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MARLIN CABRIO

**FULL
TEST**

Britain's Best Kit Car?



Merlin Build-Up, Part 1

It was disillusionment with the built-in obsolescence of mass-production cars that got Roy Bayne into kit cars. In this first of a two-part feature, he details taking his Merlin 2+2 up to rolling body/chassis stage.

MY BUSINESS IS SHIPS, FIRST AS A Deck Officer and now in shoreside administration. I have no training in engineering but was always interested in mechanics and carried out my own vehicle servicing and repairs whenever time permitted. Since 1960 all the cars I've owned have fallen short of ideal and took unnecessary toll of my time and finances. I am convinced this was due to the major manufacturers' built-in obsolescence factors, perpetuating their own industry, for their vehicles depreciated substantially in value during the first few years and then the thin steel monocoque bodyshell rotted away in our inclement weather to such an extent that the cars had to be sold to avoid further monetary loss. Fortunately engine and drive train reliability had been satisfactory and, except for the foreign cars, spares were reasonably priced. Even so, the annual MOT inspection loomed, a motorist's sword of Damocles.

From the mid-80s, however, the servicing situation gradually changed. Transverse engines and front-wheel-drive made accessibility difficult, more time consuming and less enjoyable. The advent of fuel management systems, sophisticated onboard electronic equipment and non-serviceable components made DIY become progressively less possible, so I had no choice but to commit my vehicles more and more into professional hands.

In 1985 the acquisition of a used Scimitar, fitted with the Ford V6 3-litre Essex engine, finally convinced me that for years the motor industry has led the public down a slippery path. This sweeping statement is not intended as a criticism of the Tamworth product, indeed just the opposite; for consider the benefits. The GRP bodyshell does not rust and the chassis is strong with adequate allowance for corrosion. The engine and drive train

are all reliable units, user serviceable with easily obtainable and reasonably priced spares. The body styling is unique and individual, standing out from the clones that congest our roads; this vehicle will still tread the tarmac when most of its contemporaries are either rusting in the wreckers' yards or resurrected as razor blades.

The Scimitar experience inevitably led me into the alternative kit car market where there is freedom from the major car manufacturers' carefully imposed constraints and where I can choose exactly what I want. In June 1989 I finally set eight objectives for a kit car project, namely:

- 1 - Cost range £4/5000.
- 2 - Two seater convertible — steel chassis with GRP bodyshell.
- 3 - One British donor vehicle — 1500 to



Top: The chassis and body after delivery by Merlin. The chassis is painted in primer only. Above: The donor Cortina awaits its fate. Below: Both the above will hopefully combine to form the car below which is certainly an improvement over the donor.



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- 2000cc normally aspirated.
- 4 - Experienced, reliable and helpful manufacturer.
- 5 - Reasonable insurance cover.
- 6 - Good second-hand value.
- 7 - Comprehensive build manual.
- 8 - An available Haynes manual.

In September 1989, after considerable market research, I selected Paris Cars' Merlin 2+2 with a Cortina donor, and consequently my wife and I visited Peter Gowing at Southend, had a test drive and placed an order for delivery in late December 1989.

Not wanting to run the risk of buying a cheap donor car from the breakers and finding out later that the engine or running gear was unserviceable, I decided to purchase by auction (Belmont Car Auctions in Charlton, London SE7). Finding a suitable vehicle took more visits than anticipated but after two weeks a dirty 1980 Mk.5 Cortina with a good 1600cc engine came under the hammer and was duly purchased for £165. I had arrived early, to give me time to look around the waiting area, hear the engines start from cold and check the exhaust for any telltale signs of wear or deterioration. Staying with the vehicle as it was driven to the auctioneer should also have shown up any transmission faults.

It is worth mentioning here that the 2-litre is in 'greater demand than the 1.6 and is therefore slightly more difficult to acquire, but quite often thrashed to death. One of its advantages is that a broken timing belt will not damage the valves against the piston tops, whereas a 1.6 probably will. On the other hand the 1.6 is usually treated better in the donor vehicle, will be easier to find, and parts are more available in the breakers yard. One other advantage is that it uses 2-litre inlet and exhaust manifolds and as a consequence the engine breathes better.

