

**THE EFFECT OF RESISTANCE COIL ON THE PERFORMANCE
ENGINE 4 STROKE OF SUZUKI SATRIA FU 150**



Submitted As Partial Fulfillment of the Requirements for Getting Bachelor
Degree of Engineering in Mechanical Engineering Department

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**MECHANICAL ENGINEERING DEPT. INTERNATIONAL PROGRAM
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Supervisor of Final Project


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VALIDATION PAGE

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**Has been defended in front of examiners team
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Thursday, 03 November 2016
and has been fulfill of the requirements**

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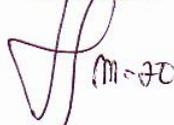
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Surakarta, November 2016

Researcher



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Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui perbedaan daya dan torsi yang dihasilkan sepeda motor 4 langkah dengan 3 koil diberikan variasi hambatan, koil 1 dengan 8.63 k Ω , koil 2 dengan 7.16 k Ω , koil 3 dengan 3.12 k Ω . Penelitian ini menggunakan metode eksperimental, dengan menggunakan sepeda motor Suzuki Satria fu 150. Penelitian data dilakukan dengan pengamatan langsung kemudian disimpulkan dan hasil penelitian dimasukkan ke dalam tabel dan grafik. Percobaan menggunakan perangkat dinamometer untuk menemukan daya dan torsi. Hasil penelitian menunjukkan ada perbedaan daya dan torsi oleh tiga koil. Daya maksimum dihasilkan oleh koil 3 dengan 8,05 Hp, sementara daya minimum dihasilkan oleh koil 1 dengan 5.1 Hp. Torsi maksimum dihasilkan oleh koil 3 dengan 12,99 Nm, sedangkan torsi minimum dihasilkan oleh koil 1 dengan 4,8 Nm.

Kata kunci: Hambatan koil, torsi, dan daya.

Abstract

The purpose of this research were to knew the differences of power and torque output of four stroke motorcycle which given coil resistance variances between coil 1 with 8.63 k Ω , coil 2 with 7.16 k Ω , coil 3 with 3.12 k Ω . The research used experimental methods, given to a Suzuki Satria fu 150 motorcycle. Output data research analyzed by direct observation experiment output data then concluded and determinate output data research into table and graph. The experiment used dynamometer device to found the power and torque. The research result showed there were differences power and torque by three coil. The maximum power output obtained at coil 3 with 8.05 Hp, while the minimum power output obtained at coil 1 with 5.1 Hp. The maximum torque output obtained at coil 3 with 12.99 Nm, while the minimum torque output obtained at coil 1 with 4.8 Nm.

Keywords : Coil resistance, torque, and power.

1. INTRODUCTION

Vehicle are one of transportation, need the engine to the starting machine, which is an energy conversion machine that converts heat energy into mechanical energy. With the heat energy as a producer of energy then it should require fuel and combustion system as the heat source.

One treatment to improve engine performance and exhaust emissions is Improved the quality of combustion of fuel in the combustion chamber.

With the increasing user of motorcycles, so there are many people who want the engine performance is increased without decimate efficiency, the reason for this is also done by the mechanics in the process of generating maximum power on the machine. There are some things you can do that is by mixing or use the fuel as well as the ways to improve the internal combustion engine.

With the efforts of attention and complete the parameters that influence, one of them is changing the ignition system, it has the intention that the combustion in the combustion chamber can occur complete combustion, with complete combustion expected performance of the machine can be increased without reducing efficiency on the machine.

Motorcycle is the type of internal combustion engine with a fuel mixture of air and gasoline. The fuel mixture of air and fuel burned by electric sparks generated by a high-voltage spark from the coil. Increase for performance work vehicles, many new innovations that developed such as coils and spark plugs. Plugs and coils Producers said that product can improve engine performance.

From the above explanation making the writer wants to research the effect of replacing coil to torque and power.

How influence resistance coil on the 4 stroke engine performance. That is influence on the torque and power. Based on the problems described above and to avoid irregularities discussion, it needs to make the limitation problems.

