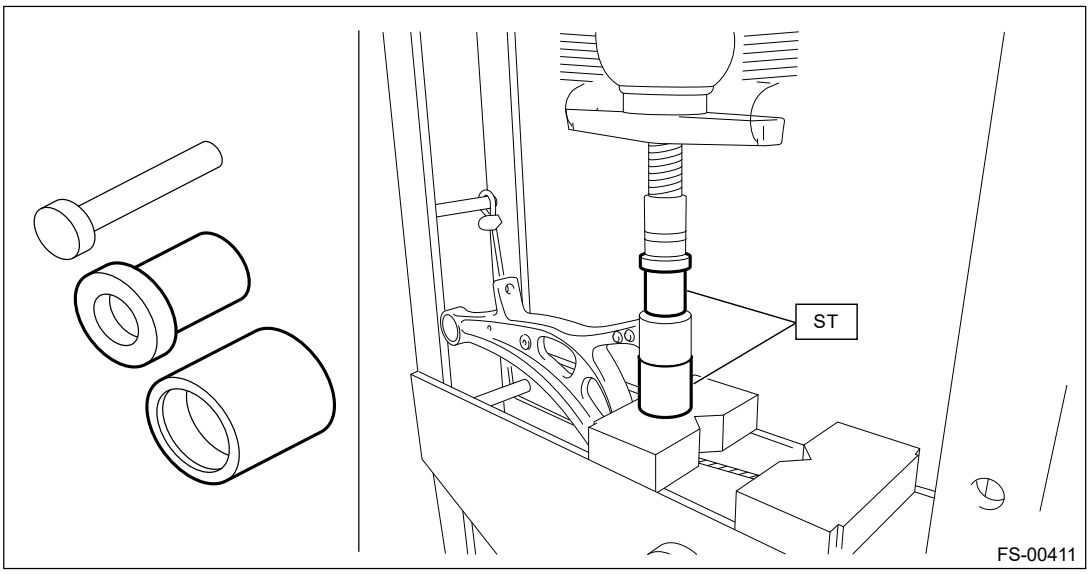
ASSEMBLY

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 for damage.
2. Align the alignment mark on the front arm assembly to the split portion of the bushing intermediate plate of the busing front - front arm.
3. Using the ST and a press, assemble the busing front - front arm.

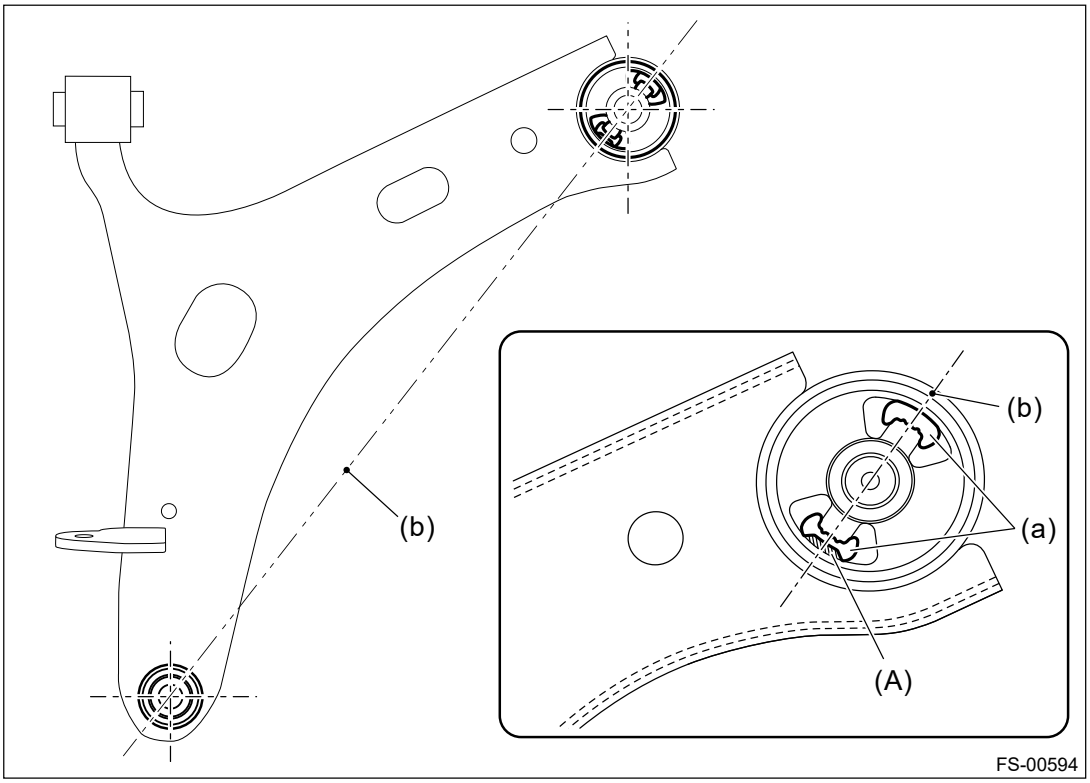
   Preparation tool:

   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 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.

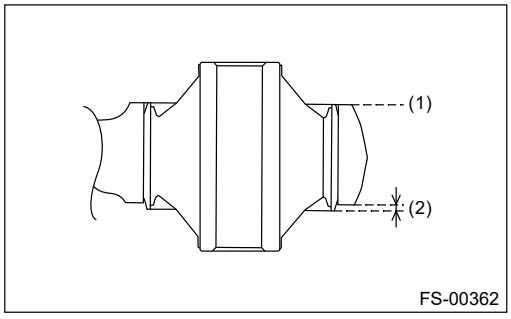


(a) Recess section (b) Center line of recess section

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.



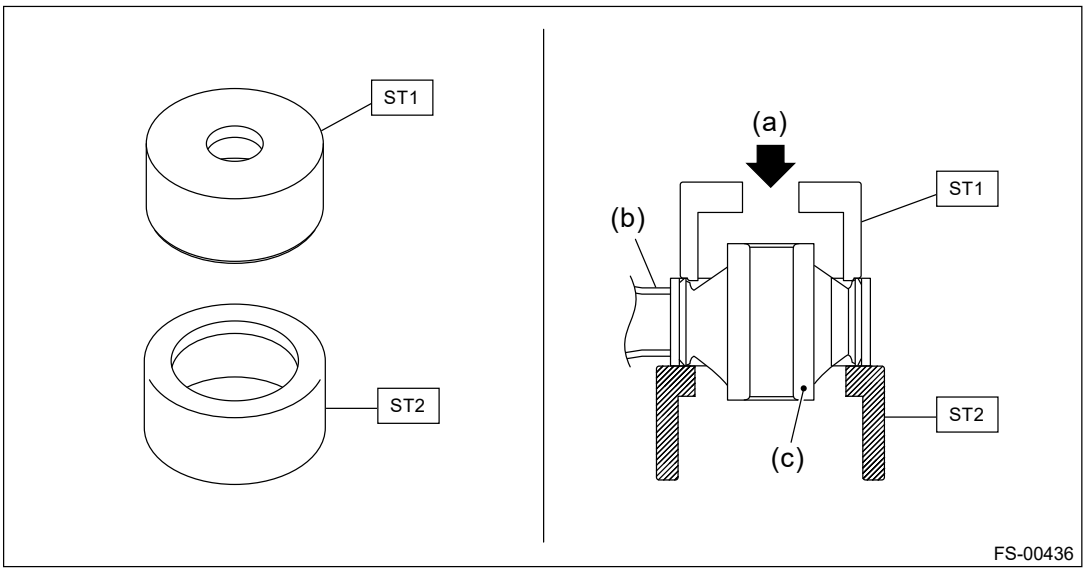
(1) Aligned

(2) Not aligned

Preparation tool:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



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

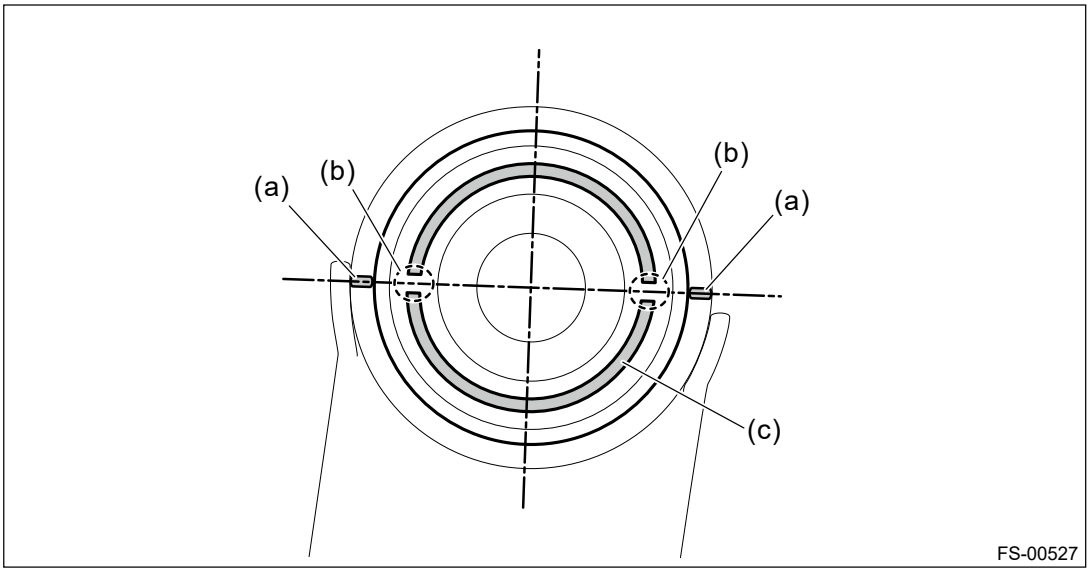
DISASSEMBLY

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.

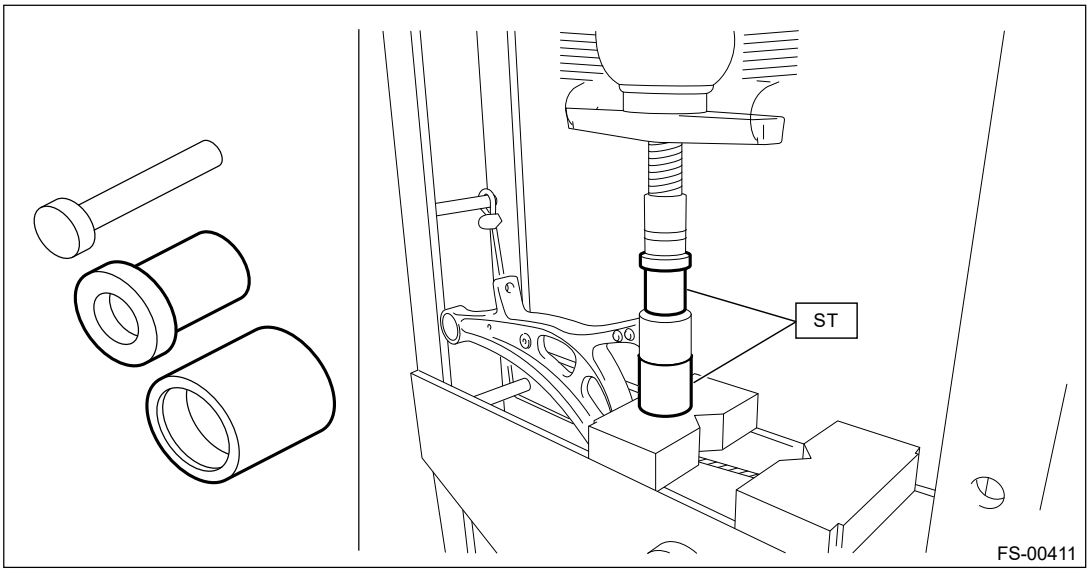


(a) Put an alignment mark.
(b) Split portion of bushing intermediate plate
(c) Bushing intermediate plate

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

Preparation tool:

ST: INSTALLER & REMOVER SET (927680000)



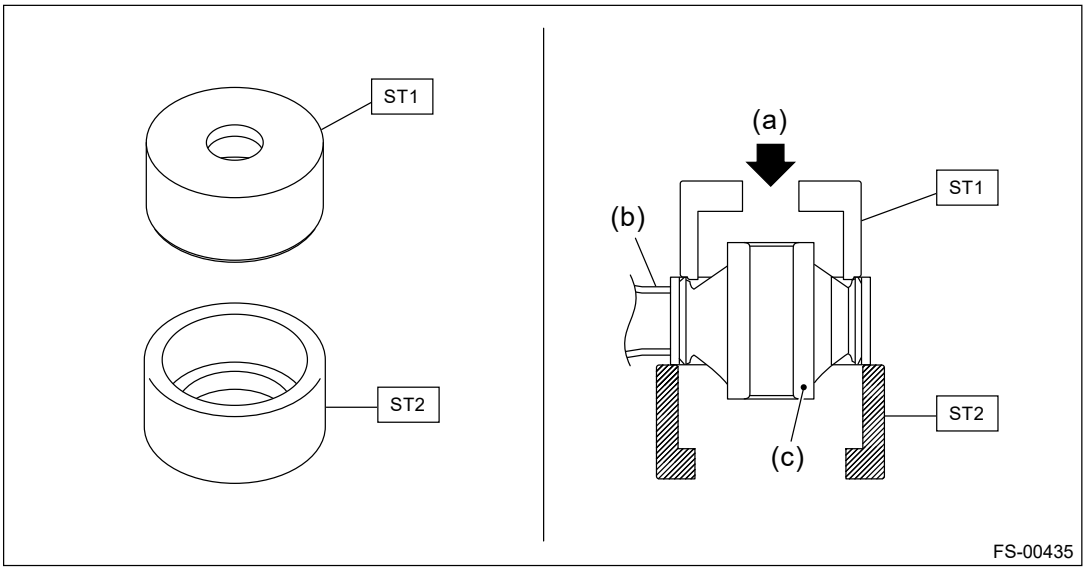
2. BUSHING REAR - FRONT ARM

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

Preparation tool:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



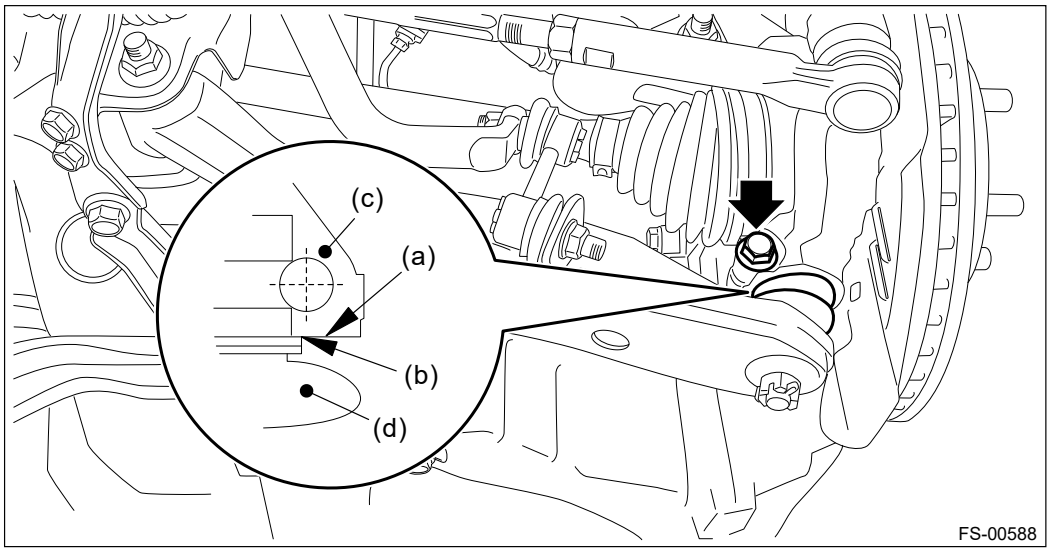
(a) Press (b) Front arm ASSY (c) Bushing rear - front arm

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 for damage.
2. Using new self-locking nuts and flange bolts, temporarily tighten the front arm assembly to the front crossmember assembly.
3. Install the ball joint into 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
(b) Raised section of ball joint

   Tightening torque:

   50 N•m (5.1 kgf-m, 36.9 ft-lb)
4. Install the stabilizer link.

   Tightening torque:

   60 N•m (6.12 kgf-m, 44.3 ft-lb)
5. Install the under cover COMPL - front.

   Tightening torque:

   Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FRONT UNDER COVER.
6. Install the front wheels.

   Tightening torque:

   120 N•m (12.24 kgf-m, 88.5 ft-lb)
7. 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:

   Bushing front - front arm: 95 N•m (9.7 kgf-m, 70.1 ft-lb)
   Bushing rear - front arm: 110 N•m (11.22 kgf-m, 81.1 ft-lb)

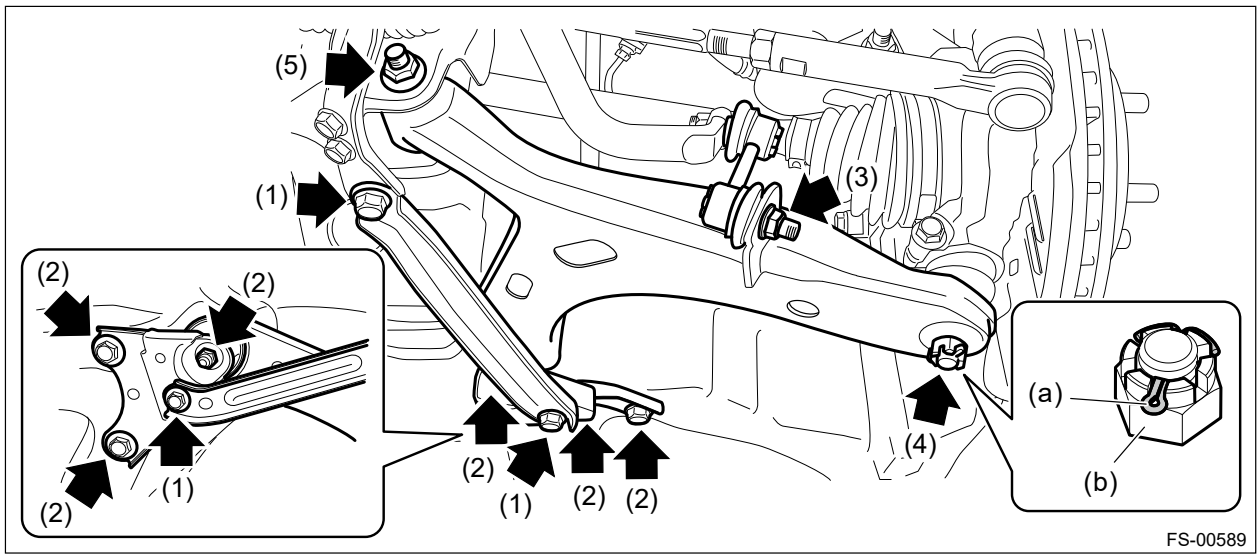
8. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

     Caution:

     When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
9. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

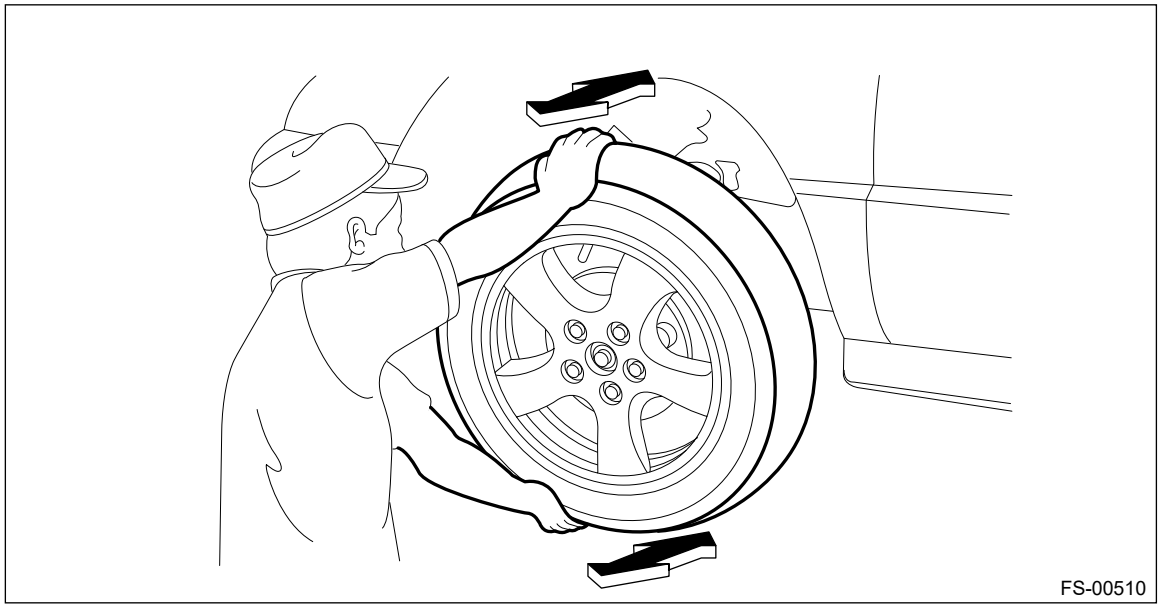
REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the under cover COMPL - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. 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.
   (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.



INSPECTION

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



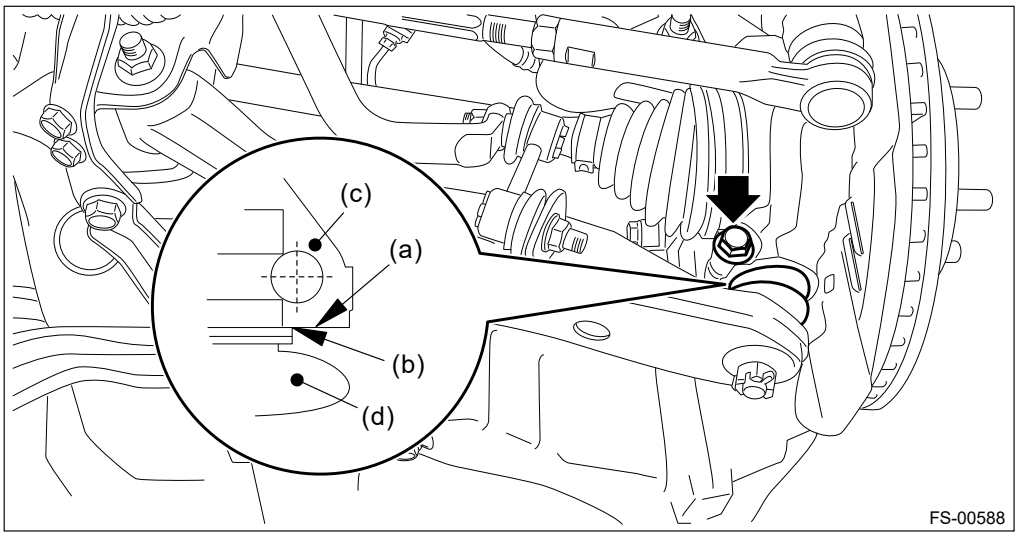
   - **Looseness exists** → Replace the ball joint. Ref. to FRONT SUSPENSION>Front Ball Joint>REMOVAL.
2. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
3. Replace the ball joint if the dust cover is damaged when visually inspecting the dust cover.

INSTALLATION

1. Install the ball joint into 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.**



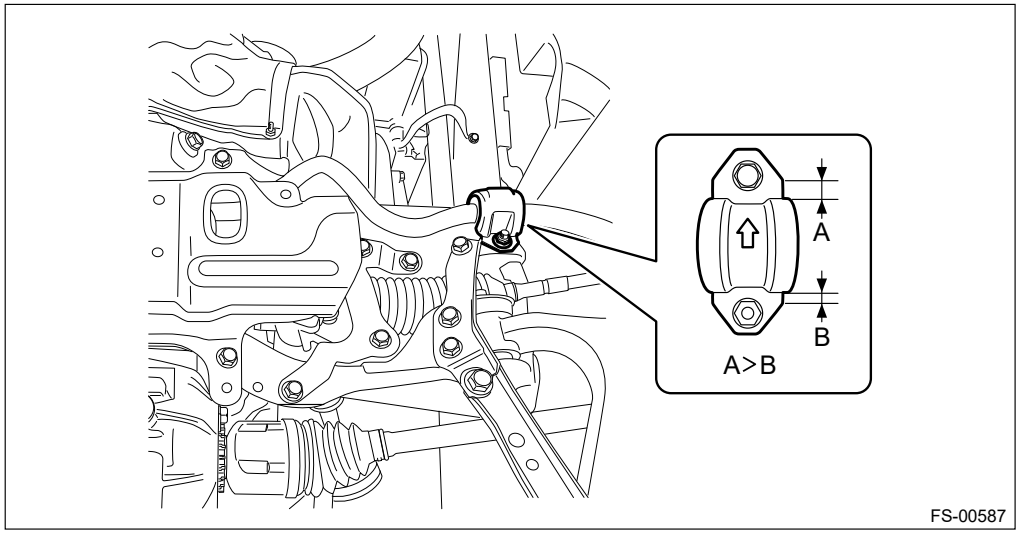
(a) Bottom surface of housing ASSY - front axle
(c) Housing ASSY - front axle
(d) Ball joint
(b) Raised section of ball joint

Tightening torque:
50 N•m (5.1 kgf-m, 36.9 ft-lb)

2. Install the ball joint into front arm assembly.
   (1) Connect the ball joint 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.
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 under cover COMPL - front.

Tightening torque:

Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FRONT UNDER COVER.

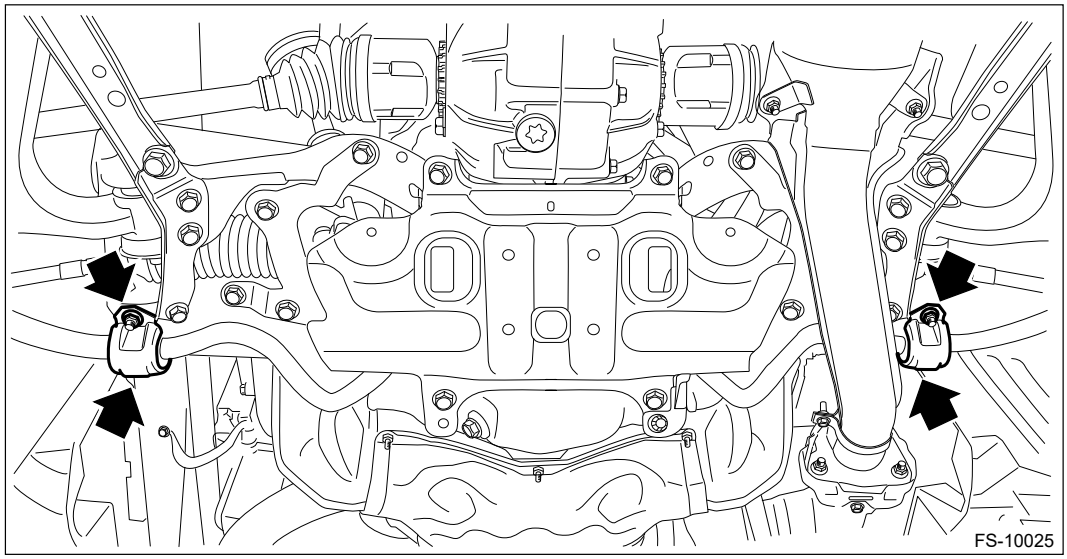
5. Install the front wheels.

