

APPENDIX.

LIST OF 1907 CARS,

Giving the Chassis Price, the Displacement Rating, the Rating according to the Formulæ of the Royal Automobile Club and a rating slightly modified from that suggested by Mr. Lanchester.

COMPILED BY MERVYN O'GORMAN.

Index No.	Name of Car.	Price of Chassis.	Royal A.C. D ²ⁿ Rating, viz., $\frac{D^2n}{2.5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\frac{4n}{D^{1.6}}$ S.4 Rating.
		£			
1	8 Cylinders:— 35-40 Adams—Eight	—	54.6	54	50.64
	6 Cylinders:—				
10	60 Napier	1,295	60.0	67.6	54.9
11	50 Mors	1,220	45.0	52.2	50.94
12	60 Fiat	1,200	58.1	54.0	62.52
13	50 De la Buire	1,200	53.5	57.5	56.94
14	60 Belsize	1,000	72.5	47.5	69.90
15	40 Napier	975	38.4	46.6	38.40
17	50 Standard	950	72.5	47.5	69.90
18	40 Rolls—Royce	950	48.6	47.5	48.6
19	35-50 Vinot	930	41.0	39.7	46.6
20	35-45 Léon Bollée	920	41.7	41.1	45.5
21	45 Siddeley	900	51.3	51.4	52.98
22	40 Gladiator	880	33.5	33.8	38.04
23	30-40 Clement	880	33.5	33.8	38.04
24	35 Orleans	875	45.0	32.4	46.62
25	40 Iris	875	43.4	27.0	47.16

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D^2n}{25}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\frac{4n}{D^{1.6}}$ S4 Rating.
		£			
26	30 Rolls—Royce	850	37.4	37.5	40.90
27	35-45 Ariel—Simplex	825	54.1	58.7	57.42
28	30-40 Darracq	805	37.2	34.5	40.02
29	36 Thornycroft	800	43.4	37.6	46.26
30	40-60 Minerva	800	41.0	38.0	43.26
31	30 Belsize	800	38.4	33.6	40.26
32	45-60 Horbick	800	39.2	48.9	51.66
33	28 Lanchester	775	38.4	31.5	34.23
34	40 Wright—Darracq	750	37.2	34.5	40.02
35	25-30 Sunbeam	750	33.5	29.7	36.84
36	40 Brown	700	45.0	44.4	48.12
37	30 Beaufort	695	37.2	37.4	41.34
38	30-40 James & Brown	680	38.4	37.5	42.0
39	18-24 Wilson—Pilcher	660	33.7	24.3	33.75
40	40 Speedwell	650	45.0	44.4	48.4
41	30-35 Simms—Welbeck	650	41.0	47.5	43.98
42	24-45 Britannia	650	38.4	39.6	42.84
43	30 Standard	650	38.4	31.5	39.36
44	30-40 Mass.	625	45.0	44.4	48.12
45	30 Vulcan	600	31.5	29.5	35.16
46	25 Scout	590	30.1	26.8	33.24
47	25 Brooke	585	31.5	29.5	35.16
48	25 Brooke	575	31.5	29.5	35.16
49	— Star	550	29.4	28.6	33.9
50	18-24 Horbick	500	23.8	24.7	24.96
51	20 Climax	475	23.8	27.2	24.96
52	15 Standard	260	21.6	20.8	19.38
53	40-50 Thames	875	48.6	47.5	50.7
4 Cylinders:—					
101	50 Benz	1,260	41.9	49.5	43.08
102	60 Metallurgique	1,250	55.8	67.1	54.28
103	45 Mercedes	1,200	35.7	45.8	39.13
104	50-65 Isotta—Fraschini	1,095	52.1	64.5	52.4
105	40-50 Delauney—Belleville	1,090	44.5	48.1	45.24
106	40 Benz	1,060	35.7	39.6	36.99
107	35-45 Renault	1,040	41.9	36	43.08
108	50 Züst	1,025	55.8	62	57.28
109	45 Mors	1,020	38.7	45	41.64
110	35 Mercedes	1,010	29.9	35.7	33.04
111	40 De Dietrich	1,000	41.9	41.3	45.2

