

## GROUP 33

# FRONT SUSPENSION

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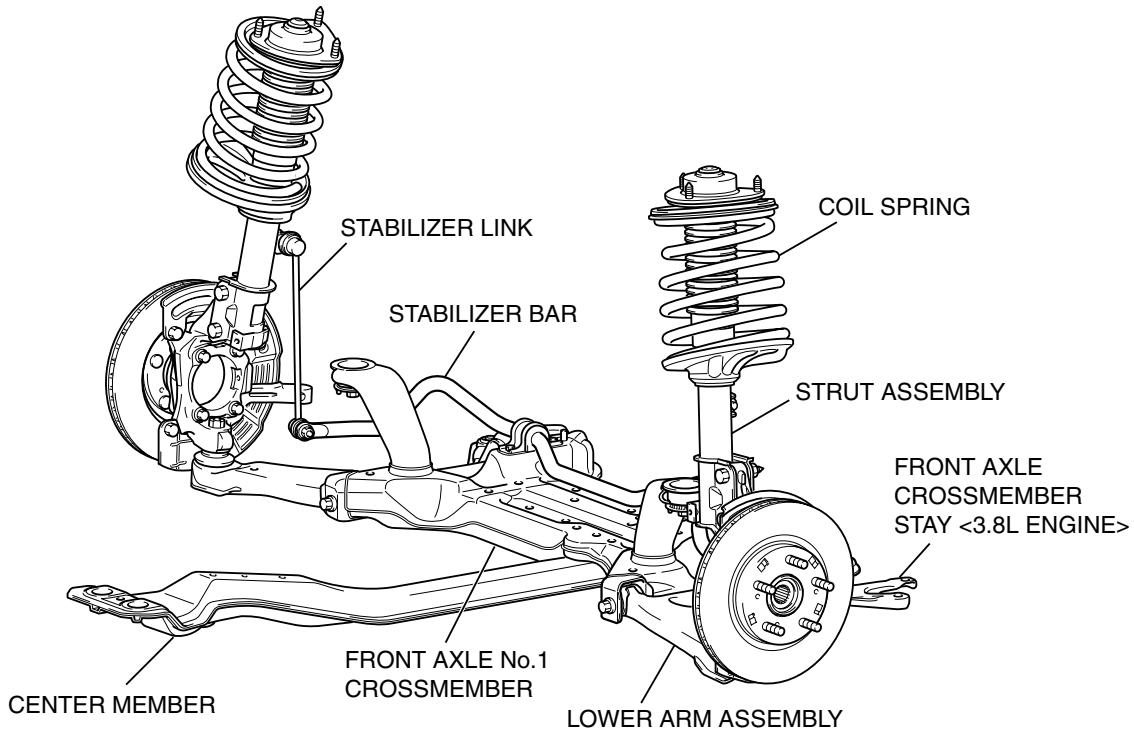
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## GENERAL DESCRIPTION

M1332000100270

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

## CONSTRUCTION DIAGRAM



AC305733 AB

## FRONT SUSPENSION DIAGNOSIS

## INTRODUCTION TO FRONT SUSPENSION DIAGNOSIS

M1332009000269

If the front suspension is faulty, the vehicle will not run straightforward or noise will occur. Incorrect wheel alignment, malfunction of strut assembly, stabilizer bar, coil spring, or worn or out-of-balance tires can cause these problems.

## FRONT SUSPENSION DIAGNOSIS TROUBLESHOOTING STRATEGY

M1332009100255

Use these steps to plan your diagnostic strategy. If you follow them thoroughly, you will be sure that you have exhausted most of the possible ways to find a front suspension fault.

1. Gather information from the customer.

2. Verify that the condition described by the customer exists.
3. Find and repair the malfunction by following the Symptom Chart and Symptom Procedures.
4. Verify malfunction is eliminated.

## SYMPTOM CHART

M1332009400290

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Steering wheel is heavy, vibrates or pulls to one side	1	<a href="#">P.33-3</a>
Excessive body rolling	2	<a href="#">P.33-3</a>
Poor ride	3	<a href="#">P.33-4</a>
Unequal ride height	4	<a href="#">P.33-4</a>
Noise	5	<a href="#">P.33-4</a>

## SYMPTOM PROCEDURES

## INSPECTION PROCEDURE 1: Steering Wheel is Heavy, Vibrates or Pulls to One Side

## DIAGNOSIS

## STEP 1. Check the tires.

Check for the tire pressure, the tire pressure balance between left and right tires, and the tire condition. Refer to GROUP 31, Diagnosis [P.31-5](#).

## Q: Are the tires in normal condition?

YES : Go to Step 2.

NO : If out of pressure, adjust the tire pressure. If out of balance, balance the tires as necessary. If excessively worn, replace the tires as necessary and then go to Step 5.

## STEP 2. Check the wheel alignment.

Refer to [P.33-6](#).

## Q: Is the wheel alignment correct?

YES : Go to Step 3.

NO : Adjust it, and then go to Step 5.

## STEP 3. Check the lower arm ball joint.

## Q: Is the ball joint in good condition?

YES : Go to Step 4.

NO : Replace the lower arm assembly, and then go to Step 5.

## STEP 4. Check the coil spring.

## Q: Is the coil spring in good condition?

YES : Go to Step 5.

NO : Replace it, and then go to Step 5.

## STEP 5. Retest the system.

## Q: Is the malfunction eliminated?

YES : The procedure is complete.

NO : Return to Step 1.

## INSPECTION PROCEDURE 2: Excessive Body Rolling

## DIAGNOSIS

## STEP 1. Check for broken or deteriorated stabilizer bar.

## Q: Is the stabilizer bar in good condition?

YES : Go to Step 2.

NO : Replace it, and then go to Step 3.

## STEP 2. Check the strut assembly for damage.

## Q: Is the strut assembly in good condition?

YES : Go to Step 3.

NO : Replace it, and then go to Step 3.

## STEP 3. Retest the system.

## Q: Is the malfunction eliminated?

YES : The procedure is complete.

NO : Return to Step 1.

## INSPECTION PROCEDURE 3: Poor Ride

## DIAGNOSIS

## STEP 1. Check for improper tire inflation pressure.

Refer to GROUP 31, On-vehicle Service – Tire Inflation Pressure Check [P.31-56](#).

Q: Is the tire inflation correct?

YES : Go to Step 2.

NO : Adjust it, and then go to Step 4.

## STEP 2. Check for broken or deteriorated coil spring(s).

Q: Are the coil spring(s) broken or deteriorated?

YES : Replace the coil spring(s), and then go to Step 4.

NO : Go to Step 3.

## STEP 3. Check for strut assembly damage.

Q: Is the strut assembly damaged?

YES : Replace it, and then go to Step 4.

NO : Go to Step 4.

## STEP 4. Retest the system.

Q: Is the malfunction eliminated?

YES : The procedure is complete.

NO : Return to Step 1.

## INSPECTION PROCEDURE 4: Unequal Ride Height

## DIAGNOSIS

## STEP 1. Check for broken or deteriorated coil spring(s).

Q: Is the coil spring(s) broken or deteriorated?

YES : Replace it, and then go to Step 2.

NO : Go to Step 2.

## STEP 2. Retest the system.

Q: Is the malfunction eliminated?

YES : The procedure is complete.

NO : Return to Step 1.

## INSPECTION PROCEDURE 5: Noise

## DIAGNOSIS

## STEP 1. Check for lack of lubrication.

Q: Is lubrication inadequate?

YES : Lubricate it, and then go to Step 5.

NO : Go to Step 2.

## STEP 3. Check for broken coil springs.

Q: Is the coil spring broken?

YES : Replace it, and then go to Step 5.

NO : Go to Step 4.

## STEP 4. Check for strut assembly damage.

Q: Is the strut assembly damaged?

YES : Replace it, and then go to Step 5.

NO : Go to Step 5.

## STEP 5. Retest the system.

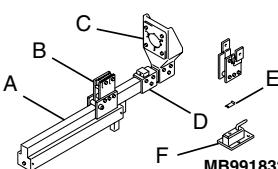
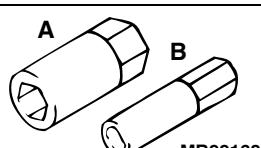
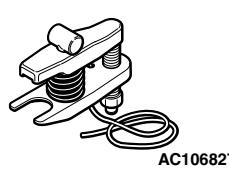
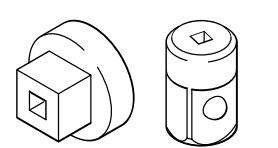
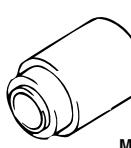
Q: Is the malfunction eliminated?

