ABSTRACT

Process to make race car sapuangin speed starts from design vehicle as part of drive train, engine, body, vehicle dynamics, control and instrumentation, and chassis. One of the crucial and important factors that affect vehicle safety lies in the chassis. Therefore, the design of the chassis is important in the process of making a formula car sapuangin sapuangin speed. Chassis is a place of attachment of the machine frame, tires, axle, brakes, steering, suspension, and others that need to know fatigue life and the critical point of the piece for the safety of vehicle. In this project, the research procedures performed with several stages that begin with perform analyzes to study the source of literature books, journals, and previous research on fatigue. The next stage is the determination of the car object to be studied, in this case a car that will be examined formula car sapuangin speed for the Formula Student Japan 2013. Then draw a 3D model of a formula car sapuangin speed chassis using solidwork software. The fourth stage is to analyze torsional force and vertical force in the fatigue resulting formula car sapuangin speed chassis then simulated using fatigue tools. The sixth stage is getting the simulation results in the form of life cycle, damage, safety factor, biaxiality indication, and the equivalent alternating stress of formula car sapuangin speed chassis. The results obtained from the fatigue analysis tools are life, safety factor, damage, biaxiality indication, and equivalent alternating stress. Life is a maximum and minimum cycle until failure of a test model. Safety factors are used to evaluate the factors that
secured planning machine elemets with minimum dimensions. If the value of safety factor is less than 1 then there is an indication of failure before reaching the design life. Damage is a comparison between life with available life design. Damage value is greater than 1 then there is an indication of failure before the design life is reached. Biaxiality indication is defined as any indication of biaxial stress. Biaxiality stress indication is the ratio between main stress is smaller with larger main stress where the main stress is close to zero are ignored. Equivalent alternating stress is the stress that occurs in a specimen that have fatigue. Equivalent alternating stress against number of cycles described in an SN (stress versus number of cycle) curve.