GROUP 33

FRONT SUSPENSION

CONTENTS

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

⚠ WARNING

- ***Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).***
- ***Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.***
- ***MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.***

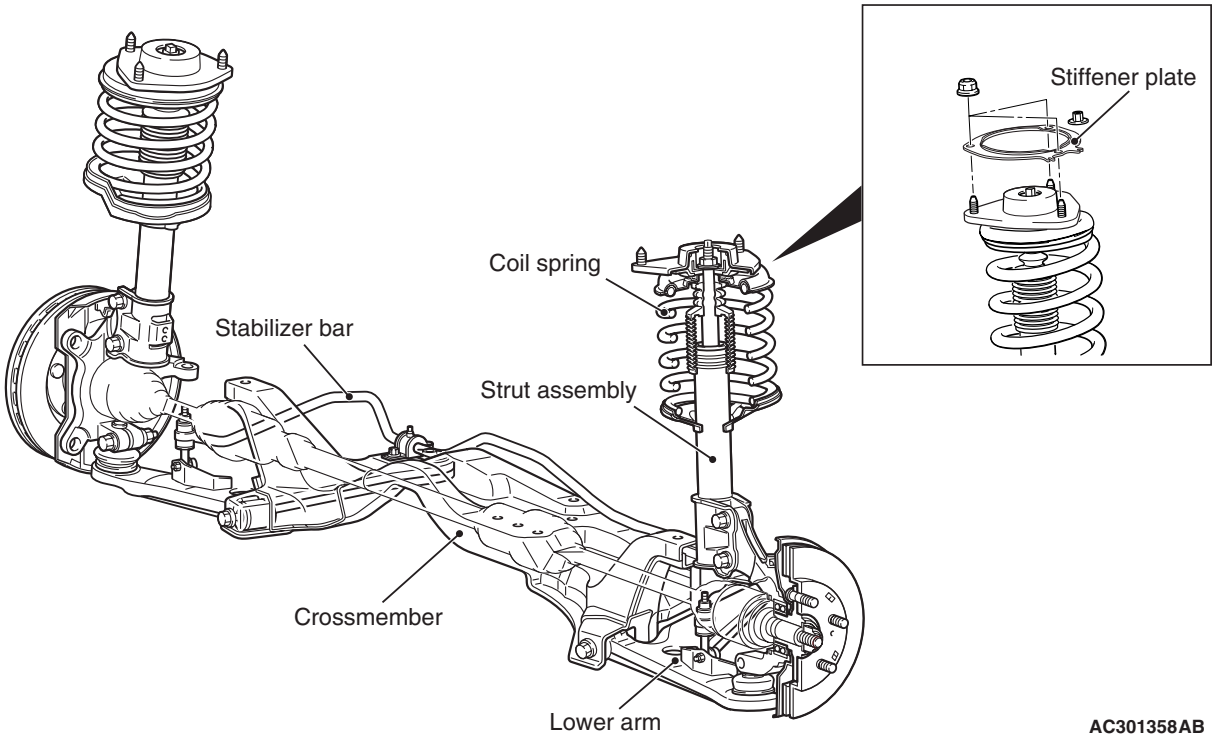
NOTE
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL INFORMATION

M1332000100292

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

CONSTRUCTION DIAGRAM



SPECIFICATIONS

COIL SPRING

Item	2WD	4WD
Wire diameter mm	14	14
Average diameter mm	160	160
Free length mm	300	305

SERVICE SPECIFICATIONS

M1332000300575

Item		Standard value
Toe-in	At the centre of tyre tread mm	1 ± 2
	Toe-angle (per wheel)	0°03' ± 05'
Toe-out angle on turns (inner wheel when outer wheel at 20°)		22°00' ± 1°30'
Steering angle	Inner wheel	34°50' ± 1°30'
	Outer wheel (reference)	29°20'
Camber		-0°10' ± 30'*
Caster		3°15' ± 30'*
Kingpin inclination		12°25' ± 1°30'
Lower arm ball joint starting torque N·m		0 – 3.9
Protruding length of stabilizer link thread part mm		9.4 ± 0.4
Stabilizer link ball joint turning torque N·m		0.5 – 1.5

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

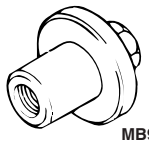
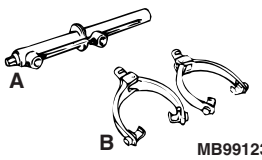
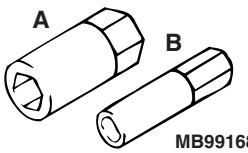
LUBRICANT

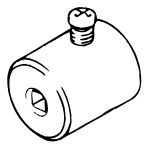
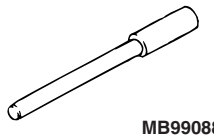
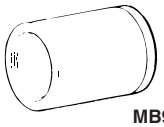
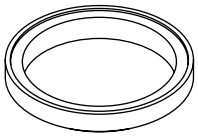
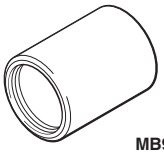
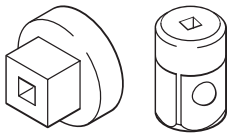
M1332000400420