During the drive home the car performed well except for a deep (Lancaster bomber) rumble from the back axle which had not been evident on the short drive at the auction. The fault turned out to be worn half-shaft bearings which were later replaced for £30, but I was lucky; it could have been the differential, costing a lot more. With hindsight I could have bought a car privately and had a long test run but the purchase price would have been higher; anyway new bearings should last at least another decade. The half-shafts having been refitted, the donor car was again test driven to ensure everything was, in fact, functioning correctly. It did and it was time therefore to tackle the next stage.

Over the next month the Cortina was stripped of the engine and ancillaries, gearbox, propshaft, back axle and rear brake assemblies, the front subframe, front suspension, steering rack and steering column, the radiator, carburettor, battery, loom and Instrument panel. All identification was then removed from the bodyshell and it was advertised for sale. One week later it was bought for £100 by

a chap who had shunted in icy conditions. Overall a very cost effective exercise.

One full week of evenings was spent in removing ten years' grease and grime with five pints of Jizer. The front subframe was the most difficult; heavy, cumbersome and full of crannies. This is the most tiresome job of the lot — do not refuse assistance if it is offered!

The engine was cleaned, dismantled and inspected for wear. The cylinder head was decoked, valves ground-in and refitted with new valve springs, oil seals and oil spray bar. The camshaft lobes showed slight wear but I decided not to change it. Fortunately the rocker box showed no signs of the dreaded black sludge but still it was thoroughly cleaned and refitted with a new gasket. The piston bores were in good condition showing no scoring or excess wear.

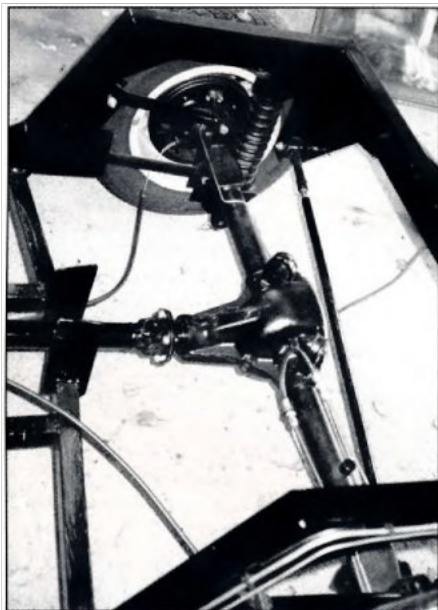
The oil pump was within tolerance and the crankshaft appeared acceptable and, as it showed no signs of big-end rumble on the test drive, I decided not to change it or fit new shells. Perhaps in the future this may prove to be false economy, but at the time I considered the task in hand was already sufficient challenge. Before rebuilding, special attention was paid to cleaning the sump and oil suction — a really messy job but necessary to ensure the new engine oil wouldn't be contaminated.

Rebuilding the engine was quite enjoyable, resetting the valve clearance and retiming being a lot easier with the engine out. The Ford distributor (black cap) showed considerable spindle wear and was replaced with a far superior Bosch (brown cap) obtained from the breakers, which was cleaned, oiled and refitted using a new contact set, capacitor and distributor cap. New spark-plugs, oil filter and water pump were also fitted at this time.