Limitation problem that needs to be used in this paper are:

1. The tests be done on a single type of machine that is 4 stroke engine 1 cylinder, using a dynamometer.
2. Do not explain about the specifications in the coil.
3. Air humidity is considered constant and motorcycles are considered standard.

2. RESEARCH METHODOLOGY

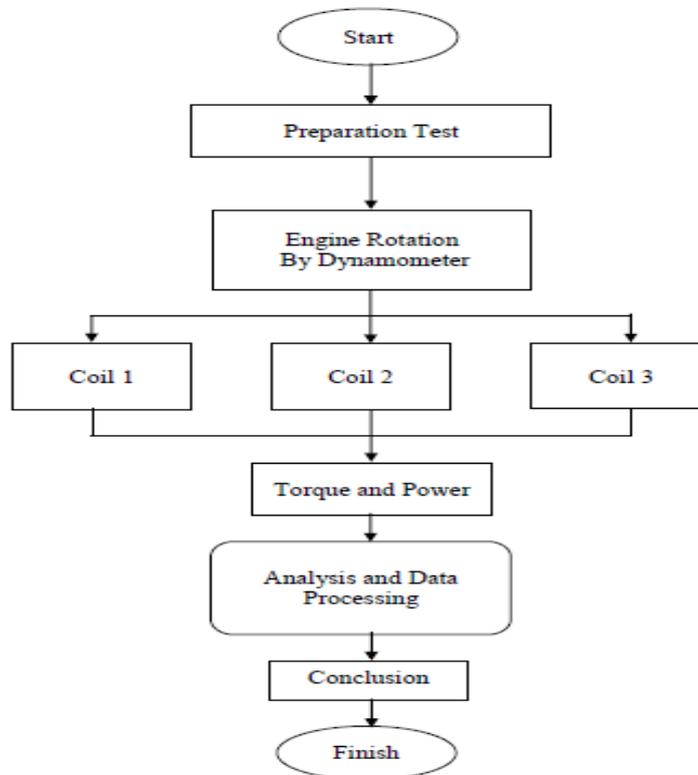


Figure 2. Flowchart Of Research

Scheme of Test



Figure 3. Scheme of Test

Note :

1. Monitor / Computer
2. Blower
3. Motorcycle
4. Dynamometer

3. RESULT AND DISCUSSION

Result of coil

Table 4.1 Variation of resistance coil

Coil	Resistance (K Ω)
Coil 1	8.63
Coil 2	7.16
Coil 3	3.12

Torque

Torque is the turning force generated by the engine shaft. The amount of torque can be measured by using a dynamometer.

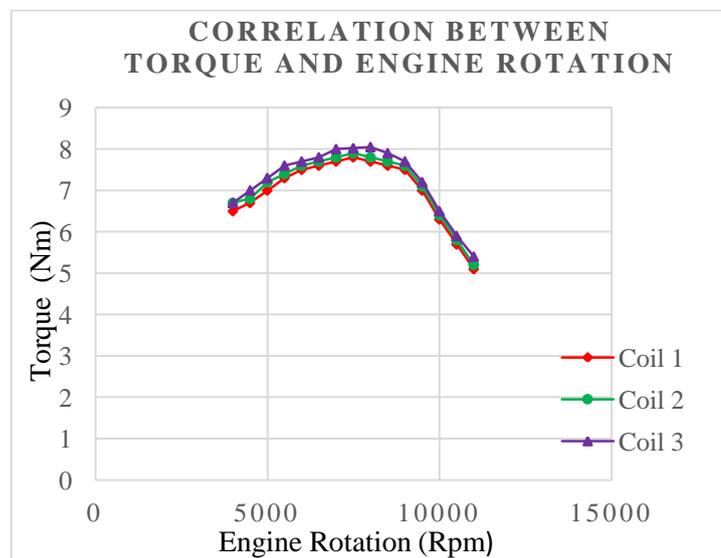


Figure 4. Correlation between Torque and Engine Rotation chart

Based on Figure 4, there is a significant influence on the torque generated on the use of the coil 1, coil 2 and coil 3. At low speed (4000 rpm) the best torque generated in the coil 2 and coil 3 is equal 6.7 Nm, and the lowest torque

generated in the coil 1 that is equal 6.5 Nm. At high speed (11000 rpm) the best torque generated in the coil 3 is equal 5.4 Nm, and the lowest torque generated on the coil 1 that is equal 5.1 Nm.

