

NOVA BOOTY CALL

Low-down and tied-down, the new Air Ride Technologies' AirBar kit finally puts your street cruiser Nova rear on solid ground



by Doc Frohmader

Although I have always loved the early Novas, there has never seemed to be much between wheel-bouncing soggy stock rear suspension and drag-race styled hard-tail. Either one works in the right situation, but for my money, no matter how good a car looks, if it doesn't handle and it doesn't ride with some manners it won't spend much time in my garage. The sad part is that there's been so much done with the front for street use while the rear just never caught up.

Having done my share of suspension modification over enough years to turn my hair white, I think I will be safe in saying that the primary reason these cars were slower than most to get substantial chassis upgrades is they are a unibody car – and a smaller one at that. The

simple solutions are traditionally swapping out the antiquated leaf springs for either a triangulated or parallel four-bar setup. While there are exceptions, this generally relies on a frame to attach the components to and the Nova doesn't have one. It also assumes there is sufficient space under the car to allow for the new bars, springs, shocks and room for travel.

Air Ride Technologies (we're getting used to this company coming up with innovations such as ShockWaves and StrongArms) looked into this problem and in typical style turned a new page in suspension for this kind of car. It's called an AirBar setup.

A monoleaf spring, OEM type shock, and you're all set for sloppy suspension, complete with swaying rear and wheel hop. It was not terrible for it's day, but today it's seriously outdated.



The upper shock mount is made through a bolt-on plate. This is removed and the old holes are used to locate the new parts.

Each is specifically designed for a unique series of car. And each provides a kind of special support integrated with the car to create a more rigid, stable rear suspension with a triangulated four-bar and ShockWaves to raise these cars to a whole new level in handling and comfortable ride.

The basis of this novel new approach is actually rooted in the drag race type suspensions where a sub-frame is installed and linked to the body. In the past, this meant cutting the trunk floor out at least and fabricating a frame to

substitute or supplement for the original. It meant a lot of time and money and it meant cutting the car up considerably. The way ART approached it was to engineer the AirBar to find solid mounts at several points in the body and unibody frame structure, following the original contours and shapes. In this way, the new structure becomes significantly stronger than the original while limiting the modification to the car. In stead of remaking the car, you end up with something that enhances the car.



The shock is removed from the original lower spring plate. Although it won't be reused, it's interesting to note that a similar concept will be used to create the new lower mount.

Because the axle rests on top of the spring, you can remove the lower plate, but to finish removing the spring the axle will need to be supported. Leave the hardware in the axle mount as it will be reused.



Key also to this approach was the invention of the ShockWave by ART a few years back. By combining an air spring and race-style adjustable shock in a single unit – quite like a coil-over unit – one of the space limitations was eased. In addition, air springs require somewhat less suspension travel than steel springs to produce a quality ride due to the way air springs absorb and distribute energy from the suspension. While I would accept a reasoned argument to the contrary, I am personally convinced that without the invention of the

ShockWave, this elegant solution to the Nova and other unibody applications would not be possible.

I always worry that when I say that kind of thing that some will take it as some kind of indictment against anything that is not current technology. Not true. I spend a great deal of my time resurrecting, modifying, and researching vintage cars because I do have a lot of respect for them.

The rear gets cut loose from the shackles first, and then the shackles are removed from the frame member. No use letting it hang there to rattle.



The front of the spring comes loose from the mount and the original hardware is retained for use on the new system. Make sure it is in good shape.

However, that same experience has taught me that time passes and new solutions arise as technology advances. Any serious comparison between air springs and steel springs, conventional tube shocks and race-style tunable billet shocks will show the advantages of the new tech. In the end, you'll be the judge and I don't think you'll be disappointed.

SOURCE:
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SETTING PINION ANGLE

How do you set the pinion angle? On a single-piece shaft you want to set it up where a line drawn through the center of the engine crankshaft or output shaft of the transmission and a line drawn through the center of the pinion are parallel to each other but not the same line.

