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ROAD WORK

Beefing up Your Musclicar's Suspension



By Steve Temple

Photos by Steve Temple and courtesy of Hotchkis

Suspension engineering may not be as exciting as stomping on the loud pedal, but it can be just as important as a hot mill to your car's overall performance. For a rough analogy, let's compare a musclecar to a professional boxer. The level of conditioning needed to win in the arena is not merely raw power. You also need strength, speed, agility and endurance. On a musclecar, that would involve precisely tuning the chassis as well as adding double-pumper carbs.

After all, it's no secret that the handling on mid-'60s to early-'70s street machines left a lot to be desired. Part of that was due to the state of automotive technology back then, but there were other factors, such as keeping costs down and keeping the ride comfy. Hence, the control arms were made of stamped steel and cushioned with soft rubber bushings. The result was a car that was both affordable and comfortable, but swayed like a punch-drunk boxer with weak legs. Not only that, a factory-stock suspension is no match for today's mega-grip radial tires and the mondo horsepower available from current-technology engines.

Beefing up the suspension is a reasonable and effective project because it doesn't have to alter the look of a classic musclecar, but can dramatically alter its performance. To that end, we took a close look at the Hotchkis Total Vehicle System (TVS) and how it applies to a GM A-Body—in this case a '69 El Camino.

The Hotchkis Total Vehicle System (TVS) is just that—a complete system of components engineered to work together as a package, upgrading the front and rear suspension on '64-'72 GM A-Body models. (Similar systems are available for other makes and models.)



To be effective, it's important that these mods not be piecemeal. Simply adding a bigger sway bar or different coil springs doesn't take into account other factors, such as camber curve or caster angle. Hence the need for an integrated system and overall strategy.

"Today's worst rent-a-car handles better than a '60s musclecar," pointed out John Hotchkis of Hotchkis Performance. "Bolting on our improved suspension will make driving a musclecar so much more enjoyable. Isn't that what this hobby is about?"

That's why Hotchkis developed new tubular control arms, among other suspension components, with significant differences in both material and design. The front arms are not only stronger and lighter for less deflection and to reduce unsprung weight, but they also have a taller spindle to maintain negative camber. They are adjustable as well for precision chassis tuning.

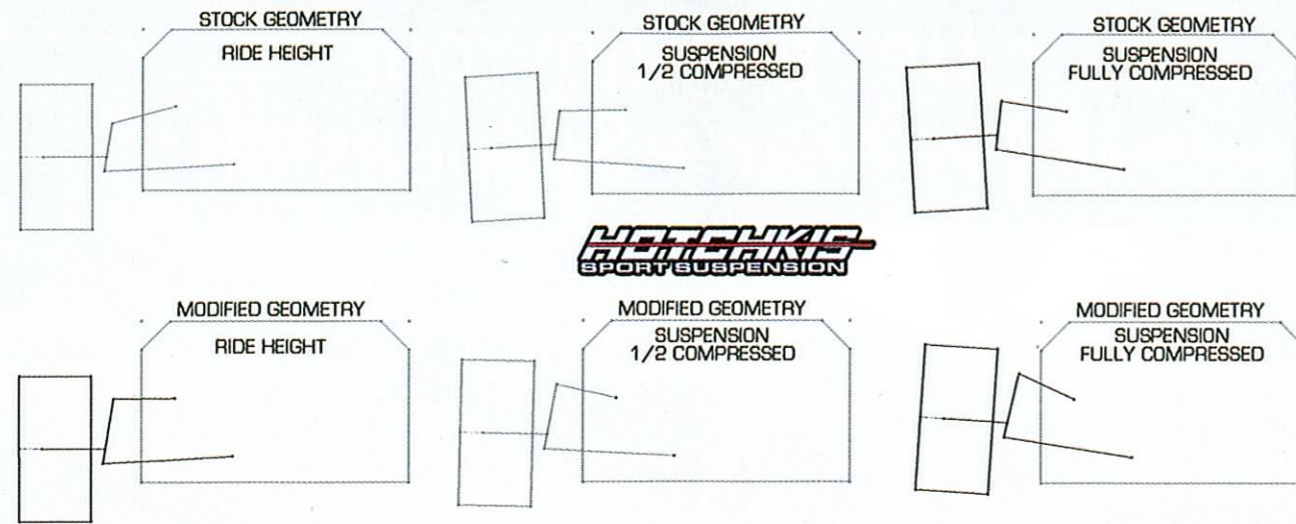
Custom-calibrated Bilstein shocks provide better damping of the upgraded suspension, and the lower control arms in the rear are now boxed for greater rigidity and to provide an at-

tachment point for a rear sway bar. To reduce body roll, Hotchkis added stiffer, large-diameter sway bars with a hollow configuration.