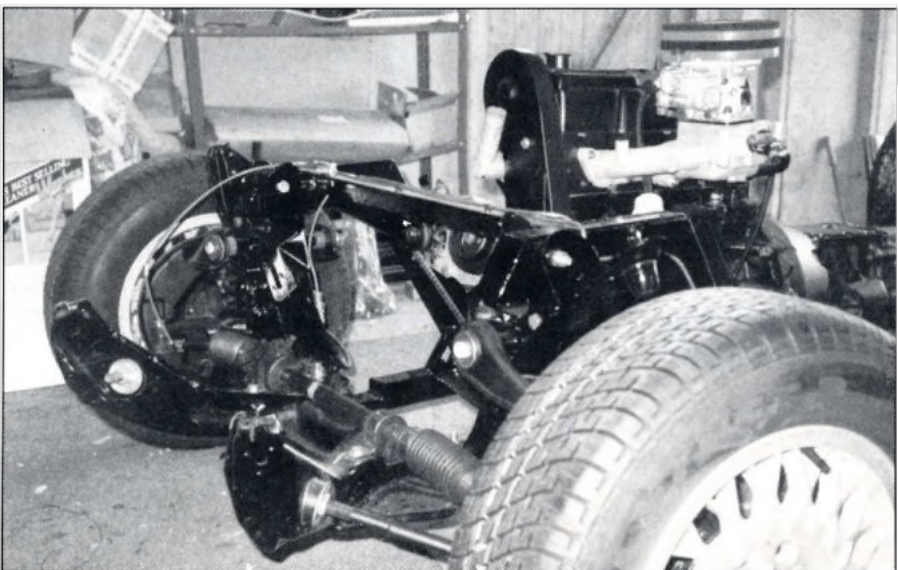
The Cortina GL donor had the usual notorious Ford VV carburettor, so having

spotted a 1975 1600cc Capri GT in the breakers fitted with a Weber twin choke (DGAV 32/36) I purchased this and, with the aid of Haynes' *Weber Carburettor Manual*, rebuilt it using the Weber service kits purchased from Sanspeed (9 Standard Road, Welling, Kent) for about £30. My reason for this was simple. The finished car is to be a tourer so my only concession to performance was to be an uprated carb and a gas flowed exhaust manifold. Later I was to find a set of twin Dellortos on a 1600 Alfa Romeo Giulietta but they will be fitted much later as the engine bay will have to be modified. A few days later I also purchased the Alfa engine and this will be the next project for the Merlin (please do not tell my wife).

The gearbox, which functioned well on the test drive, was drained of old oil and flushed out with gasoline. A new rear oil seal and two new gaskets were fitted; nothing more. In stripping the donor car, I



Above: The rear axle must be modified to accept four trailing arms and a Panhard rod. This was done at small cost by Merlin. Below: The front Suspension assembly was a simple bolt-on job and once in place parts could easily be checked for wear.



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noticed that oil had sprayed from the differential to the underside of the floorpan, so the drive pinion oil seal was replaced, not by the suggested Haynes manual method with a piece of string and a spring Balance but by marking the nut before it came off and replacing it in the same position.

The rear brake cylinders, brake shoes and copper hydraulic pipes looked new and this was confirmed when I found the receipt and packaging screwed up in the boot. The front brakes were not so good and these were cleaned and overhauled with new pads, springs and shims.

Since starting the project many enjoyable hours have been spent in the breaker's yard. Most yards now strip the vehicles and price bits on racks (some even add VAT which annoys me, seeing that the Government has already collected new car tax and VAT from the original purchaser). However, there are some yards who will allow their customers to remove parts themselves (Emmis

Breakers, Erith, Kent, for instance).

Many of the new parts required for a kit car, especially one styled on models of a past era, are obtained from specialist suppliers albeit at some cost. However, a browse around a breaker's yard can unearth some eminently suitable parts. Gauges from the Triumph Dolomite, chrome fittings and trim from the old Wolseleys, Morris Minors and Jaguars, and windscreen wipers from Minis. Leather seats and interior trim from Jaguars, Daimlers and upmarket foreign saloons. Sometimes good quality and little used carpet can be found in estate cars a useful stopgap until tailor made ones are bought.

I had one very lucky find from an off-the-shelf breaker's yard: four 13" x 5.5J Dunlop chrome wire wheels with Ford pcd and correct offset. I do not know their origin, maybe a Ford Classic/Capri, but was delighted after a bit of haggling to purchase them for £50. Even though I had planned to fit 14" alloy wheels with 185/70

x 14 tyres, the wire wheels were such a bargain that I decided to opt for 175 x 13 (80 profiles) tyres which have almost the same overall diameter and rolling circumference.