Item		Specified lubricant	Quantity
Lower arm ball joint	Lip portion of dust cover	Multipurpose grease SAE J310, NLGI No.2 or equivalent	8 – 10g
	Inside of dust cover		
Stabilizer link ball joint	Inside of dust cover		

SPECIAL TOOLS

M1332000600275

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
 MB990800	MB990800	Ball joint remover and installer	Lower arm ball joint dust cover installation
 MB990883	MB990883	Rear suspension bushing arbor	Lower arm bushing removal and press-fitting
 MB990971	MB990972	Torsion bar bushing remover base	
	MB990887	Ring	
 MB990890	MB990890	Rear suspension bushing base	
 MB990326	MB990326	Preload socket	Stabilizer link ball joint turning torque check

ON-VEHICLE SERVICE

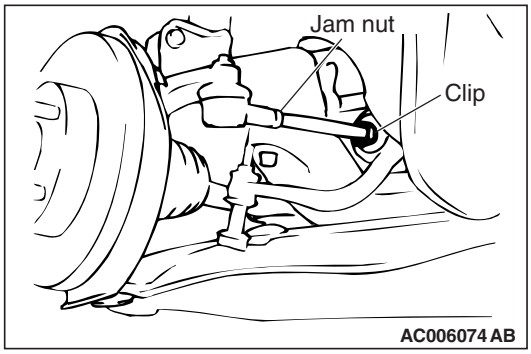
FRONT WHEEL ALIGNMENT CHECK AND ADJUSTMENT

M1331000900671

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

TOE-IN

Standard value:
at the centre of tyre tread: 1 ± 2 mm
Toe angle (per wheel): 0°03' ± 05'



1. Adjust the toe-in by undoing the clip and jam 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 clip and tighten the jam 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:

Item	Specification
Inner wheels	34°50' ± 1°30'
Outer wheels (reference)	29°20'

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°)	22°00' ± 1°30'

CAMBER, CASTER AND KINGPIN INCLINATION

Standard value:

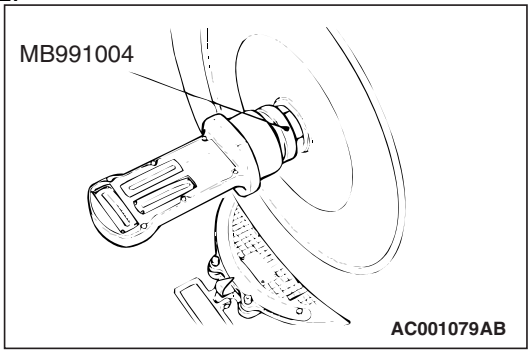
Item	Specification
Camber	-0°10' ± 30'*
Caster	3°15' ± 30'*
Kingpin inclination	12°25' ± 1°30'

*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

M1332011300063

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

M1332008600309

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.

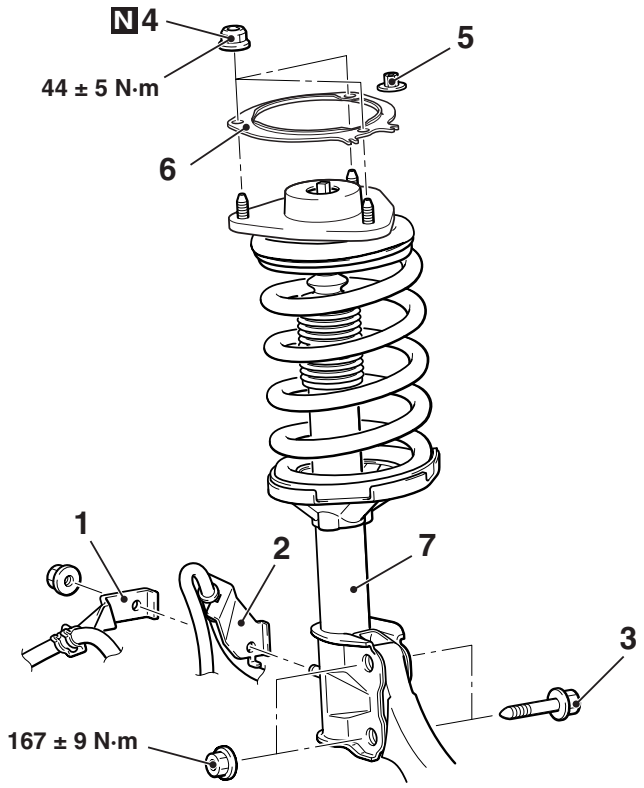
   NOTE: If the dust cover is cracked or damaged, it is possible that there may also be damage to the ball joint.

STRUT ASSEMBLY

REMOVAL AND INSTALLATION

M1332001100400

Pre-removal Operation	Post-installation Operation
• Washer Tank Assembly Removal (Refer to GROUP 51, Windshield Wiper and Washer P.51-36). <Pre-removal of the strut assembly (RH)>	• Washer Tank Assembly Installation (Refer to GROUP 51, Windshield Wiper and Washer P.51-36). <Post-installation of the strut assembly (RH)> • Front Wheel Alignment Adjustment (Refer to P.33-5).



