

# 2004 SUSPENSION

## Suspension General Diagnosis - Vue

### SPECIFICATIONS

#### TRIM HEIGHT SPECIFICATIONS

##### Trim Height Specifications

Application	Specification	
	Metric	English
Front Curb Bumper Height	410 mm	16.14 in
Rear Curb Bumper Height	435 mm	17.13 in
All Measurements Taken With a Full Tank of Gas		
All Measurement have a Tolerance of +/-25.0 mm (+/-0.98 in)		

### DIAGNOSTIC INFORMATION AND PROCEDURES

#### DIAGNOSTIC STARTING POINT - SUSPENSION GENERAL DIAGNOSIS

Begin the system diagnosis by reviewing the system Description and Operation. Reviewing the Description and Operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information, and the vehicle RPO, will also help you determine if the condition described by the customer is normal operation. Refer to **Symptoms - Suspension General Diagnosis** in order to identify the correct procedure for diagnosing the system and where the procedure is located.

#### SYMPTOMS - SUSPENSION GENERAL DIAGNOSIS

**IMPORTANT:** The following step must be completed before using the symptom tables.

Review the system description and operation in order to familiarize yourself with the system functions. Refer to the appropriate description and operation:

- **General Description (Strut)** in Front Suspension
- **General Description** in Rear Suspension
- **General Description** in Tires and Wheels

#### Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of any of the suspension subsystems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect for proper tire size and inflation pressure. Refer to **Tire Placard** in General Information.

## Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Ride Diagnosis**
- **Vehicle Leads/Pulls**
- **Suspension Bottoms**
- **Torque Steer**
- **Memory Steer**
- **Poor Directional Stability**

## RIDE DIAGNOSIS

### Ride Diagnosis

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b><u>Symptoms - Suspension General Diagnosis</u></b>
2	<b>IMPORTANT:</b> <b>Verify the vehicle suspension package RPO.</b>  Verify that the ride is too soft or too hard. Does the vehicle ride normally?	System OK	Go to <b>Step 3</b>
3	Check the tire inflation and adjust to specifications. Refer to <b><u>Tire Inflation Pressure Specifications</u></b> in Maintenance and Lubrication. Did you adjust the tire pressure?	Go to <b>Step 6</b>	Go to <b>Step 4</b>
4	Inspect the vehicle trim height. Refer to <b><u>Trim Height Inspection Procedure</u></b> . Did you find and correct the condition?	Go to <b>Step 6</b>	Go to <b>Step 5</b>
5	Inspect the following suspension components for wear or damage. <ul style="list-style-type: none"><li>• The strut and shock absorbers. Refer to <b><u>Struts or Shock Absorbers On-Vehicle Testing</u></b> .</li><li>• The springs. Refer to <b><u>Strut, Strut Component and/or Spring Replacement</u></b> or <b><u>Coil Spring Replacement</u></b> in Rear Suspension.</li></ul> Did you find and correct the condition?	Go to <b>Step 6</b>	System OK
6	Drive the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## VEHICLE LEADS/PULLS

### Vehicle Leads/Pulls

Step	Action	Yes	No
DEFINITION: At a constant highway speed on a typical straight road, lead/pull is the amount of effort required at the steering wheel to maintain the vehicle's straight path.			
1	Did you review the General Description and perform the visual/physical inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Road test the vehicle in order to verify the complaint. Does the vehicle operate normally?	System OK	Go to <b>Step 3</b>
3	Inspect the tire/wheel assemblies for: <ul style="list-style-type: none"> <li>• Correct tire pressure-Refer to the tire placard.</li> <li>• Correct tire size-Refer to the tire placard.</li> <li>• Abnormal tire wear or damage</li> </ul> Did you find and correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 4</b>
4	Perform the <b>Radial Tire Lead/Pull Correction</b> in Tires and Wheels. Did you find and correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 5</b>
5	Inspect and correct/adjust the suspension and steering systems for: <ul style="list-style-type: none"> <li>• Vehicle trim height-Refer to <b>Trim Height Specifications</b> .</li> <li>• Excessively worn, loose, or damaged components</li> </ul> Did you find and correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 6</b>
6	Inspect the brake system for brake drag. With the vehicle suspended on a hoist, brake drag can be identified by rotating each wheel several times and observing whether more force is need to rotate the left wheel or the right wheel. Refer to <b>Diagnostic Starting Point - Disc Brakes</b> in Disc Brakes. Did you find and correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 7</b>
7	Inspect the wheel alignment and adjust as necessary. Refer to <b>Measuring Wheel Alignment</b> in Wheel Alignment. Did you correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 8</b>
8	Inspect the steering gear for unequal effort. The vehicle must be suspended on a hoist, the engine running, and the transmission in park or neutral. Grasp the tire assembly and manually simulate a turn from the left of center and the right of center observing whether more force is needed to turn to the left or to the right. If this condition exists replace the steering gear. Did you correct the condition?	System OK	Go to <b>Step 3</b>

