# **ECOR 1010 – Introduction to Engineering**

**reverse engineering project**

**Project Title**

**The “Thumb Hook Pin”**

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# abstract

The part that will be reversed engineering is a thumb pin that we have named “Thumb Hook Pin”, because of the added hook function. Our whole group went to Home Depot to see the original parts and we based our dimensions on the existing model, expanding and enlarging certain areas as we saw fit. It is a multi-functional part for user; they could pin objects to the wall along with hanging a key chain, lanyard, bag, headphones, jacket, etc. This will not only save space but also be a fast easy way to grab the essential things you need by putting it on the “Thumb Hook Pin”. But there is draw back, which is the weight of an object that you put on the hook. If the object is too heavy the part might tear the dry wall or even worse come out of the wall. But we reinforced it with four pins that go into the wall and a square base that goes flush against the wall; gives it more support so the amount of weight the hook can withstand is a lot more. By making the pins out of metal it can go into the wall with ease, the rest of the part is made out of plastic for a sleeker design look and a costly efficient way of mass producing the part. The dimensions for a regular thumb tac is about 0.5 inches for height and 0.5 inches for the width. The dimension for a regular hook is roughly 2-3 inches for the height and about 0.3- 0.4 inches for the width. For the Thumb Hook Pin, the dimensions are 2.8 inches for the height and 1.7 inches for width.

# Introduction

The piece of reversed engineering project that we will be undertaking is a thumb pin with an added hook at the end, and the name for this remodelled piece is the Thumb Hook Pin. It serves as a multi-purpose component, which allows the user to pin the thumb hook into a cork board and use the hook part to hang anything the user desires. Some examples that the user can put onto the hook are a pair of headphones, lanyard, or any other type of cables. There will be manufacturing material discussed, the materials used for making the redesign object, along with manufacturing process which is making of the part. A key component of any part is finding the failure mode, and the benefit of making this redesign thumb hook pin. At the end of the report we should have an understanding of the purpose of why this redesign part is important as well as crafty new invention.

# Method

The different shapes that are part of the “Thumb hook pin” just hold the structure of the whole part together. The original thumb pin consisted of no hook and one pin that goes in the wall, the added features is four added pins, a hook, a wider head and lengthen the length and diameter of the part as a whole. The added hook, the four thin pins and square base redefines the object and strengths it, and is the main structure of the redesign portion and gives the part more reasonably useful function.

# Results

Had to find the dimensions so the whole group when to Home Depot and looked for the original parts and based our dimensions off of the existing models. The Thumb Hook Pin will consist of two materials, it will be 80 percent plastic and 20 percent of it will be iron, the head and the body of the Thumb Hook Pin will be plastic and the 4 points will be iron. The process of mass producing the Thumb Hook Pin, so that it is cost efficient will in tail a moulding machine that moulds the plastic part, which is the body, and then will go through an iron machine that will attach the four thin iron pins on the bottom of the plastic part of the Thumb Hook Pin.

# Discussion

A major failure that this thumb hook pin has is a weight limit. When the part is placed on the wall and if an object is placed on the hook of the thumb hook pin is overly heavy, the thumb pin may start to bend then break from the wall. The four thin pins that go into the wall is short, so it may not hold as strong if again you place a heavy object on the part. The values and benefits achieved by redesigning, is that it has another component to the thumb pin which makes it multi-purposeful. The hook, larger head, and four points that stick into the wall make this thumb hook pin stronger and more useful. The four thin pins make it strong when placed on the wall. The bottom square shape that the pins are attached to makes it sturdier when it needs to hold heavy objects. The head is the part where the hook is attached to making it wide to distribute the force of pushing the part into the wall.

# Conclusions

To conclude, the redesign object is thumb pin that is reasonably named “Thumb Hook Pin” that was chosen has a lot of upsides then defaults such as the four steal pins that go into the wall for stronger support oppose to the single pin. Finding the failure mode and the benefit of making this redesign thumb hook pin is very important for the integrity and life of the part, because it can tell us where to improve on the part and which places it needs to be reinforced.

# intellicad Drawing

# CREO rendered solid model