Tightening torque:

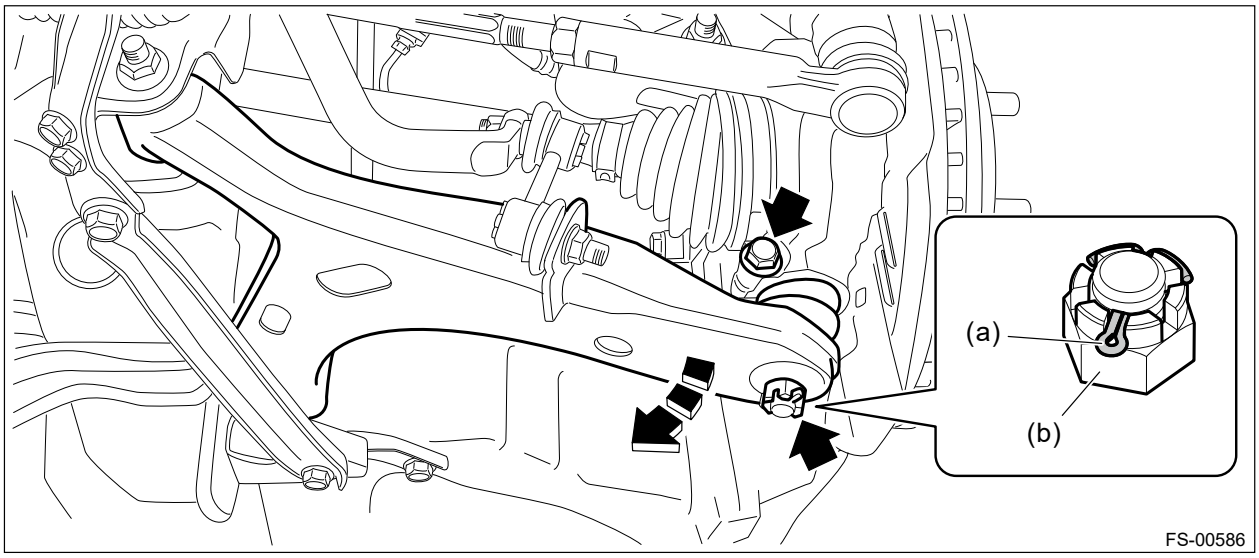
120 N•m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the under cover COMPL - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the clamp - stabilizer bushing on the left and right sides.



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

INSTALLATION

Install each part in the reverse order of removal.

Tightening torque:

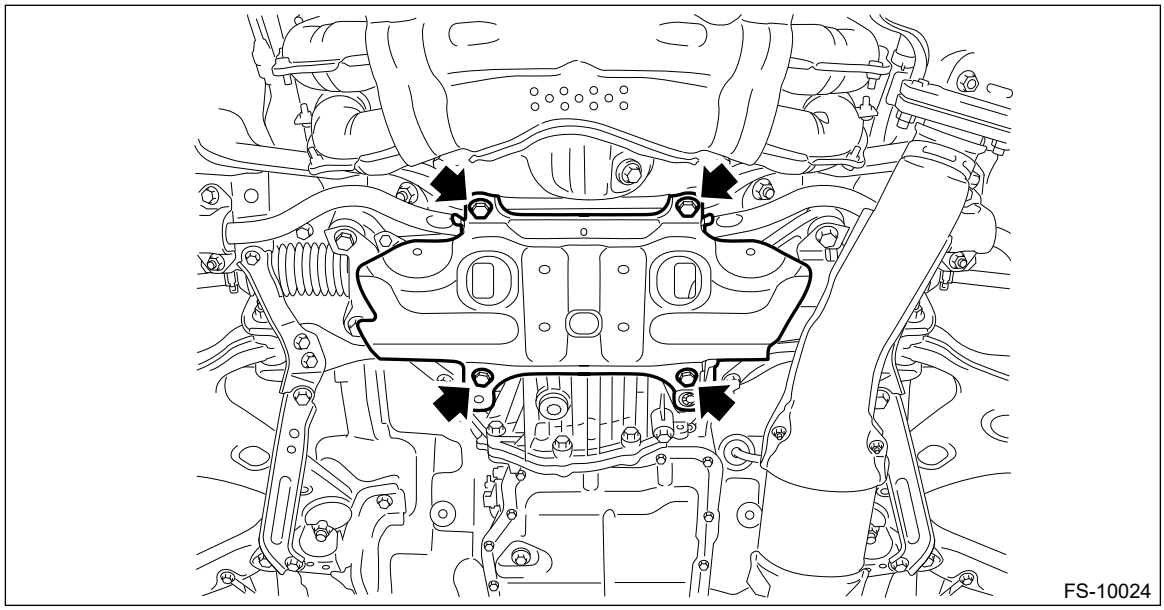
Front crossmember support — front crossmember assembly: 60 N•m (6.12 kgf-m, 44.3 ft-lb)

Under cover front - transmission: 18 N•m (1.84 kgf-m, 13.3 ft-lb)

Under cover COMPL - front: Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FRONT UNDER COVER.

REMOVAL

1. Lift up the vehicle.
2. Remove the under cover COMPL - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the under cover front - transmission. (Non-turbo model)
4. Remove the bolt, and remove the front crossmember support.

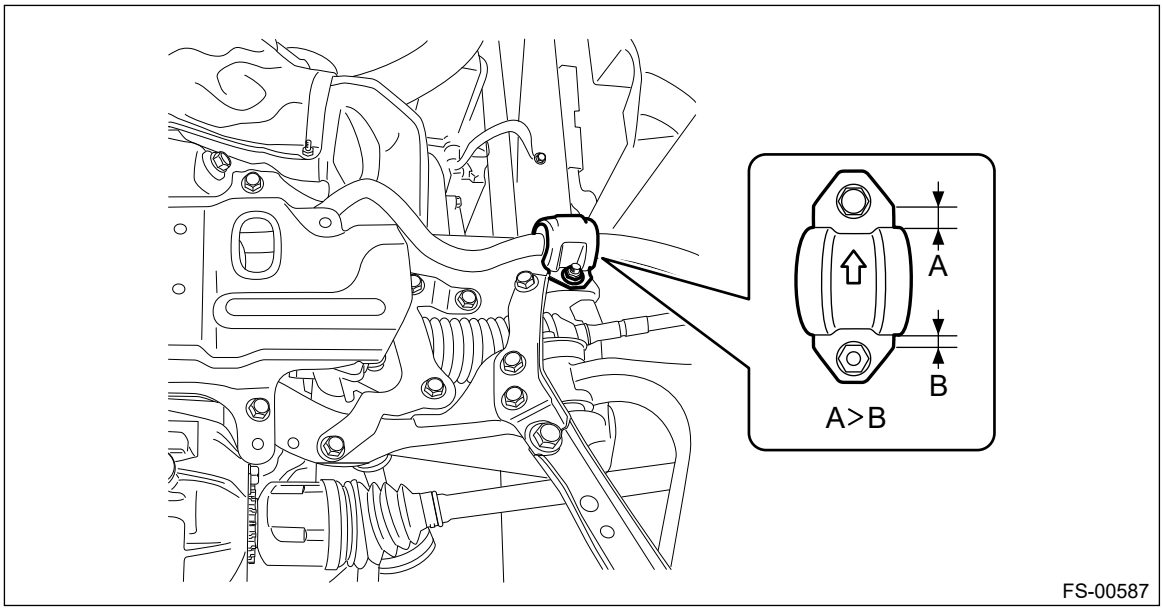


INSTALLATION

1. Check the crossmember for damage or cracks, and correct or replace if defective.
2. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
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 FRONT SUSPENSION>General Description>COMPONENT.**
- **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 mounting — front crossmember assembly (with new nuts): 60 N·m (6.12 kgf-m, 44.3 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)
Stay assembly - front hood: 20 N·m (2 kgf-m, 14.8 ft-lb)
Under cover front - transmission: 18 N•m (1.84 kgf-m, 13.3 ft-lb)
Under cover COMPL - front: Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FRONT UNDER COVER.
Front suspension parts: Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.

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. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
6. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

     Caution:

     When the wheel alignment has been adjusted, perform the adjustment of the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
7. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

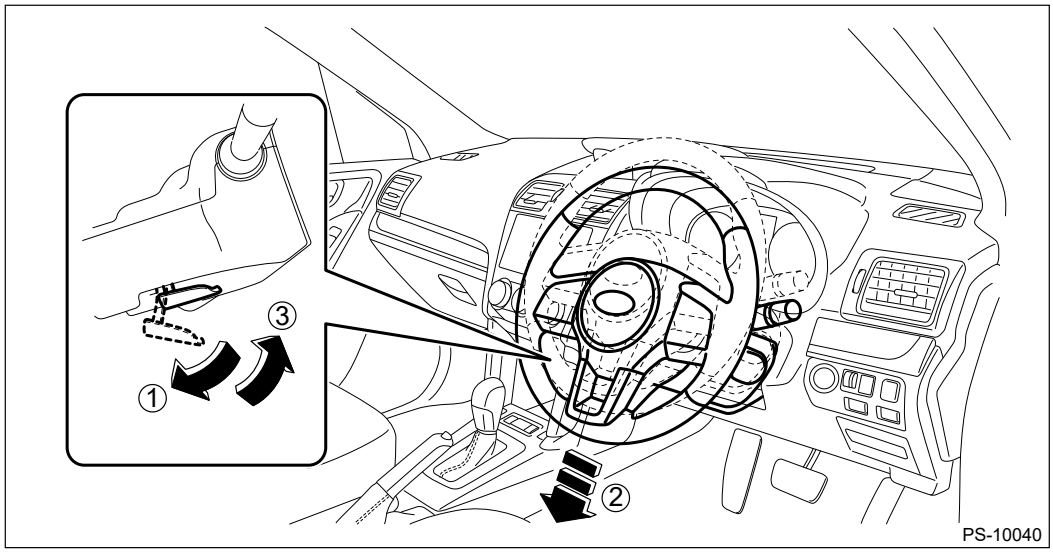
Caution:

- **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. Ref. to NOTE>NOTE > BATTERY.

   Note:

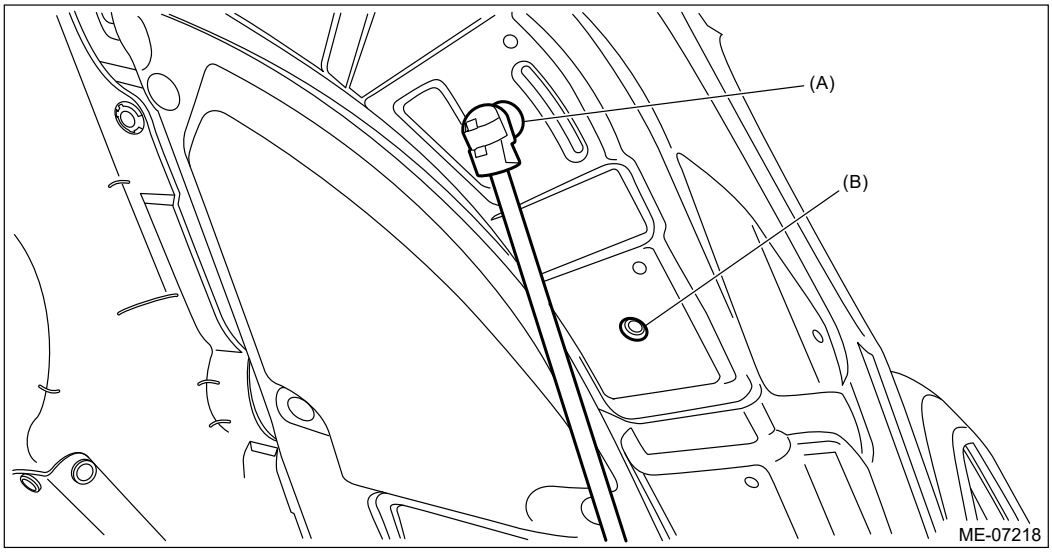
   - **For model with battery sensor, disconnect the ground terminal from battery sensor.**
2. Adjust the tilt position of the steering column to the lowest position and lock the tilt lever.



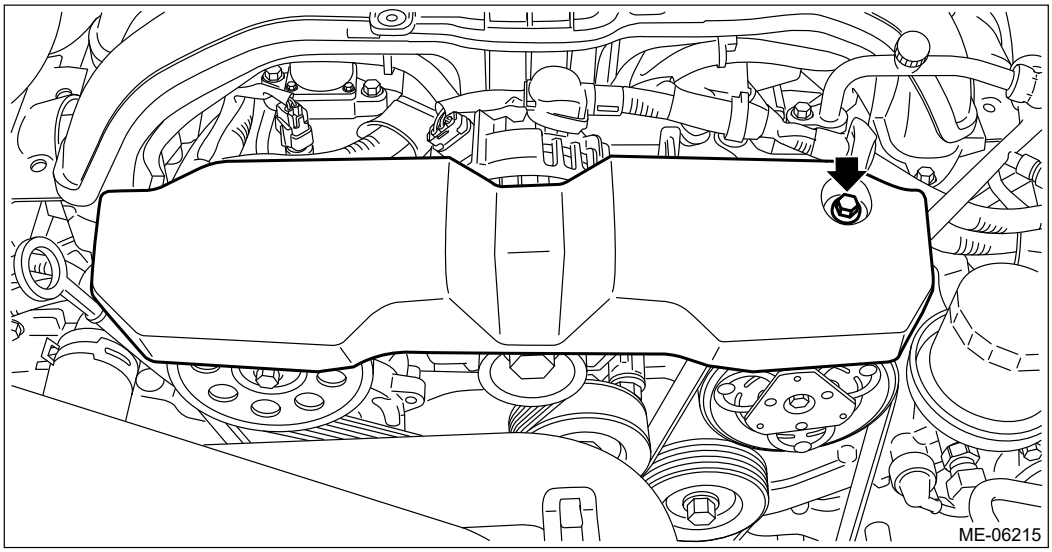
3. Lift up the vehicle, and then remove the front wheels.
4. Remove the under cover COMPL - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
5. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
6. Change the front hood stay position from (A) to (B), and completely open the front hood.

   Tightening torque:

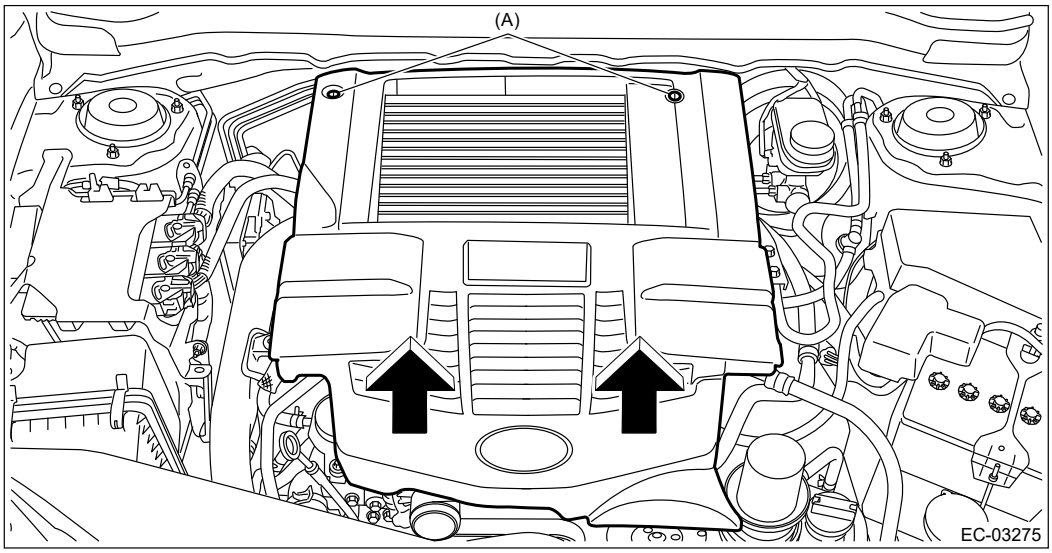
   20 N•m (2 kgf-m, 14.8 ft-lb)



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



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



9. Disconnect the connector and harness clamp from power steering control module.

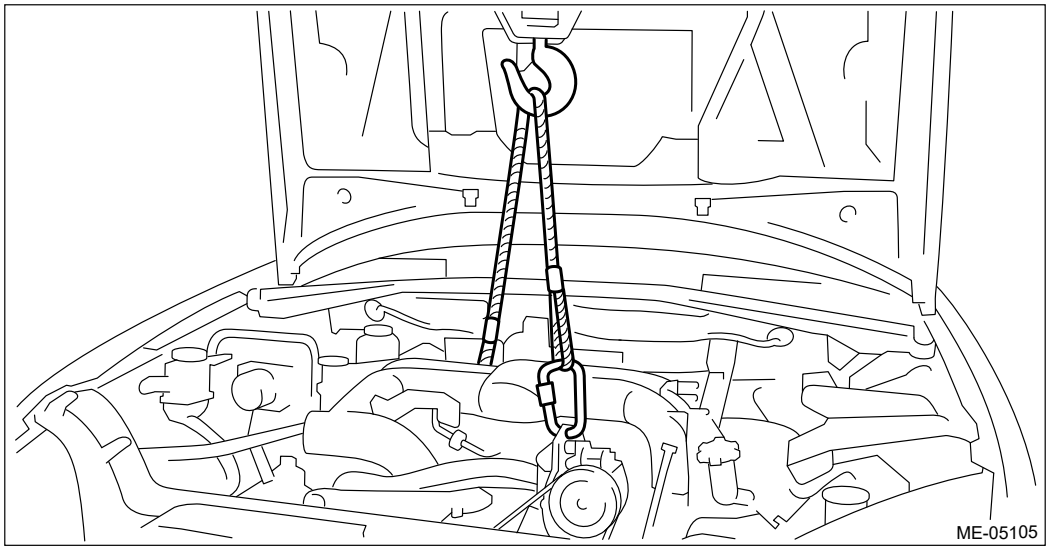
10. Support the engine with a lifting device and wire ropes.

(1) Support the engine with a lifting device and wire ropes.

(2) While lifting up the vehicle, also raise up the lifting device.

Caution:

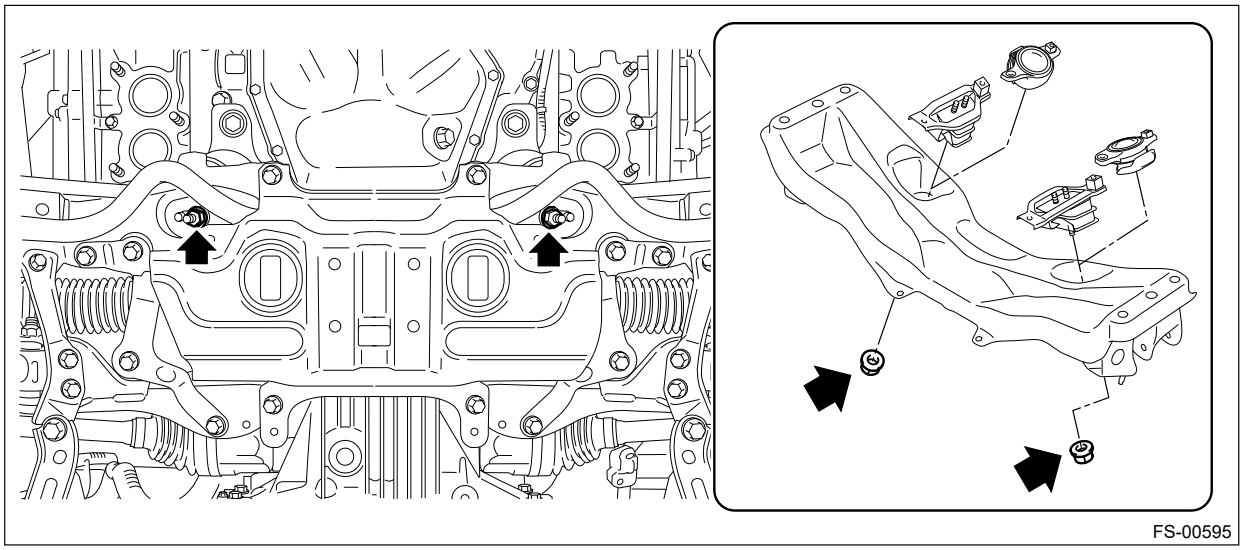
When lifting up the vehicle, raise up wire ropes at the same time.



11. 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.



12. Remove the center exhaust pipe.

- Non-turbo model: Ref. to EXHAUST(H4DO)>Center Exhaust Pipe>REMOVAL.
- Turbo model: Ref. to EXHAUST(H4DOTC)>Center Exhaust Pipe>REMOVAL.

13. Remove the under cover front - transmission. (Non-turbo model)

14. Remove the front crossmember support. Ref. to FRONT SUSPENSION>Front Crossmember Support Plate>REMOVAL.

15. Remove the front stabilizer. Ref. to FRONT SUSPENSION>Front Stabilizer>REMOVAL.

16. Disconnect the tie-rod end.

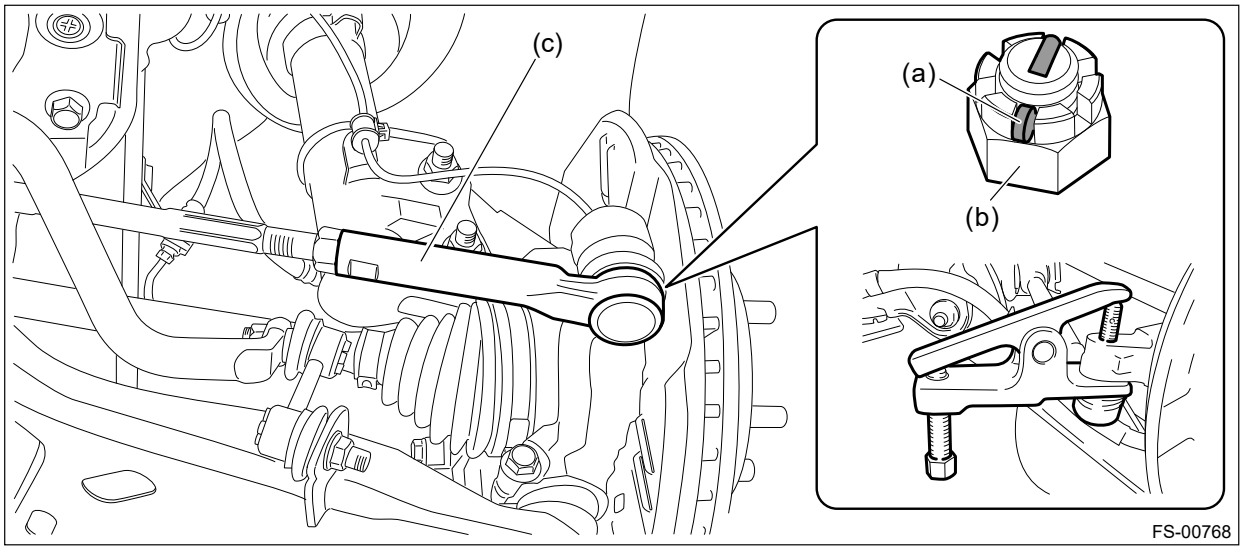
(1) Pull out the cotter pin (a).

(2) Remove the castle nut (b).

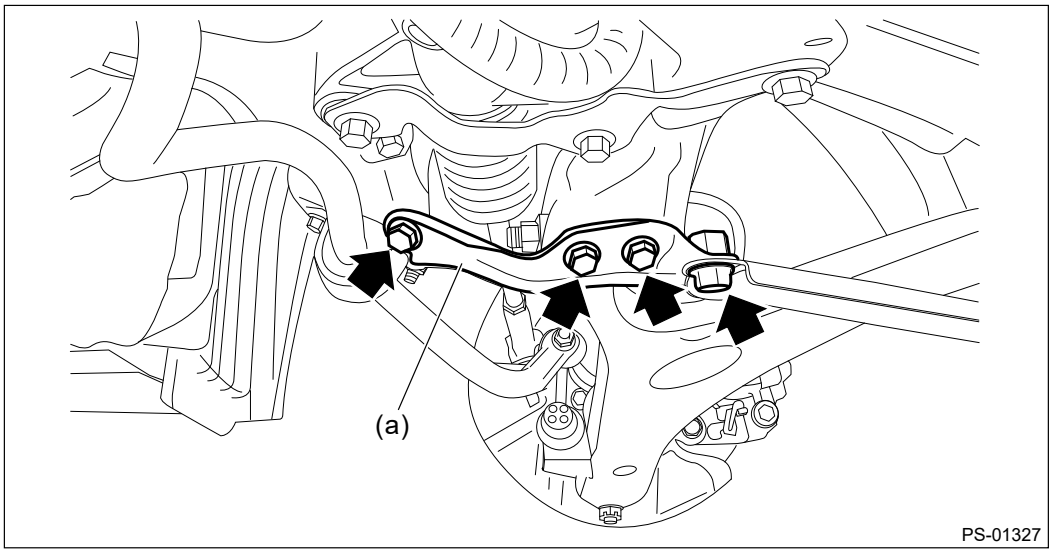
(3) Using a tie-rod ball joint puller, remove the tie-rod end (c).

Preparation tool:

Tie-rod ball joint puller

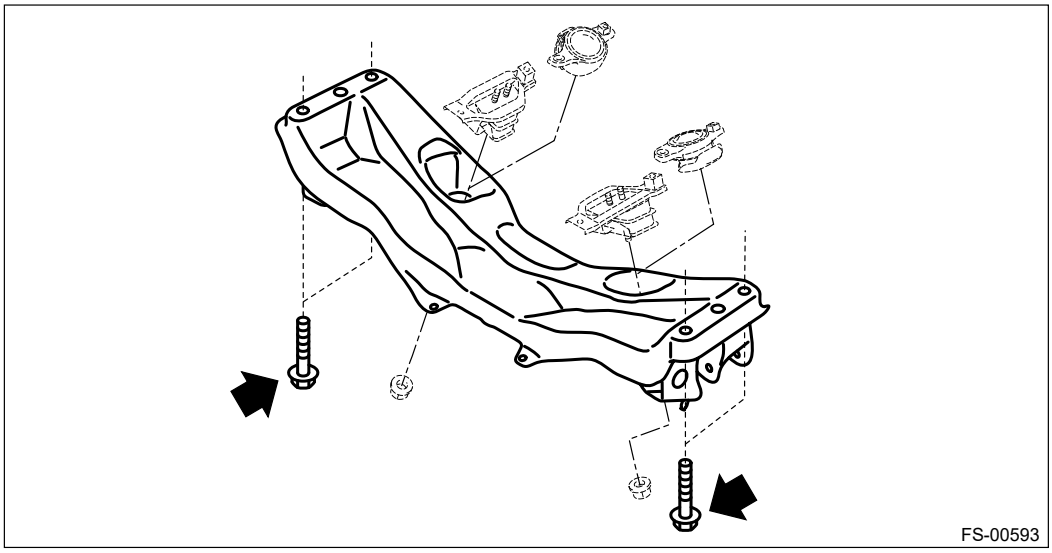


17. Remove the support plate - front crossmember (a).



18. Remove the front arm assembly. Ref. to FRONT SUSPENSION>Front Arm>REMOVAL.

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.

