

BUILDING FABRICATION JIGS - 5 TOP TIPS

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You could compose a book on the practise of building fabrication jigs - covering everything from design and identification of build method, to the value of black builds and testing phases involved. Here however, we would like to share our top five tips to consider when working on or with a jig fabrication project.

1. Ensure jigs are designed within movable dimensions (height width) for road moves.

Road Transport Restrictions (UK)

One critical aspect of every design is the logistics of transporting the jig to site after fabrication, for first use. At the design stage, if required, the jigs can be designed as a flat pack kit of parts that can be assembled at site. This avoids any requirements for escort vehicles and/or police escorts which can not only increase costs but also delay projects due to availability. Please refer to road move guidelines: www.gov.uk/esdal-and-abnormal-loads

Width Restrictions

< 2.9m	Within Gauge
>2.9m <3.5m	Notify police & local councils 2 clear days notice
>3.5m <5.0m	2nd Man required, notify police & local councils 2 clear days' notice
>4.3m <6.1m	private escort required. See note below.
>5.0m <6.1m	VR1 required (www.highways.gov.uk/esdal), notify police 2 clear days notice
>6.1m	Special Order required 27.4m O/all Length≤ 150 Te GVW

Length Restrictions

Max length 27.4m without special order.
2nd Man over 18.3m
If drawbar trailer above exclusive of tractor

Height Restrictions

16' 1" (4.9m) clears motorway bridges at 16' 6"

Trailer overhang (rear)

< 3' 6" (1067mm)	No legal requirements
< 6' 0" (1828mm)	End board
< 9' 10" (2997mm)	End & side boards
> 9' 10" (2997mm)	End & side boards, 2nd man & police notice

Note:

Over 3.5m width, provision of "private escort" covers requirement for 2nd Man (attendant).

Hauliers will in most case use this option.

2. Identify build method from the outset

Fail to prepare, prepare to fail. Before commencing with the fabrication phase, consideration must be given to the planning and build methodology. For more complex details that require a large amount of local welding, you may wish to sub-assemble the units in their pre-weld state (i.e after tack welding together). This ensures that all the mating faces are accurately aligned prior to full welding. During welding the intense heat can often distort the steelwork and misalign the mating faces resulting in additional efforts being required, not to mention additional time and costs. It is better to catch this distortion at this stage rather than fully weld and try fit misaligned joints after welding, as by that point it's far too late.

3. Ensure Section sizes and grades are readily available when designing

Another issue that arises time and time again is specifying section sizes that are not readily available. Having seen it before, the design phase closes out, the client is

fig. 04/ fabrication jig in production

happy, enquiries for procurement go out and at this point it becomes apparent that the sections are not available. It is then back to the drawing board. By having a designer’s manual/guide, it helps aid design engineers throughout the design phase in choosing off the shelf sections from the outset. These design guides are extremely useful, based upon years of lessons learned.

it is a good opportunity to inspect and assess the structure before it is finally dispatched.

Therefore, ensuring all is as it should be before arriving on site, usually the process would be as follows:

4. Green

As these jigs are generally suited to mate with another unit or piece of equipment there is often a consideration for green material to be left on. Generally speaking, this green would then be removed in situ when the mating unit is surveyed and an accurate interface is established. When designing transportation jigs it is always a good idea to identify the mating unit so that considerations can be made for tolerance and overlengthening materials.



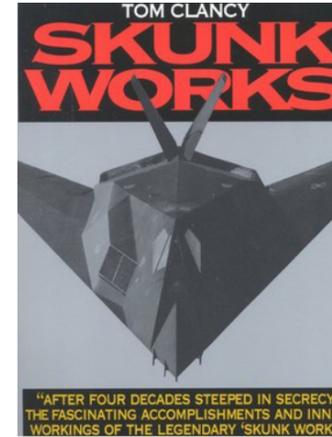
5. Black Builds & Factory Acceptance Testing (FAT)

When time permits its often a very beneficial process to black build steelwork before progressing to the surface finish phase of a project. The term black build refers to the process of assembling all components of the structure in their pre-finished state. i.e before any surface finishing takes place such as shotblasting and/or painting. Doing this ensures that all of the components fit and align as intended before committing to the finishing stages. Subsequently, if any issues do arise at this stage then they can be rectified in a timely manner. If not, then you may have to redo the paint job , if areas are to be reworked.

If the black build is not possible for whatever reason, a last precautionary measure is to hold a Factory Acceptance Test or “FAT” – this acts as the review stage before the structure is dis-assembled and dispatched to site. Although this is usually done after the structure is painted,

BOOK RECOMMENDATIONS...

SKUNKWORKS
BY BEN R. RICH & LEO JANOS



This book tells the true story behind Lockheed’s legendary Skunk Works from the perspective of the second man to take the reins and who carried the flame of Kelly Johnson through two further decades of incredible success. There is not much marine or even heavy lift in here, but the story of how to deliver research and development that results in actual products delivered against aggressive technological and competitive barriers has lessons that ring true and we can learn a lot from today.

book covers a great deal in an easy to digest way.

Layered through all of this are leadership lessons and great stories behind the development of iconic and ground breaking planes such as the U2 spy-plane, SR-71 Blackbird and the F-117 Stealth Bomber.

From the advocacy of tight knit small teams, supremely focused on a single goal, to lessons on where to play loose with controls and processes that can sometimes inhibit a team’s development and reactivity, the

“How generalists triumph in a specialised world...”

Much has been made of the 10,000 hour rule and the concept that early specialisation is needed to excel in life. In his book, David Epstein makes a convincing case that breakthroughs in today’s modern world, with its ever increasing depth of specialisations, will come from generalists who have a specialism in one subject but command knowledge of many more.

must be assimilated becomes greater with each passing year.

This is something that we talk about in these pages regularly. In the field of heavy lift engineering new technologies are being perpetually developed and released. In order to effectively deliver across the full offering of modern turnkey heavy lift projects, you need to compliment depth in a chosen core field with a solid foundation in all the others.

There are a large number of compelling examples in the book, some of which have been contested, but the core premise suggests, as the body of knowledge in the world on any given topic increases at a never ending pace, it drives a perpetual narrowing and deepening of specialities. Simply put, to be an expert, the volume of knowledge that

RANGE
BY DAVID EPSTEIN

