Rear Wing(Spoiler)

13.11.2019

Chella Thiyagarajan N
ME17B179
Machine Design Practice
Project Report

Overview

About a third of the car's total downforce can come from the rear wing assembly. The rear wings are the ones that are varied the most from track to track. As the rear wings of the car create the most drag the teams tailor the rear aerodynamic load to suit a particular track configuration.

The basic principle of a formula one wing is exactly the same as with a common aircraft. The greatest difference is the direction air is pressed and how that aerodynamic force is generated. Knowing that an aircraft wing does the opposite of an F1 wing. As air flows over the wing, it is disturbed by the shape, causing a drag force.

Rear wing in race cars increases downforce tremendously and increases corner speed but it also increases drag and tries to slow down the car in straights.

Parts

1. **Rear wing:**

   wing is a device whose intended design is to generate downforce as air passes around it, not simply disrupt existing airflow patterns. As such, rather than decreasing drag, automotive wings actually increase drag.

2. **Rear wing side plate:**

   Endplates are one of the most important aspects of the front wing. The optimization of their position and shape can significantly improve the overall aerodynamics. The endplates have 5-10 times more effective than most other parts. This minimizes the overall drag resistance produced and facilitates the airflow to continue back to the side pods.

3. **Rear wing stand:**

   The basic support system of Rear wing assembly

Tolerances and Fits:

Rear wing aerofoil design must be precise and smooth to make airflow to be laminar rather than turbulent, therefore I have kept tolerances and surface roughness to be low. Rear end plate can have limited tolerances as it guides the airflow. Tolerances much don't matter in rear wing stand.

Materials:

1. Aluminum: For low-cost manufacturing, we can use aluminum to build the assembly.

2. Carbon Fibre: For the purpose of track racing we need our assembly to withstand air pressure and make it extremely weightless to increase the pace of the car aerodynamically.