The result is an El Camino that preserves its classic looks, but works far better, with a greatly improved level of comfort for street and freeway driving, and markedly better cornering ability. These changes improve the balance, steering response, stability and safety, but don't require any modifications to the chassis for installation. All of which means you can make the most of your musclecar's performance potential, and go the distance.

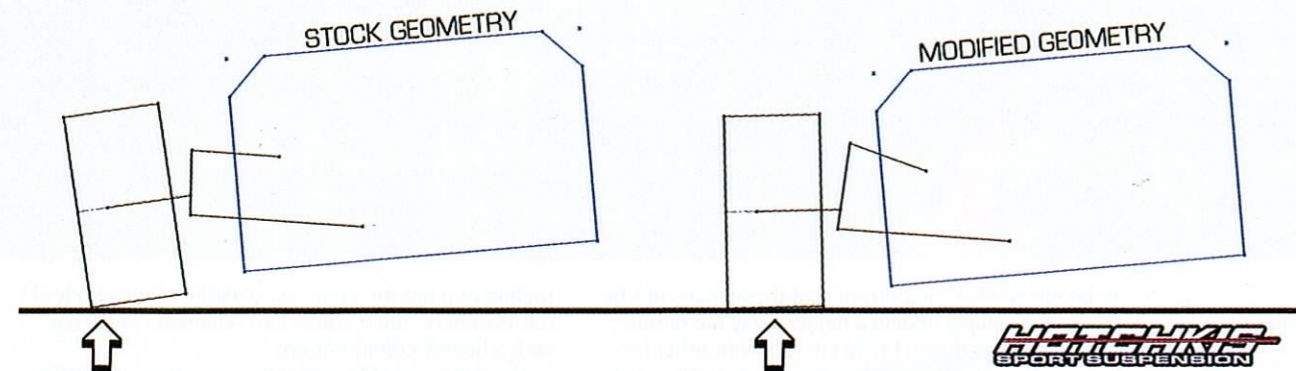


At the rear of the El Camino is Hotchkis' Extreme Rear Sway Bar kit, which is an upgraded and adjustable unit.



These schematic diagrams illustrate the changes in camber that take place at different suspension compression heights both before and after the Hotchkis TVS installation. Note the positive camber angle (outward tilt) of the tire in the factory

setup and how that changes with the new components to a negative camber angle (inward tilt). The camber change improves cornering by keeping more of the tire's contact patch on the ground.

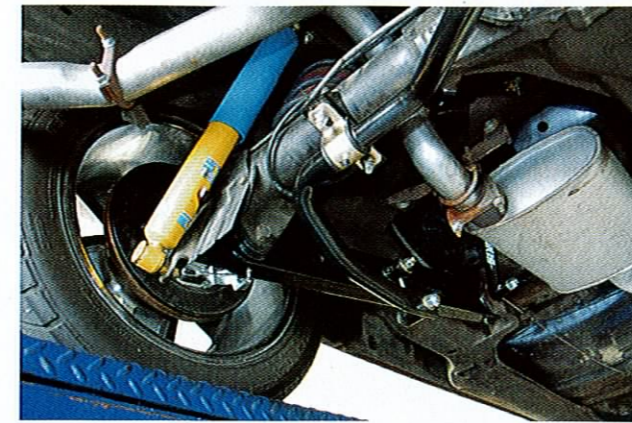


In these diagrams you can see the effects of body roll during cornering both with and without the Hotchkis components.

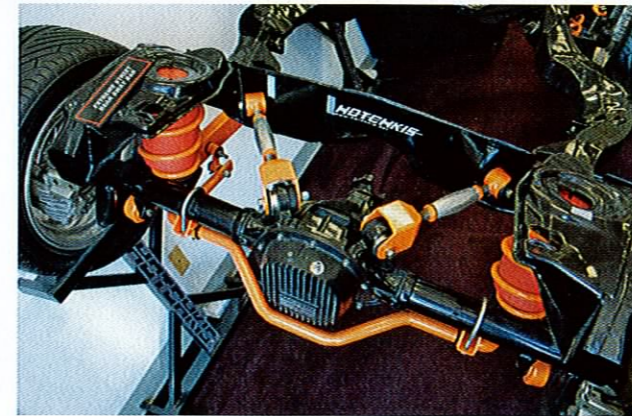
Again, the Hotchkis system helps to maximize the tire's grip with the road.



