

GROUP 34

REAR SUSPENSION

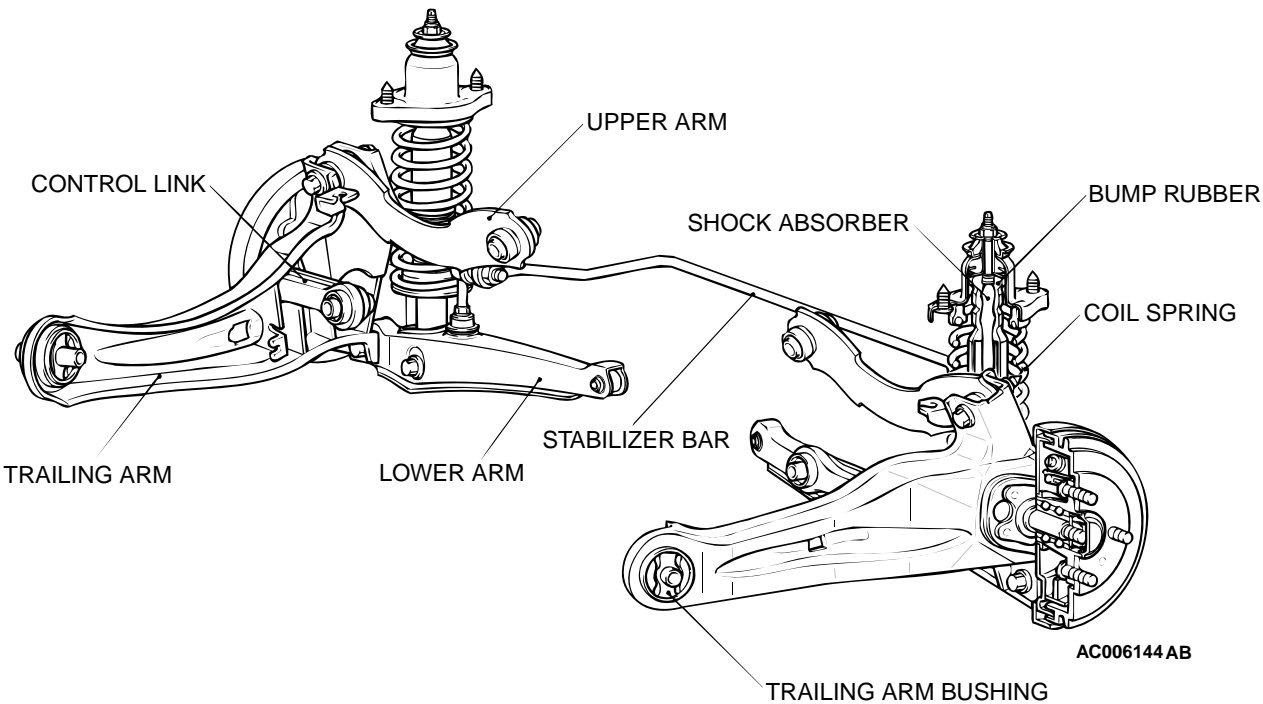
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GENERAL DESCRIPTION

M1341000100085

A trailing arm type multi-link suspension has been adopted as the rear suspension. The shock absorber is a hydraulic, cylindrical double-acting type.



REAR SUSPENSION DIAGNOSIS

INTRODUCTION TO REAR SUSPENSION DIAGNOSIS

M1341013100085

If the rear suspension is faulty, the vehicle will not run straightforward or noise will occur. Incorrect wheel alignment, malfunction of shock absorber, stabilizer bar, coil spring, control arms or worn or out-of-balance will cause these problems.

REAR SUSPENSION DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1341013200082

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

1. Gather information from the customer.

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

SYMPTOM CHART

M1341013500191

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Squeaks or other abnormal noise	1	P.34-3
Poor ride	2	P.34-3
Body tilting	3	P.34-4

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Squeaks or other Abnormal Noise

DIAGNOSIS

STEP 1. Check for loose rear suspension installation bolts and nuts.

Q: Are the rear suspension installation bolts and nuts loose?

YES : Retighten them, then go to Step 5.

NO : Go to Step 2.

STEP 2. Check the malfunction of shock absorbers (worn bushings).

Q: Are the shock absorbers (bushings) in good condition?

YES : Go to Step 3.

NO : Replace the faulty part, then go to Step 5.

STEP 3. Check the upper arms and/or lower arms and/or control links for deformity or damage.

Q: Are the upper arms and/or lower arms and/or control links in good condition?

YES : Go to Step 4.

NO : Replace the faulty part, then go to Step 5.

STEP 4. Check the trailing arms for deformity or damage.

Q: Are the trailing arms in good condition?

YES : Go to Step 5.

NO : Replace the faulty part, 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: Poor Ride

DIAGNOSIS

STEP 1. Check the excessive tire inflation pressure.

Refer to GROUP 31, On-vehicle Service–Tire Inflation Pressure Check [P.31-7](#).

Q: Is the tire inflation pressure in good condition?

YES : Go to Step 2.

NO : Adjust the pressure, then go to Step 4.

STEP 2. Check for malfunction of shock absorbers (weak or broken springs).

Q: Are the shock absorbers in good condition?

YES : Go to Step 3.

NO : Replace the faulty part, then go to Step 4.

STEP 3. Check the stabilizer bar and/or stabilizer links for deformity or damage.

Q: Are the stabilizer bar and/or stabilizer link deformed or damaged?

YES : Replace the faulty part, 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 3: Body Tilting

DIAGNOSIS

STEP 1. Check for weak or deteriorated bushings.

Q: Are the bushings in good condition?

YES : Go to Step 2.

NO : Replace the faulty part, then go to Step 5.

STEP 2. Check for weak or broken springs.

Q: Are the springs in good condition?

YES : Go to Step 3.

NO : Replace the faulty part, then go to Step 5.

STEP 3. Check the upper arms and/or lower arms and/or control links for deformity or damage.

Q: Are the upper arms and/or lower arms and/or control links deformed or damaged?

YES : Replace the faulty part, then go to Step 5.

NO : Go to Step 4.

STEP 4. Check the trailing arms for deformity or damage.

Q: Are the trailing arms deformed or damaged?

