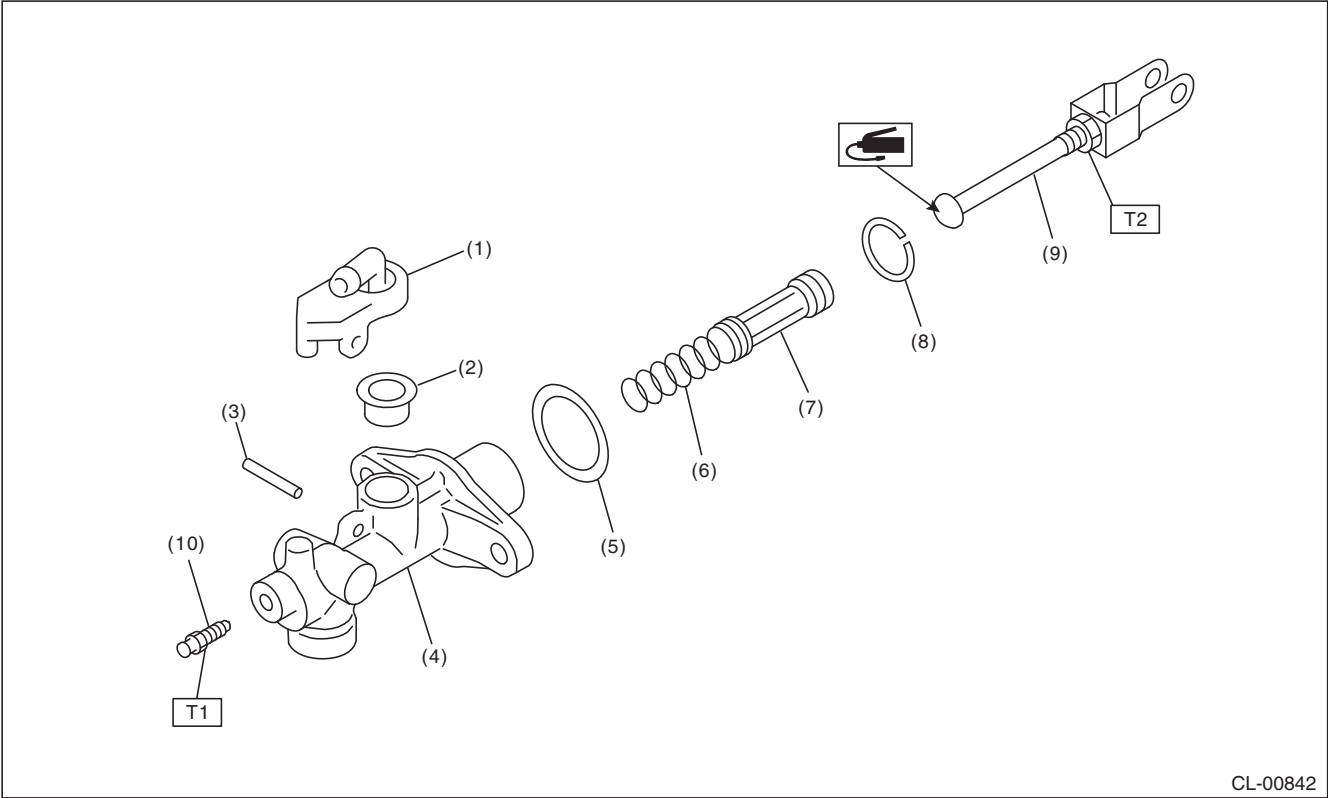
T2: 15 (1.5, 11.1)

T3: 18 (1.8, 13.3)

T4: 25 (2.5, 18.4)

T5: 37 (3.8, 27.3)

3. MASTER CYLINDER



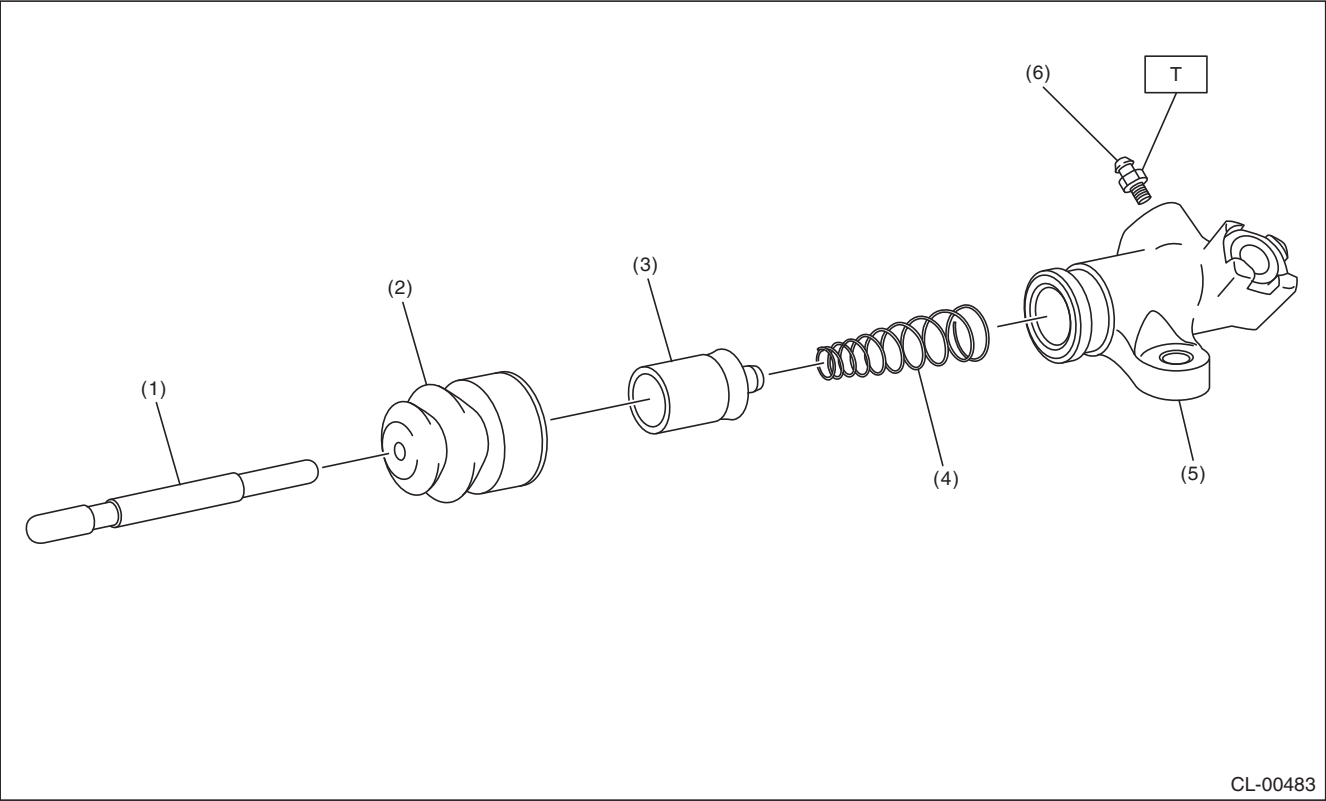
- | | |
|---------------------|----------------------|
| (1) Nipple | (6) Return spring |
| (2) Oil seal | (7) Piston |
| (3) Straight pin | (8) Piston stop ring |
| (4) Master cylinder | (9) Push rod ASSY |
| (5) Seat | (10) Breather screw |

Tightening torque: N-m (kgf-m, ft-lb)
T1: 7.8 (0.8, 5.8)
T2: 10 (1.0, 7.4)

General Description

CLUTCH SYSTEM

4. OPERATING CYLINDER



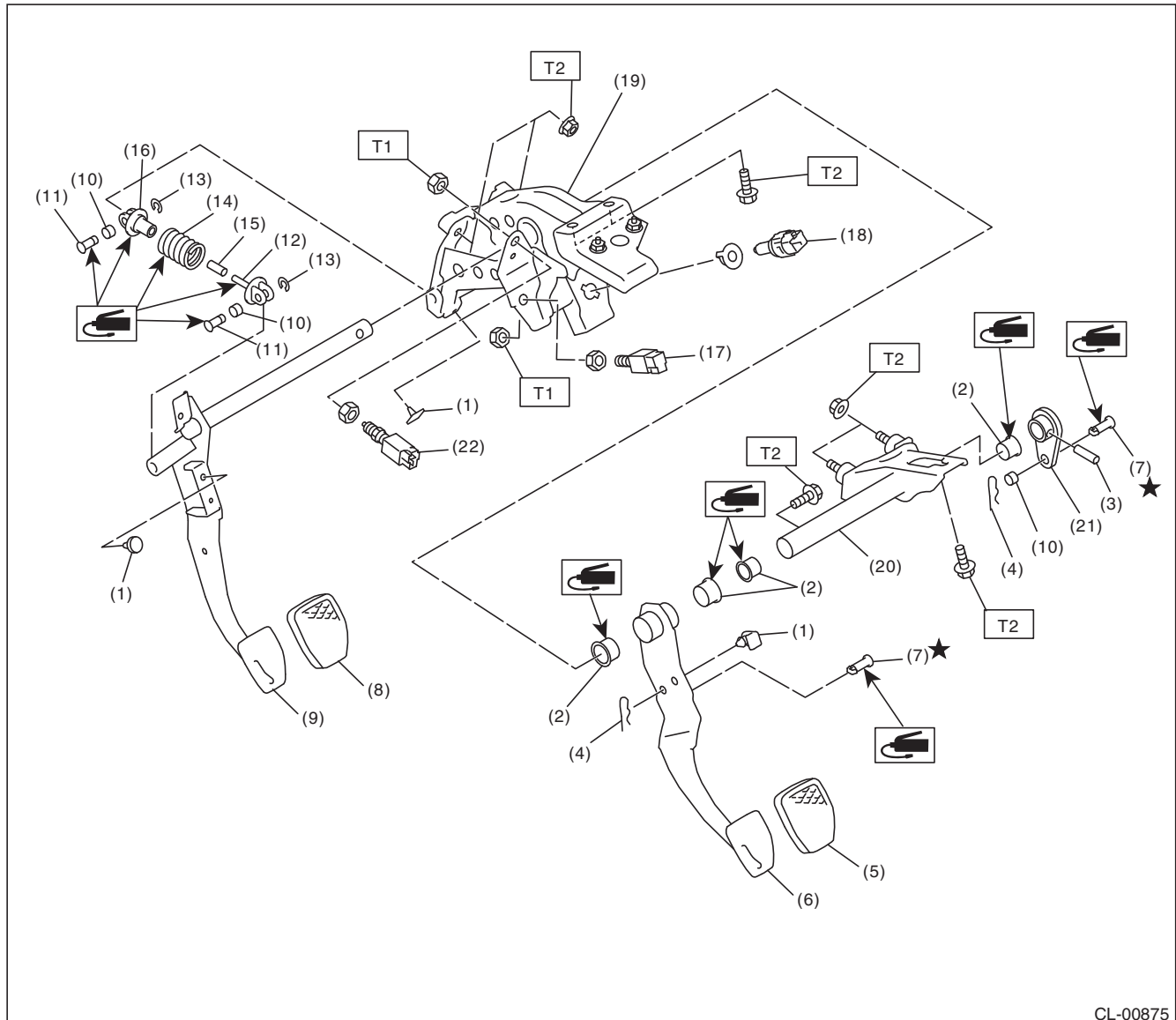
- | | |
|--------------|------------------------|
| (1) Push rod | (4) Piston spring |
| (2) Boot | (5) Operating cylinder |
| (3) Piston | (6) Breather screw |

Tightening torque: N-m (kgf-m, ft-lb)
T: 7.8 (0.8, 5.8)

General Description

CLUTCH SYSTEM

5. CLUTCH PEDAL



CL-00875

- | | | |
|----------------------|------------------------|---|
| (1) Stopper | (10) Bushing C | (19) Pedal bracket |
| (2) Bushing | (11) Clutch clevis pin | (20) Clutch master cylinder bracket |
| (3) Spring pin | (12) Assist rod A | (21) Lever |
| (4) Snap pin | (13) Clip | (22) Clutch start switch (model with push button start) |
| (5) Brake pedal pad | (14) Assist spring | |
| (6) Brake pedal | (15) Assist bushing | |
| (7) Clevis pin | (16) Assist rod B | |
| (8) Clutch pedal pad | (17) Clutch switch | |
| (9) Clutch pedal | (18) Stop light switch | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)

T2: 18 (1.8, 13.3)

General Description

CLUTCH SYSTEM

C: CAUTION

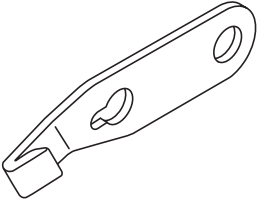
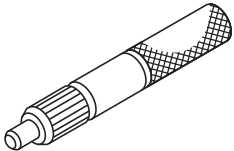
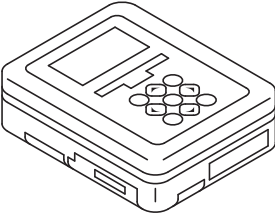
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, 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 fluid, grease etc. or equivalent. Do not mix fluid, 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 O-rings or snap rings, apply sufficient amount of fluid to avoid damage and deformation.
- Before securing a part in a vise, place cushioning material such as wood blocks, aluminum plate or cloth between the part and the vise.
- Keep fluid away from the vehicle body. If any fluid contacts the vehicle body, immediately flush the area with water.

General Description

CLUTCH SYSTEM

D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498497100	498497100	CRANKSHAFT STOPPER	- Used for stopping rotation of the flywheel. - Used for flexible flywheel model.
 ST-499747100	499747100	CLUTCH DISC GUIDE	Used for installing the clutch disc to the flywheel.
 ST1B022XU0	1B022XU0	SUBARU SELECT MONITOR III KIT	Used for installing and adjusting the clutch start switch.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Dial gauge	Used for measuring clutch disc run-out.
Depth gauge	Used for measuring clutch disc wear.
Angle gauge	Used for tightening the flywheel.

Clutch Disc and Cover

CLUTCH SYSTEM

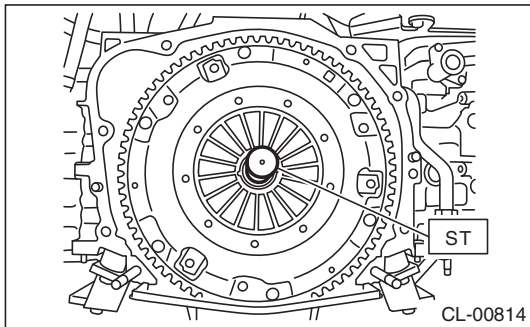
2. Clutch Disc and Cover

A: REMOVAL

1) Remove the transmission assembly from the vehicle. <Ref. to 6MT-26, REMOVAL, Manual Transmission Assembly.>

2) Attach the ST on the flywheel.

ST 499747100 CLUTCH DISC GUIDE



3) Remove the clutch cover and clutch disc.

NOTE:

- Take care not to allow oil to touch the clutch disc face.
- Do not disassemble the clutch cover or clutch disc.

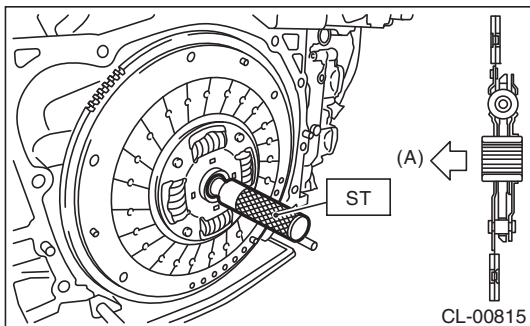
B: INSTALLATION

1) Insert the ST into the clutch disc and attach to the flywheel by inserting the ST end into pilot bearing.

NOTE:

When installing the clutch disc, be careful to attach in the correct direction.

ST 499747100 CLUTCH DISC GUIDE



(A) Flywheel side

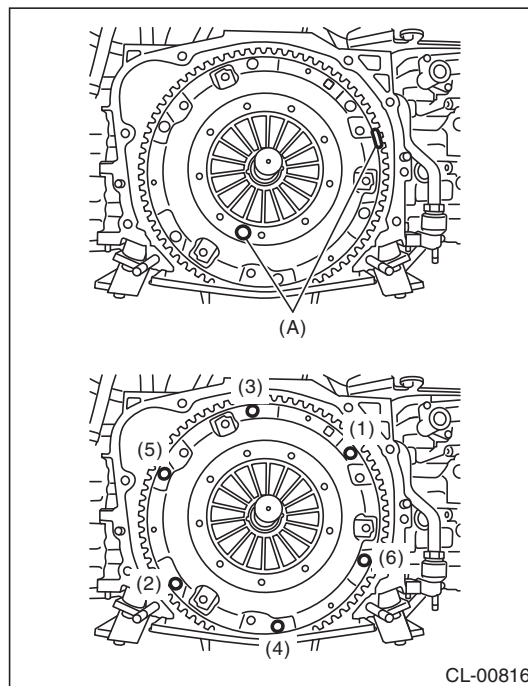
2) Install the clutch cover to the flywheel and tighten the bolts to the specified torque.

NOTE:

- When installing a clutch cover to the flywheel, position the clutch cover so that the spacing between the unbalance marks (paint mark) on the flywheel and clutch cover is 120° or more apart. (The unbalance mark indicates the direction of residual unbalance.)
- Temporarily tighten the bolts by hand. Each bolt should be tightened to the specified torque in a crisscross order.

Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



(A) Unbalance mark (paint)

3) Remove the ST.

ST 499747100 CLUTCH DISC GUIDE

4) Install the transmission assembly. <Ref. to 6MT-29, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1. CLUTCH DISC

1) Facing wear

Measure the depth from the facing surface to the rivet head. Replace if the face is worn locally or worn down to less than the specified value.

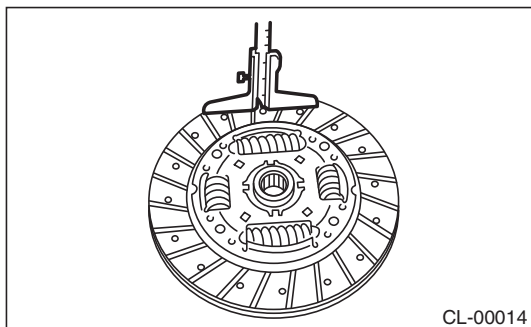
Depth to rivet head:

Limit of sinking

0.8 mm (0.031 in)

NOTE:

Do not wash the clutch disc with any type of cleaning fluid.

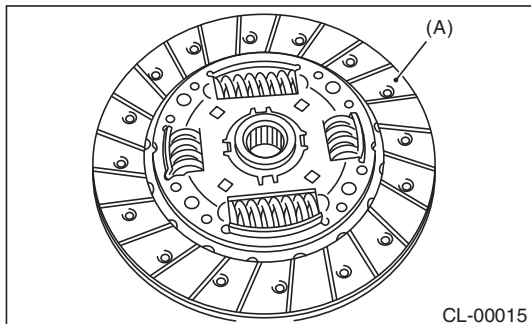


2) Hardened facing

Replace the clutch disc.

3) Oil soakage on facing

Replace the clutch disc and inspect the transmission front oil seal, transmission case mating surface, engine rear oil seal and other locations for oil leakage.



(A) Clutch facing

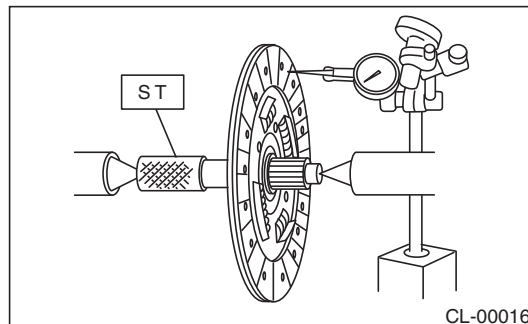
4) Deflection on facing

If deflection exceeds the specified value at the outer circumference of the facing, replace the clutch disc.

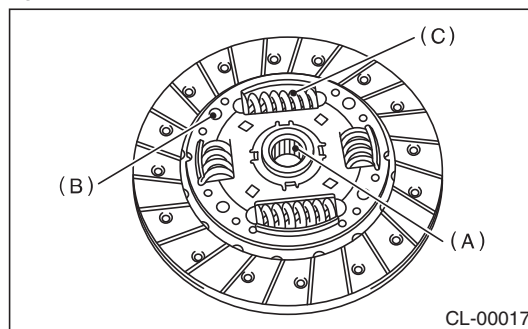
ST 499747100 CLUTCH DISC GUIDE

Limit for deflection:

0.7 mm (0.028 in) at R = 110 mm (4.33 in)



5) If there is spline wear, loose rivets, failed damper springs, etc., replace the clutch disc.



- (A) Spline
- (B) Rivet
- (C) Damper spring

Clutch Disc and Cover

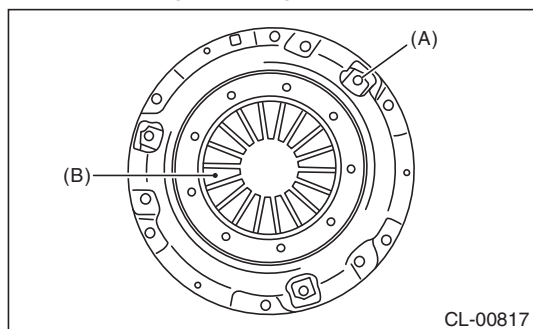
CLUTCH SYSTEM

2. CLUTCH COVER

NOTE:

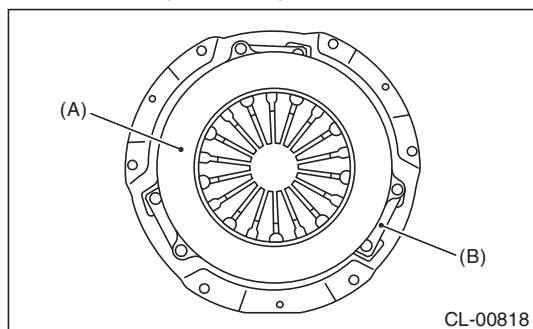
Visually check the following items without disassembling, and replace or repair if defective.

- 1) Loose thrust rivet
- 2) Damaged or worn bearing contact area at the center of diaphragm spring



- (A) Thrust rivet
(B) Diaphragm spring

- 3) Damaged or worn disc contact surface of the pressure plate
- 4) Loose strap plate installation area
- 5) Worn diaphragm sliding area

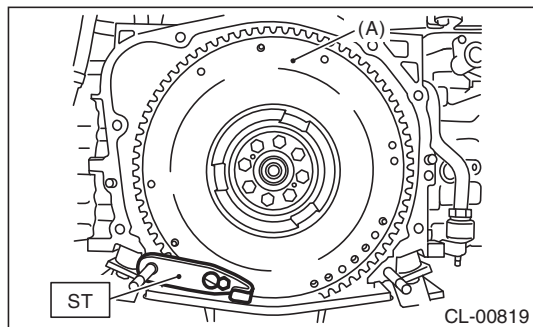


- (A) Pressure plate
(B) Strap plate

3. Flywheel

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to 6MT-26, REMOVAL, Manual Transmission Assembly.>
 - 2) Remove the clutch cover and clutch disc. <Ref. to CL-10, REMOVAL, Clutch Disc and Cover.>
 - 3) Attach the ST.
- ST 498497100 CRANKSHAFT STOPPER



(A) Flywheel

- 4) Remove the flywheel and crankshaft position sensor plate.

B: INSTALLATION

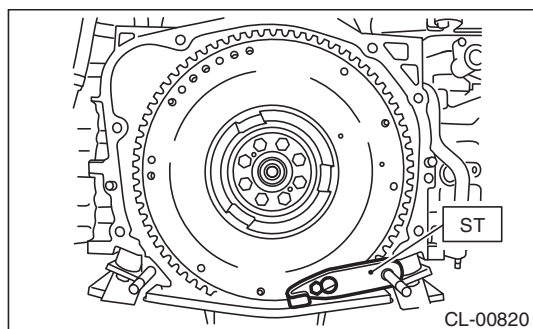
- 1) Temporarily tighten the crankshaft position sensor plate and flywheel.

NOTE:

Align the knock pin hole of the crankshaft position sensor plate to the knock pin of the crankshaft to secure the knock pin.

- 2) Attach the ST.

ST 498497100 CRANKSHAFT STOPPER

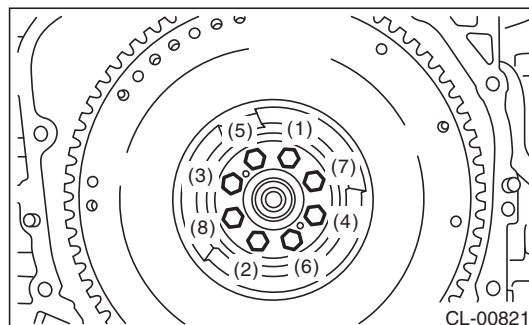


- 3) Tighten the flywheel mounting bolts in two stages.

- (1) Tighten the flywheel attachment bolts.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)



- (2) While checking the tightening angle with the angle gauge, further tighten the flywheel mounting bolts.

Tightening angle:

30° — 35°

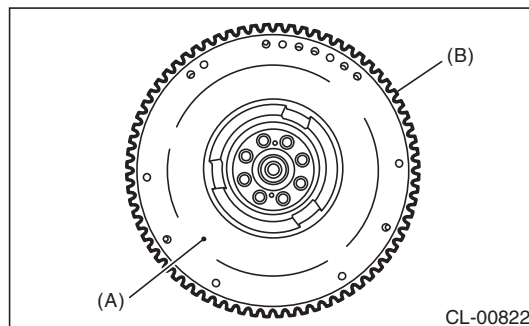
- 4) Install the clutch disc and cover. <Ref. to CL-10, INSTALLATION, Clutch Disc and Cover.>
- 5) Install the transmission assembly. <Ref. to 6MT-29, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

CAUTION:

Because the center bearing is grease-sealed and is a non-lubrication type, do not wash with gasoline or solvents.

- 1) If there is damage or defectiveness in the facing sliding surface or ring gear, replace the flywheel.



(A) Flywheel

(B) Ring gear

- 2) Smoothness of rotation

Rotate the ball bearing while applying pressure in the thrust direction.

- 3) If noise or excessive play is noted, replace the flywheel.

Release Bearing and Lever

CLUTCH SYSTEM

4. Release Bearing and Lever

A: REMOVAL

1) Remove the transmission assembly from the vehicle.

<Ref. to 6MT-26, REMOVAL, Manual Transmission Assembly.>

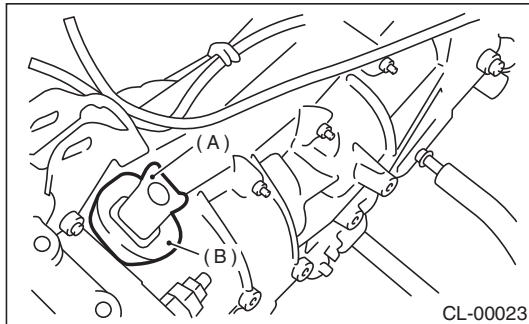
2) Remove the two clips from the release lever.

CAUTION:

Be careful not to deform the clips.

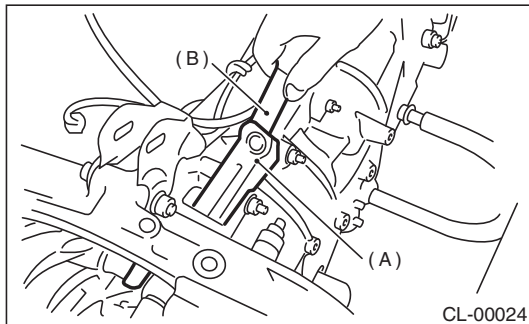
3) Remove the release bearing.

4) Remove the dust cover.



(A) Release lever
(B) Dust cover

5) Remove the lever spring from the pivot with a screwdriver by accessing it through the clutch housing release lever hole. Then remove the release lever.



(A) Release lever
(B) Screwdriver

B: INSTALLATION

NOTE:

Apply the specified grease to lubricate to the following points before installation.

- Contact surface of lever and pivot
- Contact surface of lever and bearing
- Transmission main shaft spline
- Contact surface of release bearing and transmission case

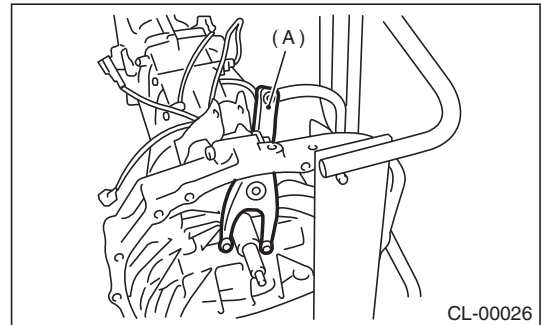
Grease

NICHIMOLY N-130 or equivalent

1) While pushing the release lever to the pivot and twisting it to both sides, fit the lever spring onto the raised portion of the pivot.

NOTE:

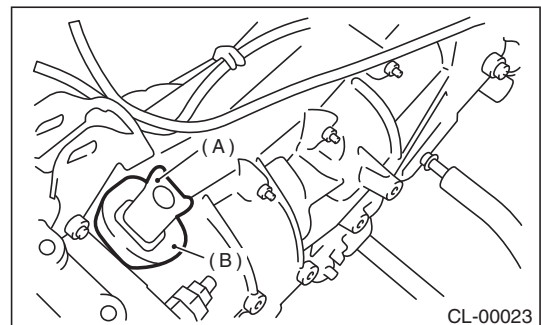
Observing from the main case hole, check that the lever spring is installed securely.



(A) Release lever

2) Install the release bearing and fasten it with two clips.

3) Install the dust cover.



(A) Release lever
(B) Dust cover

4) Check the bearing for smooth movement by operating the release lever.

5) Apply grease to the contact point of the release lever and operating cylinder.

Grease

NICHIMOLY N-130 or equivalent

Release Bearing and Lever

CLUTCH SYSTEM

6) Install the transmission assembly. <Ref. to 6MT-29, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1. RELEASE BEARING

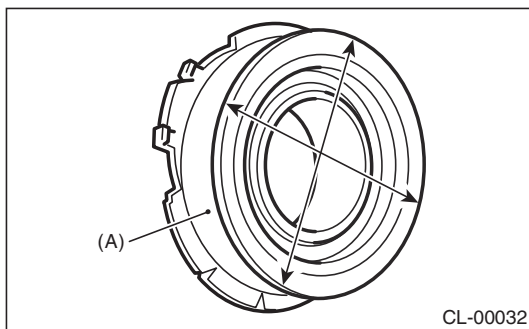
CAUTION:

Since this bearing is grease-sealed and is a non-lubrication type, do not wash with gasoline or any other solvent when servicing the clutch.

1) Check the bearing for smooth movement by applying force to the bearing in the radial direction.

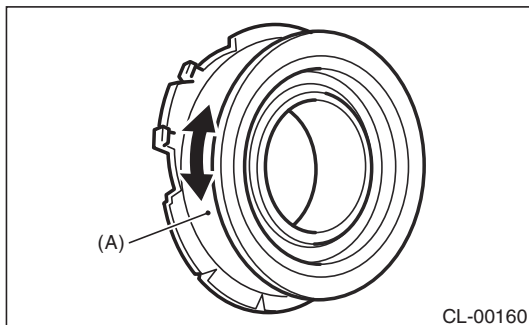
Radial direction stroke:

1.6 mm (0.063 in)



(A) Bearing case

2) While applying force to the bearing in the rotational direction, check the bearing for smooth rotation.

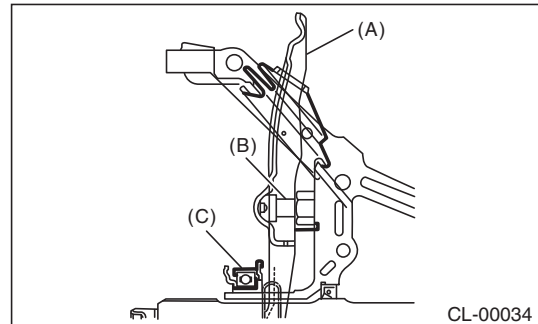


(A) Bearing case

3) Check for wear and damage at the bearing case surface in contact with the lever.

2. RELEASE LEVER

Check the pivot portion of the lever and the contact area with the release bearing case for wear.



- (A) Release lever
- (B) Pivot
- (C) Release bearing

Operating Cylinder

CLUTCH SYSTEM

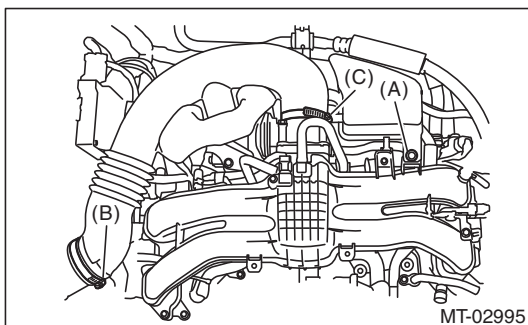
5. Operating Cylinder

A: REMOVAL

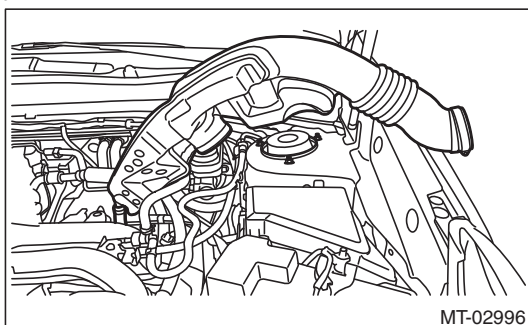
CAUTION:

Clutch fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

- 1) Remove the clip (A) from the air intake boot.
- 2) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 3) Loosen the clamp (C) which connects the air intake boot and throttle body.



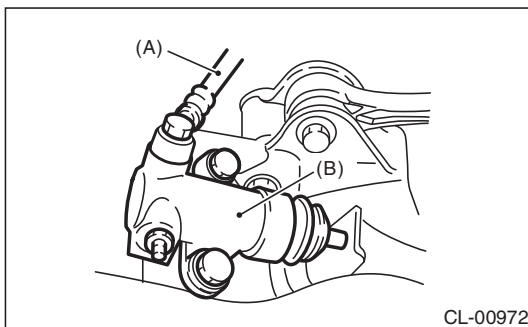
- 4) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 5) Disconnect the clutch hose from the operating cylinder.

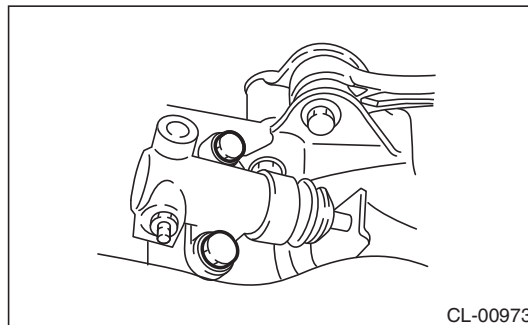
CAUTION:

Cover the hose joint to prevent the clutch fluid from flowing out.



- (A) Clutch hose
(B) Operating cylinder

- 6) Remove the operating cylinder from the transmission.



B: INSTALLATION

- 1) Install in the reverse order of removal.

NOTE:

- Before installing the operating cylinder, apply grease to the contact point of the release lever and operating cylinder.

Grease:

NICHIMOLY N-130 or equivalent

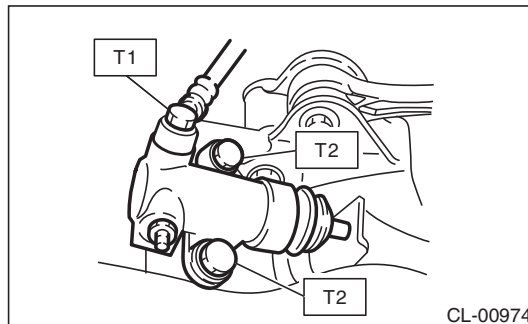
- Be sure to install the clutch hose with the mark side facing upward.
- Be careful not to twist the clutch hose during installation.
- Use a new gasket.

Tightening torque:

Operating cylinder

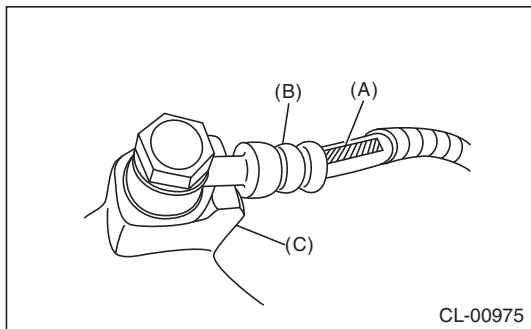
T1: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T2: 37 N·m (3.8 kgf-m, 27.3 ft-lb)



Operating Cylinder

CLUTCH SYSTEM



- (A) Mark
- (B) Clutch hose
- (C) Operating cylinder

Tightening torque:

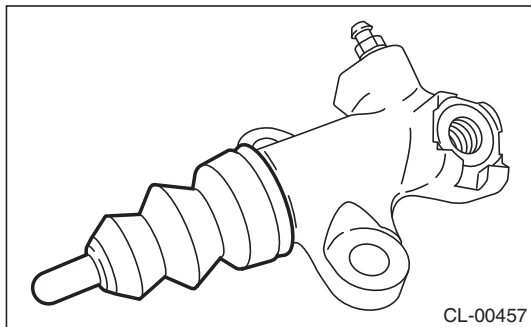
Air intake boot

3 N·m (0.3 kgf-m, 2.2 ft-lb)

2) After bleeding air from the operating cylinder, ensure that the clutch operates properly. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

C: DISASSEMBLY

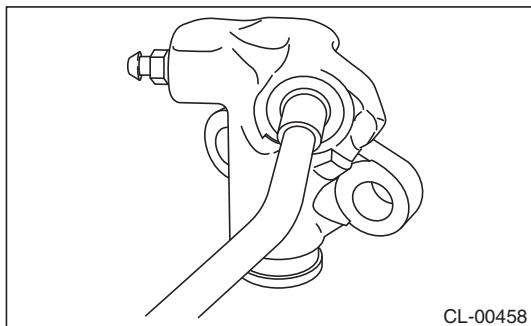
- 1) Remove the boot and push rod.



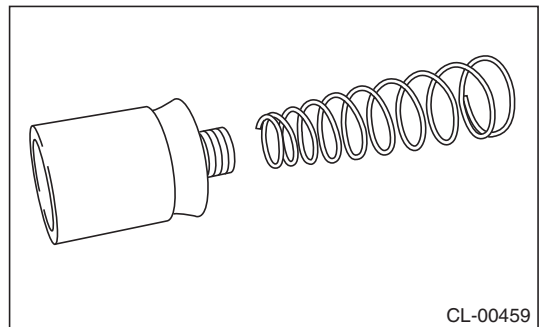
2) Apply compressed air through clutch hose attachment hole.

NOTE:

Face the piston hole down and place a piece of wood underneath to prevent the piston from popping out.



- 3) Separate the piston and piston spring.



D: ASSEMBLY

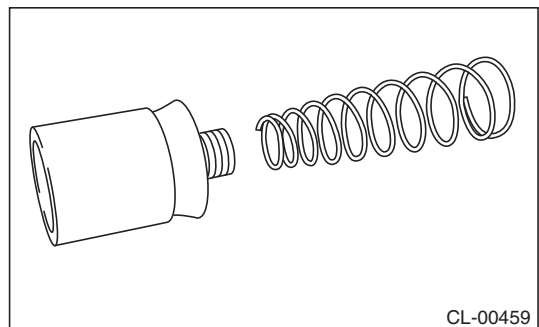
NOTE:

During assembly, apply hydraulic oil to all parts.

Recommended clutch fluid:

New FMVSS No. 116 DOT3 or DOT4

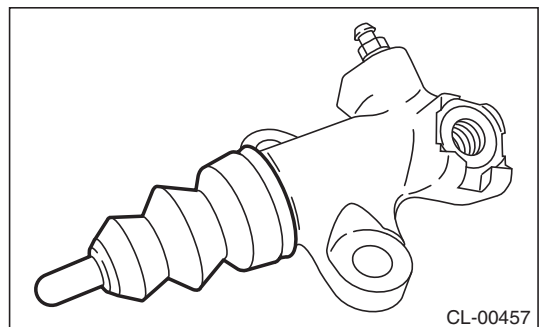
- 1) Install the piston spring onto the piston.



- 2) Insert piston into the operating cylinder.

- 3) Install push rod to the boot.

- 4) Install boot and push rod to the operating cylinder.



E: INSPECTION

- 1) Check that the operating cylinder is not damaged. Replace the operating cylinder if it is damaged.
- 2) Check the clutch fluid leakage on the operating cylinder or the boot for damage. Replace the operating cylinder if leaks or damages are noted.

Master Cylinder

CLUTCH SYSTEM

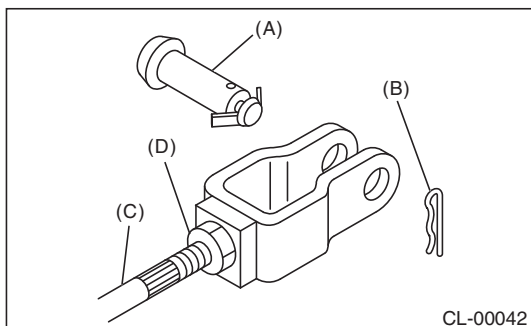
6. Master Cylinder

A: REMOVAL

CAUTION:

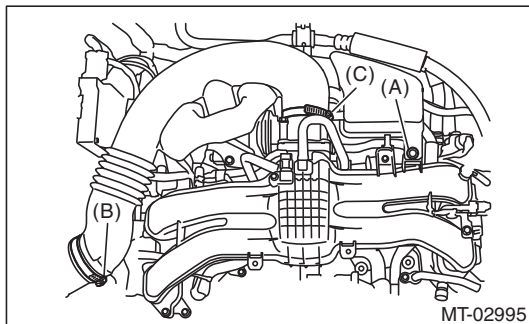
Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

- 1) Drain the clutch fluid. <Ref. to CL-23, Clutch Fluid.>
- 2) Remove the cover assembly - instrument panel LWR driver. <Ref. to EI-59, REMOVAL, Instrument Panel Lower Cover.>
- 3) Remove the snap pin and clevis pin, and then separate the push rod of the master cylinder from clutch pedal.

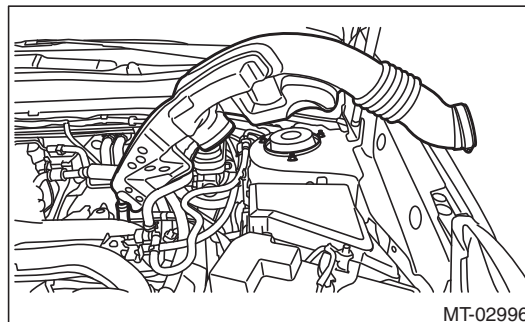


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Lock nut

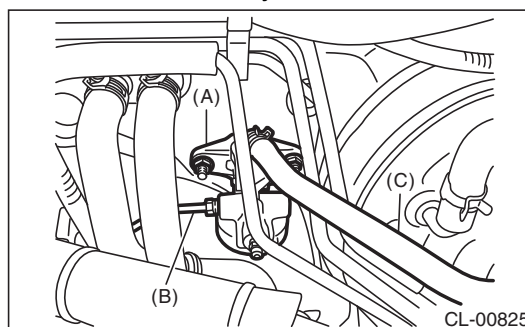
- 4) Remove the clip (A) from the air intake boot.
- 5) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 6) Loosen the clamp (C) which connects the air intake boot and throttle body.



- 7) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 8) Disconnect the clutch pipe and tank hose from the master cylinder.
- 9) Remove the master cylinder.



