

# SPARKPLUG

The newsletter of the Letchworth Garden City Classic & Vintage Car Club



MARCH 2024

## THE STORY OF YLW900 - THE OTHER YELLOW FORD POPULAR 100E

**Pete Smith**

I've been a fan of the Ford 100E range of cars ever since 1963, when my father purchased a 1958 Ford Anglia NBW482. When I could eventually afford my first car, naturally it had to be a 100E. XOY579 was a 1960 Popular Deluxe model in dove grey. I learned to drive in this, and after passing my driving test, I used it daily for travelling to and from work and college for the following three years. The poor little car suffered badly during this time, as I tended to drive it flat out to extract the 36 bhp that it had to offer. As a result, I destroyed at least three sidevalve engines, before converting it to ohv power using a 997cc Anglia 105E engine and 4 speed gearbox. After about a year, this too succumbed to my right foot and was replaced by a 1200cc Anglia/Cortina engine. By this time, I found myself fighting a losing battle with rust. It was already suffering from the dreaded 'wing worm' when I purchased it, although it was barely 10 years old. As a result, it was dismantled, the bodyshell scrapped, and the engine fitted into my next car, a Mk1 Cortina. Being an impoverished 20-year-old car nut in the early 1970's, I naturally read a lot of the car magazines of the time - Cars & Car Conversions, Hot Car, Custom Car etc. These encouraged the owners of humdrum cars like the 100E, to modify them with bigger engines, wide wheels, lowered suspensions etc. I decided that one day I would build a big engined 100E with all the trimmings.

Fast forward to 1991, and on my commute to work, I spotted a very sad looking black 100E in a front garden on the outskirts of Royston. A few days later, a sign appeared indicating that it was for sale, but at an astronomical price. After knocking on the front door of the house, and chatting to the seller, we agreed a much more sensible price, to include delivery to my home.

After it was delivered, I worked out what needed replacing. Basically, every mechanical part was rusted up, worn out, broken, missing, or all four! Bodily, the bottom 4 inches was rotten, sills, valences etc, but surprisingly, the floors were pretty good, with only a few localised repairs required. I found that the underside had been sprayed all over with old engine oil, presumably during the car's earlier life, and that had preserved it better than any underseal. What a horrible, messy job it was to remove it though, in places it was around half an inch thick! The bodyshell was repaired with new inner and outer sills, rear valance, rear lower corner panels and front wing lower panels purchased from Expressed Panels Ltd. Further smaller sections I fabricated from sheet steel, all of which I welded with my newly acquired Clarke 120e mig welder, which is still going strong over 30 years later. One of the previous owners had hand painted the car's exterior black, without any preparation, or even cleaning, beforehand. The result was that I was able to peel most of this off like wallpaper, revealing the original 'Sunburst Yellow' paintwork underneath. Unfortunately, both doors turned out to be scrapyard replacements, one originally black, and the other blue, so it was necessary to respray the whole car. The interior had not escaped the attentions of the mad painter. With the exception of the seats, instruments and headlining, everything else had been hand painted in some sort of grey primer, all of which I scraped off by hand.

At this stage of the story, the intention was to build a road legal car that could be used for track days, and possibly the odd sprint and hill climb. With this in mind I didn't worry too much about panel gaps or alignment etc. During the previous 15 or so years, I had been collecting the ingredients for my future 'hot' 100E. These included a Cortina 1500 GT engine and '2000E' close ratio gearbox, Anglia 105E rear axle, and Ford Classic 109e front suspension. I had the engine rebored +0.060", giving a capacity of around 1560 cc. It was rebuilt with all new bearings, camshaft, and high-pressure oil pump. With the inlet and exhaust ports gas flowed and polished, and with electronic ignition, I estimated a power output of around 90-100bhp. All this was fitted into the 100E, together with the close ratio gearbox. It did entail a certain amount of cutting and welding to the bulkhead, because the ohv Cortina engines are around four inches longer than the 100E sidevalve unit. The 105E rear axle was slightly modified to fit the 100E leaf springs and dampers. Lowering blocks were fitted between the axle and springs to lower the rear of the car by 1.5". Regarding the front suspension, the aforementioned Ford Classic/Capri struts and track control arms were fitted, with spacers fitted inside the struts to limit the rebound travel, thus ensuring that the shortened Classic springs didn't fall out on full rebound. All this fitted straight into the 100E perfectly with no other alterations. The disc brake assemblies from a 1980's Capri fitted the 1960's Classic struts with again, no modification. The final ingredient added, a set of genuine Lotus Cortina 5.5" J steel wheels, shod with 165 x 13 tyres.