YES : Replace the faulty part, then go to Step 5.

NO : Go to Step 5.

STEP 5. Retest the system.

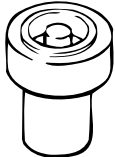
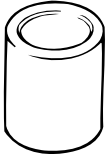
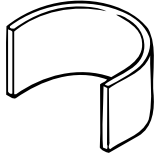
Q: Is the malfunction eliminated?

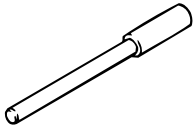

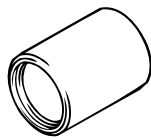
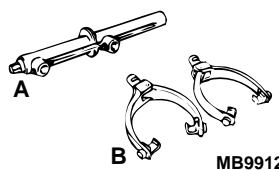
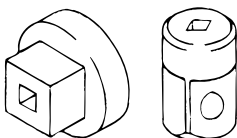
YES : The procedure is complete.

NO : Return to Step 1.

SPECIAL TOOLS

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TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MB991447 Bushing remover and installer	—	Lower arm bushing removal and press-fitting
	MB991448 Bushing remover and installer base	—	
	MB991449 Bushing remover and installer supporter	—	

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
 MB990947	MB990947 Lower arm bushing arbor	MB990947-01 or general service tool	Trailing arm bushing removal and press-fitting
	MB991816 Bushing remover and installer base	—	
 MB990890	MB990890 Rear suspension bushing base	MB990890-01 or general service tool	
 A B MB991237	<ul style="list-style-type: none"> • A: MB991237 Spring compressor body • B: MB991239 Arm set 	MIT221369 or general service tool	Coil spring removal and installation
 MB990326	MB990326 Preload socket	General service tool	Ball joint rotating torque check

ON-VEHICLE SERVICE

REAR WHEEL ALIGNMENT CHECK AND ADJUSTMENT

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Measure wheel alignment with an alignment equipment on level ground.

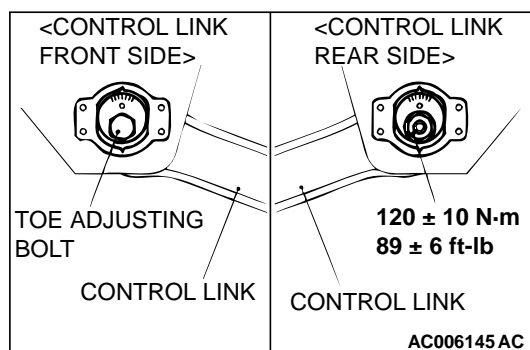
The rear suspension and wheels should be serviced to the normal condition prior to wheel alignment.

TOE-IN

Standard value: 3 ± 2 mm (0.12 ± 0.08 inch)

If toe-in is not within the standard value, adjust by following procedures.

1. Be sure to adjust the camber before making toe adjustment.



- Carry out adjustment by turning the toe adjusting bolt (control link mounting bolt which is located on the inner side of the body).

NOTE:

- LH: Clockwise viewed from the rear → Toe-out
- RH: Clockwise viewed from the rear → Toe-in
- Toe adjustment can be made at graduations of approximately 2.6 mm (0.10 inch).

CAMBER

Standard value: $-0^{\circ} 40' \pm 30'$ (Difference between right and left within 30')

⚠ CAUTION

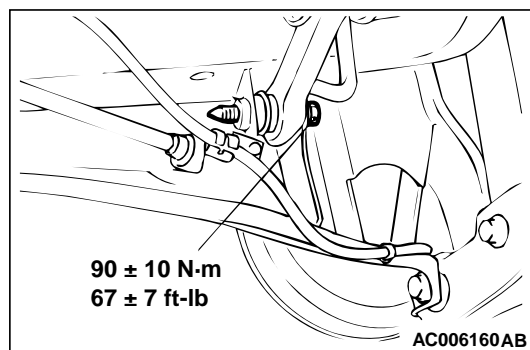
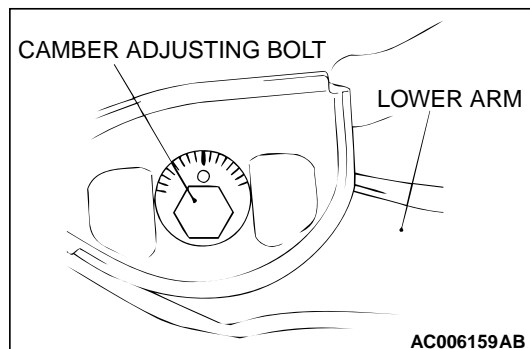
To prevent the wheel bearing from damage, never subject the wheel bearings to the vehicle load when the self-locking nuts are loosened.

If camber is not within the standard value, adjust by following procedures.

- Disconnect the conjunction of the control link and the trailing arm.
- Carry out adjustment by turning the camber adjusting bolt (lower arm mounting bolt which is located on the inner side of the body).

NOTE:

- LH: Turning clockwise (+) camber
- RH: Turning clockwise (-) camber
- The scale has graduations of approximately 14'.


⚠ CAUTION

To prevent bushings from breakage, the connecting bolt should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.

- Tighten the control link to the trailing arm.
- After adjusting the camber, the toe should be adjusted.

BALL JOINT DUST COVER INSPECTION

M1341012800092

1. Check dust covers for cracks or damage by pushing it with your finger.
2. If a dust cover is cracked or damaged, replace the stabilizer link.

