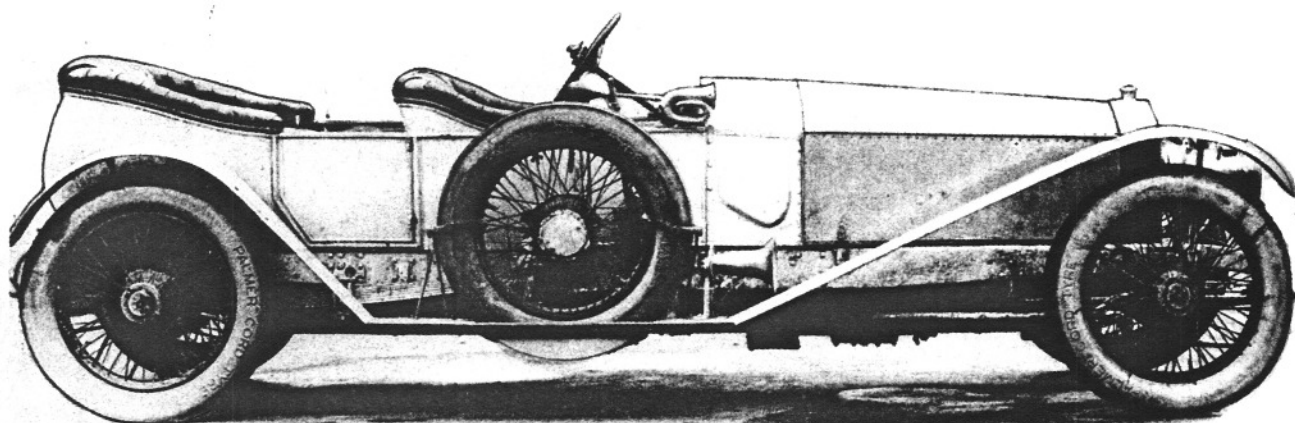


1701, the first 100 m.p.h. Rolls-Royce

by Tim Forrest © 2011

Editor's note: 2011 marks the centenary of the first sporting model of the Rolls-Royce 40/50 h.p., the 'London to Edinburgh' Silver Ghost. The successor model in 1913 was the 'Alpine Eagle' which was used in alpine trials and even a Grand Prix. But it was chassis 1701, that very first experimental 'London to Edinburgh' car, which caught the imagination. Tim Forrest here investigates the remarkable 1701, named 'The Sluggard' by Claude Johnson and which was anything but slow - Johnson had first used the name on his 1900 7 h.p. New Orleans car, which really was a sluggard! In a year of dramatic development for the Silver Ghost it was 1701 which achieved two quite remarkable performances.

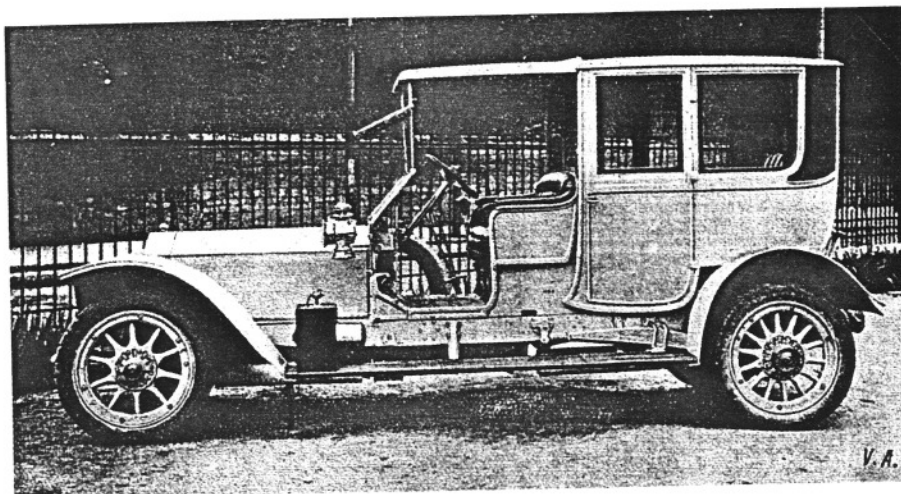


1701 in its final London to Edinburgh road form with Rudge Whitworth wire wheels replacing the earlier wood artillery type. Note the distinctive square frame bracket for the centre hanger of the underslung rear spring. Only 1700 and 1701 had this identifying feature. This image evokes the London to Edinburgh model perfectly, the minimal and angular wings proclaiming lightness and speed.

By 1910 the Silver Ghost had achieved a wonderful reputation for quality and refinement, but it had stiff competition from both Daimler for the more formal carriages beloved of royalty and the 'duchess market', and from Napier for more sporting vehicles. Napier produced the first practical 6-cylinder car in 1904 and had thrown down a challenge to its rivals on 7 July 1910 - a 65 h.p. Napier 6-cylinder, the 'Silver Bullet', was driven by

