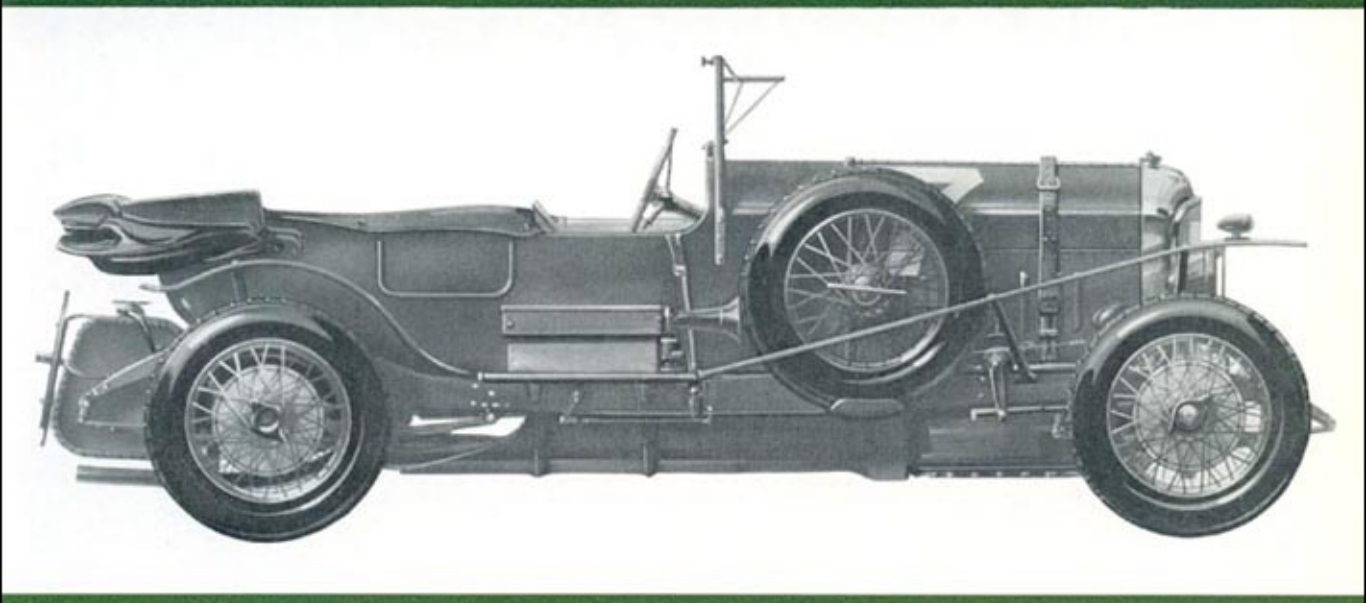
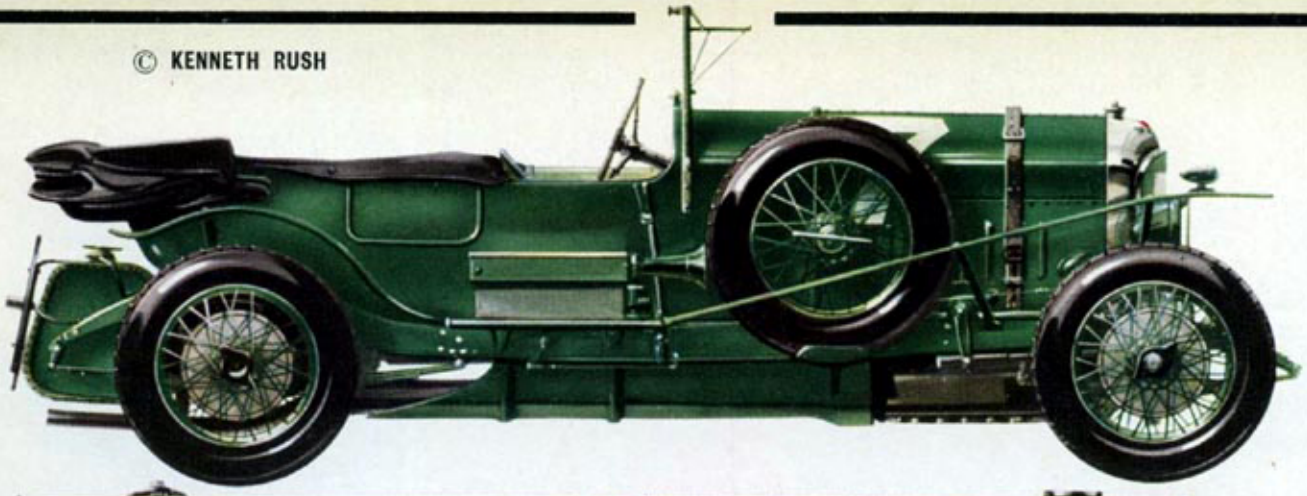
The 3 Litre Bentley