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

CONTROL LINK, UPPER ARM AND LOWER ARM REMOVAL AND INSTALLATION

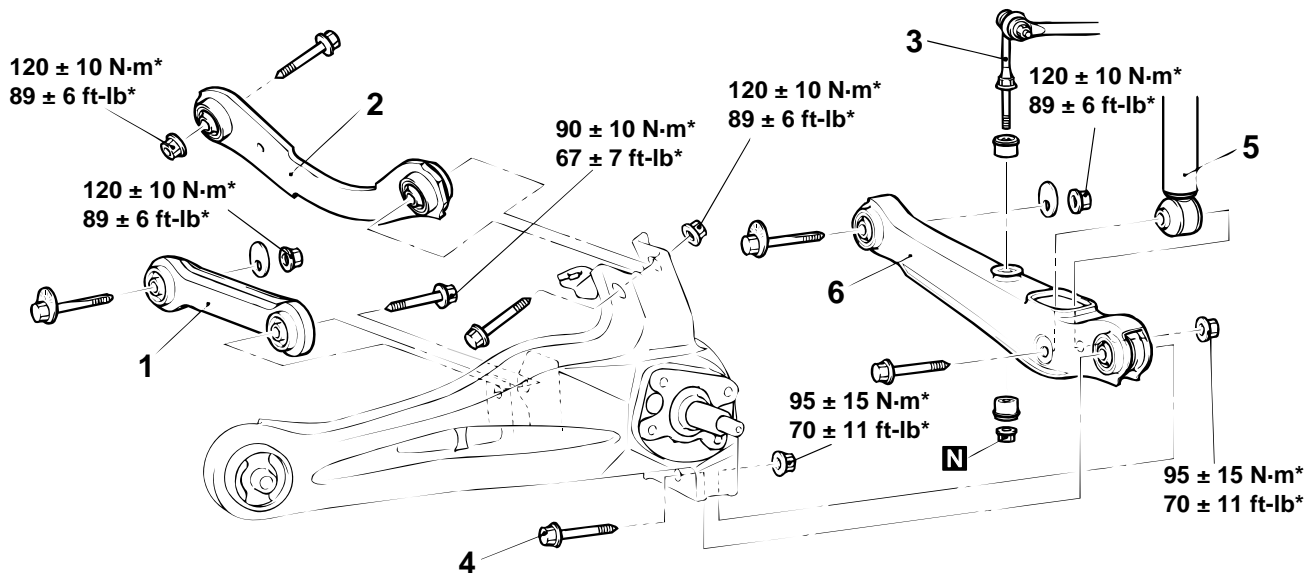
M1341004800020

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

- Wheel Alignment Check And Adjustment (Refer to P.34-5.)



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CONTROL LINK AND UPPER ARM REMOVAL STEPS

- <<A>> 1. CONTROL LINK
<> >>B<< 2. UPPER ARM
- ### LOWER ARM REMOVAL STEPS
- >>A<< 3. STABILIZER LINK CONNECTION
<<C>> 4. LOWER ARM AND TRAILING ARM CONNECTION
5. SHOCK ABSORBER CONNECTION
<<A>> 6. LOWER ARM

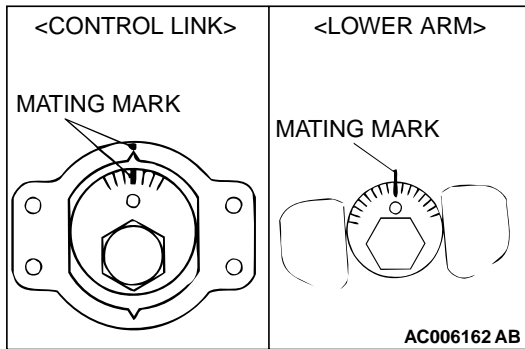
Required Special Tools:

- MB991447: Bushing remover and installer
- MB991448: Bushing remover and installer base
- MB991449: Bushing remover and installer supporter

REMOVAL SERVICE POINT

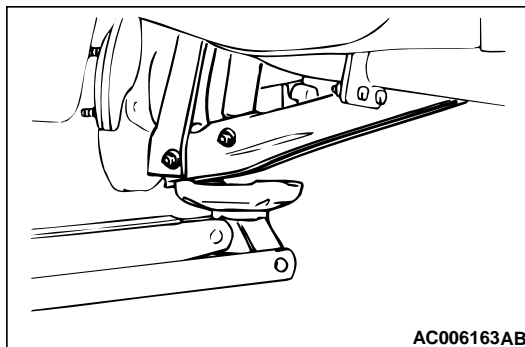
<<A>> CONTROL LINK/LOWER ARM REMOVAL

After making a mating mark on the toe-in or camber adjusting bolt, remove the control link or lower arm.



<> UPPER ARM REMOVAL

After supporting the lower arm with a jack, separate the upper arm and the trailing arm.



<<C>> LOWER ARM AND TRAILING ARM DISCONNECTION

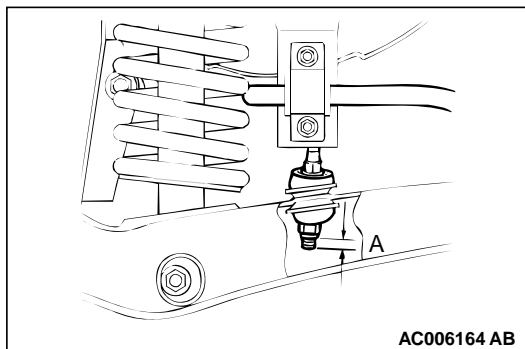
After supporting the lower arm with a jack, separate the lower arm and the trailing arm.

INSTALLATION SERVICE POINT

>>A<< STABILIZER LINK CONNECTION

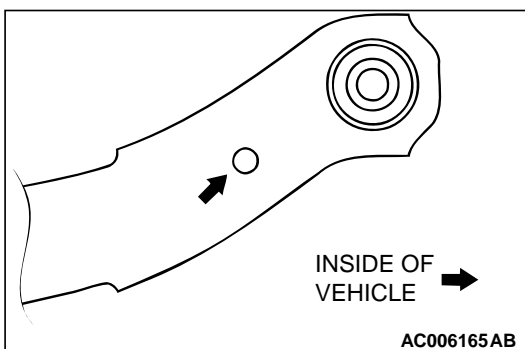
Tighten the self-locking nut so that the amount of protrusion of the end of the stabilizer link bolt is at the standard value.

Standard value (A): 6 – 8 mm (0.24 – 0.31 in)



>>B<< UPPER ARM INSTALLATION

Install the upper arm so that its hole faces inside of the vehicle.



INSPECTION

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- Check the bushing for wear and deterioration.
- Check the control link, upper arm or lower arm for bending or breakage.
- Check all bolts for condition and straightness.

