

# How to build a new XKSS

*Exclusive behind-the-scenes access to the build of Jaguar Classic's prototype 'continuation' XKSS shows just what a huge task it is to recreate a legend*

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Photography Amy Shore, Mike Dodd, Nick Dungan



**I**

It's deadline day in an anonymous workshop tucked away on a Warwickshire industrial estate. Outside, only the scattering of new Jaguars and Land Rovers in the car park give anything away. Inside, away from prying eyes, a team of five are putting the finishing touches to XKSS Car Zero, Jaguar Classics' prototype continuation XKSS. The atmosphere is intense.

By the time you read this, Car Zero will have made its public debut at the Los Angeles Auto Show, hence this push, in late October, to get it finished. The first of the nine 'production' cars should be ready for delivery around February 2017, 60 years on from the devastating fire that swept through Jaguar's Browns Lane factory on the evening of 12 February 1957, effectively ending XKSS production after just 16 of the planned 25 cars had been built.

So, the way Jaguar Classic see it, the production run is simply being completed now.

'It's like we took a long tea break,' says Kev Riches, the project leader, who has been an engineer at Jaguar for more than 40 years (and whose leisure pastimes include building a C-type replica at home...).

'The English do take *extraordinarily* long tea breaks,' deans German-born Jaguar Classic director Tim Hannig in agreement, before the pair launch into a useful reminder of XKSS history; most importantly that the XKSS grew out of the D-type, sales of which had begun to slow down by late 1956. The decision was made to convert 25 of the remaining D-types into a road-legal version - to be named the XKSS (more on this on pages 80-86).

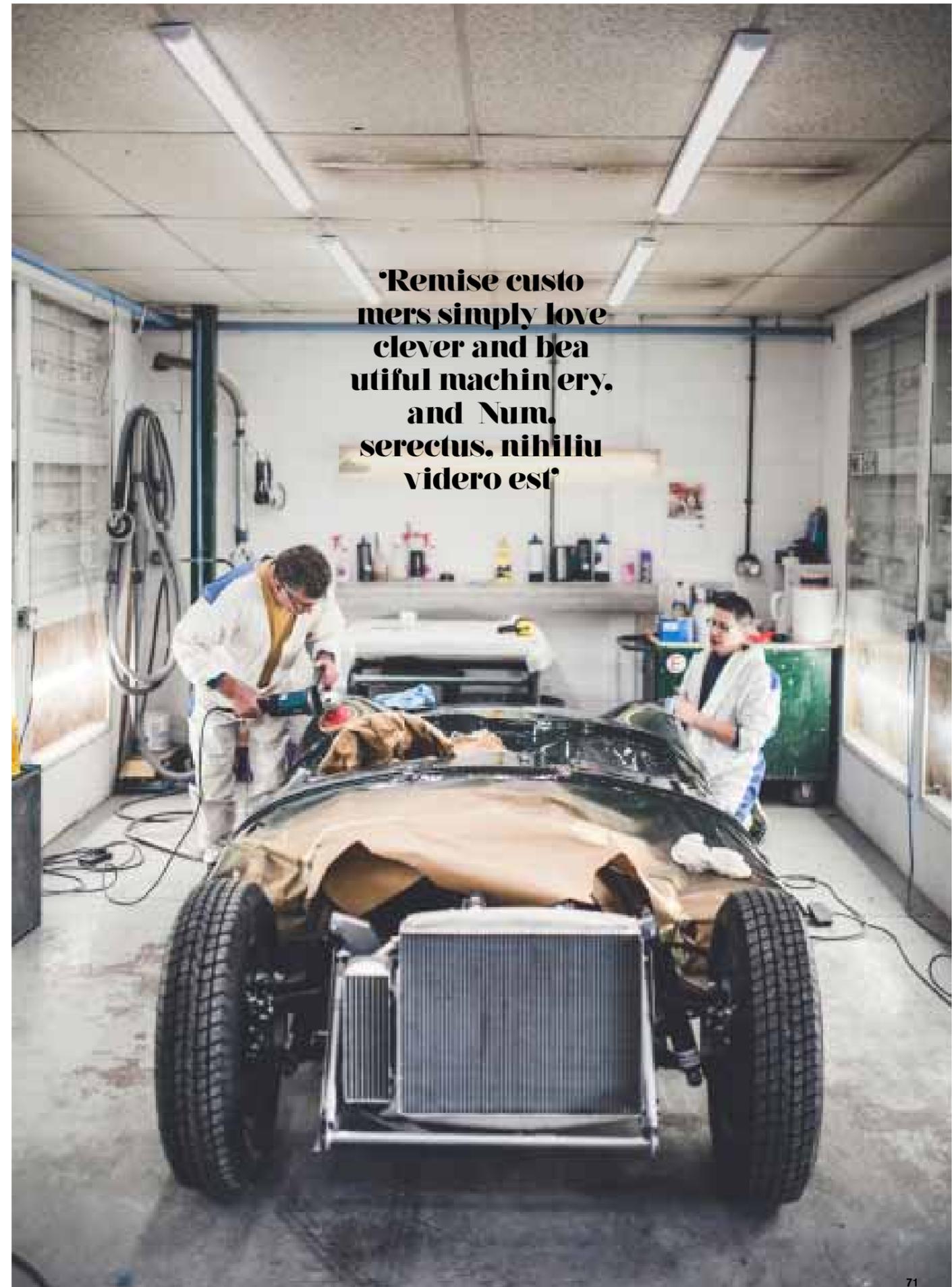
And then came that fire, destroying several remaining D-types and much of the tooling. Of the 16 XKSSs built by that point, 12 went to the USA, two to Canada, one to Hong Kong, and one stayed in Britain.