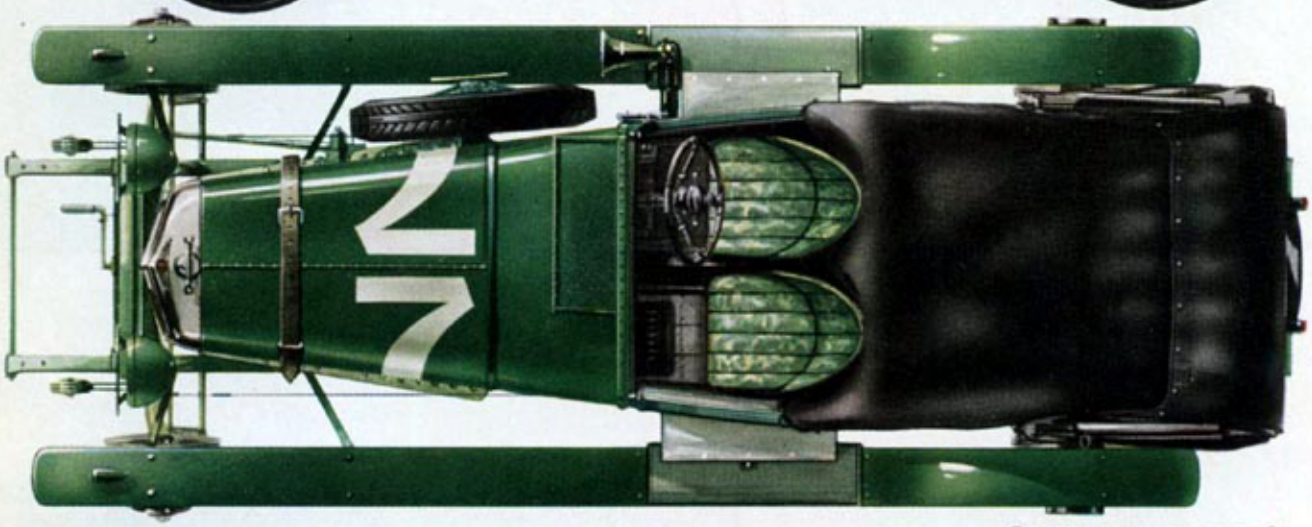


NUMBER 56

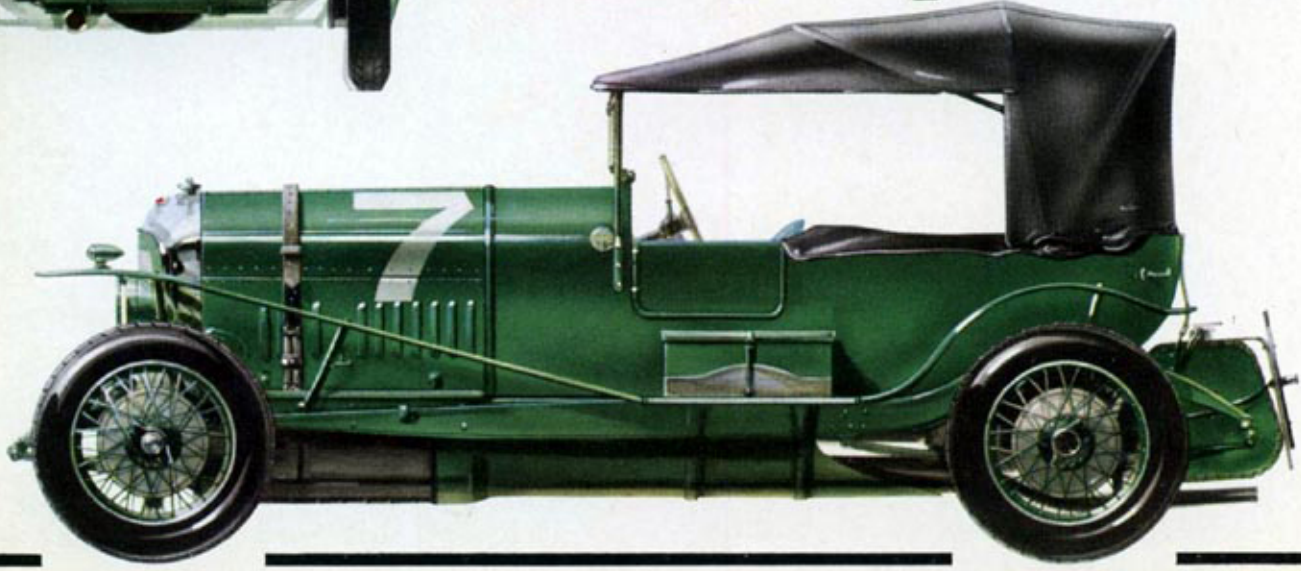
RETAIL PRICE
UNITED KINGDOM TWO SHILLINGS
UNITED STATES & CANADA 50 CENTS

PROFILE PUBLICATIONS

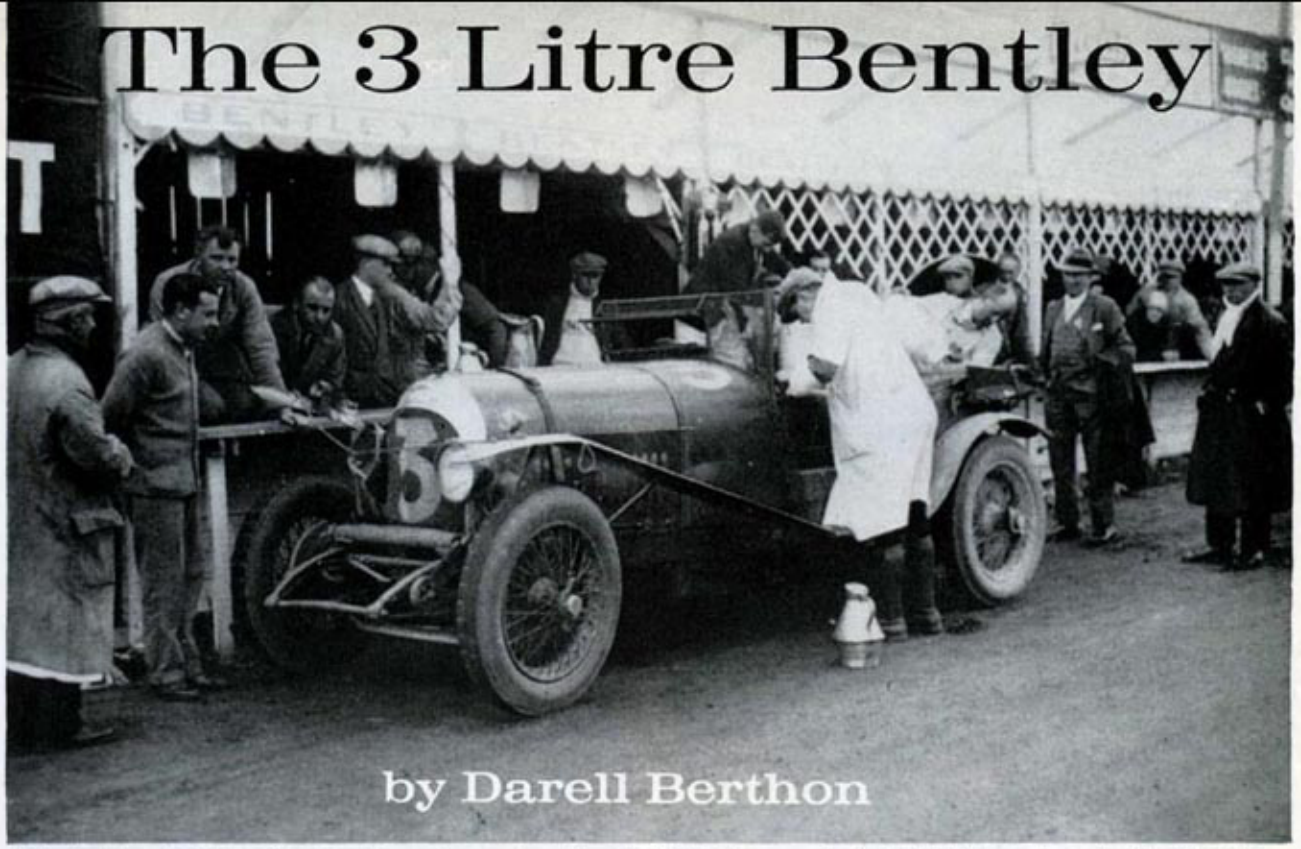




THE 3 LITRE BENTLEY (' Old No. 7 ') which crashed 20 minutes before the finish of the 1926 Le Mans 24 Hour Grand Prix d'Endurance when lying 3rd. In 1927 the same car (bearing No. 3) won the Le Mans race at 61·35 m.p.h. after being involved in the White House Corner crash. On both occasions the drivers were Dr. J. D. Benjafield and S. C. H. Davis.



The 3 Litre Bentley



by Darell Berthon

1927: *Le Mans. 'Old No. 7' at the pits on the morning after the White House crash. Benjafield fills up the tank while 'W. O.' and Nobby Clarke stare at the damaged front end from the pit counter. Later in the afternoon the car scored Bentley's second win at Le Mans.* (Photo: *The Autocar*)

The first World War had brought about great advances in the development of the piston engine, materials and fuel. It also brought about changes in the social life of the country and the redistribution of wealth. Nevertheless, there were plenty of young men coming out of the Services with money to burn and bent on combating the inevitable boredom which occurs between the ending of the excitements of war and the process of settling down to peace-time England. Practically no cars for private use had been made since 1914, and such second-hand ones as would be available, would command fantastic prices and would have no performance to speak of in any case.

It was against this background, that W. O. Bentley found himself with his engineer's training, his experience in the development and racing of the French D.F.P. sports car before the war, and in the design and development of aircraft engines, in particular the Bentley Rotary engine, during the war.

Before the war ended W. O. had already formulated his ideas for a reliable, reasonably comfortable, quiet but fast motor car of sporting type which could be owner-maintained. Taking for his inspiration the principles on which the pre-war racing Peugeot and Mercedes engines had been made, he settled down in January 1919, in New Street Mews (off Baker Street) in London, with F. T. Burgess from Humber's and Harry Varley from Vauxhall, with both of whom he had worked during the war, to make detailed drawings of the new car. Clive Gallop joined the team, and in September Nobby Clarke (Chief Petty Officer R. A. Clarke, D.S.M., R.N.A.S.) also joined. It was Nobby Clarke, later to become Head Mechanic, who put together the first 3 Litre Bentley engine which started for the first time in October 1919. A semi mock-up of an engine and chassis was on view at the Olympia Motor Show in November 1919. In December 1919 the first complete Bentley, Experimental No. 1, underwent a road test in the hands of Sammy Davis of *The Autocar*, whose report was published in January 1920.

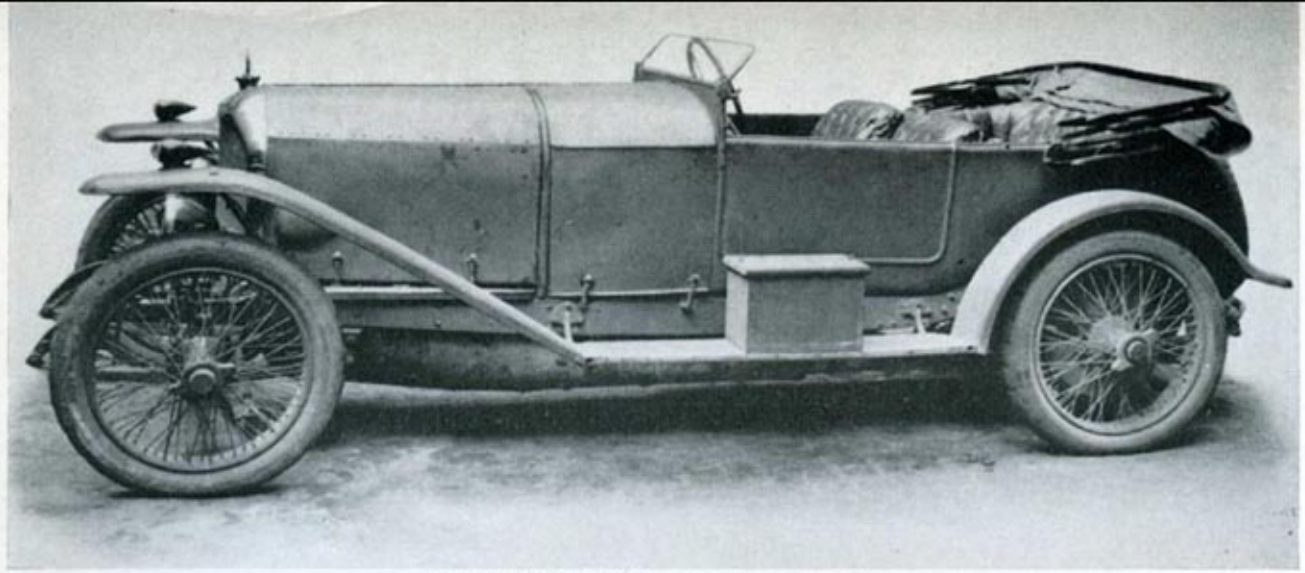
THE PROTOTYPE

The engine had four cylinders cast en bloc with four aluminium water jackets and a single overhead camshaft operating four valves per cylinder, driven by a vertical shaft from the front end of the crankshaft. The valve operating gear was enclosed by two inclined covers. A magneto on the offside and the water pump on the nearside of a cross shaft were driven by gears off the vertical shaft. Water was delivered through the cylinder jacket on the nearside and was returned to the radiator by a water rail fed by five curved branch pipes from the top of the cylinder block. A single Claudel Hobson CZP carburettor on the nearside supplied mixture to the cylinders through a ram's horn induction pipe. Lubrication was by dry sump and oil was pumped under pressure to the main and big ends and to the camshaft. Excess oil from the camshaft was returned to the sump by external pipes to the crankcase breathers.