I had finally achieved my goal - a low, mean, fast 100E! But things were going to change,,,,,,,,,,,,,,,,,,,,,

About this time, there were strong rumours afoot that DVLA were going to clamp down hard on any modified classic cars. Any car with a modified monocoque bodyshell would require re-registering, which would mean effectively removing it from the road permanently. This rather concerned me, so I considered possible alternatives. I had recently taken a trip to Northampton Stadium, to watch the Formula 2 Heritage Stock Cars racing. These are mainly 'sit up and beg' Ford Populars, fitted with tuned Ford 100E 1172cc engines. I was very impressed at their performance, considering the amount of additional steelwork they carried. It occurred to me that a similar engine was the way to go.

Firstly though, the painful task of removing all the 'go faster' bits had to be undertaken. These were then sold to help finance the project. The first job was to return the bulkhead to standard specifications. As I also own a totally standard 100E Prefect, a four-door version of the Pop, I carefully copied the bulkhead of that with new metal, and then cut and welded that into the Popular. The front suspension and brakes were returned to standard 100E specifications, with the exception of the rubber bushes, which were replaced by polyurethane. An additional anti-roll bar, made from a spare 100E item with the ends cut off, was fitted using custom made alloy clamps. At the rear, the suspension reverted to standard height, and the 105E axle replaced by a 107E Prefect unit. This axle is dimensionally identical and has the same final drive ratio as a 100E axle, but is stronger, quieter, and longer lasting.

Finally, a set of standard 100E wheels and tyres were fitted. The sidevalve engine that was in my Pop when purchased, had obviously had a fair bit of work done on it before it had been taken off the road in 1982. This included a rebore, with new +0.060" oversize pistons, and a reground crankshaft. The connecting rods had been modified to take replaceable big-end shell bearings.

Unfortunately, whoever had reassembled the engine, had failed to remove the swarf from the machining operations, so when it was started up afterwards, all the new bearings were instantly destroyed. Additionally, the car had presumably then been stored outside with no antifreeze in the cooling system, so the block, head and radiator were badly frost damaged. Through eBay, I had been very lucky in purchasing another 100E engine locally for £10! This was an early one, made in 1954, and had been fully rebuilt before being stored as a spare for a company van, but was never used. Unfortunately, it had suffered during its years in storage, and although the internals were generally in perfect condition, two pistons were badly rusted in their cylinders. After soaking in penetrating oil, and the judicious use of a block of wood and a sledgehammer, the pistons were removed, but were too damaged to be reused. The bores too, whilst completely unworn, were corroded, so I had them rebored to suit the pistons from the first engine.

One of the reasons that the 100E engine is relatively low powered for its capacity, is that it suffers from poor breathing. It therefore follows that anything that allows the gasses in and out of the cylinders quicker will improve the performance.

I'd heard a rumour that Ford Fiesta inlet valves could be persuaded to fit, and sure enough, I found that those for a 957cc Fiesta were identical dimensionally, except for the head diameter, which was about 1/8" larger. This was perfect, as when fitted, they just cleared the exhaust valves. I then spent many hours enlarging and polishing the inlet ports, also smoothing, and polishing the exhaust ports, before having all the valve seats recut. At the same time approximately 0.025" was machined from the block's top face, to increase the compression ratio. This is preferable to skimming the cylinder head on most sidevalves for several reasons. Turning now to the carburettor and manifolding. Special 4 branch exhaust manifolds are available new, but at a pretty astronomical cost, as are inlet manifolds to take twin S.U. carbs. Being a total skinflint, I opted for a different route. Firstly, I reasoned that it wouldn't be too difficult to cut and shut a proprietary exhaust manifold, so browsing eBay, I found a used example from a Ford Cortina mk2 1600GT, which I won for £6! As I didn't need the mounting flanges, I cut these off, and sold them on eBay for £13! The remainder of the manifold I cut and rewelded to match the ports of the 100E engine. A new mounting flange was cut from the base of an old patio table sunshade (as well as being a skinflint, I do like recycling things!). Regarding the carburation, I prefer to use one big unit, rather than two little ones, reasoning that it simplifies such things as the choke and throttle linkages. Besides which, I happened to have two or three 1 1/2" S.U. HS4 carburettors left over from my Mini racing days. One of these was overhauled, and a manifold fabricated to suit.

