

Shock Absorber Basics

Adjustability Costs Money. How Fast Do You Want To Go?

By Chris Alston

WHO NEEDS ADJUSTABLE SHOCKS?

Everyone knows you need to hook up your horsepower to go fast. Since the shock absorber is really what controls how the suspension works, it plays a big role.

Whether you're running in a straight line or going around corners, it's all about traction: traction going forward; traction going sideways. A drag-race car needs to come up softer and go down harder. A car that turns needs to minimize body roll. The requirements are different, but a shock that offers variable valving plus a wide range of travel can work effectively in both applications.

A nonadjustable shock, out of the box, has the wrong damping for your car or truck, period. It's like guessing a lottery number: There are too many variables, from horsepower to wheel and tire design to individual driving style. Because these options are infinite, your ability to guess correctly is nonexistent. So, why even try?

Get an adjustable shock and tune it until it delivers the performance and/or ride quality that you want — then continue experimenting whenever track or road conditions change. If you want to take your street machine to the drag strip, you can make the front end fly up a little higher to transfer more weight and launch harder. If you want to autocross it, you can dial in the extra



Chris Alston's 32 years of busted knuckles led to single- and double-adjustable VariShocks that literally bolt into most American cars built since the late Fifties, without interference. Twenty different types of top and bottom mounts duplicate OEM mounting styles, assuring easy installation.

stiffness that makes it handle better.

Dollar for dollar, I can't think of anything that offers so much potential performance, or is so easy to install and adjust. We make adjustable VariShocks that bolt right into just about any rear-drive American car made since the late 1950s. Each set comes with tips and guidelines about where to start adjusting, and what to look for.

Plus, you only buy them once: A quality shock can be repaired, rebuilt and revalved for as long as you own the vehicle.

SINGLES OR DOUBLES?

Single-adjustable ("SA") shocks control rebound (extension), primarily, while a double-adjustable ("DA") shock sets both rebound and bump (compression), truly independently. DAs are always better, but you'll pay from \$125 to \$150 more for the luxury of tuning how firmly the shock both comes together and pulls apart.

If money is a major concern and you've got a street car, single-adjustable is far preferable to nonadjustable. In any race car, the

Smooth-body VariShocks give chassis-builders any combination of shock length, travel and mounts for non-coil-over applications. Note the different mounting-eye diameters developed for a spherical bearing and an all-new, super-sized urethane bushing.



DA is a no-brainer; it's a phenomenal tuning aid for the price — especially considering what everything else on a race car costs! The only drawback is the work involved, but it pays off in performance.

For the money invested, installing a DA front shock is one of the most-important things you can do to a drag-race car, because the front suspension has a tremendous effect on how the car hooks up. This is especially true in classes that limit tire size and/or rear-suspension modifications. I've been able to get two tenths out of a restricted-tire car simply by going to a DA front



Machined arrows leave no doubt about which adjuster determines how firmly a VariShock comes together (bump) or pulls apart (rebound). Each knob offers 16 "full" settings — for a total of 256 valving combinations! Although competitors have added super-fine "half clicks" between stops to increase their advertised total, VariShock claims the widest adjustment range between "full soft" and "full hard."

shock! When a drag car launches, it comes up in front, it settles down, then it "bobbles" at the gear change. If you can tune out that bobble, you'll be more consistent and quicker. There's no way to do that without a DA shock.

It costs more because it works better. However, it's like anything else that's adjustable: You have to be willing to invest the energy into getting it right, or you could be wasting your money.

SPRINGS & RATES

If you're buying new shocks, you should buy new springs. With so many variables from vehicle to vehicle, a suspension won't work best unless you can tune both its spring rate and shock valving.

To get a performance feel in a car that turns, you'll need a stiffer spring than the factory installed. If you go too stiff, the ride will be too rough. You can run a softer spring to get a halfway-decent ride, then dial-in stiffer shock valving so when you turn, the body won't roll. On the street, you want enough travel in the shock and spring to deal with varying loads. If you have a light car that's sprung for one person and you pick up a passenger, the

spring-rate change could be as much as 20 percent!

A coil-over setup is always better. It's lighter than separate shocks and OEM-style springs; it gives you the widest choice of spring rates; it's a valuable tuning aid. Changing coil-over springs is easier, and most people selling an OEM spring don't reveal the rate. Nobody can guess which spring rate is best for your application, but we can usually get you close. That's why VariShock lets you buy a second set of VariSprings — either one rate higher or one lower — at a discount: You get twice the chances to get it right!

Everything wears out, eventually. You can wear out a spring in a single cycle if you overstress it. As a spring

VariShock's latest coil-over conversion brings unprecedented shock travel and ride-height adjustment to fourth-generation F-bodies — and it's a bolt-on! That multiangled bracket attaches to the upper A-Arm in the same holes that GM supplied for its upper strut mount. The extra-long shock length yields extraordinary choices of ride height, spring rate and valving.



Shock Basics

wears and sags, and its installed height drops, it will start artificially “jacking” weight into the car. That’s why it starts handling weird in corners, or won’t go down the drag strip straight. It’s just like a valvespring, which wears out when it travels too much and overstresses the wire. It takes a stronger, more-expensive wire to handle the higher stress.

