Tech Notes

914 REAR BRAKE AND SUSPENSION UPGRADE

STORY AND PHOTOS BY ERIC SHEA

Shifting gears from previous Tech articles, this time we'll take a look at a 914 rear brake conversion and suspension upgrade. My 914-6/GT project started with the idea of an engine transplant and has evolved as a whole, (as any Porsche engine/suspension project should). Meaning; you can't just throw a big engine in your car and call it a day. The front suspension has already been replaced with a Koni strut assembly with raised spindles and S-Calipers. This meant the rears had to be balanced with the front, assuming the engineers at Porsche would have done the same thing (and they did with the 914-6/GT).

The GT cars from the factory had the vented rotors of the era both front and rear. With the fronts it was fairly simple. A 911 front suspension simply bolts right on to a 914. The rears were a bit trickier. The 914-6 uses the 5-lug rotor but it's not vented. You would need to install some spacers in the rare 914-6 rear caliper to accomplish this feat. There are basically two ways to get a vented rotor on the rear of a 914; a) The spacer in the 914-6 rear calipers or, b) install an M-caliper from the front or rear of a 911 on the rear control arms 3" caliper ears. Here's the problems associated with both set-ups.

With the original 914-6 rear caliper the problem is both the scarcity of the calipers themselves and the quirky nature of the 914 hand brake assembly. The calipers can be found for anywhere from $600 a pair to $600 a piece. Once you find the calipers you need to dismantle a set of 911 M-Calipers and steal the spacers. Then you dismantle the 914-6 calipers and install the 911 M-caliper spacers and rebuild. Once you've done that you're still left with, what I call a quirky hand brake. All this didn't add up. First of all, being the owner of an original 914-6, I felt that a pair of rare 914-6 rear calipers should go to better use than my 914-6/GT "project" car. Next, the price of these calipers, given their weird hand brake just didn't fit. I chose the "B" route but you're left with one nagging problem; no hand brake at all.

I've mentioned the word "quirky" far too many times now; it's time I explain myself. With the 914, Porsche used a caliper that ATE developed with an "integrated" hand brake. These calipers are fairly common on a few Ferrari models as well. There are no separate shoes to grasp the rear rotor. It basically uses and armature that pushes the piston into the rotor. The quirkiness comes from the necessity to precisely set the venting clearance between the pads and the rotors. This adds an "interesting" element into the brake bleeding process. By doing away with this cumbersome caliper I was left without a hand brake… or was I?

My first thought was to use a "Neal" hydraulic line lock. This is a device that goes in the middle of the brake line (preferably in the center tunnel) and holds the hydraulic pressure once you step on the brakes. After a bit of research I found these to be unreliable. The problem begins when you set the hydraulic lock on a hot brake system the brakes tend to let go once the system cools (read car in ditch). Having just completed