I decided that a three-speed gearbox, as originally fitted to all 100E models would be too much of a handicap for performance, and I knew from previous experience with one of my previous 100E's, that fitting a later Ford 4-speed 'box wouldn't be too much hassle. Little did I realise! I had already acquired a couple of Ford 105E 4-speed gearboxes, so the best was selected for the conversion. Fighting back the tears because of the cost, I ordered an alloy 'Wooler' bellhousing from Small Ford Spares. This would theoretically allow a 105E gearbox to be fitted to a 100E engine, but in practice, the gearbox input shaft required extensive modifications before it would work. This machining was carried out on my pre-war, clapped out, Myford lathe, which did struggle a bit because the shaft material was rather tough, but we got there. I then had to assemble a hybrid clutch, involving a 105E driven plate and a modified 100E pressure plate. Modifications also had to be made to the release mechanism to make it work. This last point has been an ongoing hassle to get right, involving the engine's removal and replacement at least six times over the past nine years. It does appear to have resolved now, though. Time will tell! On fitting the engine and gearbox into the car, a clearance problem was discovered where the Wooler bellhousing fouled the bulkhead. This was solved by moving the engine/gearbox forward by 10mm using spacers. It also allowed the fitting of a standard 100E prop shaft, albeit with a 105E front end, as an added bonus.

The car returned to the road in 2014, some 23 years after purchase! Since then, it has been used for a few longish runs of 100 plus miles, but generally it is used for local pottering about. It has proved to be pretty reliable and has always got back home under its own steam. More to the point, I enjoy driving it, so it proves that you don't have to spend shed loads of money to have fun with an old car, but it will be very time consuming!





**1 1/2" SU carburettor and home brewed manifold**



**Additional front anti-roll bar**



**Off side view of the engine**



**105e gearbox and Wooler bellhousing**

Pictures provided and annotated by Pete's wife, Jane. A real team effort.

## CYCLE CARS AND GUN TURRETS

### By Plug Cap

Its twelve minutes to one and the car park behind The Three Horseshoes in Offord D'Arcy is a hive of activity. About thirty young airmen billeted in the village are scrambling into an assortment of vehicles, some of which are choking out clouds of oily smoke as they fire up. In one of them, a 1921 GN Cyclecar, Flight Sergeant Wallace McIntosh is squashed uncomfortably into the driving seat as his crewmate Alec, yanks nervously at the recoil starter wire poking through the dummy radiator up front. If the 1083cc Vee Twin backfires the recoil will take his arm with it. But it bursts into life and Alec leaps in to join the four uniformed bodies already occupying its three small seats.

Joining the small rattling convoy they wind their way out of the village a mile up the hill to the RAF Bomber Command station at Graveley. It was April 1944 and 35 Squadron had just been equipped with the latest Lancasters. They were in the elite No 8, Pathfinder group and it was a secret then that the Pathfinder operations were planned and controlled from Huntingdon, only five miles away.

Neither of them knew it just yet but tonight Wallace and Alec, both twenty four and on the same Lancaster crew, would be trailblazing a major raid on Berlin; Alec was wireless operator and Wallace the rear gunner.

The GN reached the gate with five minutes to spare. Although they would not be called to the Briefing until the pilots and navigators had finished, the gates would be locked before it started. They spluttered their way around the back of the dispersal building and as the rest climbed out, Wallace hung back and contemplated the GN. It was one year younger than himself and had belonged to his Dad. Its big, transverse, Vee twin was made in GN's own works and had been in production with only few changes since the first model launch in 1911. After WW1 the Ash chassis had become steel and a steering box replaced wire and bobbins. Belts vanished and shaft and chains now gave three speeds to the solid, braked rear axle. The whole plot weighed only six hundredweight and could see sixty five mph. It was and always had been, the best Cyclecar.

