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DESIGN FOR PERFORMANCE AND REALIBILITY OF A REAR SUSPENSION OF A FORMULA ONE CAR

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ABSTRACT

This keynote lecture focuses on the rear suspension and rear wheel group of the SF71H, the car that Scuderia Ferrari designed for the 2018 FIA Formula 1 World Championship.

The first part offers an overview of the main components of the outboard suspension, in particular wishbones, uprights, hubs, rims and brake calipers.

The second part will treat the main design process for these components, with an introduction on the targets and the constraints of the project, followed by a description of the methodologies that have been used to define the final shapes and technical specifications..

The experimental activity that followed the production of the first parts will be presented to describe in which way the initial target indexes were measured in real components.

The third part will focus on the design of a specific suspension bracket, realized with additive manufacturing process, highlighting the opportunities but also the limitations that characterized this technology on that project.

Keywords: Design, Suspension, Lightweight, Stiffness, Titanium, Additive Manufacturing

Biographical Sketch



Marco Civinelli is Head of Chassis Mechanical Design Dept of Scuderia Ferrari since 2015.

He joined Scuderia Ferrari in 2005 as mechanical design engineer and from 2006 to 2015 he worked as member of the Research and Development group. During these ten years he had the opportunity to be project leader for innovative projects related to various areas of the F1 car, with particular attention for braking system, suspension design, wheel groups, pitstops, hydraulic systems, car launch strategies, following the activities for the concept to car introduction.

The mechanical design group he is currently coordinating has the responsibility of the design of suspensions, brakes system, wheel groups and steering system, working with the target to deliver to the races the best technical solutions, defined as compromise between performance and reliability.