Make An Olds Man Happy

Updating A '50 Olds' Suspension And Steering

Cars built during the mid 20th century offered a vast improvement in steering and suspension over their predecessors of even 20 years earlier. Fast forward 50 or 60 years, however, and they're woefully inadequate for today's roads and highway speeds, especially when fitted with more modern engines and powertrains. While some lend themselves to easy suspension swaps (think of the myriad of Mustang II–based crossmembers and clips available in the aftermarket), others aren't so easily adapted.

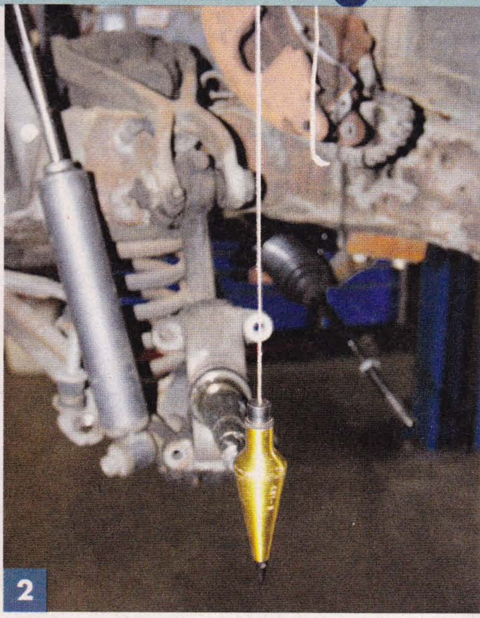
This '50 Olds is a perfect case in point. Jules Engoren bought this 455-powered coupe that already had a rack-and-pinion and disc brakes installed, yet he was less than enamored when it showed a tendency to swap lanes on the freeway at the sign of any slight deviation in the road surface. Zero (or even positive) caster made steering lighter in the days before power steering was common, and highway speeds were a lot slower back then. There is no way to adjust the caster on the Olds, yet the owner didn't want to go to the expense and amount of work involved to "clip" the car.

Having had "Kiwi" Steve Davies of Kiwi Steve's Hot Rod Shop in Brea, California, perform work on his '34 phaeton in the past, he asked Davies if he could modernize the suspension and steering without resorting to a front frame swap. The Olds has a chassis that doesn't lend itself easily to such a job, as the framerails are not parallel and the front crossmember is a hefty affair, to say the least.

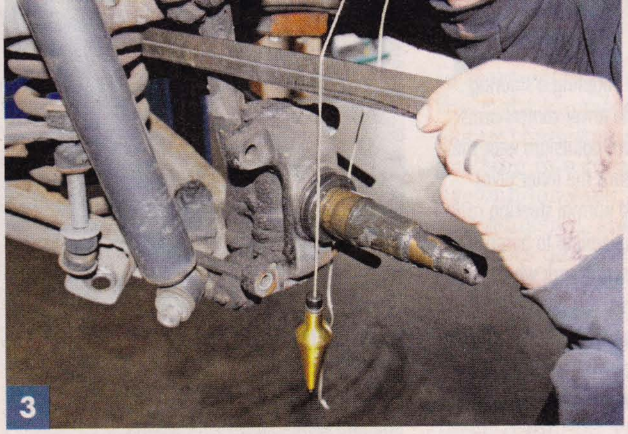
After a lot of trial and error, and much planning, the result is a vastly improved ride that instills driver confidence, not fear. It's also an upgrade that could be performed with stock parts from other cars, though aftermarket upper control arms and spindles were used from Classic Performance Products, offering the benefit of improved strength with new parts.

However, before we get into the nitty-gritty of the swap, there are a couple of things to bear in mind. Firstly, this isn't a job for a novice, as plenty of fabrication and a thorough understanding of suspension and steering geometry are required to complete the task. Secondly, this swap represents an improvement over the stock Olds components, not a perfect front suspension on this platform, as so much is inherently "wrong"

1 Here's the stock Olds suspension, though someone had previously added tube shocks, a steering rack with dubious geometry, and disc brakes. While adequate for highway speeds in the '50s, this setup had negative caster, and the car would change lanes at freeway speeds.

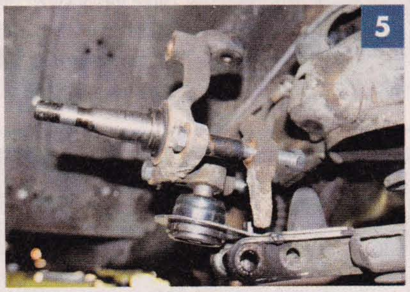


2 A plumb bob was hung from the front fender to determine where the centerline of the spindle was. The modifications will include moving the upper ball joint back and the lower forward when the CPP Chevelle spindles are installed, to correct the caster geometry, so establishing this baseline is important.



