Analisi Termo-Fluidodinamica Motori Racing
Progettazione e Sviluppo – Software Motoristici

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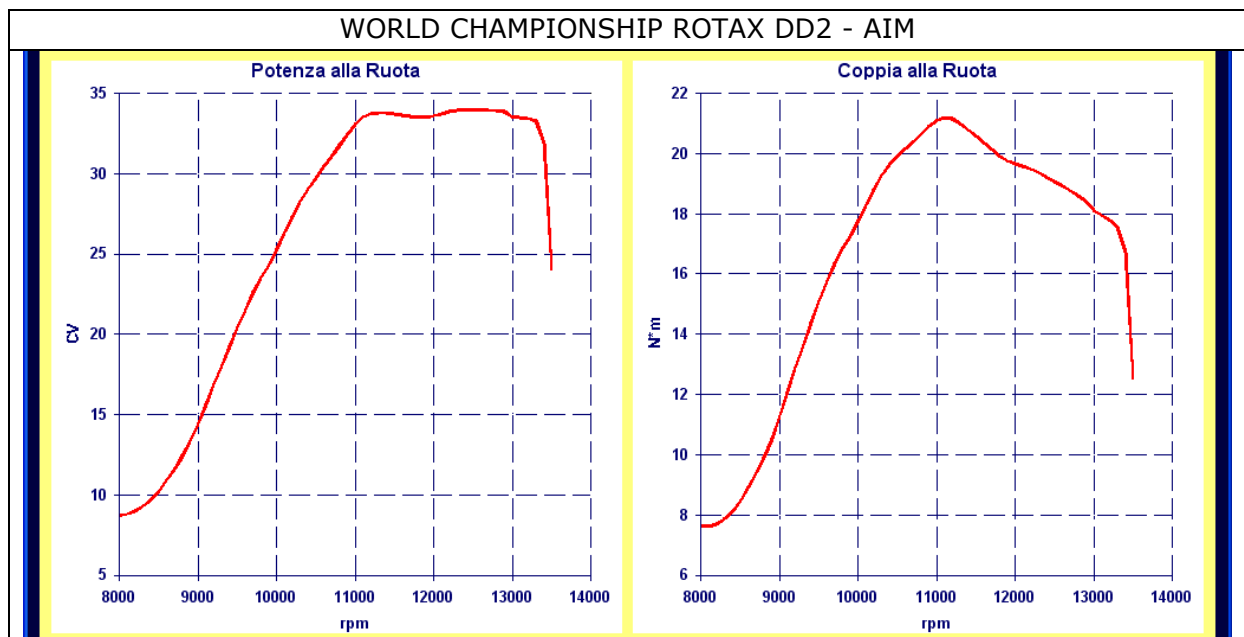   http://www.ntproject.com

SOFTWARE ENGINE ANALYSIS
EXAMPLE UTILIZATION

The software Engine Analysis allows to use in manner easy and precis your data acquisition system as an engine dynometer.

The software can be used with all the most popular data acquisition systems (ALFANO, AIM, 2D, STARLANE, UNIPRO, RKS). The minimum requirements that the system must have, are the speed sensor and the engine speed sensor. Even in the fixed transmission ratio vehicle it can be sufficient to have only the engine speed sensor.

