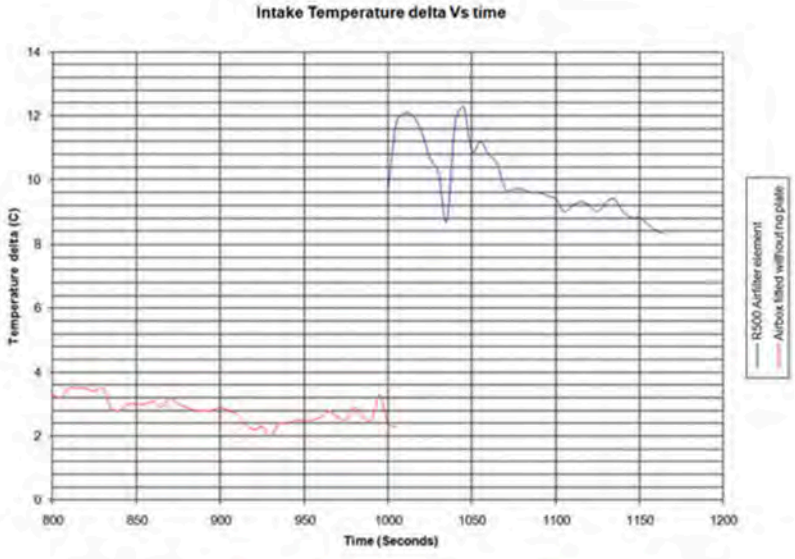
Exemplar Air box technical data

Silverstone 102 fitted to Caterham R500

Why fit an air box? To combat induction noise on a highly modified engine with throttle bodies (typically reduced by 6.5dbA) a growing problem at circuit venues, to offer reduced intake temperatures and add the possibility of ram air intakes for increased power.

The engine performance correction standard proves the horsepower advantage of using an air box to feed the engine with cool air,
from test data actually measured on a k series powered R500.
This does not show further advantages that can be gained by ram air with a correctly mapped engine management system.

Engine performance correction standard : 80/1269/EEC
The reference ambient conditions are 24.85 deg. C, 99 KPa (990 mbar)
Power correction is Po = a.P where a is the correction factor and P is measured power
Correction factor
a= (99/p)^1.2*(t/298)^0.6 p = dry atmospheric pressure (kPa) = total barometric pressure - water vapour pressure
and t = atmospheric temperature K



Data Showing Engine Performance with 340R Boost Tube Fitted

Current engine performance correction standard : 80/1269/eec.
The reference ambient conditions are 24.85 deg. C, 99 KPa (990 mbar)
Power correction is Po = a.P where a is the correction factor and P is measured power

Correction factor a= (99/p)^1.2*(t/298)^0.6
p = dry atmospheric pressure (kPa) = total barometric pressure - water vapour pressure
t = atmospheric temperature K

340R with ReVerie Boost Tube

Correction based on 10'C temperature drop alone without pressure compensation

	Std Car	Scoop	Ps delta
t=reference temperature °K + average delta temperature °C	308.23	298.5	
Correction factor a= (99/99)^1.2*(t/298)^0.6	0.979952025	0.998994638	
Power output based on 193ps (169.16 Kw) @ 24.85 °C	193.05	196.80	3.75

Correction based on 10'C temperature drop & pressure compensation 4.48mbar @40mph

	Std Car	Scoop	Ps delta @40mph
t=reference temperature °K + average delta temperature °C	308.23	298.5	
Correction factor a= (99/p)^1.2*(t/298)^0.6 **SCOOP p=(990+4.48)/10 & t=298+0'C**	0.979952025	1.004421933	
Power output based on 193ps (169.16 Kw) @ 24.85 °C	193.05	197.87	4.82

The temp & pressure calculation is awaiting extrapolation of MAP graph to + pressure

