
GROUP 33

FRONT SUSPENSION

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SERVICE SPECIFICATIONS

M1332000302195

Item		Standard value
Toe-in	At the centre of tyre tread mm	1 ± 2
	Toe-in angle (per wheel)	$0^{\circ}02' \pm 0^{\circ}04'$
Camber		$0^{\circ}20' \pm 0^{\circ}30'^*$
Caster		$2^{\circ}35' \pm 0^{\circ}45'^*$
Kingpin inclination		$12^{\circ}45' \pm 1^{\circ}30'$
Lower arm ball joint rotation starting torque N·m		0.3 – 9.0
Stabilizer link ball joint rotation torque N·m		0.3 – 2.9

NOTE: *: Difference between right and left wheels must be $0^{\circ}30'$ or less.

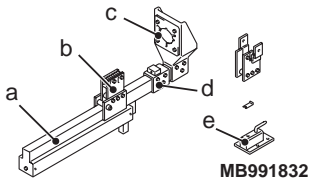
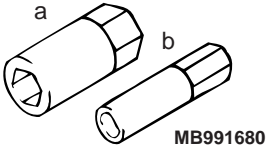
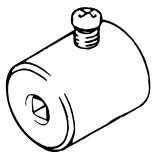
LUBRICANT


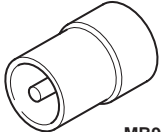
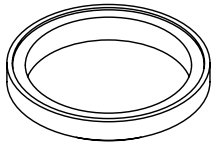
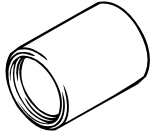
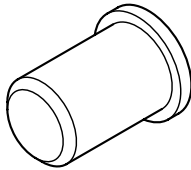
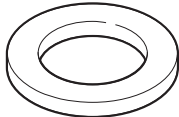
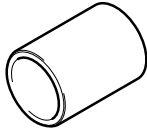
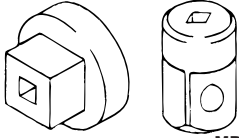
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Item	Specified Lubricant	Quantity
Inside and lip of lower arm ball joint dust cover	Multipurpose grease SAE J310, NLGI No.2 or equivalent	Inside of dust cover : 9.0 ± 1.0 g Lip: As required

SPECIAL TOOLS

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Tool	Number	Name	Use
 MB991832	MB991832 a. MB991793 b. MB991795 c. MB991794 d. MB991829 e. MB991830	Spring compressor set a. Spring compressor b. Attachment A c. Upper plate d. Arm bracket e. Fixture	Coil spring compression
 MB991680	MB991680 a. MB991681 b. MB991682	Wrench set a. Wrench b. Socket	Strut assembly disassembly and assembly
 MB991006	MB991006	Preload socket	Lower arm ball joint rotation starting torque measurement

Tool	Number	Name	Use
 MB990800	MB990800	Ball joint remover & installer	Lower arm ball joint dust cover press-fit
 MB992119	MB992119	Arm bushing remover	
 MB990979	MB990979	Ring	
 MB990890	MB990890	Rear suspension bushing base	
 MD998375	MD998375	Arm bushing installer	Lower arm bushing press-fit
 MB992868	MB992868	Spacer base	
 MB990643	MB990643	Rear suspension bushing base	
 MB990326	MB990326	Preload socket	Stabilizer link ball joint rotation torque measurement

ON-VEHICLE SERVICE

FRONT WHEEL ALIGNMENT CHECK AND ADJUSTMENT

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CAUTION

Perform a calibration for the ASC-ECU to learn the steering wheel sensor neutral point (Refer to GROUP 35C, On-vehicle Service – Steering Wheel Sensor Calibration) <Vehicles with ASC>.

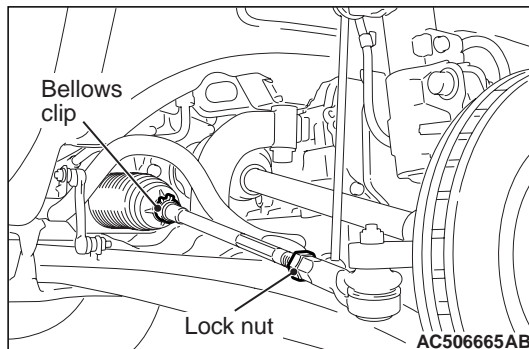
- Before the wheel alignment measurement, maintain the front suspension, the steering system and the wheel tyres in good condition.
- Park the vehicle on a level surface, and position the front wheel in the straight- ahead position to measure the wheel alignment.

TOE-IN

Standard value:

At the centre of tyre tread: 1 ± 2 mm

Toe-angle (per wheel): $0^{\circ}02' \pm 0^{\circ}04'$



1. Loosen the lock nut with tie-rod bellows clip removed, and then perform the adjustment by turning the tie-rod left/right at the same degree in the opposite direction.

NOTE: The toe moves to the outside by turning the tie-rod: left to the forward direction, and right to the reverse direction.

2. After adjustment, check that the steering angle is within the standard range using the turning radial gauge (GROUP 37 – On-vehicle Service, Steering Angle Check).

CAMBER·CASTER AND KINGPIN INCLINATION

CAMBER

Standard value: $0^{\circ}20' \pm 0^{\circ}30'$

CASTER

Standard value: $2^{\circ}35' \pm 0^{\circ}45'$

NOTE:

- Difference between right and left wheels must be $0^{\circ}30'$ or less.
- The camber and the caster are pre-adjusted at factory and not adjustable.