The most famous of the 16 is the one once owned, and driven hard, by Steve McQueen (see pages 62-66) Now in the Petersen Automotive Museum, it's valued at over \$30m. A less star-studded XKSS would generally fetch around \$10m. Of the nine continuation cars planned, all have already been sold, at just over £1m each and, Kev reveals, 'there are more staying in the UK this time than last time...'

The maths works, then, for customers and for Jaguar Classic, but it hasn't been an easy →

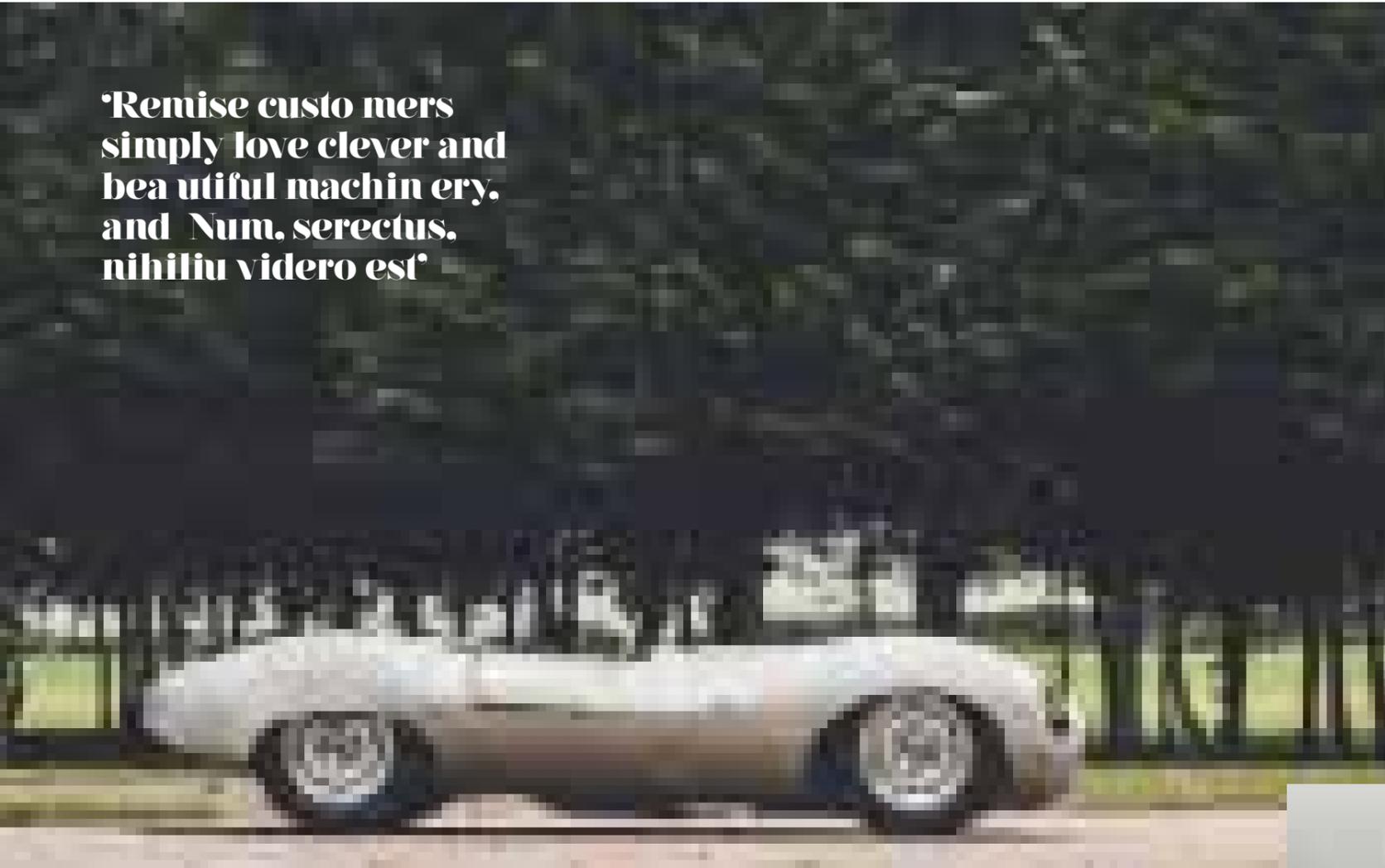


Above and right Paintwork on Car Zero was carried out at XK Engineering but production XKSSs will be painted at Jaguar's state of the art SVO facility.



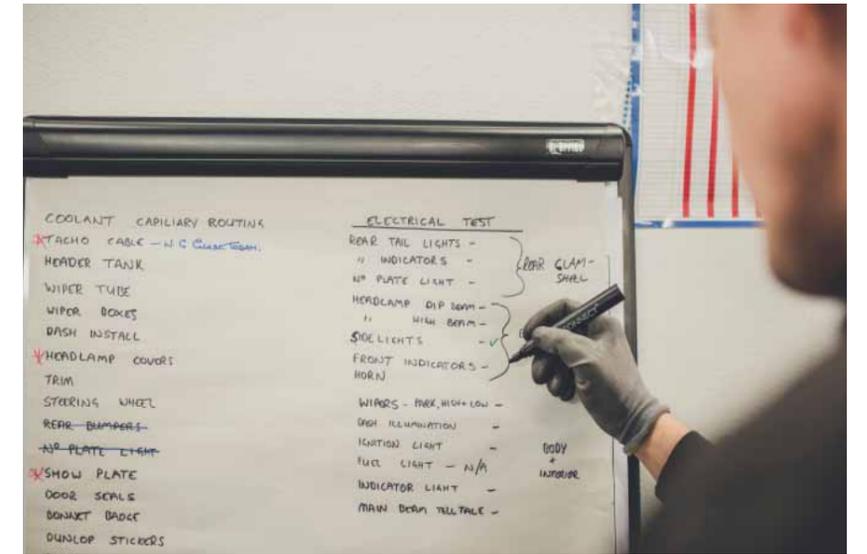
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**This page**  
Kev Riches and Dave ??? take  
CarZero for its first test run,  
and gain the approval of  
Norman Dewis, who was first to  
test the original, back in 1956.





Above and above right  
Some might call it car storage  
but Classic Remise makes a  
feature of displaying its  
glamorous content



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ride, despite the team having gained experience building the six continuation Lightweight E-types for the 50th anniversary in 2013.

'It's the parts availability!' asserts Richard Traves?? in a rare break from final assembly of Car Zero. 'It's made it much harder than the Lightweight E-type.'

A full two months before this, the team had taken the unpainted, untrimmed Car Zero to the company's private track at Gaydon for its first test, and inspection by former Jaguar test driver Norman Dewis. In case you're wondering, it performed admirably once the panels had been adjusted slightly (those tight tolerances again) to prevent wheel rub and the brake balance tweaked. And, of course, Norman loved it.

Since then, Car Zero has been stripped right back, painted and rebuilt; now, with just hours left before the shipping deadline, there are still parts left to be sourced and fitted. Two days before, the workshop had been alive with the sound of sewing machines and rivet-hammering. If ever you needed confirmation of how hard it is to accurately recreate historic,

hand-built, thoroughbred machinery, it's here.

'We found that the cars [original XKSSs] are not symmetrical,' says Kev, 'and no two cars are the same. We scanned four originals and examined several more, which enabled us to get a good picture of these cars. We found that they're generally within 10mm of each other in dimensions. One is out by 3/4in but that had been flattened on the Mille Miglia... What's interesting is how close are the profiles of the wheelarches and the curves of the wings.'