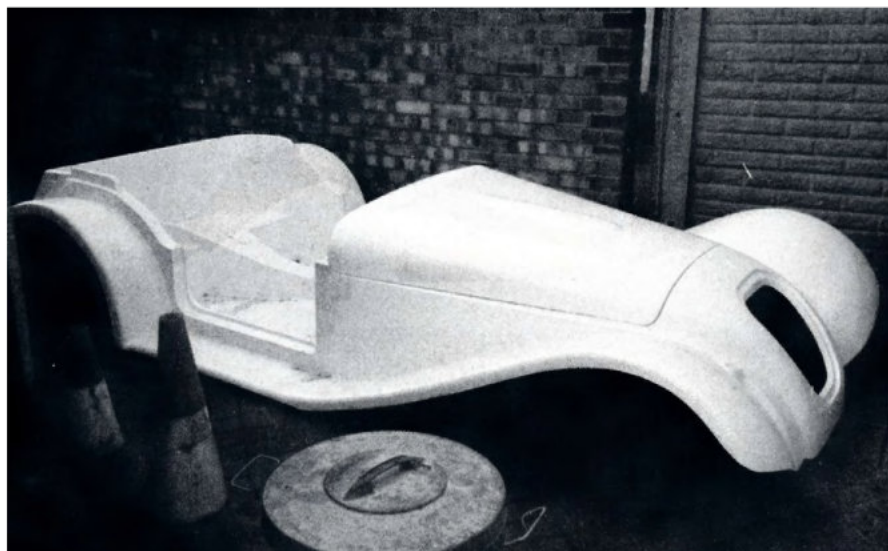
A word of warning here: don't put wire wheels in the dishwasher. It gets them clean but it makes the wife hopping mad. I couldn't see the problem myself; the tyres were in the bath.

The Merlin kit was delivered on Christmas Eve by Paris Cars. Unfortunately I was working on that day and could not collect it myself so Peter Gowing kindly agreed to arrange delivery for a reasonable charge. Usually the kits are collected by the buyer and Peter loans an A-frame trailer which connects to a normal towbar. Only two people were available but they managed to unload the bodyshell and chassis and placed them end to end in my drive, chassis nearer to the garage.

It was difficult keeping my hands off it over the festive period, but on New Year's Day the chassis was moved into the garage, raised on four axle stands and given the first coat of blue Hammerite. Because fibreglass can take months to cure, the bonnet (being the largest unsupported panel) was stored on its end in the garden shed. If stored flat it could sag in the middle. I also propped up the bodyshell's offside with a block of wood to compensate for the spare wheel bulge under the nearside wing as I was afraid that it would remain permanently twisted (Peter, however, assured me that it wouldn't).

The next step was to bolt the cleaned-up Cortina front subframe to the Merlin chassis. In this position it is much easier to work on, and all the moving parts can easily be checked for wear. The r/h lower wishbone ball and bush were very badly worn; in fact, the ball joint was about 80% of its original diameter. The r/h lower steering balljoint was replaced because the gaiter was damaged and there was a slight roughness in operation. I assumed that the joint was contaminated and would fail fairly soon anyway. The two tie bars leading forward from the lower wishbones are connected to the subframe by large nuts, washers and rubber bushes. The bushes were completely perished and reduced to about 50% of original thickness so I removed, rebushed and replaced the bars after marking the position of the nuts.

During assembly the new derated front suspension springs supplied with the kit and two new dampers were fitted. None of the donor's springs are used in the Merlin 2+2; the front ones are too strong for the Merlin's reduced weight and the rears are not suitable for the redesigned trailing arm and Panhard rod arrangement where new smaller diameter springs are supplied. Once everything was fitted, the chassis and subframe were given a second coat of green Hammerite. With this type of metallic finish paint, it is very easy to miss patches unless the subsequent coats are different colours.



Above: This is the bodyshell as it arrived from Merlin. Quality of the mouldings was good and everything was carefully stored to prevent any flexing whilst the GRP was finally curing. **Below:** The 2-litre engine was stripped down and thoroughly inspected.