Power was delivered to the rear wheels through a cone clutch, 'A' type gear box, pot joint universals and spiral bevel rear axle. The frame of deep section was made of high grade steel.

EARLY DEVELOPMENT

During 1920 and 1921, as a result of continuing testing and competition work in sprints, hill climbs and racing on Brooklands, the development of the 3 Litre proceeded. Following lubrication problems with the dry sump, a wet sump was designed having cooling



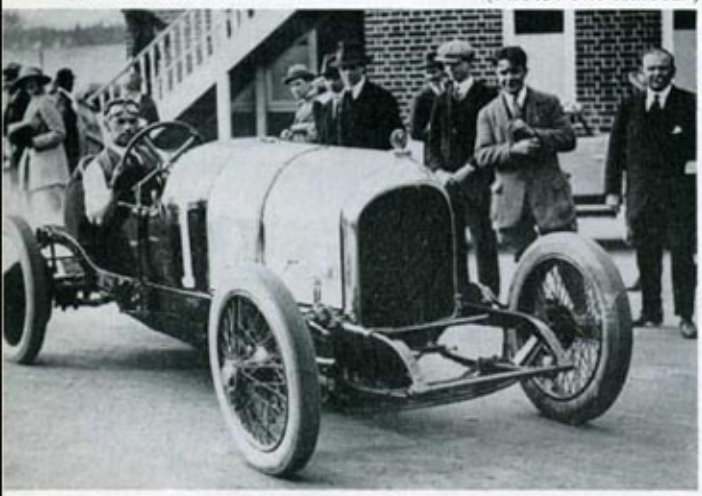
1919: *Ex No. 1. The first Bentley ever made.*

tubes running through it. However, the tubes soon became blocked with road dirt and this sump was discarded in favour of a unit having a large separate oil tank under the crankcase. A second magneto was fitted to the water pump end of the cross shaft and the water pump was moved in front of the vertical shaft housing and was driven by a skew gear from the magneto cross shaft. Provision for a second set of plugs had been incorporated in the original cylinder block casting in anticipation of future developments.

The original two-cam per cylinder camshaft was replaced by a triple-cam per cylinder shaft whose direction of rotation was reversed. A small dynamo was driven from the rear end of the camshaft through a geared-up (3 : 1) set of gears in its own box. The cam case was now enclosed in a half cover with a large oil breather in the centre and the drain tubes led to the crankcase through the cylinder jackets. The water rail with up-swept branches gave place to a neat rail along the side of the block just above the exhaust manifold.

Very little alteration was made to the chassis except for flattening the pronounced curve of the front end of the frame and the dumb irons. By September 1921, when the first production model was delivered to its owner, the 3 Litre Bentley looked much as we know it today.

1921: *Ex No. 2. The Bentley wins its first race driven by Frank Clement at Brooklands.* (Photo: *The Autocar*)



BRIEF DESCRIPTION OF PRODUCTION ENGINE AND CHASSIS

The Engine. Four cylinders cast en bloc with bore and stroke 80 × 149 mm. and having a capacity of 2,996 c.c. Each cylinder had four valves and eight valve springs operated by a single overhead camshaft with triple cams per cylinder. The cams operated two single steel rockers to the exhaust valves and a single forked rocker for the two inlet valves. The camshaft was driven by a vertical shaft and bevel gears from the front end of the crankshaft. Aluminium alloy pistons and four bolt shell bearing connecting rods were used. Twin synchronised magnetos driven from a cross shaft fired eight plugs in the order of 1–3–4–2. The carburettor was a Smith 5 Jet Type 45 VS.

Lubrication: Oil was piped under pressure from the separate oil tank under the crankcase through the drilled crankshaft to the main and big end bearings and by splash to the cylinder walls and little ends. A separate pipe from the filter, outside the engine on the near side, fed oil to the camshaft bearings and rockers. Surplus oil was returned to the tank via two drain tubes situated between the cylinders and also down the vertical shaft housing.

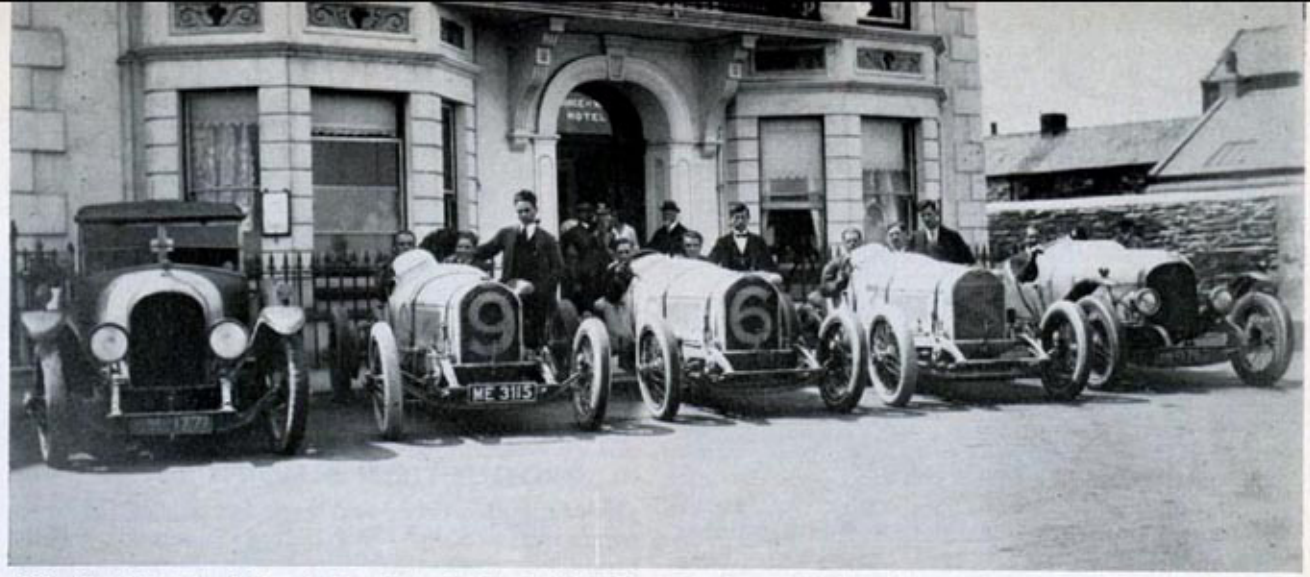
Overhead valve gear: The original BM 1800 camshaft was fitted to the first 160 chassis after which the BM 2391 was used until 1926, when the BM 1800 was reinstated. Both camshafts were hollow and had drilled oil ways for lubricating the five bearings and rocker gear. The complete set of steel rockers were threaded on long (steel) rods supported in a single rocker carrier which ran the whole length of the cam case.

Clutch: The clutch was of the inverted cone type lined with Ferodo. The compensated withdrawal mechanism was automatically lubricated.

The dynamo: The dynamo, originally geared up through its own gear box, was later driven at camshaft speed and was connected to the camshaft by a flexible coupling.

The cooling system: Water was taken from the radiator and pumped to a distribution pipe inside the offside cylinder jacket and was returned to the radiator by a water rail with short branches taking off from the area of the valve seatings.

The Chassis. The frame was of high grade steel of deep section, braced fore and aft by two tubular tie



1922: *The T.T., Isle of Man. Left to right: Ex No. 3 'W. O.'s' personal car; 'W. O.' and Pennal; Hawkes and Browning; Clement and Saunders; and Hillstead and Ex No. 2 (the practice car).*

bars and four heavy angled cross members, which combined made a rigid frame. The nose of the engine was supported on the front cross member, the gear box on the two centre cross members and the fourth cross member in rear of the rear axle.

The gear box: An 'A' type box with four speeds forward and a reverse with positive interlock, and right hand change. The gate was carried on an extension of the box. The speedometer in the early cars was driven by pulley from the propeller shaft; later it was gear driven from the nearside of the gear box casing.

The back axle: The final drive was by spiral bevel and pinion encased in a removable nose-piece without disturbing the back axle casing.

Brakes: Both the foot and hand brakes operated on the rear wheels and were of the internal expanding type. The brakes were compensated through a balance beam differential.