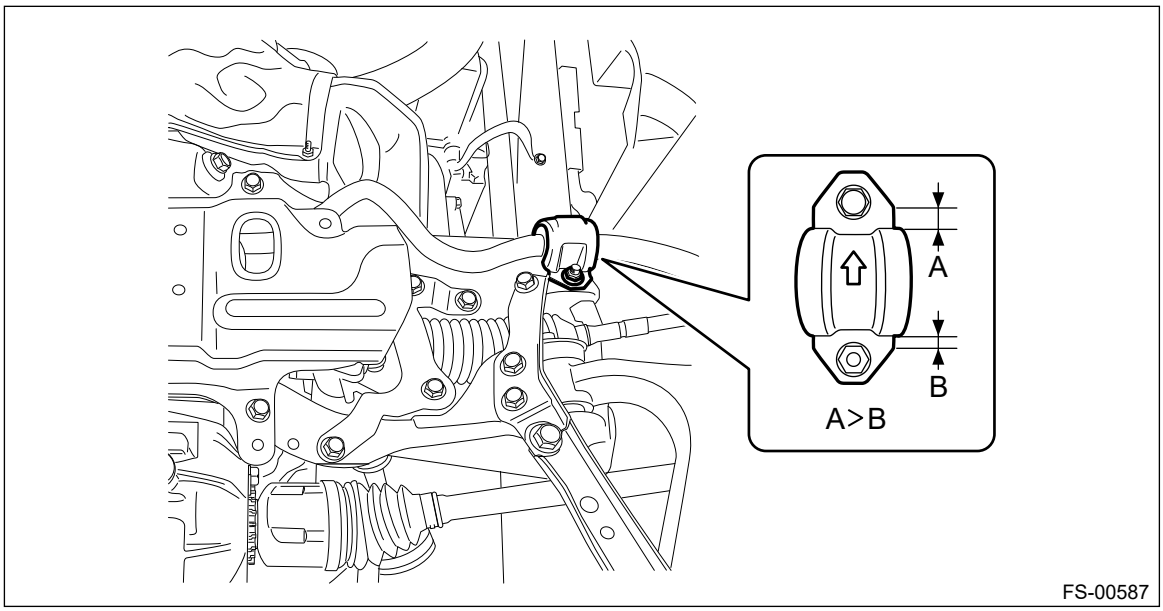
21. Remove the steering gearbox assembly from the front crossmember assembly.

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 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:

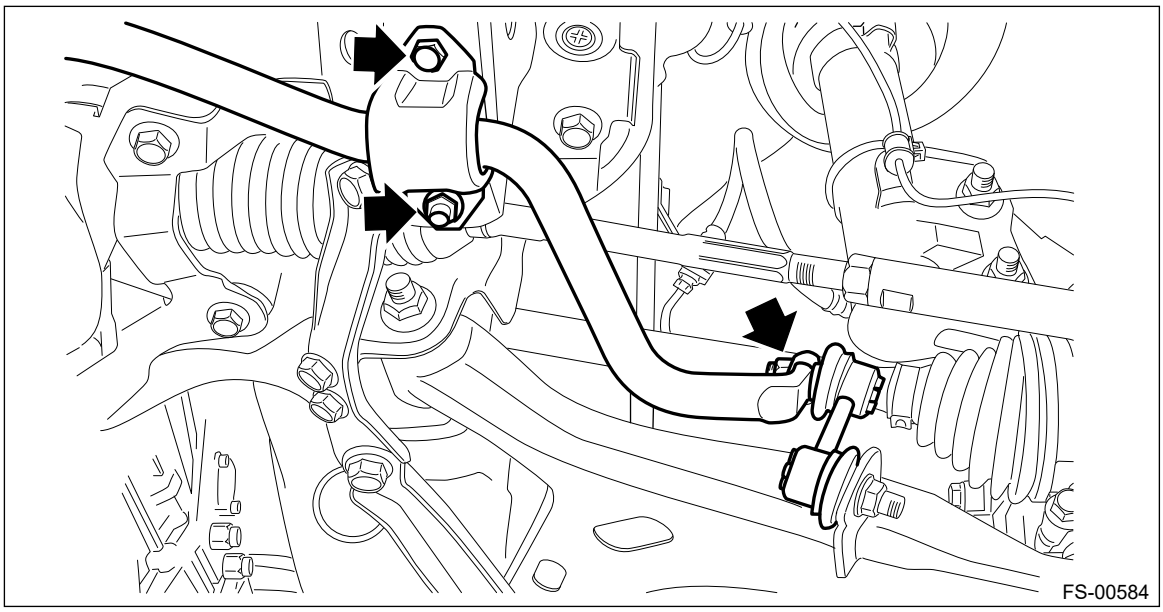
   Clamp - stabilizer bushing: 25 N•m (2.55 kgf-m, 18.4 ft-lb)
   Stabilizer link: 60 N•m (6.12 kgf-m, 44.3 ft-lb)
   Support plate - front crossmember: 60 N•m (6.12 kgf-m, 44.3 ft-lb)
   Under cover front - transmission: 18 N•m (1.84 kgf-m, 13.3 ft-lb)
   Under cover COMPL - front: Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FRONT UNDER COVER.
3. Install the front wheels.

   Tightening torque:

   120 N•m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

1. Lift up the vehicle, and then remove the left and right front wheels.
2. Remove the under cover COMPL - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the under cover front - transmission. (Non-turbo model)
4. Remove the front crossmember support. Ref. to FRONT SUSPENSION>Front Crossmember Support Plate>REMOVAL.
5. Remove the front stabilizer.
   (1) Remove the left and right stabilizer links.
   (2) Remove the clamp - stabilizer bushing on the left and right sides.



ASSEMBLY

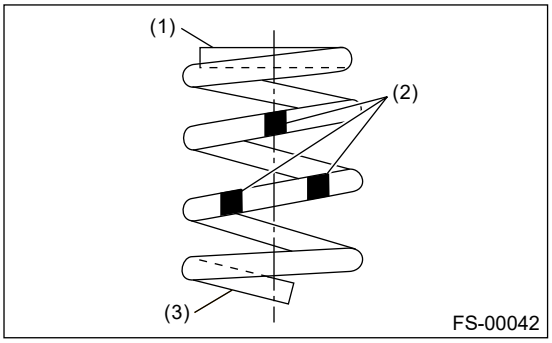
1. Before assembly, check each part. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
2. Using a coil spring compressor, compress the coil spring - front.

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

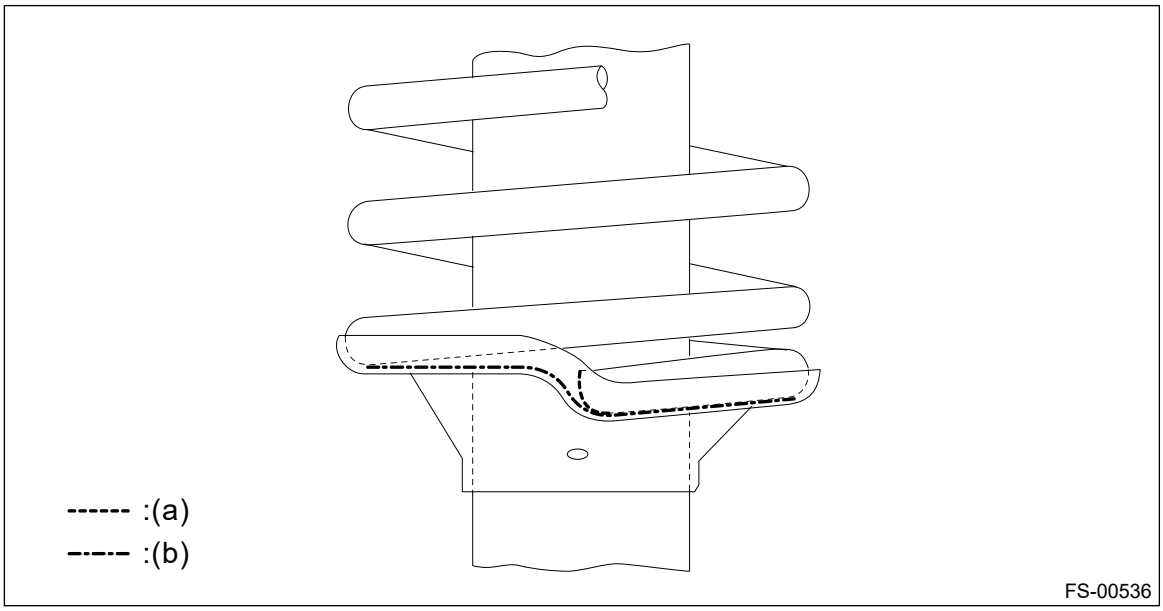
Note:

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



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

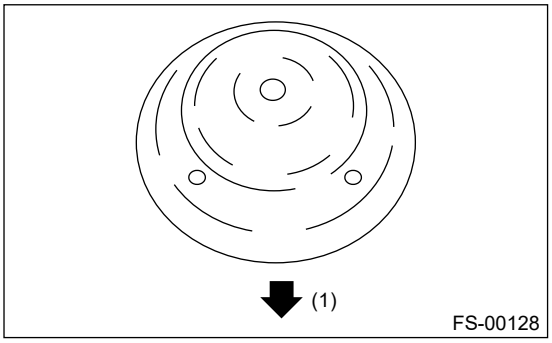
3. Set the front coil spring correctly so that its end face (a) contacts the vertical surface (b) of the spring seat - front strut UPR as shown in the figure.



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.

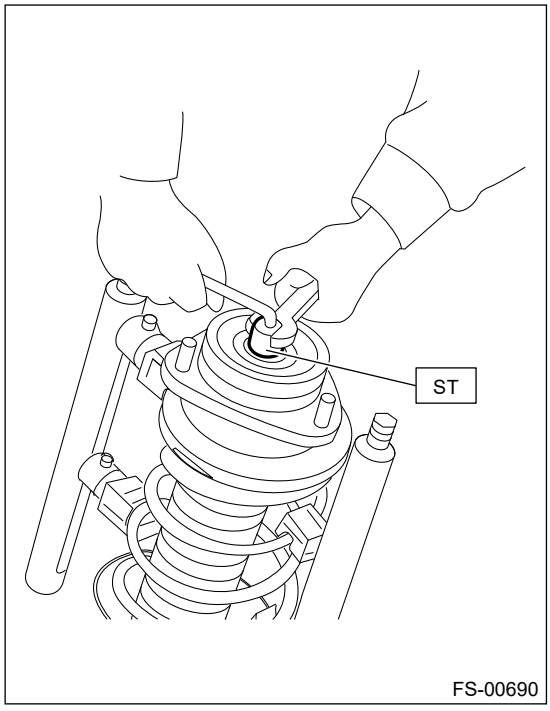


(1) Outside of body

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.

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.

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

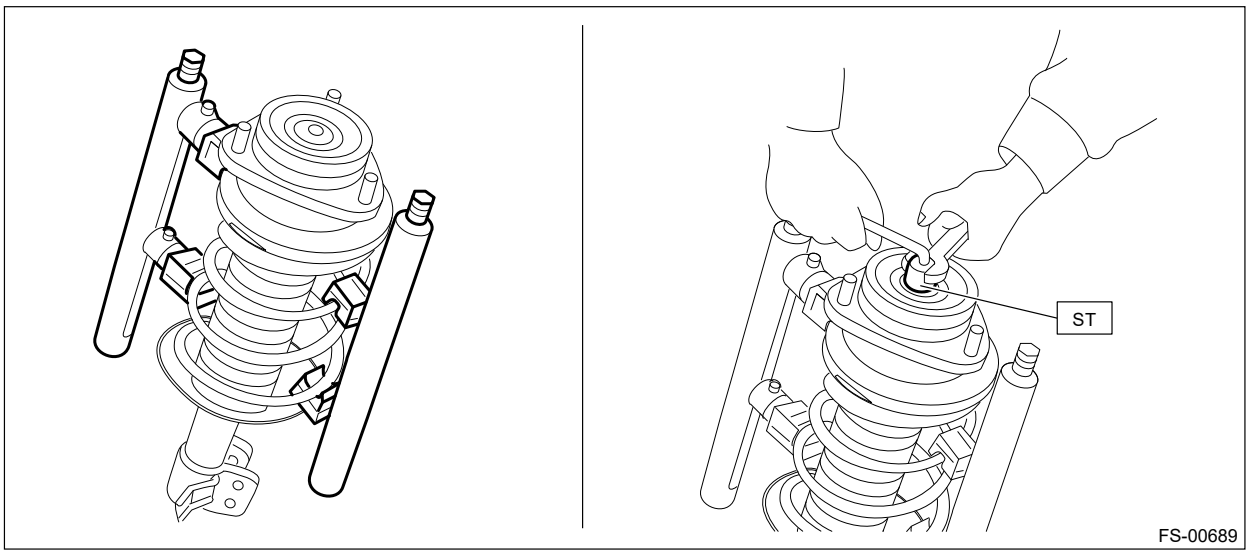
Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)

Note:

<Example of coil spring compressor installation>

The installing position of coil spring compressor varies depending on the coil spring shape and winding number.



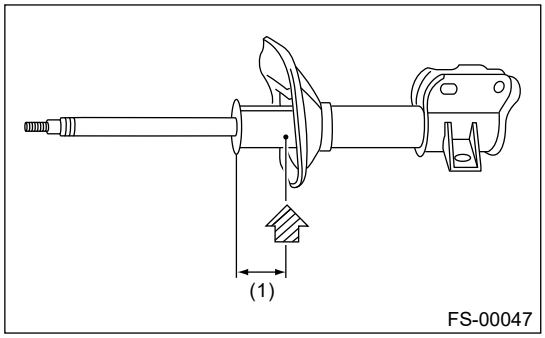
3. Remove the strut mount - front, spacer - front strut and spring seat - front strut UPR from the strut.
4. Gradually decrease the compression pressure of compressor, and remove the coil spring - front.
5. Remove the dust cover - inner and the helper - front strut.

DISPOSAL

Caution:

- **Before handling the strut damper and shock absorber, be sure to wear goggles to protect eyes from gas, oil and cutting powder.**
- **Do not disassemble the strut damper and shock absorber or place them into a fire.**
- **When discarding gas filled strut dampers and shock absorbers, drill holes in them to purge the gas.**

1. Place the strut on a level surface with the piston rod fully expanded.
2. Make a hole of 30 mm (1.18 in) deep into the specified position shown in the figure, using a drill with 2 — 3 mm (0.08 — 0.12 in) diameter.



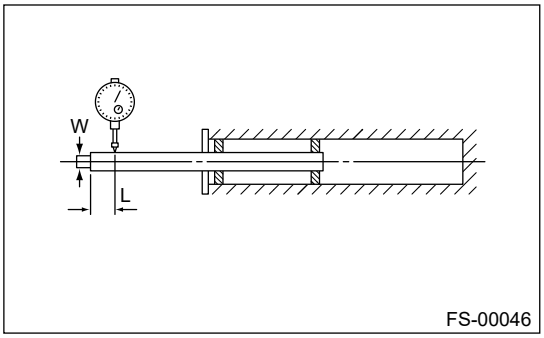
(1) 40 mm (1.57 in)

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.

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 FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

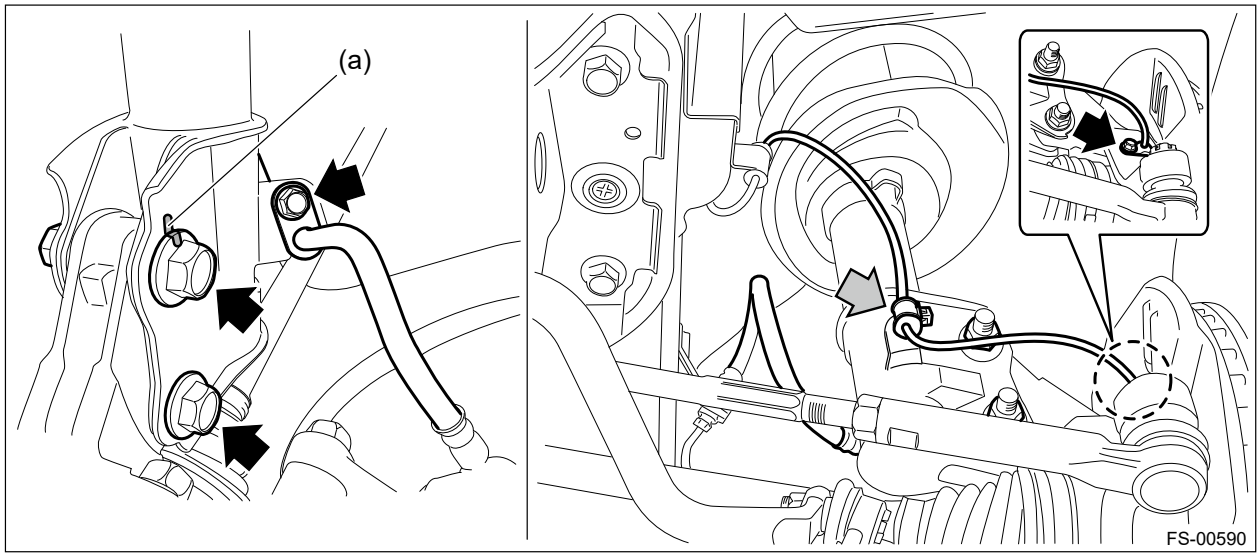
   Caution:
   When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
7. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

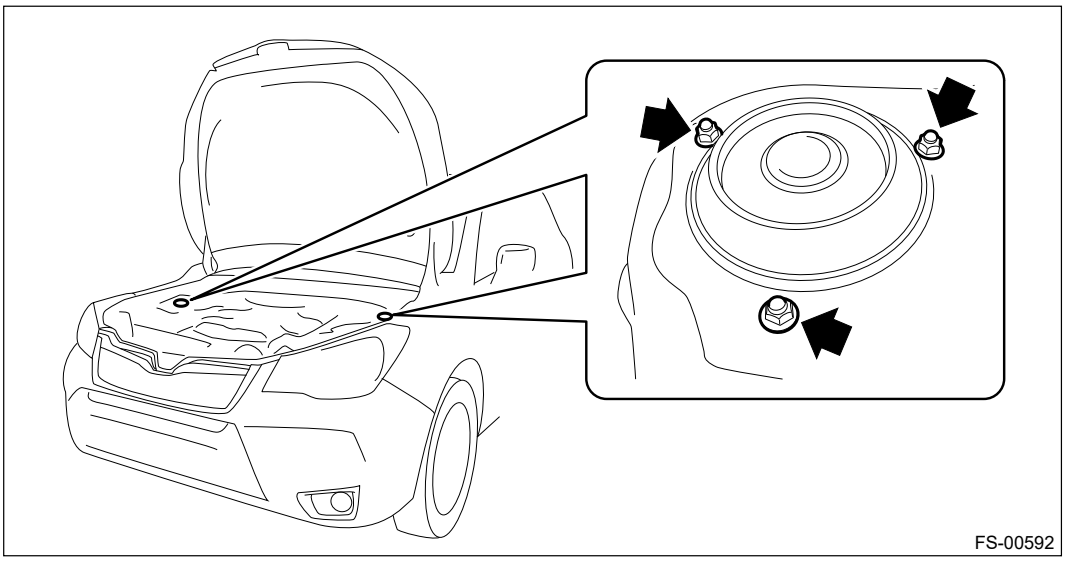
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the front strut assembly.
   (1) Place an alignment mark (a) on the adjusting bolt and the strut.
   (2) Remove the brake hose bracket.
   (3) Remove the clamp of ABS wheel speed sensor harness.
   (4) Remove the adjusting bolts and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

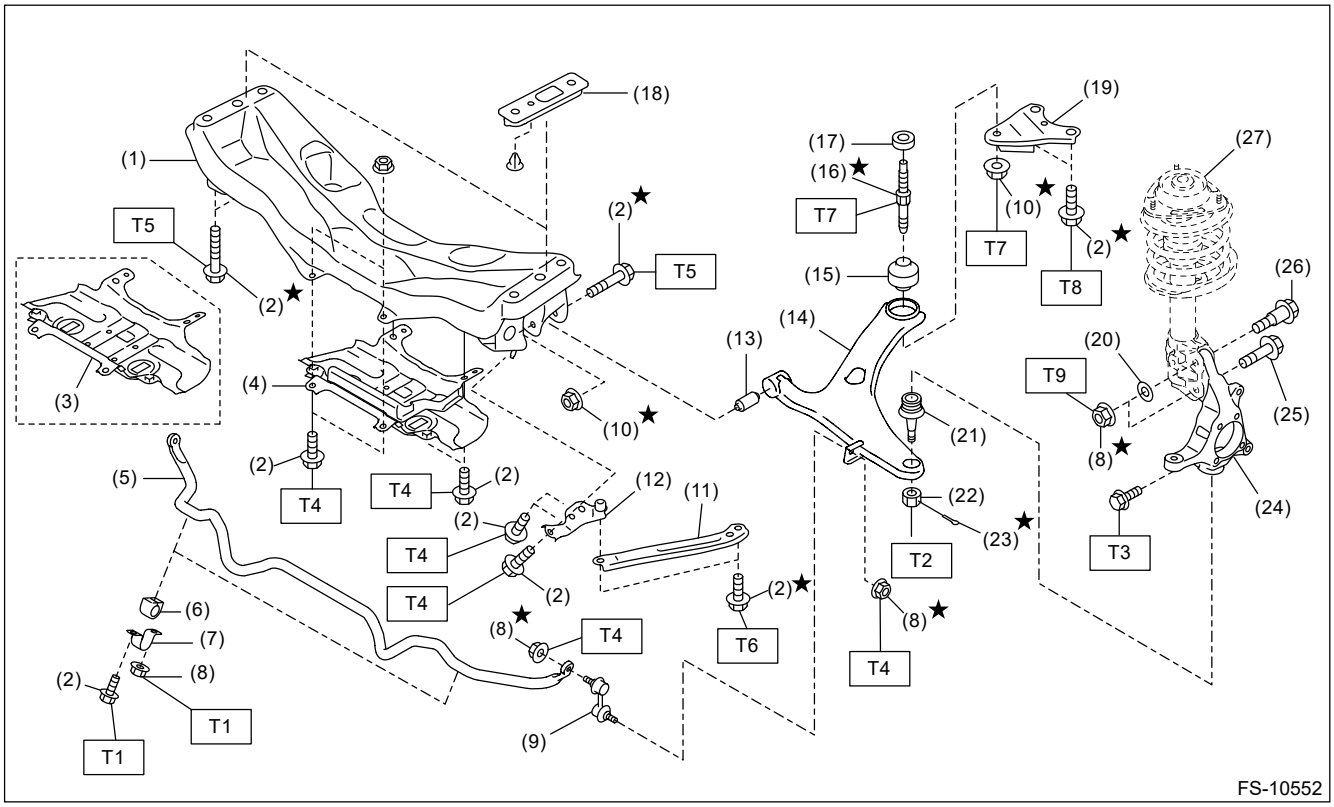


CAUTION

- 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 VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

COMPONENT

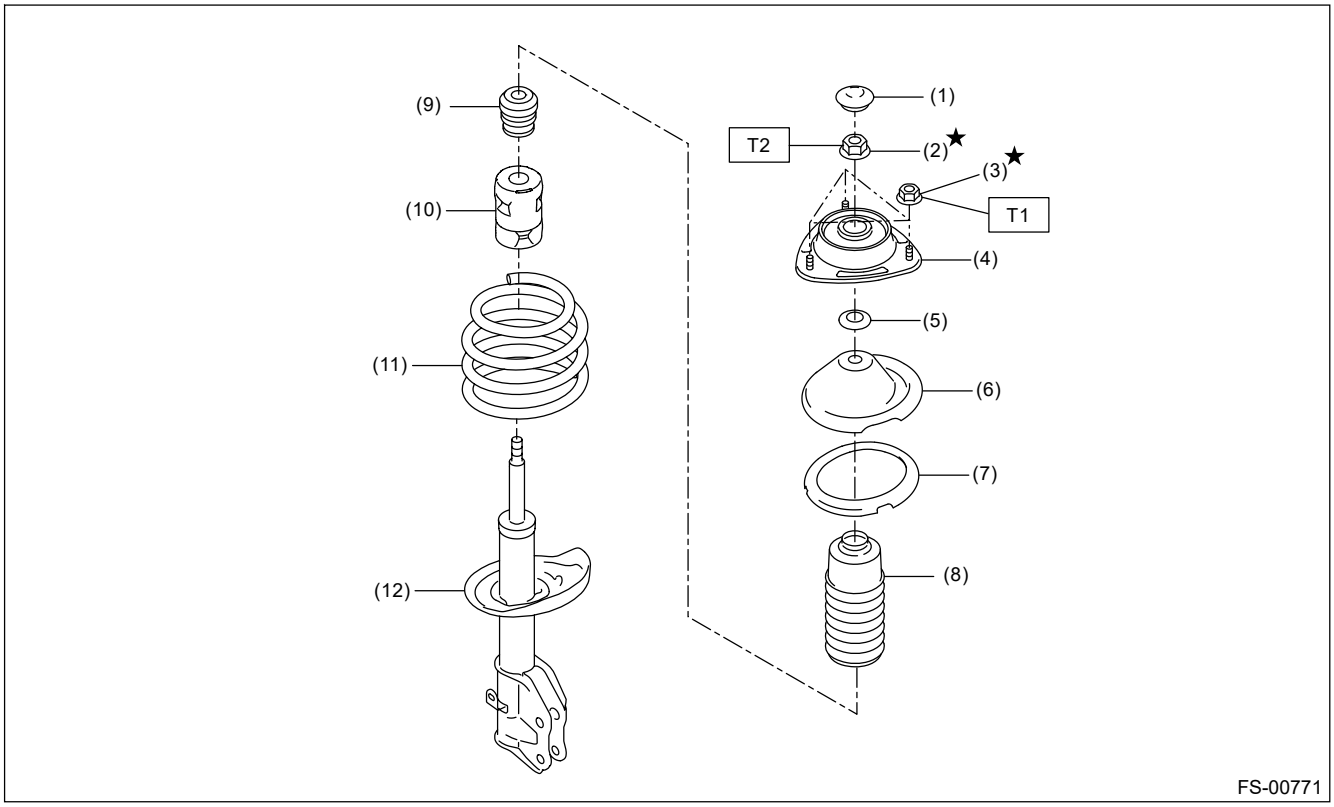
1. FRONT SUSPENSION



(1) Front crossmember COMPL	(14) Front arm ASSY	(27) Front strut ASSY
(2) Flange bolt	(15) Bushing rear - front arm	
(3) Front crossmember support (non-turbo type)	(16) Stud bolt*	***Tightening torque: N·m (kgf-m, ft-lb)***
(4) Front crossmember support (turbo type)	(17) Stopper - front arm bushing rear	***T1: 25 (2.55, 18.4)***
(5) Front stabilizer	(18) Spacer - crossmember	***T2: 39 (3.98, 28.8)***
(6) Bushing - stabilizer	(19) Front arm rear plate	***T3: 50 (5.1, 36.9)***
(7) Clamp - stabilizer bushing	(20) Adjusting washer	***T4: 60 (6.12, 44.3)***
(8) Flange nut	(21) Ball joint	***T5: 95 (9.69, 70.1)***
(9) Stabilizer link	(22) Castle nut	***T6: 100 (10.2, 73.8)***
(10) Self-locking nut	(23) Cotter pin	***T7: 110 (11.22, 81.1)***
(11) Front support	(24) Housing ASSY - front axle	***T8: 150 (15.3, 110.6)***
(12) Support plate - front crossmember	(25) Flange bolt	***T9: 155 (15.81, 114.3)***
(13) Bushing front - front arm	(26) Adjusting bolt	

*: Cannot be reused if the stud bolt is removed from the vehicle.

2. FRONT STRUT



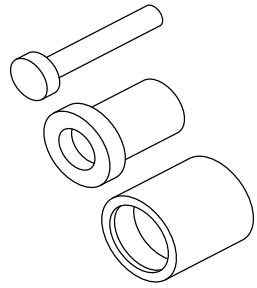
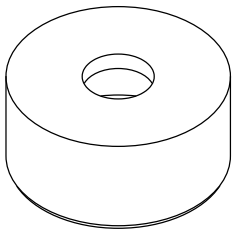
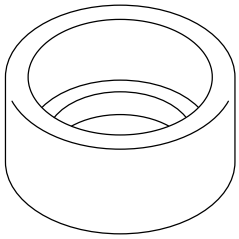
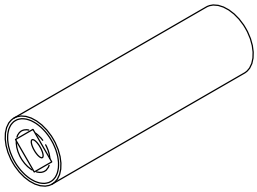
(1) Dust seal - front strut
(2) Self-locking nut
(3) Flange nut
(4) Strut mount - front
(5) Spacer - front strut
(6) Spring seat - front strut UPR
(7) Rubber seat - front strut
(8) Dust cover - front strut
(9) Helper - front strut
(10) Dust cover inner
(11) Coil spring - front
(12) Strut COMPL - front

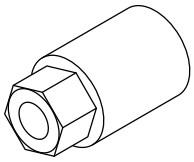
Tightening torque: N·m (kgf-m, ft-lb)

T1: 20 (2.04, 14.8)
T2: 55 (5.61, 40.6)

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.
	20399AG000	STRUT MOUNT SOCKET	Used for disassembling and assembling strut mount.

