**Beat: Sports**

# 2017 Austrian Grand Prix - Preview

### Spielberg

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**USPA NEWS -** Toto Talks Austria -

Every great Formula One season is marked by a great rivalry. Last year it was our internal battle between Lewis and Nico and this year it seems that the fight is on between Ferrari and Mercedes and Lewis and Sebastian. As calm as it started, it was only a matter of time until the rivalry would eventually become more fierce and controversial. That moment happened in Baku and we saw the results of that tension on track.

We have moved passed that moment now and it is a closed chapter. The hearing on Monday was between the FIA and Sebastian and it reached the conclusion we have all seen. Our focus since Baku has been on our own shortcomings, reviewing both the design and procedures around our headrest which cost Lewis the win two weeks ago.

There is great respect between Mercedes and Ferrari, two iconic motor racing brands, not only because of the challenging battle on track but because we are pushing for the same goal: to see Formula One flourish. The new owners could hardly have asked for a better start to this new era than this epic battle between Mercedes and Ferrari. Add to the mix a Red Bull team that can win as well and it makes Formula One into a great spectacle.

We have made a step since Monaco in understanding what it takes to make our car perform. The sweet spot is still difficult to find “ “ but we are starting to do so more regularly. Clearly, we are not the only team who took time to understand the combination of the new regulations and tyres “ “ but we are making progress, step by step. And we must continue to do so in the next two weekends to maximise our points score.

It is always special to return to Spielberg and my racing roots. As a young racing driver, I did my first laps at the old Oesterreichring, so the circuit will always be close to my heart. Since those days, Dietrich Mateschitz has invested impressively into the facility and the region and it´s a source of pride for Austria to have this world class circuit in our country.

Happily, it has been positive ground for Mercedes over the last three years. But we cannot rely on our historic success rate in Spielberg because the regulations are brand new. We start again from the ground up on Friday morning and will aim to come out of the blocks well in FP1. In a season as close as this, we have to if we are going to be on the top step at the end of the year.

Featured this Week: Understanding the Hybrid Duty Cycle

The Hybrid duty cycle. It´s a well-known term to those within the confines of Formula One engineering rooms. But outside of those bubbles, it´s not something you´ll often hear mentioned in the paddock. The advent of the Hybrid Formula One Power Unit in 2014 introduced MGU-H, MGU-K and ERS to the F1 lexicon “ “ but “˜Hybrid duty cycle´ never quite went mainstream as turbo power returned to the grid.

The basic principle of the Hybrid system is to utilise the full potential of the energy available from the fuel while harnessing energy from the MGU-H and MGU-K to propel the car around the race track as quickly and efficiently as possible. And it is each team´s job to optimise this combination at every track, so that the car can deploy the harvested energy for as long as possible around a lap while achieving the maximum available power from the ICE.

However, the nature of a lap varies significantly from one venue to the next. Circuit length and layout, quantities of slow and fast corners, altitude and elevation changes, driving style and tyre condition“¦ all of these have an impact on how the Hybrid energy is harvested and deployed. This is what the Hybrid duty cycle refers to “ “ how a car efficiently cycles energy through its ERS system and ICE.

The ERS system itself comprises the two motor generator units “ “ the MGU-K and MGU-H “ “ in addition to the Energy Store and

Control Electronics. Drivers are permitted to harvest a maximum of 2MJ per lap of energy into the Energy Store via the MGU-K, which is measured by FIA homologated sensors as it enters the batteries. Energy can also be recovered via the MGU-H (heat energy from the ICE that would otherwise go to waste). Over a single lap, the maximum amount of energy that may be deployed from the Energy Store to the rear wheels is 4MJ "" which provides an additional 161 hp for approximately 33 seconds per lap.

While drivers are allowed to recover the same amount of energy at every circuit, each track has different power sensitivities, fuel consumption levels and harvesting opportunities. At longer circuits such as Spa or Baku, for example, the necessary harvesting can be completed comparatively easy. On a shorter layout, however, it can be much tougher to complete a full harvest "" and teams must work that bit harder on the efficiency of their Hybrid duty cycle.

Spielberg, the next stop on the F1 calendar, presents one of the toughest of those challenges. The Austrian circuit is very short "" just 4.309km in length "" but also very high on ERS duty. It´s a high power sensitivity circuit, with a low number of corners, multiple straights and several acceleration and braking events "" a configuration that increases fuel consumption. But the real trick here is getting the Hybrid energy system to maximise the harvesting and deployment potential.

In Spielberg, the drivers need to harvest at every opportunity. But they´re deploying it just as regularly. With 33.3 seconds of boost to be used in a 68 second lap, they can take advantage of that extra power for almost 50% of the lap "" if they get it right. And with lap times set to fall yet further under the new regulations introduced for 2017, that percentage will rise yet further.

In the on-track battle, managing this correctly could make all the difference when attacking or defending. The first sector in particular, with the long climb up to Turn 3, is an area for which the driver must ensure they have sufficient Hybrid power to optimise their speed. Too little electrical energy at this point would leave them highly vulnerable to attack.

Furthermore, this particular circuit sits at higher altitude than most which, owing to the low atmospheric pressure, places a different kind of strain on the Power Unit and impacts its overall efficiency. While altitude has a notable effect on baseline ICE performance, electrical power is not adversely affected "" making the Hybrid element of the Power Unit all the more potent and that Hybrid duty cycle all the more crucial.

On a typical lap of Spielberg, the MGU-K and MGU-H are both pretty busy, increasing the ERS duty. As a result, the batteries in the Energy Store get hot, meaning there is an additional cooling requirement to consider too. What´s important to understand here is that each circuit has its own specific requirements and limitations, which is why so much work goes on back at Brackley and Brixworth ahead of each race to ensure that the duty cycle is optimised for that particular Grand Prix weekend.

With the Austrian Grand Prix fast approaching, the team won´t be the only one working to ensure that the Hybrid duty cycle is at least mainstream in the thoughts of those impacted by it. And with the title battle so finely poised and every last detail potentially making that crucial difference, who knows? It might finally get a mention in the paddock after all"¡

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