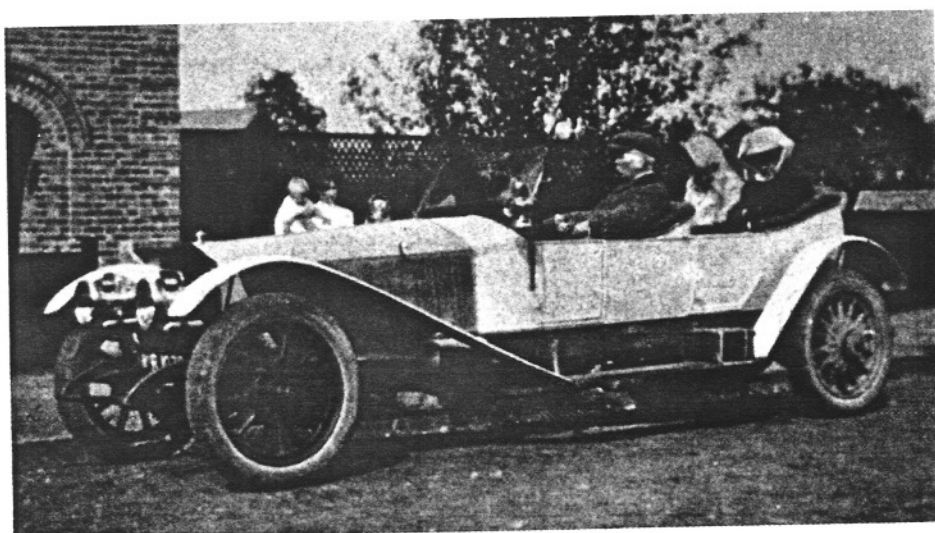
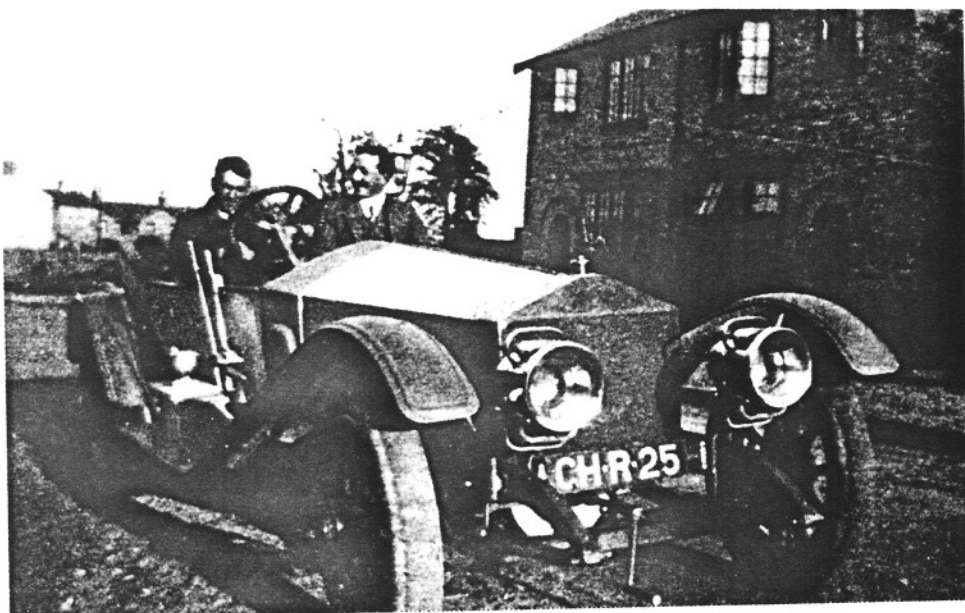
the flamboyant pioneer motorist Selwyn F. Edge, from London to Edinburgh and back in top gear only, under R.A.C. observation. It ran 799 miles carrying four passengers with luggage at an average fuel consumption of 19.35 m.p.g. It subsequently achieved 76.042 m.p.h. over the flying half-mile at Brooklands track in Surrey at the end of the top-gear run. The R.A.C. awarded Napier the prestigious Dewar Cup for this performance.

1701, the first 100 m.p.h. Rolls-Royce



Left: 1911 standard chassis 1700 with its Labourdette 'special light limousine' body. Note the underslung rear suspension and the square spring hanger bracket as on 1701. (La Vie Automobile 4 Nov. 1911 p.709)

Right: 1701 soon after completion in August 1911, wearing trade plates and showing the wood artillery wheels. Ernest Hives at the wheel. (Courtesy of the late Eric Platford albums)



Left: 1701 now registered R-1075 and fitted with a windscreen for road use, the wood artillery wheels still evident. (Courtesy of the late Eric Platford albums)

Claude Johnson (CJ), the General Managing-Director of Rolls-Royce, saw an opportunity to better this performance and create the first of a line of sporting Silver Ghosts to be produced alongside the standard car. At the same time it gave Henry Royce the opportunity to develop further the Silver Ghost chassis which was about to be fitted with a much improved suspension and stronger rear axle.

One year after the Napier success two Ghost chassis to a new specification were initially laid down, 1700 and 1701. Both had the new chassis frame with underslung cantilever rear suspension and a new torque tube rear axle. 1700 carried a 'special light limousine' body by the French coachbuilder Labourdette (1), and was used as CJ's trials car (2). On 1701 Royce went further and made extensive changes to the engine to provide a considerable increase in performance. The car was described in the factory's records as the "Experimental Speed Car" (3) and went on to achieve all its objectives and more.

After a trial run in August 1911 to Edinburgh and back by Ernest W. Hives (Hs, Experimental Department), and then to north Wales by Percy Northey (PN, Sales Department), the car was driven on an official R.A.C.-observed run by Hs on 6-13 September 1911, covering the 794 miles from London to Edinburgh and back in top gear at an average fuel consumption of 24.32 m.p.g. It was then taken to the Brooklands track and, without any changes, achieved a top speed of 78.26 m.p.h. over the flying half-mile. The second and yet more remarkable performance was when the car returned to Brooklands in November wearing a highly streamlined body and covered the flying half-mile at 101.816 m.p.h. One hundred years on these achievements seem quite exceptional given that very few Silver Ghost owners today exceed 55 m.p.h., and even 12 to 15 m.p.g. is considered to be acceptable consumption under modern conditions. So the question must be 'How did they do it and how closely might we come to matching these performances in

2011?' The secret of their success in 1911 was typically Roycean in that every single aspect of the car's potential performance was thoroughly considered and then optimised to achieve the desired result.

No. 222	
BROOKLANDS MOTOR COURSE	
Date	14 th November 1911.
Description of Car	40/50 d.P. (Makers' Description) bodyline Rolls-Royce Car Engine No 1701 Chassis No. 1701 B.H.C.
Driver and Passenger	E. W. Hives
Distance Measured on soft-ground	One half mile from a flying start
Time as per Automatic Electric Chronograph	17.679 seconds
Rate of speed attained	101.816 Miles per hour.
Certified by <i>Royce & Co. Ltd.</i> Clerk for H. Hives, Chairman Official Timekeeper to the Brooklands Automobile Club	
The Brooklands certificate for the 101.816 m.p.h. run on 14 November 1911. (Kenneth Neve 'A bit behind the times' p.165)	

To beat the Napier's top speed of 76 m.p.h. at Brooklands 1701 had to have a top speed target of 80 m.p.h. and yet still be able to pull away in top gear. At that time the maximum road wheel torque of the standard engine was around 220 lbs. ft., developed at between 500 and 1,000 r.p.m. (4). Before 1911 engine testing had been limited to a maximum 1,500 r.p.m., but in February 1911 Royce's crankshaft vibration damper was introduced (a development of his 1906 original). This allowed the engine to pass through a critical vibration period and develop more power at higher engine speeds. Mike Evans, of the Rolls-Royce Heritage Trust, has made an exhaustive study of the Silver Ghost chassis cards and his results were used in David Forward's excellent book, *The Rolls-Royce Silver Ghost: origins and development 1906 to 1926*. This shows that the maximum power of the standard 1500/1600 series cars of early 1911 averaged 44.2 b.h.p. at 1,750 r.p.m. (5).

ROYAL AUTOMOBILE CLUB.

CERTIFICATE OF PERFORMANCE, No. 232,

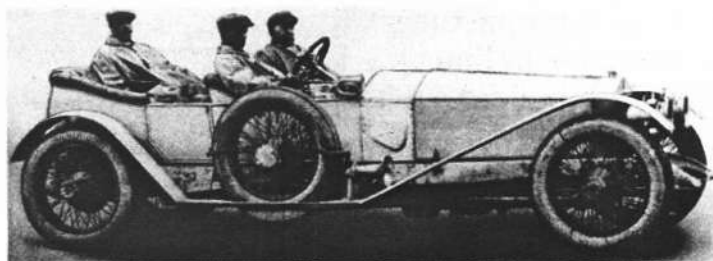
IN A

TOP GEAR RUN FROM LONDON TO EDINBURGH AND BACK OF A
48'6 H.P. (R.A.C. RATING) ROLLS-ROYCE CAR

(Under the Open Competition Rules of the R.A.C.).

