A 20 H.P. SIX-CYLINDER ROLLS-ROYCE.

Technical Details of the Latest Car to Mark the Growing Popularity of the Medium and Small Six-cylinder Engine. A Light and Lively Chassis designed to Accommodate All Classes of Coachwork.

For years past it has been known that Rolls-Royce, Ltd., have been conducting experiments and research work in connection with chassis of smaller dimensions than those of the world-famous 40-50 h.p. car that bears their name. It has, however, been the policy of the company to test every innovation to the utmost before adopting it, and the work in relation to the new 20 h.p. six-cylinder chassis has afforded further evidence of this method of procedure. The newcomer is, in reality, the result of years of practical experience. It has been tried out not only in this country, but also on the roads of France, and it may be stated definitely that those responsible for its design and construction are entirely satisfied with its capability to uphold the honour of the company and of its 40-50 h.p. "big brother," which, incidentally, it will in no way supersede. It may be remarked that the adoption of battery ignition for the smaller Rolls-Royce is likely to give no small encouragement to those who hold the view that the need for a magneto is becoming less pronounced as the general electrical equipment of motor cars comes nearer to perfection in the way of reliability. In view of the fact that no chassis of the 20 h.p. Rolls-Royce was available for examination in time for an article to be prepared by us for publication this week, the following description of the outstanding features has been compiled by Mr. F. H. Royce, the designer and Chief Engineer to Rolls-Royce, Ltd.

THERE has been no very serious departure in this chassis, but its value is greatly due to the infinite care taken in the design and proportion of the units. Simplicity was one of the aims of the designers, but not at the expense of perfection. Having this in view, no expense has been spared that the parts shall be made as perfect and as lasting as possible within the limit of weight, a leading motto being "spend as much money in the construction as can be done wisely, but not unnecessarily." This chassis is built and tyred to carry open and enclosed bodies up to six seats, and with bodies and wings of moderate dimensions the complete car is capable of high road speed. It is not recommended that this chassis shall carry such heavy bodies as are often fitted to larger chassis. The body space is ample for six seats with moderately raked steering, and the frame length behind the dash is 8ft. 3in.

Special care has been taken to allow of the rear seats being very low considering the diameter of the road wheels, and ample clearance is given for the movement of the back axle, this clearance contributing to the excellence of the car's suspension.

SPECIFICATION.

ENGINE: 20 h.p., six cylinders, 3 × 4½ in.—76 × 114 mm.—(3,150 c.c.). Overhead valves, push-rod operated. Detachable cylinder head. Battery ignition with automatic advance.
TRANSMISSION: Single dry plate clutch, three-speed gear box, spiral bevel final drive, full floating rear axle.
SUSPENSION: Semi-elliptic front and rear.
STEERING: Worm and nut. Two standard positions for steering column.
WHEELS: Dunlop detachable wire, with 32×4½ in. tyres. Wheelbase 10ft. 9 in. Track 4ft. 6in.
WEIGHT: Chassis 18cwt. 4lb.
PRICE: Chassis, £1,100, Open Touring Car, £1,590.

Range of Useful Engine Speed.

The six-cylinder engine has its crankshaft carried in seven bearings, and runs from 150 to 3,000 revolutions per minute without apparent vibration, and, owing to the perfect working of the R.-R. expanding carburetter and carburation system, it pulls with great torque throughout its useful range of speed. The journals and the pins of the crankshaft are bored hollow for lightness and strength, and the crank forgings are machined all over.

The cylinder arrangement, although appearing somewhat usual, is quite unique, as the push rods for the overhead valves are on the opposite side to the ignition plugs, which latter are in an extremely good and accessible position, *i.e.*, they are well in the crown of the combustion chamber, out of the way of oil, and very accessible. The valve gear is particularly silent, and remains so throughout an extended service; this is due to the great care taken in the design and proportions of the valve operating mechanism.

The cylinders are a *monobloc* casting, as is also the head, which is detachable; all the valve seats are water-cooled, the joint between the head and the cylinders is most carefully proportioned, and has never given a moment's trouble during prolonged tests. (These have proved considerably more reliable than the usual loose heads on a side-valve engine.) The half-time wheels driving the camshaft and other units are helically cut, and the R.-R. damped spring drive is used, giving a smooth and silent drive through the full range of speed.

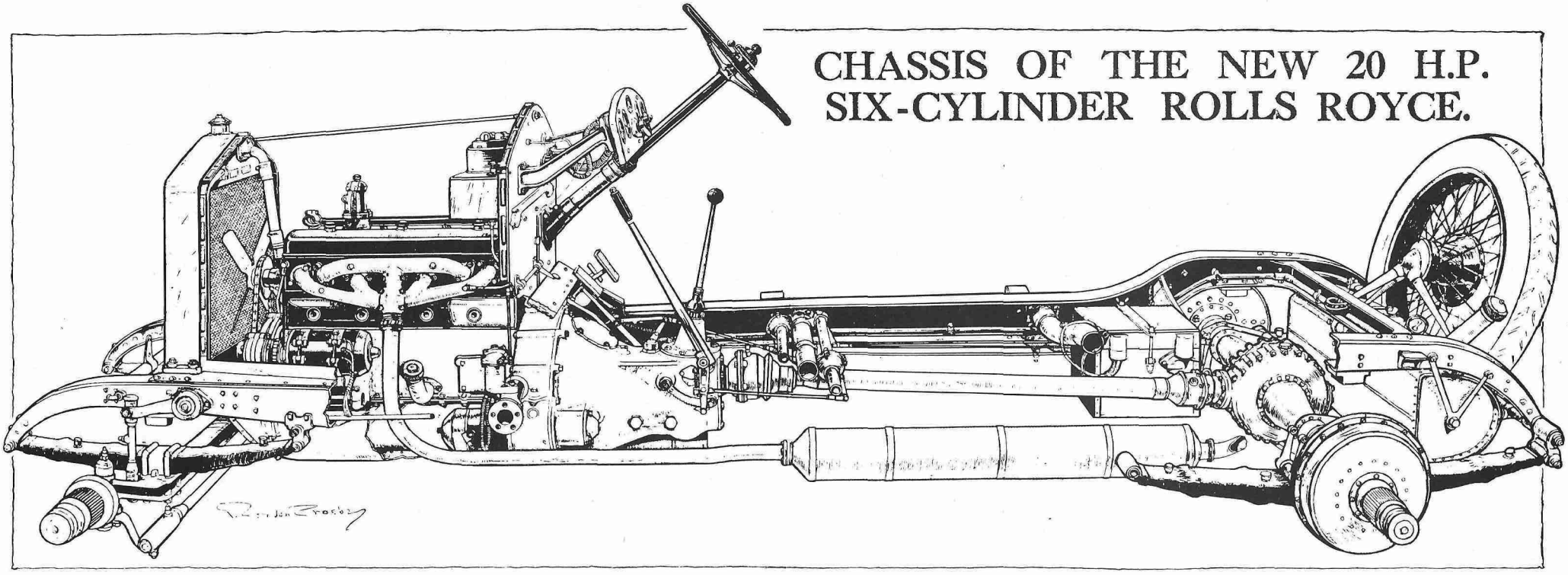
The pistons are of aluminium, and, owing to their design, they are light, free from knocks, and not liable to seize. Owing to the careful arrangement of piston rings the wearing surface can be well lubricated without fear of excess of oil entering the combustion chamber. The pressure lubrication is also carried to the little ends of the connecting rods, which are extremely light nickel steel forgings.

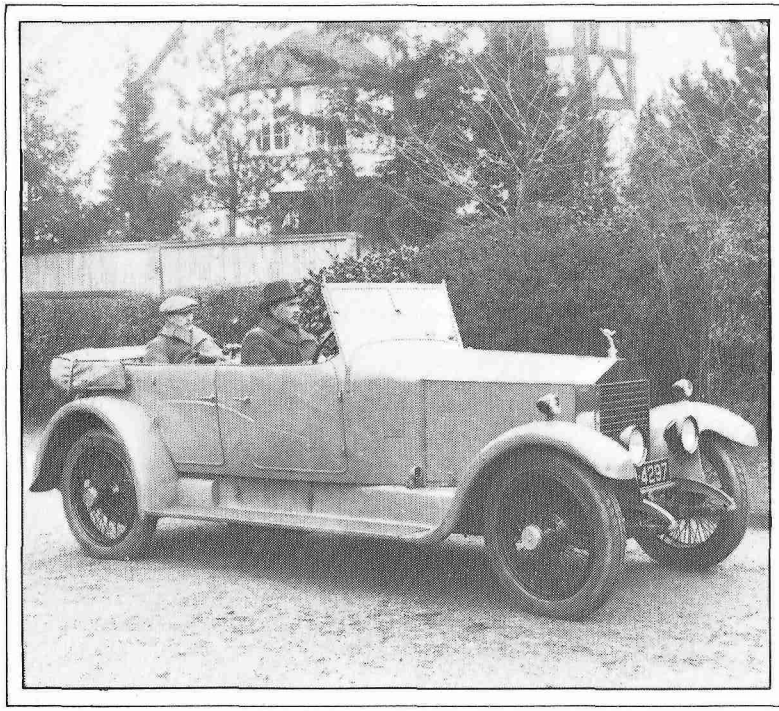
There are three oil leads to the crankshaft, and the remaining bearings and connecting rod big and little ends are lubricated by the oil passing through the passages in the crankshaft. The valves are made from high-chrome non-corrosive steel. In order to prevent the crank chamber fumes from entering the body, provision is made that these shall be drawn into the induction system.