KINGPIN INCLINATION

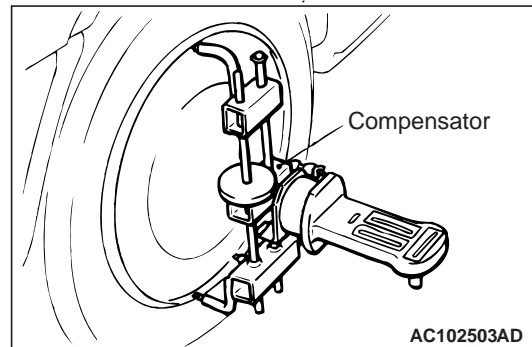
Standard value: $12^{\circ}45' \pm 1^{\circ}30'$

CAUTION

Do not apply the vehicle weight to the wheel bearing while loosening the driveshaft nut.

NOTE:

- The camber is pre-adjusted at factory and is not adjustable.



As for vehicles with aluminium wheel, use a compensator to measure the camber and caster.

LOWER ARM BALL JOINT LOOSENESS CHECK

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1. Raise the vehicle.
2. Move the lower arm vertically to inspect the ball joint for looseness in the axial direction. If there is looseness, replace the lower arm assembly (Refer to P.33-10).

BALL JOINT DUST COVER CHECK

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LOWER ARM BALL JOINT DUST COVER CHECK

1. Using your fingers, press the dust cover to check for a crack or damage.
2. If the dust cover has any crack or damage, replace the lower arm assembly (Refer to P.33-10).

NOTE: If the dust cover has a crack or damage, the ball joint could be damaged.

STABILIZER LINK BALL JOINT DUST COVER CHECK

1. Check the dust cover for cracks or damage by pushing it with your finger.

2. If the dust cover is cracked or damaged, replace the stabilizer link (Refer to [P.33-13](#)).

NOTE: If the dust cover has a crack or damage, the ball joint could be damage.

STRUT ASSEMBLY

REMOVAL AND INSTALLATION

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⚠ CAUTION

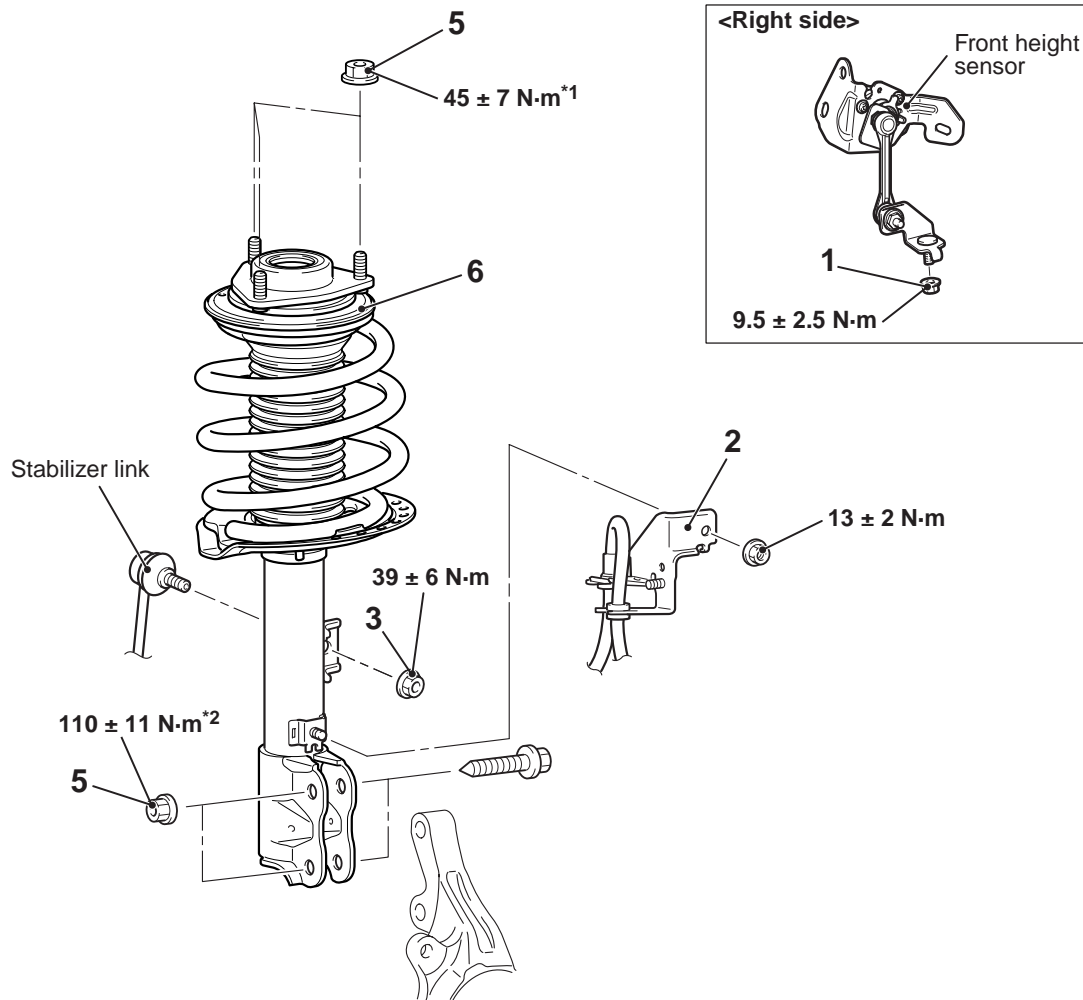
- The part indicated by * is the nut with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from the bearing and thread surfaces, and tighten it to the specified torque.