 ST-20399AG000			
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

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.
DST-i	Used together with Subaru Select Monitor 4.

SPECIFICATION

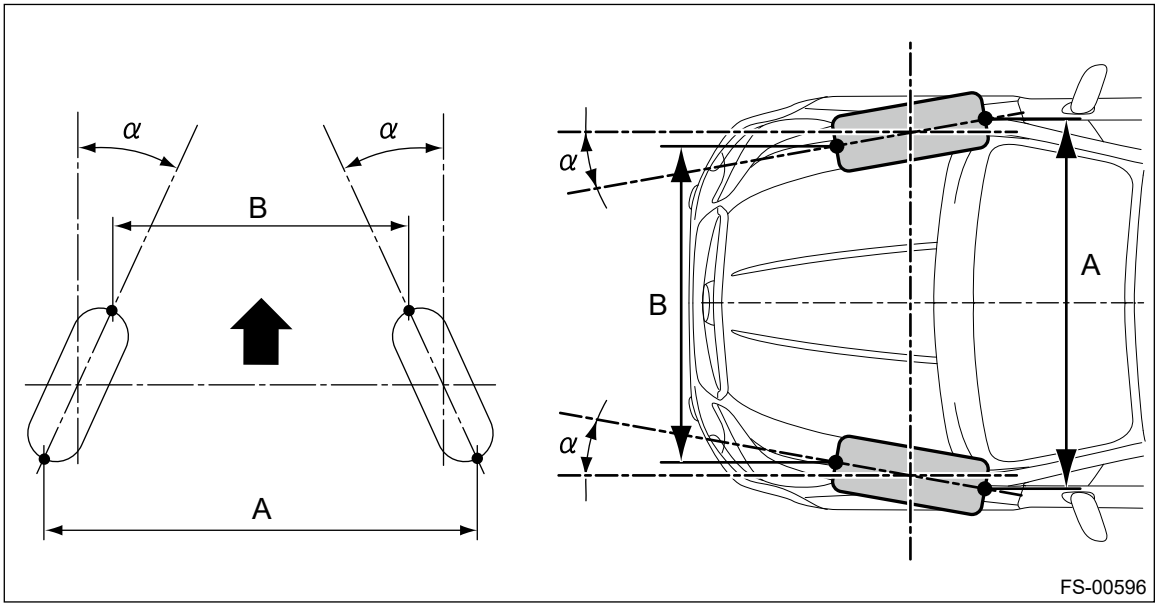
Tire size			P225/60R17	P225/55R18
Front	Wheel arch height (Tolerance: $^{+12\ mm}_{-24\ mm}$ ($^{+0.47\ in}_{-0.94\ in}$))	mm (in)	444 (17.48)	
	Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less)		−0°00′	
	Caster (referential value)		5°40′	
	Steering angle (tolerance: ±1.5°)	Inner wheel	38.4°	
		Outer wheel	33.8°	
	Toe-in	mm (in)	0±3 (0±0.12) Toe angle (sum of both wheels): 0°±0°15′	
	Kingpin angle (referential value)		14°12′	
Rear	Wheel arch height (Tolerance: $^{+12\ mm}_{-24\ mm}$ ($^{+0.47\ in}_{-0.94\ in}$))	mm (in)	458 (18.03)	
	Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less)		−1°05′	
	Toe-in	mm (in)	0±3 (0±0.12) Toe angle (sum of both wheels): 0°00′±15′	
	Thrust angle (tolerance: 0°00′±30′)		0°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.

- **Adjust with the value less than the inspection value, taking aging variation into consideration.**



A − B = Positive: Toe-in, Negative: Toe-out

α = Individual toe angles

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.

ADJUSTMENT

Caution:

When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

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°00′±0°30′

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

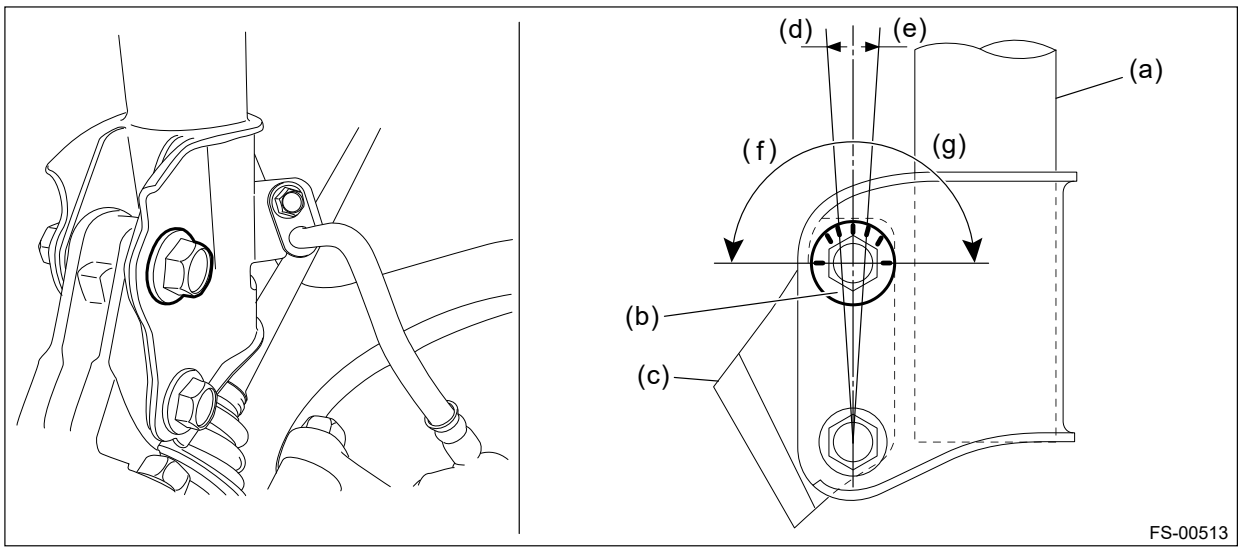
Note:

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

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

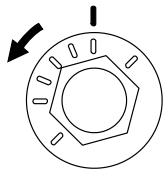
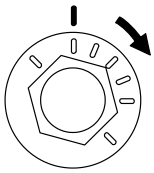
Note:

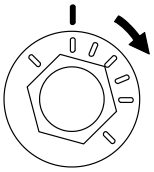
Moving the adjusting bolt by one scale changes the camber by approximately 0°15′.



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

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	代替画像1 この画像は代替画像です

4. Tighten two new flange nuts.
   Tightening torque:
   155 N·m (15.81 kgf-m, 114.3 ft-lb)

2. ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES

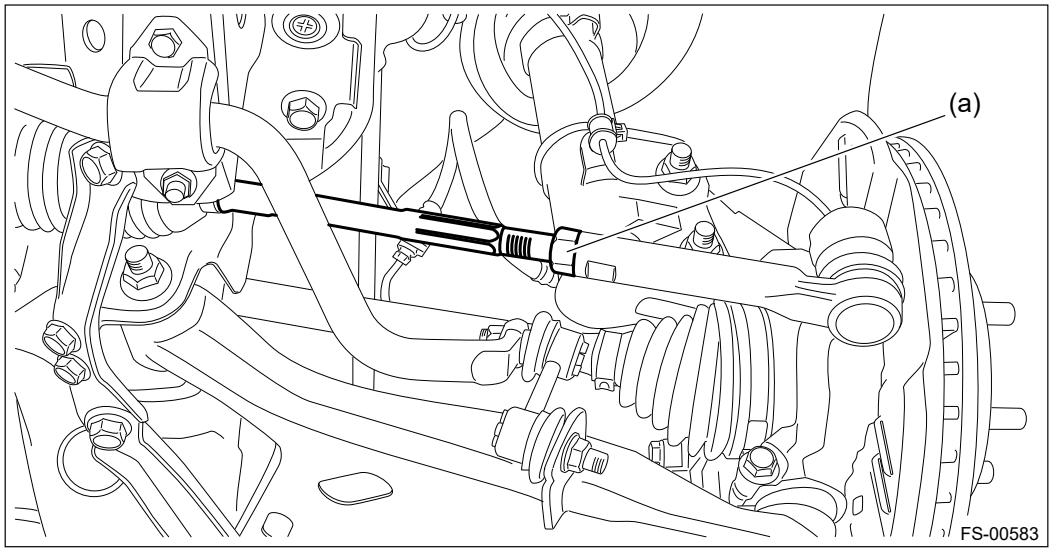
1. Operate the steering system from lock to lock and stop operating it at the center position from lock to lock, and then install the steering wheel in the straight-ahead position.
   Note:
   - **Using of the steering wheel angle sensor output values shown on Subaru Select Monitor will facilitate your work.**
2. Before adjusting toe-in, be sure to adjust the steering wheel in the straight-ahead position (steering angle sensor output: 0 deg).

3. FRONT WHEEL TOE-IN

When adjusting the toe-in, adjust it to the following value. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES.

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).
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.

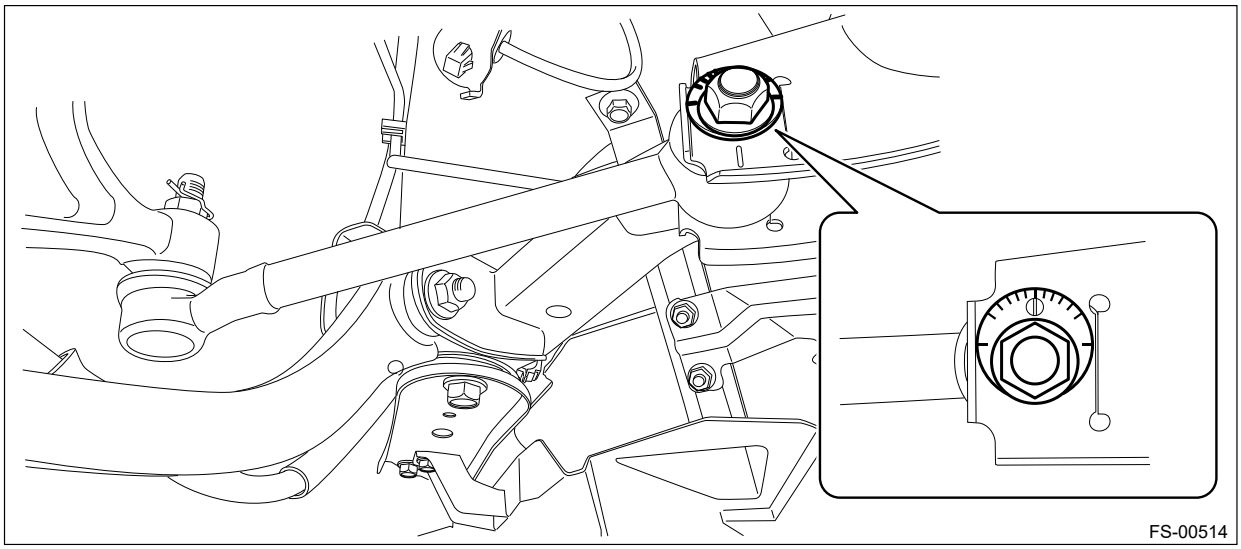
Toe-in: Adjustment value

0±2 mm (0±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.

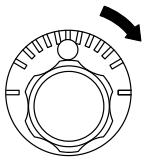


2. Turn the adjusting bolt until toe-in is within the specification.

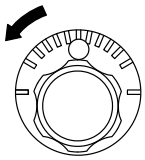
Note:

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

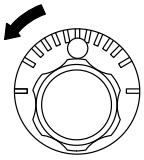
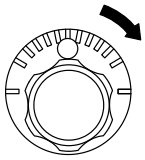
To increase toe-in.	
Rotate the left side clockwise.	Rotate the right side counterclockwise.



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)

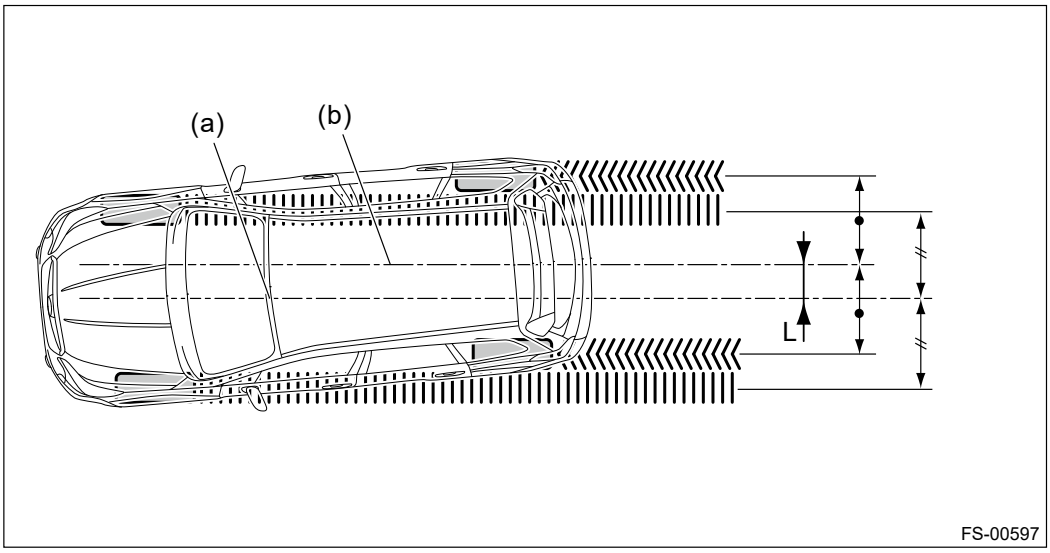
5. THRUST ANGLE

When adjusting, adjust it to the following value.

Thrust angle: Adjustment value

0°±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

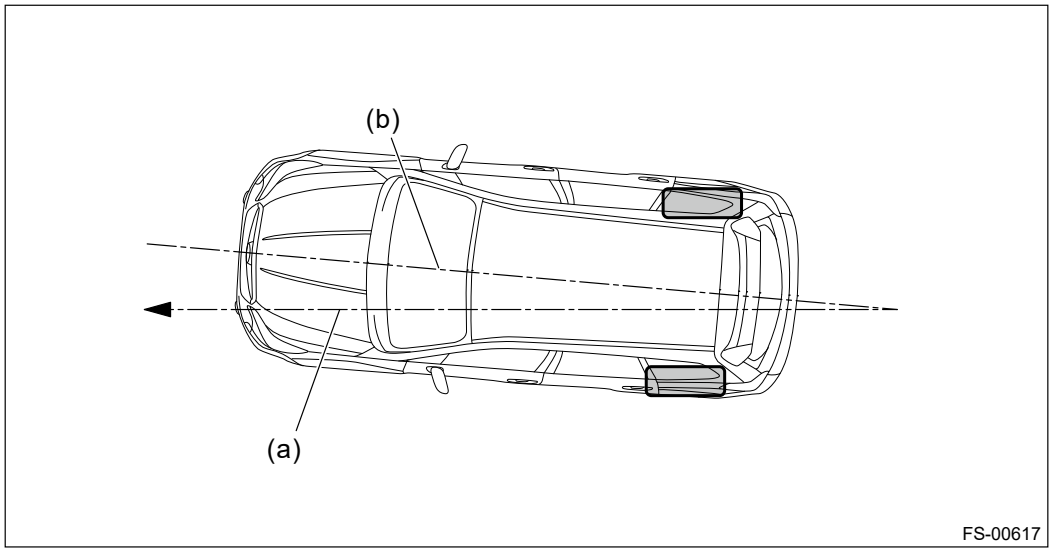
same direction.

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.
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

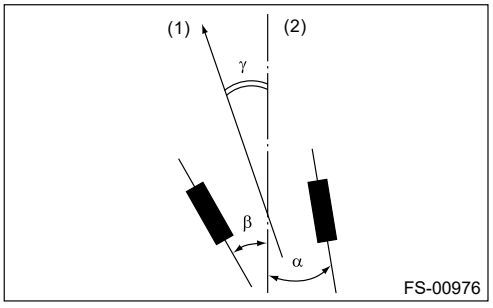
Thrust angle:

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

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

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

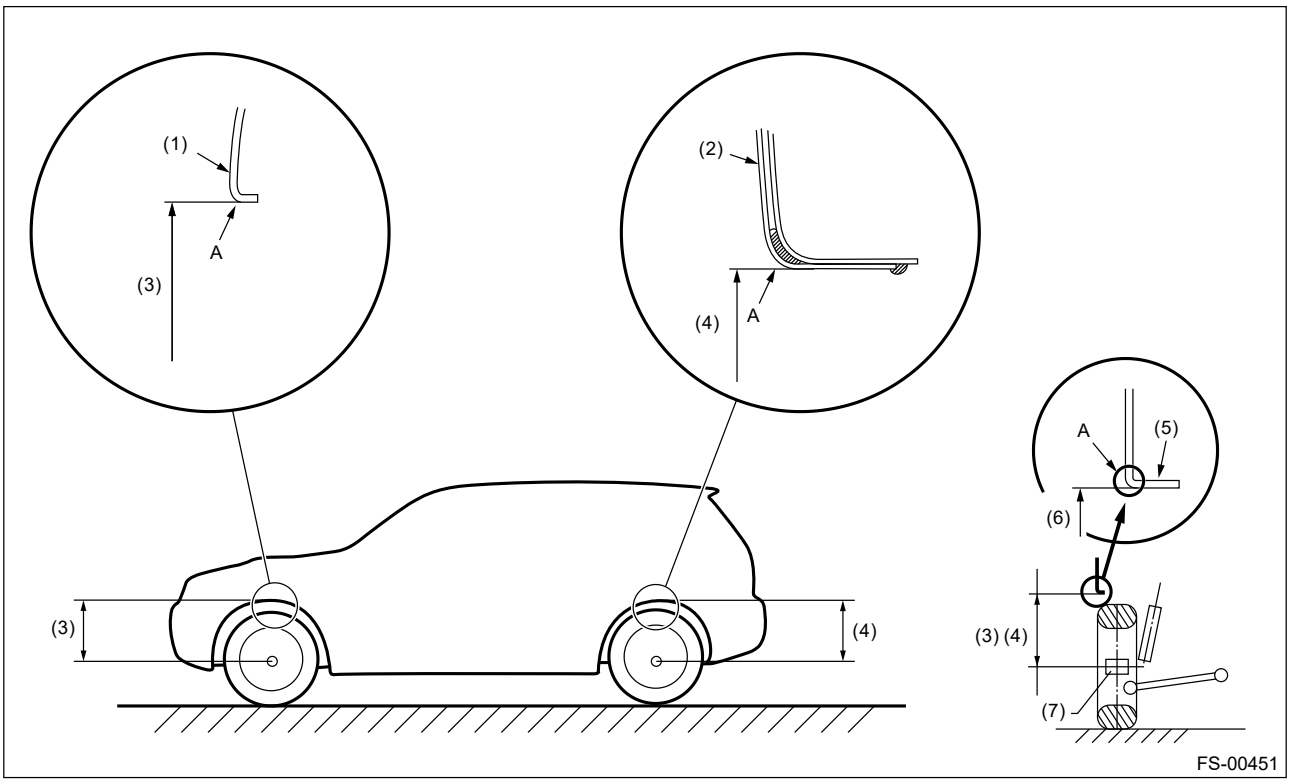
Check, adjust and measure the wheel alignment in accordance with the following procedures.

1	Wheel arch height (front and rear wheels)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > REAR WHEEL TOE-IN.
↓		
[2]	Camber (front and rear wheels)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CAMBER. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT CAMBER.
↓		
[3]	Caster (front wheel)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CASTER.
↓		
[4]	Adjustment of difference between right and left steering angles	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > FRONT WHEEL TOE-IN. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES.
↓		
[5]	Front wheel toe-in	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > STEERING ANGLE. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT WHEEL TOE-IN.
↓		
[6]	Rear wheel toe-in	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > WHEEL ARCH HEIGHT.

		Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > REAR WHEEL TOE-IN.
	↓	
[7]	Thrust angle	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > THRUST ANGLE. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > THRUST ANGLE.

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.



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

Wheel arch height specification mm (in) (tolerance: $^{+12}_{-24}$ mm ($^{+0.47}_{-0.94}$ in))		

Tire size	P225/60R17	P225/55R18
Front	444 (17.48)	
Rear	458 (18.03)	

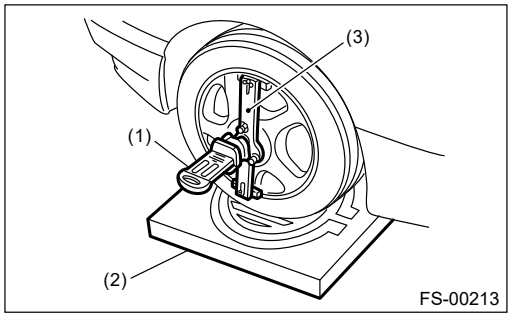
2. CAMBER

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.



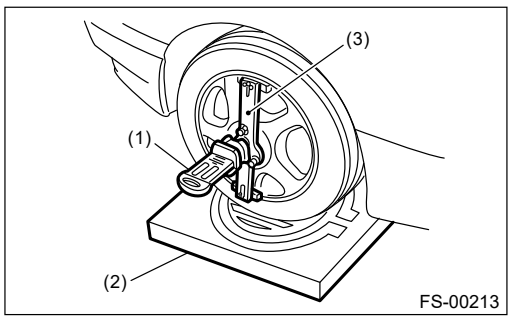
(1) Alignment gauge
(2) Turning radius gauge
(3) Adapter

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

Tire size	Camber (difference between RH and LH 45′ or less)
P225/60R17 P225/55R18	−0°00′±0°45′

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°40′

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

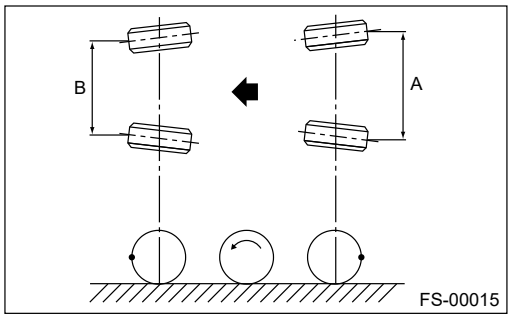
0±3 mm (0±0.12 in)

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 = Toe-in



6. REAR WHEEL TOE-IN

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

Toe-in: Inspection value

0±3 mm (0±0.12 in)

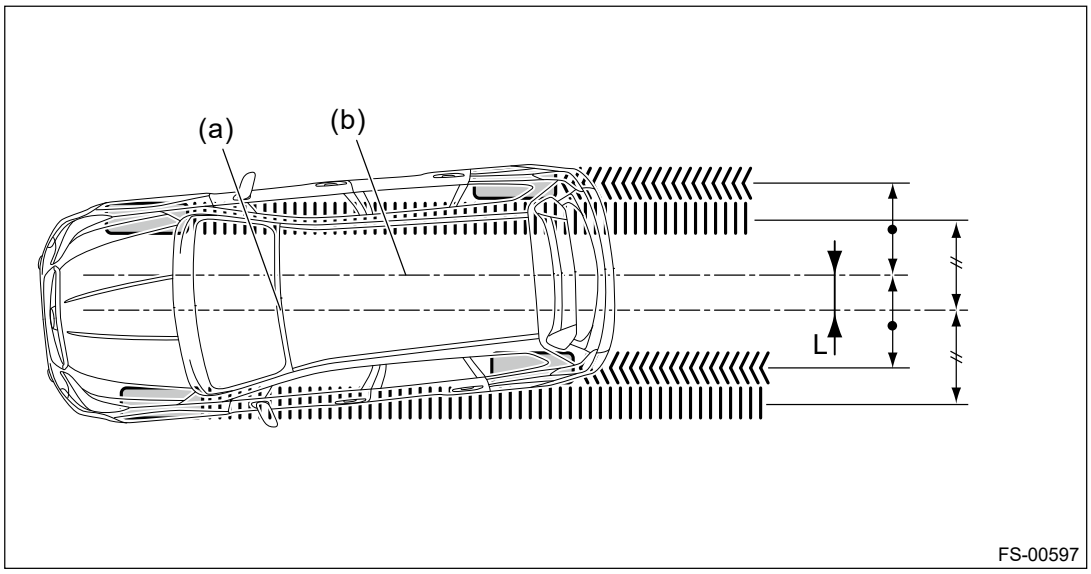
7. THRUST ANGLE

1. Park the vehicle on a level surface.
2. Move the vehicle 3 — 4 meters (10 — 13 ft) 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°±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)

ASSEMBLY

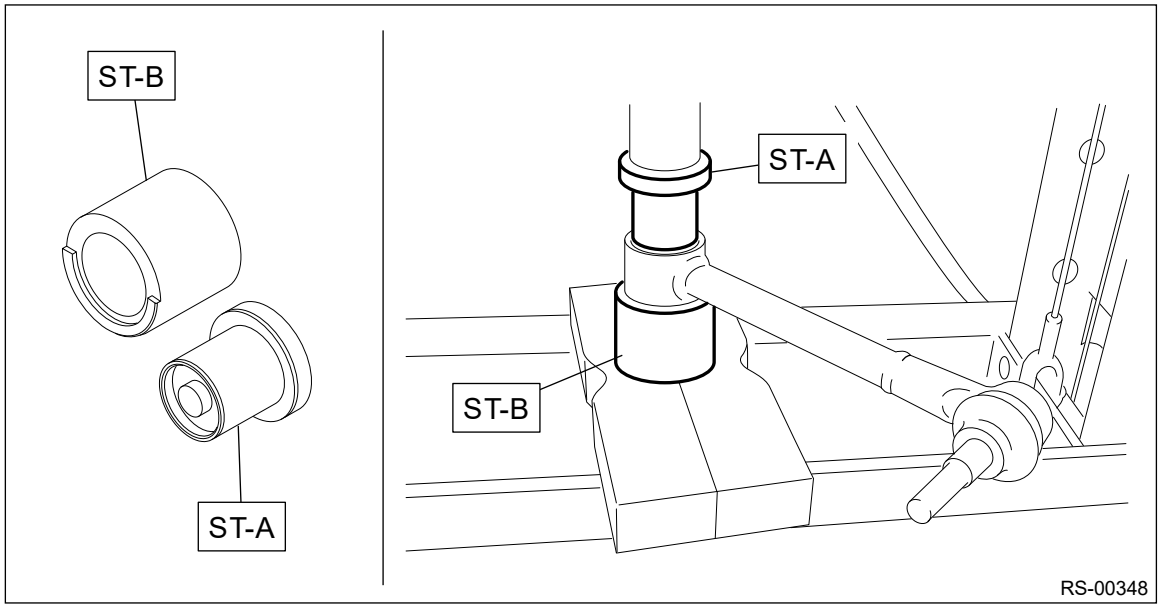
1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Visually check the lateral link assembly - front for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
   - Visually check the dust cover on the ball joint for 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 (20099AE000)