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D^2n}{2.5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\frac{1}{4}n$ $\frac{D^1s}{S^4}$ Rating.
		£			
112	50 Züst	1,000	55.8	62	57.28
113	40 Itala	1,000	41.9	49.5	43.08
114	60 Brouhot	1,000	55.8	54.2	56
115	40 Rochet—Schneider	970	48.6	54	53.92
117	30-40 Peugeot	900	41.9	49	41.6
118	40-50 Brouhot	900	41.9	36.2	42.0
119	28-36 Delauney—Belleville	850	35.7	36	36.99
120	20-25 Mercedes	850	24.8	27.5	27.55
121	30-45 Vinot	800	32.8	31.6	35.35
122	40 Orleans	800	45.8	42.6	47.8
123	40 Belsize	800	40	43.2	41.68
124	24 De Dietrich	800	35.7	26.5	35.87
125	24-30 Panhard	800	29.9	29.2	33.04
126	28-35 Isotta—Fraschini	795	41.9	48.9	44.36
127	35-45 Maudslay	775	40	35.3	40
128	40 Siddeley	775	44.1	43.3	43.24
129	28-35 Isotta—Fraschini	775	41.9	48.9	44.36
131	35-45 Ariel—Simplex	750	56.4	61	54.6
132	20-28 Delauney—Belleville (106 mm. bore)	750	27.9	28	30.2
133	20-28 Delauney—Belleville (120 mm. bore)	750	35.7	36	36.99
135	24-28 Morgan	750	32.4	30.5	35.0
136	30 Rochet—Schneider	750	35.7	35.4	41.12
137	40 Bianchi	750	41.9	48.9	44.36
138	20 Itala	750	32.8	36.2	34.4
139	28 Mors	740	28.9	33.6	32.99
140	35 Buire	740	35.7	38.4	38.06
141	28 Züst	725	41.9	40.5	43.08
142	30 Daimler	720	41.9	31.8	44.36
143	40 Berliet	720	35.7	34.5	38.06
144	30-40 Fiat	720	38.7	36	41.64
145	28 De Dion	720	30	44.3	31.95
146	28-42 Brasier	720	31.1	31.4	32.96
147	30-40 Spyker	715	41.9	42.0	41.88
148	35 Winton	700	40.0	42.9	40
149	30-40 Rapid	700	41.9	49.5	43.08
150	35 Iris	700	40	23.1	40.95
151	28-36 Armstrong—Whitworth ..	700	40	27.1	36.65
152	30-40 Crossley	700	36.3	32.5	39.87
153	35 Nagaut—Hobson	700	38.7	41	40.48

