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GORDINI R8

50 YEARS OF THINKING
OUT THE BOX



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FIAT X19

COST-EFFECTIVE FERRARI ALTERNATIVE

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SMALL BOX OF TRICKS

Take a group of South African motorsport enthusiasts in the late 1960s, turn the topic to saloon car racing, and the conversation would no doubt have resounded with names such as Lotus Cortina, Mini Cooper, Alfa GTV, Ford Mustang and... Renault Gordini. **Carvel Webb** reflects on, and pays tribute to, the Gordini 1300.
Images by Etienne Fouche

It is 50 years since this little car sprang to prominence on the local scene, becoming a household name when talking racing and rallying. It is the purpose of this article to revisit this urban legend, to examine what made it so special and pay tribute to its role in furthering the development of local engineering and driving skills. No apology is made for the random mix of imperial and metric terms, as that was the language of the day during which this tale unfolded. Kilometres per hour were starting to permeate but kilowatts and newton metres were still somewhat foreign concepts.

The story begins a few years earlier, with the launch in 1962 of Renault's R8 saloon as a replacement for the dated Dauphine. The R8 was a small, comfortable 4-seater, following the Renault practice of the time with a rear engine slung behind the back axle, independent coil spring suspension all round, and innovative features like disc brakes on all four wheels and a 4-speed, all synchromesh gearbox. The newly developed engine (dubbed 'Sierra') was a tough five main bearing design, initially 956cc but quickly upgraded to 1108cc, with a cast-iron block, wet sleeves and an alloy wedge design 8-port cylinder head developing some 40 - odd horsepower. The R8's performance potential was soon realised and R8s started appearing in local club races. Simple modifications such as bolting the 956cc head onto the 1108cc block to up the compression ratio, a high lift cam, a branch exhaust and a twin choke Weber carburettor created a sporty saloon which was competitive, but could be used as a family car during the week.

In 1964 this all took a further turn for the better from the enthusiasts' point of view when, in what many believe to be a response to the development of

the Mini Cooper, Renault approached Amédée Gordini (with whom they had had a long-standing relationship) to work his magic on the R8. The result was the R1134 model R8 1108cc Gordini. The basis of the conversion was the development of a crossflow cylinder head with hemispherical combustion chambers and twin overhead rocker shafts, but with the rockers driven by short-angled pushrods running off the existing single block-mounted camshaft. Twin Solex side-draught carburettors and a tuned branch exhaust completed the picture, more than doubling the power output to 96BHP at 6750rpm.

Although campaigned reasonably successfully in the European Rally circuit of 1965 and 1966, the 1108cc was forced to compete in the 1300cc class and suffered significant weight and power disadvantages compared to its main rivals. Further development ensued, culminating in the release of the R1135 model R8 Gordini 1300 late in 1966, which burst onto the motorsport scene in full force during 1967 – and the rest, as they say, is history.

Crossflow cylinder head with twin overhead rocker shafts driven by the single block-mounted camshaft.



A CLOSER LOOK AT THE 'HEART OF THE MATTER'

In standard form the 1300 Gordini engine (type 812) was a 1255cc, based on the 1108cc Sierra block and 72mm stroke crankshaft, but with the bore stretched to 74.5mm. Twin 40DCOE Weber side-draught carburettors replaced the Solex items and developed either 110BHP or 103BHP at 6750rpm, depending on which specification was quoted. Maximum torque of 85lbs-ft at 5000rpm was given.

The cylinder head was based on the R1134 1108cc model but with larger 35mm inlet valves. In order to accommodate the relatively large valves Gordini's approach featured spark plug chambers recessed into the head, and linked to the combustion chamber by two small flame ports. This had the added advantage of spreading the flame front during ignition, resulting in a very effective design. However, this feature also proved to be a bit of a heartache for years to come, in that if the engine overheated the head would more than likely crack in the area between the valves and the flame ports. It is a tribute to South African engineering expertise that pioneering work was done in the early days of MIG aluminium welding by the likes of Frank Shearsby, enabling the repair of otherwise scrap heads.

