GROUP 33

FRONT SUSPENSION

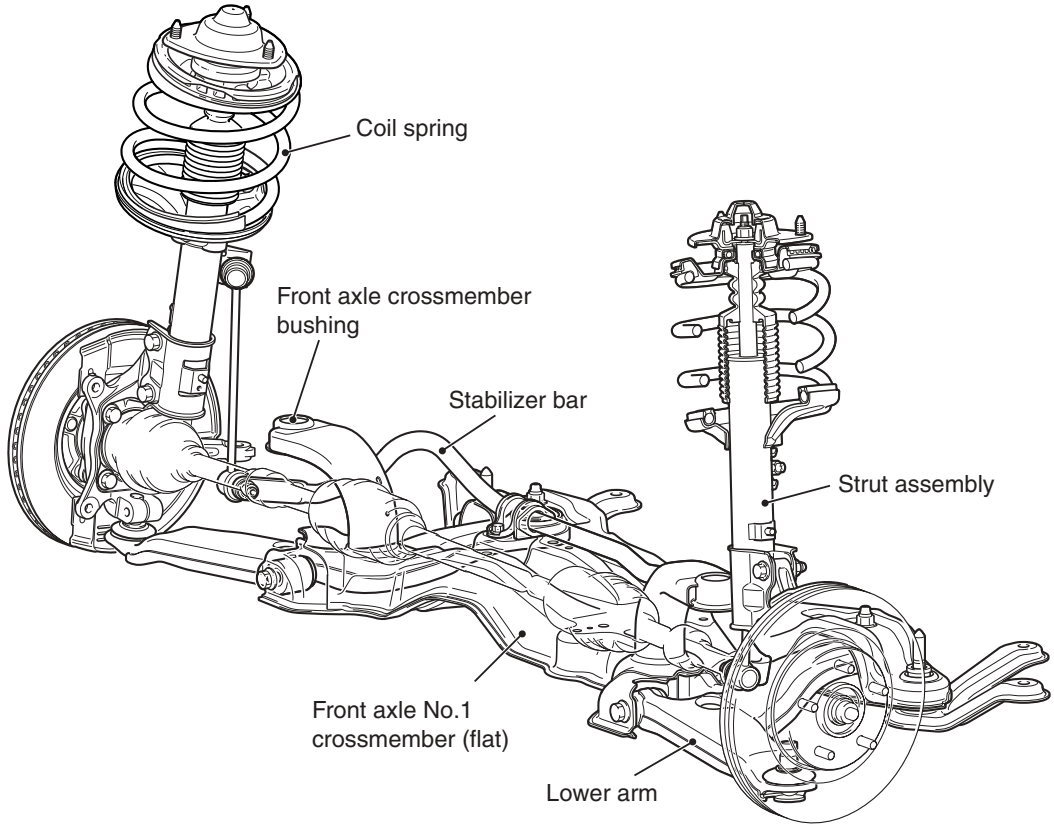
CONTENTS

GENERAL INFORMATION

M1332000100322

The front suspension is a McPherson strut with coil spring. The shock absorber is gas-filled hydraulic double-acting type.

CONSTRUCTION DIAGRAM



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SPECIFICATIONS

COIL SPRING

Item	Specification
Wire diameter mm	14
Average diameter mm	164-169
Free length mm	351 <A/T, M/T with dual sunroof>, 352<M/T>

SERVICE SPECIFICATIONS

M1332000300467

Item		Standard value
Toe-in	At the centre of tyre tread mm	0 ± 3
	Toe-angle (per wheel)	0° ± 08'
Toe-out angle on turns (inner wheel when outer wheel at 20°)		21°40'

Item			Standard value
Steering angle	Inner wheel	Vehicles with 16 inch wheel	39°30' ± 2°
		Vehicles with 17 inch wheel	36°30' ± 2°
	Outer wheel (reference)	Vehicles with 16 inch wheel	32°30'
		Vehicles with 17 inch wheel	30°50'
Camber			0°00' ± 30'*
Caster		Standard	2°46' ± 1°'*
		High ground clearance suspension	2°54' ± 1°'*
Kingpin inclination		Standard	13°12' ± 1°30'
		High ground clearance suspension	12°54' ± 1°30'
Lower arm ball joint starting torque N·m			0 – 6.6
Stabilizer link ball joint turning torque N·m			0 – 2.4