The software related to the acquisitions already sometimes give a chance to see the engine's power curve, but is a simplified calculations that are difficult to use for making assessments on the actual behavior of the engine. In fact, the acquired data are quite unstable and therefore is necessary to undertake specific filtering, moreover there are many aspects that influence the result (inertia, rolling resistance, drag resistance, etc.) Of which a simplified calculation does not take into account adequately, but that affect the result significantly. Instead the Engine Analysis software has been created for just this purpose and then everything is taken care of in an appropriate manner.
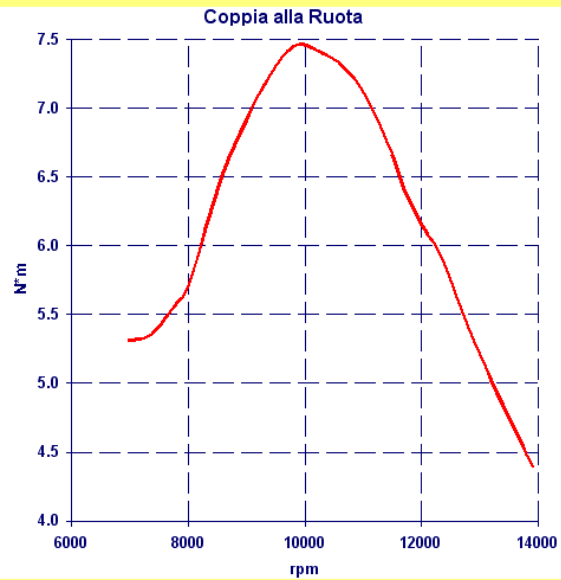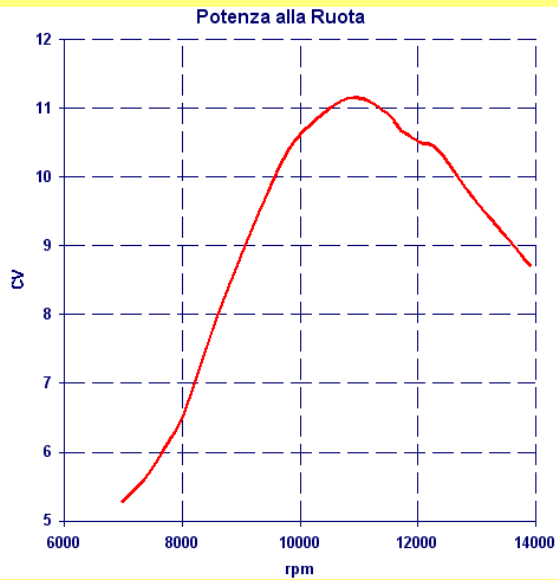
Below will show you a number of examples of the results obtained on different engines and with different acquisitions systems:
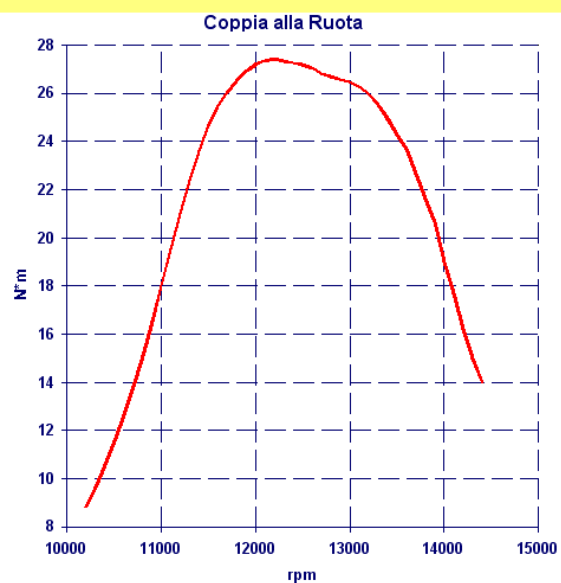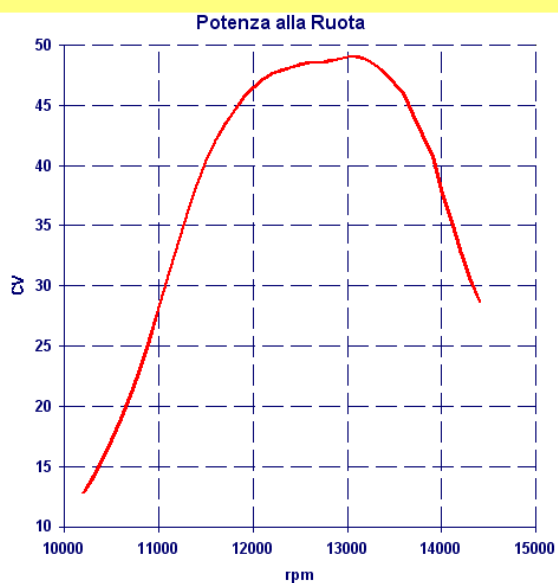

