

Preparing the Porsche 914-4

The Porsche 914-4 is a prime candidate for winning E Production. Elliott Forbes-Robinson did it in Atlanta at the ARRC with an easy first.

Part I Porsche has been more than a car for you, it has been a way of life. You have taken it everywhere, including all the SCCA REGIONALS and probably a driver school or two. After the last Atlanta Road Race of Champions you have had proof positive, like the 914-4 coming in first. Now, it's time to go try it out in earnest. However, before you dive into this project there is nothing like spending a little time talking to a winner, Richie Ginther Racing, out in Culver City, Calif. Richie is one of the prime exponents of racing both Super Vees and Porsche 914-4's. We caught him during one of his rare free weeks and received, for all practical purposes, the run of the shop. His is a small place, free of frills and devoted to one main concern—WINNING. Everything is there

Today Ginther is team manager and heads up race car preparations, but he still looks for the same type of perceptiveness from his own drivers.

Elliott Forbes-Robinson, the man at the wheel of the orange number 29 Porsche started out by doing all his own work on previous race cars. "Understanding engines and suspension is one of the steps to becoming a successful driver," says Elliott. He adds that if something doesn't sound right, the driver, the man on the spot, can't just say it doesn't feel right. He has to either pinpoint or narrow down the problem. At one point in his career Elliott and his former boss held a short conference. "Look, it seems your racing is more important than your job here," said the man, and Elliott agreed with him entirely. From there on racing became the full-time job and everything else took the back seat. Richie Ginther, Elliott, and the team mechanic, Harold Broughton, took turns filling us in on all the details we need to know to get a 914-4 successfully launched on its path to a win in SCCA's E Production.

Reducing the frontal area is like finding some extra horsepower, and so the windshield is cut off even with the cowl. Open areas left at the posts are filled and the windshield is replaced by sloping a low profile plastic wind screen just tall

enough to deflect the wind from the driver. To save weight, all glass at the doors and in the rear is also removed.

Some of the body detailing involves replacing any side glass, such as parking lights or reflectors, with aluminum panels. Rules call for leaving the front sheet metal in place. Thus, if you want to build a front spoiler, it must be added to the existing sheet metal, which turns into an expensive project. As far as Ginther is concerned, there is no need to do so.

The tires on which you'll be racing are substantially wider than the original ones. To make room for them, you'll need some form of fender flares. They can either be fabricated from scratch or bought and welded in place by a sheet metal man.

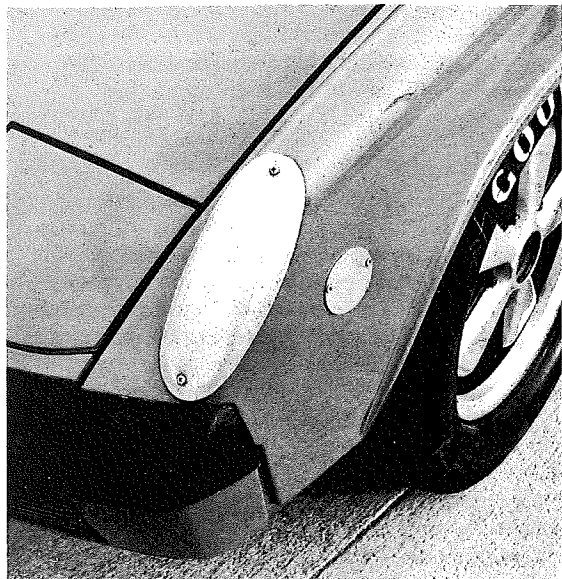
Comparatively little lightening can be done on a 914-4 because of the high class weight limit. For instance, on Ginther's No. 29, the heating duct, jack and other stock items are still in place. You are, however, allowed to get rid of as much as five percent of the total weight. A 914-4 must tip the

Richie Ginther is the team manager with Harold Broughton and Elliott Forbes-Robinson mechanic and driver.



