

Classic  
**PORSCHE**  
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# Classic **PORSCHE**

## **CARRERA 3.0**

AN UNSUNG HERO SETTING THE STANDARD

**45**

YEARS OF AN  
AIR-COOLED  
LEGEND



911 ST EVOCATION ● SAUTER 356 ROADSTER  
KMW SP20 ● CAMSHAFT TECH ● RADIAL ENGINE  
917 AT MONTEREY ● SANTA CLARITA SPEEDSTER

# A NEW DIMENSION IN POWER

Claimed to be the first design of its kind since Mazda popularised the Wankel rotary engine, this radical radial powerplant has been designed, developed and successfully tested, and is now in production in Australia...

Words and photography Richard Holdsworth







**Above** Radial Motion three-cylinder engine is perfectly suited to older classics with limited engine bay space

**O**ne of the strangest Grand Prix race cars ever assembled is the exotic 1935 Monaco-Trossi, a front-wheel-drive, open-cockpit single-seater powered by a supercharged, air-cooled, sixteen-cylinder, two-stroke radial engine.

In truth, the Monaco-Trossi was as odd at its time of manufacture as it is today, boasting a front-mounted powerplant with cylinders (and spark plug) pointing in an outward fashion from a centrally positioned crankcase. It's a configuration commonly used in vintage aircraft prior to the widespread adoption of gas turbine engines for aviation, but we'll wager all but a small minority of our readers know the design was ever used in an automotive application.

Seventeen years ago, Adelaide inhabitant, Nick Mebberson, revisited the idea and, along with friends, Loui Burke and Scott Pearce, decided to bring an efficient radial engine design for classic sports cars to fruition in the present. The talented trio formed Radial Motion and, with a sizeable investment of \$3,000,000 Australian dollars, their associated manufacturing company, Bespoke Engineering, is now putting this impressive engine design into production following a period of solid development and testing.

Inspired by the radial aircraft engines of the 1920s, the petrol-powered Radial Motion unit is currently a four-stroke radial configuration of three cylinders. It can

either be developed as air-cooled or water-cooled and will eventually be offered in a choice of three, six or a humongous twelve cylinders, as well as in electric-hybrid format. Compact in design, lightweight and making use of many already available components, Mebberson and his colleagues claim their unorthodox design to be low-maintenance and, crucially, inexpensive to maintain.

It can also be heavily tuned by specialists and enthusiasts – the three-cylinder launch engine is available to order in either two-litre or 2.1-litre variants with performance in the region of 100bhp per litre. Take it from us, the raucous sound of the exhaust is compelling, but we're getting head of ourselves. Let's get

back to the basics.

Unlike the aviation engines of yesteryear, Radial Motion's design doesn't use the master/slave rod layout favoured back then. In place of this rather complex arrangement,

## IT MIGHT HAVE CURBED THE DESIRE OF MY 356 SPEEDSTER TO DEPART A RACE TRACK BACKWARDS

the engine you see on these pages uses a common journal, much like those used in V-twin engines, delivering a more compact design. This concern for packaging makes the three-cylinder offering perfectly suited to a Volkswagen Beetle, Kombi van or diminutive Porsche. It also maintains strong ground clearance when compared to standard Porsche or Volkswagen engines and is said to offer better weight distribution. I can't help but observe, had this potentially revolutionary engine been around many moons ago, it might have curbed

the desire of my 356 Speedster to depart a race track backwards. Ahem.

There are other advantages, not least the aforementioned use of readily available engine components, such as pistons, connecting rods and valvetrain equipment lifted from the legendary GM LS-series of V8 engines. Featuring an integral dry sump oil system, the motor also has a low centre of gravity.

Bespoke Engineering has been providing a variety of engineering services — from invention to production — ever since the firm was established a few years ago. The small design team includes industrial and mechanical engineers, machinists and technicians, with commissions varying in size and complexity. With Radial Motion's project, Bespoke Engineering was in a prime position to assist with full production. Mebberson says the initial aim is to produce engines for specialist use, including keen enthusiasts who own a classic car and want to create something unique. "Obviously, our radial engine suits rear-engined Volkswagens and Porsches perfectly, but we're receiving much interest from commercial operators enquiring about the potential for use of a modern radial engine in special vehicles or even industrial powerplants. We've also had interest from the Australian military, affording us the opportunity to work on a number of offshoot projects in this exciting space."