September 6th, 1911.

This is to Certify that a **48'6 h.p.** (R.A.C. Rating) **Rolls-Royce Car** was entered
by Messrs. Rolls-Royce, Limited, of Nightingale Road, Derby, for the above trial.



<i>Particulars of Car.</i> —Bore and stroke of engine	- - - -	4½ in. × 4¾ in.
Number of cylinders	- - - -	6.
Weight of car, front axle	- - - -	1,830'5 lb.
" " back axle	- - - -	1,883'5 "
Total weight of car	- - - -	3,714 lb.
Weight of load (dead)	- - - -	1,035 "
" " (live)	- - - -	508 "
Total running weight	- - - -	5,257 lb.
Type of body	- - - -	Torpedo.
Wind resistance area of body	- - - -	13'01 sq. feet.
Gear ratio on top gear	- - - -	2'9 to 1.
Size of tires	- - - -	895 mm. × 135 mm.
No. of chassis	- - - -	1,701.
Country of origin	- - - -	Great Britain.

The total distance travelled was 794 miles. The weather was fine and warm. The car was driven at an average speed, throughout the whole of the distance, of 19'59 miles per hour. Throughout the trial, including the Brooklands portion, no adjustments were made.

Throughout the trial the car was started and driven upon top gear, a lower gear not being used at any time.

The petrol consumed was 32'648 gallons, being a consumption of 24'32 miles per gallon and 57'07 ton-miles per gallon.

After the road portion of the trial the car was driven on Brooklands Track, its speed over the flying half mile being 78'26 miles per hour.

(Signed) J. W. ORDE, *Secretary.*
Date, September 14th, 1911.
Pall Mall, London, S.W.

(Signed) TECK, *Chairman.*
(Signed) G. H. BAILLIE, *Vice-Chairman of*
Technical Committee.

The R.A.C. certificate awarded on 14 September 1911.



On the Great North Road (the A.1) at Stamford Cross in Lincolnshire, complete with the A.A. approved signboard on the famous George Hotel on the left. 1701 passed this way on what is now called the High Street. The A.1 now bypasses Stamford but the George Hotel still flourishes and this charming view survives. (John Hammerton 'Wonderful Britain', 1925)

However, even with the highest available direct drive axle ratio then available of 26/65 for the 1910-11 rear axle, the engine would have had to reach almost 2,000 r.p.m. to achieve 80 m.p.h. (6). Such a highly-gearred axle would have made the top-gear run impossible as there were some very narrow and congested streets en route which would have demanded lower gears.

It is clear that Royce and CJ felt more power and torque were required to be certain of success and so Royce and his team set about some extensive modifications to the engine. Earlier, in September 1910, the bore of the inlet manifold had been increased from $1\frac{3}{4}$ " to 2" and this improved breathing considerably, allowing the engine to reach higher revolutions. However, the standard engine continued to be fitted with packing liners under the blocks to lower the compression ratio and ensure smooth running. On 1701 and the later London to Edinburgh cars the chassis cards indicate that these liners were not used and this reduced the compression space above the standard piston from 27.25 to 26 cu. inches. There is also evidence that to raise the compression still further they machined the bottom faces of the blocks. The compression readings on

the test card were thus raised from a typical 57 lbs. to 60 lbs. without liners and then up to 63 lbs. with further machining. Analysis by Mike Evans and David Forward shows that these changes raised the power at the rear wheels from the average standard car's 45 h.p., with exhaust cut-out closed at 1,750 r.p.m., to the average for the London to Edinburgh of 58 h.p. at 2,000 r.p.m. with the cut-out open (7). This would have been more than enough power, but it must have made it hard to keep to the 20 m.p.h. speed limit on the flat and empty sections of the Great North Road (what became known as the A.1). It has been speculated that Hs drove quickly and later took his time over lunches and teas so as to bring the average speed down over a day. Moreover, did he speed up on hills and then descend undetected in neutral so as to improve petrol consumption? Much would have depended on the attitude and alertness of the R.A.C. observer, and fears for speed traps.

The original chassis cards for 1701 are no longer extant in the Rolls-Royce archives at the Hunt House. Fortunately, a transcript of them exists in the historian Bill Morton's notes on the experimental cars (8). These show clearly the changes from standard that were made on 1701 for

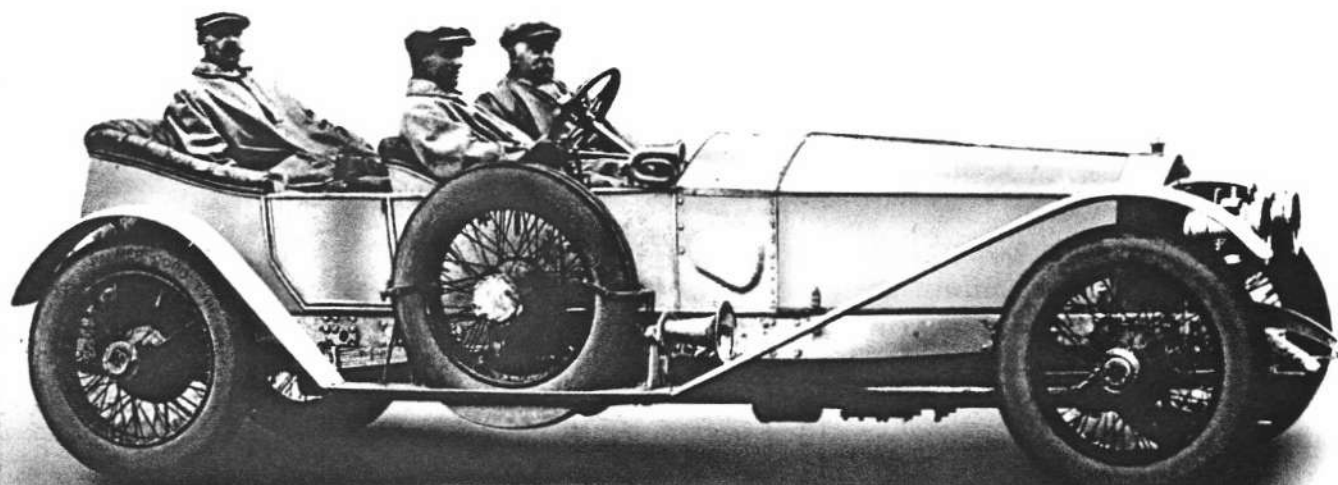


The Bramham Moor crossroads on the Great North Road, seen on 17 May 1912, a rather fine surface for easy motoring in 1701. These superb late 18th century roads had been surfaced with a finely ground granite resulting in the white appearance. Horses and wagons did no damage but motor tyres and speeds eventually degraded the surfaces. (Courtesy of Leeds City Council photographic archives)

the initial trials: larger throttle adopted from the carburetter used on the experimental 70 h.p. cars of 1908 (which had overhead inlet valves); special induction pipe of 2¼" diameter; camshaft E892 providing longer valve opening times; no packing liners under the blocks; compression space further reduced to 24.5 cu. inches (presumably by machining the bases of the blocks as the standard concave piston E1097 was still specified); and a large flywheel fitted. The exact power produced at this stage of the car's development is unclear - the only dynamometer test recorded was not until its final state of tune after the 101 m.p.h. run, of which more later. However, it was clearly sufficient and the heavy flywheel would have built up enough kinetic energy to enable top-gear starts to be made more readily.

