

Tri-5 AirBar

One of the most interesting approaches yet to installing a 4-bar and air in your 1955-57 Chevy



by Doc Frohmader

One of the problems with new technology is that it tends to make the old look sub-par. Yes, I do know that's what it's **supposed** to do, but if you love old cars like I do there are times where technology gets just a little threatening. I think this is because we all like a certain amount of comfortable stability and every time we're forced to re-examine what we thought we new as a certainty, the footing shifts just enough to make us unsure for a moment. For some of us it's also a reminder that we're getting older and that's never good either.

In this case, the technology that's changing is in suspension. Being both something of an automotive historian and an old grey-haired curmudgeon who's been around long enough to see and work on a lot of "old" cars, I see the current trends in chassis and suspension as remarkable. If you look at it in the long view, it becomes almost predestined – as a natural progression of steps toward an obvious goal.

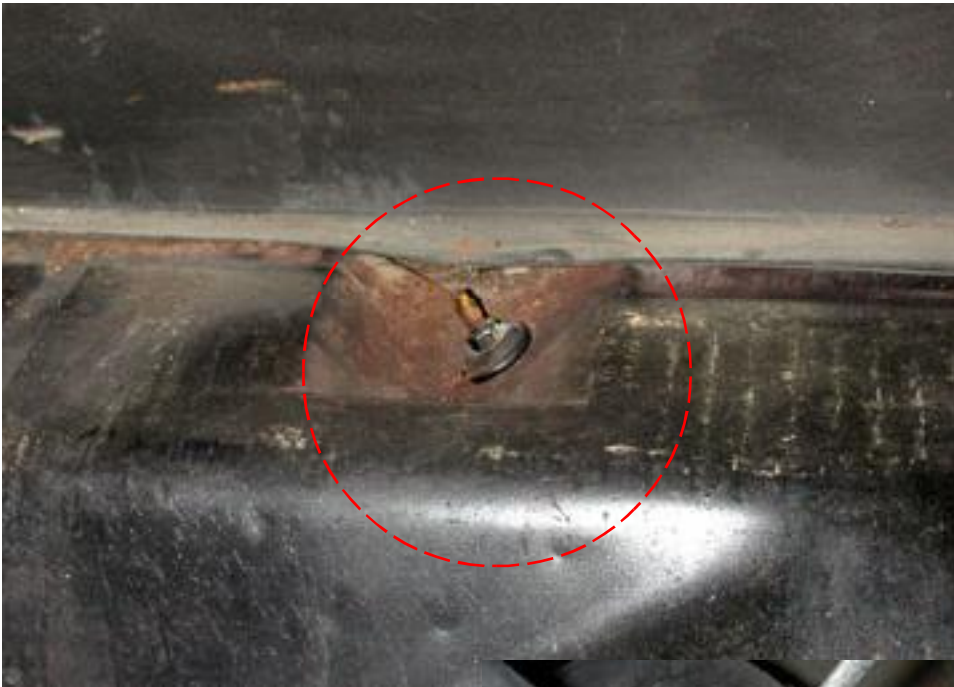
Plain and simple, the Tri-5 rear suspension is not the most obsolete rear suspension – it does have tube shocks – but the leaf springs make axle wrap, sway, and wheel bounce a fact of life.



You'll never see a leaf spring suspension without a pinion bump stop. Under hard acceleration or with any kind of power, your axle hits this to stop it from rotating. For this upgrade, you'll remove the rubber bumper but leave the steel mount intact – the four-bar setup eliminates the need for a stop.

What I mean is that at first the goal of a chassis was to hold a car up and create a platform that could carry all the other gear, prevent damage, and allow some means to turn. So suspension was for protecting the car and after a short while to make the ride a bit more civilized and allow better control of the vehicle. Over time two parallel themes were pursued – handling and ride comfort – by all of the auto manufacturers. Different versions of steel springs, dampers and shocks to control impact and bounce, tire design, and geometry were all experimented with and applied over time and at several points you can see transitions away from one technology to another. (Buggy spring to leafs, leafs to coils or lever action shocks to tubes, or bias ply to radial ply tires are all examples.)