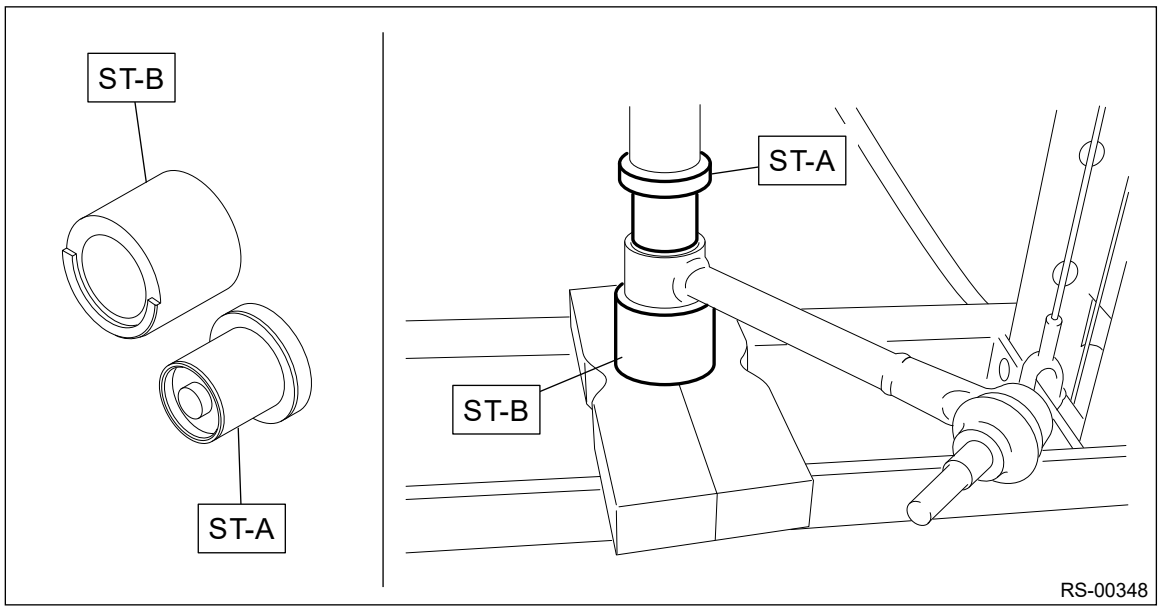


DISASSEMBLY

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

Preparation tool:

ST-A & ST-B: INSTALLER & REMOVER (20099AE000)



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 (10.2 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:

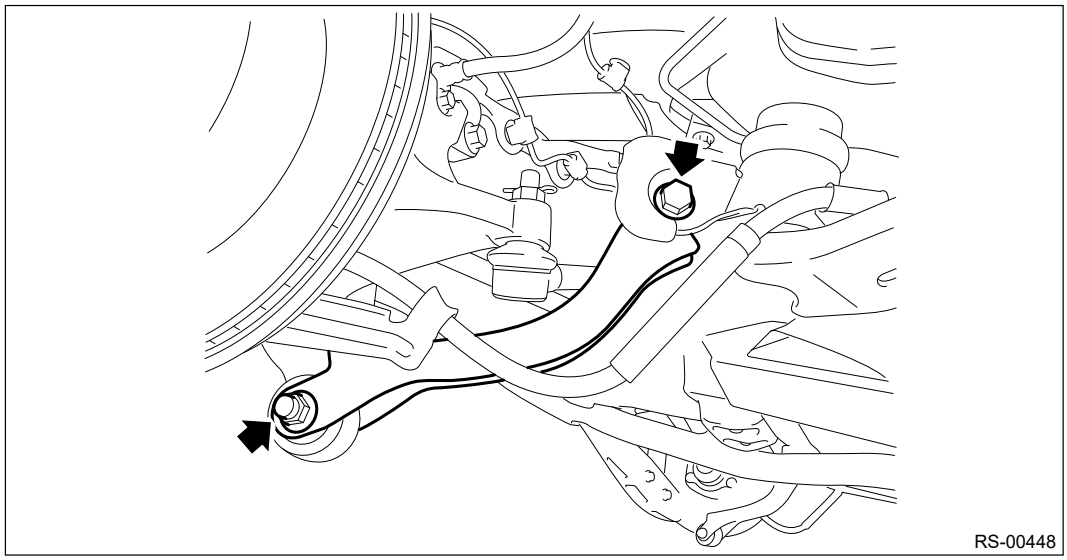
   120 N•m (12.24 kgf-m, 88.5 ft-lb)
4. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

     Caution:

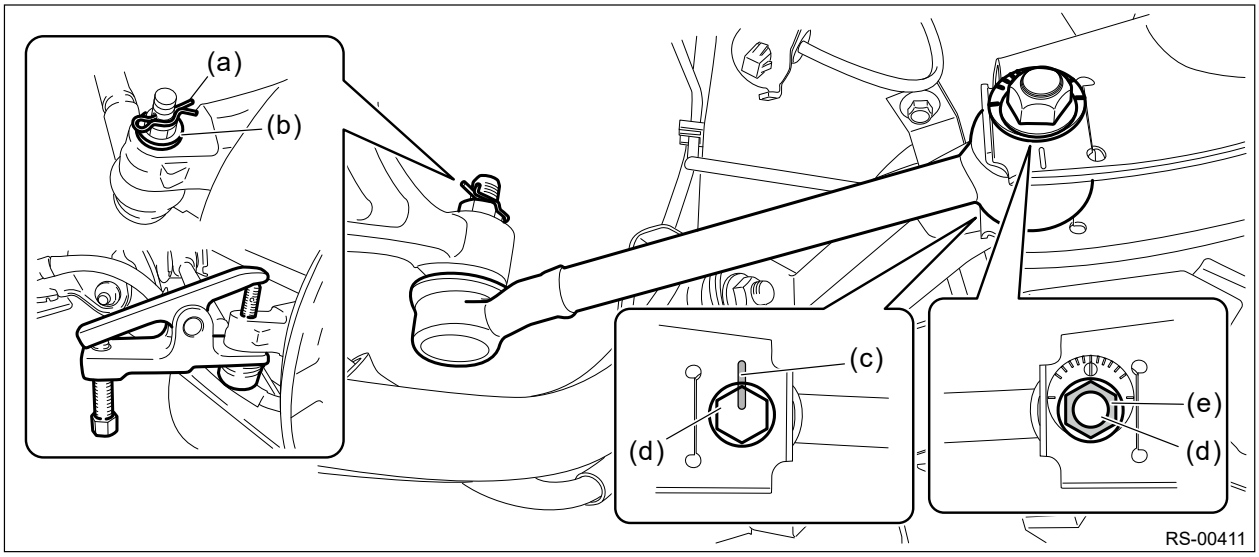
     When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

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).



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 VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

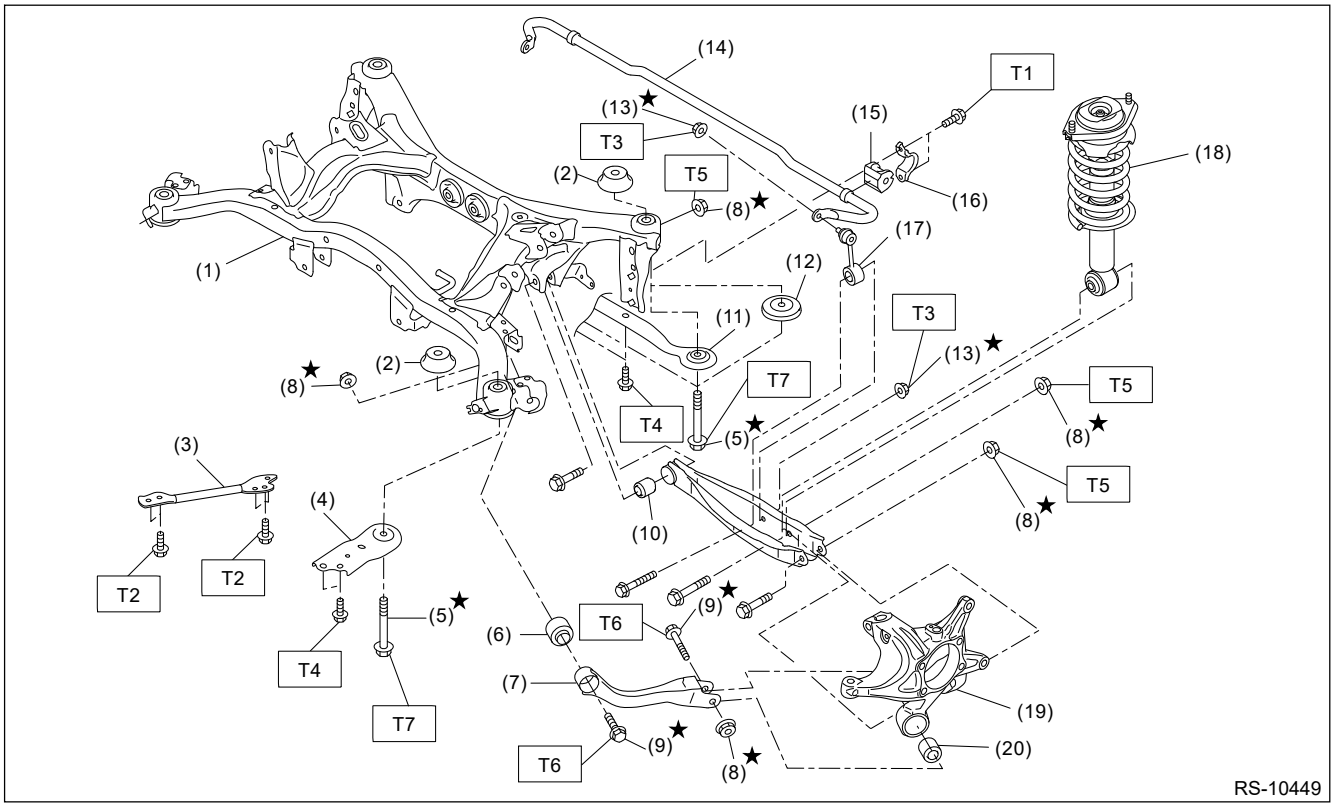
2. OIL

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.

COMPONENT

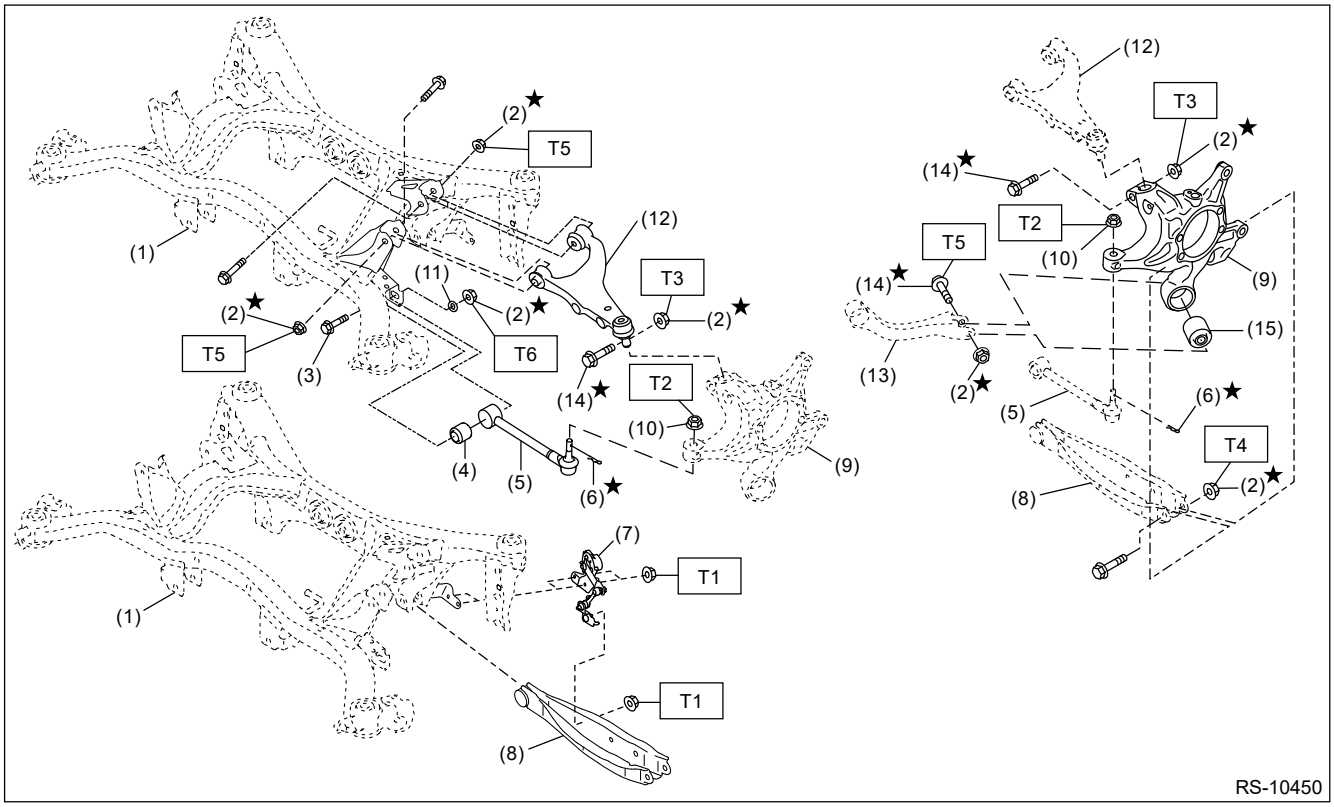
1. REAR SUSPENSION



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

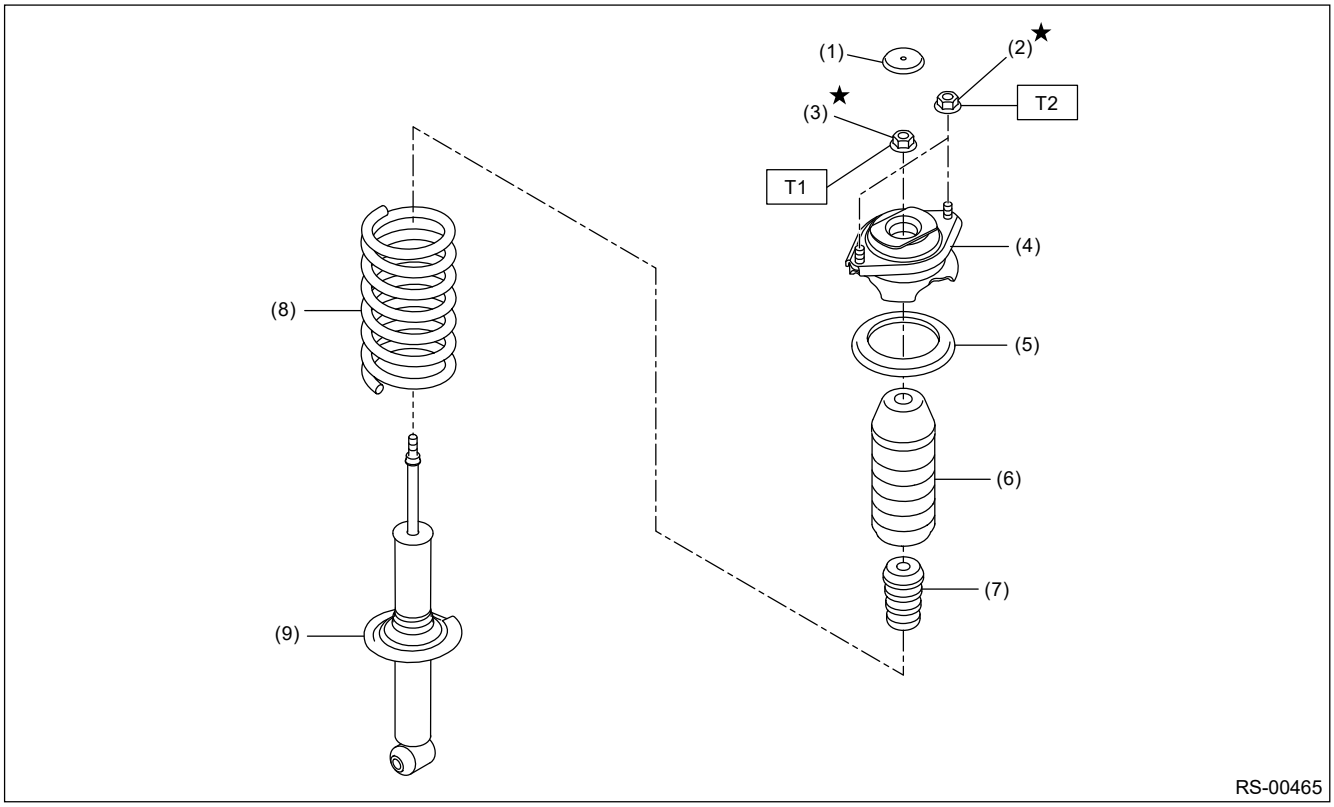
Tightening torque: N·m (kgf-m, ft-lb)

T1: 30 (3.06, 22.1)
T2: 33 (3.36, 24.3)
T3: 38 (3.87, 28)
T4: 70 (7.14, 51.6)
T5: 85 (8.67, 62.7)
T6: 90 (9.18, 66.4)
T7: 145 (14.79, 106.9)



(1)	Rear sub frame ASSY	(9)	Housing ASSY - rear axle	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Self-locking nut	(10)	Flange nut	***T1: 7.5 (0.76, 5.5)***	
(3)	Adjusting bolt	(11)	Adjusting washer	***T2: 60 (6.12, 44.3)***	
(4)	Bushing B - lateral link	(12)	Rear upper arm ASSY	***T3: 80 (8.16, 59)***	
(5)	Lateral link ASSY - front	(13)	Trailing link	***T4: 85 (8.67, 62.7)***	
(6)	Snap pin	(14)	Flange bolt	***T5: 90 (9.18, 66.4)***	
(7)	Sensor ASSY - headlight beam leveler (models with auto headlight beam leveler only)	(15)	Bushing - trailing link	***T6: 100 (10.2, 73.8)***	
(8)	Lateral link ASSY - rear				

2. REAR SHOCK ABSORBER



(1) Plug

(2) Flange nut

(3) Self-locking nut

(4) Shock mount - rear

(5) Rubber seat - shock UPR

(6) Dust cover - rear shock

(7) Helper - rear

(8) Coil spring - rear

(9) Shock absorber COMPL - rear

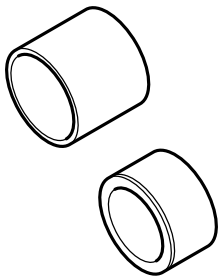
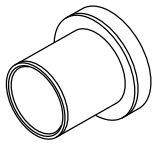
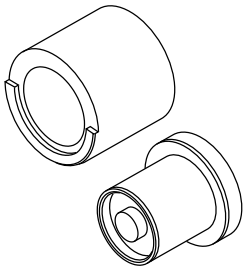
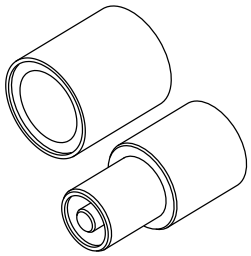
Tightening torque: N·m (kgf-m, ft-lb)

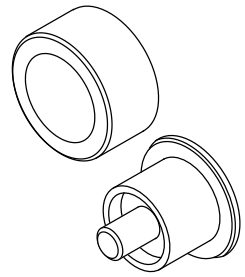
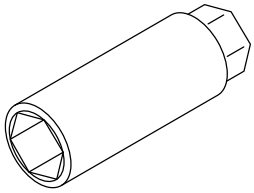
T1: 25 (2.55, 18.4)

T2: 30 (3.06, 22.1)

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).
 ST20099AE000	20099AE000	INSTALLER & REMOVER	Used for replacing the bushing B - lateral link.
 ST20099AE010	20099AE010	INSTALLER & REMOVER	Used for replacing the bushing C - lateral link.
	20099AE040	INSTALLER & REMOVER	Used for replacing the bushing C - lateral link.

 ST20099AE040			
 ST20399FG000	20399FG000	STRUT MOUNT SOCKET	• Used for disassembling and assembling strut assembly and shock absorber assembly. • Used for checking center nut torque of strut assembly and shock absorber assembly.

2. GENERAL TOOL

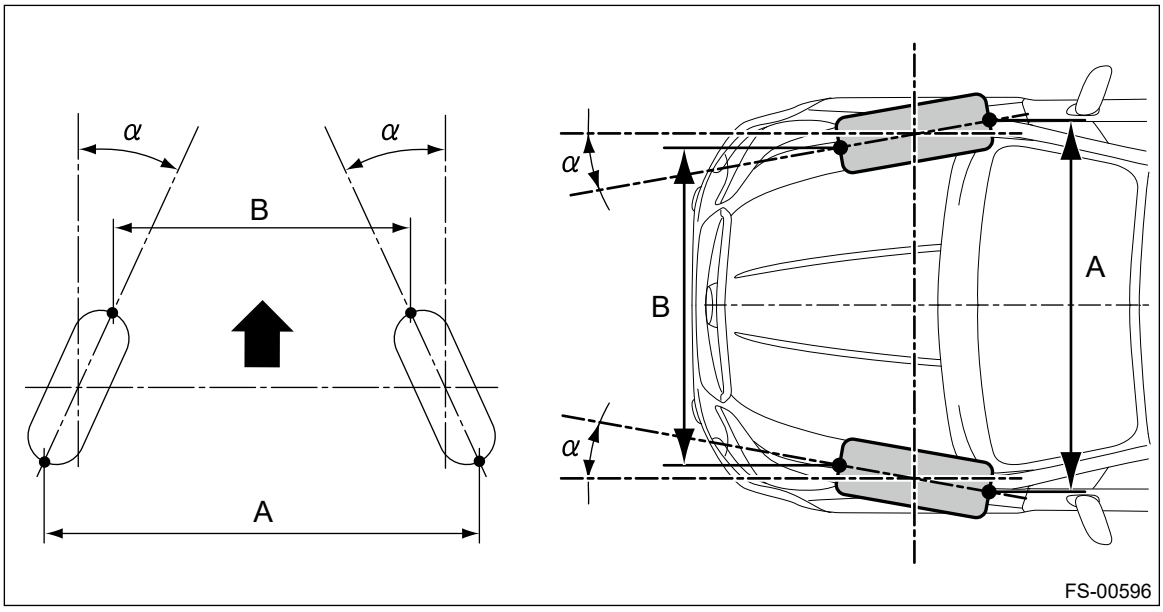
TOOL NAME	REMARKS
Alignment tester	Used for measuring wheel alignment.
Toe-in gauge	Used for toe-in measurement.
Jack	Used for removing and installing suspension.
Bearing puller	Used for removing bushings.
Tie-rod ball joint puller	Used for disconnecting the lateral link assembly - front.
Coil spring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

SPECIFICATION

Refer to “SPECIFICATIONS” in “FRONT SUSPENSION” section for rear suspension specifications. Ref. to FRONT SUSPENSION>General Description>SPECIFICATION.

Note:

- **Adjust with the value less than the inspection value, taking aging variation into consideration.**
- **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 = Positive: Toe-in, Negative: Toe-out
α = Individual toe angles

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

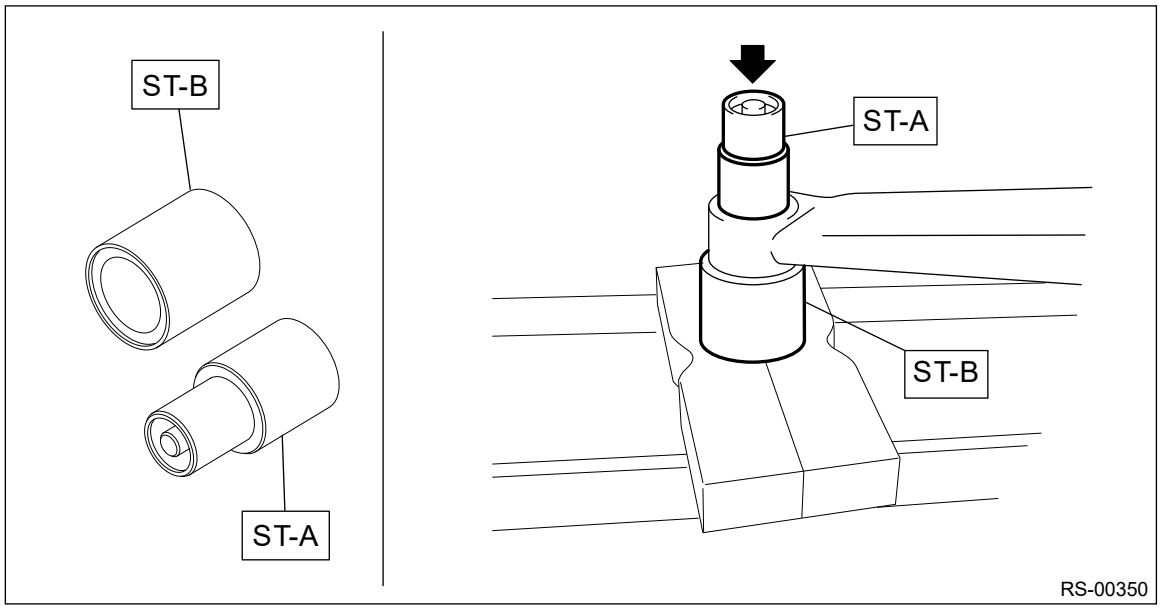
Possible cause	Corrective action
(1) Wear or damage of shock absorber component parts	Replace.
(2) Loosening of the suspension link or arm installing bolt	Tighten to the specified torque.
(3) Deformation or loss of bushing	Replace.
(4) Unsuitable length (maximum or minimum) of shock absorber	Replace 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.

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)



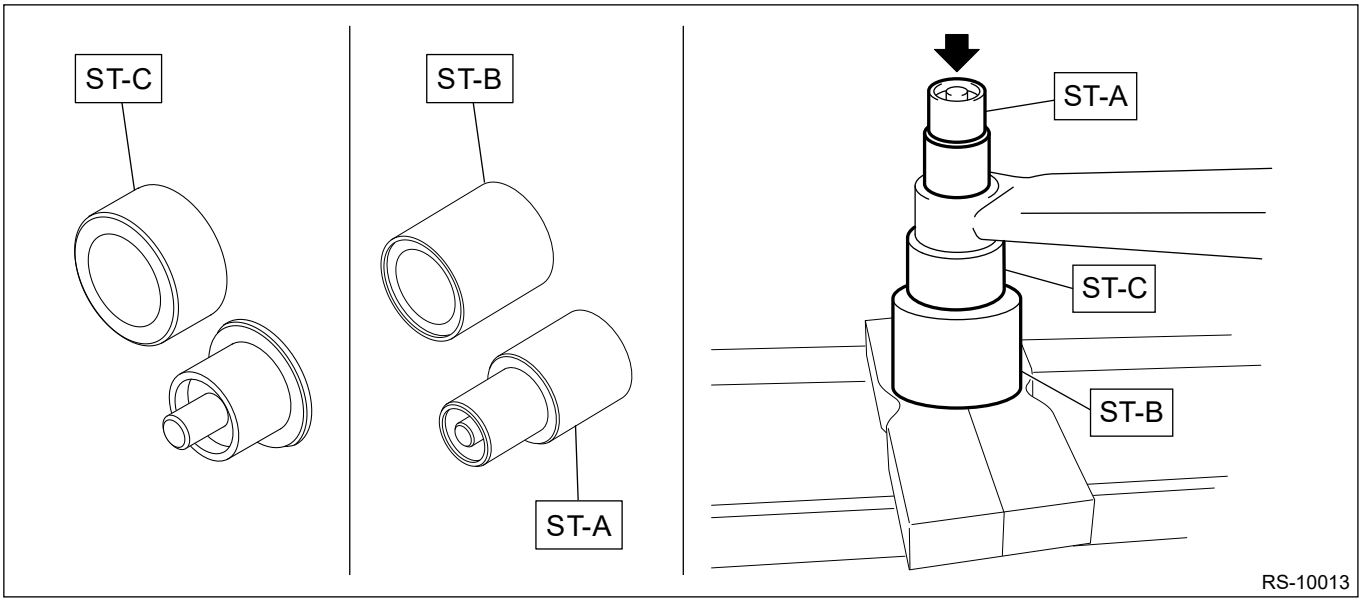
DISASSEMBLY

Using the ST, push out the bushing.

