

Suspension General Diagnosis

Specifications

Trim Height Specifications

Trim Height Specifications (Front Fascia)

Suspension	Tire	Camaro Frt. Fascia		Trans Am Frt. Fascia		Firebird Frt. Fascia	
		Metric	English	Metric	English	Metric	English
F41(Base)	235/55	443 mm	17.4 in	—	—	342 mm	13.4 in
FE2(Z28, Trans Am Base)	235/55	443 mm	17.4 in	416 mm	16.3 in	—	—
	245/50	443 mm	17.4 in	416 mm	16.3 in	—	—
FE4 (Z28, Trans Am Special)	245/50	443 mm	17.4 in	342 mm	13.4 in	—	—
FE7(Z-28 SS, B4C, WS6, Firm, HD)	275/40	443 mm	17.4 in	342 mm	13.4 in	—	—

Trim Height Specifications (Rear Fascia)

Suspension	Tire	Camaro Rear Fascia		Fire/TA Rear Fascia		Side Rocker (All)	
		Metric	English	Metric	English	Metric	English
F41(Base)	235/55	367 mm	14.4 in	375 mm	14.7 in	204 mm (Front) 208 mm (Rear)	8.0 (Front) 8.2 (Rear)
FE2(Z38, Trans Am Base)	235/55	367 mm	14.4 in	375 mm	14.7 in	204 mm (Front) 208 mm (Rear)	8.0 in (Front) 8.2 in (Rear)
	245/50	367 mm	14.4 in	375 mm	14.7 in	204 mm (Front) 208 mm (Rear)	8.0 in (Front) 8.2 in (Rear)
FE4(Z28, Trans Am Special)	245/50	367 mm	14.4 in	375 mm	14.7 in	204 mm (Front) 208 mm (Rear)	8.0 in (Front) 8.2 in (Rear)
FE7 (Z-28 SS, B4C, WS6, Firm, HD)	275/40	367 mm	14.4 in	375 mm	14.7 in	204 mm (Front,) 208 mm (Rear)	8.0 in (Front) 8.2 in (Rear)

Diagnostic Information and Procedures

Abnormal or Excessive Tire Wear

Many conditions, including the following list, can cause irregular or premature tire wear:

- Incorrect inflation pressure
- Lack of regular rotation
- Driving habits
- Improper tire and wheel alignment

If you reset tire and wheel alignment due to a tire wear condition, always rest the toe as close to 0 degrees as the specification allows.

Rotate the tires if you notice any of the following conditions:

- Front and rear tire wear is unequal
- The tread of any tire wear is uneven
- Left and right front tire wear is unequal

Test the tire and wheel alignment if you notice any of the following conditions:

- The left and the right front tire wear is unequal
- The tread of any front tire wear is uneven
- The front tire treads have a scuffed appearance with feather edges on one side of the tread ribs or blocks

Trim Height

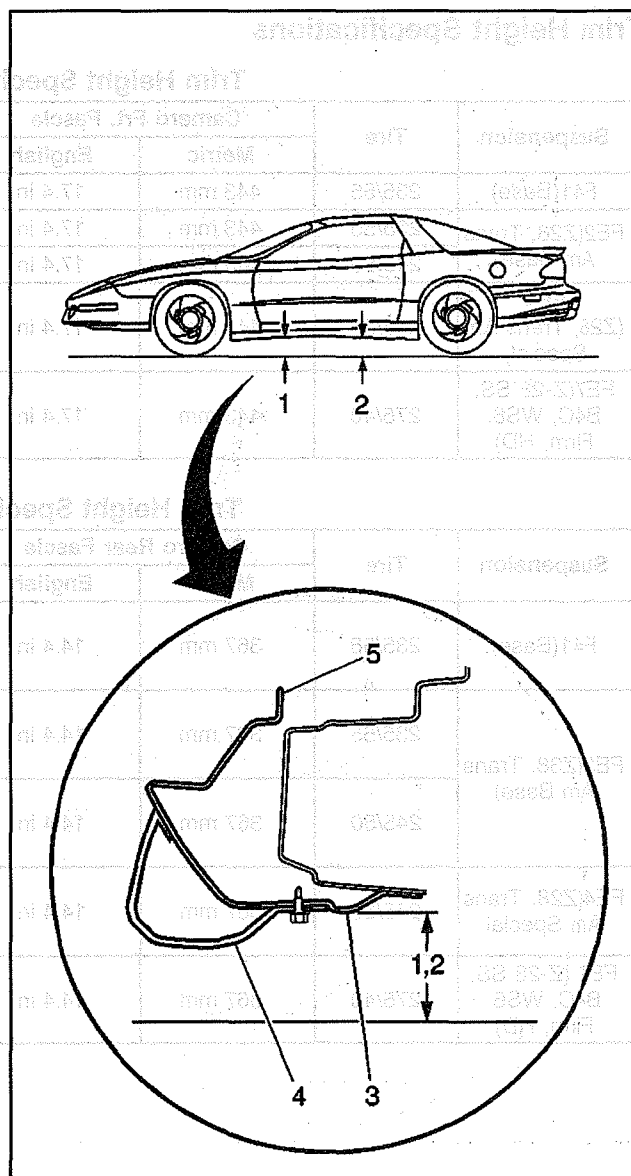
Incorrect trim heights can produce symptoms similar to those which produce tire and wheel misalignment. Inspect trim heights whenever you diagnose steering and vibration concerns.