Street cars are heavy. As the spring rate gets heavier, the wire gets bigger, so the amount of available travel in the spring is reduced. The higher the spring rate, the worse it gets. In a front spring, the wire is huge, so you start losing travel. A smooth ride requires a lot of spring travel. You have to get a more-durable, higher-strength wire to get back the travel you need.

The high-tensile wire in VariSprings can be stressed more, so it delivers more travel. It’s better for the same reason that expensive valve

Owners of 1982-91 Camaros and Firebirds can purchase this bolt-on strut either with or without the coil-over assembly. VariShock’s billet strut body is shorter than stock, to accommodate lowered cars.



Billet-aluminum, clear-anodized coil-overs are offered in either (R-L) double-adjustable QuickSet 2; single-adjustable QuickSet 1; or nonadjustable SensiSet models. Eight different lengths allow shock travel from 2-3/4 to 9-3/4 inches. Note the revolutionary lower spring seat, which accepts a standard Allen wrench and utilizes a ball-locking mechanism. One-piece housing bases are machined with different mounts for spherical bearings or urethane bushings.

springs are better. Most performance coil springs are chrome-silicone wire, which is a good choice but doesn’t possess sufficient yield strength to stress the wire as high as necessary to get maximum travel out of it.

If your car rides like crap, it’s got the wrong spring in it! That’s why so many street machines ride like skateboards. Lots of cars came with leaf springs and short shocks, so there’s no room, unless you cut out

the floor. Some people say, “I don’t have room for a five-inch-travel rear shock, so I’ll just install three-inch-travel shocks.” Now you have to run a much-stiffer spring, because the envelope has less travel. It rides real stiff because the spring rate is so stiff. You can’t put in what fits; you put in what you need, and make the car work that way.

As a licensed manufacturer and seller of Air Ride’s ShockWave™ systems, VariShock is able to offer special shock lengths not available elsewhere. Pictured are single-adjustable-front (left) and double-adjustable-rear models.



LOOK BEFORE YOU LEAP

The staff at Chris Alston's Chassisworks is well educated about shocks and springs, plus experienced in manufacturing, installing and tuning these engineered systems. Whether you've got a race car, hot rod, Pro Street vehicle or "g-machine," you'll get the correct combination of American-made VariShock products — the first time! Later, we'll be happy to help you tune the front and rear suspension to suit your exact application and driving style.

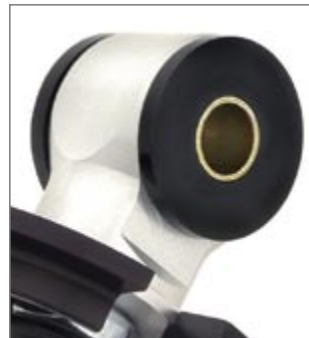
It should be obvious that your suspension is no place to compromise quality for price. Cheap parts are typically imported from other countries. Before you take a chance on mismatched, inferior components from companies that don't even make their own parts, I encourage you to consult our sales staff by phone, fax or e-mail. ■



Here's the one coil-over system for 1964-74 GM cars that not only bolts right in, but also incorporates a pivot-stud ball socket that keeps the spring perpendicular to the shock-absorber shaft — preventing the sideloading that wears out shock glands in typical, stem-mounted kits using conical springs. VariShock's design also accepts standard VariSprings, allowing a full selection of rates. The zerk fitting (top) directs grease to the ball socket. Two styles of bottom mounts bolt to OEM or aftermarket lower A-arms.

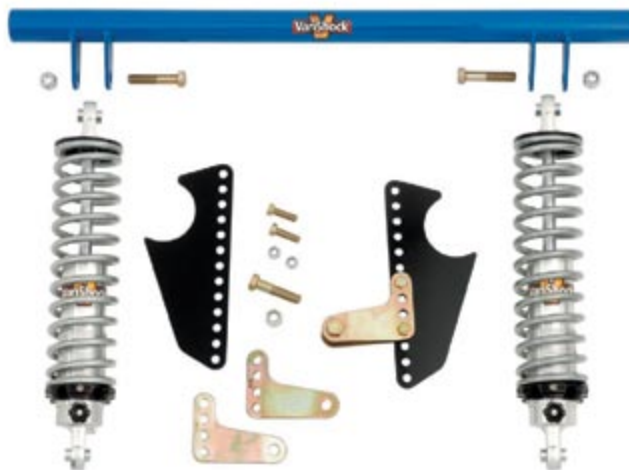


Clever engineering produced an exclusive bearing mount with longer, undercut eyes to maximize chassis clearance — without adding shock length or sacrificing travel. VariShock's Teflon-lined spherical bearing costs more, but prevents the sloppy fit of all-metal designs and short life of all-plastic races. It's also becoming popular in street applications.



Rather than use the same mounting eye for urethane bushings and spherical bearings, VariShock's larger bushing eye accepts 350-percent-more material than conventional designs. The big bushing handles heavier loads and maintains the preload necessary to eliminate deflection and premature wear. This total redesign also required the creation of special molds, into which premium-quality urethane is poured.

Converting to rear coil-overs has never been so simple! A vast selection of crossmember widths, mounts, VariShocks and VariSprings makes this complete, weld-in kit truly universal for cars and trucks alike.



Leave it to Chris Alston to solve a problem as old as coil-over shock absorbers: How to remove a coil spring quickly and easily, without scratching it up? His clever compressor adapts to the outside diameter of any VariSpring and costs only \$59!