Preparation tool:

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

ST-C: INSTALLER & REMOVER (20099AE040)



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.**

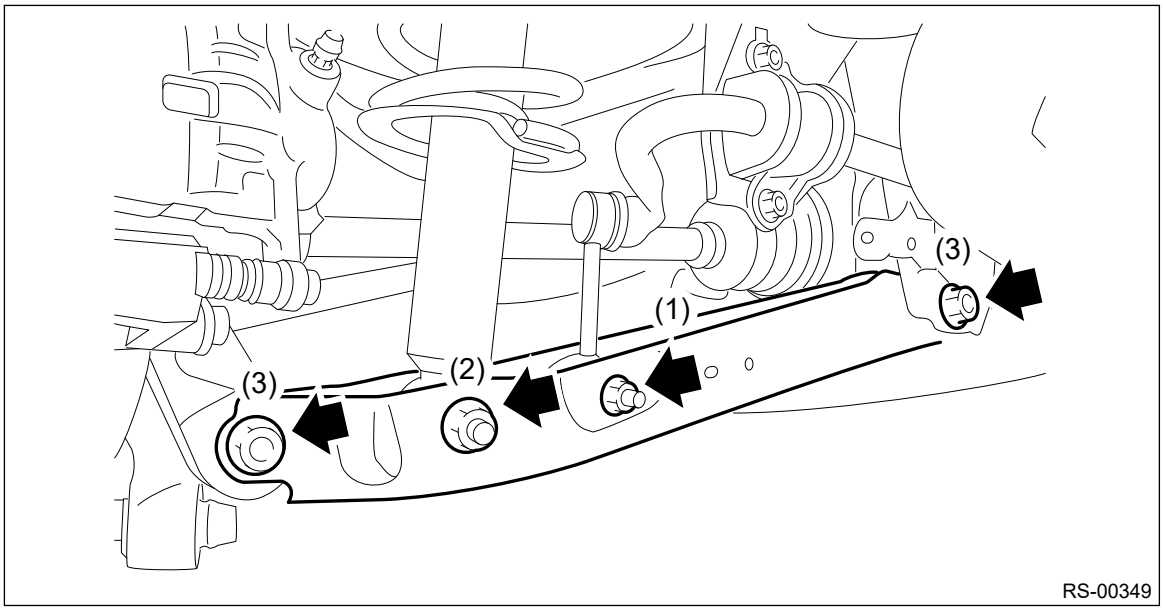
1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Visually check the lateral link assembly - rear for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
2. Install each part in the reverse order of removal.
   Tightening torque:
   Lateral link assembly - rear: 80 N·m (8.16 kgf-m, 59 ft-lb)
   Rear shock absorber assembly: 85 N·m (8.67 kgf-m, 62.7 ft-lb)
   Stabilizer link: 38 N·m (3.87 kgf-m, 28 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. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
5. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
     Caution:
     When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
6. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.
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) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.
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.
   (2) Remove the bolts from the lower side of rear shock absorber assembly.
   (3) Disconnect the lateral link assembly - rear.

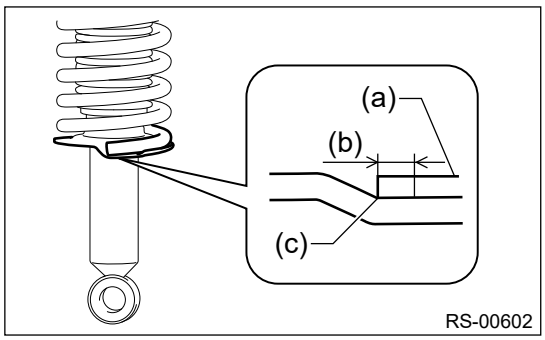


ASSEMBLY

1. Before assembly, check each part. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.
2. Using a coil spring compressor, compress the coil spring - rear.

   Caution:

   When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.
3. Install by aligning with the edge surface of the coil spring - rear and the stopper portion of the lower side spring seat.



(a) Coil spring rear

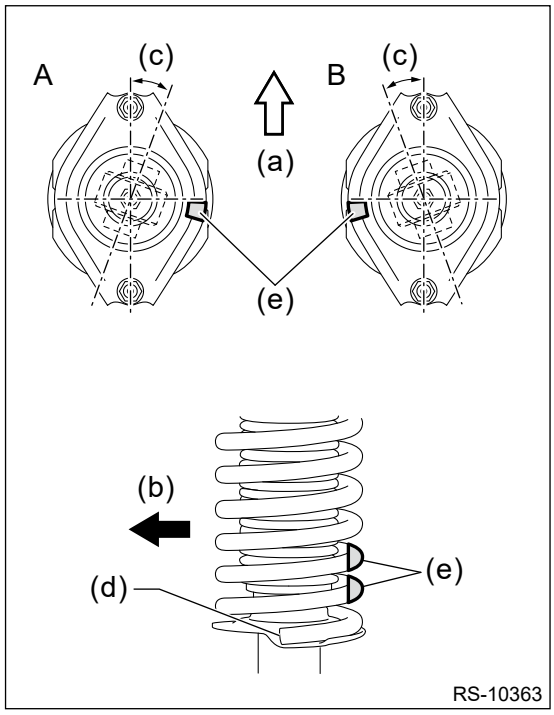
(b) 0+10mm(0+0.4 in)

(c) Spring seat stopper portion

4. Install the helper - rear and the dust cover - rear shock to the piston rod.
5. Fully pull up the piston rod in the upward direction.
6. Temporarily tighten the rubber seat - shock UPR and the shock mount - rear with new self-locking nuts.

   Note:

   Position the shock mount - rear as shown in the figure.



A LH side

B RH side

(a) Front side of vehicle

(b) Vehicle outside

(c) 10°±5°

(d) End portion of coil spring - rear

(e) Identification paint (Install with the paint facing the vehicle inside.)

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

Preparation tool:

ST: STRUT MOUNT SOCKET (20399FG000)

Tightening torque:

25 N•m (2.5 kgf-m, 18.4 ft-lb)

8. Loosen the coil spring compressor carefully.

DISASSEMBLY

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

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

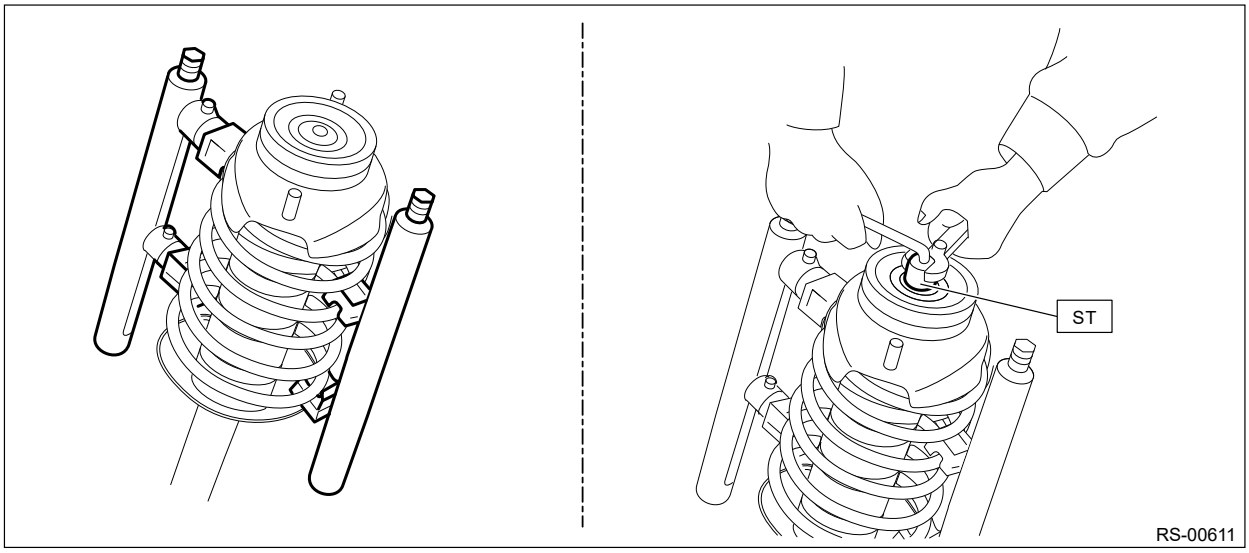
Preparation tool:

ST: STRUT MOUNT SOCKET (20399FG000)

Note:

<Example of coil spring compressor installation>

The installing position of coil spring compressor varies depending on the coil spring shape and winding number.



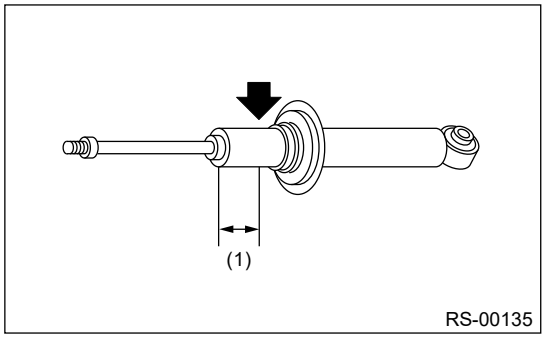
3. Remove the rubber seat - shock UPR and shock mount - rear from the shock absorber COMPL - rear.
4. Gradually decrease the compression pressure of compressor, and remove the coil spring - rear.
5. Remove the helper - rear and the dust cover - rear shock.

DISPOSAL

Caution:

- **Before handling 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.**
- **Drill a hole into shock absorbers in case of discarding shock absorbers filled with gas.**

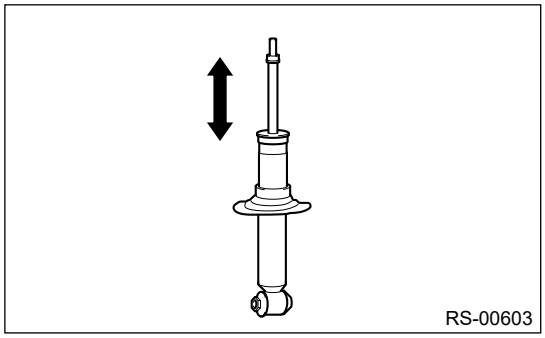
1. Place the shock absorber on a level surface with the piston rod fully expanded.
2. Make a hole of 30 mm (1.18 in) deep into the specified position shown in the figure, using a drill with 2 — 3 mm (0.08 — 0.12 in) diameter.



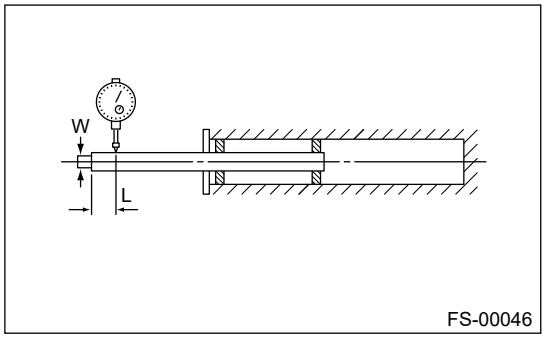
(1) 40 mm (1.57 in)

INSPECTION

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 as follows:
   (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)

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.**

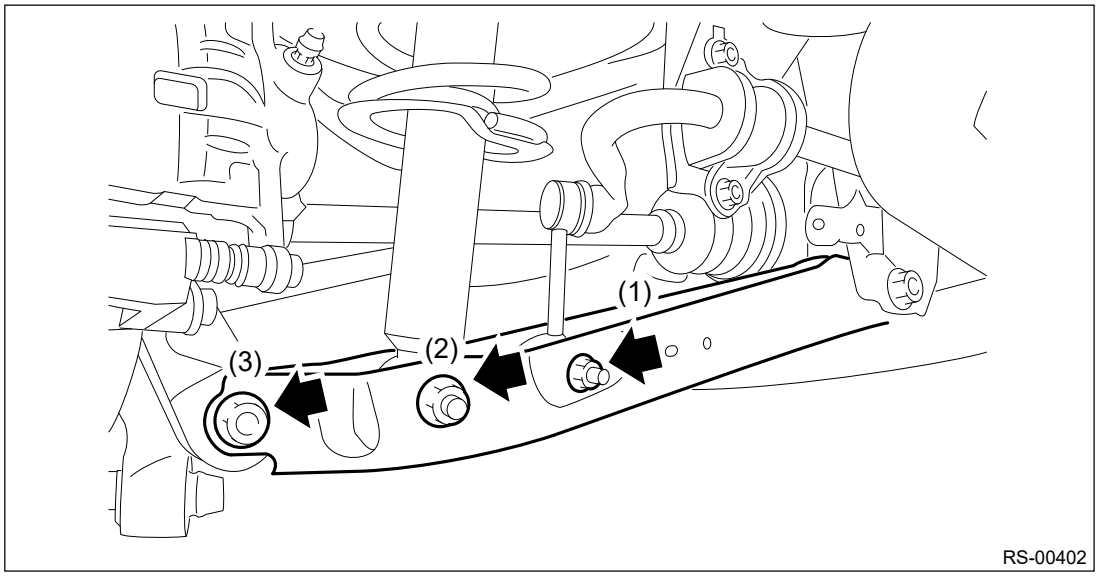
1. Install each part in the reverse order of removal.
   Tightening torque:
   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.
2. Install the rear wheels.
   Tightening torque:
   120 N•m (12.24 kgf-m, 88.5 ft-lb)
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
4. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

     Caution:

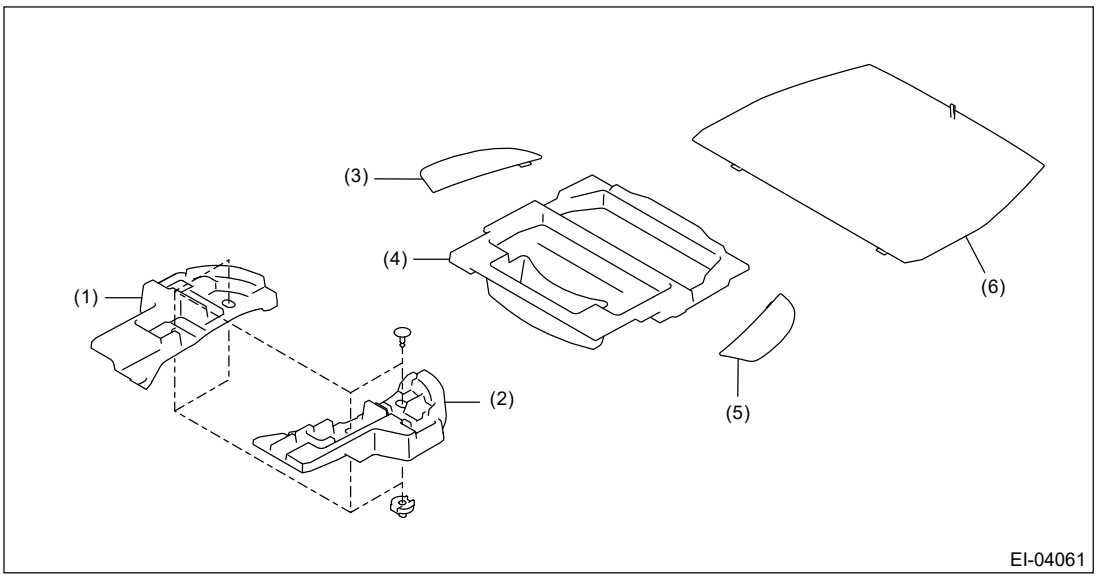
     When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
5. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.
   Note:
   For model with battery sensor, disconnect the ground terminal from battery sensor.
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) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.
4. Remove the bolts and nuts, and lower the lateral link assembly - rear.
   (1) Remove the nut and disconnect the rear stabilizer link.
   (2) Remove the bolts from the lower side of rear shock absorber assembly.
   (3) Disconnect the housing assembly - rear axle from the lateral link assembly - rear.



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

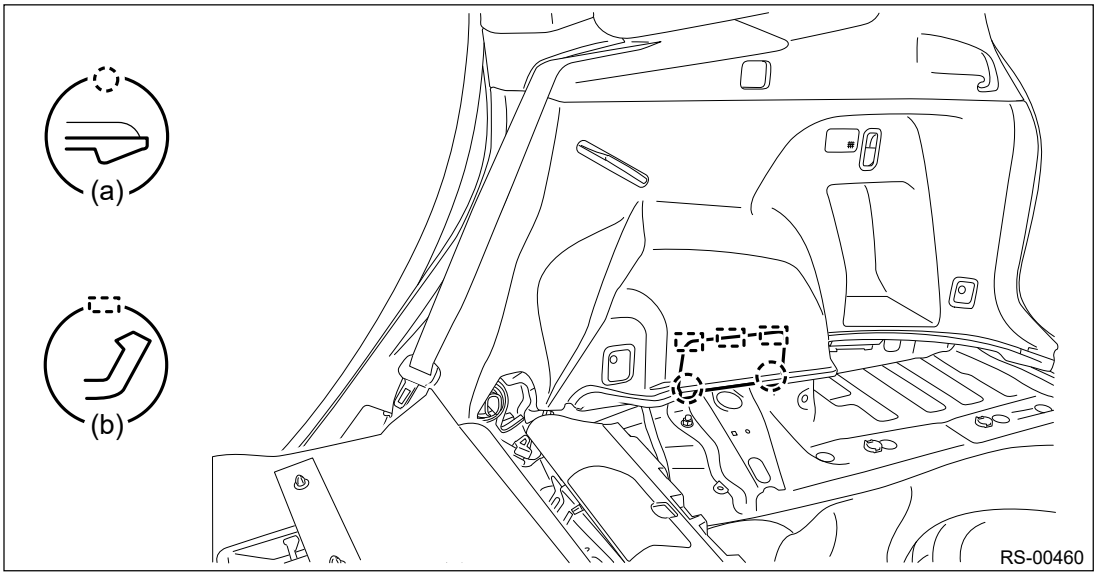


(1) Spacer - rear floor side RH
(2) Spacer - rear floor side LH
(3) Mat - rear floor RH
(4) Cover - trunk
(5) Mat - rear floor LH
(6) Mat - rear floor CTR

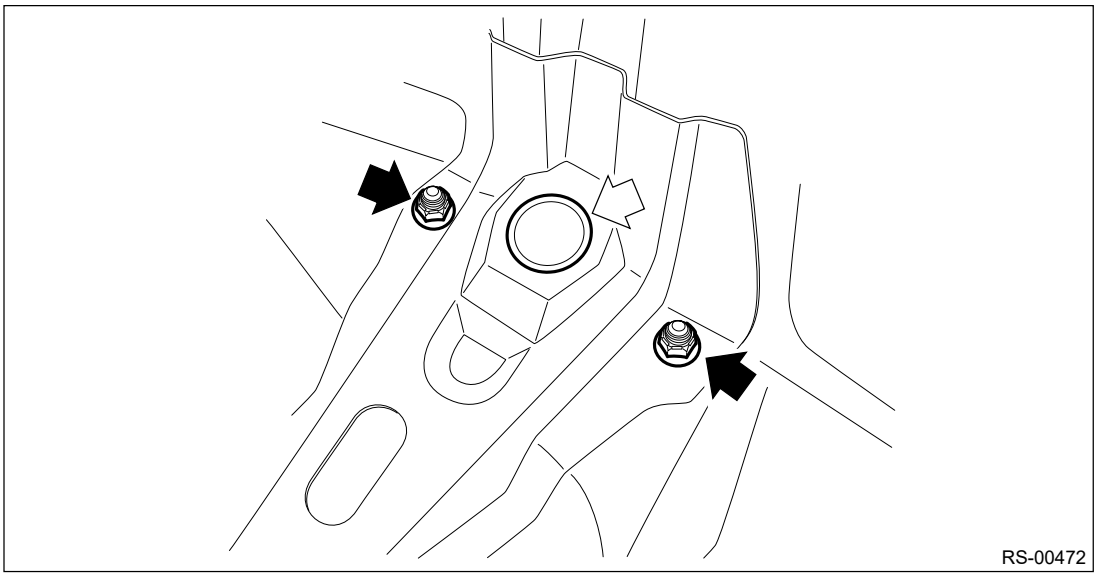
6. Release the claws (a) and guide (b), and then remove the cap - rear strut.

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.



7. Remove the plug, and remove the nuts on the upper side of rear shock absorber assembly.

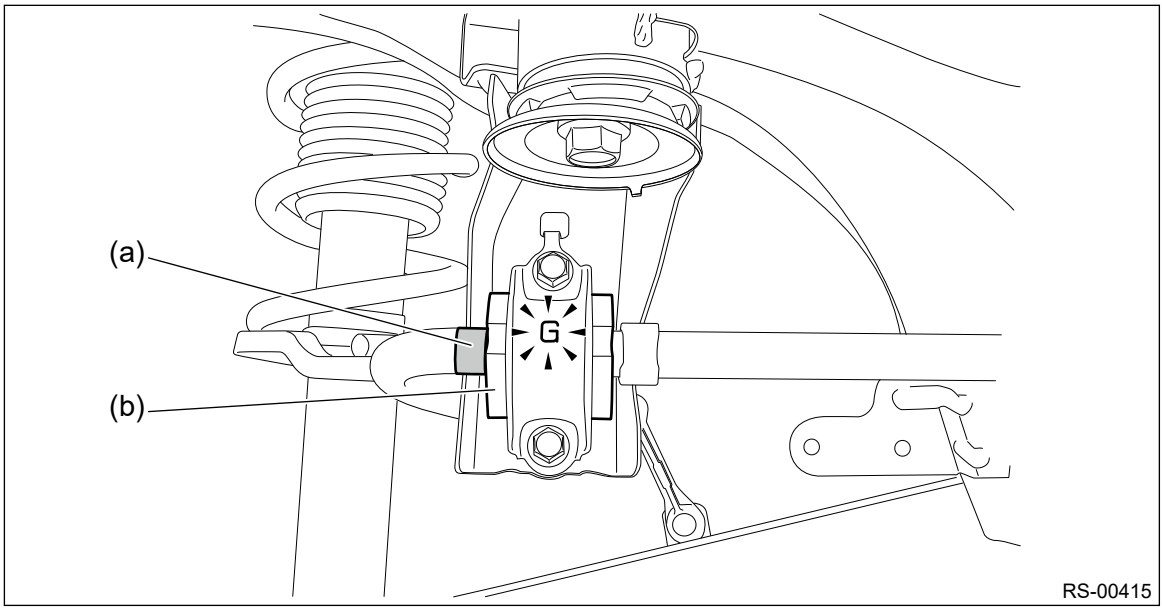


8. Lower the lateral link assembly - rear, and remove the rear shock absorber assembly.

INSTALLATION

Caution:

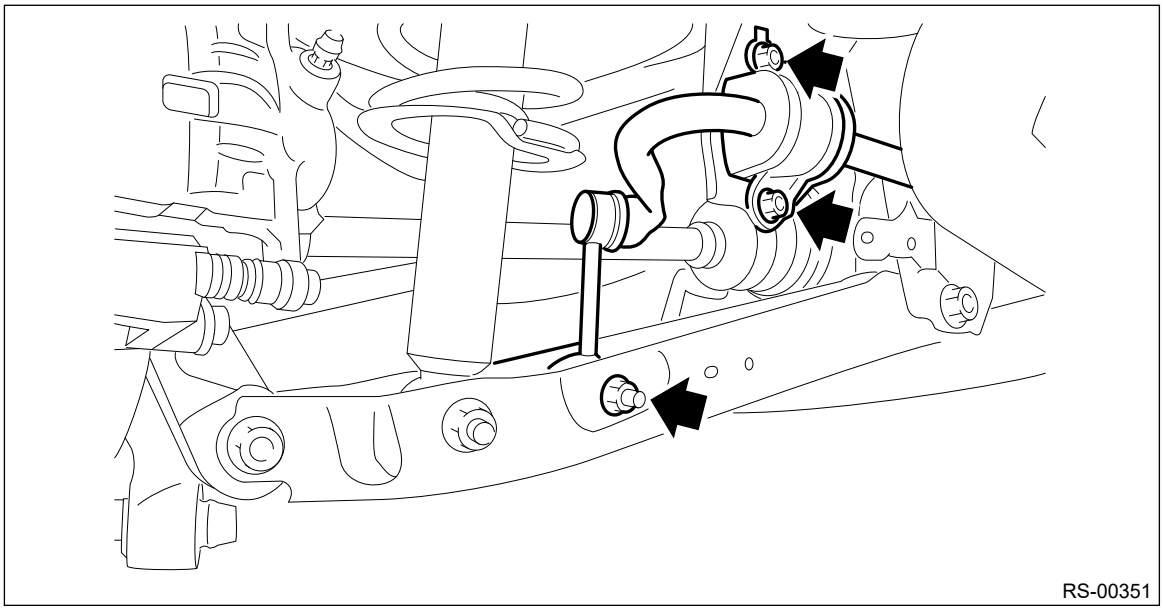
- **Be sure to use a new flange nut and self-locking nut.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**
- **Install the clamp - stabilizer bushing with the "G" character facing upward.**
- **When installing, align 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 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: 38 N•m (3.87 kgf-m, 28 ft-lb)
3. Install the rear wheels.
   Tightening torque:
   120 N•m (12.24 kgf-m, 88.5 ft-lb)

REMOVAL

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



INSPECTION

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

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 REAR SUSPENSION>General Description>COMPONENT.
   Rear suspension parts: Ref. to REAR SUSPENSION>General Description>COMPONENT.
   Fuel tank protector: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL TANK.
   Rear disc brake parts: Ref. to BRAKE>General Description>COMPONENT > REAR DISC BRAKE.
   Parking brake parts: Ref. to PARKING BRAKE>General Description>COMPONENT > PARKING BRAKE LEVER & CABLE.
3. Bleed air from brake system. Ref. to BRAKE>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 FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

   Caution:
   When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
6. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.
7. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

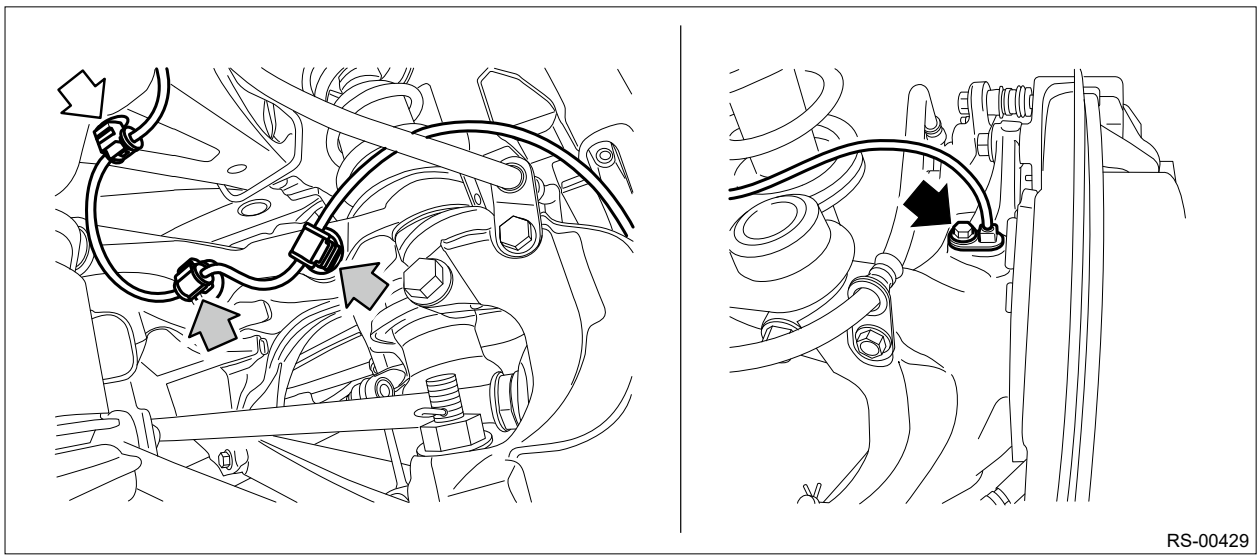
   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.