In order to measure the trim heights accurately, use the following check list:

- Tires should be at the correct pressure as shown on the tire placard and up to vehicle capacity
- The fuel tank should be full
- The vehicle should have no additional weight or passengers
- Seats should be in the full back position
- The rear compartment should be empty, except for a spare tire and a jack, and a simulated fuel load if required
- The vehicle should be on a known level floor
- Close all doors, the hood, and the rear compartment lid
- Jounce the front and/or rear bumper of the vehicle at least 38 mm (1.5 in). After jouncing, let the vehicle settle. After recording the trim height measurements desired, repeat the jounce operation for a total of two times. Trim heights are the average of the high and the low measurements

Measure all dimensions vertical to the ground. In order to be considered correct, trim heights should be within 10 mm (0.4 in) of specification.

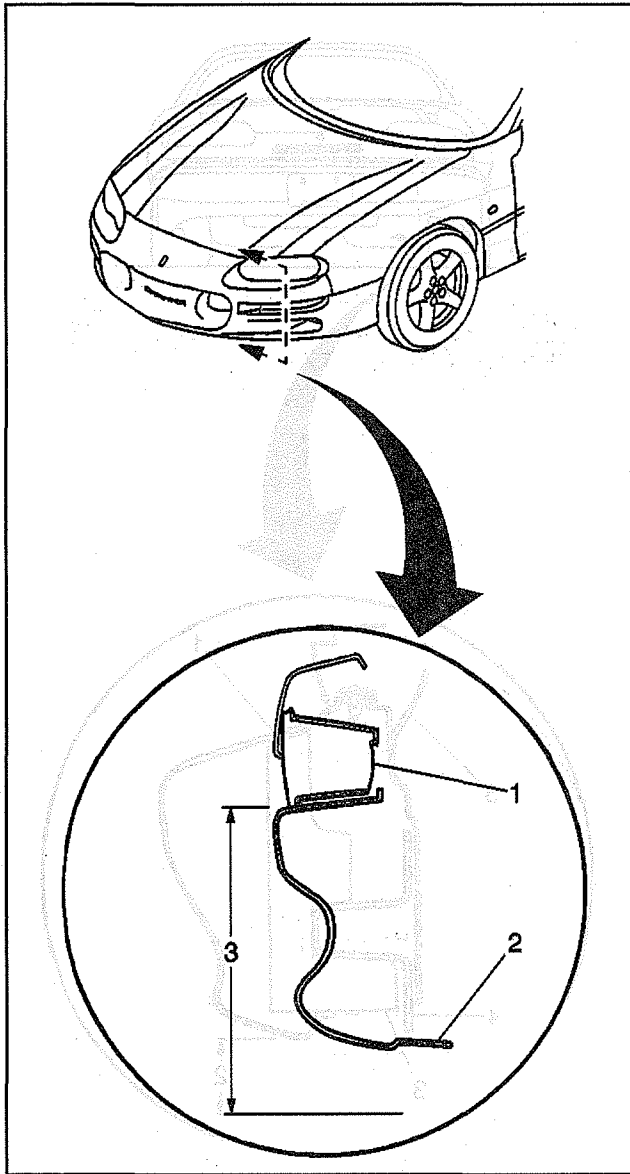
Measuring Trim Height at Vehicle Side Rocker Molding



349187

1. Calculate the trim heights (1, 2) as measured at the inner edge of the side rocker panels (3) to the ground after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the front and at the rear fascia at locations shown.

