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## GROUP 33

# FRONT SUSPENSION

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## SERVICE SPECIFICATIONS

M1332000302195

Item	Standard value
Toe-in	At the centre of tyre tread mm
	Toe-in angle (per wheel)
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.

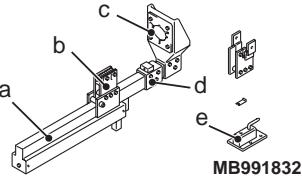
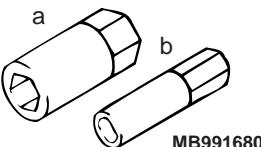
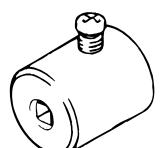
## LUBRICANT

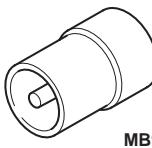
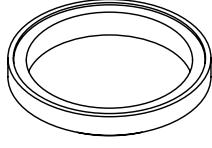
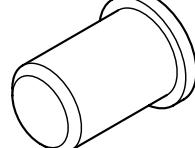
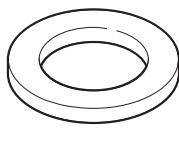
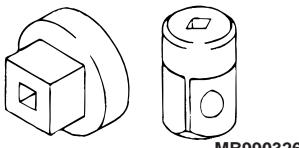
M1332000400389

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 : $9.0 \pm 1.0$ g Lip: As required

## SPECIAL TOOLS

M1332000601193

Tool	Number	Name	Use
	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 a. MB991681 b. MB991682	Wrench set a. Wrench b. Socket	Strut assembly disassembly and assembly
	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	Lower arm bushing removal
	MB990979	Ring	
 MB990890	MB990890	Rear suspension bushing base	
	MD998375	Arm bushing installer	Lower arm bushing press-fit
	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

M1332012400621

**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>.

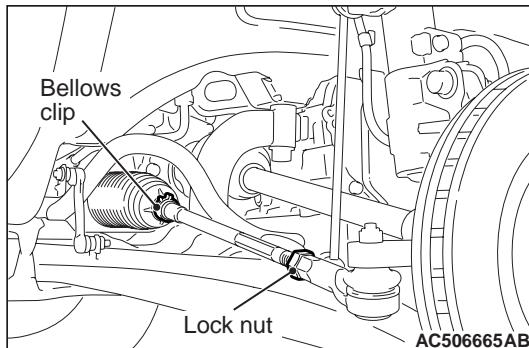
- Before the wheel alignment measurement, maintain the front suspension, the steering system and the wheel tyres in good condition.
- Park the vehicle on a level surface, and position the front wheel in the straight-ahead position to measure the wheel alignment.

## TOE-IN

**Standard value:**

At the centre of tyre tread:  $1 \pm 2$  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

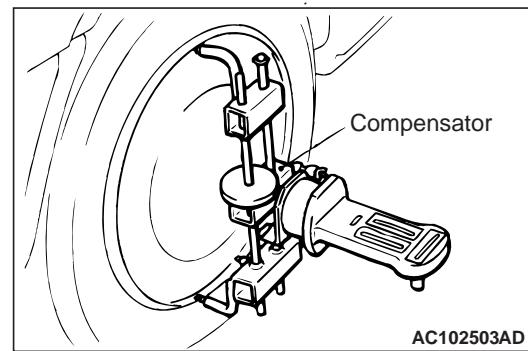
**Standard value:  $12^\circ 45' \pm 1^\circ 30'$**