However, all this wouldn't have worked if it weren't for the equally innovative overhead rocker shaft arrangement driven via short-angled pushrods by the existing block-mounted camshaft. This provided many advantages of a double overhead camshaft arrangement, but was considerably cheaper and simpler – and easier to adjust. This head and rocker shaft design served Renault well and the principle was adopted for the engines used in the R16TS, R12 Gordini, R5 Gordini and Alpine, Alpine A110 and Renault-supplied engines for the Lotus Europa and others.

The Gordini engine wasn't just a Sierra block with a fancy head, though. The block was bored with a 2mm offset to accommodate the larger cylinder sleeves, which together with the higher output necessitated the development of thicker section conrods with a corresponding 2mm offset big end. Pistons were domed, with pockets cut out for the valves, and compression ratio ranged from 10.5:1 (standard) to 11.5:1 and higher for sport and racing.

To accommodate the more stressful demands the camshaft was fitted with phosphor bronze bearing bushes and wider cam lobes as well as wider cam followers, which reduced the initial valve train acceleration shock on the flank of the cam and enabled quite a phenomenal rev range. A larger capacity oil pump and full flow oil cooler were fitted, the lighter flywheel was dowelled to the crankshaft, and a balanced heavy-duty clutch plate was fitted to the flywheel. A 4-into-2-into-1 branch

manifold with slightly unequal lengths to give a spread around the max torque range was fitted, and to handle the electrical demands the Gordini was fitted with a Motorola alternator. Larger diameter crank and water pump pulleys found a home, driven by a 12mm (as opposed to 10mm) fan belt. The cooling fan went from four to six blades to help a thicker core radiator stay cool.



Domed pistons with pockets cut out for the valves.



To accommodate the relatively large valves the spark plugs were recessed into the head, and linked to the combustion chamber by two small flame ports.

FURTHER DEVELOPMENT

In 1968 a factory 1296cc kit was made available to fully exploit the limits of the 1300cc class. Locally the likes of John Conchie, 'Puddles' Adler and 'Pee Wee' Buys joined forces to form the famous Alconi tuning business and their 701B road-race and IR8 full-race camshafts saw power outputs approaching the 140BHP mark, with the sturdy short-stroke engine revving freely to anything from 7500rpm to 8500rpm, depending on the state of tune.

With the advent of the 1289cc production engine in the R10 saloon in 1968, Alconi and others pounced on the opportunity presented by the new, longer 77mm stroke crankshaft and extended the capacity of the Gordini engine to 1480cc, which with larger inlet valves of 38mm saw power outputs approaching 160BHP.

GETTING THE HORSES ON THE ROAD (OR TRACK)

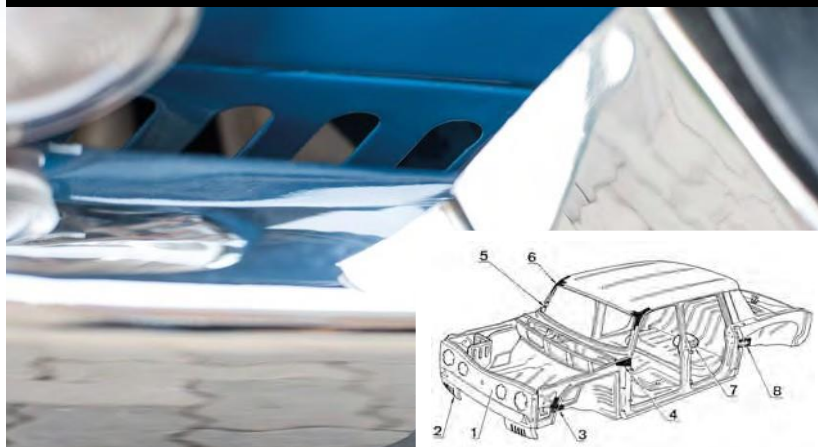
The other mechanical component contributing to its success was the Gordini's 5-speed, close-ratio gearbox. This type 353 box was based closely on the standard type 330 found in the R8/R10 saloons but obtained its extra gears by using lengthened primary and secondary shafts which protruded through the end of the case and onto which were mounted the extra two cogs with the necessary selector mechanism – all this covered with a cast-aluminium cover. The 5-speed box is therefore easily distinguishable as it looks like the standard 4-speed version with a hump on the end. One weak point in the original 330 design proved to be the differential which, as many owners of modified R8s found out, could shred its innards – particularly under shock loading experienced with tyre slip and grip through fast corners.