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D \cdot n}{2 \cdot 5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\frac{4n}{D \cdot 1 \cdot 6}$ S·4 Rating.
		£			
154	33-35 Metallurgique	700	26·8	29	30·15
155	28 Züst	700	41·9	40·5	43·08
156	30-40 Ariel—Simplex	695	45·1	49	45·76
158	24-30 Brouhot	675	27·6	20·2	28·87
159	30 Daimler	670	41·9	31·8	44·36
160	20-30 Renault	660	24·8	21·4	28·34
161	24-32 Clement	660	27·3	29·5	30·68
162	25-35 Gladiator	660	27·3	29·5	30·68
163	20-30 Léon Bollée	660	28	25·3	30·2
164	18-24 Peugeot	700	27·8	30·5	27·65
165	30 Siddeley	650	34·2	33·5	35·21
166	24-32 Clement	650	27·3	29·5	30·68
167	25-35 Gladiator	650	27·3	29·5	30·68
168	30 Thornycroft	650	32·4	31·7	33·53
169	30-35 Dennis	650	35·7	32·4	36·99
170	24-30 Dennis	650	27·3	28·0	30·68
171	28 Beaufort	645	35·7	30·7	36·99
172	20 Rolls—Royce	640	25·2	24·4	27·37
173	20-24 C. G. V.	640	30·6	23·7	32·78
174	28-36 Pipe	640	25·6	21·4	25·95
175	18 Benz	635	21·8	14·7	23·66
176	40 Maxwell	—	40	35·2	40
177	30-40 Chenard—Walker	630	35·7	28·7	36·99
178	20-25 Brotherhood	610	25·6	25·1	27·8
179	28-38 Ariel Simplex	625	36·4	39·0	38·2
180	20-30 Maudslay	625	32·4	25·5	30·35
181	20-28 Spyker	615	30·0	27·9	30·9
182	20-25 Brotherhood	610	25·6	25·1	27·8
183	30 N. E. Co.	600	32·4	28·6	32·08
184	20-22 Dennis	600	22·3	33·5	24·66
185	30 Bell	600	34·2	31·5	37·65
187	25-30 Austin	600	32·4	28·6	32·43
189	32 Vinot	595	27·3	26·5	30·68
190	24-30 Nordenfeldt	595	31·1	32·1	31·80
191	24-30 Buire	590	24·8	24·9	27·55
192	20 Rochet—Schneider	590	24·8	21·5	28·34
193	25 Iris	575	28·8	22·3	31·52
194	24-28 Metallurgique	570	25·6	27·8	27·06
195	22 Berliet	560	24·8	20·6	26·7
196	16-22 Isotta—Fraschini	560	24·8	25·2	27·55
197	14-18 C. G. V.	560	22·4	13·2	23·36

THERMAL EFFICIENCY OF MOTORS.

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Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D \cdot n}{2 \cdot 5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\cdot 4n$ D ^{1.6} S ⁴ Rating.
		£			
198	18-22 Whitlock—Aster	—	22.3	22.2	24.66
199	25 Straker—Squire	550	30	30.2	31.95
200	20 Lanchester	550	25.6	21.1	22.6
201	20-30 Bianchi	550	30	33.2	31.95
202	25 Enfield	550	35.7	34.0	37.55
203	20-30 Rapid	550	30.0	30.8	30.9
204	20-24 Rothwell	550	25.6	25.1	27.81
205	12-14 Whitlock—Aster	—	17.4	14.9	19.16
206	22-30 Cottureau	545	27.3	25.4	28.87
207	14-20 Renault	540	20.1	14.8	22.51
208	22 Berliet	540	24.8	20.9	26.7
209	18-28 Clement	540	22.2	22.2	24.66
210	18-28 Gladiator	540	22.2	22.2	24.66
211	30 Belsize	540	34.2	33.6	35.21
212	16-20 Léon Bollée	540	22.3	20.1	24.66
213	17 Mors	535	19.1	17.4	21.68
214	15 De Dion	533	20.1	23.4	20.92
215	18-28 Clement	530	22.3	22.2	24.66
216	18-28 Gladiator	530	22.3	22.2	24.66
217	20-24 Mieusset	530	27.3	27.4	29.79
218	20-24 Talbot	530	24.8	25.5	26.7
219	26-30 Cadillac	525	30.6	30.1	32.18
220	24-30 Courier	525	30	30.4	31.95
221	16-20 Brouhot	520	27.6	19.7	28.0
222	24-32 Leader	515	25.6	22.6	29.83
223	16-24 Vinot	510	22.3	22.2	24.66
224	25-30 James & Brown	510	32.4	22.8	35.8
225	16-20 De Cauville	505	24.8	20.3	25.26
226	20-28 Darracq	504	31.1	28.8	31.95
227	25 Winton	500	32.4	35	33.43
228	20-30 Pilgrim	500	32.4	20.7	33.43
229	20-22 Mascot	500	22.3	24.4	26.66
230	26-30 Argyll	500	27.3	29.4	30.68
231	18 Siddeley	500	25.6	22.6	26.63
232	24 Brown	500	30	27.1	31.95
233	24-30 Courier	500	30	30.2	31.95
234	20 Beaufort	500	27.3	23.6	29.92
235	20-24 Vulpes	500	30	30.2	31.95
236	24 Mass	500	30	30.2	31.95
237	25 Speedwell	500	30	30.2	31.95
238	24 Junior	500	24.8	27.8	26.7