**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

M1332015000387

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

M1332013200181

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

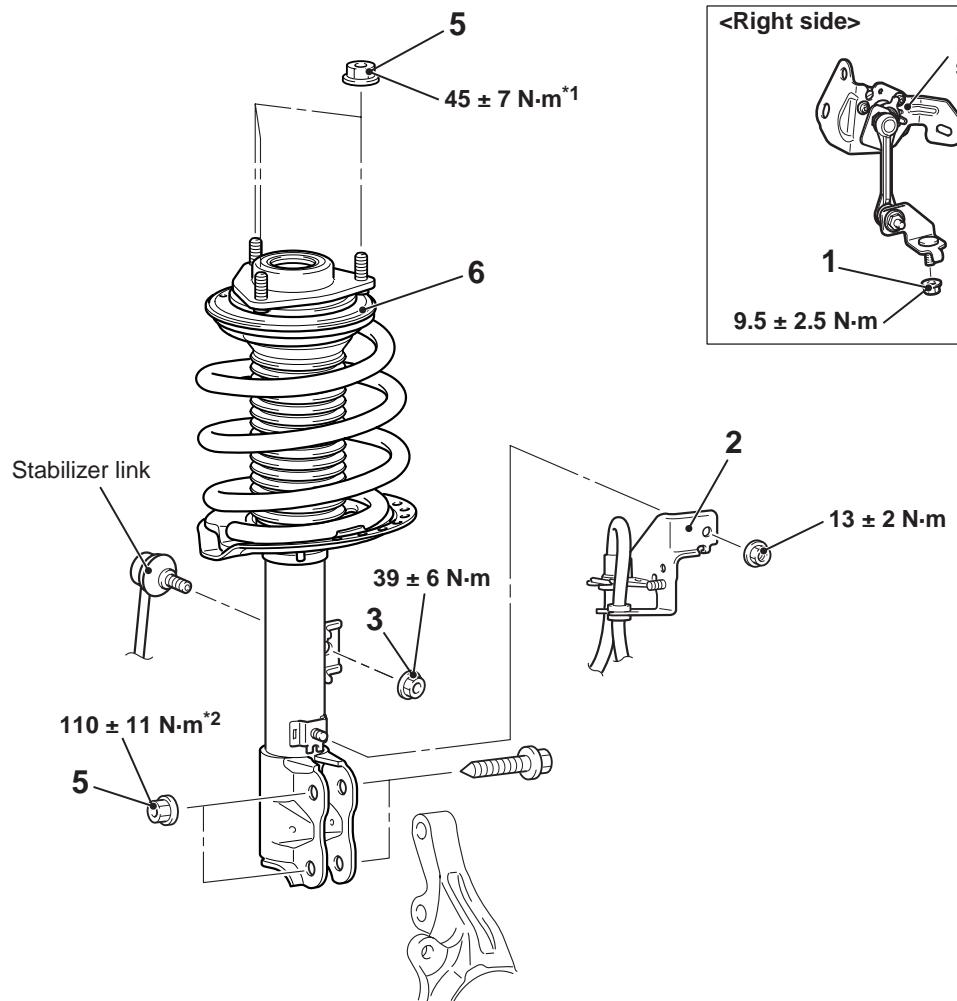
- The part indicated by \* is the nut with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from the bearing and thread surfaces, and tighten it to the specified torque.

#### Pre-removal Operation

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

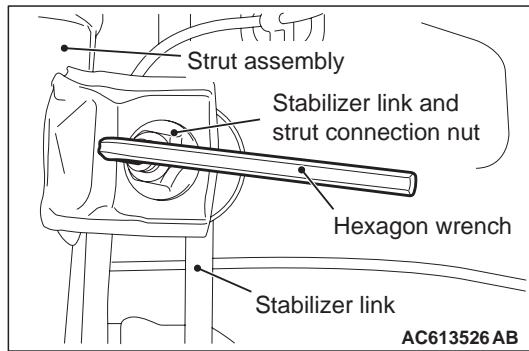
#### Post-installation Operation

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

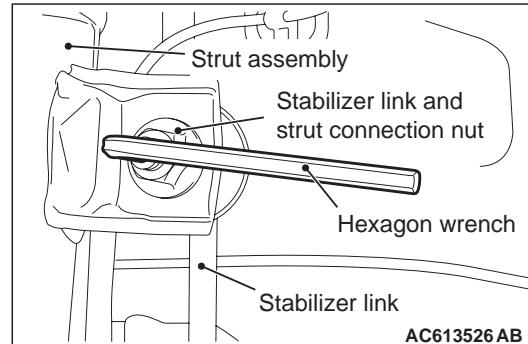


**Removal steps**

1. Front height sensor and lower arm connecting nut <Vehicles with discharge headlamp>  
 2. Brake hose bracket  
 <>A>> 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.