*NOTE: *: difference between right and left wheels must be less than 30'*

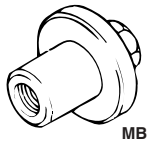
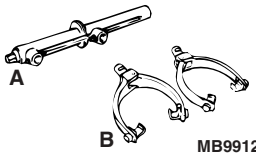
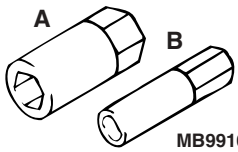
LUBRICANT

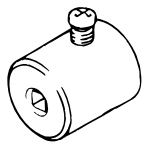
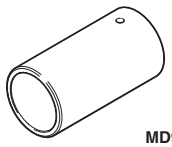
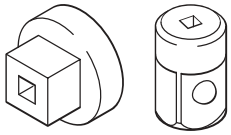
M1332000400185

Item		Specified lubricant	Quantity
Lower arm ball joint	Lip portion of dust cover	Multipurpose grease SAE J310, NLGI No.2 or equivalent	As required
	Inside of dust cover		10.0 ± 0.5 g

SPECIAL TOOLS

M1332000600361

Tool	Number	Name	Use
 MB991004	MB991004	Wheel alignment gauge attachment	Wheel alignment measurement <Vehicles with aluminium wheels>
 A B MB991237	A: MB991237 B: MB991238	A: Spring compressor body B: Arm set	Coil spring compression
 A B MB991680	MB991680 A: MB991681 B: MB991682	Wrench set A: Wrench B: Socket	Strut assembly disassembly and reassembly

Tool	Number	Name	Use
 MB991006	MB991006	Preload socket	Lower arm ball joint starting torque check
 MD998911	MD998911	Bearing installer	Lower arm ball joint dust cover installation
 MB990326	MB990326	Preload socket	Stabilizer link ball joint turning torque check

ON-VEHICLE SERVICE

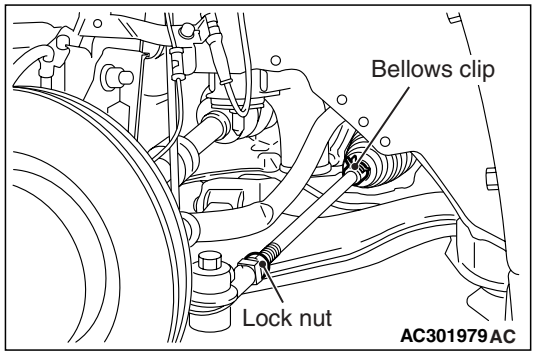
FRONT WHEEL ALIGNMENT CHECK AND ADJUSTMENT

M1331000900552

Measure wheel alignment with alignment equipment on a level surface. The front suspension, steering system, wheels, and tyres should be serviced to normal condition before measuring wheel alignment.

TOE-IN

Standard value:
at the centre of tyre tread: 0 ± 3 mm
Toe angle (per wheel): 0° ± 08'



1. Adjust the toe-in by undoing the bellows clip and lock nut, and turning the left and right tie rod turnbuckles by the same amount (in opposite directions).

   NOTE: The toe will move out as the left turnbuckle is turned toward the front of the vehicle and the right turnbuckle is turned toward the rear of the vehicle.

2. Install the bellows clip and tighten the lock nut to the specified torque.

   Tightening torque: 52 ± 2 N·m

3. Confirm that the toe-in is at the standard value.
4. Use a turning radius gauge to check that the steering angle is at the standard value.

   STEERING ANGLE
   Standard value:

<VEHICLES WITH 16 INCH WHEEL>

Item	Specification
Inner wheels	39°30' ± 2°
Outer wheels (reference)	32°30'

<VEHICLES WITH 17 INCH WHEEL>

Item	Specification
Inner wheels	36°30' ± 2°
Outer wheels (reference)	30°50'

TOE-OUT ANGLE ON TURNS

To check the steering linkage, especially after the vehicle has been involved in an accident or if an accident is presumed, it is advisable to check the toe-out angle on turns in addition to the wheel alignment.
Conduct this test on the left turn as well as on the right turn.