The latest of these transitions, though not new technology in and of itself, is the triangulated or parallel four-bar rear suspension. It solves a lot of common problems including front to rear (acceleration/deceleration) stability, side to side sway control, and pinion rotation using the geometry of lightweight steel bars. It's such a simple concept that it is hard to believe it works so well, but most great technology does tend to be elegant simplicity.



Another common problem in tri-5's is the original upper shock mount. Part of the body, it cracks or rusts out and leaves you without. You won't have to worry about this again.



To pull the shock, remove the nut and washer and it will pull off the shock stud on the leaf spring lower retainer plate.

The result of this design has been to make cars that will handle in ways the old iron never even got within spitting distance of. The cheapest squashed jelly-bean econo-commuter car will flat out-handle any stock Tri-5 ever built. If you are like me this is an offense to my tender sensibilities. That there are a lot of cars you couldn't pay me to ride in much less own capable of out-handling hands-down the classic Tri-5 series cars just can't be allowed to stand. No wonder so many of us have gone to aftermarket four-bar and even IRS setups to get the rear of

these cars under serious control – we want the new technology without the new container.

Simultaneous to this line of development has been the transition from steel springs to air springs. As early as the 50's air was found to have a considerable positive affect on the ride comfort of an automobile. Unfortunately, this technology was launched prematurely – well before some of the bugs were properly ironed out. Air leaks and bag failures, frozen controls and failed controls all made a good idea look pretty bad.

The spring plate is also removed to release the leaf spring. None of this is reused. At this point you will have both the car and the axle supported safely.



The original axle tube to frame bump stop is wedged under the inner U-bolt. It too is removed and not needed as the ShockWaves have a built-in bump stop.

Tie that in with what people recall about air shocks and the failures and leaks they presented, and for quite some time the public was scared off.

Meanwhile, the big trucks quietly embraced air suspension. Not only was making the ride comfortable an imperative for long-distance hauling, but before long the same concept was applied to the contents of the trucks. Air ride protected the cargo by isolating it from the road a lot better than steel springs. Passenger buses found their cargo and drivers to

be equally well treated. So while the lighter vehicles went without, the big stuff went about perfecting and improving air ride.

Finally, taking the lead of heavy haulers, both Detroit and the aftermarket (specifically Air Ride Technologies) woke to the possibilities of air suspension and the world of suspension flipped over again. With a combination of four-bar control, air spring smoothness and dampening, and the modern designs in shock absorbers, a lot of new and vintage cars and trucks entered a new age of comfort and ride control.



The front spring mount comes apart by removing the bolt. In some cases you may find this bolt is rusted tight into place. Drive it out the best you can. If you want to clean up the frame rails, you can actually cut the whole mount off and dress the frame.

Let the spring rotate down and hang, then remove the shackle nuts. Then you can push the spring off the shackle and you're done. Her again you can clean the rail by cutting the welded-on frame mount if you want.



We take most of this for granted, but I assure you that if you ever experience the differences evident when swapping out a vintage steel-spring suspension for this new technology, you won't care to look back.

The problem for many of us has been that the design and execution of a four-bar/air system in our vintage cars was a somewhat major chunk to bite off. Generic kits required significant fabrication skills. Each new vehicle-specific version took time to develop and prototype and most of us lacked the time and inclination to do the work. Each car or truck has its own quirks

that make altering or re-designing the suspension a serious exercise – no backyard Saturday afternoon romp. Fortunately, Air Ride Technologies has made much of this a thing of the past.

Their new series of AirBar suspension kits, now including one for the venerable Tri-5 Chevies, incorporates the four-bar and the patented ShockWave combination air spring and 12-way adjustable race-style billet shock, along with a special group of vehicle-specific mounting components.



Both E-brake cable brackets will interfere with the new hardware, so they have to be removed. Don't try to beat them out and don't just start hacking away.

Loosen the E-Brake adjuster or even pull the connector off of the stud like this. You can clean threads, apply anti-seize, and be ready to readjust the brake later.