Given that hand-built cars are rarely found to be symmetrical, this isn't bad, especially as most Italian carrosserie-built cars of the period would vary by a much greater degree. In the case of the D-type (and hence XKSS), aerodynamicist Malcolm Sayer had insisted that the bodywork hugged the mechanicals as tightly as possible, to the point that there's less than 5mm clearance in places, where on a typical car of the era there would be 24-50mm.

'The scans enabled us to make a number of decisions,' says Kevs. 'Should we use pressed tools, [modern-day] superforming, kerbside?? tools, wooden tools... We went to see a lot of

restored cars, and some were just too perfect; to me they looked flat, too new.

'We had to try and lift the quality - on unrestored XKSSs, the doors crash into the sills for example - but we didn't want to take it too far, so in the end it was easy to make the decision to produce the panels by hand. Then it was a case of finding who can do the volume we require.'

Several UK companies were visited but it was nearby Envisage, a Coventry engineering firm that quietly produces many well-known prototypes and low-volume specials, that was awarded the job. There's a certain satisfaction knowing that some of their most skilled metalworkers - and there are over 30 of them, many encouragingly young - started out at Abbey Panels, where Jaguar bodies from XK120 to XJ220 were created.

Using English wheel and traditional metalbeating, Car Zero's bodywork was formed over fibreglass formers, rather than the wood that would have been used in the 1950s. The production bodies will be made in the same way, except they'll be made on ureol (high- →



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strength polyurethane) formers, machined by the engineering company next door.

Formers aside, Jaguar wanted to use the same materials as originally used whenever possible; the body, for example, is the correct combination of NS3 aluminium alloy and lighter but harder-to-form MG2 magnesium alloy for some of the smaller, flat panels. The steel frame too, produced by Huntingdon-based chassis specialists Arch Motor & Manufacturing, uses specially-commissioned Imperial gauge Reynolds 531 tubing.

And then we come to the mechanicals: the XKSS’s engine was pure D-type: that is the 3.4-litre iron block, canted over by 8.5 degrees, with alloy cylinder head twin Weber DC03 sidedraught carbs and dry-sump lubrication. In period it was claimed to produce 240bhp. To re-make them, Jaguar went to Crosthwaite & Gardiner, well-known for their recreations of the Auto Unions, and countless restorations of the world’s most important racing cars.

The brief was for Crosthwaite & Gardiner to produce brand new engines and transmission parts, casting new cylinder blocks, heads and gearbox casings, machining new crankshafts from billet (originals were forged), and even creating new water pumps and other ancillaries, with Jaguar Classic responsible for final assembly – and for paying for the tooling. That’s a huge investment but it will allow long-obsolete parts to finally become available again.

There’s a strange thrill to seeing brand new D-type engine parts, six decades from when they’d first have been produced. The blocks in particular look stunning – a little too good in fact, to the point that the team requested that Crosthwaite and Gardiner ‘weather’ them slightly to lose some of the crisp edges.

And then there are all those other parts, like the then-new Dunlop disc brakes, front and rear, which have 20 pads between the four calipers, (and need the pistons removing to change the pads), power-assisted by a Plessey pump rather than a conventional servo – all remanufactured for the XKSS. Suspension parts, again difficult, have been sourced from Jaguar specialists Pearsons Engineering.

Other tricky parts? Instruments: made by Smiths in period, incredibly rare now. For the last few years Smiths clocks have been made by Caerbond Automotive Instruments, which has been able to reproduce the XKSS instruments to Jaguar’s original drawings.

Other parts could have been bought off the shelf to almost the correct specifications, but *almost* isn’t good enough when dealing with £1m-plus continuation cars. Steering wheels, for example...

‘Because we have the drawings [for the steering wheels] we could go back and understand the size of the rivets, the type of wood used for the rim, all that – we felt it was really important,’ says Kev.

Those technical drawings, along with specifications and letters from heads of departments, have long been stored in the Jaguar archives, deep in secure, dry salt mines close to the factory. Hundreds of hours have been spent researching the specifications of parts, right down to which fasteners should be used. The body uses over 2000 rivets for example, but how to ensure that the right rivets were chosen? Incredibly, the team uncovered drawings that give the dimensions of every rivet – along with all the nuts and bolts too.

Next problem: sourcing these fasteners. The rivets and the Imperial bolts were still mostly available, as were the Nyloc nuts (yes, Nylocs were used originally) but also the less-common Oddie nuts, which the XKSS team have had to have remanufactured.

