

# Re-Assimilation and Reuse of Industrial Scrap Mechanical Components to Design and Fabricate the IDOL of VISHWAKARMA by Primary Manufacturing Processes, Mainly Welding

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## Abstract

This project demonstrates the successful reusability of various mechanical parts. From the design process to the fabrication and assembly stages, each step was executed with precision and attention to detail. The use of recycled and worn-out also showcases the importance of sustainability and resourcefulness in engineering. Overall, this project serves as a testament to the creativity and innovation skills that define a major part in the field of mechanical engineering.

**Keywords:** Metal Fabrication, TIG Welding, Arc Welding, Shielded Metal Arc Welding (SMAW), Welding, MIG welding.

## 1.0 PREFACE

At the inception of the month of September 2022 students of the 3rd year Mechanical Engineering Department, Techno Main Salt Lake approached with the idea to assemble and fabricate different industrial used and worn-out mechanical components to design and fabricate the idol of VISHWAKARMA who is considered as the divine architect of the Universe and commonly worshipped in every small and large-scale industry of India and especially in West Bengal.

## 2.0 PROJECT INITIATION

After the official letter was forwarded by the Head of the Department, Mechanical Engineering; the 3rd year students of Mechanical Engineering, Techno Main Salt Lake were permitted to carry out their project activities in the Mechanical Workshop premises from 7th to 16th September 2022 after the scheduled class hours of the college in presence of the project coordinator.

## 3.0 OBJECTIVE OF THE WORK

The main objective of the project work is to learn and acquire a skillset in most of the commonly used manufacturing processes such as fitting, machining, welding, carpentry, sheet metal operation, casting etc. These are available in the mechanical workshop of Techno Main Salt Lake so that it enables the students to have proficient skills in many areas of

manufacturing technology which will provide them with extra mileage in their industrial or professional careers in days to come. On the other hand, the main idea is also to interconnect technological ideas with art, aesthetics and mythology all inculcated into one.

## 4.0 WORKING PROCEDURE

The whole assembly of the body parts along with the base unit is divided into the following sections:

### 4.1 Head

The head unit is first sculpted by the students as a clay pattern made out of plasticine clay which is further used as a pattern to create a mould cavity in the green sand mould. The mould cavity is further filled up with liquid aluminium and solidified to create the actual face of the Idol. This cast product (head) is further clamped by the fixture with the help of a nut and bolt joint and welded thereafter by Shielded Metal Arc Welding. The hair of the idol is represented by a small part of the chain drive used in two-wheelers.

### 4.2 Chest and Abdomen

The chest along with the abdomen portion is joined together with worn-out gears of bi-cycle of similar pitch circle diameters which are welded together by the Shielded Metal Arc Welding process.





### 4.3 Arms

The arms are connected to the side of the chest part by gears which are connected by worn-out TMT bars by the SMAW welding process. The muscular element is created by sheet

metal covered around the rods with the help of Spot Welding operations. Wastage spark plugs of IC engines are welded to the worn-out footrests of bi-cycles connected by welding. These resemble as fingers and palms of the idol respectively.



#### 4.4 Legs

The legs are made of silencer pipes of bikes welded on the base unit and welded above the chest portion by the SMAW process. The shoes are made of sheet metal spot welded to resemble a

“kolhapuri” shoe design. The silencers are covered with sheet metal to resemble as dhoti of the Idol. The whole body along with the leg unit is permanently assembled together by the SMAW process and also welded to the Circular base plate made out of mild steel.



#### 4.5 Vahana (Elephant)

The face of the Vahana (Elephant) is represented by using a cut-out portion of the tank of the Bike done with hand grinding

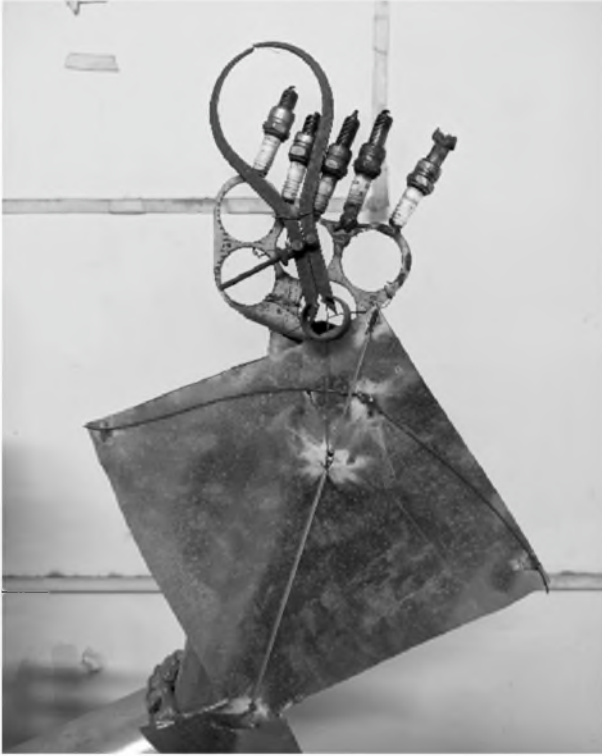
operation. The nose of the Vahana is used as a scrap of silencer pipe welded by SMAW on the fuel inlet of the cutout portion of the tank used.



#### 4.6 Weapons

The worn-out hand tools of the ME workshop such as scribe, Try-square, etc. are used as weapons to enhance the

aesthetics of the Engineering study; even the kite used here is made of sheet metal on which fillers of GTAW weld is used by the spot-welding operation.



#### 4.7 Base Plate

The base plate used here is a scrap cover of a water tank made out of iron.

#### 5.0 CONCLUSION

By making this project, our team knows the importance of teamwork. It got a very minimal time of 4 days, without teamwork this was not possible at any cost. Although the team faces many small difficulties like choosing the right parts and using the right welding electrode diameter, for which the welded part was not strong or easily molten in the welding time. With the help of honorable teachers and teammates, the problem is solved in no time after overcoming all the difficulties and with the help of everyone. The **VISHWAKARMA IDOL** has been made quickly. As a mechanical engineer, it is most important to identify the problem and rectify it and work as a team. After all, teamwork makes the dream work. and this is a dream work.

#### 6.0 IMAGE OF THE PROJECT VISWAKARMA