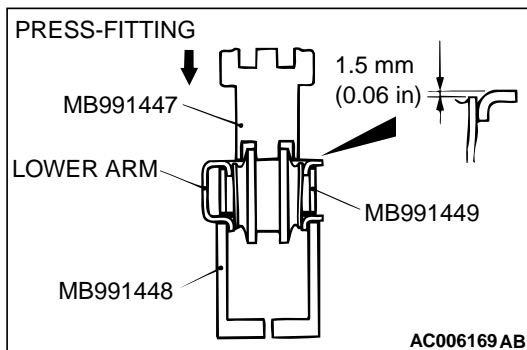
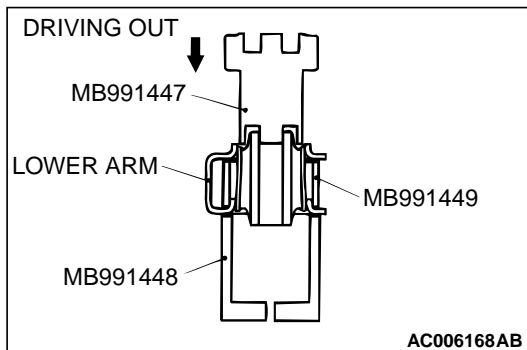
LOWER ARM BUSHING REPLACEMENT

M1341011800044

CAUTION

Because the outside of both edges of the bushing are different, be careful not to mistake the direction when driving out and press-fitting.

Use the special tools to drive out and press fit the lower arm bushing.



TRAILING ARM ASSEMBLY

REMOVAL AND INSTALLATION

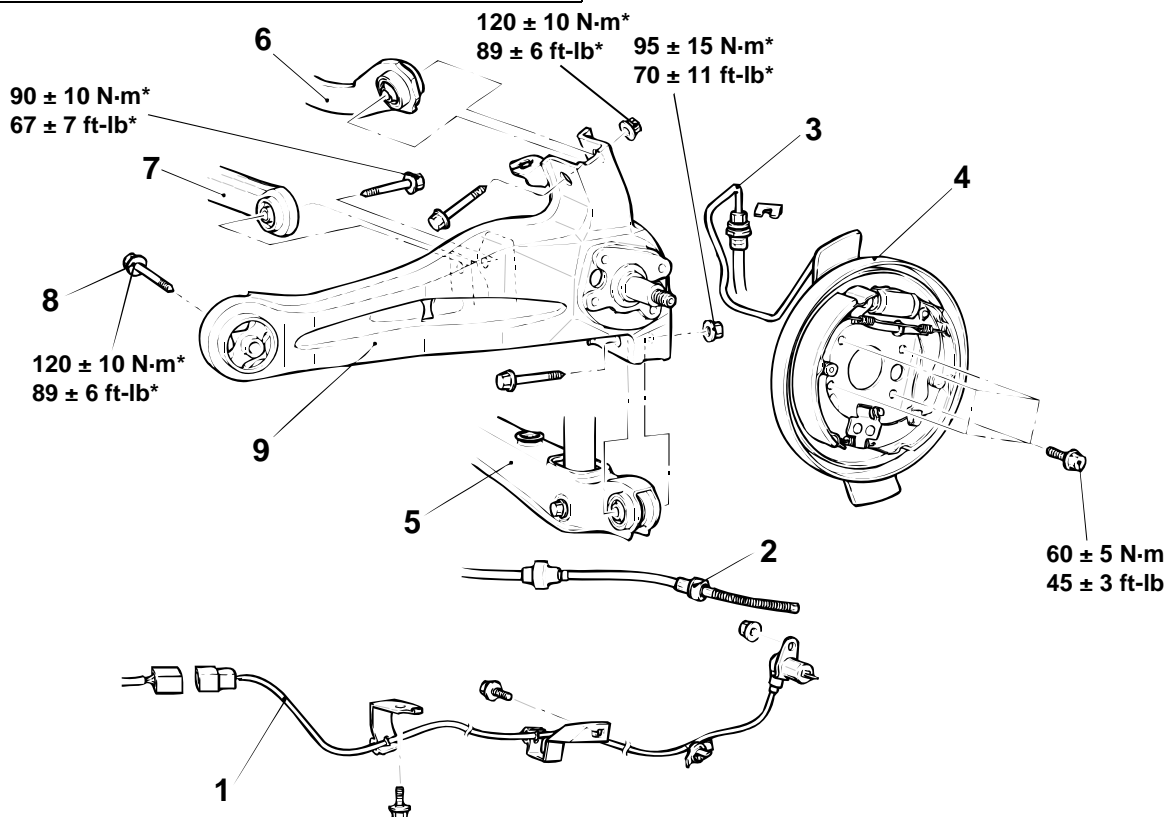
M1341002200185

CAUTION

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

Pre-removal and Post-installation Operation

- Rear Hub Assembly Removal and Installation (Refer to GROUP 27, Rear Axle Hub [P.27-6.](#))



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<<A>>

REMOVAL STEPS

- LIFTING POINT
- 1. REAR WHEEL SPEED SENSOR <VEHICLES WITH ABS> (REFER TO GROUP 35B, WHEEL SPEED SENSOR [P.35B-67.](#))
- 2. PARKING BRAKE CABLE CONNECTION (REFER TO GROUP 36, PARKING BRAKE CABLE [P.36-6.](#))
- 3. BRAKE HOSE AND TRAILING ARM CONNECTION
- 4. REAR BRAKE ASSEMBLY
- 5. LOWER ARM AND TRAILING ARM CONNECTION

<>

<<C>>

REMOVAL STEPS (Continued)

- 6. UPPER ARM AND TRAILING ARM CONNECTION
- 7. CONTROL LINK AND TRAILING ARM CONNECTION
- 8. TRAILING ARM AND BODY CONNECTING BOLT
- 9. TRAILING ARM

Required Special Tools:

- MB990890: Rear suspension bushing base
- MB990947: Lower arm bushing arbor
- MB991816: Bushing remover and installer base

REMOVAL SERVICE POINTS

<<A>> LIFTING POINT

When removing the trailing arm, move the lifting arm slightly towards the front of the vehicle so that it will not be in the way.