Coachwork: Initially the Company supplied chassis for customers to fit the kind of body they wanted, but to qualify for the Five Years Guarantee the complete car had to be returned to the Works for a final test. Later the Firm was able to sell complete cars with bodies to their own specifications.

Handling qualities. By any standards the 3 Litre handled well. Although at low speeds the steering was somewhat heavy, it became easy and light as the speed increased and at all times remained positive. The steering was extremely sensitive to correctly balanced front wheels; each wheel being supplied with four 'studs' on to which lead and fibre rings were threaded and secured with a nut. The tendency of the car was to understeer with the rear end breaking away first but, even on ice, it always gave plenty of warning long before things got out of hand.

The brakes, considering the weight of the car, were extraordinarily effective, but considerable pedal pressure was required.

The Super Sports model with its very short (9 ft.) wheelbase was tricky to handle at the best of times, being liable to break away at either end almost without warning.

TYPES OF 3 LITRE MODELS

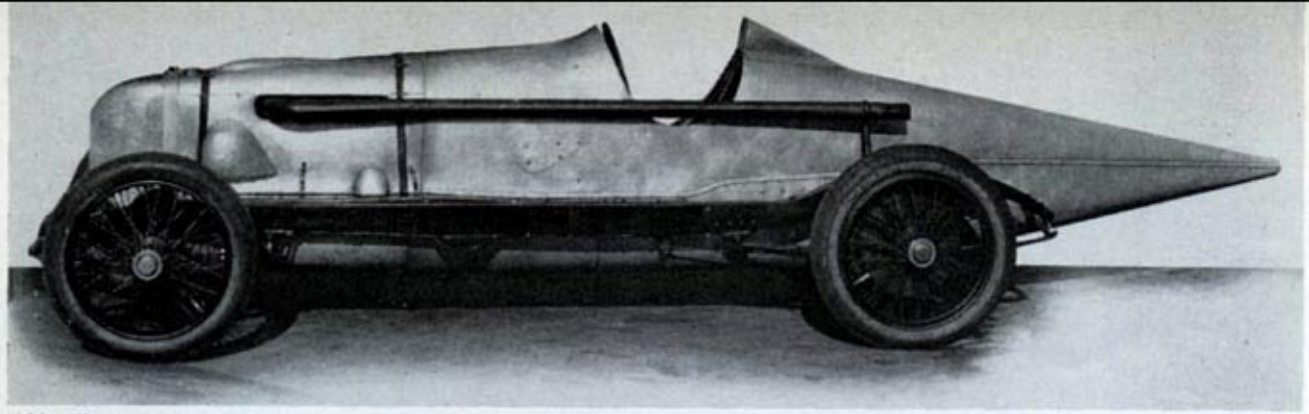
The Short Standard. This was the first model made and it had a 9 ft. 9½ in. wheelbase chassis with a low (4·3) compression engine, 'A' Type gear box and 13/51 (or optional 3·53) rear axle ratio. One hundred and forty-one chassis were made in 1922, 44 in 1923 and 8 more during 1924/5. Total production was 193. Each chassis was guaranteed to do 80 m.p.h. on Brooklands Track.

The T.T. Replica. Following the Firm's success in the Tourist Trophy race of 1922, a replica chassis, as regards engine, was produced. The compression ratio was raised to 5·3 and the body was the new light sporting four-seater Vanden Plas. Each chassis was guaranteed to achieve 90 m.p.h. Sixty-seven cars of this type were made in 1923 and four in 1924, bringing the total of replicas to 71.

The Long Standard. At Chassis No. 161, the 10 ft. 10½ in. wheelbase model was introduced to cater for those who wanted larger or heavier closed bodies for continental touring. This model had the low compression engine, a new wide ratio 'B' type gear box and 13/55 final drive. In 1923, 93 Long Chassis cars were made and in this year the Smith Bentley 45 BVS replaced the Smith 45 VS carburettor. In the next two years production increased rapidly, 266 cars in 1924, 240 cars in 1925. In 1926 production fell to 122 and during the next three years only 79 cars were made because the 6½ Litre and the 4½ Litre were beginning to come into production. In all 800 Long Chassis cars were built—almost half the whole 3 Litre output. Each chassis was guaranteed to do 75 m.p.h.

All the cars mentioned so far had blue backgrounds to the 'B' in the winged radiator and fuel tank badges.

1922: *The T.T. 'W. O.' at Quarter Bridge.*
(Photo: Sport and General Press Agency Ltd.)



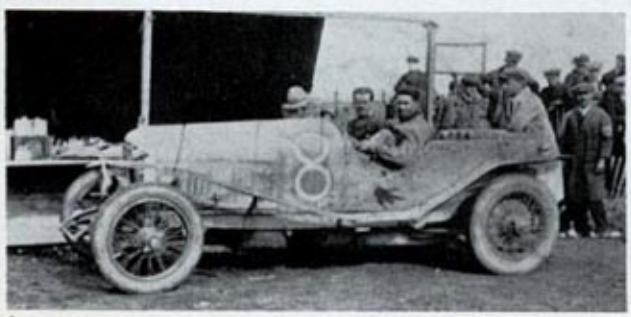
1922: *The Single Seater nearing completion (October).* (Photo: Tella Ltd.)

The Speed Model. The first Speed Model was Chassis No. 356, and the type had the T.T. Replica engine with 5·3 compression, 9 ft. 9½ in. wheelbase, B.H.B. pistons, twin S.U. carburettors ('Slopers'), 'A' type gear box, 3·53 rear axle ratio and front wheel brakes. Each chassis was guaranteed to do 90 m.p.h. Vanden Plas bodies for this model were most favoured but two-seater and saloon bodies could also be fitted. In each of the years 1924/5/6, production was 130/134 cars a year. In 1927 only 88 cars, 1928 21, and 1929 four cars were made bringing the total production for this model up to 507 cars. Except for the T.T. this model supplied all but one of the Firm's racing 3 Litres. All Speed Model Chassis had red backgrounds to the 'B' in the badge.

The Light Tourer. It was necessary for the Firm to make a cheaper model to sell quickly at under £1,000 for the complete car in order to help finance the launching of the 6½ Litre Bentley. This model had the short chassis, low compression engine, 'B' type gear box and low axle ratio. Forty were made and they did what they were intended to do. Some of these cars have been converted to Speed Model specifications in later years.

The Super Sports 100 m.p.h. Model. In 1925, to meet a limited demand for something even more exciting than the Speed Model, a 9 ft. wheelbase chassis with a 6·1 compression engine with the Speed Model gear box and final drive was produced. The background to the 'B' in the badge was green and the radiator tapered in at the bottom like the Standard 6½ Litre. Only 15 of these chassis were built, but each was guaranteed to do 100 m.p.h. and the guarantee for this model was reduced to one year. The specification of this engine became the standard specification of the Speed Model engine from 1926. Most of the bodies were two seaters, nevertheless, Martin Walter managed to build a four-seater body which complied with the Le Mans regulations for the car which ran in the 1926 Le Mans race.

1923: *Le Mans. Clement and Duff after the race, having finished equal fourth.*



PRODUCTION MODIFICATIONS

As experience on road and track was gained, improvements were made to the 3 Litre, but even in the early production stages there were few major modifications to the engine or chassis to correct initial faults. Such modifications as were produced were for the purpose of increasing reliability, power and docility as can be seen from the following paragraphs.

1923. The T.T. Replica, based on the T.T. cars and the Long Wheelbase chassis were introduced as the first link in the separation of the town carriage type of car from the sporting car.

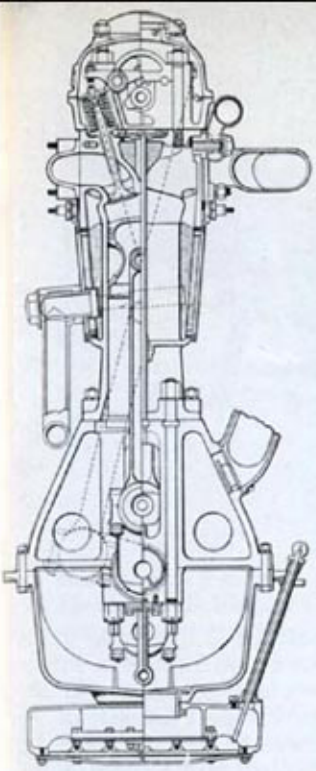
1924. The Speed Model with twin S.U. carburettors came into being as an improved version of the T.T. engine and chassis. Four-wheel brakes of Bentley–Perrot design were fitted to all the new 3 Litre chassis, necessitating a redesigned front axle and modifications to the steering. A single adjustment under the floorboards took up wear on the linings of all four wheels simultaneously. Experiments were tried out with hydraulic brakes, but for a variety of reasons the Firm decided to keep to the rod operated system and in fact used no other system in any of their later models.

1925. A larger header-tank was fitted to all chassis (from No. 1010) which raised the height of the radiator by 1 in. This greatly improved the appearance of the line of the bonnet which previously had sloped downwards.