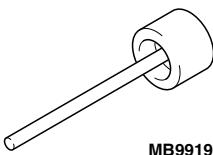
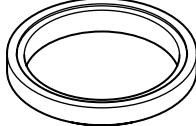
YES : The procedure is complete.

NO : Return to Step 1.

## SPECIAL TOOLS

M1332000600327

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB991004	MB991004 Wheel alignment gauge attachment	MB991004-01 or General service tool	Wheel alignment measurement
 MB991832	MB991832 Spring compressor set A: MB991793 Spring compressor B: MB991795 Attachment A C: MB991794 Upper plate D: MB991829 Arm bracket E: MB991831 Spacer F: MB991830 Fixture	General service tool	Front coil spring compression <i>NOTE: The coil spring can not be compressed by following conventional special tools.</i> <ul style="list-style-type: none"><li>• MB991237 Spring compressor body</li><li>• MB991238 Arm set</li></ul>
 MB991680	MB991680 Wrench set A: MB991681 Wrench B: MB991682 Socket	—	Strut assembly disassembly and assembly
 AC106827	MB991897 Ball joint remover	MB991113-01, MB990635-01 or General service tool	Knuckle and ball joint disconnection <i>NOTE: Steering linkage puller (MB990635 or MB991113) is also available to disconnect knuckle and ball joint.</i>
 MB990326	MB990326 Preload socket	General service tool	Ball joint breakaway torque check
 MB990776	MB990776 Front axle base	MB990776-01	Lower arm ball joint dust cover installation

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB991963	MB991963 Suspension bushing arbor	—	Lower arm bushing removal and press-fitting
 MB990889	MB990889 Rear suspension bushing ring	—	
 MB990890	MB990890 Rear suspension bushing base	MB990890-01 or general service tool	

## ON-VEHICLE SERVICE

### FRONT WHEEL ALIGNMENT CHECK AND ADJUSTMENT

M1331000901038

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

#### TOE-IN

**Standard value:  $0 \pm 3 \text{ mm}$  ( $0 \pm 0.12 \text{ inch}$ )**

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.*

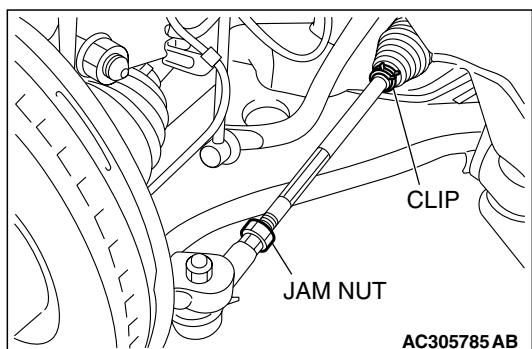
2. Install the clip and tighten the jam nut to the specified torque.

**Tightening torque:  $52 \pm 2 \text{ N}\cdot\text{m}$  ( $38 \pm 2 \text{ ft-lb}$ )**

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	VEHICLES WITH 16- INCH WHEELS	VEHICLES WITH 17- INCH WHEELS	VEHICLES WITH 18- INCH WHEELS
Inner wheel	$37^{\circ}12' \pm 2^{\circ}00'$	$33^{\circ}48' \pm 2^{\circ}00'$	$32^{\circ}54' \pm 2^{\circ}00'$
Outer wheel (reference)	$30^{\circ}18'$	$28^{\circ}18'$	$27^{\circ}48'$

**CAMBER, CASTER AND KINGPIN INCLINATION****Required Special Tool:**

- MB991004: Wheel Alignment Gauge Attachment

**Standard value:**

Camber:  $0^{\circ}00' \pm 0^{\circ}30'$  (Left/right deviation within 30')

Caster:  $3^{\circ}00' \pm 0^{\circ}30'$  (Left/right deviation within 30')

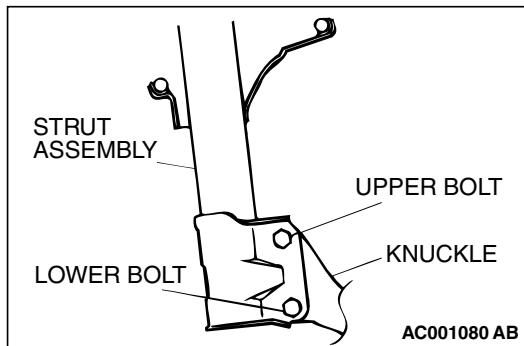
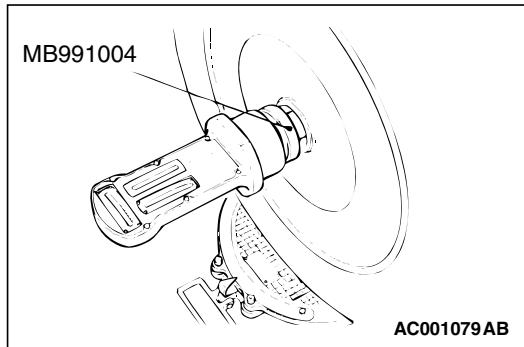
Kingpin inclination:  $12^{\circ}54' \pm 1^{\circ}30'$

*NOTE: Caster are preset at the factory and cannot be adjusted.*

**⚠ CAUTION**

**Never subject the wheel bearings to the vehicle load when the drive shaft nuts are loosened.**

*NOTE: Attach the camber/caster/kingpin gauge to the drive-shaft by using special tool MB991004. Tighten special tool MB991004 to the same torque  $226 \pm 29 \text{ N}\cdot\text{m}$  ( $167 \pm 21 \text{ ft-lb}$ ) as the drive shaft nut.*



If the camber is outside of the standard value, perform the following adjustment procedures.

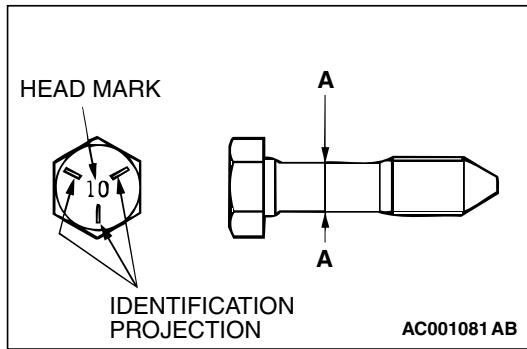
1. Estimate how much additional camber adjustment is required. Using the table below, select the camber adjusting bolt, and then replace the knuckle and strut assembly connection bolts (upper bolt, lower bolt) with the selected bolts.

BOLT DIAMETER mm (in)		CAMBER ADJUSTING VALUE					
		$0^{\circ}00'$	$0^{\circ}15'$	$0^{\circ}30'$	$0^{\circ}45'$	$1^{\circ}00'$	$1^{\circ}15'$
Upper bolt	16.0 (0.63)	•	•				
	14.9 (0.59)			•	•		
	14.1 (0.56)					•	
	13.6 (0.54)						•

BOLT DIAMETER mm (in)		CAMBER ADJUSTING VALUE					
		0°00'	0°15'	0°30'	0°45'	1°00'	1°15'
Lower bolt	16.0 (0.63)	•					
	14.9 (0.59)		•	•			
	14.1 (0.56)				•	•	
	13.6 (0.54)						•

*NOTE: If the camber adjusting value that is required is greater than 1° 30', check for bent or damaged parts and replace as necessary.*

Bolts are identified in the following table:



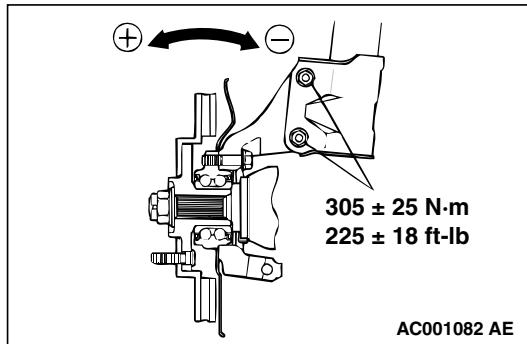
DIAMETER A mm (in)		NUMBER OF IDENTIFICATION PROJECTION
Set bolt	16.0 (0.63)	0
Adjusting bolt	14.9 (0.59)	1
	14.1 (0.59)	2
	13.6 (0.54)	3

*NOTE: Set bolt is the bolt installed at factory. "10" embossed on bolt head is head mark.*

2. Tighten the nuts temporarily, and then pull or push the front axle to adjust the camber.

*NOTE: Pulling the upper side of the front axle to the outside of the vehicle will increase the camber. Pushing it to the inside of the vehicle will decrease the camber.*

3. Tighten the nuts to  $305 \pm 25 \text{ N}\cdot\text{m}$  (225  $\pm$  18 ft-lb).
4. Recheck the camber.



## LOWER ARM BALL JOINT END PLAY CHECK

M1332011300085

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

## BALL JOINT DUST COVER CHECK

M1332008600354

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 or the stabilizer link.

