ROLLS-ROYCE

enthusiasts club bulletin

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FEBRUARY 1965 - No.31

A very enjoyable Film & Social Meeting was held in the cinema and reception room of Shell-Mex House in the Strand on Thursday January 14th, when some ninety-five members were present. The Shell-Goodwood film was shown, together with the 1964 Grand Prix Event and a film on suspension problems. Our thanks are extended to the Company for providing such excellent facilities and lavish hospitality for the occasion of our first meeting in London.

FORTHCOMING MEETINGS IN 1965

Annual Dinner (Please note change from original date)

The club's dinner will be held on Friday April 9th, at The Weston Manor Hotel, Weston-on-the-Green, four miles north of Oxford just off the Bicester Road. The sevententh-century panelled dining room will only accommodate seventy diners so early application to the honorary secretary for tickets is advised. This will be the second week of daylight saving and enable members to arrive in daylight and to see the cars parked in the quadrangle in front of the manor. Members wishing to stay the night can write directly to book accommodation if they so desire. Tickets are one guinea per person.

Annual General Meeting

The A.G.M. will be held at the Farmers Union,269 Banbury Road, Oxford at 9pm on Friday March 12th.

Sunday 2nd May Rally at Woburn Abbey.

Saturday 22nd May R.A.F. Croughton.

We have been invited, by the American Air Force, to rally at Croughton on 22nd May, which will be the occasion of their Armed Forces Day and our programme will be similar to that of the successful Rally with the Americans at Heyford. Members can arrive for picnic lunches from noon onwards . The programme will start at two-thirty. Members wishing to attend apply to the Hon.Secretary.

Sunday 30th May Members have been invited by the R.R. section of the V.S.C.C. to a meeting at the Royal Naval College Dartmouth. Entry forms can be obtained from the Hon.Secretary.

French Tour June 1965

The French wine tour party will cross from Southampton to Cherbourg on Thursday 10th June and participants should present themselves with their cars one hour before sailing time, 10.30am. Crossing is about four hours and lunch and refreshments will be available on board, at duty-free prices. Special reduced rates have been obtained from Messrs Thoronson, of £11 each way per car irrespective of car length and a passenger fare of 35s. only. The return voyage will be from Le Havre on Wednesday June 23rd. Members who cannot travel at these times will be able to proceed independantly on these ferries providing the reservations are made in good time.

Sunday 18th July Concours D'Elegance, held in conjunction with the 20 Ghost, Midland and Bentley Drivers Clubs at Blenheim Palace.

Saturday 24th July Rally at Stowe School.

Wraith Valve Timing

4 1/2 degrees of top dead centre. I.O. Mark on clutch, number one inlet valve open 25 thou.", turn camshaft anti-clockwise until 25 thou. clearance taken up. Allow two teeth for helix of gear.

R.S.

SIR HENRY ROYCE, Bart, SEEN FROM 1964

by IVAN EVERDEN, MBE, BSc (London)

Part II

Three years later I was summoned to return to West Wittering, together with my chief, B.I. Day and colleague Bill Hardy, to form an addition to the Elmstead Drawing Office, to be housed in an artists studio called Camacha situated in the village a quarter of a mile away. This was described as a temporary measure to hasten the completion of the designs for the 20 HP. Rolls-Royce, then known to us as Goshawk II. It lasted twelve years.

There was little change in Elmstead, except that the oil lamps had given place to electric lighting, which consisted of two motor car headlamps per drawing board supplied by a car dynamo and powered by a rather ancient Gardiner engine, the whole having been engineered by Royce himself. The oil lamps had been bequethed to us at 'Camacha'.

Nominally, the working hours had returned to the normal period of 9am to 5.30pm with one hour for lunch. However, Royce was seldom in circulation before 11 am. After a spell in his own office before lunch and a stroll along the shore in the afternoon he would often call on we people little before knock-off time, full of a new idea. A design session could then go on until after 7pm to be broken up only by his nurse calling him back for the evening meal.

What was the life of a designer like under these unusual circumstances? Domestically, whether single or married it was limited. Some gave it up, to return to the amenities of town life. If one was capable of making one's own amusements and was a lover of the countryside and the sea, it was a grand life.

For the designer, in many ways, the conditions were ideal - - a roomy office, a mild sunny climate, clean air and absolute quiet with no telephone and no callers, Royce or his secretary excluded. Devoid of any direct contact with the factory personnel, and the day to day worries of development engineers and test department, there were no distractions.

