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# SUSPENSION REPAIR AND MAINTENANCE

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"It feels like driving a truck," complains your significant other. Okay, she was the inspiration for "The Princess and the Pea," and you point out, "Well, it is a truck." But you know the truth: It used to ride and drive a lot more like a car, and that's why you bought it.

The carlike feel of today's pickups and sport utility vehicles is there when they're new. But most pickups and some SUVs have solid axles (at the rear and even the front of some four-wheel-drive models), and rear suspensions with leaf springs. The tuning is carefully balanced between an acceptable ride at no load (besides passengers) and something tolerable when the pickup bed is stacked high with 2 x 4s, paneling and decorative brick.

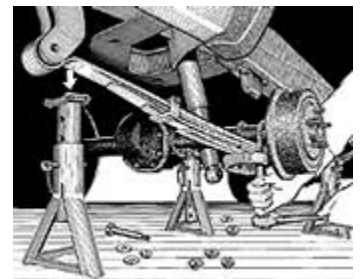
So it doesn't take a lot of deterioration to make the ride/drive experience something that even you have to admit is somewhat harsh.

You can get all kinds of assist springs for the rear axle, including auxiliary leaves—even air assists that you can deflate or inflate. But the object of these is to increase the load-carrying capacity of the vehicle.

What you want to do is restore the ride/handling of everyday or weekend trips after 20,000 to 30,000 miles or so have precipitated a harsher ride and vaguer handling. There are aftermarket shock absorbers made for pickups and SUVs used primarily as transportation, and they will help. If you want more, there are additional steps you can take to further restore the ride and handling.

## Springs And Shackles

Look at the leaf springs—at the rear on each side, even at the front if your vehicle also has them there. Loose center U-bolts are an occasional problem, and retightening with a torque wrench could be helpful. But when the ride quality is down significantly, look closely for a cracked leaf, and if you find one, change the spring, plus the mounting bushings and shackle in back. In fact



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Raise the vehicle on safety stands. Then support the axle itself to get the tension off the spring. Remove the center U-bolt nuts, washers, plate and then the U-bolts.

, even with the leaves intact, there can be enough deterioration in the rear shackles to justify replacing both for a real ride improvement.

Take out the bolts that hold the spring assembly at front and rear, which can be easier said than done in many cases. Turning the bolts while holding the nuts with a second wrench is straightforward stuff, but the rear bolts can almost "mate" with the rubber bushings inside the shackle, and getting them out can be a tedious job if that happens. You may have to slowly unthread the bolt, while at the same time prying under the bolt head to keep outward pressure on the bolt. Or you may be able to tap it out with a hammer and punch. Just keep clear of the top of the end of the leaf spring, which could snap up (against the frame) if there's still some tension on the spring.

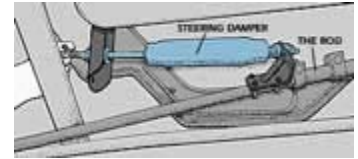
On some trucks, the shackle's upper bolt is installed on the inboard side and it won't clear the frame to come out. Jack up the rear of the vehicle until the shackle end of the leaf spring comes down far enough below the frame.

The original equipment bushings with those metal shackles are part of the reason for loss of ride quality. To get a long-term smoother ride, install aftermarket shackles that include small rubber springs with two metal sleeve inserts and metal arms—almost a reverse of the original equipment design. The Dana Velvet-Ride series that we installed is an example. You attach the metal arms to one metal sleeve of the rubber shackle, insert and tighten the through bolt and nut, and then install the new shackle in place of the original. The metal arms connect to the chassis and the rubber spring, and the rubber spring is bolted (through its second metal sleeve) to the leaf spring.

Inspect the underbody frame-to-body bushings and the radius rod bushings, and apply rubber lubricant as routine maintenance. If they're badly cracked, perhaps missing chunks of rubber, installing replacements will help eliminate body shake. Occasionally, the metal floor pan of the vehicle is the problem—it's rusted and weak. A piece of galvanized flat sheetmetal, thick enough for support, should be welded in place.

Even if you just have to replace bad bushings, don't simply loosen the bolts and pry to get clearance to install replacements, or you could cause damage you won't see. This work normally requires loosening radiator mounts, the steering gear and column, and other parts, so check and follow the factory-prescribed procedure for your vehicle. Or better still, lube periodically and the bushings will be fine.

[For background on how a car's suspension system works, click here.](#)



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Shimmy can be caused by a worn or loose steering stabilizer. Check the mounts, and check the damper for a bent rod or leakage.

## Steering Stabilizers

Is a lot of vibration coming through the steering wheel? The problem could be wheel balance or alignment, even the steering gear's free play adjustment. But if it's a low-speed problem on secondary roads, look for something worn out.

If your operation has pounded the tightness out of steering parts, you can feel the looseness when you grab the tie rod and idler arms and find you can flex them too easily. If you want to replace them just this once, get heavy-duty parts specifically designed for pickups and SUVs. They'll not only be labeled for heavy-duty use, but they'll have grease fittings, which the original equipment may not.

