

FINAL PROJECT
POWER ANALYSIS OF GRAND VITARA CAR



**Submitted as a Partial Fulfillment of the Requirements for Getting
the Bachelor Degree of Engineering in Automotive Department**

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2014

DECLARATION OF RESEARCH AUTHENTICITY

I assert verily that the research entitles:

POWER ANALYSIS OF GRAND VITARA CAR

That made to fulfill some of requirements to get bachelor degree of Engineering in Automotive Department of Muhammadiyah University of Surakarta, as far as I know is not a plagiarism of a research that has been published, except the information source that used to solve the problem.

Surakarta, May 2014

Researcher,



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Dr. Tri Widodo Besar Riyadi

MOTTO

[7] Then shall anyone who has done an atom's weight of good, see it! [8]

And anyone who has done an atom's weight of evil, shall see it.

(Al-Zalzalah: 7-8)

The best person is the person who is the most beneficial for others
(Narrated by Bukhari)

Prayer gives strength to the weak, making people does not believe to be
believed and to give courage to those who fear.

(Nasrul Kurniawan)

Our task is not to succeed. Our task is to try, because in trying that we find
and learn to build an opportunity to succeed.

(Mario Teguh)

To live this life, everyone must pay attention from various sides. Each side
should be set so that humans can live properly. If there is one side of the
for gotten, the ultimate goal man would not be achieved perfectly. Only by
setting a true human being can achieve the ultimate goal of this life.

(Haryanto P.O)

DEDICATION

This research paper is dedicated to:

Allah SWT,

Thanks for the best everything that You have given for me and thanks for

Your love that always make me to never give up to do the best.

I believe that You will always give me the best for everything.

My beloved Mom and Dad,

Thanks for your prayer, love and support.

You always give me happiness but often I made you disappointed.

I am sorry and I promise to give you the best in the future.

My all family,

Thanks for your prayer, love, support and everything.

All my friends,

Thanks for your support and love me.

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The writer realizes that this research paper is far from being perfect, so the writer sincerely welcomes any constructive comment, criticism, and suggestion from anyone.

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Surakarta, May 2014

The writer



Cancan Candiana

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LIST OF SYMBOLS

TDC	= Top Dead Center
BDC	= Bottom Dead Center
P	= gas pressure in cylinder (kPa)
V	= volume in cylinder (cm^3)
T	= temperature ($^{\circ}\text{K}$)
W	= specific work (kJ)
r_c	= compression ratio
Q	= heat transfer for one cycle
Q_{HV}	= heating value of fuel (kJ/kg)
η_c	= combustion efficiency (%)
W_{nett}	= Work of one cycle (kJ)
V_d	= Volume displacement (m^3)
W	= Work of one cycle
P_{θ}	= Pressure angle (kPa)
F_p	= Force (N)
P_{mep}	= Mean effective pressure (kPa)
A_p	= Area of piston (m^2)
l	= Stroke (m)
r	= radius of crank (m)
F	= force (N)
ℓ	= lever length (m)
T	= Torque (Nm)
P	= Power (kW)
n	= Engine rotation (rpm)

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ABSTRACT

Cancan Candiana. D200 090 203, "Power Analysis of Grand Vitara Car" Muhammadiyah University of Surakarta 2014.

The objective of this research is to know the power engine of Grand Vitara Car. Research uses engine 2.0 liters. Use calculation analysis to know that power of Grand Vitara Car.

The first step to start calculate we collect all the data engine of Grand Vitara Car, diameter of bore, length of stroke, volume of cylinder, and fuel used. After all the data has been collected. Then begins the process of calculation fuel decomposition, pressure, torque, and power.

The calculation of the engine analysis of crank angle and pressure, that at crank angle 15° until 180° , the pressure table show is decreased, the engine analysis of crank angle and force, that at crank angle 15° until 180° , the force table show is decreased, the engine analysis of crank angle and torque, that at crank angle 15° until 30° , the torque show is increased, and at crank angle 45° until 180° , the torque show is decreased.

Key words: pressure, power and torque.