But, the best torque generated in the coil 3 is equal 8.05 Nm at the 8000 rpm.

In Figure 4.1, can be seen that the use of a coil with small resistance can produce more torque than coil with big resistance, it is because the good system ignition that will result in the process of burning a mixture of fuel and air in the combustion chamber will be better or more rapid fire. Torque generated by the engine also affect to the power generated. On machines that use a low resistance coil tend to be more responsive or more rapidly in the combustion process that produces torque continues to increase.

Effective Power

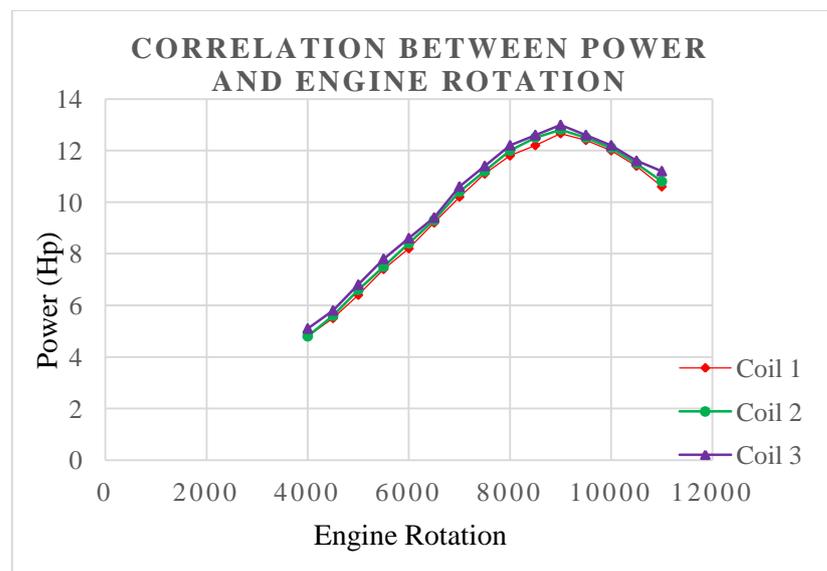


Figure 5. Correlation between Power and Engine Rotation chart

Based on Figure 5, there is a significant influence on the power generated on the use of the coil 1, coil 2 and coil 3. At low speed (4000 rpm) the best power generated in the coil 3 is equal 5.1 Hp and the lowest power generated in the coil 1 that is equal 4.8 Hp. At high speed (11000 rpm) the best power

generated in the coil 3 is equal 11.2 Hp, and the lowest power generated on the coil 1 that is equal 10.6 Hp.

But, the best power generated in the coil 3 is equal 12.99 Hp at the 9000 rpm.

The power produced by the engine at high speed is greater than the power produced by the engine at low rpm, this is cause the higher engine rotation so the more work steps in the same time.

4. CONCLUSION

Conclusion

From the observations and calculations test “The Effect of Resistance Coil on The Performance Engine 4 Stroke of Suzuki Satria FU 150”, it can be concluded as follows:

1. Torque produced by the engine which uses a coil that has a low resistance better than coil that has high resistance. And the highest torque produced by the engine is uses coil 3.
2. The power generated by the engine which uses a coil that has a low resistance better than coil that has high resistance. And the peak power generated by the engine which uses coil 3.
3. In a research note that machines that use low resistance coil is produce the best engine performance.

Suggestion

From the conclusions of the above, the authors propose the following suggestions:

1. Need to recalibrate for dynamometer testing machine, because the resulting data the less accurate.
2. Need to hold similar studies for different types of motorcycle to another, with variations in engine speed more so that in the end can be given a study whose results have been more perfect for the issue of power and fuel consumption.

3. There should be research on the effect that the torque or power from the higher, as increases in temperatures and pressures on the bike because the temperature rise will affect engine durability.

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