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Removal steps

1. Front ABS sensor harness bracket
2. Brake hose bracket
3. Knuckle connection
4. Strut mounting nut
5. Insulator clip
6. Stiffener plate
7. Strut assembly

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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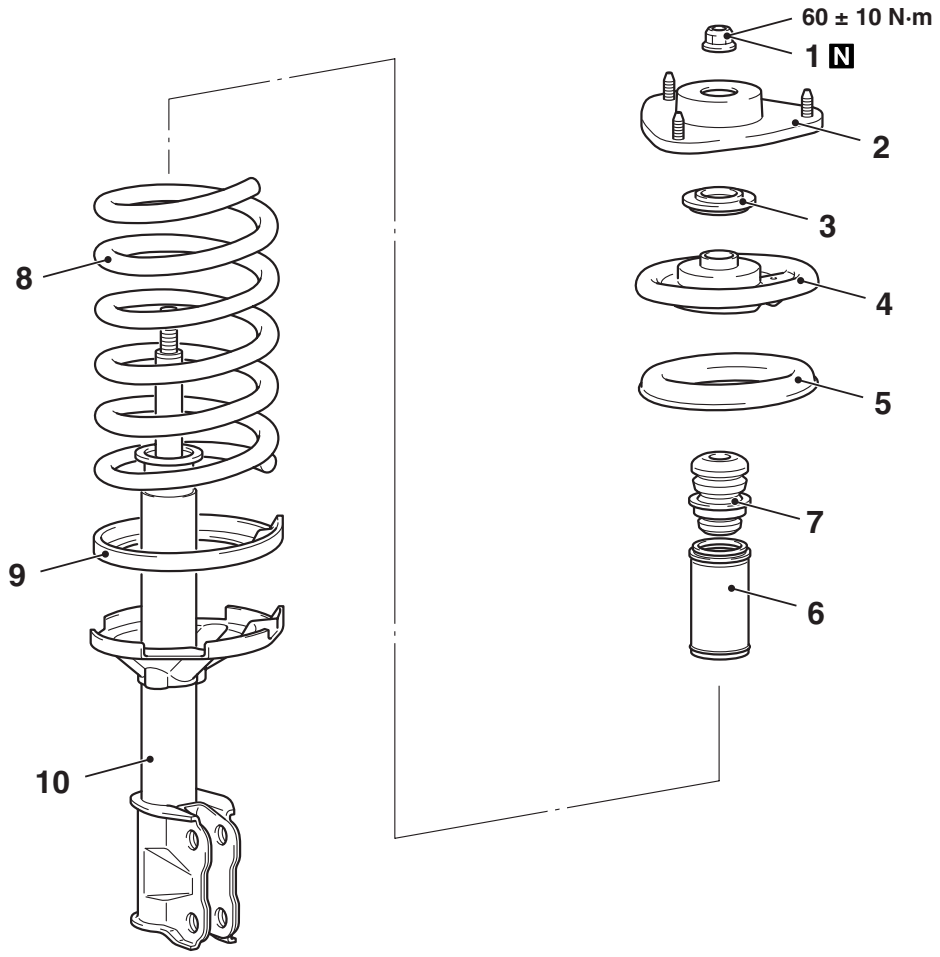

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Disassembly steps

<<**A**>>>>**A**<<1. Self-locking nut
2. Strut insulator assembly
3. Bearing
4. Upper spring seat
5. Upper spring pad

Disassembly steps (Continued)

6. Dust cover
7. Bump stopper
8. Coil spring
9. Lower spring pad

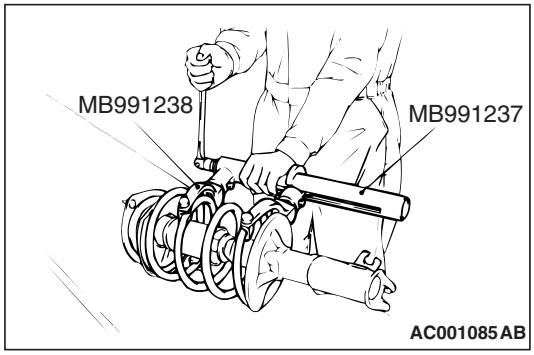
<<**B**>> 10. Strut assembly

DISASSEMBLY SERVICE POINTS

<<A>> SELF-LOCKING NUT REMOVAL

⚠ CAUTION

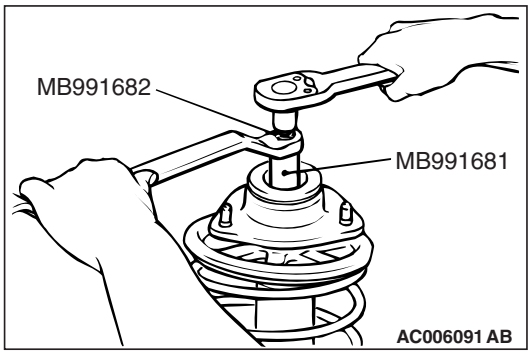
- **Install special tool arm set (MB991238) evenly, and so that the maximum length will be attained within the installation range.**
- **Do not use an impact wrench to tighten the bolt of special tool spring compressor body (MB991237), otherwise the special tool will break.**



1. Use following special tools to compress the coil spring.
   - MB991237: Spring Compressor Body
   - MB991238: Arm Set

⚠ WARNING

Do not use an impact wrench to remove the self-locking nut. Vibration of the impact wrench will cause special tools (MB991237 and MB991238) to slip and cause personal injury.

