Club Elite Newsletter – Issue 10 Extra – March 2007

Hello Elite enthusiasts,

Every once in a while, we find an Elite or story that is so large and so focused that it is worth an issue just by itself. In this case, it is #1821, which was recently re-delivered to its owner, Stuart Strickland, after a multi-year full restoration by Randall Fehr…with some help from others. I visited Randall at his shop shortly before the car left for England, and took some of the photos you will see here. Randall provides the story.

Stuart Strickland's EB 1821

Notes on Restoration by Randall Fehr

The Brief

As I understand it, Stuart's objective was to compete with a period - authentic Elite racer prepared to a high standard. He patiently surveyed the cars available in 2001 and was considering EB 1821, an unrestored Series 2 SE. He contacted me to discuss the project and we agreed that a complete restoration and race build of this car to his specs was preferable to purchasing someone else's completed car.

I told him I had only built road cars but expected the FIA regulations and other Elite racers would provide guidance. Upon completion, the car was to be shipped to Stuart's home in England.

As purchased in Boston. Note intake air duct. Chris Tchorznicki photos.

Begin

So the car was purchased and transported from Boston to Seattle and my part of the adventure began. The engine and transmission had been left behind in an initial arrangement for rebuild, and I plunged into disassembling everything else.

Strip and Repair

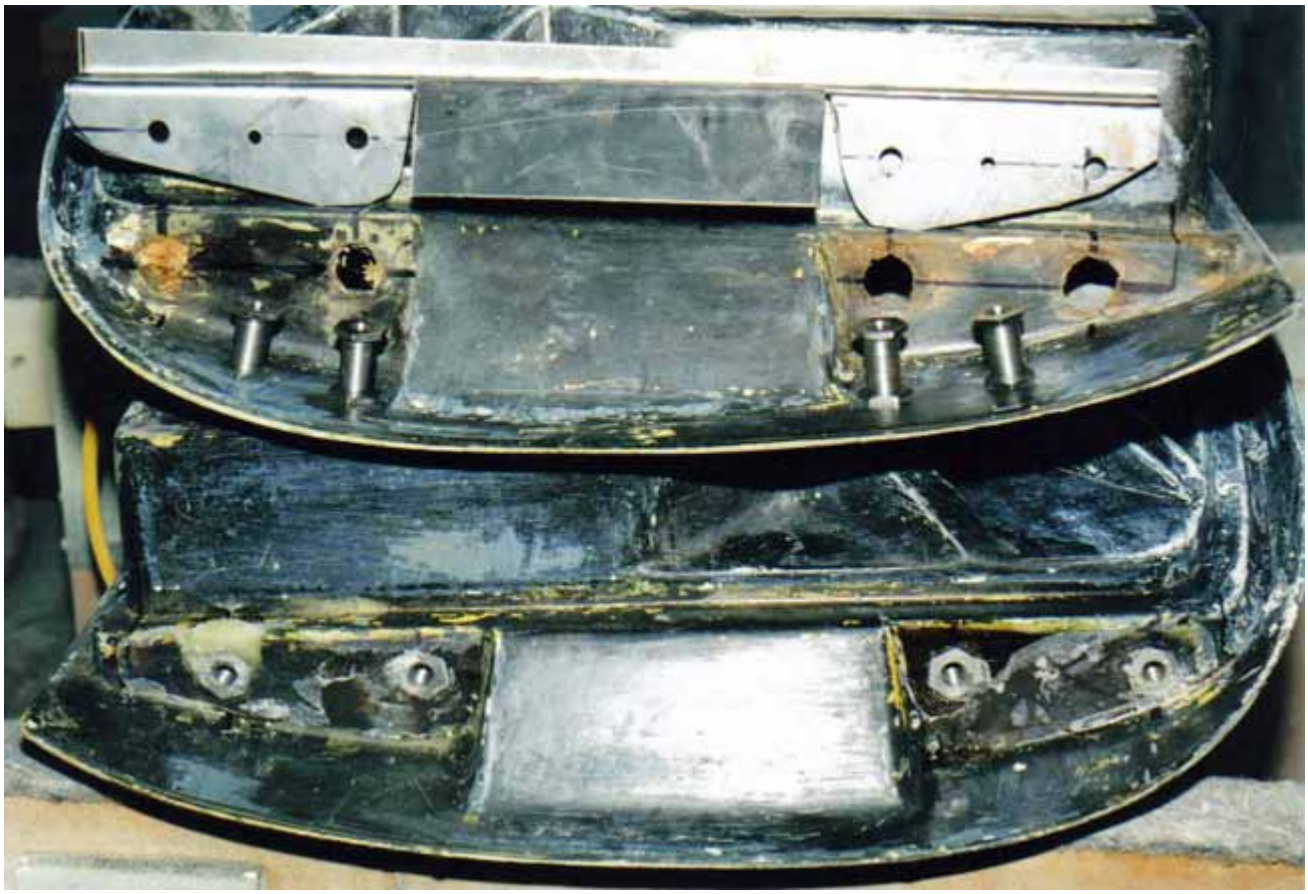
Paint and primers were removed with a pneumatic dual-action sander where possible, and sandpaper on fingers & blocks everywhere else. Under the various resprays and the original white there was relatively little body damage. The panel at the left rear lights had been split, the boot lid cracked, and typical gel coat cracks here and there.