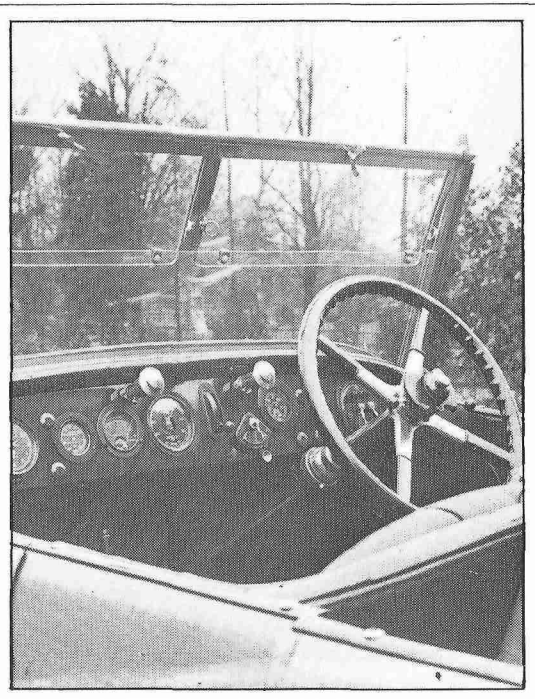
Carburation and Lubrication.

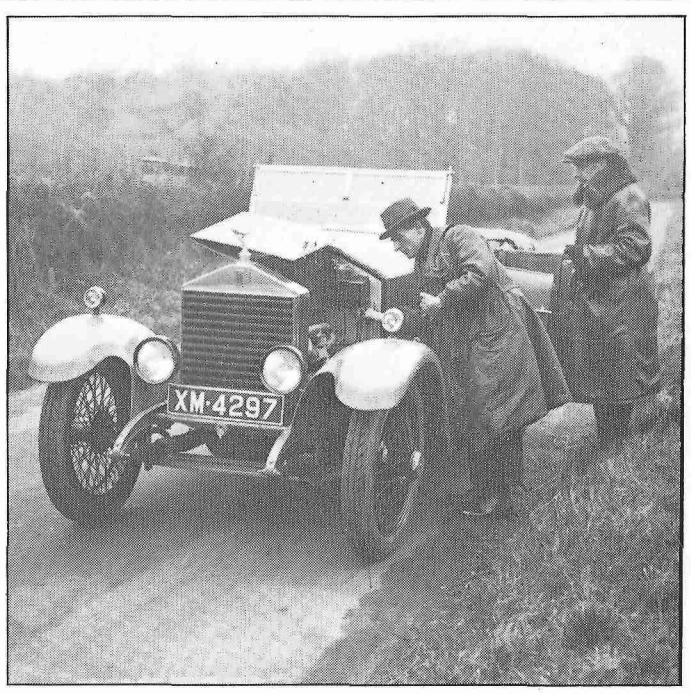
The carburetter is a modified design of the standard R.-R. expanding carburetter, which has already proved so successful, and has two jets controllable from the instrument board. There is also a third jet for starting purposes, controlled from the instrument board, which gives a mixture of ample strength during starting operations. The induction system is well heated, and the engine has been run successfully on a mixture of petrol and paraffin, although this is not advised in general use. The induction manifold is arranged to give equal distribution at low temperatures, or with poor fuel.

CHASSIS OF THE NEW 20 H.P. SIX-CYLINDER ROLLS ROYCE.









Engine lubrication is by pressure by pump, with float and pointer level indicator, that of the gear box and back axle—which is oil-retaining—by splash. The road wheels and universal joints are oil-retaining, while the details (spring shackles) are lubricated by a *portable* grease injector with rapid connectors.

The oil consumption on this chassis is remarkably low, the car running 1,000 miles to the gallon. This is due to the care given to the oil-retaining in the design of the bearings and oil joints about the whole chassis, and to the design of the pistons, which prevents oil working up into the combustion chambers.

Radiator Shutters Standard.

The radiator, of the honeycomb type, is of ample size, and is fitted with a set of shutters, under the driver's control, so that the water temperature can be maintained in cold weather.

Close behind the radiator an efficient fan is mounted on a spring-controlled support, which maintains a constant tension in the V belt over a large range of movement. The water is circulated by a centrifugal pump fitted with a special form of lubricated double gland, which is remarkable for water retaining and absence of wear. There is a thermometer fitted with a gauge on the instrument board, thus giving complete indication and control of the water temperature, which so largely contributes to efficient running and low petrol consumption.

The clutch is of the single dry-plate type fitted with Ferodo and steel surfaces. It carries four levers revolving with it, so that the thrust is light, and with this and other features its operation is remarkably smooth. Owing to the extreme lightness of the driving member, and its great freedom when declutched, the changing of gears is easy and free from shocks.

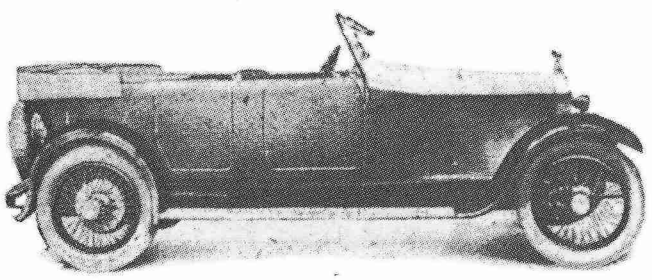
Central Control for the Gears.

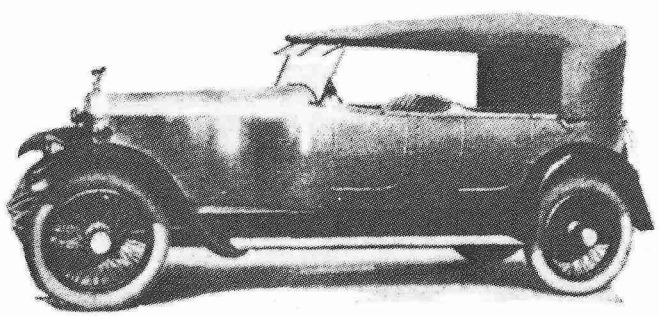
The gear box, which provides three forward speeds and a reverse, is of the conventional sliding type. The layshaft is driven by helical gears, and has the unusual feature of being supported in three bearings. The driven shaft is also carried in three bearings. The third bearing on the latter shaft almost entirely relieves the spigot bearing, which has in some cases proved unsatisfactory in the more usual form of design. These extra bearings contribute largely to the permanency of the silence of the box, and considerably reduce the tendency to wear. Enclosed in the gear box there is a special worm drive for the speed indicator.

The change-speed lever is controlled by an internal gate, and has a positive interlocking device, as well as the position spring plungers. The interlocking device enables the spring plungers to be very light in action, and the whole change mechanism works with great freedom and delicacy. The hand brake lever is carried on the box, and has its ratchet below the floorboards, but, unlike the usual arrangement, the teeth are on the lower side of the quadrant, so that no foreign substance can fall and lodge in them and render the ratchet unsafe.

Both brakes are internal expanding, and take effect direct on rear wheel hubs; they are enclosed and protected from road dirt and oil, and compensated by bevel-gear equalisers of R.-R. pattern. The brake shoes are of aluminium, and internal and external adjustment is provided close to the point of wear. The brakes are remarkable for their smooth and effective action; the special R.-R. cams, which have great efficiency and equality, are used to expand the shoes; it is very noticeable how the rear axle steadily keeps on to the road when the brakes are applied, resulting in a straight, powerful, and smooth pull up of the car.

The rear axle is of very light construction, having an aluminium central box, steel tubes with large flanges, and a substantial tie-rod; it is extremely compact for the diameter of the bevel gear. The road wheels are entirely mounted on extensions of the tubes; therefore no part of the rear axle is subject to reverse stresses due to the weight carried, the internal driving shafts being subject to torsional stresses only. The bevel gears are spirally cut, and the pinion is fitted with a third (nose) bearing so that its alignment is maintained.





The new 20 h.p. Rolls-Royce. The open touring body is built on smart lines and equipped with a permanently sloping windscreen with adjustable panels. The hood when raised is provided with permanently attached half sides at the rear.

Front Axle Arrangements.

The front axle is a high tensile alloy steel forging of I section of light and accurate proportions; the stub axles, which are of large diameter, are carefully radiused and bored for strength and lightness. The steering pivots are arranged to give "centre point steering," so as to reduce to a minimum the forces exerted upon the steering gear through rough roads, soft borders to roads, or deflated tyres. The road wheel hubs have special provision to render them oil retaining, and water and mud excluding.

The attachment of the road springs is carried out in a unique manner by the use of a steel sheath which fits keys formed on the axle, transmitting the shocks directly from the axle to the upper plate of the spring to obviate the possibility of shearing the central bolt. The steering arms are attached by the R.-R. system used in the larger chassis.

The steering is by worm and nut, as in the larger R.-R. chassis. The ignition and throttle controls are placed on and above the steering wheel, as in R.-R. practice, but the ignition switch and mixture control are on the instrument board. The longitudinal steering tube is fitted with set-up spring buffers to reduce the force of the shocks reaching the steering box. The well-proportioned steering wheel is notched and covered with black non-conducting covering (including

the spokes), so that the steering wheel is pleasant and clean to handle and has a handsome appearance. The thrust bearing is easily adjustable, being on the steering column. The steering joints are of R.-R. design, easily adjustable, and all parts of the bearing are firmly locked after adjustment, so that the blocks do not knock about and become loose in their housing—a unique feature. The steering is fitted in two standard positions—for owner-driving and for chauffeur-driving; the former is for bodies not exceeding four seats.

The Suspension System.

Both back and front springs are semi-elliptic and very long for the size of chassis. They are extremely carefully fitted, and at the front end of each spring, where the control is taken, they are provided with solid ends having central eyes, to avoid road shocks causing unnecessary and dangerous bending stresses.

The frame is of deep channel section, fitted with a number of tubular cross members to render it more rigid than usual against twisting, and brackets are provided along the outside for the attachment of the bodywork, so making it unnecessary to use wide and heavy runners in body construction, and permitting the rear seats to be unusually low. Every effort has been made to keep the frame low, and, considering the large road wheels and large road clearance (11in.), this has been extremely successful.