<> REAR BRAKE ASSEMBLY REMOVAL

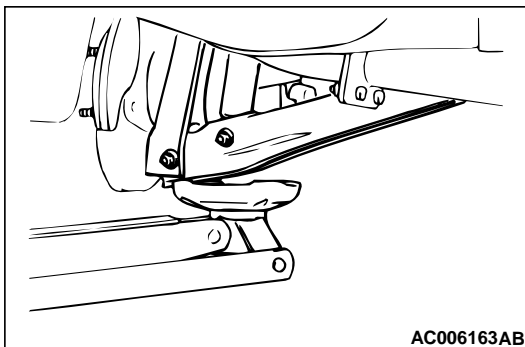
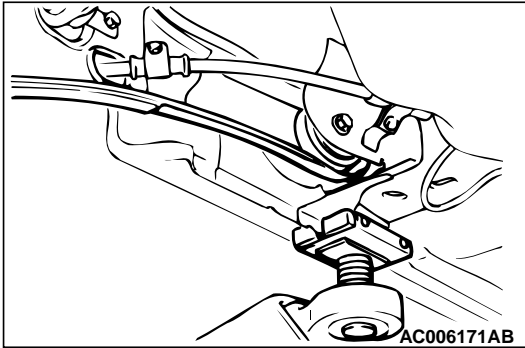
CAUTION

Be careful not to bend the brake pipe then suspending the rear brake assembly.

After removing the rear brake assembly, suspend it to the body with a cord to prevent it from dropping.

<<C>> LOWER ARM AND TRAILING ARM DISCONNECTION

After supporting the lower arm with a jack, separate the lower arm and trailing arm connection.



INSPECTION

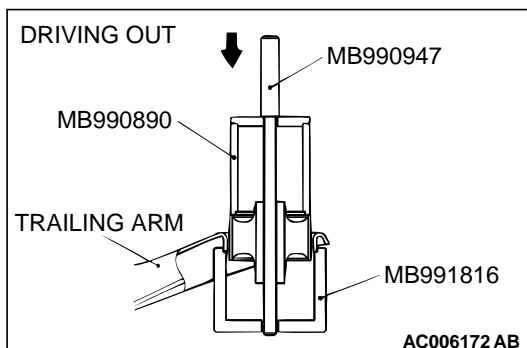
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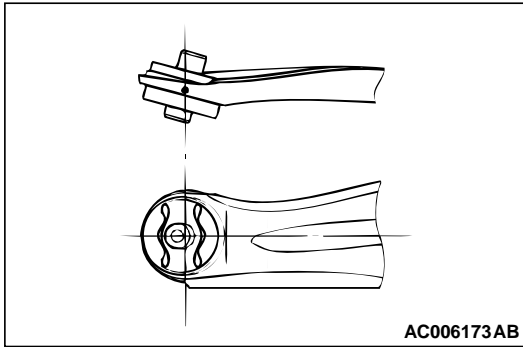
- Check the bushings for wear and deterioration.
- Check the trailing arm for bending or damage.

TRAILING ARM BUSHING REPLACEMENT

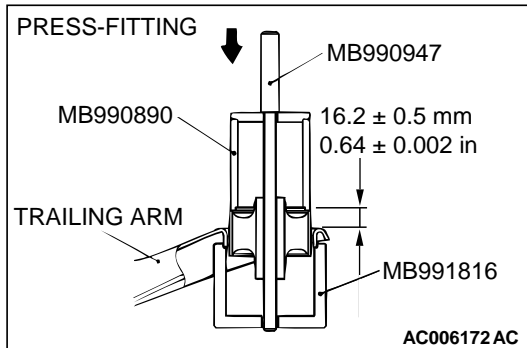
M1341011300049

1. Use the special tools to drive out the trailing arm bushing.





2. Set the installation direction and installation location of the trailing arm bushing.
 - (1) Place the long projection end of the trailing arm bushing inner pipe towards the inside of the vehicle.
 - (2) Make sure that the hollow of the trailing arm bushing is located as shown in the illustration.



3. Using the special tool, press the trailing arm bushing into the position shown.

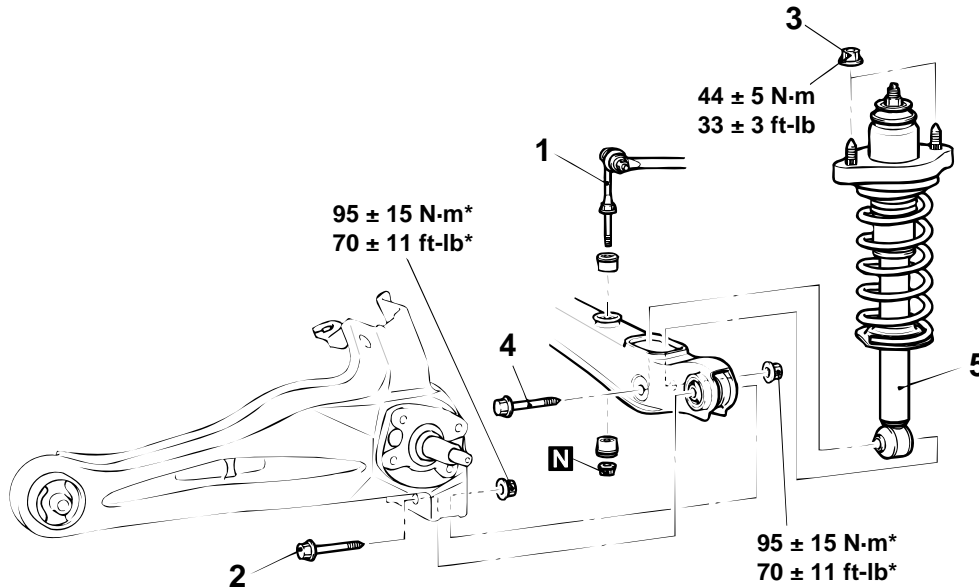
SHOCK ABSORBER ASSEMBLY

REMOVAL AND INSTALLATION

M1341002500045

CAUTION

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



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REMOVAL STEPS

- >>B<< 1. STABILIZER LINK CONNECTION
<<A>> 2. LOWER ARM AND TRAILING ARM CONNECTION
3. SHOCK ABSORBER MOUNTING NUT

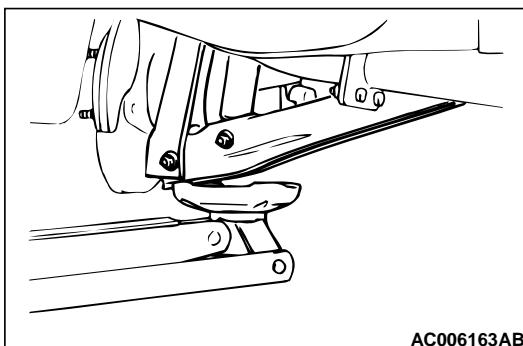
REMOVAL STEPS (Continued)

4. SHOCK ABSORBER AND LOWER ARM CONNECTING BOLT
>>A<< 5. SHOCK ABSORBER ASSEMBLY

REMOVAL SERVICE POINT

<<A>> LOWER ARM AND TRAILING ARM DISCONNECTION

After supporting the lower arm with a jack, separate the lower arm and trailing arm connection.

