

This Note is dedicated to the memory of the *White Mouse* stable, whose exploits over 1935 to 1946 as described by Prince Chula of Siam in his books *Wheels at Speed*, *Road Racing 1936*, *Road Star Hat-trick* and *Blue and Yellow* provided so much pleasure to this author.

1.5 Litre ERA Lap Speeds, 1935 – 1968

The 1.5 Litre ERA offers a unique way of examining Lap Speed (LS) across a variety of racing circuits because:-

- It has had such a long career – 1935 to date (taken up to 1968 here);
- Power and Weight are well-known (within the limits that any racing car data is known!), provided allowance is made for whether the engine was Pressure-Charged by Jamieson Roots supercharger (177 BHP) or Zoller vane-type (230 BHP);
- The range of circuits for which LS is known is very wide – from Monaco (56.8 MPH) to Brooklands Outer (124.8).

Clearly there was a range of abilities in producing LS and also learning, as a driver became accustomed to a car over the years, so some scatter is unavoidable. The drivers are listed on P.2

The LS (MPH) by driver and circuit are given on P.4 , together with the Track Factor (TF). TF was defined in "Progress over 64 years of Grand Prix racing, 1951 to 2014" as:-

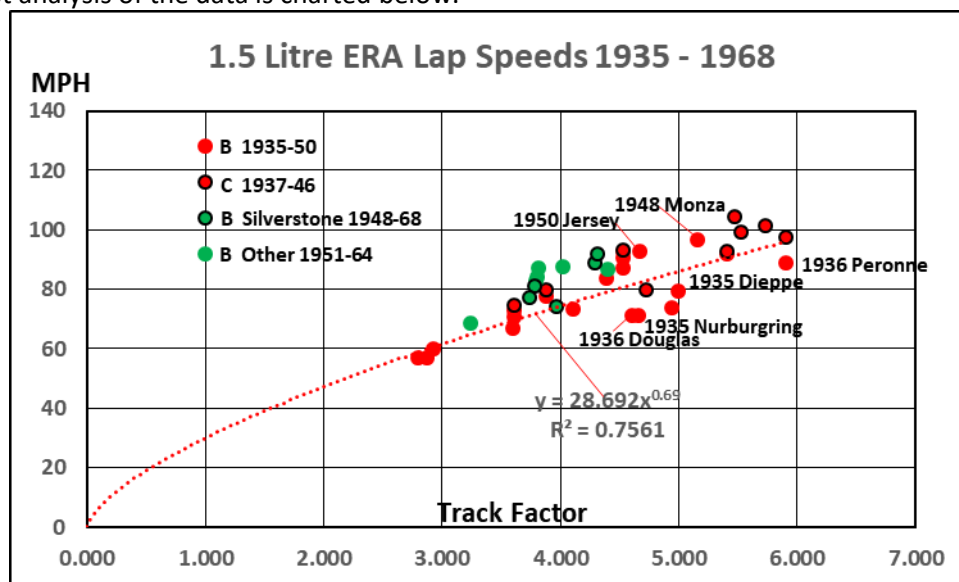
$$TF \propto (1609 \times L)^{0.4} / T^{0.3}$$

where L = Lap length in miles (1609 converts to metres to be consistent with "64 Years Progress");

T = Total turning per lap, degrees.

The temperature term in the ref. is discarded.

The best analysis of the data is charted below.



The trendline shown was based on B-type cars over 1935 to 1950. It is a poor correlation, but does provide a picture of the data. Generally-faster C-type figures were added separately, as shown. In 1937 these had Porsche-type independent front suspension (IFS).

What is surprising is that LS after 1948 on English circuits were generally so much faster at a given TF. The initial thought was that this was due to grippier tyres, but the Dunlop R1 in use from 1946 to 1958 was, it is believed, essentially the same as the pre-War "5 Stud" type. It was not until 1958 that the better R5 became available and was certainly used on some ERAs, and this may account for some higher speeds later.