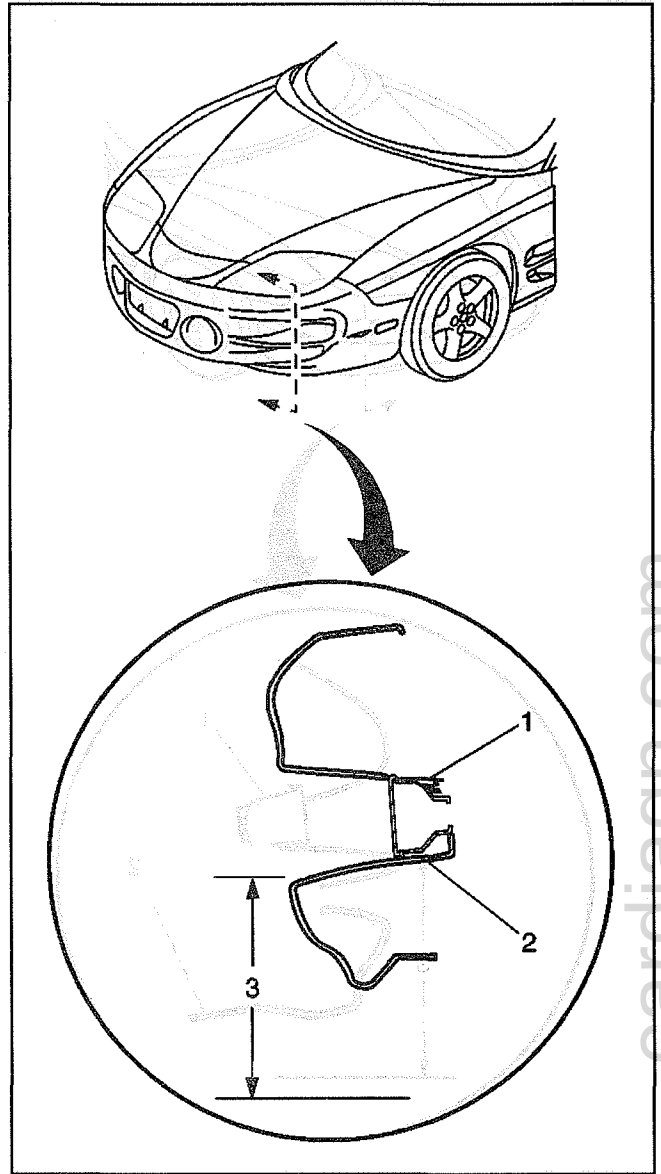
Measuring Trim Height at Front Fascia
(Chevrolet)



349201

1. Calculate the trim heights (3) as measured from the ground to the bottom of the park/turn signal lamp (1) after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements for that particular vehicle. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the front and at the rear fascia at locations shown below.

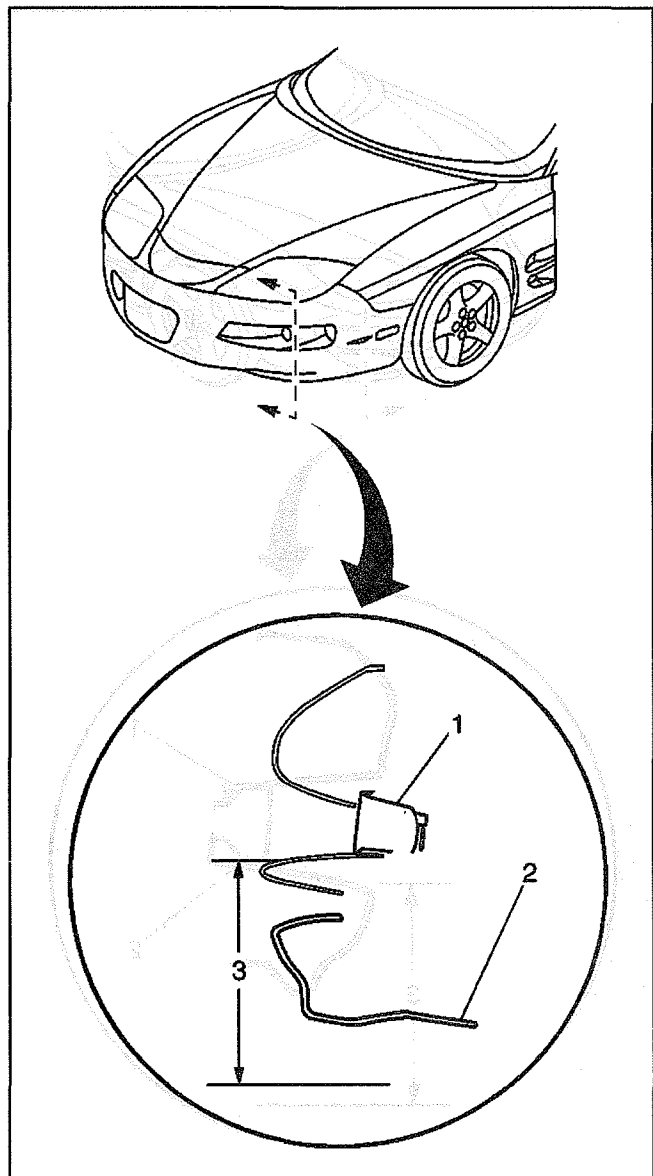
Measuring Trim Height at Front Fascia
(Pontiac Trans Am)



