

Design and Develop Portable Silent Air Compressor

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ABSTRACT

The an ending learning of motorcycle small engine servicing NC II is up grading facilities and instructions in the field. Trainers and learners of motorcycles repair need to address the observe problem in overhauling the engine of a motorcycle, some mechanics are suffering from back pain, muscle pain and many other due to in appropriate position and elevation of what they are doing. The challenge of the demand is to develop a movable overhauling stand to address the ergonomically problem. Movable overhauling stand is very useful and reliable in dismantling/assembling and demonstrating overhaul motorcycle small engine. Its main purpose is to hold, move and contain oil spill through gutter going to oil container and strain small parts from engine oil, it is elevated onto its ideal height to repair.

The main objective of this study is to develop an overhauling stand which will be an aid for training purposes in Motorcycle/Small Engine Servicing NC II. Its aim to: a) Design low cost and affordable equipment that is needed in the training; and b) Validate the design, construction, functionality, relevance and safety aspects of the innovation.

Keywords: *Fridge motor, air tank pressure switch, Training Equipment Layout, pressure gauge, table roller, gate valve.*

A. INTRODUCTION

Third world countries like Philippines is left behind in the used of modern technologies however Filipinos are resourceful to find ways to make their work easier by innovating equipment that are cheap but engineered. On the other hand, mechanics and trainees of motorcycles small engine servicing need equipment to make the job systematized and precisely delivered. They need well-found tools and equipment to do their works accurate and meaningful, certain tools that safe and echo responsive. For this reason the challenge of the un stoppable manufacturing of motorcycle is to develop a portable and silent air compressor. Portable and silent air compressor is price-less and consistent in repairing motorcycle fuel system. . Its main purpose is to clean dust on parts, inflating motorcycle tires and other function to repair

B. METHODS

1. Project Design

The design of Portable silent air compressor was formed in order to get by with the demand in cleaning fuel system on present time to adapt increasing unit of motorcycles, to happen with manageable machine and tools for repair, convenient, movable, transportable and efficient. Instead of a high cost and heavy to use air compressor, that requires difficult physical power, the proponent created a design that is portable, run smoothly machine and easy to use.

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2. Project Development

Preparation of Materials Needed

Parts and materials are necessary to fabricate the Portable silent air compressor were carefully studied and assemble to emanate with efficient, convenient, practical and user-friendly equipment. Quality part materials were carefully chosen including the manufacturer brand actually to assemble such quality Portable silent air compressor capable to its uses.

Quantity	Unit	Item description	Unit cost	Total cost
1	Pc	Empty shell Fire extinguisher	150.00	150.00
1	Pc	Surplus refrigerator compressor	800.00	800.00
2	Pcs	Roller hinge 3"dia of 2	150.00	300.00
2	pcs	1/4 inch dia. T coupling	35.00	70.00
4	Pcs	1/4 nipple pipe	30.00	120.00
2	set	Flaring nut (male and female)	70.00	140.00
1	pcs	¼ gate valve	80.00	80.00
1	pc	Steel tube @ ¼ dia. X 60mm	100.00	100.00
1	Pc	Blow off valve @1/4 dia.	120.00	120.00
1	pc	Pressure switch	350.00	350.00
1	pc	Pressure gauge	130.00	130.00
½	kg	Welding rod	60.00	60.00
1	qrt.	Epoxy primer gray	150.00	150.00
1	Qrt.	Acrylic paint green	250.00	250.00
1	set	Air inflator nozzle w/ coil type hose	1200.00	1200.00

The table presents the different materials needed in order to manufacture in constructing the Portable silent air compressor and the corresponding cost per material part. The table also involves that the constitution of the project as durable and heavy-duty since it is made out of steel and quality materials. Specific and detailed costing was made to really analyze not only the material but also the cost of the material to measure whether it is cheap or not.

The over-all cost of the construction of portable silent air compressor will have a total of Php. 4,020.00. With a kind of materials used in the fabrication of the compressor from quality durable steel, foldable and easy-to-use and capable of lifting motorcycle up and down, the price cost of the project can be reciprocated by the investment return as to the function, purpose, technology and advancement as an effect in return.

Constructing the Portable silent air compressor

In constructing the Portable silent air compressor, precise consideration and honest execution in the fabrication of the Portable silent air compressor plan was given and followed to create the innovative project. Joining and controls were checked for guarantee of durability of the movable Portable silent air compressor and safety of the user and the motorcycle units for repair.

