ABSTRAK

PENGARUH KELEMBAPAN UDARA TERHADAP PRESTASI MESIN BENSIN 4-LANGKAH PADA MOTOR 4-TAK 1 SILINDER DENGAN METODE CHASSIS DYNAMOMETER

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Kondisi kelembapan mempengaruhi performa motor bakar dan kadar emisi yang dihasilkan. Studi menunjukkan meningkatnya kelembapan dapat menekan kadar emisi pada motor bakar. Penelitian ini dailakukan untuk mengetahui nilai torsi, daya, dan emisi gas buang yang dihasilkan motor bakar bensin 4 langkah yang dipengaruhi oleh kelembapan dan putaran mesin. Penelitian dilakukan menggunakan motor bakar bensin 4 langkah dengan variasi kelembapan 53%, 64%, dan 73%. Variasi putaran mesin pada pengujian torsi dan daya adalah 4500 RPM, 6000 RPM, dan 7500 RPM, sedangkan nilai putaran pada pengujian emisi adalah 6000 RPM. Variasi kelembapan diatur dengan nano mist sprayer, performa mesin diuji menggunakan alat dynotest serta pengujian emisi menggunakan Exhaust Gas Analizer Stargas 898. Berdasarkan pengujian, kelembapan 64% menghasilkan nilai terbaik dimana pada putaran mesin 6000 RPM menghasilkan daya terbaik dengan peningkatan dari nilai putaran sebelumnya sebesar 72%. Pada variasi kelembapan yang sama, torsi terbaik didapat pada putaran mesin 7500 RPM dimana peningkatan nilai dari pengujian sebelumnya sebesar 29%. Variasi kelembapan 64% juga dapat menekan emisi gas buang pada motor bakar bensin 4 langkah. Variasi kelembapan 64% mendapat nilai terbaik karena kadar uap air yang sedang tidak mempengaruhi performa mesin secara signifikan sehingga performa mesin stabil. Variasi 64% menghasilkan nilai terbaik karena kadar kelembapan yang tidak terlalu tinggi dapat mengikat emisi gas buang saat proses pembakaran dan menekan emisi yang keluar.

Kata kunci: ***Torsi, daya, Emisi, Kelembapan, Putaran Mesin.***

ABSTRACT

INFLUENCE OF AIR HUMIDITY ON THE PERFORMANCE OF 4-STROKE GASOLINE ENGINE IN 1-CYLINDER 4-STROK MOTORCYCLES USING THE CHASSIS DYNAMOMETER METHOD

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Humidity conditions affect the performance of combustion engines and the levels of emissions produced. Studies show that increasing humidity can reduce emission levels in combustion engines. This research was carried out to determine the values of torque, power and exhaust emissions produced by a 4-stroke petrol engine which are influenced by humidity and engine speed. The research was carried out using a 4-stroke petrol motorbike with humidity variations of 53%, 64% and 73%. The engine speed variations in torque and power testing are 4500 RPM, 6000 RPM and 7500 RPM, while the rotation value in emissions testing is 6000 RPM. Humidity variations were regulated using a nano mist sprayer, engine performance was tested using a dynotest tool and emissions were tested using a Stargas 898 Exhaust Gas Analyzer. Based on the test, 64% humidity produced the best value where at 6000 RPM engine speed it produced the best power with an increase from the previous value of 72 %. At the same humidity variation, the best torque was obtained at 7500 RPM engine speed, which increased the value from the previous test by 29%. Humidity variations of 64% can also reduce exhaust emissions in 4-stroke petrol motorbikes. The humidity variation of 64% gets the best score because the moderate water vapor content does not significantly affect engine performance so engine performance is stable. The 64% variation produces the best value because humidity levels that are not too high can bind exhaust emissions during the combustion process and suppress emissions that come out.

Keywords: ***Torque, Power, Emissions, Humidity, Engine Speed.***