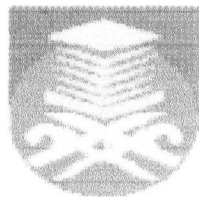


REV LOGGER AND COUNTER FOR AUTOMOBILE ENGINE MONITORING

**This thesis presented in partial of fulfillment for the award of the
Bachelor of Electrical Engineering (Honours)
UNIVERSITI TEKNOLOGI MARA**



MOHD ZAIRI BIN HARON
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 Shah Alam
Selangor Darul Ehsan
APRIL 2001

ACKNOWLEDGEMENT

In the name of Allah, the most Beneficent and the Most Merciful, I would like to express my grateful to Him for giving me a strength, patience and ability to complete this project report as it is today.

First of all, I would like to express most sincere gratitude to my supervisor, Encik Ahmad Jamal Bin Salim for his concerned, guideline and kindness to make sure the successful of this project.

I also would like to thank my grateful to En. Mohd Zaidi B. Mohd Yusoff, Head of engine and transmission assembly and to En. Anuar at Perusahaan Otomobil Nasional Berhad for providing information for my project. Last but not least, to all my friend for their moral support.

ABSTRACT

This thesis will bring out the hardware development to count the total revolution and revolution per minute pulses that comes from the primary winding of the car's ignition coil. This two device will be in digital readout display

The digital tachometer can replace the existing analog tachometer, which displays just the average values of the crankshaft's revolution.

The rev logger is the new invention for automobile indication system since it count the number of crankshaft revolution, thereby give the exact automobile engine's lifetime.

This design can replaces the car's odometer as indication to the total engine running and also for engine's fluid and peripheral that needs to be changed.

The circuit was simulated using Electronic Workbench Version 5.12.

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
	DECLARATION	i
	DEDICATION	ii
	ACKNOWLEDGEMENT	iii
	ABSTRACT	iv
	TABLE OF CONTENTS	v
	LIST OF FIGURES	vii
	LIST OF TABLES	x
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Scope of Work	3
	1.3 Organization of Project Report	3
2	TECHNICAL LITERATURE	
	2.1 Introduction	4
	2.2 Flip flops	4
	2.3 And Gate	6
	2.4 Decoder	8
	2.4.1 BCD to Seven-Segment Decoder	8
	2.5 Timer	9
	2.6 Counter	13
	2.6.1 Asynchronous Counter	14
	2.6.2 Synchronous Counter	16
	2.7 Schmitt Trigger	16

CHAPTER 1

INTRODUCTION

1.1 Introduction

A tachometer is simply a means of counting the engine revolutions of an automobile engine. The engine tachometer uses the ignition signal from the primary winding of ignition coil to indicate the engine speed.

The ignition signal (pulse) is fed to the electronic circuit (digital circuit). Since the number of pulses is proportional to the engine speed, the electronic circuit counts the number of pulses and converts the count to the engine speed.

At present, many automobiles used analog tachometer as indication for engine's running which is inform of pulse per minute. While the digital design display the present exact readings.

The advantage over an analogue meter is a reading that is more accurate since the "needle" is much quicker to react.

The rev logger counts the engine's revolution and this counting allows the car owner to realize the engine condition maintenance purposes such as engine oil, timing belt and spark plug replacement. Usually the engine's conditions are predicted by visualizing the mileage readings, but this is not the accurate performance of the engine, since engine's crankshaft will be in running mode (ideal rpm) even when the car is not traveling any distance.

Once the engine is started, the revolution is at its idling revolution per minute (rpm) which are around 850rpm – 950rpm.