Pre-removal Operation

- Front Height Sensor Removal (Refer to GROUP 54A – Height Sensor). <Vehicles with discharge headlamp>

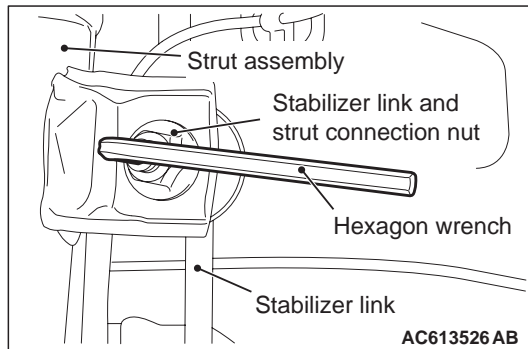
Post-installation Operation

- Front Height Sensor Installation (Refer to GROUP 54A – Height Sensor). <Vehicles with discharge headlamp>
- Front Wheel Alignment Check and Adjustment (Refer to [P.33-4](#)).

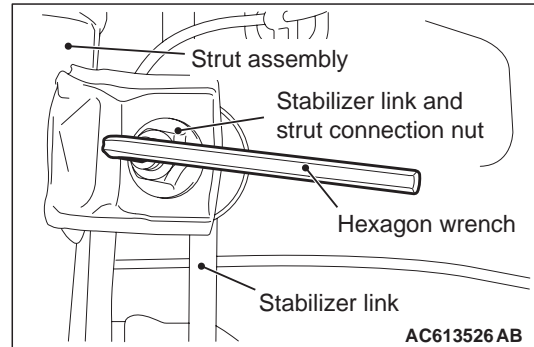


Removal steps

1. Front height sensor and lower arm connecting nut <Vehicles with discharge headlamp>
2. Brake hose bracket
- <<A>> >>A<< 3. Stabilizer link and strut connection nut
4. Knuckle and strut connection
5. Strut mounting nut
6. Strut assembly

REMOVAL SERVICE POINT**<<A>> STABILIZER LINK AND STRUT CONNECTION NUT REMOVAL**

Use a hexagon wrench to remove the stabilizer link and strut connection nut as shown in the figure.

INSTALLATION SERVICE POINT**>>A<< STABILIZER LINK AND STRUT CONNECTION NUT INSTALLATION**

Use a hexagon wrench to install the stabilizer link and strut connection nut as shown in the figure.

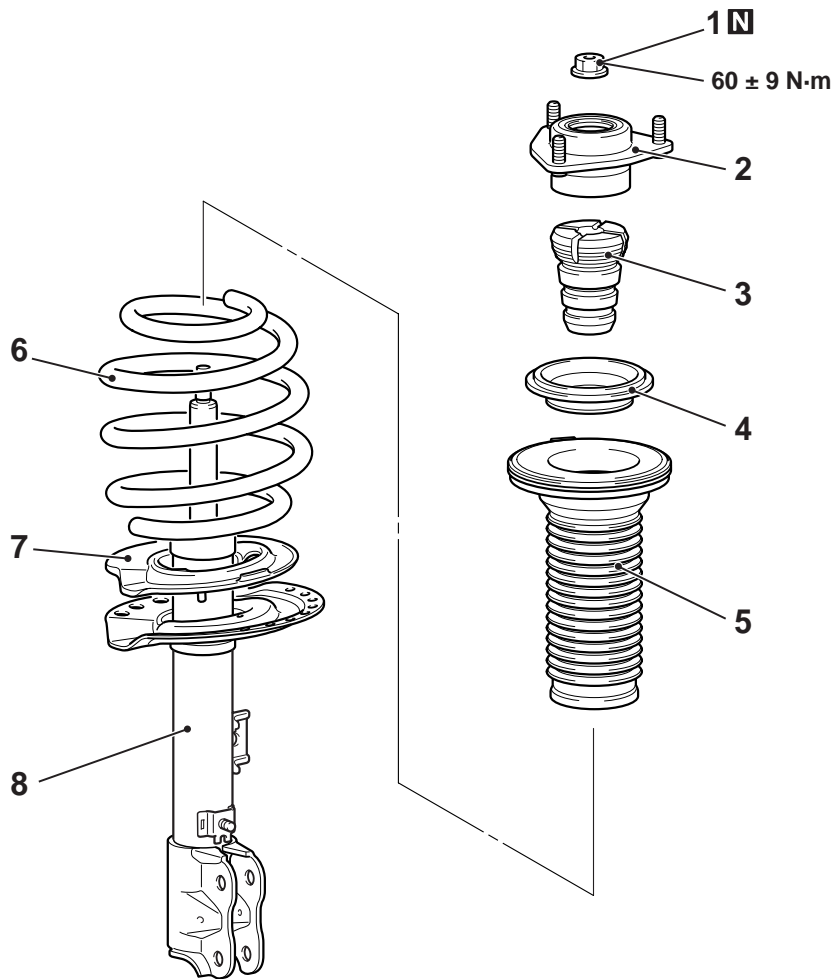
INSPECTION

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- Check for oil leaks from the strut assembly.
- Check the strut assembly for damage or deformation.

