

A Half Century of Yamaha Motorcycle racing

Moto Column



Road Racing
World Championship
Grand Prix
50th ANNIVERSARY

2000-10 RR World Grand Prix

A change in displacement
and tire restrictions;
the challenges of
new regulations

Vol.

33

2000-10 RR World Grand Prix

A change in displacement and tire restrictions; the challenges of new regulations

To avoid the daytime heat, the 2008 season opening race in Qatar started at 11.00 p.m., the first night race in GP history. Yamaha's Valentino Rossi had his sights set on recapturing the title but, unable to find the right settings to match the new Bridgestone tires, finished in 5th place. Jorge Lorenzo, though, finished an impressive 2nd from pole position in his MotoGP debut. James Toseland and Colin Edwards, both riding the YZR-M1, followed Rossi into 6th and 7th spots and the Yamaha engineering manager showed a glimpse of confidence, commenting that this proved the competitiveness of the new YZR-M1.

In fact, since the previous year when displacement for MotoGP machines was changed from 900cc to 800cc, Yamaha had succeeded in reducing the overall weight of the YZR-M1 (0WS4) racing machine. However, they had still not achieved their target engine performance by the time of the opening round. That year, the season opening Qatar GP was still held during extreme daytime heat that placed a huge burden on the race machines. The low elevation of the Losail Circuit where the race is held has high air pressure, which increases fuel consumption. And to cap it off, the fuel allowance had been reduced by one liter compared with the previous year, down to 21 liters. The team members all had concerns going into the race.

Losail International Circuit 2008



Qatar GP, the 2008 season opener. Riding the YZR-M1, Jorge Lorenzo, James Toseland and Colin Edwards dominated by taking 1st 2nd and 3rd places in the qualifying. While missing out on a win that day it started a train of events that led to Yamaha capturing the triple crown (rider, manufacturer and team titles)

Their premonitions proved true, in the worst possible ways. The speed gap compared to the rival machines was around 15km/h. The Yamaha riders were easily overtaken on the straights and could do nothing about it. These were the images broadcast to the world. The Yamaha pit fell silent at the futility of it all and one engineer reflected, "It was painful to even look at the TV monitor. It felt like we were fighting against 1000cc machines. I felt so guilty I couldn't set foot in the garage." In addition to not being able to reach their engine performance target, they were hindered by having to make fuel consumption adjustments to finish the race with 21 liters of fuel which in turn reduced engine performance with devastating results.

The 2007 season also produced other issues. It wasn't just that one liter was shaved off the fuel allotment but tires were also restricted to 14 front and 17 rear tires per race. This made it essential for the teams to apply even more stringent race management. To compensate for its engine performance handicap Yamaha set about ramping up its engine rpm. Seven new engine versions were introduced during the course of the season that included changing from the conventional coil spring to a pneumatic valve system that utilizes an air spring. These improvements succeeded in closing the initially overwhelming speed deficit down to about 1%, but it was already too late. Yamaha's only wins this season were the four Rossi managed to take.

Restrictions introduced in late 2009 on the number of engines used per season represented another big hurdle. Engine endurance was traditionally assumed to be 600km of racing, but the number of engines that could be used in a season was restricted to six per rider in 2010. This required reliability that would ensure an engine lasted for three races, or more than 2000km of use. An engineer reflects, "This is around double the Suzuka 8 hour endurance race distance. Our previous experience there paid off." Photo from the Dutch GP





The adoption of a single tire maker began from 2009 and the number of tires used was subject to various restrictions. "There were essentially two types of tires, soft and hard. To the extent that there was no freedom of choice, it simplified things and eliminated a lot of the former confusion. Technicians said this made setting work easier." Photo from the Valencia GP in 2010

The 2008 model YZR-M1 (0WS5) was a machine developed in the course of the 2007 season efforts at overcoming such lack of performance. The engine, considered the main issue, was greatly enhanced in terms of peak output and maximum torque by the adoption of the significantly improved pneumatic valve system and its attendant change in configuration of the intake and exhaust ports and combustion chamber. The valve system was made 40% lighter in weight while pistons and piston springs were optimized and crankshaft diameter revised. All this reduced friction loss by as much as 14% compared with the final 2007 model. A Yamaha

engineer involved notes, "We originally incorporated the pneumatic valve system to achieve higher rpm but it also had a number of other beneficial effects on engine performance, particularly in reducing friction loss."

Rossi, who rode the 0WS5, refined the relationship between the machine and Bridgestone tires from race to race to stage a brilliant comeback and win the championship title again. For Yamaha, the burning heat of Qatar (2007) was the start of a long ordeal while the Qatar night race (2008) represented the first step that heralded a dramatic revival.