2250 County Road 319
Rifle, CO 81650
970 945 7777
info@offroaddesign.com

Offroad Design Custom Leaf Springs

1: Read the instruction package, these leaves have some features that are quite a bit different from normal “lift kit” and stock spring systems.

2: ORD springs have more arch than a normal “lift kit” spring.

3: Leaf spring length are measured along the arch of the top leaf, not directly across. One example is that a 52” long spring can measure 46” between the eyes before they are installed, but are 52” if measured along the arch.

4: Military wrap goes to the front. “Military wrap” is the term for the double wrapped spring eye.

5: Bolt the rear axle to the springs before you bolt the back end of the spring to the shackle.

6: Install rear shackles with open end forward.

7: Torque specs:

5/8” Diameter u-bolts	135 ft. lbs.
9/16” Diameter u-bolts	100 ft. lbs.
Main eye bolt, front of the front spring	75 ft. lbs.
Front leaf spring bolt, stock 7/16”	44 ft. lbs.
Front leaf spring bolt, 1/2” (ORD HD front shackles)	50 ft. lbs.
Rear leaf spring bolt, 9/16”	75 ft. lbs.
Shock bolts	67 ft. lbs.
Sector shaft bolt, for 4WD pitman arm	115 ft. lbs.
Sector shaft nut, for 2WD steering box (for crossover steering)	197 ft. lbs.

	Most any grease is appropriate for our polyurethane spring bushings. Typically, the same grease used in ball joints or tie rod ends is fine.

The ORD custom spring pack is very different from what many people are accustomed to in a GM truck lift spring. The overall construction with many thin leaves will give a thick spring pack but a lower spring rate. This seems backward but that's the way it works.

The benefit of the thinner leaf material is that the spring can flex farther before it takes a permanent set. Think about how far a piece of thin gauge sheet metal will flex before it permanently bends. Thicker steel will not flex that much but will bend where the thinner material will just spring back. So a thinner individual leaf can flex farther before permanently bending and we just have to put more pieces together to get the rate (stiffness) we need to hold up the truck.

Another consequence of the lower spring rates designed into your springs is the deeper arch. At first glance they will appear to have more "lift" than other springs but with the softer rate they will compress farther to hold the weight of the truck.

Initial inspection

Leaf springs are inherently simple so there's not a whole lot to check out before you bolt them on but you need to check a couple things:

General condition: Did they survive the shipping process? Make sure the center pin is intact and the leaf clamps are firmly attached. Paint scars or scuffs can be painted over and it's very difficult to scratch the hardened material of the spring so that's not a huge concern.

Free Arch: To verify your springs are right and efficiently troubleshoot any ride height problems, you need to measure the free arch of each spring pack **before** installation. Simply lay a straight edge or stretch a string line between the centers of the eyes and measure from that line down to the top of the leaf pack near the center pin location. You can install the bushings and our greasable bolts to make it easier to find the bolt centers since the zerks are centered on the bolt. Note the measurements below:

Driver front: _____ Pass. front: _____

Driver rear: _____ Pass. rear: _____

After the springs are installed and the truck has its final weight on the springs, you need to measure the ride height of your truck. On the GM straight axle

trucks we measure from the top of the front axle tube to the bumpstop mounting bracket on the frame. Check this on both sides and record below:

Driver front: [ ] Pass. front: [ ]

To check if the truck is level front to back measure the body line crease above each tire. You may not prefer the body crease level and that's just fine, we just need a common measuring point to check.

GM trucks run with a very flat leaf spring in the front and thus a good part of the suspensions' travel will be when the spring is in an inverted arch position. This is not damaging to the spring and is not a problem as long as your bumpstops are in the right position. The springs will look like they're working hard for you and in fact they are, but are designed to take it.

"Military wrap" is the term used for the double wrap on the front eye of the spring. This military wrap's purpose is to keep the axle located in the event of a main leaf failure and to add a little extra support to the main leaf in the front eye area. It always goes to the front of the truck whether we're talking about front or rear suspension.