The pedals have long strokes to permit of light operation and avoid frequent adjustments of the operated parts. They are fitted in two positions, corresponding to the two positions of the steering column. So that the pedals can be conveniently placed, the steering column passes through the dash high up, the brake pedal being in the centre.

The instrument board is carried from the dash by brackets in two standard positions, corresponding to the two positions of the steering column. It is fitted with clock, chassis number plate, speed indicator, thermometer gauge, radiator shutter control, mixture control and starting carburetter lever, ammeter, oil pressure gauge, dashboard light, and switchbox. These fittings form part of the standard equipment of the complete car.

The switchbox is fitted with two handles, one controlling the lighting and the other controlling the ignition and dynamo. This switchbox can be locked by the Yale type of key when the ignition is off, and either the lamps are off, or the side and tail lights only burning. It contains a connection socket for the inspection lamp, and also a press-button for the dashboard light.

Except for the accumulator and a few other obvious parts, the whole of the electrical equipment is manufactured by the Rolls-Royce Co., and has been made with the *first object of reliability*, having in view simplicity and weight. For simplicity and robustness the single-wire system is adopted, which permits of the more substantial single-contact lamps and holders being used. For the sake of easily understanding and tracing the various circuits, the installation has been made with coloured wires of the colours shown on the diagram of the wiring in the instruction book. The wiring is carried out in aluminium tubes and channels so as to be well protected. In connection with the head and side lamps special provision is made to support these on the wings by the standard support stays provided with the chassis, and by using these the wiring is enclosed and invisible.

The dynamo has third brush control and cuts in at an extremely slow speed, giving an output which rises rapidly at first (for night running), and afterwards, at high speed, falls to avoid overcharging the battery. It runs with great silence, and even at the highest speed without excessive heat; it is easily dismounted for cleaning and inspection, and is controlled by an effective automatic switch mounted on the distribution board, which is in an accessible position.

The starter motor is of R.-R. manufacture, and is geared to the flywheel with spring drive automatic pinion. There is an extra nose bearing on the motor spindle to prevent excessive deflection and risk of breakage. It is controlled by a pedal-operated switch, which has the unusual feature of being oil-immersed.

The battery, of 12 volts, is carried in the frame, and is accessible and removable through the floor.

On the distribution board the wires, the dynamo, the battery, and the switch box meet together, ample fuses being provided and carefully arranged.

A spare wheel is securely carried at the back of the chassis on a tubular carrier, with aluminium shoes in which the tyre rests. It is important to carry this spare in this position so that its weight can be utilised to make the road wheels more effectively hold the road.

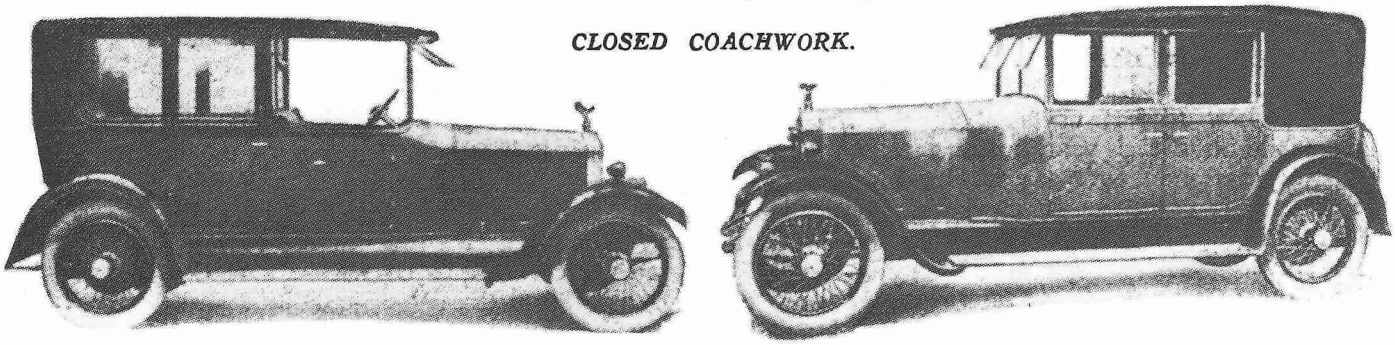
Shock dampers are fitted to both front and rear axles. They are of R.-R. construction, and those at the rear are of the progressive type.

Vacuum Petrol Feed.

The rear tank is suspended in a safe position, being protected by the spare wheel, etc. It is fitted with a side filler and petrol gauge. A very large filter is provided in the petrol tank, which can be removed without emptying the tank. There is also a filter of large area under the carburetter float chamber, also easily detachable.

The vacuum feed tank on the dash is of extra large capacity, which permits the car to run for a long time at slow speed without closing the throttle to obtain the necessary vacuum for refilling. This tank is fitted with a needle valve, so that the petrol can be turned off for safety when necessary.

CLOSED COACHWORK.



The standard closed coachwork provided for the new 20 h.p. Rolls-Royce embraces a landaulet (left) and an all-weather body fitted with extremely wide doors.

THE SERVO BRAKES OF THE ROLLS-ROYCE.

A Road Test of their Efficiency. Details of the Actuating Mechanism. Light Operation a Feature

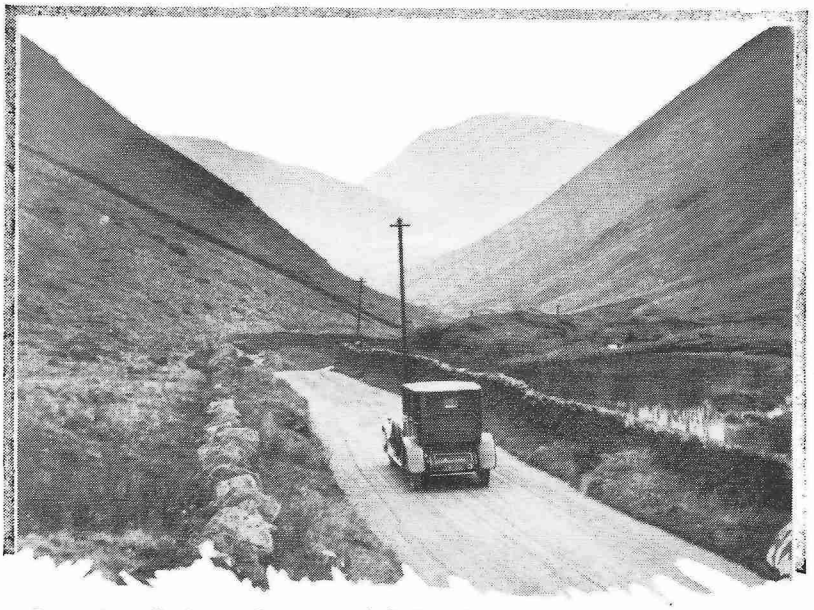
Breasting the summit of Kirkstone Pass (1481 ft.) from Ambleside on the run from London to Glasgow. The road to the left is the easier ascent from Troutbeck.

WHEN the Rolls-Royce Company announced last year its adoption of the principle of brakes on all wheels, considerable interest was evoked. The delay in their final application to cars sold to the public only served to increase curiosity as to the design decided upon, since it was common knowledge that the company, in accord with its usual principles, made a point of testing, over a prolonged period, every known system as well as experimental brakes of its own design. This shows how extremely thoroughly the Rolls-Royce engineers have tackled the job.

It was as long ago as last February that we saw a 40-50 h.p. Rolls-Royce under test on the French Riviera with a six-brake system, the majority of the tests having taken place on the other side of the Channel. First shown to the public at the Paris Salon, the braking system of the Rolls-Royce was a centre of interest at the recent Olympia Show, but hitherto authentic details of the internal design adopted have been withheld. The general arrangement and description of the brakes appeared in *The Autocar* of October 17th, and we are now able to supplement those notes with details of the operation of the servo mechanism employed, together with observations upon their efficacy in practice as a result of an extended run on the latest model car.