9	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>
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## BODY LEANS OR SWAYS IN CORNERS

### Body Leans or Sways in Corners

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Verify the vehicle leans or sways in corners. Does the vehicle operate normally?	System OK	Go to <b>Step 3</b>
3	Inspect the following components for wear or damage: <ul style="list-style-type: none"> <li>• The front springs</li> <li>• The rear springs</li> </ul> Are the components worn or damaged?	Go to <b>Step 5</b>	Go to <b>Step 4</b>
4	Inspect the stabilizer shaft link for wear or damage. Is the stabilizer shaft link worn or damaged?	Go to <b>Step 6</b>	Go to <b>Step 2</b>
5	Replace the springs. Refer to the appropriate procedure: <ul style="list-style-type: none"> <li>• <b>Strut, Strut Component and/or Spring Replacement</b> in Front Suspension</li> <li>• <b>Coil Spring Replacement</b> in Rear Suspension</li> </ul> Did you complete the repair?	Go to <b>Step 7</b>	-
6	Replace the stabilizer shaft link. Refer to <b>Stabilizer Shaft Link Replacement</b> in Front Suspension. Did you complete the repair?	Go to <b>Step 7</b>	-
7	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## SUSPENSION BOTTOMS

### Suspension Bottoms

Step	Action	Yes	No
DEFINITION: A loud bang or thump that can usually be felt and/or heard when the vehicle is driven over bumps. This condition is commonly noticed when the vehicle trim height is too low.			
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>

2	Verify that the suspension bottoms. Does the vehicle operate normally?	System OK	Go to <b>Step 3</b>
3	Check for vehicle overloading and correct the overloading condition as necessary. Refer to <b>Label - Vehicle Certification</b> in General Information. Did you find and correct the condition?	Go to <b>Step 6</b>	Go to <b>Step 4</b>
4	Inspect the following components for damage or wear: <ul style="list-style-type: none"> <li>• Struts and shock absorbers, refer to <b>Struts or Shock Absorbers On-Vehicle Testing</b> .</li> <li>• Coil springs, refer to <b>General Description (Strut)</b> in Front Suspension or <b>Coil Spring Replacement</b> in Rear Suspension.</li> </ul> Did you find and correct the condition?	Go to <b>Step 6</b>	Go to <b>Step 5</b>
5	Inspect the vehicle trim height. Refer to <b>Trim Height Inspection Procedure</b> . Did you complete the trim height inspection procedure?	Go to <b>Step 6</b>	-
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## TORQUE STEER

### Torque Steer

Step	Action	Yes	No
DEFINITION: On a dry, smooth, flat road, the vehicle has a left or right steering force during acceleration that is eliminated when the transmission is shifted into NEUTRAL. The level of the steering force is usually (but not always) dependent on the amount of torque which is applied by the engine.			
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	<ol style="list-style-type: none"> <li>1. Drive the vehicle on a straight, smooth, flat road.</li> <li>2. Press the accelerator and momentarily release the steering wheel.</li> <li>3. Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal.</li> </ol> Does the vehicle exhibit torque steer when the accelerator is pressed?	Go to <b>Step 3</b>	System OK
	1. Drive the vehicle on a straight, smooth, flat road at 64-97		

