

# **THE FABRICATION OF RC ENGINE MODEL CRANKSHAFT**

MOHD. SHAIRIZAL MOHD. SHAITE  
98500027

KHAIRULNIZAM MD. SAID  
98551590

DIPLOMA IN MECHANICAL ENGINEERING (AUTOMOTIVE)  
FACULTY OF MECHANICAL ENGINEERING  
MARA UNIVERSITY OF TECHNOLOGY  
OCTOBER 2001

## TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	iv
OBJECTIVES	v
1- ABSTRACT	1
2- INTRODUCTION	2
3- DRAWING	5
4- TOOLING	9
4.1 Feedrates and Spindles Speed	9
4.2 Cutting Fluid	10
4.3 Lathe Machine	11
4.4 Drilling Machine	13
FABRICATION	14
5.1 General Process	14
5.2 First Stage	15
5.3 Second Stage	17
5.4 Third Stage	18
5.5 Fourth Stage	19
5.6 Fifth Stage	20
5.7 Sixth Stage	21
5.8 Seventh Stage	22
6- SUMMARY OF THE PROCESS	24
7- PROBLEMS AND DISCUSSION	28
8- CONCLUSION	29
9- APPENDICES	30
10- REFERENCES	35

## ACKNOWLEDGEMENT

Assalamualaikum w.b.t.

First and foremost we would like to express our grateful to Allah s.w.t for the completion of our final project.

We would also like to give a very big thank you to our advisors, En. Zaidi b. Md Zain and En. Nik Rosli Abdullah for their invaluable assistance in giving the ideas and comments. We would also please to express our gratitude to En. Suhaime, En. Rahim Rahman, En. Halim, En. Redzuan and especially to En. Adam Mokhlas for all their guidance and advices. Not forgotten also to our parents, families, lecturers and friends. Thank you for all your support and encouragement.

Finally, we wish to thank all the people who have involved directly or indirectly in the fabrication of this "RC engine model crankshaft". The success of this project is the manifestation of the tenacity and commitment from many people. Without them the outcome of this project would not have been a success.

MOHD.SHAIRIZAL MOHD.SHAITE  
KHAIRULNIZAM MD.SAID

## 1- ABSTRACT

The title of our project is the fabrication of the "RC engine model crankshaft". In this project we need to fabricate a model crankshaft for the remote control engine. The material we use for the fabrication process is the mild steel, as it possesses the characteristics that we need for the machining work. This project begins with the drawings, then continues with the machining process and finally to the preparation of the report. But the concentration will be given on the machining process, as it is the most important part for this fabrication process. For an easy understanding, the machining process is divided into seven stages and in each stage, a detailed explanations of the process was given. Besides the pictures given in every stage, several pieces of photographs are also provided to give a clear view of the machining works. In this project, the application of the machines such as the lathe and drilling machine is a must as a mean to achieve our mission. Besides that, other equipments which are also important are the vernier caliper and the ruler. They are used for the measurement purpose. Due to several problems, we have to do the machining process for three times in order to get the best product in terms of its quality and the precision of measurements.

## 2 - INTRODUCTION

The letters 'RC' stand for the words 'Radio Control'. Radio control models may be powered by various means including electric motor, 2-cycle glow engines, 4-cycle glow engines and gas engines. Each have their own advantages and disadvantages and all are widely used by thousands of modelers world wide. Our choice will have to be based on the type of aircraft we must power, the size of our aircraft, the noise limitations of our flying area, the sound we wish our model to have and of course how much we must spend. However the newest form of power for model aircraft are the electric motors. With the vast improvement in NiCad battery technology (reduce size and greater capacity) over the past few years, electric motors have really become a viable means of power.

RC Engines (Fig. 2.1), like full size car engines, have a finite mechanical life. Assuming that the engine is correctly manufactured of three major factors that affect engine longevity are the engine design, engine running condition and the engine maintenance.

The function of the RC Engine crankshaft is the same as used in the automotive field. It is used to change the reciprocating motion of the piston into rotary motion. A connecting rod and a crank pin on the crankshaft make this conversion. The connecting rods connect the piston pin in the piston to a crankpin on the crankshaft. The piston pin allows the connecting rod to tilt back and forth.

The crankpin is an offset part of the crankshaft. It swings in a circle as the crankshaft rotates. A rod cap and bolts attach the connecting rod to the crankpin. They hold a split bearing or a connecting rod bearing in place in the cap and crankpin. A slight clearance allows the crankpin to turn inside the bearing. The clearance is normally filled with oil to prevent metal-to-metal contact.

As the piston moves up and down, the crankpin moves in a circle and the crankshaft rotates. The connecting rod swings to one side so its lower end follows the crankpin. After the piston reaches BDC and starts up, the crankpin tilts to the other side.