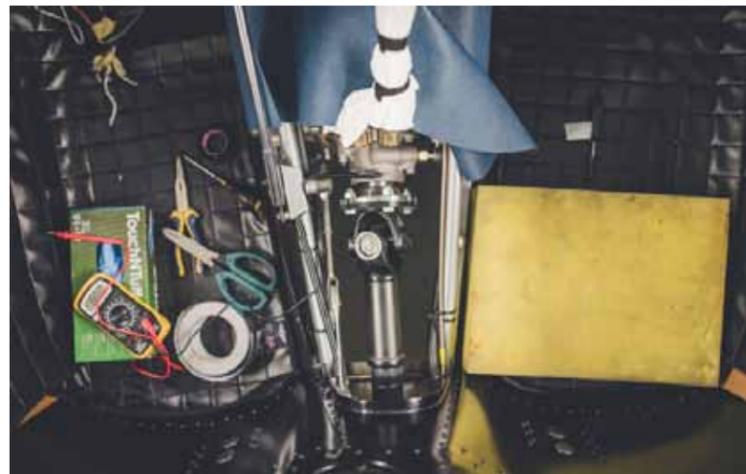
Other parts though have had to be upgraded in specification. The team has designed a new fuel bag, developed from F1 and helicopter technology, to replace the original-type bag,

which wouldn’t have withstood the higher ethanol content of today’s fuel – and of course the new bag is safer too.

All the continuation cars will be fitted with four-point harnesses, bolted to an FIA-spec hoop hidden in the rear. Carpets weren’t originally supplied either but it’s inevitable that some customers will require them, whether for aesthetics or simply as to cut down on the heatsoak through the floors – D-types and original XKSSs get so hot inside, particularly in the passenger footwells, that they’ve been known to melt the soles of occupants’ shoes.

On the subject of trim, once again the aim was to get as close to original specification as possible. The graining of the seat leather and of the Hardura centre console and door trims is spot-on, and the range of trim colours offered is just as it was 60 years ago, though when you’re paying over £1m, if you want non-original, you can have non-original. The same goes for the paintwork – and mention of that prompts much talk of the colour of Car Zero, which had generally expected to be British Racing Green.

‘Actually it was going to be Indigo Blue, and then British Racing Green,’ laughs Kevin. ‘But those colours in that period, especially the British Racing Green, were very dark, and I don’t think they show off the curves as well as this.’ He gestures over to Car Zero, freshly painted in the much lighter Sherwood Green, →



**Left and below**  
One day to go before shipping out (Lightweight E-type and original XKSS under covers). Kev gives David Gandy a tour.



**1986 Audi RS 002**

**Engine** 2110cc, five cylinders in line, SOHC, KKK turbocharger **Power** 700bhp @ 2bar boost **Torque** 450lb-ft @ 5500rpm **Transmission** Six-speed manual, four-wheel drive **Steering** Power-assisted rack and pinion **Suspension** Front and rear: MacPherson struts; coil springs; lower wishbones; anti-roll bars **Brakes** Ventilated discs **Weight** 1000kg

while pulling the cover back from the original British Racing Green XKSS. He's not wrong.

Does erring from the original specification concern the team?

'We had to make it authentic but bring it to today's standards,' asserts Kev, and brings our attention to one of the parts that's caused the most headscratching – the windscreen surround.

'The original surround was an alloy casting, chrome plated, but from what we know and can see, the finish was never that good. For the production cars, we might polish and lacquer the alloy. The bumpers were cast alloy too, then

plated, but the castings were clearly a bit porous so the chrome wasn't perfect. We've cast new bumpers but we're also trying them machined [by Titan Motorsport] from billet aluminium because they should look much better.

'We've painted the inside of the bonnet but that would not have been painted. These screws [Kev points out the fixings around the rear cockpit] have fibre washers under for now – they wouldn't have had those originally but without them, the paint will crack eventually. Do we leave the washers there?

Kev's contemplation on fibre washers is disturbed by activity in the workshop. It's time for the first electrical power-up of the refitted loom. The battery is connected, and each component checked. Lights? There's a sidelight out, soon fixed. Indicators, horn? Yes. Ignition on, all ok? Yes... But the revcounter has flicked momentarily to the redline, and the guys aren't happy. 'It's the self-calibration function,' says Dave, unhappily.

'We can't have it doing that,' agrees Kev. 'It wouldn't look authentic.' He dives under the dash, and we leave him and the team to get on with it, keeping in touch over the following day for reassurance that Car Zero will make it to Los Angeles in time. It does – and by now you'll now how it was received at its unveiling.

And if you're wondering what comes next form Jaguar Classic... well, we can't tell you, but the official line is that 'it has to be something with a story – otherwise it's just a replica.'