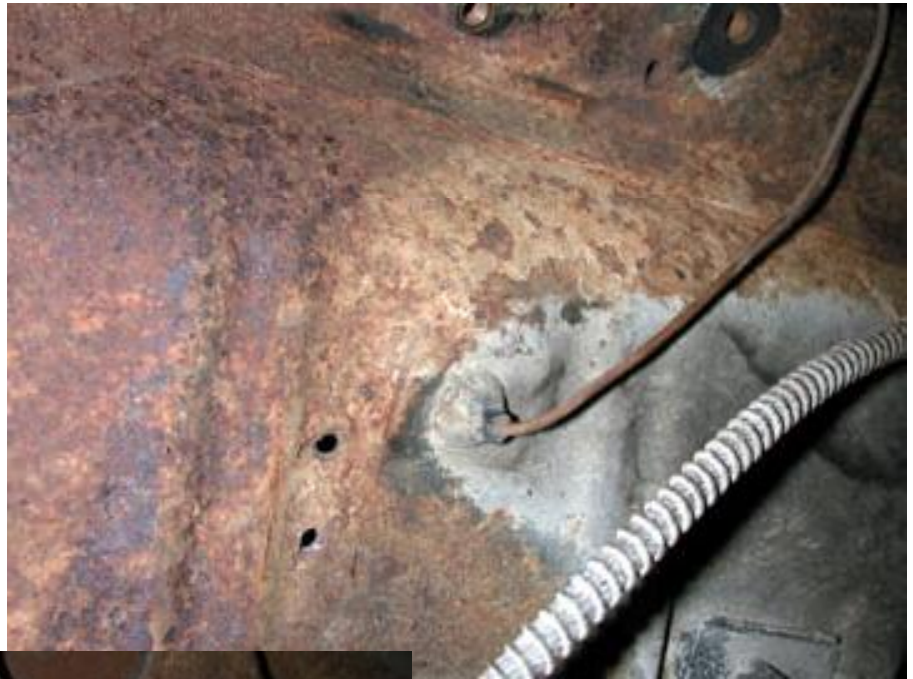
A simple way to do this is to place a digital angle finder or dial level on the front face of the lower engine pulley or harmonic balancer. This will give you a reading that is 90 degrees to the crank or output shaft unless you have real problems with your balancer. At the other end, you can place the same level or angle finder against the front face of the pinion yoke that is also at 90 degrees to the centerline. If you rotate the yoke up or down so both angles match, you have perfect alignment.

Road testing will tell you if you have it right. If you accelerate and you get or increase a vibration, then the pinion yoke is too HIGH. Rotate it downward in small increments of a degree or two until the problem goes away. If you get or increase a vibration when decelerating, then the pinion yoke is too LOW. Rotate it upward to correct it.

The Novas use an integral pinion snubber. The fact that such an item is a requirement of leaf spring suspensions tells you a great deal about how prone they are to axle wrap and wheel hop.



Near the upper shock mount, the fuel tank sender wire passes through a grommet. This is the same area where the new upper bar mount will be, so the wire must be carefully removed.



Around the grommet the underbody has a hump. This area has to be flat, so you can pie-cut and weld it back together, hammering it flat, or you can just remove the material.

The new AirBar upper front bar mount is located by bolting the mount to the original upper shock mount. Now the rest of the holes can be marked and drilled.





The body is sandwiched between an upper and lower set of plates. All six holes are aligned or the mount won't fit, so do accurate, careful work.



The upper plate is accessed through the trunk. The hardware is welded to the plate so you can keep it from turning without a second set of hands.



See how it fits? I like this concept of using several smaller fasteners to spread the load over the unibody structure instead of concentrating all the stress on a single point that's more likely to fail.