WORLD CHAMPIONSHIP ROTAX DD2 - AIM

LONATO TROFEO MARGUTTI KZ2 - AIM

Potenza alla Ruota

Coppia alla Ruota
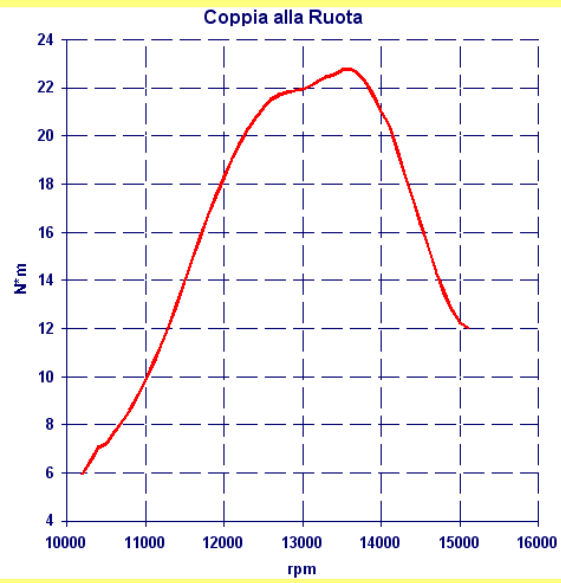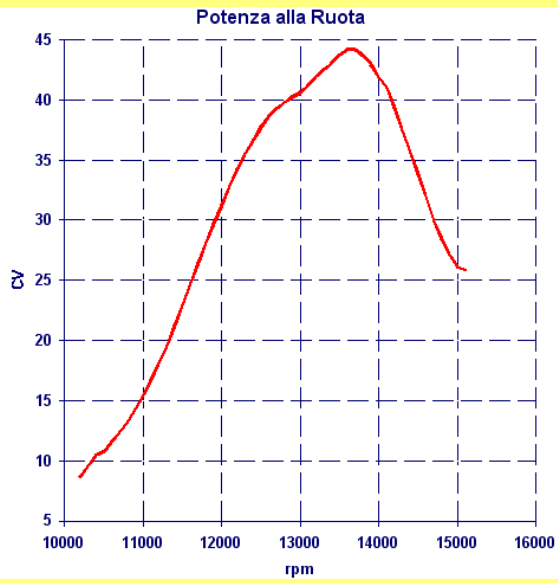
SWEDEN CHAMPIONSHIP 60 MINI - UNIPRO

Potenza alla Ruota

Coppia alla Ruota

SARNO EUROPEAN CHAMPIONSHIP KZ1 - ALFANO

Potenza alla Ruota

Coppia alla Ruota

SIENA TROFEO PACINI PRODRIVER – AIM MYCHRON 5

Potenza alla Ruota — CV vs rpm

Coppia alla Ruota — N*m vs rpm
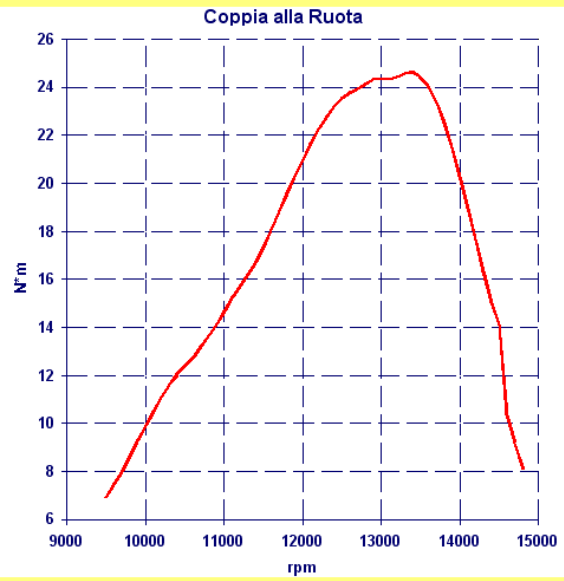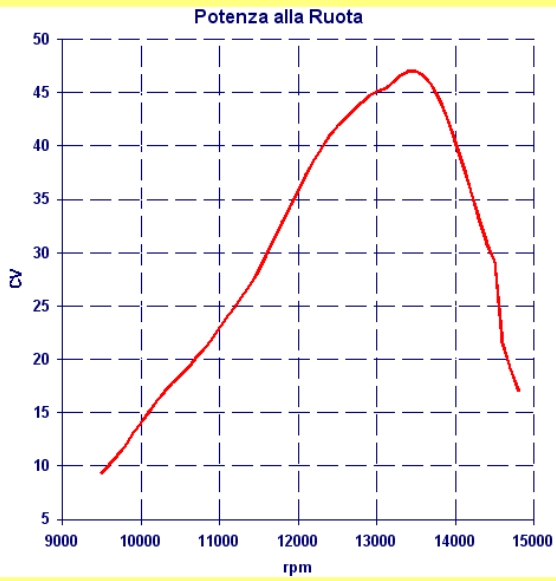
ROK FINAL 60 MINIROK - STARLANE