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Fragile glass items such as parking lights and side markers must be replaced by aluminum sections.

scales at 1,962 pounds with no fuel in the tank, and on the one that Ginther runs, each front wheel carries 380 pounds, while rear wheel loads are set at 600 pounds each.

Part of any weight you remove will be made back up by adding a roll bar cage. "When you try to save weight on a roll bar cage," says Richie Ginther, "the only one you're kidding is yourself." On his cars, the boxed members at the sides of the floor pan are cut open, with window sections at the side of the box folded back so that fish plating (steel reinforcing plates) can be inserted to support the cage. Once the roll bar cage is bolted in place, the windows in, the boxed members are welded back up.

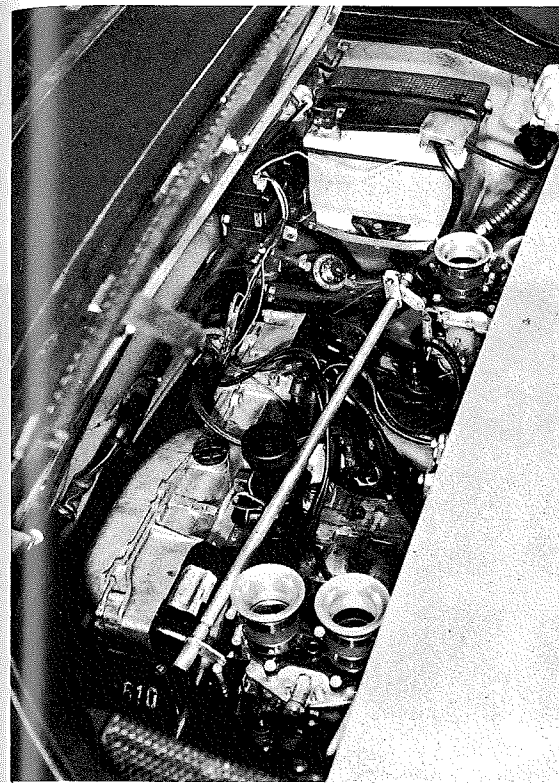
Let's important to be well supported and comfortable while driving. You can go faster and longer when the seat fits well and comfort improves the lap times. Here, relatively little modification is needed, but Elliott does advise pulling the padding out from the center of the driver's seat, replacing it with a pair of cushions. This makes the driver fit deeper and increases the side support

Porsche brakes are protected by splash shields to prevent grit from being sprayed into the brake pads and wearing them out. For track use, the shields are removed so as to lower the temperatures and chances are that you'll never run a race long enough to wear out the pads in one session. The stock pad material is good and the original brake proportioning valve is retained.

The suspension is stiffened considerably, over and above what the Porsche 914 calls for in street trim. However, even when race prepared, it can still be driven on the road. The car becomes a little more sensitive to tar strips and the passenger may jump a little when going over bumps, but the driver is fine. California is famous for its combination road dips and cross drains. When Richie takes a stock Porsche through one of them at any speed, the suspension both tops and bottoms, while the stiffer suspension does away with flying excursions. We didn't really appreciate how stiff that suspension becomes until the car was jacked up, pulling the wheels off the ground. You could then see the rear wheels coming down slowly, well after the car went up in the air.

One of the first steps is to replace the stock 17.9 front torsion bars with a set of 22 mm bars. Next comes the addition of a front stabilizer bar. It would normally be an easy installation, since all mounting points are already in place in the Porsche,

Roll bar cage is anchored to the frame that forms part of the floor pan. Windows were cut into the boxed member to fit in gusset plates for reinforcement.



The cover under the deck was removed for better cooling and all of the original fuel injection and emissions package are gone.

except for one place in the inside sheet metal, where a hole is not punched through. However, since SCCA rules don't allow holes to be drilled in the chassis and a bar using that setup would not be legal for races, Ginther instead adds a different stabilizer bar with special mounts to fit existing bolt holes. A 19 mm diameter has worked out best so far. The result is a car that corners flat enough so you cannot feel the lean. If you were engaging in gymkhana type driving, the slower speed would call for a more instantaneous reaction and you would back off on the stabilizer bar size from 19 mm to 16 mm. That smaller bar would, however, be too oversteering for road racing. Front shocks are replaced by Konis.