3	<p>km/h (40-60 mph).</p> <ol style="list-style-type: none"> <li>Remove your foot from the accelerator.</li> <li>Shift the transmission into NEUTRAL in order to allow the vehicle to coast.</li> <li>Momentarily release the steering wheel and note any change in the direction of the vehicle.</li> <li>Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal.</li> </ol> <p>Does the vehicle direction change when the steering wheel is momentarily released?</p>	Go to <b>Vehicle Leads/Pulls</b>	Go to <b>Step 4</b>
4	<p>Inspect the front suspension for worn or damaged components and repair as necessary.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 7</b>	Go to <b>Step 5</b>
5	<p>Inspect the vehicle trim height. Refer to <b>Trim Height Inspection Procedure</b>.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 7</b>	Go to <b>Step 6</b>
6	<p>Inspect for worn or damaged powertrain mounts. Replace as necessary. Refer to <b>Engine Mount Inspection</b> in Engine Mechanical 2.2L (L61), <b>Engine Mount Inspection</b> in Engine Mechanical 3.5L (L66), <b>Transmission Mount Inspection</b> Automatic Transaxle - 5AT.</p> <p>Did you complete the inspection/repair?</p>	Go to <b>Step 7</b>	-
7	<p>Operate the vehicle in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	Go to <b>Step 3</b>

## MEMORY STEER

### Memory Steer

Step	Action	Yes	No
DEFINITION: The steering wheel does not return to center after completing a turn.			
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Verify that memory steer is present. Does the system operate normally?	System OK	Go to <b>Step 3</b>
3	Check the tire inflation and adjust to specifications. Refer to <b>Tire Inflation Pressure Specifications</b> in Maintenance and Lubrication. Did you adjust the tire pressure?	Go to <b>Step 14</b>	Go to <b>Step 4</b>
	<ol style="list-style-type: none"> <li>Raise and support the vehicle. Refer to <b>Lifting and Jacking the Vehicle</b> in General Information.</li> <li>Inspect the suspension system for worn or</li> </ol>		

4	<p>damaged components.</p> <p>3. Repair as necessary.</p> <p>Did you find and correct the condition?</p>	<p>Go to <b>Step 14</b></p>	<p>Go to <b>Step 5</b></p>
5	<p>1. Rotate the steering wheel ONE revolution in both directions.</p> <p>2. Rotate the steering wheel back to the original position.</p> <p>Was the steering wheel abnormally difficult to rotate in either direction?</p>	<p>Go to <b>Step 6</b></p>	<p>Go to <b>Step 10</b></p>
6	<p>1. Remove the front tire and wheel assemblies. Refer to <b><u>Tire and Wheel Removal and Installation</u></b> in Tires and Wheels.</p> <p>2. Disconnect both of the outer tie rod ends from the steering knuckles. Refer to <b><u>Rack and Pinion Outer Tie Rod End Replacement</u></b> in Power Steering System.</p> <p>3. Use your hands in order to move the tie rod ends.</p> <p>Are either of the tie rod ends abnormally difficult to move?</p>	<p>Go to <b>Step 11</b></p>	<p>Go to <b>Step 7</b></p>
7	<p>Inspect for binding strut bearings or ball joints. Use your hands to push and pull the steering knuckle inboard and outboard.</p> <p>Are either of the steering knuckles abnormally difficult to move?</p>	<p>Go to <b>Step 8</b></p>	<p>Go to <b>Step 9</b></p>
8	<p>1. Disconnect the strut from the steering knuckle.</p> <p>2. Use your hands to rotate the strut.</p> <p>Is the strut abnormally difficult to rotate?</p>	<p>Go to <b>Step 12</b></p>	<p>Go to <b>Step 13</b></p>
9	<p>Perform the Power Steering Diagnostic System Check.</p> <p>Did you perform the power steering diagnostic system check?</p>	<p>Go to <b>Step 14</b></p>	<p>Go to <b><u>Diagnostic System Check - Power Steering System</u></b> in Power Steering Systems</p>
10	<p>Inspect the wheel alignment and adjust as necessary. Refer to <b><u>Measuring Wheel Alignment</u></b> in Wheel Alignment.</p> <p>Did you complete the wheel alignment?</p>	<p>Go to <b>Step 14</b></p>	<p>-</p>
11	<p>Replace the outer tie rod end. Refer to <b><u>Rack and Pinion Outer Tie Rod End Replacement</u></b> in Power Steering System.</p> <p>Did you complete the repair?</p>	<p>Go to <b>Step 14</b></p>	<p>-</p>