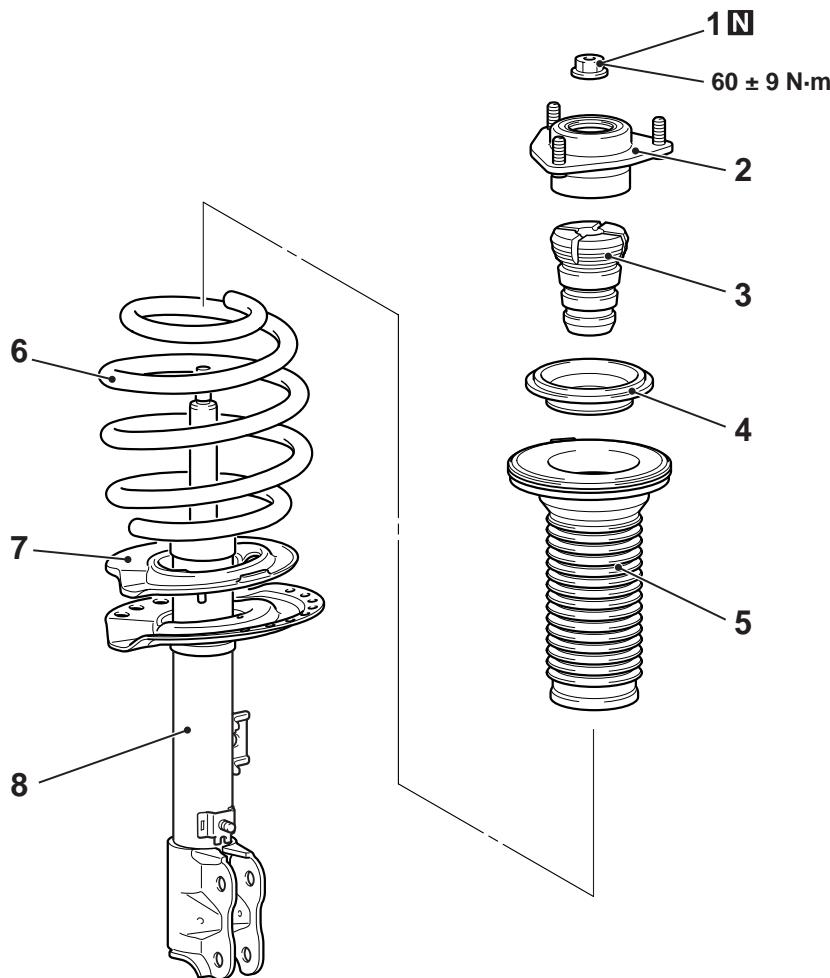
**INSPECTION**

M1332001200407

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

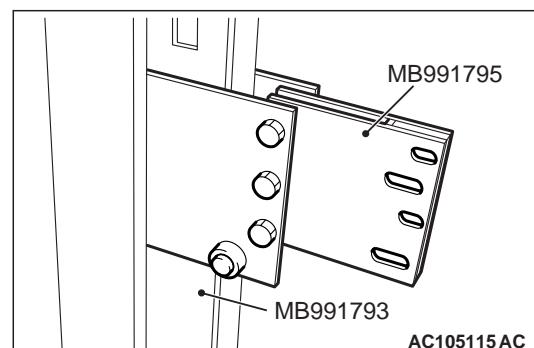
## DISASSEMBLY AND REASSEMBLY

M1332001301140

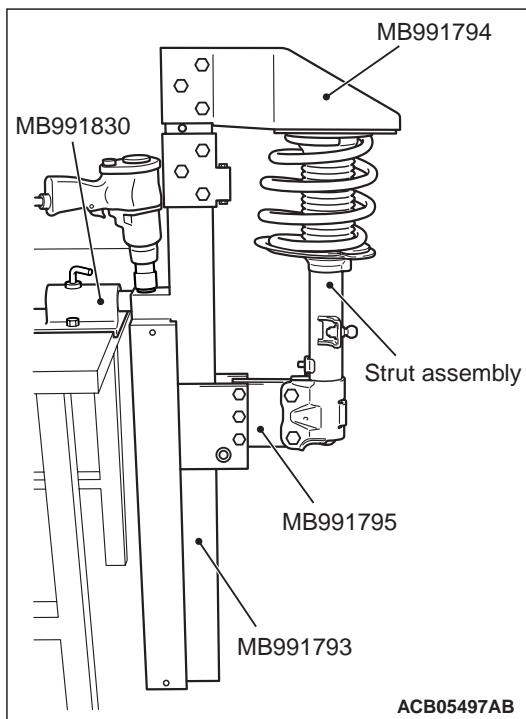


<<A>>	>>C<<	<b>Disassembly steps</b> <ol style="list-style-type: none"> <li>1. Strut nut (Self-locking nut)</li> <li>2. Strut insulator assembly</li> <li>3. Bump stopper</li> <li>4. Strut bearing</li> <li>5. Upper spring pad</li> <li>6. Coil spring</li> <li>7. Lower spring pad</li> <li>8. Strut</li> </ol>
>>B<<		
>>A<<		
<<B>>		

