

Analisa pengaruh perubahan tinggi bukaan katup terhadap kinerja motor bakar otto = analysis of the influence of variable valve lifting to performance of otto internal combustion engine / Fajardo Yoshia

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Abstrak

[**ABSTRAK**]

Sepeda motor merupakan kendaraan yang banyak digunakan saat ini. Sepeda motor menggunakan motor bakar agar dapat dioperasikan dan menghasilkan gas-gas sisa pembakaran, antara lain Karbon Monoksida (CO), Karbon Dioksida (CO₂), Hydrocarbon (HC), dan Oksigen (O₂). Untuk mengurangi produksi polutan tersebut, dilakukan penelitian untuk optimalisasi kinerja motor bakar 4 langkah yang digunakan oleh sepeda motor dengan melakukan modifikasi pada camshaft, yaitu membuat lift bervariasi pada camshaft yang akan digunakan. Tujuannya adalah untuk menghasilkan tinggi bukaan katup yang paling efektif, baik dari segi konsumsi bahan bakar, emisi, maupun daya yang dihasilkan. Dari hasil penelitian, penggunaan camshaft kondisi 1 dengan intake lift 4 mm dan exhaust lift 3.95 mm, efektif digunakan untuk pengoperasian motor bakar pada putaran mesin < 5000 RPM, dengan penurunan kadar CO 42.07%; kenaikan kadar CO₂ 5.58%; penurunan kadar HC 21.63%; kenaikan kadar O₂ 3.54%; penurunan daya yang kecil, yaitu 1.92%; dan penurunan konsumsi bahan bakar 9.95%. Camshaft kondisi 3 dengan intake lift 5 mm dan exhaust lift 4.9 mm, efektif digunakan pada putaran mesin > 5000 RPM, dengan penurunan kadar CO 26.47%; penurunan kadar CO₂ 4.99%; penurunan kadar HC 20,83%; dan kenaikan kadar O₂ 3.17%; penurunan daya yang kecil 2.74%; dan penurunan konsumsi bahan bakar 0.71%. Dapat disimpulkan dengan menggunakan camshaft kondisi 1 pada putaran mesin < 5000 RPM dan camshaft kondisi 3 pada putaran mesin > 5000 RPM, maka dapat dilakukan penghematan konsumsi bahan bakar dan pengurangan emisi gas beracun hasil proses pembakaran secara signifikan.;

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ABSTRACT

A motorcycle is the vehicle that widely used today. To operate this kind of vehicle, motorcycles use internal combustion engine and produces combustion residual gases, such as Carbon Monoxide (CO), Carbon Dioxide (CO₂), Hydrocarbon (HC), and Oxygen (O₂). In order to reduce the production of these pollutants, a research is done for the optimization of the performance of four strokes engine that used by motorcycle, by doing a modification of the camshaft to make variation lift on camshaft. The purpose is to make the most effective opening valve lift, in terms of fuel consumption, emissions, and power generated. From this research, the used of ?camshaft 1? with 4 mm intake lift and 3.95 mm exhaust lift, effectively used for the operation of internal combustion engine below 5000 RPM, with 42.07% decreasing of CO levels; 5.58% increasing of CO₂ levels; 21.63% decreasing of HC levels; 3.54% increasing of O₂ levels; little reduction of power for 1.92%; and fuel consumption decreased of 9.95%. The use of ?Camshaft 3? with 5 mm intake lift and 4.9 mm exhaust lift, effectively used for the operation of internal combustion engine above 5000 RPM, with 26.47 decreasing of CO levels; 4.99% decreasing of CO₂ levels; 20.83% decreasing of HC levels, 3.17% increasing of O₂ levels; little reduction of power for 2.74%; and fuel consumption decreased 0.71%. In conclusion, by using the ?camshaft 1? below 5000 RPM and ?camshaft 3? above 5000 RPM, we can

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