The rear wheels have just as much effect in steering the car as the front ones and when the suspension points start moving around far enough to do this on their own, on a race car it's time for changes. Here we'll begin by removing the rear trailing arms and pressing out the cushioned rubber bushings essential to a street machine's comfort.



New teflon bushings are installed in their place. The teflon is slippery enough not to interfere with the swing of the arms, but does not compress like the rubber and accurately holds the pivot locations. With this change you will have eliminated any trace of rear end sway at racing speeds.

To match the increased front spring rate, the rear springs are changed from 60 pounds to 180 pounds per inch. Spring rate means how much load it takes to compress a spring one inch. For instance, here, it takes a load of 180 pounds to deflect the spring one inch. The double adjustable Koni rear shocks which replace the original rear shocks have threaded barrels that allow changes in ride height.

There are no rules requirements for the minimum ground clearance. Your jig points, or measuring points, are at the four pads on the corners of the floor pan and Richie generally sets them so that the height from the ground to the pad is 5-3/4 inches at the front and 5-1/2 inches at the rear. Generally, the faster and more convenient method of making the measurements is to use a ruler between the lip of the wheel opening and the ground, with the ruler passing through the wheel center line. Those dimensions will depend on the way you make the fender flares.

All of the padding was pulled out of the original seat and replaced by a thin cushion. This lets the driver sit deeper and be better contained on turns.



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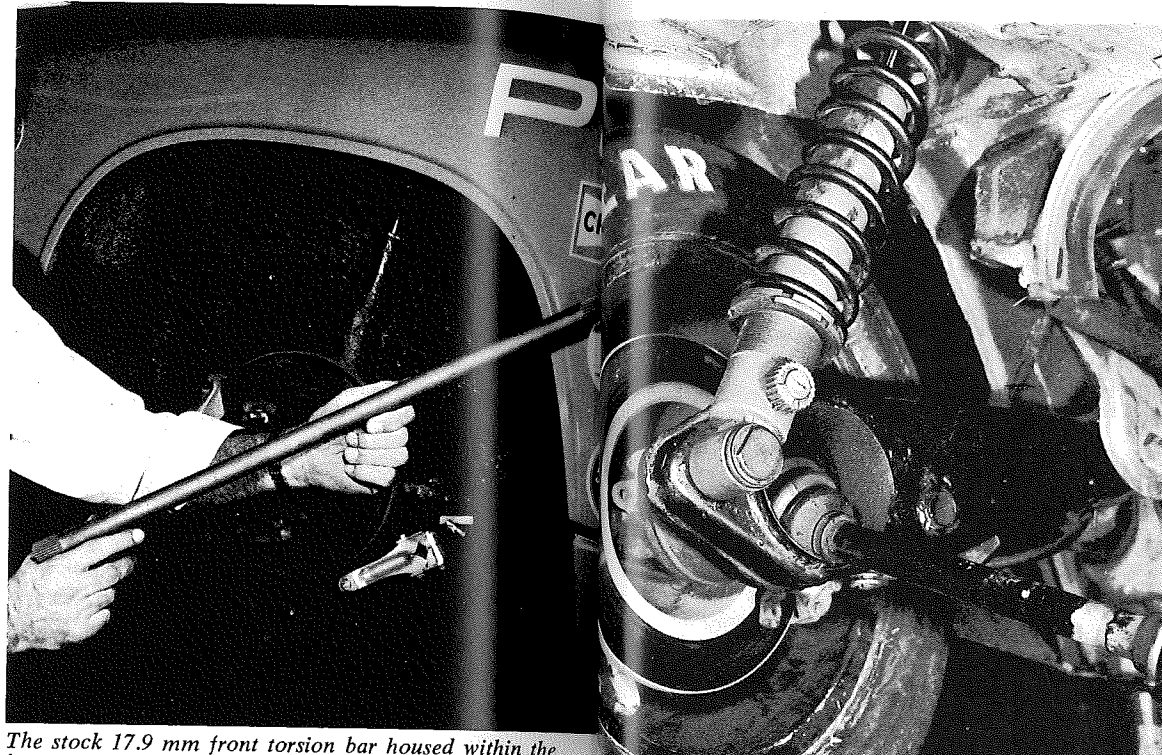
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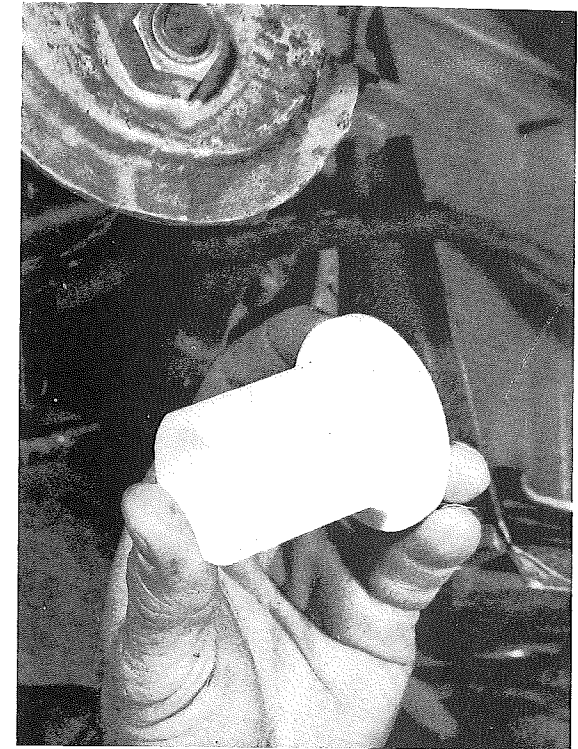
When you make changes in shock settings, do so in large steps to give the driver a feel and make him become aware of the difference. When the rest of the springing is set up correctly, you'll be able to effect handling changes by fine tuning with the shocks alone.

