

Coil Pro for CVPI Rear Springs

By Eric Winn

The Ford CVPI has a suspension that promotes a comfort ride needed by law enforcement officers. The downside may be only average handling in severe maneuvers, especially when heavily loaded.

The other area for improvement is additional load carrying needed by SWAT team cars, canine configured cars and other special service cars. The average weight of equipment carried in the trunk of a patrol vehicle ranges from 200 pounds to as much as 350 pounds. With heavy loads, the rear end sags noticeably, which raises the front of the car. This affects the handling, as there is less traction to the front wheels.

With the additional weight in the trunk, when the car makes a sharp turn or a sudden maneuver, the lateral force shifts the weight of the car plus the cargo to the opposite side of the turn. This causes the rear coil spring on the one side (which is already under extra load) to compress, resulting in the wheel tucking under the wheel arch.

The opposite occurs on the other side. This results in one front wheel making very little or no contact with the road surface and the steering of the vehicle relegated to only one wheel. This affects the steering and driver control.

The second problem is that the rear sagging promotes tearing and in some cases complete destruction of the rear bumper cover when an officer crosses a median or a steep grade. Repair costs are high and time consuming. Several departments have used cable ties to secure the rear bumper fascia upward to the subframe with marginal success.

Our department has tried several products such as air shocks and stiffer coils to rectify these issues with our patrol cars, but with little success. In some cases the ride height was preserved but the comfort of the vehicle was sacrificed and officers complained about the harsh ride. These products only marginally improved the handling.

Skeptical, we tried Roadmaster's Coil Pro bolt-on springs with a few

CVPIs. After installing our first Coil Pro, we put the car through a test session at the NASCAR facility in our area, the Martinsville Speedway.

We allocated two identical 2001 Crown Victoria Police cars each loaded exactly to 300 pounds in the trunk for testing. The tires were inflated to the correct pressure recommended by the manufacturer. One car had a Coil Pro installed and the other did not.

Our test consisted of a slalom course with cones placed at 58-foot centers. Target speed for the maneuver was 35 mph. The first test was on the car without Coil Pro installed, entering the first two cones at 35 mph with considerable oversteer. As the car approached the final three cones, the rear end began to drift out and speed was reduced to 30 mph in order to prevent the car from continuing to skid sideways and spin.





In the next run the driver entered the cones once again at 35 mph and the driver failed to maintain a constant speed. Halfway through the run the rear end once again drifted and the driver lost all adhesion and control and battled the skid to regain control of the vehicle. The same maneuver was repeated a further four times with similar results.

The CVPI with the Coil Pro springs was put through the same test. The car entered the cones at 35mph and exhibited no rear drift and the driver was able to maintain a constant speed of 35 mph throughout the run. The car exhibited little body lean in the sharp turns and the steering was completely more neutral. The driver then repeated the maneuver five times with the same results.

The Coil Pro system involves a pair of small, progressive spring rate,

torsion springs that fit between the coils of the existing rear coil springs. As the main coil springs compress under load, the Coil Pro exerts progressively greater force. Coil Pro's torsion springs give approximately 35% more load-carrying ability in the rear.

A Crown Victoria spring was tested on a spring compression press that measured the load applied at various compression distances. To register 120 pounds of load, the OE spring was compressed one inch. The same spring with Coil Pro installed was compressed only one-half inch. At 440 pounds, the OE spring was compressed 3 ¼ inches whereas the Coil Pro outfitted spring was compressed to only 2 ¼ inches.

When the car has a Coil Pro fitted and without any load in the trunk it will raise the rear by one-half inch and with a load of 250 pounds in the trunk there

is an improvement of approximately 1.5 inches over cars without Coil Pro installed. The Coil Pro did not noticeably harshen the ride because of the variable nature of the torsion spring assembly. In other words, the Coil Pro only engages when needed.

Installation was easy. Our technicians installed the Coil Pro units in 25 minutes. Our mechanics noted that the best method of installation was removing the rear wheels with the car on a lift for ease of access to the coil springs. The Coil Pro assembly is packed in the box fully assembled and with step-by-step instructions.

The Coil Pro device is connected to the coil springs with polyurethane blocks and held in place by two parallel brass pins that insert into a loop in the W-shaped torsion spring. The solid polyurethane blocks that clip onto the coil spring wire move in a sliding motion on the legs of the Coil Pro spring and the manufacturers tell us they will last the life of the car with no maintenance required.

After this testing, the sheriff and fleet manager decided to outfit the entire fleet with this system. They felt that improved handling directly translates to safety for officers and other motorists in our jurisdiction. Combined with the cost savings of underbody components such as exhaust systems and bumper covers, this product is viable in the lean financial climate for our department.

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