



**PULSE JET ENGINE**

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## **ABSTRACT**

As a final year project, the group decided to design, fabricate and test a pulsejet engine. The design was targeted to produce 1.5kg of static thrust. As there is no design guidelines or textbook material regarding pulsejet engine available for reference, it was decided that data of historically functional pulsejet engines was collected and empirically correlated. The data collected include produced thrust, dimensions of pulsejet engine components (viz. tail pipe length, diameter) and valve flow area.

All components were designed and fabricated from sketch. The pulsejet engine was successfully assembled. Testing was carried out using different fuels. The pulsejet failed to ignite with kerosene and gasoline due to the difficulty in getting the correct proportion of air: fuel mixture. Subsequently, liquefied petroleum gas, LPG was selected based on its wider flammability limits.

After repeated toiling with different design parameters such as reed valve design and valve retainer angle, the pulsejet engine finally successfully started.

However, the engine can only run continuously under constant supply of air from a vacuum cleaner. This can be sustained for about 15 to 20 seconds before the front of the engine caught fire. This was due to leakage or wear from the reed valve to the mixing inlet cone of the engine.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction of pulsejet engine

Pulsejet engine is the simplest form of a jet engine that creates pulsate gases in order to produce thrust. Once, pulsejet is widely used in WWII to launch missiles. Nowadays pulsejets are mainly used in model airplanes, though some experimenters continue to work on improved designs.

The pulsejet engine has become famous recently because of its reliability. Today, NASA is reported that they have been involved in pulsejet engine development. They planned to maximize the jet power by placing the pulsejet engine around the main jet so that the hot gases around the main jet can be utilized by pulsejet engine. They are also planned to design a pulsejet engine that can speed up to 3 Ma.

In Malaysia, pulsejet is a quite new thing because of its limited application but there is some that already apply this engine for their model airplanes. Researches should be done to introduce pulsejet engine in Malaysia because pulsejet engine can be applied in many fields.