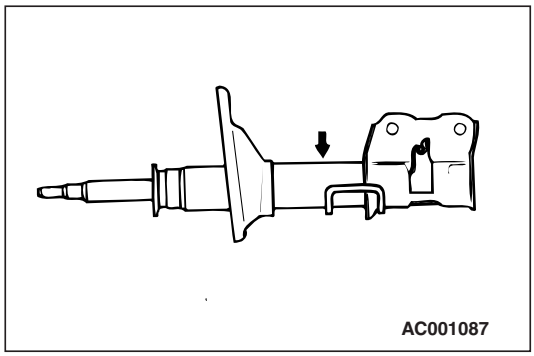


2. Use following special tools to secure the strut, and then remove the self-locking nut.
   - MB991681: Wrench
   - MB991682: Socket

<<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.

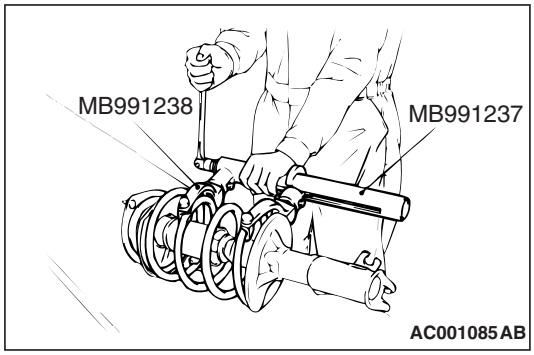
REASSEMBLY SERVICE POINT

>>A<< SELF-LOCKING NUT INSTALLATION

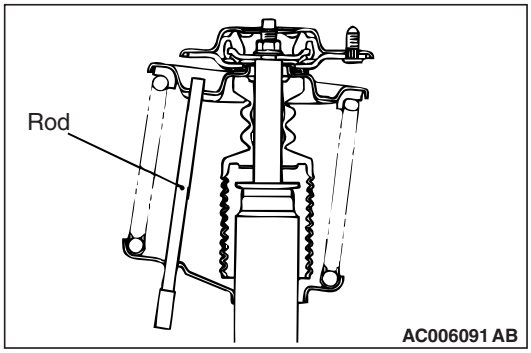
1. Ensure that the bearing is seated correctly.

⚠ 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.
   - MB991237: Spring Compressor Body
   - MB991238: Arm Set
3. While the coil spring is being compressed by the special tools, temporarily tighten the self-locking nut.



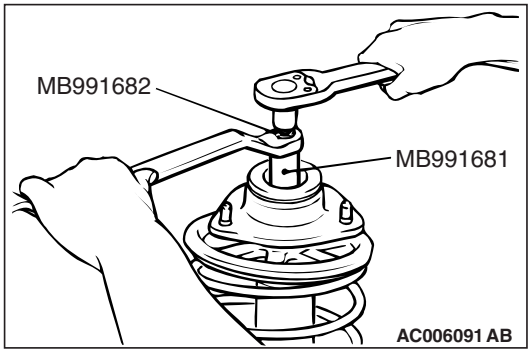
4. Align the hole in the strut assembly lower spring seat with the hole in the upper spring seat.

   NOTE: . Using a rod as shown facilitates the alignment.

5. Align both ends of the coil spring with the grooves in the spring seat, and then loosen the special tools.

⚠ CAUTION

Do not use an impact wrench to tighten the self-locking nut, otherwise the self-locking nut will be damaged.



6. Using following special tools, tighten the self-locking nut to 60 ± 10 N·m.
   - MB991681: Wrench
   - MB991682: Socket