Index No.	Name of Car.	Price of Chassis.	Royal A. C. Rating, viz., $\frac{D^{2n}}{2^5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	4n D ^{1.6} S ⁴ Rating.
		£			
239	28-40 Calthorpe	500	30	30.8	30.9
240	24-30 Nordenfeldt.	495	31.1	32.1	31.8
241	24 Deasy	494	27.3	27.2	29.79
242	16 Rochet—Schneider	490	24.8	20.9	26.7
243	24 Minerva	490	27.8	27.1	28.72
244	15-20 Panhard	490	20.1	18.2	23.23
245	16-20 Swift	490	20.1	20.5	21.7
246	24 Deasy	483	27.3	27.4	29.79
247	16-20 Sunbeam	480	22.3	29.2	23.91
248	20-22 Singer	480	22.3	24.4	26.66
249	14 Thornycroft	475	22.5	16.6	22.49
250	22 Orleans	475	23.7	19.2	25.42
251	15 Mors	475	17.9	13.9	19.12
252	12-14 Dennis	475	17.4	14.9	19.16
253	20-22 West	475	22.3	22.2	24.66
254	30 Humber	473	30	27.1	31.95
255	12-16 Wilson—Pilcher	465	22.4	16.6	22.49
256	20-25 Simms—Welbeck	465	27.3	31.3	29.29
257	14-16 Fiat	460	22.3	15.2	23.04
258	15-20 Buire	460	17.9	16.7	20.96
259	12-16 Peugeot	500	18.2	18.8	19.06
260	16-20 Mascot	455	19.0	21.2	22.45
261	12-16 Talbot	450	17.9	18.2	20.96
262	15 Talbot	450	20.1	18.2	22.27
263	16-20 Metallurgique.	450	20.1	18.8	21.7
264	16-20 Robins—Hole.	450	20.1	20.5	22.51
265	20 Mass	450	23.7	24.0	26.67
266	24 Austin	450	27.3	24.0	29.48
267	18 S. C. A. R.	450	20.1	21.7	20.92
268	28 Lindsay.	450	31.1	28.8	31.95
269	20-25 Seymour—Turner.	450	25.6	22.6	27.81
270	22-25 Globe	445	28.9	30.7	29.55
271	16-24 Vinot	440	22.3	20.0	24.66
272	17-20 Scout	440	20.1	28.0	22.11
273	16-20 West	440	20.0	20.2	23.23
274	16 James & Brown	436	19.6	13.4	21.74
275	20-22 Quadrant.	—	22.3	24.4	24.66
276	16-18 Darracq	434	20.1	26.0	22.51
277	14-18 Clement	430	17.9	16.6	20.96
278	14-18 Gladiator.	430	17.9	16.6	20.96
279	18-24 Courier	430	23.7	24.0	26.67