Gordini's answer to this was both simple, elegant and effective – he fitted four planet wheels into the differential casing in place of two, effectively doubling the number of teeth in engagement at any one point. This modification, together with uprated universal joints and half shafts, handled most of what could be thrown at it at the time.

WHAT ABOUT THE REST OF THE CAR?

Apart from its engine and gearbox the R8 Gordini enjoyed the ministrations of Monsieur Gordini in many other aspects, transforming this unsuspecting runabout into a true sport saloon. He even added a touch of luxury to give it a mini gran tourer flavour.

The lower front body panel was pierced with vertical slots to enhance airflow to the front disc brakes.



The body was stiffened in strategic places (3, 4, 5, 6 and 8) and a hump added under the rear seat (7) to accommodate the 5-speed gearbox.

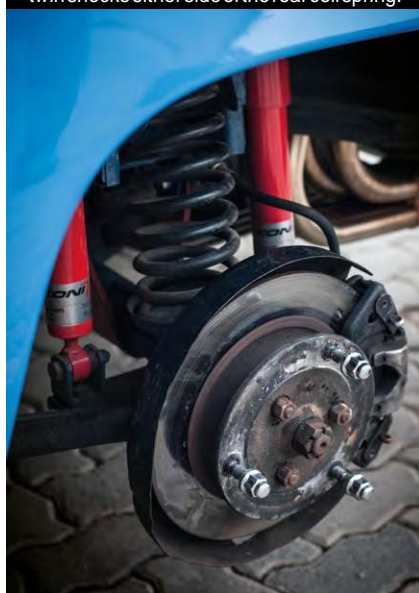
BODY

The body shell was stiffened in strategic places, the front panel was modified to accept two additional quartz iodine driving lights, the lower section was pierced with vertical slots to enhance the flow of air to the front disc brakes and the floor pan under the rear seat acquired a hump to accommodate the 5-speed box. All the removable panels (doors, mudguards, engine lid, bonnet, and rear panel) were made of a thinner gauge material to 'add lightness', as Colin Chapman would have said. A stiffening brace was bolted across the width of the car between the rear chassis frames to increase structural rigidity and the rear cross member supporting the engine was almost doubled in thickness, with 'U' sections welded in.

SUSPENSION

One of the most obvious rear suspension changes was the quadruple shock absorber arrangement with twin shocks either side of the rear coil springs. The springs themselves were different, being borrowed from the R1093 Dauphine. These were 25mm shorter, with a flex rate of 24% as opposed to 27%, and included a 10mm spacer in the top of the spring well. The swing axle design of the regular R8 included suspension travel-limiting straps and these were beefed up from 25mm to 50mm for Gordini use. At the front end shorter (25mm) and thicker (13.5mm compared to 12.5mm) springs with an 18% flex rate compared to 24% were used and the anti-roll bar mountings were reinforced with an additional bracing strap.

The most obvious rear suspension change: twin shocks either side of the rear coil spring.



Rear suspension travel-limiting straps were beefed up from 25mm to 50mm.



Front disc thickness was increased and brake deflector plates were flared for better cooling.



BRAKES

When the R8 was introduced it caused a bit of a stir with the inclusion of disc brakes on all four wheels. Gordini then waved his wand and the discs were increased in thickness from 6.5mm to 7.5mm and later 8mm, the master cylinder bore grew from 19mm to 22mm and a remote booster was added in the front trunk compartment. In addition, the front brake deflector plates were modified to include an air scoop for additional cooling (fed by the mentioned slots in the front body panel).