INSPECTION

M1332001400177

- 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

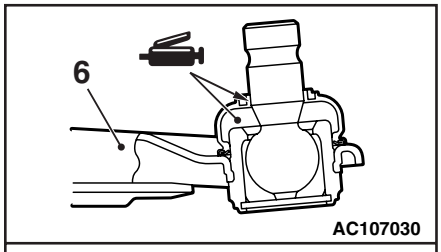
REMOVAL AND INSTALLATION

M1332001600966

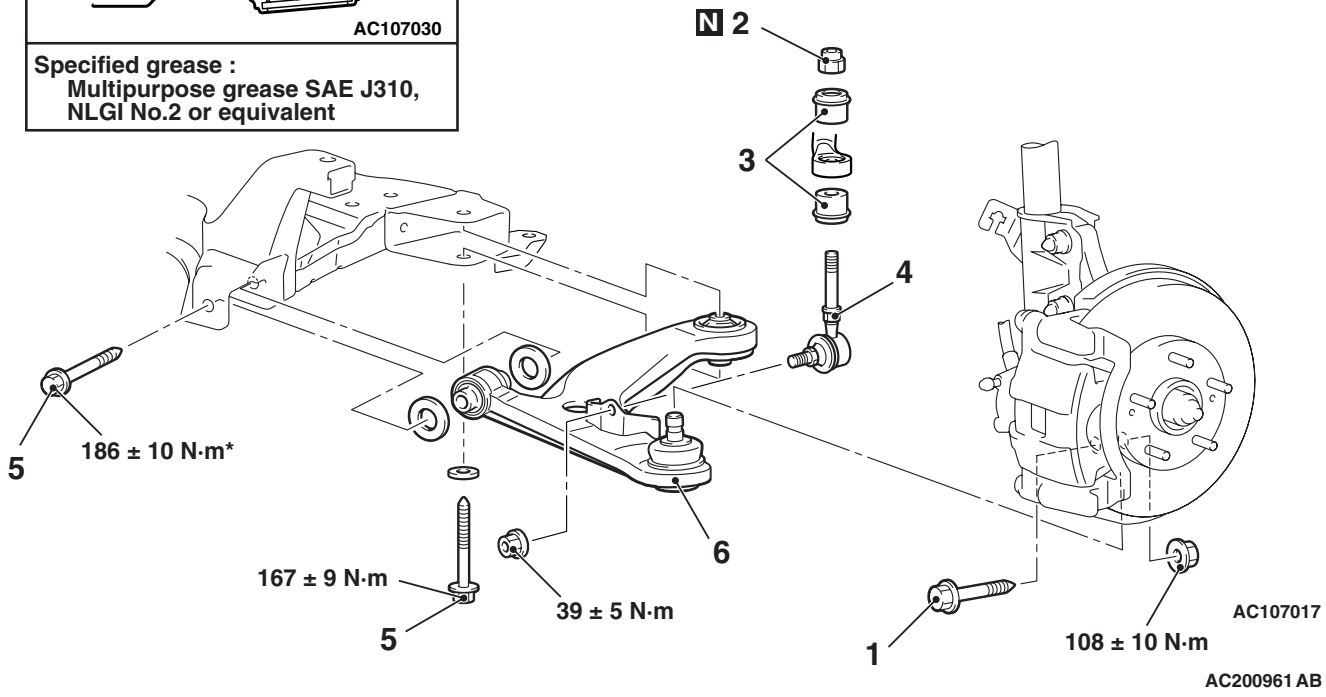
⚠ CAUTION

***: 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.33-5).



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

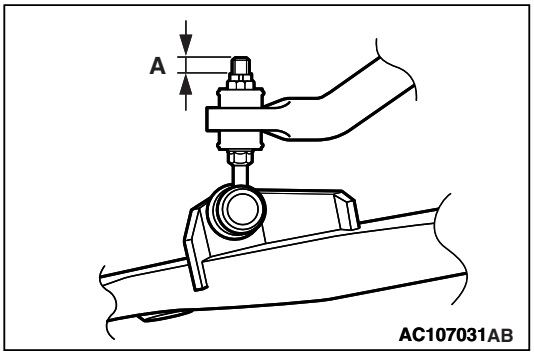


Removal steps
1. Lower arm and knuckle connection
>>**A**<< 2. Self-locking nut
3. Stabilizer rubber
4. Stabilizer link assembly

Removal steps (Continued)
5. Lower arm and crossmember connection
6. Lower arm assembly

INSTALLATION SERVICE POINT

>>A<< SELF-LOCKING NUT INSTALLATION



Tighten the self-locking nut until the stabilizer link thread part protruding length meets the standard value.

Standard value (A): 9.4 ± 0.4 mm

INSPECTION

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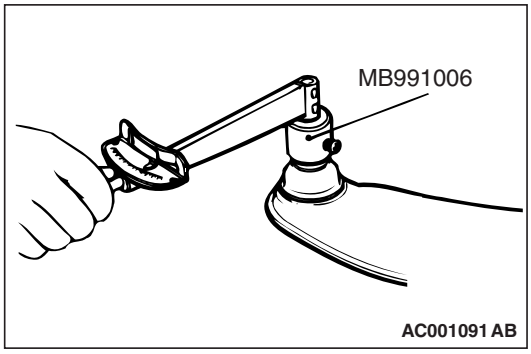
- Check the bushing for wear and deterioration.
- Check the lower arm for bend or breakage.
- Check all bolts for condition and straightness.

LOWER ARM BALL JOINT 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 – 3.9 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.

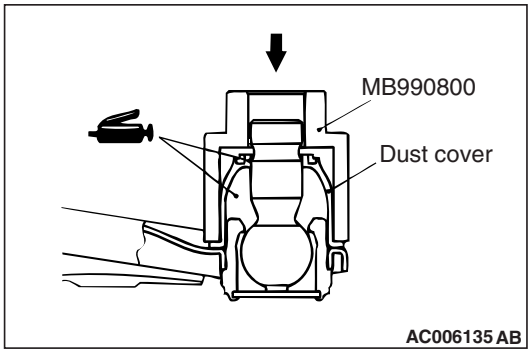
   NOTE: Cracks or damage to the dust cover may cause damage to the ball joint. When it is damaged during service work, replace the dust cover.