One area of considerable discussion on 1701 relates to the axle ratios used for the two tests. In part the difficulty stems from around the time the new torque tube rear axle was introduced when Rolls-Royce changed from using a 65 tooth crown wheel to a 52

tooth version. The new pinion for it was designed by Robert Harvey-Bailey (By), without the express approval of Royce who was seriously ill at this time. The R.A.C. certificate for the London to Edinburgh car records that it had a 2.9 : 1 rear axle which would be consistent with either a 22/65 axle or the newer 18/52 type. Subsequent production, or 'replica', London to Edinburgh chassis, beginning with chassis 1800E on test 8 March 1912, used an 18/52 set, but the 1914 parts book confirms that both sets of gears were available on the 1700 to 1800 series inclusive (9). However, 1701's chassis was on test from 27 June 1911 and was certainly fitted with the 22/65 axle. This is confirmed by the despatch card for 1701 dated 4 July 1911, which states that the car was '*fitted with special speed body, dashboard and bonnet and 22 tooth pinion in rear axle*' (10). After the Test Department finished its high-speed run in December the car was fitted on 14 February 1912 with the new and quieter 18/52 gear set (subsequently fitted to all the 'replica' chassis), thus further confirming the earlier use of the 22/65 axle.



1701 on the road with the company's Frank Holgate in the rear and Ernest Hives at the wheel, R.A.C. observer in the front. There was probably a fourth passenger, who perhaps took this photograph. The studs from the windscreen fitted for normal use can be seen on the scuttle side. (Rolls-Royce Ltd. negative WHP5641)

The engine and chassis having been optimised, the next stage was the body. A special body was commissioned from Holmes of Derby. This body was much lower and narrower than a usual tourer and incorporated slender mudguards, the first of the new taper bonnets, low D-rake steering column and, initially, no windscreen. The result was a low frontal area measured at 13 sq. ft. by the R.A.C. (By way of comparison, the author's 1912 Silver Ghost tourer with a straight-sided parallel bonnet and flat scuttle has a frontal area of between 25 and 30 sq. ft. depending on whether the hood is up or down!) This body was also extremely light, the complete car weighing 3,714 lbs., or just 600 lbs. more than the bare chassis weight, according to the R.A.C.

Given the increased power, low frontal area and high gearing, 80 m.p.h. was entirely feasible for 1701 in her 1911 specification. This would have equated to 2,230 r.p.m. which, as we shall see, was achievable as the engine had been bench tested to 2,250 r.p.m. ⁽¹¹⁾. This specification would also have helped achieve the remarkable fuel consumption, further greatly helped by the need to keep to the then speed limit of 20 m.p.h. Hives, who was involved in the official run, said in later years that they also used very thin oils in the engine, gearbox and rear axle to reduce friction losses and to increase both performance and economy. The car was now ready for the official run.

For the actual R.A.C. run 1701's weight advantage was compromised by the addition of 1,015 lbs. of 'dead weight', which was considerably more than the usual weight of the standard spares, tools and fuel carried. In addition, there was a further 508 lbs. of 'live weight' for the driver, a passenger and an R.A.C. observer (*The Times* later claimed there were four occupants). This gave a total weight of 5,257 lbs. or 2.4 tons. Quite why they carried so much dead weight is unclear, but it might have been because a lot of store at the time was put on the miles per gallon per ton which was a truly impressive 57.07



The Great North Road (A.1) through Berwick on Tweed, just below the Scottish border, a few years after the 1911 run. The third car on the left just happens to be a Silver Ghost limousine. (John Hammerton 'Wonderful Britain', 1925)

ton miles per gallon. The 65 h.p. Napier clearly had not carried so much dead weight as it weighed 4,028 lbs., according to Rolls-Royce's press release, giving a much less impressive 42.57 ton miles per gallon!

The run to Edinburgh and back was completed trouble-free via the Grantham, Doncaster, Newcastle, Alnwick, and Belford route (calling through other towns as well). Immediately after the run the car was put on display in the company's Conduit Street showrooms, along with Rolls-Royces ordered for King George V's forthcoming Delhi Durbar. Even with CJ's publicity skills *The Times* only took notice of this display and the 6-13 September success in its issue for 21 September. Rolls-Royce also sent *The Autocar* advance particulars of the results, reproducing the salient facts from the R.A.C. report. In addition, the company drew the attention of *The Autocar* ⁽¹²⁾ and its readers to the previous best record made in a similar R.A.C. test, which was of course the 65 h.p. Napier, the performance of which they had now so soundly beaten. However, apart from *The Autocar*, there seems to have been surprisingly little press coverage at the time. Accordingly the company undertook a publicity campaign in *The Times* during mid October,

running several large advertisements and even one at full-page, emphasising the much larger engine of the unnamed Napier. According to the company the Rolls-Royce was 'on a plane by itself', in another league. Correspondence in *The Autocar* from other manufacturers tried to belittle the achievement, however, questioning the merit of the completion of the run by several 6-cylinder cars, saying it was done under favourable conditions and that the R.A.C. refused to certify that cars were of standard specification (13). This was disappointing after all the effort and the impressive results achieved and may have provided the stimulus to go one step further and achieve a 100 m.p.h. Run.

After its initial run of 78.3 m.p.h. at Brooklands on 13 September, 1701 returned on 14 November and reached 101.816 m.p.h. over the flying half-mile, the first Rolls-Royce car to exceed 100 m.p.h. Increasing the top speed by 23.5 m.p.h. or 30% was a remarkable improvement and clearly required further detailed changes to the car. Exactly what modifications were made is difficult to ascertain as they were secret and not documented in records. However, it is still possible to identify a number of further changes. Bill Morton's transcript of the chassis cards reveals two bench tests of the engine (14), but none for the initial test before the London to Edinburgh run itself. A second dynamometer

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THE SIX-CYLINDER

ROLLS-ROYCE

**An UNPRECEDENTED and UNPARALLELED
combination of EFFICIENCY, FLEXIBILITY, and SPEED**

A standard Rolls-Royce chassis, fitted with four seated touring body, was recently entered for a trial under Royal Automobile Club observation on the road from London to Edinburgh (via Grantham, Doncaster, Newcastle, Alnwick, Belford) and back, finishing with a speed test on Brooklands. The results are shown below in comparison with the results of a similar trial run last year by a 65 h.p. cylinder car of another make, for which performance it was awarded the Dewar Trophy for 1910.

