

Uryk Dmyterko Ltd

Jaguar E-Type Chassis Frames

Technical Specs & Information

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Tubing specs

Type	Material	Size	Thickness	Tensile Str.	Use
Rect. Tube	BS4T-45	1.25"x1"	18g	700/900 MPa	Engine frame
Rect. Tube	BS4T-45	1.5"x1.25"	16g	700/900 MPa	Engine frame
Rect. Tube	BS4T-45	1.5"x1.25"	14g	700/900 MPa	Engine frame
Round Tube	BS4T-45	1"	16g	700/900 MPa	Engine frame, bonnet frame
Round Tube	CDS	12mm	2mm		Picture frame
Round Tube	CDS	14mm	2mm		V12 Picture frame
Round Tube	CDS	18mm	2mm		Engine frame
Sheet	HSLA	N/a	18g	500 MPa	Picture frame
Sheet	HSLA	N/a	16g	500 MPa	Picture frame
Sheet	C10	N/a	16g	500 MPa	Engine frame
Sheet	C10	N/a	10g	500 MPa	Engine frame, bonnet frame

Frame Overview

Tubing

The tubing I use, even on the std sets, is uprated.

Its commercial grade BS4T-45 carbon manganese steel manufactured in accordance with BS5-T100

Its fully weldable and has excellent post weld recovery, meaning it retains its strength and requires little or no stress relieving to prevent fracture during service.

All the tubing is uprated in the sense that the wall thicknesses are now 18g & 16g (as opposed to the originals which were 20g = 0,9mm..!), except for the TB lever which is the same at 14g.

All outside dimensions are the same as the originals, so too are the all-important corner rads – 1/8” the small box and 3/16” on the large box, except the TB lever, which originally, for some reason, had the small corner rad... and I follow suit.

All tubing is internally phosphate coated, which creates a barrier against corrosion, although we recommend that you cavity wax inject after painting and prior to final assembly.



Figure 1 - Frame tubing specification.



Figure 2 - Selection of tubing used in frame manufacture.

Bracketry

All the bracketry is low alloy, high yield material, the same gauges as original = 16g and 10g. All bend rads are the same and all hole centres conform to the original build specs, thereby maintaining accuracy and correctness during the assembly process.

The original picture frame used low carbon / mild steel in 20g with 18g for the sides – I use 18g and 16g for the sides, with the same hole centres and overall thickness, yet maintaining the correct width to suit the upper and lower fulcrum blocks.

One alteration I do perform however – and this is because most cars, if not all, now run radial tyres and not cross plies - the original frames were set up to use suspension that provided 0 to +ve camber (mid-laden) on the front wheels, in order to prevent washout / scrub on the tyre contact patch as they move from bounce to rebound. To achieve this, camber shims are added to both upper fulcrum blocks. I now set the frames so that during build, you don't add any shims whatsoever and this will achieve 0 to -ve camber (mid-laden) which suits the radial tyres better than the previous set up.

Build Method

I use bronze welding exclusively for welding all joints. All brackets and assemblies are spot welded as original. I also use heliarc on the EMP mounting pad (to prevent a stress raiser) and on the TB bracket (to close off the lower return)

I use a gas fluxer, which effectively puts the flux in the flame and is way more controllable than the dipping rod/powdered flux or serrated flux impregnated rod. It also allows me to pre-flux/pre-heat all joints, thereby producing joints with the minimum of heat and distortion – which can only be good for the structural integrity of the frame.

I use special high strength - low mp alloy brazing rods and all my welds are super smooth and flawless... they look like they've been painted on, which I guess they have, but at 800 C!

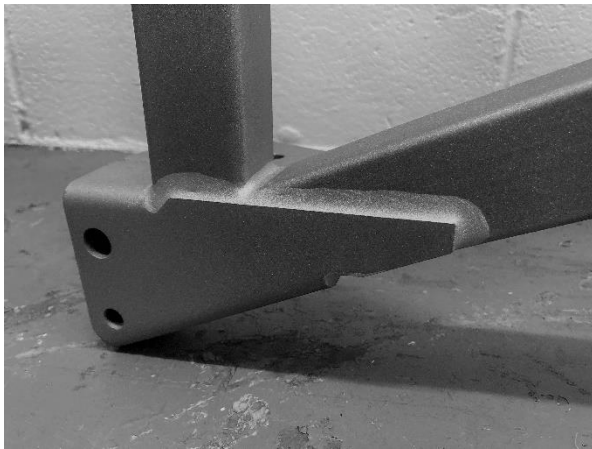


Figure 3



Figure 4



Figure 5



Figure 6

Finish

Upon completion, every frame is checked for conformity and trueness on the master jig. Each frame is then etch blasted (to remove flux and welding scale) and epoxy primed.