DISASSEMBLY AND REASSEMBLY

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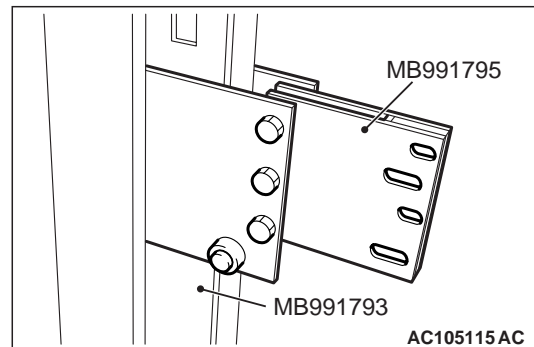
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- | | | |
|-------|-------|---------------------------------|
| <<A>> | >>C<< | 1. Strut nut (Self-locking nut) |
| | | 2. Strut insulator assembly |
| | | 3. Bump stopper |
| | >>B<< | 4. Strut bearing pad |
| | | 5. Upper spring pad |
| | >>A<< | 6. Coil spring |
| | | 7. Lower spring pad |
| <> | | 8. Strut |

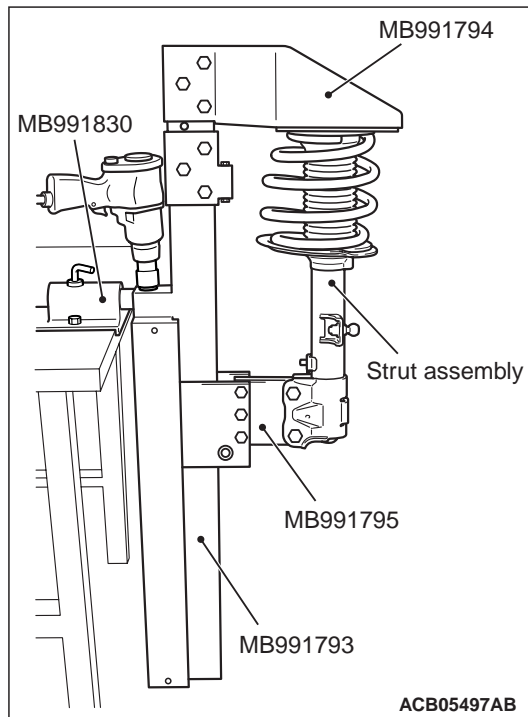
Disassembly steps

DISASSEMBLY SERVICE POINTS

<<A>> STRUT NUT (SELF-LOCKING NUT) REMOVAL



1. Install special tool attachment A (MB991795) to special tool spring compressor (MB991793) as shown in the figure.



2. Set the strut assembly to the following special tools:

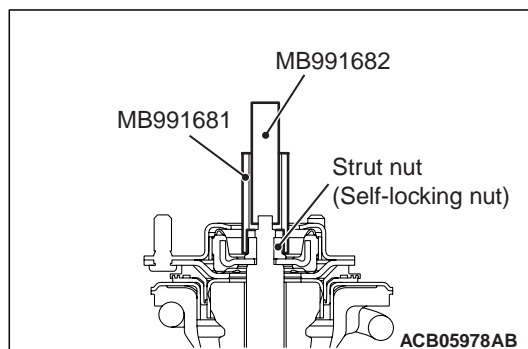
- Spring compressor (MB991793)
- Attachment A (MB991795)
- Upper plate (MB991794)
- Fixture (MB991830)

NOTE: Use the bolts and nuts removed from the vehicle to secure the strut assembly and tighten them lightly by hand.

3. After setting the strut assembly, operate the spring compressor and compress the coil spring by approximately 5 mm.

CAUTION

The locking nut for the piston rod inside the strut may be loose. Do not use the impact wrench to loosen the strut nut (self-locking nut).



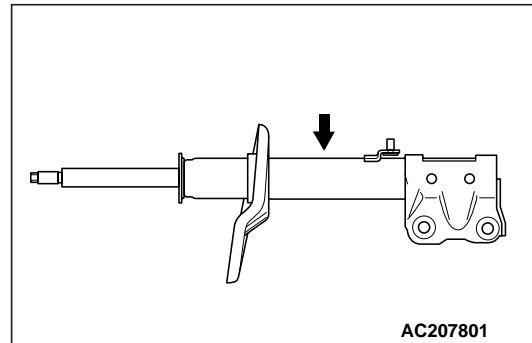
4. Use the following special tools to loosen the strut nut (self-locking nut):

- Wrench (MB991681)
- Socket (MB991682)

<> STRUT REMOVAL

CAUTION

Wear the protective glasses. Although the gas is harmless, drilling chips may be blown out by the gas.



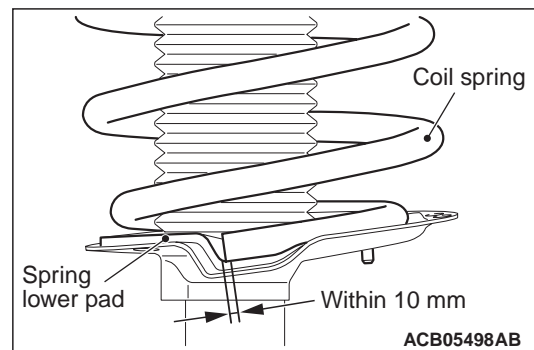
Before disposal of the strut, place the strut on the level surface with the piston rod extended, and make a hole of approximately 3 mm in diameter at the point shown in the figure to discharge the gas.

