AirRide & Held Motorsports

Two companies, a Solid solution

A "Bolt-on" Adjustable Air Suspension for Fiero based KitCars

Article by Jason Jones 2003

Four inches clearance, that is the average distance from the bottom of the front bumper lip and the road beneath. Five inches, this the size of your average everyday speed bump. What does this tell you? Well aside from a cracked bumper, you have between $500 to $5000 in damage. If you have heard this scenario before, it is likely that you know we are talking about the Lamborghini Diablo and Countach's both original and replica's. There have been some crafty folks who have attempted to solve this problem in the past including Lamborghini themselves who have since moved to a air lift system in the late 90's. We have seen Kirban's "Devil" with the modified skateboard trucks and others who are using lawn mower parts, and we have seen some people's attempts to add air bags to existing coilovers. Although these are "work-arounds", we felt that there must be a better solution to this problem. At a "Tuner & Power Jam" event some staff members attended last year, we were introduced to a product call *Shockwaves* from the Indiana based company AirRide Technologies. The car was a truck that appeared to have no springs but rather something that resembled a Coil over or shock. With the press of a button and 2 seconds later, the truck went from "laying" on the ground to about 5 or 6 inches

Held's Modified A-arms

above. Talking to ourselves, we thought this would be a nice setup for the Lambo cars and lifting up the front high enough to clear obstacles. The fact that it took just a second or two added to the excitement. The ones we saw at this show were immediately dismissed, because we could not see how they would fit in the popular wide track A-Arms. They were almost 9 inches in diameter but the idea was, "what if we could get smaller ones, would they work?" The next week we contacted a few "Tuner" customizing shops who install these air systems. We contacted Trendsetter Customs in Dayton, Ohio and they gave us more information on AirRide and showed us their smaller 6 inch Shockwaves. We came to the conclusion that this system may work. Although we had what seemed to be the solution, we were hoping to provide builders and owners an even better option. We contacted AirRide Technologies and explained the problem and how their 6 inch Shockwave may work but we would need to check clearance with a model or a product version. They were willing to work with us to help find a solution and to our surprise AirRide was in the final stages of releasing a new four inch version. After a check with our application and weight requirements it was agreed AirRide's 4" shockwave may do the trick. Shortly after we received the new versions and indeed they were almost perfect but required cutting some of the top A-Arm mounting plate off to clear the bag at full extension. AirRide also did not like the fact the there would be modifications in order to get their product to work, since most of their "kits" are made for a novice, bolt in application. We decided to make the modifications and then decided to called on our friends at Held Motorsport and told them about our project. Held Motorsport is one of the leading manufactures of Fiero and after market suspension in the US so we valued their opinion and it was their A-Arms we had to hack up. Since the A-Arms that most KitCar builders are using, are Held Motorsport brand, we were hoping that we could develop an A-Arm together that would accommodate the larger area surrounding the shock. A few weeks later Lee (president of Held Motorsport) sent us out a set of modified A-Arms that were beefed up around the top plate to accommodate the missing material removed to clear the Shockwaves.

Testing and installation:

Our friends at Trendsetter Customs installed all of the basic components of the AirRide system. Their work was impeccable and in a few days the installation was completed. With the push of a button the car lifted instantly almost 5 inches higher than at full deflation. We did have a slight problem. At full deflation (no air = no cushion) the car sat about 3 inches too high. A quick call to AirRide corrected the problem and we sent the Shockwaves back for a custom length. 3 inches were removed from the

Note the small amount of material behind the ba joint mounting hole. This modified Arm's plat is much thicker than the original providing extra support for the missing material.

AirRide Technologies SKW7001 Shockwaves. Compressed height of 10.50" and extended heigh of 14.25"

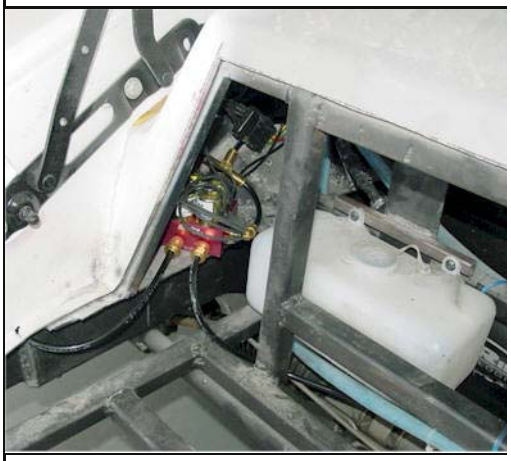
The Shockwaves installed in the old "Coilover's" location with the new A-arms

piston and a week later we re-installed them. At the correct ride height and 80lbs of pressure the car looked at it's stock height. At the touch of the button the car raised about 3 to 4 inches plenty of room to clear the most difficult road obstacle. We finally had it, a completely bolt on AirRide system.