The Air Gunner patted its bonnet and hastened to his briefing wondering if he would drive it home again.

Once briefed, kitted and frisked in Dispersal, an old Bedford bus carried him to his Lancaster on the fringe of the airfield and he crawled his way down the sloping fuselage through a tiny door into the rear gun turret. He tightened the belt in his bucket seat. Each forearm rested neatly on an ammunition box containing 2000 rounds to feed the four 303 Browning machine guns that he sat between and his hands fell perfectly onto neat little joy sticks. It would be some minutes before the Merlins were run up but one of them would provide hydraulic pressure and those joy sticks would come alive, arcing and aiming turret and guns smooth and fast. A reflector sight kept his target in vision as the guns did their stuff.

This was an FN20 turret. The four gun version of the two gun FN5, a British invention that served extensively in WW2. If he got lucky Flight Sergeant Wallace would spend more than eight hours in his tonight and he knew every rivet. But then even the first time he had sat in it, he had felt at home. There was something familiar about the shape of the linkages, the spindle profiles and the finish of the bearing caps that was reassuring.

Wallace didn't know it then, but there was a reason for that. The turret had been designed by the same man as his beloved cycle car – Archie Frazer Nash.

In 1909 H R (Ron) Godfrey and A F (Archie) Nash started the GN company to make Cyclecars. They adapted and manufactured a Peugeot, inlet over exhaust, single plate clutch, vee twin that was unusually tractable and reliable. Almost from the start Archie eschewed any differential and installed a solid axle with multiple chain drive and a sprocket for each gear. It was a winner.

GN survived WW1 but by 1922 Herbert Austin was on the scene, the Cyclecar was dead and Archie formed Frazer Nash Ltd. Pre-WW2 all of their sports cars, so sought after today, exploited Archie's multi chain solid back axle to give them their notoriously spirited handling.

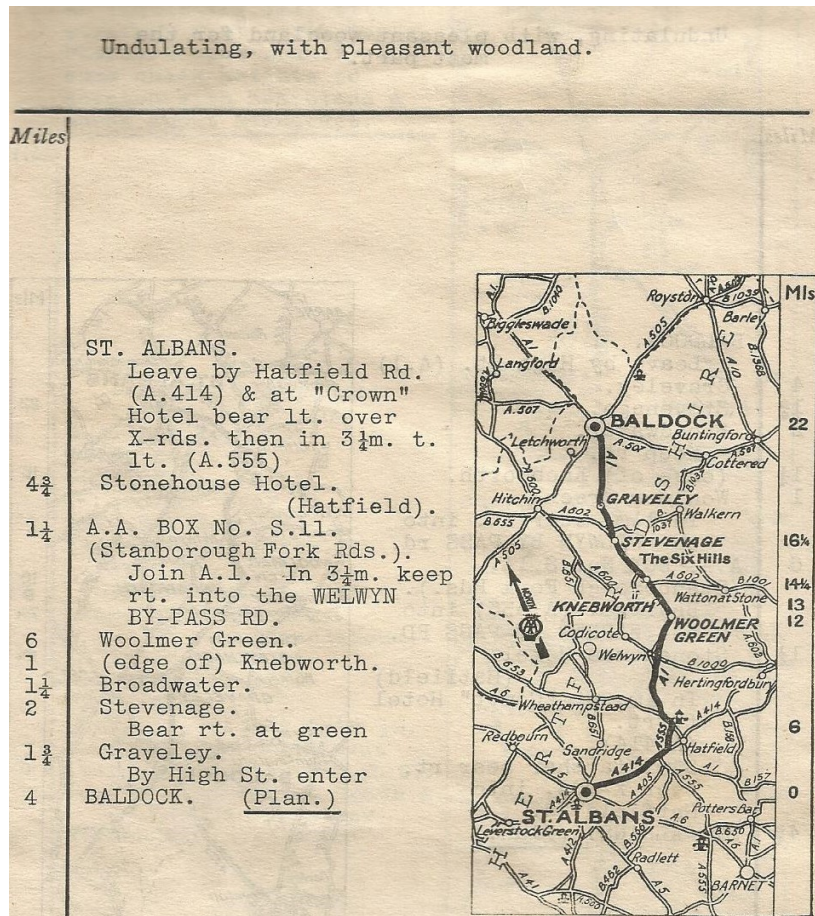
Then in 1929 Archie moved out of the company and formed Nash and Thompson Ltd., who became, amongst other things, contractors to the Air Ministry. One of his many personal inventions was the hydraulic gun turret and by the time they merged with Parnell Aircraft in 1935 the secret turret had already passed extensive RAF testing. As Technical Director Archie saw his turret through to production and during WW2 twenty three different variants were installed in Twelve warplane types. No less than twenty two thousand F-N5s alone, were manufactured ! And Archie continued inventing successfully until his death in 1965. His partner H Ron Godfrey worked with Archie on and off until 1935 when with two partners, he founded HRG and produced fabulous sports cars until 1956.