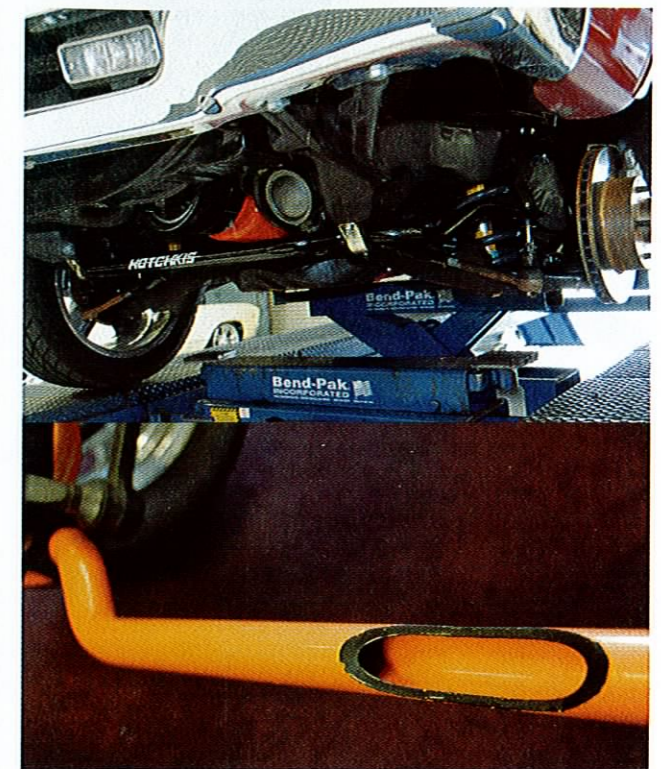
While the Hotchkis TVS dramatically improves handling, it's barely visible from behind. Only the 1-inch, high-carbon-steel sway bar and Bilstein shocks are visible.



This close-up shows how the Hotchkis boxed trailing arms fit into the stock chassis with no modifications required. The adjustable trailing-arm braces (adjacent to the forward end of the trailing arms) are designed to reinforce the trailing-arm mounting points on the chassis.



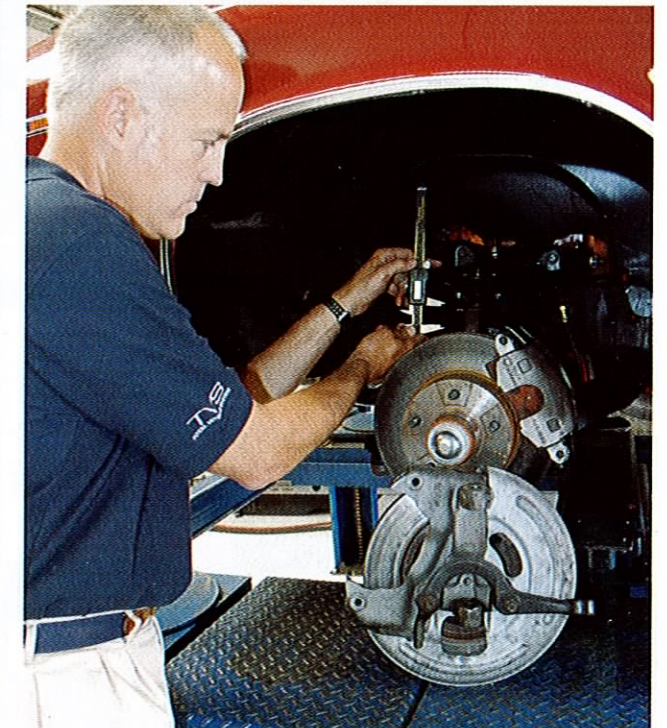
Additional adjustable bracing (shown here on a display chassis, where it's easier to see) is provided for the differential. The braces also work against axle wrap for better hookup and quicker launches.