REASSEMBLY SERVICE POINTS

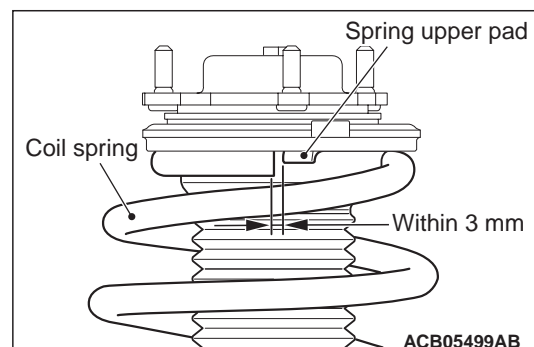
>>A<< COIL SPRING INSTALLATION

CAUTION

Make sure that the coil spring is seated properly in the concave groove of the spring pad.



1. Align the bottom end of the coil spring with the end of the recess in the spring lower pad.



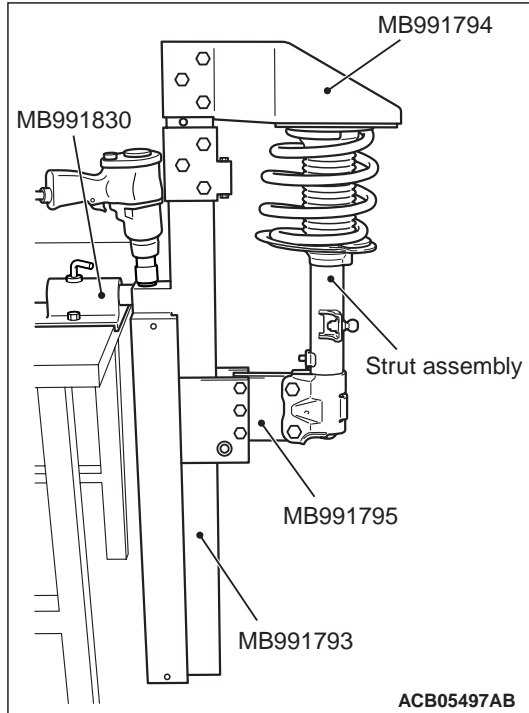
2. Align the top end of the coil spring with the end of the lug in the spring upper pad.

>>B<< STRUT BEARING INSTALLATION

⚠ CAUTION

Install the strut bearing without any damage.

>>C<< STRUT NUT (SELF-LOCKING NUT) INSTALLATION

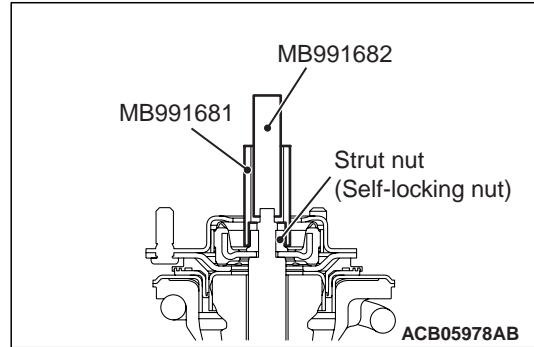


1. Use the following special tools to compress the coil spring gradually.:

- Spring compressor (MB991793)
- Attachment A (MB991795)
- Upper plate (MB991794)
- Fixture (MB991830)

⚠ CAUTION

The locking nut for the piston rod inside the strut may be loose. Do not use the impact wrench to loosen the strut nut (self-locking nut).



2. Use the following special tools to tighten the strut nut (self-locking nut) to the specified torque:

- Wrench (MB991681)
- Socket (MB991682)

Tightening torque: 60 ± 9 N·m

LOWER ARM

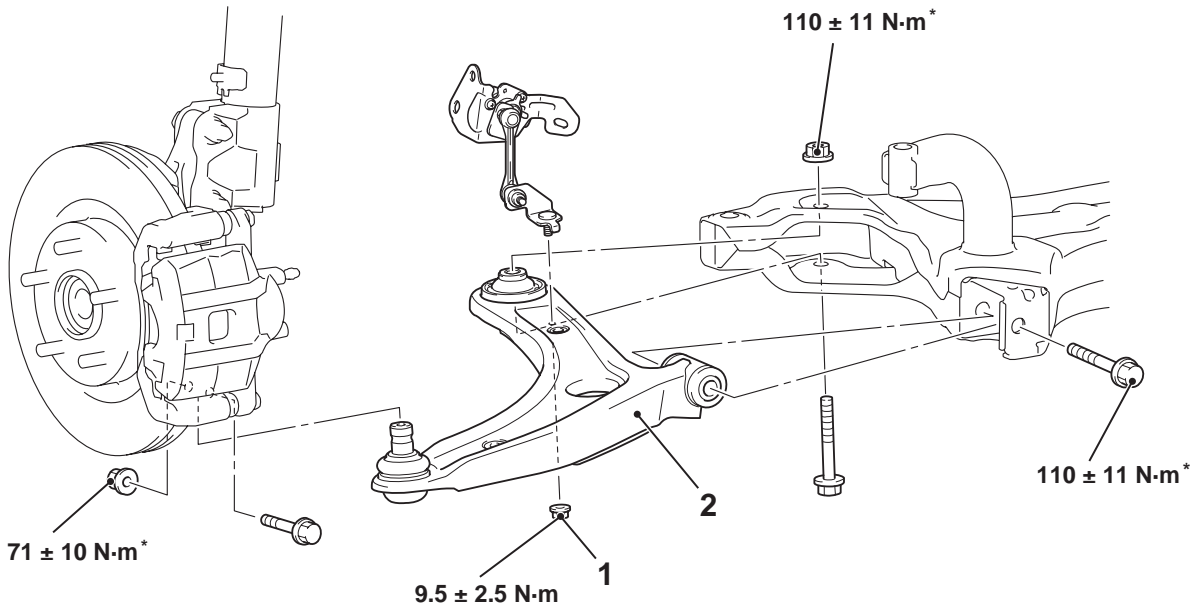
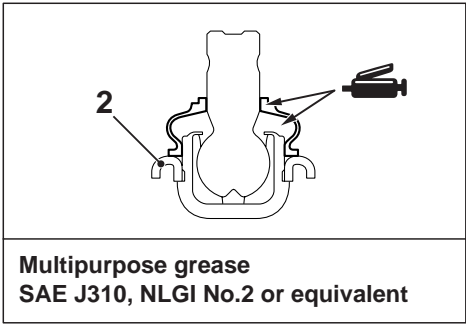
REMOVAL AND INSTALLATION