**Below** Beautifully engineered, the unit promises near 100bhp per litre and will soon be available in three, six and twelve-cylinder variants, as well as the option of hybrid-electric power

All of this sounds brilliant, and we applaud Mebberson, the Radial Motion team and everyone at Bespoke Engineering for turning dreams into reality, but the application which we thought might make *Classic Porsche* readers salivate is the special 356 race car fitted with a Radial Motion engine and owned by Australian motorsport legend, Ron Goodman.

The first of Ron's 356s to be fitted with one of these engines (yes, he plans to install more) is now running road tests before intended motorsport use. Fittingly, the car carries the name *Aero 356* and is being prepared for participation in the Shannons Adelaide Rally, the largest tarmac rally event held in the southern hemisphere. Hosted annually and offering a \$25,000 prize pool (\$10,000 handed to the outright winner), this massively popular three-day motorsport event attracts wild four-wheeled participants, including heavily modified 911s, Super Touring BMWs, classic Fords, Ferraris, Holdens and much metal from the Land of the Rising Sun, including plenty of specially prepared rally cars (chiefly Toyota Celicas, Subaru Imprezas and Mitsubishi Lancer Evolutions). In total, the event attracts close to 450 entries each year.

Ron is well-known in Australia, but he has also forged a reputation as a capable race in the Americas and mainland Europe. Put it this way, his 1954 356 — built





**Above** Ron Goodman on his way to victory at the Monterey Motorsports Reunion

in accordance with historic racing regulations — has brought him across the line in first-place at Monterey Motorsport Reunion, said to be the Holy Grail of historic race car action in the USA.

Amazingly, he beat back a gaggle of more expensive machinery, including wide-bodied 911s and purpose-built weaponry from Maranello. With this background, he couldn't resist the invitation to test a new Radial Motion engine. In fact, he was so impressed, he was one of the first enthusiasts to place an order for one of his own cars. "I tried a Beetle fitted with one of these new radial engines and was blown away by the performance. I immediately recognised the potential for enhancing the power of a 356 and wanted to try a Radial Motion engine in one of my own Porsches, primarily in the interests of offering the conversion to customers of my own maintenance, restoration and tuning business, Exclusive Body Werks, a certified Porsche Collision Centre. Installation is very easy. In truth, it'd be an easy fit in any swing-axle, rear-engined vehicle, classic Porsche or otherwise."

### UNLEASH THE BEAST

His Radial Motion engine is fitted to no ordinary air-cooled Porsche (if *ordinary* is a word one can ever use to describe these cars?!). He found the car in Queensland, brought it to his workshop in Sydney and began modifying. Aero 356 started life as a basic 356 B T5 built in 1960, but now carries an aluminium floor pan in place of standard steel. In fact, pretty much everything has been lightened. For example, the windows are made from Lexan, a polycarbonate resin thermoplastic said to have impact strength 250 times greater than that

of glass and thirty times that of standard acrylic. A purpose-built dashboard has been fashioned by Ron's in-house craftsmen, and though Porsche torsion bar suspension has been retained, the entire chassis has been strengthened and stiffened for race car duties.

The front spindles have been custom fabricated to allow optimised caster and camber, while disc brakes now feature in each corner. The standard 741 transmission has been retained (you'll be pleased to learn it's fully compatible with the Radial Motion engine), but makes use of a selection of different gear sets to

suit different circuits and surfaces. A limited-slip differential keeps the car planted, equipment needed more than ever since the installation of the powerful radial motor, which Ron is testing to the limit by feeding

the manifolds with a shot of nitrous injection whenever he wants his potent Porsche — clearly altered, but no Outlaw — to reach warp speed. When we said he was putting the new engine through its paces, we weren't kidding! We're delighted to report performance, reliability and durability have, thus far, proved bulletproof.

We'll bring you a more detailed look at the Radial Motion engine, not to mention Ron's real-world findings behind the wheel, in a forthcoming issue of *Classic Porsche*. Suffice to say, in a scene obsessed with alternative fuel types and a move toward electrification, and notwithstanding its origins in the days of early aviation, it's great to see serious investment of time and money in a new petrol engine aimed squarely at owners of cherished classic cars. And if Ron's early experiences are anything to go by, we have no doubt Radial Motion's order books will be busy before long. Stay tuned! **CP**

## WE'RE DELIGHTED TO REPORT PERFORMANCE, RELIABILITY AND DURABILITY HAVE, THUS FAR, PROVED BULLETPROOF