- (A) Master cylinder
- (B) Clutch pipe
- (C) Tank hose

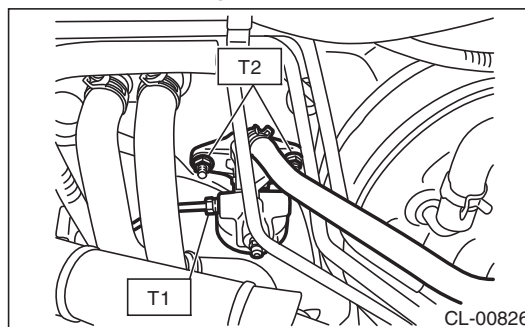
B: INSTALLATION

- 1) Install the master cylinder to the vehicle body, and connect the clutch pipe and tank hose to the master cylinder.

Tightening torque:

T1: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)



Master Cylinder

CLUTCH SYSTEM

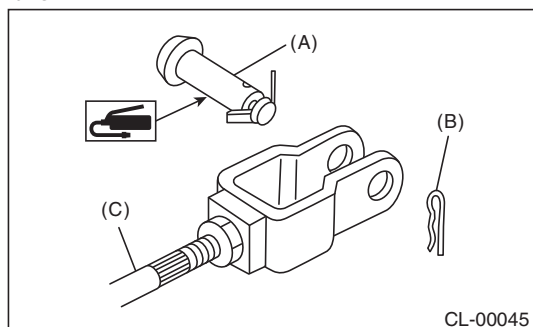
2) Connect the push rod of the master cylinder to the clutch pedal, and install the clevis pin and snap pin.

CAUTION:

Always use a new clevis pin.

NOTE:

Apply grease to the clevis pin.



- (A) Clevis pin
- (B) Snap pin
- (C) Push rod

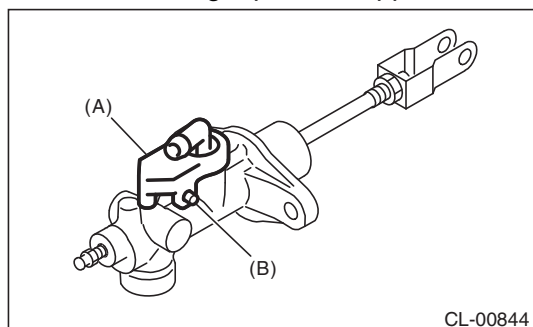
3) Install the cover assembly - instrument panel LWR driver. <Ref. to EI-60, INSTALLATION, Instrument Panel Lower Cover.>

4) After bleeding air from the clutch system, ensure that the clutch operates properly. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

5) Install the air intake boot assembly. <Ref. to IN(H4DO)-11, INSTALLATION, Air Intake Boot.>

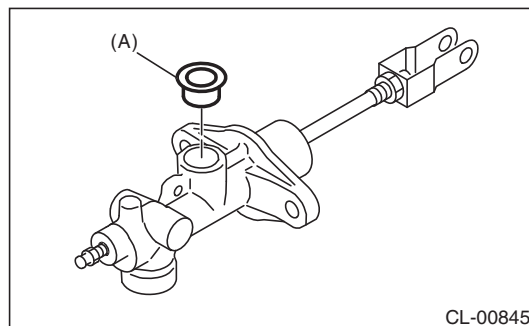
C: DISASSEMBLY

1) Remove the straight pin and nipple.



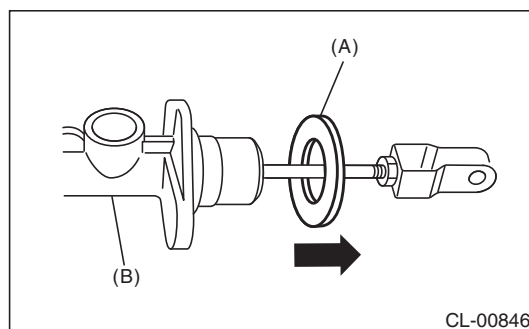
- (A) Nipple
- (B) Straight pin

2) Remove the oil seal.



- (A) Oil seal

3) Move the seat towards the rear.



- (A) Seat
- (B) Master cylinder

4) Remove the piston stop ring.

CAUTION:

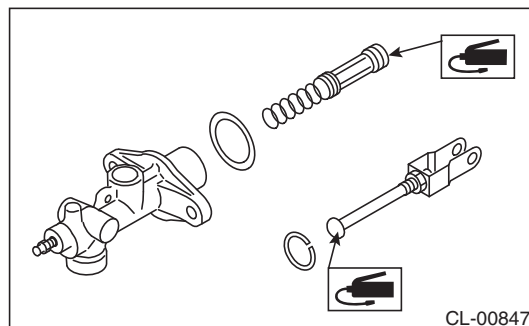
When removing the piston stop ring, be careful to prevent the rod, washer, piston and return spring from popping out.

D: ASSEMBLY

1) Apply a coat of grease to the contact surfaces of the push rod and piston before installation.

Grease:

SILICONE GREASE G-40M or equivalent



2) Assemble in the reverse order of disassembly.

Tightening torque:

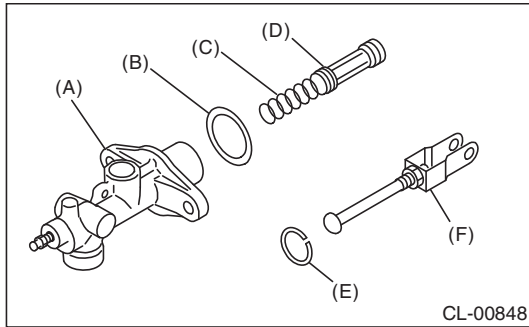
10 N·m (1.0 kgf-m, 7.4 ft-lb)

Master Cylinder

CLUTCH SYSTEM

E: INSPECTION

If any damage, deformation, wear, swelling, rust or other faults are found on the cylinder, piston, push rod, nipple, return spring, breather screw, seat or hose, replace the faulty part.



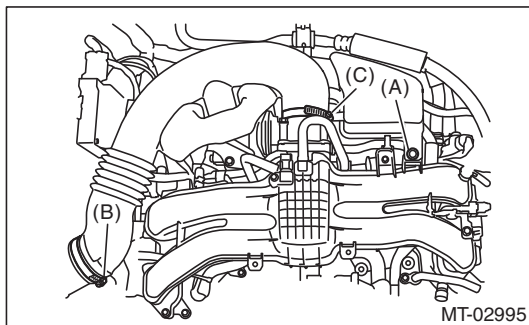
- (A) Master cylinder body
- (B) Seat
- (C) Return spring
- (D) Piston
- (E) Piston stop ring
- (F) Push rod ASSY



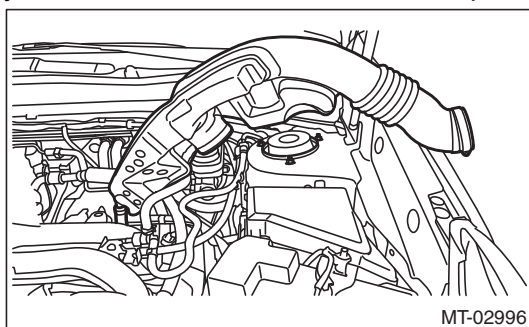
7. Clutch Pipe and Hose

A: REMOVAL

- 1) Remove the clip (A) from the air intake boot.
- 2) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 3) Loosen the clamp (C) which connects the air intake boot and throttle body.

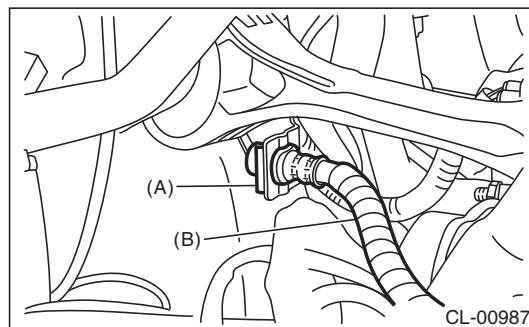


- 4) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



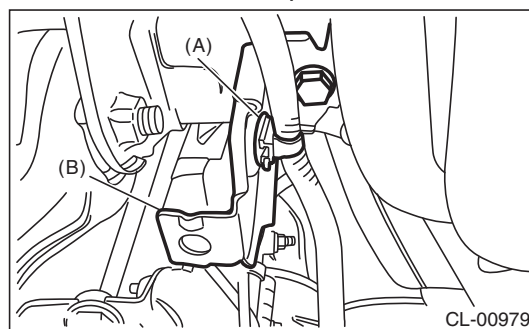
- 5) Drain the clutch fluid. <Ref. to CL-23, Clutch Fluid.>
- 6) Disconnect the clutch pipe from the clutch hose and master cylinder.

- 7) Pull out the clamp, then remove the clutch hose from the bracket.



- (A) Clamp
(B) Clutch hose

- 8) Disconnect the hose from operating cylinder.
- 9) Remove the harness clip from the bracket.



- (A) Harness clip
(B) Bracket

- 10) Remove the bracket.

Clutch Pipe and Hose

CLUTCH SYSTEM

B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Bleed air from the clutch fluid. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

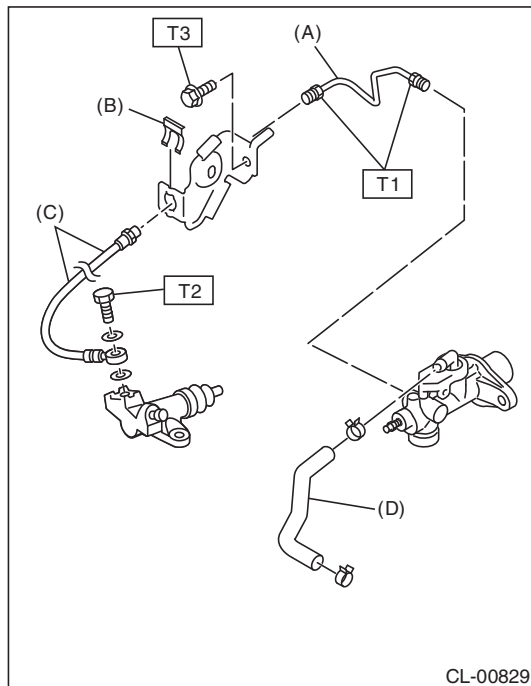
Tightening torque:

Clutch

T1: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T3: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



- (A) Clutch pipe
- (B) Clamp
- (C) Clutch hose
- (D) Tank hose

Tightening torque:

Air intake boot

3 N·m (0.3 kgf-m, 2.2 ft-lb)

C: INSPECTION

Check the pipes and hoses for breaks and damage. Check joints for fluid leakage. If crack, breakage or damage is found, repair or replace the faulty pipe or hose.

8. Clutch Fluid

A: INSPECTION

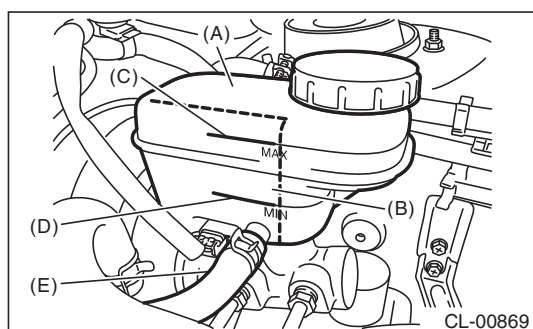
CAUTION:

Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

- 1) Park the vehicle on a level surface.
- 2) Inspect the fluid level using the scale on the outside of the reservoir tank. If the level is below "MIN", add fluid to bring it up to "MAX", and also inspect for leakage.

Recommended brake fluid:

New FMVSS No. 116 DOT3 or DOT4



- (A) Reservoir tank
- (B) Clutch fluid chamber
- (C) MAX. level
- (D) MIN. level
- (E) Tank hose

CAUTION:

This reservoir tank has the brake fluid chamber and the clutch fluid chamber. When checking the fluid level, always check the fluid from the clutch fluid chamber side where the tank hose is connected.

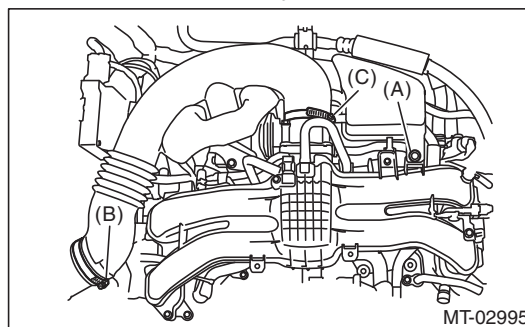
B: REPLACEMENT

CAUTION:

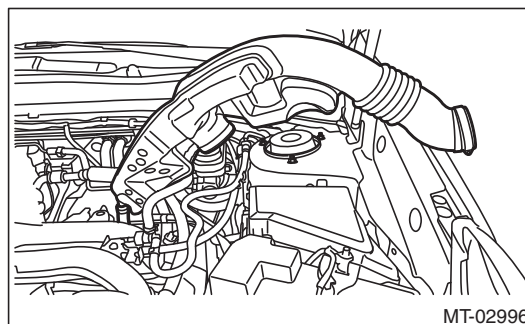
- Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.
- Use new FMVSS No. 116 DOT3 or DOT4.
- Cover the air breather with cloth to prevent clutch fluid from being splashed on surrounding parts when loosening the breather.
- Avoid mixing clutch fluid of different brands to prevent fluid performance from degrading.
- Be careful not to allow dirt or dust to enter the reservoir tank.

NOTE:

- During bleeding operation, keep the clutch reservoir tank filled with clutch fluid to prevent entry of air.
- Clutch pedal must be operated very slowly.
- Bleed air from the oil line with help of a co-worker.
- The required amount of clutch fluid is approximately 150 mL (5.1 US fl oz, 5.3 Imp fl oz) for total clutch system.
- 1) Remove the clip (A) from the air intake boot.
- 2) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 3) Loosen the clamp (C) which connects the air intake boot and throttle body.



- 4) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 5) Drain the clutch fluid from the air breather of the operating cylinder.
- 6) Refill the reservoir tank with recommended clutch fluid.

Recommended clutch fluid:

New FMVSS No. 116 DOT3 or DOT4

- 7) If necessary, bleed air from the clutch fluid. <Ref. to CL-24, Clutch Fluid Air Bleeding.>
- 8) Install the air intake boot assembly. <Ref. to IN(H4DO)-11, INSTALLATION, Air Intake Boot.>

Clutch Fluid Air Bleeding

CLUTCH SYSTEM

9. Clutch Fluid Air Bleeding

A: PROCEDURE

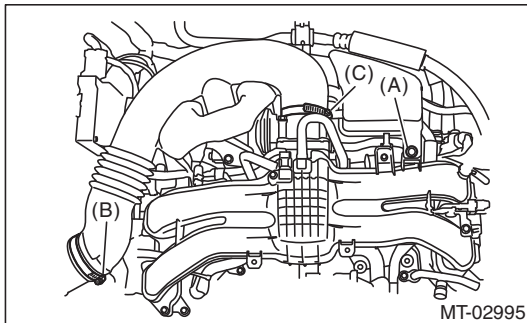
CAUTION:

Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

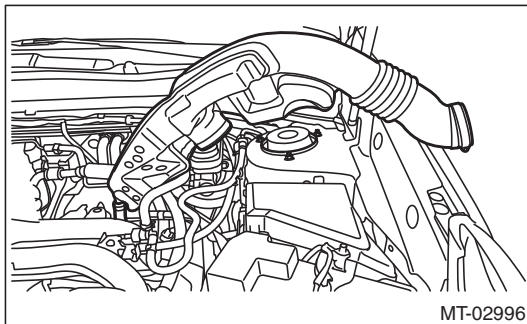
NOTE:

Bleed air from the oil line with help of a co-worker.

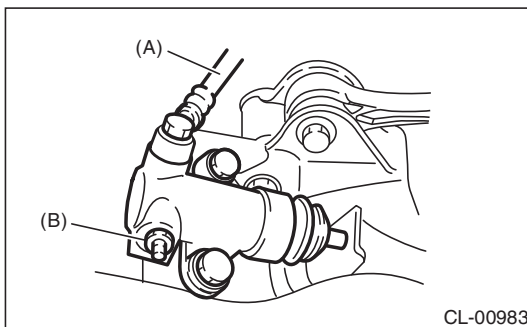
- 1) Remove the clip (A) from the air intake boot.
- 2) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 3) Loosen the clamp (C) which connects the air intake boot and throttle body.



- 4) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 5) Fit one end of a vinyl tube into the air breather of the operating cylinder, and put the other end into a container.



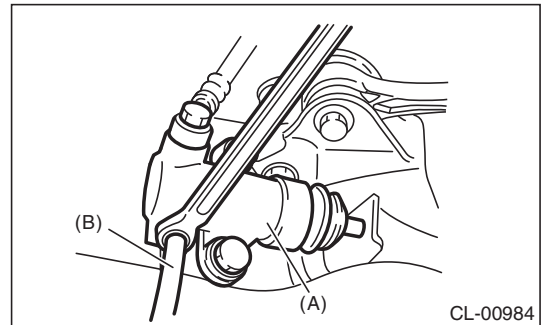
- (A) Clutch hose
(B) Air breather

- 6) Slowly depress the clutch pedal and keep it depressed. Open the air breather to discharge air together with the clutch fluid.

Release the air breather for 1 or 2 seconds. Next, close the air breather, and slowly release the clutch pedal.

CAUTION:

Cover the air breather with cloth to prevent clutch fluid from being splashed on surrounding parts when loosening the breather.



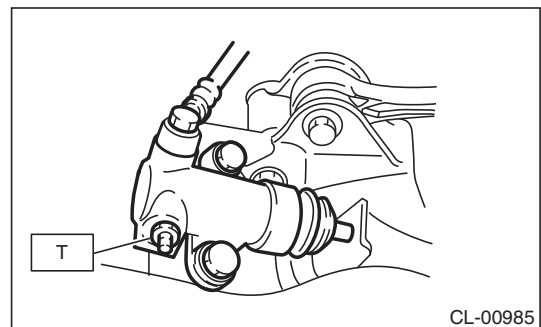
- (A) Operating cylinder
(B) Vinyl tube

- 7) Repeat procedure 4), until there are no more air bubbles appearing from the air breather.

- 8) Tighten the air breather.

Tightening torque:

T: 7.8 N·m (0.8 kgf·m, 5.8 ft·lb)



- 9) After stepping on the clutch pedal, make sure that there are no leaks evident in the entire clutch system.

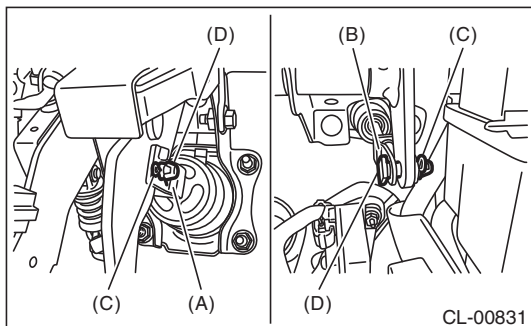
- 10) After bleeding the air from clutch system, ensure that the clutch operates properly.

- 11) Install the air intake boot assembly. <Ref. to IN(H4DO)-11, INSTALLATION, Air Intake Boot.>

10. Clutch Pedal

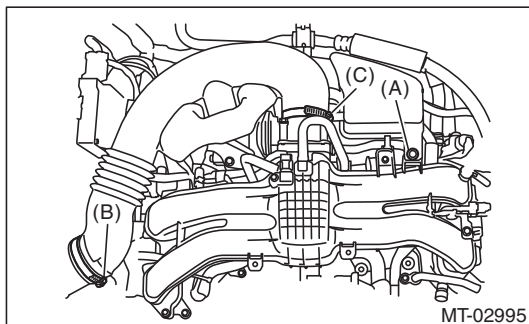
A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the steering column. <Ref. to PS-18, REMOVAL, Steering Column.>
- 3) Disconnect the connector from the stop light switch and clutch switch.
- 4) Remove the snap pins from clevis pins which secure the lever to the push rod and operating rod.
- 5) Pull out the clevis pins which secures the lever to the push rod and operating rod.

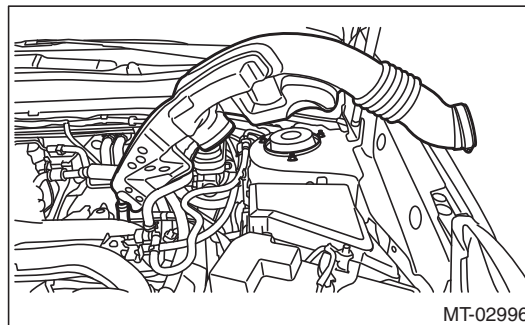


- (A) Operating rod
- (B) Push rod
- (C) Snap pin
- (D) Clevis pin

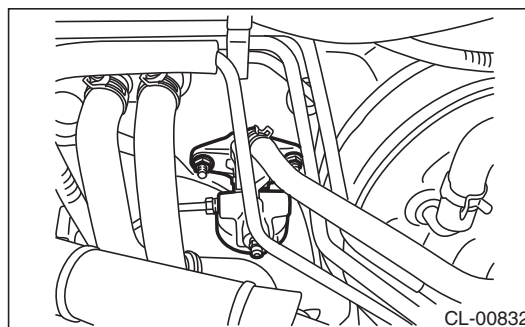
- 6) Remove the clip (A) from the air intake boot.
- 7) Loosen the clamp (B) connecting the air intake boot and air cleaner case (rear).
- 8) Loosen the clamp (C) which connects the air intake boot and throttle body.



- 9) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 10) Remove the nut which secures the clutch master cylinder.



- 11) Remove the bolts and nuts which secure the brake pedal and clutch pedal, and remove the pedal assembly.

NOTE:

Hold the clutch master cylinder with a wire or a string onto the vehicle body to avoid the clutch pipe from bending.

B: INSTALLATION

- 1) Install in the reverse order of removal.

Tightening torque:

Clutch pedal

18 N·m (1.8 kgf-m, 13.3 ft-lb)

Air intake boot

3 N·m (0.3 kgf-m, 2.2 ft-lb)

CAUTION:

Always use a new clevis pin.

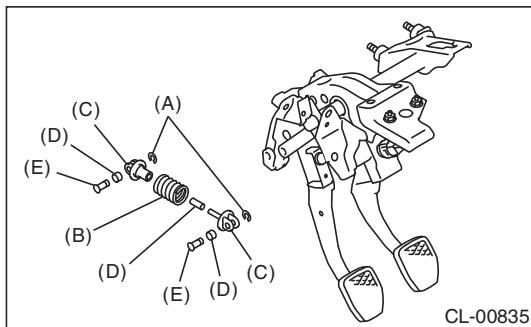
- 2) Adjust the clutch pedal after installation. <Ref. to CL-27, ADJUSTMENT, Clutch Pedal.>

Clutch Pedal

CLUTCH SYSTEM

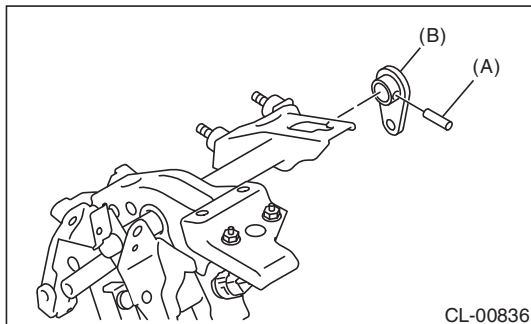
C: DISASSEMBLY

- 1) Remove the clutch switches.
- 2) Remove the clip, assist spring, rod and bushing.



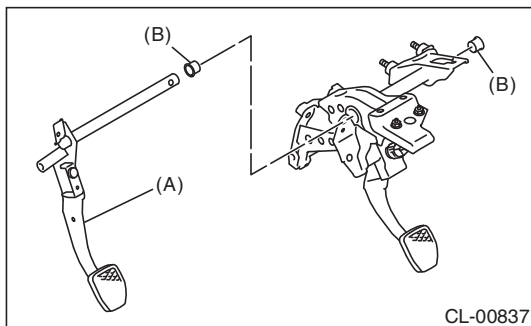
- (A) Clip
- (B) Assist spring
- (C) Assist rod
- (D) Bushing
- (E) Clevis pin

- 3) Remove the spring pin and lever.



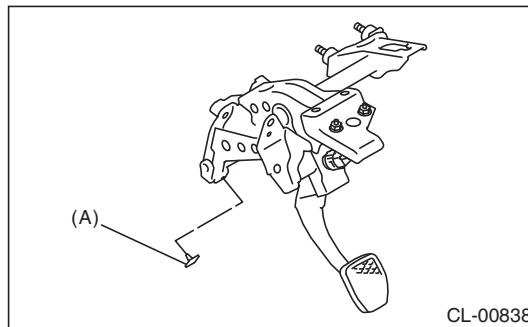
- (A) Spring pin
- (B) Lever

- 4) Remove the clutch pedal and bushings.



- (A) Clutch pedal
- (B) Bushing

- 5) Remove the stopper from the pedal bracket.



- (A) Stopper

- 6) Remove the clutch pedal pad.

D: ASSEMBLY

- 1) Install the stopper and pedal pad to the clutch pedal.
- 2) Install the clutch switch to the pedal bracket.
- 3) Clean the pedal bushing holes of the clutch pedal and the brake pedal, apply grease, and install the pedal bushings.
- 4) Install the clutch pedal, brake pedal and lever to the pedal bracket, and fix with a spring pin.
- 5) Install the assist rod A, assist rod B, assist bushing and assist spring to the clutch pedal and pedal bracket.

E: INSPECTION

1. CLUTCH PEDAL

Move the clutch pedal in the lateral direction with a force of approximately 10 N (1 kgf, 2 lbf) to check that the clutch pedal deflection is within the service limit.

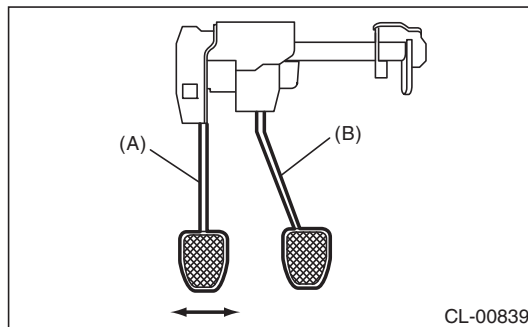
CAUTION:

If it exceeds the service limit, replace the clutch pedal assembly with a new part.

Deflection of the clutch pedal:

Service limit

4.0 mm (0.157 in) or less



- (A) Clutch pedal
- (B) Brake pedal

Clutch Pedal

CLUTCH SYSTEM

F: ADJUSTMENT

1) Turn the lock nut until the full stroke of clutch pedal becomes within the specification.

CAUTION:

When adjusting the full stroke of clutch pedal, do not turn the clutch switch.

NOTE:

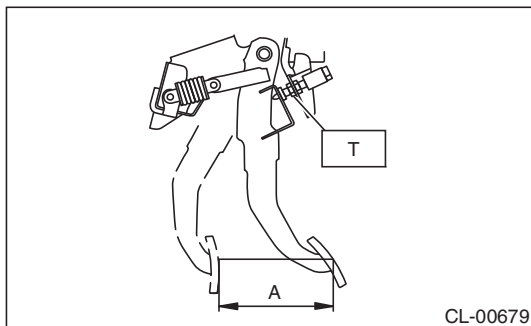
If the lock nut cannot adjust the full stroke of clutch pedal to the specified value, adjust it by turning the master cylinder push rod.

Clutch pedal full stroke A:

130 — 135 mm (5.12 — 5.31 in)

Tightening torque (clutch switch lock nut):

T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)

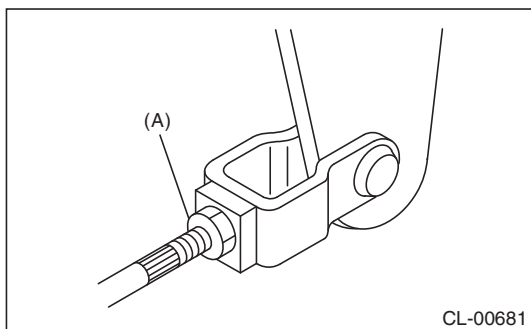


2) If the full stroke is not within the specified value, loosen the clutch switch lock nut to adjust.

Tightening torque:

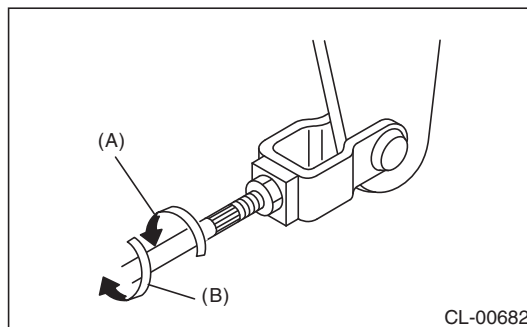
8 N·m (0.8 kgf-m, 5.9 ft-lb)

3) Loosen the push rod lock nuts.



(A) Push rod lock nut

4) Make sure that the clutch pedal contacts the clutch pedal bracket stopper when the clutch pedal is at the maximum stroke position.

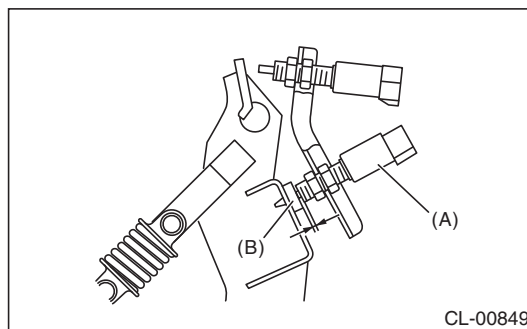


(A) In the longer direction

(B) In the shorter direction

5) Make sure that the clutch pedal contacts the clutch switch side when the pedal is released.

6) Turn the push rod to shorten until a clearance is gained on the clutch switch side.

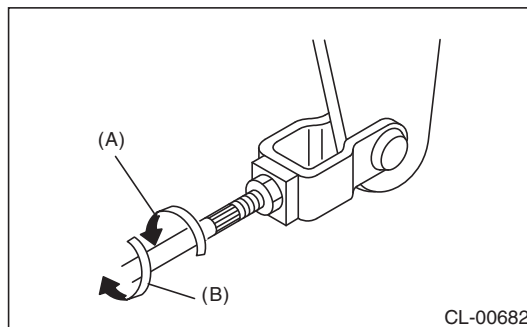


(A) Clutch switch

(B) Stopper

7) Turn the push rod to lengthen until clutch pedal contacts the clutch switch.

8) Turn further in the direction that will shorten the push rod by 270°.



(A) In the longer direction

(B) In the shorter direction

9) Check that the clevis pin moves smoothly by moving it in the left and right directions.

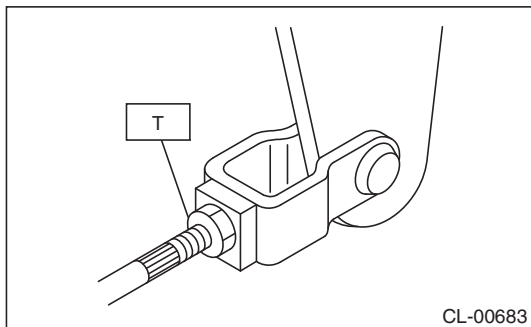
Clutch Pedal

CLUTCH SYSTEM

10) Tighten the push rod lock nut.

Tightening torque (push rod lock nut):

T: 10 N·m (1.0 kgf-m, 7.4 ft-lb)



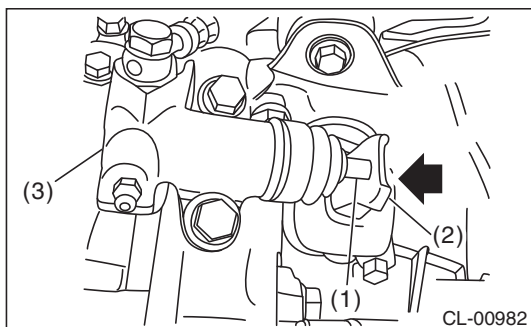
11) Depress and release the clutch pedal two or three times to ensure that the clutch pedal and release lever operate smoothly. If the clutch pedal and release lever do not operate smoothly, bleed air from the clutch hydraulic system. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

12) Measure the clutch pedal full stroke length again to ensure that it is within specifications. If it is not within specifications, repeat adjustment procedures again from the beginning.

Clutch pedal full stroke:

130 — 135 mm (5.12 — 5.31 in)

13) Push the release lever until the operating cylinder push rod retracts. Check that the clutch fluid level in the reservoir tank increases.



- (1) Push rod
- (2) Release lever
- (3) Operating cylinder

14) If the clutch fluid level increases, hydraulic clutch play is correct.

15) If the clutch fluid level does not increase or push rod does not retract, readjust the clutch pedal.

16) Check the fluid level using the scale on the reservoir tank. <Ref. to CL-23, INSPECTION, Clutch Fluid.>

11.Clutch Switch

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the cover assembly - instrument panel LWR driver. <Ref. to EI-59, REMOVAL, Instrument Panel Lower Cover.>
- 3) Disconnect the connector from the clutch switch.
- 4) Remove the clutch switches.

B: INSTALLATION

1. CLUTCH SWITCH

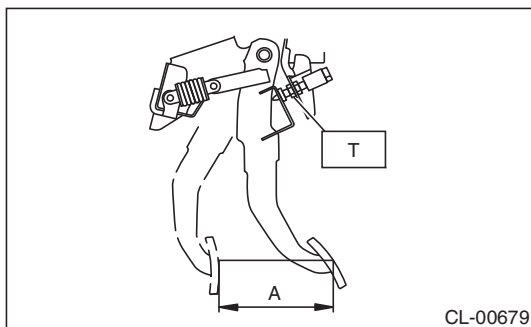
- 1) Move the clevis pin of push rod to left and right, retain it at the position where it moves smoothly, and measure the clutch pedal stroke.

Clutch pedal full stroke A:

130 — 135 mm (5.12 — 5.31 in)

Tightening torque:

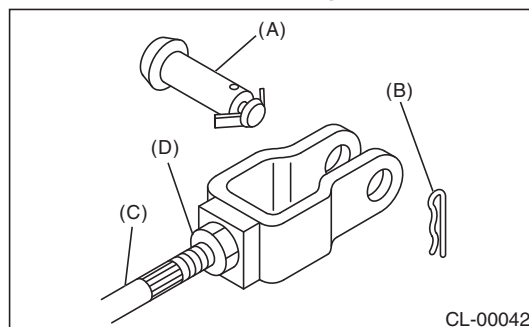
T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)



- 2) If the clutch pedal stroke is out of specification, adjust the stroke. <Ref. to CL-27, ADJUSTMENT, Clutch Pedal.>
- 3) Connect the clutch switch connector.

2. CLUTCH START SWITCH

- 1) Remove the snap pin and clevis pin connecting the clutch pedal and operating rod.



- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Lock nut

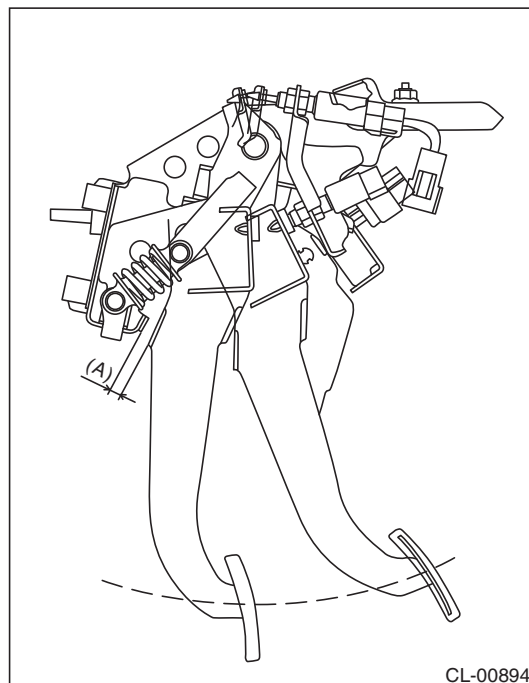
- 2) Install the clutch start switch so that the clutch switch turns on when the clearance between clutch pedal stopper and clutch pedal is within the specification described below.

Clearance A:

6.3 — 8.6 mm (0.25 — 0.34 in)

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

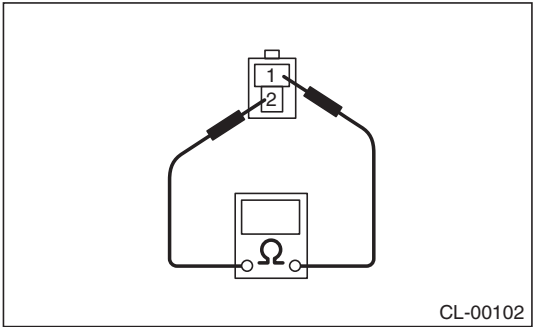


Clutch Switch

CLUTCH SYSTEM

NOTE:

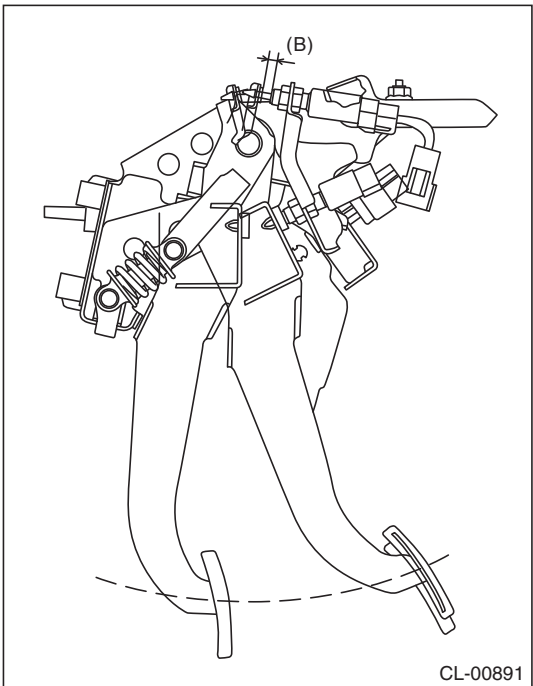
- Using a plate of the same thickness for the clearance facilitates the adjustment operation.
 - Using the Subaru Select Monitor or a tester, check the position where the switch turns on.
- Check the following figure for the terminal layout of the harness connector.



- When performing adjustment by the clearance between clutch start switch and clutch pedal plate, perform installation according to the following gap.

Clearance B:

8.6 — 9.0 mm (0.34 — 0.35 in)



- 3) Connect the clutch start switch connector.
- 4) Make sure that engine does not start with clutch pedal not depressed.
- 5) Make sure that engine starts with clutch pedal depressed.

C: INSPECTION

1. CLUTCH START SWITCH

1) Perform the following inspections. If the clutch start switch does not operate normally, adjust the switch, and check it again. <Ref. to CL-31, ADJUSTMENT, Clutch Switch.>

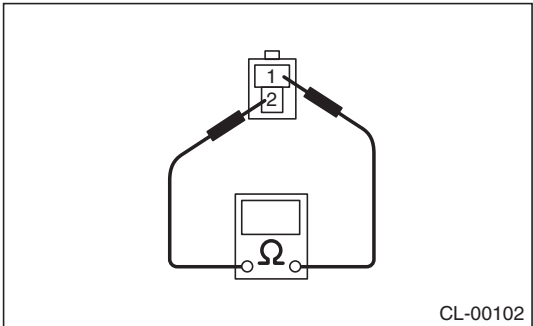
- Make sure that engine does not start with clutch pedal not depressed.
- Make sure that engine starts with clutch pedal fully depressed.

2) When the clutch start switch does not operate normally even if it is adjusted, check the clutch start switch for continuity.

(1) Remove the clutch start switch. <Ref. to CL-29, REMOVAL, Clutch Switch.>

(2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not at the standard value, replace the switch.

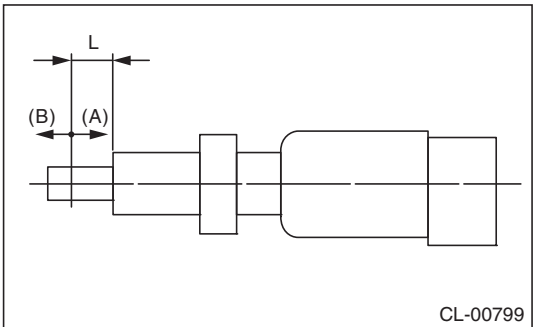
Condition	Terminal No.	Specified resistance
ON	No. 1 — No. 2	Less than 1 Ω
OFF	No. 1 — No. 2	1 MΩ or more



(3) Check that the switch is turned on and off in dimension L.

Dimension L:

9 — 10 mm (0.35 — 0.39 in)



(A) ON

(B) OFF

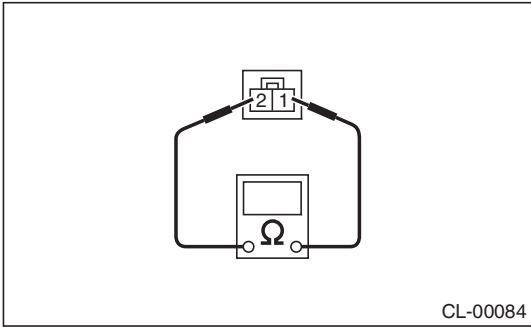
Clutch Switch

CLUTCH SYSTEM

2. CLUTCH SWITCH

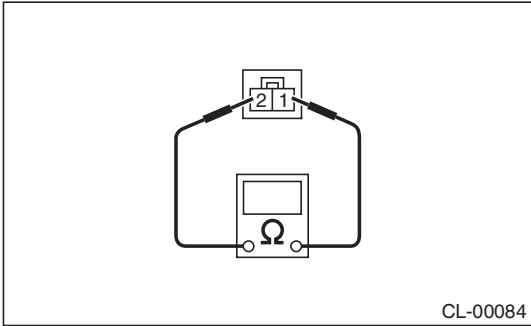
- 1) Check the clutch switch for continuity.
- (1) Disconnect the connector of clutch switch.
- (2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not within the specification, check the clutch stroke and installation condition, and check the clutch switch again.

Condition	Terminal No.	Specified resistance
When clutch pedal is depressed	No. 1 — No. 2	1 MΩ or more
When the clutch pedal is not depressed	No. 1 — No. 2	Less than 1 Ω



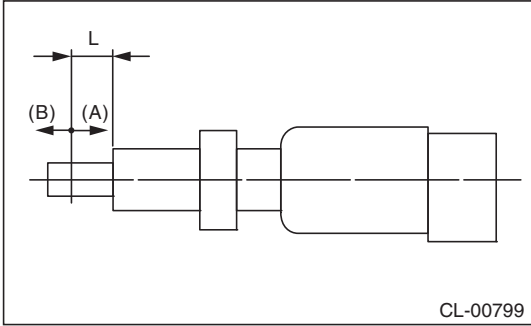
- 2) When the clutch switch does not operate normally even if the clutch stroke and installation condition are normal, check the clutch switch for continuity.
- (1) Remove the clutch switches. <Ref. to CL-29, REMOVAL, Clutch Switch.>
- (2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not at the standard value, replace the switch.

Condition	Terminal No.	Specified resistance
ON	No. 1 — No. 2	Less than 1 Ω
OFF	No. 1 — No. 2	1 MΩ or more



- (3) Check that the switch is turned on and off in Dimension L.

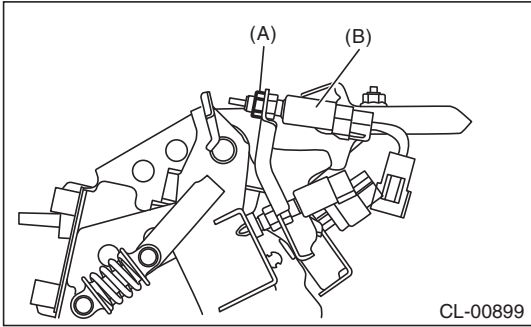
Dimension L:
5 — 6.5 mm (0.2 — 0.26 in)



- (A) ON
(B) OFF

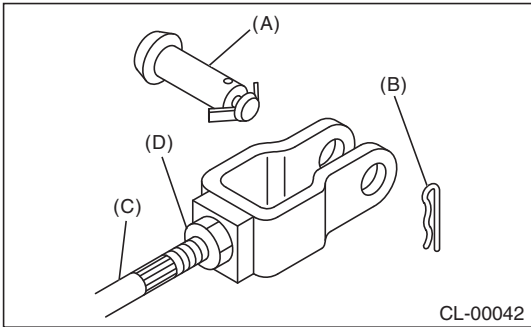
D: ADJUSTMENT

- 1) Loosen the lock nut of the clutch start switch.