1926. The original steel rocker arms were replaced by duralumin ones, the initial design of which gave trouble, but was quickly modified. All chassis frames were reinforced and the Long Chassis were fitted with strut gear strengthening plates. The early type of sliding Perrot shafts were found to cause excessive wear and seizure of the shafts after considerable mileages, and to cure this the male and female shafts were pinned and the sliding effect transferred to the frame bracket. Stone guards were fitted to Speed Model radiators and Dunlop tyres were fitted to all chassis. From chassis No. RT 1549 a cast-iron differential casing replaced the original aluminium type. At the end of the year the separate oil tank under the crankcase was replaced by a sump and crankcase in one casting (like that of the 4½ Litre). The capacity remained the same at 2½ gallons.

1927. Speed Model chassis were equipped with 'C' type gear box instead of the original 'A' type close ratio box. (The new box was more robust and quieter, but was not nearly as much fun to handle according to some.)

1928. The final changes appeared after the introduction of the 4½ Litre when some parts such as the thicker gauge frame, heavier front axle beds, separate



End section drawing of 3 Litre engine. (Photo: *The Autocar*)

rocker boxes for each cylinder and fixed type top vertical bevels were incorporated in the last of the 3-Litres.

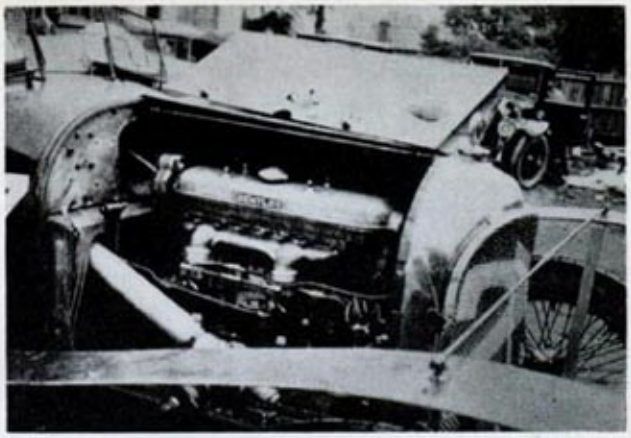
THE 3 LITRE IN COMPETITIONS

W. O. Bentley set out with the intention of putting into practice what he had learnt from racing the French D.F.P. car before the first World War, and that was that racing was the surest and cheapest way of testing a car, and that success was the cheapest form of advertising.

1921. Some months before the first production chassis were being delivered to their owners, Experimental No. 2 started winning races, hill-climbs and speed trials up and down the country and in the process collected eight 'firsts'.

1922. It was not until a year later, in May and June 1922, that Bentley Motors entered for major races. Early in the year four production chassis, whose engines had shown up well on test, were taken in hand in the Experimental shop where, under Frank Clement, they were stripped down and meticulously rebuilt. Modifications to these chassis included a small, flat, most un-Bentley-like radiator, an outside exhaust system, a 22 gallon fuel tank slung amidships (in addition to the standard 11 gallon tank) and a 2 gallon spare oil tank on the near side between the gear box cross members. The fuel and spare oil were fed under pressure by an air pump under the dash operated by the riding mechanic. High compression pistons were used and a C.Z.P. Claudel Hobson carburettor with heating coils round the induction pipe. A good deal of lightening of parts was done, such as drilled pistons, hand-brake lever, brake drums and filed connecting rods.

INDIANAPOLIS. One of these cars was shipped to America to be driven by Douglas Hawkes in the Indianapolis 500 Mile Race. The car was hopelessly outclassed, but it finished the course at an average speed of around 81 m.p.h. after a trouble-free run.



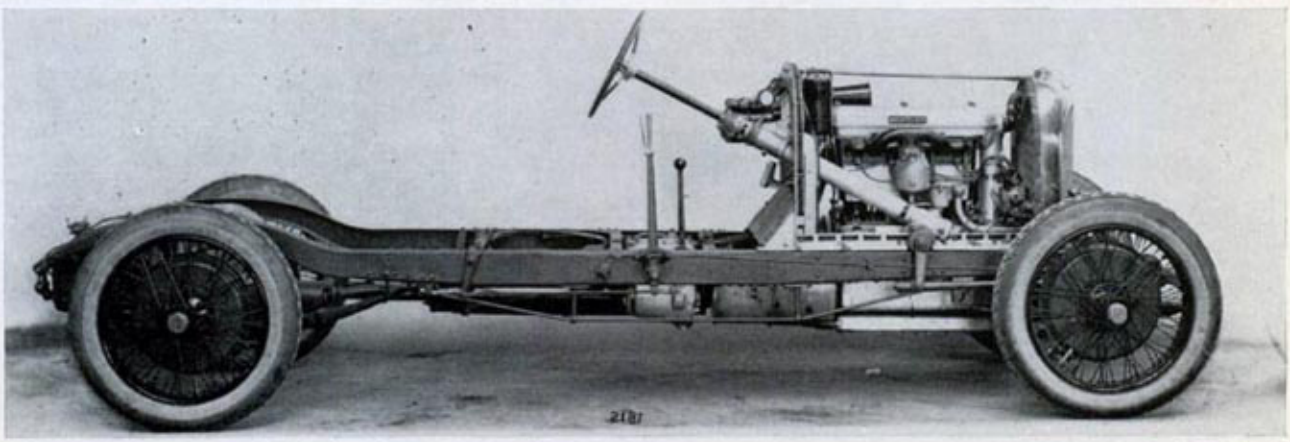
1923: *Kensington Moir's Boulogne Car. Chassis No. 7 borrowed from Hubert Pike (Service Manager) and fitted with twin Zenith RA 48 carburettors and heating coils.* (Photo: Mr H. K. Moir)

1924: *Le Mans. Clement working on the car. Note front wheel brakes and disintegrating shock-absorbers. Bentley's first win at Le Mans.*

The car created a very good impression, but the cost of the venture was fearful at a time when money was in short supply. For all that this very new marque had been tested and had come out with credit.

THE T.T. The next event was in June, a month later, when a team of three 3 Litres to be driven by W. O. Bentley, Frank Clement and Douglas Hawkes were entered for the International Tourist Trophy Race in the Isle of Man. This race was somewhat odd in that it was for 3-litre cars when the International formula was for 2-litre cars. The entry list was, therefore, small and the R.A.C., to give it greater spectator

1924: *A Standard 3 Litre with small header tank, Smith Bentley carburettor and Pirelli tyres.* (Photo: C. K. Bowers Studio)



1925: *Le Mans. The 3 Litre team at the pits before the start.* (Photo: *The Autocar*)

appeal, ran a 1,500 c.c. race over a shorter distance, concurrently with the main race, which was over eight laps of the 37½ mile circuit. Two Sunbeam and three Vauxhall racing cars and three Bentley modified touring cars started in the race which was run in pouring rain. One Sunbeam and two of the Vauxhalls dropped out leaving the remaining Sunbeam to win with Clement's Bentley 2nd, 'W. O.' 4th and Hawkes 5th. The sole remaining Vauxhall was 3rd.

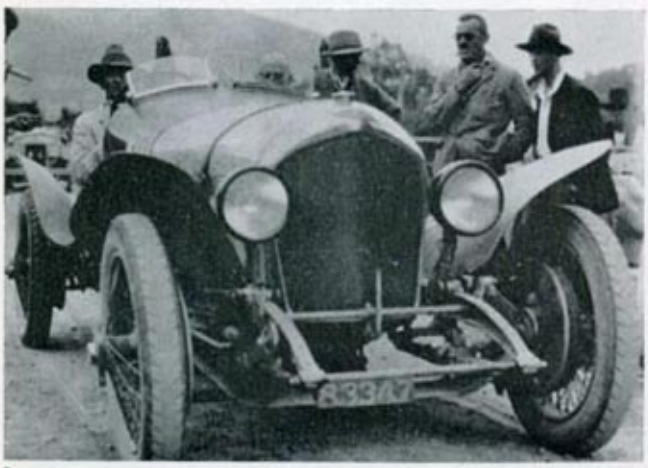
The most important thing for Bentleys was that they won the Team Prize against two teams of well-known racing cars which made for very good publicity.

Small time events were not neglected either, for between July and October, Bentleys took no less than 19 firsts in speed events, and private owners were beginning to take a hand.

RECORDS. In September, J. F. Duff, one of the Bentley Agents, took single-handed the British 'Double Twelve Hour' record (in England, of course, 24 hour racing was not allowed) at 86·79 m.p.h. covering just over 2,082 miles in the two periods. He also took Class 'D' records (as they were then called) of 1 to 13 hours, 100 to 1,000 miles and 100 to 1,000 kilometres at between 86 and 87 m.p.h. The car weighed 23½ cwt. on the start line, and petrol and oil consumption averaged 14·7 and 85 m.p.g. respectively.

1923. LE MANS. While Bentley Motors continued to pile up successes in minor meetings, John Duff, impressed with the reliability of the 3 Litre, persuaded

1926 circa: F. Brodribb's 9-foot Super Sports model at the start of the Mont Talbengo Hill Climb, N.S.W.