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D^{2n}}{2^5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	4n D ^{1/2} S ⁴ Rating.
		£			
280	15 Siddeley	425	25.6	20.0	25.36
281	18 Star	425	28.9	28.3	30.56
282	16 Climax	425	17.4	19.4	19.7
283	12-16 Brouhot	425	22.3	14.6	21.68
284	16-20 Chenard—Walcker	425	19.0	15.4	22.25
285	18 Regent	420	20.1	22.3	22.51
286	16-20 Argyll	415	22.3	24.4	24.66
287	16-18 Darracq	414	20.1	26.0	22.51
288	20 Vulcan	410	21.0	19.6	23.44
289	12-16 Decauville	410	20.1	16.3	21.36
290	12-16 Mascot	405	17.4	16.4	19.48
291	18-24 Britannia	400	25.6	26.3	28.56
292	15-18 Cottureau	400	17.9	14.5	19.48
293	14-16 Cupelle	400	17.9	13.4	19.88
294	14-22 Germain	400	21.9	18.7	22.55
295	15 West	400	17.4	14.8	19.48
296	20-22 Brown	385	24.8	26.3	26.68
297	12-16 Cottureau	385	17.9	13.8	19.12
298	10-14 Renault	380	13.9	12.9	16.84
299	14-20 Unic	380	19.1	16.0	20.6
300	18-22 Leader	375	21.0	17.5	23.92
301	14 West	375	15.8	11.0	16.64
302	20 Bell	370	25.6	22.6	28.0
303	20 Alldays	368	22.5	21.8	24.2
304	20 Belsize	360	25.6	22.6	26.84
305	10-14 Unic	350	13.9	11.8	16.28
306	14 Mass	350	17.9	15.2	19.88
307	16-20 Rover	—	22.3	19.0	23.72
308	12-14 Swift	345	20.1	23.0	16.64
309	16 Bentall	345	20.1	17.8	20.52
310	14-16 Argyll	340	20.1	20.5	22.52
311	14-16 Quadrant	—	15.8	18.2	16.64
312	18-20 Brown	335	24.8	24.2	25.78
313	12-16 Leader	335	19.6	13.8	20.68
314	10 Mors	330	13.9	9.7	15.0
315	10-14 Talbot	330	13.9	10.6	15.0
316	12-16 Vauxhall	330	19.6	14.4	20.16
317	14 Star	325	22.4	22.1	25.24
318	15 Enfield	—	22.3	19.8	24.16
319	14-16 Argyll	325	20.1	20.5	22.52
320	14 Lutece	325	20.1	18.5	21.76

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D^2n}{25}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	$\frac{4n}{D^{1.6}}$ S'4 Rating.
		£			
321	14 Vulcan	310	19.6	16.4	21.2
322	15 C. Humber	—	22.4	19.9	24.2
323	10-14 Gregoire	300	13.9	10.8	15.64
324	12-14 Argyll	300	17.4	14.8	19.48
325	12-15 Vulpes	295	20.1	15.5	20.96
326	12-14 Globe	285	15.8	17.6	16.64
327	16 Bell	275	19.6	15.5	20.68
328	12-14 Calthorpe	275	15.8	17.6	16.64
329	14-16 North British	275	21.0	16.5	21.88
330	10-12 C. Humber	—	19.6	14.4	20.12
331	12-14 Singer	270	15.8	15.5	16.64
332	12 Vulcan	265	15.6	13.4	17.68
333	12-14 Rothwell	265	15.8	14.5	16.64
334	12-14 Singer	255	15.8	15.5	16.64
335	14 British	240	15.8	13.7	15.88
336	10 Star	235	14.4	12.7	16.92
337	10-12 Leader	218	17.4	13.2	17.92
338	12 Lindsay	200	15.8	13.7	15.88
339	10-12 British	190	13.9	12	14.32
340	10 Standard	185	12.8	13.8	12.92
341	8 Courier	165	12.1	8.6	12.56
342	15 Ford	—	21.0	18.8	20.12
3 Cylinders:—					
402	8-11 Panhard	320	15.8	9.9	14.01
403	10½ Singer	230	15.8	13.4	12.48
2 Cylinders:—					
412	15 N. E. Co.	350	16.2	14.3	16.2
413	12 Beaufort	315	17.8	16.1	18.44
414	10-12 Mascot	315	11.2	12.2	12.68
415	10 De Dion	300	7.9	11.0	9.34
416	16 Russell	—	16.2	18.8	16.56
417	10-12 Clement	280	9.5	10.2	11.56
418	10 Darracq	275	12.4	17.8	13.34
419	10 Darracq	255	12.4	17.8	13.34
420	12-14 Adams	250	13.7	12.8	14.42
421	10 Siddeley	250	12.8	11.3	13.42
422	16 Maxwell	—	20.0	17.7	20.0
422a	10-12 Speedwell	250	11.8	12.1	13.34
423	8-10 Grégoire	230	10.0	9.4	11.26