STEERING

The rack-and-pinion steering of the R8 was a pleasure to use, so apart from an appealing sport steering wheel and a ratio reduction from 20:1 to 17:1 with an eye on its envisaged competition role, everything was left as it was.

LIGHTING

The R8G R1134 1108cc model had already seen the enhancement of the front headlights from 5" to 7" Cibie units, but this was further augmented with new twin quartz iodine long-range driving lights, which gave the 1300 Gordini its signature four-eyed look. Again with an eye on motorsport, wiring was incorporated for additional fog lights which could be fitted to the bumper brackets. A selector switch on the dash allowed for either 'fog' or 'driving' lights to be energised, although this was changed from 1969 onwards to a double switch arrangement so that both could be selected simultaneously.

FUEL

Although the Gordini could return quite respectable fuel consumption figures when cruising, the twin 40DCOE Webers were thirsty when driven enthusiastically (is there any other way?). Consequently, an additional fuel tank was included in the front trunk, which while doing little for the luggage capacity certainly worked wonders for its long-range capability. It also had the advantage that in club competition on weekends the back tank could be left empty to even up the weight distribution slightly. A selector switch on the dash allowed the fuel gauge to register either of the tanks and a tap on the floor next to the gear lever facilitated easy change over.

INSTRUMENTATION

The Gordini dash is joy for any car enthusiast, with a full complement of instruments, switches and warning lights confronting *le pilote*. The left-hand drive and right-hand drive layouts were not a mirror image however, and our right-hand drive version had an inviting blank space between the rev counter and the air vent, which almost universally was seized by its owners for the incorporation of an almost obligatory oil pressure gauge.

HORNS AND HORNS!

In standard trim the R8 sported single and later twin electric diaphragm hooters, but it was felt that these were not up to clearing the way through the forest stages on the European rally circuit. So Gordini increased the cacophony with a set of powerful compressor-driven air horns that gave a signature initial mild beep of the electric hooters, followed half a second later by the resounding blast of the air horns.



New twin quartz iodine long-range driving lights gave the 1300 Gordini its signature look.



An additional fuel tank and remote booster were included in the front trunk.



Gordinis got a full complement of instruments and warning lights.

THE ROAD AND TRACK

The exploits of the R8G have become legendary – almost to the degree of suffering from a bit of ‘the older I get the faster I was’, but it was undoubtedly a giant-killer in its day. My enduring memory is as a student watching Spencer Shultze howling down the old Kyalami main straight (the sound from the straight through exhaust music to my ears) during the Onyx Production Car events of the Rand Autumn Trophy meeting in 1968. He was ahead of Dirk Marais’s V8 Sunbeam Tiger and Peter Markham’s Alfa Sprint and was changing up to 5th through the ‘Kink’, before disappearing down to Crowthorne Corner.

I had the opportunity – as we did back then – to have a close look under the engine lid in the pits while Spencer was fettling things between heats and immediately fell in love with the thing, although I had to wait another four long years before I could afford to lay my hands on one.

It was in 1969 that Gordini cemented its place in SA motorsport history when, at the Rand Daily Mail Nine Hour, a 1300cc Gordini driven by Scamp Porter and Geoff Mortimer passed a Ferrari and a Porsche 917 on Kyalami’s main straight – and clinched first saloon car home and 4th overall honours. Granted, it was influenced by a typical Highveld thunderstorm and the cars were aquaplaning all over the track, but the fans loved it.

The further development of the car, culminating in supercharged versions campaigning against Meissner Escorts and Ford Mustangs, is arguably as famous – together with the exploits of one emerging youngster, in a similar car, with the name of Jody...