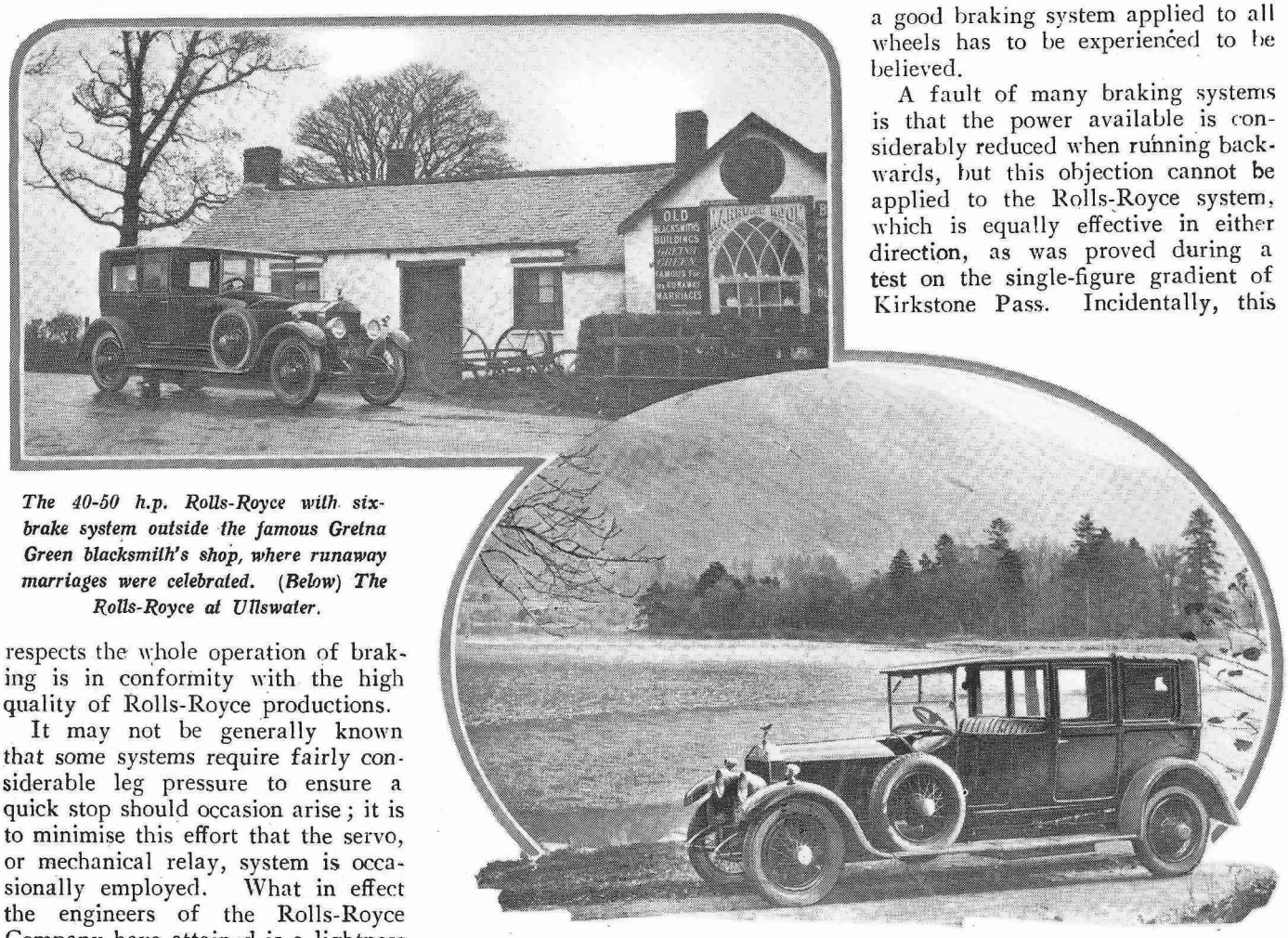
Our test was carried out during a two days' run from London, *via* the Lake District, to Glasgow for the Scottish Exhibition, the type of vehicle used being a 40-50 h.p. chassis with a handsome Hooper landaulet body to seat six. On the first day's run a distance of 259 miles was covered without undue effort, Windermere being our halting place ready for an ascent of Kirkstone Pass from Ambleside on the morrow, with further opportunities of testing the brakes on the sharp descent to Patterdale, and again on the narrow and winding roads leading past Brotherswater and Ullswater. It is doubtful if a better all-round testing route could be found in the length and breadth of the land.

At the outset it can be said that the most striking feature of the new Rolls-Royce braking system is their delicate operation. A mere touch of the pedal is sufficient to arrest the progress of the car, whilst ordinary leg pressure will gently but firmly bring it to a standstill in an incredibly short space, no matter what the speed, and with an absence of wheel skid indicating correct equalisation. Braking power, as such, naturally depends upon the mass of weight, the speed, and the size of the brake shoes and drums. The Rolls-Royce system does not necessarily offer quicker stopping powers than the best four wheel brake designs, but, as indicated, it is the silence and sweetness of operation, coupled with the delicate touch necessary to attain that object, that users will most appreciate.



Descending Kirkstone Pass toward Patterdale. Brotherswater in the distance.

A point is made of the prompt release of the brakes, and there is no doubt about this, for a distinct click is heard as the foot is removed from the pedal, which may be accidental or intentional. In other



The 40-50 h.p. Rolls-Royce with six-brake system outside the famous Gretna Green blacksmith's shop, where runaway marriages were celebrated. (Below) The Rolls-Royce at Ullswater.

respects the whole operation of braking is in conformity with the high quality of Rolls-Royce productions.

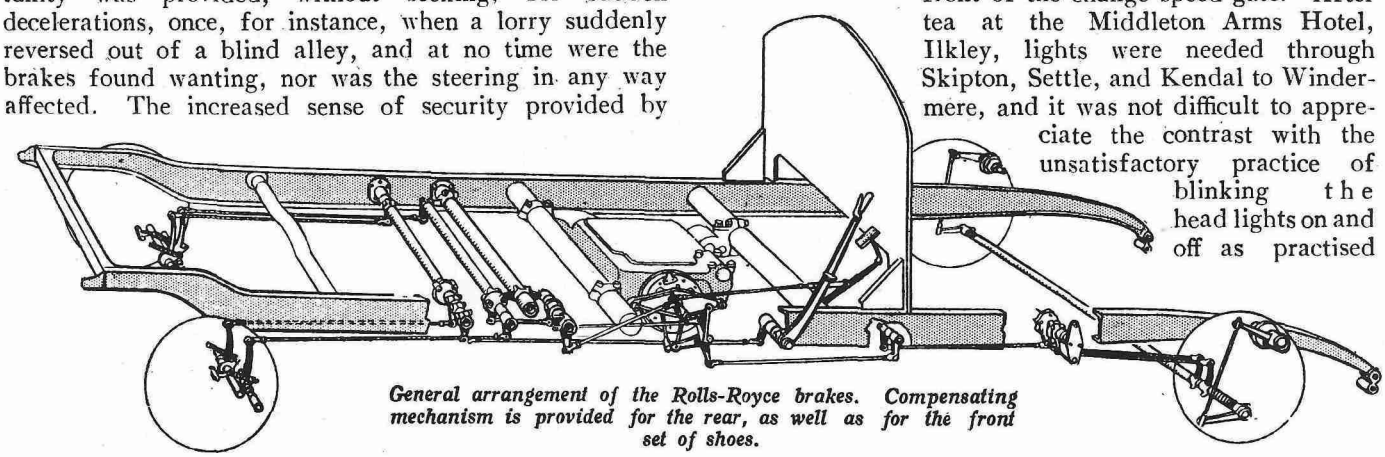
It may not be generally known that some systems require fairly considerable leg pressure to ensure a quick stop should occasion arise; it is to minimise this effort that the servo, or mechanical relay, system is occasionally employed. What in effect the engineers of the Rolls-Royce Company have attained is a lightness of operation in keeping with the sensitive steering and general controls of the car, a distinct asset which will be appreciated most by those accustomed to driving far in a day. No sense of fatigue should be felt after long distances at the wheel. So light is the pedal operation that we several times demonstrated that by leaning forward in the driving seat it is possible to pull the car up quickly by merely pressing the brake pedal with the fingers—quite a new experience so far as we are concerned. For a given foot pressure it is claimed that the total braking effect is approximately three times greater than in either two or four wheel brake systems unassisted by servo—and after personal test we can well believe that this is no empty boast.

On many occasions during our first day's run the opportunity was provided, without seeking, for sudden decelerations, once, for instance, when a lorry suddenly reversed out of a blind alley, and at no time were the brakes found wanting, nor was the steering in any way affected. The increased sense of security provided by a good braking system applied to all wheels has to be experienced to be believed.

A fault of many braking systems is that the power available is considerably reduced when running backwards, but this objection cannot be applied to the Rolls-Royce system, which is equally effective in either direction, as was proved during a test on the single-figure gradient of Kirkstone Pass. Incidentally, this long and tiring gradient, used in the M.C.C. London-Edinburgh annual competition, was ascended on second, third, and top gears with four passengers and luggage aboard with the greatest ease, though steam was emitted from the radiator on the crucial stretch near the summit (1,481ft. altitude). Kirkstone Pass in November is usually regarded as a place to avoid, and prominent notices still affirm that it is "unfit for motors." This year, however, the road surface is in excellent order, being firm and smooth for the most part, presumably due to its copious dressing of granite chippings.

To Dim or Dip?

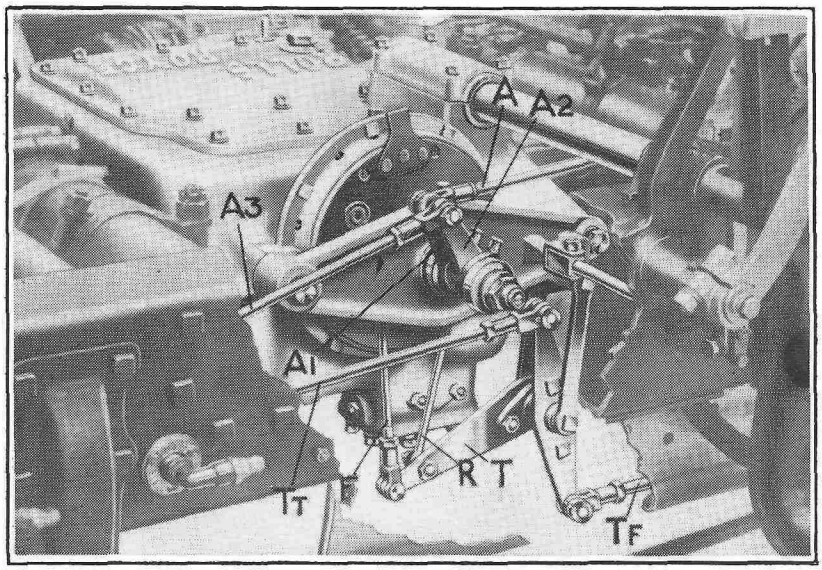
The car we used was fitted with Barker dipping head lights operated by a long lever conveniently situated in front of the change speed gate. After tea at the Middleton Arms Hotel, Ilkley, lights were needed through Skipton, Settle, and Kendal to Windermere, and it was not difficult to appreciate the contrast with the unsatisfactory practice of blinking the head lights on and off as practised



General arrangement of the Rolls-Royce brakes. Compensating mechanism is provided for the rear, as well as for the front set of shoes.

by the driver of practically every car we encountered. The Barker dipping device not only enabled us readily to avoid inconveniencing oncoming drivers, but actually assisted their progress materially, since the act of reflecting the beam of light almost directly downwards both eliminated dazzle and, at the same time, clearly illuminated the roadsides opposite our car, and thus served to assist the progress of passing vehicles. If more costly than a dimmer, there is no doubt of the efficacy of the Barker dipping device, which possesses benefits for users as well as non-users.