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

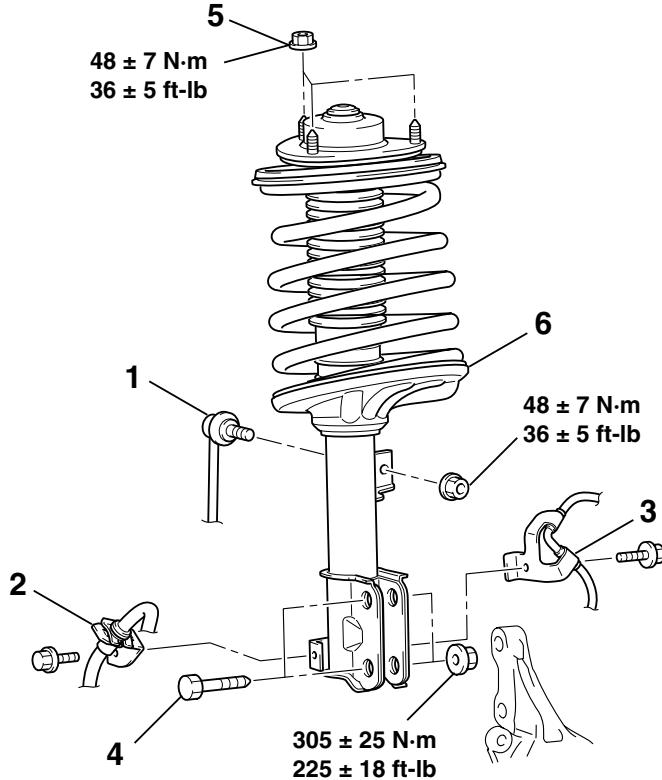
## STRUT ASSEMBLY

## REMOVAL AND INSTALLATION

M1332001100789

## Post-installation Operation

- Front Wheel Alignment Check and Adjustment (Refer to P.33-6).



AC205769AC

## REMOVAL STEPS

1. STABILIZER LINK
2. BRAKE HOSE BRACKET
3. FRONT WHEEL SPEED SENSOR CLAMP <VEHICLES WITH ABS>
4. STRUT BOLT

## REMOVAL STEPS (Continued)

5. STRUT NUT
- STRUT TOWER BAR BRACKET <RALLIART> (REFER TO GROUP 42, STRUT TOWER BAR P.42-11).
6. STRUT ASSEMBLY

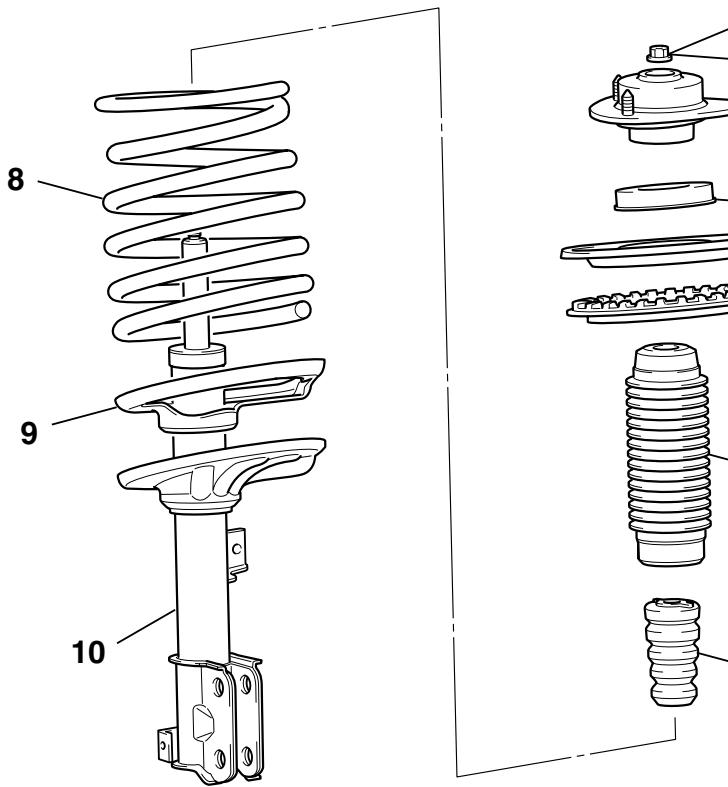
## INSPECTION

M1332001200281

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

## DISASSEMBLY AND ASSEMBLY

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AC305783 AB

**DISASSEMBLY STEPS**

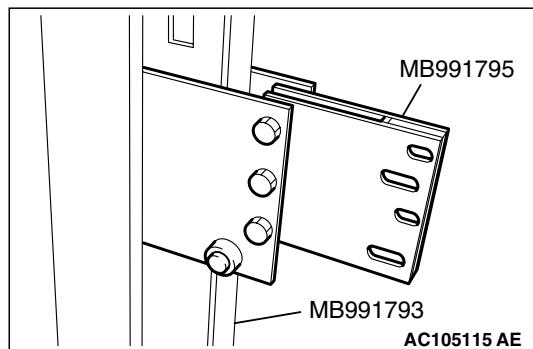
<<A>>>C<<1. STRUT NUT (JAM NUT)  
 >>B<<2. STRUT INSULATOR  
 3. STRUT BEARING  
 4. SPRING UPPER SEAT  
 5. SPRING UPPER PAD  
 6. STRUT COVER  
 7. STRUT DAMPER  
 8. COIL SPRING  
 >>A<<9. SPRING LOWER PAD  
 <<B>> 10. FRONT SUSPENSION STRUT

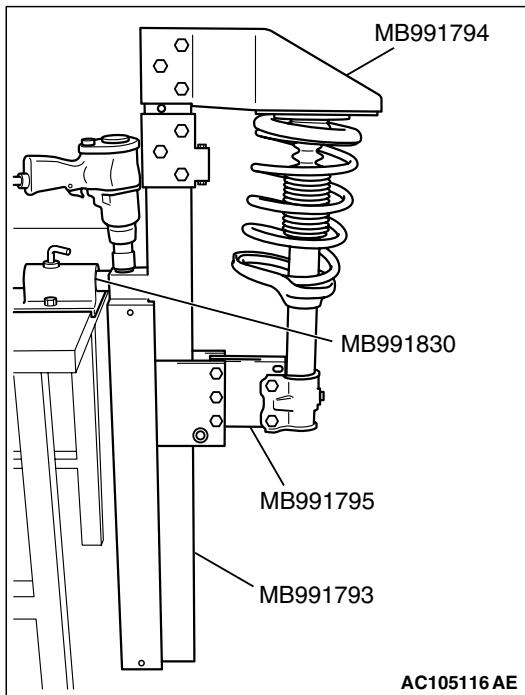
**Required Special Tools:**

- MB991680: Wrench Set
  - MB991681: Wrench
  - MB991682: Socket
- MB991832: Spring Compressor Set
  - MB991793: Spring Compressor
  - MB991794: Upper Plate
  - MB991795: Attachment A
  - MB991829: Arm Bracket
  - MB991830: Fixture
  - MB991831: Spacer

**DISASSEMBLY SERVICE POINTS****<<A>> STRUT NUT (JAM NUT) REMOVAL**

1. Install special tool MB991795 to special tool MB991793 as shown in the illustration.





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

- MB991793: Spring Compressor
- MB991794: Upper Plate
- MB991795: Attachment A
- MB991830: Fixture

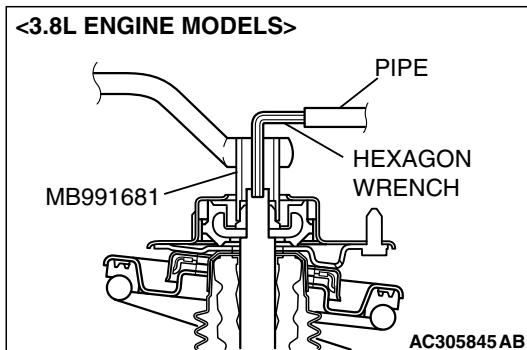
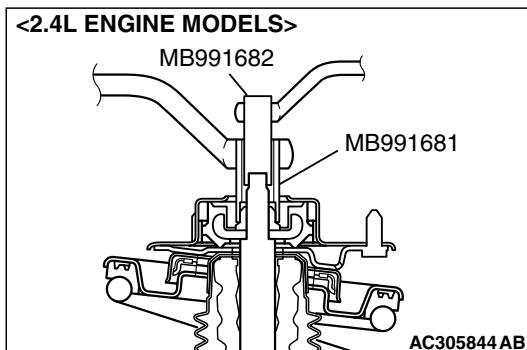
*NOTE: Set the strut assembly by using the bolt and nut that are removed from the vehicle. When installing the bolt and nut, lightly tighten them by hand.*

3. Compress the coil spring approximately 5 mm (0.20 inch) using the spring compressor.

#### CAUTION

**Do not use an impact wrench to tighten the strut nut, otherwise the strut nut will be damaged. Vibration of the impact wrench will cause the valve inside the strut to drop out.**

4. For 2.4L engine models, use special tool MB991682 to secure the strut, and then remove the strut nut (jam nut) using special tool MB991681.