ACC00558AB

**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:

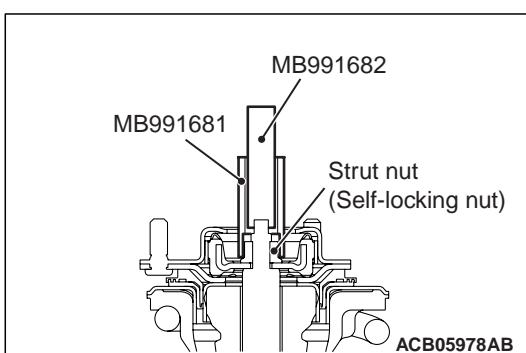
- Spring compressor (MB991793)
- Attachment A (MB991795)
- Upper plate (MB991794)
- Fixture (MB991830)

*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).



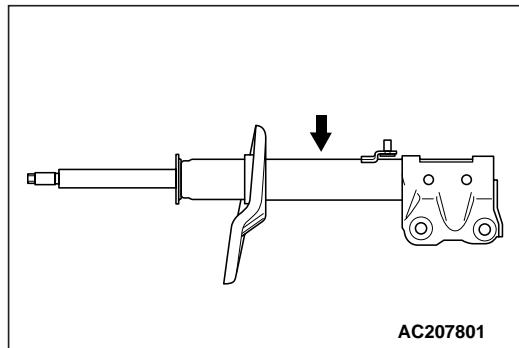
4. Use the following special tools to loosen the strut nut (self-locking nut):

- Wrench (MB991681)
- Socket (MB991682)

**<<B>> STRUT REMOVAL**

**CAUTION**

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



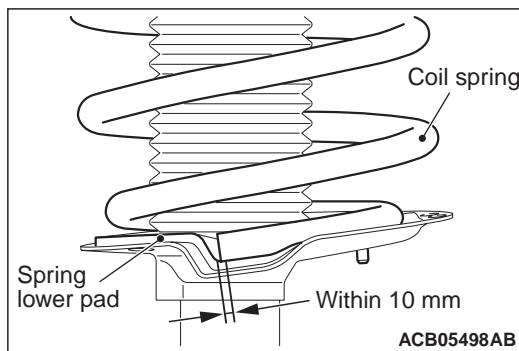
Before disposal of the strut, place the strut on the level surface with the piston rod extended, and make a hole of approximately 3 mm in diameter at the point shown in the figure to discharge the gas.