The plumb bob was also used to determine the track width, measured from the spring pocket to the inner bearing face on the spindle. This was done with the suspension under load, and shown here mocked up. The original plan was to reuse the stock wheels, but the 5-on-5 bolt pattern (to match the hubs and rotors already fitted) dictated otherwise once the Chevelle hubs were installed. However, new wheels of the same offset were used.

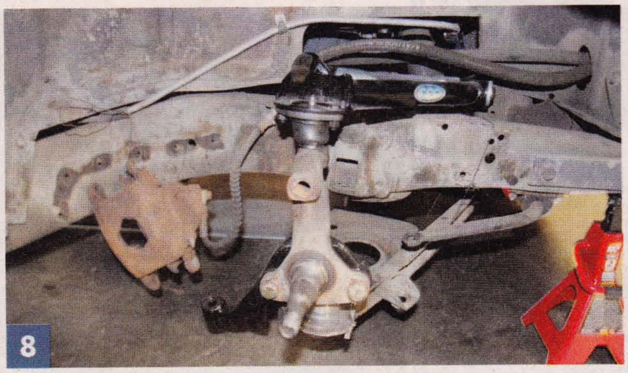
A new lower ball joint mount was mocked in position to determine everything would fit. This placed the ball joint forward of the stock lower kingpin joint as required.



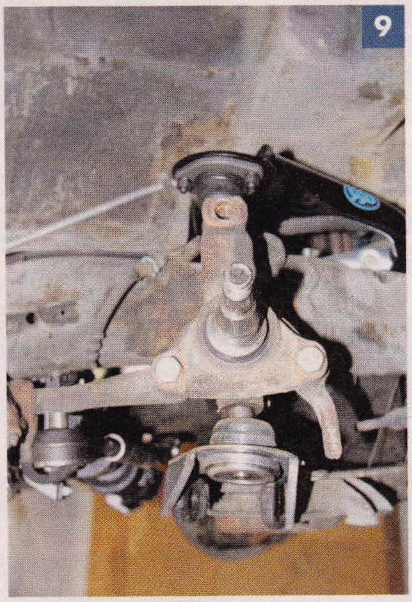
With the ball joint mount tacked in place, a pair of junkyard Chevelle spindles was used for setup purposes. Davies then began experimenting with steering arms.

CPP provided a pair of '64-72 Chevelle upper control arms *(top)* as well as a pair of '55 Chevy arms *(bottom)*, so we could determine which would work best for the conversion. Points to consider were the placement and angle of the ball joint, as well as the latter having the correct taper to match the Chevelle spindles. At this point too, Davies was trying to make the job simpler by mounting the upper arms to the stock knee-action upper arm mounts.

Chevelle spindles were selected because the measurement between the ball joints was as close as possible to the distance between the stock kingpin pivots. Also, they accept bolt-on steering arms, which makes them ideal for front- or rear-steer applications (meaning whether the steering rack is behind or in front of the spindle). Here the steering tie rod is being mocked up.

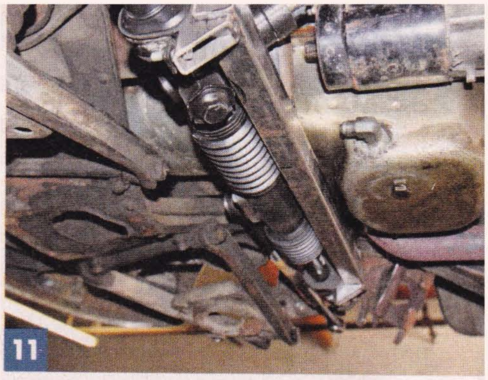


A couple of things are going on in this picture. First, Davies was experimenting with the placement of the upper control arm mount using the '55 Chevy arms. Secondly, he was trying a '67-69 Camaro steering arm. The idea behind this was that it was from a rear-steer car, so the Ackerman would likely be close to what was required, but it had way too much drop, and placed the tie-rod end in the wrong place in relation to the steering rack.

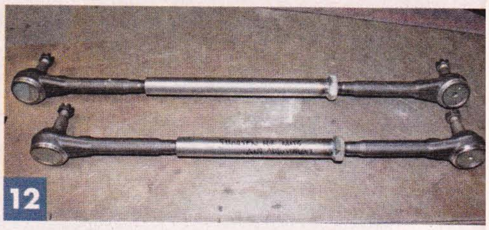


With the upper arm temporarily mounted, you can see how the caster is much improved over stock. Here it's set at 3 degrees. Also, a Chevelle steering arm is now bolted up. It puts the tie rod at the right height for the steering rack, but being from a front-steer car, it'll have to be modified to correct the Ackerman angle.