Once you receive the frames, all that is required during the paint process is scotching off, a light coat of primer and a wet on wet top coat or base/clearcoat.

The epoxy primer bonds itself to the newly etched surface and is difficult to remove (and also an excellent rust inhibitor), so lends itself perfectly to the final paint process, whether 1K acrylic, cellulose, 2K acrylic or water based, as well as 2K polyester filler.

Guarantee

So... Why do my frames fit and how do I guarantee this?

Each frame is personally built by me, from start to finish – and with over twenty-five years' experience and over 4000 units made, you know you're in safe hands.

As I'm an engineer as well as a restorer/builder, I understand the problems faced making these specialised parts and how they interact with the bodyshell and other outlying parts (suspension, engine), that's why I employ sound engineering principles throughout.

I stress relieve and set each frame using the time-honoured method of the heat torch....and a lot of intuition and instinct.

I only use one jig to perform the initial setting, part build assemblies and the final finished product, thereby eliminating errors that may creep in by using separate jigs.

From time to time, I check my work on original bodysells that I have access to – untouched and structurally sound. This is my gateway to the knowledge that I'm still on the right track with my work...and never rely on customers as Guinea pigs to help me solve problems.

I use factory build data, as well as original parts, to determine the position of critical parts of the frames, such as the torsion bar brackets, engine mounting posts and mounting flanges.

To this end, I use the floor rail datum (inside edges of the rails where the reaction plate sits) as 454mm.

The reaction plate needs to be this dimension also, and when the floors are set, needs to just slide into position with no paint applied.

The hole centres for the keeper plates on the reaction plate are 396.8 mm.

The floor – firewall datum (the lower edge of the firewall where the frame attach to the underside of the floor) = 346 mm.

The floor rails centre line sits exactly on the centre line of the firewall.

The floor is parallel to the firewall mounting flanges.

The picture frame upper and lower, outer hole centres are 543.8mm & 576.4mm apart horizontally and 273.0mm apart vertically.

So you see, making one of these frames isn't as simple as you may think, and trying to get all these constraints in place while I weld at over 800 C and watch the tubing move this way and that, is, to say the least, challenging!

When fitting the frames to the bulkhead the two most important aids are the picture frame and the reaction plate which must be fitted at the same time.

6 Cylinder Frames

I make three main types of frame specifications, to cater for all types of car or use:

1. The std set, which is updated, is an exact copy of the original factory frames.
2. The LWE set, which is FIA approved, is as above, except for the following additions:
 - the open sides of the EMP have been closed off, to prevent flexing under load
 - there is an extra spacer tube in the TB bracket, so the 3/8" bolt can now be tightened fully
 - there is a stiffener / spacer tube in the lower side of the picture frame, to add strength to the ARB mounting.
3. The LWE PLUS set, is above except:
 - The main diagonal strut that passes through the EMP is now welded to the EMP - increasing rigidity to this weak area and preventing flexing during hard cornering.

In addition to the above, I also make and supply the following upgrades:

- Picture frame single cross brace, double cross brace or LWE corner gussets
- Picture frame – LWE holes

Additional round strut from the lower outer mounting flange to the upper part of the EMP – this strut prevents the use of the std air filter canister so is only really worthwhile if this is not in place, i.e. racing



Figure 7 – LWE engine mounting gusset, prevents buckling.



Figure 8 – LWE suspension mounting gusset for increased rigidity.

12 Cylinder Frames

I employ the same tubing, sheet metal and build philosophy as with the 6 cylinder frames.