	Tom Dwyer Thruout 1910 65 h-p. per	Tom Rozz Thruout 1911 40/50 h-p. per
Number of times the car respectively had to be a gear other than the top gear	NR	NR
Fuel consumption " " " "	35-36 miles per gallon	2432 miles per gallon
" " " " " "	47-47 1/2 tons per gallon	57-07 tons per gallon
Speed on the Brooklands Track " "	70-65 m.p.h.	78-26 m.p.h.

The above performance is so far in advance of anything which has been previously accomplished as to form an epoch in the history of motoring.

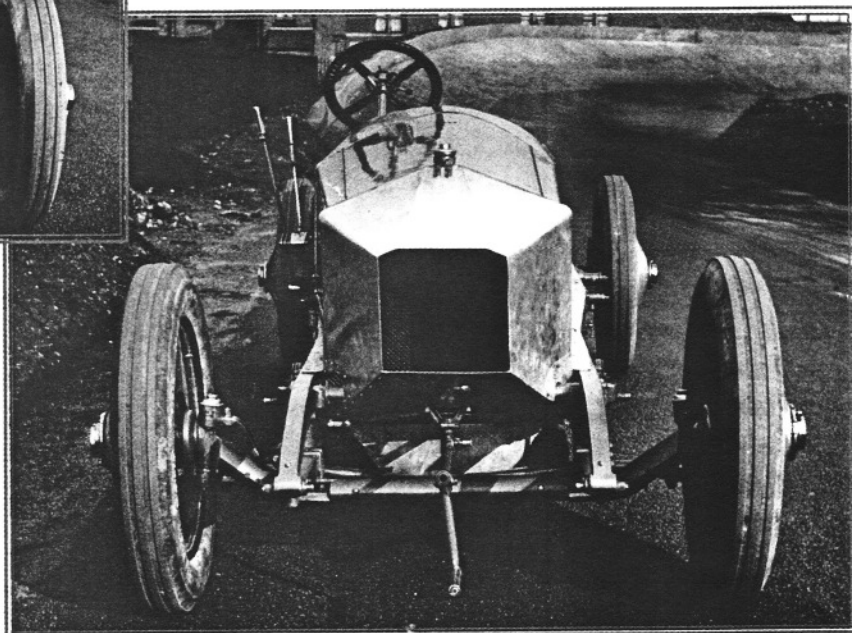
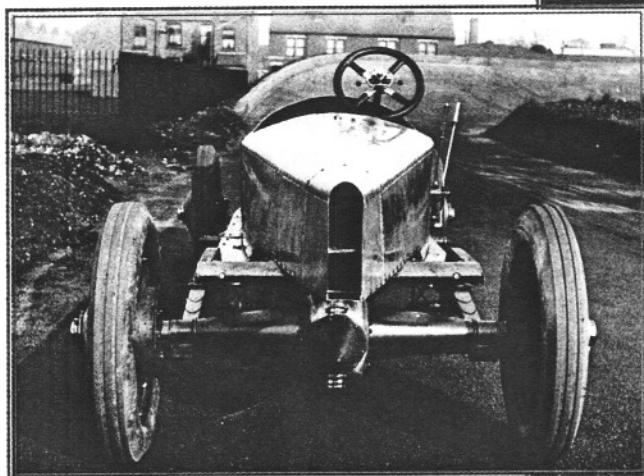
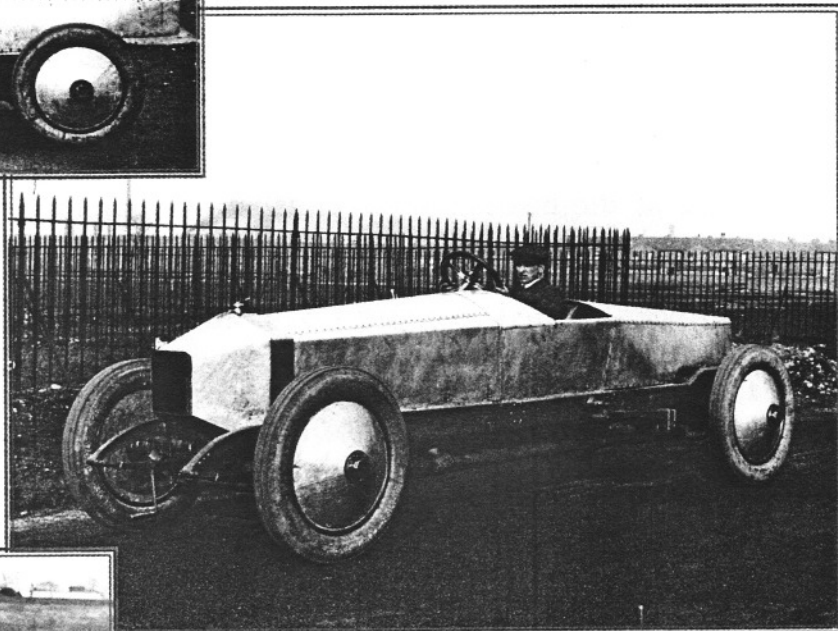
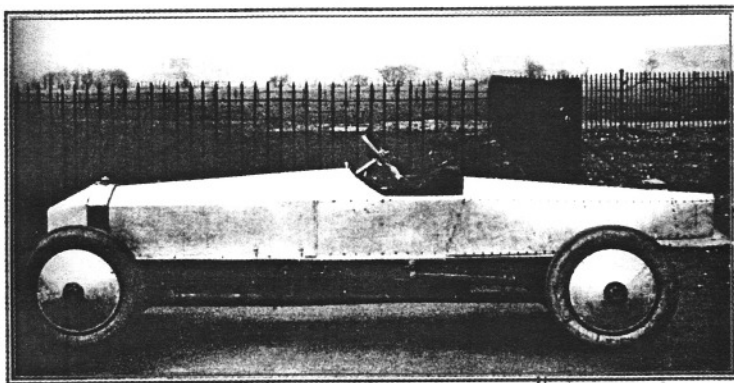
An Expert Opinion:—

"It is an undoubted fact that CLASS TELLS in the case of the car as in most other things, and in the result of this Rolls-Royce test is to be found confirmation of the universal opinion that this car is *facile princeps* in the world of automobilism."—The Pall Mall Gazette, Sept. 21st, 1911.

ROLLS-ROYCE, LIMITED, 14 & 15, Conduit Street, London, W.