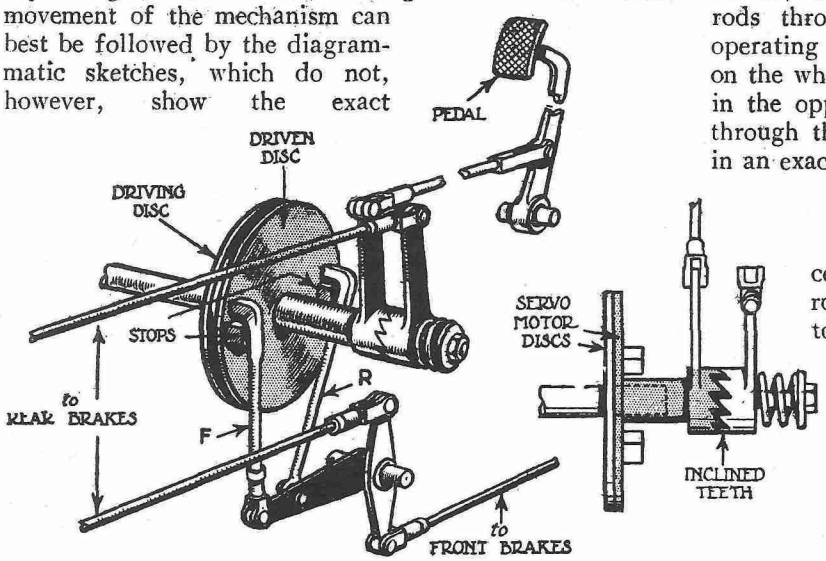
On the run North, on the second day, opportunities were presented to test the speed capabilities of the car, which, though exceeding two tons in weight and in full touring trim, proved itself capable of easily beating a mile a minute gait. Such a speedy closed car needs equally effective braking power, and those who may have been impatient for brakes on all four wheels will now learn that, if outward progress has seemed slow, the Rolls-Royce Company, thanks to prolonged and patient experimental work, have now decidedly attained their object.

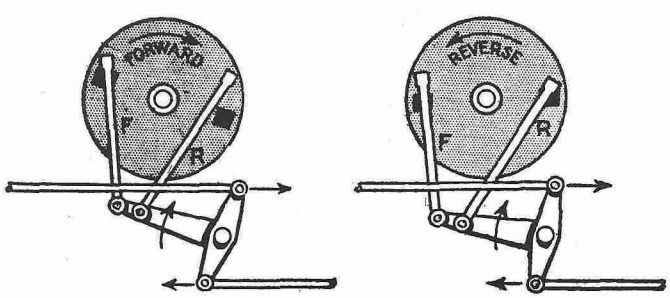


The servo motor and its operating mechanism. A, brake pedal rod; A1, servo-operating lever; A2, rear brake operating lever; A3, rear brake operating rod; F, rod from servo actuating T; R, second rod from servo to T; T, lever operating four wheel brakes; TF, rod to front brakes; TR, rod to rear brakes.

Details of the Servo Mechanism.

And now as to the design of the brakes, which, as may be imagined, is distinctly interesting. The servo mechanism, which is the principal feature of the brake system, consists of a disc clutch instead of a set of expanding shoes or a contracting band. The actual movement of the mechanism can best be followed by the diagrammatic sketches, which do not, however, show the exact mechanism employed, but indicate the sequence of the successive operations involved.





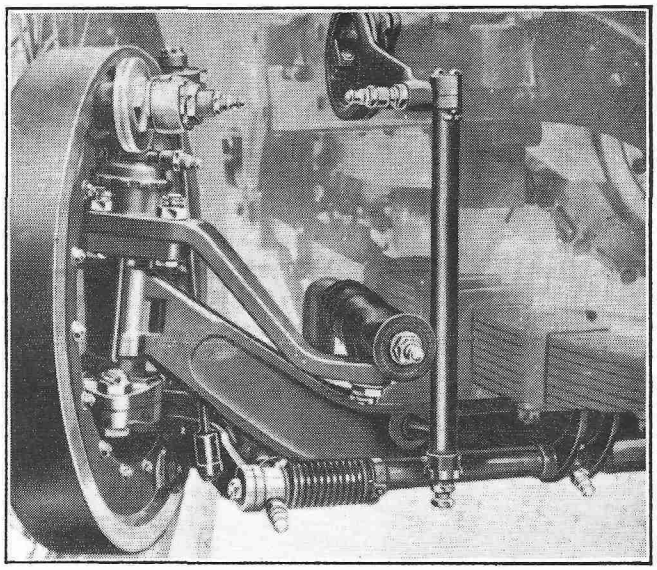
Diagrammatic sketch to explain the operation of the servo motor. The rods F and R are not facsimiles of the actual mechanism, but function in a similar manner, and the spring behind the two levers with ratchet teeth is shown for the sake of clearness.

The driving disc in the servo is rotated through the gear box, *via* the bevel and the propeller-shaft, when the rear wheels revolve, and in direct proportion to the speed of those wheels. The driven disc has upon it two stops which, if pressed hard against the driving disc, will tend to rotate. If it rotates in one direction one stop pulls rod F, which is attached to a lever in turn secured by rods through pressure equalising devices to the cam operating levers of the four sets of brake shoes in drums on the wheel hubs. In reversing, the driving disc rotates in the opposite direction, and the second stop functions through the medium of the rod R, applying the brakes in an exactly similar manner.

How the Brakes are Applied.

The servo motor is brought into operation in a certain sequence, for the pedal is connected by a rod to a lever—A^1 in the photograph—attached to the shaft of the driven disc, which lever is also coupled to a second lever, A^2, by teeth of ratchet shape. The lever A^2 is connected to the rear brake shoes by a rod. What happens when the pedal is depressed is that the two levers move as one until the rear brakes are applied. Further pressure on the brake pedal then forces the lever A^1 to move still further forward, and the only way in which it can do this is for the ratchet teeth between it and A^2 to move relative to each other. Any movement of the ratchet teeth could only take place if the two levers were to separate. One of them, A^1, is fixed, so it is the other, A^2, which moves to one side, not, of course, sufficiently to disengage the teeth, and in doing so moves the driven disc of the servo motor, to which it is attached, into engagement with the driving disc. Immediately, the servo motor comes into operation as already described, and the brake power is augmented.

It will be noticed at once that there are some interesting features; for example, the rear brake shoes are in contact with the 18in. drums before the servo motor commences to act. When the servo motor does operate, it applies the smaller front wheel brakes and simultaneously



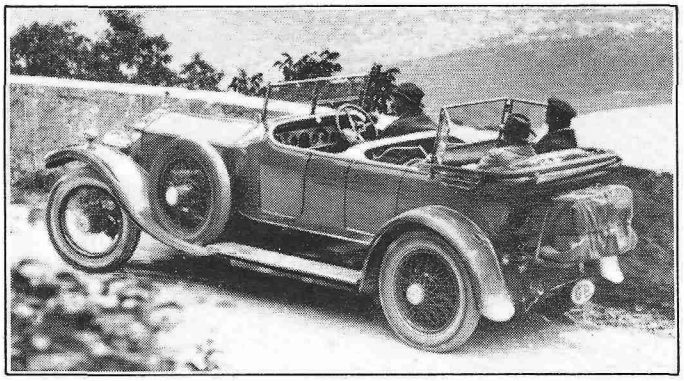
Details of the front brake operating mechanism, also showing the shock absorber.

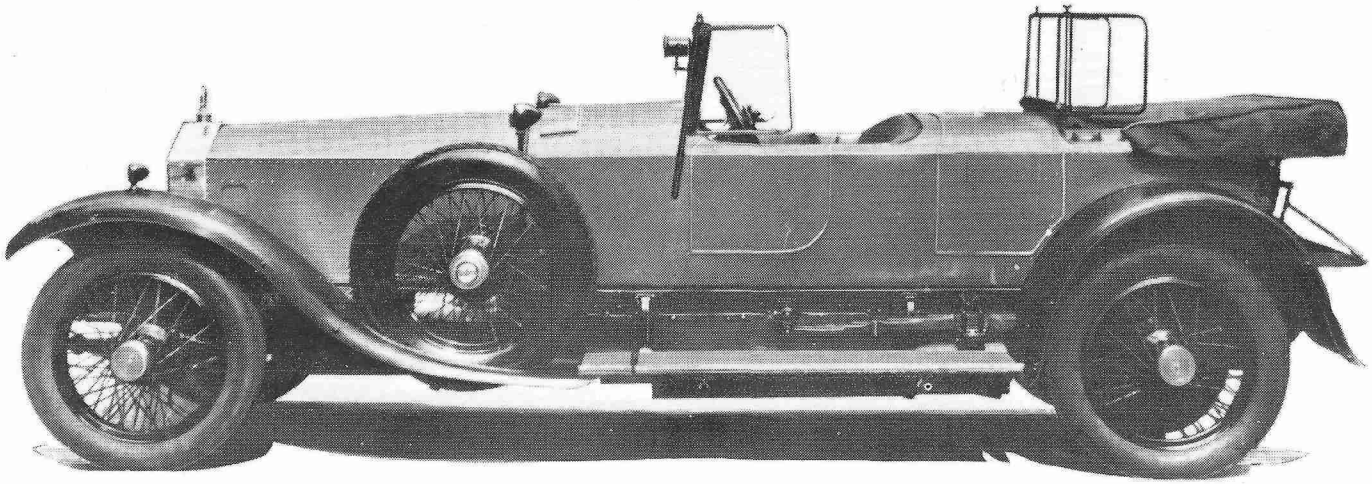
increases the pressure on the rear brakes. There is a reason for this sequence of operations and for reduced braking power on the front wheels, since the manufacturers were particularly anxious to avoid locking the front wheels, which might prove dangerous. Therefore, the action of the servo motor, which alone controls the pressure on the front wheel brakes, is dependent on the speed of rotation of the rear wheels. If the latter are locked, the servo motor ceases to operate, and the brake pressure on the front wheels is released so that steering control is possible. The moment the rear wheels revolve again, the servo operates the front brakes.