Air Ride provided us with their SKW7001 (ShockWaves) with a compressed height of 10.50" and an extended height of 14.25". The compressor kit we installed was the ARC2000. which included two remote controlled Air vales, 2 Gallon air tank, air compressor and control system. This kit will provide a 2-way solenoid control to control left and right lift independently. AirRide says "This type of system also effectively eliminates air transfer from side to side." They continued to explain that air transfer is a phenomenon that happens when one side of the vehicle is heavier than the other side and the air is forced from one air spring to the one on the other side. Air transfer can also happen during cornering when the G force of a vehicle that is turning at speed. The SKW7001 Shockwaves also have a 12 way adjustable dampening knob so you can set it as firm or as soft as you desire. The huge benefit to running air springs is that the spring rate can be manipulated by simply increasing or decreasing the air pressure. This means that by getting yourself familiar with the air system and the adjustable dampening of the Shockwaves, you can literally make the car ride and handle exactly how you want it to.

Our next step was to find a way to make the system "user friendly." So now we have this great system that when you see an obstacle we hold down the left and right buttons to lift the front but now we have to readjust the ride height back to what it was before and make it appear balanced and not lopsided by an onlooker. We began to research methods to controlling this automatically and found two similar but distinctly different systems. Air Ride offers a auto balance system that maintains the ride height no matter how much weight is added to the vehicle. The concept is great if you are driving a truck or a Cadillac however completely opposite of what we wanted. We then cam across Dakota Digital's ARC-1000 system. Using a computer controlled display, the driver can preset pressures for up to 4 separate air bags and the tank pressure. With a touch of a button the driver can raise the front of the car to a preset height and then back down again to the original location with another press. This system sounded perfect for what we were looking for and called up Dakota Digital out of Sioux Falls, SD and talked to Scott Johnson. We were confident that this system would allow for the extended automatic control we were looking for. A week later the system arrived. All the parts were top notch and included very detailed instructions for installation. A few weeks later the ARC-1000 was installed

The Air compressor and tank peaking out from behind the dash.



The electric air valves. These control the ride height from switch control in the cockpit.

"Slammed" This is the lowest position of the shocks. We would not recommend driving it this low but you can see just how low it can go. It is high enough to clear the fiberglass and not cause any damage in case of an unexpected air pressur loss.

and working. True to their claims, the Air bag Control system delivered perfectly. The control panel can be ordered in different color displays and can be inconspicuously hidden. A true electrical guru could also rig the system up to the Diablo's OEM air lift system and completely hide the main unit! All in all this last item made this long project and research worth it.

Key Points:

1. Completely Bolt together "kit"
2. Degree of lift: Approximately 3 to 4 inches
3. Ride adjustment/lift time approx 2 seconds
4. Kits start at $1800 The exact kit that we installed will run you about $2,150
5. Performance equal to a Cadillac
6. Customers who have already purchased Held's wide arm kits can purchase the new modified A-Arms
7. Optional control components can be added to make the system more user friendly (ARC-1000)

So almost 6 months later we successfully pair AirRide Technologies and Held Motorsport to bring Lambo builders the first REAL solution to the extremely low front bumper.

Cost & Purchase information:

This "Kit" is now available through Held Motorsport www.heldmotorsport.com. For builders who already have Held's Wide track you can order a new modified pair for $275.00 USD

Held says the whole basic "kit" that includes the Wide track suspension and Airbag setup will cost you $1800 with a more advanced kit for $2150. If you want to get your Air Ride components from another place Held will sell you the Wide Track front suspension without the Shocks and springs for $650

If you want to add Dakota Digital's ARC-1000 control system it retails for $675 however if you are only using 2 of the 4 bag control you may be able to get a discount for the other two control solenoids.

We would like to thank Lee Waldmiller (owner of Held Motorsports) and Bret Voelkel (Owner of AirRide), Tony Bicknell (AirRide); Trendsetters of Dayton who did the initial install and Scott Johnson (Dakota Digital), for all their cooperation and help.

Resources:

"Jacked" All the way up.. if you can't get over a speed bump now - Buy a Jeep!

From a 4" clearance to an adjustable 10" - Finally a solution!

The Complete ARC-1000 System from Dakota Digital (2 bag sensors and one tank sensor)

The Slick digital control unit of the ARC-1000

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