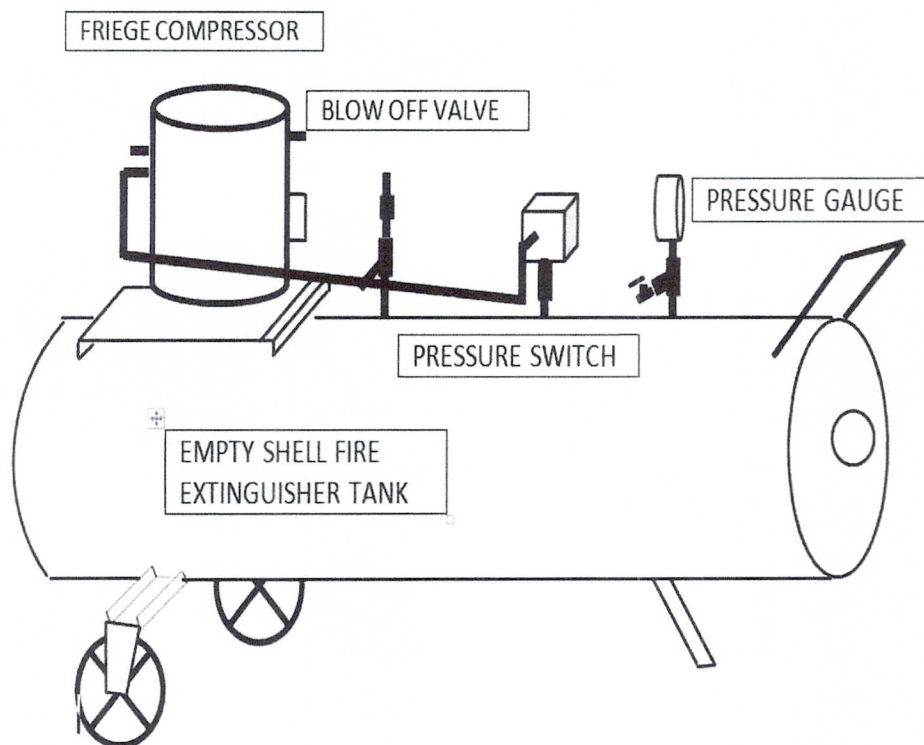


Figure 1. Design of the Silent Air Compressor

3. Operation and Testing Procedure

Standard procedure of the fabricated Portable silent air compressor is the checking whether the design was honestly followed by testing the efficacy and application of the said equipment to actual motorcycle unit repair. Recording plays a vital role in order to formally document in the testing of the durability, safety, and ability of the fabricated product equipment.

Repeated, continuous and constant testing application of the said Portable silent air compressor in the repair of motorcycle units especially in inflating tires, cleaning small holes of the carburetor and blowing dust of the different surface of a motorcycle and the capacity of the equipment to sustain and maintain motorcycle engine for repair shall be thoroughly exercised and monitored in the testing of the equipment.

C. RESULTS AND DISCUSSION

1. Project Description

Portable and silent air compressor is price-less and consistent in repairing motorcycle fuel system. . Its main purpose is to clean dust on parts, inflating motorcycle tires and other function to repair.

2. Project Structure

The project has been designed by the researcher. During the construction, the students of MSES assisted and most of the fabrication was performed by the researcher. The materials was purchased by the researcher and some were just taken from the scarp materials in welding.

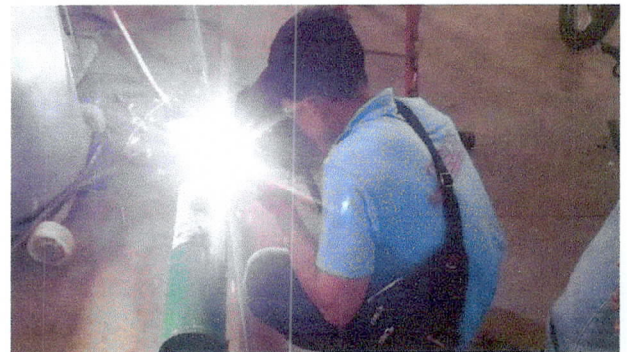


Figure 2. *Project Actual Appearance*

3. Project Capabilities and Limitations

Load Capacity

During the testing, the respondents have stated that the project could be long-lasting since it is made out of steel and quality materials. Though as of today, the project is still under observation, measuring the consistency of its durability and functionality.

4. Project Evaluation

With the kind of materials used in the assembly of the compressor from quality durable steel, movable and easy-to-use and capable to move, carry and contain air pressure 1 , the price cost of the project can be reciprocated by the outlay re occurrence as to the function, purpose, technology and improvement as an outcome in return. It can also be replicated and greatly produced for promotion and be available for the community, peticularly to the industry partners.

D. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The project was design and studied carefully and materialized to its function. This friendly simple machine was easily stimulated, very energy efficient and can be operated economically. For maximum compressor performance and extended life however users should practice regular and careful maintenance beginning by routinely changing oil and checking leaks.

Recommendations

Based on the persistence and outcome of the project, here are some recommendations:

1. Permissible and trade papers must be secured for manufacturing and commercial operations.
2. Product must be patented.
3. Arrangement and publication of the study must be done.
4. After scientific, legal and business required papers were met, funding for massive reproduction of the product must be provided.
5. Market announcement, linkage, and promotion must be done to make known the product to public.
6. Advertising must be carefully studied and have strong linkage with motor companies and corporations.
7. Continuous research must be maintained to develop more the product.

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