Standard value:

Item	Specification
Toe-out angle on turns (inner wheel when outer wheel at 20°)	21°40'

CAMBER, CASTER AND KINGPIN INCLINATION

Standard value:

Item	Specification
Camber	0°00' ± 30'*
Caster	2°46' ± 1°'* <Standard>, 2°54' ± 1°'* <High ground clearance suspension>
Kingpin inclination	13°12' ± 1°30'<Standard>, 12°54' ± 1°30' <High ground clearance suspension>

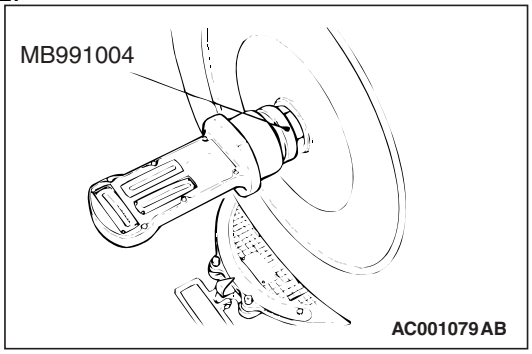
*NOTE: *: difference between right and left wheels must be less than 30'*

NOTE: Camber and caster are preset at the factory and cannot be adjusted.

⚠ CAUTION

Never subject the wheel bearings to the vehicle load when the driveshaft nuts are loosened.

NOTE:



For vehicles with aluminium wheels, attach the camber/caster/kingpin gauge to the driveshaft by using special tool wheel alignment gauge attachment (MB991004). Tighten the special tool to the same torque 245 ± 29 N·m as the driveshaft nut.

LOWER ARM BALL JOINT AXIAL PLAY CHECK

M1332011300104

1. Raise the vehicle.
2. Remove the stabilizer link from the lower arm.
3. Move the lower arm up and down with your hands to check for an excessive play in the axial direction of the ball joint. If there is an excessive play, replace the lower arm assembly.

BALL JOINT DUST COVER CHECK

M1332008600406

1. Press the dust cover with your finger to check that there are no cracks or damage in the dust cover.
2. If the dust cover is cracked or damaged, replace the lower arm assembly.

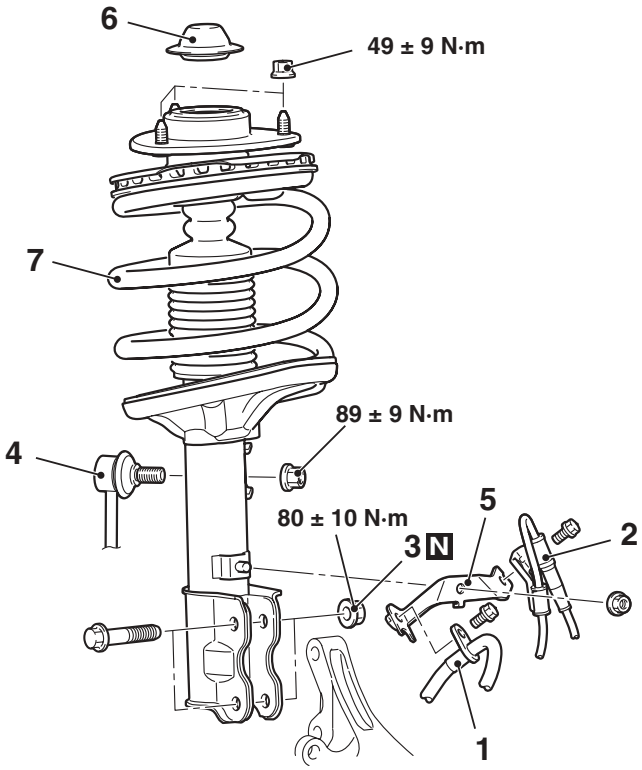
   NOTE: If the dust cover is cracked or damaged, it is possible that there may also be damage to the ball joint.

