

Analysis Of Performance Use Fuel Pertamina And Pertamina Turbo On Automatic Motor 125cc

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Abstract: as has been known generally the performance of a motor is not as complete as we know especially with the new government product of the pertamax turbo fuel Ron 98, hence the purpose of this research is to perform experimental performance that occurs at the Otto cycle at every step. The pertamax turbo fuel consumption study will have an impact on the performance of the combustion engine with a comparative ratio of at least 11: 1 power increase of 3.81% and torque 4.39% greater than Ron 92.

Index Terms: RON 98, RON 92, Otto Cycle, fuel consumption

1 INTRODUCTION

One reason for the emergence of automatic motorbikes is a practical transmission system without the need for manual operation when traffic conditions are jammed. This is often a matter of consideration for Indonesians living in big cities, besides the need for motorbikes every year has increased dramatically from year of discovery based on data in 2014 the number of motorbikes in Indonesia reached 86.253 million units (Data from the Indonesian national police traffic corps 2016) This automatic motorbike has entered into aspects of life from rural environments to big cities. Both from market entrepreneurs, high school children, high school students, and many civilians who choose this type of automatic vehicle because these transportation facilities are easy to reach besides public transportation [1]. Based on previous research, conducting research on the effect of pentalite fuel on the performance of automatic transmission motorcycles, therefore to know the performance must be done, performance testing with test parameters includes power, torque, and consumption of specific fuel (SFC). Tests are carried out at different engine speeds and the results of premium testing are obtained with octane value 88, pentalite with octane value 90, and pertamax with octane value 92 on the graph of torque with fuel [2]. Furthermore, a combination of alternative fuels tests the internal combustion motor using a mixture of ethanol fuel with fuel oil [3]. The next study stated, the use of CFD simulation to get the effect of incoming air pressure affects the motor performance results of spark ignition [4]. For this reason, further research is needed on the theme of the performance test analysis of pertamax and pertamax turbo fuel on 125cc automatic motors in 2012. So that it can provide more complete data using turbo pertamax fuel.

2 RESEARCH METHOD

The following is a flow of research conducted in accordance with Figure 1.

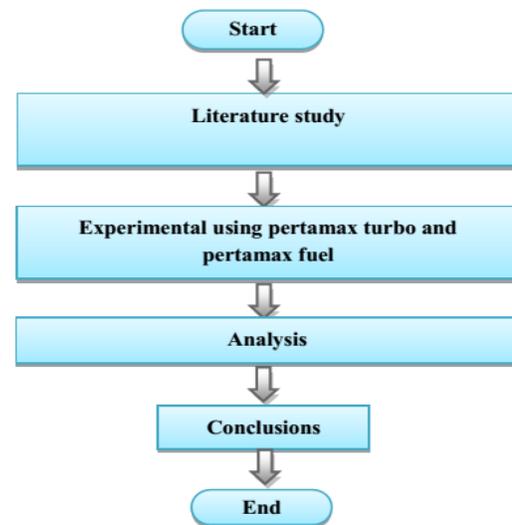


Figure 1. Flowchart of this research

3 RESULTS AND DISCUSSION

Following are the actual test results on the Dyno engine described in the graph below, Figure 2.

