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S1.1 Metric versus Imperial

This document was written by 'The Wagon Man' and was written for the FMES on line readership. 'The Wagon Man' is a Committee Member of FMES and has as his speciality producing scratch-built models of Railway Wagons in 5-inch gauge. This series of Articles includes his personal perspective on this fascinating branch of the hobby.

Supplement 1.1

Introduction

I have now covered 7 out of 15 (plus one more currently in build) of the wagons and carriages that I have built over the period January 2013 to May 2016, and it seemed time for the first of occasional Supplements of a more general nature that will produced..

The intention was to take a top-level overview of two inter-related topics: -

- Imperial vs Metric Measurements
- Tools and Machinery

It was accepted that any of these topics require volumes the size of Tolstoy's "War and Peace" merely to scratch the surface. In the event this happened, so the decision was taken that rather than publish as an indigestible lump the topics would be covered in three separate, but inter-related, notes, designated S1.1 (Imperial vs Metric), S1.2 (a basic hand tool list) and S1.3 (a basic machine tool list). They would also be limited to how they affect us as Model Engineers.

I can only explain the reasons why I made the choices that I did and make suggestions based on my own experience – you may well have different drivers.

The writer would welcome suggestions for other topics from the reader, via info@fmes.org.uk

Metric versus Imperial

The history of different measurement systems is a long and fascinating one, and worthy of study in itself. Fortunately, from a modeller's viewpoint it is the easiest to deal with, as each nation used/imposed them on their own citizens and the advantages or disadvantages of each were decided by and controlled by law. Incidentally, officially Britain has been metric since the 1960s, not that you would notice in day-to-day life.

If you are one of those lucky individuals who can add say 43/64" to 75/8" easily and quickly, and then mark the mid point I admire you, and you would probably be happy with Imperial measurements. On the other hand, if you find it easier to add say 119 mm to 38 mm, then Metric is for you.

If you work from existing established designs the chances are these dictate materials and dimensions in Imperial, but you will immediately come up against availability. Steel 1/8th thick (a popular frame size) is no longer widely available, and has been replaced by 3 mm. It may not sound much, but the 0.007" difference adds up – in frames for example it becomes 0.014" overall (2 sides) and this will affect all width dimensions. You will have to take this into account. In effect you have already started to scratch build!

This type of interaction is considered in more depth in the following Supplements and will influence your acquisition policy, and will have an effect on **COSTS.**

Fixings

It is also convenient here to consider fixings – nuts, bolts, screws, washers, rivets etc.

Metric. Metric fixings are becoming common, and hence should become cheaper than Imperial (we hope). They are available in various materials, Steel and Stainless Steel probably being the most relevant to us. They are less versatile in the choice of size, typically increasing in 0.5 mm steps in diameter. The variety of head types also seems limited compared with Imperial types.

Also, to my eye at least, Metric fixings somehow seem clumsy and bulky compared with Imperial, but perhaps that's just me.

Imperial. Imperial nuts, bolts etc are still available from the specialists, but the range of available sizes is continually decreasing, making it increasingly necessary to go Metric. The BA range are still available, and can be obtained with a variety of heads – cheese, countersunk, round and even round without a slot (useful to represent rivets), socket head etc etc. They are also available in a variety of materials – Steel, Brass, Stainless. Long may this continue.

A particularly attractive feature available in the BA sizes is the "one size smaller" hexagon head bolts and associated nuts., (eg a 6 BA thread but with a 7 BA head). It has a major advantage over Metric - the appearance is dramatically improved. I normally finish up with a hybrid with visible fixings being BA reduced head, whilst the remaining internal majority are whatever I have got or can buy cheap. I was lucky enough to pick up a large quantity of bog-standard BA cheese head bolts and associated nuts which I use internally. It is not important what you use - no-one will know as they are not visible, and will bring overall build costs down. It is surprising just how many internal fixings there are in even a simple model, and it can run into hundreds in a larger one.

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Rivets. Rivets are available with a variety of heads, and in different materials. For us the most useful are likely to be Aluminium, Copper and Soft Iron. Unfortunately, the Soft Iron variety are getting harder to obtain, and Steel is supplied instead. I find steel too hard for satisfactory riveting, and ideally rivets should be softened by heating to red heat before use.

Washers. Finally, the humble washer. Again, a variety of materials, but some different types. Most common is the plain disc, but there are others. The most common ones are "Star" and "Wavy" in steel, and "Split" in spring steel. These are useful for locking purposes, although they are now becoming increasingly overtaken by liquid locking compounds.

Conclusions

So, where does that put us? I will now confuse the matter further by saying that I use whichever is most convenient for what I am trying to do and the material and tools that I have to hand and am familiar with.

The choice is yours.

The Wagon Man

August, 2025.