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CAUTION

The parts indicated by * are the bolts/nuts with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from the bearing and thread surfaces, and tighten them to the specified torque.

Pre-removal Operation Engine Room Side Cover Removal (Refer to GROUP 51 – Under Cover).	Post-installation Operation <ul style="list-style-type: none">Using Your Fingers, Press the Dust Cover to Check for a Crack or Damage.Engine Room Side Cover Installation (Refer to GROUP 51 – Under Cover).Wheel Alignment Check and Adjustment (Refer to P.33-4).Check the Beam Direction of the Headlamp (Refer to 54A – Headlamp Aiming).
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Removal steps

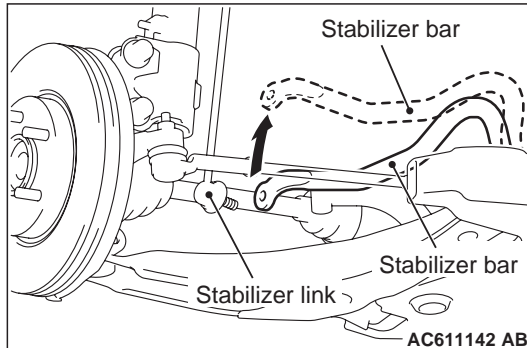
- Stabilizer link and stabilizer bar connection at both sides (Refer to P.33-13).

Removal steps (Continued)

- Front height sensor and lower arm connecting nut <Vehicles with headlamp automatic levelling system>
- Lower arm assembly

<<A>>

REMOVAL SERVICE POINT <<A>> LOWER ARM ASSEMBLY REMOVAL



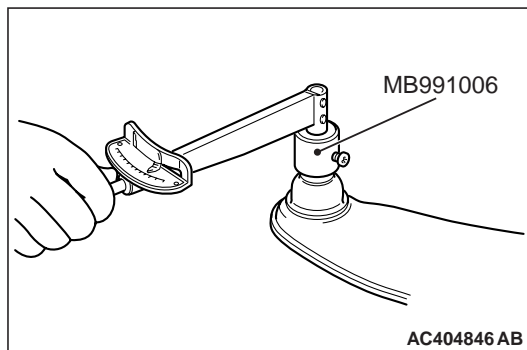
Rotate upward the stabilizer bar so as not to interfere the lower arm removal.

LOWER ARM CHECK

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- Check the bushing for wear and deterioration.
- Check the lower arm for bend or breakage.
- Check all bolts for condition and straightness.

LOWER ARM BALL JOINT ROTATION STARTING TORQUE



1. Move the lower arm ball joint stud back and forth for several times, and measure the lower arm ball joint rotation starting torque using special tool preload socket (MB991006).

Standard value: 0.3 – 9.0 N·m

2. If the measured value exceeds the standard range, replace the lower arm assembly (Refer to P.33-10).
3. Even if the measured value is within the standard range, check the lower arm ball joint that there is no looseness or gritty feeling. If there is no looseness or gritty feeling, it is judged as usable.

LOWER ARM BALL JOINT DUST COVER CHECK

(Refer to P.33-4)

LOWER ARM BALL JOINT DUST COVER REPLACEMENT

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Only when the dust cover is damaged accidentally during maintenance, replace the dust cover as follows:

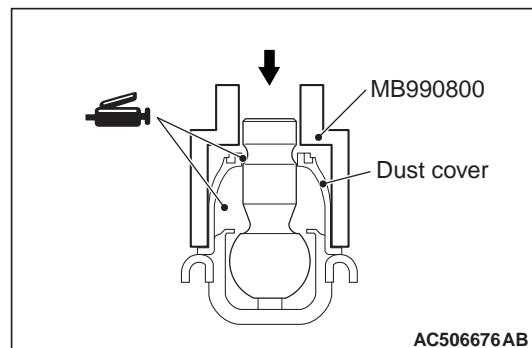
1. Remove the dust cover.
2. Fill and apply the specified grease into the inside and lip of the dust cover.

