Coilover Conversion for Torsion bar Rangers

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Coilover Conversion Overview

What are coilovers and why do I need them?
A coilsprung suspension uses a spring and coilover shock to provide a smoother ride than the factory torsion bars used in late model rangers. Torsion bars are rods parallel to the ranger frame that twist (hence the term “torsion”) to dampen suspension movement. Coilovers dampen suspension motion through straight compression. In the pictures below, you can see the torsion bar and its bracket (figure 1) compared to a coilover (figure 2). The coilover refers to the combination of the spring and the coilover shock. Standard shocks can not be used for coilovers.

![Figure 1](image1)
![Figure 2](image2)

As you can see, the low-hanging torsion bar reduces clearance in that area, another benefit to eliminating torsion bars in favor of coilovers. However, the main benefit of converting to coilovers is for improved ride quality. Regardless of the spring rate you select, the ride will be smoother than with torsion bars.

Can I do this to my truck?
Do you have a Ford Ranger or Mazda B-series pickup? You're on the right track! Your truck should also have torsion bars, since this is what you are eliminating. This should apply to all 1998-2011 Rangers or Mazdas.

What components will I be replacing?
The torsion bars may be completely removed from the truck, as well as their mounting brackets. You will also be replacing your factory shocks in the front.
Will this lift my truck?
Yes, and no. This is NOT a lift kit, and will not provide any additional lift compared to torsion bars. However, you can safely get the same amount of lift you would with a torsion bar crank. If you crank the coilovers up more, you’ll put too much of an angle on your cv axles which would cause them to need to be replaced quite often. The other thing to keep in mind with coilovers is that cranking them up too high with a factory suspension will bring the upper control arms very close to the coils. There’s not a lot of room in there. About 3” higher than stock for a 98-07 truck is as high as you want to go. This conversion is all about ride quality, nothing else. Ride height possibilities are no different than a stock torsion bar setup

Is this for stock height or lifted trucks?
Both! Brackets and hardware will be the same for both applications. The only difference between the conversion will be the sizes and stroke of the coilovers and springs, as well as the limiting strap. This will be discussed in more detail later

*Please note: for body lifted trucks, suspension is not modified so for the sake of this document, you have a stock height truck. “Lift” refers to the Superlift kit, which changes the suspension.

How much will this cost?
This depends in large part upon your coilover selection. Expect to cost to be from $650 at the low end, to $1500 or up. The kit from ME00Stepside including brackets and hardware is $270-290 plus shipping. Coilover shocks and springs will make up the majority of the remaining cost, not including any labor if you aren’t doing the work yourself.

What tools will I need?
You will need a standard set of tools, as well as a good jack and jack stands. You will also need spanner wrenches for the springs. A welder is also required to add gussets to the stock shock mount for additional support.

What parts do I need?
In general:
- Coilover shocks
- Springs
- Custom brackets
- Shock Mount Gussets
- Mounting hardware
- Extended eyelets
- Spacers for shock mount rod ends
- Limit straps

Figure 3 – Some of the components needed
ME00Stepside bracket kit
A kit has been put together including many of the custom components needed for this install. Ranger-forums.com member ME00Stepside is creating these kits in limited runs of ten or so. They include all grade 8 hardware, brackets, gussets, and spacers, and may come in either a powdercoated or raw finish. Coilovers are not included.

Pricing and Shipping
The kits sell for $290 with powdercoated brackets or $270 for a raw finish. Paint and/or corrosion protection will be necessary for raw steel. Shipping is $16 in the US and $34 in Canada.

Brackets
The kit includes upper and lower brackets for both sides, as well as shock mount gussets. In the picture below, you can see the lower brackets (top) and upper brackets (bottom).

Figure 4 - Kit components, including brackets (left side) and gussets and hardware (right side)
**Spacers**

There are two kinds of spacers needed, included in this kit: Eight (4 × 3/16” and 4 × 1/2”) side to side spacers, to prevent motion of the coilover rod ends, and a top spacer between the upper bracket and the stock upper shock mount for each side.

