



880 panettones, 18 coffee machines, Schumacher and Vettel help to explain brake use on the Italian circuit.

The Italian GP according to Brembo

An in-depth look at Formula 1 brake use at the Monza National Autodrome

The Monza circuit will host the 14th race of the 2016 Formula 1 World Championship from 2 to 4 September.

Known the world over as the Temple of Speed, the Monza Autodrome was built in 1922 to host the Italian Grand Prix, which had previously been held at the semi-permanent circuit in Montichiari. In the 1970s, 3 chicanes were introduced to slow the high-performance single-seaters down.

The Monza track puts the braking systems on the single-seaters to the test. The long straightaways and the lack of aerodynamic load, which reduces the possibility of efficiently unloading braking torque to the ground, make the braking sections violent and very difficult to manage.

According to Brembo technicians, who classified the 21 World Championship tracks on a scale of 1 to 10, the Monza circuit is in the category of tracks that present a high level of difficulty for the brakes. This historical Italian race track earned an 8 on the difficulty index, which oddly enough is the same score assigned to the Sochi track, the site of the most recent World Champion race.

Brake use during the GP

Although the top speeds from the 2000s (in 2004 Rubens Barrichello with Ferrari took pole position going an average of 260 km/h per lap) are no longer reached, Monza is still the fastest track in the World Championship: in the qualifying laps the cars go at full gas for 17 consecutive seconds and maintain an average speed of 250 km/h. It is therefore no surprise that the time spent braking is just 13% of the overall duration of the race.

However, almost all of the 7 braking sections are excruciatingly difficult, as proven by the 4.3 g average deceleration, one of the 3 highest in the Championship. The energy dissipated in braking comes to 118 kWh, which is equivalent to the amount consumed by 18 coffee machines continuously dispensing coffee throughout the entire duration of the race. From the starting line to the chequered flag, each driver applies a total load of 40 tonnes on the pedal.

The most challenging stops

Of the 7 braking sections on the Monza circuit, Brembo technicians have classified 4, which is more than half, as hard on the brakes, 2 as presenting mid-level difficulty and 1 as light.

The most challenging of them all is the Prima Variante (curve 1), which the drivers hit after attaining their maximum speed. At this turn, the cars go from over 360 km/h to 82 km/h in 1.65 seconds travelling 159 metres, the same distance as 880 panettones (typical cake from Milan) lying in a row. The drivers are required to make an extraordinary effort: 5.8 g of deceleration and a 177 kg load on the brake pedal.

What is curious is that even before coming out of this chicane, the drivers turn to their brakes, but to a much lesser degree: a load of 24 kg on the pedal and seventy hundredths of a second are needed to drop 5 km/h.

The other abrupt drop in velocity occurs at the Seconda Variante (curve 4): from 343 to 100 km/h in 133 metres, with a load of 163 kg on the brake pedal. Yet in terms of driver deceleration, braking at curves 8 (Variante Ascari) and 11 (Parabolica Curve) go beyond: 5.6 g for the first, 5.5 g for the second.

Brembo Victories

Single-seaters with Brembo brakes have won 22 of the 41 Italian GP races they have competed in. Ferrari won half of these, 5 with Michael Schumacher. Sebastian Vettel took three victories, but not with Ferrari.