



Note 2

Power (Horsepower and Accuracy)

Output in this review is quoted in Horsepower (HP) rather than converted to Kilowatts (even although the latter are a compliment to the man who conceived Horsepower!), and Torque is in Lb.Wt.Ft not Newton Metres (another compliment!). This is because it is believed that most readers, like the author, will be more at home with the historical units in a history.

The engine test methods can be considered as “SAE-standard”, i.e.:-

- Unobstructed and unheated* inlet (no air cleaner);
- No dynamo or alternator;
- No engine fan unless air-cooled;
- No exhaust silencer - no Grand Prix engine has been silenced;
- Ignition and fuel/air mixture adjusted to optimum at each speed.

Although every care has been taken to obtain correct data, no distinction has been drawn generally in the text between British “Brake Horsepower” (BHP) and the 1.4% smaller Continental Horsepower (French “Cheval Vapeur” (CV); Italian “Cavallino Vapori” (CV); German “Pferdstärke” (PS)), because it is certain that the figures quoted by many makers over the years are nowhere near that accuracy. Apart from the variation in test-bed equipment and methods (steady settled conditions or “flash”), there are good reasons why this should be so:-

Racing engines are modified continuously and published specifications and powers may not always be consistent;

Some nominally-identical units are better than others for undiscovered differences;

Tests are brief because parts lives are short;

Few units are available;

And, to cap it all, the competition must be misled!

The broad sweep of power across the years is the effect at which the author has aimed.

There are particular cases where there is good evidence that quoted powers were as much as 10% optimistic and these are described in [Note 5 \(Delage\)](#) and [Note 6 \(Maserati\)](#)

On the other hand some makers have given figures in KW, CV or PS which can be trusted and a reliable conversion can be made to BHP and this has been done.

“Rated power”

A special point about power is that it has sometimes *not* been the “Natural Peak” value but some lower figure because engine speed has been limited mechanically or thermally, i.e. the engine has been “Rated” so as to achieve a desired life. Without a power curve for each engine – and these are fairly rare – it cannot be known where the given figure is “Rated”.

*Cosworth found that the usual empirical correction used in testing:-

Power proportional to $\sqrt{[\text{Absolute ambient Temperature}]}$
was insufficiently accurate when looking for small power changes from modifications *versus* the range of temperatures possible in an ordinary working day (cold at the start, hot by midday).

Therefore they built a test cell with an air conditioning system for the inlet so as to be able to run at a constant temperature. The figure chosen was that expected at the circuit where the engines would be raced. A typical level was 25°C (1114)