STRUT ASSEMBLY

REMOVAL AND INSTALLATION

M1332001100444

Pre-removal Operation	Post-installation Operation
• Front Deck Garnish (LH) Removal (Refer to GROUP 51, Windshield WiperP.51-22.) <Pre-removal of the strut assembly (LH)> • Front Deck Garnish (RH) and Windshield Wiper Motor Assembly Removal (Refer to GROUP 51, Windshield WiperP.51-22.) <Pre-removal of the strut assembly (RH)>	• Front Deck Garnish (RH) and Windshield Wiper Motor Assembly Installation (Refer to GROUP 51, Windshield WiperP.51-22.) <Post-installation of the strut assembly (RH)> • Front Deck Garnish (LH) Installation (Refer to GROUP 51, Windshield WiperP.51-22.) <Post-installation of the strut assembly (LH)> • Front Wheel Alignment Adjustment (Refer to P.33-4).



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Removal steps

1. Brake hose clamp (strut side)
2. Front wheel speed sensor clamp (strut side)
3. Knuckle and strut connection (self-locking nut)
4. Stabilizer link and strut connection
5. Brake hose bracket

Removal steps (Continued)

6. Strut cap
7. Strut assembly

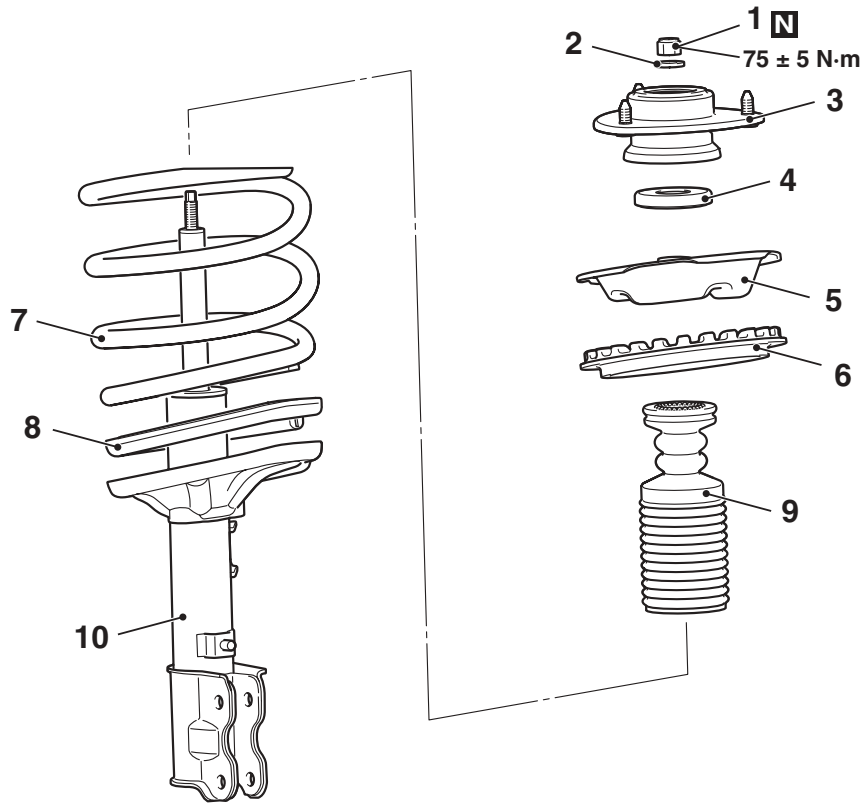
INSPECTION

M1332001200311

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

DISASSEMBLY AND REASSEMBLY

M1332001300448



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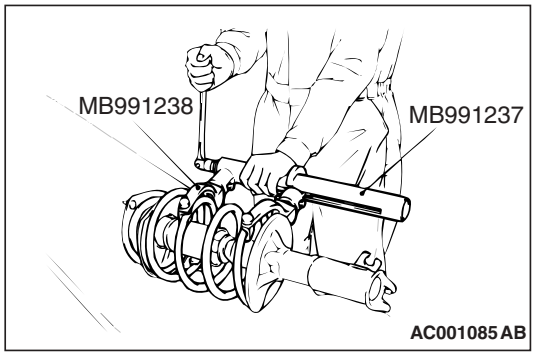
		Disassembly steps
<<A>> >>C<<	1.	Strut nut (self-locking nut)
	2.	Strut washer
	3.	Strut insulator assembly
>>B<<	4.	Strut bearing
	5.	Spring upper seat
	6.	Spring upper pad
>>A<<	7.	Coil spring
	8.	Spring lower pad
	9.	Strut damper
<<B>>	10.	Strut assembly