**REASSEMBLY SERVICE POINTS**

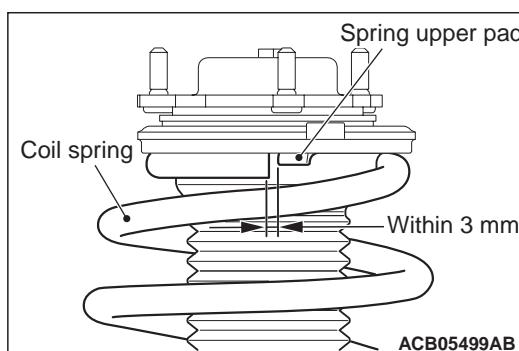
**>>A<< COIL SPRING INSTALLATION**

**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.

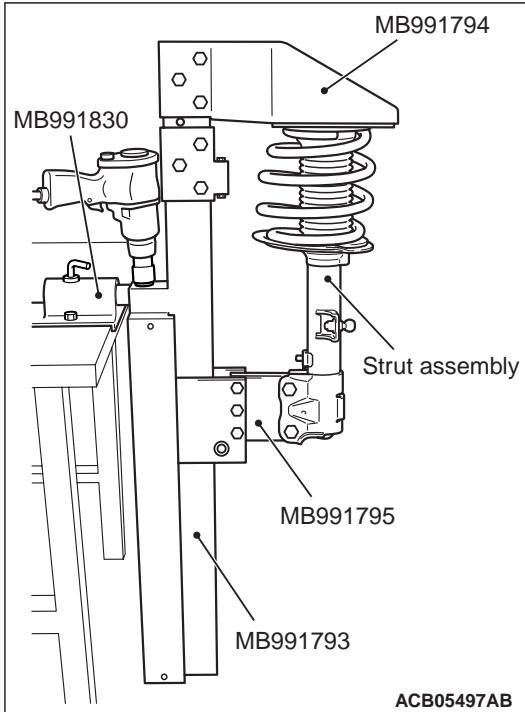


2. Align the top end of the coil spring with the end of the lug in the spring upper pad.

## &gt;&gt;B&lt;&lt; STRUT BEARING INSTALLATION

**CAUTION**

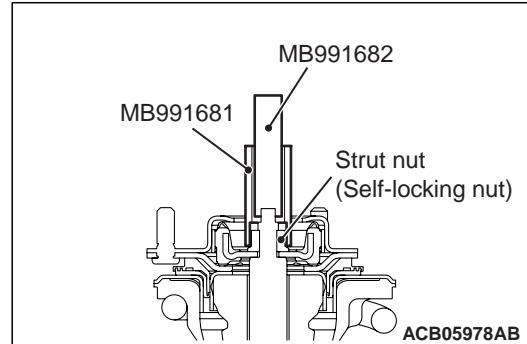
Install the strut bearing without any damage.

>>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:  $60 \pm 9 \text{ N}\cdot\text{m}$**

## LOWER ARM

## REMOVAL AND INSTALLATION

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**CAUTION**

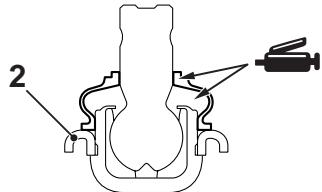
The parts indicated by \* are the bolts/nuts with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from the bearing and thread surfaces, and tighten them to the specified torque.

**Pre-removal Operation**

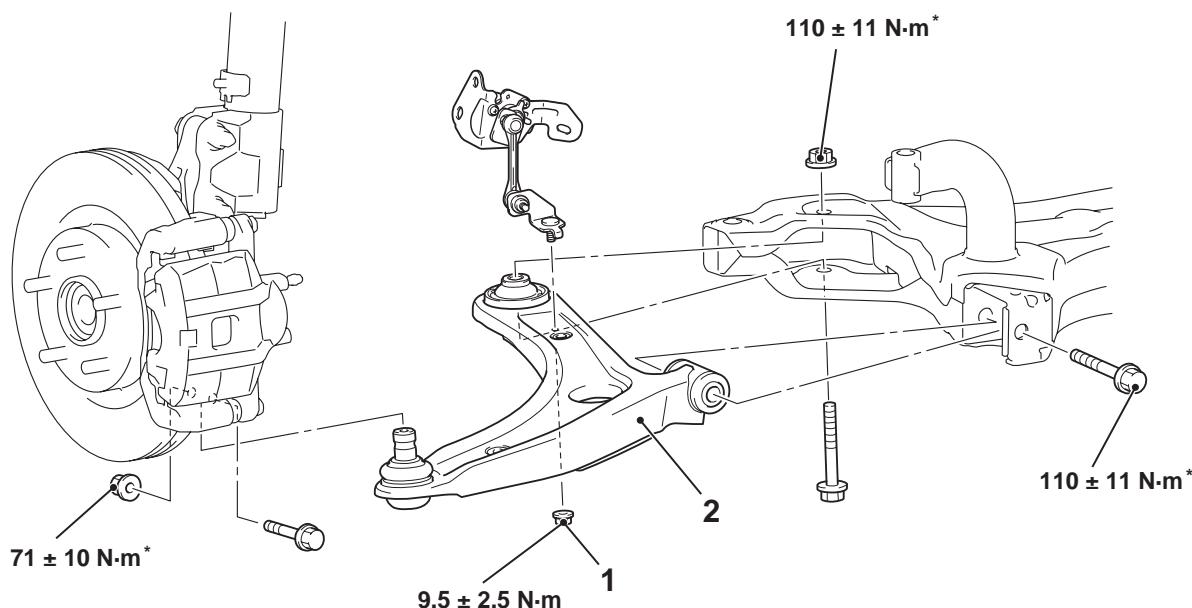
Engine Room Side Cover Removal (Refer to GROUP 51 – Under Cover ).