Paint stripping. Two yellow and one white respray with associated primers and fillers on top of original white.

The most worrisome problem was pulled-out door hinge bobbins. They had been replaced with a sandwich of hefty steel plate and angle but the doors still drooped out of alignment. The proper repair is to bond in new bobbins but the challenges are great – bonding them in correct position so door alignment is easy, and performing the layup inside the door.

First step was laboriously grinding and feathering the torn glass/epoxy laminate inside the door with various compact pneumatic tools reached through the large cutout next to the inside release handle. This hole was just large enough for an arm but not enough to see through as well. The hole for the quarter glass pivot just allowed me to peer in and see enough not to cut off my own fingers.

Then a sheet-steel jig was fabricated and screwed to the outer hinge face of the door, to which the new bobbins were bolted. With position verified and locked securely, several layers of epoxy-saturated woven glass mat were wrapped around the bobbins and spread out on the hinge face. When cured the hinges and doors were trial assembled on the body to verify fit and operation.



Top door: original bobbins torn out, new bobbins and their positions marked and sheet metal jig ready for location. Bottom door: new bobbins bonded in.

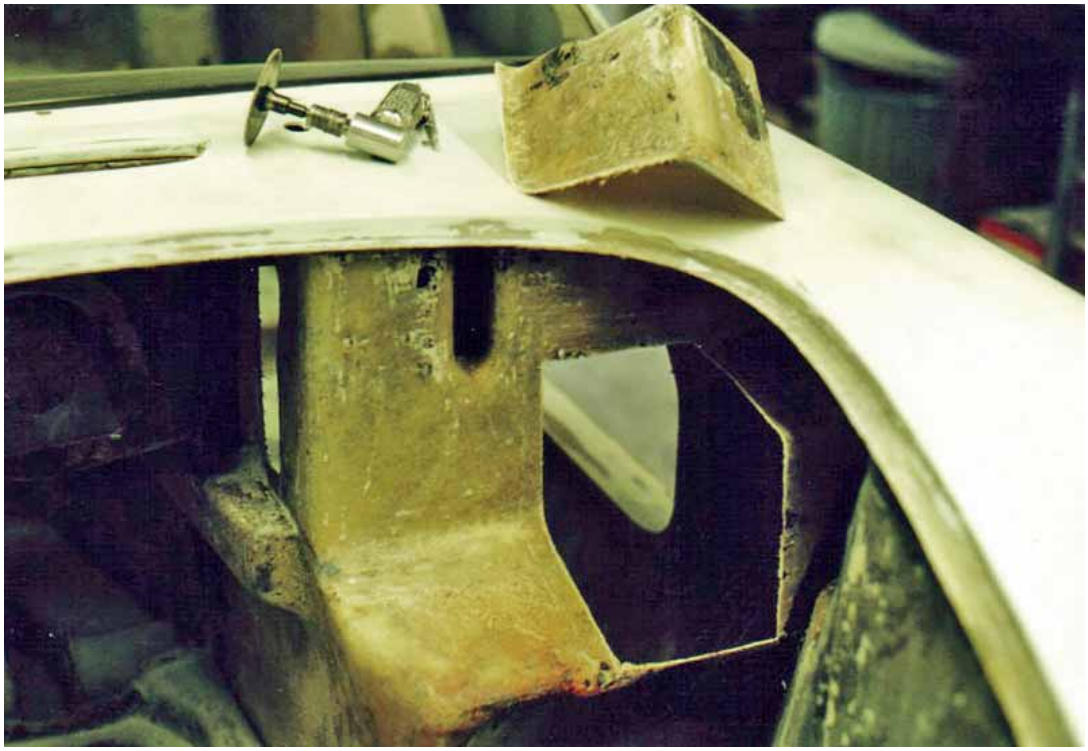
Modifications

Note FIA-spec tow eye tied into subframe forward extension.

Stuart's specification included an oil cooler behind a scoop under the radiator intake. EB 1821 did not have this 'Super' feature so EB 1982 Super 95 was measured and modeled. The scoop was made by forming a sheet of aluminum into a shallow open box. Chopped-strand mat and polyester resin were laid up to the original thickness inside the box. When cured the part was extracted and the long sides trimmed out.

If just the three sides were laid up the two short sides of the scoop would bend in upon curing due to shrinkage of the resin. The sacrificial sides help support and prevent this distortion. After trimming the scoop was positioned under the nose and marks made for the rectangular hole. This was cut and trimmed through the double panel, and the scoop bonded on with reinforced polyester filler/adhesive. After trimming and feathering the scoop appears exactly like the model.

Another specification was dual Weber DCOEs with a cold air box. Since this is a right hand drive Elite it was possible to move part of the passenger footwell away from the rear carburetor trumpet. This was done by cutting out, reversing and re-bonding part of the footwell.



Footwell section carefully marked, then cut out with Rem-Grit cutting disk.

Pieces bonded from the inside, ready for filling & sanding. Note resin above starter blister is cooked red/brown from exhaust.