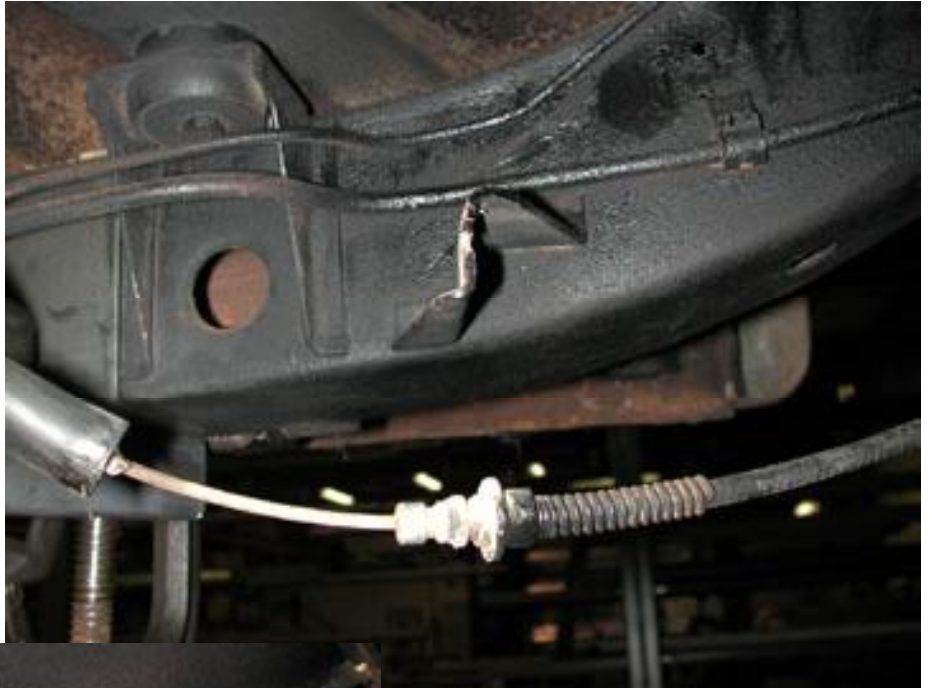


The resulting rear suspension provides all the control, handling, and ride comfort you want in a kit of parts that significantly reduces or eliminates modification and fabrication required for installation. Having scratch-built a number of similar rear suspensions I can tell you there is a world of difference between the time and effort expended building one of mine and an AirBar kit install.

Intrigued? To resolve your interest into a decision I suspect you'll need two things. First, since you're already here, you'll want to see just what's involved in installing the AirBar in a Tri-5

Chevy. Read and peruse the photos and captions and most of your questions should be satisfied. Second, you'll want to get with someone who has stepped up to this new technology and see what they think of it – maybe even talk yourself into a cruise. Sometimes the only persuasion you need is to get the facts together and look at them.

Now that it is loose, the cable will slide out of the bracket without damage. Saving the cable is what you are after.



The bracket is just spot welded to the frame rail and it will come off easily with an impact or hammer and flat chisel.

The brake line also has a bracket that will be in the way. You will have to remove the line, pull the clip off of the flex line, and pull the line out. For now just leave the line loose and knock the bracket off.





