

912 vs 914 COMPARISON

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916 - The Ultimate 914
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PORSCHE 911

3.5L COUPE

By: Peter Bell



My love affair with the iconic 911 started as a small boy and has continued through to adulthood. As soon as I had gathered enough money I purchased my one and only Porsche: a Guards Red 1974 2.7 911 Coupe. I have owned this car now for 18 years and in that time have embarked on a journey of restoration and modification to build my ultimate 911. I hadn't planned to build my ultimate 911, rather just to have the opportunity to own and drive the classic icon that I had admired so much as a boy. However after a few years of ownership I started to think about restoration and then ultimately modification. For me the ultimate 911 is in keeping as much as possible the classic lines of the impact bumper cars from the period between 1974 to 1989, but in all other ways enhancing its all round performance - creating my very own wolf in sheep's clothing (if you can call a 911 a sheep). For the purists among you look away now as this may make you feel queasy. This is not a story of fanatical restoration. Rather the development over many years of my own personalized 911.

So what have I done? Well, as far as restoration goes, I stripped the car to bare metal, repaired and replaced those panels

that were in need of a refresh after many years of faithful service to previous owners. This included new front wings, new sills and a kidney bowl. The wiring loom was removed and fresh wiring installed providing a new nervous system throughout the car. The car was then sprayed in Porsche A1 black.

With restoration complete, modification began and hasn't really stopped. Each time enough money was put by, another stage of the build is undertaken. The brakes were upgraded to servo assisted using the servo from a 3.2 Carrera and the master cylinder from a 930 turbo. The interior was also updated. All of the interior carpets were replaced along with a new roof lining and a leather interior transplanted from a late 3.2 Carrera. Electric windows from a late 3.2c were also installed. Next, the engine. This was the part that excited me the most. The 2.7 engine was discarded and sold (more money for future works!). A second hand 3.2 Carrera engine was sourced and would become basis for the cars new heart. The engine was stripped down completely and then rebuilt with a few important changes. The engine case halves were skimmed and bore aligned to ensure perfect alignment of crank shaft. The crank case halves were shuffle pinned to ensure no movement

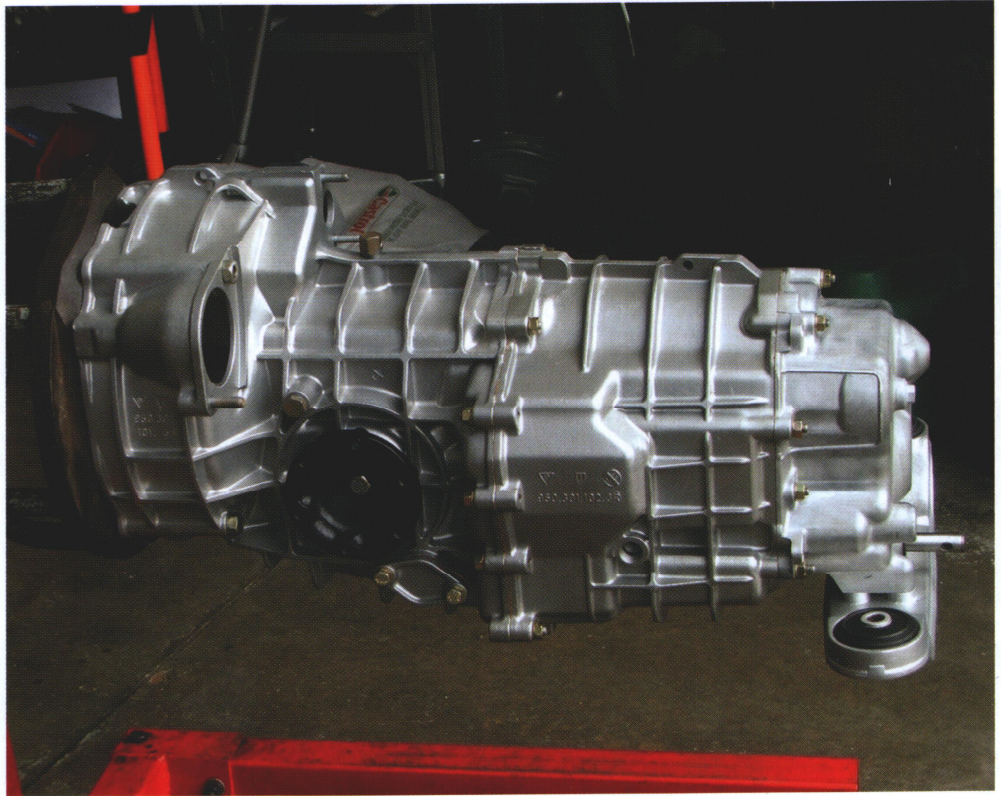
between the cases under high load. The Cases were also gas flowed to ensure every last drop of power could be extracted from the engine. The crankshaft was tested for straightness, then polished and balanced before being reunited with the case in a set of new bearings. The con-rods also had the same the treatment. They were capped and honed and then balanced end over end. Capacity was increased from 3.2 to 3.5 litres using OEM Mahle pistons and barrels.