On the driver footwell, I reinforced the pedal mounting area with a few alternating layers of woven glass fabric and chopped mat, roughly doubling the thickness from the cable holes above down around the steering column lower bush and onto the tunnel side.

An unusual repair on this body was patching holes in the central spine where the propshaft had evidently flailed. The car may have been flat-towed with the engine and transmission out.

Back on the outside, gel coat cracks were ground out and feathered then sealed with tissue glass mat and polyester resin. A few minor cracks on the epoxy doors were repaired with glass-reinforced polyester filler. The cream-type hardener used in fillers is not inhibited by epoxy, unlike liquid MEKP catalyst used in polyester lay-up resin.

The last job before turning the CBU over to the paint shop was welding gussets into the front subframe lower wishbone pickup points.

Body and Paint

Stephen Clapsaddle took over at this point and rectified any distorted shapes with polyester filler and meticulous sanding.

White is good original primer/surfacer. Dark patches are gel-coat repairs with glassfiber veil. Original gel-coat is not colored.

All shut lines were adjusted and corrected. High-build spray primer was applied and blocked down, a final primer sprayed and wet-blocked, then the outer color in Glasurit single-stage progressively blended with clear in several coats. After a few weeks of cure this was wet-sanded and buffed to a mirror finish. (Stephen has since named his business Liquid Reflections.) The engine bay and dash shroud were sprayed in semi-flat black epoxy. We reproduced the cabin roof texture with a home wall texture spray covered with custom-blended matte gray epoxy.

Applying the finish

Stephen Clapsaddle

Plating and Polishing

We were lucky that most of the chrome plated parts were in very good condition. Only a thorough cleaning was needed to make them acceptable. The saved time and money was spent on the dented bumpers.

I have not been able to find a reliable metal finisher who is patient enough to massage these delicate hand-made pieces back into shape, so I have spent many hours learning and practicing. The flat expanse on the rear bumper is especially challenging since the slightest distortion is plainly visible. With great patience and various steel dollies, wood blocks, rubber mallets, files and felt marking pens the

stainless was worked gradually back into shape. A metal finishing shop did the final buff and polish.

Paris photo

The front eyebrows and intake surround are somewhat less difficult due to the greater curvature. The bumpers fit to the body with an extruded gasket that I was unable to find for restoration of EB 1982, so we commissioned a die made from a sample of the original. This correct gasket is now also available from Hutton and Mousley.