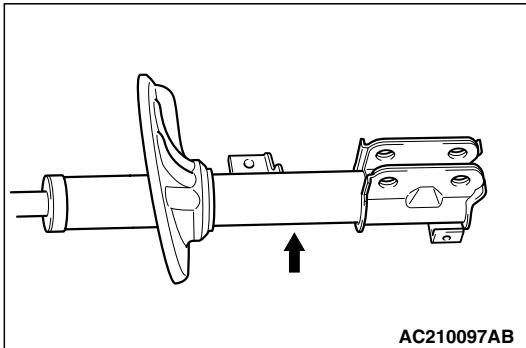
For 3.8L engine models, use a hexagon wrench and a pipe to secure the strut, and then remove the strut nut (jam nut) using special tool MB991681.

## &lt;&lt;B&gt;&gt; FRONT SUSPENSION STRUT DISPOSAL

**WARNING**

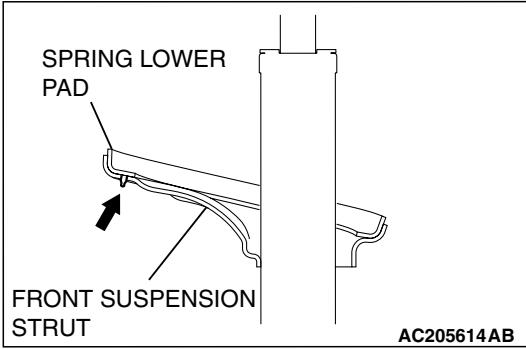
***Wear goggles when drilling to protect your eyes from flying metal debris.***

The gas must be discharged from the strut before discarding it. Place the strut horizontally with its piston rod extended. Then drill a hole of approximately 3 mm (0.1 inch) in diameter at the location shown in the illustration and discharge the gas.

**ASSEMBLY SERVICE POINTS**

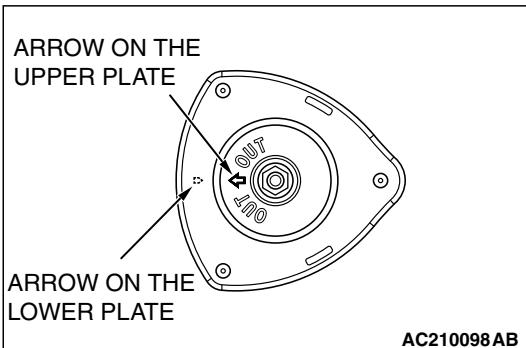
## &gt;&gt;A&lt;&lt; SPRING LOWER PAD INSTALLATION

Engage the three lugs of the spring lower pad into the holes on the front suspension strut as shown.



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

If the upper plate and lower plate of the strut insulator have been disassembled, assemble them as shown.

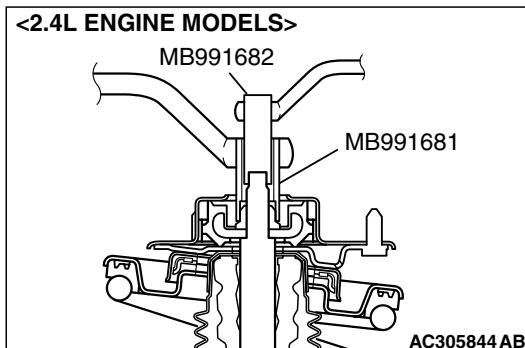
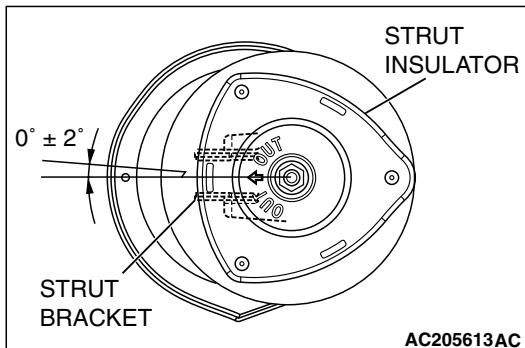
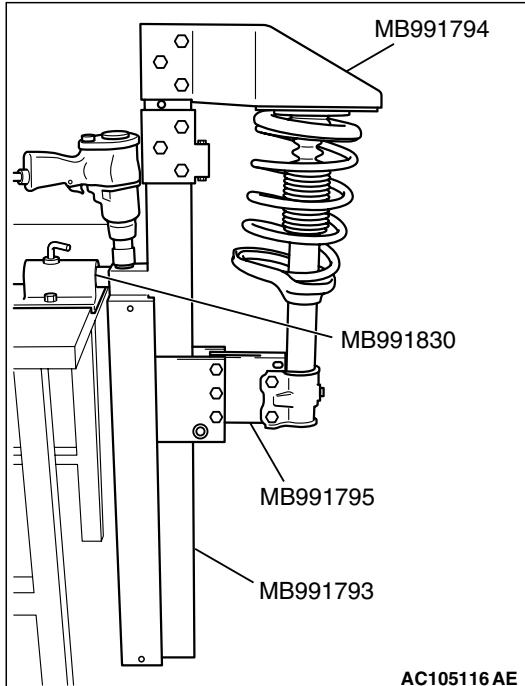


## &gt;&gt;C&lt;&lt; STRUT NUT (JAM NUT) INSTALLATION

1. Ensure that the bearing is seated correctly.

**⚠ WARNING**

**When the strut piston rod is positioned to the hole of strut insulator with compressing the coil spring, be careful not that your hand is jammed by the coil spring.**



2. Compress the coil spring slowly using the following special tools, penetrating the strut piston rod to the hole of strut insulator.

- MB991793: Spring Compressor
- MB991794: Upper Plate
- MB991795: Attachment A
- MB991830: Fixture

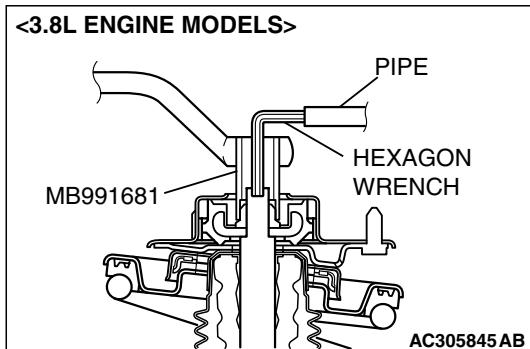
3. While the coil spring is being compressed by the special tools, temporarily tighten the strut nut (jam nut).

4. Ensure that the arrows on the strut bracket center and the strut insulator are positioned as shown.

**⚠ CAUTION**

**Do not use an impact wrench to tighten the strut nut, otherwise the strut nut will be damaged. Vibration of the impact wrench will cause the valve inside the strut to drop out.**

5. For 2.4L engine models, using special tools MB991681 and MB991682, tighten the strut nut (jam nut) to  $65 \pm 5 \text{ N}\cdot\text{m}$  ( $48 \pm 4 \text{ ft-lb}$ ).



For 3.8L engine models, using special tool MB991681, a hexagon wrench and a pipe, tighten the strut nut (jam nut) to  $65 \pm 5 \text{ N}\cdot\text{m}$  ( $48 \pm 4 \text{ ft-lb}$ ).

## INSPECTION

M1332001400207

- Check the strut bearing for wear.
- Check the rubber parts for damage or deterioration.
- Check the coil spring for deformation, deterioration or damage.
- Check the front suspension strut for deformation.