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The back axle was stripped of all brake components, halfshafts withdrawn and made ready for welding on the new trailing arms brackets. I have had some DIY experience with arc welding and during the last year have also become proficient with a mig. Positioning of the brackets is critical and it is advisable to get some assistance. Don't forget that a second pair of leather gauntlets and welding mask are necessary, otherwise your mate may get burnt with U.V. light or suffer from 'arc eye' both of which are painful and potentially dangerous.

Whilst on the subject of welding safety, I should mention a narrow escape. When returning to the garage late at night to check the padlock I found the garage full of smoke. Armed with the kitchen extinguisher and asbestos blanket, I made a cautious entry to find a piece of rag which had been smouldering for hours. After that I made sure that all combustibles were well removed from the welding area and fitted a smoke alarm. I now even spray water around the area afterwards with a plant spray just to be sure.

After the back axle, the engine, gearbox and shortened propshaft were secured in place. The Cortina propshaft was in two lengths with a universal joint in the middle. The Merlin requires a shorter one-piece shaft so I cut out the joint and took both pieces to JW Engineering in Crayford, who welded the two pieces together, replaced each UJ and dynamically balanced it for £60. I delivered it to them at 10am and picked up the finished job at 4.30pm. I was really pleased with their work; they also showed a lot of interest and invited me into their workshop.

One of the disadvantages of the Cortina is Ford's box-shaped cast iron exhaust manifold which not only restricts the gas flow but, due to the varying wall thickness, is unable to cope with the thermal stress of continuous expansion and contraction. This makes it prone to hairline cracking which unfortunately can only be spotted upon removal: suspending it on a piece of wire and striking it like a bell should produce a ringing sound if it is OK, but a clunk indicates a possible crack. Paris Cars sell a stainless steel exhaust system, complete with a branch manifold which not only decreases the back pressure but emits a pleasing throaty growl and should last the life of the vehicle.

The manifold really transforms the visual appearance of the engine bay and, in order to enhance it, I painted the manifold (also rocker cover and timing belt guard) with Signal red heat-resistant enamel. It looked absolutely marvellous until, that is, I ran the engine. The rocker cover was OK but within seconds the manifold turned black, emitted a mass of acrid black smoke and cleared the garage of all spectators at a stroke. I first turned white with fright (imagining the GRP

going up as well) and then red with total embarrassment as my street cred went up in smoke too. Obviously with hindsight, the manifold should be brushed or preferably sprayed with very high temperature (VHT) paint. I say no more except that it's one way to test a smoke alarm — it went berserk!

Fitting the bodyshell to the chassis was easier than I had anticipated. Other build-up stories suggested it could be a headache so perhaps I was lucky. 5mm shims were inserted front and back, clearing the underside of the wheel arches from the chassis. This prevents the wings vibrating against the chassis and stress cracking of the gelcoat. 10mm shims were inserted amidships allowing the doors to shut properly. It appears that, if necessary, the bodyshell can be flexed (either hogged or sagged) about 10mm over its entire length without causing any undue stress.

Although it was a deliberate decision to leave all the painting until late, with hindsight it would have been better at least to have sprayed the engine bay before fitting the bodyshell because access was severely limited with the engine and ancillaries in place. The spray job had been pre-arranged with my brother Peter in Portsmouth, so it was necessary to drill the body and fit all the chrome lamps and Bits 'n' pieces for the road. Although this removal and refitting appears labour intensive, in fact it was an advantage because I was able to rectify mistakes and blemishes in the gelcoat with Isopon. To ensure the chrome fittings did not mark the new paintwork I made gaskets from a piece of clear plastic. This idea worked well, and whilst the gaskets were slightly larger than the Base of the fittings they were almost invisible.



Above: Fitting the body was easier than expected and various shims were used to avoid the body rattling against the chassis. Below: Separate scuttle top also acts as a dash backing plate into which Roy fitted some Triumph Dolomite instruments.