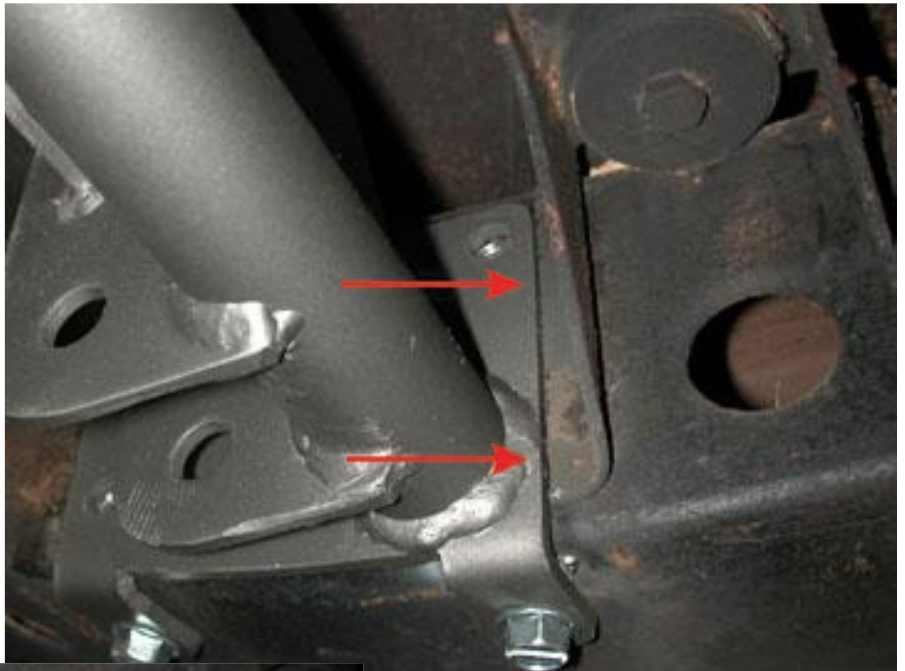
All gone and ready for the next step. You will be moving both brake and fuel lines to clear new mounts, but you will not have to remake or significantly modify them.

This is the entire AirBar kit as shipped. Although not shown here, the kit contains everything right up to the last fastener so you don't have to go running for missing bits.



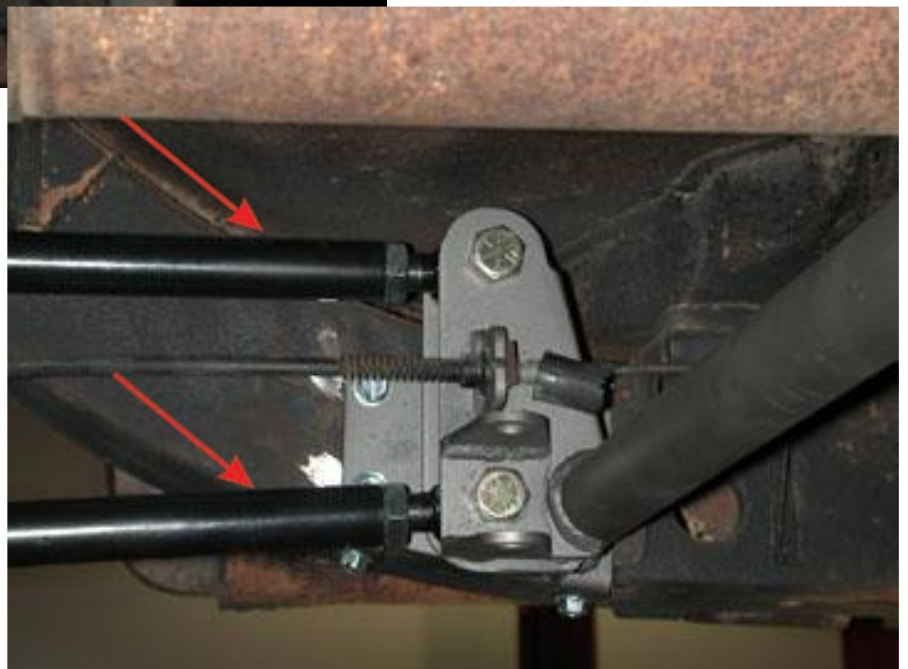
The front bridge is used to attach both bars. It fits under the driveshaft. But how do you tell when it is in the right place?

The front edge of the bridge mount fits tight to the rear edge of the body mount like this. That and push the bridge up tight to the bottom of the frame rail and it is perfectly located.



There are five self-tapping 3/8 bolts used on each side to hold the bridge in place. Drill the holes after marking them with the bridge as a template with a 5/16 bit. Notice how the bridge has a new ear to mount the E-brake cable – you gotta love the little details designed into these kits!

Now you can mount both upper and lower bars on the bridge. Make sure they are the same length! The small C-shaped bracket you see bolted on here will come to you welded on as part of the bridge in the production kit.



