

CHAPTER I

INTRODUCTION

1.1 Background

A thermostat is a component which senses the temperature of a system so that the system's temperature is maintained near a desired *setpoint*. The thermostat does this by switching heating or cooling devices on or off, or regulating the flow of a heat transfer fluid as needed, to maintain the correct temperature. Thermostats are used in any device or system that heats or cools to a setpoint temperature, examples include building heating, central heating, air conditioner, HVAC system, as well as kitchen equipment including ovens and refrigerators and medical and scientific incubators.

A thermostat is often the main control unit for a heating or cooling system, through setting the target temperature. Thermostats can be constructed in many ways and may use a variety of sensors to measure the temperature, commonly a thermistor or bimetallic strip. The output of the sensor then controls the heating or cooling apparatus. A thermostat is most often an instance of a "bang-bang controller" as the heating or cooling equipment interface is not typically controlled in a proportional manner to the difference between actual temperature and the temperature setpoint. Instead, the heating or cooling equipment runs at full capacity until the set temperature is reached, then shuts off. Increasing the difference between the thermostat setting and the desired temperature therefore does not shorten the time to achieve the desired temperature. A thermostat may have a maximum switching frequency, or switch heating and cooling equipment on and off at temperatures either side of the setpoint. This reduces the risk of equipment damage from frequent switching.

When the diesel engine gas temperature up to about 1800 °C, to make direct contact with the gas cylinder head, cylinder liner serious heat, pistons, valves, fuel injectors and other components. Severe heat can cause: ① mechanical properties of materials decreased, resulting in greater thermal

stress and deformation, leading to the above components fatigue cracks or plastic deformation; ② undermine the normal gap between the moving parts, causing excessive wear, or even bite each other dead or accident damage; ③ parts around the combustion chamber temperature is too high, the intake air temperature increases, the density decreases, thereby reducing the amount of intake air; pressurized air temperature will rise and affect the amount of intake air; ④ lubricants the temperature is gradually increased, viscosity decreases, the friction surface is not conducive to the formation of the film, and even loss of lubrication. In summary, in order to ensure reliable operation of the diesel engine must be heated diesel engine parts, oil and pressurized air and the like for cooling.

However, from the point of view of energy use, cooling diesel engine is an energy loss will result in excessive cooling of fuel ignition delay period is extended, resulting in incomplete combustion and detonation, plus increased heat loss; parts inside and outside temperature difference is too large, so that the thermal stress the strength of the material over itself and cracks, oil viscosity becomes large increase friction power consumption; at higher fuel sulfur content of heavy oil, will produce low temperature corrosion, cylinder liner so severe corrosion. Therefore thermostat process design and fixture design and processing has become the core of the problem.

1.2 Problem Statement

Problem of statement that can be drawn in this case is how to create a program which able to help student to study CNC Machine, it mean that the program should be able to calculate and simulate the and make thermostat it easy to understand.

1.3 Problem Limitations

To keep from being out of the discussion and make it more focused on issues discussed. it should be limited in this study. Those problem are :

1. Discusses the tools used in the manufacturing process thermostat.

2. Studying the creation flow thermostat.
3. Cnc machine used is 4 axis cnc machines, use CJK6032A horizontal CNC lathes and vertical CNC milling machine ZJK7532A.

1.4 Objective Research

Based on the background and the problem statement in this report, the objective of this research are:

1. To detection of tool failure that occur in surface-rough processes by Three Wave System soft. Simulation before operation.
2. To determine the best feed rate and cutting depth for effective processing.
3. To find out the correlation of spindle speed, feedrate and cutting depth for consideration of next production

1.5 Benefit

Benefits of this research was completed after an intensive search are:

1. Understand the processes required to make a thermostat using 4 axis cnc machine.
2. Minimize human error in conducting the program on cnc machine, thus reducing disability in the workpiece

1.6 Writing Systematics

To serve what is the main goal, so the readers can be guided into the same understanding of the writer, this papers has systematically shown in a structure below:

1. CHAPTER I INTRODUCTION

Consists of background that trigger the writer take this research, problem statement and its limitations, also the main objectives of the writer do the research until the benefits of this research.

2. CHAPTER II LITERATURE REVIEW

Derived into the mentioned several relevant researches and the explanation of the basic theories that will used in this research.

3. CHAPTER III RESEARCH METHODOLOGY

Explain how the writer done the research and collecting data with particular tools and materials.

4. CHAPTER IV RESULT ANALYZE

It will show us the research representations, and explain the advantages and disadvantages during the research.

5. CHAPTER V CONCLUSION

This last chapter performs the conclusions of this research and also gives some recommendations for further works.