

RESTORING A LOTUS ELAN OR WHAT TO DO UNTIL THE PSYCHIATRIST ARRIVES!

Instalment 1 - Chassis

Lester Reader

First of all, I better introduce myself as most of you won't know me. My name is Lester Reader and I have been a member of The Constructors Car Club for nearly 2 years – I joined on Skite Day 2001, being introduced by John Hill. Unfortunately I can very seldom get to a club meeting as I have other commitments on a Tuesday night for most of the year. I very much enjoy reading 'Spare Parts' and I thought it was time I put something back into the club. Whilst this article isn't about the construction of a new car', it does cover the same sort of basic engineering.

I worked for Civil Aviation for about 30 years as a radar and electronics technician before moving to the Airways Corporation as a Quality Assurance Specialist. In the early 1990's I set up my own business as a Quality Systems Auditor and consultant. I have had a lifelong interest in sports car racing and spent nearly 40 years designing, building and racing my LJR (wasn't that an original name?) in all its various guises. We (the LJR and I) even managed to win the SCANZ 2 litre sports-racing title twice in the early 1980's. I may be persuaded to do an article on the LJR some time in the future.

My background in electrical and mechanical engineering and the availability of an excellent government workshop proved to be of great benefit! I was forced to stop racing in 1995 due to a medical problem and this caused a large gap in my life, which even my wife and family couldn't fully fill and that is where this story begins:

My son-in-law Kevin was looking for a project after giving up racing Formula Fords and rather unwisely bought (and paid far too much for) a **very** tatty Lotus Elan +2, first registered in NZ in 1968. The car had been driven round the rough roads in North Auckland for some years and had suffered a prang or two as well. The body was terrible – delaminating everywhere, drivers foot-well nearly non existent, right front

guard badly repaired and split in two and some idiot had fitted a sun roof, taking all the strength out of the shell! The chassis was also in bad condition with both front towers rotted out at the bottom and the right one twisted so far out of line I couldn't believe it had been driven that way. Wishbones nearly all bent, rear struts had been attacked with vice-grips, so damaging the seals that they had pumped all the oil out, etc. etc. etc.

It was obvious after a couple of years that Kevin wasn't going to get anything started on the car due to his business and family commitments so we came to an arrangement whereby I would do the restoration and co-own the car. Kevin and my daughter Helen live in Feilding so we loaded the Elan on to my race car trailer, minus the body and brought it to Wellington. There wasn't room in my garage for the LJR and the Elan so the LJR was stripped and the chassis/body stored outside under a cover. (Poor old girl, I think she felt hard done-by after all the years of faithful (and unfaithful) service she had given me. Never mind, she's now gone to a good home and is to be restored and raced again some time in the future.

We decided that the Elan body was so bad that neither of us wanted to tackle it so we enlisted the help of a fibreglass specialist friend of Kevin's in the Manawatu. The body is now almost complete structurally but will need lots of hours of finishing work.

I started by completely stripping the chassis of all components and set it up on trestles. The first job was to get it clean so I could see just how bad it was. I unstuck the felt blanket from round the backbone and stupidly hung it over a joist above our road car. It proved to be so soaked in gooey oil that it dripped all over the Telstar and even ran down the windscreen. I was somewhat unpopular with wife Shirley when she came to drive it!



Chassis as it was



Left Front as it was



Right front as it was



Engine Bay as it was

A water blaster proved to be just the ticket for getting the muck off the chassis. There was enough gravel in the backbone part of the chassis to re-cover the drive to my garage (or nearly anyway)! Once cleaned and dried I gave it a good going over and decided that the back half was not too bad and wasn't even rusty, the original oxide paint was still sound and the mounting points were all correctly aligned. A few minor modifications to remove, some welding holes to fill and some straightening round the back wishbone anchor points where someone had put a jack in the wrong place.

The front half was a different matter! As mentioned earlier, both towers were beyond repair, there were several cracks in the side rails of the chassis, the right side was distorted and some idiot had cut a section out to enable the exhaust system to be removed, causing another large crack to develop. I can't imagine what the thing must have been like to drive with the front geometry drastically out of kilter and the chassis about as stiff as spaghetti soaked in tomato sauce!

I decided that we would have to fabricate two new front towers as well as straightening the chassis rails, welding and reinforcing the cracks and cut-outs and realigning the whole fersh mess.

