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Replacing Shocks



Install new shocks with all the boots, bushings and bump stops in good shape, or you'll be doing it again soon.

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The first real sign that something is wrong is at night. After you pull out of the drive, your headlights are illuminating parts of the trees you've never noticed before. Then you realize the car rocks fore and aft for a few seconds as you stop at lights. But the real eye-opener is when you hit a speed bump you've encountered a thousand times before.

And I mean hit. You've traversed this nuisance at a cautious 12 mph for years without spilling your Big Gulp. Today, same speed bump, same speed and your next stop is the dry cleaner--your suspension tops out and bottoms out with a thump, spilling sticky purple stuff everywhere. Diagnosis: Your shock absorbers are worn out.

SHOCK ABSORBERS DON'T ABSORB SHOCKS

What we incorrectly call shocks in the United States, the rest of the civilized world refers to more accurately as dampers. Your suspension, if it is working correctly, has little friction in its travel. Consequently, there's a tendency for the wheel to overshoot during normal up-and-down movement, which can make the vehicle bounce up and down for several cycles after a disturbance. Over large bumps, a poorly controlled axle can slam into either the top or bottom limits of its travel. Not only is this uncomfortable, it can make the vehicle difficult to control.

What's happening inside that shock (er, damper, whatever) as your suspension scales that speed bump? A piston forces oil through carefully tuned orifices and valves as the wheel moves up into the wheel well. When you hit the top of the bump, a different set of valves allows the oil to return, resisting the spring's return force. At higher speeds, some additional orifices remain open to provide less resistance and a smoother ride.

As the miles pile on, the piston and its sealing rings wear, allowing more fluid to pass. The valves and their springs or spring washers wear out, permitting even more fluid flow. Eventually, the calibrated damping rates degrade, leaving you with too little damping for the spring rates, and a wallowy ride. In more extreme cases, the seal around the piston rod starts to leak, allowing oil to escape. Since there are only a few ounces of oil inside, almost any evidence of leaking oil on the outside of a shock makes it a candidate for immediate replacement. Always replace both shocks on one end of the car at a time, or you'll wind up going over that speed bump in a corkscrewing motion as one side of the vehicle responds differently than the other.



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Loosen any wires or brake lines tethered to the front shock before you remove anything else.



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Lower bolts may also be the

ONE TUBE, OR TWO?

Traditional shocks have used two concentric tubes, one to act as a reservoir for hydraulic fluid. Recently, single-tube shocks (aka gas shocks) have become more popular. These types use an inert gas under high pressure (200-plus psi) to prevent aeration of the fluid under rough conditions. This slightly more expensive design has a superior (albeit stiffer) ride, and one odd feature--single-tube shocks tend to extend themselves to their full travel when not installed. They're shipped with a strap of some sort to keep their damper rods retracted, to prevent damage and to make the packaging smaller.

suspension's camber adjustment. Mark them before disassembly so you can get close later.



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The upper shock mount goes through a large bushing and maybe even a bearing. Check for deterioration.

OPTIONS

For the most part, replacing shock absorbers is a straightforward remove-and-replace. It's accomplished with simple hand tools and some elbow grease. Unless, that is, your vehicle uses coil-over struts. These require the use of a spring compressor and may prove a more difficult job than the average Saturday mechanic wants to bite off. You'll need to rent or borrow the compressor, which will allow you to take all the tension off the coil spring while you change the strut or its innards. Warning! Compressed springs have enough stored force to lift a car--or enough to exit the wheel well with considerable velocity if the spring compressor slips, which the tool has a tendency to do. If something important--like your face--is in the way, damage can occur.

There are a couple of alternatives. Most vehicles allow you to remove the entire strut with the spring still attached. You can then take the strut to a shop and have a mechanic swap the shock out. A better solution might be a Monroe Quick Strut. It's a complete preassembled unit, including top bearing, all ready to swap for the old unit. Good idea, especially if your car has high mileage or one of the springs has started to sack out and let that corner droop.

As always, check a good service manual for your vehicle to see if there are any serious hurdles before taking something apart.

GETTING DIRTY

Start by blocking the wheels to the front and rear. Loosen all the lug nuts on whichever end of the car you're doing first. Now jack up the car and secure it on stands. You'll be twisting big bolts with a lot of force while working partly under the car: Be certain it won't fall off. Cement blocks are not an acceptable substitute for proper jackstands. They're way too brittle and prone to suddenly returning to their gravelly ancestry when provoked.



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Support the suspension from the bottom before removing this upper shock mount to prevent the suspension from falling.



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No floor jack? You can use the car's scissors jack to lift it far enough one corner at a time.

Remove the wheel. If you're changing a rear shock, it's usually only necessary to remove the hardware at the top and bottom. You may need to dive into the trunk or hatchback to remove the upper bolt, which might even mean removing or displacing some interior parts to access it. Loosen the top and bottom bolts. Before you remove them, however, hold up the suspension with a jack to keep it from drooping under the pressure from the spring. Check the bushings and the bump stop. Most shocks will come with fresh hardware, locknuts and rubber bushings, which I recommend replacing even if the old ones look fine.

The fronts generally represent a stiffer challenge. You'll probably need to remove a clip to free up the brake line. Late-model cars may have ABS sensor wiring that also needs to be dealt with. Work carefully and avoid damaging the brake line or wiring. Now you can jack up the suspension. If your vehicle makes its camber adjustment at the strut/shock bottom attachment bolts with integral eccentric washers, mark the index position of the bolts for later.

Remove the upper bolt from the shock's central damper rod and remove the shock from the vehicle. Important: Now you can check the upper bearing, if you have one, for wear. That may have been the source of that thumping noise you thought was a bad ball joint. On many front suspensions, the steering pivots in this bearing, and if it's worn, bad things will happen whenever you steer.

Now thoroughly inspect each bump stop, which may be either a pillow- or cone-shaped chunk of black rubber between the control arm and the frame, or perhaps a doughnut surrounding the damper rod hiding under a weather boot. If it's deteriorated, you must replace it to prevent damage to the new shock caused by overtravel. Oil leaking from the shock body or from the engine is usually tough on these rubber bumpers. If they are oily, out they go. While you're under there, check the ball joints, tie rod ends and CV joints as well.

Buttoning up

You'll probably need to use the jack holding the suspension up to let you push the upper damper rod back into its bearing or bushing. And don't forget to torque the wheel lug nuts with a proper torque wrench. If your camber adjustments have been disturbed, you'll need to have the front end realigned.

The lower mounting bushing is prone to damage and deterioration from road salt and debris.




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Here's an example of a cone-shaped bump stop (in the spring).

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