This author suggests that much of the increase was due to the circuits being much safer than pre-War. All circuits up to 1939 and some after were extremely dangerous. A small deviation could cause a fatal accident with the car wrapped round a tree, as happened to Dick Seaman at Spa in 1939. Even the boldest drivers had to temper valour with discretion. Post-war British circuits were usually adapted from airfields, with wide run-ways and space for off-track excursions, and drivers expected the same consideration with later purpose-built tracks.

To complete the range of circuits, figures are given on P.4 of two super-fast cases:-

- Charles Martin's lap of the Berlin AVUS at 122.7 MPH in 1937. This was after the North Curve had been rebuilt with a 43 degree bank. The rest of the lap was two long straights joined by the slightly-banked South curve.
- St John Horsfall's lap of the Brooklands Outer circuit at 124.8 MPH in 1939. The circuit is described in Brooklands Outer Circuit Lap Speeds. This exploit must have been at max. RPM with a road-racing axle ratio, because, geared for the track, it should have been at least 10 MPH faster.

1.5 Litre ERA Lap Speeds:- 1935 - 1968

Key to Tables

- B 1 Jamieson Roots-type Supercharger (100 or 120 mm rotor length).
Details are given in [Appendix 5](#) at col. X, and a section in [Illustrations for App.5](#) at P.25.
There is a good B-type cutaway drawing in [Note 128](#).
- C 1 Zoller Vane-type Supercharger.
Details are given in [Appendix 5](#) at col. AB. See also [Illustrations for App.5](#) at P. 25.

Drivers

- M Raymond Mays
B "B. Bira"
S Dick Seaman
L Marcel Lehoux
H Lord Howe
F Pat Fairfield
CM Charles Martin
R Tony Rolt
D Arthur Dobson
G Bob Gerard
ST Brian Shaw-Taylor
BM Bill Morris
W Ken Wharton
GW Graham Whitehead
CH Cuthbert Harrison
JH St John Horsfall
PW Peter Walker
WM Bill Moss
JC Jimmy Clark



B Bira, R2B Romulus at Crystal Palace in 1938.

Photo by Louis Klementaski

The original caption reads:- *“May it serve as a reminder that the 4-wheel drift is not a post-War invention”.*

R2B probably cost £1,050 in July 1935 (DASO 449. £75,000 in 2019 money). It was fitted originally with a 100 mm supercharger (L. Snellman) driven at 1.8 x crank RPM (DASO 449). For the 1936 event on the fast Peronne circuit the 120 mm unit from R5B was fitted (L. Snellman), probably with the same driving gears to increase the boost, although a 1.4 ratio was specified for the bigger blower. Bira won the race. De Ram spring dampers were fitted by the Chula équipe after 1936, as seen, replacing the original Hartford simple friction-type. These were true “Shock absorbers” as they were also friction-type but the plate pressure was varied hydraulically proportionately to the speed of the operating arm. The de Ram type had been fitted on the 1933 Bugatti T59 and were said to improve greatly the ride over bumpy roads. They cost £200 per set, fitted (*M. Sport* April 1935. 19% of the original car cost!). Also fitted later with Lockheed 2 leading shoe hydraulic brakes, replacing original Girling mechanical.



R5B Remus ex-Chula, which was driven by Bill Moss, 1956-1959. Ludovic Lindsay aboard here.

Photo credit:- Goodwood

R5B probably cost £1,800 in 1936 (*Road Racing 1936*. £129,000 in 2019 money) because ERA raised their prices after the car showed itself to be successful. It was supplied with a 120 mm supercharger driven at 1.4 x crank RPM (L.Snellman & DASO 449). This may have been more efficient than the higher RPM 100 mm blower. As reported above this unit was removed and fitted to R2B in 1936. Current spec. not known.