At this stage I needed to involve a vehicle repair certifier as the job was so major. I was not a member of the Constructors Club at the time so I was recommended a guy from Naenae who has proved most helpful and realistic. I managed to find all the critical specifications in various books including a workshop manual held in the Wellington Public Library and the "Authentic Lotus Elan and Plus 2" by Robinshaw and Ross plus various other magazines and restoration books.

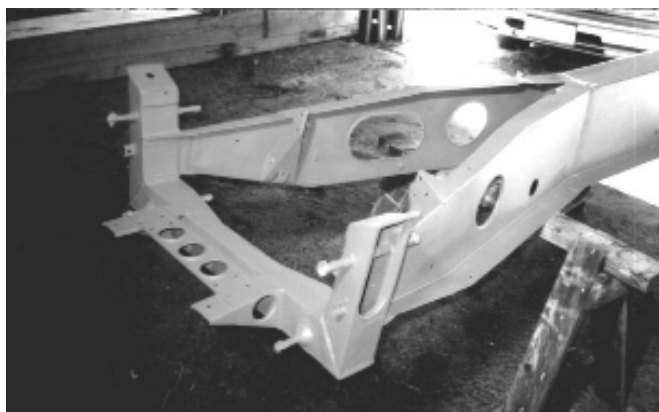
The next job was to make a set of jigs so that the chassis could be set up so that all the pick-up points would be in the right place when it was welded back together. I was

lucky here because the left hand tower, although full of rust, was correctly aligned as measured by various straight edges, steel rulers and a clinometer. This gave reference points for setting up the left side and aligning the whole lot with the rear of the chassis.

I then removed the right (damaged) tower from the side rail and cross member and tidied up the rail and the end of the cross member which were to remain. I had decided that the top section of the tower which holds the wishbone pivots and spring/damper attachment was ok so I cut off the bottom three quarters and set about fabricating a new tower round the remains of the old. This was made of 2mm mild steel sheet (slightly heavier than the original 1.8mm ms sheet). I found gas welding the easiest for this



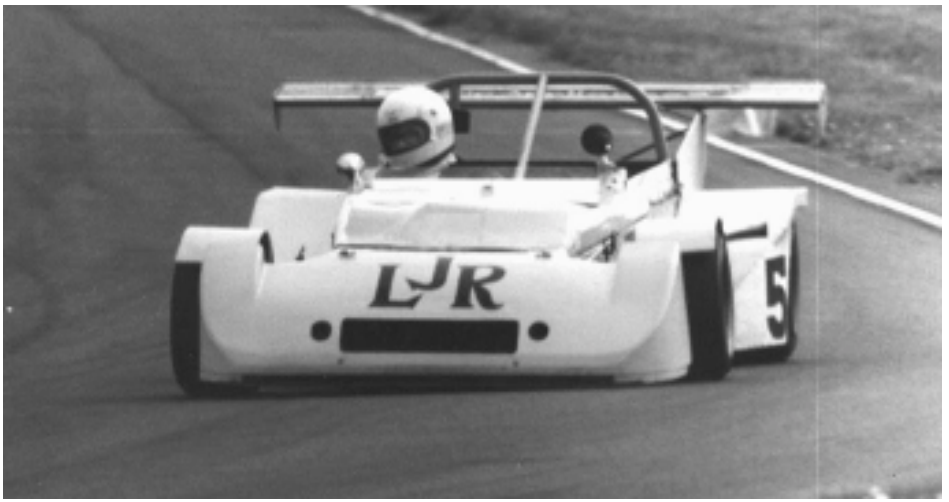
Right front finished



Front of chassis finished

job and it finished up very strong and quite professional looking. Next we set up the new tower in the jig and DC Arc welded it onto the cross member and side rail. One side was now structurally complete and straight.

The left side was a repeat of the right and was less of a problem as there was less damage and distortion to worry about. The chassis side rail cracks were then cleaned up and welded with the aid of John Hill's Mig Welder and these were reinforced with a number of beads of weld stitched across each crack at strategic points. Finally the whole chassis was checked for alignment and dimensions and found to be less than 1.0mm out at any point and the castor angle correct within 15 minutes of arc – probably better than new!



LJR at Manfeild

All that remained was to clean it all over with wire buff, disc sander and hand rubbing before applying the recommended POR15 treatment brushed on and followed by a sprayed coat of POR 'Tie Coat' to enable finishing with 3 coats of Red Oxide Lacquer.

The Repair Certifier inspected it again at this stage and went away happy – said he didn't need to see it again until it was mechanically complete.

Instalment 2: Suspension rebuild (If anyone's awake to read it)!



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