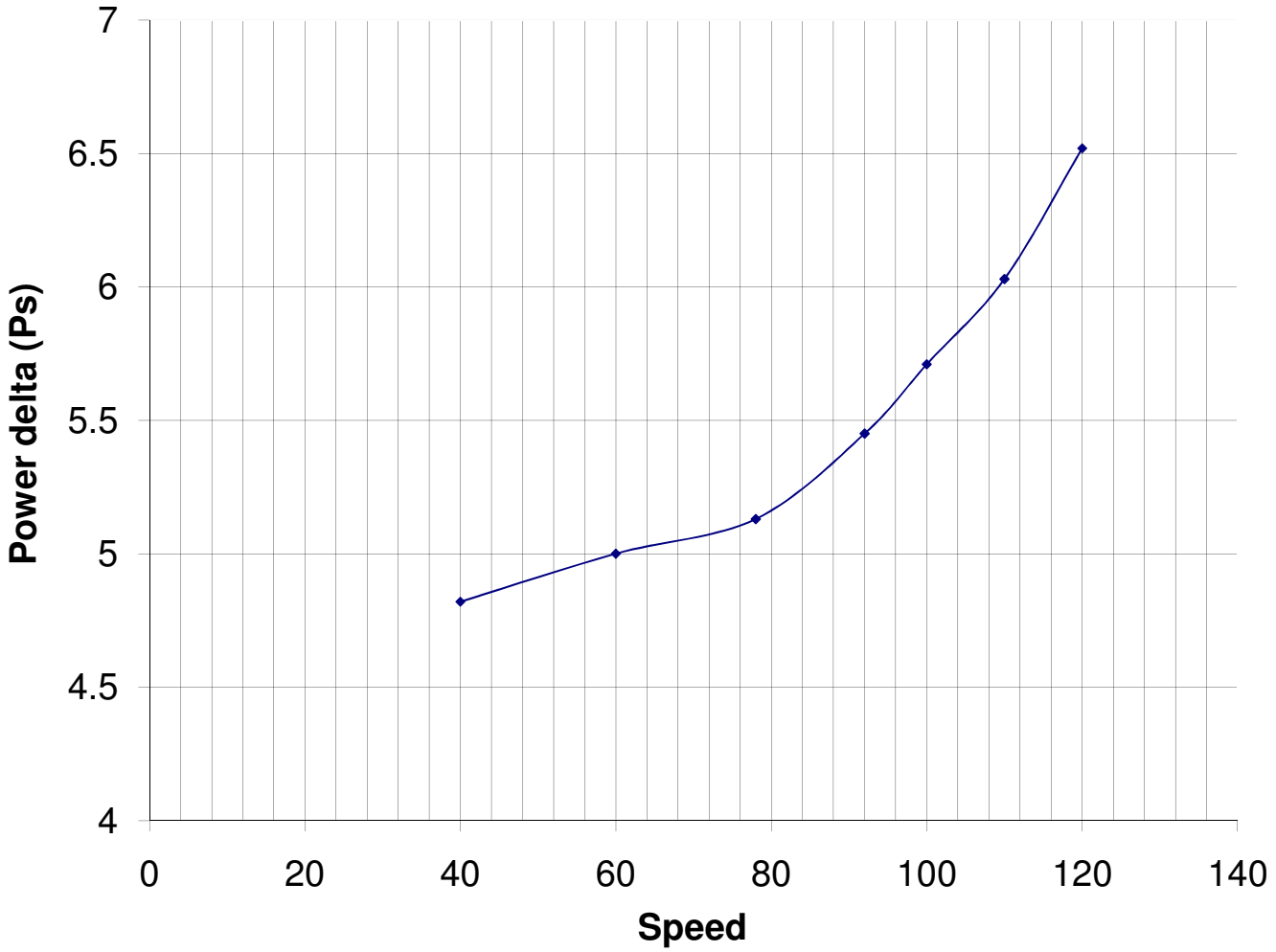
Correction based on 10'C temperature drop & pressure compensation 11.59mbar @120mph

	Std Car	Scoop	Ps delta @120mph
t=reference temperature °K + average delta temperature °C	308.23	298.5	
Correction factor a= (99/p)^1.2*(t/298)^0.6 **SCOOP p=(990+1011.59)/10 & t=298+0'C**	0.979952025	1.013045378	
Power output based on 193ps (169.16 Kw) @ 24.85 °C	193.05	199.57	6.52

Correction based on 10'C temperature drop & estimated pressure compensation 17.4mbar @135mph

	Std Car	Scoop	Ps delta @135mph
t=reference temperature °K + average delta temperature °C	308.23	298.5	
Correction factor a= (99/p)^1.2*(t/298)^0.6 **SCOOP p=(990+1011.59)/10 & t=298+0'C**	0.979952025	1.020101202	
Power output based on 193ps (169.16 Kw) @ 24.85 °C	193.05	200.96	7.91

Speed Vs Power delta (Ps) with temperature & ram effects



340R Boost tube fitted