And Flight Sergeant Wallace McIntosh survived WW2 to become the most decorated rear gunner of the war. He lived until 2007. What happened to his GN is not known.

Heroes All.

## The AA by the Editor

I was recently kindly lent an original Automobile Association route map which shows part of the Great North Road. I had not seen one previously. These works of art were available to order if you were in the Association. The detailed text is hand typed (on a typewriter) next to a strip map of the route including, elsewhere, the total mileage of 125 ½ miles between St. Albans and Cromer. The distances are to the ¼ mile. Turning the stapled pamphlet over reveals the return journey.

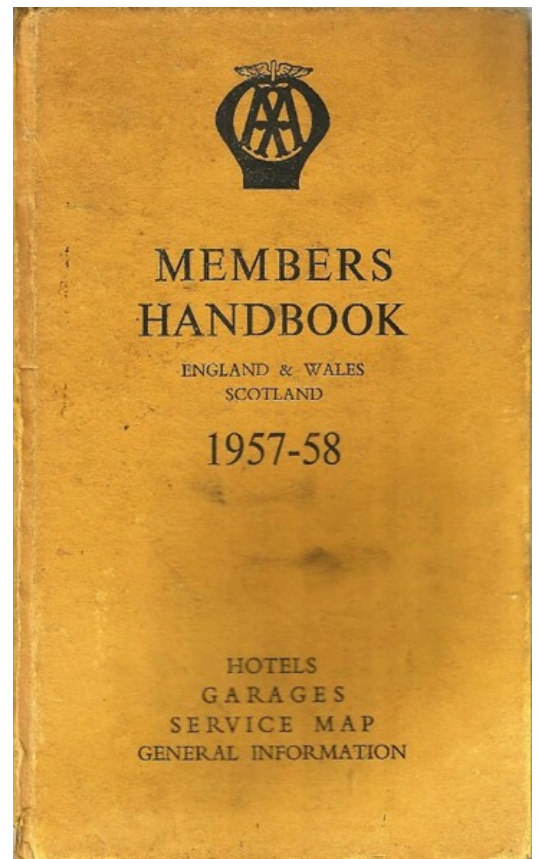


*On seeing this AA plaque in Somerset  
 I was surprised by the fine resolution:  
 London 149¼ miles*



This got me thinking of when I was a little lad, travelling with my sisters going on holiday in the back of the family Austin of England car, we discovered the Automobile Association's Handbook.