DISASSEMBLY SERVICE POINTS

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

⚠ CAUTION

- **Install special tool arm set (MB991238) evenly, and so that the maximum length will be attained within the installation range.**
- **Do not use an impact wrench to tighten the bolt of special tool spring compressor body (MB991237), otherwise the special tool will break.**



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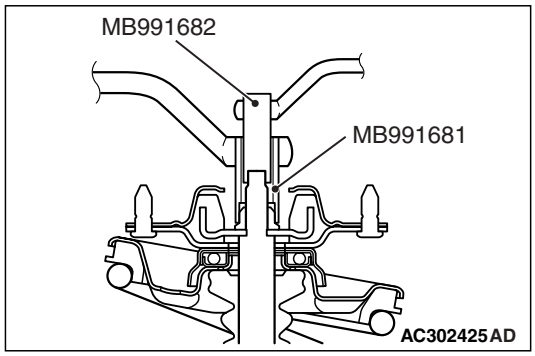
1. Use following special tools to compress the coil spring.
   - Arm set (MB991795)
   - Spring compressor (MB991237)

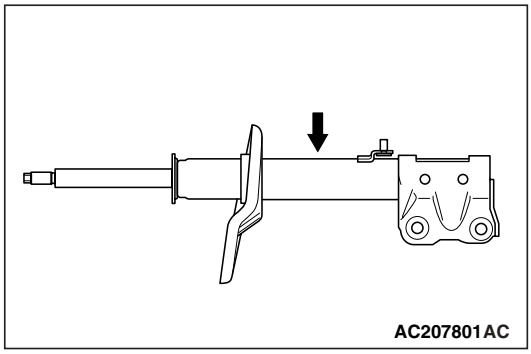
⚠ CAUTION
Do not use an impact wrench to loosen the strut nut (self-locking nut), otherwise the strut inner piston rod locking nut will be loosened.



2. Use the following special tools to loose the strut nut (self-locking nut), and then remove it.
   - Wrench (MB991681)
   - Socket (MB991682)

<<B>> STRUT ASSEMBLY DISPOSAL

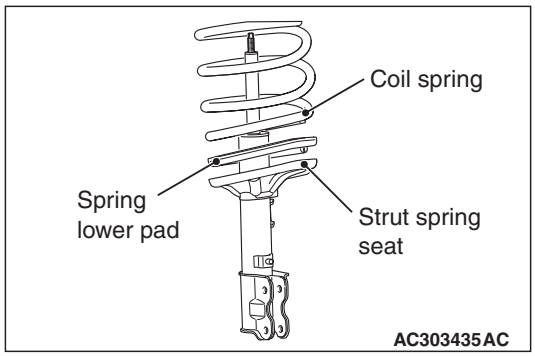
⚠ WARNING
Wear goggles when drilling to protect your eyes from flying metal debris.



The gas must be discharged from the strut assembly before discarding it. Place the strut assembly horizontally with its piston rod extended. Then drill a hole of approximately 3 mm in diameter at the location shown in the illustration and discharge the gas.

REASSEMBLY SERVICE POINT

>>A<< COIL SPRING INSTALLATION



1. Make sure that the coil spring is mounted in the spring lower pad.
2. Install the coil spring by aligning the coil spring lower end with the strut spring seat.