Potenza alla Ruota — CV vs rpm

Coppia alla Ruota — N*m vs rpm
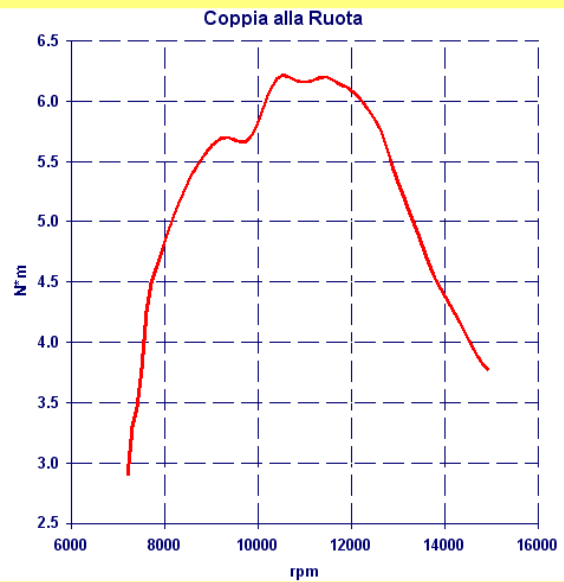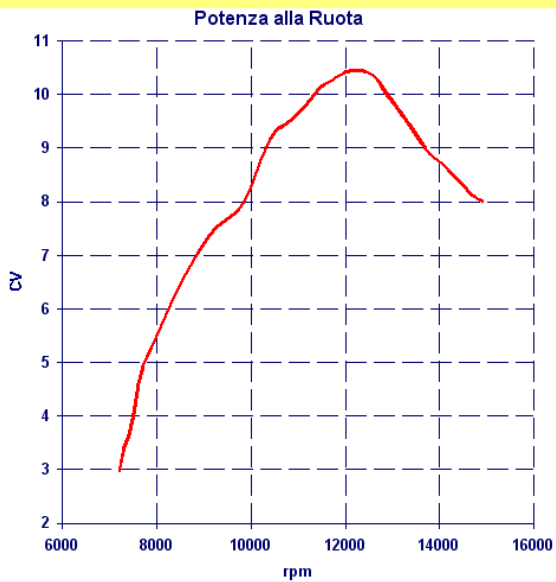
ITALIAN CHAMPIONSHIP KZ2 – 2D

Potenza alla Ruota — CV vs rpm

Coppia alla Ruota — N*m vs rpm
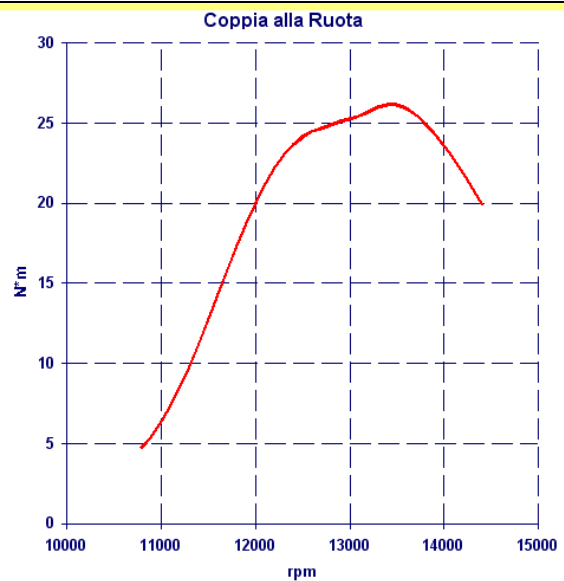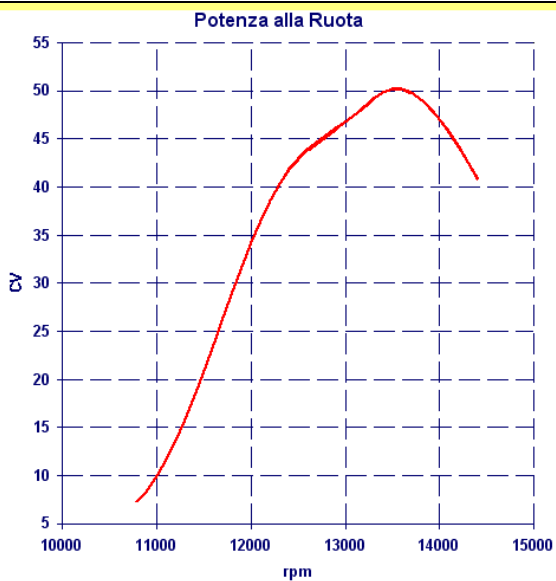
As you have seen from these examples, the Engine Analysis software allows to obtain the torque and power curves from all the main acquisition systems and for all types of engine.

