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Get a Griiip

Israel is hardly well-known for racecar design, but with its clever little G1 bike-engined single seater new manufacturer Griiip aims to put that right

By LEIGH O'GORMAN



There is nothing new in a company creating an all-new single seater from scratch. But it's not often that you will hear of a new racecar coming out of a country with very little single seater heritage. That is just one of the reasons the Griiip G1 is so very interesting.

Based in Petah Tikva, in the Central District of Israel, Griiip has created an entry-level single-seater to the Sports Car Club of America's Formula 1000 regulations. Called the G1 and launched earlier this year, the machine is paired with an Aprilia RSV4 Superbike engine and developed in association with Internet of Things (IoT) and augmented reality specialist Parametric Technology Corporation (PTC). But while the concept and design is all-Israeli, the Griiip G1 is built in Italy by Dallara, and it also started racing in the Formula X Italia Series.

'We did a market analysis back in 2013 before Formula 4 was introduced,' says Griiip's co-founder and CEO Tamir Plachinsky. 'You had karting and you had Formula 3 and many, many

types of racing series in the middle like Formula Renault. A year later the FIA introduced F4, but before that we found a regulation from the US called Formula 1000, which uses a motorcycle engine at 1000cc and is a very simple package.'

Promised land

While there is some off-road competition in Israel, Plachinsky admits that the country's lack of motorsport industry made the in-house construction of the G1 a tricky proposition, acknowledging that the Griiip team had to focus on the design, in the face of limited knowledge of building cars. Its existing relationship with Italian constructor Dallara helped here, as Plachinsky explains. 'I had worked with Dallara in 2012 and kept a warm and very close connection with Gian Paolo Dallara, the owner, president and founder. He helped us lot with this.'

Despite its headquarters being situated some 3500km away from Dallara's base, Plachinsky sees some advantages to Griiip's

location. 'Because there is no motorsport industry here it means we are not confined by any kind of dogma or certain ways of thinking that tells you a racecar should look like this, or should be operated like that. We have no culture behind us; and so we can think outside of the box very easily.'

He adds that while Israel may not have a motorsport industry, it does contain a significant hi-tech sector. 'Being part of this industry gives access to many new and interesting technologies that we always look at and think of adapting for our racecars.'

Power to Griiip

Griiip does have a facility in Italy now, though, as well as another high-profile Italian partner: Aprilia. 'We met Aprilia and asked them if they would be willing to allow us to use their engine in our racecar, which is the best engine we could ask for,' says Plachinsky.

With an output of 201bhp, the Aprilia RSV4 engine is rotated longitudinally to 90 degrees,

TECH SPEC



Griip G1

Chassis: Tubular 4130 chrome-moly steel spaceframe. Front, rear and side crash structures.

Engine: Aprilia RSV4 1000cc Superbike powerplant; power, 201bhp. Griip intake and exhaust systems.

Transmission: 6-speed sequential gearbox; ECU contains built-in cut-offs for clutch-less quick up- and down-shifts. Limited slip differential. No chain drive.

Suspension: Double wishbone made from aerofoil section; pushrod-actuated coilover dampers; front and rear anti-roll bars.

Aerodynamics: Front and rear twin element wings; front splitter; rear diffuser.

Brakes: Double circuit, 2-pot calipers acting on 256mm diameter ventilated discs.

Fuel tank: 28-litre FT3 FIA fuel tank.

Dimensions: Wheelbase 2.5m; front-track 1.6m; rear track 1.55m.

Weight: 390kg including fuel.

‘Because there is no motorsport industry here it means we are not confined by any kind of dogma’



with the crankshaft mounted along the car and the power output shaft pointing to the rear of the car, which attaches to the driveshaft. The engine and the driveshaft runs a crown pinion system; and the crown wheel is now attached to the differential in our custom differential housing, which is also a stressed member. All of the rear suspension is attached to that case,’ Plachinsky says.

That suspension is a double wishbone pushrod, front and rear, actuating coilover dampers, with front and rear anti-roll bars.

The engine and a 6-speed sequential gearbox are installed as a single unit, which reduces weight and ensures the unit is compact. ‘In the Aprilia motor, you have a feature where you can take out the gearbox without having to take out the engine,’ says Plachinsky. ‘It’s like a cassette, so it’s very comfortable. It’s something they adapted from their Superbike engine.’

Plachinsky and his team also decided to opt for a driveshaft system with a limited-slip differential, rather than a chain drive.

‘It is a system we have a patent pending on, and it looks like a really good system, mainly because of the performance, but also the zero maintenance. We think that this system makes the car completely better.’

The Israel-lights

Considering the level at which Formula 1000 sits, keeping the costs in check was a must.

‘It looks like the perfect car to fit into that gap between karting and F4, with the right performance, the right sound, right look, right cost and performance,’ Plachinsky says. ‘It’s a very simple package and the thing we loved is that it’s very light; when finishing the race, it’s around 450kg with driver, which is nothing.’

