

TRACK TEST

HOW TO "CREATE" PRESSURE

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UNDER PRESSURE





The definition of tyre pressure is one of the basic parameters concerned with kart setup. Let's see how to find out which is the best, using a practical example on the track with a Tony-Vortex given to us by Miliziano

This month too, we are going to see a test that isn't really for a particular kart, but to find out how to adjust the technical aspect of a kart. This time we have focused our attention on one of the parameters that really doesn't take much to see how important it is: tyre

pressure. Considering the evident importance of tyres when talking about performance of a racing vehicle – enough to make some think that it's the chassis and engine to be considered as accessories for tyres, and not vice versa... – it is normal that their "being in order" is just as important. And seeing that air pressure contained therein is the only direct parameter that is required to adjust these elements...

However, it is easy to say that tyre has to be pumped up to a certain pressure: because, in fact, not only do each model of tyre require a certain "dose" of air, variable depending on how they are made, but also depending on the atmospheric situation, from track to the kart, i.e., setup. However, apart from what has just been mentioned being true, it is not like Vroom to

leave things so approximately like that. So let's go on and see what can be done to define tyre pressure as best as possible on the kart that we are using, with the help of Miliziano's team who lent us not only a driver Daniele Galbati but also a KF2 kart with Tonykart chassis powered by Vortex. The test took place at the 7 Laghi circuit in Castelletto Branduzzo, near Pavia (I).

CHECK WHEN COLD AND WHEN WARMED UP

To keep the situation under control and understand in which direction you were going, we have always checked the tyre pressure not just when they are cold before going on the track, but also when they have "heated up" when you finish lapping.

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"NICE" SOLUTIONS
In the pictures above, besides the Starlane instrument and relative sensors used to help us during our test; you can see a round front bar that you always find on Tonykart chassis, and an elegant solution use by Miliziano on the cams to "hide" camber and caster adjustment without using adhesive tape.

instrument with relative data acquisition to assess performance on the track (and a camera that we will deal with in another column), while we were able to carry out this assessment perfectly to a hundredth of a bar, in pumping up LeCont LH-07 tyres that, as they are requested by regulations in national races. We must also say that Miliziano's team certainly has nothing "to learn" about tyre pressure - Michele Miliziano and Antonio Bruno help us on the track also as telemetry operator -, but we have included him in this digression, "forgetting" for a second that he would have used pressure that varied from ≈ 0.58 to 0.62 bar as a basis

going from the left rear wheel to the right, so as to balance the different stress and therefore the air heating up inside the tyre. In fact, remember the basic concept in physics that hot air expands, therefore if it is in a closed container – such as wheels – the pressure increases. And we all know how much kart wheels heat up...

PUMP UP AND BALANCE

After a few laps just to see if everything worked and to see in what condition the track was in. It was a bit slippery as it often is in mid-week sessions – with 40°C measured on the asphalt, we "baptise" starting pressure for starting the test: 0.58 bar on all four wheels. When Daniele starts to really drive, it is evident that the rear skids, due to the track surface, which hasn't got much grip and setup being more suitable for conditions on a race day like the last Italian championship in Siena. Obviously the wheels skid and heat up more, and in fact, this happens in no time at all when we go back to the pit and measure the tyre pressure: nearly a tenth of a bar more at the rear compared to the front.

A little too much, so we opt for two operations: on one side half a shim is removed from front track, to balance setup, freeing it a little at the front too; on the other you go along with the increasing pressure "exercise", slightly



DRIVER

DANIELE GALBIATI

The driver who was with us as “assistant-tester” this time (but to tell it all, he has driver all the time, to get homogeneity) with the KF2 kart is 17 year-old Daniele Galbiati from Monza. He started driving in 2006 in the 60 Easykart and then moved to KF3 and again to KF2. Out of his best results we see 3rd place in a regional championship. Daniele is still at school and his aim is to make it in the racing world, in any formula, seeing how difficult it is to keep up a racing career. In any case, he has no intention of giving up...

reducing rear wheel pressure. This is really much easier to do than one may think: in fact, all you have to do is set tyre pressure when the tyres are warm, balancing them. In this case, we set both front tyres to 0.76 and the rear ones at 0.80 bar. Don't take this data as “absolute”, well, as when we measured tyre pressure the tyres had cooled down and because what counts is measuring pressure when tyres are cold. Therefore, if you have the patience to wait after having carried out “balancing”, you can check what is pressure with cold tyres (that is if you have already reached ideal pressure) measuring environmental temperature: that will be the reference pressure for future tests. Unfortunately we weren't able to do this – time is a tyranny – and we carried on with the track test.