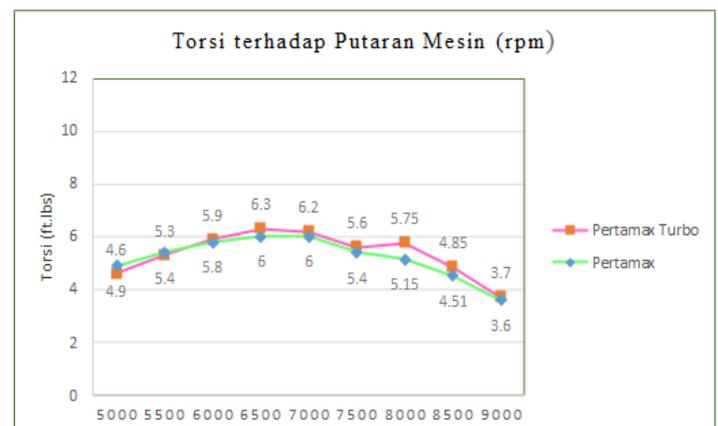


Figure 2. The results of the torque test on engine speed

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The graph image above is the test result when using a dyno engine that has been converted into a graph where it has been converted through calculations. Torque plays an important role at the start of the vehicle when it will affect the power produced, the greater the torque to move, the more power will be generated. Based on the results of maximum torque testing on Ron 92 is located at 6000-7000rpm engine speed with a maximum torque of 6.0 ft.lbs using fuel with Ron of 92, while on fuel Ron 98 torque is seen increasing at engine speed 5500-7000rpm with torque a maximum of 6.3 ft.lbs at 7500-8000 rpm. Torque increases due to this process of combustion that occurs forward earlier so that fuel and air fluids increase in volume and pressure because of the translational motion generated from the rotation of the crankshaft which rotates very fast so that it will result in the combustion produced due to combustion it's not maximal. In Figure 2 the high speed of torque produced decreases due to the opening and closing of the valve very quickly and the movement of the piston from TMA to TMB also accelerates so that the steps that take place do not operate so that the pressure in the combustion chamber decreases fuel Ron 92 and Ron 98. It can be concluded from the results obtained that with a compression ratio of 11: 1 on this vehicle the greater the power produced when using fuel with Ron 98. As a comparison material, the actual test results obtained when carrying out the dyno test can be seen in Figure 3.

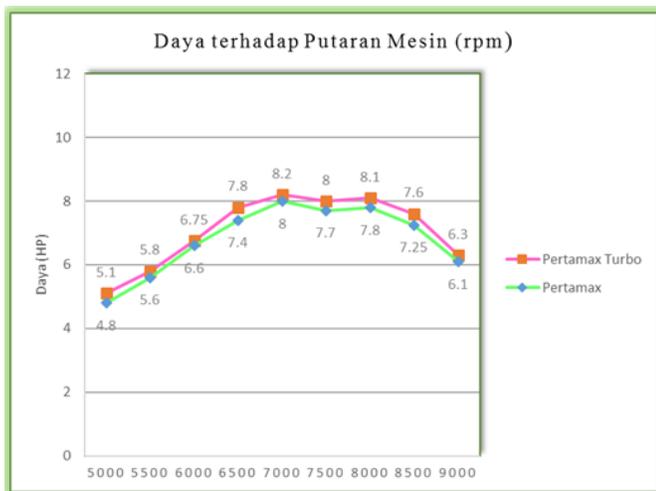


Figure 3. The results of the pertamax power dyno test with pertamax turbo

Based on the data above can be taken several comparisons of power produced using Ron 92 and Ron 98 fuels used in testing. As shown in the graph the use of fuel with Ron 98 has a greater increase in power compared to Ron 92 with a maximum power of 8.2 HP at 7000rpm, the difference in power produced because the level of Ron fuel has different octane and distillation values of evaporation different at 7500-9000rpm engine speed the resulting power has decreased due to detonation where the pressure has increased and the power produced decreases.

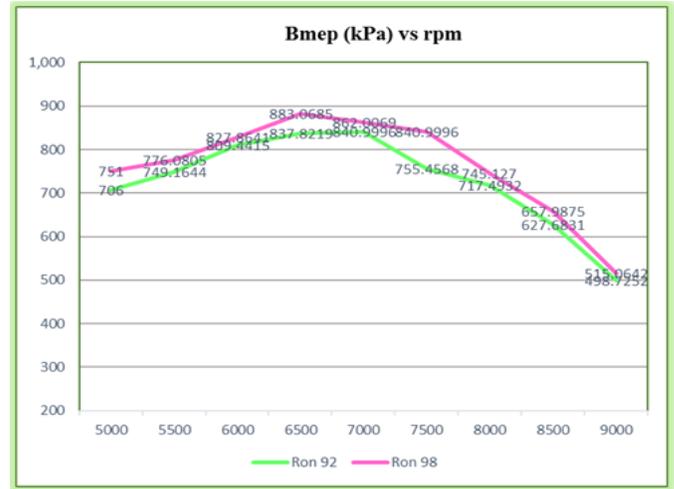


Figure 4. Average effective pressure on engine speed

Bmep value (brake mean effective pressure) is the average effective pressure produced on the cylinder at a certain rotation where the pressure on a particular rotation that hits the piston that moves from TMA to TMB exits through the output and can be measured using a dyno-test. The value produced on Ron 98 fuel occurs at 6500rpm at 883.0685 kPa and decreases with increasing engine speed, while for Ron 92 Bmep the maximum is 840.9996 kPa at 7000rpm rotation can be seen in Figure 4.