The badge, handbook, and key to all the AA (and RAC) roadside boxes came with Dad's membership. The badge and key are still the property of the AA. The patrols, when this handbook was issued, were by motorbike and sidecar. In the Summer months some patrols used solo motorbikes so that they could get around more quickly. The roadside boxes could be used to call for assistance, and also call anywhere in the UK on a trunk call. Money to cover the cost of any trunk calls was to be left in a box by the phone, or the charges reversed. Messages could also be relayed back to the stranded motorist or a patrol through these boxes. Two boxes are shown on the map for our area. One by Jacks Hill and one just out of Baldock going North. I don't recall Dad ever using a roadside box, but I was impressed by the substantial key, at the time (I was a lot smaller then). There were five ranks of patrol men (I think that they were always men) reflecting police ranks I assume. Length of service was also identified on the patrolman's uniform. The first few pages of the handbook include detail of the availability of a London Pilot Service where a uniformed pilot could be met on the outskirts of the metropolis to guide, or drive, the member through London, or to a location within London. The charge was based on the public transport fare; this to allow the pilot to return to his starting point. Most of the handbook is filled with very compressed and comprehensive detailed lists of hotels and garages. At the back of the book are the maps and a page printed with a High Tide Table at London Bridge (GMT). Tidal Constant (TC) figures, to be used in conjunction with this table, were printed on the maps that included a coastline. Useful if you were, for example, trying to cross the causeway to Holy Island, off the Great North Road in Northumberland. All you would have to do is take a note of the Tidal Constant (TC), in this case plus 0 hours and 55 minutes, plus 1 hour in Summer. Apply this to the time shown in the High Tide at London Bridge Table for your month, date, and morning or afternoon tides. Low Water is approximately 6 hours and 10 minutes after the preceding High Water. It's as simple as that. I think that by the time I had worked that out the tide would have come in again. Were we more numerate in 1957/58?



It is a pity that Sparkplug doesn't incorporate a 'scratch and sniff' feature as my handbook, bought recently on eBay, certainly smells like 1957. It has two routes, marked on the map pages, in blue crayon: Watford to Hereford and Torquay to Penzance, not using any motorways at all. I wonder what those journeys were for and who completed them, or at least expected to. I'll probably never know.

## The Great North Road

Now into Stevenage Old Town, just South of Middle Row.



*Stevenage Old Town High Street in the mid-1950s?*

*"C'mon mate I could get a boat through there!"*

*Not sure where this picture was taken on a bright Winter's day.*

*It shows how busy the single carriageway road was. There were marches conducted by Stevenage folk to press for safety features like pedestrian bridges to be built, to allow people to cross without getting squashed.*



The GNR departed the Old Town towards Gravelly and Baldock with the Bowling Green on the left. This green is where Samuel Pepys (does he?) played bowls at one time. On the right, near this green, was the famous HRD Vincent motorcycle factory. Philip Vincent built the fastest and most glamorous motorcycles in the world - yet he ended his days in poverty. Some 40 years after he died, one of his machines, a 1951 Vincent Black Lightning, sold for around one million US dollars. Interestingly when the factory was in its heyday Vincent took lunch in The Cromwell Hotel (which still thrives) also marrying an Irish barmaid who worked there. Rolls Royce allowed the Vincent company to call their motor bikes 'The Rolls Royce's of the motorbike world'. It is a fascinating quirk of geography that Vincent chose Stevenage, then a small rural town, to set up shop. It did afford the use of the Great North Road as a test track. One anecdote is that the Police had no machinery faster than the Vincents and so could never catch a test rider, until one day they did. The judge at the subsequent court case threw the case out because, although the Police stated that the Vincent was doing a 120mph, the Judge said that this was impossible.