[illegible]

The company's advertisement in The Times 16 October 1911 laying out its achievements over the Napier.



Four views of 1701, the soon-to-be 100 m.p.h. Silver Ghost, at the Rolls-Royce test track. This track was an early feature at the back of the new Derby works but was dispensed with during the Great War when the space was needed for buildings. In the side views (showing Ernest Hives at the wheel) note the straight-through exhaust behind the front silencer, thus reducing back pressure, and the Palmer cord tyres. The front and rear views show streamlining attempts, particularly the light wooden deflectors on the front axle beam. By comparison with the side views it is clear the photographs were not all taken at the same time as the rear view does not show the flat faring by the pointed tail. (Rolls-Royce Ltd. negatives WHP35 front; WHP39 rear; two others)

test of the engine was carried out on 22 May 1912, probably of the engine still in its final high-speed specification. Some months later in September 1912 the car was returned to its normal London to Edinburgh specification prior to its sale to the sporting motorist and Rolls-Royce enthusiast Norman C. 'Fatty' Neill in October that year.

1701's dynamometer test of May 1912 (see figures in the box below) is unusual in that it recorded power up to 2,250 r.p.m., whereas earlier test cards on standard engines had been limited to 1,500 r.p.m. and only in 1910 did they increase this to readings up to 1,750 r.p.m. The following comparison gives an indication of the increase in brake horsepower obtained throughout the engine speed range.

The transcript chassis cards and other sources indicate how this high power was achieved. The 1912 dynamometer test recorded a very high compression of 75-77 lbs. per sq. inch. Although a faulty gauge was known to have been in use in 1910, this was replaced long before this reading which is therefore likely to be correct, subject to atmospheric conditions. Although significantly higher than the standard engines, it is perfectly feasible. As already noted, London to Edinburgh engines had the bases of their blocks machined ⁽¹⁵⁾ to raise compression, and experiments with high-compression pistons had been carried out on both the 1908 70 h.p. chassis and on some of the later 40/50 h.p. experimental chassis. A change of pistons on 1701 is also shown on the chassis cards. The car originally had cast iron pistons fitted that weighed 4 lb. 3 oz. but on the reverse of the

piston section of the record cards there is a note of the piston weights known in 1920 (when the engine must have been disassembled) showing much lighter pistons of between 3 lb. 1½ oz. and 3 lb. 2¼ oz. ⁽¹⁶⁾ Since there is no mention of there being a change of pistons between 1912 and 1920, it is probable these were the ones used for the 1911 runs. If so, it is possible they were specially-made ones giving both lighter weight and higher compression. The lightweight cast iron pistons in the car in 1920 were replaced in 1925 with even lighter aluminium pistons, noted on the chassis cards as weighing 2 lb. 1½ oz.

Bill Morton made a side note on his transcript of the carburettor card that *'it is most probable that for the Brooklands 101 mph speed tests, a 1.2" diameter main choke was used'*. This was a considerable increase on the standard 0.9" choke. Jonathan Harley, who did extensive research on the car when he rebuilt it in the 1990s, agrees that the larger choke was fitted ⁽¹⁷⁾. He also wrote that a special camshaft (E1900) was fitted. Photographs show a large bore exhaust pipe was fitted with no rear silencer. The combined effect would have been to improve the breathing of the engine significantly, increase the engine's speed range, and thus to raise both the torque and power developed.

Judging by the photographs of the car on the Rolls-Royce test track at the Derby works it is clear that the company used the two months between the two runs at Brooklands to good effect. 1701 was first put through its paces on the Derby track long before it went to Brooklands but the track was far too short for very high speeds. It is likely

	500	750	1000	1250	1500	1750	2000	2250
1500 series	18.7	26.9	34.4	39.5	41.5	44.2		
1701	20.5	30.2	39.6	48.0	55.0	59.0	61.6	59.2

The notes do not show whether the figures for 1701 were with cut-out open or shut. Even if the test was carried out with the big-bore exhaust pipe used for the 100 m.p.h. run, it was clearly a very powerful engine, almost equivalent to the post-war high compression engines.

some speed was attempted on more isolated Derbyshire roads away from the law. They would also have had extensive bench testing of the engine to show that the car was likely to break the 100 m.p.h. barrier when it got to Brooklands. By far the most evident changes were to the body and chassis to reduce drag: the original Holmes 4-seater body, wings, lights and accessories were removed; a rudimentary light and narrow single-seater body was made and fitted to the car with a streamlined cowl in front of the radiator and a long pointed tail; the rear fuel tank was removed and a small one fitted within the chassis; various chassis parts, including the front axle and rear cross member, were streamlined with wooden fairings; the wheels were fitted with aluminium discs on both the inner and outer sides; a remarkable pointed cover was fitted on the back of the central rear axle casing; the driver's seat was dropped to frame level. Somewhat incongruously, after all the effort on streamlining, the small frontal area of the body meant that the gear and brake levers, along with the steering wheel, were left exposed to the air stream.

One last question remains regarding the ratio inside that streamlined rear axle. David Forward and most other commentators say that a 2.7 : 1 axle was fitted. If the company had retained the 65 tooth crown wheel all that was necessary was to change the 22 tooth pinion for one with 24 teeth, giving a ratio of 2.71. On standard Dunlop wheels and tyres this would have given 39 m.p.h. per 1,000 r.p.m. However, closer examination of the photographs show that the car had 35 x 6 Palmer cord tyres that were substantially taller than the Dunlops used in most calculations of gearing. With a diameter of 35" inches versus 33" for the Dunlop tyres, the Palmer cords would have raised the effective gearing by 7% to give 41 m.p.h. per 1,000 r.p.m. (18). To achieve 101.816 m.p.h. the engine would need to have been running at 2,480 r.p.m., taking it well past the power peak shown above at 2,000 r.p.m. By comparison, in a test of the 1914 Alpine Trials Rolls-Royce (chassis 18PB), *The Autocar* not-

ed the engine as running up to 2,500 r.p.m. and over (19), so perhaps 1701's engine would have done the same.

Jonathan Harley states in his book, *The Silver Ghost: a supernatural car*, that 1701 had a special 22 tooth pinion giving an axle ratio of 2.36 resulting in 47 m.p.h. per 1,000 r.p.m. This corresponds to 102 m.p.h. at 2,130 r.p.m. which was within 1701's maximum power range. However, no record has been found in Bill Morton's notes, or the parts books, of a 22 tooth pinion to go with the 52 tooth crown wheel. Since there was definitely a 26/65 set available, and the car was already fitted with the 65 tooth crown wheel, it would have been logical to have married this with the 26 tooth pinion. This 2.5 set would have given 44 m.p.h. per 1,000 r.p.m. on Palmer cords, meaning the engine would be running at 2,310 r.p.m., which is only just outside the bounds of the maximum recorded speed on the dynamometer. Whichever final configuration was employed it was extremely successful as the various changes to the engine, gearing, chassis and body enabled Hs to achieve 101.816 m.p.h. over the flying half-mile.