349189

1. Calculate the trim heights (3) as measured from the ground to the bottom of the fog lamp cavity (1) after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the front and at the rear fascia at locations shown.

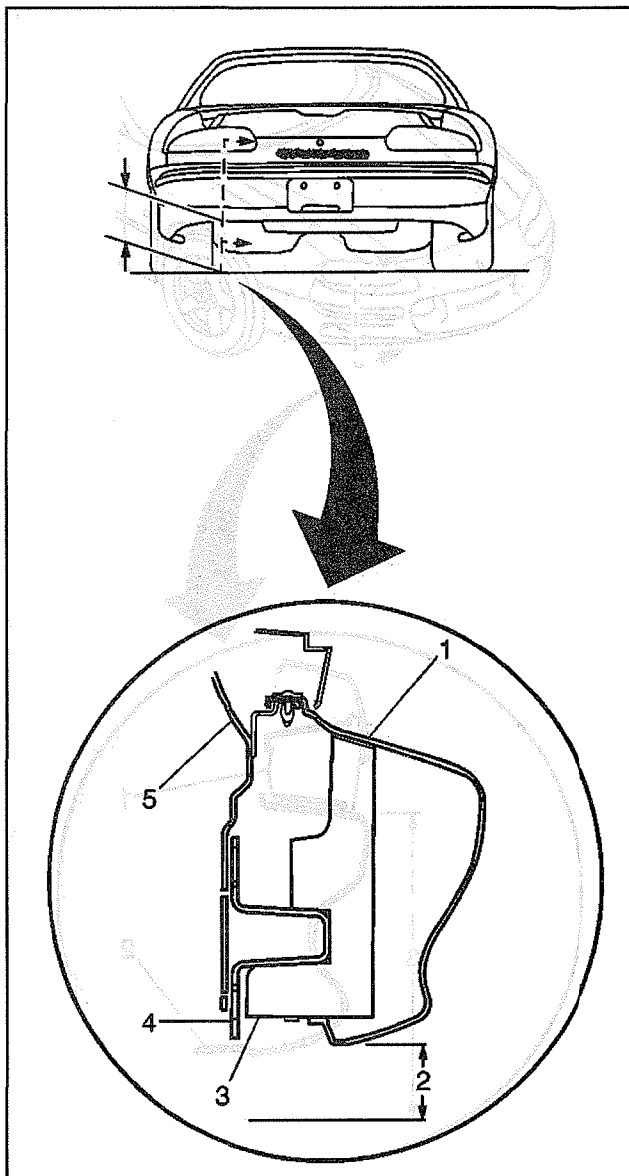
Measuring Trim Height at Front Fascia (Pontiac Non-Trans Am)



1. Calculate the trim heights (3) as measured from the ground to the bottom of the park/turn signal lamp (1) after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the fascia locations shown.