In a nutshell:

- all frame tubing is now 16g, although outside dims and corner rads are as per original
- all brackets are made from 16g and 10g high strength, low alloy material as per original
- the picture frame employs the same method of construction as the originals = swaged holes with the tubing pushed through and brazed in place

As the V12 frames are substantially stronger than the 6 cylinder siblings, the only upgrade that I carry out on these is to add a round strut between the upper/outer mounting flange and the lower part of the EMP.

Preservation, Identity, Provenance, Historical Reference...

Due to the ever-increasing scrutiny over a car's identity, whether it be in the name of provenance or for legal reasons, it has never been more important to preserve as much of the original car as possible. There are different ways to interpret this however, which is where the problems arise.

Most licencing authorities are now demanding that the original stamped picture frame be included in your new restoration or re-body, to maintain that all important historical reference that the car left the factory with (See 'Picture Frame Repair Service'). Same goes with the original data plate.

I'll tell you how important this is, in terms of originality, authenticity, traceability, identity... call it what you will, but the Picture Frame is the only part of the car's sheet metal/body shell that has the chassis or car number stamped into it.

The data plate also has the chassis/car number on it, but this is not part of the body shell structure.

Even though the picture frame is a bolt on item, it's still considered a homogeneous part of the body shell and hence the car's identity.

The ironic part about the whole thing is that the picture frame is listed as a separate sub-assembly, in the Jaguar Spare Parts Catalogue, and hence, a legitimate replacement part, but... once you change this part, even having the number re-stamped, you lose all the originality and provenance that the car came with - period..!

Talking about number stamping - we can stamp a new picture frame with your chassis/car number - this service is FOC and completely legal.

What is a grey area is when you then fit that picture frame to your car without first notifying the licencing authority.

Unfortunately, it is not viable to repair structural members such as the engine frames. These are not only responsible for supporting the suspension and brakes but also act as an impact zone in the event of a crash. My replacement frames bolt straight onto the original bodyshell with no drama and are much stronger than the originals.

Picture Frame Repair Service

I've now developed a working method to reclaim the old picture frames and turn them into better than new condition, c/w their original stamped numbers!

Trouble is, they tend to be in a condition that's not worthy of the cars' new status, or at worst, beyond salvage due to jack damage, corrosion, cracks, seized-in bolts, bent, and so on...

Regardless of condition, I try to retain as much of the original as possible without compromising its structural integrity - in actual fact, when they're finished, they're stronger than when they were first made.

All frames start off by being chemi-cleaned and blasted, then the evaluation process begins - carefully stripping away the offending parts and re-building back to as-new condition.

The completed frame comes finished in epoxy primer ready for trial fitting with the new frames and then onto paint.

The only modification that I perform is to permanently weld the two lower frame packing pieces onto the bottom rail, as this not only adds to the strength of this delicate part, but makes installation a doddle,

Due to the nature and complexity of the work involved, this service is currently only available as part of a full frame kit purchased directly through me.

You get a full photographic library of the work involved and a signed certificate of conformity outlining the work carried out and a that the frame is now fully roadworthy and contains the original stamping, as how it left the factory... your licencing authority will love you for this!

I don't repair the side or bonnet frames due to the complex nature of construction and the exclusive use of high- tensile thin wall tubing. These frames are not stamped with the chassis / car number, so even though they're still classed as part of the bodyshell structure, they don't carry the same weight in terms of vehicle identity or originality.

Cost – this service is not cheap as the finished item could take up to sixty hours to complete... but what price originality and provenance?

Pricing

6 Cylinder	Price
Engine Frames STD (Pair)	£2,200
Engine Frames LWE-Spec (Pair)	£2,425
Engine Frames LWE -Spec PLUS (Pair)	£2,625
Picture Frame STD (S1/S2)	£200
Picture Frame LWE-Spec	£250
Bonnet Frame (S1/S2)	£600
Full frame set (inc fitting kit)	£3,000
Full frame set LWE-Spec (inc fitting kit)	£3,500
Full frame set LWE-Spec PLUS (inc fitting kit)	£3,700
12 Cylinder	
Engine Frames (Pair)	£2,800
Picture Frame	£600
Bonnet Frame	£600
Full frame set (inc fitting kit)	£4,000

All prices exclusive of carriage & 20% VAT