Specified grease

Multipurpose grease SAE J310, NLGI No.2 or equivalent

Usage:

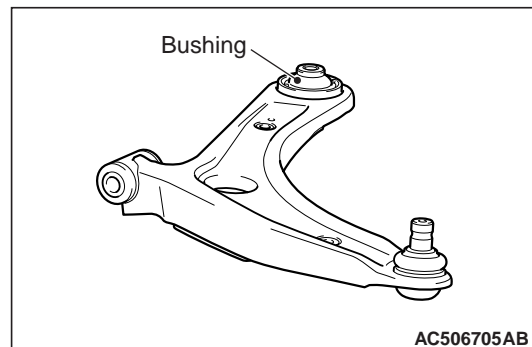
Inside of dust cover 9.0 ± 1.0 g, Lip: As required



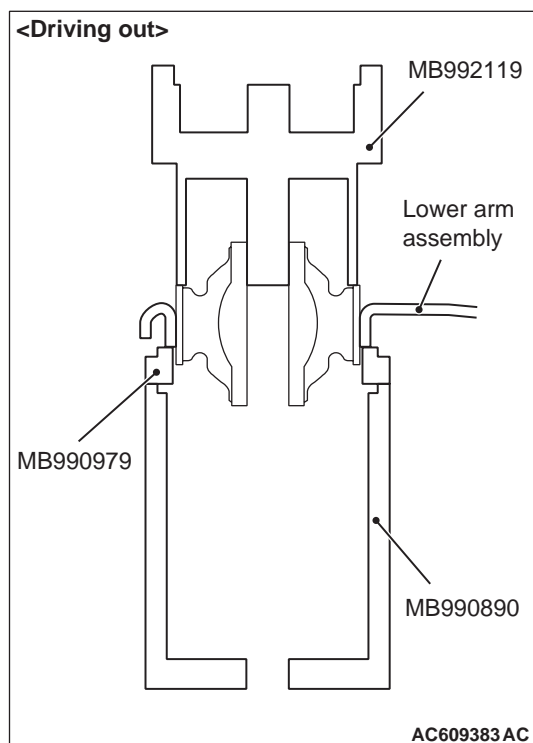
3. Use special tool ball joint remover & installer (MB990800) to drive in the dust cover to the point where it contact with the lower arm assembly.
4. Using your fingers, press the dust cover to check for a crack or damage.

LOWER ARM BUSHING REPLACEMENT

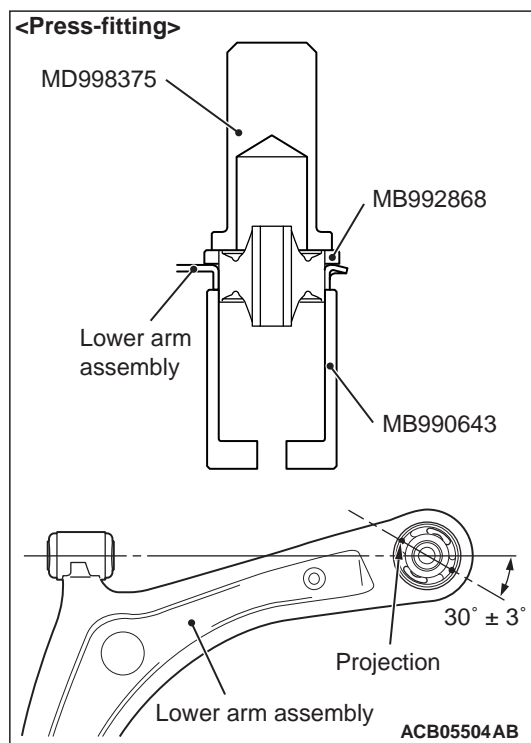
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Replace the back side bushing according to the following procedure.



1. Use the following special tools to remove the bushing:
 - Arm bushing remover and installer (MB992119)
 - Ring (MB990979)
 - Rear suspension bushing base (MB990890)



2. Use the following special tools to locate the front suspension lower arm bushing protrusion as shown in the figure. Press-fit the special tool until it reaches the lower arm assembly.
 - Arm bushing installer (MD998375)
 - Spacer base (MB992868)
 - Suspension bushing base (MB990643)

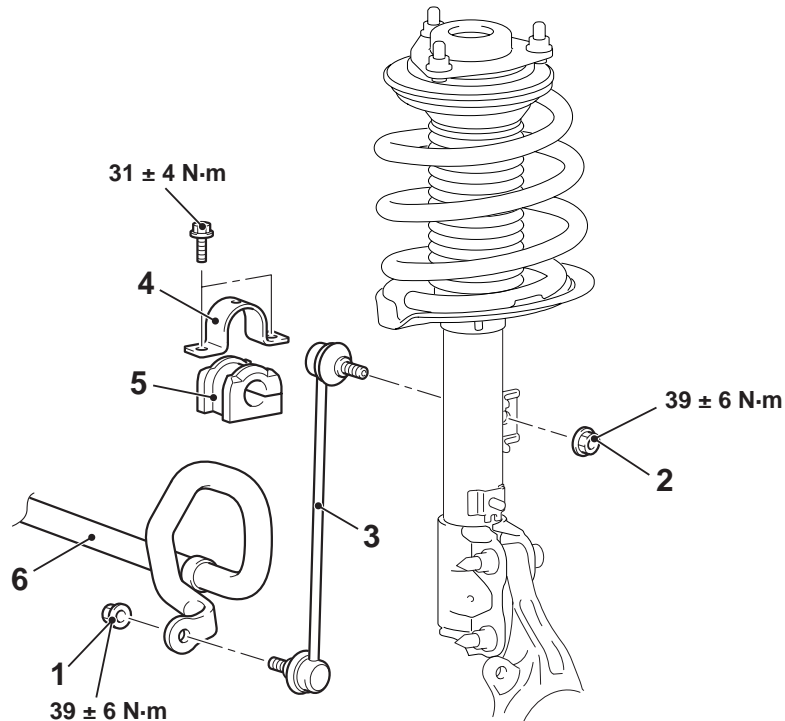
STABILIZER BAR

REMOVAL AND INSTALLATION

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Post-installation Operation

- Check the Dust Cover for Cracks or Damage by Pushing it with your finger.
- Front Wheel Alignment Check and Adjustment (Refer to P.33-4).