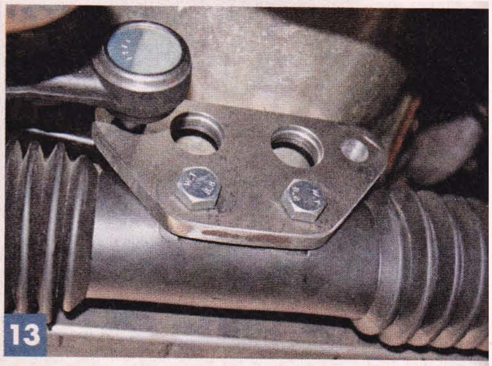
Part of the problem with adapting a steering rack to the Olds is that the lower control arms are so long, the inner pivot points are near the center of the car. This means the inner pivot points of the tie rods on a normal steering rack wouldn't align with them, leading to bumpsteer. The solution? To use a steering rack where the pivots are in the center. This one is from a late-'80s to early-'90s Grand Am. It can also be found in a Cutlass or Calais. The left side of the mounting bracket bolts to the original steering box mounting holes.



The rack in position. Note how it clears the oil pan and starter of the 455 engine.

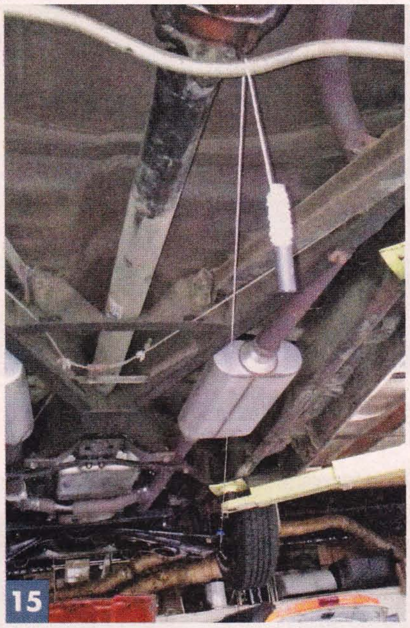


Using Chevelle tie-rod ends, Davies fabricated these tie rods in order to start setting up the steering, though ultimately they weren't used.

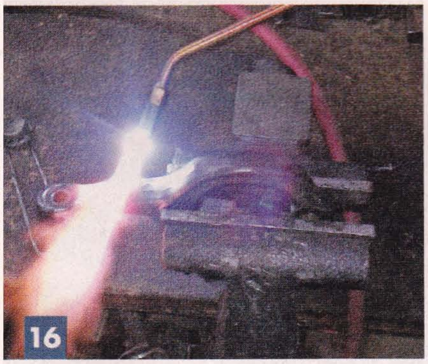


This plate was also made as a starting point to determine where the inner tie-rod ends should mount to the steering rack.

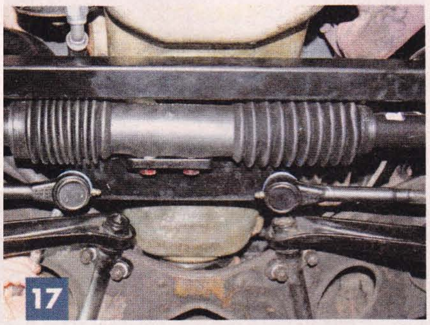
With the steering mocked up, a bumpsteer gauge was connected and the suspension moved through its travel. This showed the steering arms were way too long, so the central bracket was made longer to bring the inner tie rod pivot outward.



The Ackerman needed to be set before any further work could be done on the steering. With a length of string pulled taut between the lower ball joint center and the center of the rearend, the outer tie rod pivot on the steering arm should intersect the string line …



… meaning the steering arms had to be heated and bent to suit.



Slightly out of sequence as it's all painted, this is what the final steering rack center bracket looks like. With this bracket, the bumpsteer gauge read a total of 0.150 inch of deflection throughout the travel, compared to 2 1/2 inches with the first bracket, and the Ackerman yet to be set. The steering is turned here; the tie rods are not offset!

to start with. It is, however, with the right knowledge and skills, easier than stripping the car and grafting in a front clip from the firewall forward, as the engine, transmission, sheetmetal, and bumpers don't require removal and remounting. The use of Chevelle spindles means there is a vast selection of rotors and calipers that can be used, from stock versions all the way up to six-pot calipers and large-diameter vented rotors. R&C

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With the steering geometry set, the lower control arms could be finished. A jig was fabricated around the modified arm.

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The same jig was used for the opposite arm, though the angle of the ball joint had to be copied and flipped right to left.

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A pair of ball joint cups were machined on the lathe for the end of each lower arm …

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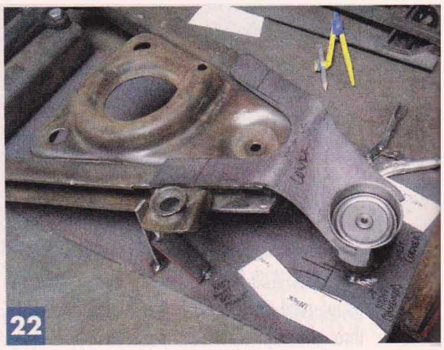
… then placed in the jig for assembly.