349195

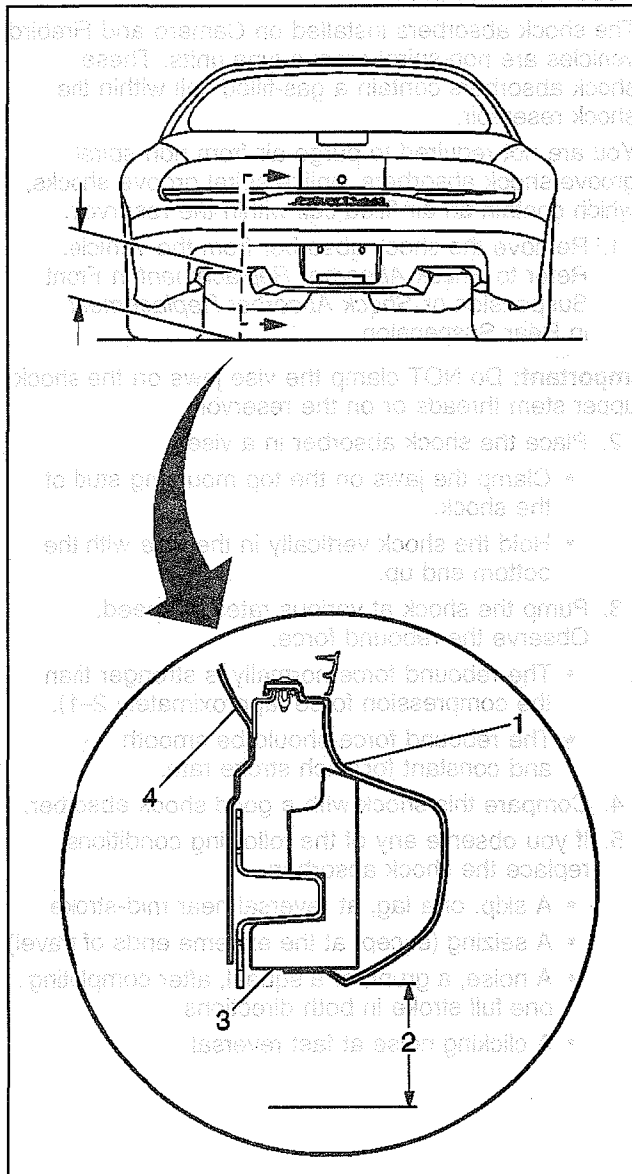
Measuring Trim Height at Rear Fascia (Chevrolet)



1. Calculate the trim heights (2) as measured from the ground to the bottom of the rear fascia (1) after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the fascia locations shown.

349202

Measuring Trim Height at Rear Fascia (Pontiac)



349191

1. Calculate the trim heights (2) as measured from the ground to the bottom of the rear fascia (1) after each jounce/rebound cycle. Record your measurement.
2. Verify the trim height measurements. Refer to *Trim Height Specifications*.
3. Continue to measure the vehicle trim heights at the fascia locations shown.
4. Correct any irregular trim height dimensions as necessary.

Struts or Shock Absorbers Weak

Important: The single-tube shock absorbers are highly gas-pressurized. The shock absorbers require a force of 445 N (100 lb) in order to initiate movement of the shock absorber rod. Do NOT dent or puncture the shock absorber assemblies.

1. Test and adjust the tire pressures to those pressures shown on the tire placard.
 2. Notice the load conditions in effect when the vehicle is driven under normal conditions.
 3. If practical, ride with the owner in order to be sure that you understand the problem before proceeding to the next step.
 4. Test each shock absorber in turn by quickly pushing down, then lifting up, on the corner of the bumper nearest to the shock absorber which you are testing.
 - 4.1. Use the same amount of effort on each test and notice the resistance on compression and rebound.
 - 4.2. Repeat this test on a similar vehicle having acceptable ride quality. The shock absorbers on both vehicles should provide the same feeling of resistance. If you notice much difference between the two vehicles, continue with the next step.
 5. Support the vehicle in order to expose the shock mounts.
 6. Remove the shock absorber assemblies.
- Caution:** The shock absorbers are highly pressurized. Be sure to properly disassemble module or personal injury could result.
7. Disassemble the plastic dust tube.
 8. Remove the rod washer from the shock absorber.

Important: Do not fully compress the shock absorber. Shock absorbers are highly gas-charged and will extend when released.

9. Turn the shock absorber so that the lower mount is up and the upper mount is down. Compress the shock absorber against the ground at various rates of speed through approximately one-half of the length of the exposed chromed shock absorber rod:
 - Rear – 75 mm (3 in)
 - Front – 50 mm (2 in)
10. Compare the right and the left shock absorbers for compression resistance and rebound speed:
 - The right and the left shock absorbers should feel comparable.
 - Differences between the front and the rear shock absorbers are normal.
 - If you are doubtful about the condition of any shock absorber, compare with a shock absorber known to be good.

Struts or Shock Absorbers Noisy

Important: The single-tube shock absorbers are highly gas pressurized and require a force of 445 N (100 lb) in order to initiate movement of the shock absorber rod. Do NOT dent or puncture the shock absorber assemblies.