12	Replace the strut bearing. Refer to <b><u>Strut, Strut Component and/or Spring Replacement</u></b> in Front Suspension. Did you complete the repair?	Go to <b>Step 14</b>	-
13	Replace the damaged ball joint. Refer to <b><u>Lower Ball Joint Replacement</u></b> in Front Suspension. Did you complete the repair?	Go to <b>Step 14</b>	-
14	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## POOR DIRECTIONAL STABILITY

### Poor Directional Stability

Step	Action	Yes	No
DEFINITION: Driver is unable to maintain consistent, predictable vehicle driving control in any direction.			
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Verify that the directional stability is poor. Does the system operate normally?	System OK	Go to <b>Step 3</b>
3	Inspect the front stabilizer for the following conditions: <ul style="list-style-type: none"> <li>• Stabilizer fasteners for looseness. Refer to <b><u>Fastener Tightening Specifications</u></b> in Front Suspension.</li> <li>• Damaged Stabilizer. Refer to <b><u>Stabilizer Shaft Replacement</u></b> in Front Suspension.</li> <li>• Worn or damaged stabilizer bushings. Refer to <b><u>Stabilizer Shaft Insulator Replacement</u></b> in Front Suspension.</li> <li>• Damaged or missing stabilizer links. Refer to <b><u>Stabilizer Shaft Link Replacement</u></b> in Front Suspension.</li> </ul> Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 4</b>
4	Inspect the following suspension and steering components for wear or damage: <ul style="list-style-type: none"> <li>• Control Arms, refer to <b><u>Lower Control Arm Replacement</u></b> in Front Suspension.</li> <li>• Ball Joints, refer to <b><u>Ball Joint Inspection</u></b> .</li> <li>• Outer tie rod ends, refer to <b><u>Rack and Pinion Outer Tie Rod End Replacement</u></b> in Power Steering</li> </ul>		



	System. Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 5</b>
5	Inspect the wheel bearing. Refer to <b>Wheel Bearings Diagnosis</b> . Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 6</b>
6	Inspect the vehicle trim height. Refer to <b>Trim Height Inspection Procedure</b> . Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 7</b>
7	Inspect the steering column for looseness. Refer to <b>Looseness in Steering Column</b> in Steering Wheel and Column. Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 8</b>
8	Inspect the steering gear mounting bolts for looseness. Refer to <b>Fastener Tightening Specifications</b> in Power Steering System. Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 9</b>
9	Inspect and adjust the wheel alignment as necessary. Refer to <b>Measuring Wheel Alignment</b> in Wheel Alignment. Did you complete the alignment?	Go to <b>Step 10</b>	-
10	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## NOISE DIAGNOSIS - FRONT SUSPENSION

### Noise Diagnosis - Front Suspension

Step	Action	Yes	No
DEFINITION: Any noise emitted from the front of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the front suspension.			
1	Did you review the General Description and perform the necessary Inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to <b>Step 3</b>	System OK
3	Is the noise reactive to vehicle load or speed?	Go to <b>Step 4</b>	Go to <b>Step 7</b>
4	Inspect the tires for the following condition: <ul style="list-style-type: none"> <li>• Proper tire Inflation and adjust as necessary. Refer to <b>Tire Inflation Pressure Specifications</b> in Maintenance and Lubrication.</li> <li>• Unusual tire wear. Refer to <b>Vibration Analysis - Tire and Wheel</b> in Vibration Diagnosis and Correction.</li> </ul>		