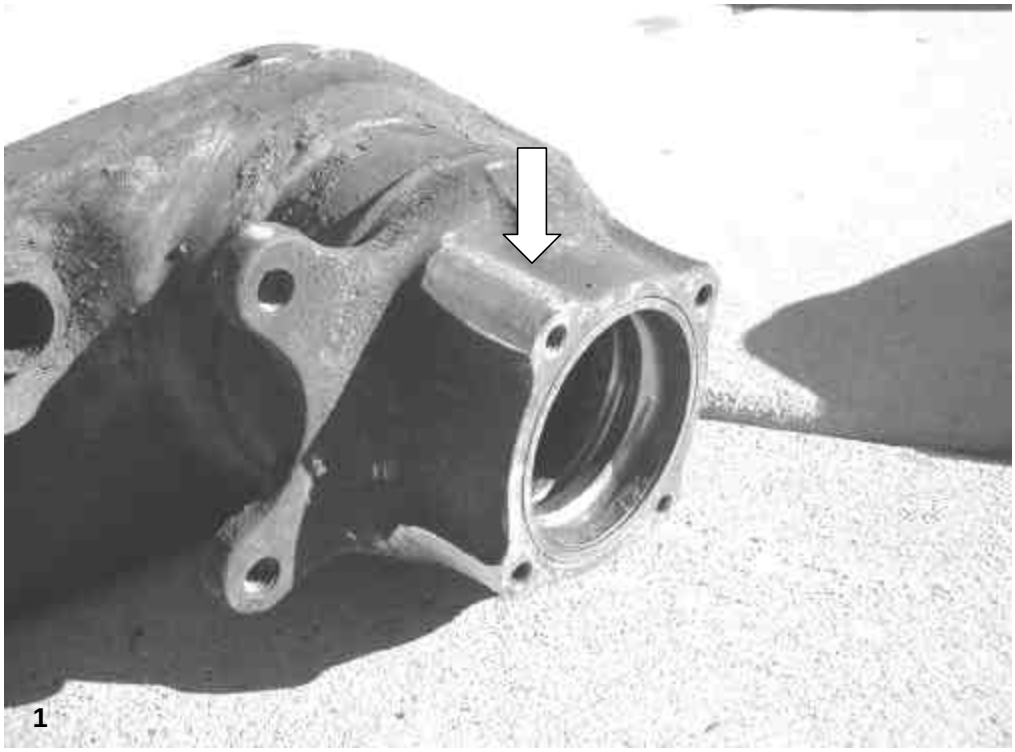
installing aluminum control arms on my 911, I was left with an extra pair of 911 hand brake assemblies (the new control arms came loaded). So I wondered; would these work? The Internet is a wonderful thing. I was able to find two individuals who had already taken on this task. Believe it or not, one of these people was in Newfoundland and the other was in Finland. It definitely is a small, small world. Both varied slightly and my version is a little different than theirs simply due to the fact that I wanted to use a 911 hand brake similar to the factory 914-6/GT rally cars. As stated earlier, the factory had performed this modification on many of the 914-6/GT cars. Bottom line; the early 911 emergency brake assembly fits (with a very small amount of grinding). Here's what was done on this project:

Starting with the 911 hand brake assemblies; I completely dismantled the assemblies and had the backing plates and shoes glass bead blasted. All of the springs and related hardware went off to the Zinc plater to have a coat of silver zinc plating applied. The stripped plates and shoes were then repainted with POR-15. While they were apart I used the backing plates as a guide for grinding the 914 control arms.

The control arms need about 2mm ground off the outside of the bearing housing for the 911 back plates to slip on (just like a hat). You'll also need to grind off the mounting tab for the rear brake shield. The bolt holes lined right up! Once a test fit confirmed that the grinding was done the old control arms went off to Mr. Sandblaster (Arvil Parcell) to have the years of grunge and rust removed.

This car is being developed for competition use so I took this opportunity to "box" the rear control arms. Boxing a 914 rear control arm helps strengthen the arm and reduce the risk of the arm twisting under had cornering. If your 914 has a severe negative rear camber problem chances are your control arms have twisted. Boxed control arm kits can be purchased from various vendors in the $85-$105 price range.