No Wasted Pressure.

It will be noticed that the force of the braking power is in exact relation to the amount of pressure exerted on the pedal by the driver, and that pressure is not more than would be necessary for rear brakes only, while the pedal travel is quite small. Actually, the braking effect on the car before the servo motor comes into operation is exactly the same as it was when rear brakes only were used; that is, the two rear brakes or all four wheel brakes are alternatively available at the will of the driver.

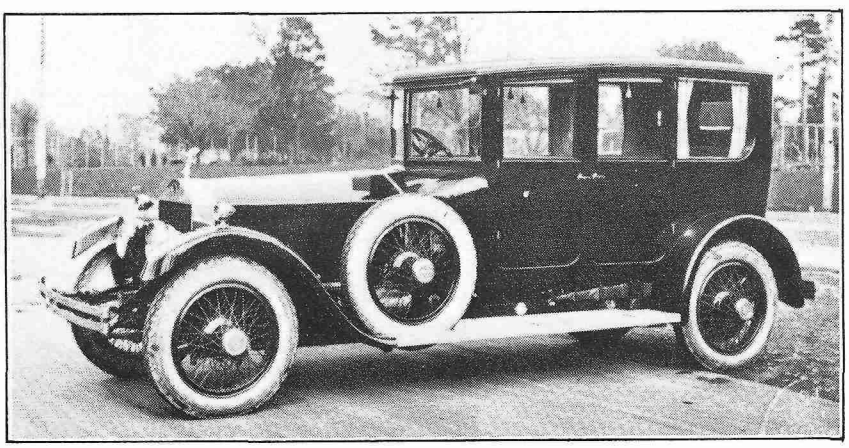
Right: In August 1924 a member of **The Autocar** *staff accompanied Percy Northey of Rolls-Royce on a Continental trip in a 40/50 which was not equipped with the recently announced front wheel brakes. On many cars these were fitted as a retrospective modification after delivery. The route was from Lyons to Grenoble and took in a number of Alpine passes. Normal cruising speed was 50 mph with a maximum of 72 mph recorded. Here the car, with Northey at the wheel, pauses on the Col du Chat overlooking Aix Les Bains and Lake Bourget.*



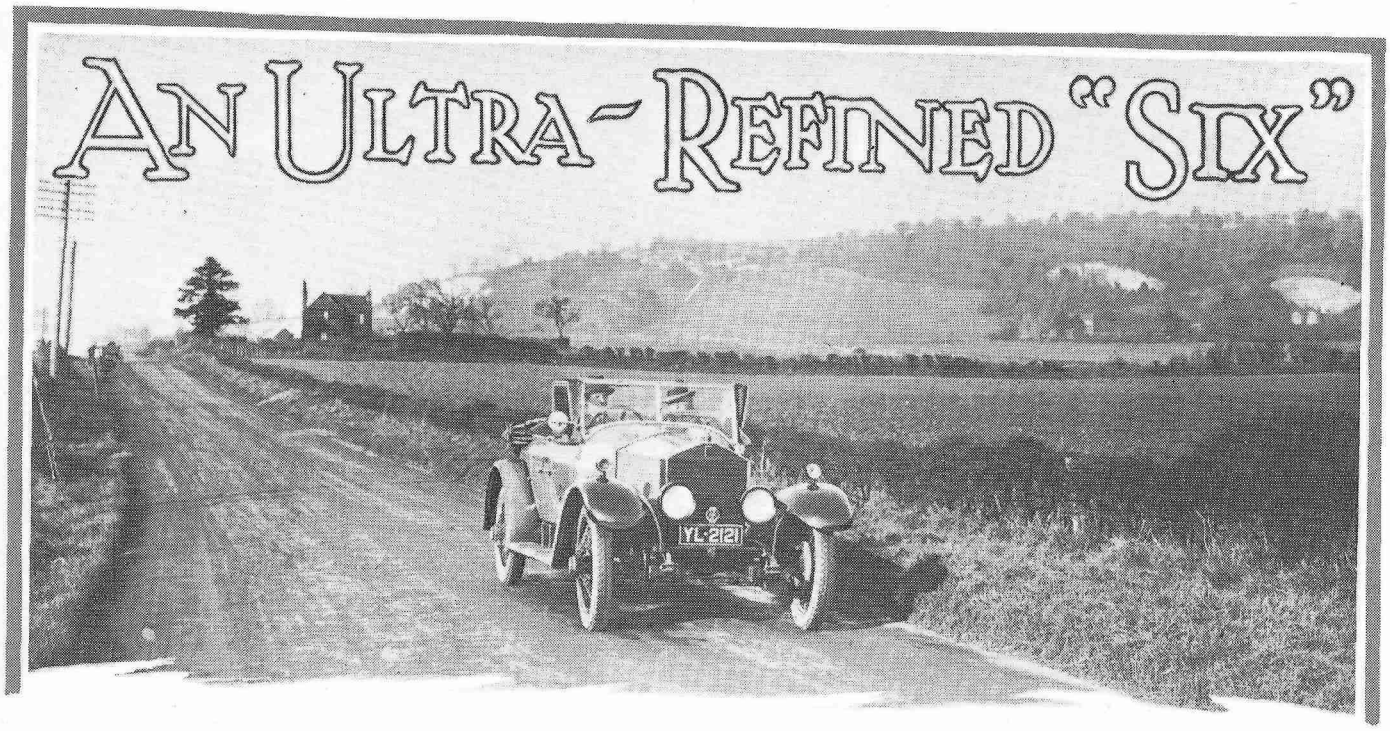


Above: A similar tourer with body by Barker pictured in May 1925—still with no front wheel brakes fitted.

Right: An Australian body by Waring Bros. of Melbourne pictured in 1924 on 40/50 h.p. chassis 67 LK which had been erected at Derby in 1923



AN ULTRA-REFINED "SIX"



Test of the Latest Rolls-Royce "Twenty" Reveals a Car which May be Said to Disarm Criticism. Perfection of Workmanship Apparent throughout the Chassis.

THE latest model of the 20 h.p. Rolls-Royce is a very considerable improvement on its predecessors. A four-speed gear box, right-hand gear lever, servo-operated four wheel brakes, and a number of small details have made the car altogether different from the first model, and it now is much more a smaller edition of the larger car which has made the firm world-famous.

Quite what it is that gives a Rolls-Royce its character would be difficult to define in words, for there is no car in which detail has been more carefully studied or in which it has been proved by experiment carried on over such long periods. Moreover, the very smallest part of the chassis, equally with the largest component, is considered and reconsidered until it is estimated that the best arrangement for the particular duty has been found and adopted. This means, naturally, that those responsible for the work have a relatively free scope; they are not hindered, as are so many of their rivals, by considerations of what the component in question will cost when it has been evolved. The result, at all events, gives a car which is very near to the ideal of the average motorist—an exceptionally comfortable, silent carriage which is a delight to handle.

DATA FOR THE DRIVER.

20 h.p., six cylinders, 76·2 × 114·3 mm. (3,103 c.c.). Tax, £22.
Tested weight of complete car, less passengers, 28 cwt. 2 qr. 23 lb.
Weight per c.c., 1 lb.
Gear ratios: 16·98, 10·62, 6·89 and 4·55 to 1.
Spiral bevel final drive.
Half-elliptic springs.
32 × 4½in. tyres on detachable wire wheels.
Brakes on all four wheels.
Wheelbase, 10ft. 9in. Track, 4ft. 8in.
Fuel consumption, 23 m.p.g.
Tank capacity, 14 gallons.
Price chassis, £1,185.

Gear Changing a Pleasure.

Delicacy of control is a notable feature. There is no part, big or small, which moves heavily or has not a progressive effect. In fact, to the average driver who is not solely concerned with Rolls-Royce cars, the gear change of the "20" is very much lighter and more sensitive to handle than that of many excellent cars. It would, indeed, be difficult to imagine even the possibility of not effecting a quiet change, and a gear change of this nature is a joy. In fact, there is a sense of great satisfaction in handling the car in circumstances where repeated changes of gear improve the performance.

The gear box has one feature very rarely found, and the more pleasant when it is found. Third and, to an almost equal extent, second gears are almost noiseless; indeed, the other occupants of the car cannot tell whether the driver is using top or one of the indirects.

High Speed without Fuss.

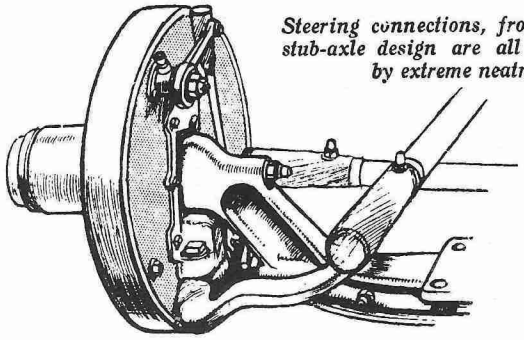
Very wisely, the car is not designed simply with a view to high speed, but rather to allow the occupants to forget that there is an engine and at the same time to make it possible to maintain that high, steady, smooth speed which results in a surprisingly high average. Until the very end of its range of speed the engine has no period and emits scarcely a sound, and the end of the speed range is well outside the limit of ordinary needs. Take it on any main road in England, and the 20 h.p. Rolls-Royce will run at a steady 40 m.p.h. nearly the whole time, giving never a sign of labouring or stress. At 60 m.p.h. it is still smooth and only very slightly more noisy, though what sound there is will be found to come chiefly from elsewhere than the engine. About 40 m.p.h. is a useful maximum on third, 30 m.p.h. a similar figure for second, and first is the sort of gear that is a real boon in awkward or unfavourable circumstances in very hilly country.