- (A) Lock nut
(B) Clutch start switch

- 2) Disconnect the harness connector of the clutch start switch.
- 3) Remove the snap pin and clevis pin connecting the clutch pedal and operating rod.



- (A) Clevis pin
(B) Snap pin
(C) Push rod
(D) Lock nut

Clutch Switch

CLUTCH SYSTEM

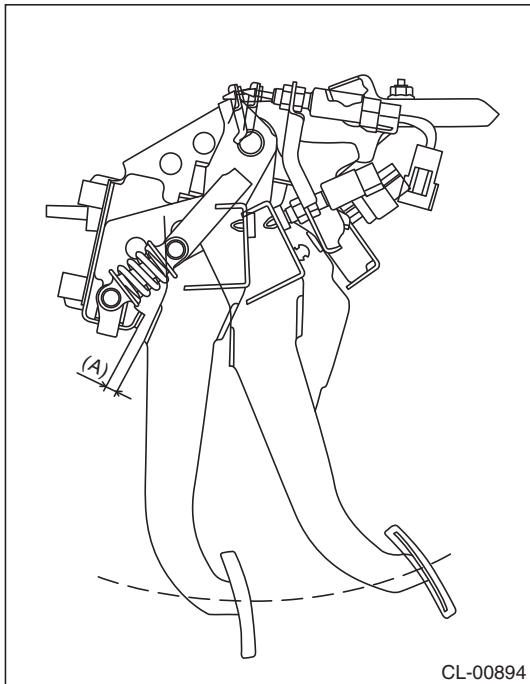
4) Adjust the clutch start switch so that the switch turns on when the clearance between clutch pedal stopper and clutch pedal is within the specification described below, and then tighten the lock nut.

Clearance A:

6.3 — 8.6 mm (0.25 — 0.34 in)

Tightening torque:

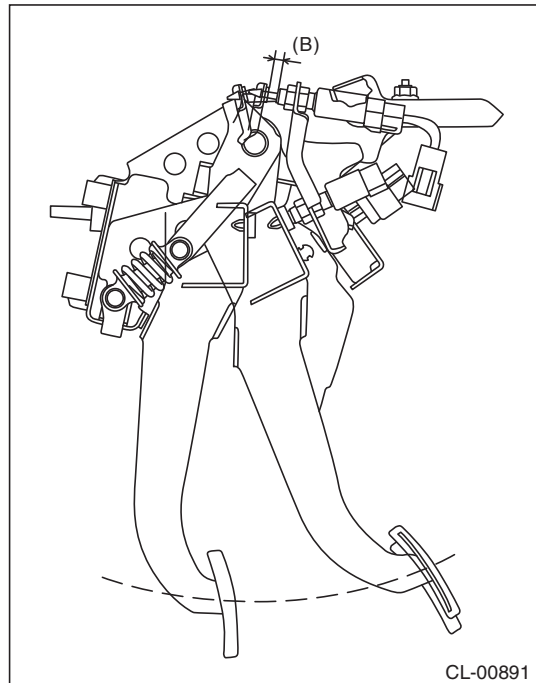
8 N·m (0.8 kgf-m, 5.9 ft-lb)



- When performing adjustment by the clearance between clutch start switch and clutch pedal plate, perform installation according to the following gap.

Clearance B:

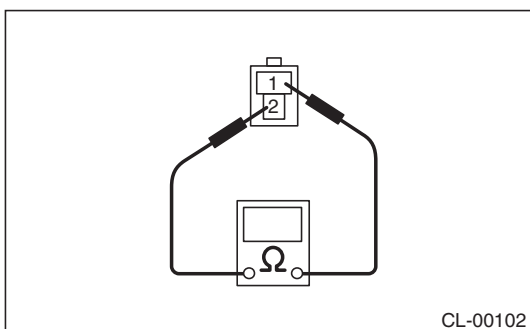
8.6 — 9.0 mm (0.34 — 0.35 in)



5) Connect the clutch start switch connector.

NOTE:

- Using a plate of the same thickness for the clearance facilitates the adjustment operation.
- Using the Subaru Select Monitor or a tester, check the position where the switch turns on. Check the following figure for the terminal layout of the harness connector.



12.General Diagnostic Table

A: INSPECTION

1. CLUTCH

Symptoms	Possible cause	Corrective action
1. Clutch slippage. It is hard to perceive clutch slippage in the early stage, but pay attention to the following symptoms. • Engine speeds up when shifting. • High-speed driving is not possible; especially rapid acceleration is not possible and vehicle speed does not increase in proportion to the increase in engine speed. • Power drops particularly when ascending a slope, and there is a burning smell of the clutch plate. • Method of testing: Park the vehicle and fully apply the parking brake. Disengage the clutch and shift the transmission gear into the 1st. Gradually increase the engine speed while gradually allowing the clutch to engage. The clutch function is satisfactory if the engine stalls. However, the clutch is slipping if the vehicle does not move forward and the engine does not stall.	(a) Oil on the clutch face	Replace.
	(b) Worn clutch face	Replace.
	(c) Deteriorated diaphragm spring	Replace.
	(d) Warped pressure plate or flywheel	Repair or replace.
	(e) Defective release bearing holder	Repair or replace.
2. Clutch drags. As a symptom of this trouble, a harsh scratching noise occurs and control becomes difficult when shifting gears. The symptom becomes more apparent when shifting into the 1st gear. However, because most trouble of this sort is due to a defective synchronization mechanism, perform the following tests. • Method of testing: <Ref. to CL-34, DIAGNOSTIC DIAGRAM OF CLUTCH DRAG, INSPECTION, General Diagnostic Table.> The problem is caused by insufficient disengagement of the clutch if an abnormal noise occurs during this test.	(a) Worn or rusty clutch disc hub spline	Replace the clutch disc.
	(b) Excessive deflection of clutch disc face	Repair or replace.
	(c) Crankshaft pilot needle bearing sticking	Replace.
	(d) Cracked clutch disc face	Replace.
	(e) Stuck clutch disc (smeared by oil or water)	Replace.
3. Clutch chatters. Clutch chattering is an unpleasant vibration to the whole vehicle when the vehicle is just started with clutch partially engaged.	(a) Adhesion of oil on the clutch face	Replace the clutch disc.
	(b) Weak or broken damper spring	Replace the clutch disc.
	(c) Poor contact of the disc surface or excessively worn disc	Replace the faulty clutch disc.
	(d) Warped pressure plate or flywheel	Repair or replace.
	(e) Loose disc rivets	Replace the clutch disc.
	(f) Loose engine mounting	Retighten or replace mounting.
	(g) Loose pitching stopper	Retighten or replace the pitching stopper.

General Diagnostic Table

CLUTCH SYSTEM

Symptoms	Possible cause	Corrective action
4. Noisy clutch Examine whether the noise is generated when the clutch is disengaged, engaged, or partially engaged.	(a) Broken, worn or insufficiently lubricated release bearing	Replace the release bearing.
	(b) Insufficient lubrication of the pilot bearing	Replace the pilot bearing.
	(c) Loose clutch disc hub	Replace the clutch disc.
	(d) Loose damper spring retainer	Replace the clutch disc.
	(e) Deteriorated or broken damper spring	Replace the clutch disc.
5. Clutch grabs suddenly. When starting the vehicle with the clutch partially engaged, the clutch engages suddenly and the vehicle jumps instead of making a smooth start.	(a) Grease or oil on facing	Replace the clutch disc.
	(b) Deteriorated cushioning spring	Replace the clutch disc.
	(c) Worn or rusted spline of clutch disc or main shaft	Take off rust, apply grease or replace clutch disc or main shaft.
	(d) Deteriorated or broken damper spring	Replace the clutch disc.
	(e) Loose engine mounting	Retighten or replace mounting.
	(f) Deteriorated diaphragm spring	Replace.

2. CLUTCH PEDAL

Symptoms	Corrective action
Insufficient clutch pedal free play	Adjust the free play of the pedal.
Excessively worn and damaged pedal shaft and/or bushing	Replace the bushing or shaft with a new part.

3. DIAGNOSTIC DIAGRAM OF CLUTCH DRAG

Step	Check	Yes	No
1 CHECK GEAR NOISE. 1) Start the engine. 2) While idling the engine, step on the clutch pedal and quickly shift from neutral to reverse.	Is there any abnormal noise from the transmission gear?	Go to step 2.	Clutch is normal.
2 CHECK GEAR NOISE. Depress the clutch pedal at idle and shift from neutral to reverse within 0.5 — 1.0 second.	Is there any abnormal noise from the transmission gear?	Go to step 3.	Defective transmission or excessive clutch drag torque. Inspect pilot bearing, clutch disc, transmission and clutch disc hub spline.
3 CHECK GEAR NOISE. 1) Depress the clutch pedal at idle and shift from neutral to reverse within 0.5 — 1.0 second. 2) While stepping on the clutch pedal, shift from neutral to reverse, reverse to neutral several times.	Is there any abnormal noise from the transmission gear?	Inadequate clutch disengage. Inspect the clutch disc, clutch cover, clutch release, and clutch pedal free play.	Clutch and fly-wheel seizure. Inspect the clutch disc and the spline of the clutch disc hub.

FRONT SUSPENSION

FS

	Page
1. General Description	2
2. Wheel Alignment	7
3. Front Crossmember	18
4. Front Crossmember Support Plate	27
5. Front Stabilizer	29
6. Front Ball Joint	31
7. Front Arm	34
8. Front Strut	41
9. General Diagnostic Table	47

General Description

FRONT SUSPENSION

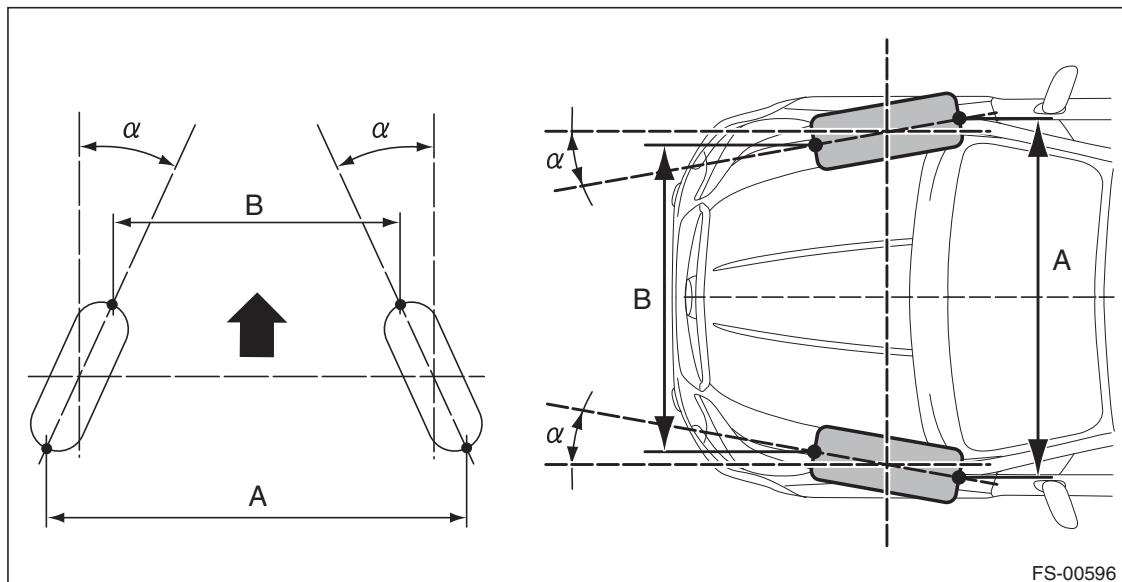
1. General Description

A: SPECIFICATION

Tire size		P225/60R17	P225/55R18
Front	Wheel arch height (Tolerance: +12 mm -24 mm (+0.47 in -0.94 in))	444 (17.48)	
	Camber (tolerance: $\pm 0^{\circ}30'$ Differences between RH and LH: 35' or less)	$-0^{\circ}00'$	
	Caster (referential value)	$5^{\circ}40'$	
	Steering angle (tolerance: $\pm 1.5^{\circ}$)	Inner wheel	38.4°
		Outer wheel	33.8°
	Toe-in	0 $\pm$ 3 (0 $\pm$ 0.12) Toe angle (sum of both wheels): $0^{\circ}\pm 0^{\circ}15'$	
Rear	Kingpin angle (referential value)	$14^{\circ}12'$	
	Wheel arch height (Tolerance: +12 mm -24 mm (+0.47 in -0.94 in))	458 (18.03)	
	Camber (tolerance: $\pm 0^{\circ}45'$ Differences between RH and LH: 45' or less)	$-1^{\circ}00'$	
	Toe-in	IN 3 $\pm$ 3 (IN 0.12 $\pm$ 0.12) Toe angle (sum of both wheels): $0^{\circ}15^{\circ}\pm 15'$	
	Thrust angle (tolerance: $0^{\circ}00'\pm 30'$)	$0^{\circ}00'$	

NOTE:

- Front toe-in, rear toe-in and front camber can be adjusted. Adjust if the value of toe-in or camber exceeds the tolerance range of the specification chart.
- Other items except for front toe-in, rear toe-in and front camber that are described in the specification chart cannot be adjusted. If other items exceed the tolerance range of the specification chart, check the suspension parts and connections for deformation. If defective, replace with new parts.

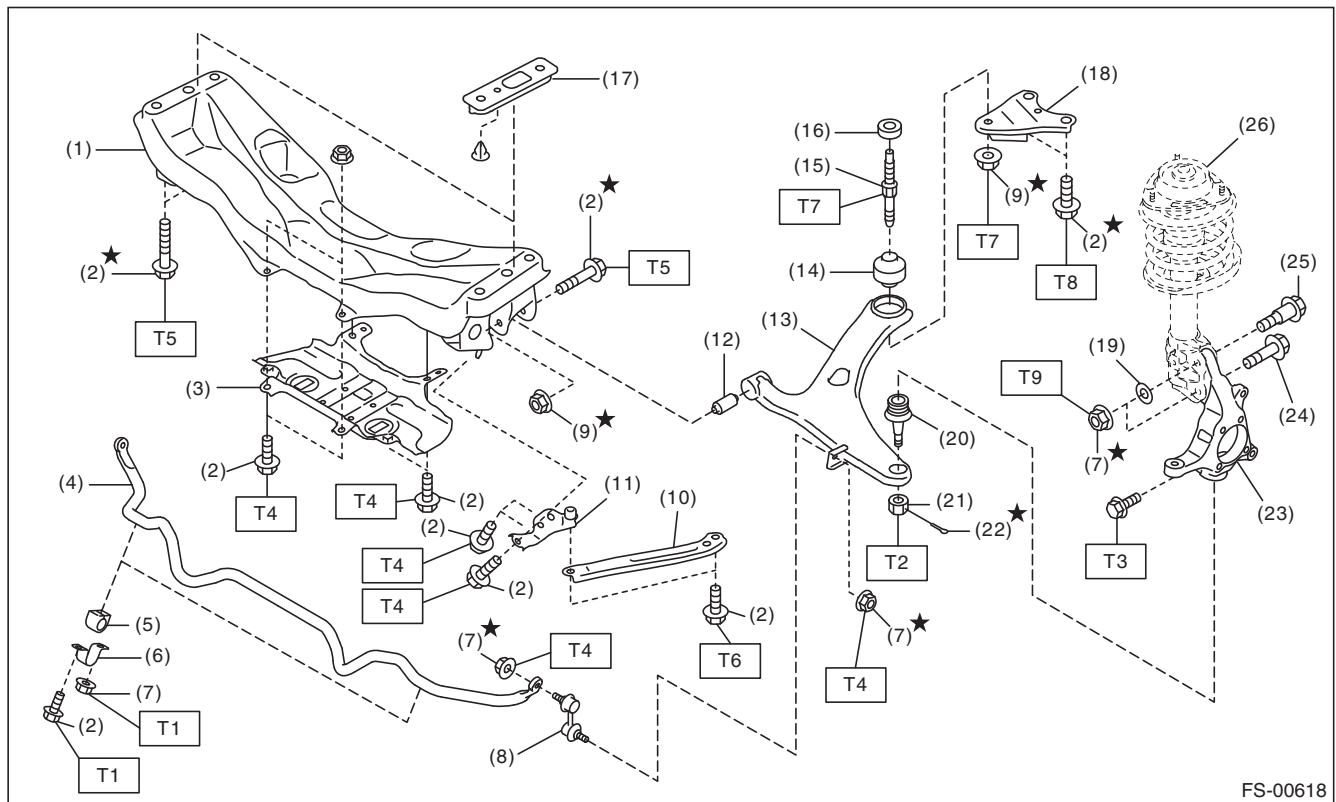


$A - B = \text{Positive: Toe-in, Negative: Toe-out}$

$\alpha = \text{Individual toe angles}$

B: COMPONENT

1. FRONT SUSPENSION



- | | |
|--|---------------------------------------|
| (1) Front crossmember COMPL | (14) Bushing rear - front arm |
| (2) Flange bolt | (15) Stud bolt |
| (3) Front crossmember support | (16) Stopper - front arm bushing rear |
| (4) Front stabilizer | (17) Spacer - crossmember |
| (5) Bushing - stabilizer | (18) Front arm rear plate |
| (6) Clamp - stabilizer bushing | (19) Adjusting washer |
| (7) Flange nut | (20) Ball joint ASSY |
| (8) Stabilizer link ASSY | (21) Castle nut |
| (9) Self-locking nut | (22) Cotter pin |
| (10) Front support | (23) Housing ASSY - front axle |
| (11) Support plate - front crossmember | (24) Flange bolt |
| (12) Bushing front - front arm | (25) Adjusting bolt |
| (13) Front arm ASSY | (26) Front strut ASSY |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.55, 18.4)

T2: 39 (3.98, 28.8)

T3: 50 (5.10, 36.9)

T4: 60 (6.12, 44.3)

T5: 95 (9.69, 70.1)

T6: 100 (10.20, 73.8)

T7: 110 (11.22, 81.1)

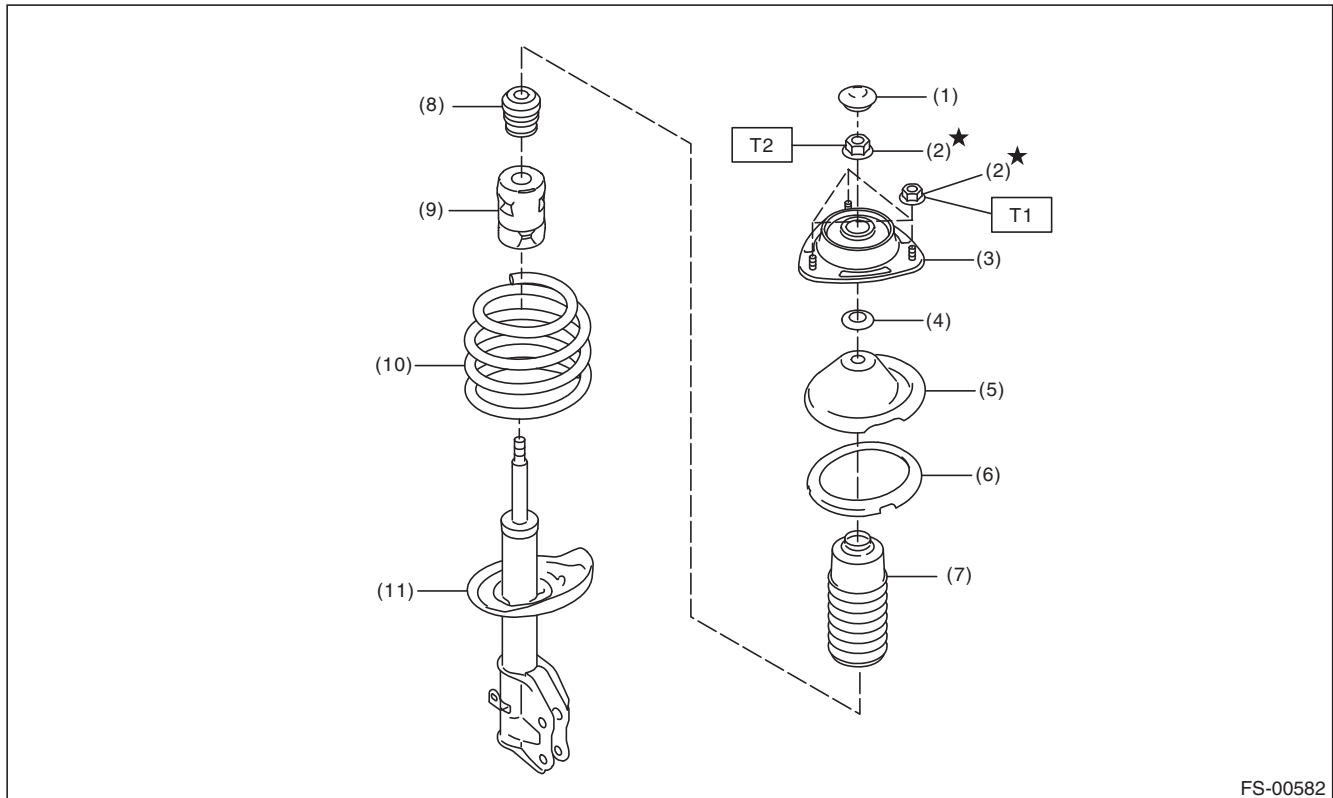
T8: 150 (15.30, 110.6)

T9: 155 (15.81, 114.3)

General Description

FRONT SUSPENSION

2. FRONT STRUT



FS-00582

- | | | |
|-----------------------------------|-------------------------------|--------------------------|
| (1) Dust seal - front strut | (6) Rubber seat - front strut | (11) Strut COMPL - front |
| (2) Self-locking nut | (7) Dust cover - front strut | |
| (3) Strut mount - front | (8) Helper - front strut | |
| (4) Spacer - front strut | (9) Dust cover inner | |
| (5) Spring seat - front strut UPR | (10) Coil spring - front | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 20 (2.04, 14.8)

T2: 55 (5.61, 40.6)

C: CAUTION

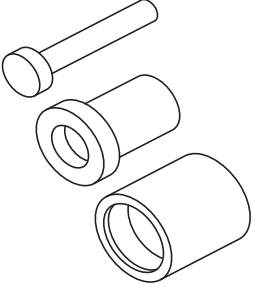
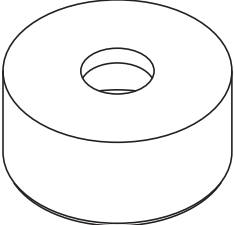
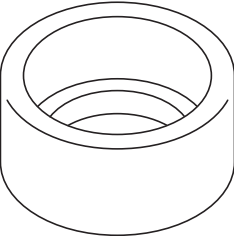
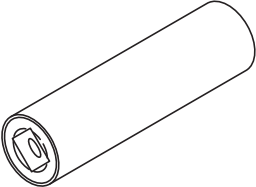
- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Use SUBARU genuine grease etc. or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- When the suspension-related components have been replaced, perform "VDC sensor midpoint setting mode" of the VDC. <Ref. to VDC-23, VDC SENSOR MIDPOINT SETTING MODE, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

General Description

FRONT SUSPENSION

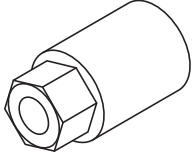
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-927680000	927680000	INSTALLER & REMOVER SET	Used for replacing the bushing front - front arm of front arm assembly.
 ST20299AG000	20299AG000	REMOVER	- Used for replacing the bushing rear - front arm of front arm assembly. - Used together with BASE (20299AG010).
 ST20299AG010	20299AG010	BASE	- Used for replacing the bushing rear - front arm of front arm assembly. - Used together with REMOVER (20299AG000).
 ST20299AG020	20299AG020	STUD BOLT SOCKET	Used for removing and installing the stud bolt for front arm assembly installing portion.

General Description

FRONT SUSPENSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20399AG000	20399AG000	STRUT MOUNT SOCKET	Used for disassembling and assembling strut mount.

2. GENERAL TOOL

TOOL NAME	REMARKS
Alignment gauge	Used for measuring wheel alignment.
Alignment gauge adapter	Used for measuring wheel alignment.
Turning radius gauge	Used for measuring wheel alignment.
Toe-in gauge	Used for toe-in measurement.
Tie-rod ball joint puller	Used for disconnecting tie-rod end.
Dial gauge	Used for damper strut measurement.
Coil spring compressor	Used for strut assembly/disassembly.



2. Wheel Alignment

A: INSPECTION

Check the following items before performing the wheel alignment measurement.

- Tire inflation pressure
- Uneven wear of RH and LH tires, or difference of sizes
- Tire runout
- Excessive play and wear of ball joint
- Excessive play and wear of tie-rod end
- Excessive play of wheel bearing
- Right and left wheel base imbalance
- Deformation and excessive play of steering link
- Deformation and excessive play of suspension parts

Check, adjust and measure the wheel alignment in accordance with the following procedures.

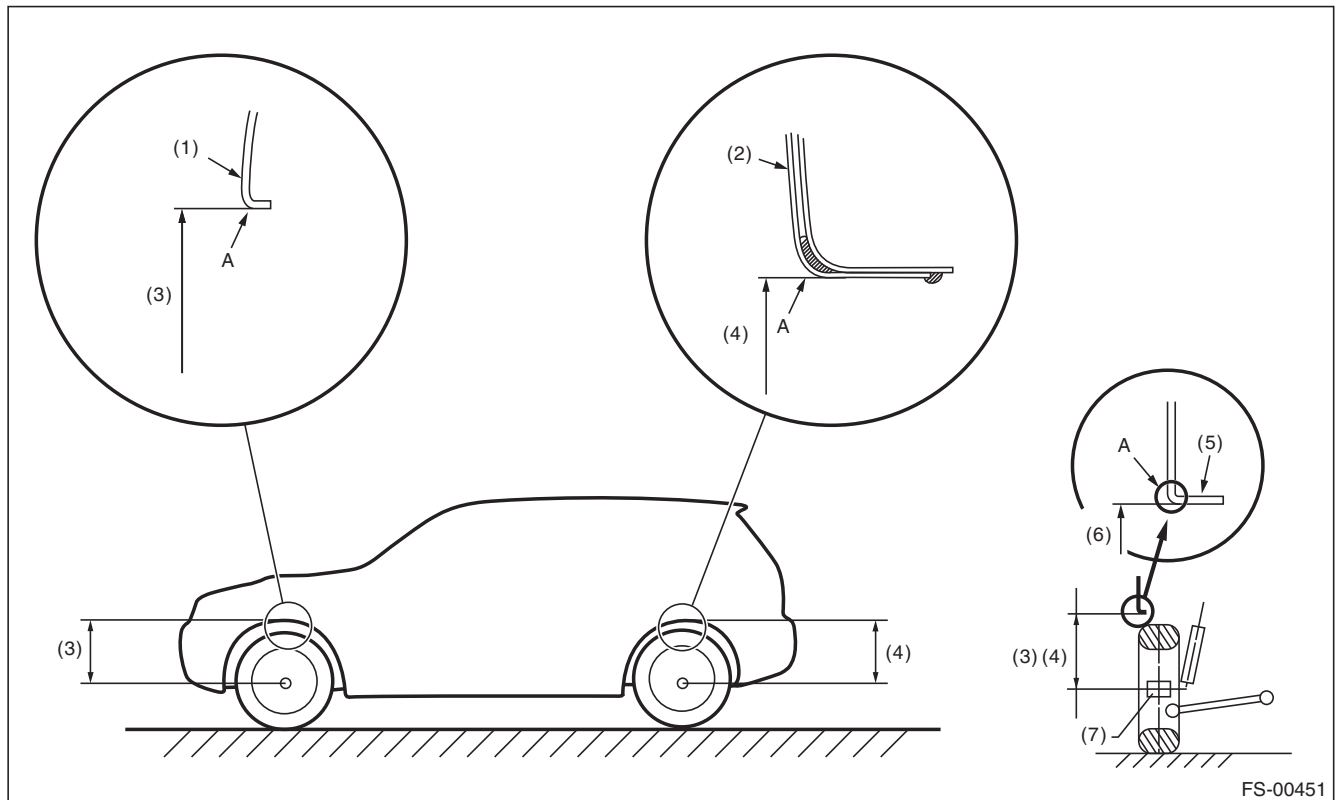
1	Wheel arch height (front and rear wheels)	Inspection: <Ref. to FS-10, REAR WHEEL TOE-IN, INSPECTION, Wheel Alignment.>
↓		
2	Camber (front and rear wheels)	Inspection: <Ref. to FS-9, CAMBER, INSPECTION, Wheel Alignment.> Adjustment: <Ref. to FS-11, FRONT CAMBER, ADJUSTMENT, Wheel Alignment.>
↓		
3	Caster (front wheel)	Inspection: <Ref. to FS-9, CASTER, INSPECTION, Wheel Alignment.>
↓		
4	Steering angle	Inspection: <Ref. to FS-10, FRONT WHEEL TOE-IN, INSPECTION, Wheel Alignment.> Adjustment: <Ref. to FS-13, STEERING ANGLE, ADJUSTMENT, Wheel Alignment.>
↓		
5	Front wheel toe-in	Inspection: <Ref. to FS-10, STEERING ANGLE, INSPECTION, Wheel Alignment.> Adjustment: <Ref. to FS-13, FRONT WHEEL TOE-IN, ADJUSTMENT, Wheel Alignment.>
↓		
6	Rear wheel toe-in	Inspection: <Ref. to FS-8, WHEEL ARCH HEIGHT, INSPECTION, Wheel Alignment.> Adjustment: <Ref. to FS-14, REAR WHEEL TOE-IN, ADJUSTMENT, Wheel Alignment.>
↓		
7	Thrust angle	Inspection: <Ref. to FS-11, THRUST ANGLE, INSPECTION, Wheel Alignment.> Adjustment: <Ref. to FS-16, THRUST ANGLE, ADJUSTMENT, Wheel Alignment.>

Wheel Alignment

FRONT SUSPENSION

1. WHEEL ARCH HEIGHT

- 1) Park the vehicle on a level surface.
- 2) Empty the vehicle so that it is at "curb weight". (Empty the cargo room, load the spare tire, jack and service tools, and fill up the fuel tank.)
- 3) Set the steering wheel in a straight-ahead position, and stabilize the suspension by moving the vehicle in a straight line for 5 m (16 ft) or more.
- 4) Suspend a thread from the wheel arch (point "A" in the figure below) and affix at a position directly above the center of wheel.
- 5) Measure the distance between the point "A" and the center of wheel.



FS-00451

- | | | |
|-----------------------------|----------------------------|--------------------|
| (1) Front fender | (4) Rear wheel arch height | (7) End of spindle |
| (2) Rear quarter | (5) Flange bend line | |
| (3) Front wheel arch height | (6) Point of measurement | |

Wheel arch height specification mm (in) (tolerance: $+12\text{ mm}$ -24 mm ($+0.47\text{ in}$ -0.94 in))		
Tire size	P225/60R17	P225/55R18
Front	444 (17.48)	
Rear	458 (18.03)	

Wheel Alignment

FRONT SUSPENSION

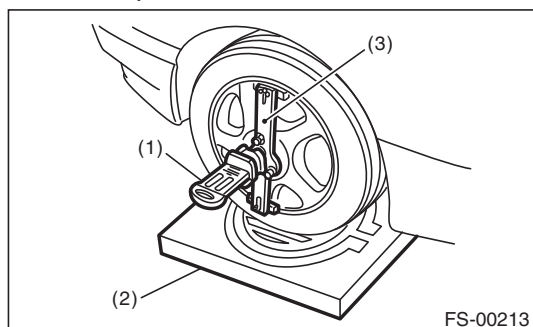
2. CAMBER

1) Place the front wheel on the turning radius gauge.

NOTE:

Make sure the ground contact surfaces of the front and rear wheels are at the same height.

2) Set the adapter into the center of wheel, and then set the wheel alignment gauge.



- (1) Alignment gauge
- (2) Turning radius gauge
- (3) Adapter

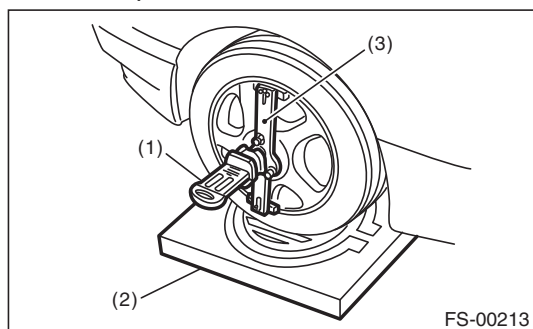
3) Measure the camber angle in accordance with the operation manual for wheel alignment gauge.

Tire size	Camber (difference between RH and LH 35' or less)
P225/60R17 P225/55R18	$-0^{\circ}00' \pm 0^{\circ}30'$

3. CASTER

1) Place the front wheel on the turning radius gauge. Make sure the ground contact surfaces of the front and rear wheels are at the same height.

2) Set the adapter into the center of wheel, and then set the wheel alignment gauge.



- (1) Alignment gauge
- (2) Turning radius gauge
- (3) Adapter

3) Measure the caster angle in accordance with the operation manual for wheel alignment gauge.

Tire size	Caster
P225/60R17 P225/55R18	$5^{\circ}40'$

Wheel Alignment

FRONT SUSPENSION

4. STEERING ANGLE

- 1) Place the vehicle on turning radius gauge.
- 2) While depressing the brake pedal, turn the steering wheel fully to the left and right.
- 3) With the steering wheel held at each fully turned position, measure both the inner and outer wheel steering angles.

Tire size	Inner wheel	Outer wheel
P225/60R17 P225/55R18	38.4°±1.5°	33.8°±1.5°

5. FRONT WHEEL TOE-IN

Toe-in: Inspection value

0±3 mm (0±0.12 in)

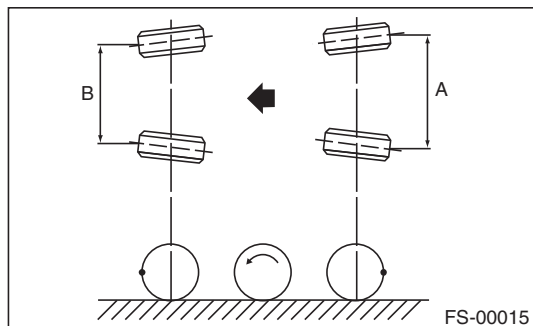
- 1) Set the toe-in gauge in the position at wheel axis center height behind the right and left front tires.
- 2) Place a mark at the center of both left and right tires, and measure distance "A" between the marks.
- 3) Move the vehicle forward to rotate the tires 180°.

NOTE:

Be sure to rotate the tires in the forward direction.

- 4) Measure the distance "B" between the left and right marks. Find toe-in using the following calculation:

$$A - B = \text{Toe-in}$$



6. REAR WHEEL TOE-IN

Refer to the FRONT WHEEL TOE-IN for rear toe-in inspection procedures. <Ref. to FS-10, FRONT WHEEL TOE-IN, INSPECTION, Wheel Alignment.>

Toe-in: Inspection value

3±3 mm (0.12±0.12 in)

Wheel Alignment

FRONT SUSPENSION

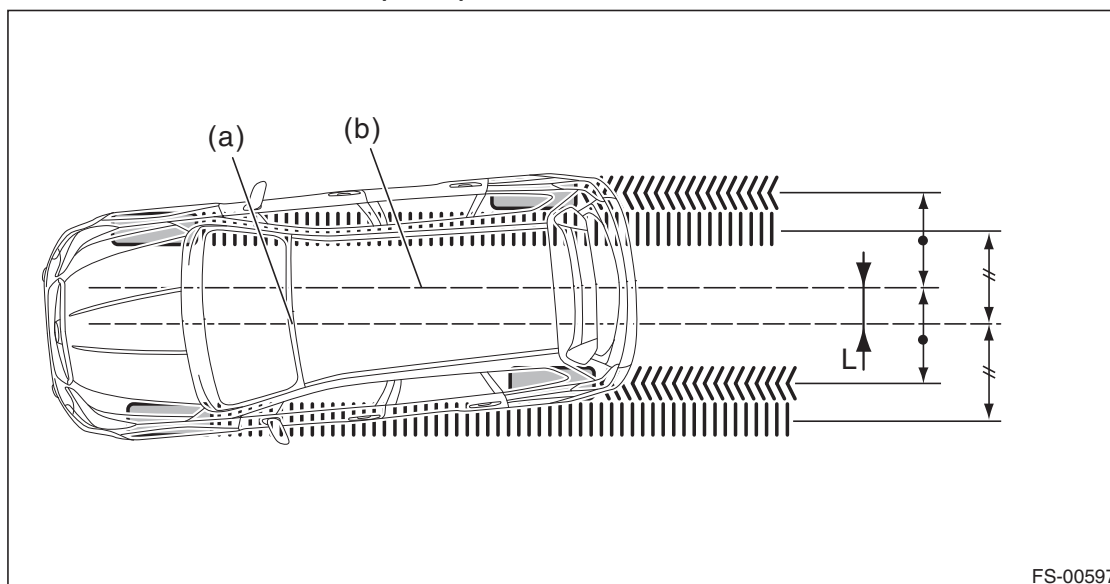
7. THRUST ANGLE

- 1) Park the vehicle on a level surface.
- 2) Move the vehicle 3 — 4 meters (10 — 13 feet) straight forward.
- 3) Draw the center of loci for both the front and rear axles.
- 4) Measure distance “L” between the center lines of the axle loci.

Thrust angle: Inspection value

$0^{\circ}\pm 30'$

Less than 30' when “L” is 23 mm (0.9 in) or less



(a) Center line of loci (front axle)

(b) Center line of loci (rear axle)

B: ADJUSTMENT

CAUTION:

When the wheel alignment has been adjusted, perform “VDC sensor midpoint setting mode” of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

1. FRONT CAMBER

- 1) Adjust the camber angle to the following value.

Tire size	Camber (difference between RH and LH 35' or less)
P225/60R17 P225/55R18	$-0^{\circ}00'\pm 0^{\circ}30'$

- 2) Loosen the two flange nuts located at the front lower section of the strut.

NOTE:

When the adjusting bolt needs to be loosened or tightened, hold its head with a wrench and turn the flange nut.

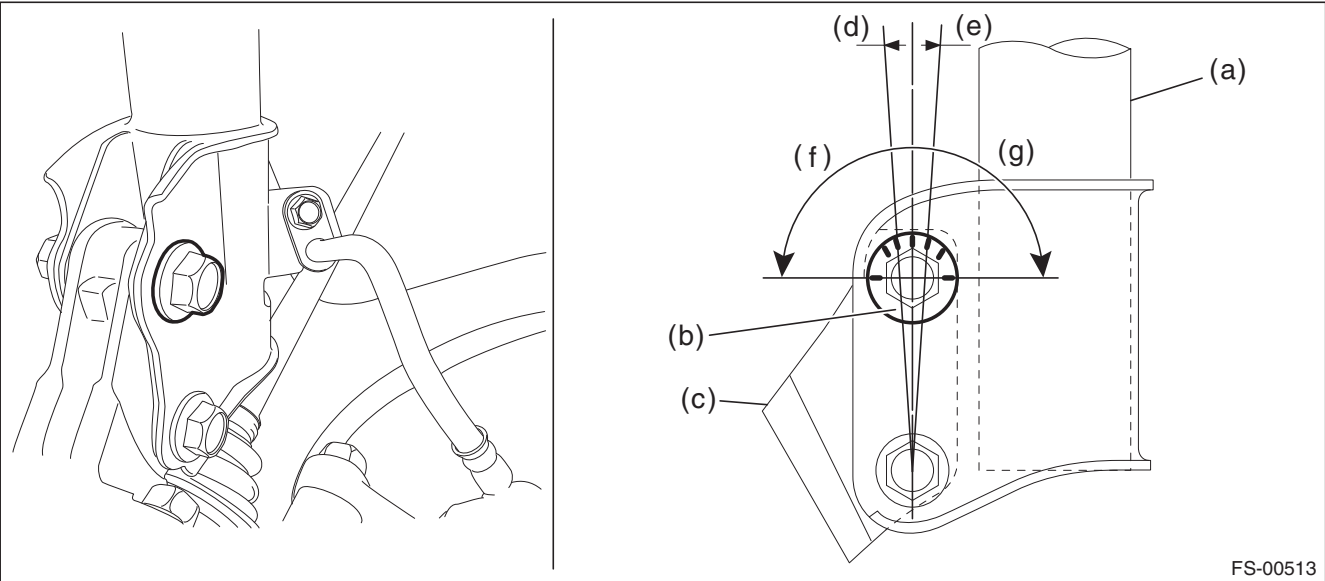
Wheel Alignment

FRONT SUSPENSION

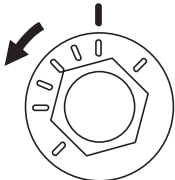
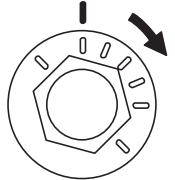
3) Turn the camber adjusting bolt so that the camber is set at specification.

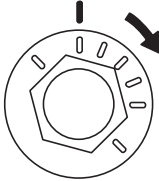
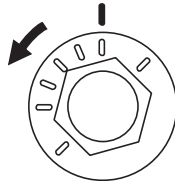
NOTE:

Moving the adjusting bolt by one scale changes the camber by approximately 0°15'.



- | | | |
|-------------------------------|--------------------------|--------------------------|
| (a) Strut ASSY | (d) Outer direction | (g) Camber is decreased. |
| (b) Adjusting bolt | (e) Inner direction | |
| (c) Housing ASSY - front axle | (f) Camber is increased. | |

To increase camber.	
Rotate the left side counterclockwise.	Rotate the right side clockwise.
	
FS-00352	FS-00353

To decrease camber.	
Rotate the left side clockwise.	Rotate the right side counterclockwise.
	
FS-00353	FS-00352

Wheel Alignment

FRONT SUSPENSION

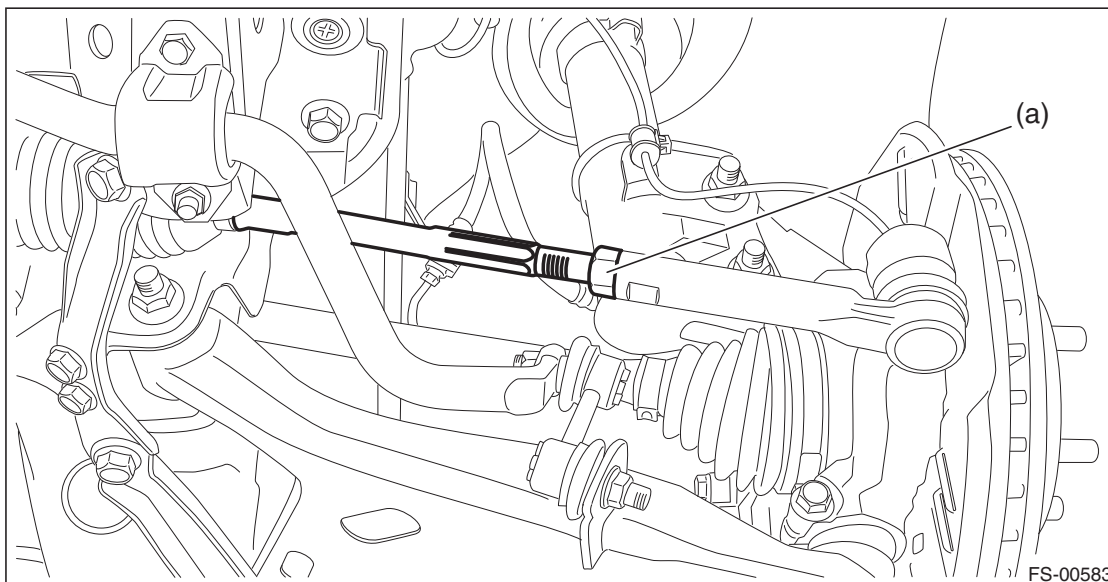
- 4) Tighten two new flange nuts.