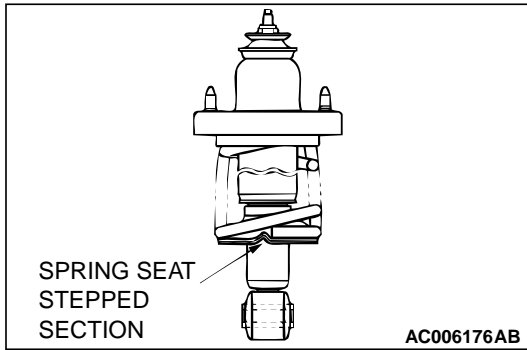


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INSTALLATION SERVICE POINT

>>A<< SHOCK ABSORBER ASSEMBLY INSTALLATION

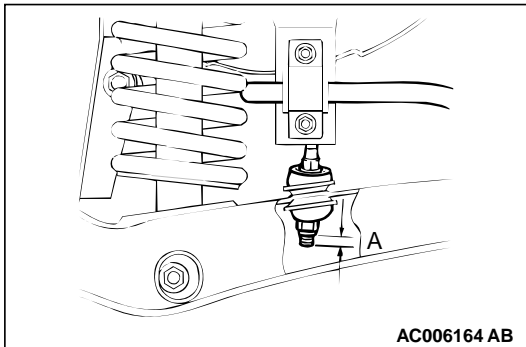
Install the spring seat stepped section so that it points towards the rear side of the vehicle.



>>B<< STABILIZER LINK CONNECTION

Tighten the self-locking nuts so that the amount of protrusion of the end of the stabilizer link bolt is at the standard value.

Standard value (A): 6 – 8 mm (0.24 – 0.31 inch)



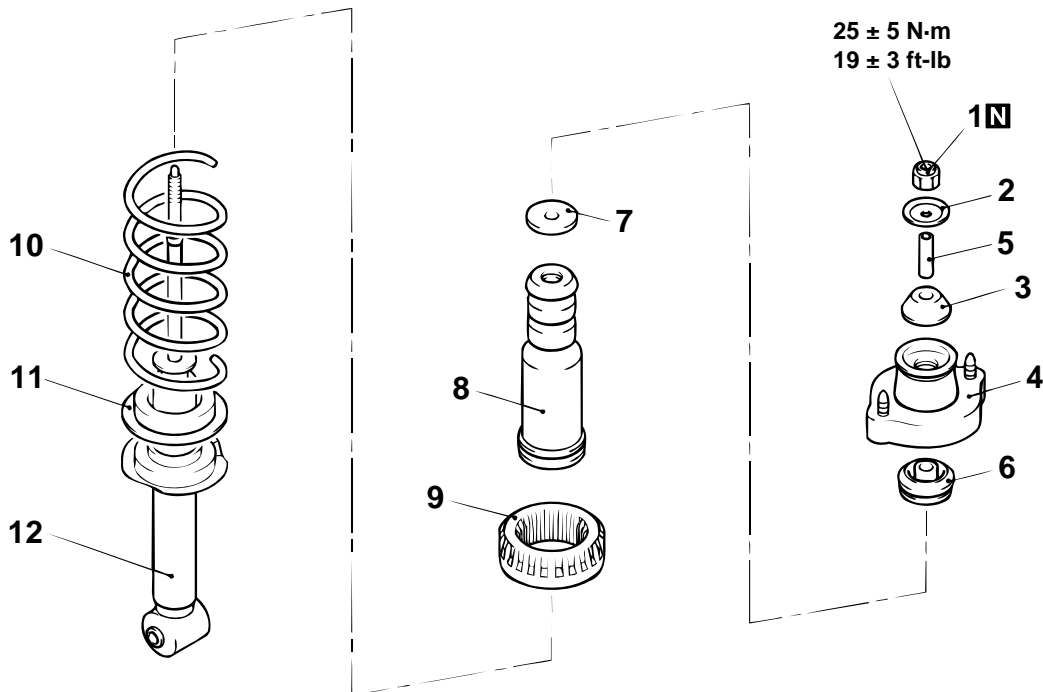
INSPECTION

M1341002600042

- Check the rubber parts for cracks and wear.
- Check the shock absorber for malfunctions, oil leakage, or abnormal noise.

DISASSEMBLY AND ASSEMBLY

M1341005300158



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DISASSEMBLY STEPS

- <<A>> >>D<< 1. SELF-LOCKING NUT
2. WASHER
3. UPPER BUSHING B
>>C<< 4. BRACKET ASSEMBLY
5. COLLAR
6. UPPER BUSHING A
7. PLATE
8. BUMP RUBBER
>>B<< 9. UPPER SPRING PAD

DISASSEMBLY STEPS (Continued)

- >>A<< 10. COIL SPRING
11. LOWER SPRING PAD
12. SHOCK ABSORBER

Required Special Tools:

- MB991237: Spring Compressor Body
- MB991239: Arm Set

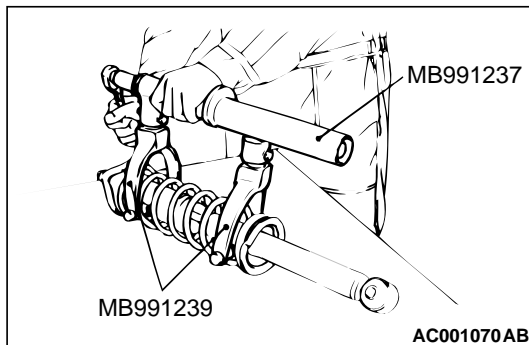
DISASSEMBLY SERVICE POINT

<<A>> SELF-LOCKING NUT REMOVAL

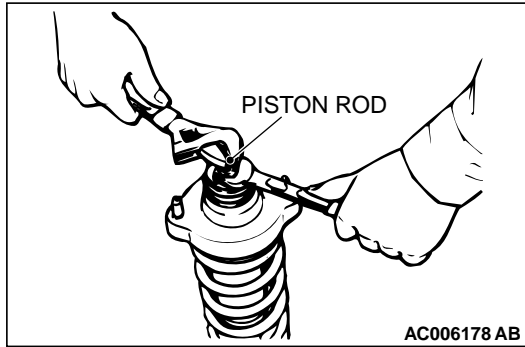
⚠ CAUTION

- To hold the coil spring securely, install special tools MB991237 and MB991239 evenly, and so that the space between both arms of the special tool will be maximum within the installation range.
- Do not use an impact wrench to tighten the bolt of special tool MB991237. It will break the special tool.

1. Use special tools MB991237 and MB991239 to compress the coil spring.



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⚠ WARNING

Do not use an impact wrench to remove the self-locking nut. Vibration of the impact wrench will cause special tools MB991237 and MB991239 to slip and cause personal injury.

2. While holding the piston rod, remove the self-locking nut.

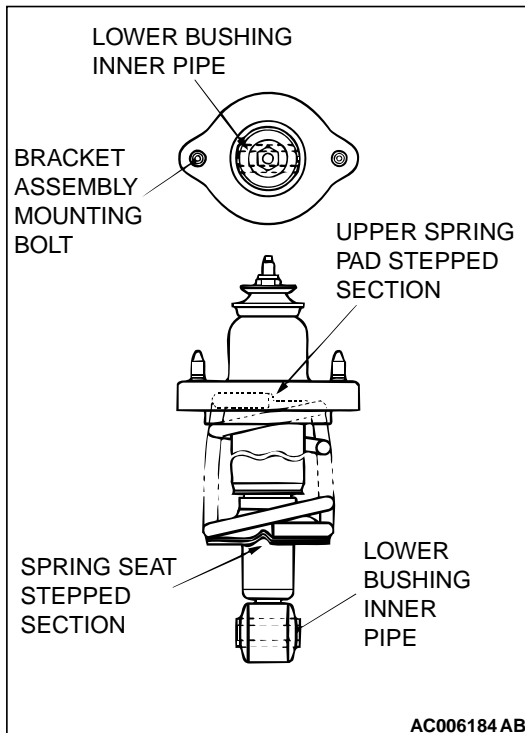
ASSEMBLY SERVICE POINTS

>>A<< COIL SPRING INSTALLATION

⚠ CAUTION

Do not use an impact wrench to tighten the bolt of special tool MB991237. It will break the special tool.

1. Use special tools MB991237 and MB991239 to compress the coil spring, and install it to the spring seat of the shock absorber.
2. Align the end of the coil spring with the stepped section of the spring seat of the shock absorber.



>>B<< UPPER SPRING PAD INSTALLATION

Align the stepped section of the upper spring pad with the end of the coil spring, and install the upper spring pad.

>>C<< BRACKET ASSEMBLY INSTALLATION

Install the bracket assembly so that the lower bushing inner pipe of the shock absorber and the line between the bracket mounting bolts are straight when looking from above.

>>D<< SELF-LOCKING NUT INSTALLATION

1. Temporarily tighten the self-locking nut.

CAUTION

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

2. Remove special tools MB991237 and MB991239, and then tighten the self-locking nut to $25 \pm 5 \text{ N}\cdot\text{m}$ ($19 \pm 3 \text{ ft}\cdot\text{lb}$).

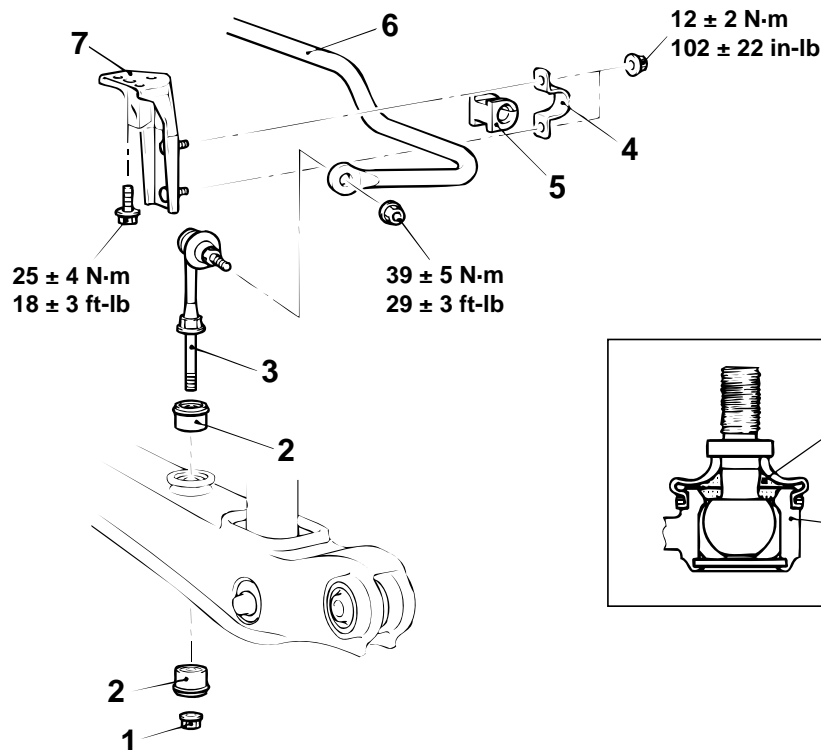
STABILIZER BAR

REMOVAL AND INSTALLATION

M1341003000151

Post-installation Operation

- Press the dust cover with your finger to check that there are no cracks or damage in the dust cover.



