CHAPTER 3

METHODOLOGY

3.1 Planning and reverse engineering

A briefing is given by the person in charge of the air-hybrid ATV to introduce the job scope. Some design of the part of the suspension system are given. Planning for the work progress is important to work more systematically and more efficient.

Reverse engineering is done by study on double A-arm suspension system and the design given by the person in charge. The suspension system should attach on the chassis of the air-hybrid ATV to ensure that the suspension system could function. Thus, we measured and decide the location of the suspension system. The design of the double A-arm is modified based on the result.
3.2 Materials and tool preparation

For the front suspension system, most of the part is customize for the ATV chassis. So, it is important to prepare the material needed. Some simple calculation is done to estimate the amount of materials needed the type of material. Solid stainless steel bar is prepared for the brackets, hollow round stainless steel is prepared for the A-arms, and solid round mild steel is prepared for shaft and joints. Some part of the suspension system which is too complicated to be fabricated is bought and standby for assembly. This includes the absorber and bearings.

Based on the planning, tools are prepared based on the type of fabrication use. The tools prepared include angle grinder, welding machine, lathe machine, bench saw, milling machine and sand blast machine. The preparation made is to ensure that the fabrication process goes well and smoothly.
3.3 Fabrication

In fabricating the double wishbone suspension system, various type of fabrication method is used to fabricate the parts of the suspension system. This includes cutting and grinding, lathing, welding, cutting solid metals, drilling and sand blasting.

Cutting and Grinding

Angle grinder (Figure 3.1) is used to cut hollow round stainless steel for the A-arms. The hollow steel is cut according the dimension of the design before it is weld together as a A-arms. The brackets (Figure 3.2 and Figure 3.3) are cut from stainless steel bar by using angle grinder. Notching is done so that it can fit the round steel hollow.

It is also used to grind off the chips result by cutting. The excess weld also grinds by using angle grinder.

Figure 3.1: Angle Grinder