This is very useful especially in the process of fine tuning, in order to see how the set-up work done on the engine is really translates on the engine performance, regardless of the lap times, which of course are influenced by many other factors and therefore are likely to confuse what is being done on the engine.
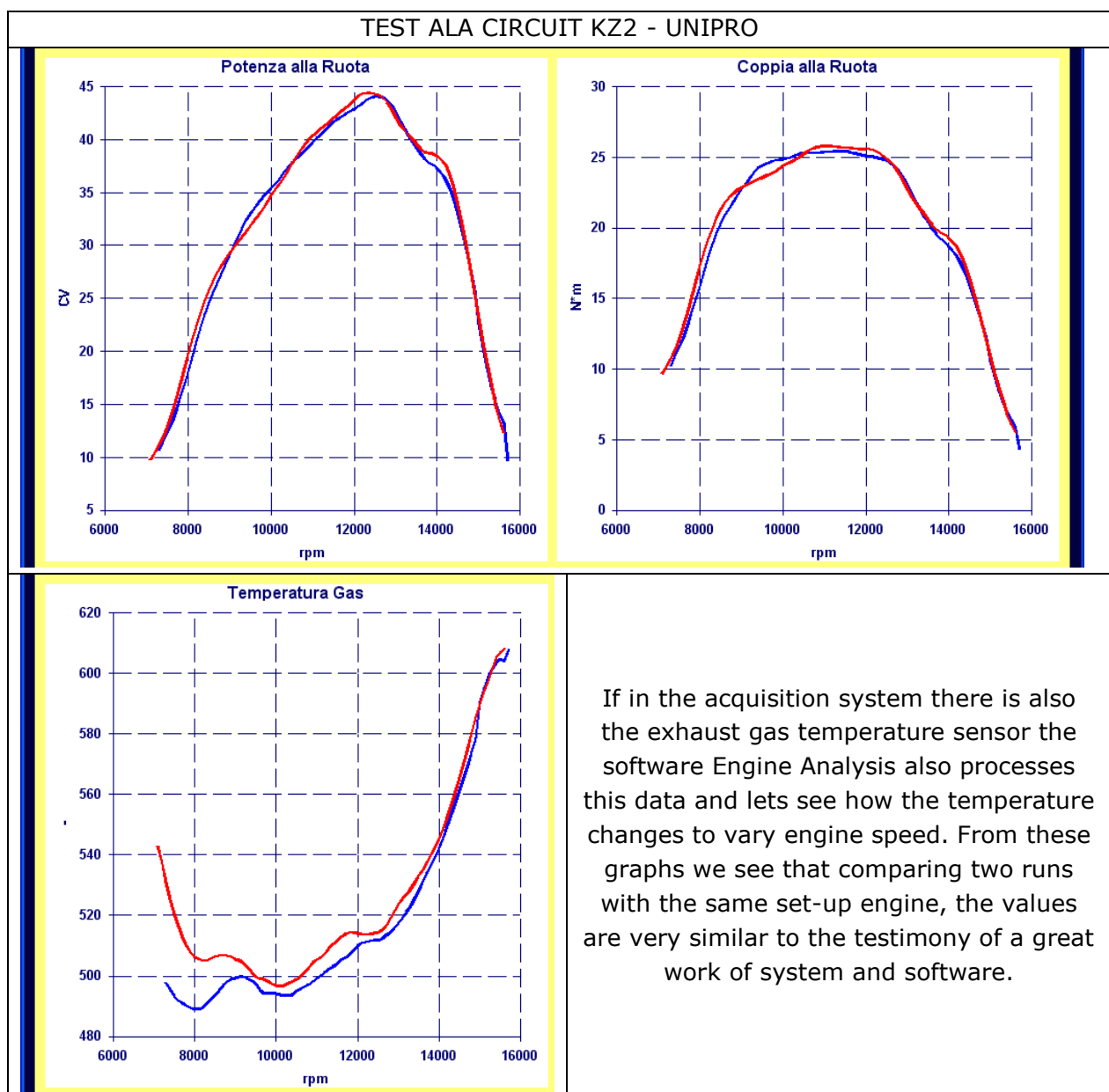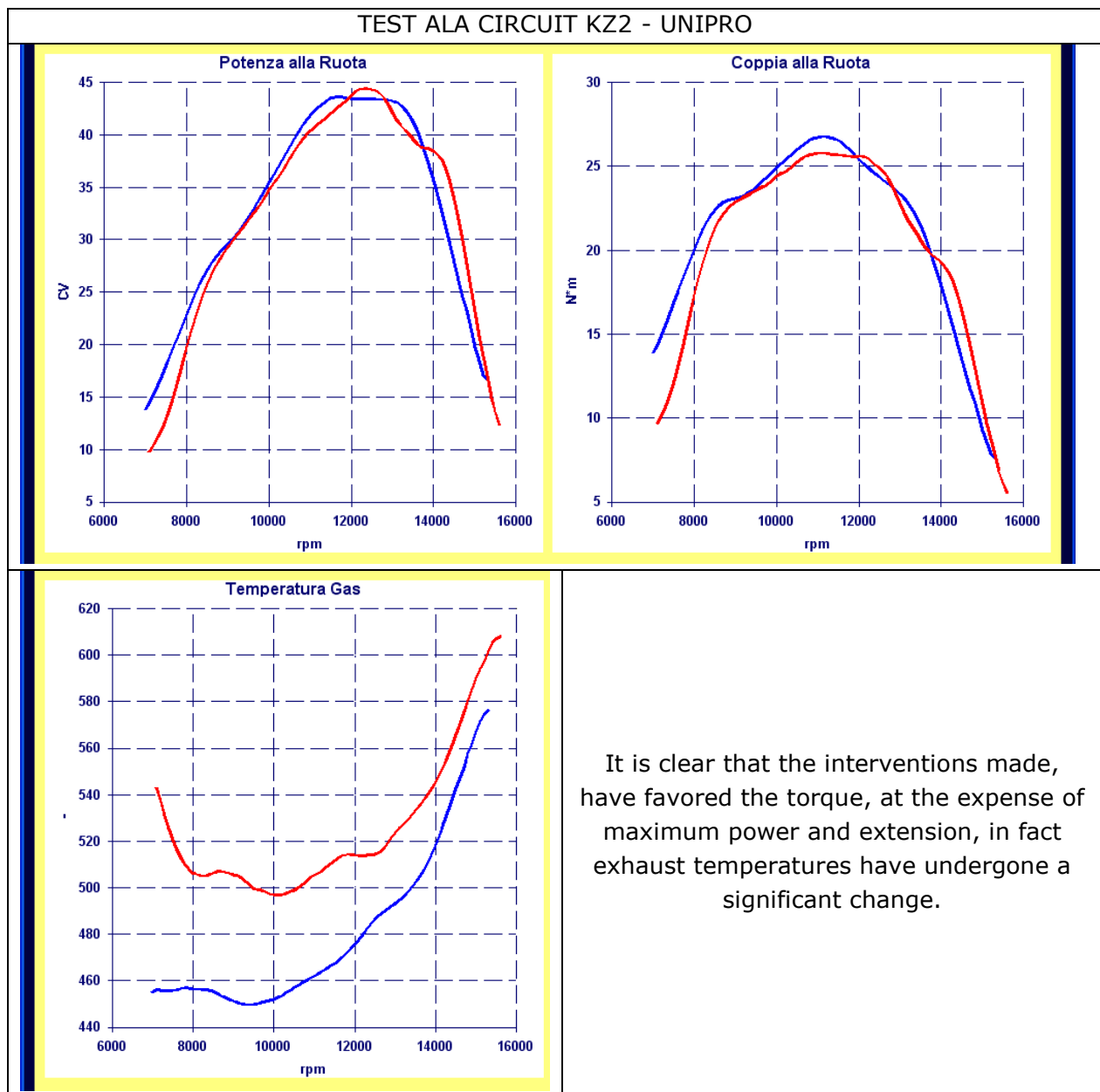
Afterwards we will see how thanks to Engine Analysis you can appreciate the effects of jetting and ignition changes by analyzing the different runs of a test day.