'W. O.' to prepare his record-taking 3 Litre for a 24 hour race to be held at a place called Le Mans, in France. 'W. O.' thought it was a mad idea, but unwillingly agreed and lent him Frank Clement as co-driver. In the event the car ran well and, in spite of no front-wheel brakes, finished equal 4th, and in the hands of Clement set up the first Sports Car lap record at Le Mans at 66·69 m.p.h. During the race, trouble was experienced with stones flung up by the car in front, breaking lamp glasses and puncturing the petrol tank. In future years Bentleys were fitted with stone guards on radiator, lamps and tanks.

A month later Duff entered the same 3 Litre privately (in company with a locally-owned Bentley) in a touring car G.P. at San Sebastian. Neither car did any good, although they were ahead of the Hispanos and Peugeots which suffered from tyre troubles. Duff was leading at an average of 65 m.p.h. when a stone hit him in the face and caused him to crash. The second Bentley retired shortly before the end of the race. For this magnificent drive Duff was given, ex gratia, the 3-litre class prize.

BOULOGNE. In September, three 3 Litres were entered for the Georges Boillot Cup at Boulogne to be driven by Frank Clement, Bertie Moir and John Duff, the first two cars being Works entries. Clement burnt out a new type of magnesium alloy piston and retired. Duff had hit a cow in practice, the result of which showed up in the race, and Moir, in spite of continual carburettor trouble, managed to finish without distinction.

1924. LE MANS. Duff again entered his Works-prepared 3 Litre, a new car with front-wheel brakes and stone guards all round. The Bentley's speed and reliability told as the opposition gradually fell out; then the Bentley was in trouble itself with a jammed gate, the windscreen broke away and finally swollen hubs delayed the car for 40 minutes while a wheel was changed. In spite of all these tribulations, the Bentley won the race at 53·78 m.p.h. and recorded the Firm's first win at Le Mans.

1925. LE MANS. The Firm entered two new cars, one driven by Clement and Duff and the other by Kensington Moir and Dr. J. D. Benjafield. The 'Le Mans Start' was first used in this race. Segrave's Sunbeam and Moir's Bentley had a great duel for 15 laps, when the Bentley ran out of fuel due to a miscalculation as to the extra amount of fuel a Bentley would use when

racing with the hood up. As the rules did not allow filling up under 20 laps, Moir was out of the race. Duff continued with the second car until a petrol pipe broke causing an hour and a half's delay. (For the future all racing Bentleys had duplicated pipes and change-over taps.) Clement and Duff continued through the night making up for lost time until the early hours of the morning, when a carburettor fire caused too much damage for the car to continue. Future S.U. 'Sloper' carburettors had a strengthening rib underneath the float chamber. A 3½-litre Lorraine-Dietrich won the race at 57·84 m.p.h.

RECORDS. In September, Benjafield and Duff, in the latter's 3 Litre, made two attempts at Montlhéry on the 24 Hours Class 'D' record. In the second attempt they took it at 95·03 m.p.h.

1926. RECORDS. The Firm attempted in April to take the 24 Hours Class 'D' record at Montlhéry at over 100 m.p.h. The drivers were Barnato, Clement and Benjafield, in the latter's very short chassis Brooklands 3 Litre with a light body. After taking the 12 Hours at 97·54 m.p.h., the car retired. A second attempt was made at the end of April with the same car and drivers. This time only the Six Hours record was taken at 102·2 m.p.h. before the car was retired.

The final attempt was made at the end of June using, again, Benjafield's short chassis with a long tailed, very light, streamlined body. The drivers were the same, but with the addition of Duller. The 12 Hours record was taken at 100·96 m.p.h. Four hours later the car was crashed during a thunder storm in dramatic circumstances which put off further attempts indefinitely.

LE MANS. A team of three new cars were entered; two Speed Models driven by Benjafield/Davis and Clement/Duller, and a Super Sports 9 ft. car driven by Thistlethwayte and Gallop. By 4 a.m., Bentleys were 5th, 7th and 8th. Two hours later Duller retired with valve stretch due to over-revving, and at 9 a.m. Gallop brought in the 9 ft. chassis with a broken rocker. The Davis/Benjafield car was then running 3rd, three laps behind the Lorraine in front. With orders to take second place and with failing brakes, Davis over did it at Mulsanne and was out of the race 20 minutes before the end. The Lorraines came in 1st, 2nd and 3rd, the winner averaging 66·08 m.p.h.

The Benjafield/Davis Bentley was numbered 7 in this race and, as a result of its dramatic failure, was for ever afterwards known as 'Old No. 7'.

BOULOGNE. Benjafield bought 'Old No. 7' and entered it for the Georges Boillot Cup race in September with Kensington Moir as his co-driver. On the 13th lap,

1926: *Le Mans. 'Old No. 7' at Arnage.* (Photo: *The Autocar*)

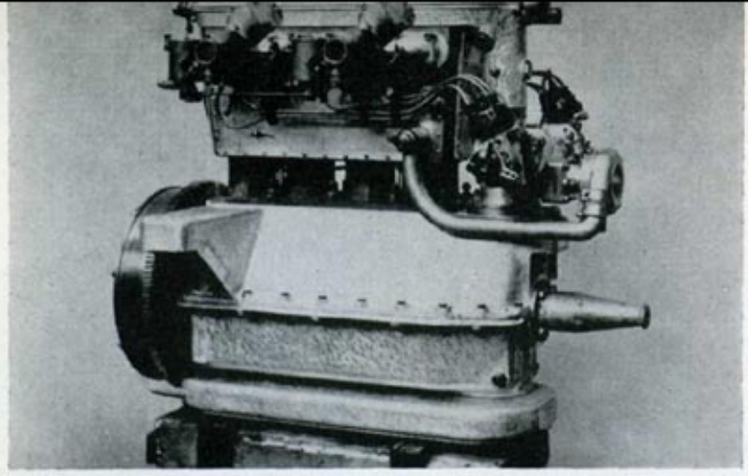
when Benjafield was in 3rd position, he crashed the car badly and was himself taken to hospital. Both subsequently recovered fully from their injuries.

1927. THE SIX HOURS. Four 3 Litres were entered for the Essex Six Hours race at Brooklands, two of the Works' cars, one driven by Clement and the other by Benjafield and Barnato; and the two private entries of Callingham and the Birkin brothers. All but the Birkin car had the new type of duralumin rocker arms and these broke up one after the other during the race and the cars retired. Tim Birkin's car had lost all its gears except 3rd, when Clement took the car over, and between them they drove it into third place behind Duller's Sunbeam and Davis's Alvis.

LE MANS. The Works entered three cars. The first of the new 4½ Litres driven by Clement and Callingham and the two 3 Litres which ran in last year's race, driven by Benjafield and Davis (in 'Old No. 7') and Duller and Baron D'Erlanger in the other. The race started at 4 p.m. as usual, and the three Bentleys ran away from the rest of the field. At 9.30 p.m. all three Bentleys were involved in the 'White House Crash'. Two of them were out for good and the third, 'Old No. 7', so badly damaged it was doubtful if it could continue. Davis managed to get the car to the pits. In spite of a bent front axle, twisted chassis, cracked steering arm ball joint, a broken headlamp, loose and flapping offside running-board and wing, the two drivers in turn kept the car going through the night and the next day, even increasing speed to destroy the leading Aries and finally winning the race at 61·35 m.p.h.

This was the last of the nine races in which Works prepared and entered 3 Litres took part. With their second win at Le Mans the Firm's luck had at last turned and in a blaze of glory (for wasn't she the Guest of Honour at the Savoy?), 'Old No. 7' handed over the torch to the new 4½ Litre.