1.5 Litre ERA Lap Speeds:- 1935 - 1968										
Year	Type	Driver	Circuit	Code	L - Miles	T - Degrees	Practice - P	TF	Lap Speed - MPH for B-type	Lap Speed - MPH for C-type
							or Race - R			
1935 B	M		Nurburgring	NU	14.173	3840 R		4.655	71.3	
1935 B	M		Dieppe	DE	5.005	760 R		4.990	79.3	
1935 B	S		Berne	BE	4.524	920 R		4.526	87	
1936 B	H		Monaco	MO	1.96	1494 P		2.800	56.8	
1936 B	B		Donington	DO	2.551	916 P		3.604	70.6	
1936 B	L		Douglas 36	DS36	4	736 P		4.607	71.2	
1936 A	F		Berne	BE	4.524	920 P		4.526	92.96	
1936 B	B		"	'	4.524	920 R		4.526	90.5	
1936 A	F		Donington	DO	2.551	916 P		3.604	72.9	
1936 A	F		Peronne	PE	6.06	560 P		5.904	88.7	
1936 B	B		Cork	CO	6.088	754		5.410	92.08	
1936 B	B		Limerick	LI	2.76	660 R		4.103	73.34	
1937 B	B		Turin-Valentino	TU	1.818	1242 P		2.872	56.9	
1937 C	M		Donington	DO as '36	2.551	916 P		3.604		74.7
1937 C	M		Albi	AL	5.53	617 R		5.529		99.1
1937 C	M		Phoenix Park	PP	4.261	450 R		5.476		104.36
1938 C	B		Cork	CO	6.088	754 R		5.410		92.86
1938 C	M		Peronne	PE	6.06	560 P		5.904		97.39
1938 B	R		Leinster	LE	5.917	1454 R		4.392	83.53	
1938 C	M		Berne	BE	4.524	920 P		4.526		93.1
1938 B	D		Donington 1937	DO37	3.125	936 P		3.883	77.8	
1939 C	B		Donington 1937	DO37	3.125	936 P		3.883		79.63
1939 B	B		Crystal Palace	CP	2	1332 P		2.922	60.2	
1939 C	B		Rheims	RH	4.861	460 P		5.734		101.6
1946 B	B		Geneva	GE	1.855	604		3.595	66.8	
1946 B/C	B		Ballyclare	BL	4.142	708 R		4.726		79.7
1948 B/C	CH		Monza	MA	3.915	490		5.160	96.5	
1949 B	G		Douglas37	DS37	3.87	558 R		4.940	73.9	
1950 B	G		Jersey	J	3.198	520 P		4.675	92.6	

1948 B	G		Silverstone 1948	SI48	3.67	1080		3.967	74.1	
1949 B	PW		Silverstone 1949	SI49	3	964		3.787	81.1	
1951 B	G		Silverstone 1950	SI50	2.889	604		4.292	88.9	
1952 B/C	GW		Silverstone Club	SC	1.608	440		3.733	77.2	
1968 B	BM		Silverstone	SI52	2.927	604		4.314	91.8	

1951 B	ST		Goodwood	GO	2.4	586		4.021	87.7	
1952 B	KW		Castle Combe	CC	1.84	494		3.806	84.1	
1953 B/C	GW		Crystal Palace	CP53	1.39	580		3.242	68.55	
1953 B/C	GW		Goodwood 1952	GO52	2.4	700		3.812	87.3	
1961? B	WM		Oulton Park	OP	2.761	860 R		3.791	82.97	
1964 B	JC		Rouen	RO	4.065	874		4.403	86.75	

Banked Circuits

1937 B	CM		AVUS	AV	11.98	446 R		8.302	122.7	
1939 B	JH		Brooklands Outer	BO	2.767	414		4.724	124.82	

Any Corrections & Additions

Hundreds of people have operated ERAs over the years, and the author would be pleased to receive from them any corrections or additions to this Note 131 via the Enquiries Contact.

Conclusions

- Modifying Total Turning (T) to discard slight curves and magnify sharp corners (very frequent on pre-War circuits) might improve the correlation. This would need a defined method, to avoid judgement. A fresh Multi-Variable Regression Analysis might also be helpful, considering the very-different characteristics of an ERA vs. 2013 cars.
- The advantage of the C-type IFS on bumpy pre-War circuits cannot be separated from the higher power and cannot be shown geometrically.
- The suggested “mental” gain from safer circuits also cannot be shown geometrically.

Comment

Although the original intention of this note was not achieved, re-visiting ERA history has been a pleasure and the author hopes that visitors will also enjoy it

References

DASO 449 Racing an Historic Car P.Hull MRP 1960.

www.kolumbus.f1/leif.snellman The Golden Era of GP racing, 1926-1940.