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Stabilizer link removal steps

- <<A>> >>C<< 1. Stabilizer link and stabilizer bar connection nut
- <<A>> >>C<< 2. Stabilizer link and strut connection nut
3. Stabiliser link

Stabilizer bushing removal steps

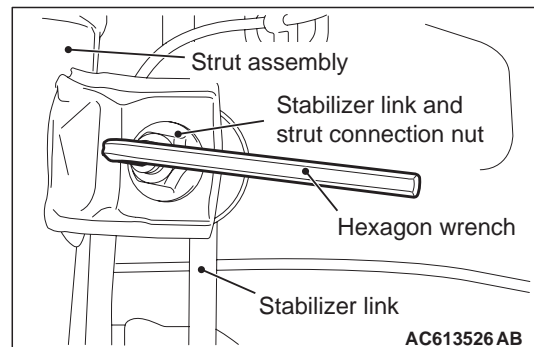
- <<A>> >>C<< 1. Stabilizer link and stabilizer bar connection nut
4. Stabilizer bar bracket
- >>B<< 5. Stabilizer bushing

Stabilizer bar removal steps

- <<A>> >>C<< 1. Stabilizer link and stabilizer bar connection nut
4. Stabilizer bar bracket
- >>B<< 5. Stabilizer bushing
- >>A<< 6. Stabilizer bar

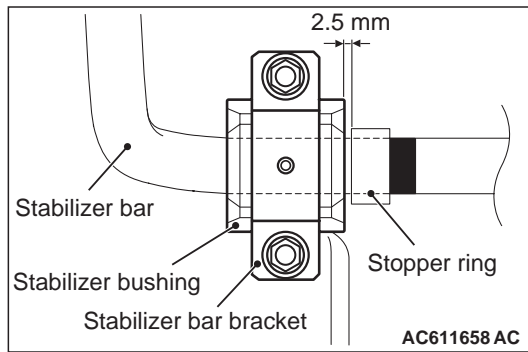
REMOVAL SERVICE POINT

<<A>> STABILIZER LINK AND STABILIZER BAR CONNECTION NUT/STABILIZER LINK AND STRUT CONNECTION NUT REMOVAL

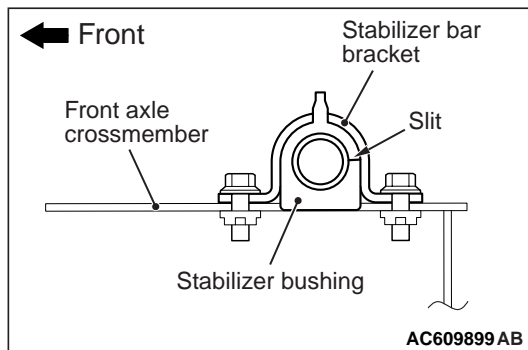


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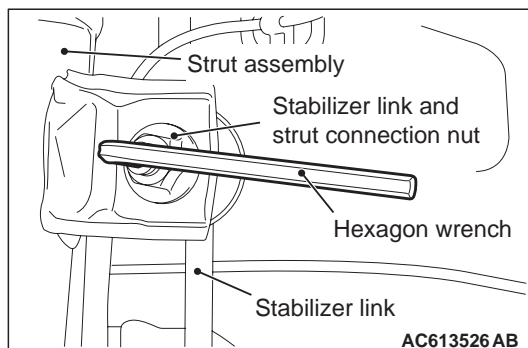
Use a hexagon wrench to remove the stabilizer link and strut connection nut as shown in the figure.

INSTALLATION SERVICE POINTS**>>A<< STABILIZER BAR INSTALLATION**

Install the stabilizer bar as shown in the figure.

>>B<< STABILIZER BUSHING INSTALLATION

Install the stabilizer bushing as shown in the figure.

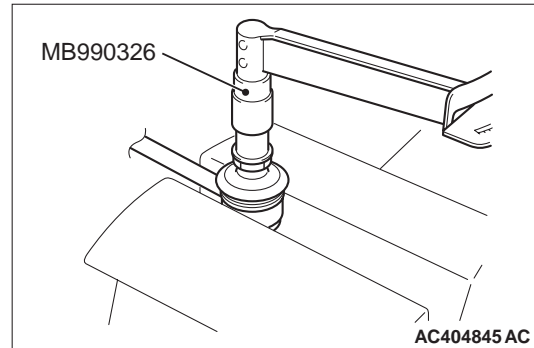
>>C<< STABILIZER LINK AND STABILIZER BAR CONNECTION NUT/STABILIZER LINK AND STRUT CONNECTION NUT INSTALLATION

Use a hexagon wrench to install the stabilizer link and strut connection nut as shown in the figure.

INSPECTION

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- Check the bushings for wear and deterioration.
- Check the stabilizer bar for deterioration or damage.
- Check all bolts for condition and straightness.

STABILIZER LINK BALL JOINT**ROTATION STARTING TORQUE CHECK**

1. Move the stabilizer link ball joint stud back and forth for several times, install the stud with nut, and measure the stabilizer link ball joint rotation starting torque using special tool preload socket (MB990326).

Standard value: 0.3 – 2.9 N·m

2. When the measured value exceeds the standard range, replace the stabilizer link (Refer to P.33-13).
3. When the measured value stays within the standard range, if there is any looseness or gritty feeling, it is judged as unusable and replaced.

STABILIZER LINK BALL JOINT DUST COVER CHECK

(Refer to P.33-4)