## LOWER ARM

## REMOVAL AND INSTALLATION

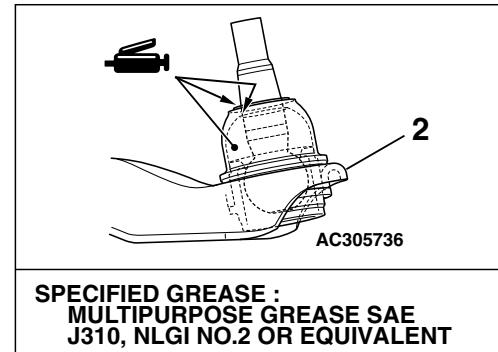
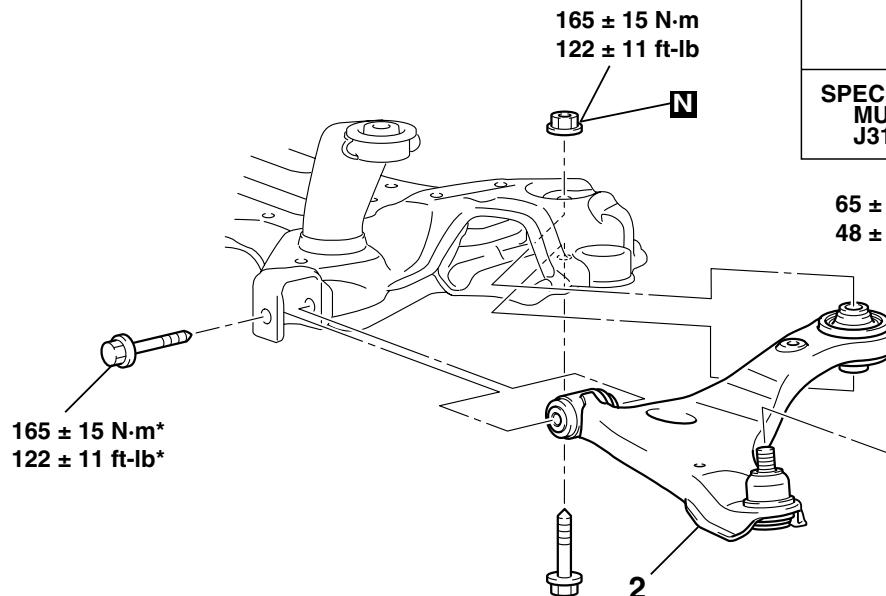
M1332001600364

**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.33-6).



**REMOVAL STEPS**

<<A>> 1. LOWER ARM AND KNUCKLE CONNECTION  
2. LOWER ARM ASSEMBLY

**Required Special Tool:**

- MB991897: Ball Joint Remover

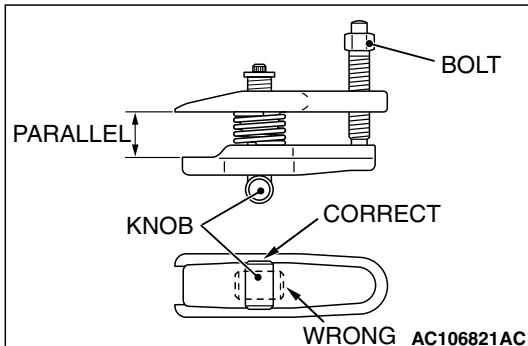
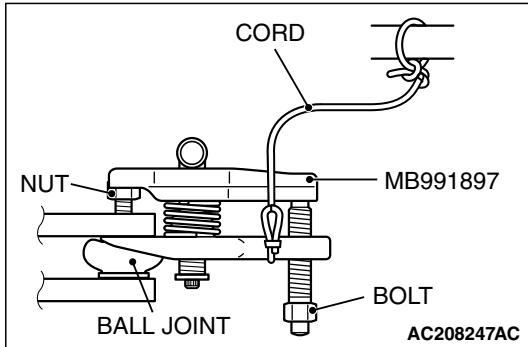
## REMOVAL SERVICE POINT

## &lt;&lt;A&gt;&gt; LOWER ARM AND KNUCKLE DISCONNECTION

**CAUTION**

- Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.
- Hang special tool MB991897 with a cord to prevent it from falling.

1. Replace the jam nut for lower arm ball joint with a regular nut, because the original one is a little bit large to install the special tool. And then install special tool MB991897 as shown in the figure.



2. Turn the bolt and knob as necessary to make the jaws of special tool MB991897 parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

*NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.*

3. Tighten the bolt with a wrench to disconnect the ball joint.

## INSPECTION

M1332001700316

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

## LOWER ARM BALL JOINT BREAKAWAY TORQUE CHECK

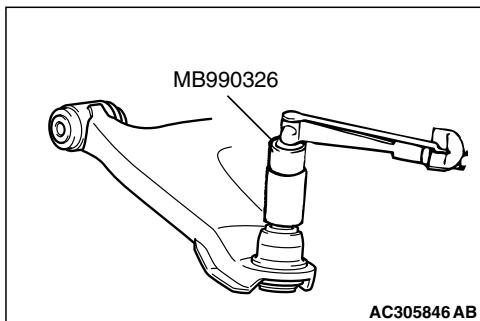
## Required Special Tool:

- MB990326: Preload Socket

1. Move the ball joint stud several times and install the lower arm nut on the stud. Using special tool MB990326, measure the ball joint breakaway torque.

**Standard value: 3.5 – 6.9 N·m (31 – 61 in-lb)**

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.*

**LOWER ARM BALL JOINT DUST COVER  
REPLACEMENT**

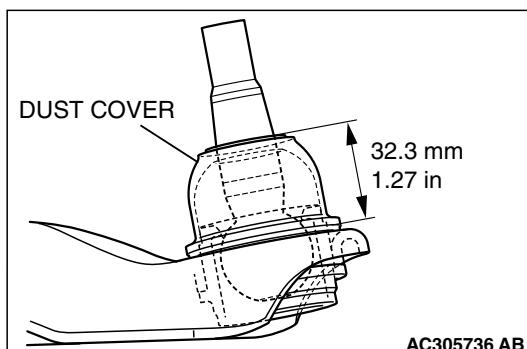
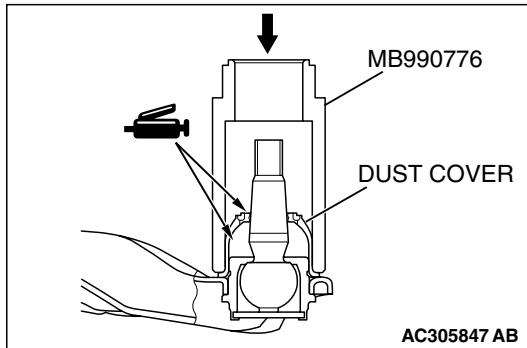
M1332008200282

**Required Special Tool:**

- MB990776: Front Axle Base

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

1. Remove the dust cover.
2. Apply the multipurpose grease SAE J310, NLGI No.2 or equivalent to the lip and the inside of a new dust cover.  
**Grease amount for the inside the dust cover (reference):  $13 \pm 0.5$  g (0.45  $\pm$  0.02 oz)**
3. Using special tool MB990776, drive in the dust cover until it is fully seated.



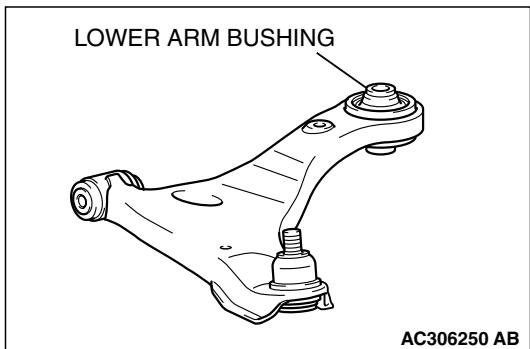
4. Position the dust cover as shown in the illustration. Make sure that there is no abnormal bulge or pressure applied to the dust cover.
5. Check the dust cover for cracks or damage by pushing it with your finger.