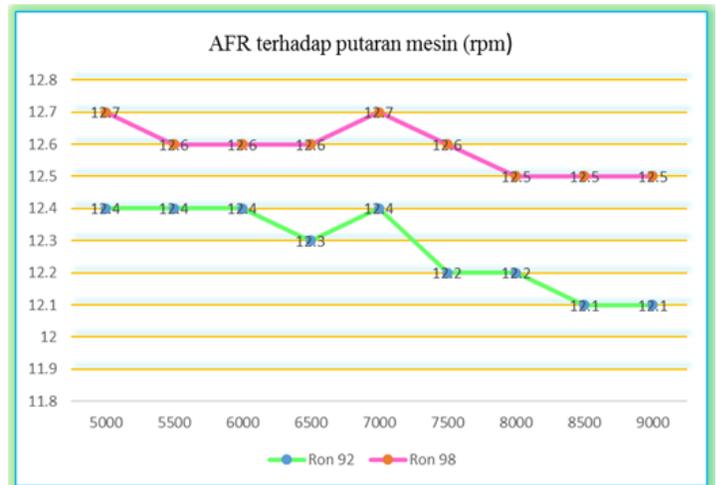
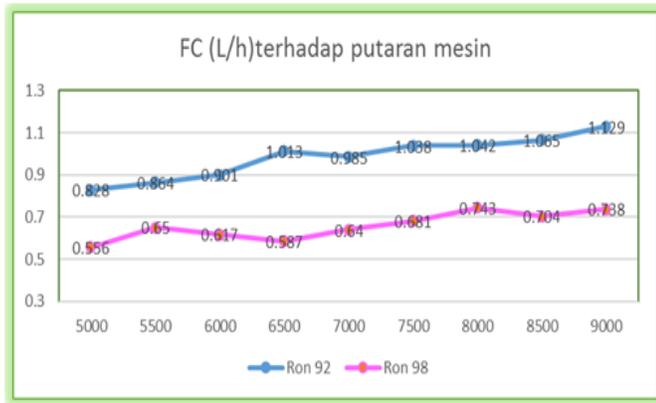


Figure 5. Comparison of engine speed against AFR

Based on Figure 5 above, the experimental test results of combustion occur only with the ratio of fuel to air where it has a predetermined threshold requirement. Where is often referred to between the rich and poor in the air mixture with fuel, where the value of the air fuel ratio is obtained when carrying out the dyno-test using a sensor mounted on the muffler. At high speed the water value of the fuel ratio between Ron 92 and Ron 98 has decreased due to the rotation of the process where the ratio of generating power to the maximum is between 12-13:1. The reference in the stoichiometric graph is a lambda value of 1.



With the graph results shown in Figure 6 above, it shows that the fuel consumption of Ron 98 and Ron 92 shows differences in numbers, where the fuel consumption on the Ron 92 is greater than Ron 98. This is because the 125cc automatic motor manufacturing standard has a comparison 11: 1 compression where it will be highly recommended to use minimal fuel which has a octane value of 92 so compared to Ron 98 pertamax fuel is more wasteful when driving.

4 CONCLUSION

Based on the above study obtained conclusion that is: The use of pertamax turbo fuel on a fuel motor with a minimum compression requirement of 11: 1 has an effect on the results of combustion performance both power, torque, and air fuel ratio. Based on the experimental test results the use of Ron 98 fuel in 11: 1 compressed vehicles will produce a maximum power of 8.2 HP with 6.2 ft lbs of torque where the maximum power and torque at 7000rpm engine speed, while at Ron 92 the maximum torque produced is 6.0ft.lbs on the engine range 6500-7000rpm and produces power of 8.0 HP at 7000rpm engine speed. Increase in power using Ron 98 of 3.81% and an increase in torque of 4.39% greater than Ron 92.

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