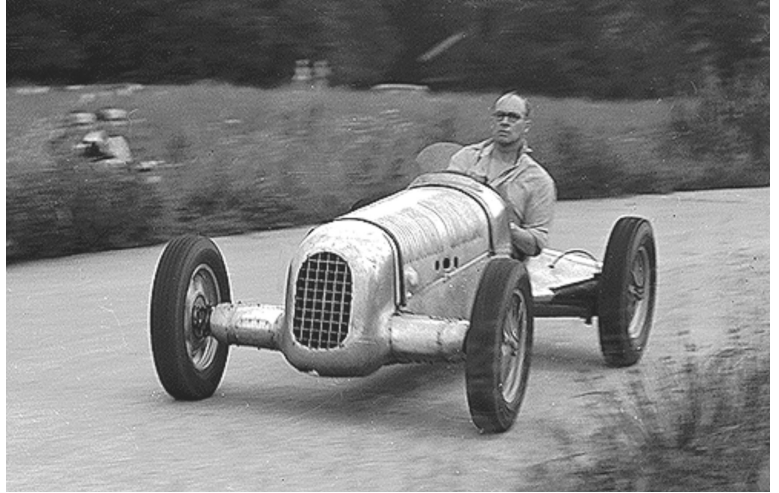


## Issigonis's Lightweight Special

Andrew Croysdill

We had a very engaging presentation on Minis at the January Club Meet. Nick Cooke gave an introduction to the pioneering designer of the car, Alec Issigonis, mentioning his previous work in designing the Morris Minor. I would have liked reference made to some of his other achievements: for example the design of the 1947 MG YA steering and front suspension that lived on until 1980, almost unchanged through Morris Oxford, Austin Cambridge and then MGB. Sadly, he also knew nothing about perhaps Issigonis's astonishing, most personal and innovative achievement, his racing car The Lightweight Special. In case this achievement has also been missed by Club Members, I have gathered some information which comes abridged, mainly from the best seller book *Specials* by that great motor-journalist, commentator and racing driver John Bolster. (Foulis 1949)

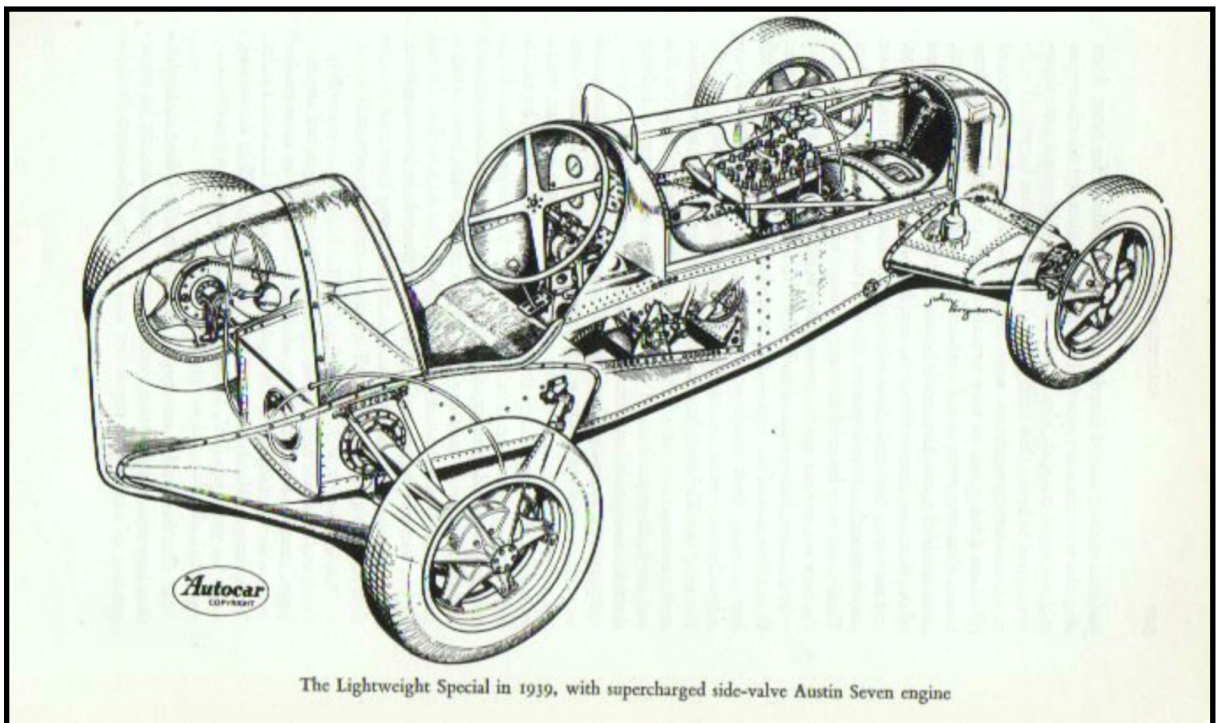
"The Lightweight is one of the most amazing specials (or should I say the most amazing special?) ever constructed. It has a rare thing among specials, a monocoque, stressed-skin construction and the whole layout was designed on engineering principles with no compromise on account of time or availability of parts. It has the appearance of having been built regardless of cost in the racing department of some great factory, whereas it is the result of sheer hard labour in a little shed, with no proper equipment whatsoever." Designed wholly by Alec Issigonis, his partner in its construction was his friend George Dowson. "In the best tradition of special-building, the front suspension assembly was built up on the dining room table of Issigonis's mother's house. When money was short, as frequently happened, Alec and George spent their time drilling lightening holes in the finished pieces until such time as sufficient funds had accumulated to enable more bits to be bought." In 1936 his work demanded a move to Oxford where Morris Motors were based. There Issigonis needed to build a new shed to hold his project but there was no power for lighting or tools so all cutting, drilling and grinding was performed by hand. The designer of the Works racing Austin Sevens, Murray Jamieson, saw it at this stage and he was so impressed that he provided parts to make up a supercharged side valve Austin 7 engine equivalent to the Works cars. This was replaced in later years with a developed, blown OHC Morris engine."