Index No.	Name of Car.	Price of Chassis.	Royal A.C. Rating, viz., $\frac{D^2n}{2.5}$	Displacement Rating. Total Vol. displaced by piston per min. $\div 10,000$.	4n D ^{1.6} S ⁴ Rating.
		£			
424	8-10 Darracq	—	10.0	10.8	11.26
425	8-9 Renault	228	6.9	6.5	8.42
426	10 Vulcan	220	10.4	9.8	11.72
427	9-10 Swift	220	10.0	9.5	10.88
428	9 Bentall	220	10.0	12.1	10.26
429	9 Jackson	200	8.9	5.2	9.56
430	10 Alldays	200	11.2	11.9	12.10
431	7 Singer	180	7.9	9.0	8.32
432	8 Mass	175	8.9	7.0	9.56
433	8 Maxwell	—	12.8	12.1	12.8
434	7 Star	165	9.8	7.8	10.84
435	8½ Horley	—	7.9	6.4	7.94
436	10-12 Premier	—	9.5	10.2	11.56
437	7 British	90	6.9	6.9	7.16
1 Cylinder :—					
460	8 De Dion	250	6.2	11.0	6.674
461	8 De Dion	211	6.2	11.0	6.674
462	8 Rover	—	6.7	8.1	8.43
463	9-10 Cadillac	195	10.0	8.9	10.0
464	8 Rover	—	6.7	8.1	8.43
465	8 Darracq	191	7.8	9.3	8.241
466	9 Jackson	185	6.9	5.8	7.312
467	9-10 Cadillac	195	10.0	8.9	10.0
468	9-10 Adams—Hewitt	175	9.1	10.6	9.865
469	7 Darracq	—	6.8	7.6	7.218
470	6½ Friswell	—	5.0	5.1	5.425
471	6 Jackson	155	5.0	3.8	5.425
472	6 Rover	—	5.6	5.7	5.759
473	5 Jackson	115	4.3	2.7	4.488
474	9 Horley	—	7.8	7.7	8.241

N.B.—Those Arrol-Johnston and Gobron Brillé cars whose engines operate in a manner different from the more normal type of engine, and all cars working on the two-stroke cycle, are omitted from this list as not being susceptible to rating in strict accordance with the formulæ at the head of the various columns.

The Displacement rating takes into account the volume swept by

the cylinder in a given time and therefore depends on the engine speed as declared by the makers and as printed in the Automotor Journal's excellent list of cars at the exhibition of 1907 cars in 1906.

The Royal Automobile Club rating is based on $\cdot 4D^2n$ where D is the diameter of the cylinder in inches and n the number of cylinders.

The last column is a rating based on $\cdot 00062n D^{1.6} S^{.4}$ where D is the diameter of cylinder in millimetres and S the stroke in mm., or as given at the head of the column if D and S be taken in inches. This differs (by giving slightly less importance to the *stroke*) from Lanchester's rating, which the compiler considers to give too much value to the stroke, as will be seen by working the formula for engines of abnormally long stroke. (See Col. H. C. L. Holden's contribution to the discussion of Mr. Lanchester's Paper on "The Horse Power of the Petrol Motor in its Relation to Bore, Stroke and Weight," read before the Incorporated Institution of Automobile Engineers.)

NOTE BY PROFESSOR CALLENDAR.

This table is most instructive as illustrating the wide divergence of the makers' views with regard to normal piston-speed, and the necessity for some conventional standard. A comparison of the R. A. C. rating with Mr. O'Gorman's modification of Lanchester's (assuming the latter to be correct) shows that the long-stroke engines would have an advantage of about 25 per cent. over the short stroke, if the R. A. C. formula were adopted in competitions.

It must also be observed that none of the three formulæ take any account of the effect of size, which is the main object of the present paper. It is obvious that the effect of size should be taken into account, if the weight of the car is one of the factors included in the hill-climb formula according to the usual practice.