With the control arms sandblasted clean it was a fairly easy task to weld the boxed kit in place. First I positioned the metal on the control arm where it was to be welded. I used simple body clamps to hold it in place while I tacked the edges down with the MIG welder. The kit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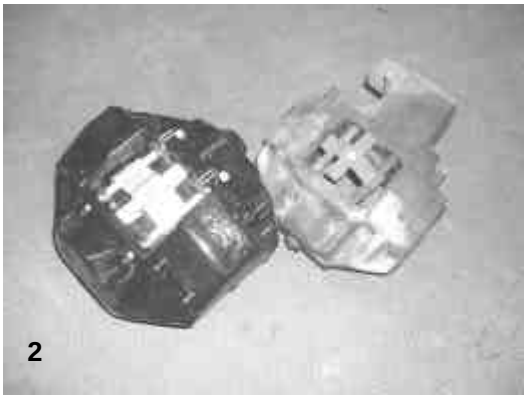
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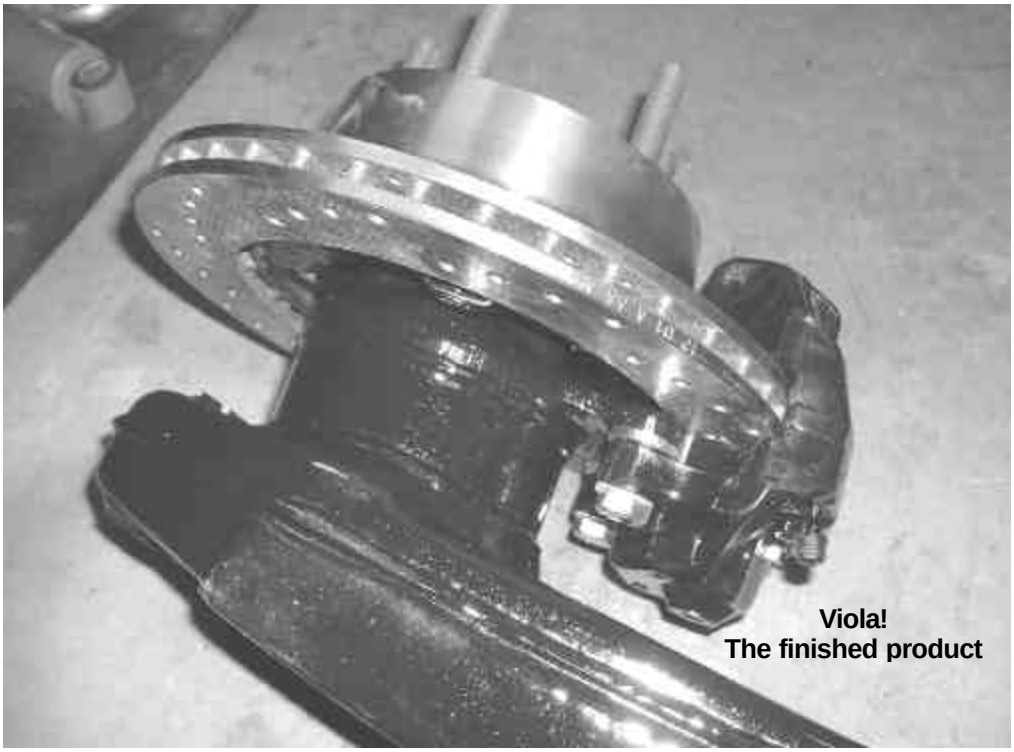
1. **Arrow indicates areas where material was ground off.**
2. **911 "M-Caliper" next to stock 914 rear caliper.**
3. **Control arm ground down and sand blasted clean.**
4. **911 parking brake assembly's trial fit to the control arms.**
5. **Boxed stiffening kit welded to the control arm.**



Viola!
The finished product

comes drilled for "rosette" style welding. When performing rosette welds it's best to start in the middle and get the hole very hot, then rotate your welding tip in a circular motion filling the hole and joining the top metal to the control arm underneath. With the welding complete I went the extra step of grinding them smooth for finishing.

Once the boxed control arm kits were welded on and finished it was time to paint the entire control arm. Again, POR-15 to the rescue. This protective coating is a rust inhibitive paint process that virtually matches the factory finish for suspension components. I've used it on everything from torsion bars to sway bars. It's great for painting directly on bare metal.

As a final step you'll want to press out your old wheel bearings and press in new ones. You may want to look at your bushings as well. Mine were still in good shape so I skipped this step but… there's no better time to do this than while the control arm is out.

All that's left is to reassemble. With the new bearing pressed in I used my old 911 rear wheel hubs matted to a special 914-6 stub axle. This allows the classic 5-bolt pattern to be applied to the 914. Vented rotors dropped right on. A 5mm spacer was used (along with new longer bolts) to attach the 911 "M-Caliper" to the arm. Strange project but fun!