This did not mean that we lived in complete isolation. On the average, Hives, Rowledge and members of the design and development staff at Derby paid fortnightly visits to West Wittering to give news of the latest tests, and to discuss current problems. Usually a car and experimental pieces were brought to demonstrate relavant features, good or bad. It was the custom for a prototype, made to our designs, to be brought to us to illustrate the problems encountered in its manufacture and during its initial tests.

In Summer, these meetings were held under the mulberry tree on the lawn at Elmstead, continuing indoors until late evening.

Furthermore, Royce insisted that major experiments which we conducted at Derby should be the subject of a detailed written report, because he believed that during any experiment, it is so easy to omit certain facts and observations necessary to the logical proof of the conclusions arrived at. The writing of a report brings to light these omissions and they can be remedied before the apparatus is dismantled. The compiling of these reports must have been akin to the preparation of a brief for the Council for the Defense. If there was a flaw in the evidence, Royce would find it. The sentence was not a light one.

What of the personnel composing the design team? All had worked for a considerable while in the drawing office at Derby The chief, A.G. Elliott, had been with Royce for at least seven years All had received technical training of the polytechnic standard. As far as I am aware, I was the only university graduate, a fact which I was advised to keep secret, which I did until five years later when, inadvertently, it leaked out,

The petrol engine and the motor cars were not in the curriculums of the ancient universities. The internal combustion engine in my day was the gas engine. Graduates were not attracted to the then new motor car industry To take up Civil or Mechanical Engineering was considered to be following a profession Motor car engineering had no academic status and therefore it did not attract university graduates - However, some ten years later, and not long before Royce died, I was instrumental in getting appointed to our office two young graduates, both of whom now hold very high posts in the industry.

Normally new people were recruited from Derby. Whilst a high standard of ability to design was essential it was by no means the only qualification needed. One's acceptability to Royce depended also on personality, manner of speech and mannerisms, style of dress and private life. Some came and failed to make the grade of the first few days. To obviate the loss of acceptable candidates, each was asked to sign a contract to serve, for a period of at least three years at any place where so directed. This covered going in the winter to Le Canadel.

Royce was no draughtsman. He worked mentally all of his waking hours, making small sketches on the back of an envelope or any odd piece of paper that was at hand. However, he could read, with extreme rapidity, the most complicated drawing, to the extent that he could see the components in the flesh, visualising the mechanism working and so sense

the loads to which the parts would be subjected, and the stresses and strains which would ensue.

Years of practical experience gave him an eye for knowing the right size for any particular piece, such as a shaft. If he criticised one's calculated dimension it was wise not to argue and to remake the calculation, for it was the calculation and not Royce that was usually in error.

His power of logical deduction was so highly developed that to follow his reasoning was like a walking child trying to keep pace with his father, who takes the fewer steps to cover the distance. Royce once remarked 'If we could observe to the full a given phenomenon and through logical reasoning fully comprehend, there would be no problems left to solve'.

Whenever possible, Royce based each new design on a previous one, either of his own making or of a competitor. I can recall more than one instance when he took up a design discarded by a competitor as a failure, and made it into a success, because he realised that the idea had been good but the execution faulty. He believed in the process of evolution and often said 'I am a mechanic and not a pioneer'.

Perhaps his most outstanding quality was the patient attention he would give to the very smallest detail of a design. He would spend an hour or more with one at the drawing board reviewing every conceivable solution of a simple problem, which too many would seem to be a trivial matter. The expression 'good enough' never failed to invoke his wrath.

The provision of the adequate attachment of two or more pieces to each other always received great attention.

At the outset of his career he realised that, with a few exceptions, the largest bolt he would use would be .375 ins in diameter, and that the majority would be much smaller. Consequently, the mild steel bolts in common use in heavy engineering would be inadequate. He chose to use 3.5% nickel steel. Likewise, because the Whitworth thread in these smaller diameters was too coarse, making the core diameter too small, for sizes up to and including .187 ins diameter he chose British Association Threads, and for all of the larger sizes British Standard Fine Threads.

He chose to use square headed bolts in preference to the orthodox hexagon head to reduce the amount of stock which had to be turned away, but more important because the square head could be held from turning by the use of a step or spigot on the component. A simple exercise will show how this is not really adequate using a hexagon head and a clearance hole.