The upper shock mounts are located by measuring back from the large slotted frame fixture hole ahead of the axle in a straight line 20-1/4 inches.



The front edge of the upper shock mount is located at that 20-1/4 inch position and just pushed up tight to locate. Again, mark and drill five 5/16 holes per mount and use the 3/8 self-tapping screws.

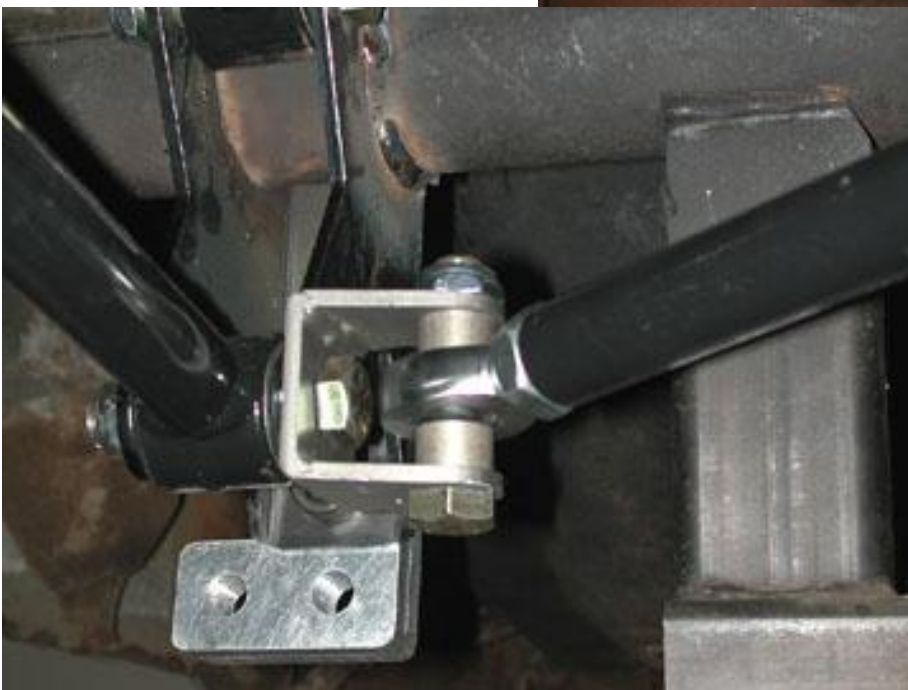


Fixing the ride height, the pinion angle, axle location front to rear, and the centering of the axle side to side is critical. At ART Rodney likes to use a spacer tacked to both the frame rail and axle tube to keep the axle from moving once all the dimensions are set. Use the same length both sides to position the axle at ride height.



With the axle in position, the rear mount is attached to the bars and the entire unit is lifted up against the axle tube. Make sure the mounts are the same distance in in on either side so the axle stays centered. Tack first, check dimensions, and weld the mounts after removing the bars so you don't fry the bushings.

This billet mount is secured to the rear bar mount with the two large Allen machine screws.



The diagonal bar used to prevent the four-bar setup from moving side to side is attached to the ear on the rear mount. Make sure you include the spacers. On the production kit, the ears holding the bar will again be part of the mount itself.

This is a parallel four-bar which requires a separate member to fix side motion of the suspension. Instead of a traditional panhard bar that has it's own problems, or a Watts link that is more complicated, ART chose this diagonal bar for their solution. It's adjustable, too.



The lower ShockWave mount uses this stud type hardware. It threads into the billet mount. Make sure you use a generous coat of anti-seize on the threads if you EVER intend to remove it or the threads will gall and seize.

You can position the adjuster knob for the shock absorber inside the ShockWave pointing in or out. Out is easier to reach but in offers more protection from road rash.





Up top the ShockWave mounts to the shock bracket with a single bolt. The air fitting swivels so you can position it where you want it when installing the air lines.

A new bracket is supplied for the brake line. This is installed at the last so you can be sure you won't have any interference with any of the other moving parts.



Looking good! Simple, clean, and effective, you'll quickly learn to love the performance and ride qualities you just installed in your Tri-5 project.