*The Klemantaski Collection / Louis Klemantaski – [www.klemcoll.com](http://www.klemcoll.com)*

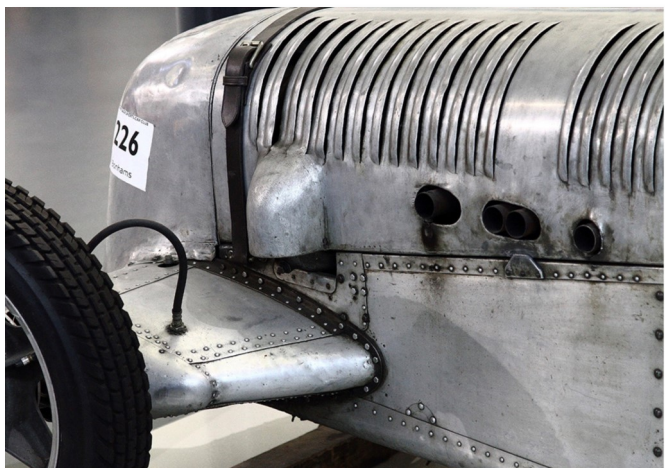
The technical details of the Lightweight Special could easily fill a book. The two side members of the body-cum-chassis form the whole basis of the car. These consist of five-ply wood faced on both sides by thin aluminium sheet, a combination that was formally used a great deal in aircraft construction. These members, which are very deep are united by the bulkhead, engine, seat pan and differential casing, in addition to tubular crossmembers in strategic positions. There is hardly a component of the vehicle which is not also employed as a structural member of the body frame assembly. The body is finished off by various light alloy fairings and a streamlined cowl and tail." The front suspension has narrow based wishbones which act on rubber under compression. The rear utilises swing axles supported by rubber in tension with long alloy torque arms extending forwards from the hubs. The wheels were made of cast Elektron (Magnesium alloy) with pressed-in steel brake liners with hubs. Cable operation of the brakes was later replaced by hydraulics. In execution and performance, it was exemplary. The final weight was 587lbs (267kg) - so about 5cwt? Of which about half was the engine.

It is a little jewel of a car and proved highly effective in Sprints and particularly Hill Climbs. It had an estimated top speed of 110mph. Regrettably, its completion only a few months before the outbreak of war in 1939 prevented much use before hostilities and when motor sport had resumed its competitive life had been seriously curtailed.



The Lightweight Special in 1939, with supercharged side-valve Austin Seven engine

It is now housed at the British Motor Museum, Gaydon. It is worthy of close inspection. Try to imagine the time and devotion to hand forming those cowls, louvres and perform all that riveting. (No blind 'pop rivets' then!)



GPL Collection

**More questions? It's as though the Editor didn't have quite enough material to fill this corner of the back page.**

**Q1.** At Christmas I was given this automotive tool by a very kind relative, but .....What does it do?



**Q2.** I rather liked this beautifully made remote greasing facility in the engine bay of a fabulous MG TA seen on New Year's Day in Stony Stratford.

My question is – how many years will it take for the annual two pumps of grease, from a grease gun, to reach the rear spring shackle?



**Q3.** Also on this MG was this cast aluminium dated and intriguing badge.

Was this an early forerunner of our club?



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