First we see the stability of the system, in fact, if the acquisition is working properly, thanks to the software Engine Analysis you see how comparing two runs with the same set-up engine, the result is much the same as if you were on the dyno.

TEST ALA CIRCUIT KZ2 - UNIPRO

If in the acquisition system there is also the exhaust gas temperature sensor the software Engine Analysis also processes this data and lets see how the temperature changes to vary engine speed. From these graphs we see that comparing two runs with the same set-up engine, the values are very similar to the testimony of a great work of system and software.

Verified this, let's see what happens instead comparing two run with different jetting and ignition set-up.

It is clear that the interventions made, have favored the torque, at the expense of maximum power and extension, in fact exhaust temperatures have undergone a significant change.

As you can see, thanks to Engine Analysis each test that you do on the engine, both with technical modifications, or both with operations of jetting and ignition set-up, can be evaluated clearly. So you'll enable to make the optimal choices and therefore may concentrate without doubts about the other steps of fine tuning of chassis and tire.

We show to conclude another example of test analysis, made on another track and with another acquisition system.

TEST SIENA CIRCUIT PRODRIVER - AIM
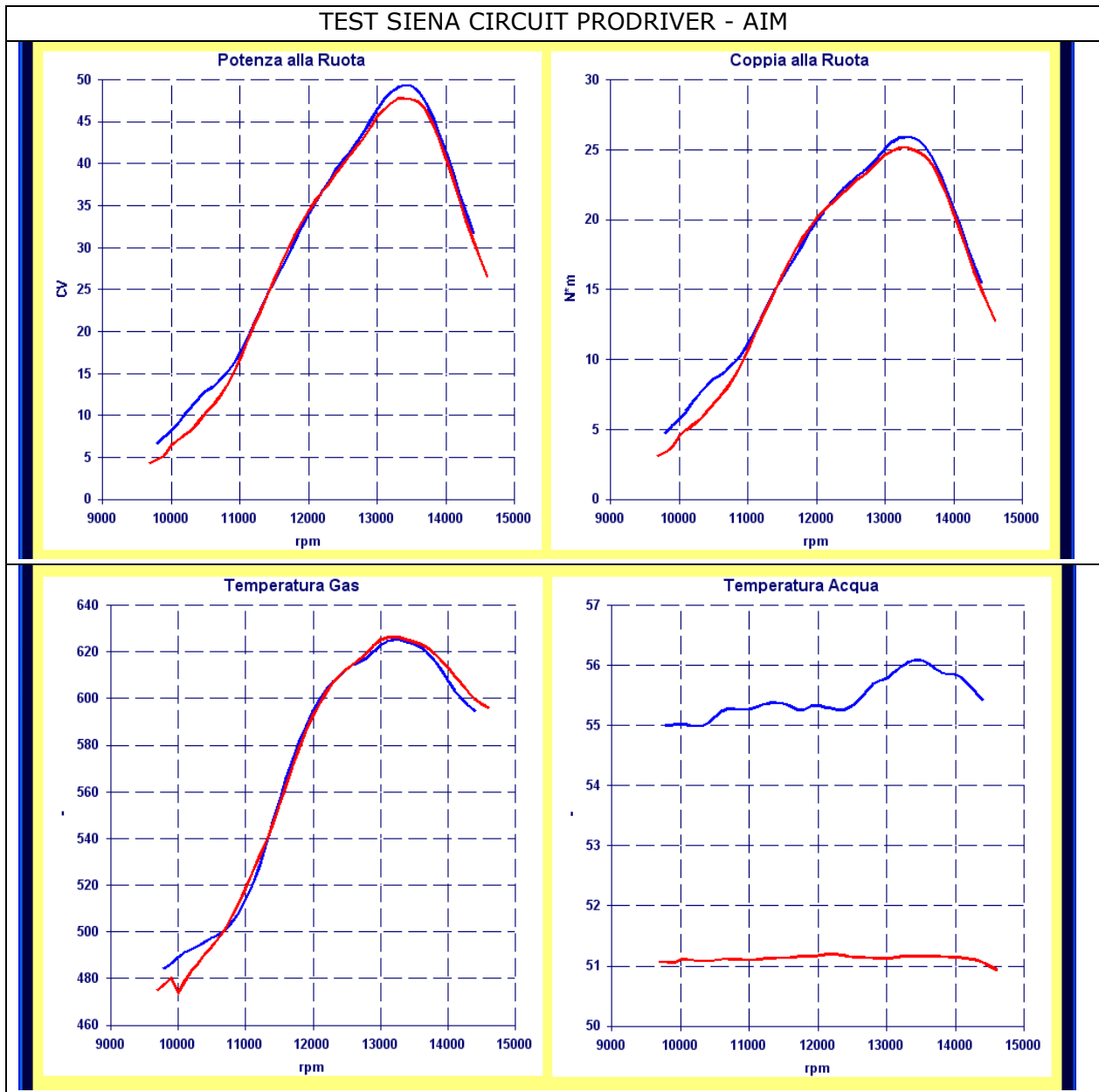
Also in this case we can see that between two runs with the same set-up engine the result, is very similar, here the performance variation is only due to the fact that in a run, the engine had not yet reached the optimum operating temperature.