Tightening torque:

155 N·m (15.81 kgf-m, 114.3 ft-lb)

2. STEERING ANGLE

- 1) Adjust the steering angle of both inner and outer wheels.
 - (1) Loosen the steering tie-rod lock nut (a), and rotate the tie-rod.



- (2) Turn the tie-rod to adjust the steering angle of both inner and outer wheels.
 - (3) Tighten the steering tie-rod lock nut (a).

Tightening torque:

85 N·m (8.67 kgf-m, 62.7 ft-lb)

NOTE:

Check and correct the tie-rod boot if twisted.

- 2) Check the toe-in. <Ref. to FS-10, STEERING ANGLE, INSPECTION, Wheel Alignment.>

3. FRONT WHEEL TOE-IN

When adjusting the toe-in, adjust it to the following value. <Ref. to FS-13, STEERING ANGLE, ADJUSTMENT, Wheel Alignment.>

Toe-in: Adjustment value

0±2 mm (0±0.08 in)

- 1) Check that the left and right wheel steering angles are within specification.
- 2) Loosen the left and right side steering tie-rod lock nuts (a).
- 3) Turn the left and right tie-rods by equal amounts until the toe-in is at the specification.

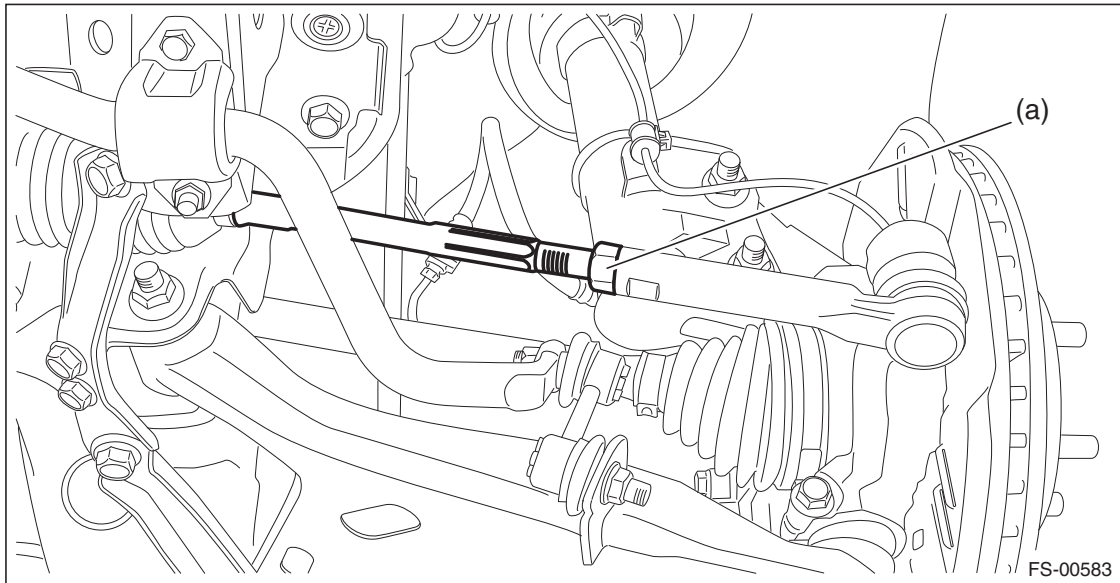
NOTE:

Both the left and right tie-rods are right-hand threaded. To increase toe-in, turn both tie-rods clockwise by equal amount (viewing from the inside of vehicle).

Wheel Alignment

FRONT SUSPENSION

- 4) Tighten the tie-rod lock nut (a).



Tightening torque:

85 N·m (8.67 kgf-m, 62.7 ft-lb)

- 5) Check and correct the tie-rod boot if twisted.

4. REAR WHEEL TOE-IN

When adjusting, adjust it to the following value.

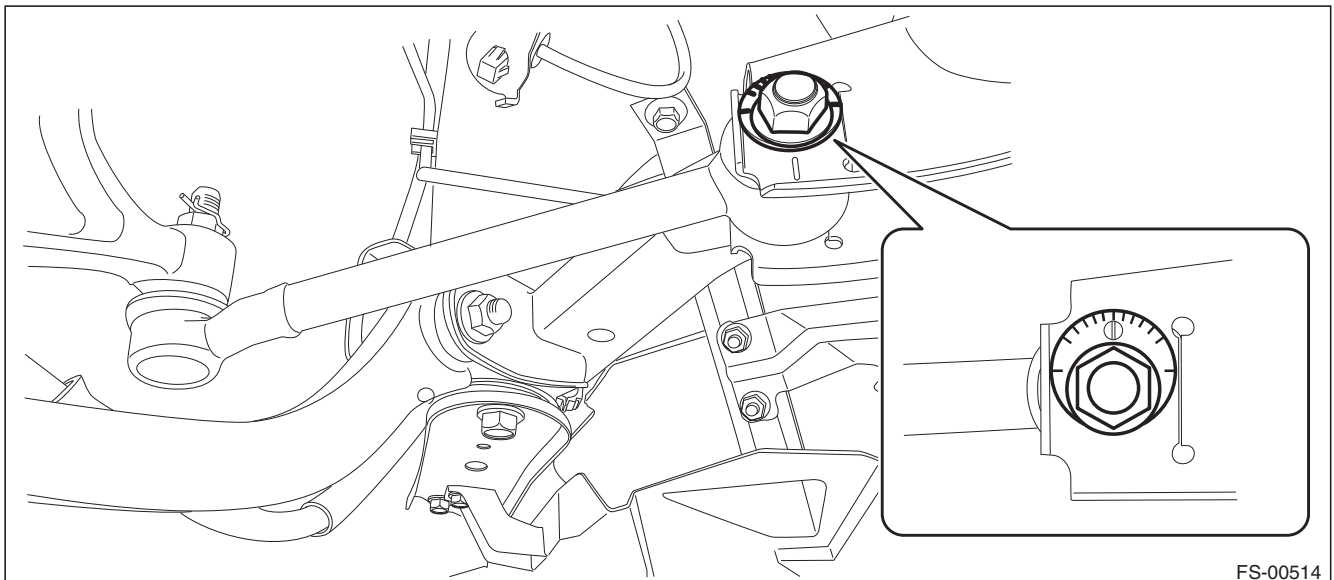
Toe-in: Adjustment value

3±2 mm (0.12±0.08 in)

- 1) Loosen the self-locking nut for the lateral link assembly - front.

NOTE:

When loosening or tightening the adjusting bolt, hold the bolt head and turn the self-locking nut.



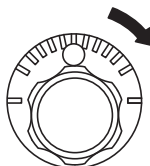
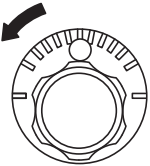
Wheel Alignment

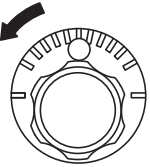
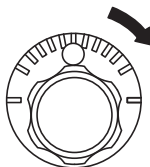
FRONT SUSPENSION

2) Turn the adjusting bolt until toe-in is within the specification.

NOTE:

When the left and right wheels are adjusted for toe-in at the same time, the movement of one scale graduation changes toe-in by approx. 6.0 mm (0.24 in).

To increase toe-in.	
Rotate the left side clockwise.	Rotate the right side counterclockwise.
 FS-00018	 FS-00019

To decrease toe-in.	
Rotate the left side counterclockwise.	Rotate the right side clockwise.
 FS-00019	 FS-00018

3) Attach and tighten a new self-locking nut.

Tightening torque:
100 N·m (10.20 kgf-m, 73.8 ft-lb)

Provided Exclusively on Ebay
by Seller "4SubaruManuals"



Wheel Alignment

FRONT SUSPENSION

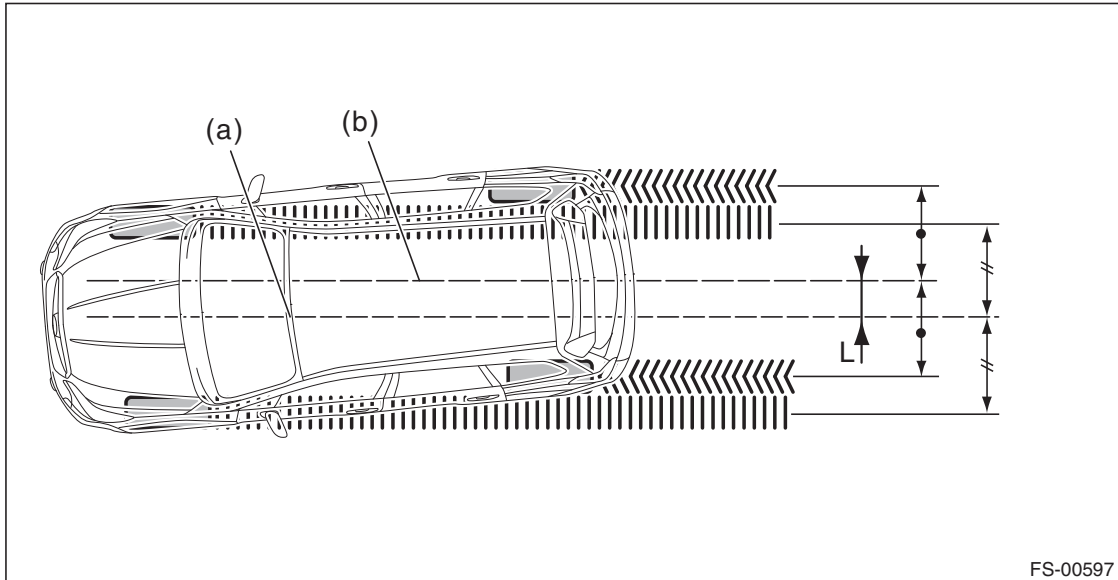
5. THRUST ANGLE

When adjusting, adjust it to the following value.

Thrust angle: Adjustment value

$0^{\circ} \pm 20'$

Less than 20' when "L" is 15 mm (0.6 in) or less



(a) Center line of loci (front axle)

(b) Center line of loci (rear axle)

- 1) Make thrust angle adjustments by turning the toe-in adjusting bolts of the rear suspension equally in the same direction.
- 2) When one rear wheel is adjusted in a toe-in direction, adjust the other rear wheel equally in toe-out direction, in order to make the thrust angle adjustment.

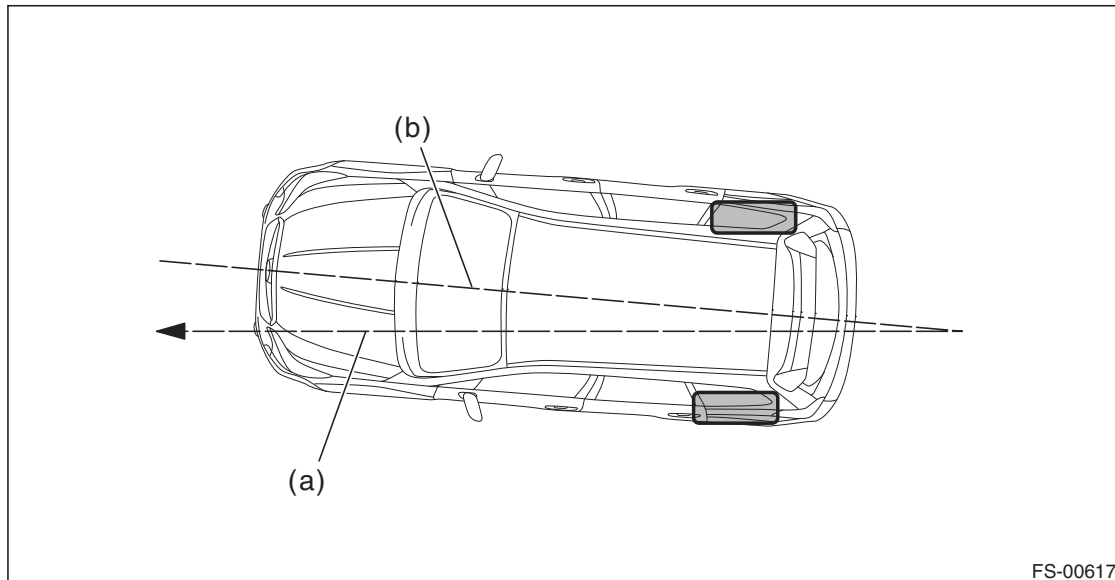
Wheel Alignment

FRONT SUSPENSION

3) When the left and right adjusting bolts are turned by one graduation, the thrust angle will change approx. 15'. ("L" is approx. 11 mm (0.43 in)).

NOTE:

Thrust angle is a mean value of left and right wheel toe angles in relation to the vehicle body center line. Vehicle is driven straight in the thrust angle direction while slanting in the oblique direction depending on the degree of the mean thrust angle.



(a) Thrust angle

(b) Body center line

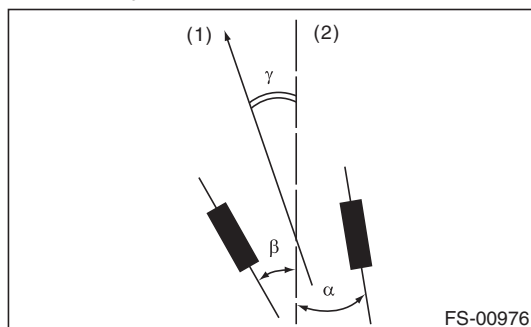
Thrust angle:

$$\gamma = (\alpha - \beta)/2$$

α : Rear RH wheel toe-in angle

β : Rear LH wheel toe-in angle

Substitute only the positive toe-in values from each wheel into α and β in the calculation.



(1) Front

(2) Body center line

Front Crossmember

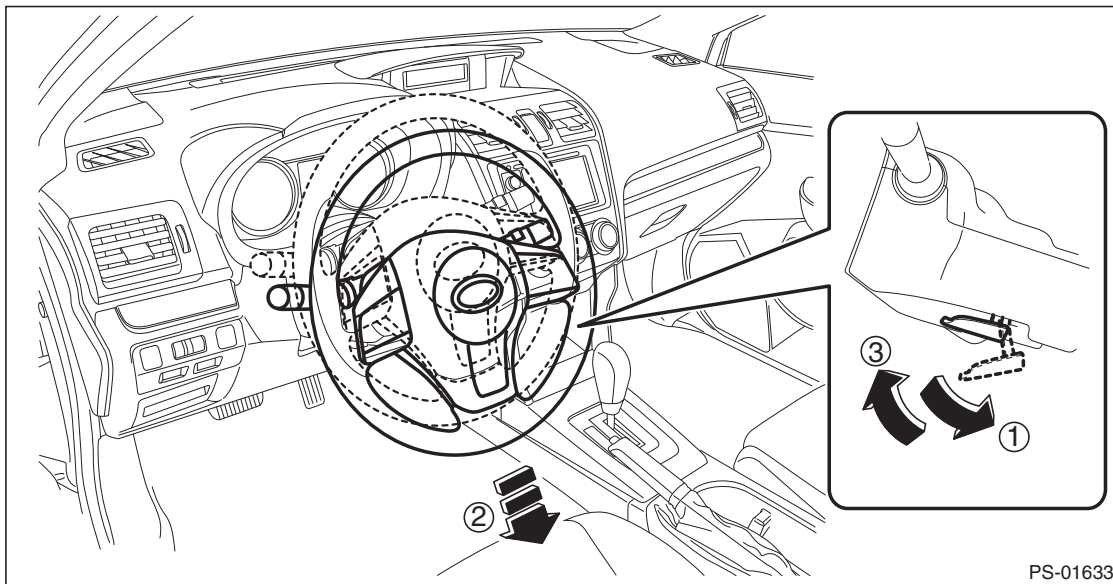
FRONT SUSPENSION

3. Front Crossmember

A: REMOVAL

CAUTION:

- The power steering control module continues to operate after the engine stops and calculate the temperature in the control module. Therefore, before starting service of the power steering system which requires disconnection of the connector, stop the engine and allow approx. 30 minutes until the control module becomes cold.
 - Before removal or installation, be sure to remove any foreign matter (dust, moisture, oil, etc.) from the power steering control module connector.
- 1) Disconnect the ground cable from battery.
 - 2) Adjust the tilt position of the steering column to the lowest position and lock the tilt lever.

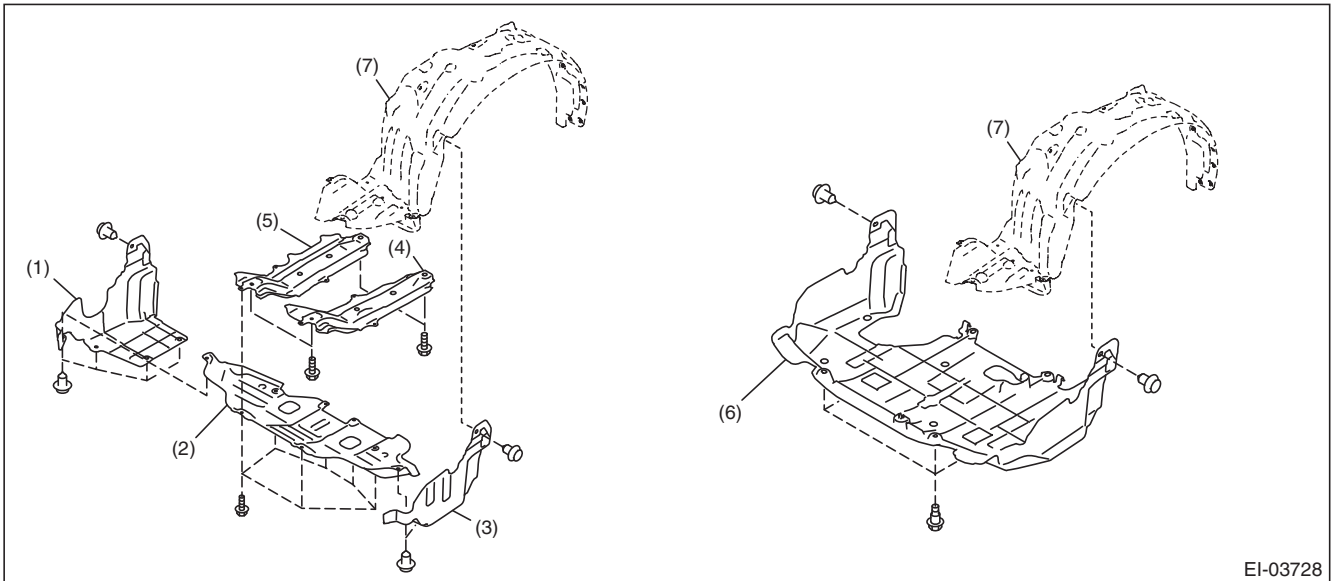


- 3) Lift up the vehicle, and then remove the front wheels.

Front Crossmember

FRONT SUSPENSION

4) Remove the bolts and clips, and remove the under cover - front.



EI-03728

- | | | |
|--|--|-----------------------|
| (1) Under cover COMPL - front RH (turbo model) | (4) Under cover - front guard LH (turbo model) | (7) Mud guard - front |
| (2) Plate CTR - aluminum (turbo model) | (5) Under cover - front guard RH (turbo model) | |
| (3) Under cover COMPL - front LH (turbo model) | (6) Under cover - front (non-turbo model) | |

5) Remove the universal joint assembly - steering.

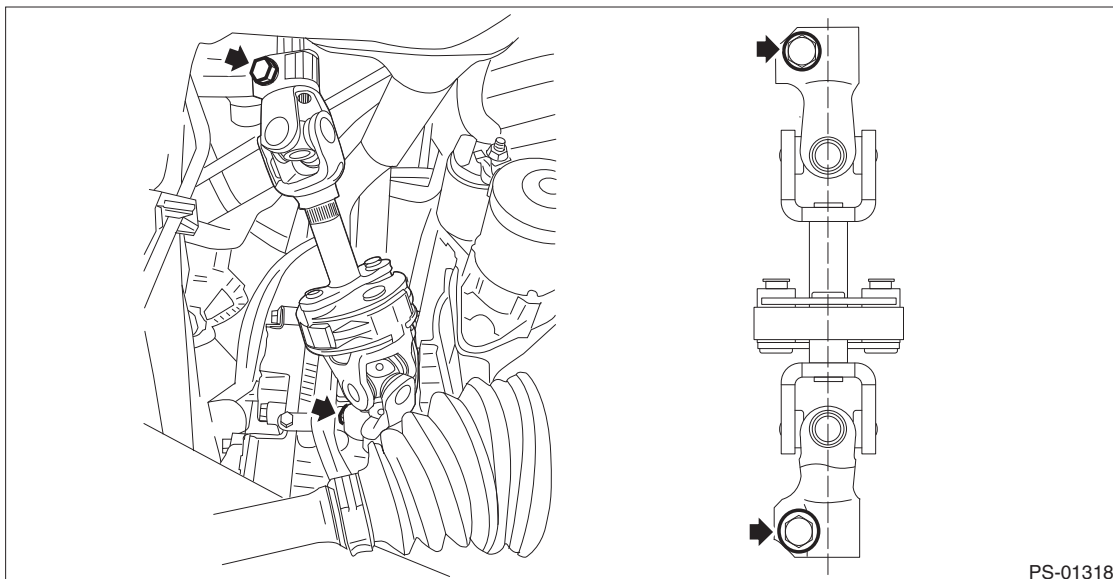
(1) Place alignment marks on the universal joint assembly - steering.

NOTE:

Place alignment marks on the following positions.

- Between the column assembly - steering and the universal joint assembly - steering
- Between the steering gearbox assembly and the universal joint assembly - steering

(2) Remove the bolt, and remove the universal joint assembly - steering.

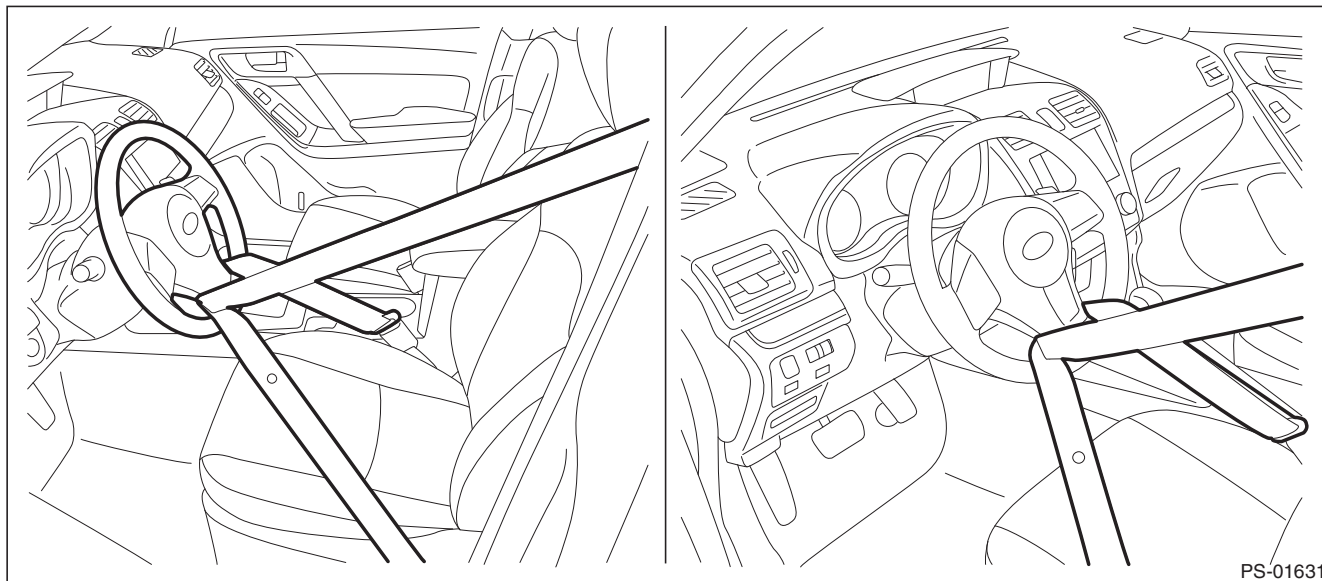


PS-01318

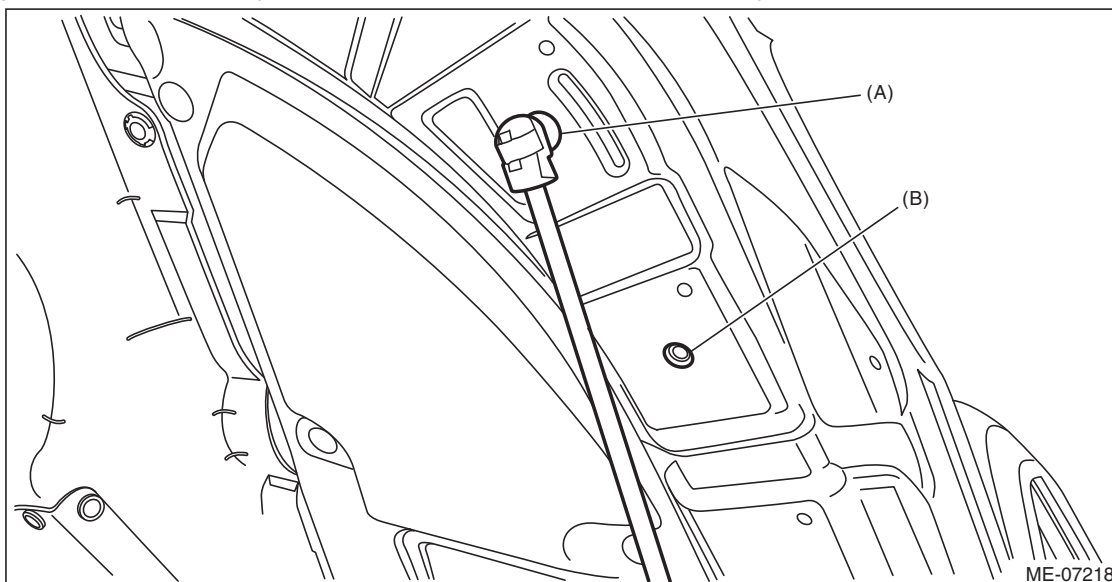
Front Crossmember

FRONT SUSPENSION

6) Prevent the steering wheel from turning using the seat belt.



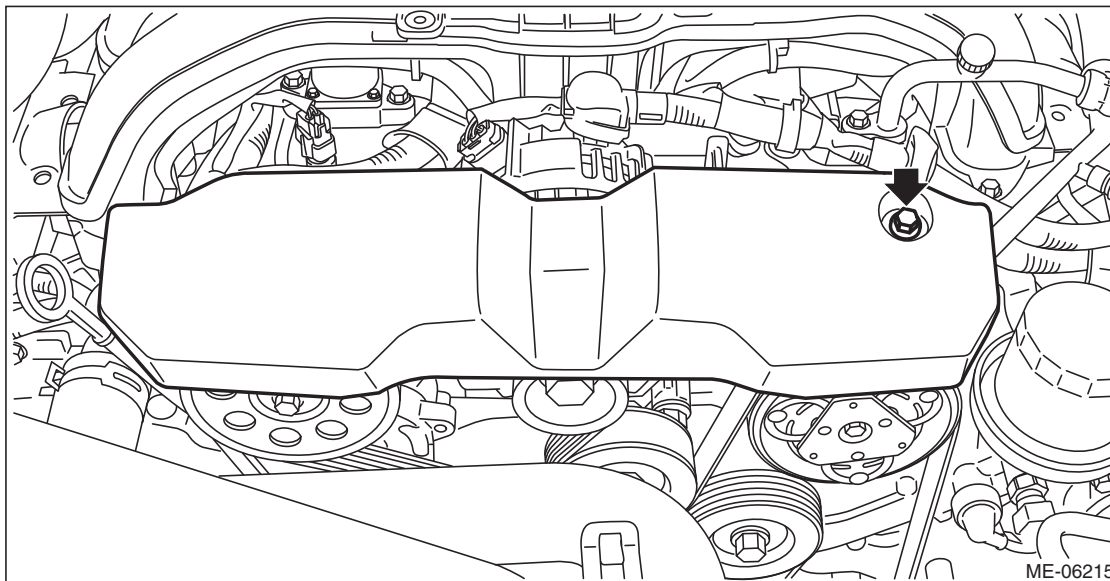
7) Change the front hood stay position from (A) to (B), and completely open the front hood.



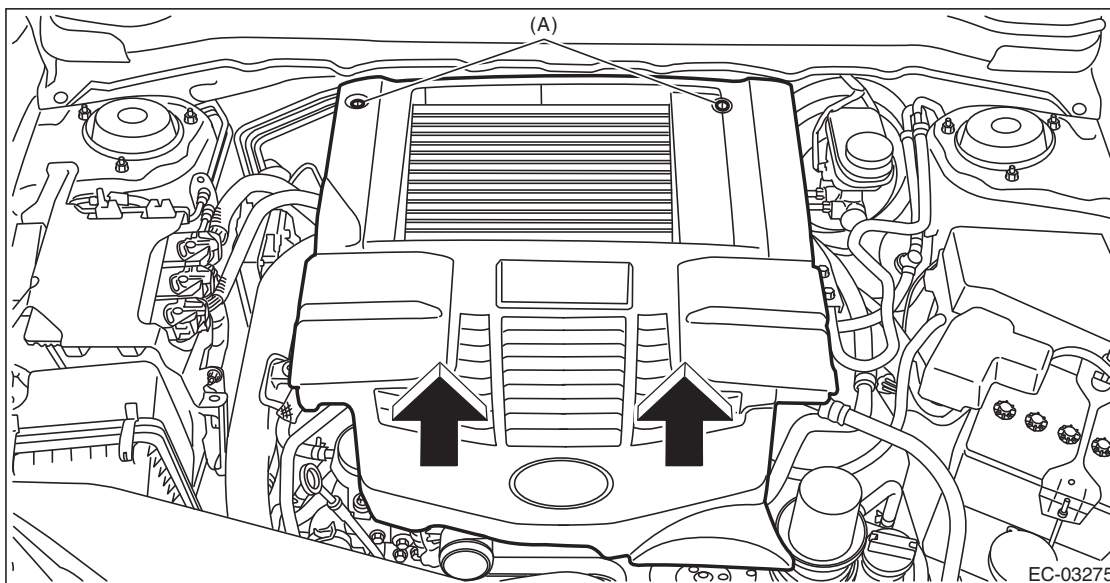
Front Crossmember

FRONT SUSPENSION

- 8) Remove the bolts and remove the V-belt cover. (Non-turbo model)



- 9) Remove the clip (A), lift the front of the collector cover in the direction of arrow, and then remove the collector cover. (Turbo model)



- 10) Disconnect the connector and harness clamp from power steering control module.

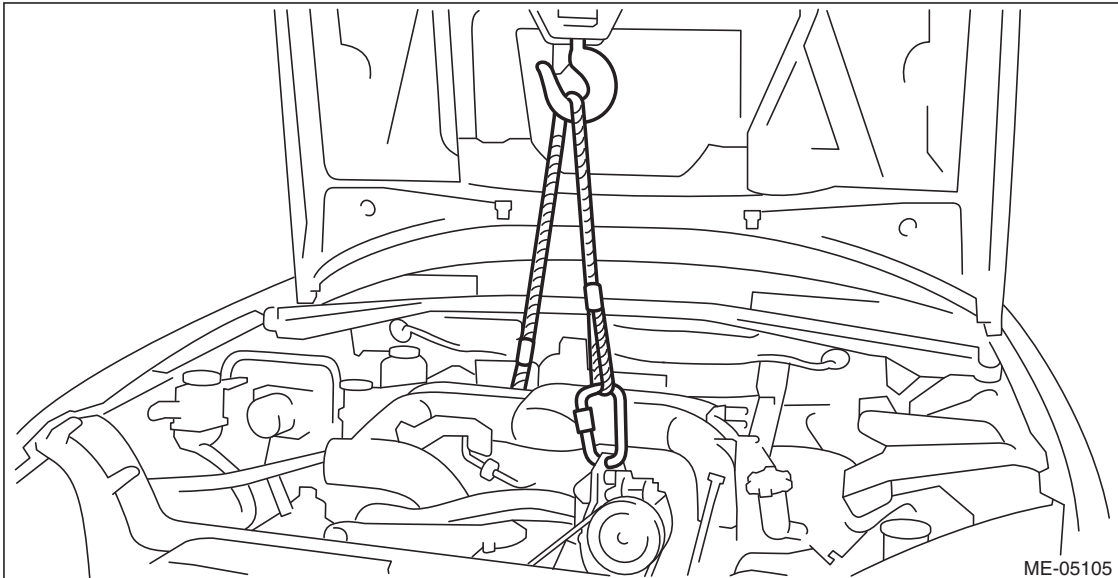
Front Crossmember

FRONT SUSPENSION

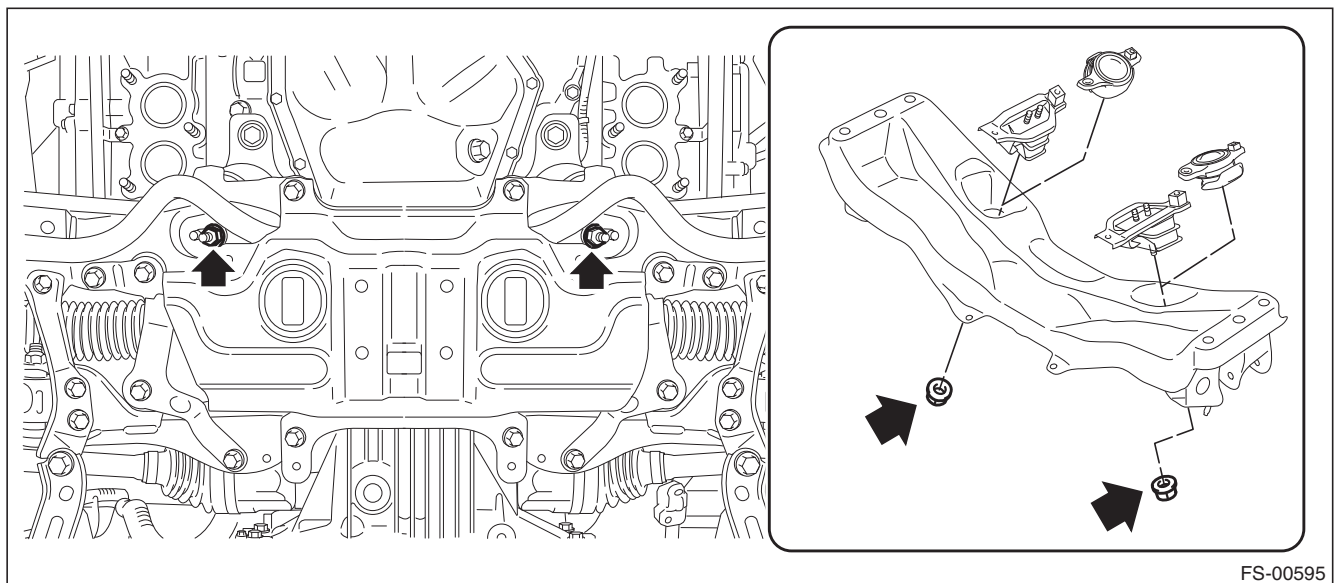
- 11) Support the engine with a lifting device and wire ropes.
 - (1) Support the engine with a lifting device and wire ropes.
 - (2) While lifting up the vehicle, also raise up the lifting device.

CAUTION:

When lifting up the vehicle, raise up wire ropes at the same time.



- 12) Remove the nuts which secure the engine mounting.
 - (1) Raise up the lifting device, and lift the engine by approx. 10 mm (0.39 in).
 - (2) Remove the nuts which secure the engine mounting to the front crossmember assembly.

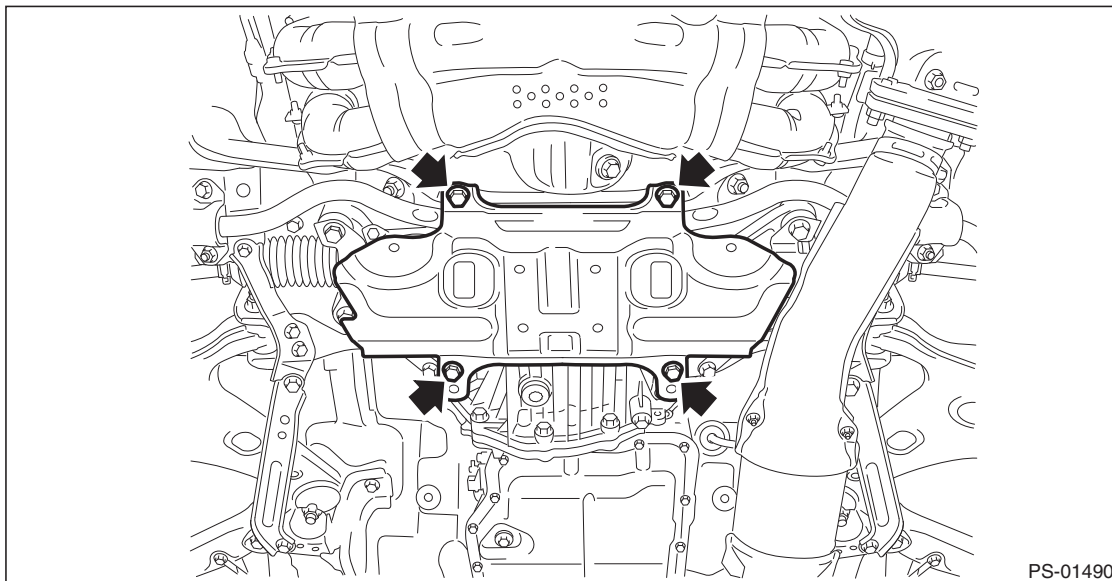


- 13) Remove the center exhaust pipe.
 - Non-turbo model: <Ref. to EX(H4DO)-14, REMOVAL, Center Exhaust Pipe.>
 - Turbo model: <Ref. to EX(H4DOTC)-30, REMOVAL, Center Exhaust Pipe.>

Front Crossmember

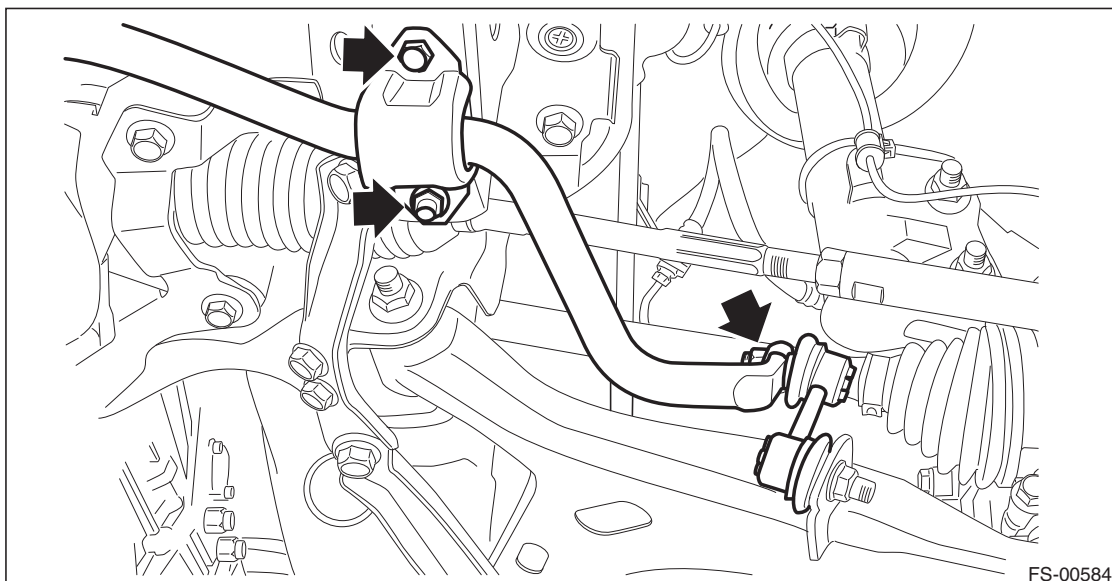
FRONT SUSPENSION

- 14) Remove the bolt, and remove the front crossmember support.



- 15) Remove the front stabilizer.

- (1) Remove the left and right stabilizer links.
- (2) Remove the clamp - stabilizer bushing on the left and right sides.



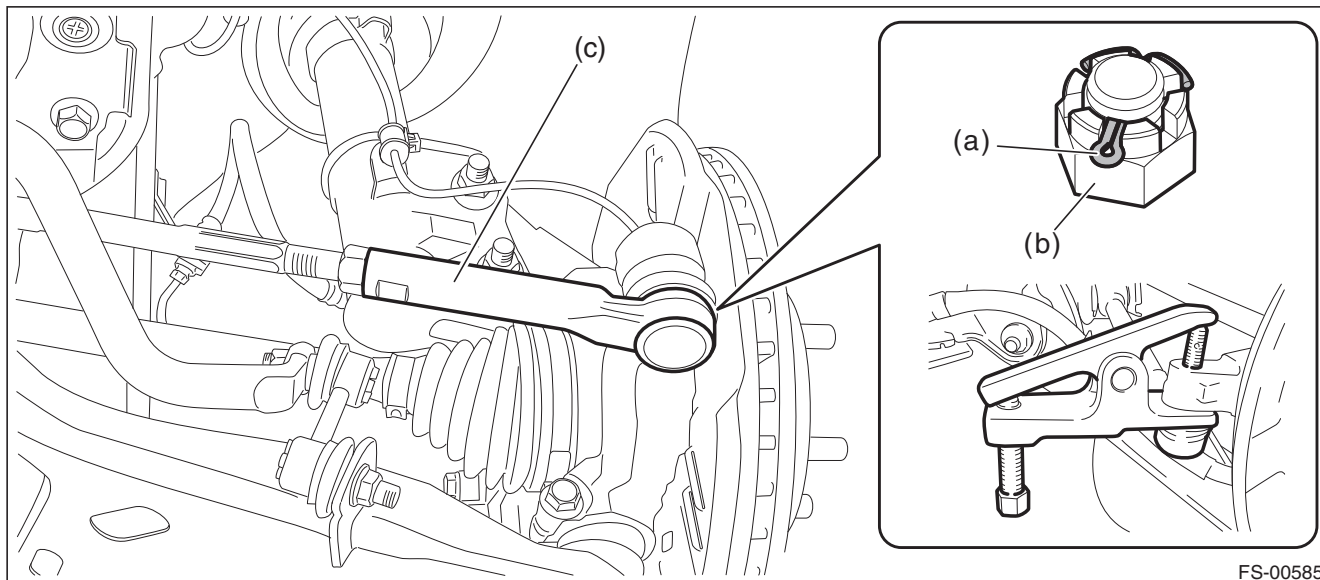
Front Crossmember

FRONT SUSPENSION

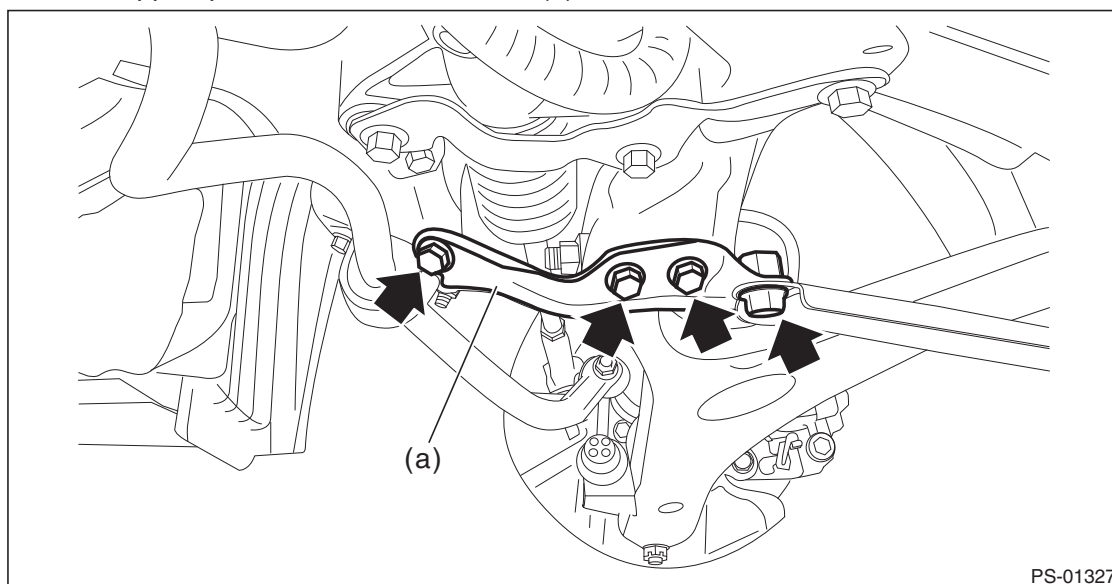
- 16) Disconnect the tie-rod end.
- (1) Pull out the cotter pin (a).
 - (2) Remove the castle nut (b).
 - (3) Using a tie-rod ball joint puller, remove the tie-rod end (c).