As part of building my ultimate 911, I wanted to ensure as far as possible, the use of Porsche components. The heads were individually matched to the barrels for a perfect gas tight fit and had an additional spark plug added to both balance the pressure across the piston face as well as allow high compression and less ignition advance. The twin spark is powered by a twin distributor from a 964 linked to two coils. That wasn't the end of it however. Next came the camshafts. This took a lot of thinking about. The cams really do create the personality for your car so it was important to get the choice right. For me, I wanted a car that would deliver power early in the rev range and then consistently deliver more power smoothly as the revs built up. The choice then was the profile

from a Porsche 911 GT2 Turbo.

Next was improving the air intake system. The Porsche inlet manifold is a good design, but if I was going to get the most out of the 3.5litre engine with high lift cams it was going to need to be able to consume vast amounts of air quickly and efficiently. The answer was a set of individual throttle bodies from Jenvey providing an unimpeded straight line for the air to find its way into the combustion chambers. Last but by no means least, was engine management. On this I opted to try and future proof myself against any further enhancements I might make. I ended up buying a Motec M48 pro FIS. This meant among many other things that I could run digital sequential fuel injection rather than the continuous system from the 3.2c. It also meant that coping with the aggressive cam profile at idle was easier when creating the map to run the engine. Since completing the engine I have enjoyed 8,000 miles of very happy motoring. I have to admit I have been very pleased with the result. She now produces almost 330 bhp and delivers power right across the rev range all the way up to a new limit of 7,350 rpm. With increased revs comes the chance of valve bounce, so then engine has titanium racing valves and retainers to cope with the higher rev range.

The noise the engine makes is fabulous too. She retains the distinctive air-cooled signature tune, but there are now some new ingredients in the mix. The induction noise from the throttle bodies reminds you how thirsty she is, followed by the growl of the high lift cams. To top off her new found vocal expressiveness, an equal length stainless steel exhaust from Hayward and



Scott ensures other street users know you're coming in advance of your arrival. So with the help of a little Viagra this old 911 punches well above her weight and is up there with the very best of them.

But that's not the end of the story...With all this new found power comes a need for upgraded the braking system, traction, transmission and suspension. To help tame the engine she's been donned with bigger Fuch alloys, Brembo GTPL brakes, a G50 transmission and RSR coil over suspension and RSR spring plates.

I had previously upgraded the brakes from the stock 2.7 ones to 3.2 Carrera brakes. But stopping the car with this much power needs a little more punch. I chose to go with Brembo Gran Turismo's, or GTPL's. These brakes were designed by Brembo to fit behind the 16 inch Fuchs alloys. The brakes are truly enormous when you compare them to the 3.2 Carrera brakes. Despite being made to fit a stock car, it didn't turn out to be that straight forward. First of all, the callipers at the front won't fit behind a standard offset Fuch



Alloy. This required me to source a Pair of 951 offset Fuchs which have a few mm's of extra offset. I managed to get a pair of 951 8x16's which took a while as it turns out they are as abundant as hens teeth! While I was at it I took the opportunity to put a pair of 9x16's on the back giving the car a bigger rubber footprint. Next problem to overcome was the bigger diameter Brembo discs rubbing on the wishbone flange when on full lock. This was cured by machining 0.5mm off the hub. The bigger brakes were accompanied by Brembo high pressure hoses that replaced the rubber originals. More braking pressure was provided courtesy of a master cylinder from a 930 Turbo. My first experience with the brakes was to promptly lock up the rears, which was made scarier with the rear of car trying to overtake the front.....Not something you want to experience on the public roads. This problem was solved by installing a brake

the original cable system.