Continuing the analysis you can instead appreciate how, thanks to the software Engine Analysis, the set-up interventions on the engine are detected clearly in torque and power curves.

TEST SIENA CIRCUIT PRODRIVER - AIM

Potenza alla Ruota

Coppia alla Ruota
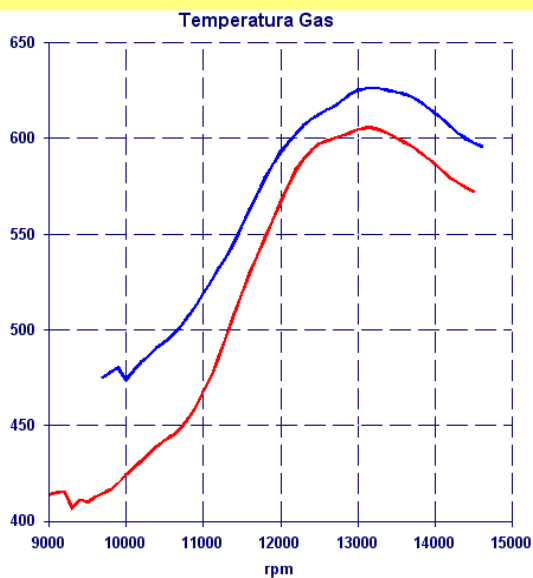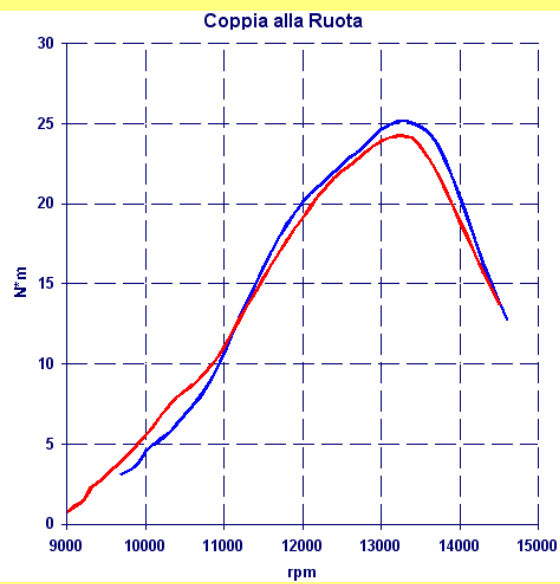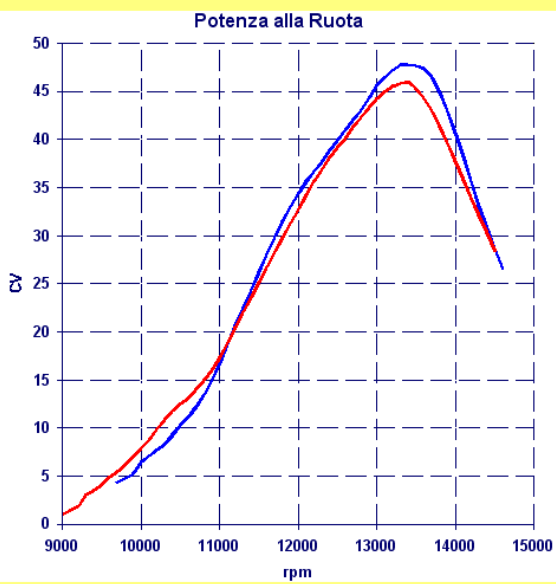
Temperatura Gas

It is clear that the interventions made have allowed to increase the maximum power, and this is consistent with what was happening to the temperature of the exhaust gases, a testimony to the good work of the system and the software Engine Analysis.

The software Engine Analysis allows you to easily analyze the performance and the actions that you make on your engine in a manner clear and precise, thus allowing you to make the optimal choices, making full use of the data recording from your acquisition system.