Thereafter, the success and appeal of 1701 led to a significant demand for the factory to produce 'replicas' of the London to Edinburgh car. The cantilever springing (soon changed to overslung), new rear axle, larger carburettor and other changes all became part of the standard Silver Ghost as well over the next two years. A line of sporting versions of the Silver Ghost continued with the Continental (i.e. the Colonial London to Edinburgh), the Alpine Eagle, and the post-war High Speed models. That Rolls-Royce had succeeded in changing its image can be confirmed from the following extract in *The Autocar* during July 1914 after they had tested James Radley's 1914 Alpine Trial Silver Ghost 18PB:

'What particularly interests us is the evolution of what one may call the high-efficiency Rolls-Royce. To go back to 1911, the

car was then, as now, a splendidly smooth running and reliable machine with a reputation that was thoroughly deserved, but it was not what one might call a lively car ... Then came the Edinburgh-London-Edinburgh trip under RAC observation, winding up with an eighty mile an hour sprint on Brooklands, and people were astonished that such a fast car under the Rolls-Royce brand had been made. Those who were fortunate enough to try it, found it ran very smoothly, besides being so speedy when it was desired to hurry and it became an established pattern known as the London to Edinburgh. Another year had elapsed, and it had, as it were, blended with the ordinary engine again; somehow or other the virtues of the two engines had been grafted into one; there was still the silky, noiseless running, plus the abundance of life and power.'

It is interesting to reflect on the almost total silence about the 101 m.p.h. run. Some company advertisements emphasised that it was not part of the Rolls-Royce 'programme' to build cars suitable for racing or excessive speed. Clearly the high-speed car was not one that could have been run hour after hour at 100 m.p.h. and no 'replica' of it would have been sold to a customer. Even 'Fatty' Neill got the detuned version of 1701. Derby would have known from their experience of the 1908 run at Brooklands by their highly-stressed 70 h.p., and the 1911 101 m.p.h. run at Brooklands in 1701 for only the flying half-mile, that the engines were at their limit. Cooling the pistons was a critical issue. And CJ would have been alert to the adverse effect on the company's genteel customers of anti-social high speeds being promoted by Rolls-Royce. Nevertheless, CJ could not resist letting at least some of the world know about this success, a little belatedly, and in *The Times* for 28 November 1911 all was revealed:

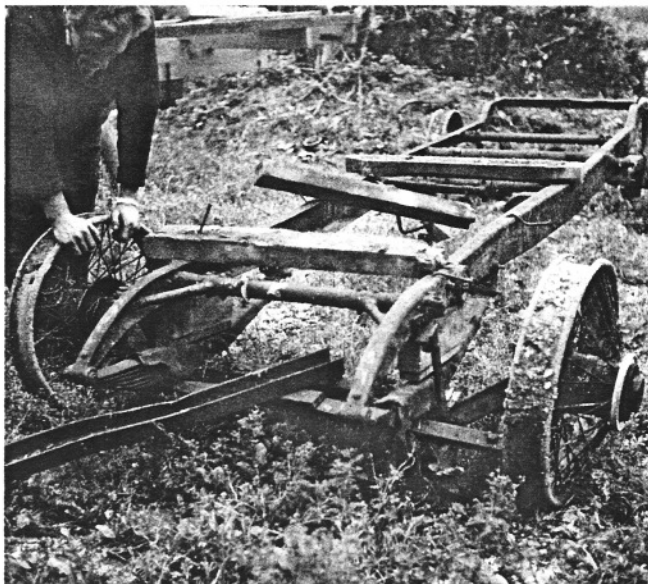
'A month or so ago a Rolls-Royce chassis ... ran at the rate of 78¼ miles an hour at Brooklands ... Speed was not the special object of that [London to Edinburgh] trial, but

*lately the Rolls-Royce Company decided to see what could be done with a chassis expressly prepared for fast running. They therefore took the car which had run to Edinburgh, and, while retaining the standard engine ... valves of standard size, and the same camshaft, they altered the compression, put on a higher gear, and fitted a wind-cutting bonnet and a single-seated racing body. The result was that at Brooklands the car attained a **maximum** speed of 101 miles an hour, and showed itself capable of maintaining an average speed only a few miles less.'*

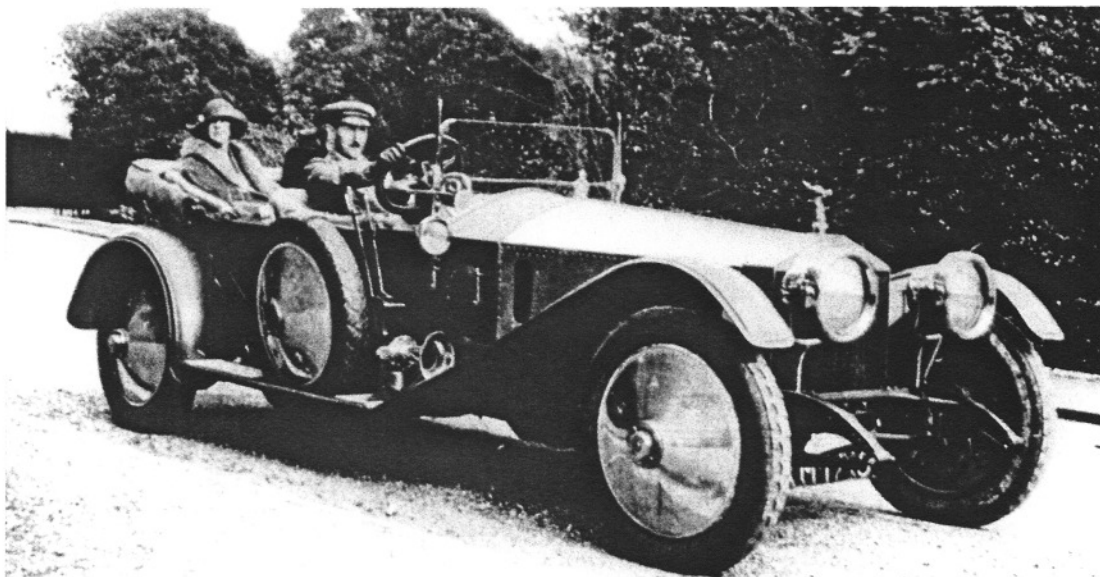
There must be doubts about the claim for a high average speed but at last the news was out. One of the reasons that the company's publicity could have been muted, about this and the earlier run, is that Royce and CJ were not present for the latter period. In early October they sailed to Egypt to give Royce some convalescence after his illness and they were still away in early November. It seems clear that in Royce's absence Hs was the driving force behind this speed effort, and he knew that Royce liked a car with a bit of 'fizz'! Nevertheless, CJ had met his objective of broadening the appeal of the car to a wider and younger market, without losing the appeal of the car to its original clientele. As for 1701 itself, the transcript of the chassis cards reveals that shortly after the final run at Brooklands the car was gradually returned to a more normal specification. First the original Holmes lightweight 'speed body' was refitted and then on 18 February 1912 the car was fitted with the new and quieter type of 18/52 gears in the rear axle. Interestingly, a year later this was replaced with a 17/52 gear set. Following the May 1912 dynamometer test the engine itself was gradually returned to a more standard specification. On 27 September 1912 the car was in the Test Department for general repairs, adjustments and improvements including the fitting of liners 1/16" thick under the blocks to reduce compression, changing the 2¼" induction pipe for a standard 2" bore, and returning the carburetter main choke to 0.9".