Exactly like the larger Rolls-Royce, the "Twenty" corners smoothly and rides well, the throttle and ignition controls move smoothly and progressively, the mixture control is well worth using, having considerable effect, and, provided the driver does not forget the hand-controlled radiator shutters, the temperature of the cooling water can be maintained at an effective heat the whole time.

A great deal of good design has gone into the servo operation and brake mechanism generally. Servo motors often are apt to be rather violent when first applied, so that at slow speeds in traffic a driver only just accustomed

to the car tends to apply the brakes, unwittingly, with too much vigour. This is exactly what the servo on the 20 h.p. Rolls-Royce does not do. As far as the driver can feel, there is no servo, yet, on reflection, it is obvious that the brakes are being applied with much more power than the relatively light pressure on the pedal would generate.

A definite pressure is necessary at low speeds, which is exactly what one wants, for it overcomes the tendency for the servo motor to take control in such circumstances.



Steering connections, front brake and stub-axle design are all characterised by extreme neatness.

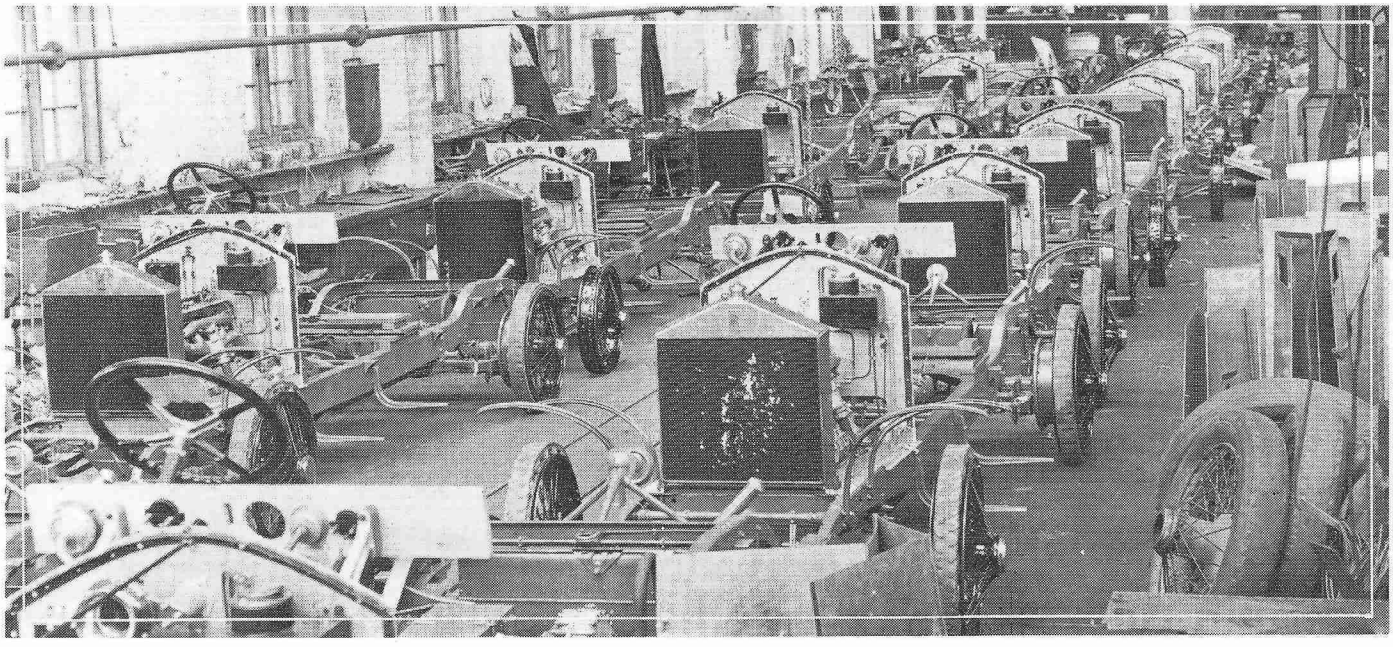
The brakes are extremely powerful, and they do not cause the car to slide sideways on a greasy surface as much as some four wheel brakes do, one test on such a surface at 40 m.p.h. resulting in the machine progressing in a definite straight line without a trace of lateral skid. Unquestionably, the brakes do not affect the steering.

From the general point of view, the detail work is beautifully carried out. Every lamp has its own circuit and its own fuse, the fuses being housed in a very neat case. The filler for the rear petrol tank projects well to one side, clearing luggage on the carrier, and, as an instance of the extent to which the detail consideration is carried, the wheels are balanced by counter-weights.

(Top) Instrument board of the 20 h.p. Rolls-Royce. Near the steering column support is the mixture control and the lever operating the radiator shutters. (Bottom) On the dashboard of the car is the fuse box with separate fuses and circuits for each lamp.

Concerning the body, not much can be said, because the purchaser has the choice of any sort of coachwork. The car is a sheer delight with either open or closed coachwork, whether it be used as a town carriage or for country touring.

The 20 h.p. six-cylinder production line at Derby in February 1923 showing chassis being built in fair numbers, even though there was still a considerable amount of hand finishing

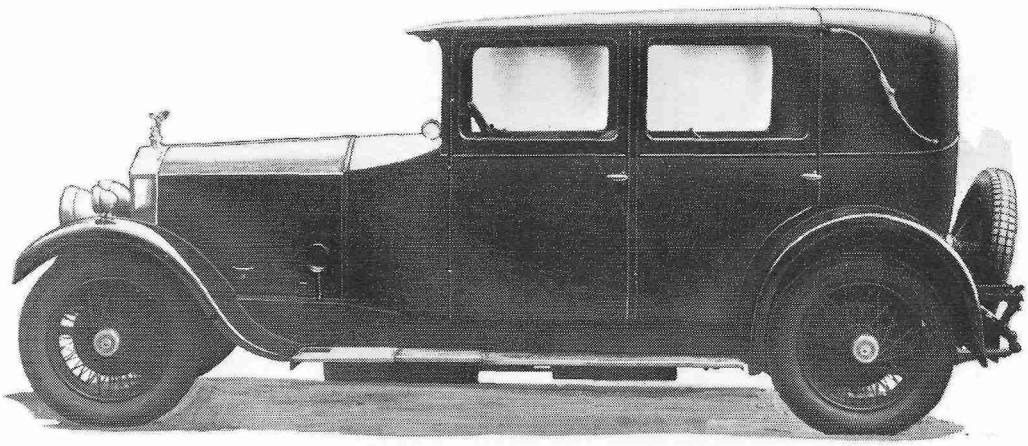


The Autocar

"THE AUTOCAR" ROAD TESTS

20 h.p. ROLLS-ROYCE SALOON

A Car that Combines Performance with Exceptional Refinement.



IN its general characteristics the 20 h.p. Rolls-Royce is very like its larger and possibly more famous relative, the 40-50 h.p. model. That is to say, its qualities are those of a thoroughbred, quietness, smoothness, and ease of control standing out prominently from a background of lesser, but still important, virtues.

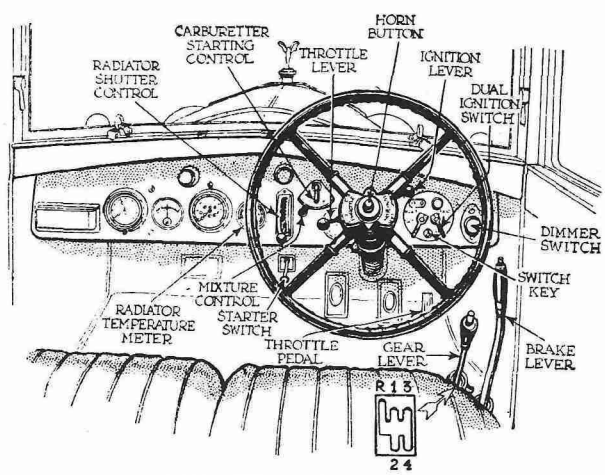
Whether the car be stationary with the engine idling, or cruising comfortably at any speed up to 55 m.p.h. or even more, there is practically no engine noise beyond the hiss of the carburetter and a faint murmur from the exhaust. Transmission noise also is non-existent on top gear, and when the indirect gears are brought into play there is only a slight hum as evidence of the fact, the third speed being particularly quiet.

As at all normal speeds the engine is singularly free from vibration, only evincing a slight harshness when forced up to its maximum rate of revolution on the indirect gears, when it naturally becomes audible at the same time, the result is that, as far as the occupants of the rear seat are concerned, the engine might be idle and the car coasting.

It will, perhaps, be imagined that performance has been sacrificed to refinement, but the acceleration figures given in the accompanying table prove that this is not so. For a car weighing nearly 33 cwt. unladen, and with three up, the figures are distinctly good. As one might imagine from the figures, there is no need to change down from top in traffic, for when an opening presents itself the acceleration on top is rapid enough to allow the opportunity to be seized.

To all intents and purposes, therefore, top gear is sufficient for normal driving when once the car is in motion. Hills of 1 in 10 can be taken in the car's stride by merely depressing the accelerator a little harder, and even on a gradient of 1 in 6½ third gear will suffice to keep up a pace but little below 20 m.p.h. if the change down be made early.

