Note 48

"Super-Tuning "with short life

A classic way of "Super-Tuning" to produce a short-time power gain was to reduce the inlet valve/seat contact area virtually to a line. This raised airflow but the seats hammered-out quickly so that valve-tappet clearance was lost and the valve began to leak. Such a modification was described by Tony Rudd as it was applied to the V8 1.5L BRM engines for the 1965 Italian GP, where it raised airflow by 5% (40).In that case Rudd was successful in persuading his drivers (Graham Hill and Jackie Stewart) not to use full RPM initially and so preserve the power gain until signalled to do so towards the end of the race. The 2 BRMs then drew away from Jimmy Clark in a Lotus-Climax, whose engine blew up in trying to hold them and the BRM team took 1st and 2nd places. See Fig. N48.

When good grid positions became of greater importance as aero downforce with the consequential *up*flowing wake made passing much more difficult, the teams introduced special engines to obtain the best Qualification lap time even although they only lasted a few laps. Such engines could make good use of "Super-Tuning". Race-life units were then fitted. (These arrangements came to an end by regulation after the end of this review when in 2003 the same engine had to be used for Qualification and the race, followed in 2004 and onwards by rules forcing engine life to be extended, year by year.)

Although *not* "Super-Tuning", strictly, the advantage of a brand new clean engine for a short period was quoted for the 1962 Coventry Climax FWMV2 in ref. (1071). This gave 182 HP @ 9,000 RPM when newly built but, after a film of black carbon formed on the combustion chamber surfaces with running which prevented heat from being reflected back into the burning charge, the power dropped to 177 HP @ 8,500 RPM, i.e. a loss of 2.7%. It is presumed that this is a universal effect.

Fig. 48
The BRMs at Monza in 1965

Stewart took advantage of a small mistake by Hill on the penultimate lap to pip his team-leader to the finish to win his 1st Grand Prix, going on to accumulate 27 in 99 starts (27%).

Note the BRM understeering.

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