**Post-installation Operation**

- 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 ).



**Multipurpose grease**  
SAE J310, NLGI No.2 or equivalent



AC702291AI

**Removal steps**

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

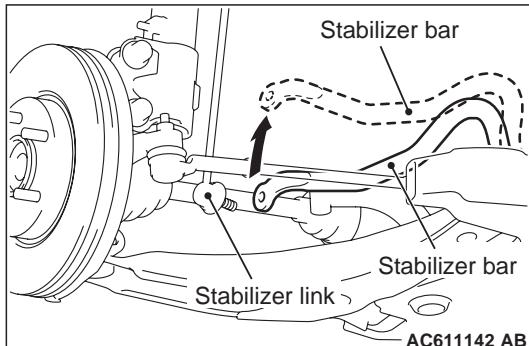
&lt;&lt;A&gt;&gt;

**Removal steps (Continued)**

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

## REMOVAL SERVICE POINT

### <<A>> LOWER ARM ASSEMBLY REMOVAL



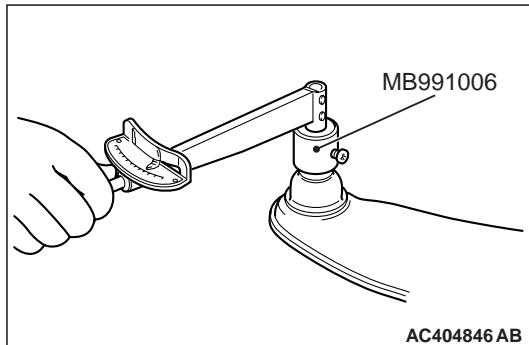
Rotate upward the stabilizer bar so as not to interfere the lower arm removal.

## LOWER ARM CHECK

M1332001701212

- 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

M1332020000145

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

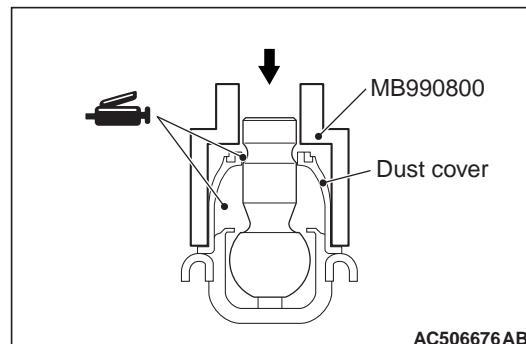
1. Remove the dust cover.
2. Fill and apply the specified grease into the inside and lip of the dust cover.

### Specified grease

**Multipurpose grease SAE J310, NLGI No.2 or equivalent**

### Usage:

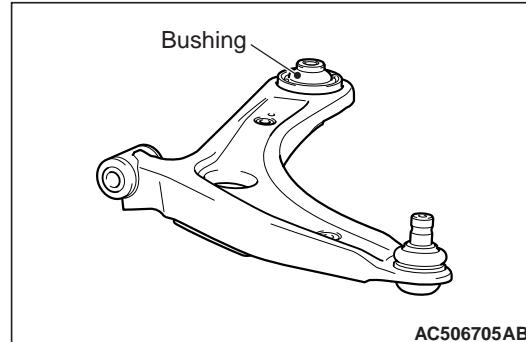
**Inside of dust cover 9.0 ± 1.0 g, Lip: As required**



