

***Analysis of the Effect Intercooler Variations on the Performance of a Multi-Cylinder Turbocharger Motor Engine Type K3-VET***

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***ABSTRACT***

*Turbocharger is a device that have forced induction system, which works to compress the air which aims to increase the air pressure that will enter the combustion chamber. The turbocharger's working system is to supply compressed air to the combustion chamber. Intercooler is a device that works by exchanging heat, which functions to cool the compressed air by the turbocharger. The density of the air will increase as the air temperature gets lower. This research aims to determine the performance output of the K3-VET engine which is varied in two different types of intercooler devices, between air-cooled intercooler and a liquid-cooled intercooler. The results of the performance test conducted at GUT Motorsport using the dynotest tool showed the results on the test machine in a state using a standard intercooler, with the power of 98.4 (H.p) at 7000 rpm, the torque of 130.4 (Nm) at 2000 rpm. The result of air-cooled intercooler gets the power output of 102.3 (H.p) at 6500 rpm, the torque of 136.3 (Nm) at 2500 rpm, on the other hand liquid-cooled intercooler gets the highest power result of 111.5 (H.p) at 6500 rpm, the highest torque is 152.1 (Nm) at 2000 rpm. This test uses the 3rd gear position at the time of testing. The results of the measurement of the temperature difference at the inlet and outlet pipes in each type of intercooler are, air-cooled intercooler of 2°C, while for a liquid-cooled intercooler it is 0.2°C at 2000 rpm. Air-cooled intercooler is 18.3°C, while the liquid-cooled intercooler is 33.1°C at 3000 rpm. Air-cooled intercooler it is 22.7°C, while the liquid-cooled intercooler is 31.6°C at 4000 rpm. The conclusion is that the liquid cooled intercooler gets the highest power and torque results, this is because the air and fuel mixture become homogeneous.*

*keywords : turbocharger, intercooler, dynotest, temprature*