On the road it was no less impressive. At a time when the average small 4-cylinder saloon would wend its way to 100km/h in anything from 15 to 20 seconds, the Gordini’s 0-100 time of around 11 seconds was astounding. With a modicum of tuning (the almost as iconic 701 camshaft from Alconi *et al*) and smaller 13-inch AMW rims, this dropped to just under 10 seconds. To put this into perspective, this was in the same league as the BMW big sixes, and even the Jaguar XK120. My car had this cam fitted with a couple of other stage 1 tweaks which resulted in an extra 20BHP, peaking at 7500rpm according to the Alconi dynamometer. I recall indulging in a mild late night robot-to-robot dice down a relatively deserted West Street in Durban with the owner of the then newly-introduced Honda Four. At the end of the fourth stretch he leapt off his bike and came striding across towards me. My worry that he was upset fell away as he got close. With a huge grin on his face he demanded: “You’ve got to show me the engine of this damn thing – now!”



Scamp Porter ahead of Geoff Mortimer.



Scamp Porter and Jody Scheckter.



Scamp Porter.



A shot taken on the day described in the text. Spencer Shultze (Gordini) flanked by Dirk Marais (Sunbeam) and Peter Markham (Alfa Romeo).

G FOR GRIEF?

After its heyday in the late ‘60s and early ‘70s the Gordini continued to soldier on in historic and club competition events. But due to the scarcity of spares and lack of information on the intricacies of its engine, more and more Gordinis were seen with replacement ‘wedge’ engines or 16TS conversions, as opposed to the original 812 engines. Renowned Renault expert and tuning guru Ian Schwartz wrote a fascinating article (with the above title) on the subject at the time, which outlined many of the pitfalls which could face the unwary when fiddling with the original engine.

Scarcity of original workshop manuals also proved a problem and it was not unusual to find engines with conrods or pistons the wrong way round, incorrect valve geometry, incorrectly assembled rocker gear, oval valve guides, warped and/or leaking cylinder liners and a host of other challenges.

Another less understood gremlin was overheating. The Gordini cooling system relied on the vortex effect of the car in motion to suck hot air out of the engine bay through the aperture between the bottom of the rear panel and the engine bay bottom covers. The Gordini engine bay was clearly designed to be worked on by French mechanics of small stature and double-jointed wrists, with the result that many owners removed these bottom cover plates from the engine bay to facilitate access to the carb linkage, oil filter, oil cooler hoses, fuel pump, or coil. However, leaving these plates off results in air being forced into the engine bay in the opposite direction to what the fan is trying to achieve, which would result in chronic overheating and damage – particularly to the cylinder head.

The Gordini’s original competition history and proud record in both sprint and endurance events is a testimony to the soundness of its fundamental design, but as one commentator put it, “there are over 40 different ways to assemble a Gordini engine, only one of which is correct!”.

So the message is clear: restoration of a reliable Gordini engine is possible – just make sure you have of all the necessary information and be aware of its idiosyncrasies before you start. I wrote an article some years ago covering the 812 engine assembly essentials which, together with Ian’s original treatise, are available from the editor at stuart@classiccarafrika.com.



A sporting steering wheel framed the full complement of Jaeger gauges.