	<ul style="list-style-type: none"> <li>Inspect the wheel nuts for looseness and tighten as necessary. Refer to <b><u>Fastener Tightening Specifications</u></b> in Tires and Wheels.</li> </ul>		
	Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 5</b>
5	Inspect the front wheel bearings. Refer to <b><u>Wheel Bearings Diagnosis</u></b> . Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 6</b>
6	Inspect for front axle or transaxle noises. Refer to <b><u>Symptoms - Automatic Transmission</u></b> in Automatic Transaxle - VT25-E or <b><u>Symptoms - Manual Transmission</u></b> in Manual Transmission - M86 Getrag. Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 7</b>
7	Bounce the front of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to <b>Step 8</b>	Go to <b>Step 9</b>
8	<ol style="list-style-type: none"> <li>Raise and support the vehicle. Refer to <b><u>Lifting and Jacking the Vehicle</u></b> in General Information.</li> <li>Inspect the front suspension components for looseness. Refer to <b><u>Fastener Tightening Specifications</u></b> in Front Suspension.</li> <li>Inspect the front suspension components for damage and repair as necessary.</li> </ol>		
	Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 9</b>
9	<ol style="list-style-type: none"> <li>Install the <b>J 39570</b> Chassis Ear or equivalent.</li> <li>Bounce the front of the vehicle, using the <b>J 39570</b> or equivalent in order to locate the source of the noise. If necessary road test the vehicle.</li> <li>Repair or replace any damaged components as necessary.</li> </ol>		
	Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 10</b>
10	Inspect the ball joints and steering components for the following conditions. <ul style="list-style-type: none"> <li>Lack of lubrication where applicable.</li> <li>Looseness in the ball joints. Refer to <b><u>Ball Joint Inspection</u></b>.</li> <li>Looseness in the tie rods. Refer to <b><u>Rack and Pinion Outer Tie Rod End Replacement</u></b> in Power Steering System.</li> </ul>		
	Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 11</b>
	Inspect for damaged shock absorbers. Refer to <b><u>Struts or Shock</u></b>		

11	<b>Absorbers On-Vehicle Testing .</b> Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 12</b>
12	Inspect the front stabilizer shaft and stabilizer shaft links for damage and repair as necessary. Refer to <b>Stabilizer Shaft Replacement</b> or <b>Stabilizer Shaft Link Replacement</b> in Front Suspension. Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 13</b>
13	Inspect for control arm damage and repair as necessary. Refer to <b>Lower Control Arm Replacement</b> in Front Suspension. Did you find and correct the condition?	Go to <b>Step 14</b>	-
14	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## NOISE DIAGNOSIS - REAR SUSPENSION

### Noise Diagnosis - Rear Suspension

Step	Action	Yes	No
DEFINITION: Any noise emitted from the rear of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the rear suspension.			
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to <b>Step 3</b>	System OK
3	Is the noise reactive to vehicle load or speed?	Go to <b>Step 4</b>	Go to <b>Step 6</b>
4	Perform the following Inspections: <ul style="list-style-type: none"> <li>Inspect and adjust the tire Inflation. Refer to <b>Tire Inflation Pressure Specifications</b> in Maintenance and Lubrication.</li> <li>Inspect for unusual tire wear. Refer to <b>Vibration Analysis - Tire and Wheel</b> in Vibration Diagnosis and Correction.</li> <li>Inspect the wheel nuts for looseness. Refer to <b>Fastener Tightening Specifications</b> in Tires and Wheels.</li> </ul> Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 5</b>
5	Inspect the rear wheel bearings. Refer to <b>Wheel Bearings Diagnosis</b> . Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 6</b>
6	Bounce the rear of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to <b>Step 7</b>	Go to <b>Step 9</b>

7	<ol style="list-style-type: none"> <li>1. Raise the vehicle. Refer to <b><u>Lifting and Jacking the Vehicle</u></b> in General Information.</li> <li>2. Inspect the rear suspension components for looseness. Refer to <b><u>Fastener Tightening Specifications</u></b> in Rear Suspension.</li> <li>3. Inspect the rear suspension components for damage and repair as necessary.</li> </ol> <p>Did you find and correct the condition?</p>	Go to <b>Step 10</b>	Go to <b>Step 8</b>
8	<p>Inspect the rear shock absorber. Refer to <b><u>Struts or Shock Absorbers On-Vehicle Testing</u></b> .</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 10</b>	Go to <b>Step 9</b>
9	<ol style="list-style-type: none"> <li>1. Install the <b>J 39570</b> Chassis Ear or equivalent.</li> <li>2. Bounce the rear of the vehicle, using the <b>J 39570</b> or equivalent, in order to locate the source of the noise. If necessary, road test the vehicle.</li> <li>3. Repair or replace any defective component as necessary.</li> </ol> <p>Did you find and correct the condition?</p>	Go to <b>Step 10</b>	System OK
10	<p>Operate the system in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	Go to <b>Step 3</b>