Many of the steel body and mechanical parts and fasteners were originally plated with silver cadmium or zinc. These were all stripped and re-plated. For racing we substituted aircraft-grade fasteners in the suspension assemblies.

At left is one of the inventory photos used to verify that every part came back from the plater.

A good idea!! – Ed.

Assembly

By the time the body was ready for assembly Stuart had decided to prepare for FIA vintage rallies rather than track events. This gave the car a reprieve from the

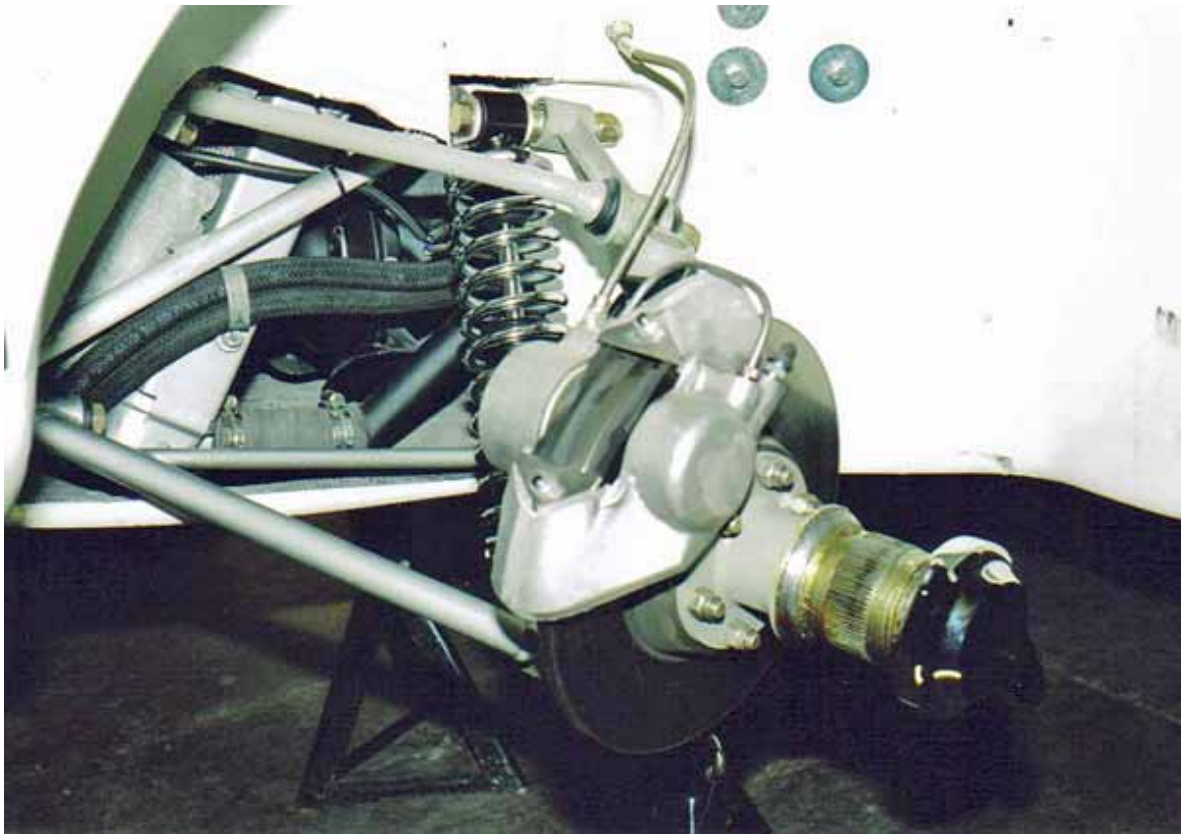
dreaded modification drills and saws in several places. The original bonnet lock could be retained and a roll bar or cage was not required. With his stature Stuart is a tight fit in the cockpit even without helmet much less a cage of tubing.

We built an FIA-spec fuel cell to look like the Le Mans tank. The fitted foam-filled bladder holds about 32 liters (8 ½ gallons).