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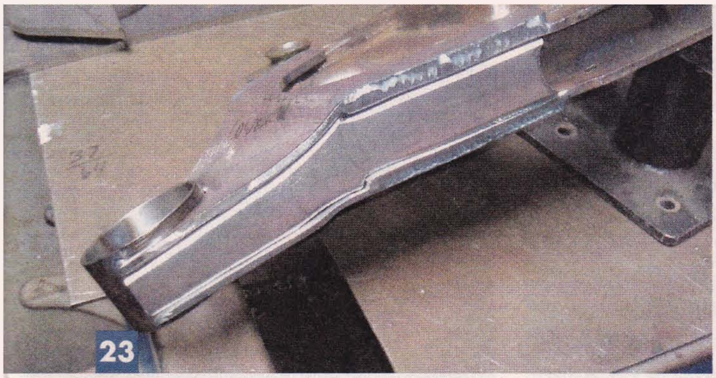
Here's how the ball joint cup was attached to the control arm, substantially stronger than the temporary method it replaced.



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Upper and lower plates were TIG-welded in place before boxing plates were added.

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These plates were made to bolt to the original upper arm mounts …

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… which then became the baseplates for the new upper control arm mounts.

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While the Chevelle upper arms eventually worked out to be the best fit for this application, there was still a small amount of bind in the ball joints, owing to the angle of the arm. Davies modified the arm as shown on the left to cure this.

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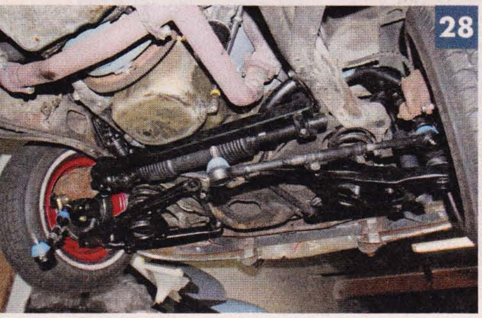
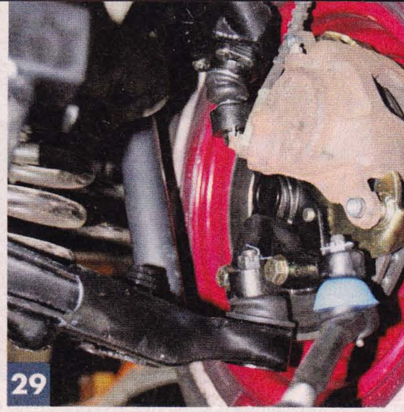
Though shown while the upper arm mounts were at the prototype stage, you can clearly see how plenty of adjustment was built in to the suspension for future alignment. It may look like a lot of shims have been used, but there's only a 1/2 inch of adjustment for camber.

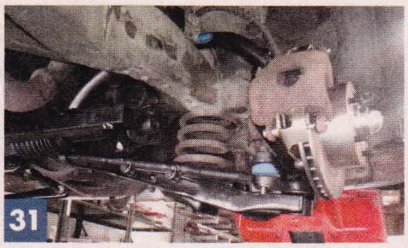


28 Though the tie rods have yet to be connected to the steering rack, '67-69 Camaro tie rod adjustment sleeves were used in the final version, and you can see that CPP dropped Chevelle spindles have replaced the stock versions now. The new wheels have the same backspacing as the previous ones, and as the suspension was designed with the same track width, we know they'll have sufficient clearance.



29 Here's a better view of the dropped spindle and the modified, boxed, lower control arm.

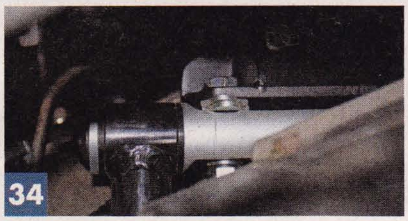
30 The tube shocks and antiroll bar brackets were re-attached to the lower arms, the shock mounting to the same towers that had previously been added (the original shocks would have been integral to the knee-action upper arms).



31 The final assembly, ready to go to the alignment shop.

32 Using specs for a '64-70 Chevelle, as that's pretty much what the suspension was based on, the digital Hawkeye machine made alignment a snap.

33 The screen tells the story; with some shims removed from the upper arms, the camber is about as close to 0 as it could be. Each side has 3 degrees of caster, and the total toe is 0.15 degree.



34 Here's the upper arm inner mount after alignment, with just two shims left. If Davies had started with less than a 1/2 inch of adjustment, there wouldn't have been enough room to set the camber correctly.