Many vehicles have steering stabilizers. If the vehicle is suffering from vibration and shimmy, look for worn-out stabilizers, basically one or two horizontally installed "dampers" (shock absorbers) that connect the steering linkage to the frame or axle.

The dampers mount to the steering linkage with a bracket (held by U-bolts) and to the frame or front axle with another bracket, and there are washers and rubber bushings at each end. If they're loose but the bushings look good, a simple tightening may remedy the problem. When they have significant mileage on them, replace the dampers along with mounting hardware and bushings.

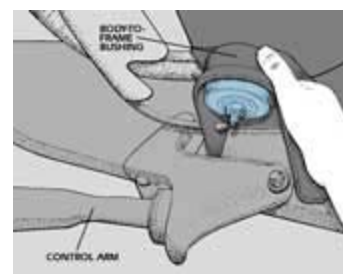
If you don't have stabilizers, but use the vehicle on bad roads a lot and want to get rid of the shimmy, there are kits you can install, complete with frame brackets and U-bolts. These kits have been a factory fix for otherwise unfixable shimmy for years, and aftermarket kits for trucks and SUVs are available.

## Jounce Bumpers

Have the rear axle jounce bumpers been taking a beating? If they have, you may see that the ends are scuffed. However, you probably know without even looking whether or not the vehicle has been bottoming. If you get stiffer shocks, your normal ride will suffer. A better approach is to replace the jounce bumpers with ones that really are small rubber assist springs, such as Monroe's Muscle LSE. They look like a short stack of thick pancakes, and when you're driving on bad roads they make contact with the jounce pad on the axle and prevent bottoming out. You could perceive this as causing a slight stiffening of the ride, but the bottoms of the "short stacks" have a couple of inches of clearance to the pads, so they're only in the picture on bumps. And because they're springs, they absorb impact so the overall ride quality should be better.

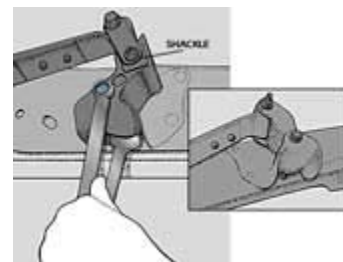
On many trucks, you can just unbolt the bracket that holds the original jounce bumper, bolt on a universal bracket (with elongated holes) and attach the "short stack." If the jounce bumper bracket is riveted to the frame, use a chisel or hand grinder to cut it loose.

After installing the bracket and rubber spring, tighten the bracket bolts lightly,



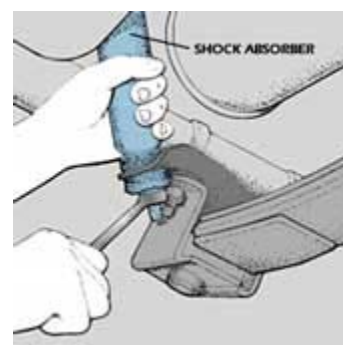
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Check underbody-to-frame and suspension bushings. Look for cracks or overly brittle rubber as well as missing chunks.



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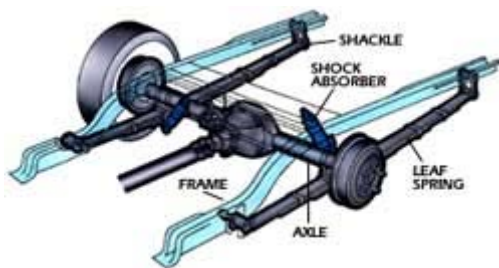
Removing some spring shackles can be tedious, requiring two wrenches.



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Check shock mounts and bushings before condemning any shock absorbers.

then lower the vehicle to the ground, adjust the bracket height to the recommended clearance with a normal load in the truck bed, and do a final tightening.



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## HOW IT WORKS: The Leaf Spring Suspension


The leaf spring suspension is a popular choice for the rear of trucks and some sport utility vehicles. It has been used for some heavy-duty truck front suspensions and the rear of passenger cars, but the leading application is the truck/SUV with the nonindependent rear axle. The leaf spring has several leaves—simply adding leaves increases the load-carrying ability of the suspension. The top leaf typically is the longest and each end of that leaf is formed into an eye, into which a rubber bushing is installed. The spring eyes are bolted to the chassis in front and attached at the rear through a hinge joint called a shackle. The shackle permits the spring to effectively change its length as it flexes to absorb impacts. The leaf spring also attaches (through U-bolts) to the solid rear axle, so it locates the axle without the use of arms, an important function. This permits a simple suspension design with obvious packaging benefits. However, these advantages are offset in passenger cars and some SUVs by the superior ride qualities of the coil spring, which merely supports the vehicle and simply compresses and expands as it absorbs the impacts.

### Links referenced within this article

For background on how a car's suspension system works, click here.  
<http://auto.howstuffworks.com/car-suspension.htm>

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