1926: *Le Mans. The start with hoods up. 'Old No. 7', as she was always to be known, in her first race. In company are two O.M.s and a Roland-Pilain.* (Photo: *The Motor*)



1923–26: *3 Litre engine, inlet side. Note the sloping carburettors.*

RECORD OF 3 LITRES IN RACES

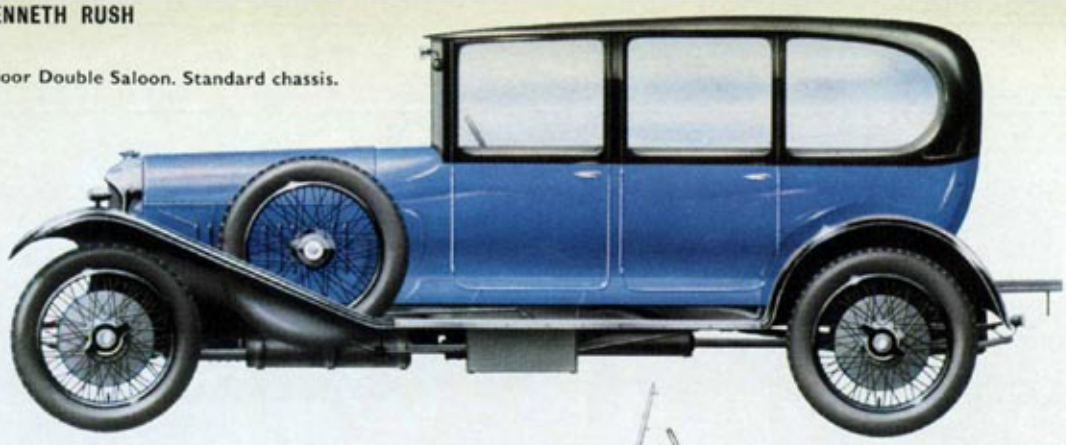
Year	Event	Race No.	Drivers	Result	Speed m.p.h.
1922	**500 Mile Race, Indianapolis**	22	W. D. Hawkes	Finished	81 approx.
	Tourist Trophy Race, Isle of Man	3	F. C. Clement	2nd	55·21
		9	W. O. Bentley	4th	52·69
		6	W. D. Hawkes	5th	46·61
1923	**Le Mans**	8	*F. C. Clement J. F. Duff	4th	50·05
	Georges Boillot Cup, Boulogne	25	F. C. Clement	Retired	—
		26	H. K. Moir	Finished	—
		21	J. F. Duff	Retired	—
1924	**Le Mans**	8	F. C. Clement J. F. Duff	1st	53·78
1925	**Le Mans**	9	F. C. Clement J. F. Duff	Retired	—
		10	H. K. Moir J. D. Benjafield	Retired	—
1926	**Le Mans**	7	J. D. Benjafield S. C. H. Davis	Crashed	—
		8	F. C. Clement G. Duller	Retired	—
		9	R. C. Gallop T. Thistlethwayte	Retired	—
1927	**Essex Six Hours Race, Brooklands**	6	L. G. Callingham	Retired	—
		10	J. D. Benjafield Woolf Barnato	Retired	—
		11	F. C. Clement H. R. S. Birkin C. A. C. Birkin	3rd	59·8
		12	F. C. Clement	Retired	—
	Le Mans	1	†*F. C. Clement* *L. G. Callingham*	*Crashed*	—
		2	G. Duller Baron D'Erlanger	Crashed	—
		3	‡J. D. Benjafield S. C. H. Davis	1st	61·35

** Denotes Lap record also. † The first 4½ Litre. ‡ 'Old No. 7'.*

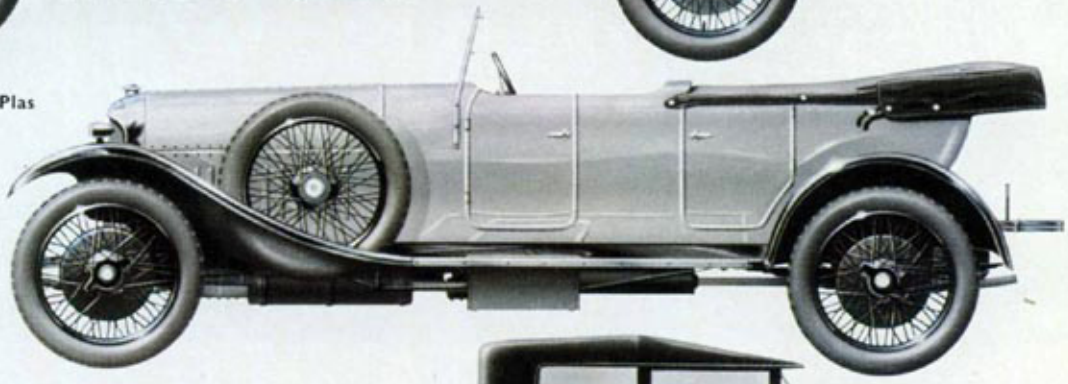
SPECIFICATIONS: 3 LITRE BENTLEYS

	All Models	Short Standard 1922–25 T.T. Replica 1922–24 Speed Model 1924–29	Long Standard 1923–29 Light Tourer 1925–27	9 ft. Wheelbase Super Sports 1925–27	Works Team Cars 1922–27
ENGINE					
Cylinders	Four cast en bloc, non-detachable head				
Bore, stroke, c.c.	80 × 149 mm. 2,996 c.c.				
Camshaft, single overhead	Driven by vertical shaft from front end of crankshaft. Triple cam per cylinder. Rockers; steel up to 1926, thereafter Duralumin	B.M. 1800 first 160 chassis. B.M. 2391 until 1926 then B.M. 1800	B.M. 2391	B.M. 1800	B.M. 1800
Tappet clearance					
Inlet		B.M. 1800 ·019 in. B.M. 2391 ·004 in.	·004 in.	·019 in.	B.M. 1800 ·019 in.
Exhaust		B.M. 1800 ·019 in. B.M. 2391 ·006 in.	·006 in.	·019 in.	·019 in.
Valves	16 tulip shaped. Hardened tips				
Valve springs	32 coil. 16 inner. 16 outer				
Compression ratio		Short 1922, 4·3 : 1 1923 to 1925, 5·3 : 1 1926 onwards, 5·6 : 1. 6·1 : 1	4·3 : 1	5·6 : 1 6·1 : 1	1922 T.T., 5·3 : 1 (?) From 1926, 6·5 : 1
R.p.m.	3,500				1922 T.T., 4,000 in bottom gear 1923–27, 3,750 in an emergency
B.h.p.		Up to 1925, 80–82 After 1925, 85	70–72	85	86–88
Pistons	Aluminium alloy	'Hour glass' or split skirt B.H.B.	B.H.B.	Drilled 'hour glass'	Drilled 'hour glass' type (Magnesium alloy failed)
Connecting rods		1922–24 B.M. 1768. Four bolt shell	B.M. 1768		B.M. 1768
		1924–26 B.M. 3105. Two bolt shell	B.M. 3105		B.M. 3105
		1926–29 B.M. 4017. Two bolt direct metal	B.M. 4017	B.M. 4017	B.M. 4017
Ignition	Two synchronised 'ML' magnetos	1922–23, G4. 1924–27, CG4. 1928–29, RG4. (some only)	CG4. GR4. (some only)	CG4.	1922 T.T., G4. Others, CG4. 1927, RG4.
Firing order	1–3–4–2				
Carburettor(s)		1922, Smith 45 VS			1922, Claudel-Hobson CZP
		1923, Smith Bentley 45 BVS	Smith Bentley		1923, Zenith 48 R.A.
		1924–29, twin S.U. Type G5	Type 45 BVS	Twin S.U. G5	1924–29, twin S.U. G5
Fuel consumption	At 30 m.p.h.	45 VS—25 m.p.g. Twin S.U., 22 m.p.g.	45 BVS—25 m.p.g.	S.U., 16–20 m.p.g.	Claudel-Hobson, 10–11 m.p.g. (average) S.U.
Fuel feed		Autovac	Autovac	Pressurised	Pressurised
Fuel tank capacity		11 gallons	11 gallons	11 gallons	1922 T.T., 33 gallons 1926–27, 25 gallons
Oil tank sump	2½ gallons capacity				1922–27, plus 2 gallon pressurised spare oil tank
Oil consumption	800 m.p.g.				150 m.p.g. approx.
Plugs	KLG, K1, KS1, Champion 6, 7 or 16				
Battery	1922–1923, Smith, 12V. 1924–28, Peto and Radford, 12V				1927, Young (?), 12V
Dynamo	Smith. 1922, Type 4D 1926, Type 2DA (chassis 1206)				
Starter motor	Smith. 1922, Type 4LS 1926, Type 4LSA				

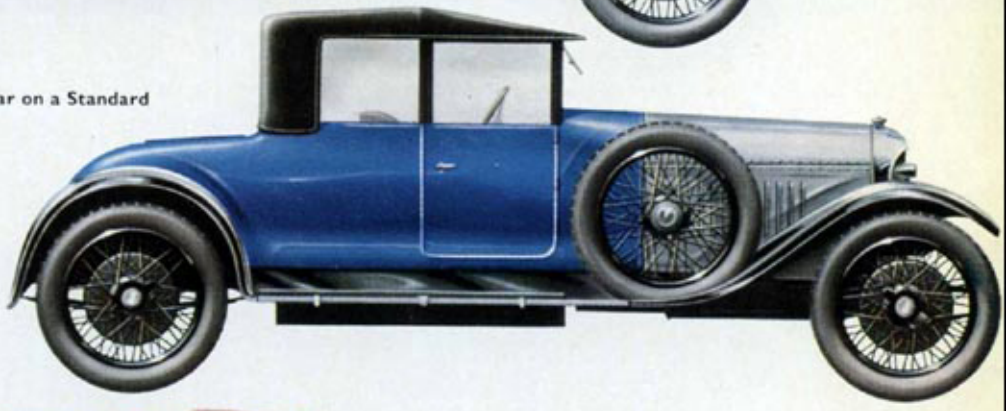
1924 Four-door Double Saloon. Standard chassis.