1. Examine all of the mountings for proper tightening. Loose mountings will cause a noise.
2. If all of the mountings are intact, test each shock absorber by quickly pushing down, then lifting up, on the corner of the bumper nearest to the shock absorber which you are testing.
 - 2.1. Use the same amount of effort on each test and notice the resistance on compression and rebound.
 - 2.2. Repeat this test on a similar vehicle having acceptable ride quality. The shock absorbers on both vehicles should provide the same feeling of resistance. If you notice much difference between the two vehicles, continue with the next step.
3. Remove the suspected shock absorber.
4. Shake the shock absorber and listen for loose metallic parts inside the shock absorber body. If you hear a suspicious noise, replace the shock absorber.
5. Turn the shock absorber so that the lower mount is up and the upper mount and rod are down. Slowly compress the shock absorber. Do not allow the chromed portion of the shock absorber rod to pass below the black seal cover.
6. Replace the shock absorber if you encounter a seize condition with more than 25 mm (1 in) of the chromed portion of the shock absorber rod exposed above the seal cover.

Struts or Shock Absorbers Leak

Important: The single-tube shock absorbers are highly gas-pressurized and require a force of 445 N (100 lb) in order to initiate movement of the shock absorber rod. Do NOT dent or puncture the shock absorber assemblies.

1. Fully extend the shock absorbers, with the tires and the wheels unsupported, in order to expose the seal cover area for inspection.
2. Look for signs of leaks at the top of the shock absorber:
 - A small amount of fluid in not cause for replacement. The seal permits some seepage in order to lubricate the shock absorber rod.
 - You can easily determine a leaking shock absorber because an excessive amount of fluid will cover the shock absorber.
3. Replace a leaking shock absorber.

Struts or Shock Absorbers Bench Test

Testing Procedure

The shock absorbers installed on Camaro and Firebird vehicles are non-spiral groove type units. These shock absorbers contain a gas-filled cell within the shock reservoir.

You are not required to purge air from non-spiral groove shock absorbers, unlike spiral groove shocks, which contain an air-filled cell within the reservoir.

1. Remove the shock absorber from the vehicle. Refer to *Shock Absorber Replacement* in Front Suspension or *Shock Absorber Replacement* in Rear Suspension.

Important: Do NOT clamp the vise jaws on the shock upper stem threads or on the reservoir.

2. Place the shock absorber in a vise.
 - Clamp the jaws on the top mounting stud of the shock.
 - Hold the shock vertically in the vise with the bottom end up.
3. Pump the shock at various rates of speed. Observe the rebound force.
 - The rebound force normally is stronger than the compression force (approximately 2–1).
 - The rebound force should be smooth and constant for each stroke rate.
4. Compare this shock with a good shock absorber.
5. If you observe any of the following conditions, replace the shock absorber:
 - A skip, or a lag, at reversal near mid-stroke
 - A seizing (except at the extreme ends of travel)
 - A noise, a grunt, or a squeal, after completing one full stroke in both directions
 - A clicking noise at fast reversal

Struts or Shock Absorbers On-Vehicle Testing

Step	Action	Yes	No
1	Important: A light film of oil on the top portion of the reservoir is normal. Inspect each shock absorber for external fluid leakage. Is the shock absorber leaking?	Go to Step 5	Go to Step 2
2	Inspect the vehicle trim height. Refer to <i>Trim Height</i> . Is the vehicle trim height correct?	Go to Step 3	Go to Step 4
3	1. Use your hands in order to lift up and push down each corner of the vehicle 3 times. 2. Remove your hands from the vehicle. Does the vehicle stop bouncing after 2 cycles?	System OK	Go to Step 5
4	Replace the springs. Refer to <i>Coil Spring Replacement</i> in Rear Suspension. Is the repair complete?	System OK	—
5	Replace the shock absorber. Refer to <i>Shock Absorber Replacement</i> in Front Suspension. Is the repair complete?	System OK	—

Description and Operation

General Description

Because the problems in steering, suspension, and tires and wheels involve several systems, you must consider all of these systems whenever you diagnose a concern. In order to avoid diagnosing the wrong symptom, always road test the vehicle first. Proceed with the following preliminary tests, and correct any substandard conditions which you may find.

Inspect for the following conditions:

- Wrong pressure and uneven tire wear
- Loose connections or wear on joints, from the steering column to the steering gear
- Loose or damaged parts on the front and on the rear suspension or on the steering gear
- Out-of-round or out-of-balance tires, bent wheels, and loose or rough wheel bearings
- Leaks in the power steering system. Inspect the power steering fluid level and inspect the accessory drive belt for proper condition and tension