

Know your Component Car

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Introduction

If you are at all like me, before making a major purchase, such as a GT40 recreation, you gather as much information as possible. It allows for a confident stance when someone else criticises your decision. In this game, as we all know, everyone thinks they are an expert and someone is bound to ask, "did you know it was like this?" or "you wouldn't be in this predicament if only you had ...". As a manufacturer we are contacted all too often by people who have bought what looked like a viable semi-complete project, only to find that there is an excellent reason why it is semi-complete! They are initially unwilling to accept that, for example, the CAV GT suspension won't just bolt straight on to their mid engine replica, or that our BRM rims won't fit onto the hubs of what they have standing in the garage.



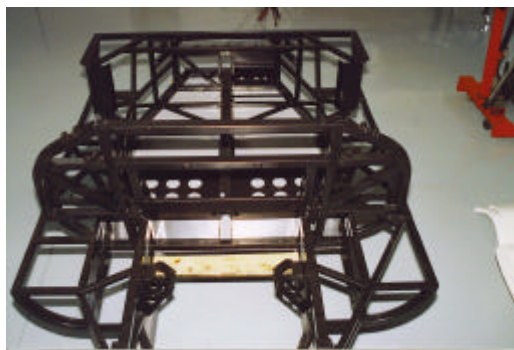
As we are faced with these questions regularly, and because we wanted to create a component programme that provided owners with the rewarding experience of building a high quality sports car they can be proud of, Auto Futura acquired a Ford sanctioned professionally built, space frame GT40 replica from the UK - and stripped it down to study it. A coat of paint and a nice interior can make any car look good from a distance, but we wanted to know what was underneath.

We are sure you do too. This is the first in a series of articles where we will compare the typical space frame type replica with the CAV GT recreation.

Part 1: Chassis

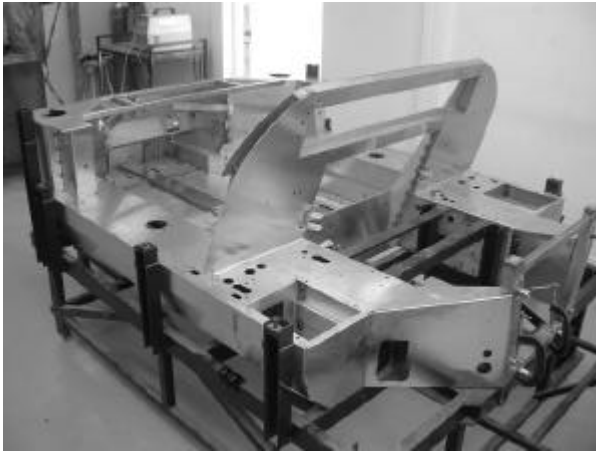
The chassis is the backbone of a car - to the engine's heart. If the chassis isn't up to scratch, it doesn't matter what other components you buy - the end result will be below expectations in terms of performance, appearance, handling and longevity. The integrity of a chassis lies in its design, quality of the materials and construction. It is essential to start any building project with a good quality chassis, be it space frame or monocoque. A space

frame chassis is made from steel sections that are welded together to form the structure of the chassis. These chassis' are typically MIG welded together and are either painted or powder coated for protection. It is a cost effective way to build low volume chassis and can be done with



minimal tooling expense. The downside is that they are time consuming to manufacture, the process cannot be automated, and it is finicky to cut all the pieces of the chassis, position them correctly and then weld them together. Torsional stiffness is measured by holding the front or rear of the chassis rigidly and then trying to "twist it" at the other end. The stiffer the chassis, the better. Space frame chassis can be made to be stiff but the appropriate design is required - this is an art in itself and in a GT40, this is quite difficult, as the roof does not carry any load and there is limited space for cross bracing.

Due to the nature of the space frame, it needs to be clad. This is usually done by pop riveting aluminium sheets onto the space frame. This requires a lot of holes to be drilled into the chassis and this, unfortunately, also provides many places for moisture to gain access to the inside of the chassis tubes where corrosion can take hold.

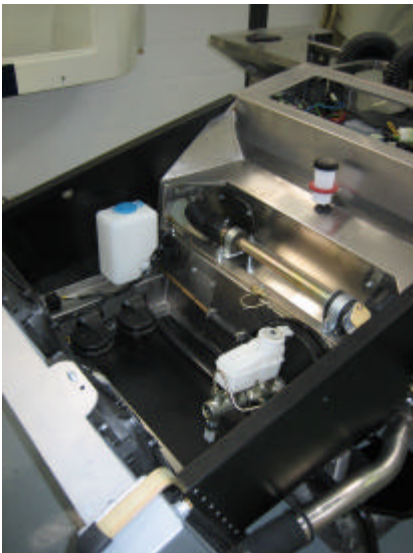


When designing the CAV GT we opted for the monocoque design for the following reasons: authenticity in terms of design concept with the original car, overall strength, torsional stiffness, quality of manufacture, longevity and safety. In a monocoque chassis, structural strength is derived from the way the sheet metal panels are welded together, rather like the ancient art of origami, where a flat sheet of paper, with no strength, can be turned into something of amazing strength for its weight, simply by folding it into the correct shape. By welding sheet metal panels together to the right design, a very stiff and strong chassis is constructed. The CAV GT monocoque chassis is manufactured from 304 grade stainless steel meaning that corrosion is not an issue for the CAV GT and chassis longevity and integrity is guaranteed.

As part of a major redevelopment program undertaken in 2004 and 2005, we have recently completely revised the CAV GT chassis. Of the 67 original panels comprising the chassis, 66 have been modified and several new panels have been incorporated into the structure. The motivations for the redesign were:

1. improve quality of manufacture;
2. to improve torsional stiffness;
3. increase strength; and
4. increase interior head and leg room.

The design of each panel was re-assessed for fit and function, with special attention being paid to the location and number of welds used. We moved away from continuous beads of welding to short evenly spaced stitch welding. The sequence of welding a stainless steel chassis is vitally important to ensure the dimensional accuracy of the structure. In the redesign of the chassis, the floor pan was dropped and several interior panels altered, providing an additional 2 inches head- and 3 inches legroom, such that a 6'3" person can now comfortably be seated in a CAV GT without a Gurney bubble!. This was achieved whilst remaining completely faithful to the iconic profile of the GT40 MK1 – quite a design feat! The end result is that the CAV GT has a spacious and comfortable cabin – that encourages one to drive the car – hard!



We have achieved all the objectives we set for with the chassis. Comparative tests conducted in-house demonstrate conclusively that the CAV GT monocoque is significantly stiffer and stronger than the space frame chassis we acquired from the U.K. – and the cabin space speaks for itself.

The CAV GT chassis is the core of Auto Futura's component program - everything else literally hangs off it. All components for the CAV GT are either custom manufactured (e.g. suspension system) or ordered from specialist manufacturers (e.g. Wilwood brakes) and they are all designed to work together without modification. What this means is that with the CAV GT component program, one can be confident of an exciting, but trouble free, assembly – resulting in a quality sports car that really performs and is built to last.

In the next article we will discuss the development of the CAV GT suspension and brakes and compare them to the systems installed on the space frame car we imported from the UK.

Should you wish to comment on this article or discuss any aspects of the CAV GT, please feel free to contact me on john@cavgt.co.za.