**LOWER ARM BUSHING (REAR) REPLACEMENT**

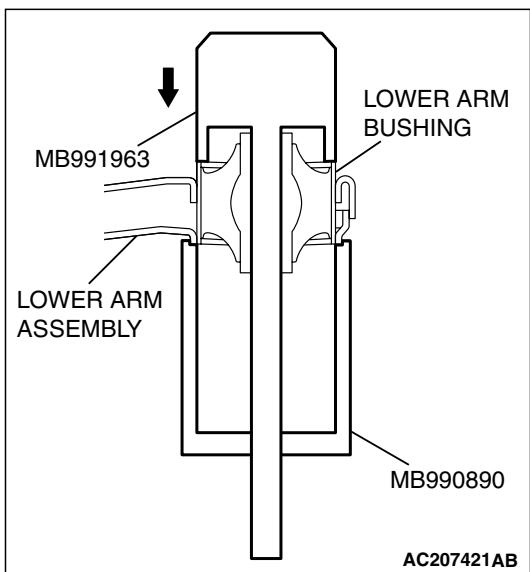
M1332008100371

**Required Special Tools:**

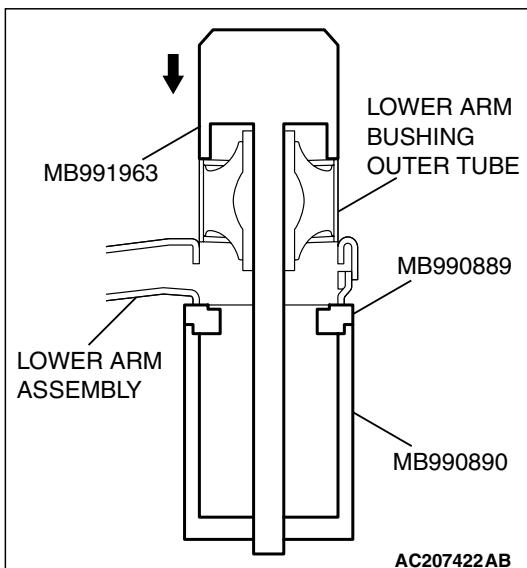
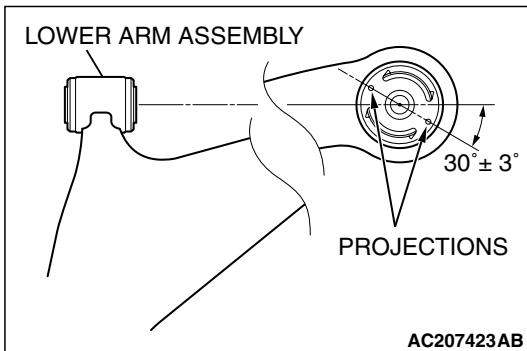
- MB991963: Suspension Bushing Arbor
- MB990889: Rear Suspension Bushing Ring
- MB990890: Rear Suspension Bushing Base



Replace the lower arm bushing as follows:



1. Use special tools MB991963 and MB990890 to drive out the lower arm bushing.



2. Position the lower arm bushing so that its projections are positioned as shown, and then use special tools MB991963, MB990889 and MB990890 to press in the lower arm bushing.

**⚠ CAUTION**

**When pressing in the lower arm bushing, take care not to deform the lower arm.**

3. Press the lower arm bushing until its outer tube is flush with the lower arm assembly surface while checking that the press-in pressure is at the standard value. If the press-in pressure is lower than the standard value, replace the lower arm assembly.

**Standard value: 10 kN (2,248 pounds) or more**

## STABILIZER BAR

## REMOVAL AND INSTALLATION

M1332004000297

**CAUTION**

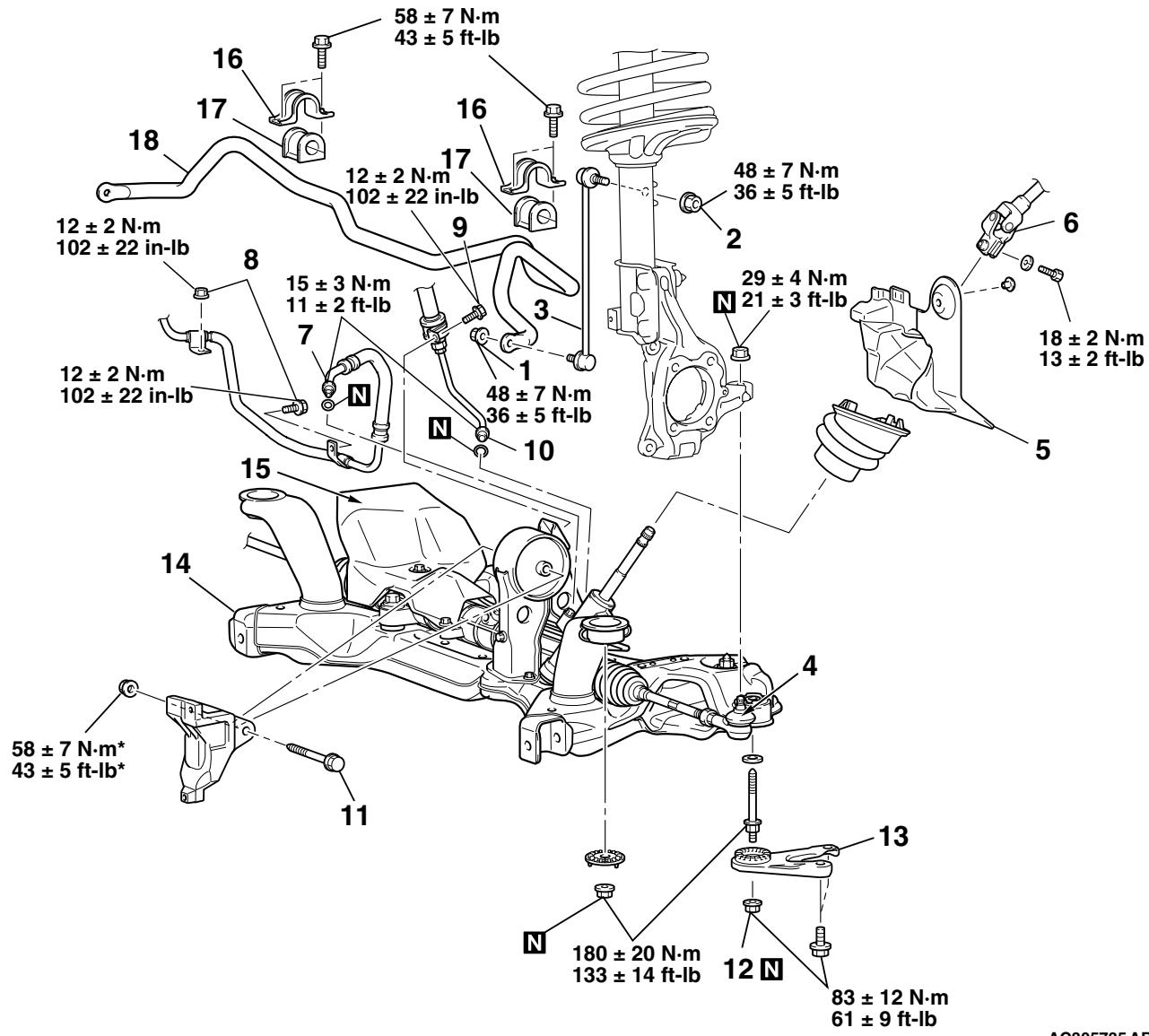
- Before removing the steering wheel and air bag module assembly, refer to GROUP 52B – Service Precautions ([P.52B-29](#)) and Air Bag Module and Clock Spring ([P.52B-408](#)). Also, put the front wheels in straight-ahead position. Failure to do so may damage the SRS clock spring and render the SRS air bag inoperative, which results in serious driver injury.
- \* : Indicates parts which should be initially tightened, and then fully tightened after placing the vehicle horizontally and loading the full weight of the engine on the vehicle body.