No full nuts were used, only half-nuts, and these were made in a lower grade of steel than the bolts so that the female thread of the nut would be slightly less strong than that of the bolt; a good feature he believed.

His aero-engine experience made him ever conscious of the need to save weight. Castings in iron or bronze were avoided if at all possible and preference was given to aluminium. It is of interest to note that the first Royce car had an aluminium engine crankcase, sump and wheelcase whilst the gearbox and axle casings were made of the same material.

He liked very much to use sheet metal, sheet steel or sheet aluminium, because he could be sure of its physical properties. He would make brackets in sheet steel and having gas welded joints if such were unavoidable pro - vided always that the weld occurred at a point of low stress and not tensile stress. In those days the welding was done by a gas torch.

Examples of Royce's attention to the details of design are innumerable and could well form the subject of a book. I have chosen to illustrate just a few.

The first relates to the attachment of a lever to a shaft by friction in which the clamping bolt is placed to one side to make the flexible portion of the boss as long as possible. Note the weight saving on the bolt boss.

The second illustration shows a control rod ball end. Of particular interest is the spherical seat of the bolt and nut to relieve the former of any bending stress, the bolt being only 5.BA.

The last is the waisted stud, used to save weight, to avoid stress concentration and to provide elasticity. The stud end which was threaded into the aluminium was made one size larger than that of the nut end for an obvious reason.

Set-screws of course were not possible for use in aluminium, but Royce would not tolerate their use even in steel because, in a clearance hole, unless a balanced tightening torque is applied, the stem is bent, the threaded portion is tilted and the head digs into the surface of the component.

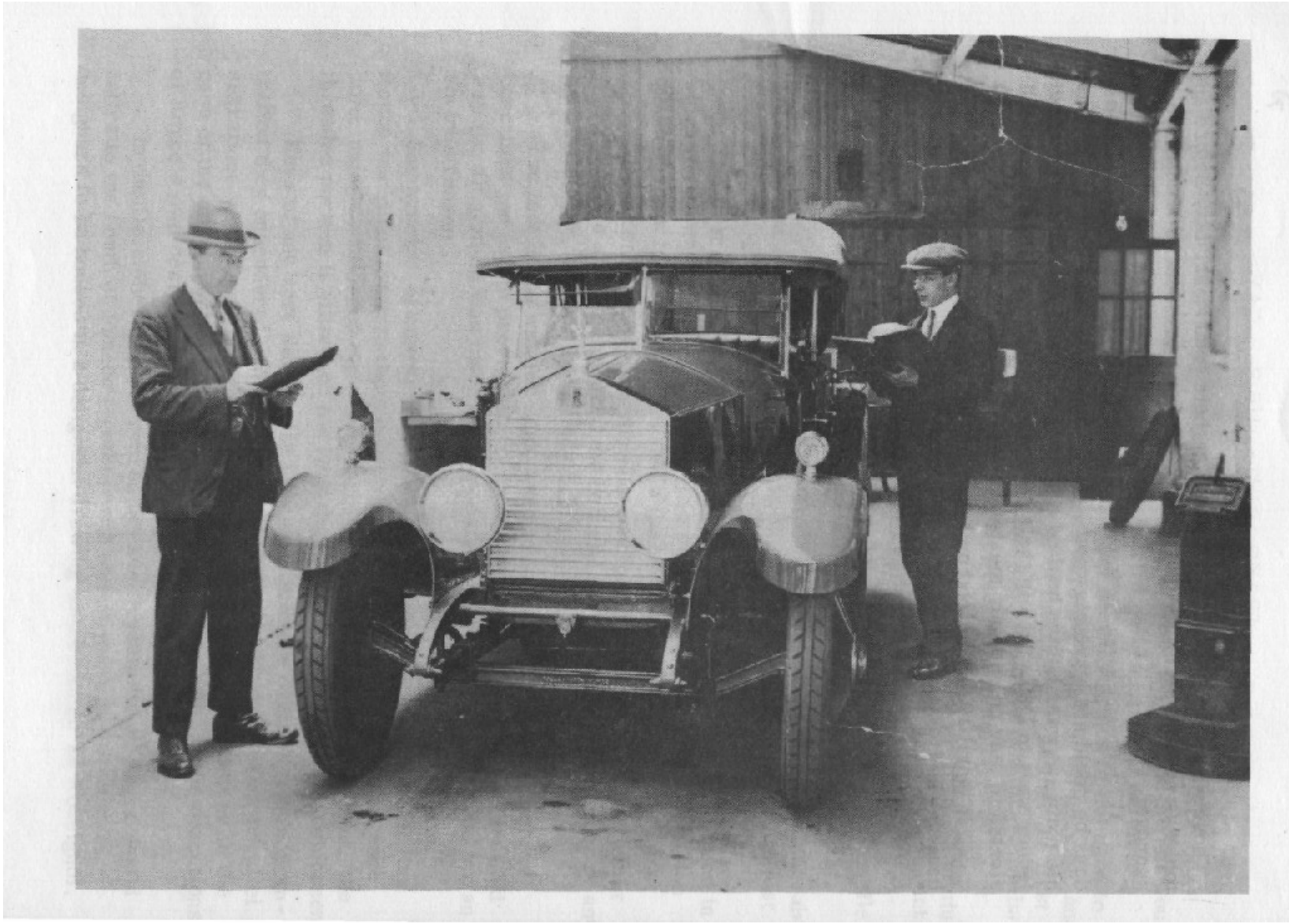
Keys of any sort were never favoured, because of the stress concen- tration they engendered. When no reversal of torque was present parallel serrations were used, but when reversal of torque was present, as in the case of the attachment of the steering wheel to its column, taper serrations of Royce's own design were used.