Preparation tool:

Tie-rod ball joint puller



- 17) Remove the support plate - front crossmember (a).

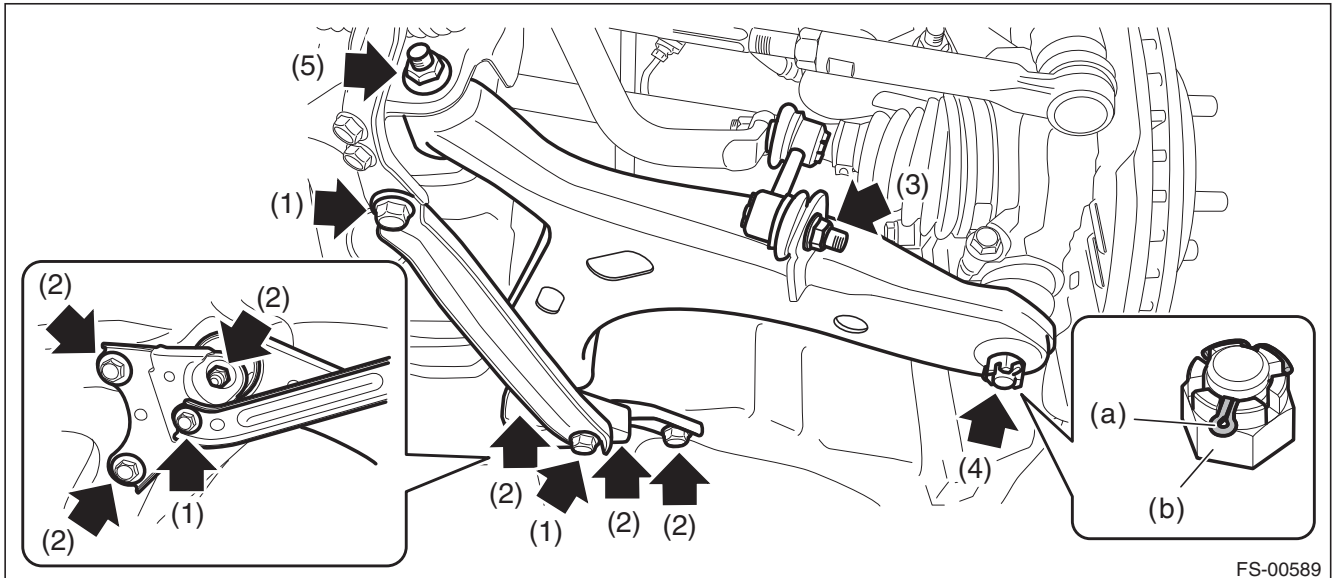


Front Crossmember

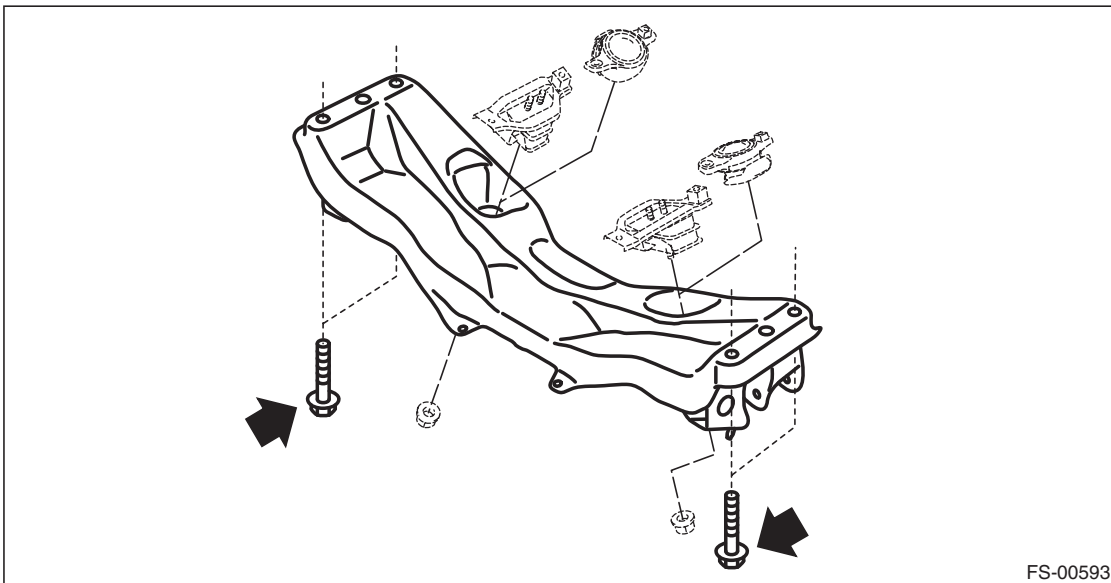
FRONT SUSPENSION

18) Remove the front arm assembly.

- (1) Remove the bolt, and then detach the front support.
- (2) Remove the bolts and nuts, and then remove the front arm rear plate.
- (3) Remove the nut and disconnect the stabilizer link assembly.
- (4) Pull out the cotter pin (a), remove the castle nut (b), and remove the ball joint from front arm assembly.
- (5) Remove the nuts, pull out the flange bolt, and remove the front arm assembly.



19) Support the front crossmember assembly using a jack, and remove the bolts which hold the crossmember on the body.



20) Slowly lower the front crossmember assembly with the steering gearbox assembly as a single unit.

CAUTION:

When removing the crossmember, make sure that the tie-rod end does not interfere with the drive shaft boot.

21) Remove the steering gearbox assembly from the front crossmember assembly.

Front Crossmember

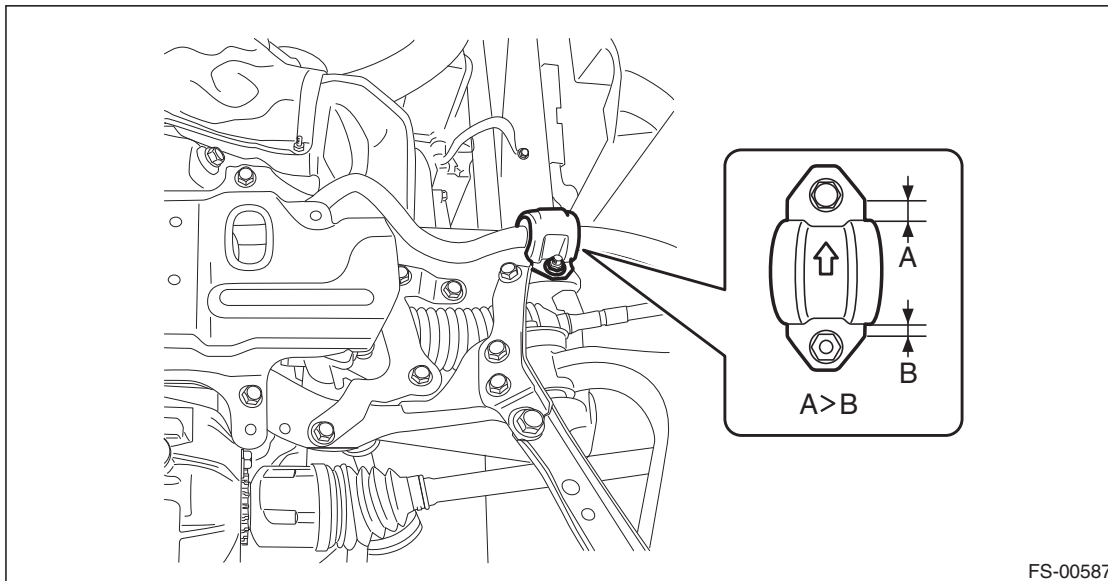
FRONT SUSPENSION

B: INSTALLATION

- 1) Check the crossmember for damage or cracks, and correct or replace if defective.
- 2) Install the universal joint assembly - steering. <Ref. to PS-14, INSTALLATION, Universal Joint.>
- 3) Install each part in the reverse order of removal.

CAUTION:

- Use a new bolt and self-locking nut. For parts which are not reusable, refer to "COMPONENT". <Ref. to FS-3, COMPONENT, General Description.>
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.
- Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.



Tightening torque:

Engine mount — front crossmember assembly: 45 N·m (4.59 kgf-m, 33.2 ft-lb)

Universal joint assembly - steering: 24 N·m (2.45 kgf-m, 17.7 ft-lb)

V-belt cover: 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

Under cover - front: 17.5 N·m (1.78 kgf-m, 12.9 ft-lb)

Front suspension parts: <Ref. to FS-3, FRONT SUSPENSION, COMPONENT, General Description.>

When tightening the castle nut, tighten the castle nut to the specified torque first, then tighten it further but within 60° until the hole in the ball stud is aligned with a slot in castle nut.

- 4) Install the front wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

- 5) 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 the adjustment of the steering angle sensor. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

- 6) 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.>

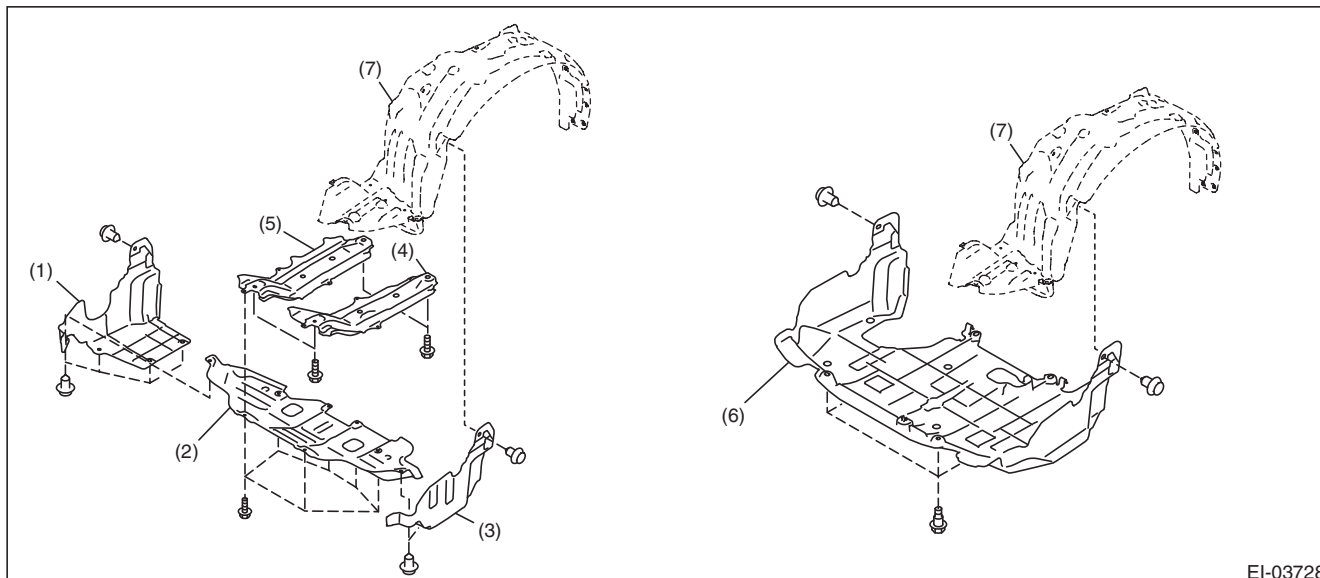
Front Crossmember Support Plate

FRONT SUSPENSION

4. Front Crossmember Support Plate

A: REMOVAL

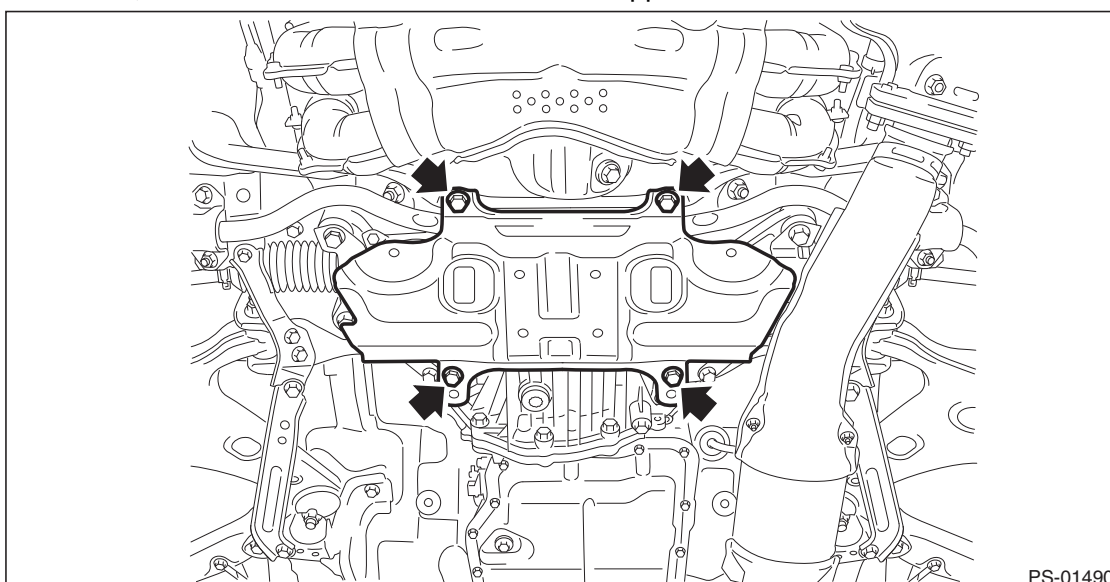
- 1) Lift up the vehicle.
- 2) Remove the bolts and clips, and remove the under cover - front.



EI-03728

- | | | |
|--|--|-----------------------|
| (1) Under cover COMPL - front RH (turbo model) | (4) Under cover - front guard LH (turbo model) | (7) Mud guard - front |
| (2) Plate CTR - aluminum (turbo model) | (5) Under cover - front guard RH (turbo model) | |
| (3) Under cover COMPL - front LH (turbo model) | (6) Under cover - front (non-turbo model) | |

- 3) Remove the bolt, and remove the front crossmember support.



PS-01490

Front Crossmember Support Plate

FRONT SUSPENSION

B: INSTALLATION

Install each part in the reverse order of removal.

Tightening torque:

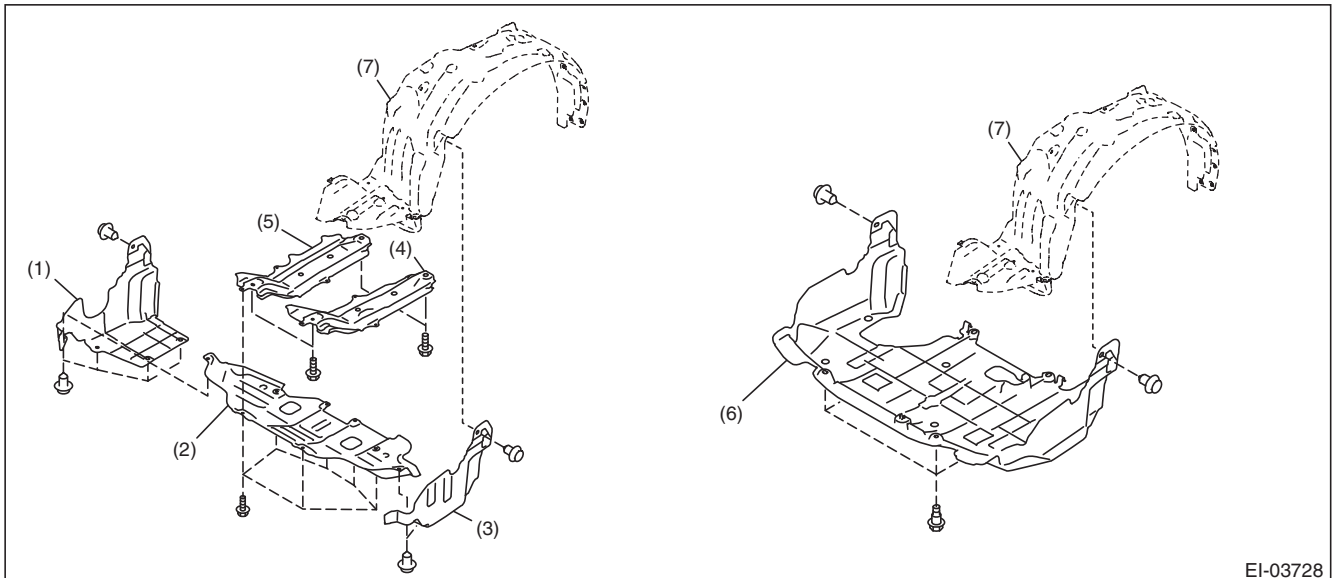
Front crossmember support — front crossmember assembly: 60 N·m (6.12 kgf-m, 44.3 ft-lb)

Under cover - front: 17.5 N·m (1.78 kgf-m, 12.9 ft-lb)

5. Front Stabilizer

A: REMOVAL

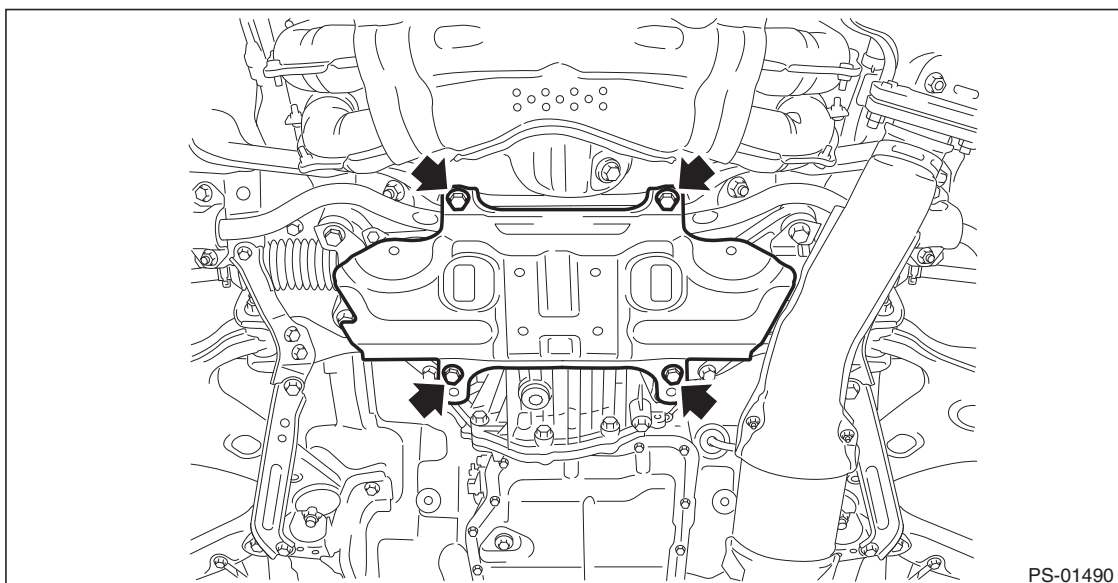
- 1) Lift up the vehicle, and then remove the left and right front wheels.
- 2) Remove the bolts and clips, and remove the under cover - front.



EI-03728

- | | | |
|--|--|-----------------------|
| (1) Under cover COMPL - front RH (turbo model) | (4) Under cover - front guard LH (turbo model) | (7) Mud guard - front |
| (2) Plate CTR - aluminum (turbo model) | (5) Under cover - front guard RH (turbo model) | |
| (3) Under cover COMPL - front LH (turbo model) | (6) Under cover - front (non-turbo model) | |

- 3) Remove the bolt, and remove the front crossmember support.



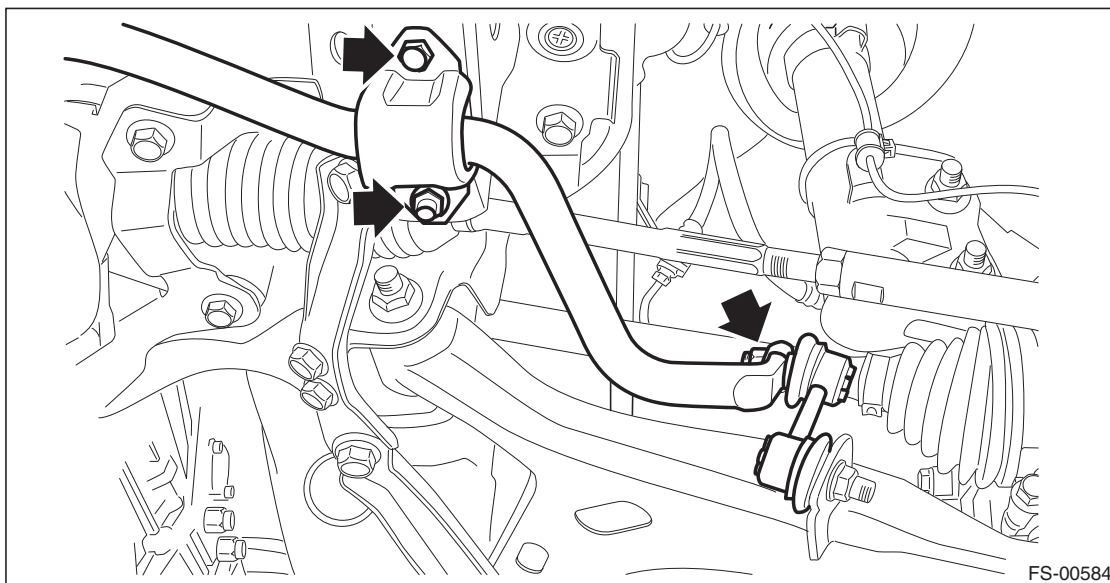
PS-01490

- 4) Remove the front stabilizer.
 - (1) Remove the left and right stabilizer links.

Front Stabilizer

FRONT SUSPENSION

- (2) Remove the clamp - stabilizer bushing on the left and right sides.

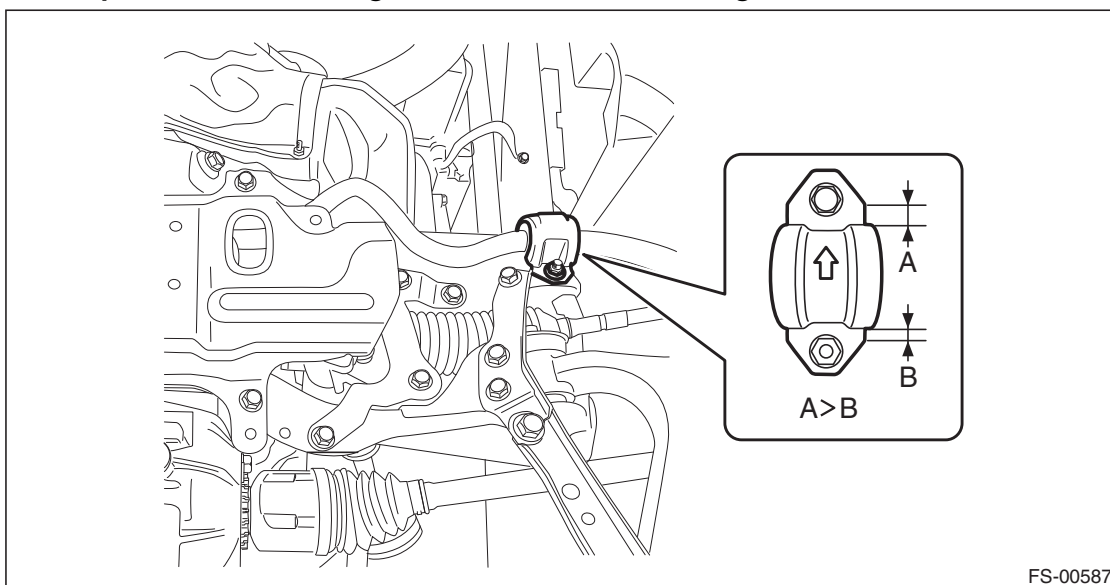


B: INSTALLATION

- 1) Before installation, inspect the following items and replace any faulty part with a new one.
 - Check the bushing - stabilizer for abnormal cracks, fatigue or damage.
 - Check the stabilizer link assembly for damage.
- 2) Install each part in the reverse order of removal.

CAUTION:

Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.



Tightening torque:

Clamp - stabilizer bushing: 25 N·m (2.55 kgf-m, 18.4 ft-lb)

Stabilizer link assembly: 60 N·m (6.12 kgf-m, 44.3 ft-lb)

Support plate - front crossmember: 60 N·m (6.12 kgf-m, 44.3 ft-lb)

Under cover - front: 17.5 N·m (1.78 kgf-m, 12.9 ft-lb)

- 3) Install the front wheels.

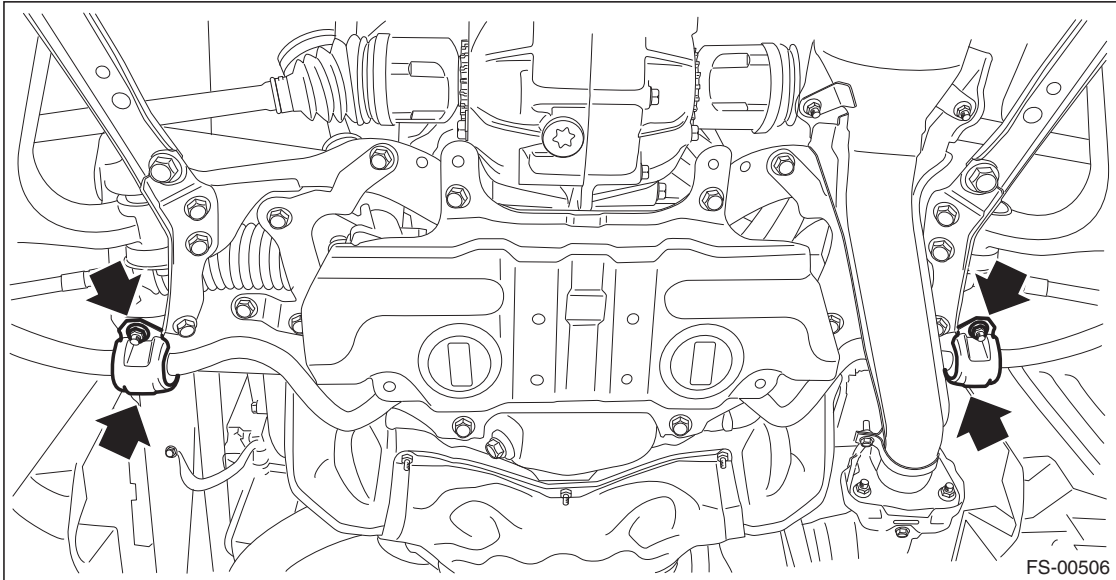
Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

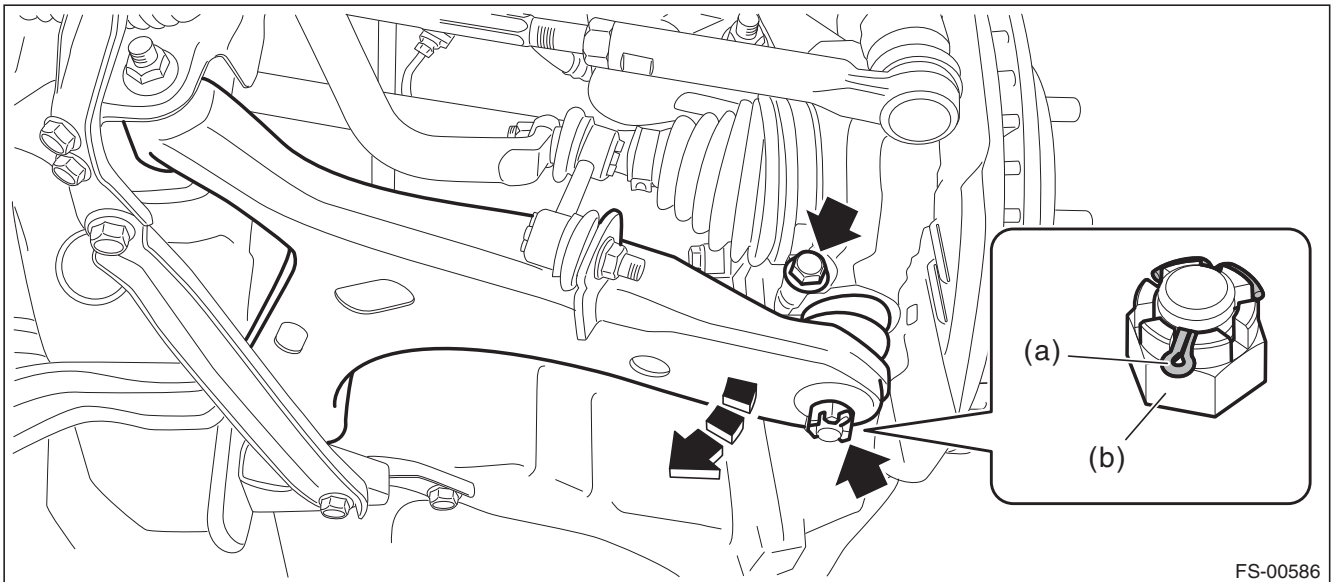
6. Front Ball Joint

A: REMOVAL

- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the clamp - stabilizer bushing on the left and right sides.



- 3) Remove the ball joint assembly.
 - (1) Pull out the cotter pin (a), and remove the castle nut (b).
 - (2) Lower the front arm assembly, and remove the ball stud.
 - (3) Remove the bolt from the housing assembly - front axle.



- (4) Extract the ball joint assembly from the housing assembly - front axle.

Front Ball Joint

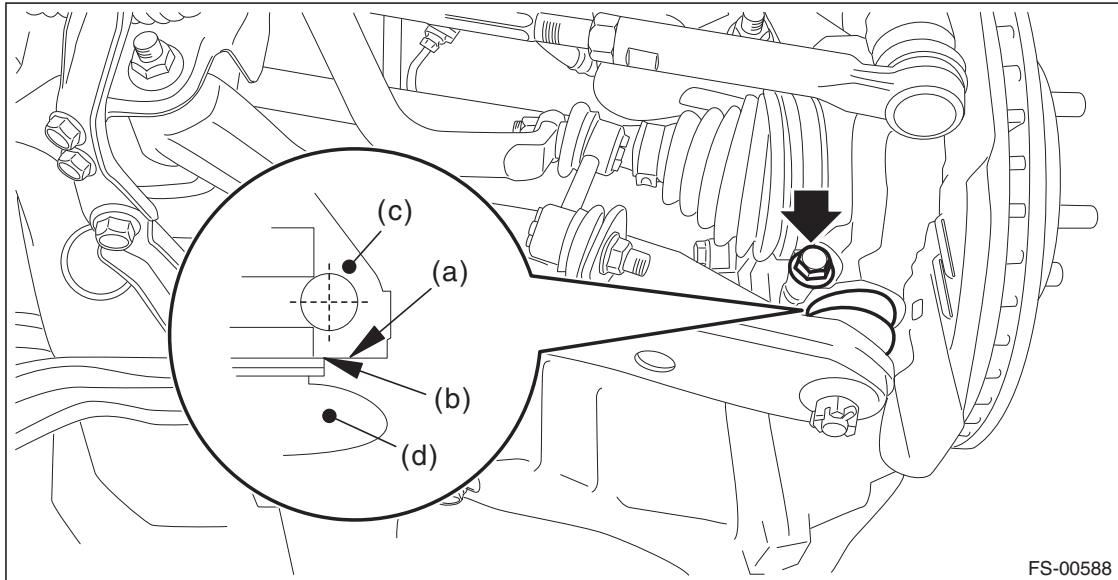
FRONT SUSPENSION

B: INSTALLATION

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

CAUTION:

- Do not apply grease to the tapered portion of ball stud.
- Before tightening, make sure the bottom surface of the housing assembly - front axle and the stepped section of ball joint are in contact.



FS-00588

- (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)

2) Install the ball joint assembly to the front arm assembly.

- (1) Connect the ball joint assembly to the front arm assembly.

Tightening torque:

39 N·m (3.98 kgf-m, 28.8 ft-lb)

- (2) Retighten the castle nut further up to 60° until the hole in the ball stud is aligned with a slot in castle nut.
(3) Insert a new cotter pin and bend it around the castle nut.

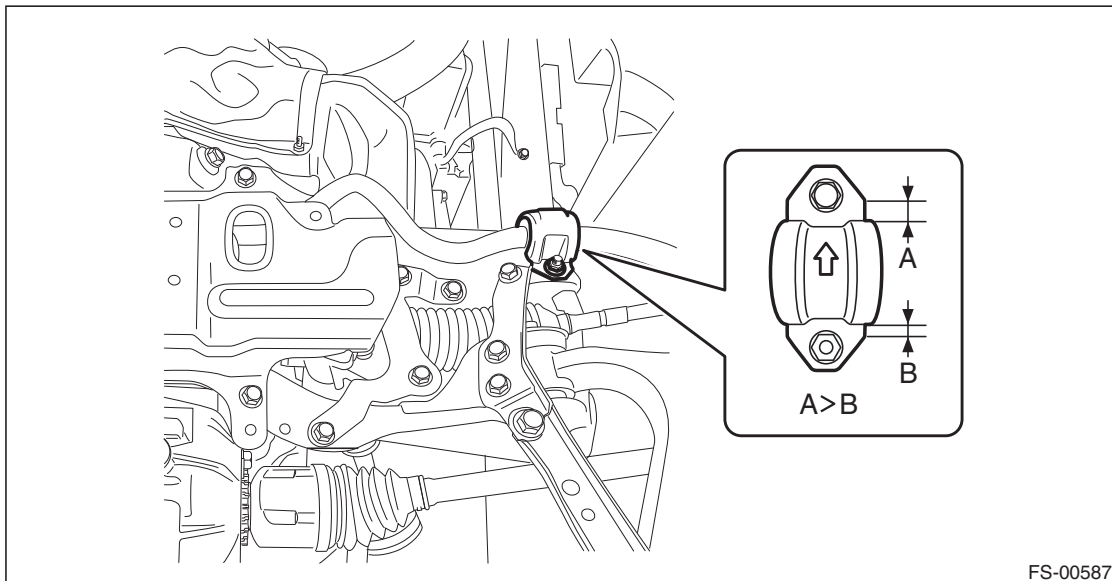
Front Ball Joint

FRONT SUSPENSION

3) Install the clamp - stabilizer bushing.

CAUTION:

Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.



Tightening torque:

25 N·m (2.55 kgf-m, 18.4 ft-lb)

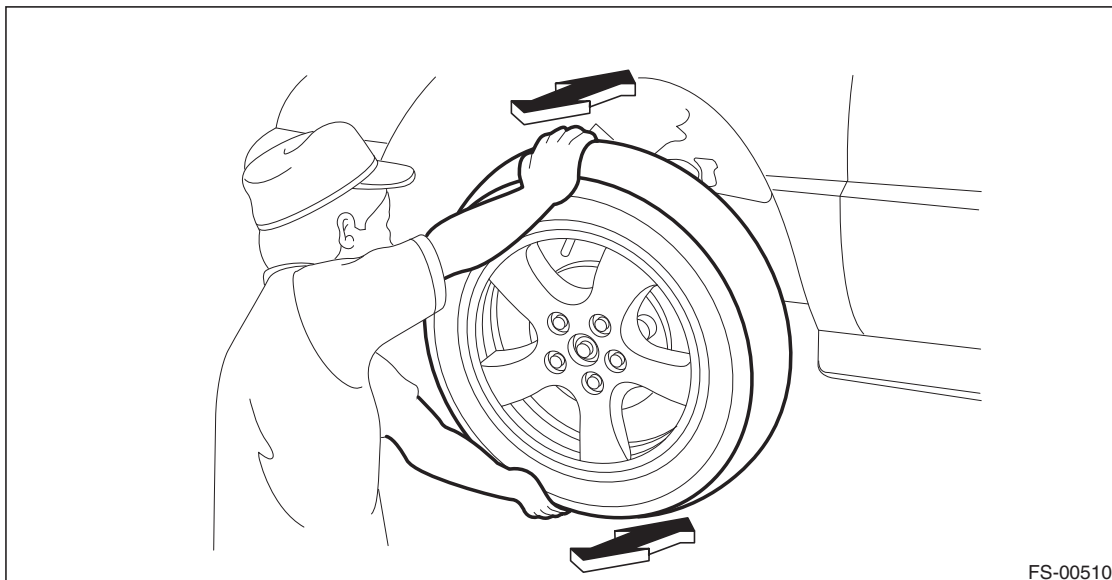
4) Install the front wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

C: INSPECTION

1) 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.>

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) Replace the ball joint assembly if the dust cover is damaged when visually inspecting the dust cover.

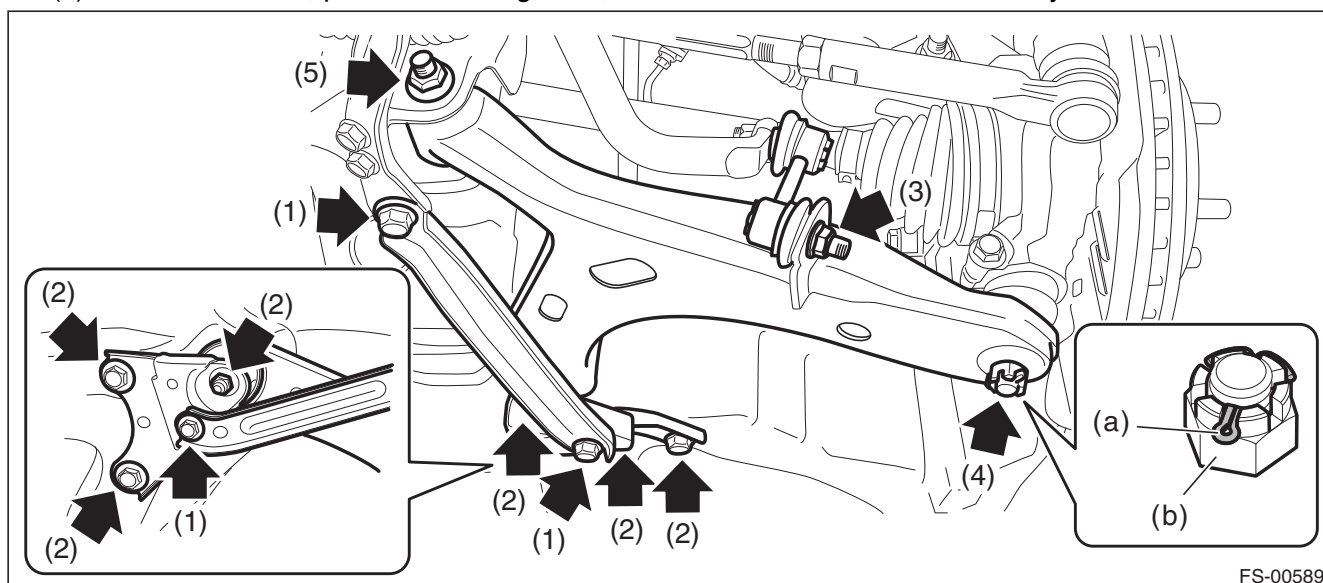
Front Arm

FRONT SUSPENSION

7. Front Arm

A: REMOVAL

- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the front arm assembly.
 - (1) Remove the bolt, and then detach the front support.
 - (2) Remove the bolts and nuts, and then remove the front arm rear plate.
 - (3) Remove the nut and disconnect the stabilizer link assembly.
 - (4) Pull out the cotter pin (a), remove the castle nut (b), and remove the ball joint assembly from front arm assembly.
 - (5) Remove the nuts, pull out the flange bolt, and remove the front arm assembly.



B: INSTALLATION

- 1) Before installation, inspect the following items and replace any faulty part with a new one.
 - Check the front arm assembly for damage or cracks, and replace if defective.
 - Visually check the bushing for abnormal cracks, fatigue or damage.
 - Visually check the dust cover on the ball joint assembly for damage.
- 2) Using new self-locking nuts and flange bolts, temporarily tighten the front arm assembly to the front cross-member assembly.

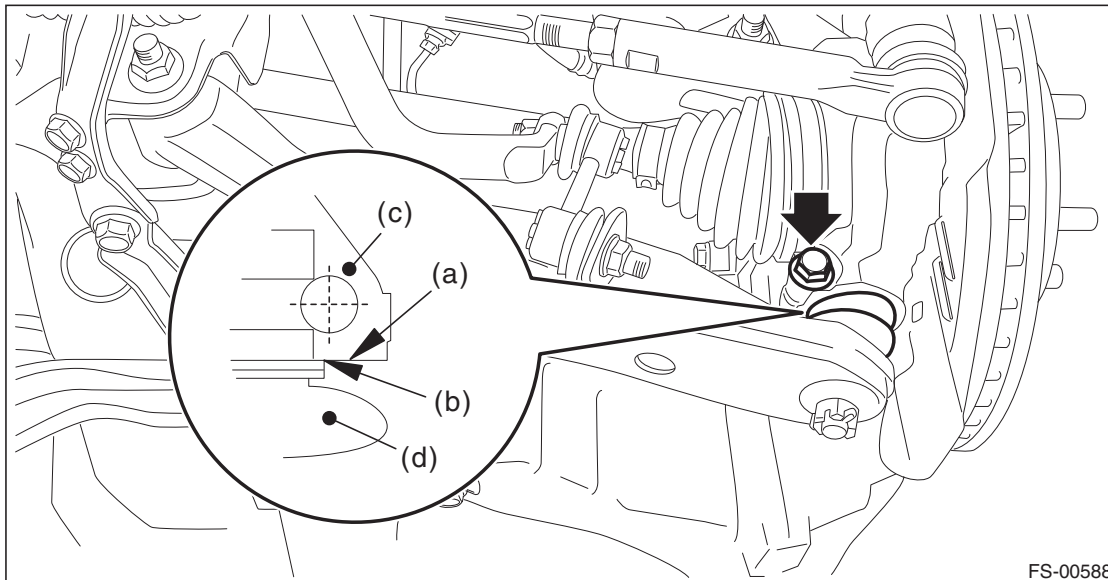
Front Arm

FRONT SUSPENSION

3) 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.



- (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)

4) Install the stabilizer link assembly.

Tightening torque:

60 N·m (6.12 kgf-m, 44.3 ft-lb)

5) Install the front wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

6) Unload the vehicle from the lift, and tighten the bolt which secures the front arm assembly to the front crossmember assembly while the wheels are in full contact with the ground and the vehicle is at curb weight.