**Stabilizer Bar Pre-removal Operation**

- Power Steering Fluid Draining (Refer to GROUP 37, On-Vehicle Service – Fluid Replacement [P.37-20](#)).
- Front Under Cover Removal.
- Centermember Removal (Refer to GROUP 32, Engine Roll Stopper, Centermember [P.32-7](#)).
- Lower Arm Assembly Removal (Refer to [P.33-15](#)).
- Air Bag Module Assembly, Steering Damper and Steering Wheel Assembly Removal (Refer to GROUP 37, Steering Wheel [P.37-24](#)).
- Floor Console Assembly Removal (Refer to GROUP 52A, Floor Console Assembly [P.52A-22](#)).
- Front Scuff Plate and Cowl Side Trim Removal (Refer to GROUP 52A, Trims [P.52A-23](#)).
- Trunk Lid Opener Cover Removal
- Accelerator Pedal Stopper Removal
- Floor Carpet Removal

**Stabilizer Bar Post-installation Operation**

- Check the dust covers for cracks or damage by pushing it with your finger.
- Floor Carpet Installation
- Trunk Lid Opener Cover Installation
- Accelerator Pedal Stopper Installation
- Cowl Side Trim and Front Scuff Plate Removal (Refer to GROUP 52A, Trims [P.52A-23](#)).
- Floor Console Assembly Installation (Refer to GROUP 52A, Floor Console Assembly [P.52A-22](#)).
- Steering Wheel Assembly, Steering Damper and Air Bag Module Assembly Installation (Refer to GROUP 37, Steering Wheel [P.37-24](#)).
- Checking Steering Wheel Position with Wheels Straight Ahead
- Lower Arm Assembly Installation (Refer to [P.33-15](#)).
- Centermember Installation (Refer to GROUP 32, Engine Roll Stopper, Centermember [P.32-7](#)).
- Front Wheel Alignment Check and Adjustment (Refer to [P.33-6](#)).
- Front Under Cover Installation.
- Power Steering Fluid Supplying (Refer to GROUP 37, On-Vehicle Service – Fluid Replacement [P.37-20](#)).
- Power Steering Fluid Line Bleeding (Refer to GROUP 37, On-Vehicle Service – Power Steering System Air Bleeding [P.37-20](#)).



AC305735 AB

#### STABILIZER LINK REMOVAL STEPS

1. STABILIZER NUT
2. STABILIZER NUT
3. STABILIZER LINK

**STABILIZER BUSHING  
REMOVAL STEPS**

1. STABILIZER NUT
15. STEERING GEAR AND  
LINKAGE PROTECTOR  
<3.8L ENGINE> (REFER TO  
GROUP 32, CROSSMEMBER  
P.32-10).

>>A<< 16. STABILIZER BRACKET

>>A<< 17. STABILIZER BUSHING

**STABILIZER BAR REMOVAL  
STEPS**

1. STABILIZER NUT
4. TIE ROD END AND  
KNUCKLE CONNECTION
5. STEERING SHAFT PAD

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

&lt;&lt;B&gt;&gt;

6. STEERING GEAR AND  
STEERING COLUMN  
ASSEMBLY CONNECTION
7. STEERING GEAR AND  
RETURN TUBE  
CONNECTION
8. RETURN TUBE CLAMP NUT  
AND BOLT
9. PRESSURE HOSE CLAMP  
BOLT
10. STEERING GEAR AND  
PRESSURE TUBE  
CONNECTION
11. REAR ROLL STOPPER  
CONNECTION BOLT
12. JAM NUT
13. FRONT AXLE  
CROSSMEMBER STAY

>>C<< >>C<<

STABILIZER BAR REMOVAL STEPS (Continued)		STABILIZER BAR REMOVAL STEPS (Continued)	
>>B<< 14.	FRONT AXLE NO.1 CROSSMEMBER, REAR ROLL STOPPER AND STEERING GEAR ASSEMBLY	>>A<< 17.	STABILIZER BUSHING
15.	STEERING GEAR AND LINKAGE PROTECTOR <3.8L ENGINE> (REFER TO GROUP 32, CROSSMEMBER <a href="#">P.32-10</a> ).	>>A<< 18.	STABILIZER BAR
>>A<< 16.	STABILIZER BRACKET	Required Special Tool: • MB991897: Ball Joint Remover	

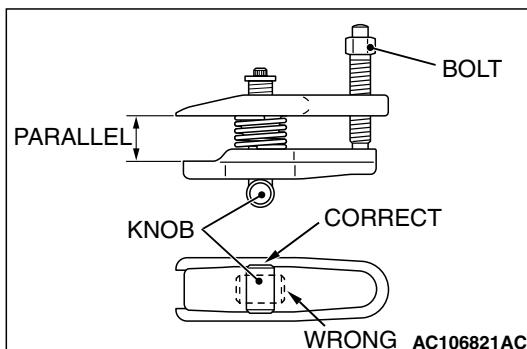
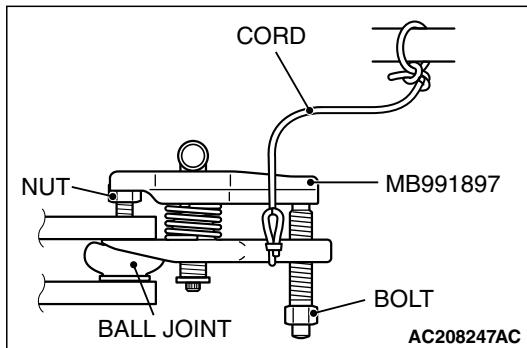
## REMOVAL SERVICE POINTS

### <<A>> TIE ROD END AND KNUCKLE DISCONNECTION

#### **CAUTION**

- Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.
- Hang special tool MB991897 with a cord to prevent it from falling.

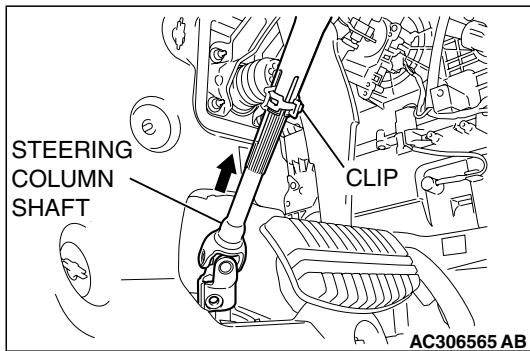
1. Install special tool MB991897 as shown in the figure.



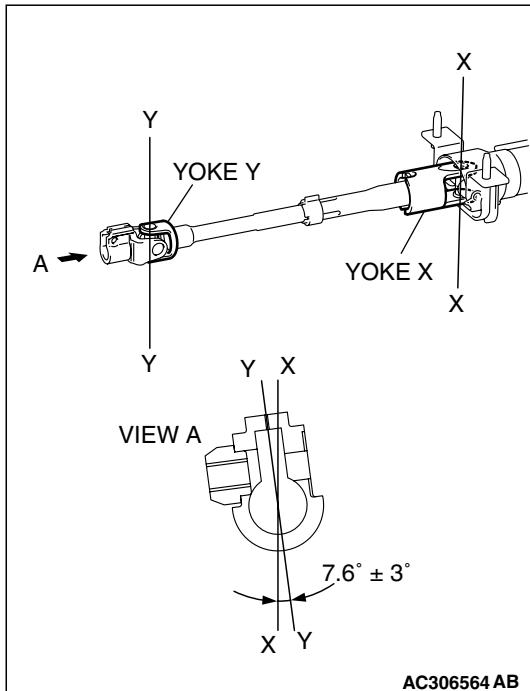
2. Turn the bolt and knob as necessary to make the jaws of special tool MB991897 parallel, tighten the bolt by hand and confirm that the jaws are still parallel.  
*NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.*
3. Tighten the bolt with a wrench to disconnect the tie rod end.

### <<B>> STEERING GEAR AND STEERING COLUMN ASSEMBLY DISCONNECTION

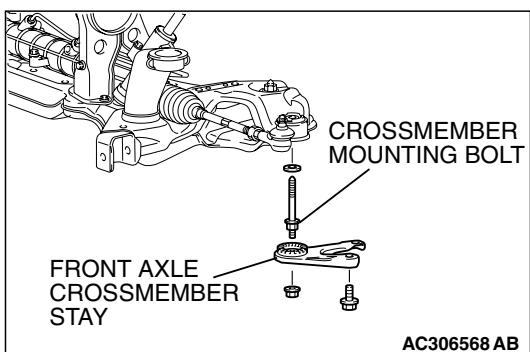
1. Remove the steering gear and steering column assembly connecting bolt.



2. Pinch the steering column shaft clip with pliers, and pull up the shaft in the direction shown to disengage the steering column assembly.



*NOTE: If the steering column shaft is removed accidentally, remove the steering column assembly and be sure to insert the steering column shaft into the steering column as shown in the figure.*



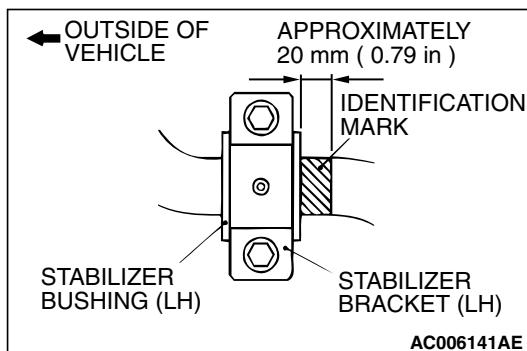
#### <<C>> FRONT AXLE CROSSMEMBER STAY REMOVAL

The crossmember mounting bolts need not be unscrewed when the front axle crossmember stay is replaced. However, the bolts may be loosened while the front axle crossmember stay is removed. It is recommended that you retighten the bolts to  $180 \pm 20 \text{ N}\cdot\text{m}$  ( $133 \pm 14 \text{ ft-lb}$ ).