The car was returned to the Test Department in February 1913 to have the heavy flywheel removed and thereafter there is a record of continuous maintenance and upgrading of the car. Amongst the changes was the fitting of a C.A.V. dynamo and electric lighting, and in 1925 re-boring the cylinders, fitting a set of aluminium pistons, and new valves (20). At the same time a starting carburetter, a self-starter and a non-trembler coil were fitted. Little now remained of its former high-speed specification. The last record on the chassis cards is for 1928, when the car was based in Chester Mews, London S.W.1. Little is known of its history between then and its rediscovery by Fairfax Guy Wade-Palmer in 1963 on a farm in Hampshire - just the chassis frame with front axle and with the rear axle being the later replacement number 1817. The chassis still carried its unique identifying rear spring centre hangers. It was then sold to the late Kenneth Neve, an ardent collector, and he and subsequent owners carried out several restorations. It is now back to a very similar specification to that when it completed the London to Edinburgh run in Sep-

tember 1911 and became one of the most illustrious Rolls-Royce models.



1701 discovered in Hampshire in 1963. Many years earlier a side frame member had been replaced and a later front crossmember with stays fitted, as seen in the previous picture. From these remains 1701 arose anew. (Courtesy of Rick Ford)



1701 in the early 1920s somewhat modernised. Note the diagonal stays at the front added some years later to a replacement crossmember. The other changes include changed shape for the scuttle swelling for the driver's foot, vent in the bonnet sides, domed rear wings and inner valances on the front wings. 1700 was also modernised in this period with a tourer body by Gill. (Courtesy of John Fasal)

1701's Derby coachbuilder: *Work in progress by Will Morrison*

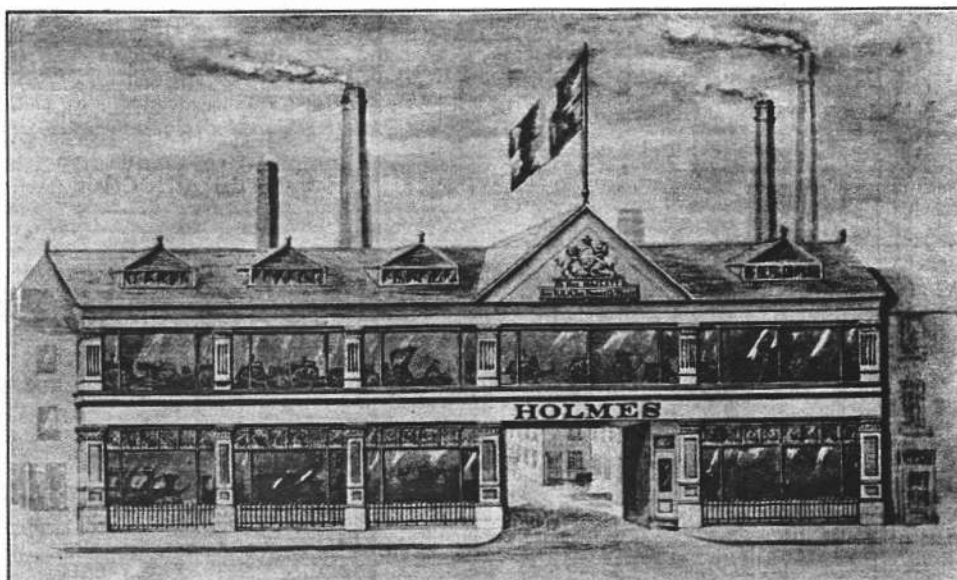
Charles Holmes started as a coach and harness maker in Lichfield in 1786, and was settled in Derby by 1803. His son, Herbert Mountford Holmes, was born in the town in 1815. Herbert inherited his father's business aged only 20 years old, and was to run Holmes for 58 years. When he died in 1893, Cooper's Art Journal commented: *"The works at Derby, which have been almost entirely constructed by Mr. Holmes, are the best arranged and most complete in every way of any in the trade, and are a striking example of the thorough way in which he always did*

his work, his motto being "Quod facis valde facis." In 1895, Holmes of Derby also had branches in London, Lichfield, Burton-on-Trent and Sheffield. When the first body for 1701 was built in 1911, three of Herbert's sons were involved with the family firm; Charles, Herbert and George, and the London Road showrooms shown below would, most probably, have been filled with a selection of both carriages and motor cars. The works were situated through the arch and are indicated by the smoking chimneys. Early in 1923, the old established family firm of Holmes Brothers Ltd. was taken over by Sanderson and Sons of Midland Road, Derby, and became Sanderson and Holmes Ltd. (R)

THE COACH BUILDERS', HARNESS MAKERS' & SADDLERS' ART JOURNAL.

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MESSRS HOLMES & CO., DERBY.



Holmes & Co's new showrooms and works - as presented in Cooper's Art Journal, February 1895.

Notes on the article: 1. *Flying Lady* May/June 2009; 2. John Fasal & Bryan Goodman *The Edwardian Rolls-Royce* p.424; 3. 1701 chassis cards 4 July 1911; 4. David Forward *The Rolls-Royce Silver Ghost* p.416; 5. Forward p.429; 6. Forward p.404; 7. Forward p.430; 8. Bill Morton transcript at the Sir Henry Royce Memorial Foundation; 9. *Catalogue of Parts* Aug. 1914 p.183; 10. 1701 despatch card; 11. Morton transcript p.7; 12. *The Autocar* Sept. 1911 p.841; 13. Sheffield-Simplex letter in *The Autocar* 1911 p.685-6; 14. Morton transcript p.7; 15. Forward op.cit. p.440; 16. Morton transcript p.4; 17. Jonathan Harley *The Silver Ghost: a supernatural car* p.163; 18. Dunlop 895x135 rolling radius 16.19 inches, Palmer cord rolling radius 17.25 inches, from *Memorandum on fitting coachwork and completing of Rolls-Royce cars* 1912, p.23 Approximate Tyre Dimensions; 19. *The Autocar* 18 July 1914; 20. Morton transcript.