



Finite Element Analysis

How to improve a car's tub.

We're now going to look at a completely different example of a component but still relate its analysis to the 7 step process we used for the hub.

In this case we're looking at the main chassis tub. This is literally the backbone and shell of the car and houses the driver, fuel tank and controls.

The front suspension attaches to it, and the whole rear end of the car, engine and all, is attached to the back. Incidentally the words "chassis," "tub," and indeed "chassis tub" refer to the same part.

The tub is made of a carbon fibre composite sandwiching an aluminium honeycomb core and is immensely strong, protecting the driver in the event of quite major accidents and impacts. Another crucial difference from the hub is that the tub is subject to a range of mandatory safety regulations and tests which apply to all teams' cars.

Thus apart from carrying the working loads there are some additional worst cases in the form of practical tests. Such tests are vital in assessing performance and harnessing data on the properties of the materials used. One reason being that the material properties are not quite as easy to determine as are the hub steel properties.

As with the hub though, we'll be looking at a specific load case for the tub. One which enables the team to compare new designs or modifications from one model to the next.