## BALL JOINT INSPECTION

### Ball Joint Inspection

Step	Action	Values	Yes	No
1	Did you review the General Description and perform the necessary inspections?	-	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	<ol style="list-style-type: none"> <li>1. Raise and support the vehicle. Refer to <b><u>Lifting and Jacking the Vehicle</u></b> in General Information.</li> <li>2. Clean the ball joint and inspect the seal for damage.</li> </ol> <p>Is the ball joint seal damaged?</p>	-	Go to <b>Step 6</b>	Go to <b>Step 3</b>
3	<p>Check the wheel bearing for looseness. Refer to <b><u>Wheel Bearings Diagnosis</u></b> .</p> <p>Did you find and correct the condition?</p>	-	Go to <b>Step 7</b>	Go to <b>Step 4</b>
	<p><b>IMPORTANT:</b> <b>Remove tension from the ball joints.</b></p> <p>Check the ball joint for horizontal looseness using</p>			

4	<p>the following procedure:</p> <ol style="list-style-type: none"> <li>1. Position the <b>J 8001</b> Dial Indicator against the lowest outboard point of the wheel rim.</li> <li>2. Rock the wheel in and out while reading the dial indicator.</li> </ol> <p>Does the dial indicator measure greater than the specified value?</p>	3.18 mm (0.125 in)	Go to <b>Step 6</b>	Go to <b>Step 5</b>
5	<p><b>IMPORTANT:</b> <b>Remove tension from the ball joints.</b></p> <p>Check the ball joint for vertical looseness using the following procedure:</p> <ol style="list-style-type: none"> <li>1. Install the <b>J 8001</b> .</li> <li>2. Move the ball joint up and down while reading the dial indicator.</li> </ol> <p>Does the dial indicator measure greater than the specified value?</p>	3.18 mm (0.125 in)	Go to <b>Step 6</b>	Go to <b>Step 7</b>
6	<p>Replace the ball joint/lower control arm. Refer to <b>Lower Control Arm Replacement</b> in Front Suspension. Did you complete the repair?</p>	-	Go to <b>Step 7</b>	-
7	<p>Operate the system in order to verify the repair. Did you correct the condition?</p>	-	System OK	Go to <b>Step 2</b>

## STRUTS OR SHOCK ABSORBERS ON-VEHICLE TESTING

### Struts or Shock Absorbers On-Vehicle Testing

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Verify that the customer's concern is present. Does the vehicle operate normally?	System OK	Go to <b>Step 3</b>
3	<p><b>IMPORTANT:</b> <b>A light film of oil on the top portion of the shock reservoir is normal.</b></p> <p>Inspect each strut or shock absorber for external fluid leakage. Is a strut or shock absorber leaking?</p>	Go to <b>Step 5</b>	Go to <b>Step 4</b>
	1. Use your hands in order to lift up and push down each		

4	<p>corner of the vehicle 3 times.</p> <p>2. Remove your hands from the vehicle.</p> <p>3. Locate a shock or strut that exceeds 2 cycles.</p> <p>Did you locate shock or strut that exceeds 2 cycles?</p>	Go to <b>Step 5</b>	Go to <b>Step 6</b>
5	<p><b>IMPORTANT:</b> <b>Inspect the vehicle trim height in order to correct any possible causes of shock/strut failures. Refer to <u>Trim Height Inspection Procedure</u> .</b></p> <p>Replace the strut or shock absorber. Refer to <b><u>Strut, Strut Component and/or Spring Replacement</u></b> in Front Suspension or <b><u>Shock Absorber Replacement</u></b> in Rear Suspension. Did you complete the repair?</p>	Go to <b>Step 6</b>	-
6	<p>Operate the vehicle in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	Go to <b>Step 3</b>

## WHEEL BEARINGS DIAGNOSIS

### Wheel Bearings Diagnosis

Step	Action	Values	Yes	No
1	Did you review the General Description and perform the necessary inspections?	-	Go to <b>Step 2</b>	Go to <b>Symptoms - Suspension General Diagnosis</b>
2	Road test the vehicle in order to verify the customer's complaint. Does the vehicle operate normally?	-	System OK	Go to <b>Step 3</b>
3	<p>1. Raise and support the vehicle. Refer to <b><u>Lifting and Jacking the Vehicle</u></b> in General Information.</p> <p>2. Inspect for tire or wheel damage. Refer to <b><u>Tire and Wheel Assembly Runout Measurement - On-Vehicle</u></b> in Vibration Diagnosis and Correction.</p> <p>Did you find and correct the condition?</p>	-	Go to <b>Step 7</b>	Go to <b>Step 4</b>
4	<p>1. Install the <b>J 39570</b> Chassis Ear.</p> <p>2. Road test the vehicle to verify the location of the wheel bearing noise.</p> <p>Did you locate the source of the wheel bearing noise?</p>	-	Go to <b>Step 6</b>	Go to <b>Step 5</b>
	<p><b>IMPORTANT:</b> <b>Support the vehicle by the lower control arms or the rear axle to prevent movement during wheel bearing/hub inspection.</b></p>			