The shock absorber is there not to prevent motion but to delay it. In effect, it gives you a time element. As you initiate a turn, the force that the shock absorber generates is added to that of the spring, or subtracted from it, depending on whether you are pushing or pulling. In a steady state turn, where the attitude of the car has stabilized, the shock still controls the suspension, but will have less force input.

You cannot rely just on a driver's reaction alone in setting up the shocks, since there are things which he cannot possibly observe from within the car. Looking at the outside of the car in action will give you many clues. For instance, if you see the



The stock 17.9 mm front torsion bar housed within the lower control arm is replaced by a larger 22 mm torsion bar.



The stock rubber bushing in the rear suspension pivot is replaced by a teflon one that has virtually no give and maintains perfect alignment.

Richie Ginther installs a heavy duty front stabilizer package. To stay within the rules you are not allowed to drill holes in inner or outer body panels.



car bouncing on the straightaway, you can generally add damping. When a wheel is picking up, you can cut down on rebound damping. In effect, this is an indication of the car ratcheting down because the rebound control does not let the wheel return to the ground. Generally, you can rebalance the damping forces, maintaining the same overall control, but increasing compression and loosening the rebound. Richie Ginther suggests that you always start from a soft setting and increase the damping action in getting your base lines worked out.

On the front shocks which have only a compression adjustment, the total range is 2 1/4 turns. This

Double adjustable Koni suspension units are fitted at the rear. When you are working out a car, begin with the weaker settings and work up progressively.

the compression and, here again, you have 1 1/2 turns from full soft. When you run into understeer on the race course, stiffening the damper by a full turn in compression will generally cure it. Oversteer, on the other hand, is more difficult to cope with. More rear toe-in is one way.

The bump rubbers which limit the compression travel of the suspension take the form of a convoluted rubber bushing on a shock absorber rod. They increase in rate and stiffen as the suspension goes to bump on a stock machine. If you don't shorten the bump stops substantially, when the

Next Month:

**Preparing the Porsche
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