## INSTALLATION SERVICE POINTS

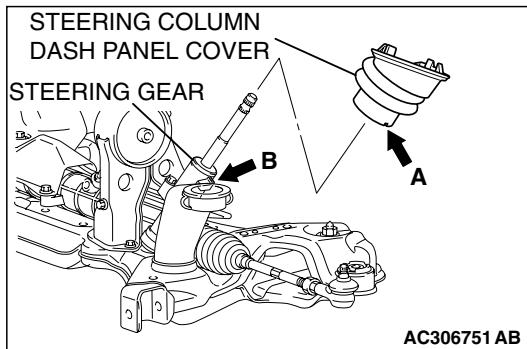
## &gt;&gt;A&lt;&lt; STABILIZER BAR/STABILIZER BUSHING/STABILIZER BRACKET INSTALLATION

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



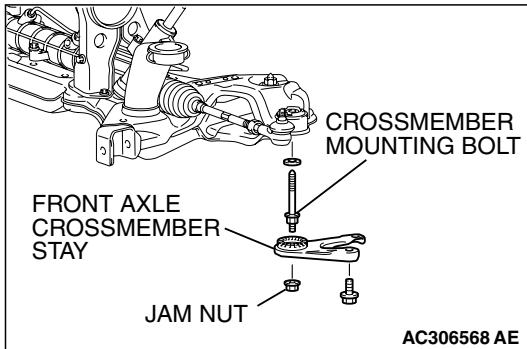
## &gt;&gt;B&lt;&lt; FRONT AXLE NO.1 CROSMEMBER, REAR ROLL STOPPER AND STEERING GEAR ASSEMBLY INSTALLATION

Align the steering column dash panel cover notch (arrow A) with the steering gear lug (arrow B), and install the front axle number 1 crossmember, the rear roll stopper and steering gear assembly.



## &gt;&gt;C&lt;&lt; FRONT AXLE CROSMEMBER STAY/JAM NUT INSTALLATION

Ensure that the crossmember mounting bolts have been tightened to  $180 \pm 20 \text{ N}\cdot\text{m}$  ( $133 \pm 14 \text{ ft-lb}$ ), and then install the front crossmember stay with the jam nut.



## INSPECTION

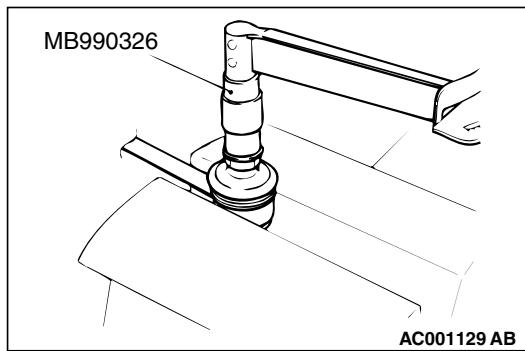
M1332002000291

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

## STABILIZER LINK BALL JOINT BREAKAWAY TORQUE CHECK

## Required Special Tool:

- MB990326: Preload Socket



1. After shaking the ball joint stud several times, install the nut to the stud and use special tool MB990326 to measure the breakaway torque of the ball joint.

**Standard value: 3.4 – 9.0 N·m (30 – 80 in-lb)**

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.*

## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

M1332008500227

ITEM	SPECIFICATION
<b>Lower arm assembly</b>	
Lower arm to crossmember connection bolt	$165 \pm 15 \text{ N}\cdot\text{m}$ ( $122 \pm 11 \text{ ft-lb}$ )
Lower arm to crossmember connection nut (jam nut)	$165 \pm 15 \text{ N}\cdot\text{m}$ ( $122 \pm 11 \text{ ft-lb}$ )
Lower arm to knuckle connection nut (jam nut)	$65 \pm 6 \text{ N}\cdot\text{m}$ ( $48 \pm 4 \text{ ft-lb}$ )
<b>Stabilizer bar</b>	
Crossmember to body connection bolt and nut	$180 \pm 20 \text{ N}\cdot\text{m}$ ( $133 \pm 14 \text{ ft-lb}$ )
Front axle crossmember stay bolt and nut	$83 \pm 12 \text{ N}\cdot\text{m}$ ( $61 \pm 9 \text{ ft-lb}$ )
Pressure hose clamp bolt	$12 \pm 2 \text{ N}\cdot\text{m}$ ( $102 \pm 22 \text{ in-lb}$ )
Rear roll stopper connection nut	$58 \pm 7 \text{ N}\cdot\text{m}$ ( $43 \pm 5 \text{ ft-lb}$ )
Return tube clamp bolt and nut	$12 \pm 2 \text{ N}\cdot\text{m}$ ( $102 \pm 22 \text{ in-lb}$ )
Stabilizer bracket bolt	$58 \pm 7 \text{ N}\cdot\text{m}$ ( $43 \pm 5 \text{ ft-lb}$ )
Stabilizer link nut	$48 \pm 7 \text{ N}\cdot\text{m}$ ( $36 \pm 5 \text{ ft-lb}$ )
Steering gear and joint connecting bolt	$18 \pm 2 \text{ N}\cdot\text{m}$ ( $13 \pm 2 \text{ ft-lb}$ )
Steering gear and pressure tube flare nut	$15 \pm 3 \text{ N}\cdot\text{m}$ ( $11 \pm 2 \text{ ft-lb}$ )
Steering gear and return tube flare nut	$15 \pm 3 \text{ N}\cdot\text{m}$ ( $11 \pm 2 \text{ ft-lb}$ )
Tie rod to knuckle connection nut	$29 \pm 4 \text{ N}\cdot\text{m}$ ( $21 \pm 3 \text{ ft-lb}$ )
<b>Strut assembly</b>	
Stabilizer link nut	$48 \pm 7 \text{ N}\cdot\text{m}$ ( $36 \pm 5 \text{ ft-lb}$ )
Strut assembly to body connection nut	$48 \pm 7 \text{ N}\cdot\text{m}$ ( $36 \pm 5 \text{ ft-lb}$ )
Strut assembly to knuckle connection nut	$305 \pm 25 \text{ N}\cdot\text{m}$ ( $225 \pm 18 \text{ ft-lb}$ )
Strut nut (jam nut)	$65 \pm 5 \text{ N}\cdot\text{m}$ ( $48 \pm 4 \text{ ft-lb}$ )

## GENERAL SPECIFICATIONS

M1332000200318

## COIL SPRING

ITEM	2.4L ENGINE	3.8L ENGINE
Wire diameter mm (in)	15.3 (0.60)	15.0 (0.59) <Except RALLIART> 15.1 (0.59) <RALLIART>
Average diameter mm (in)	170 – 180 (6.7 – 7.1)	170 – 180 (6.7 – 7.1)
Free length mm (in)	348.0 (13.70)	333.5 (13.13)

## SERVICE SPECIFICATIONS

M1332000300876

ITEM	STANDARD VALUE
Toe-in mm (in)	0 ± 3 (0 ± 0.12)
Steering angle	Inner wheel 37°12' ± 2°00' <vehicles with 16-inch wheels> 33°48' ± 2°00' <vehicles with 17-inch wheels> 32°54' ± 2°00' <vehicles with 18-inch wheels>
	Outer wheel (reference) 30°18' <vehicles with 16-inch wheels> 28°18' <vehicles with 17-inch wheels> 27°48' <vehicles with 18-inch wheels>
Camber	0°00' ± 0°30' (Left/right deviation within 30')
Caster	3°00' ± 0°30' (Left/right deviation within 30')
Kingpin inclination	12°54' ± 1°30'
Lower arm ball joint breakaway torque N·m (in-lb)	3.5 – 6.9 (31 – 61)
Lower arm bushing press-in pressure kN (lb)	10 (2,248) or more
Stabilizer link ball joint breakaway torque N·m (in-lb)	3.4 – 9.0 (30 – 80)

## LUBRICANT

M1332000400163

ITEM	SPECIFIED LUBRICANT	QUANTITY
Lower arm ball joint	Lip portion of dust cover	Multipurpose grease SAE J310, NLGI No.2 or equivalent
	Inside of dust cover	As required 13 ± 0.5 g (0.45 ± 0.02 oz)