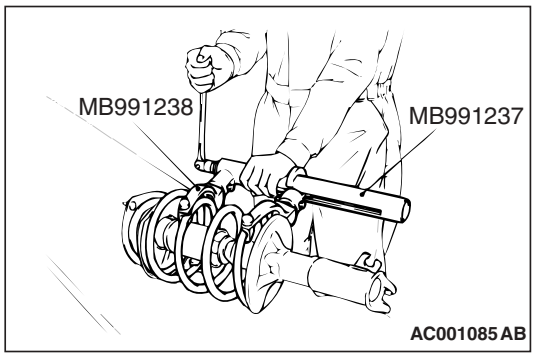
>>B<< STRUT BEARING INSTALLATION

⚠ CAUTION
Install the strut bearing so as not to be damaged.

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

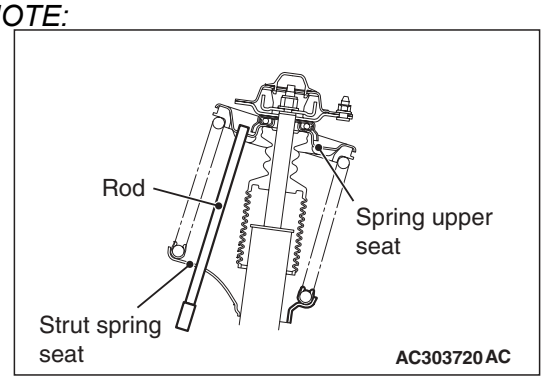
1. Ensure that the bearing is seated correctly.

⚠ CAUTION
Do not use an impact wrench to tighten the bolt of special tool spring compressor body (MB991237), otherwise the special tool will break.



2. Install following special tools to the strut assembly same as its removal.
   - Spring compressor (MB991237)
   - Arm set (MB991238)
3. While the coil spring is being compressed by the special tools, temporarily tighten the strut nut (self-locking nut).
4. Align the hole in the strut spring lower seat with the hole in the spring upper seat.

NOTE:

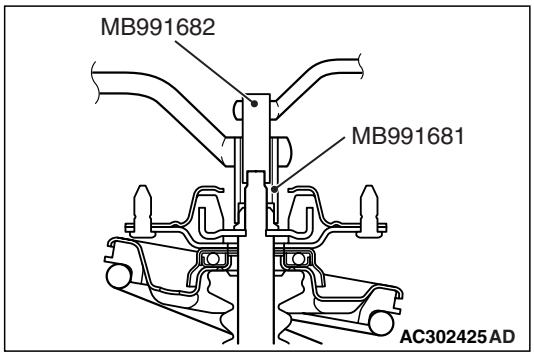


Using a rod as shown facilitates the alignment.

5. Align lower end of the coil spring with the groove in the spring lower seat, and then loosen the special tools.

⚠ CAUTION

Do not use an impact wrench to tighten the strut nut (self-locking nut), otherwise the strut inner piston rod locking nut will be loosened.



6. Using the following special tools, tighten the strut nut (self-locking nut) to 75 ± 5 N·m.
   - Wrench (MB991681)
   - Socket (MB991682)

INSPECTION

M1332001400230

- Check the bearing for wear or rust.
- Check the rubber parts for damage or deterioration.
- Check the spring for deformation, deterioration or damage.
- Check the shock absorber for deformation.