In the December of most years, his health permitting, Royce would retire to the South of France together with one or more of his team of designers to be housed in a delightful drawing office named Le Rossignol.

Those who were left behind carried on their good work, but, before any tool was set to metal blue-prints of the design were sent to Le Canadel for approval.

As the years went by Royce became poorer in health. Sometimes for days he could not leave his room. More and more responsibility fell upon his team. A year before he died his chief assistant Elliott accompanied by Jenner went to Derby to join their design team. Others, like myself, elected to stay on with our master until they must leave him.

In April 1933 we stood on his lawn, whilst a very old Silver Ghost hearse was ticking over quietly on the road outside, waiting to pay our last respects to 'The Old Man'.



BRAKE LIGHTS THE R-R WAY

This article will only be of interest to those who strive to maintain or restore their cars to R-R standards. It is of course hoped that an increasing number of our members fall into that class, though it is appreciated that many cannot afford the necessary time.

The tail light wiring on the early 20 and 20/25 H.P. cars is as shown in fig.l, and although a socket exists on the nearside for power to a second tail lamp, almost always the twin tail lamps now required by law are wired to the offside socket. Although not required by law for these cars, it is becoming increasingly desirable to have stop lights in modern traffic conditions. Where these have been 'fitted', the wiring is usually draped round the conduit and across the petrol tank in a worse-than-B.M.C. manner, and the true enthusiast will not be prepared to tolerate such a lash-up. Access to the wiring conduit in which the existing R-R wiring runs is quite easy, if time consuming, once the principles have been grasped, and the brake lights can be wired into the system properly as shown in fig. 2.

The relevant parts of the conduit are shown in fig.3. In wiring up the stop lamps, a power wire should be run from No.6 fuse and through the conduit on the dash to the brake light switch, which can be situated near the brake pedal spring. On no account should power be taken direct from the ammeter. The lead from the switch can be run into the conduit at the 'T' piece near the dash, leaving a minimum of the brake light wiring exposed. To conform with colour coding employed on later chassis, the stop light wiring should be blue. Since running the new wire through the conduit will entail gaining access to the tail light wiring at several points, it will be possible to re-wire the tail lights at the same time. The R-R wiring was executed very neatly, but the cotton insulation of the wires has usually deteriorated seriously where the wires emerge into the open air, and re-wiring with a suitable grade of plastic covered wire is recommended. Always use the original style of terminations for the wire, and stick to the original colour code, even if you do have to spend more time finding the wire. There is nothing worse than a bastard colour scheme when it comes to fault tracing.

The two clues to rewiring are to split the conduit into short enough lengths for the wire to be pulled through easily, and never to pull wire out of the pipe without using it to pull a new piece in. It is always easier to pull a wire through than to push it through. For this job, sufficient access can be obtained by removing the 'U' section on the dash, removing the brass connector on the pipe near the body light junction

box, and by removing the sections of pipe .'A' and 'B' complete. This latter operation may be impossible on some cars without removing the petrol tank, and as an alternative, section 'C' and the section across the chassis can be removed. The sections of pipe are push fitted into the elbows and 'T' pieces and clamped to the chassis with aluminium clamps. Access to the chassis side member is usually good once the floorboards and rear seat have been removed. When using old wire to pull new through, strip the insulation off each piece for a couple of inches and twist or preferably solder the ends together well. Have an assistant push the wire into the pipe while you pull on the other end.