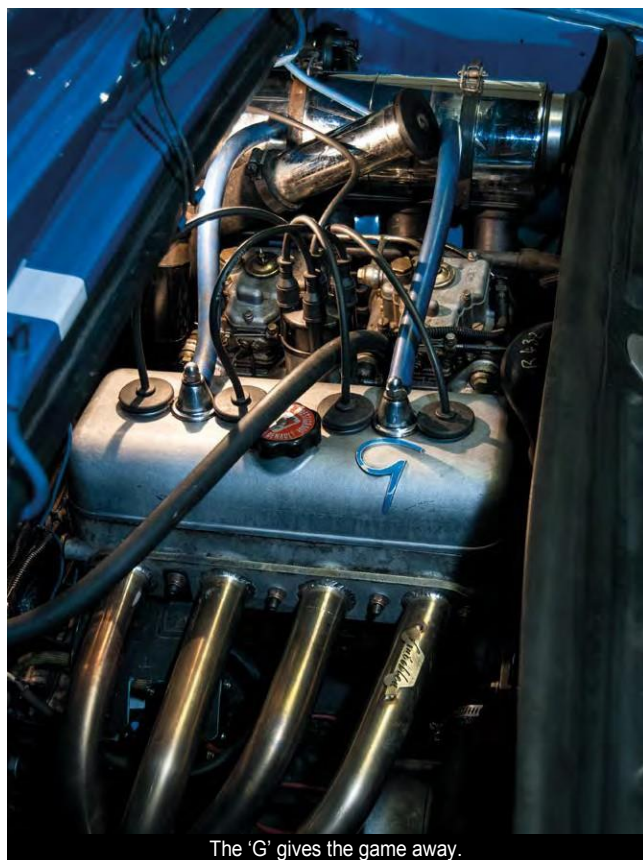
THE R8 GORDINI TODAY

Some 294 examples of the 1300cc Gordini were assembled and sold in South Africa, which given the consumption of a fair number of these in competition has meant that only a few original examples survive today. Compared to the modern 'hot hatch' its performance in standard trim might be considered rather mild, but we need to remember that at the time the 0-100km/h sprint time and 175km/h top speed was phenomenal – the essence of a sporting family saloon – and was on a par with the Mini Cooper, Lotus Cortina and Alfa GT of the day. Owners today are more concerned with originality than its potential as a performance car, but this is not to say it is not capable of holding its own in modern company.

Following a spares drought for many years, parts can now be sourced from specialist suppliers in Belgium (RAG) and France (Mecaparts), which means that most restoration and preservation work can be tackled successfully, albeit at a price. With modern metal spray and Mig welding techniques, even many of those precious cylinder heads thought to be scrap can be recovered and brought up to original spec. And if you want more, opt for the legendary factory 1296cc performance kit which will result in a very sporty performance, even by today's standards, with 0-100km/h times well down into the sub-10 second bracket.

What many owners the world over have done is put the original motor safely on one side and enlisted the services of an R9 or R11 block, crank, conrods and other bits to build a 1397cc 'wedge' performance motor. Or they source the head and associated parts from the R5 Alpine/Gordini (type 840) which looks similar to the original 812 engine. Engines of up to 1550cc can be built, with normally-aspirated power outputs in the 170BHP region. This sort of figure requires gearbox and drivetrain attention though, like what was done by Dave Wheeler and Frans Cronje, who fit R16TS type 336 gearbox internals into a 330 gearbox.


Another popular engine alternative is the 16TS motor. The bell housing bolts straight onto the 330 or 353 gearbox but the removal of the rear-mounted fuel tank and fitment of a front-mounted radiator is necessary.



The 'G' gives the game away.

QUO VADIS?

We are privileged to have a comparatively high surviving population of R8 Gordinis in South Africa compared to many other countries, courtesy of its local assembly programme and its popularity in local motorsport circles in its heyday. It is up to us to maintain and conserve this motoring heritage; the breeding ground for some of our best drivers, engineering and tuning skills.

Not bad for what started as a little 44BHP runabout... 



Smaller optional 13-inch AMW alloy wheels dropped the 0-100km/h to under 10 seconds.

ACKNOWLEDGEMENTS

My love affair with this little blue car would not have been possible without the inspiration, help, encouragement, advice and support of many people over the last 45 years. Principal amongst these are the following:

Spencer Shultze, 'Puddles' Adler and the late 'Pee Wee' Buys (then at Alconi and who motivated and helped me to keep going despite a litany of seized gearboxes, broken crankshafts, cracked cylinder heads and snapped half axles), Scamp Porter ('Mr Renault'), Bunny Wentzel (who convinced me of the merits of the short-stroke 1340cc configuration), Salv Sacco (Motor Sport services UK), Dave Wheeler (gearbox genius), Jean Yves Lardinois (RAG in Belgium), Jimmy Brink and team (Mico SA), Wally Vorlauffer (in between his Jaguars), Frans Cronje (New Zealand), the late Nic Erasmus (Erasmus Renault in Johannesburg) and Frank Shearsby (pioneer wizard with a Mig welder).

If I have left anybody out I apologise unreservedly and will make it up on the 60th anniversary – if I am still around!