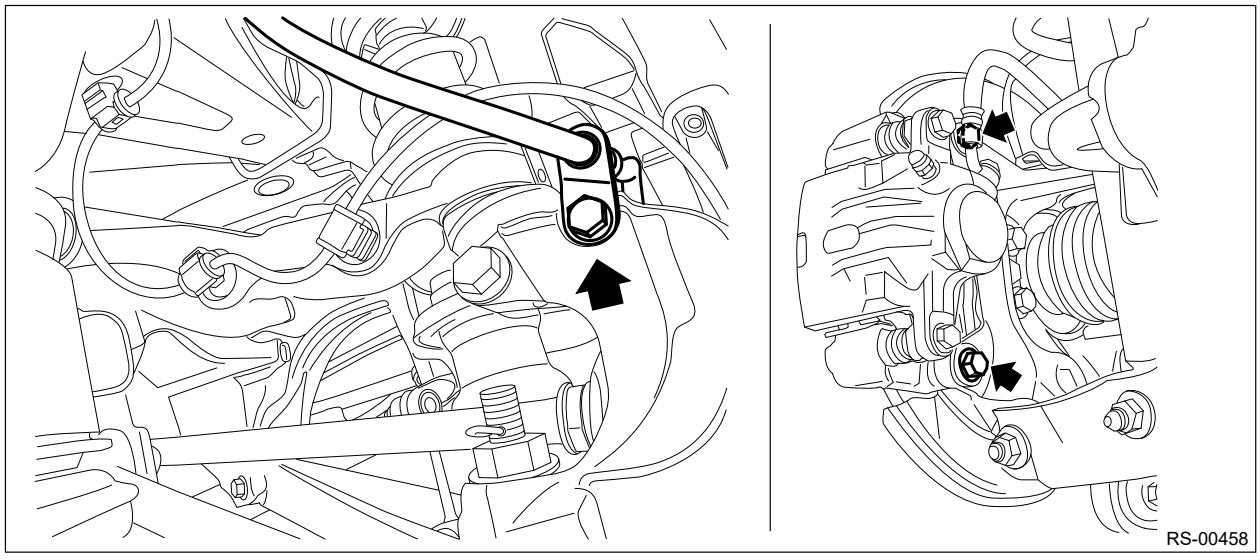
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
4. Remove the rear ABS wheel speed sensor from the housing assembly - rear axle.
   (1) Remove the bolts, and remove the rear ABS wheel speed sensor.
   (2) Remove the rear ABS wheel speed sensor harness from the upper arm assembly.

   Caution:

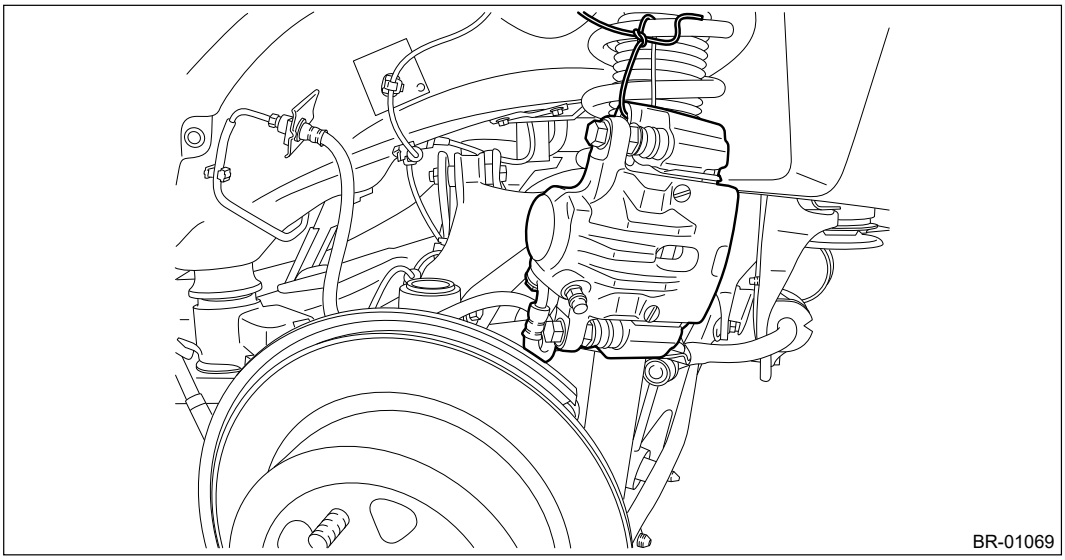
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**



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.



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



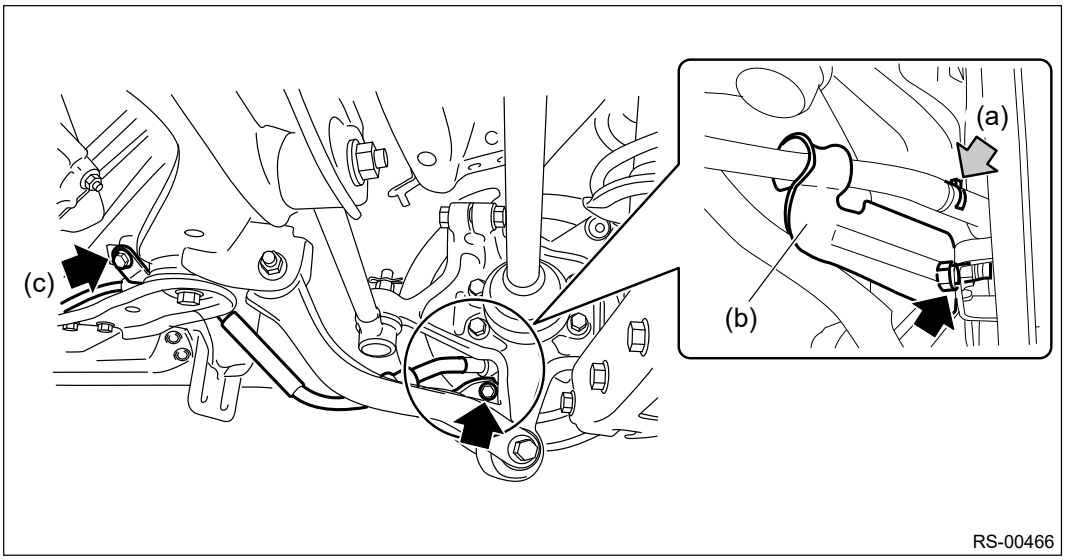
6. Remove the cable assembly - parking brake from the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.

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

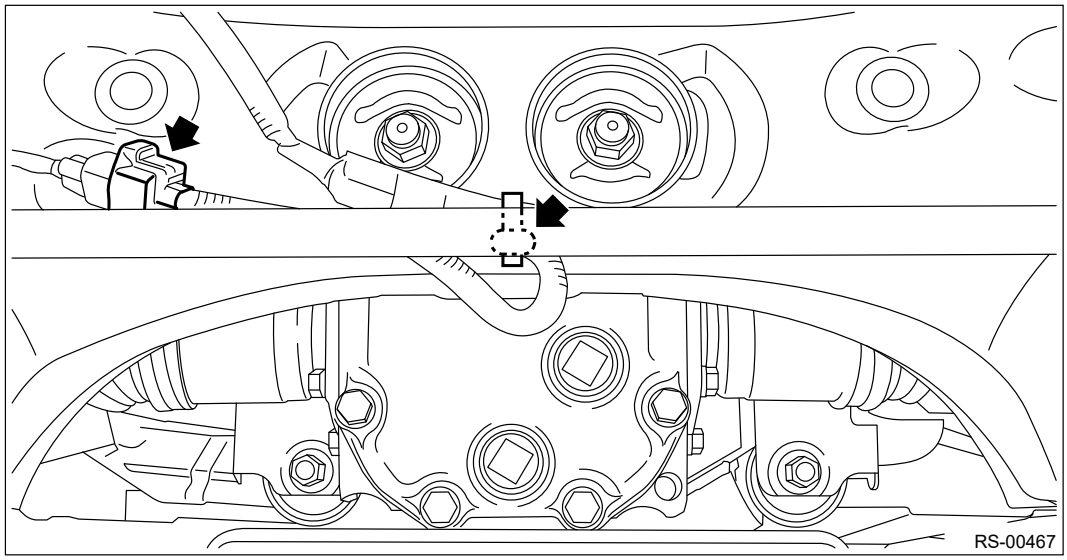
(1) Remove the clamp B - hand brake cable (a) from the rear brake.

(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.

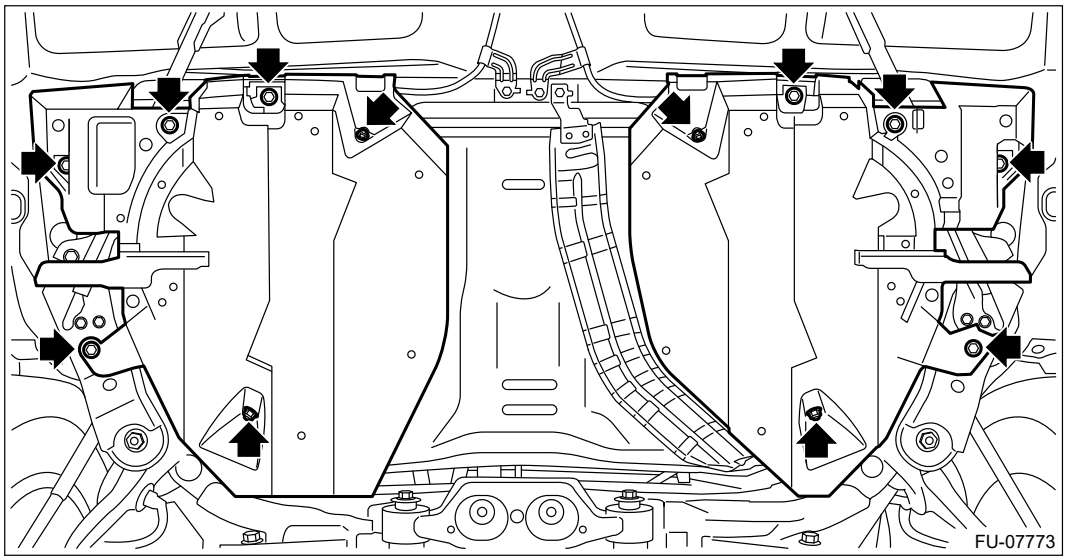


8. Remove the sub rear harness clamp and connector.



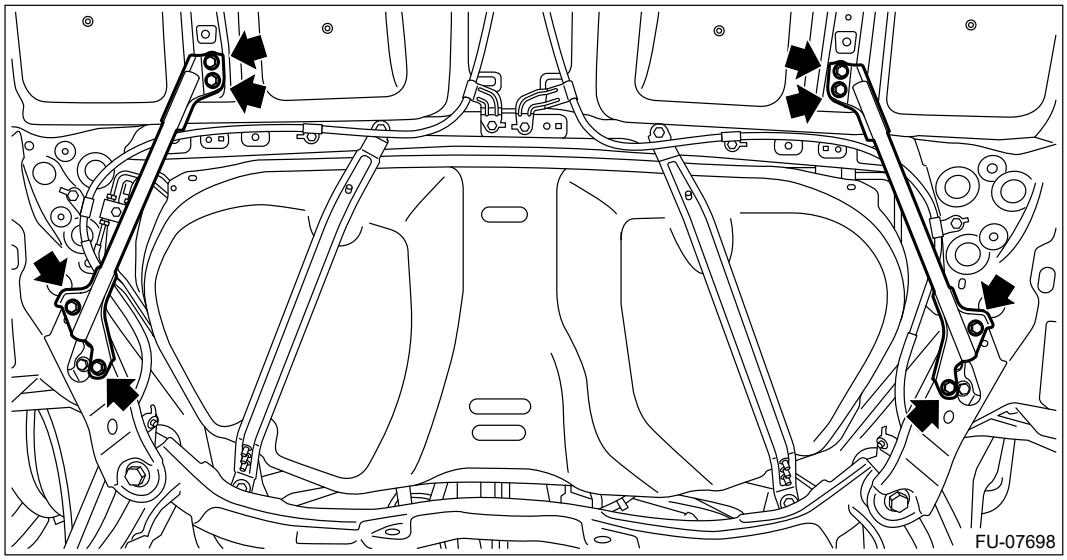
9. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler, left side only) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.

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

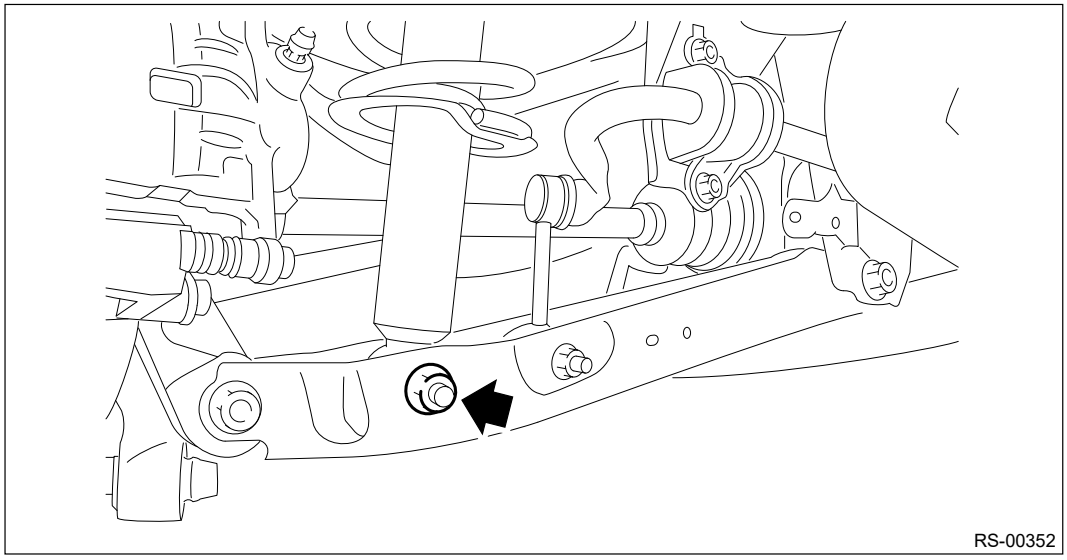


11. Remove the rear sub frame assembly.

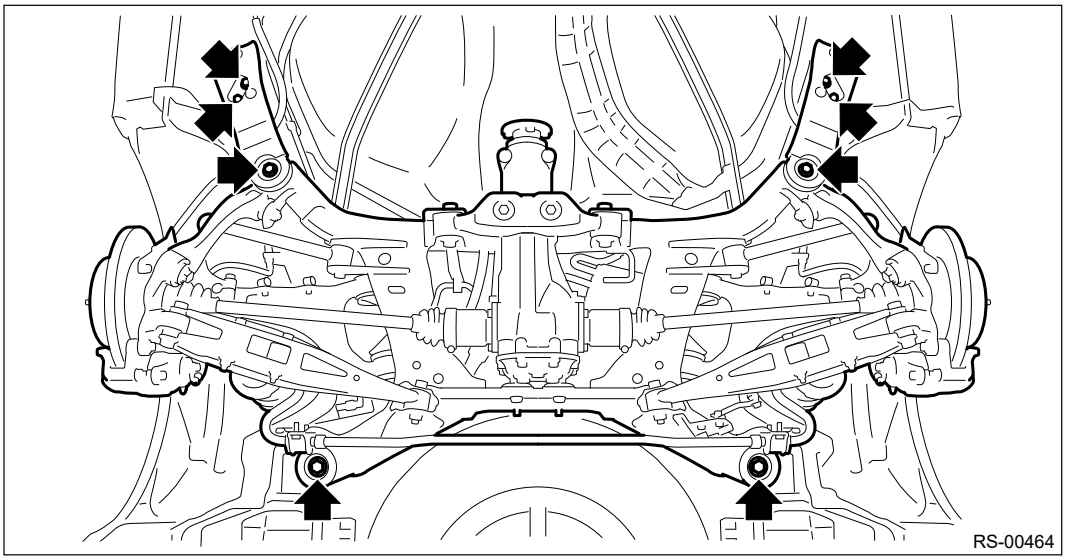
(1) Remove the bolts, and remove the stay - rear frame COMPL.



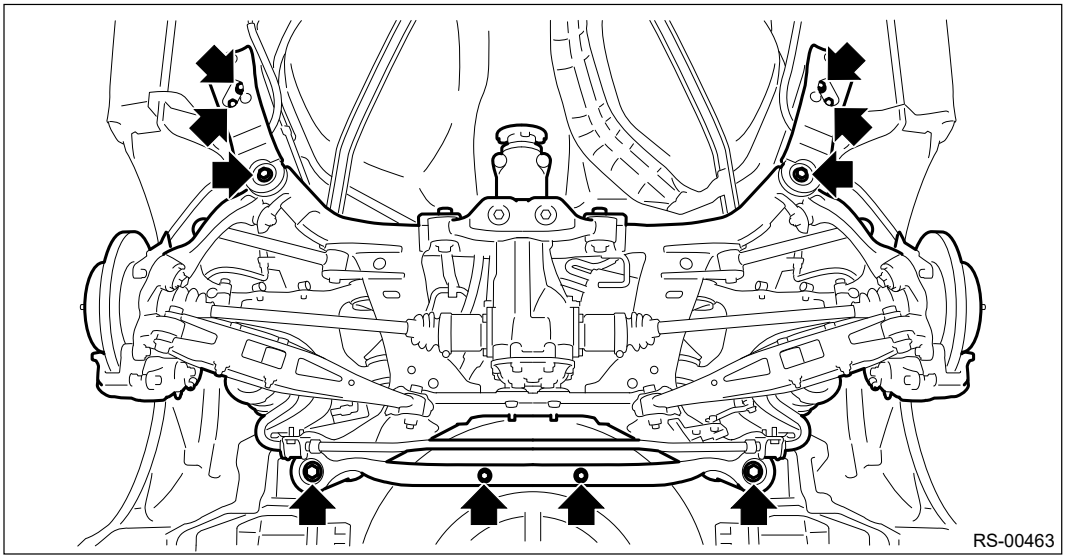
(2) Remove the bolts from the lower side of rear shock absorber assembly.



(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



- Turbo model



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

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.

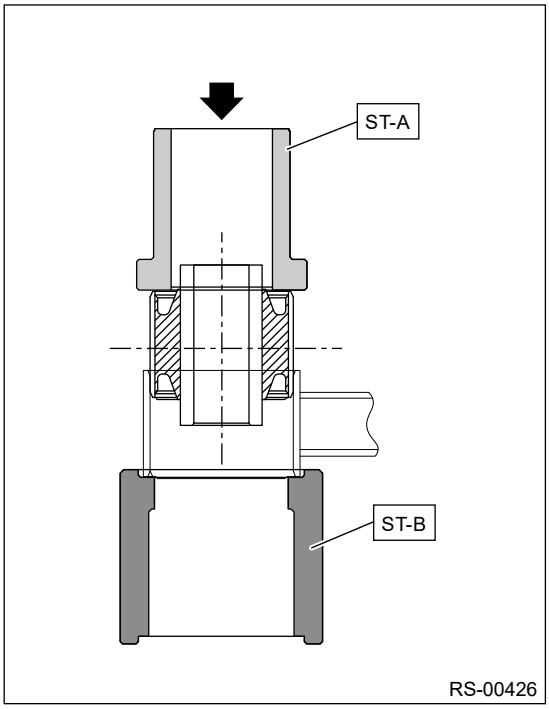
Caution:

Make sure to press the bushing straight in.

Preparation tool:

ST-A: BUSHING REMOVER (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 DRIVE SHAFT SYSTEM>Rear Axle>ASSEMBLY > BUSHING - TRAILING LINK.

DISASSEMBLY

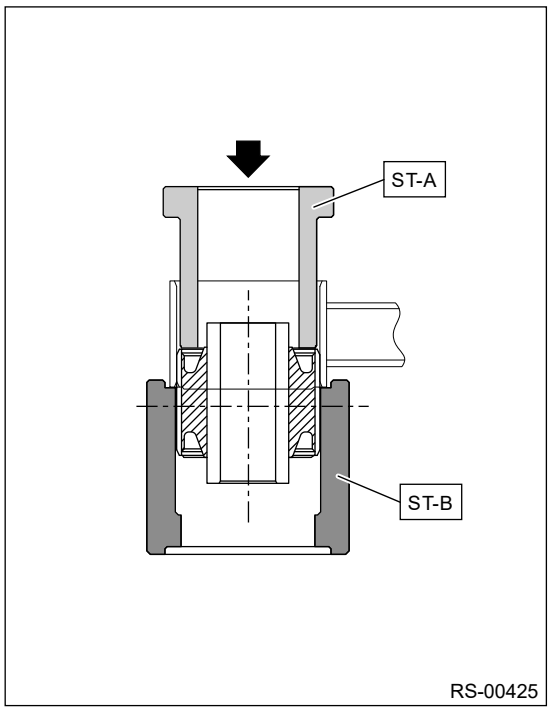
1. BUSHING A - TRAILING LINK

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

Preparation tool:

ST-A: BUSHING REMOVER (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 DRIVE SHAFT SYSTEM>Rear Axle>DISASSEMBLY > BUSHING - TRAILING LINK.

INSTALLATION

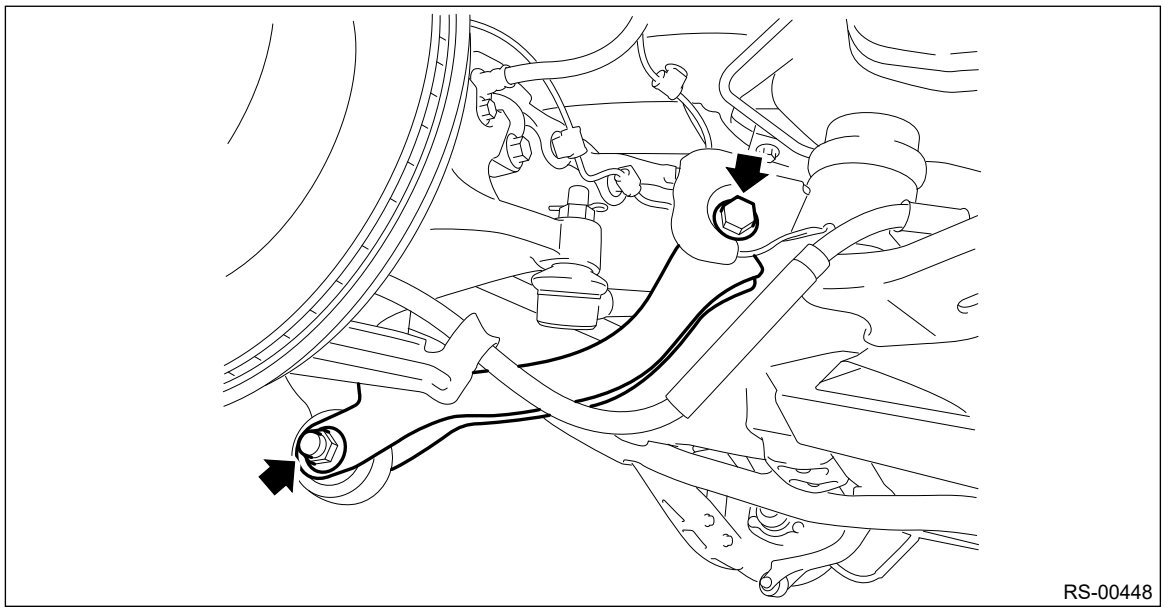
Caution:

- **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)

REMOVAL

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

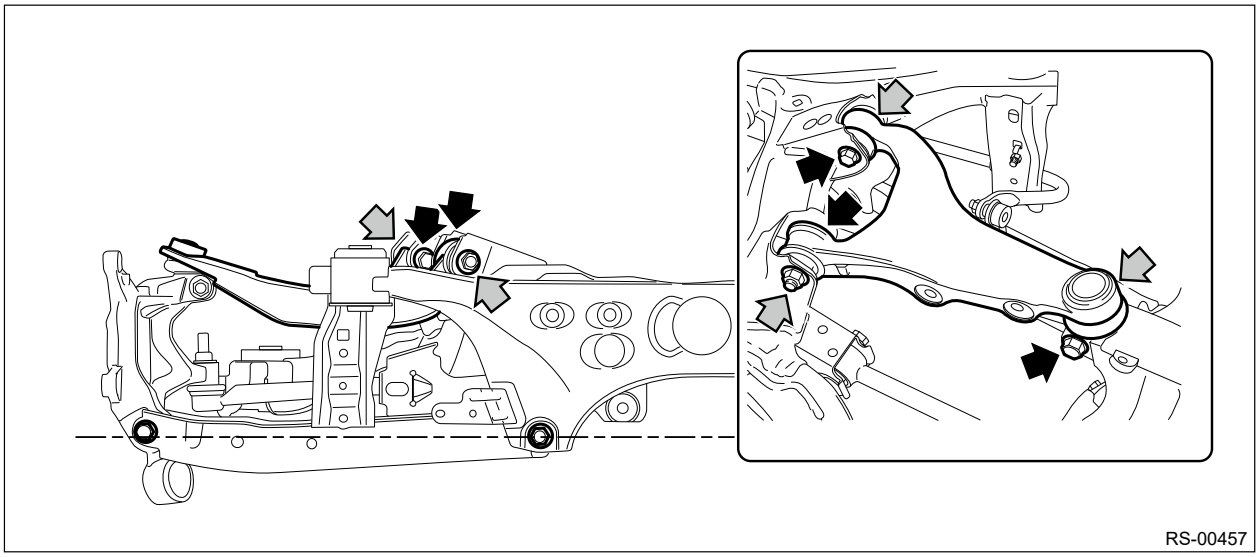


INSTALLATION

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.



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 ft-lb)
4. Install the rear sub frame assembly in the reverse order of removal. Ref. to REAR SUSPENSION>Rear Sub Frame>INSTALLATION.
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 FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

   Caution:
   When the wheel alignment has been adjusted, perform "VDC sensor midpoint setting mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
7. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

8. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

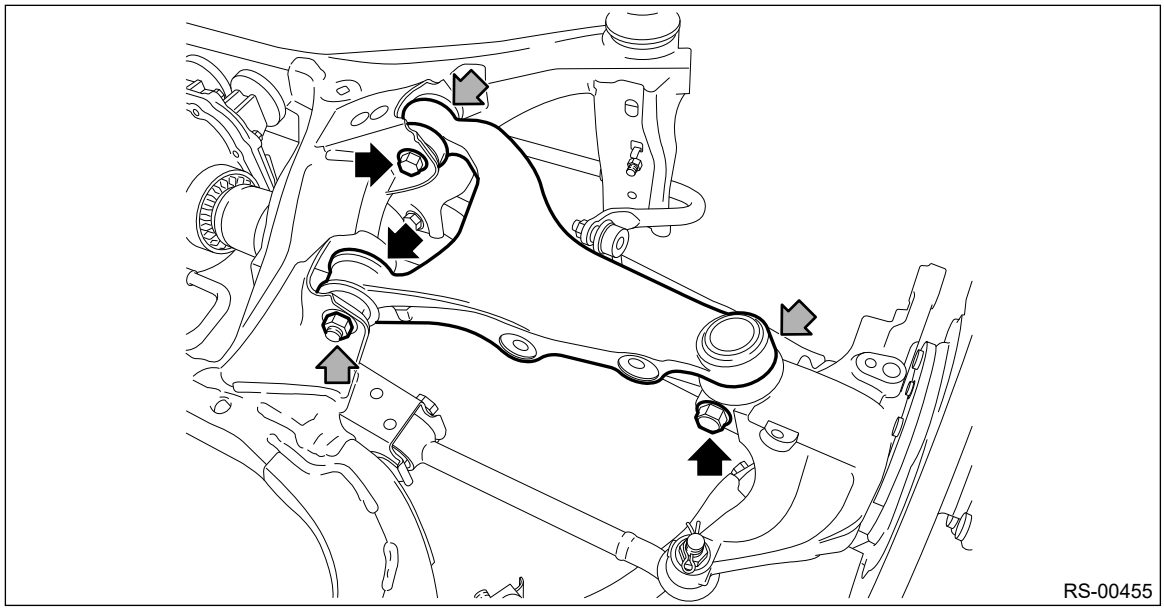
REMOVAL

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

   Note:

   For model with battery sensor, disconnect the ground terminal from battery sensor.

