

FEATURE VEHICLE

Korres P4

INTERSTELLAR 4x4

Simply out of this world. The story of one multi talented Greek engineer and off-road enthusiast and his self designed supercar. Introducing the Korres P4, a vehicle that left this writer almost speechless...

Words: Robb Pritchard **Photography:** Robb Pritchard and Korres



The old concrete road surface is slippery, the seatbelts are far too loose and not five point, which I think a car of this performance should have. And no helmet either. Nor body panels... Acceleration of 0-100kph in just 3.8 seconds is supercar territory, but our test track is a public road in a suburb of Athens, and there is on-coming traffic. It all happens too quickly for my brain to keep up with. My arms flail about looking for something to grab hold of as in just a few seconds we are at 170kph and need to cut the corner to get around it safely. But there's a car there.

Dimitris has to steer out of the turn and we start to slide. The rocks to the side are big and sharp, the trees solid, and the other car is coming fast. Dimitris is an expert driver though, and knows this car inside out. He should. Not only does he know every single nut and bolt, he designed more than 10,000 individual parts on it! It also bares his name. Introducing the Korres P4.

But this is an off-road magazine so that's enough about tarmac. I've been in a few cars with comparable performance and I've driven some pretty amazing off-roaders, but no car that I can think of is so good both on

AND off-road. The track up the hill was rough and rocky, better suited to goats and Land Rovers, in Low range, for sure. If you are a lover of cars and of motorsport you have seen You Tube videos of the Group B rallying days; the Peugeot 205 T16, Audi Quattro, Lancia Delta S4. The Korres P4 can be included in that exclusive group.

Power comes from a 7-litre LS7 V8 out of a Corvette Z06, mid-mounted and produces 505bhp and mind-numbing acceleration. Dimitris knows the track ahead and knows he has to keep to the left before a blind crest, but I can't help thinking that we are off-line ➤

The Korres P4 is equally at home climbing rocks or at speed on a race track



FEATURE VEHICLE

Korres P4



◀ and clipping a large rock will flip us over, and the lack of helmet and dodgy seatbelts would sort out the rest. But the Korres takes it at speed with hardly a shudder.

But then the track ends and in front of us is a very steep outcrop of bare rock. Dimitris pushes a lever and there is a grinding noise like a broken gearbox. More shaking of the head in disbelief; the car is lifting itself up to get more ground clearance. Considerably more. I had seen a photo of this car with a wheel perched high up on rock, but have no idea what is about to happen...

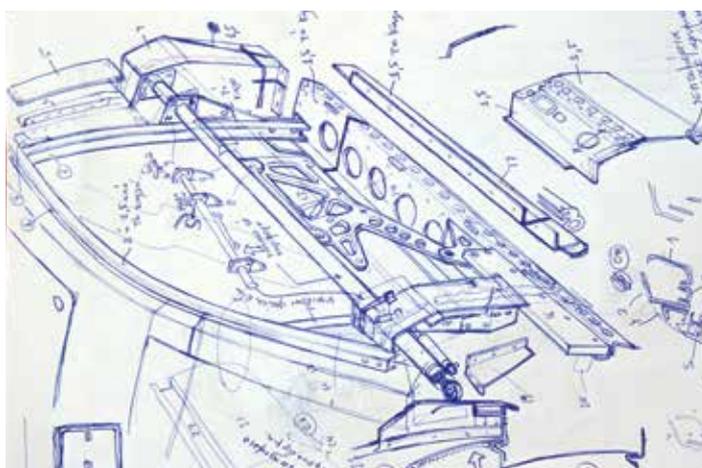
Dimitris decides that about 60cm is enough for what's ahead but it can go up to a metre high! There is clearly something underneath that needs some serious investigation, especially as the

car that just performed like a Ferrari on the road is now rock crawling! It's steep, about 45 degrees but even on standard road tyres there is no issue. We got straight up. I just can't believe it. Over the top there is a sizeable rock, so big that I point it out as a good co-driver should, but Dimitris aimed right for it and over we went. Seriously, a tricked up Land Rover would have struggled with that!

We bumped over the rough ground full of loose rocks and bushes unbelievably capably, until we got back to the track again and then it was all flat out Dakar-style driving back to his workshop, with me holding desperately onto the roof as we drifted around the corners, back wheel hanging out over the drop. I was shaking like a leaf when

Right: Dimitris Korres is an highly qualified engineer by trade, but this off-roader is merely a hobby!

Below: The exquisite details of the rough sketches and engineering drawings have been transferred to the prototype



I got out and also grinning from ear to ear... and then he said some amazing words. "Your turn next." But first I wanted to find out how this car can do what it just did.

The project started with the engineering genius of Dimitris Korres. His day job is coming up with practical solutions to crazy engineering problems, such as working out how to move a thousand ton ancient carving up a mountain in Yemen. Bridges and buildings are also on his impressive CV and he regularly gives TED talks, which puts him instantly into hero status for me. But cars are where his heart is.