BALL JOINT DUST COVER REPLACEMENT

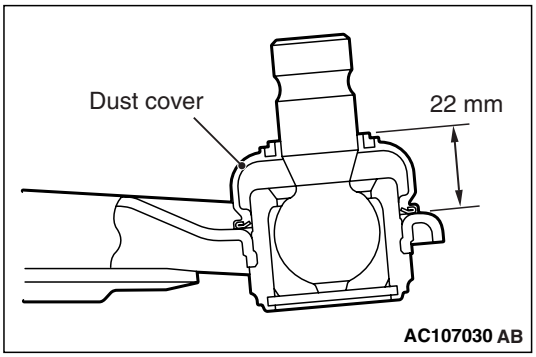
M1332008200259

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**
   - **Grease amount for the inside the dust cover (reference): 8 – 10g**



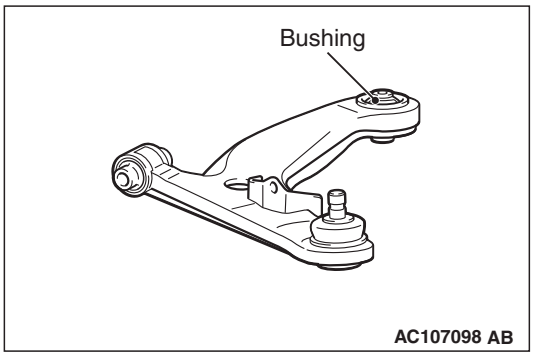
3. Using special tool ball Joint remover and installer (MB990800), drive in the dust cover until it is fully seated.



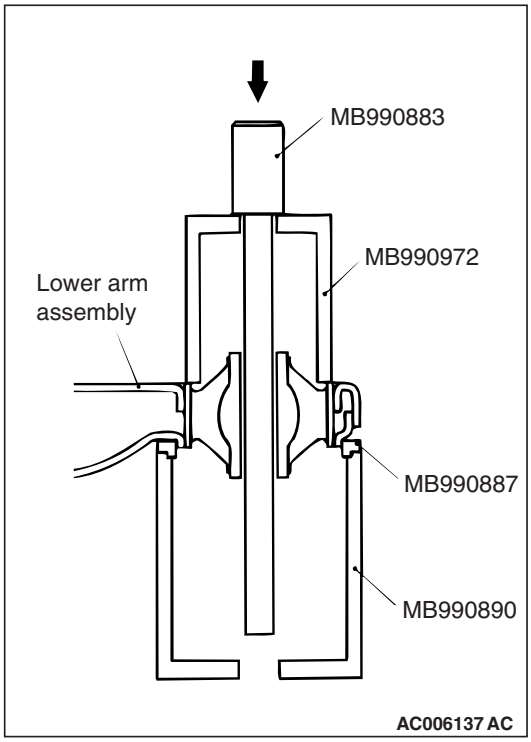
4. Position the dust cover as shown in the illustration. Make sure that there is no abnormal bulge or pressure applied on the dust cover.
5. Check the dust cover for cracks or damage by pushing it with your finger.

LOWER ARM REAR BUSHING REPLACEMENT

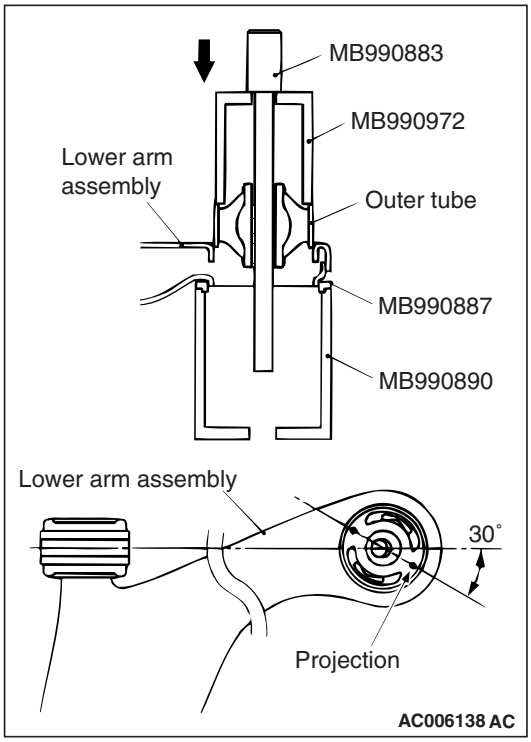
M1332008100337



Replace the bushing as follows:



1. Use following special tools to drive out the bushing.
   - MB990883: Rear Suspension Bushing Arbor
   - MB990972: Torsion Bar Bushing Remover Base
   - MB990887: Ring
   - MB990890: Rear Suspension Bushing Base



2. Position the bushing so that its projection is as shown, and then use the special tools to press in the bushing.
3. Press the bushing until its outer tube is flush with the lower arm assembly surface.