Tightening torque:

Busing front - front arm: 95 N·m (9.7 kgf-m, 70.1 ft-lb)

Busing rear - front arm: 110 N·m (11.22 kgf-m, 81.1 ft-lb)

7) 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" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

8) 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 Arm

FRONT SUSPENSION

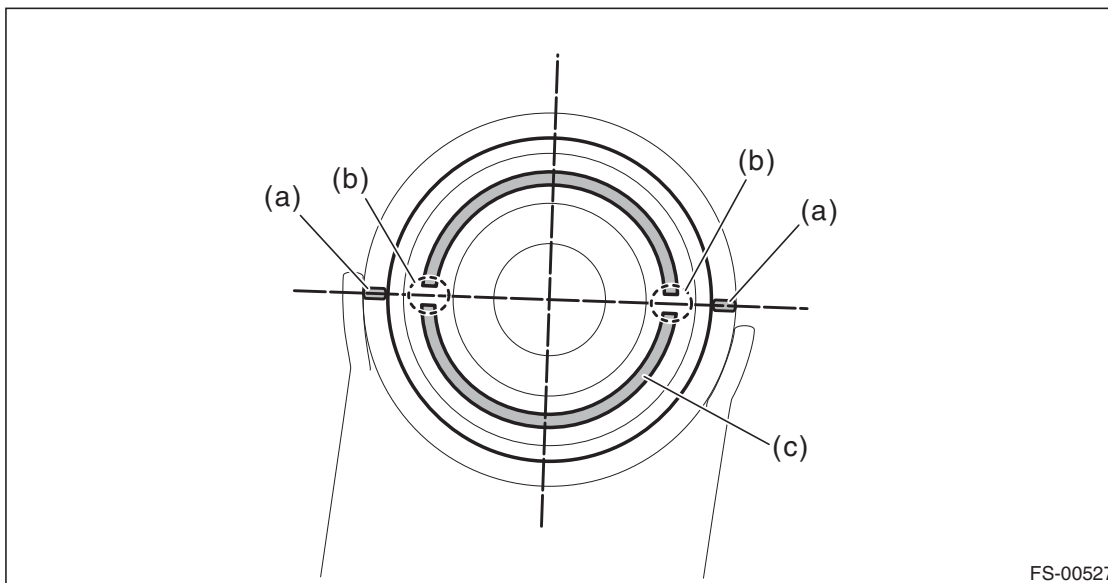
C: DISASSEMBLY

1. BUSHING FRONT - FRONT ARM

1) Put an alignment mark on the front arm assembly based on the split portion of the bushing intermediate plate of the busing front - front arm.

CAUTION:

Always put an alignment mark for aligning the position on bushing installation.



(a) Put an alignment mark.

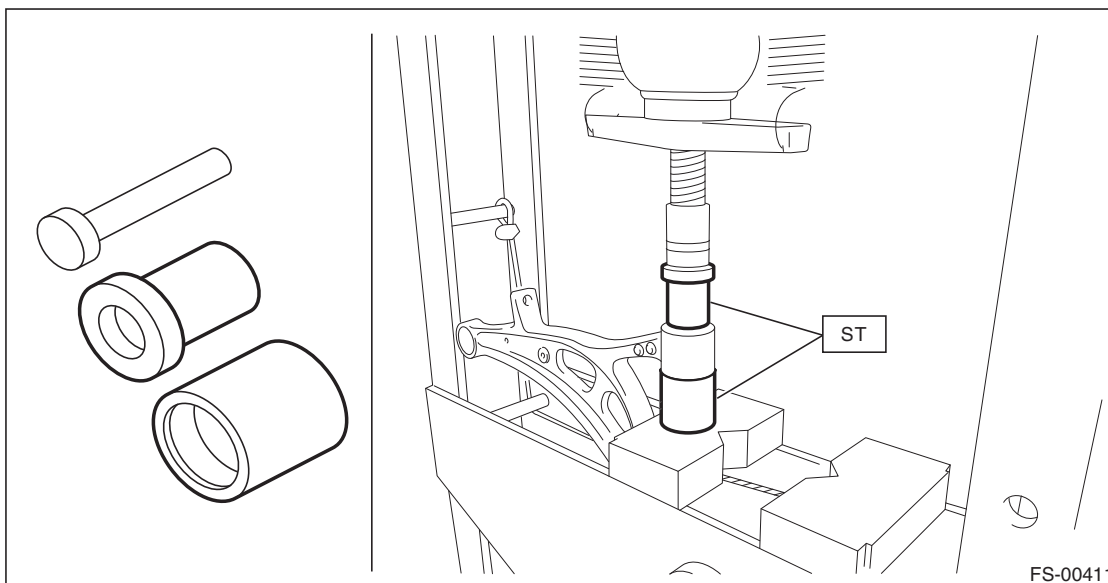
(b) Split portion of bushing intermediate plate

(c) Bushing intermediate plate

2) Using the ST and a press, remove the busing front - front arm.

PREPARATION TOOL:

ST: INSTALLER & REMOVER SET (927680000)



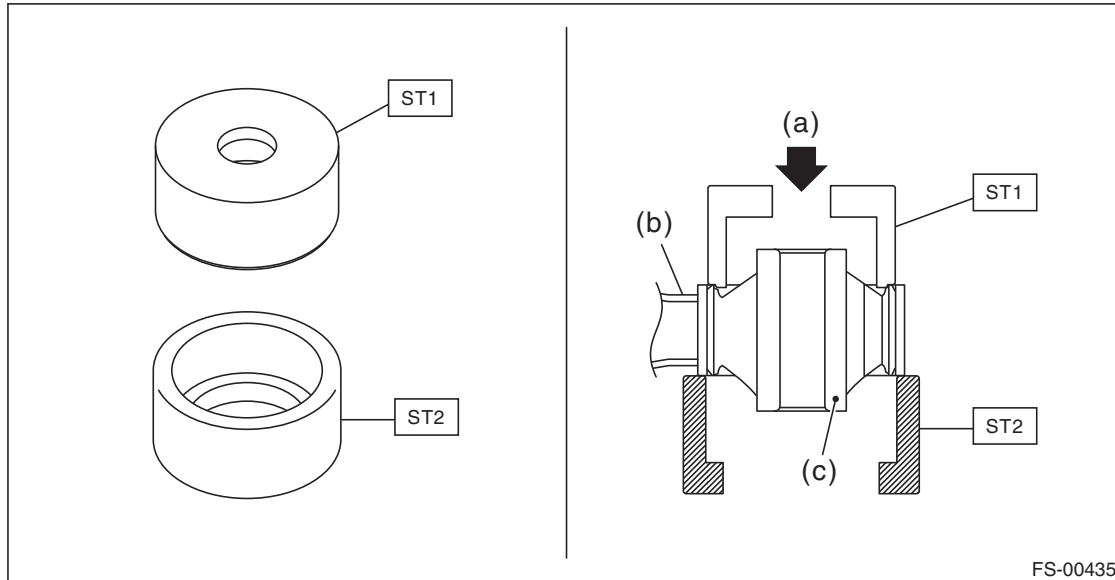
2. BUSHING REAR - FRONT ARM

- 1) Put an alignment mark on the front arm assembly based on the center of recess portion of the bushing rear - front arm.
- 2) Using the ST and a press, remove the bushing rear - front arm.

PREPARATION TOOL:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



(a) Press

(b) Front arm ASSY

(c) Bushing rear - front arm

Front Arm

FRONT SUSPENSION

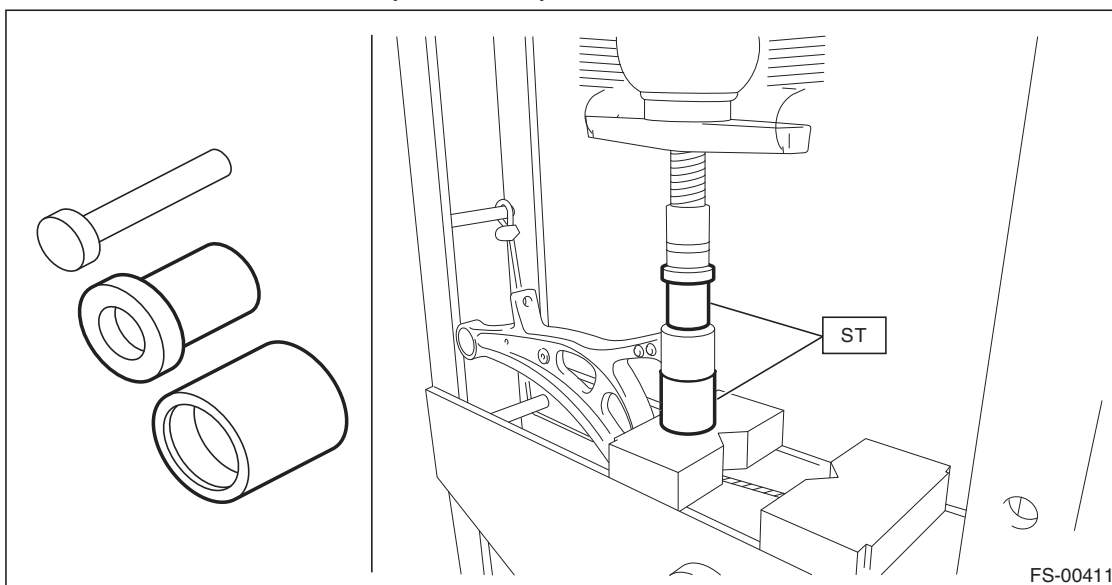
D: ASSEMBLY

1. BUSHING FRONT - FRONT ARM

- 1) Before assembly, inspect the following items and replace any faulty part with a new one.
 - Check the front arm assembly for damage or cracks, and replace if defective.
 - Visually check the bushing for abnormal cracks, fatigue or damage.
 - Visually check the dust cover on the ball joint assembly for damage.
- 2) Align the alignment mark on the front arm assembly to the split portion of the bushing intermediate plate of the bushing front - front arm.
- 3) Using the ST and a press, assemble the bushing front - front arm.

PREPARATION TOOL:

ST: INSTALLER & REMOVER SET (927680000)

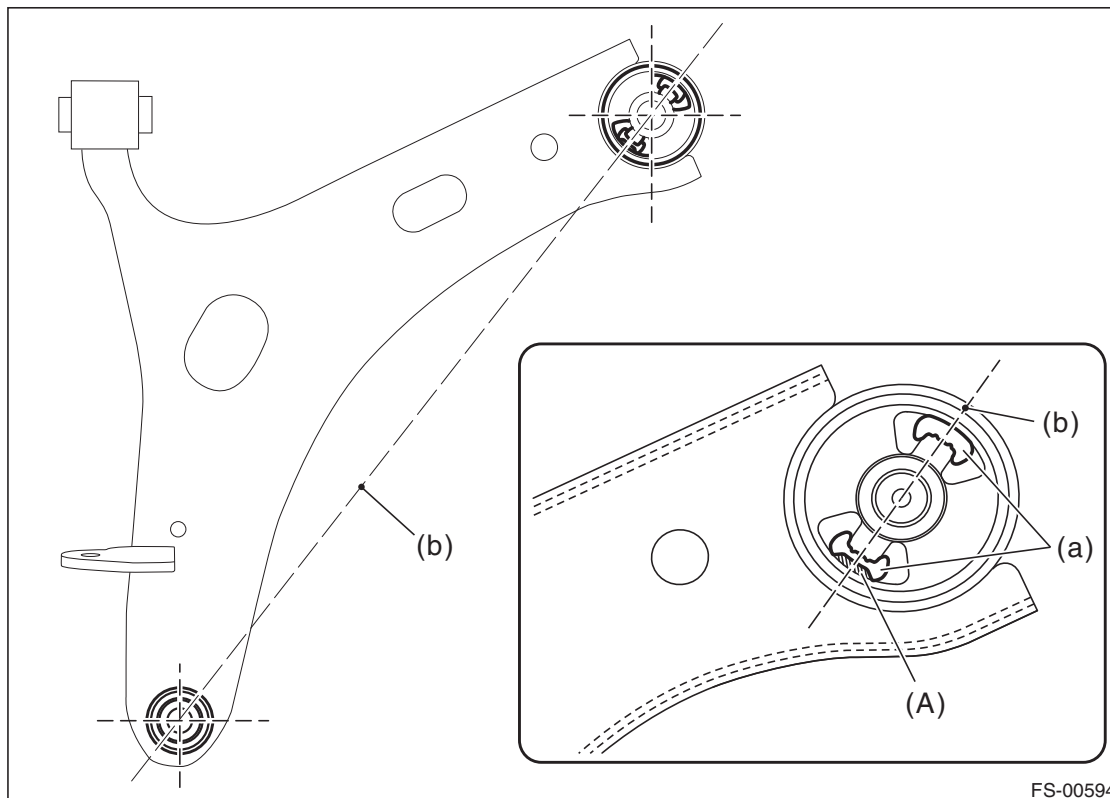


2. BUSHING REAR - FRONT ARM

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

- Check the front arm assembly for damage or cracks, and replace if defective.
- Visually check the bushing for abnormal cracks, fatigue or damage.
- Visually check the dust cover on the ball joint assembly for damage.

2) Align a line extending from the center of recess portion with the ball joint after placing the protrusion (A) of recess portion to the ball joint side of the front arm assembly.



FS-00594

(a) Recess section

(b) Center line of recess section

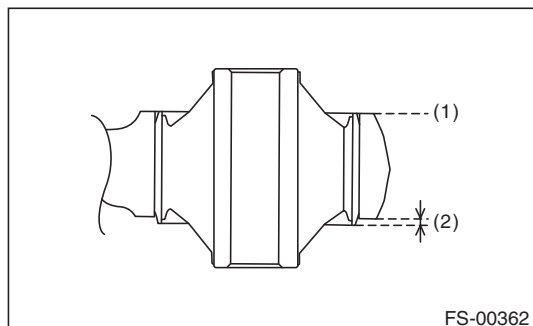
Front Arm

FRONT SUSPENSION

3) Using the ST and a press, install the busing rear - front arm.

CAUTION:

Align the upper face of front arm assembly and the end of bushing during installation.

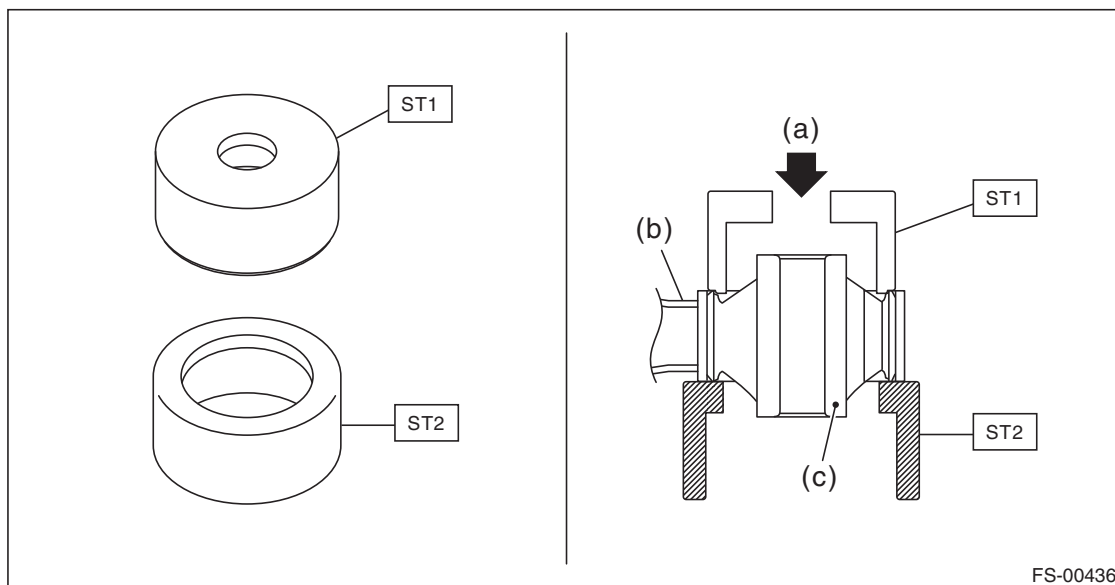


- (1) Aligned
- (2) Not aligned

Preparation tool:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



- (a) Press
- (b) Front arm ASSY
- (c) Bushing rear - front arm

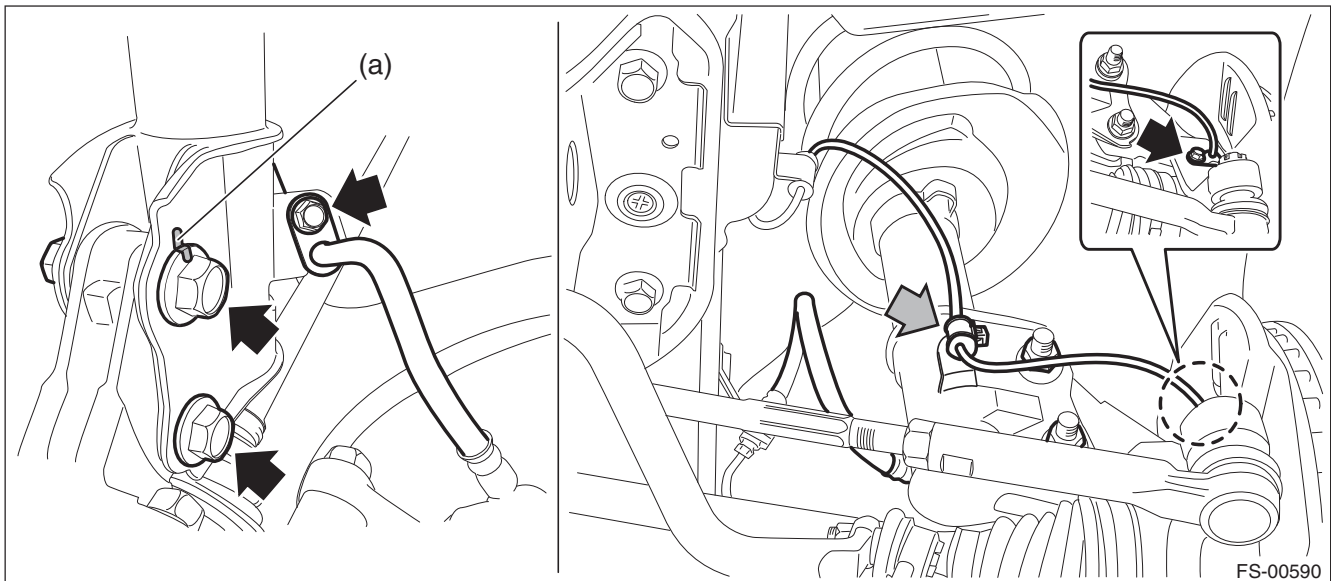
8. Front Strut

A: REMOVAL

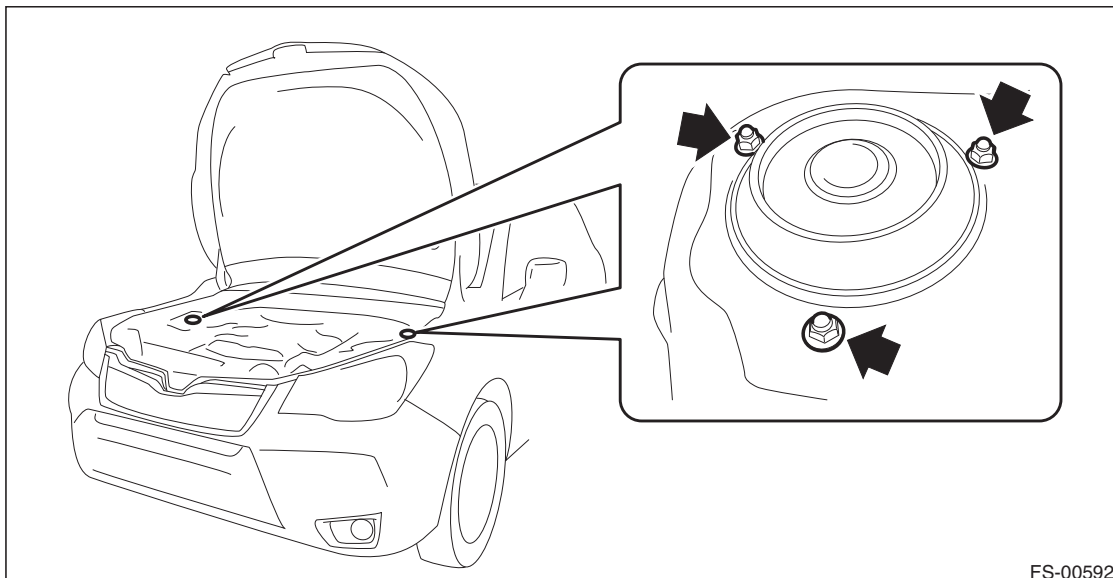
- 1) Lift up the vehicle, and then remove the front wheels.
- 2) Remove the front strut assembly.
 - (1) Place an alignment mark (a) on the adjusting bolt and the strut.
 - (2) Remove the brake hose bracket.
 - (3) Remove the clamp of ABS wheel speed sensor harness.
 - (4) Remove the adjusting bolts and flange bolts for the strut assembly.

CAUTION:

While holding the head of the adjusting bolt, loosen the flange nut.



- (5) Remove the three nuts securing strut mount to body.



Front Strut

FRONT SUSPENSION

B: INSTALLATION

1) Install the strut mount - front at the upper side of the strut to the body, and tighten it with new self-locking nuts.

Tightening torque:

20 N·m (2.04 kgf-m, 14.8 ft-lb)

2) Align alignment marks on the camber adjusting bolt and strut.

Using new self-locking nuts, install the strut to the housing assembly - front axle.

NOTE:

While holding the head of adjusting bolt, tighten the nut.

Tightening torque:

155 N·m (15.81 kgf-m, 114.3 ft-lb)

3) Secure the ABS wheel speed sensor harness bracket to the strut.

CAUTION:

During the installation, make sure that the marking of ABS wheel speed sensor harness does not twist.

4) Install the brake hose bracket.

Tightening torque:

33 N·m (3.36 kgf-m, 24.3 ft-lb)

5) Install the front wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

6) 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" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

7) 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.>

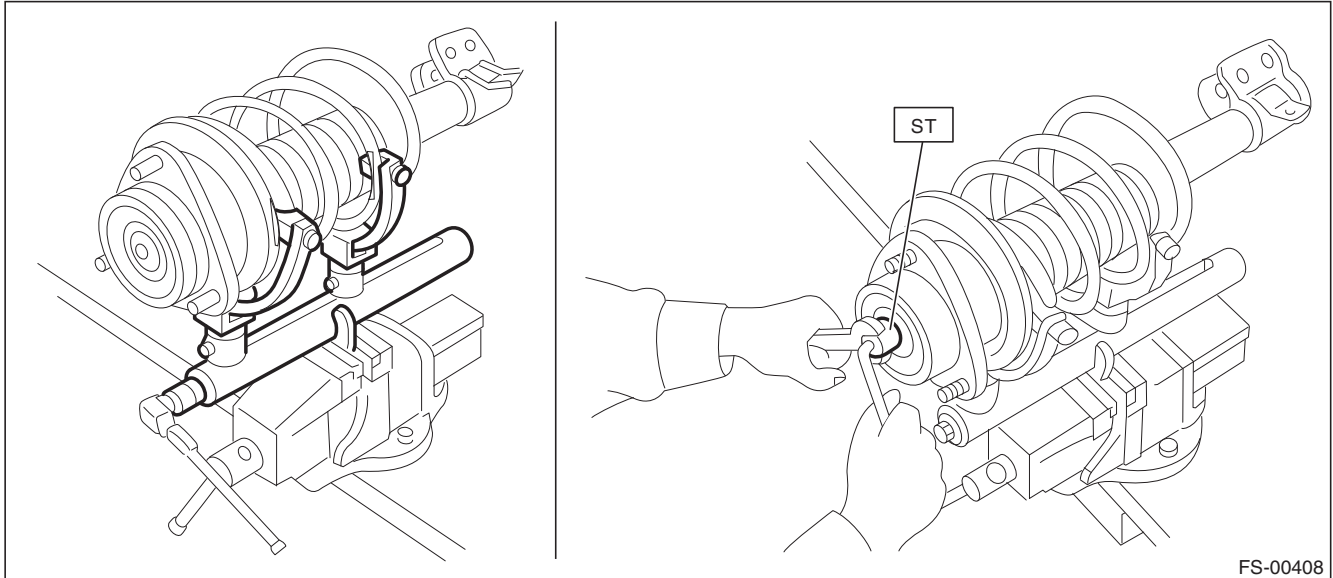


C: DISASSEMBLY

- 1) Using a coil spring compressor, compress the coil spring - front.
- 2) Using a hexagon wrench to prevent strut rod from turning, remove the self-locking nut with ST.

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)



FS-00408

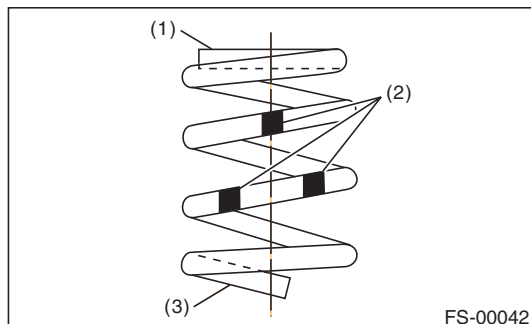
- 3) Remove the strut mount - front, spacer - front strut and spring seat - front strut UPR from the strut.
- 4) Gradually decrease the compression pressure of compressor, and remove the coil spring - front.
- 5) Remove the dust cover - inner and the helper - front strut.

D: ASSEMBLY

- 1) Before assembly, check each part. <Ref. to FS-45, INSPECTION, Front Strut.>
- 2) Using a coil spring compressor, compress the coil spring - front.

NOTE:

Make sure that the vertical installation direction of the coil spring - front is as shown in the figure.



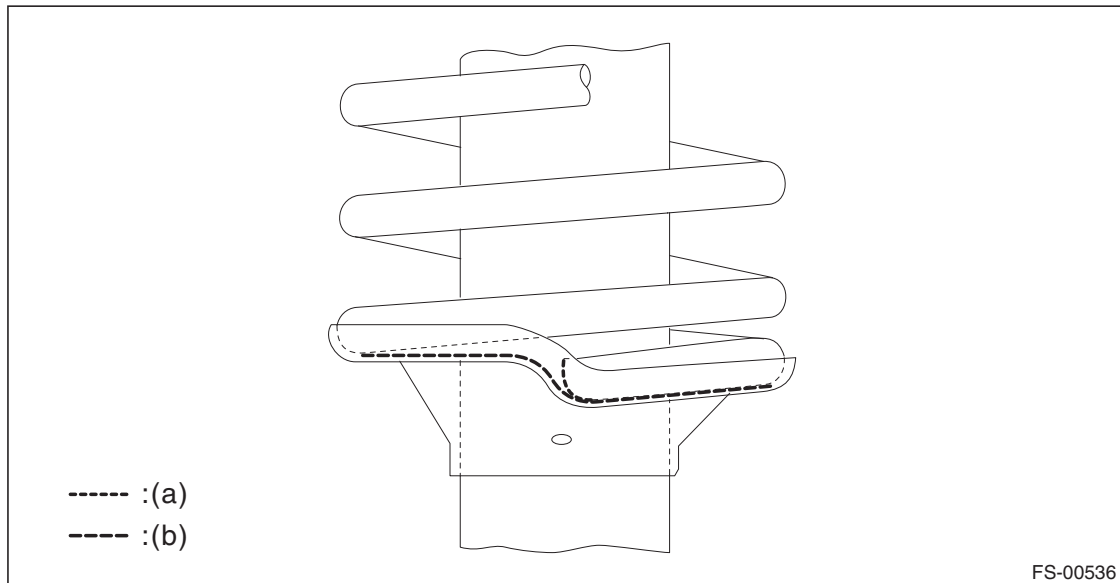
FS-00042

- (1) Diameter is small (upper part)
- (2) Identification paint
- (3) Diameter is large (bottom part)

Front Strut

FRONT SUSPENSION

3) Set the coil spring - front correctly so that its end face (a) contacts the vertical surface (b) of the spring seat - front strut UPR as shown in the figure.

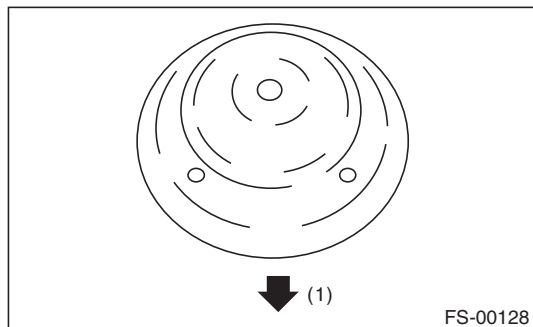


4) Install the dust cover - inner and the helper - front strut to the piston rod.

5) Pull the piston rod fully upward, and install the spring seat.

NOTE:

Position the spring seat - front strut UPR as shown in the figure.



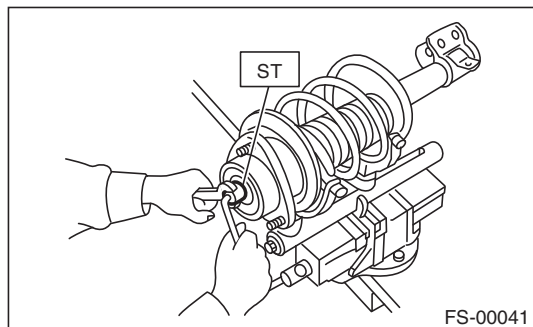
(1) Outside of body

6) Install the spacer - front strut and the strut mount - front to the piston rod, and temporarily tighten a new self-locking nut.

7) Using a hexagon wrench to prevent strut rod from turning, tighten the new self-locking nut with ST.

PREPARATION TOOL:

ST: STRUT MOUNT SOCKET (20399AG000)



Tightening torque:

55 N·m (5.61 kgf·m, 40.6 ft·lb)

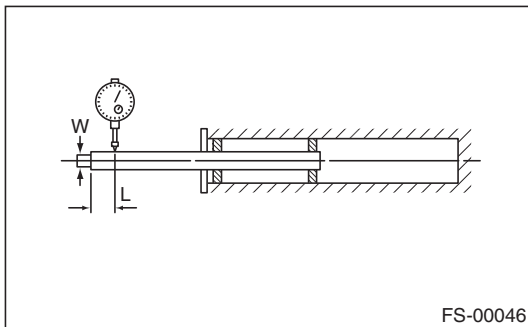
8) Loosen the coil spring compressor carefully.

E: INSPECTION

Check the removed part for wear, damage and cracks, and then repair or replace it if defective.

1. STRUT

- 1) Check for oil leaks.
- 2) Move the piston rod up and down to check that it operates smoothly without any hitch.
- 3) Check the piston rod for play.
 - (1) Fix the outer shell in place and fully extend the rod.
 - (2) Set the dial gauge on the end of the rod L [10 mm (0.39 in)].
 - (3) While applying a force of W [20 N (2 kgf, 4 lbf)] to the threaded part, read the dial gauge indication P_1 .
 - (4) Apply a force of 20 N (2 kgf, 4 lbf) from the opposite direction of "W", and then read the dial gauge indication P_2 .



Play limit ($P_1 + P_2$): 0.8 mm (0.031 in)

- 4) Replace the strut if faulty is found in the inspection or limit value is exceeded.

2. STRUT MOUNT - FRONT

Check the rubber part for deformation, cracks or deterioration, and then replace it with a new part if defective.

3. DUST COVER - INNER

If cracks or damage are found, replace it with a new part.

4. COIL SPRING - FRONT

If a permanent strain is found, replace it with a new part.

5. HELPER - FRONT STRUT

If major cracks or damage are found, replace it with a new part.

Front Strut

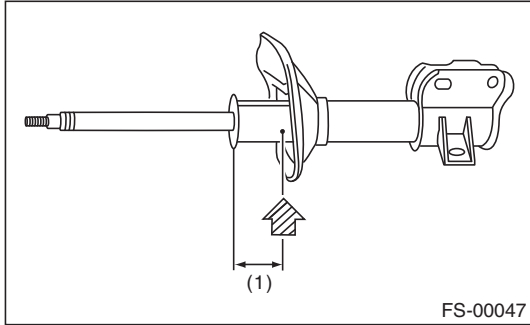
FRONT SUSPENSION

F: DISPOSAL

CAUTION:

- Before handling struts, be sure to wear goggles to protect eyes from gas, oil and cutting powder.
- Do not disassemble the strut damper or throw into flames.
- When discarding gas filled struts, drill holes in them to purge the gas.

- 1) Place the strut on a level surface with the piston rod fully expanded.
- 2) Using a 2 — 3 mm (0.08 — 0.12 in) dia. drill, make holes in areas shown in the figure.



(1) 40 mm (1.57 in)



General Diagnostic Table

FRONT SUSPENSION

9. General Diagnostic Table

A: INSPECTION

1. IMPROPER VEHICLE POSTURE OR IMPROPER WHEEL ARCH HEIGHT

Possible cause	Corrective action
(1) Permanent distortion or damage of the coil spring	Replace.
(2) Rough operation of strut or shock absorber	Replace.
(3) Improper installation of strut or shock absorber	Replace with appropriate parts.
(4) Installation of the wrong coil spring	Replace with appropriate parts.

2. POOR RIDE COMFORT

- 1) Large rebound shock
- 2) Rocking of the vehicle continues too long after running over bump and hump.
- 3) Excessive shock in bumping

Possible cause	Corrective action
(1) Damaged coil spring	Replace.
(2) Overinflation of tires	Adjust.
(3) Improper wheel arch height	Replace the coil springs with new parts.
(4) Fault in operation of strut or shock absorber	Replace.
(5) Damage or deformation of strut mount or shock absorber mount	Replace.
(6) Unsuitable length (maximum or minimum) of strut or shock absorber	Replace with appropriate parts.
(7) Abnormal deformation or loss of bushing	Replace.
(8) Deformation or damage of helper in strut assembly or shock absorber	Replace.
(9) Oil leakage from the strut or shock absorber	Replace.

3. NOISE

Possible cause	Corrective action
(1) Wear or damage of strut or shock absorber component parts	Replace.
(2) Loosening of the suspension link installing bolt	Tighten to the specified torque.
(3) Abnormal deformation or loss of bushing	Replace.
(4) Unsuitable length (maximum or minimum) of strut or shock absorber	Replace with appropriate parts.
(5) Damaged coil spring	Replace.
(6) Wear or damage of the ball joint	Replace.
(7) Deformation of the clamp - stabilizer bushing	Replace.

General Diagnostic Table

FRONT SUSPENSION



REAR SUSPENSION

RS

	Page
1. General Description	2
2. Wheel Alignment	8
3. Rear Sub Frame	9
4. Rear Stabilizer	15
5. Rear Trailing Link	17
6. Upper Arm	20
7. Front Lateral Link	22
8. Rear Lateral Link	25
9. Rear Shock Absorber	28
10. General Diagnostic Table	32

General Description

REAR SUSPENSION

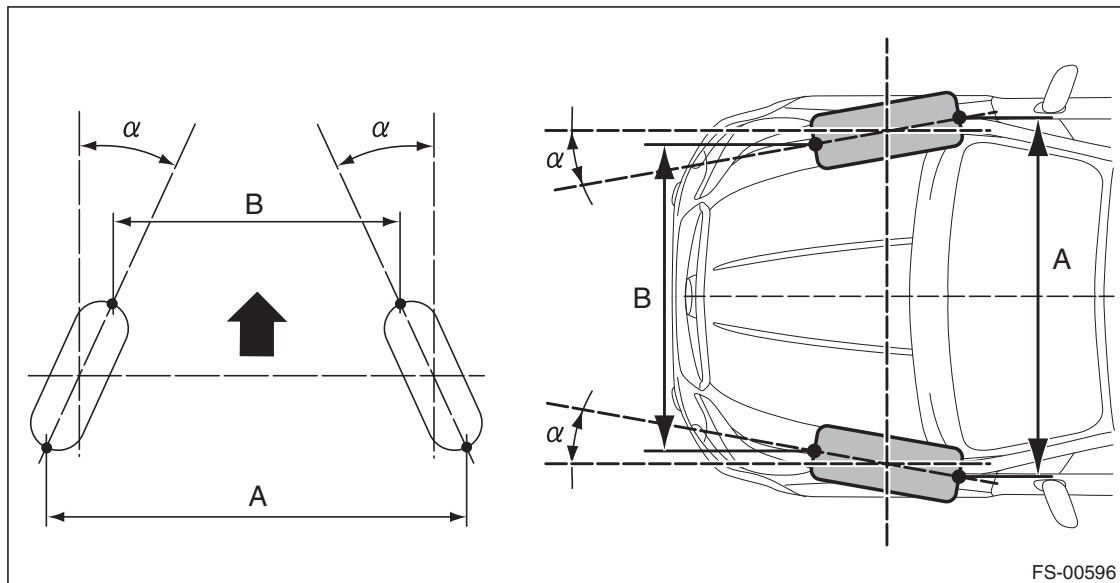
1. General Description

A: SPECIFICATION

Refer to "SPECIFICATIONS" in "FRONT SUSPENSION" section for rear suspension specifications. <Ref. to FS-2, SPECIFICATION, General Description.>

NOTE:

- Front toe-in, rear toe-in and front camber can be adjusted. Adjust if the value of toe-in or camber exceeds the tolerance range of the specification chart.
- Other items except for front toe-in, rear toe-in and front camber that are described in the specification chart cannot be adjusted. If other items exceed the tolerance range of the specification chart, check the suspension parts and connections for deformation. If defective, replace with new parts.



$A - B = \text{Positive: Toe-in, Negative: Toe-out}$

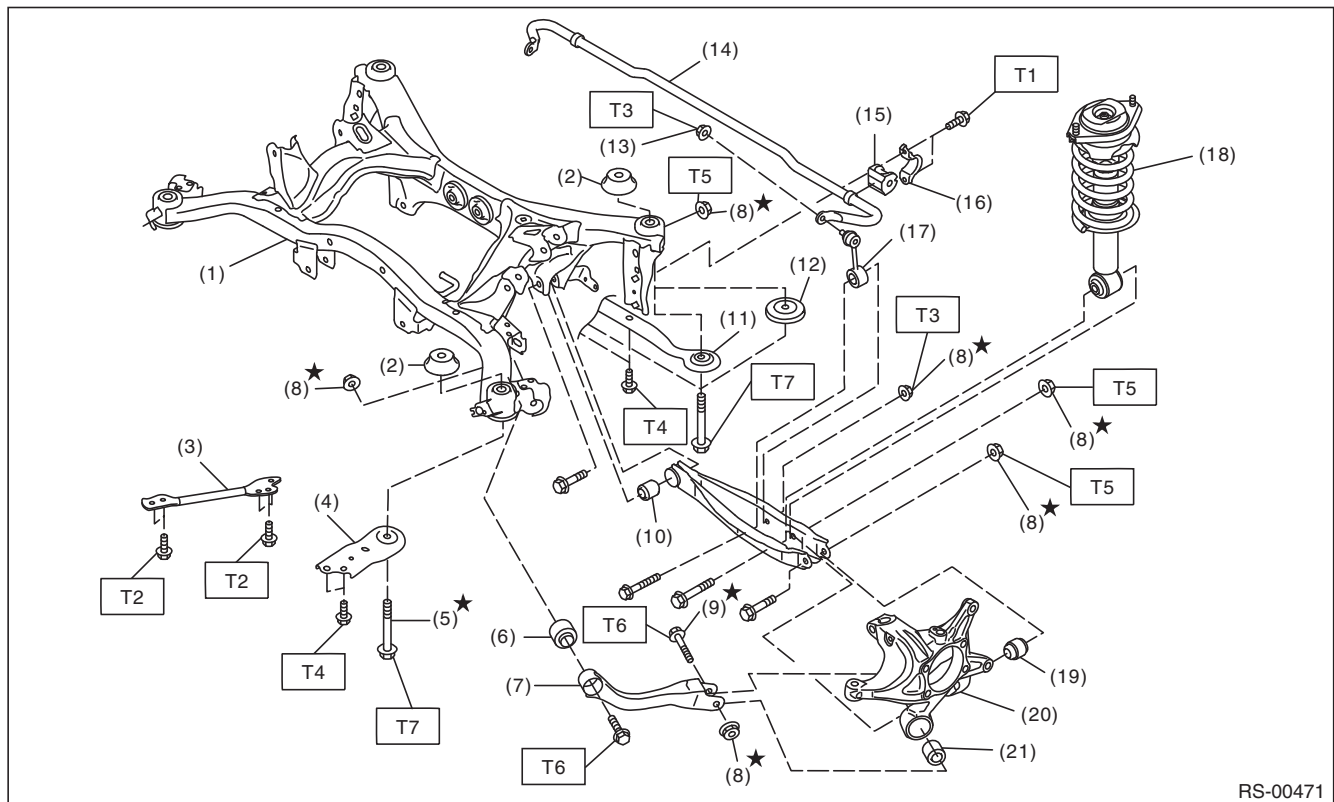
$\alpha = \text{Individual toe angles}$

General Description

REAR SUSPENSION

B: COMPONENT

1. REAR SUSPENSION



RS-00471

- | | | |
|------------------------------------|---|------------------------------|
| (1) Rear sub frame ASSY | (11) Rear support sub frame (turbo model) | (21) Bushing - trailing link |
| (2) Stopper upper | (12) Stopper LWR (non-turbo model) | |
| (3) Stay - rear frame COMPL | (13) Flange nut | |
| (4) Front sub frame support | (14) Rear stabilizer | |
| (5) Flange bolt A | (15) Bushing - stabilizer | |
| (6) Bushing A - trailing link | (16) Clamp - stabilizer bushing | |
| (7) Trailing link | (17) Stabilizer link ASSY | |
| (8) Self-locking nut | (18) Rear shock absorber ASSY | |
| (9) Flange bolt B | (19) Rear axle housing bushing | |
| (10) Bushing C - lateral link rear | (20) Housing ASSY - rear axle | |

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

T1: 30 (3.06, 22.1)

T2: 33 (3.36, 24.3)

T3: 38 (3.87, 28.0)

T4: 70 (7.14, 51.6)

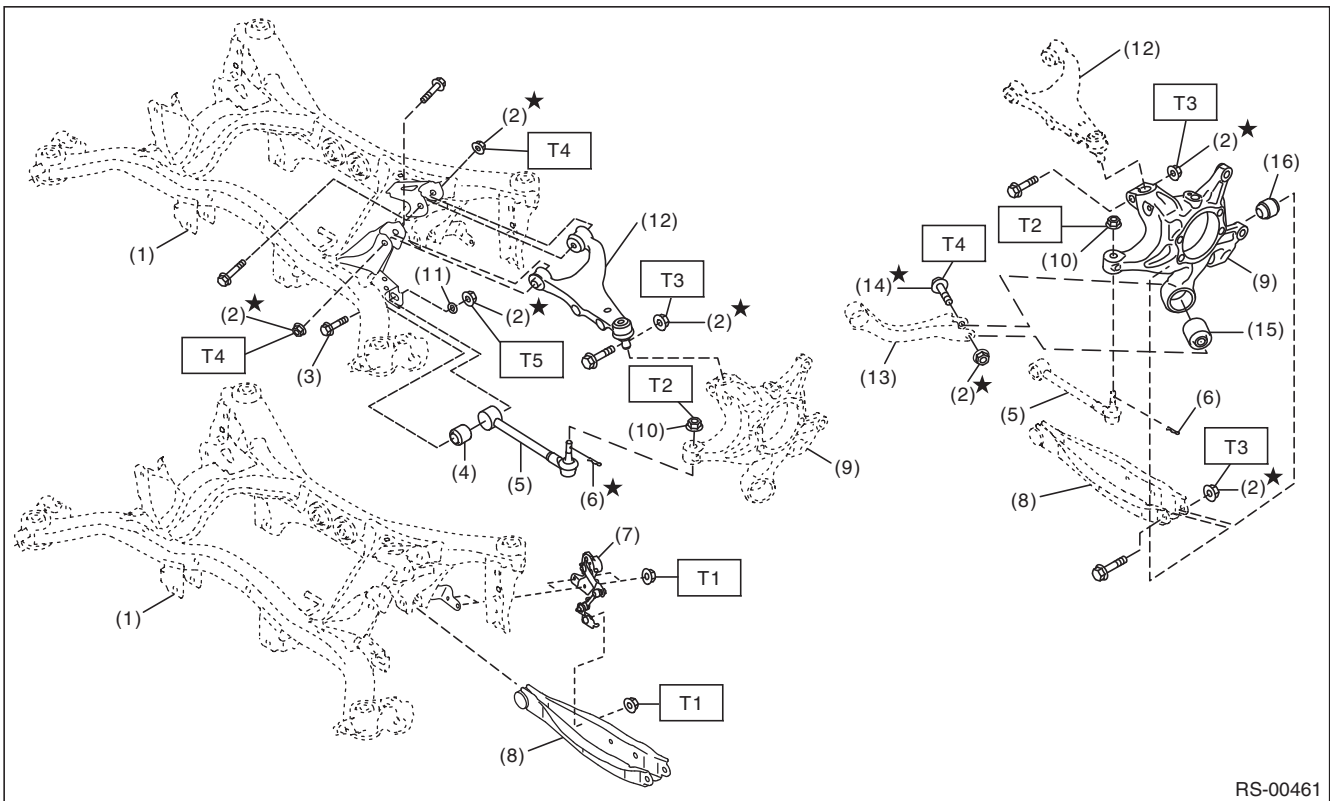
T5: 80 (8.16, 59.0)

T6: 90 (9.18, 66.4)

T7: 145 (14.79, 106.9)

General Description

REAR SUSPENSION



RS-00461

- | | |
|---|----------------------------------|
| (1) Rear sub frame ASSY | (9) Housing ASSY - rear axle |
| (2) Self-locking nut | (10) Flange nut |
| (3) Adjusting bolt | (11) Adjusting washer |
| (4) Bushing B - lateral link | (12) Rear upper arm ASSY |
| (5) Lateral link ASSY - front | (13) Trailing link |
| (6) Snap pin | (14) Flange bolt |
| (7) Sensor ASSY - headlight beam leveler (models with auto headlight beam leveler only) | (15) Bushing - trailing link |
| (8) Lateral link ASSY - rear | (16) Bushing - rear axle housing |

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

T1: 7.5 (0.76, 5.5)

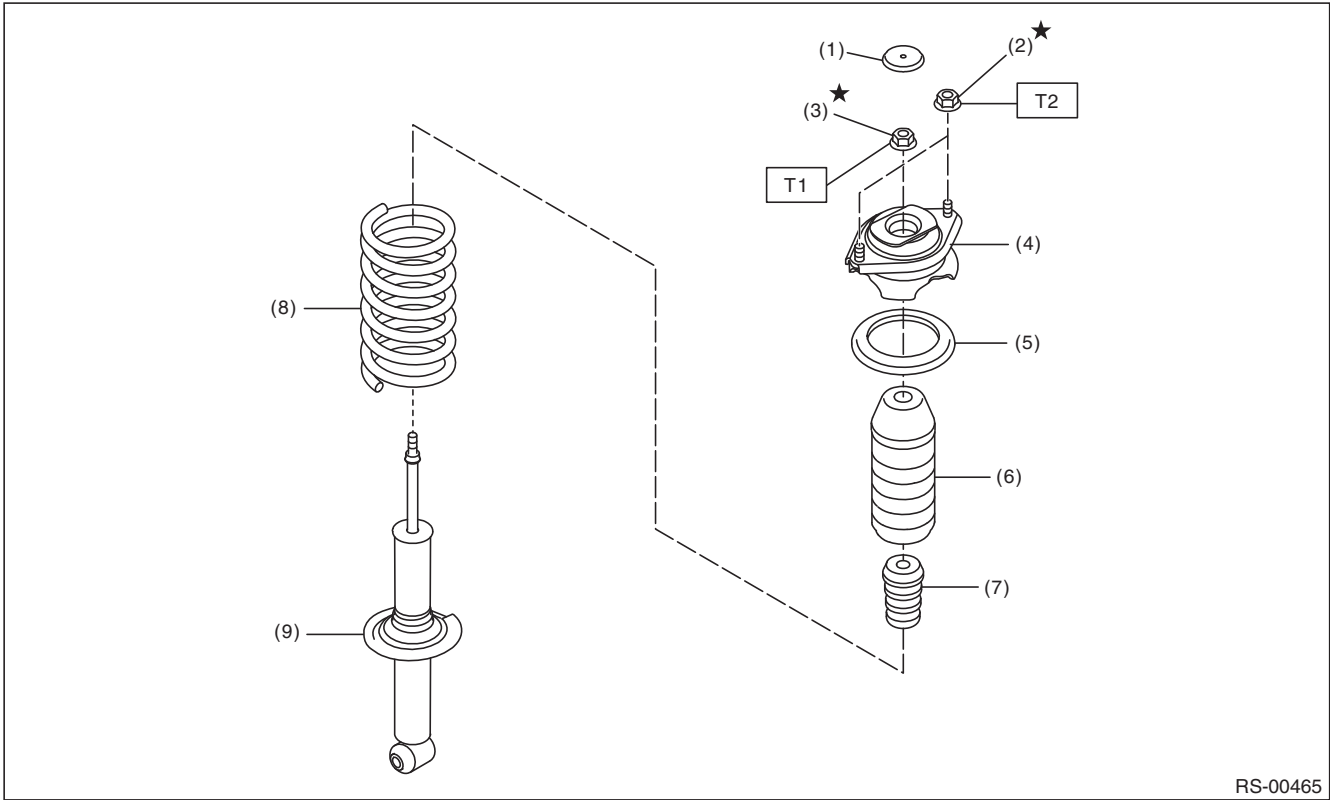
T2: 60 (6.12, 44.3)

T3: 80 (8.16, 59)

T4: 90 (9.18, 66.4)

T5: 100 (10.20, 73.8)

2. REAR STRUT



- | | |
|-----------------------------|--------------------------------|
| (1) Plug | (6) Dust cover - rear strut |
| (2) Flange nut | (7) Helper - rear |
| (3) Self-locking nut | (8) Coil spring - rear |
| (4) Strut mount - rear | (9) Shock absorber ASSY - rear |
| (5) Rubber seat - strut UPR | |

Tightening torque: N-m (kgf-m, ft-lb)
T1: 25 (2.55, 18.4)
T2: 30 (3.06, 22.1)

General Description

REAR SUSPENSION

C: CAUTION

Please clearly understand and adhere to the following general precautions. They must be strictly followed to avoid minor or serious injury to the person doing the work or people in the area.