5	<ol style="list-style-type: none"> <li>1. Mount and secure the <b>J 8001</b> Dial Indicator.</li> <li>2. Ensure that the dial indicator contacts the vertical surface of the wheel as close as possible to the top wheel stud.</li> <li>3. Push and pull on the top of the tire in order to inspect the total travel indicated by the dial indicator.</li> </ol> <p>Is the measurement greater then the specified value?</p>	0.27 mm (0.005 in)	Go to <b>Step 6</b>	System OK
6	<p>Replace the wheel bearing. Refer to <b><u>Wheel Bearing/Hub Replacement - Front</u></b> in Front Suspension or <b><u>Wheel Bearing/Hub Replacement - Rear</u></b> in Rear Suspension.</p> <p>Did you complete the repair?</p>	-	Go to <b>Step 7</b>	-
7	<p>Road test the vehicle to verify the repair.</p> <p>Does the vehicle operate normally?</p>	-	System OK	Go to <b>Step 3</b>

## TRIM HEIGHT INSPECTION PROCEDURE

### Trim Height Measurement

Trim height is a predetermined measurement relating to vehicle ride height. Incorrect trim heights can cause the vehicle to bottom out over bumps, damage to the suspension components and symptoms similar to wheel alignment problems. Check the trim heights when diagnosing suspension concerns and before checking the wheel alignment.

Perform the following before measuring the trim heights:

- Set the tire pressure to the specifications shown on the certification label. Refer to **Label - Vehicle Certification** in General Information.
- Check the fuel level. Add additional weight if necessary to simulate a full tank.
- Make sure the passenger and rear compartments are empty, except for the spare tire.
- Make sure the vehicle is on a flat and level surface, such as an alignment rack.
- Check that all the vehicle doors are securely closed.
- Check that the vehicle hood and rear deck lids are securely closed.
- Check for installed after market accessories or modifications that could affect trim height measurement.

**IMPORTANT: All dimensions are measured vertical to the ground. Trim height should be within +/-22.0 mm (+/-0.87 in) to be considered correct.**

### Measuring the Bumper Heights

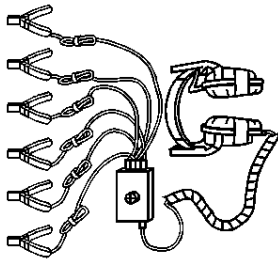
Use the following procedure to check the front bumper height:

1. Jounce the front and rear of the vehicle a few times and allow the suspension to settle.
2. The front bumper height measurement is taken outward 390 mm (15.35 in) from the center of the fascia to ground level. Measurements are made from the inner bumper core to ground level. Measure both sides and average the measurements.
3. Compare the measurement to the front bumper curb height specification. Refer to **Trim Height Specifications** .
4. If the measurement is outside of the specified range, replace the front springs. Refer to **Strut, Strut Component and/or Spring Replacement** in Front Suspension.
5. Using your hands, lift the rear bumper approximately 38 mm (1.59 in).
6. Gently remove your hands and allow the vehicle to lower.
7. Using your hands, jounce the rear of the vehicle downward approximately 38 mm (1.59 in).
8. Gently remove your hands and allow the vehicle to rise.
9. The rear bumper height measurement is taken outward 530 mm (20.86 in) from the center of the fascia to ground level. Measurements are made from the inner bumper core to ground level. Measure both sides and average the measurements.
10. Compare the measurement to the rear bumper curb height specification. Refer to **Trim Height Specifications** .
11. If the measurement is outside of the specified range, replace the rear springs. Refer to **Coil Spring Replacement** in Rear Suspension.

## SPECIAL TOOLS AND EQUIPMENT

### SPECIAL TOOLS

#### Special Tools

Illustration	Tool Number/ Description
	<p style="text-align: center;">J 39570 Chassis Ear</p>
	<p style="text-align: center;">J 8001</p>



Dial Indicator