The gearbox was a second hand unit that had been lying around in the corner of a garage for many years. As I need a G50/00 (shorter unit that the later years of G50), which were only produced for about a year, I had to take what I could get. The gearbox was completely stripped and rebuilt. It wasn't re-assembled however until the casing was ultrasonically cleaned and all the usual suspects replaced including springs, bearings, nuts, bolts, washers etc. I also treated the gearbox to a limited slip differential from Quaife. The Quaife unit wasn't cheap, but something I felt strongly about adding to the car to help with handling and traction. Luckily the ratios were original and all in perfect condition. Of course this G50 conversion wasn't plain sailing either: I had to replace the flywheel with a G50 unit and the clutch had to be upgraded to a turbo to provide the

completely replace the original ones. These are based on a much more solid design removing the rubber bushing of the original replacing it with a rose joint. The RSR spring plates also provide more dexterity with it comes to setting up the suspension geometry and allows camber and toe and the rear to be set independently of one another unlike the original set up.

Cosmetically the only change has been to remove the original flag door mirrors and replace them with the more aerodynamic teardrop mirrors from a 993. They also have the advantage of being some 1450g lighter than the original flags.

So how has all the changes effected the car. Well, the change in drive and feel of the car is dramatically improved over the original. For beginners braking is amazing. The speed bleeds off quickly and evenly with the car behaving itself under heavy braking from higher speeds. Wider tires



bias valve from a Porsche 964 RS. Finally, I treated the braking system to some Castrol SRF brake fluid: expensive, but probably one of the better fluids you can use in high stress conditions.

Next came a need for a change in transmission. The 915 gearbox although slightly lighter than the later gearboxes that Porsche replaced it with, but it didn't have the capacity to deal with the increased bhp and torque, and in my opinion, has never been the best gearbox at delivering a smooth gear change. So, I decided that the best replacement was a G50 gearbox from a 1987 3.2 Carrera. The biggest issue for installing a G50 in an early 911 is the space required to squeeze the larger gearbox in place. This is solved by altering the profile of the rear torsion tube and slightly modifying the gearbox mounting cross member. You also need to change the peddle box to upgrade the clutch peddle to hydraulic from

extra clamping force. Of course the speedo was no longer compatible as the G50 cars dropped the cable driven speedo's for electronic ones. I found a good second hand one which I had refurbished, colour coded to match my existing white dials and recalibrated to 180mph. If you do the math, with the original ratios, tyre diameter and new redline of 7,400 rpm the theoretical max speed is 185 mph...theoretical of course!

Last but not least was the suspension upgrade. Here I adopted for the tried and tested RSR Bilstein coil-overs but with added helper springs. In order to ensure the rear shock towers could cope with the additional forces of the coil-over setup, I also strengthened the towers with the addition of welded strengthening ribs. Additionally, with the removal of the torsion bars I decided to play with the rear spring plates. I opted for RSR spring plates with

on the fatter Fuchs also provide that little extra bit of contact area between the car and the road. The suspension though has made the biggest difference. The car sits more firmly and confidently on the road. The suspension is harder than the 3.2 setup, but not overly so. You have the benefit of feeling road and a huge reduction of body roll in the corners. Accelerating out of the corners is also a new experience. Less energy is wasted in the soft suspension and more power transferred to where it's supposed to be. The Quaife LSD is also a great addition and helps the car accelerate hard from a standing start as well as assisting in the twisty bits.

All the changes to the car seem to have teased out the hidden potential of the car without taking away the very essence of the car that remains truly 911. You can read more about Peter's 911 at his website: <http://www.myporsche911.co.uk>