STABILIZER BAR

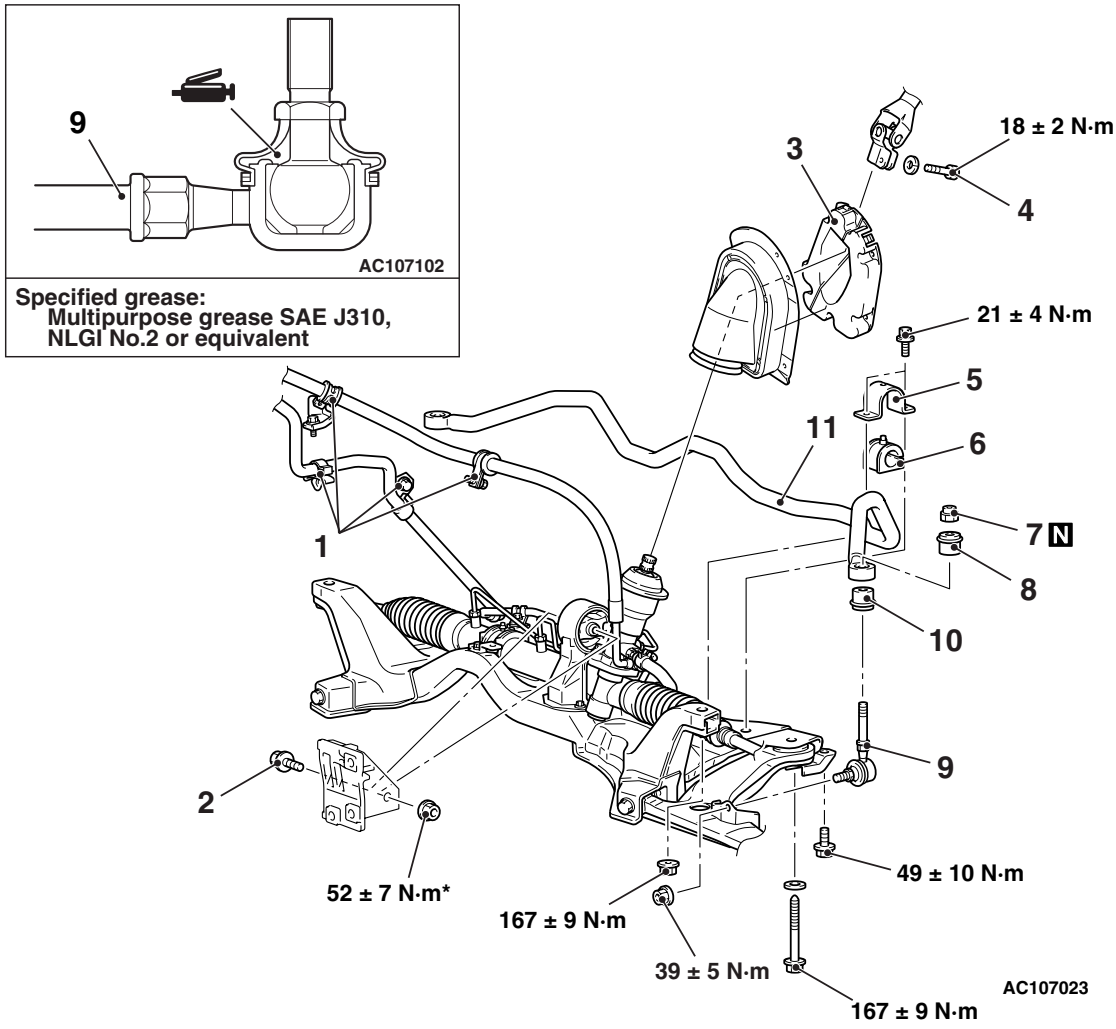
REMOVAL AND INSTALLATION

M1332004000781

⚠ CAUTION

- **Before removing the steering wheel and air bag module assembly, refer to GROUP 52B, Service Precautions P.52B-4 and Air Bag Module and Clock Spring P.52B-136. Also, put the front wheels in straight-ahead position. Failure to do so may damage the SRS clock spring and render the SRS air bag inoperative, which results serious driver injury.**
- ***: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the earth in an unladen condition.**

Pre-removal Operation	Post-installation Operation
• Side Under Cover and Centre Under Cover Removal (Refer to GROUP 51, Under Cover P.51-31). • Steering Wheel and Air Bag Module Assembly Removal (Refer to GROUP 37, Steering Wheel P.37-15). • Clock Spring Removal (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-136). • Centre Member Removal (Refer to GROUP 32, Engine Roll Stopper, Centre Member P.32-11 <4G63>, P.32-13 <4G69>). • Front Exhaust Pipe Removal (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-25 <4G63-Non-Torbo,4G69>,P.15-27 <4G63-Turbo>).	• Front Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-25 <4G63-Non-Torbo,4G69>,P.15-27 <4G63-Turbo>). • Centre Member Installation (Refer to GROUP 32, Engine Roll Stopper, Centre Member P.32-11 <4G63>, P.32-13 <4G69>). • Clock Spring Installation (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-136). • Steering Wheel and Air Bag Module Assembly Installation (Refer to GROUP 37, Steering Wheel P.37-15). • Check the dust covers for cracks or damage by pushing it with your finger. • Checking Steering Wheel Position with Wheels Straight Ahead • Front Wheel Alignment Check and Adjustment (Refer to P.33-5). • Side Under Cover and Centre Under Cover Installation (Refer to GROUP 51, Under Cover P.51-31).