"One thing Greece has plenty of, is bad roads," he smiles. "I lost count of the number of cars that fell to pieces as I was trying to drive fast, so that was the first design parameter and the most important aspect for that is suspension. The Citroen 2CV has a twisted, suspension-like coil, so when the front wheel lifts there is a reaction in the back wheel. I always liked that but think it worked the wrong way because the higher the suspension goes the stiffer it gets. I needed a system that worked in the opposite way, stiff for on road and soft for off. That wasn't an easy solution. But nothing is impossible."

The first prototype was just a working platform to integrate the ideas in a working environment, the second, with a bike engine, was a great trials buggy but it wasn't until the previous incarnation, the P3, that the project started to be properly realised. This is the car on the You Tube video you can see climbing up the amphitheatre steps and then doing a three point turn on them. You cannot fail to be wide-eyed impressed. But the project is now another four years on from that...

"The P3 was good but showed us what parts needed to be redeveloped. For example we learned that the chassis could take a lot more power than the Nissan 350Z engine we had fitted, but the transmission couldn't. So we started redesigning the gearbox." Sounds simple, right? But as I listen to how they spent nearly two years learning about planetary geometry and what miniscule tolerances they had to incorporate I understand just how amazing the P4 is. "The gearbox is very compact, just 18cm long and doesn't just have high and low ratios but also a middle one for normal off-roading. The lowest gearing has a ratio of 1:5. There are many people who say that they are experts, but to find a real one who can take all of our crazy ideas and make them into reality inside an 18cm box is not easy! It's a little bit like going on a quest to find a spiritual guru," Dimitris smiles. "But our pilgrimage ended when we found rallying gearbox specialist Maktrak, truly a master of cogs and shafts and now we have something wonderful!"



FEATURE VEHICLE

Korres P4



◀ The rear diff is also an engineering masterpiece. "The rear propshaft has to run next to the engine so inevitably the rear diff has to be offset, but we needed to get the shafts the same length. We designed it so that the CV joints are actually inside the diff. We don't know if anyone else has ever done this."

"We also chose to make the chassis with plates rather than tubes because then you can get it much more accurate. By accurate I mean down to tenths of millimetres. Basically it's perfect." Without body panels a lot of its inner workings are plainly visible, including the beefy front double wishbone assembly. "We started with 400kg of high grade aluminium but machined it down to 40."

But the main component that elevates the Korres from a cool car to an unbelievably amazing one is the suspension and it goes a lot further than just the bespoke, self-designed shocks made by Bilstein. The secret is the golden arm with a drop bar attached to the lower wishbone. For those not too mechanically minded, like myself, it seems either hocus-pocus or even outright voodoo. "The front wheels are attached to the chassis via upper and lower wishbones and the rear wheels by trailing arms. The dampers are independent as on many vehicles. But the suspension is based on the principle of wheel interconnection between front left and right rear and vice-versa. The front to back is through a system of pushrods, rocker arms and

levers with an elastic unit containing a spring, on either side of the vehicle. The diagonal connection is achieved through a system of pushrods and two torsion bars."

But there is more! The mechanical ride height variation system elevates the car, not only by a metre of ride height, but also into the realms of the barely conceivable. "This works by a mechanical system that takes drive from the output shaft of the engine and increases or decreases the length of the side elastic unit, therefore lowering or raising the height respectively. This is the mechanism we designed that makes the suspension stiff for on-road and soft when it is extended to flex-mode."

And then there's the aesthetics. The body looks like a loose cross between a Lotus Elise and a DeLorean but was strangely one of the most complicated things to get right, a difficult compromise between form and function. Most of the work was done with one-third scale wooden models and over 20 of them were made and discarded until the version you see now was arrived at, by way of the general consensus of racing drivers, engineers, professional car designers and even visual artists!

And then it's my turn behind the wheel. My off-road background is greenlaning and expeditions where 'as fast as necessary, as slow as possible' is the mantra. The P4 ethos, however, is 'faster than you thought possible.'



Above: What can we say? Apart from we'd love to see this amazing vehicle in the UK. Astonishing...

"You can put your foot down," Dimitris kept saying, but perhaps he has no idea just how far out of my depth I am drifting at speed on rocks, ruts and the gravel. Also, the Korres is practically a work of art and somehow, it felt wrong just hammering it around just for fun.

Another You Tube video you must see is one where international rally driver, and three times RAC Rally winner, Tommi Mäkinen puts the P4 through its paces. "Absolutely incredible," he stutters, almost speechless when he gets out. "I thought I had seen everything, but..." And after my drive I completely agree with him. I'm sure someone used to such speed and performance could give a much better report on just how good this thing is, but the only thing I can say with any authority is "WOW!" **4x4**