2. Remove the rear sub frame assembly. Ref. to REAR SUSPENSION>Rear Sub Frame>REMOVAL.
3. Remove the bolts and nuts to remove the upper arm assembly.



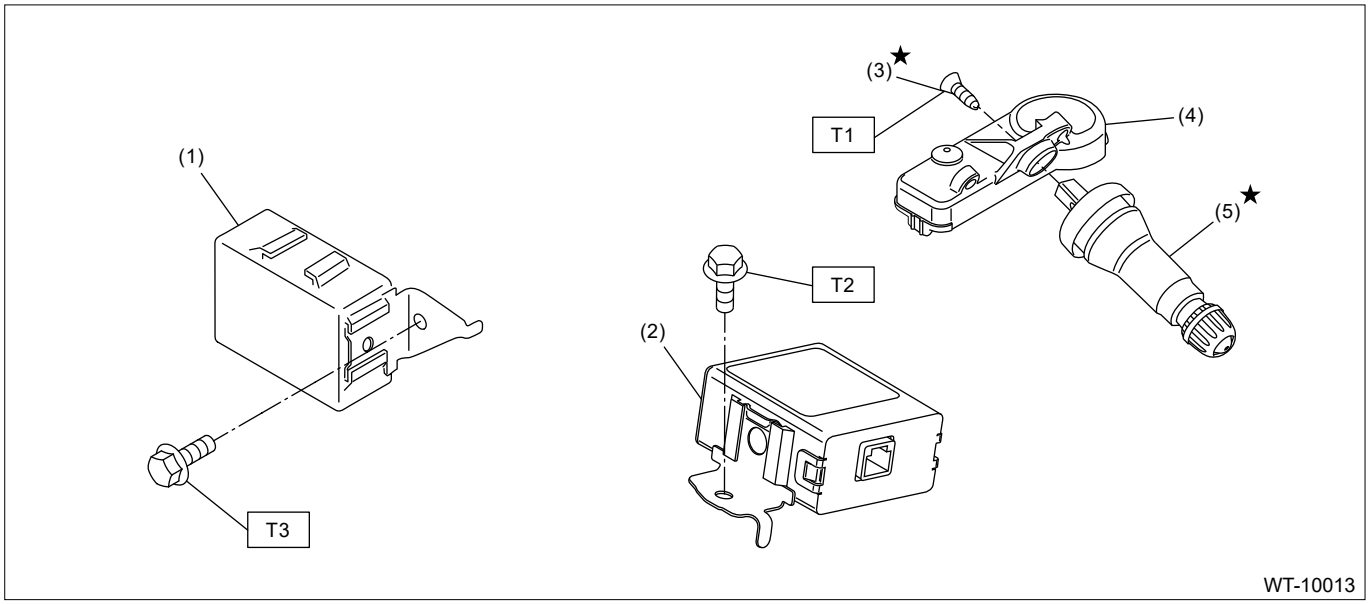
INSPECTION

Note:

Measure or 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 FRONT SUSPENSION>Wheel Alignment>INSPECTION.**
- **Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.**

COMPONENT



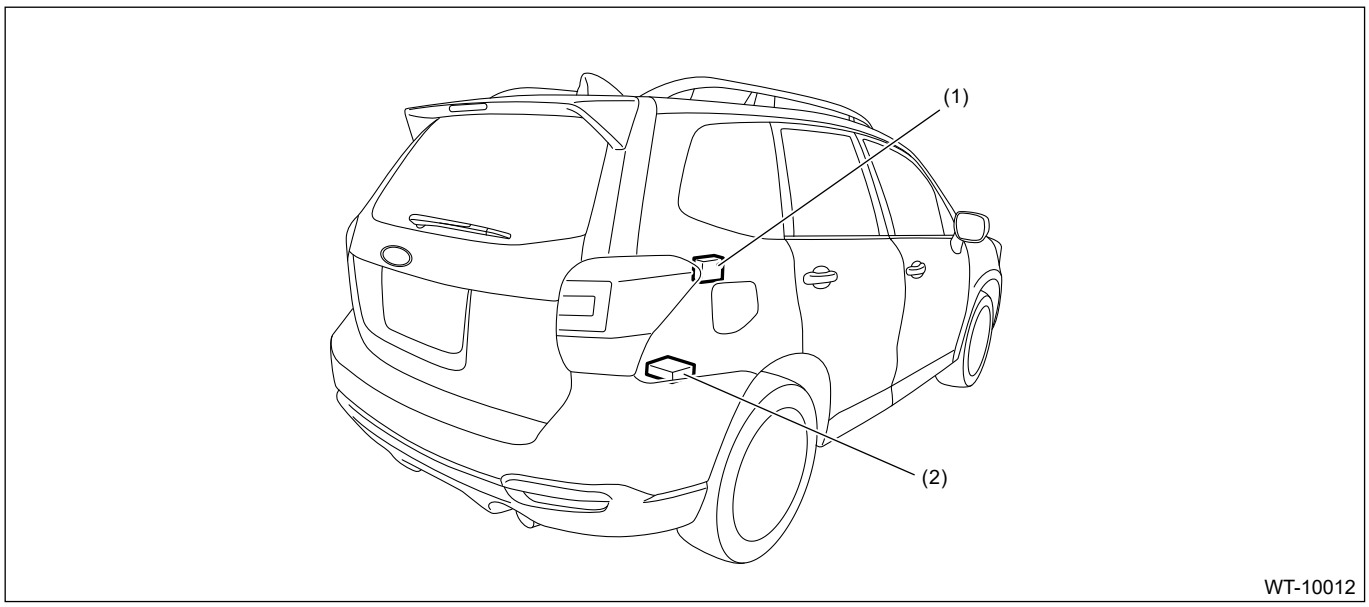
(1) TPMS & keyless entry control module (model without keyless access with push button start)
(2) TPMS CM (model with keyless access with push button start)
(3) Screw
(4) Transmitter (snap in type)
(5) Valve

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.4 (0.14, 1)

T2: 7.5 (0.76, 5.5)

T3: 13 (1.33, 9.6)



(1) TPMS & keyless entry control module (model without
(2) TPMS CM (model with keyless access with push button start)

keyless access with push
button start)

NOTE

For procedure of each component in the tire pressure monitoring system, refer to the respective section.

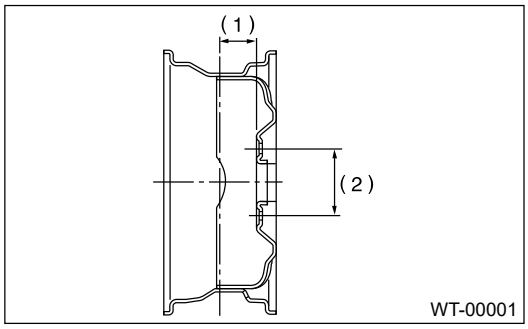
- Transmitter (tire inflation pressure sensor): Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL > TRANSMITTER (TIRE INFLATION PRESSURE SENSOR).
- TPMS & keyless control module: Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL > TPMS & KEYLESS CONTROL MODULE.
- TPMS module: Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL > TPMS CM.

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Air pressure gauge	Used for measuring tire air pressure.
DIAL GAUGE	Used for measuring wheel runout.
Wheel balancer	Used for adjusting wheel balance.

SPECIFICATION



(1) Inset
(2) P.C.D.

Tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
P225/60R17 98H	17 × 7J	48 (1.89)	100 (3.94)	210 (2.1, 30)	200 (2.0, 29)
P225/55R18 97H	18 × 7J			220 (2.2, 32) (Non-turbo model)	210 (2.1, 30) (Non-turbo model)
				230 (2.3, 33) (Turbo model)	220 (2.2, 32) (Turbo model)

Temporary tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
T145/80D17 107M	17 × 4T	20 (0.79)	100 (3.94)	Not used	420 (4.2, 60)
185/65R17 90M	17 × 6JJ	55 (2.17)		Not used	230 (2.3, 33)

Note:
Size and inflation pressure of the standard equipment tire and temporary tire are described on the "Tire inflation pressure" label attached to the body side of the driver's door.

1. SERVICE DATA

Part	Axial runout	Radial runout
Steel wheel	1.5 mm (0.059 in)	
Aluminum wheel	1 mm (0.039 in)	

Wheel balancing	Standard	Service limit
Dynamic unbalance	5 g (0.18 oz) or less	

INSPECTION

Symptoms	Possible cause	Corrective action
Wheel is out of balance.	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to "Abnormal tire wear" in this table, carry out the procedure and replace the tire.
	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Front strut	Check the front strut. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
	Rear shock absorber	Check the rear shock absorber. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.
	Housing assembly - front axle	Check the housing assembly - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - front axle	Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - rear axle	Check the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
Vehicle is abnormally out of balance.	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to "Abnormal tire wear" in this table, carry out the procedure and replace the tire.
	Front stabilizer	Inspect the front stabilizer.

	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
Abnormal wheel vibration	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to "Abnormal tire wear" in this table, carry out the procedure and replace the tire.
	Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Housing assembly - front axle	Check the housing assembly - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - front axle	Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - rear axle	Check the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
Abnormal tire wear	Improperly inflated tire	Adjust the tire pressure.
	Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.

		• Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

INSPECTION

For inspection of the “T-type” or “Temporary” tire, refer to “Inspection” for tires of standard size.
Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > TIRES.

NOTE

"T-type" or "Temporary" tire for temporary use is equipped as a temporary tire.

Caution:

- **The "T-type" or "Temporary" tire is only for temporary use. Replace with a tire of standard size as soon as possible.**
- **Do not use standard sized tire chains for "T-type" or "Temporary" tires. Because tire size is small, tire chains can not be installed properly and will damage the vehicle and tires if they are detached while driving.**
- **Do not drive at a speed greater than 80 km/h (50 MPH).**
- **Drive the vehicle as slowly as possible and avoid bumps on the road.**

REPLACEMENT

Refer to "Tire and Wheel" for removal and installation of the "T-type" or "temporary" tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel.

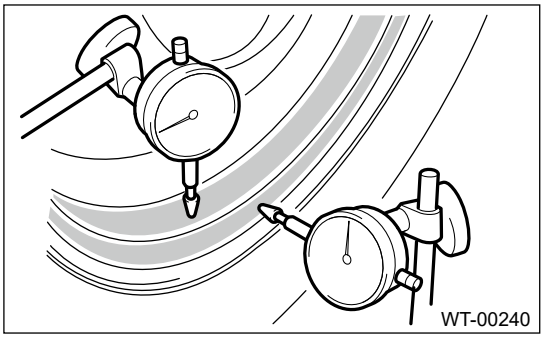
INSPECTION

1. TIRES

Caution:

When replacing a tire, make sure to use tires of the same size, construction and load range as originally installed.

1. Tire size and tire inflation pressure check Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.
2. Cracks, damage and wear check
3. Tire runout check
   (1) Lift up the vehicle.
   (2) Slowly rotate the wheel to check rim "runout" using a dial gauge.



- Aluminum wheel

Axial runout limit	Radial runout limit
1 mm (0.04 in)	

- Steel wheel

Axial runout limit	Radial runout limit
1.5 mm (0.06 in)	

   (3) If the rim runout exceeds service limit, replace the wheel.

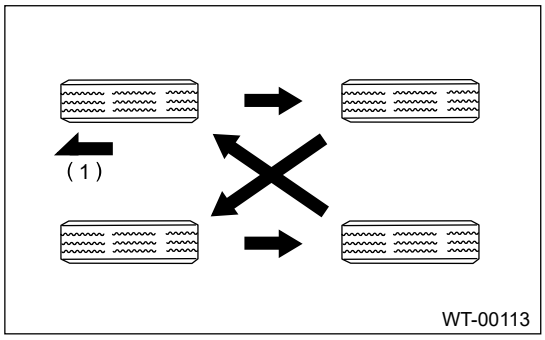
2. TIRE ROTATION

Note:

Rotate tires periodically (9,600 km/6,000 miles) in order to prolong life and to prevent uneven wear.

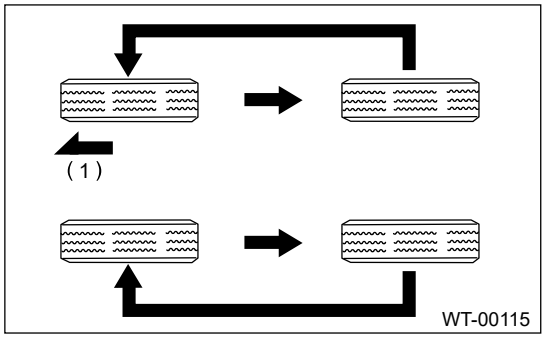
Rotate tires as shown in the figure depending on whether or not the direction of the tire rotation is specified.

- When the direction of tire rotation is not specified



(1) Front side of vehicle

- When the direction of tire rotation is specified



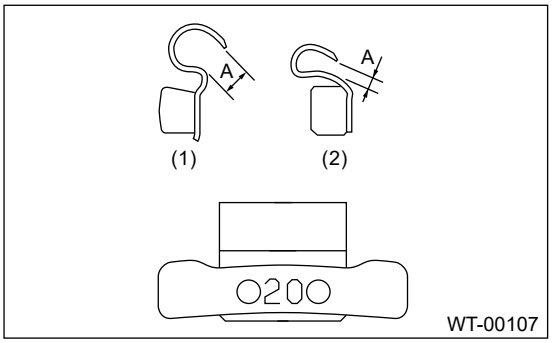
(1) Front side of vehicle

3. WHEEL BALANCING

1. Using the wheel balancer, measure wheel balance.
2. Adjust the wheel balancing.

Note:

- **Unbalance after adjusting the wheel balancing should be 5 g (0.18 oz) or less.**
- **When using the adhesive type weight, degrease the surface where the adhesive type weight will be applied securely.**
- **After applying the adhesive type weight, apply a force to the weight and attain full adhesion.**
- **Using the knock-on type weight, check the size of the knock-on part.**



(1) Knock-on type weight for aluminum wheel

(2) Knock-on type weight for steel wheel

Service limit A:

Knock-on type weight for steel wheel: 2 mm (0.08 in)

Knock-on type weight for aluminum wheel: 5 mm (0.2 in)

INSTALLATION

1. Install the wheels to vehicle.
2. Tighten the wheel nuts to the specified torque.
   Tightening torque:
   120 N·m (12.24 kgf-m, 88.5 ft-lb)

NOTE

"T-type" or "temporary" tires for temporary use are prepared as a temporary tire.

Caution:

- **"T-type" or "temporary" tires are only for temporary use. Replace with a conventional tire as soon as possible.**
- **Do not use tire chains for "T-type" or "temporary" tires. Because tire size is small, tire chains can not be installed and will damage the vehicle and tires.**
- **Do not drive at a speed greater than 80 km/h (50 MPH).**
- **Drive the vehicle as slowly as possible and avoid bumps on the road.**

REMOVAL

1. Lift up the vehicle.
2. Remove the wheel nut.
3. Remove the wheels.

Caution:

When removing the wheels, be careful not to damage the bolt - hub.

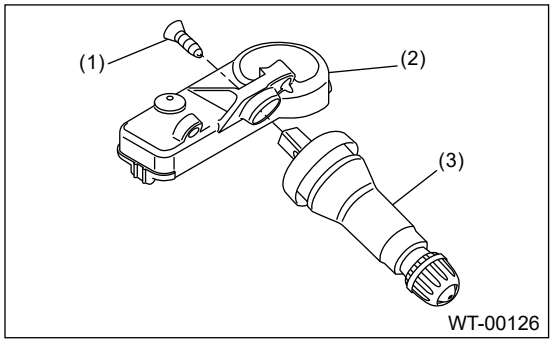
INSTALLATION

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

Caution:

Use the new transmitter assembly or replace the new valve and screw, when installing.

1. Replace the valve and screw with a new part when reusing transmitter.



(1) Screw
(2) Transmitter
(3) Valve

Tightening torque:

1.4 N•m (0.14 kgf-m, 1 ft-lb)

2. Install the transmitter to the wheel by aligning it with valve hole.

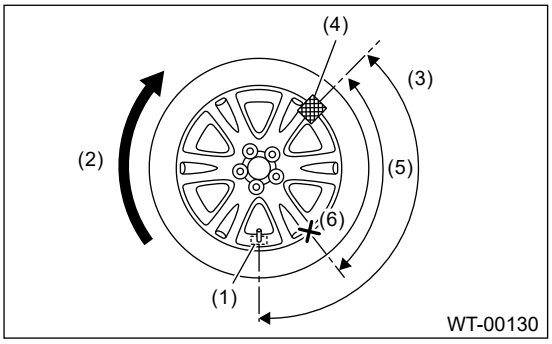
Note:

When using the jig that pulls the valve cap by hooking its neck part, use another short-type cap.

3. Install the tires to wheels.

Caution:

- **Use a tire changer when installing tire to wheel.**
- **To prevent damaging the transmitter, set the tire changer boom in the position as shown in the figure.**



(1) Transmitter
(2) Direction of turn table rotation

(3) 135°
(4) Tire changer boom
(5) 90°
(6) Starting point for fitting the bead to the rim

4. Install the wheels to vehicle. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
5. Register the transmitter ID when the transmitter has been replaced. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).

2. TPMS & KEYLESS CONTROL MODULE

1. Install each part in the reverse order of removal.
   Tightening torque:
   13 N•m (1.33 kgf-m, 9.6 ft-lb)
2. Re-register the transmitter ID and the keyless transmitter when the TPMS & keyless control module has been replaced.
   - Register transmitter ID Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).
   - Keyless transmitter registration Ref. to SECURITY AND LOCKS>Keyless Transmitter>REPLACEMENT > REGISTRATION OF KEYLESS TRANSMITTER WITH SUBARU SELECT MONITOR.
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

3. TPMS CM

1. Install each part in the reverse order of removal.
   Tightening torque:
   7.5 N•m (0.76 kgf-m, 5.5 ft-lb)
2. Re-register the transmitter ID when the TPMS CM has been replaced. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).
3. Connect the battery ground terminal. Ref. to NOTE>NOTE > BATTERY.

REMOVAL

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

1. Remove the wheels from the vehicle. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the tires from wheels.

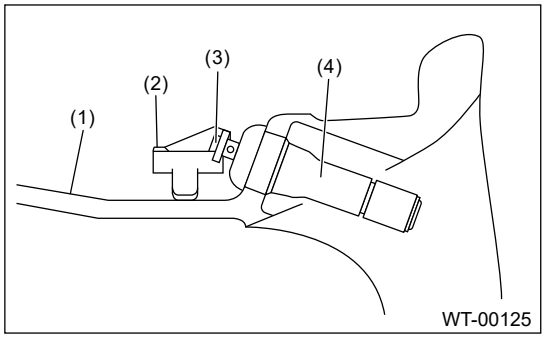
   Caution:

   Use a tire changer when removing the tire from the wheel.
3. Loosen the screw to remove the transmitter from the valve stem.

   Caution:

   Do not reuse the valve and screw.

   Replace the valve and screw with a new part even when reusing transmitter.



(1) Wheel
(2) Transmitter
(3) Screw
(4) Valve

4. Remove the valve from the wheel.

2. TPMS & KEYLESS CONTROL MODULE

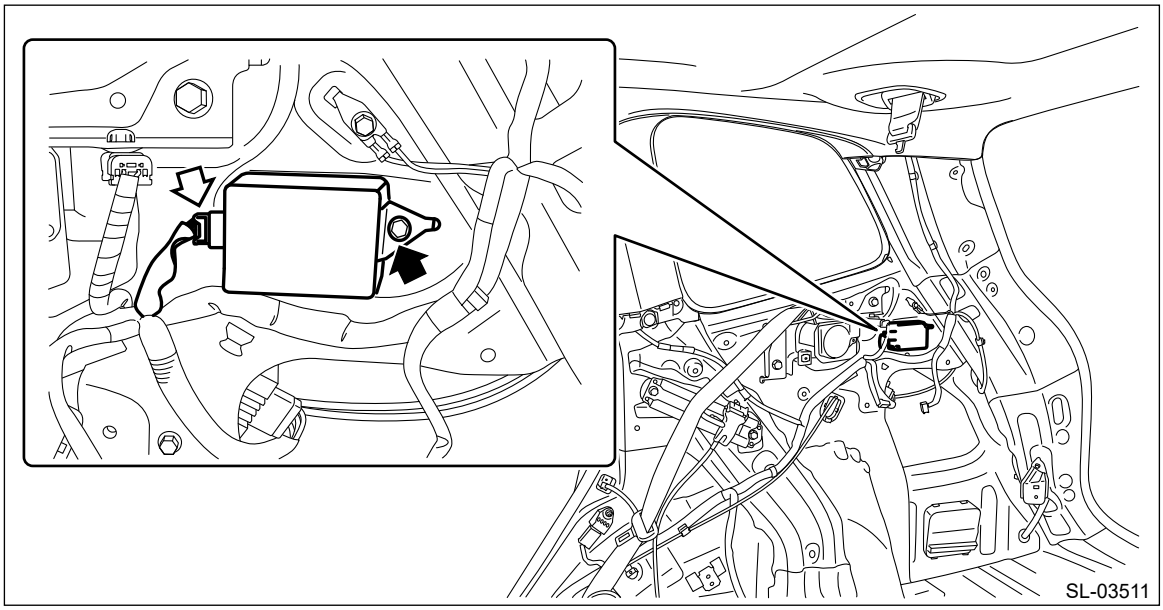
Note:

TPMS control module is integrated with the keyless entry control module.

1. Disconnect the ground cable from battery. Ref. to NOTE>NOTE > BATTERY.

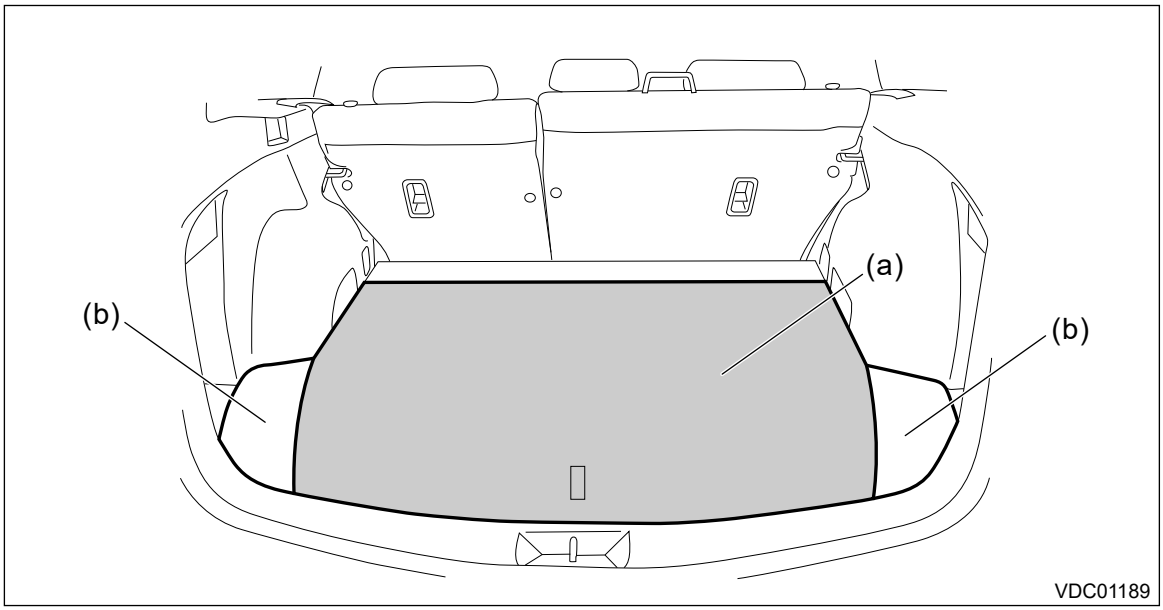
   Note:

   For model with battery sensor, remove the ground terminal from battery sensor.
2. Remove the trim panel - rear apron. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.
3. Remove the TPMS & keyless control module.
   (1) Disconnect the connector.
   (2) Remove the bolt and then remove the TPMS & keyless control module.

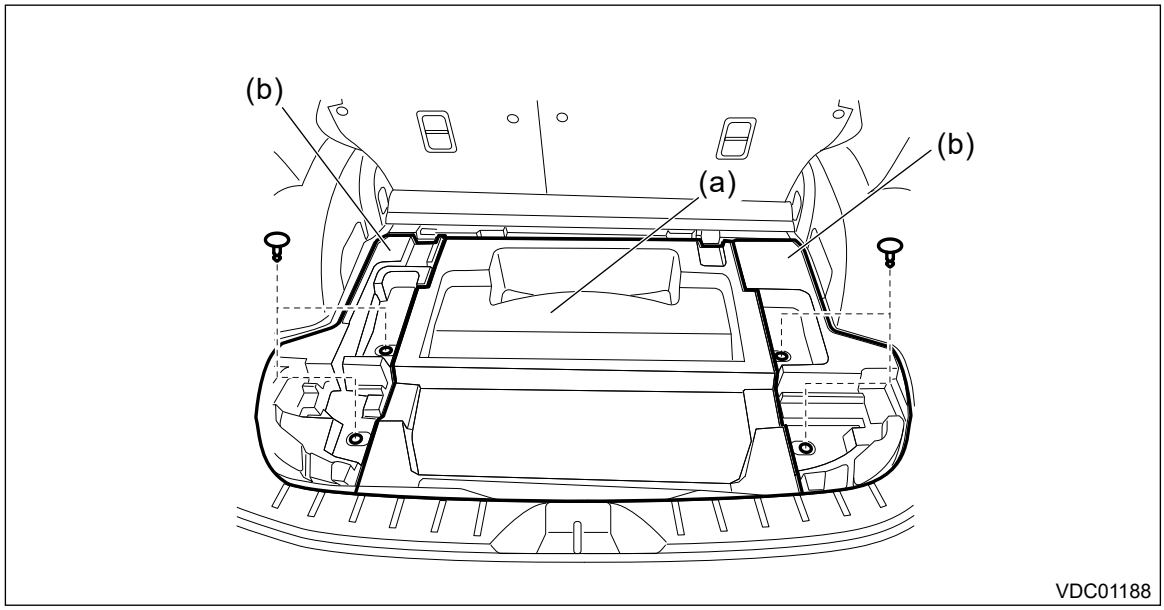


3. TPMS CM

1. Disconnect the ground cable from battery.
2. Remove the mat - rear floor CTR (a) and the mats - rear floor (b) of right and left sides.



3. Remove the clips and remove the cover - trunk (a) and right and left spacers - rear front side (b).



4. Remove the TPMS CM.

(1) Disconnect the connector.

(2) Remove the bolts to remove the TPMS CM.