N.H.H.

WHAT'S ON TELE?

The Hobson Telegage is viewed sometimes with suspicion, possibly because the principle of this instrument is not fully understood.

Basically, the Telegage is a manometer which measures small differences of air pressure in the inverted stand-pipe within the petrol tank. The important thing is that the stand-pipe contains a colum of air, and not, as might be supposed, petrol.

Mounted on the stand-pipe are a number of small trays, arranged one above another, each with a drain tube which vents into the bell shaped bottom of the stand-pipe. As the fuel swills about when the car is running, petrol drains down these tubes and releases trapped air bubbles into the stand-pipe, thus maintaining the air column.

The depth of petrol in the tank controls the pressure of the air column, which, in turn, creates an unbalance in the facia unit. Two refinements to the system are the balance pipe connecting the unpres - surised side of the manometer to the tank, and the hand pump. A crafty feature is the 'heavy' indicating fluid which has a specific gravity of about 3.5.

Principal causes of non-operation are damaged pipes and the pre- sence of moisture in same, especially the presence of moisture.

R.H.

CYLINDER HEADS

It is unfortunately true that we no longer have any stocks of 25/ 30 cylinder heads but a few for 20/25 cars are still available; their current price is £ 89. 4. 8d.

It has always been this Company's policy to do everything possible to provide spares for old Rolls-Royce cars, regardless of difficulty, but the time does inevitably come when the cost of producing small batches becomes uneconomical at the prices ruling today; the majority of owners would simply not be prepared to pay the price, and stocks of extremely expensive parts would either remain unsold or would take so long to sell that the amount of capital tied up could not be sustained.

Because of this, if there is a requirement for a part which we do not have in stock then we shall only be prepared to manufacture it on a realistic cost basis.

It is possible that we might ask the customer to agree to purchase a complete batch and in the case of parts as complex as a cylinder head the cost might well be considerably in excess of a thousand pounds.

Speaking in general terms, we are still holding, and will continue to hold, a considerable amount of spares for pre-war cars.

The decision we have to make is in regard to further replenishment at present day prices .

Naturally if you wished to do business in the manner we have outlined, then the terms would have to be agreed.

Assuring you of our best attention at all times.

We are,
Yours faithfully,
for and on behalf of
ROLLS-ROYCE LIMITED.

J.K.Hargreaves.
Technical Spares Engineer
(Motor Car)

ADJUSTMENT OF SERVO MOTOR - ALL MODELS

The adjustment of the servo motor is effected through the larger hexagonal nut, located at the extreme end of the servo shaft.

This nut is locked by 25 radial serrations which engage similar serrations formed on the face of a washer which is secured against rotation relative to the shaft. Each of these serrations are carefully proportioned to give the correct clearance of the servo, and care should be taken to see that these are in proper engagement at all times.

On all occasions when screwing up the adjusting nut, force should not be used, as this will only result in defeating the object of the teeth, namely, to ensure the correct amount of clearance with the minimum amount of trouble.

There are two methods of adjustment. The first is that already laid down in the various handbooks. This consists of screwing up the adjusting nut one serration at a time until the correct amount of free pedal travel is obtained. Owing to the fact that a certain amount of wear may have taken place in the linkage joints and the pedal fulcrum, this method may result in a servo clearance which is slightly too close. Should it be decided that this method will be used, however, the free pedal travel recommended for the various chassis types is as follows: -

20H.P .....)	1/4"
Phantom I .....)	
20/25 H.P.....)	
25/30 H.P.....)	
Wraith .....)	1/2"
Phantom II .....)	
Phantom III .....)	

The alternative method is by checking of the servo clearance itself. This is effected by pushing the servo drum towards the gearbox as far as it will go, and applying the foot brake, noting the amount of movement of the servo drum. The correct clearance for all models is 1/32" end float. The adjusting nut should be screwed up one serration at a time only, until this clearance is obtained.

Should the adjusting nut be screwed up beyond the recommended amount, there will be a tendency for the servo to drag, thereby causing deterioration in braking efficiency.