By double declutching a smooth, noiseless change from top to third can be made at 40 m.p.h., so that on a give-and-take road quite a high average speed can be maintained, although the maximum speed is not, for these days, really high. In changing up a perceptible pause in neutral is necessary, but the delicacy of movement of the gear lever is such that the gears can be "felt" and engaged inaudibly with but little skill. It should be remarked that the gear lever is so arranged that in neutral it automatically takes up a position in the centre of the gate.

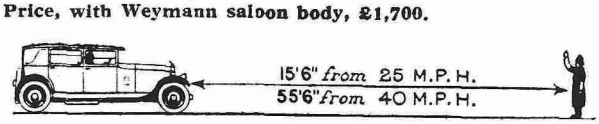


DATA FOR THE DRIVER.

20 h.p., six cylinders, 76.2 × 114.3 mm. (3,127 c.c.).
Tax £22.
Wheelbase 10ft. 9in., track 4ft. 8in.
Overall length 14ft. 10in., width 5ft. 10in., height 6ft. 1in.
Tyres: 32 × 6in. on detachable wire wheels.

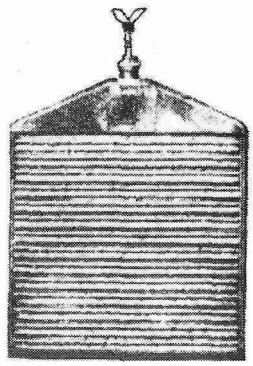
Engine—rear axle gear ratios.	Maxima (m.p.h.).	Acceleration (10–30 m.p.h.).
16.98	15	—
10.62	31	7 sec.
6.89	43	8⅘ sec.
4.55	65	11¼ sec.

Tank capacity, 14 gallons; fuel consumption, 20–25 m.p.g.
Turning circle, right 45ft. 8in., left 39ft. 2in.
12-volt lighting set cuts in at 12 m.p.h., 10 amps. at 25 m.p.h.
Weight 32 cwt. 3 qrs.
Price, with Weymann saloon body, £1,700.



Brake Test Figures.

One of the charms of the Rolls-Royce is the exact and easy manner in which all the controls carry out their work. The clutch is very smooth in action, and calls for only a light pressure on the pedal, the four wheel brakes are operated by a servo mechanism and require the minimum of effort from the driver, while the steering is of the " finger-and-thumb " order and possesses ample self-centring action, straightening up automatically after a corner as the wheel is released. Even the minor controls, such as ignition and throttle levers, mixture control, and the accelerator pedal perform their tasks with meticulous accuracy and no vestige of lost motion, so contributing not a little to the charm of driving the car.



On bad roads the suspension system, which incorporates hydraulic shock absorbers, shows up to advantage, but does not produce a feeling of harshness on better surfaces as is sometimes the case. There is, moreover, no rolling on corners; the car holds the road well and gives the driver the feeling that he can steer to a hair's breadth

As regards the brakes, it should be explained that the servo is as effective on reverse as forwards. From a speed of 25 m.p.h. the car was stopped in a distance of 15½ft. on a tarred macadam road, the surface being dry—a remarkable performance. From 40 m.p.h. also a very good figure was obtained, the distance being 55½ft. Even when stopping so suddenly there was no harshness, nor was there any pull on the steering.

From these acceleration and brake test figures it will be realised that there is no difficulty in keeping up a high average speed, while a long journey can be made without any feeling of fatigue being experienced by the driver, thanks to the lightness of the controls. His mind, too, is always easy as regards the car; for example, should he omit to glance at the thermometer on the instrument board, and forget to open the hand-controlled shutters, he will be reminded of his neglect when the radiator reaches a temperature of about 95 degrees C., as a red warning light then flashes up. Carelessness regarding the fuel supply is also provided for by a tap on the main tank, which gives a reserve supply of two gallons. Again, one has not to be constantly replenishing the oil supply, as a distance of 1,000 miles can be covered without raising the bonnet for this purpose.

As ignition is by coil and battery, a magneto being fitted purely as a stand-by and remaining idle until its quick-acting coupling is engaged, it is worthy of note that the dynamo cuts in at a low speed and charges at 10 amps. at 25 m.p.h. on top gear.

Regarding coachwork little need be said, as it is usual to fit special bodies to the chassis. The car tested had a four-door, four-light Weymann saloon, which proved roomy, comfortable, and quiet, except for a minor rattle apparently from the neighbourhood of the dash, but this would have passed unnoticed on a chassis of less refinement. Allowance should be made also for the mileage covered by the car, which was considerable.

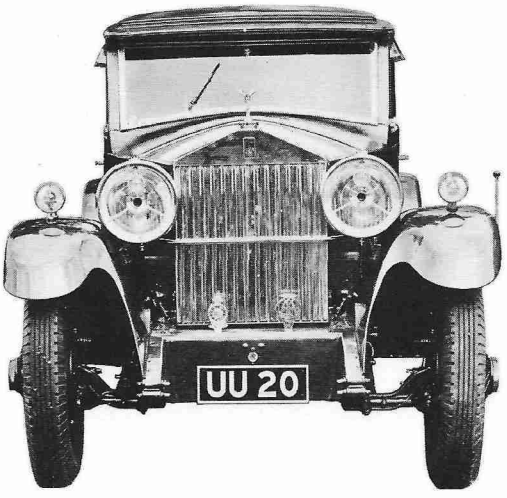
To sum up, it may be said that refinement is the outstanding feature, but that this has not been obtained at the expense of performance. The 20 h.p. Rolls-Royce is, indeed, a very pleasant car to handle, and can suit its paces to the mentality of the driver of the moment.

THE ADVANCE OF THE SPORTSMAN'S COUPE

Details of a Recent Specimen of a Popular Form of Body for an Owner-driver.

THE type of body which has made the quickest rise to popularity in the last two years is the close-coupled saloon—or sportsman's coupé, as it is now more commonly termed. It was during the autumn of 1927 that suggested designs for a wide, two-door sportsman's coupé appeared in these columns, and its special attractions were advanced, coupled with a plea for deep doors, obscuring the then prevalent valances. The effect of those designs and recommendations is now recognisable on every hand.

In the original conception of the design, a separate luggage trunk was arranged at the rear; the tendency is now to have the luggage compartment neatly incorporated in the tail of the body. Such an



Vertical radiator shutters and a wider dash are features of this new 20 h.p. Rolls-Royce. Note the position indicator on the near wing.

Showing the clearance behind the front seats.

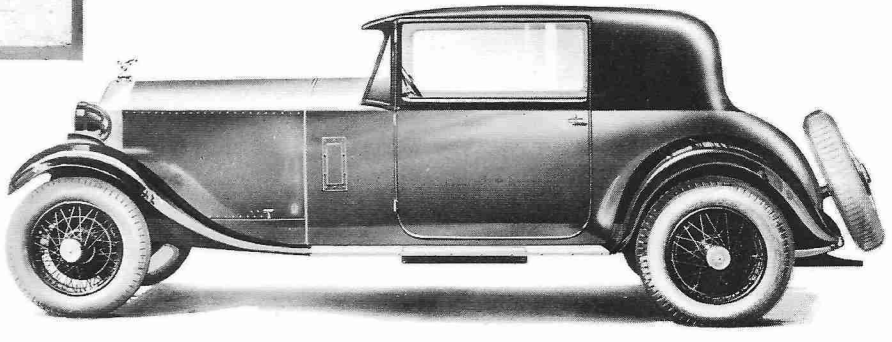
example forms the subject of the accompanying illustrations, which depict a new 20 h.p. Rolls-Royce, with a Weymann two-door body, a provisional drawing of which appeared in *The Autocar* of December 21st, 1928. The floor-roof height of this body is 44½in., and in front there are two sliding bucket seats with folding backs; really luxurious accommodation is provided for two at the rear. Two suit-cases are carried in the streamline tail, space for tools and spares being arranged under the frame on each side and enclosed by the deep doors. In this body there is a Pytchley sliding roof, easily opened or closed on the run; the 41in. doors, in conjunction with the folding back rests to the front seats, provide easy access to the rear compartment. There is ample leg room, since the floor is "welled."

The colour scheme is black, with green wings and chassis, and green upholstery, lining and carpets inside—a very effective and pleasing combination.

As to the chassis, the dash width is slightly wider than standard, which has resulted in a handsome front appearance, and enabled the bonnet sides to be dropped low and neatly merged with the body sides. All bright parts are chromium-plated as regards both chassis and body fittings, as well as the new Lucas P.100 lamps, incorporated in which is a dimming device actuated by a switch on the dash.

Since the down cushions mounted on air bags provide a lower seating position than usual, a position indicator is mounted on the left wing extremity. This chassis, one of the latest to leave the Derby works, has vertical shutters fitted to the radiator, which is deeper than usual, their operation having a simplified control. The mixture control is mounted on the steering wheel, as in the case of the Phantom, and more rake has been given to the steering column.

Other special points of this very attractive car are leather upholstery, windscreen wipers operating from the bottom of the screen, and divided sliding windows which the owner finds an improvement over the usual winding type.



Coachbuilder's drawing of the 20 h.p. Weymann-bodied Rolls-Royce

T.T. PRACTICE

AT the suggestion of the R.A.C., who are organising the Tourist Trophy Race near Belfast on August 17th, the Northern Ireland Government have agreed that there shall be official practising periods from 10.30 a.m. to 12.30 p.m. on the Wednesday and Thursday preceding the race. Last year, it will be recollected, practice took place in the early hours of the morning.

In connection with this event the R.A.C. has published a leaflet, giving full particulars of train departures and arrivals, all boat sailings, and fares. In addition, the Club has issued a circular concerning particulars of accommodation on the grand stand, together with an application form and a plan of the course. Copies can be obtained free of charge on application to the Secretary, Royal Automobile Club, Pall Mall, S.W.1.