Removal steps

1. Power steering hose clamp
2. Rear roll stopper connecting bolt
3. Steering shaft cover
4. Steering gear and joint connecting bolt

<<A>> >>A<< 5. Fixture

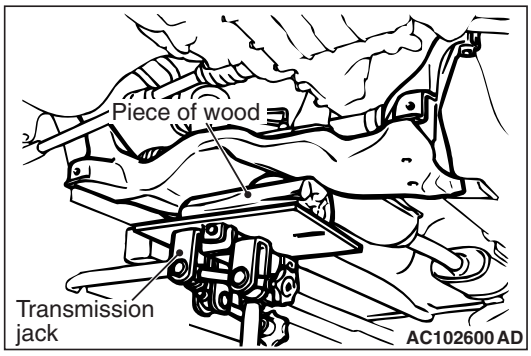
Removal steps (Continued)

<<A>> >>A<< 6. Bushing
>>B<< 7. Self-locking nut
8. Stabilizer rubber
<<A>> 9. Stabilizer link
10. Stabilizer rubber
<<A>> >>A<< 11. Stabilizer bar

REMOVAL SERVICE POINT

<<A>> FIXTURE/BUSHING/STABILIZER LINK/STABILIZER BAR REMOVAL

Carry out the following operations to ensure working space in order to remove the fixtures, the bushings, the stabilizer links and the stabilizer bar.



1. Use a transmission jack to hold the crossmember, and then remove the crossmember mounting nuts and bolts.

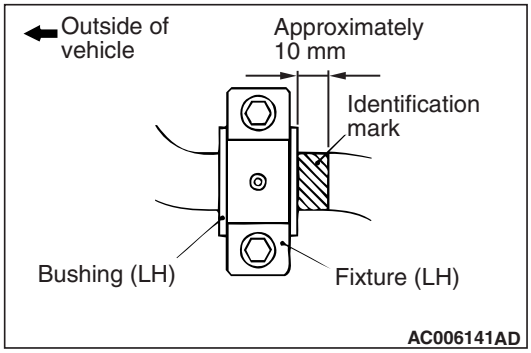
⚠ CAUTION

Be careful not to lower the crossmember excessively, otherwise the power steering return hose bracket may deform.

2. Lower the crossmember until the fixtures, the bushings, the stabilizer links and the stabilizer bar can be removed.

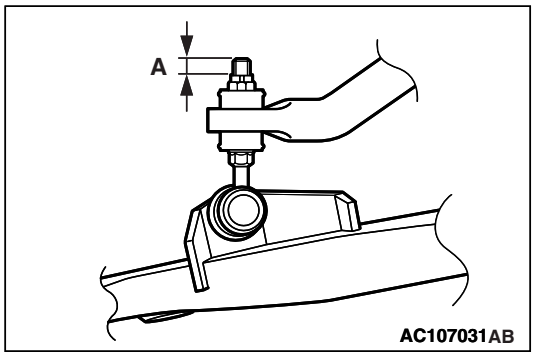
INSTALLATION SERVICE POINTS

>>A<< STABILIZER BAR/BUSHING/FIXTURE INSTALLATION



Align the stabilizer bar identification mark with the right end of the bushing (LH).

>>B<< SELF-LOCKING NUT INSTALLATION



Tighten the self-locking nut until the stabilizer link thread part protruding length meets the standard value.

Standard value (A): 9.4 ± 0.4 mm

INSPECTION

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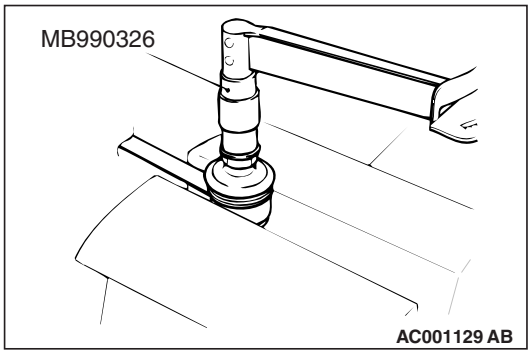
- Check the bushings for wear and deterioration.
- Check the stabilizer bar for deterioration or damage.
- Check all bolts for condition and straightness.

STABILIZER LINK BALL JOINT 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: 0.5 – 1.5 N·m

2. When the measured value exceeds the standard value, replace the stabilizer link.
3. When the measured value is lower than the standard value, check that the ball joint turns smoothly without excessive play. If so, it is possible to re-use that ball joint.

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. When it is damaged during service work, replace the dust cover (Refer to P.33-16).

STABILIZER LINK BALL JOINT DUST COVER REPLACEMENT

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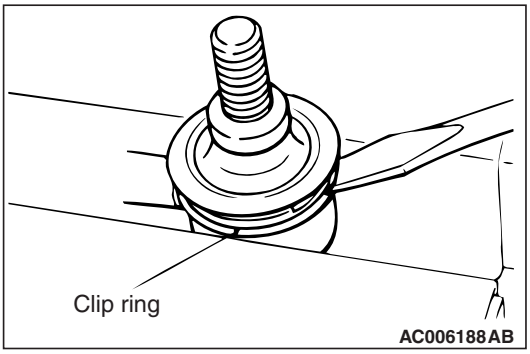
Only when the dust cover is damaged accidentally during service work, replace the dust cover as follows:



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

   Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent
3. Wrap plastic tape around the stabilizer link stud, and then install the dust cover to the stabilizer link.
4. Secure the dust cover by the clip ring.
5. Check the dust cover for cracks or damage by pushing it with finger.