

MINI WRC TEAM

Press release



Safety Plays a Major Role in Design of MINI John Cooper Works WRC.

Munich, 1st July, 2011. The MINI WRC Team is setting new standards, and for its debut into world rallying has made an important step forward in the safety of its car by designing a ground breaking roll cage.

The MINI John Cooper Works WRC's roll cage has a unique side-impact structure which the engineers from Prodrive believe make it the safest rally car ever. In any accident, be it on the public highway or on a rally stage, a side-impact is the most dangerous, as the distance between the occupants and the point of impact is the smallest. To overcome this, the car has innovative door beams which curve outwards, allowing them to withstand much greater impact forces and to begin the deceleration of the car sooner and over a longer period of time. This significantly reduces the G-forces experienced by the crew.

The MINI WRC Team's Technical Director, Dave Wilcock, explained the simple but very important philosophy behind their work in this area: "The new generation of rally cars are more compact than before, however we wanted to ensure that the crew were safer than ever and also that the car felt as spacious as possible. This brought some unique challenges."

It was in the early days of the project that this work started with the engineers doing an exhaustive study of crash data. "The Eureka moment was the redesign of the side impact protection bars, routing them farther away from each crew member and subtly changing their shape," explained Wilcock. "In an impact, this brings the structure into play much sooner, allowing softer materials to be specified to safely decelerate the crew over a much longer period of time."

The convex curve shape of the door beams allows them to withstand much higher impact forces than traditional straight bars, as well as feeding the loads into nearby welds in a controlled direction, minimising the chance of failure by tearing. The beams are now so far outboard that they pass through the car's B-pillars, to which they are welded, contributing further strength to the structure.

One important factor that helped this part of the project was the strength of the MINI Countryman bodyshell. "For previous rally cars, we have effectively ignored the original road car bodyshell in calculating the design of the roll cage. However, the Countryman is such a strong and safe car that we very much used this to our advantage and integrated it into the roll cage design, reducing the material we needed to add and so saving weight," said Wilcock.

To evaluate how different roll cage joints and welds performed, Prodrive specially prepared more than 50 roll cage joint samples and carried out physical tests on each one to see how each would fail. This led to the complete redesign of many of the joints and the use of a different welding process, as well as the application of a new grade of steel for the cage tubing.



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The team is justifiably proud of its achievement which has come at no cost to the car's performance. Also so safe is the new design that the FIA is now looking to make the unique side impact configuration mandatory in future designs of motorsport roll cages.

Overview of the 2011 FIA WRC Calendar.

Date	Event
10-13 February 2011	Rally Sweden
3-6 March 2011	Rally Mexico
24-26 March 2011	Rally Portugal
14-16 April 2011	Rally Jordan
5-8 May 2011	Rally Italy*
26-29 May 2011	Rally Argentina
16-19 June 2011	Rally Greece
28-30 July 2011	Rally Finland*
18-21 August 2011	Rally Germany*
8-11 September 2011	Rally Australia
29 September-2 October 2011	Rally France*
20-23 October 2011	Rally Spain*
10-13 November 2011	Rally Great Britain*

* participation by the MINI WRC Team

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