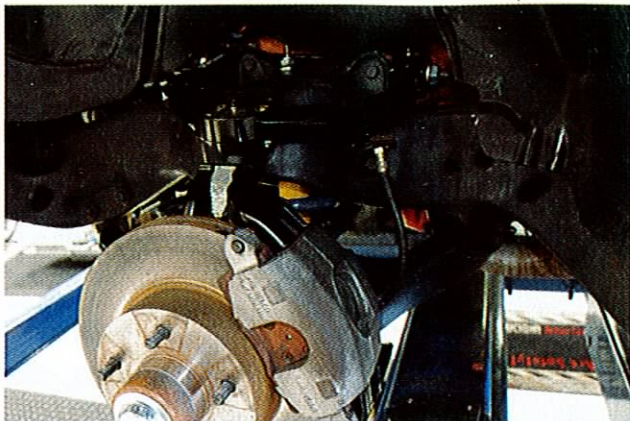
The sway bar for the front, at a diameter of 1-3/8 inches, is much larger than the rear bar. Its hollow construction is much lighter, but just as torsionally stiff as a solid factory bar.



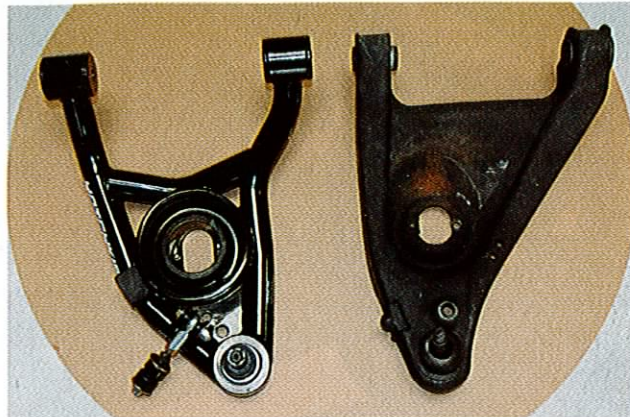
Custom-calibrated Bilstein shocks and 1-inch-lower, precision-wound coil springs provide a more stable ride and a more aggressive stance. The airbags (red) are not included.



John Hotchkis of Hotchkis Performance measures the difference in height between the stock spindle (foreground) and the one installed on the El Camino. The taller spindle allows for an improved camber angle under loading, and also makes room for larger brakes.



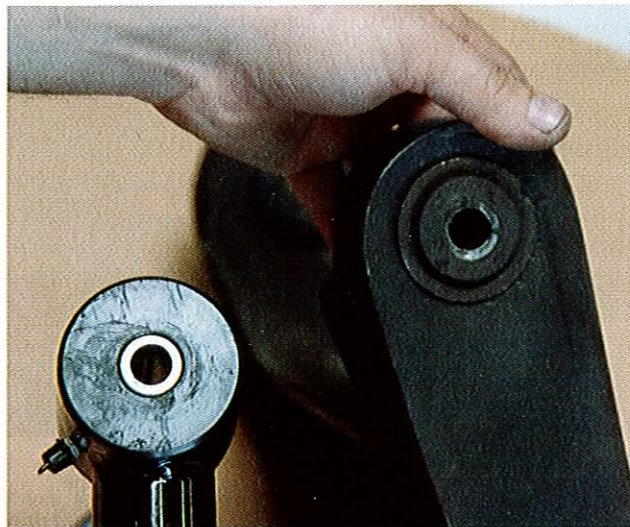
The upper A-arm is made of tubular steel, instead of stamped metal, and has a much flatter angle than stock for improved suspension geometry and camber control.



This photo really highlights the differences between the Hotchkis tubular lower control arm (left) and the stamped steel factory unit. The Hotchkis piece is both lighter and stronger for less deflection and unsprung weight.



Note how the factory upper A-arm has to curve downward due to the shorter spindle, while the Hotchkis A-arm is much flatter in-configuration. This setup helps to maintain negative camber and thus better tire grip throughout the suspension travel.



Stiffer polyurethane or Delrin bushings are used instead of soft rubber (right).



From top to bottom, factory versus Hotchkis rear suspension arms and braces. The higher quality of construction is clearly obvious, as is the adjustability.



Note the difference in size, quality and adjustability of the brace for the trailing arm mount.



Here's an overall photo of the display chassis mentioned in previous shots. You can easily see most of the TVS components, as they're painted bright orange. *MCR*

Source

Hotchkis Performance
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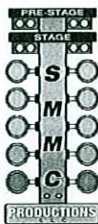


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