LOWER ARM

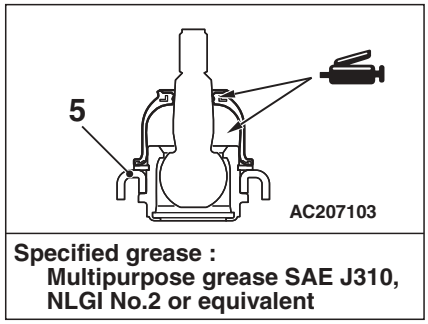
REMOVAL AND INSTALLATION

M1332001600449

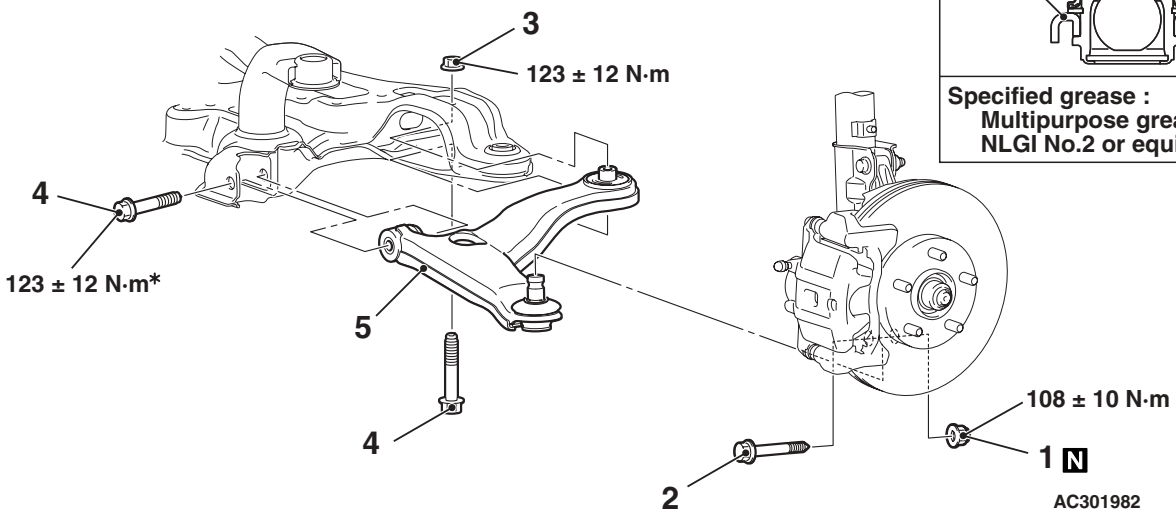
⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in an unladen condition.**

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.)



Specified grease :
Multipurpose grease SAE J310, NLGI No.2 or equivalent



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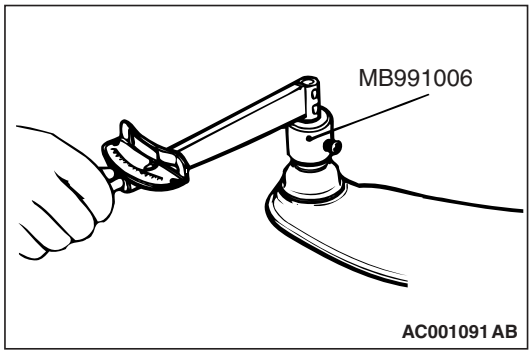
Removal steps
1. Lower arm nut (self-locking nut)
2. Lower arm bolt
3. Lower arm nut
4. Lower arm bolt
5. Lower arm assembly

INSPECTION

M1332001700349

- 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 STARTING TORQUE CHECK



1. After shaking the ball joint stud several times, use special tool preload socket (MB991006) to measure the starting torque of the ball joint.

   Standard value: 0 – 6.6 N·m

2. If the measured value is not within the standard value, or if the ball joint is difficult to turn or does not turn smoothly, replace the lower arm assembly.

LOWER ARM 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 lower arm assembly.

   NOTE: Cracks or damage to the dust cover may cause damage to the ball joint. When it is damaged during service work, replace the dust cover.

BALL JOINT DUST COVER REPLACEMENT

M1332008200323

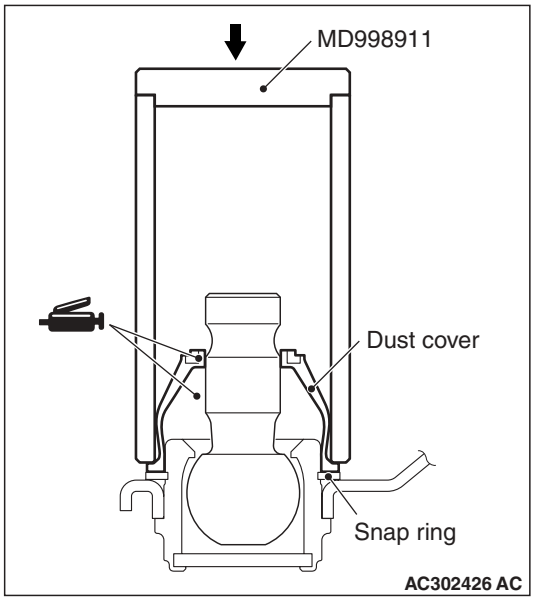
If the dust cover is damaged accidentally during service work, replace the dust cover as follows:

1. Remove the dust cover.
2. Apply specified grease to the lip and the inside of a new dust cover.

   Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent

   Amount used for lip portion of dust cover: As required

   Amount used for the inside the dust cover: 10.0 ± 0.5 g



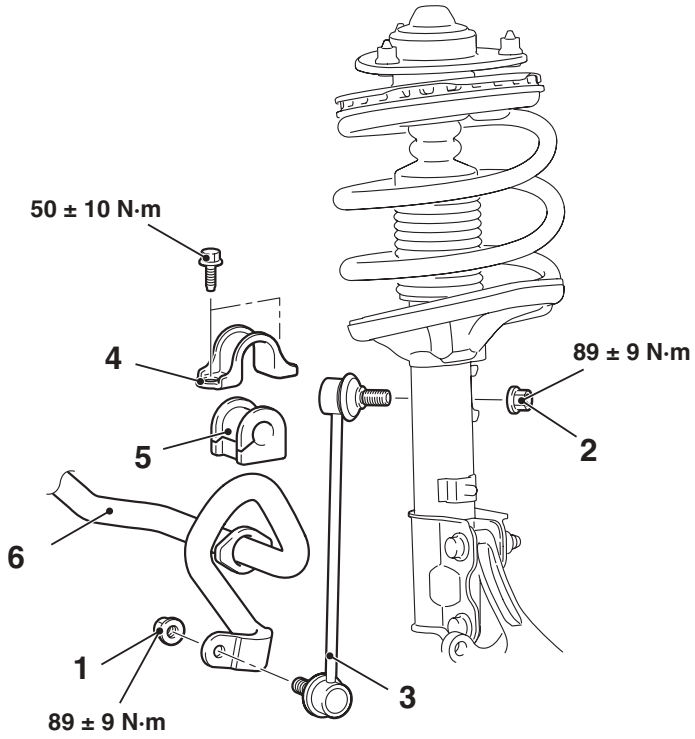
3. Using special tool bearing installer (MD998911), drive in the dust cover until it is seated on the snap ring.
4. Check the dust cover for cracks or damage by pushing it with your finger.

STABILIZER BAR

REMOVAL AND INSTALLATION

M1332004000402

Post-installation Operation
² Front Wheel Alignment Check and Adjustment (Refer to P.33-4.)



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Stabilizer link removal steps
1. Stabilizer nut
2. Stabilizer nut
3. Stabilizer link

Stabilizer bushing removal steps
1. Stabilizer nut
- Exhaust pipe hanger bracket (Refer to GROUP 15, Exhaust pipe and main muffler P.15-9.)
4. Stabilizer bar bracket
5. Stabilizer bushing

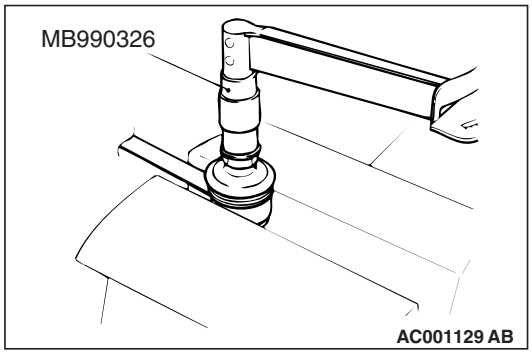
Stabilizer bar removal steps
1. Stabilizer nut
- Crossmember (Refer to GROUP 32, Crossmember P.32-8.)
4. Stabilizer bar bracket
5. Stabilizer bushing
6. Stabilizer bar

INSPECTION

M1332002000332

- 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 TURNING TORQUE CHECK



1. After shaking the ball joint stud several times, install the nut to the stud and use special tool preload socket (MB990326) to measure the turning torque of the ball joint.

   Standard value: 0 – 2.4 N·m

2. When the measured value exceeds the standard value, replace the stabilizer link.
3. Although the measured value is within the standard value, if the ball joint is difficult to turn or does not turn smoothly, replace the stabilizer link.

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.

   NOTE: Cracks or damage of the dust cover may cause damage to the ball joint.