1. EACH PROCEDURE

- Wear appropriate work clothing, including a helmet, protective goggles and protective shoes when performing any work.
- Before disposing of shock absorbers, be sure to bleed the gas out completely. Also, do not expose to flames or fire.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Use SUBARU genuine grease etc. or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- When the suspension-related components have been replaced, perform "VDC sensor midpoint setting mode" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

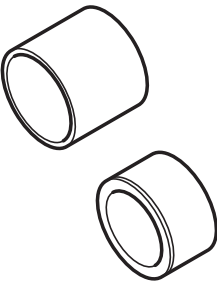
2. OIL

When handling oil, adhere to the following to prevent unexpected accident.

- Prepare container and waste cloths when performing work which oil could possibly spill. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing outside, for environmental protection.
- Follow all government regulations concerning disposal of refuse when disposing.

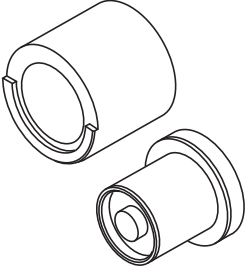
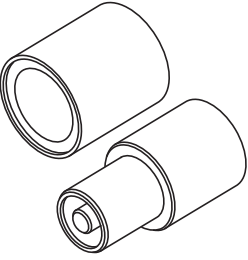
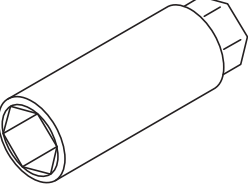
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20099PA010	20099PA010	INSTALLER & REMOVER	• Used for replacing the bushing A - trailing link of the housing assembly - rear axle. • Used together with BUSHING REMOVER (20099FG000).
 ST20099FG000	20099FG000	BUSHING REMOVER	• Used for replacing the bushing A - trailing link of the housing assembly - rear axle. • Used together with base part of INSTALLER & REMOVER (20099PA000).

General Description

REAR SUSPENSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20099AE000	20099AE000	INSTALLER & REMOVER	Used for replacing the bushing B - lateral link.
 ST20099AE010	20099AE010	INSTALLER & REMOVER	Used for replacing the bushing C - lateral link.
 ST20399FG000	20399FG000	STRUT MOUNT SOCKET	• Used for removing and installing strut mount. • Used for checking torque of strut mount center nut.

2. GENERAL TOOL

TOOL NAME	REMARKS
Alignment tester	Used for measuring wheel alignment.
Toe-in gauge	Used for toe-in measurement.
Jack	Used for removing and installing suspension.
Bearing puller	Used for removing bushings.
Tie-rod ball joint puller	Used for disconnecting the lateral link assembly - front.
Coil spring compressor	Used for disassembling and assembling shock absorber.

Wheel Alignment

REAR SUSPENSION

2. Wheel Alignment

A: INSPECTION

NOTE:

Measure and adjust the front and rear wheel alignment at a time. Refer to "Wheel Alignment" in "FRONT SUSPENSION" section for measurement or adjustment of wheel alignment.

- Inspection: <Ref. to FS-7, INSPECTION, Wheel Alignment.>
- Adjustment: <Ref. to FS-11, ADJUSTMENT, Wheel Alignment.>

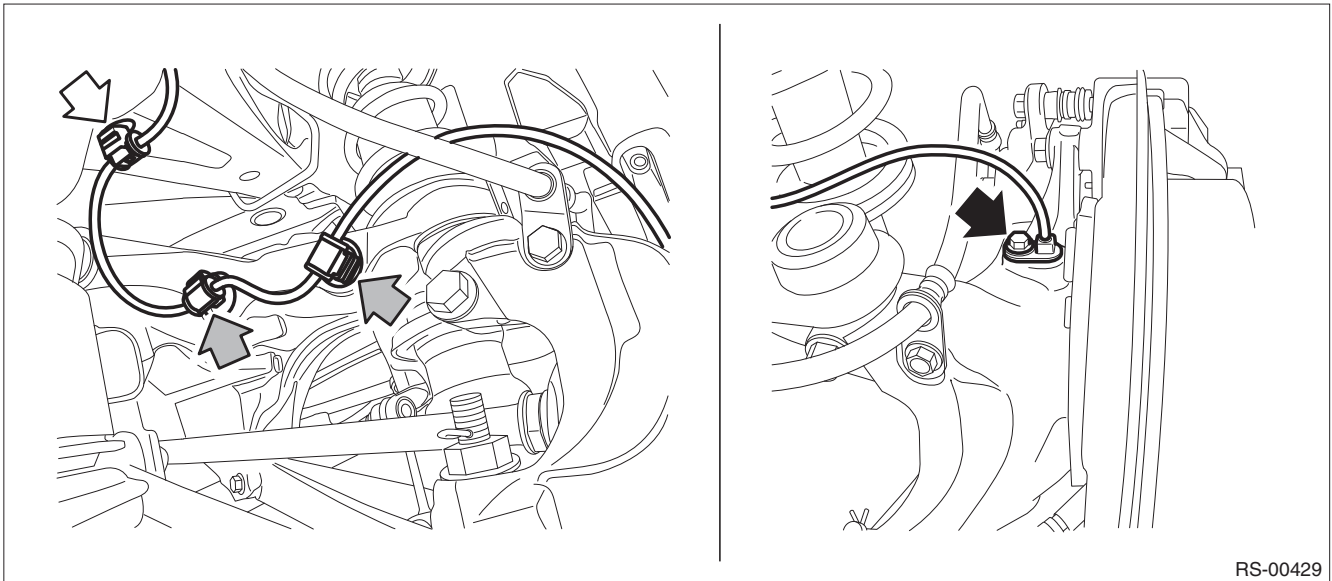
3. Rear Sub Frame

A: REMOVAL

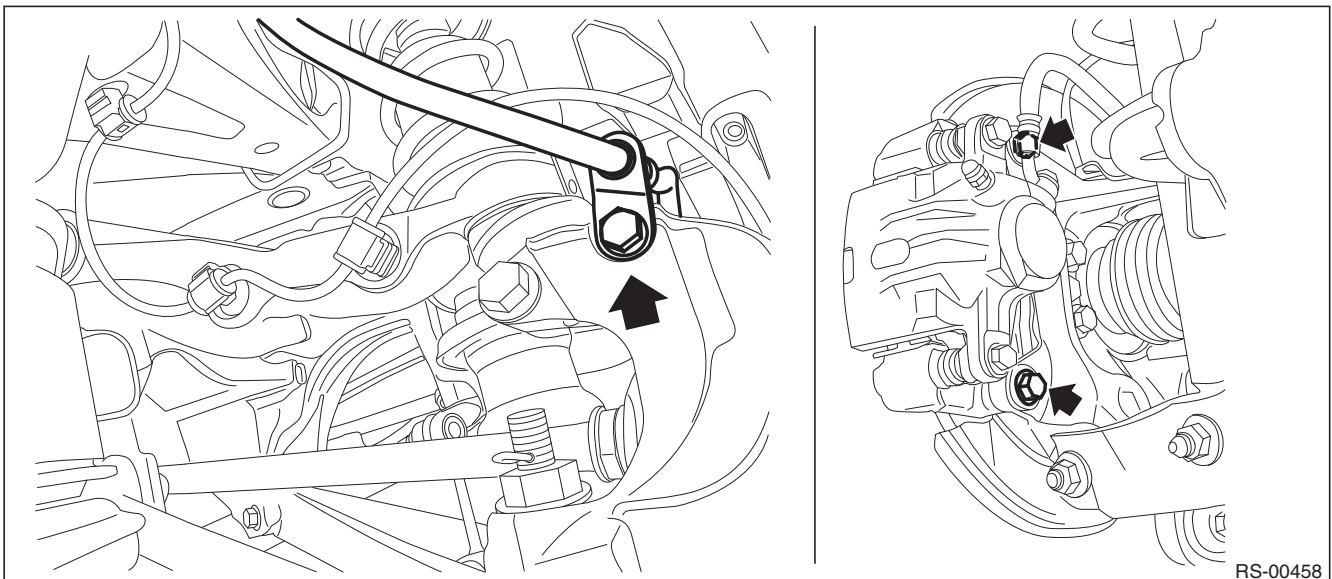
- 1) Disconnect the ground cable from battery.
- 2) Lift up the vehicle, and then remove the rear wheels.
- 3) Remove the propeller shaft assembly. <Ref. to DS-11, REMOVAL, Propeller Shaft.>
- 4) Remove the rear ABS wheel speed sensor from the housing assembly - rear axle.
 - (1) Remove the bolts, and remove the rear ABS wheel speed sensor.
 - (2) Remove the rear ABS wheel speed sensor harness from the upper arm assembly.

CAUTION:

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



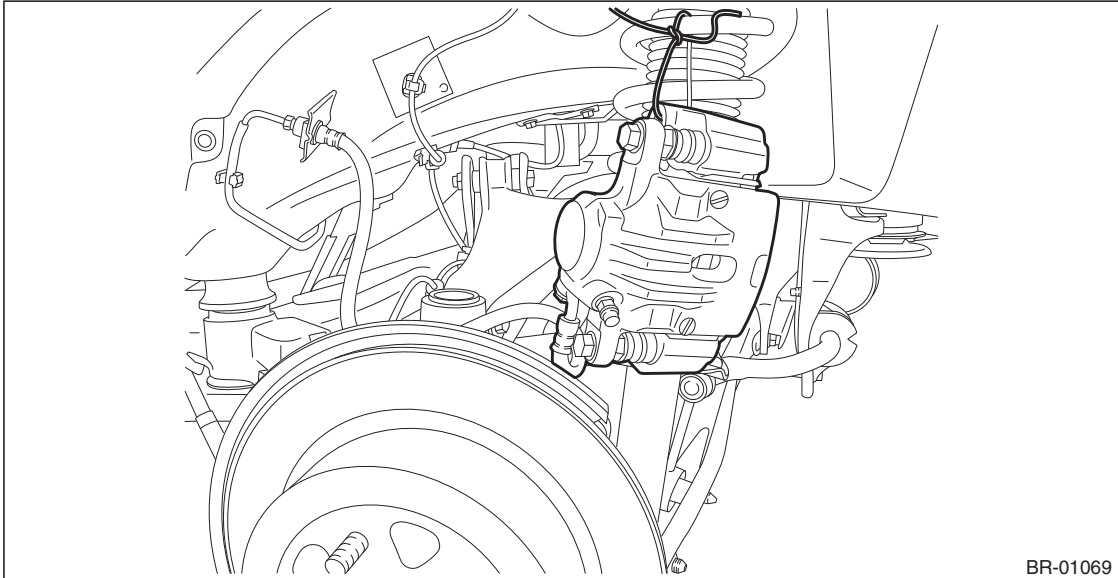
- 5) Remove the caliper body assembly from the housing assembly - rear axle.
 - (1) Remove the bolts and then remove the brake hose bracket and caliper body assembly.



Rear Sub Frame

REAR SUSPENSION

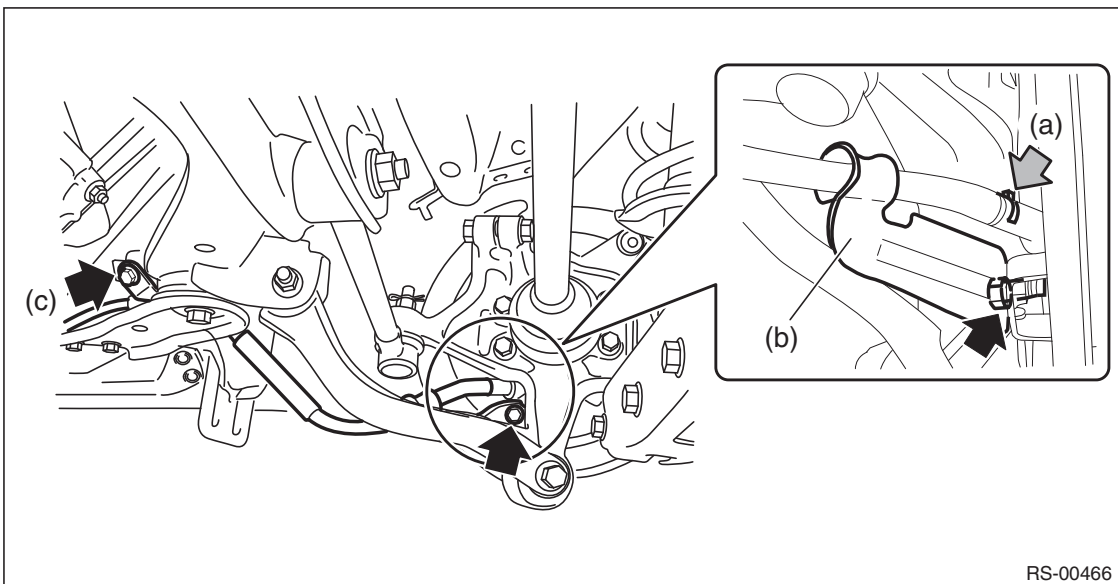
- (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



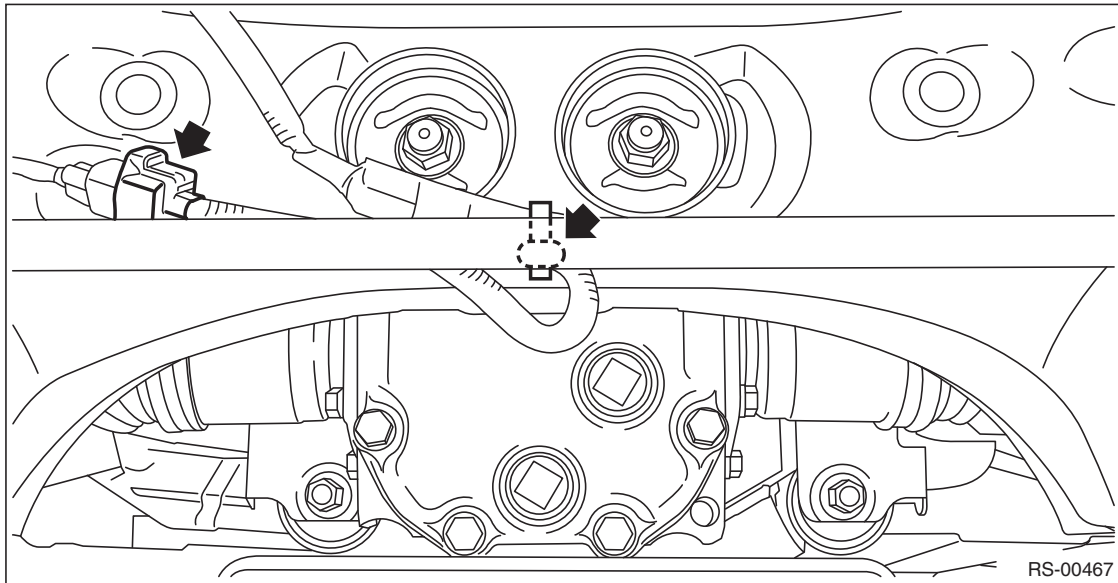
- 6) Remove the cable assembly - parking brake from the lever section of parking brake shoe. <Ref. to PB-16, REMOVAL, Parking Brake Assembly (Rear Disc Brake).>

- 7) Remove the rear parking brake cable from the parking brake assembly.

- (1) Remove the clamp B - hand brake cable (a) from the rear brake.
- (2) Remove the cable clamp (b) from the back plate - rear brake.
- (3) Remove the cable clamp (c) and pull out the cable assembly - parking brake.



8) Remove the sub rear harness clamp and connector.

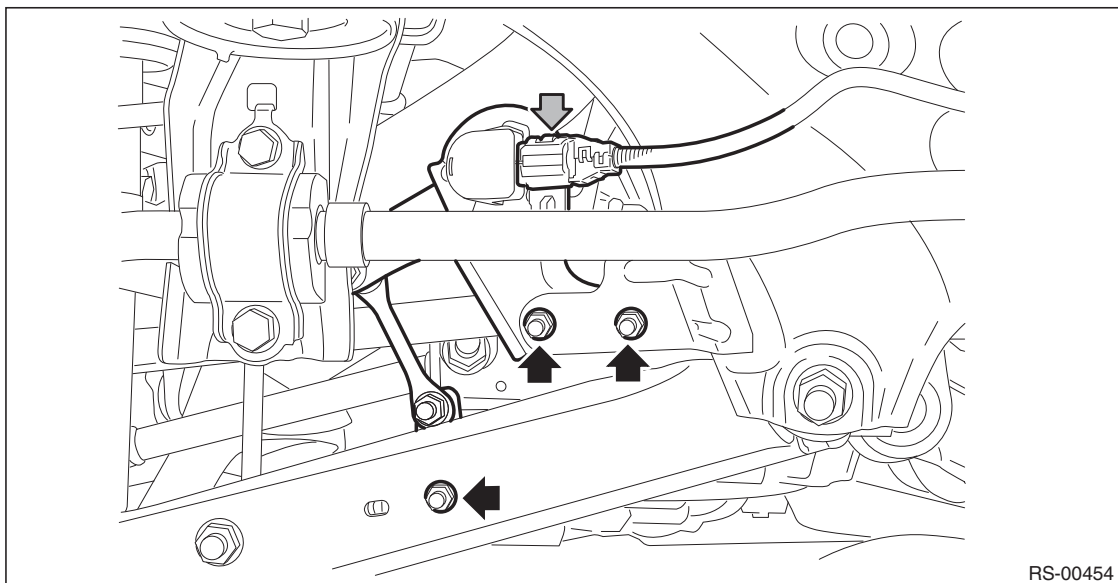


9) Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler, left side only)

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.

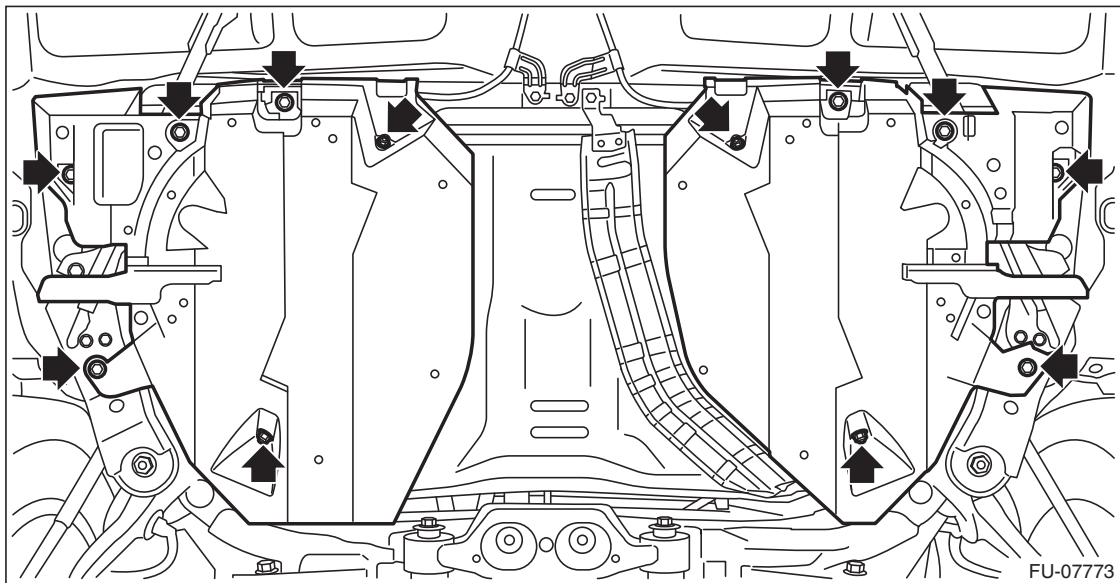
- (1) Disconnect the connector of the sensor assembly - headlight beam leveler.
- (2) Remove the nuts, and remove the sensor assembly - headlight beam leveler.



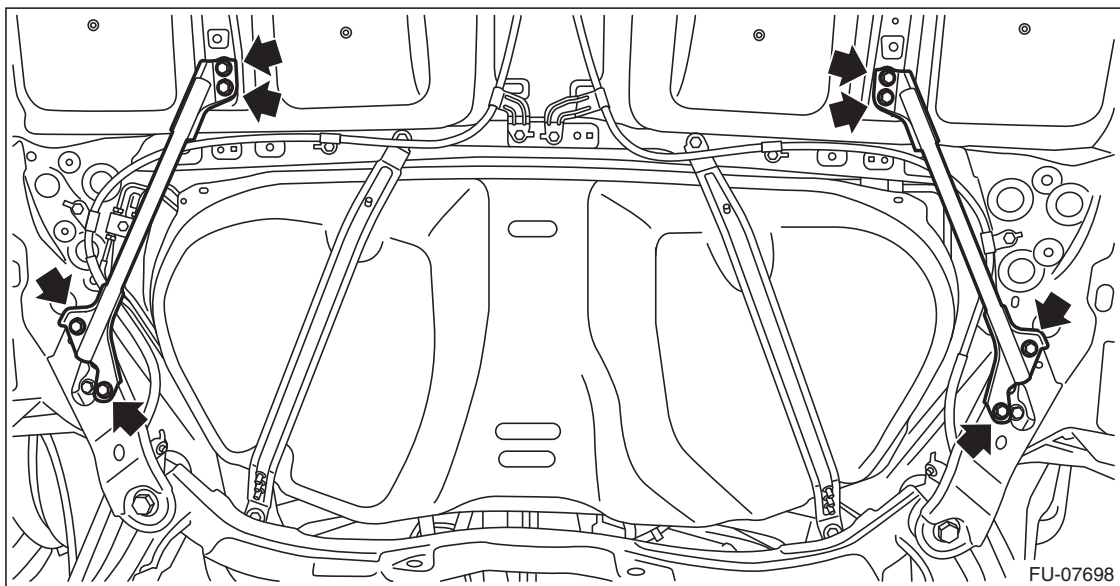
Rear Sub Frame

REAR SUSPENSION

- 10) Remove the bolt and nuts and remove the fuel tank protector.



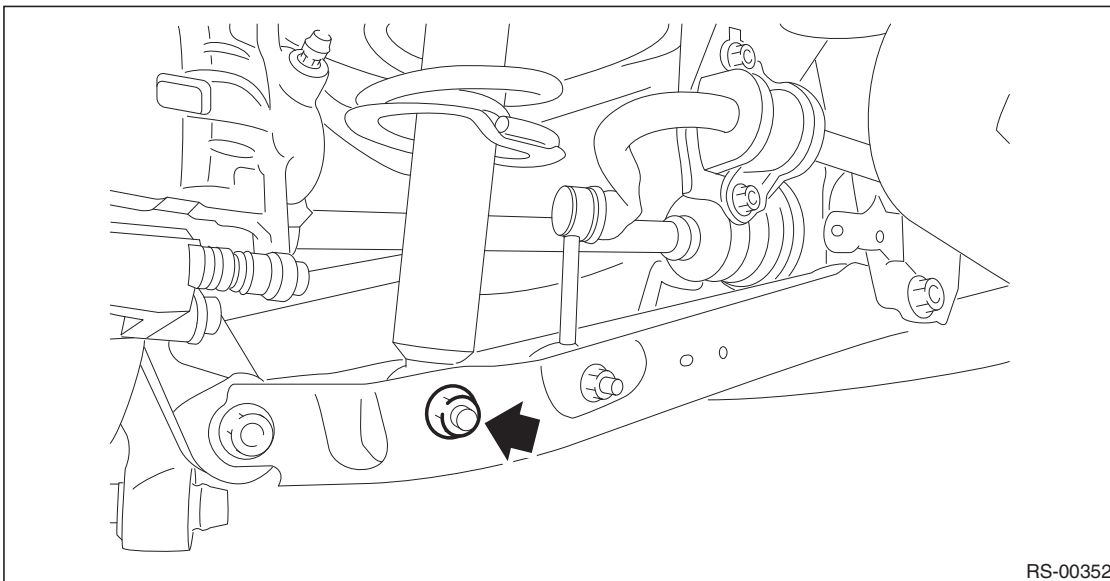
- 11) Remove the rear sub frame assembly.
(1) Remove the bolts, and remove the stay - rear frame COMPL.



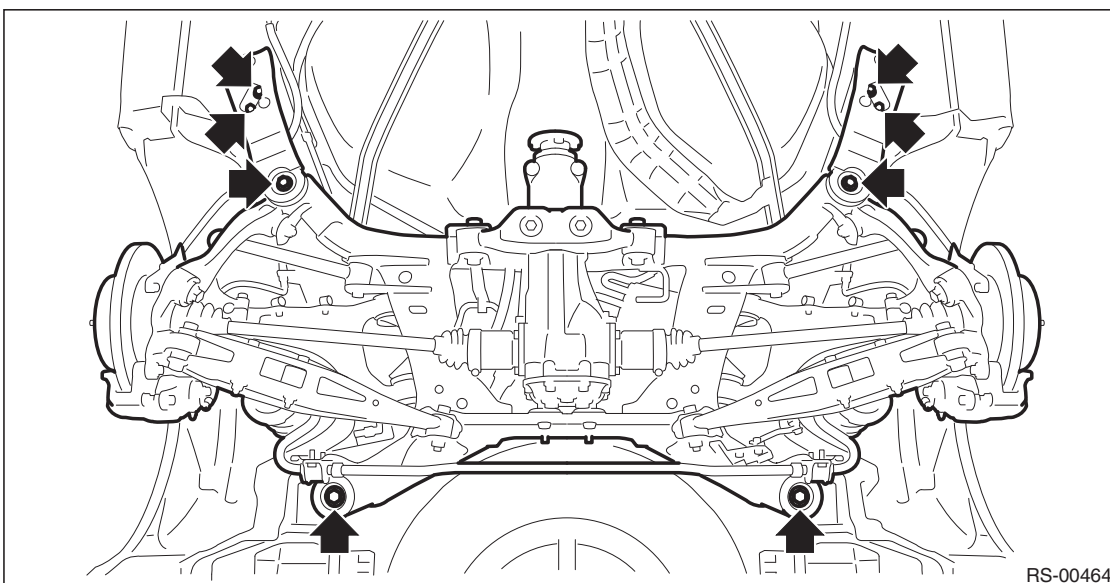
Rear Sub Frame

REAR SUSPENSION

- (2) Remove the bolts at the bottom of rear strut assembly.



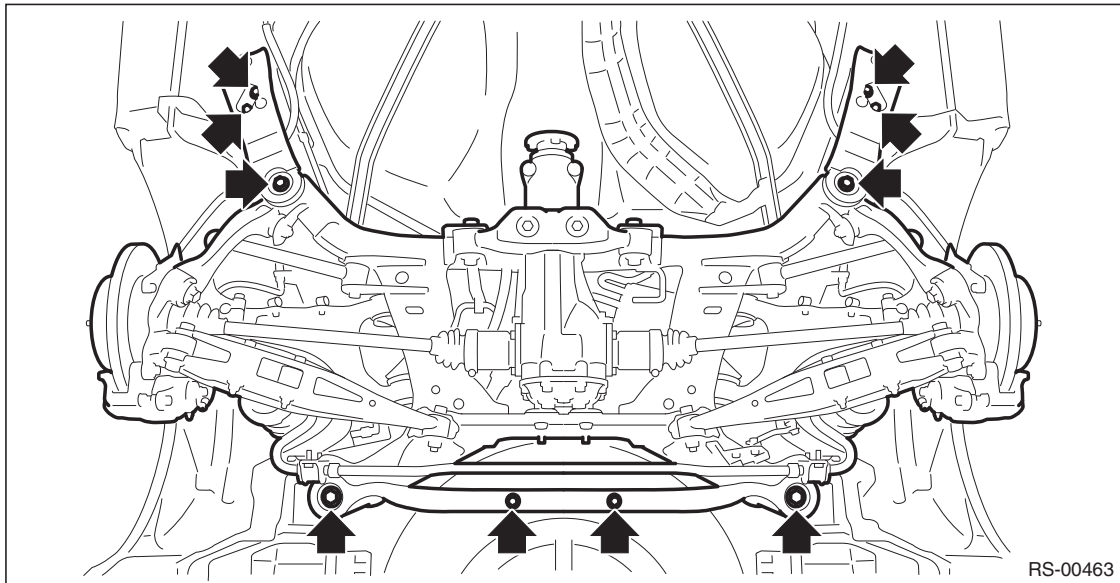
- (3) Support the rear sub frame assembly using a transmission jack.
(4) Remove the bolt, and remove the left and right sub frame supports.
(5) Remove the bolts, then remove the rear sub frame assembly.
- Non-turbo model



Rear Sub Frame

REAR SUSPENSION

- Turbo model



12) As necessary, remove each part from the rear sub frame assembly.

B: INSTALLATION

CAUTION:

- Be sure to use a new self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.
- During the installation, make sure that the marking of ABS wheel speed sensor harness does not twist.

- 1) Check the removed parts for wear, damage and crack, and repair or replace them if faulty.
- 2) Install each part in the reverse order of removal.

Tightening torque:

Refer to "COMPONENT" of "General Description" for the tightening torque. <Ref. to RS-3, COMPONENT, General Description.>

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

Fuel tank protector: <Ref. to FU(H4DO)-7, FUEL TANK, COMPONENT, General Description.>

Rear disc brake parts: <Ref. to BR-5, REAR DISC BRAKE, COMPONENT, General Description.>

Parking brake parts: <Ref. to PB-3, PARKING BRAKE LEVER & CABLE, COMPONENT, General Description.>

- 3) Bleed air from brake system. <Ref. to BR-61, Air Bleeding.>
- 4) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

- 5) 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" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

- 6) Connect the battery ground terminal.
- 7) 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.>

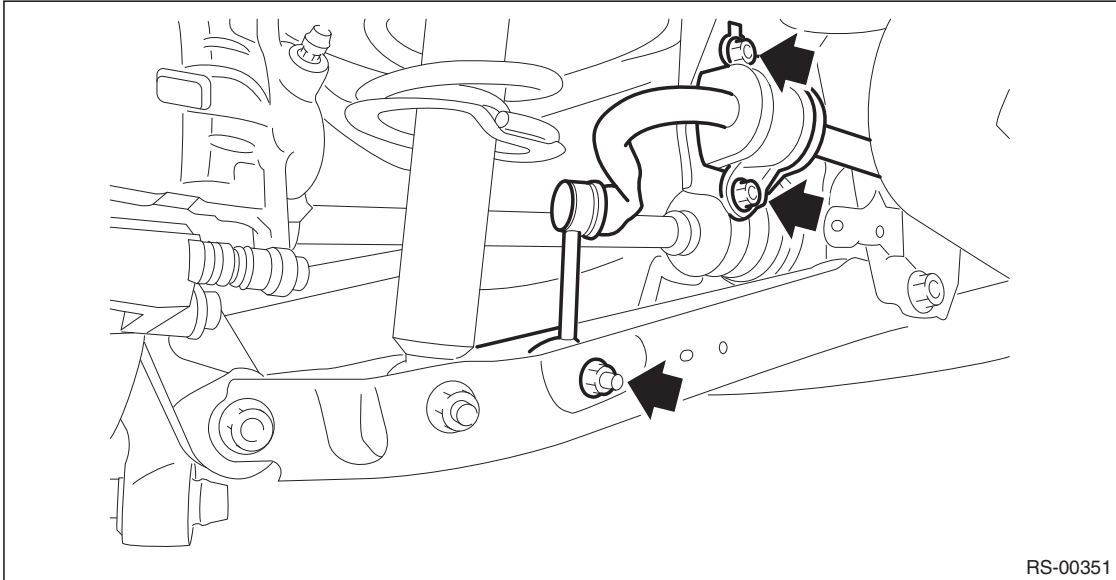
C: INSPECTION

Check the removed parts for wear, damage and crack, and repair or replace them if faulty.

4. Rear Stabilizer

A: REMOVAL

- 1) Lift up the vehicle, and then remove the rear wheels.
- 2) Remove the rear stabilizer.
 - (1) Remove the left and right stabilizer link assemblies.
 - (2) Detach the clamp - stabilizer bushing and remove the rear stabilizer.



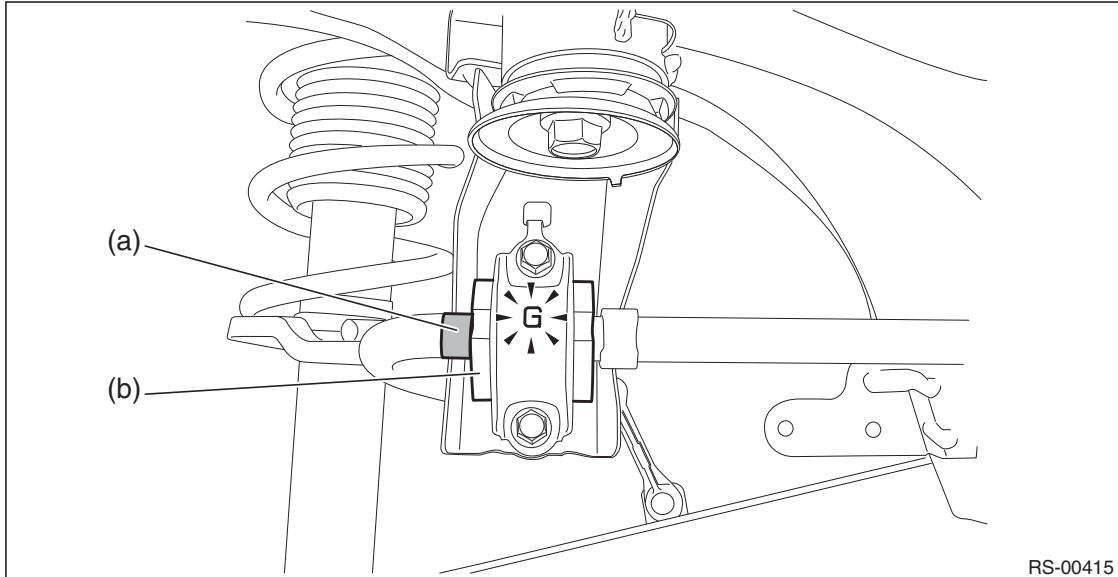
Rear Stabilizer

REAR SUSPENSION

B: INSTALLATION

CAUTION:

- Be sure to use a new flange nut and self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.
- Install the clamp - stabilizer bushing with the "G" character facing upward.
- When installing, align the edge of identification paint (a) to the end face of the bushing (b).



- 1) Before installation, inspect the following items and replace any faulty part with a new one.
 - Check the bushing - stabilizer for abnormal cracks, fatigue or damage.
 - Check the stabilizer link assembly for damage.
- 2) Install each part in the reverse order of removal.

Tightening torque:

Clamp - stabilizer bushing: 30 N·m (3.06 kgf-m, 22.1 ft-lb)

Stabilizer link assembly: 38 N·m (3.87 kgf-m, 28.0 ft-lb)

- 3) Install the rear wheels.

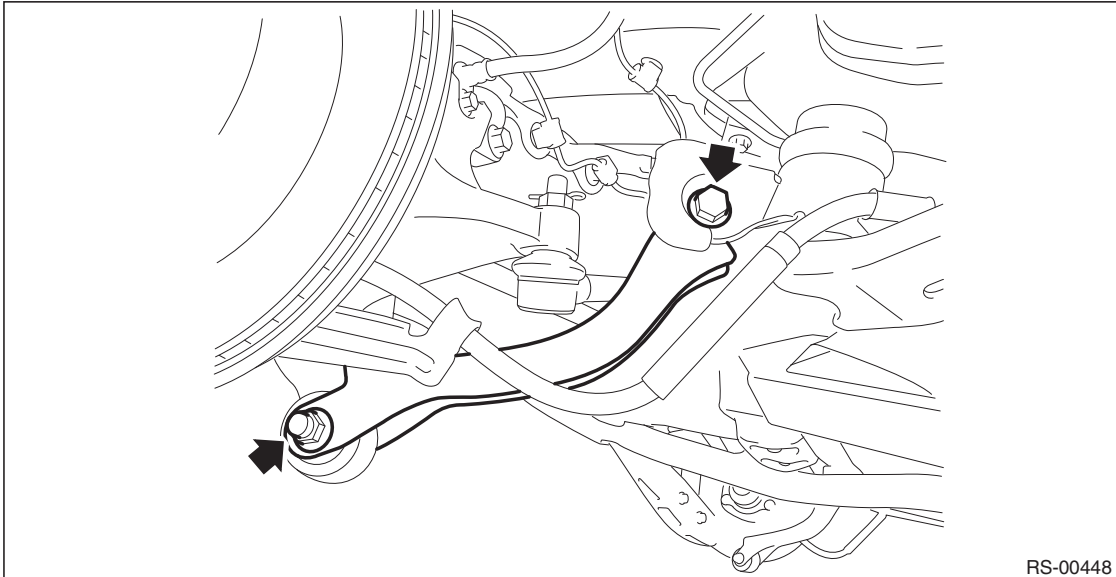
Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

5. Rear Trailing Link

A: REMOVAL

- 1) Lift up the vehicle, and then remove the rear wheels.
- 2) Remove the bolts and nuts, and then remove the trailing link.



B: INSTALLATION

CAUTION:

- Be sure to use a new self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.

- 1) Install each part in the reverse order of removal.

Tightening torque:

Trailing link — rear sub frame assembly: 90 N·m (9.18 kgf-m, 66.4 ft-lb)

Trailing link — housing assembly - rear axle: 90 N·m (9.18 kgf-m, 66.4 ft-lb)

- 2) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

Rear Trailing Link

REAR SUSPENSION

C: DISASSEMBLY

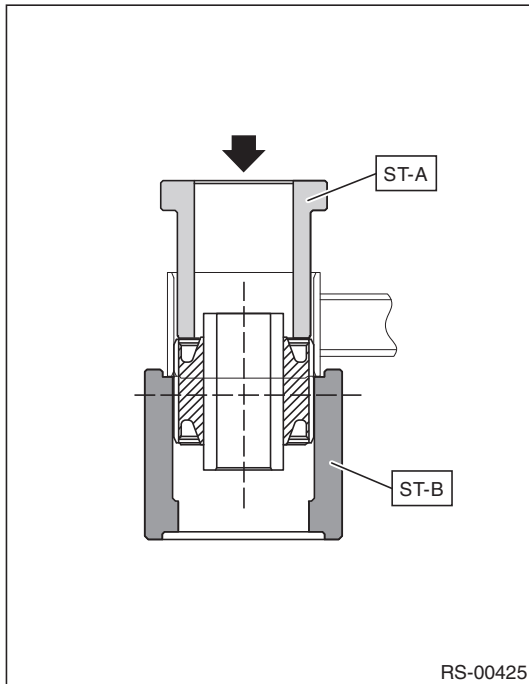
1. BUSHING A - TRAILING LINK

Using the ST, push out the bushing A - trailing link.