The AFFF Fire Fighter System has nozzles in the engine bay and cockpit with bottle mounted just behind the passenger seat. The battery isolation switch mounted in front of the shift lever has a cable remote control on the heater intake outside the car next to the extinguisher remote trigger.

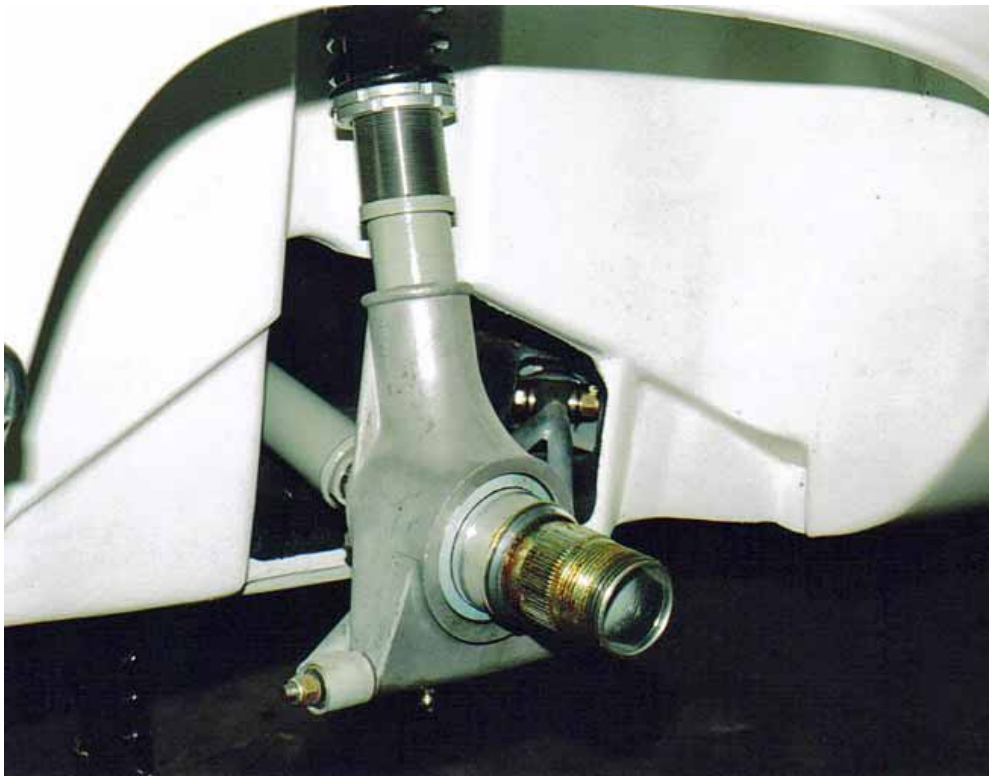
To anchor the shoulder harness we devised an extended rear strut top nut.

Even though this car was essentially complete we knew many parts would need to be replaced in anticipation of the stresses and demands of racing. David Mousley supplied these items and more.

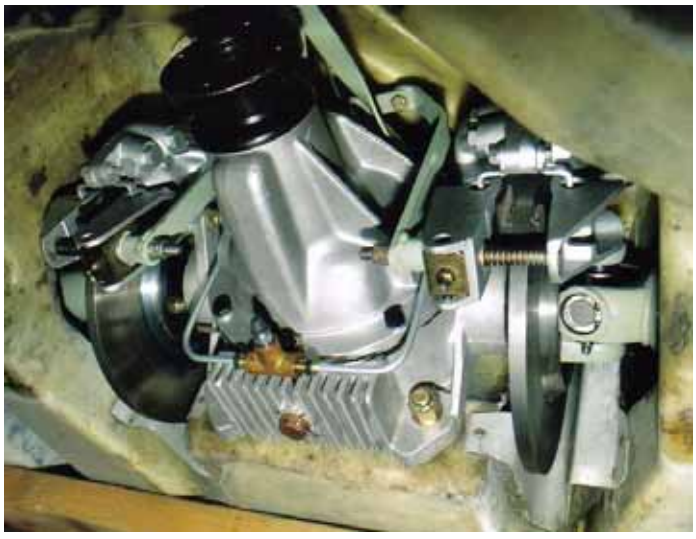


Any safety-critical parts not replaced were carefully inspected, crack-checked and refinished. The steering column rubber joint was replaced with a needle-roller u-joint assembly and the rack carefully rebuilt. Incorrect steering arms on this car were replaced with Standard items, bent to the correct angle just as probably done at Lotus. Cast-iron front calipers were replaced with alloy ARs. Shim

washers were used at the upper wishbone inner pivot for castor angle and no bending pre-load at the trunnion. For suspension alignment the fuel tank was half full and the driver seat loaded. There are few easy adjustment opportunities, but these were enough to 'dial-in' the angles to where we wanted them.