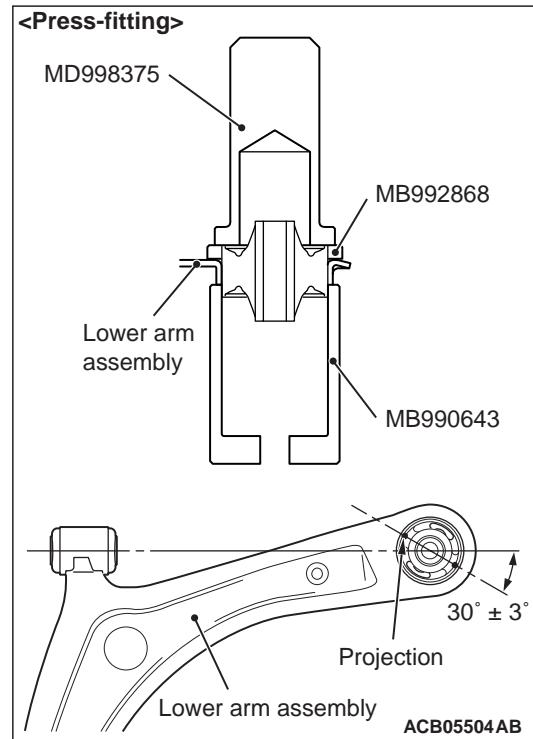
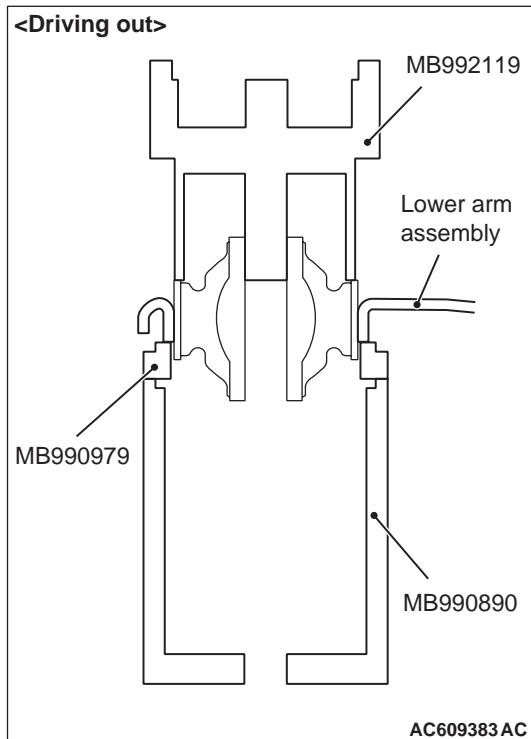
3. Use special tool ball joint remover & installer (MB990800) to drive in the dust cover to the point where it contact with the lower arm assembly.
4. Using your fingers, press the dust cover to check for a crack or damage.

## LOWER ARM BUSHING REPLACEMENT

M1332008101073



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)