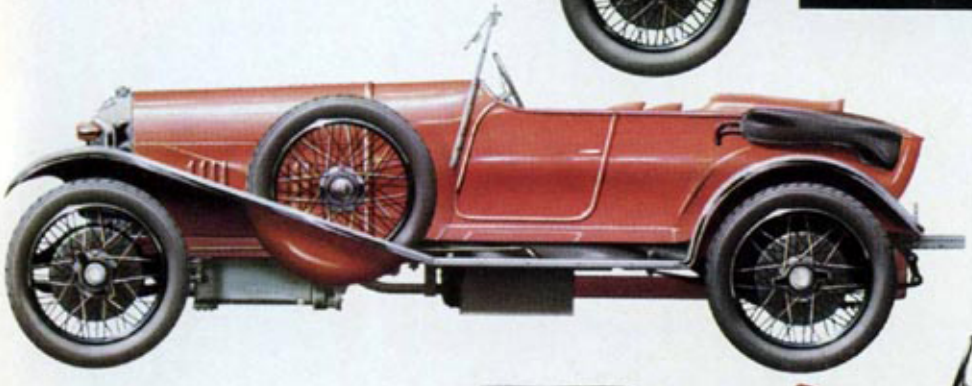


1925 Open four-seater Vanden Plas
Standard chassis tourer.



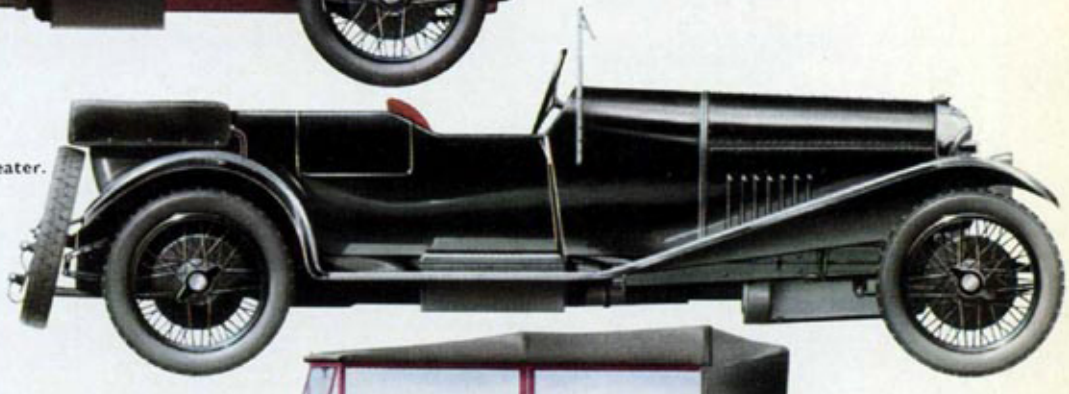
1926 Coupé with double dickey seat in rear on a Standard chassis.



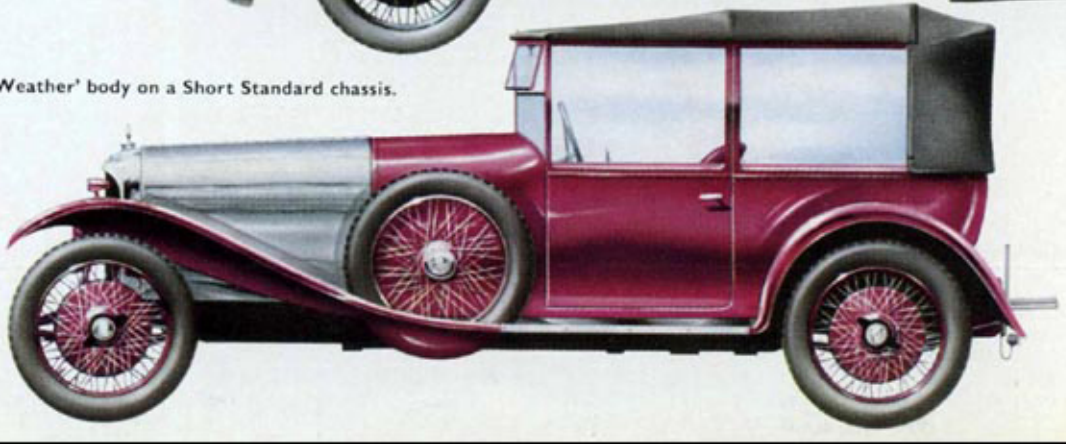


1926 Speed Model boat-tailed two-seater.

1927 Speed Model Vanden Plas Sports four-seater.



1924 Two-door 'All-Weather' body on a Short Standard chassis.



	All Models	Short Standard 1922–25 T.T. Replica 1922–24 Speed Model 1924–29	Long Standard 1923–29 Light Tourer 1925–27	9 ft. Wheelbase Super Sports 1925–27	Works Team Cars 1922–27
CHASSIS					
Wheelbase		9 ft. 9½ in.	10 ft. 10½ in. (long) 9 ft. 9½ in. (light)	9 ft.	9 ft. 9½ in. 9ft. One only (1926)
Track	4 ft. 8 in.				
Width overall	5 ft. 8½ in.				
Length overall		13 ft. 3 in.	14 ft. 4½ in. (long) 13 ft. 3 in. (light)	12 ft. 6½ in.	13 ft. 3 in. 12 ft. 6½ in. One only (1926)
Weight (chassis only)		1922–24, 19½ cwt. 1925–28, 23 cwt.	1923, 20 cwt. 1924, 21 cwt. 1925–28, 24½ cwt. Light, 23½ cwt.	22½ cwt.	1922 T.T., 19 cwt. approx.
Weight (complete car)	i.e. Maximum permitted under guarantee	1922–24, (about) 25–26 cwt. 1925–28, 28½ cwt.	1925–28, 35 cwt. Light, 32 cwt.	26½ cwt.	1922 T.T., on start line, 23 cwt. 50 lb. Other years—not known
Frame	Thickness, 1922–26, ·144 in. Thickness, 1927, ·156in. Thickness, 1928–29, ·188 in.		1926. Strut gear strengthening plate fitted		
Brakes	To mid 1923, rear wheels only After mid 1923, Bentley-Perrot F.W.B. Drums, I.D. 16 in. Shoes Ferodo lined				
Front axle	'H' section. 40 ton tensile steel 1923, redesigned for F.W.B. 1928, strengthened from chassis No. DN. 1729				
Rear axle	Semi-floating. Underslung Oil capacity 3 pints	Ratios, 1921–23, 15/53, 13/51 1924–29, 14/53, 13/51	13/55	1925–26, 15/53 1927, 14/53	1922 T.T., Special 14/48 Others, 15/53 straight cut.
Springs	Semi-elliptic of varying types				Corded
Gear box	Four speeds forward and reverse. Right-hand change. Three-point suspension. Six pints oil capacity	1922–27, 'A' type close ratio. 1927–29, 'C' type (from chassis No. LT. 1596)	'B' type, wide ratio	'A' type	1922 T.T., 'A' type, five DP gears Others 'A' type seven DP gears
Wheels	Rudge Whitworth. Wire. Centre lock				
Tyres	Pre 1926, 820×120 B.E. (overseas 880×120 B.E.) (Rapson, Palmer or Pirelli) Post 1926, Dunlop 5¼ in.×33½ in. to fit 21 in. well-base rims 1928, 5·25 in.×21 in. Note. From 1926 Dunlop fitted as standard				
Steering	Worm and wheel (adjustable)				
Radiator	Pre 1925, 4¼ gallons Mid 1925, large header tank, 4¾ gallons. Radiator 1 in. higher			Tapered-in at the bottom	1922 T.T., small flat radiators. Special for race
Instruments	1922/3, Smith Ammeter, clock and oil gauge with white dials, black dials after 1923. A.T. speedometer. Rev counter				1922 T.T., Smith air gauge, Cambridge rad thermometer
Lamps	1922–24, Lucas 1925–28, Lucas or Smith				1927 Smith
Speed (maximum)		Short Standard 80 m.p.h. T.T. Replica, Speed Model 90 m.p.h.	75 m.p.h.	100 m.p.h.	1922 T.T., cars, 101 m.p.h. Others, 95–100 m.p.h.
Badge on radiator and fuel tank	Each model had a distinctive colour background to the letter 'B'	Short Standard, T.T. Replica Blue Speed Model Red	Blue	Green	As for the standard chassis
Guarantee		Five years	Five years	One year	
Price (chassis only)		1921, £1,150 1922, £1,050 1924–29, £925	1923, £1,100 1924, £895 Without F.W.B. to special order, £875 Light, £795	£1,050	
Price (complete car)	As sold under guarantee	1923, £1,275–£1,475 1924–29, £1,125–£1,350	1923, £1,450–£1,575 1924–29, £1,225–£1,450 Light, £995–£1,195	To special order	

ACKNOWLEDGMENTS

Acknowledgment is made of the assistance received from: The Autobiography of W. O. Bentley, the records of the Bentley Drivers Club, the 'Autocar' race reports, 'Motor Sport', and Cyril Wadsworth for information on the 1922 T.T. cars.