A damaged rear hub carrier was replaced, rear trailing arms changed to inner rose-jointed parts, spring rates raised to Series 1 specification, and final drive ratio increased. Due to spline wear both rear hubs were replaced, and since some of the intermediate axle u-joint bores were loose we replaced these as well. New units from Mk 14 Components are made from heavier tubing for increased torque capacity. The output shafts are also new uprated parts but unfortunately these were not made with a shoulder for the inner oil seal used on the later final drive case. We added a pigtail hose to the final drive breather/fill plug.



NR calipers were on the wish list but aside from the need to change to a Series 1 diff case and handbrake, it was decided that being sprung mass the smaller performance gain would not be worth the expense.

Stuart desired weight savings wherever possible. In the end we only left out the cabin insulation, carpet and miscellaneous trim.

Before Photo - driver's side entry

…And after. Non-original padded steering wheel was retained.

We installed a plastic rear window, but added safety equipment and more fuel. I argued against deleting the heater & ducts, reasoning that effective defogging might be a greater advantage than a pound or two less mass. An aluminum radiator was tempting, but the desire for originality outweighed.

Wider wheels with more spokes were considered but in this case both originality and lower unsprung mass were retained with new 15 x 4 48-spoke Daytons painted silver. The hubs are forged and the spokes have increased diameter at the inner end. With half fuel load the car weighs just over 1500 lbs.

Engine

Details of the engine can best be told by Stuart and by Bill Hutton. My part was to install and plumb and link. With a Mousley header and silencers we fabricated a stainless system from straights and mandrel bends. The header was wrapped and aluminum heat shields installed on the engine bay side and rear face, the latter to cut heat transferring through the passenger footwell as much as to protect the GRP.

A remote oil filter and cooler were installed in the usual places with Oetiker-clamped braid-covered hose, and a Smiths oil temperature gauge sensor is in the sump drain plug.

For the Weber DCOEs, a combination heat shield and throttle cable anchor was devised and fabricated, sandwiched between the carb bodies and aluminum trumpets.

The original throttle pedal for SUs needed its lever extended to obtain enough cable stroke at the carb levers. A hairpin return spring like the one on Elan Webers was made from piano wire.

Though we planned to duct intake air to the carbs I did an initial road test without a duct and found engine bay temperature at the intakes was rarely below 40 deg C and climbed past 60 deg C when stopped and idling in 20 deg C ambient. With the addition of a 3-inch duct from in front of the radiator to the trumpets temperature rarely rose beyond 40 deg C, and declined quickly to near ambient at speed.

I suppose an air box enclosing the trumpets would further decrease intake air temperature (and thus increase mass of charge) but leaving the ducted air free to also flush engine bay heat seemed just as beneficial. Also an air box would have somewhat obstructed the intake, especially the forward carb trumpet which is very near the engine bay side. For this same reason we decided not to run filters.

Finish Line

I put about 200 road miles on the car sorting out various issues and finishing engine break-in (Hutton had done 150 miles in his 'mule' before delivery to us). One of the issues was a violently oscillating oil pressure gauge needle once the oil came up to temperature. This was solved by exchanging the stainless braided Teflon hose for a much longer Smiths nylon hose in coils.

The engine is a pleasure to rev and pulls hard from 2000 rpm past 6000. Braking is excellent with moderate pedal force. Steering is free and precise. Ride is somewhat firm on the street but handling is communicative and responsive. Exhaust note from the twin pipes has a smooth rasp. The engine makes a thrilling gear whine at high revs. The doors, bonnet and boot close easily with a click.

1821 Ready for delivery

The car arrived in England in early January. Stuart plans to enter his first rally event in March and to display it at Donington for the 50th anniversary.

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