



27 Porsches, the Brandenburg Gate, 3,800 crates of beer and part of the FC Bayern Munich stadium help explain how brakes are used on the German circuit.

The German Grand Prix according to Brembo

An in-depth look into Formula One brake use on the Hockenheimring

From 29 to 31 July, the Hockenheimring will be hosting the 12th round of the World Formula One championship.

Situated in Baden-Wurttemberg, the Hockenheimring hosted the German Grand Prix every year from 1977 to 2006 with the exception of 2005. Recently, after being redesigned by Hermann Tilke, it has alternated with the Nurburgring and has only been used on even years - 2008, 2010, 2012 and 2014.

With average lap speeds of over 220 km/h, the Hockenheim circuit is one of the fastest in the championship. The first part of the track is very fast and does not involve much braking. From bend 8 onwards, on the other hand, the track gets more demanding and downforce plays a vital role.

According to the Brembo technicians who have ranked the 21 world championship tracks on a scale from 1 to 10, the Hockenheimring is considered of average difficulty for brakes. The German track has been awarded a difficulty index of 6, the same as the Barcelona and Shanghai circuits.

Brake use during the GP

The drivers use the brakes only 8 times every lap amounting to 19 % of the overall duration of the race. However, in Formula 1, when you don't brake much, you brake very decisively: in fact, average deceleration at the Hockenheim circuit is 3.6 g.

The energy dissipated when braking during the entire Grand Prix is lower than on other tracks - 123 kWh, which is a quarter of the electricity consumed during a football match by the coloured panels of Bayern Munich's Allianz Arena.

From the start of the race to the chequered flag, each driver applies a total force on the brake pedal of 58 tonnes, the equivalent of the weight of 3,800 crates of beer.

The most demanding braking

Of the 8 braking sections on the Hockenheimring, none are classified by the Brembo technicians as demanding for brakes, but 7 are of average difficulty and only one is light.

The most challenging one is the Spitzkehre corner (bend 6) because it goes from top to bottom speed in just a few metres: the single-seaters approach at 333 km/h and brake for 1.49 seconds to drop down to 70 km/h in just 126 metres, the same length as 27 Porsche 919 Hybrids, winner of the 24 Hours of Le Mans.

A huge challenge for the braking system and the drivers who face a deceleration of 4.3 g.

When considering the force applied to the pedal, on the other hand, the highest value (132 kg) is exerted at the Einfahrt corner (bend 2) and at bend 8, even if the braking time is lower because the speed coming into the bend is just over 300 km/h.

The force on the pedal at the Onkokurve corner (bend 12) is also very high: 107 kg which are used to reduce speed by roughly 70 km (from 294 to 225 km/h) in just 62 metres, less than the length of the Brandenburg Gate.

Brembo wins

The single-seaters with Brembo brakes have won the German Grand Prix 19 times, 4 times with Michael Schumacher.

Red Bull and Sebastian Vettel and Kimi Raikkonen, on the other hand, have unbelievably never won at the Hockenheimring.