Front ORD leaf systems may require a long slip driveshaft. We've found that a 6" slip can work if the length is set perfectly but a custom long travel slip with 7" or more is way easier to set up and will not come apart. The danger point is at full droop with a little traction. The pinion will drop and the front axle will pull farther forward than you think.

Rear driveshafts do not plunge much because the fixed end of the spring is toward the transfer case so a standard slip is fine for the back.

Rear leaves will often require a traction bar system of some sort, either a "ladder bar" type or a "2-link". More weight, more power and more traction (bigger tires), and/or harder use will increase the need for wrap control.

Normally rear springs are bolted to the main eye hanger and the shackle first, then the rear axle is bolted to the spring. The rear spring installation is a bit different for ORD springs. Bolt the spring to the main eye (front of spring) first. Then bolt the axle to the leaves. This will flatten the spring and help the rear eye reach the shackle.

Bumpstops

Bumpstops must be set to prevent travel beyond the springs' limits. Overtravel will cause the springs to settle. We're talking full compression of the bumpstop here. Your stop may engage initially at 3" of bump travel and not fully stop the suspension for another 2" (for 5" total) for example.

45" long front springs ('69-72 GM trucks) are good for 4.5 to 5" of bump travel from ride height or 9-9.5" of total travel (from free arch).

48" fronts ('73-87 ('91) GM trucks) are good for 5 to 5.5" of bump travel for a total travel of 10-10.5" (from free arch).

52" rears are good for 5 to 5.5" of bump travel for a total of 11-12" of total travel (from free arch).

56" rears get to 5.5" of bump travel and a total of 12-12.5" measured from free arch.

You can measure the total travel from the spring's free arch/full droop position or measure the bump travel from ride height which is when the weight of the truck is sitting on the springs ready to drive.

Break-in and ride height change

Your new ORD springs will drop a little ride height in the first few trips. Roughly ½" is to be expected and it will come from a couple sources. One is that the springs are dipped to coat them with paint after they are assembled. As the paint is broken loose and smoothed out they'll move a little more freely. The second source of break in is that even with hand fit leaves, each leaf will not match its neighbors perfectly and they will all form to each other in their first few trips and possibly lose a little arch in the process.

Maintenance

Leaf springs are pretty simple and don't require much maintenance. Regularly inspect the u-bolt torque and mounting bolt torque. Periodically make sure all the tip pads are present and serviceable, see if the eye bushings are deforming and check for cracked or broken leaves. Bushings and tip pads are wear points and lifespan will depend on the truck's use. Keeping the leaves clean will help them ride smooth and help the tip pads last longer. Imagine a little bit of corrosion buildup on each leaf's sliding surface then multiply that by 8-10 leaves and you have a stiffer, stickier spring. It's common to notice that the truck rides better after a trip that cycles the suspension fully and it's the leaves polishing themselves that makes them run smoother. Greasing the leaves helps them ride extra smooth but tends to attract grit so a dry "lube and protect" product will work

better overall.

Ride height side to side

The softer spring rate will make your truck more sensitive to weight changes and even its reaction to things like how the wheels are turned when you park. It's common for trucks to lean to one side or the other based on many details like drivetrain, passengers, cargo and fuel tanks on only one side.

Another factor that amplifies everything, is that these trucks have wide bodies and narrow spring spacing. With the springs 32" apart and 80" wide bodies, a ½" difference at the spring translates to 1-1/4" at the fender.

This is why we have you measure your springs before installing them, so that if your truck does end up pitched to one side, we know it's not in the springs and that it's from the weight of the truck. To fix it, the easiest way is to reconfigure what you can easily move; things like tool bags, spare parts/tire, etc. Beyond that, we can add a spacer or add-a-leaf under just one side, and in the most severe cases swap out individual leaves to adjust the spring rate side to side. Start with the easy stuff first, and then contact us if you are having problems.

Body roll

Spring rate and body roll are directly related, a softer spring will lean over more in a corner. For those that have a sway bar, that keeps everything really tame on the street.

For those that do not have a sway bar, you will have more body roll. To many, this is acceptable and something that you'll get used to over time. Drive carefully and see how it goes.

Enjoy the new soft ride in your truck and use it more than ever before!