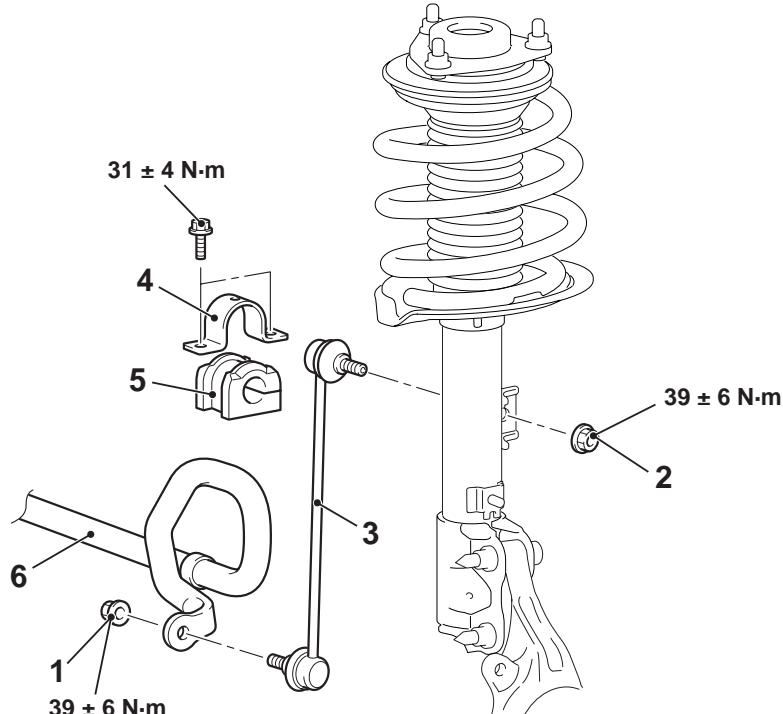
## STABILIZER BAR

## REMOVAL AND INSTALLATION

M1332001901034

## 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

<<A>>    >>C<<    3. Stabiliser link

**Stabilizer bushing removal steps**

<<A>>    >>C<<    1. Stabilizer link and stabilizer bar connection nut

<<A>>    >>B<<    4. Stabilizer bar bracket

<<A>>    >>B<<    5. Stabilizer bushing

**Stabilizer bar removal steps**

<<A>>    >>C<<    1. Stabilizer link and stabilizer bar connection nut

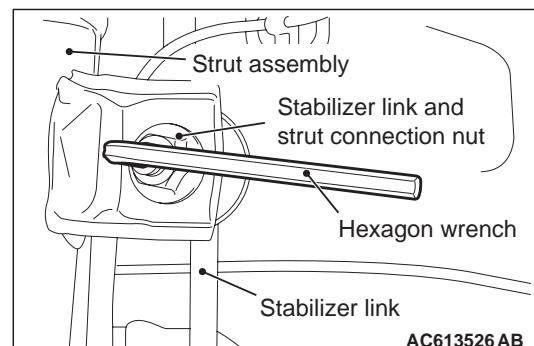
<<A>>    >>B<<    4. Stabilizer bar bracket

<<A>>    >>A<<    5. Stabilizer bushing

<<A>>    >>A<<    6. Stabilizer bar

## REMOVAL SERVICE POINT

## &lt;&lt;A&gt;&gt; STABILIZER LINK AND STABILIZER BAR CONNECTION NUT/STABILIZER LINK AND STRUT CONNECTION NUT REMOVAL

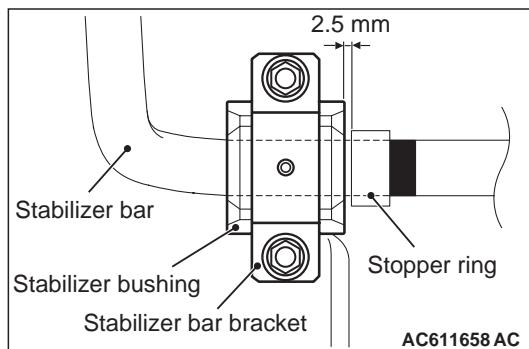


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Use a hexagon wrench to remove the stabilizer link and strut connection nut as shown in the figure.

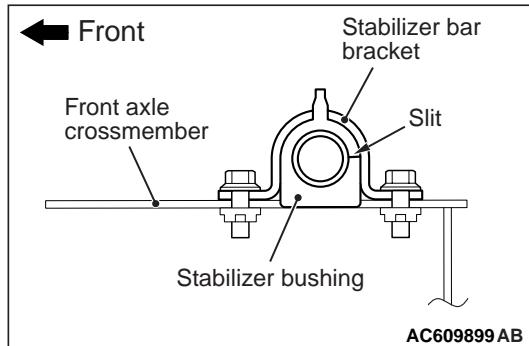
## INSTALLATION SERVICE POINTS

### >>A<< STABILIZER BAR INSTALLATION



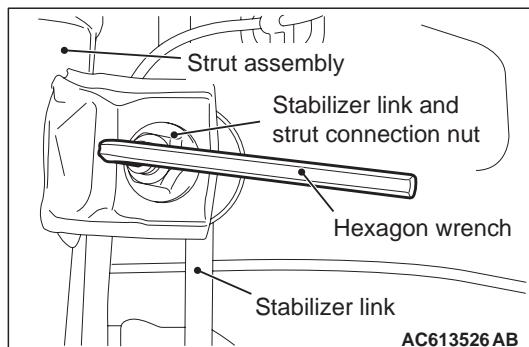
Install the stabilizer bar as shown in the figure.

### >>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



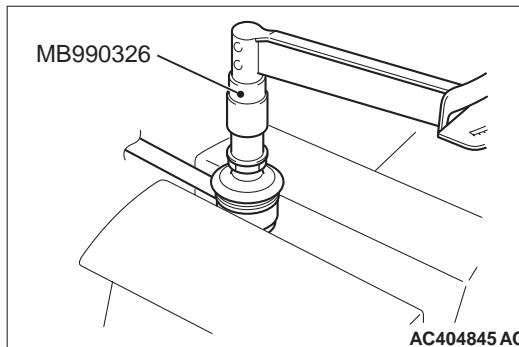
Use a hexagon wrench to install the stabilizer link and strut connection nut as shown in the figure.

## INSPECTION

M1332002000967

- 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](#))