OVERHAUL OF SERVO MOTOR - ALL MODELS

Removal and dismantling

(a) 20 H.P. 20/25 H.P; 25/30 H.P.: Phantom I & II:

1. Disconnect all the centralised lubrication pipes to the servo, where fitted.
2. Remove all the clevis pins and collars from the following points:-
   Servo shaft cam levers.
   Pneumatic damper connecting arm. (Where applicable).
   Upper and lower arms of 'T' shaped balance lever.

7. Having removed the servo drum from the chassis, screw up the adjusting nut at the end of the servo shaft until the two castellated nuts project through the holes in the inner pressure plate. Remove these nuts and separate the pressure plates.
8. Remove the circlip from the end of the servo shaft, unscrew the adjusting nut, pull off the serrated washer and buffer springs.
9. Remove the cam levers, taking care not to lose the steel balls.

NOTE: In relation to the 'Wraith', Item 4, this form of damping will only be found on models prior to chassis WHC-1.

Thoroughly clean the unit with petrol to remove all traces of oil and dirt, and examine the liners for oiliness or superficial hardness and gloss.

Inspect the clevis pins and connecting link yokes for wear and ovality, renewing where necessary. Failure to do so may result in noisy and delayed action of the servo.

NEWLY JOINED MEMBERS

Lt.Col.H.M.Harvy-Jamieson, T.D., 4 Moray Place, Edinburgh. 1936 25/30, 1937 25/30.
J.B.Cowasti, Air India, 84 Mahatma Gandi Road, Bombay, India. 1928 PI.
G.J.Ellis, 171a Gloucester Place, Regents Park, London N.W.I. 1931 20/25.
S.Critchley, 211-213 St Georges Road, Bolton, Lanes. 1936 25/30.
M.Pleasants, 83 Gasstobury Drive, Watford, Herts. 1934 20/25.
S.Goode, 151 Columbia Heights, Brooklyn 1, New York, U.S.A. 1938 James Young.
Lt. L.H.Jamieson, Officers Mess, Old Park Barracks, Dover, Kent. 1932 20/25 1923 20.
Dr.J.M.Newbury, Burnt Norton, Chipping Campden, Glos. Car pending.
D.Sargeant, 11 Jacksons Lane, London, N.6. 1931 20/25.
W.A.Lockley-Cook, Keston Court, Keston, Kent. 1912 Silver Ghost. 1937 PIII 1936 Silver Cloud III
M.S.Coxe, 72 Orange Street, Brooklyn, New York, U.S.A. 1954 Silver Wraith.
R.Brooks, Brookside, 40 Starling Road, Radcliffe, Nr.Manchester. 1924 20, 1937 25/30.
D.Crittow, 17 Harpes Road, Oxford. 1934 PII.
J.Campbell-Forbes, 48 St Georges Road, Henley-on-Thames, Oxon, 1929 20.
N.H.Hoffar, Half moon Bay, British Columbia, Canada. 1933 20/25.

W.G.Bablock, 18 Countesbury Road, Norton, Stockton-on-Tees, Co. Durham. 1934 20/25.

G.Barton, lona Bridgeland Avenue, Homestead, Menston, Ilkley, Yorks. associate.

Capt. P.R.Camm, R.A.M.C., 9 Digdens Rise, Epsom, Surrey. 1932 20/25.

P.F.Fulford, Westbourne, The Ridge, Maybury, Woking, Surrey. 1938 25/30.

A.M.Sutton, Riversbridge, Dartmouth, Devon. 1923 Silver Ghost, 1930 PII.

Lt.Col. N.J.R.Crawley, M.B.E., The Barton, Cobham, Surrey. 1929 PII.

M.D.Foster, The Manor, Manor Drive, Sutton Coldfield. 1928 20.

A.J.Barrowman, Barrowby Hall, Garford, Nr. Leeds. 1935 20/25.

M.JJohn, 92 Harley Street, London, W.I. 1925 PI.

B.H.Packman, 267 Pinkhurst Lane, West Wickham, Kent. 1926 20.

FOR SALE

1937 25/30 fixed head coupe two-seater. Re-conditioned engine. Refitted carburettor, petrol pumps, brakes, servo-motor, starter, dog drive, wiring, windscreen wipers, etc. Photographs and A. A. report.

1929 PI Limousine by Windover in regular use. £250 or would exchange for 20/25.

1934 20/25 Sports Saloon £100.
1938 25/30 £295.
1939 Wraith - £250.
1929 PII - £69.

Apply Chairman.