



820 slot machines, one-fifth of a skyscraper and 333 durians help to explain brake use on the Asian circuit.

The Singapore GP according to Brembo

An in-depth look at Formula 1 brake use on the Marina Bay Street Circuit

The Marina Bay Street Circuit will host the 15th race of the 2016 Formula 1 World Championship from 16 to 18 September.

Serving as the stage in 2008 for the first night-time event in Formula 1 history, the Marina Bay Street Circuit has continued its use of artificial lighting. Architect Hermann Tilke designed the track to wind around Marina Bay. The first modification to his original design came in 2012, followed by another last year.

The quick pace and the lack of sufficient space to cool down (the longest straightaway measures only 832 metres) makes this circuit one of the most challenging for the braking systems. Wear on the friction material is one of the factors that is constantly monitored every lap by means of telemetry.

According to Brembo technicians, who have classified the 21 World Championship tracks on a scale of 1 to 10, the Marina Bay Street Circuit falls into the category of tracks that present a high level of difficulty on the brakes. The track in Singapore earned a 9 on the difficulty index, the exact same score that the Mexican GP and the Bahrain GP received.

Brake Use During the GP

The 22 curves on the track call for using the brakes 13 times per lap, with a resulting time spent braking that totals 24% of the overall duration of the race. The amount of energy dissipated in braking is also high: a good 144 kWh, which is equivalent to the amount of electricity consumed by 85 inhabitants of Singapore during the race. The extreme winding nature of the track prevents the single-seaters from reaching elevated velocity, which explains the average deceleration of 3.3 g. As a comparison, two weeks ago during the GP race on the very fast track at Monza, the average deceleration was 4.3 g.

From the starting line to the chequered flag, each driver applies a total load of 81 tonnes on the pedal, the same weight as 820 slot machines.

The Most Challenging Stops

Of the 13 braking sections on the Marina Bay Street Circuit, 2 are classified by Brembo technicians as very challenging on the brakes, 5 as presenting mid-level difficulty and 6 as light.

The most difficult by far is the Memorial Curve (the name of turn 7 comes from the nearby monument to the victims of World War II). The single-seaters go from 329 to 100 km/h in just 1.42 seconds, travelling 100 metres to do so, which is the same length of 333 durians (the typical fruit from this country) laid in a row. At this point the drivers are subjected to a deceleration of 5.1 g.

The effort put out by the drivers (4.9 g) and the braking systems is significant on the Sheares Curve (curve 1) as well: the cars' velocity drops from 321 to 128 km/h in 1.22 seconds thanks to a 151 kg-load applied to the brake pedal.

Among the curves that present a mid-level difficulty, worth mentioning is number 14 because of the deceleration that surpasses 200 km/h: 293 to 79 km/h in 121 metres and 1.41 seconds.

The slowest curve is number 8, which is taken at 70 km/h after braking in 92 metres and applying a load of 85 kg on the brake pedal. The shortest curve is turn 3: 56 metres (from 142 to 85 km/h), or precisely one-fifth of the height of the tallest skyscrapers in Singapore.

Brembo Victories

The single-seaters with Brembo brakes have won 6 of the 8 GP races in Singapore. Half of these successes are attributed to Red Bull, but all of them were won by Sebastian Vettel, who managed to win last year as well with Ferrari. Since then however, the manufacturer from Maranello has not won any others.