TRY AND TRY AGAIN

So, we lap again with this setup and the improvement is evident. However, this gives Daniele more confidence so there is still some oversteering, besides worsening lap-time at a certain point. «The front has improved – he said after – but the rear still skidded so lap-time got worse with each lap».

Performance getting worse with each lap could mean that pressure is too high (but also little grip which takes track temperature way up, on a hot day) so we make a first change: we let down the tyres, take all the air out of the tyres – so that the taken temperature is influenced as little as possible by the

hot air inside the tyres – then we take the tyre pressure of all four wheels to 0.48 bar, that is, one tenth less than what they were before. This time, the difficulties in driving increase, even visibly, and not just over the early laps, when tyres aren't in ideal conditions because the pressure still hasn't reached the right point. «You could feel that the tyres tended to “go down” from the early laps, especially at the rear – Danielle said – then the kart tended to skid more and more when resting on ground».

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①	58 ↑ 58 58 58	→	85 ↑ 80 93 88
②	76 ↑ 76 80 80	→	80 ↑ 78 87 86
③	48 ↑ 48 48 48	→	60 ↑ 52 63 58
④/5	68 ↑ 68 68 68	→	79 ↑ 76 87 86
TEORICO	60 ↑ 62 58 60		

TECHNICAL BOX

CHASSIS	Tonykart Racer EVK
CIK HOMOLOGATION	56/CH/14
CHASSIS HEIGHT FRONT/REAR.	low/average
TRACK FRONT/REAR.	121.5/139.5 cm
HUBS	standard
CAMBER/CASTER	4 mm open below /half load
TOE-IN	Open 2 mm
AXLE	ø50x1030 type N
THIRD BEARING	No grains, just 2 screws
SUPPLEMENTARY BARS	Front circular
TYRES	LeCont LH-07
TYRE PRESSURE	See article
ENGINE	Vortex 125 RKF
CIK HOMOLOGATION	4/M/21
CARBURETTOR	Bolex 2013 ø24
SPARK PLUG	NGK R7282-10
FUEL MIX.	4% Elf 909
RATIO	01/12/79
MUFFLER	homologated

NOTES ON PRESSURE Tyre pressures are given on the form on the left (in hundredths of bar) set before going on the track and then at pit after warm up, on all four wheels (obviously giving drove direction). Above, Antonio and Michele who helped us with the test.

OPPOSITE DIRECTION

So, the result of this first change wasn't positive. No problem: tests are, in fact, "for testing", aren't they? So, for next adjustment, we go in the opposite direction: before, we lowered the pressure by a tenth of a bar, this time we raise it (compared to the initial pressure) always by one tenth. Then after letting the tyres down, we take it to 0.68 bar. We go back to the track and kart response is better,

but a small inconvenience puts an end to the session: ignition explodes! However, Michele Miliziano isn't too worried, the waste of time worries him more: «unfortunately this is not the first time that this has happened – he tells us – the rotor inside "opens". It has happened to other drivers and it does not depend on the engine».

While they change the engine Daniele says: «You could feel that it was better immediately, this time. I was doing 3 tenths better than the first time before I stopped», which confirms our impressions. In fact, it is almost confirmed as soon as we go back to the track to carry out the set up operation on the kart. "Almost" because after doing so many laps the tyres had worn out so you can't

COSTS

Tonykart Racer EVK mod.KF2

3,960 euro + VAT

Engine Vortex RKF 125

2,950 euro + VAT

Prices taken from tuner's internet site