![Figure 5 - Side to side spacers](image1)

![Figure 6 - Spacer between upper shock mount and upper bracket](image2)

**Hardware**

All necessary hardware is included in the kit and is grade 8 zinc plated for maximum strength and corrosion protection. The included hardware is as follows:

**Bolts:**
- ◊ 4 - 1/2"x3" (shock bolts)
- ◊ 4 - 3/8"x1.25 (upper bracket drilled holes through back)
- ◊ 2 - 1/2"x2.25 (upper shock mount through top)
- ◊ 8 - 3/8"x1.25 (lower bracket)

**Washers:**
- ◊ 20 - 1/2 Grade 8 Flat Washers
- ◊ 16 - 3/8 Grade 8 Flat Washers

**Lock Nut – Metal:**
- ◊ 10 - 1/2 Grade 8 Metal Lock Nuts
- ◊ 8 – 3/8 Grade 8 Metal Lock Nuts
Coilover Shocks
The most important part of the coilover conversion, you must decide what you want in a shock and what you want to spend. There are numerous brands to choose from, and many suppliers that will sell them to you. Please be aware that not all shocks are designed for use in coilovers.

Specifications
The important aspects of the shock are diameter, travel, and extended/compressed length. For the Ranger, we will use 2.0 shocks for all applications, to be paired with a 2.5” diameter spring. You want 2.0, not 2.5 shocks. There is no need for the larger, and it's a tight enough fit on our trucks with 2.5” springs.
For stock suspension trucks, a 5.0 travel shock should be used. For superlifted trucks, a 6.5 travel shock is recommended.

Valving
Valving is an important adjustment of the coilover shock. It refers to the setting of compression and rebound damping of the shock. This should be done by the dealer you purchase your components from, based on how you plan to use your truck. Whatever the shocks you get, you want to let them know the spring rate, and your application. The shop or manufacturer will be able to set the shocks up for you. It is recommended to communicate with them via phone or email to obtain proper valving rather than ordering off the shelf components online.

Valving numbers vary by brand:
• Bilstein uses xxx/xx. The xxx is the compression damping and xx is the rebound damping, both in Newton Meters per Second.
• King uses shim thicknesses. For example, the compression stack might be all .010” Shims and the rebound stack might be .012” shim thicknesses.
• Fox uses percentages. For example 50/70, where 50 means 50% of the available compression damping and 70 means 70% of the available rebound damping.

From Pirate4x4.com:
“The shims, discs, or washers, come in different diameters and thicknesses. A particular combination of discs is called a valve stack or shim stack. As the shock strokes through the oil, depending on the direction of travel, the oil passes through the appropriate orifices and then reaches the shim stack. The shim stack must then flex and "open" to allow the oil to pass out the other side of the orifices in the piston. By varying the number, diameter, and thickness of the discs in the shim stack, the pressure at which the stack flexes and opens to allow oil to pass is varied, and thus the shock damping is varied.”
**Extended Eyelets**

All trucks, superlifted or not, will require extended eyelets. The Fox part number is 213-01-238-A, which is 4.488 in long, 3.75 in center to eye. You can't get extended eyelets for the Strange coilovers, because they're part of the body. The figure below show coilovers with extended eyelets installed. If extended eyelets are not available, they may need to be custom machined. This should run around $75 for anodized.

![Figure 8 - Fox coilovers with extended eyelets installed. Standard eyelets are shown for comparison.](image1)

![Figure 7 - Installed with extended eyelets](image2)
Emulsion vs reservoir shocks
You may choose to use emulsion or reservoir shocks. Reservoir shocks have a separate reservoir, and are generally more expensive and for high speed applications that require greater heat dissipation. Under severe usage, emulsion shock damping may decrease due to mixing of oil and the nitrogen gas. Reservoir shocks separate the nitrogen from the oil. Examples of each are shown below.

Figure 9 – Emulsion shocks (with springs installed)
Figure 10 – Reservoir Shocks (shown with limiting strap)