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REMOVAL STEPS

- >>B<< 1. SELF-LOCKING NUT
2. STABILIZER RUBBER
>>A<< 3. STABILIZER LINK
4. FIXTURE

REMOVAL STEPS (Continued)

- >>A<< 5. BUSHING
>>A<< 6. STABILIZER BAR
7. STABILIZER BRACKET

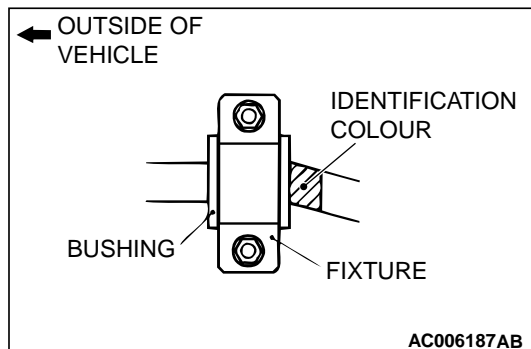
Required Special Tool:

- MB990326: Preload Socket

INSTALLATION SERVICE POINT

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

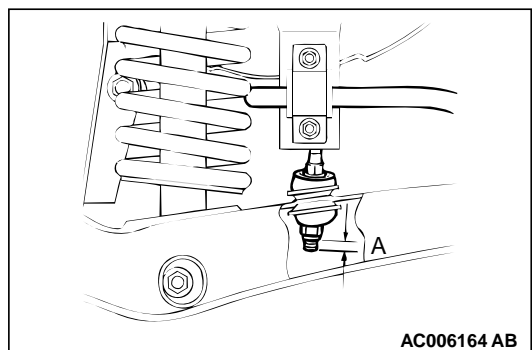
Align the identification color on the left side of the stabilizer bar with the right end of the bushing.



>>B<< SELF-LOCKING NUT INSTALLATION

Tighten the self-locking nut so that the amount of protrusion of the end of the stabilizer link bolt is at the standard value.

Standard value (A): 6 – 8 mm (0.24 – 0.31 inch)



INSPECTION

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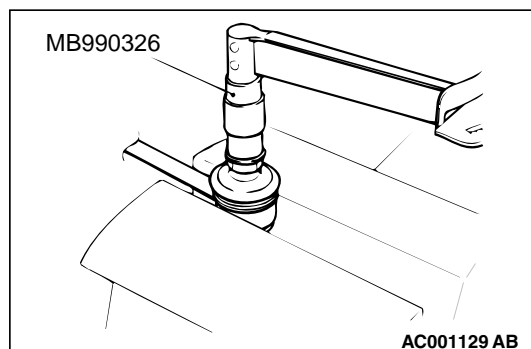
- Check the bushings for wear and deterioration.
- Check the stabilizer bar for deterioration or damage.
- Check all bolts for condition and straightness.

STABILIZER LINK BALL JOINT BREAKAWAY TORQUE CHECK

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: 0.5 – 1.5 N·m (4.4 – 13.3 in-lb)

2. If the measured value exceeds the standard value, replace the stabilizer link.
3. If 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.

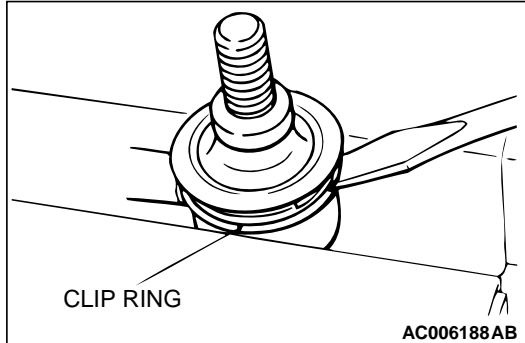
NOTE: Cracks or damage of the dust cover may cause damage to the ball joint. When it is damaged during service work, replace the dust cover. (Refer to P.34-19.)

STABILIZER LINK BALL JOINT DUST COVER REPLACEMENT

M1341010900048

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 multipurpose grease to the inside of the dust cover.
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.



SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1341012700222

ITEM	SPECIFICATION
Control link	
Control link to crossmember nut	120 ± 10 N·m (89 ± 6 ft-lb)
Lower arm	
Lower arm to crossmember nut	120 ± 10 N·m (89 ± 6 ft-lb)
Shock absorber assembly	
Shock absorber assembly to body nut	44 ± 5 N·m (33 ± 3 ft-lb)
Shock absorber assembly to knuckle nut	95 ± 15 N·m (70 ± 11 ft-lb)
Shock absorber jam nut	25 ± 5 N·m (19 ± 3 ft-lb)
Stabilizer bar	
Stabilizer bar bracket bolt	25 ± 4 N·m (18 ± 3 ft-lb)
Stabilizer link nut	39 ± 5 N·m (29 ± 3 ft-lb)
Fixture nut	12 ± 2 N·m (102 ± 22 in-lb)
Trailing arm	
Body to trailing arm bolt	120 ± 10 N·m (89 ± 6 ft-lb)
Control link to trailing arm bolt	90 ± 10 N·m (67 ± 7 ft-lb)
Lower arm to trailing arm nut	95 ± 15 N·m (70 ± 11 ft-lb)
Upper arm to trailing arm nut	120 ± 10 N·m (89 ± 6 ft-lb)
Rear brake assembly to trailing arm bolt	60 ± 5 N·m (45 ± 3 ft-lb)
Upper arm	
Upper arm to crossmember nut	120 ± 10 N·m (89 ± 6 ft-lb)

GENERAL SPECIFICATIONS

M1341000200220

COIL SPRING

ITEM	SPECIFICATION
Wire diameter mm (in)	10.4 (0.41)
Average diameter mm (in)	90.4 (3.6)
Free length mm (in)	370 (14.6)

SERVICE SPECIFICATIONS

M1341000300261

ITEM	STANDARD VALUE
Toe-in mm (in)	3 ± 2 (0.12 ± 0.08)
Camber	$-0^{\circ}40' \pm 30'$ (Difference between right and left within 30')
Thrust angle	$0^{\circ}00' \pm 0^{\circ}09'$
Protruding length of stabilizer link bolt mm (in)	6 – 8 (0.24 – 0.31)
Stabilizer link ball joint breakaway torque N·m (in-lb)	0.5 – 1.5 (4.4 – 13.3)