During the test all the characteristic parameters, such as the power and torque curves, have to be recorded and comparatively assessed.

In figure 2 and 3 are presented the results obtained for the for the two types of gasoline (RON 95 and 100) and in figure 4 is represented the comparative analyses between them.

The tests were performed in the fourth gear of the gearbox where the power and torque are maximum.

IV Conclusions

As it can be seen from diagrams the maximum engine power was 112,6 kW for 95 RON gasoline and 119,9 kW for 100 RON gasoline, an increase of about 6%, and this above 5000 rpm.

In the speed range between 2000 and 3000 rpm the differences between the registered power values for the two types of gasoline are insignificant, the curves overlapping almost the entire interval. In this case a higher-octane level doesn't increase the vehicle performance.

In the speed range between 3000 and 3500 rpm the power values for 95 RON gasoline are superior compared to 100 RON gasoline, the usage of a superior octane number decreased the engine energetical performance.

Only after the speed of 3600 rpm the power values become superior in the case of the 100 RON gasoline, in other words after this speed, the 100 RON gasoline makes its presence felt. Between 3600 rpm and 6000 rpm the engine power level become superior, compared with the case of 95 RON gasoline.

Maximum torque and maximum speed were obtained at about the same points for both types of gasoline, these aspects can be seen on the related diagrams.

In the case of this type of turbocharged engine, higher octanes can improve performance and can reduce emissions during some average to severe duty operations, above 3600 rpm. However, under normal driving conditions, it will do little to nothing for the vehicle performance.

Extrapolating the research results, it can be concluded that in a large number of cases a higher-octane level may not necessarily increase the vehicle's performance, but only paying extra for premium gasoline. This is especially true for naturally aspirated engines, which clearly do not have a mapping that can capitalize the benefits of a higher-octane number.

This can be contradicted, for example, by the corresponding increase of the compression ratio value for the naturally aspirated engines, in order to increase their performance and efficiency.

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