Preparation tool:

ST-A: INSTALLER (20099FG000)

ST-B: INSTALLER & REMOVER (BASE) (20099PA010)



2. BUSHING - TRAILING LINK

For the removal procedure of bushing - trailing link, refer to "Rear Axle" in the "DRIVE SHAFT SYSTEM" section. <Ref. to DS-43, BUSHING - TRAILING LINK, DISASSEMBLY, Rear Axle.>

D: ASSEMBLY

1. BUSHING A - 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) Using the ST-A and ST-B, press-fit the bushing.

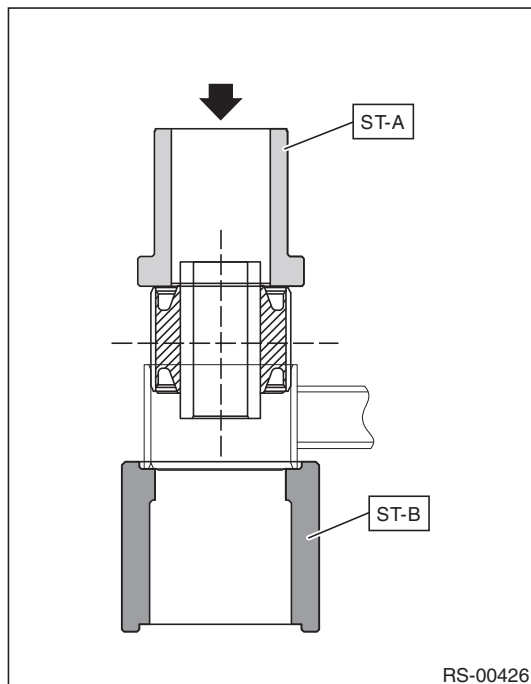
CAUTION:

Make sure to press the bushing straight in.

Preparation tool:

ST-A: INSTALLER (20099FG000)

ST-B: INSTALLER & REMOVER (BASE) (20099PA010)



2. BUSHING - TRAILING LINK

For the installation procedure of bushing - trailing link, refer to "Rear Axle" in the "DRIVE SHAFT SYSTEM" section. <Ref. to DS-44, BUSHING - TRAILING LINK, ASSEMBLY, Rear Axle.>

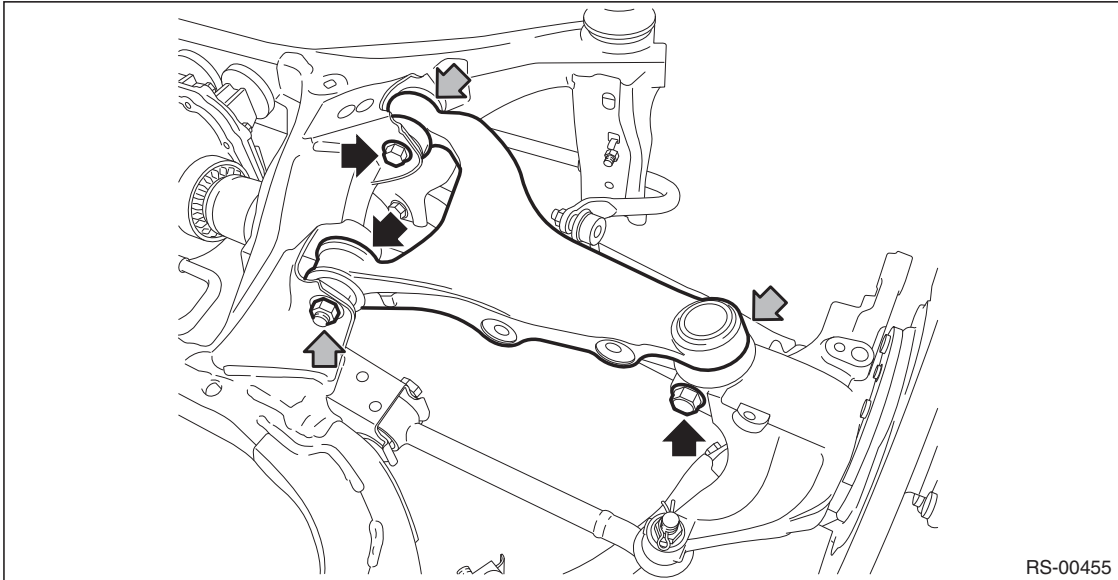
Upper Arm

REAR SUSPENSION

6. Upper Arm

A: REMOVAL

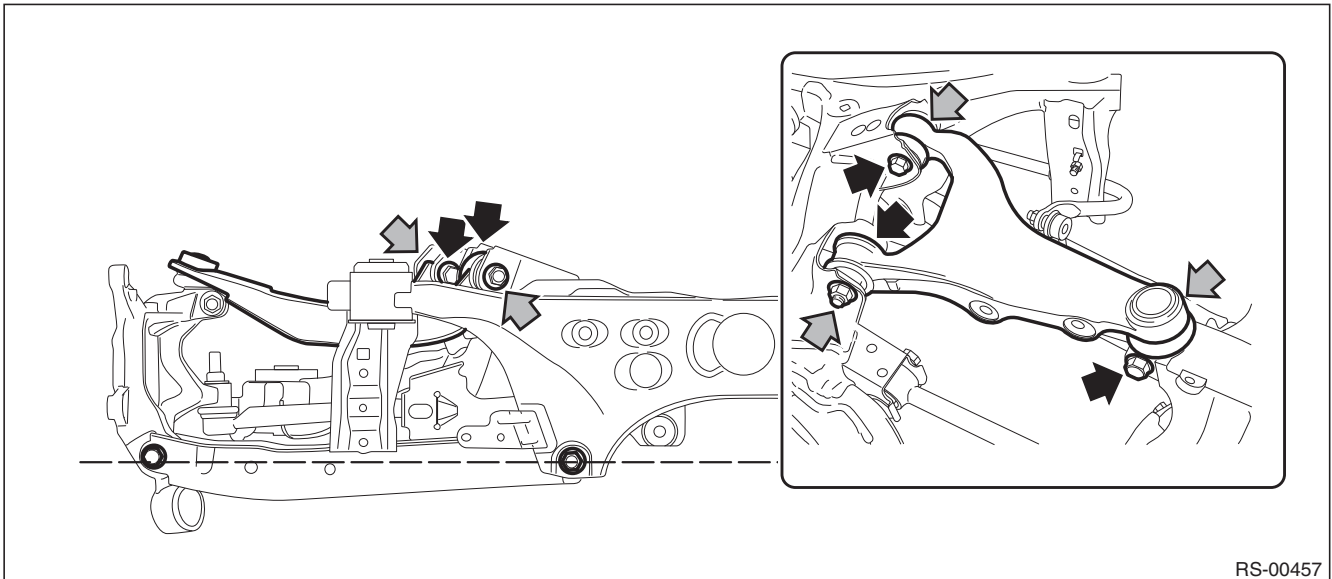
- 1) Remove the rear sub frame assembly. <Ref. to RS-9, REMOVAL, Rear Sub Frame.>
- 2) Remove the bolts and nuts to remove the upper arm assembly.



B: INSTALLATION**CAUTION:**

- Use a new self-locking nut.
- Always tighten the bushing when the arm is positioned in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.

- 1) Before installation, inspect the following items and replace any faulty part with a new one.
 - Visually check the upper arm assembly for damage and deformation.
 - Visually check the bushing for abnormal cracks, fatigue or damage.
 - Visually check the dust cover on the ball joint for abnormal cracks, fatigue or damage.
- 2) Install the upper arm assembly to the rear sub frame assembly.
 - (1) Make the installation sections of the rear lateral link assembly (the bolt on the housing assembly - rear axle side and the bolt on the rear sub frame assembly side) horizontal.
 - (2) Install the upper arm assembly to the rear sub frame assembly.



RS-00457

Tightening torque:

Upper arm assembly — rear sub frame assembly: 90 N·m (9.18 kgf-m, 66.4 ft-lb)

- 3) Connect the upper arm assembly and the housing assembly - rear axle.

Tightening torque:

Upper arm assembly — housing assembly - rear axle: 80 N·m (8.16 kgf-m, 59.0 ft-lb)

- 4) Install the rear sub frame assembly in the reverse order of removal. <Ref. to RS-14, INSTALLATION, Rear Sub Frame.>
- 5) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

- 6) 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” of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

- 7) Connect the battery ground terminal.
- 8) 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.>

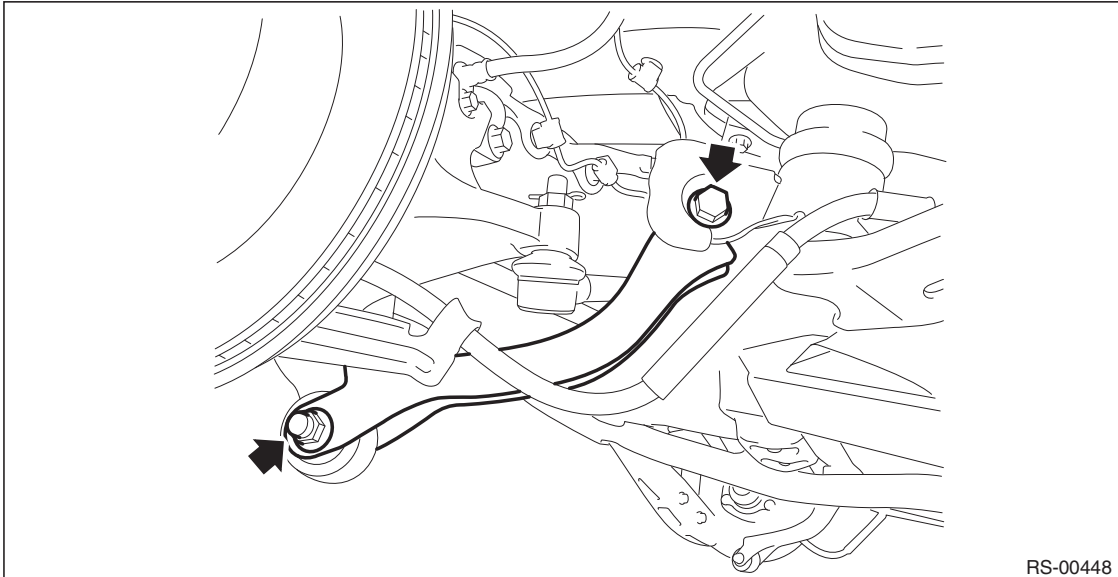
Front Lateral Link

REAR SUSPENSION

7. Front Lateral Link

A: REMOVAL

- 1) Lift up the vehicle, and then remove the rear wheels.
- 2) Remove the bolts and nuts, and then remove the trailing link.



- 3) 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.

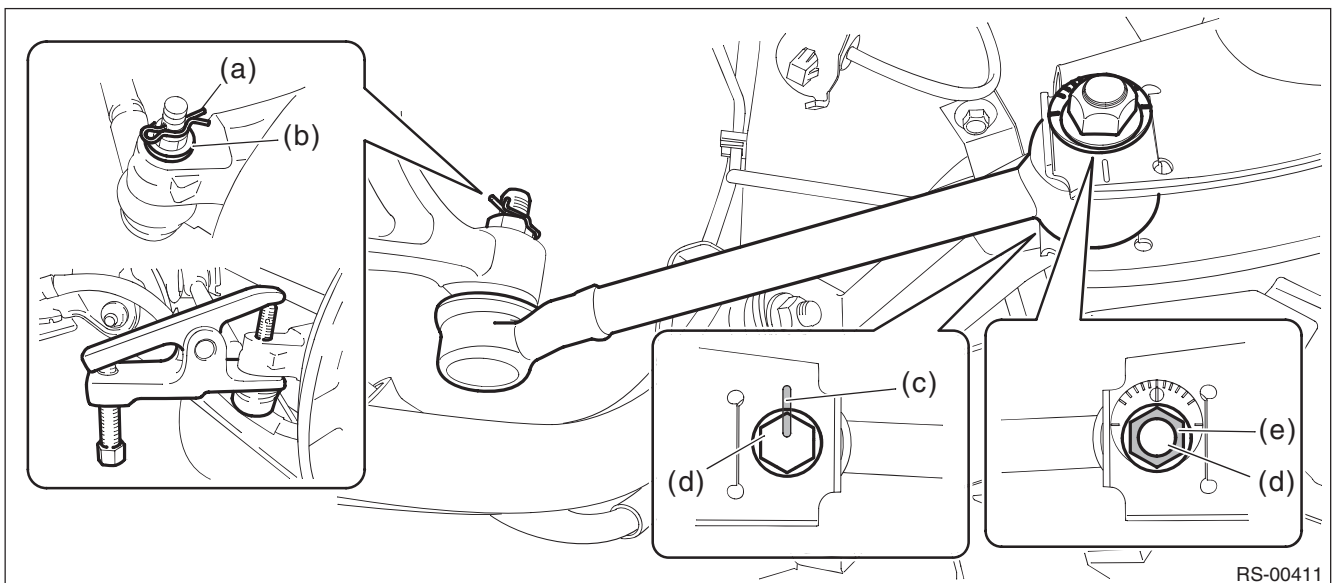
Preparation tool:

Tie-rod ball joint puller

- (3) Scribe alignment marks (c) on the adjusting bolt for lateral link assembly - front and on the rear sub frame assembly.
- (4) Remove the adjusting bolt (d), and remove the lateral link assembly - front.

CAUTION:

When removing the adjusting bolt (d), make sure to fix the bolt head in place when loosening the nut (e).



B: INSTALLATION

CAUTION:

- Be sure to use a new self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.

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

- Visually check the lateral link assembly - front for damage and deformation.
- Visually check the bushing for abnormal cracks, fatigue or damage.
- Visually check the dust cover on the ball joint for abnormal cracks, fatigue or damage.

2) Install each part in the reverse order of removal.

Tightening torque:

Lateral link assembly - front — rear sub frame assembly: 100 N·m (10.20 kgf-m, 73.8 ft-lb)

Lateral link assembly - front — housing assembly - rear axle: 60 N·m (6.12 kgf-m, 44.3 ft-lb)

3) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

4) 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:

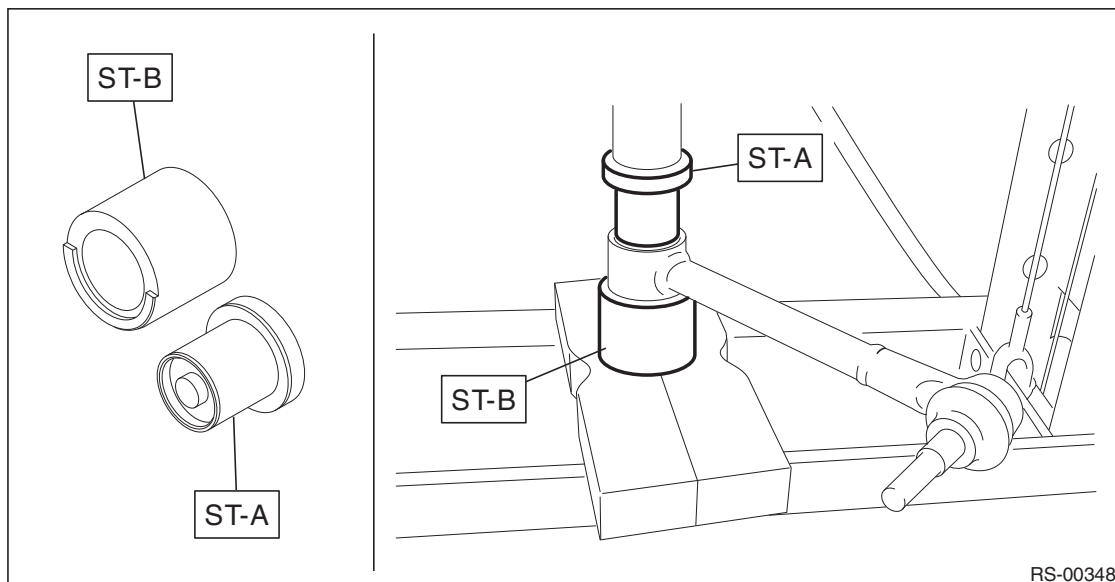
When the wheel alignment has been adjusted, perform “VDC sensor midpoint setting mode” of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

C: DISASSEMBLY

Using the ST, push out the bushing B - lateral link.

PREPARATION TOOL:

ST-A & ST-B: INSTALLER & REMOVER (20299AE000)



Front Lateral Link

REAR SUSPENSION

D: ASSEMBLY

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

- Visually check the lateral link assembly - front for damage and deformation.
- Visually check the bushing for abnormal cracks, fatigue or damage.
- Visually check the dust cover on the ball joint for damage.

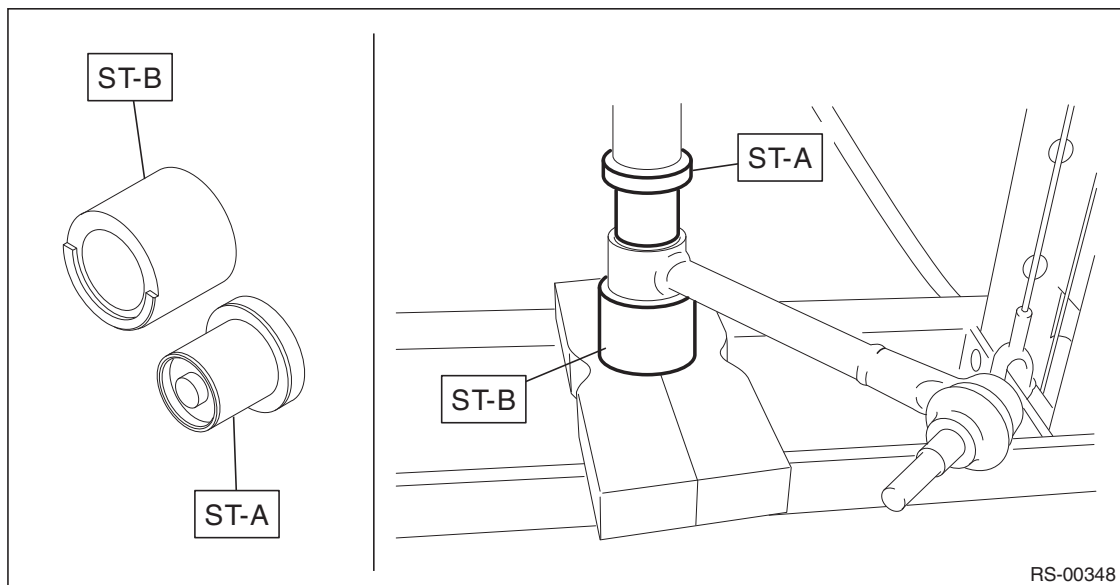
2) Using the ST, press-fit the bushing B - lateral link.

CAUTION:

Make sure to press the bushing straight in.

Preparation tool:

ST-A & ST-B: INSTALLER & REMOVER (20299AE000)



8. Rear Lateral Link

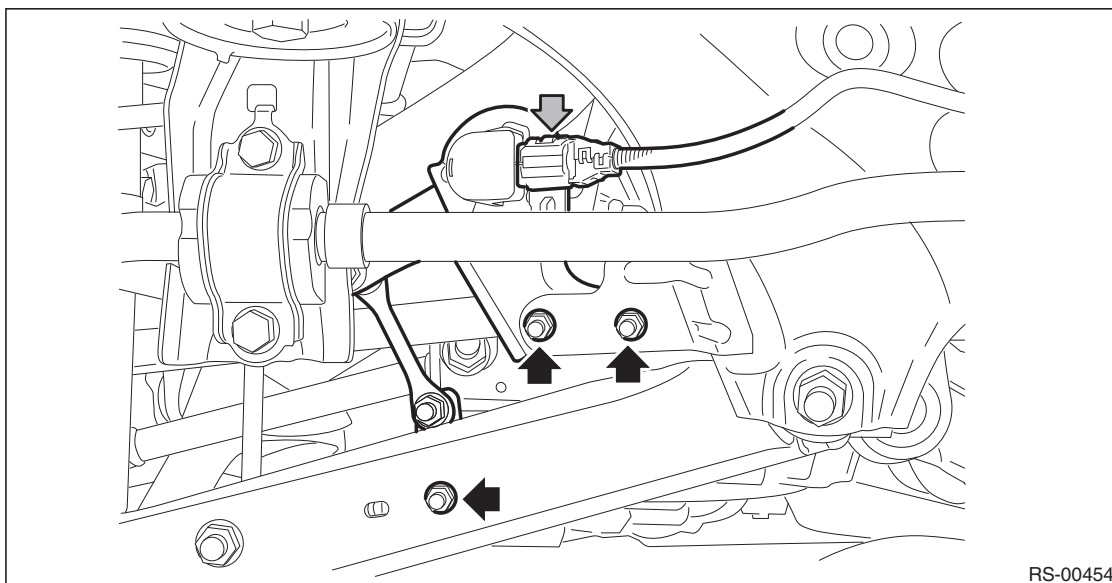
A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Lift up the vehicle, and then remove the rear wheels.
- 3) Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler, left side only)

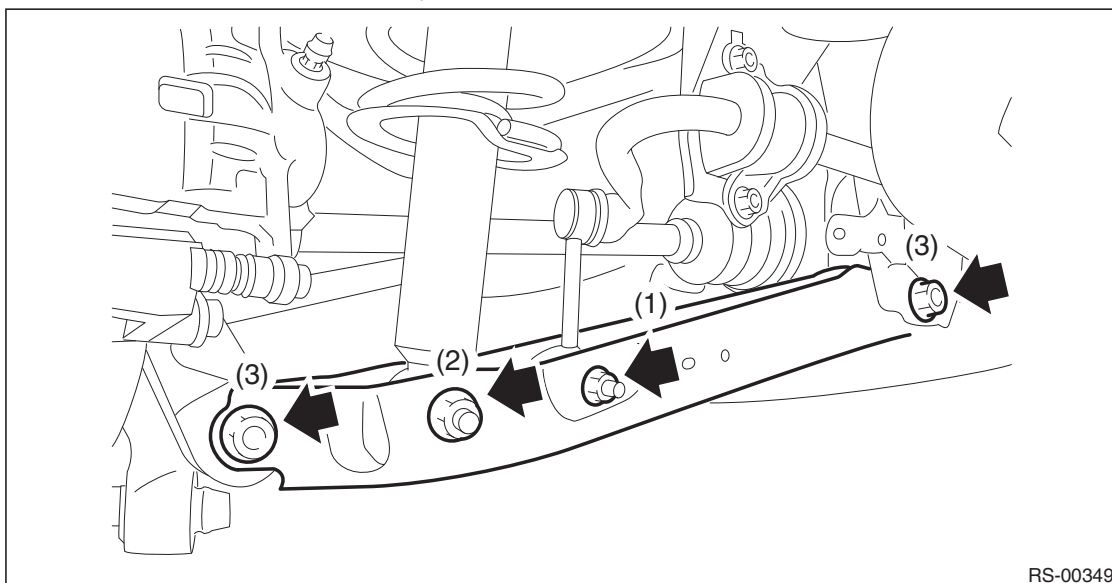
CAUTION:

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 nuts, and remove the sensor assembly - headlight beam leveler.



- 4) Remove the bolts and nuts, and remove the lateral link assembly - rear on the left and right sides.
 - (1) Remove the nut and disconnect the rear stabilizer link assembly.
 - (2) Remove the bolts at the bottom of rear strut assembly.
 - (3) Disconnect the lateral link assembly - rear.



Rear Lateral Link

REAR SUSPENSION

B: INSTALLATION

CAUTION:

- Be sure to use a new self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.

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

- Visually check the lateral link assembly - rear for damage and deformation.
- Visually check the bushing for abnormal cracks, fatigue or damage.

2) Install each part in the reverse order of removal.

Tightening torque:

Sensor assembly - headlight beam leveler: 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

Lateral link assembly - rear: 80 N·m (8.16 kgf-m, 59.0 ft-lb)

Rear strut assembly: 80 N·m (8.16 kgf-m, 59.0 ft-lb)

Stabilizer link assembly: 38 N·m (3.87 kgf-m, 28.0 ft-lb)

Sensor assembly - headlight beam leveler: 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

3) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

4) 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" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

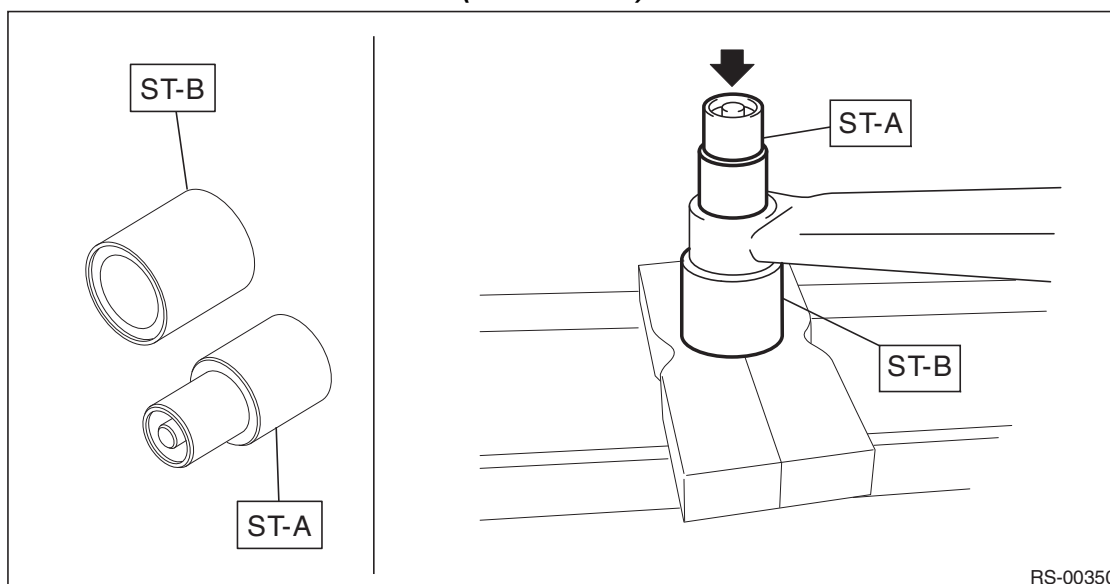
5) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-17, REINITIALIZATION, PROCEDURE, Auto Headlight Beam Leveler System.>

C: DISASSEMBLY

Using the ST, push out the bushing.

Preparation tool:

ST-A & ST-B: INSTALLER & REMOVER (20099AE010)

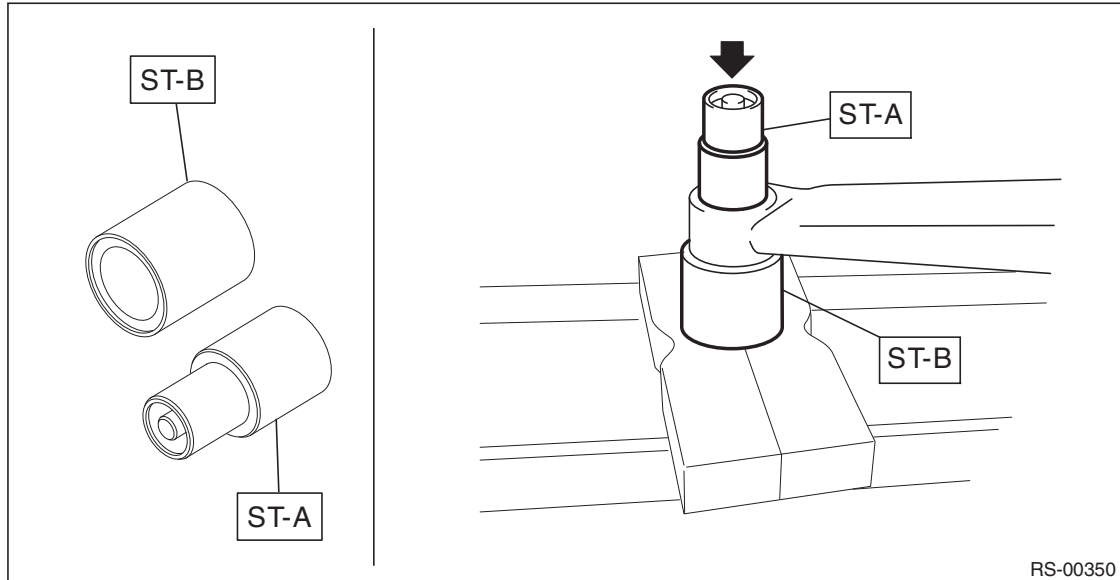


D: ASSEMBLY

- 1) Before assembly, inspect the following items and replace any faulty part with a new one.
 - Visually check the lateral link assembly - rear for damage and deformation.
 - Visually check the bushing for abnormal cracks, fatigue or damage.
- 2) Using the ST, press the bushing into place.

Preparation tool:

ST-A & ST-B: INSTALLER & REMOVER (20099AE010)



Rear Shock Absorber

REAR SUSPENSION

9. Rear Shock Absorber

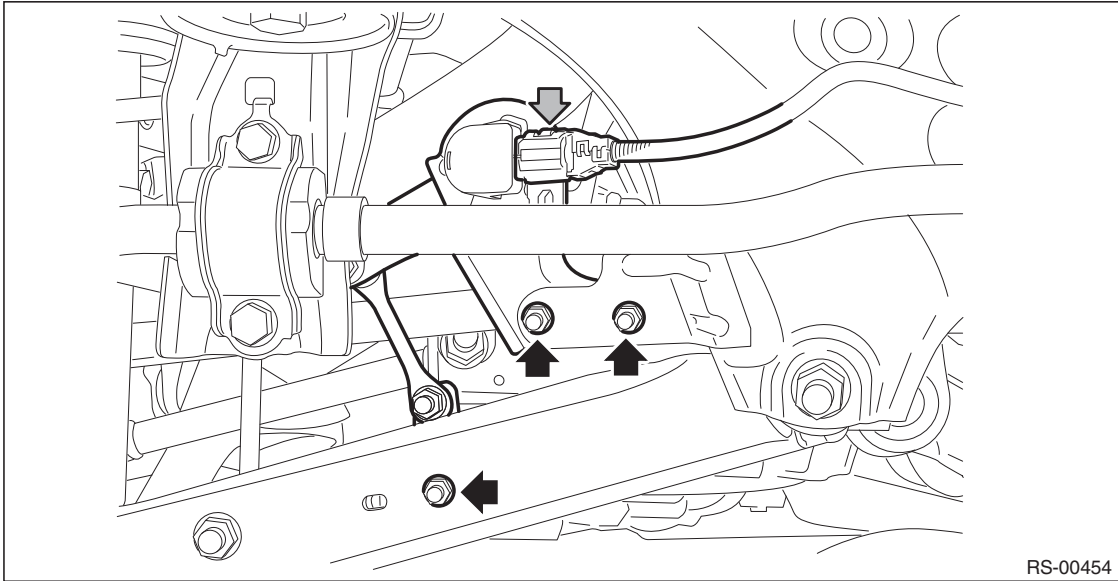
A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Lift up the vehicle, and then remove the rear wheels.
- 3) Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler, left side only)

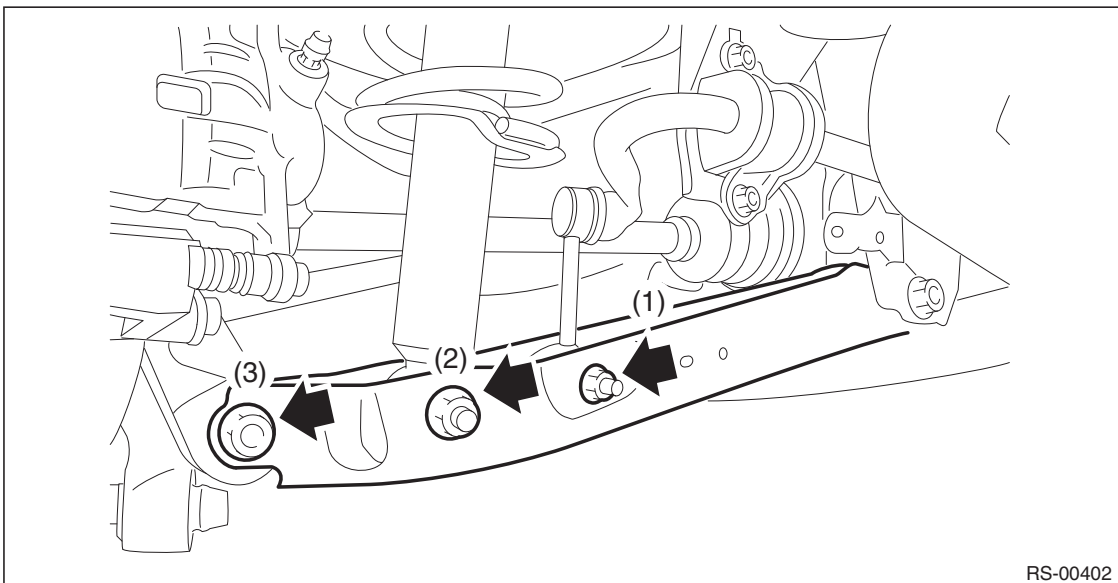
CAUTION:

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 nuts, and remove the sensor assembly - headlight beam leveler.



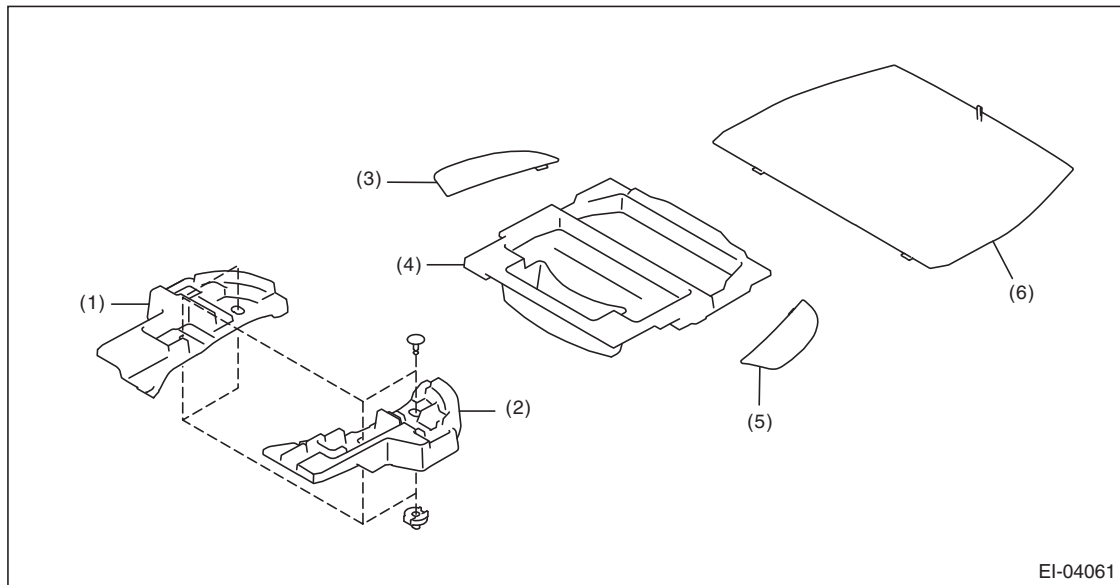
- 4) Remove the bolts and nuts, and lower the lateral link assembly - rear.
 - (1) Remove the nut and disconnect the rear stabilizer link assembly.
 - (2) Remove the bolts at the bottom of rear strut assembly.
 - (3) Disconnect the housing assembly - rear axle from the lateral link assembly - rear.



Rear Shock Absorber

REAR SUSPENSION

5) Remove the mat - rear floor, spacer - rear floor, and cover - trunk.



- (1) Spacer - rear floor side RH
- (2) Spacer - rear floor side LH

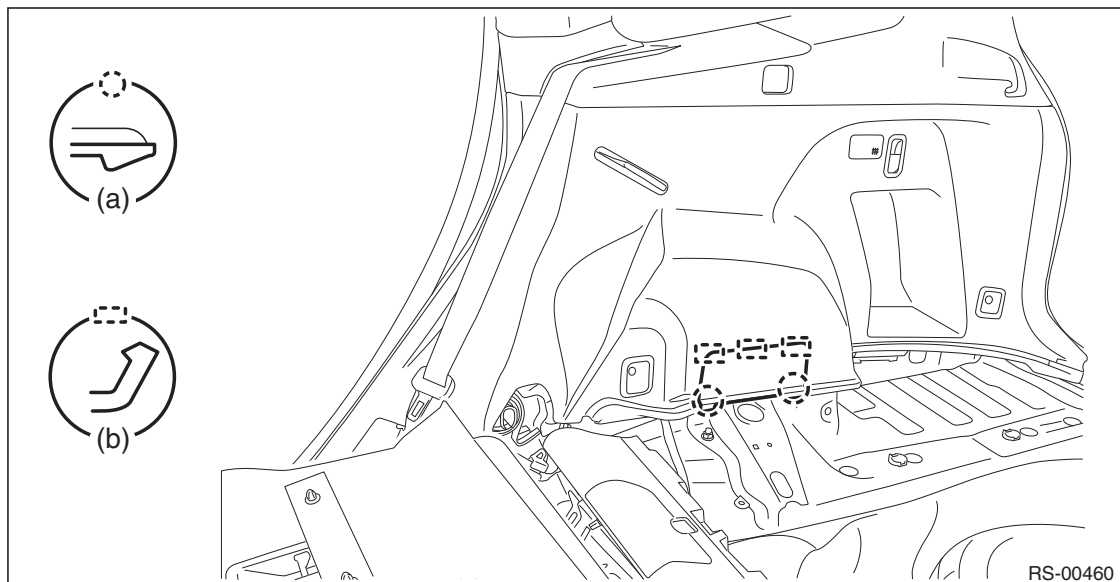
- (3) Mat - rear floor RH
- (4) Cover - trunk

- (5) Mat - rear floor LH
- (6) Mat - rear floor CTR

6) Release the claws (a) and guide (b), and then remove the cap - rear strut.

CAUTION:

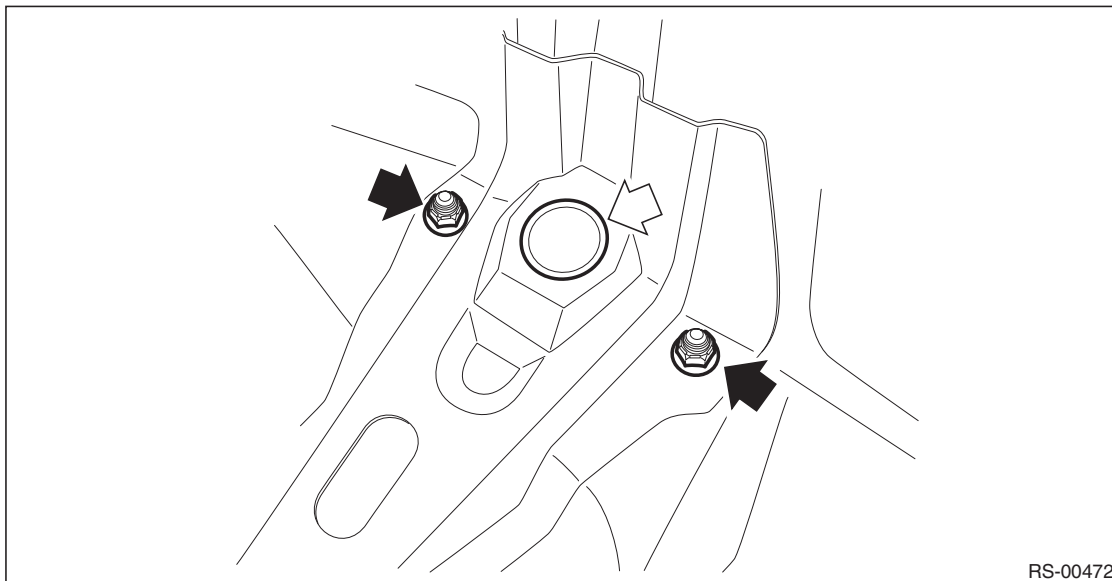
When removing the cap - rear strut, make sure to remove the claws (a) first. Removing the guide (b) first may damage claws or guide.



Rear Shock Absorber

REAR SUSPENSION

7) Remove the plug, and remove the nuts on the upper side of rear strut assembly.



8) Lower the lateral link assembly - rear, and remove the rear strut assembly.

B: INSTALLATION

CAUTION:

- Be sure to use a new self-locking nut.
- Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.

1) Install each part in the reverse order of removal.

Tightening torque:

Refer to "COMPONENT" of "General Description" for the tightening torque. <Ref. to RS-3, COMPONENT, General Description.>

2) Install the rear wheels.

Tightening torque:

120 N·m (12.24 kgf-m, 88.5 ft-lb)

3) 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" of the VDC. <Ref. to VDC-23, ADJUSTMENT, VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).>

4) Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) <Ref. to LI-17, REINITIALIZATION, PROCEDURE, Auto Headlight Beam Leveler System.>

C: DISASSEMBLY

Refer to "Front Strut" in "FRONT SUSPENSION" section for disassembly. <Ref. to FS-43, DISASSEMBLY, Front Strut.>

D: ASSEMBLY

Refer to "Front Strut" in "FRONT SUSPENSION" section for assembly. <Ref. to FS-43, ASSEMBLY, Front Strut.>

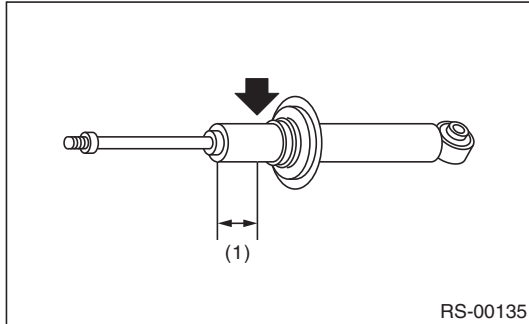
E: INSPECTION

Refer to "Front Strut" in "FRONT SUSPENSION" section for inspection procedures. <Ref. to FS-45, INSPECTION, Front Strut.>

F: DISPOSAL

CAUTION:

- Before discarding the shock absorber, be sure to wear goggles to protect eyes from gas, oil and cutting powder.
 - Do not disassemble the shock absorber or place it into a fire.
 - When discarding gas filled shock absorbers, drill holes in them to purge the gas.
- 1) Place the shock absorber on a level surface with the piston rod fully expanded.
 - 2) Make a hole into the specified position 30 mm (1.18 in) deep using a drill with 2 — 3 mm (0.08 — 0.12 in) diameter.



(1) 40 mm (1.57 in)

General Diagnostic Table

REAR SUSPENSION

10. General Diagnostic Table

A: INSPECTION

1. IMPROPER VEHICLE POSTURE OR IMPROPER WHEEL ARCH HEIGHT

Possible cause	Corrective action
(1) Permanent distortion or damaged coil spring	Replace.
(2) Rough operation of shock absorber	Replace.
(3) Installation of the wrong shock absorber	Replace with proper parts.
(4) Installation of the wrong coil spring	Replace with proper parts.

2. POOR RIDE COMFORT

- 1) Large rebound shock
- 2) Rocking of the vehicle continues too long after running over bump and hump.
- 3) Excessive shock in bumping

Possible cause	Corrective action
(1) Damaged coil spring	Replace.
(2) Overinflation of tires	Adjust.
(3) Improper wheel arch height	Replace the coil springs with new parts.
(4) Defective operation of shock absorber	Replace.
(5) Damage or deformation of shock absorber mount	Replace.
(6) Unsuitable length (maximum or minimum) of shock absorber	Replace with appropriate parts.
(7) Deformation or loss of bushing	Replace.
(8) Deformation or damage of helper in shock absorber	Replace.
(9) Oil leakage from the shock absorber	Replace.

3. NOISE

Possible cause	Corrective action
(1) Wear or damage of shock absorber component parts	Replace.
(2) Loosening of the suspension link or arm installing bolt	Tighten to the specified torque.
(3) Deformation or loss of bushing	Replace.
(4) Unsuitable length (maximum or minimum) of shock absorber	Replace with appropriate parts.
(5) Damaged coil spring	Replace.
(6) Wear or damage of the ball joint	Replace.
(7) Deformation of the clamp - stabilizer bushing	Replace.
(8) Broken, missing, or removed plug	Adjust or replace.