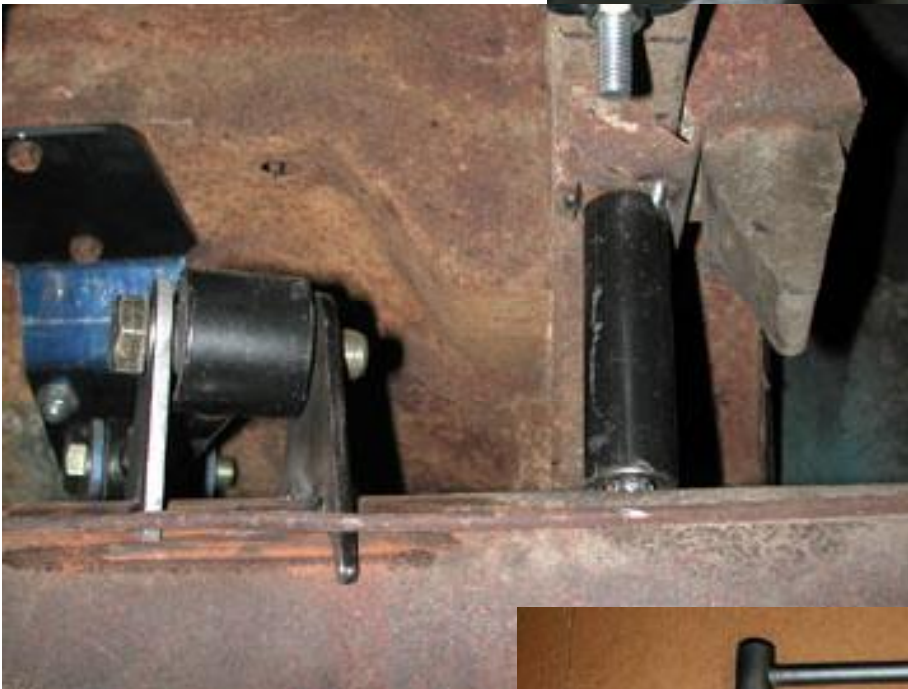
That snubber and the housing for it have to go. The car will drop down a lot farther with this new AirBar setup so you want to make clearance. The new ShockWaves have an internal bump stop that replaces this.

The lower bar attaches using the original front spring mount and the original hardware is reused. The tapered cup locates the bar in the center of the hole.



The new lower bar mount bolts on to replace the original mount. Use the original hardware without modification to the mount. When you install the lower bar, this whole set of suspension attachment is complete and the axle will now be positioned and held there for the front to rear dimension. This will make the rest of the work less clumsy.

Assemble the upper bar to the front mount and add the two small mount ears to the rear of the bar, rest it on top of the axle for the moment as you have alignment to do first.



Before moving on, you have to position the axle so it is centered side to side, set ride height, and set the pinion angle to match that of the engine/trans. Rodney mason, the ART shop genius, likes to use spacers (4-inch long in this case) to fix the ride height. By positioning the axle in all three dimensions and then tacking the spacers he holds it all in place while finishing the work. This is not required, just a good trick for you... Note that the ears are laid on the axle, ready to be tacked in place.



The whole AirBar/ShockWave kit for the rear of the Novas. You'll appreciate how complete this kit is when you can install it without chasing parts.



The lower ShockWave mount bolts onto the lower axle mount. It can be positioned up or down – Rodney used the lower set of mount holes.

The upper ShockWave mount crossmember fits close to the trunk well and the bar fits tight to the rails. The rails are tapered so there is only one place for it to fit. Make sure it is squared side to side.



How to get the mount secured? After the mount holes for the crossmember are marked and drilled with a 7/16 bit, you start to feed the U-bolts through.

Yes, it is slid up into the rail. This is a fishing trip and takes a little patience.



The U-bolt has to be dropped down through the second hole and flat to the inside. You should not need to beat the thing into place or it probably won't fit.

The top of the ShockWave slides into the mount and is held by a single large bolt. Make sure you use anti-seize on all the hardware, but especially where you use nyloc nuts.





The completed ShockWave setup. It's compact and stout so in combination with the new triangulated four-bar you have a much more stable, better handling, and comfortable Nova.

Remember that fuel sender wire? It's gotta have a home, so Rodney punched a 3/4 inch hole here, next to the new mount and near the old location.



Whether it's the sender wire or the new air lines, when you pass through a bulkhead or through a metal panel, always insulate and protect it with a grommet. The original sender wire grommet was reused here.