Griip’s ambition stretches beyond the supply of entry-level machines for club races and Plachinsky sees an opportunity to create a G1 series in its own right and there are moves to have something running in 2018. ‘We saw a gap and we said we want to change this situation and we want to offer some kind of solution

for drivers, which would be much more cost effective than anything that is currently on the market,’ Plachinsky says. ‘You see that [with] Formula 4, the car itself is not that expensive – it goes up to around €50,000. Then if you want to enter a series, you need to add at least €200,000 plus and it’s a lot of money and not a lot of people can afford it, and we asked ourselves if this was a just cost and if the drivers are getting back what they are paying for.’

Shared data

Plachinsky adds that he wants Griip to change the perception of how the racecar is used, primarily by involving the driver in the engineering and data correlation process, with the help of a lead software engineer. Rather than each team collecting information and using this to drive their individual needs, logged data will be processed to a cloud server and shared amongst all competitors. ‘This is essentially what I want the G1 series to be – a place where drivers can learn and



The car's been built to Formula 1000 regulations but its creator is planning a spec G1 series. It packs an Aprilia Superbike engine

grow together. That this can broadcast data to one server means that everybody learns from everybody, so you have to accept that others drivers will have access to your data and learn from it. All the technology that we are developing means that you will be able to run the car and learn and improve without the need to have a full racing team helping you.' The server is currently in development, Plachinsky says. The G1 racecar uses a data logger from Evo4 and an AiM Formula steering wheel.

Sump action

Griip has also designed a unique dry sump system, says Plachinsky, but it cannot divulge details at this time. 'We are checking also the possibility of a patent on that. Being a dry sump system, you need to monitor all the time the oil pressure, so we have sensors on that.' An upgraded car package allows for additional sensors to monitor other areas.

The company's collaboration with augmented reality specialist PTC began after the gestation of the G1 had already started, but it is a relationship that is beginning to bear fruit. Plachinsky met representatives of PTC, which opened a development centre in Israel back in 1991, at various tech events and eventually switched development of the G1 to the Creo software programme, with a particular focus on PTC's augmented reality and Internet of Things platform. 'They see a lot of value for them using our racecar as a development platform for their technologies, so now we are one of the partners in PTC,' Plachinsky says. 'ThingWorx is

the system that we are using to collect the data and analyse it and everything.'

As would be expected for this level, the aerodynamic profile of the G1 is relatively straightforward, partially due to regulatory constraints but also because of a desire to maintain simplicity. It features twin-element front and rear wings, a front splitter and rear diffuser, but Plachinsky deliberately avoided adding numerous extra aero devices such as bargeboards, deflectors and dive planes and has reduced the complexity without overly harming the drag coefficient.

Limited resources ensured effectively no CFD work on the design, but with the aid of PTC Plachinsky now plans to re-examine this aspect for the racecar's next generation upgrades. 'Now we are switching back to focus on those parts, because it is very easy to change them on the car. You can change the front wing by itself and not change [the car concept] and I think it will improve even more the performance of the racecar once we introduce them.'

Space race

The chassis is constructed from a tubular 4130 chrome-moly steel spaceframe. As Formula 1000 is not an FIA regulation, a crash test was not necessary, while the diameter and width of the tube in the spaceframe exceeded the minimum requirements for an F1000 car – an element that further reduced costs. Griip, however, *did* complete a simulated crash test.

'We decided that, for us, the regulation is not strict enough, so we made an interpretation from the Formula 3 crash test to our car, remembering that our car weighs around 100 kilos less,' Plachinsky says. 'We made some interpretations of the speed and weight of a Formula 3 compared to us and made simulations on our frame and made it strong enough to hold that kind of test and we are currently exceeding that. We have doubled [the strength of] the main hoop and have a

rear crash box, which is not mandatory in the regulations. The fuel tank is F3 standard, the safety harness is six-point, all the normal things.' Plachinsky adds that bulking the car up to full F3 standard would add too much weight, negating any power delivered from the engine.

The G1 uses Formula 4 specification brake calipers and discs, as supplied by AP Racing. Plachinsky considers these items to be quite cost-effective and less prone to excessive wear when considering the relatively lower weight and speed of the car. The wheels are lightweight aluminium single-nut rims supplied by Evo Corse and the G1 has, to date at least, run on Formula 4 Pirelli tyres.

Sales drive

The base price for a G1 car is €52,900, which includes the chassis, the new engine, the dry sump, the data acquisition system and an additional set of wings – but Plachinsky is keen to emphasise that early buyers could be in line for a reasonable discount.

Griip have sold seven cars – all to Israeli clients – and with Israel's first permanent circuit set to open at the turn of the year, it is hoped these machines will be running in anger in their homeland soon. For now, though, the focus is shifting towards selling cars in Italy, so that a series can begin in earnest next year. 'We have started manufacturing 12 cars that will be used next year in the first G1 series that we are establishing in Italy,' Plachinsky says.

Plachinsky ultimately sees the G1 series and racecar project growing, and he leaves you in no doubt he has lofty ambitions. 'We want to have a G1 series running in every country in the world that has racecars; not only because it will be the most cost effective series, but also because it will be the most exciting series,' he insists, adding: 'Eventually, if one or more of our drivers that started his career in the G1 series get to the top classes, like Formula 1, I think it will be a success story.'

'We want to have a G1 series running in every country in the world that has racecars'