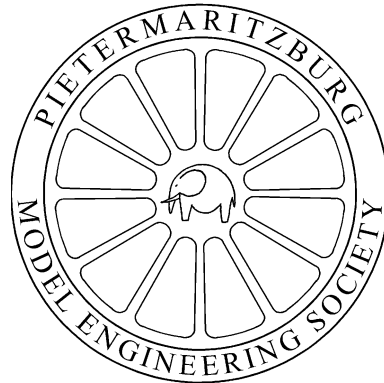


Maritzburg Matters

September



2018

PIETERMARITZBURG MODEL
ENGINEERING SOCIETY



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Club Meetings- **General Meeting:** Third Monday of each month at 19H45 at Halley Park. Visitors welcome
Running Day: First Sunday of each month
Committee meetings: First Monday of each month
Work Day: Saturday following the General Meeting

Web Page- www.pmes.co.za

Facebook-  (Pietermaritzburg Model Engineering Society)

GPS co-ordinates- 29.5833° S, 30.4167° E

No responsibility is taken by the Society for any subject matter in this Newsletter other than official Society notices.

And so the world continues to function after WWW2018!! This month's running day was once again a great success with a great turnout of members and passengers, we pulled somewhere in excess of 900 passengers! The engine kits and boiler kits also continue to attract enthusiasts.

We have managed to carry on with our maintenance program despite WWW getting in the way! The signal cabin has been completely repainted, both inside and out. The last bits of the ticket office has been done. We intend completing the last bits of the container roof as well. More lights have also been installed in the containers and new storage tunnel. The containers and the cage between have been re-organised and cleaned, leaving a whole lot of space! There are of course many of these types of jobs still to do, please come along and lend a hand!!

This is probably a good opportunity to remind drivers of some of the safety aspects of driving!! Please make sure that you abide by the signal light instructions, if the light is red you are expected to stop and wait for it to change, there is simply no excuse to justify ignoring these instructions! Excessive speeding is also absolutely frowned upon, fortunately this aspect is largely adhered to so this one is just a reminder!

I was remiss in the last newsletter in not expressing specific thanks to two couples who spent an extraordinary amount of time in manning the gate and train ticket sales for WWW, Chris and Tracey Walker, Theo and Ann De Jong, and Roy and Charlotte, your efforts were much appreciated!! And also to Connor Graaf for looking after the level crossing so well again this year. These are generally quite thankless tasks!!

On a more sombre note, our condolences go to Jim Stark on the very sudden loss of his wife Caroline, our thoughts are with you.

We also wish Vic Lotter an easy recovery after his motorcycle met up with a taxi on his way home, hopefully all the nuts and bolts are not too unpleasant, and do their job properly!! This might be a great opportunity to do some more of your very good model engineering!

Getting Started in model Engineering

Getting started in model engineering is a bit daunting and can be a significant investment as there are specialist tools available for every job. However the reality is that very fine models can be produced with some hand tools and a few key pieces of machinery. There are even models built by people who only have hand tools, but because we are talking about engineering here I will assume that there is some interest in owning and using machine tools.

Hand tools.

Amongst the box of hand tools a model engineer will need a centre punch and small hammer, a Vernier calliper, scriber, dividers and an engineer's square for marking out. Also a selection of files, a hacksaw, a vice, some small screwdrivers, and some clamps for cutting and shaping. Investment here is minimal and many tools can be purchased over time as needed.

Additionally some taps and dies will be needed to cut threads. These are probably best bought as needed by the projects being worked on. If you can standardise on a thread type such as metric or BA or ME, then this will reduce the number of threading tools needed and the quantity of screws held in stock.

The Lathe.

The lathe is the centre piece of the workshop and even the most basic device will enable the operator to turn pistons, bore cylinders and true up flywheels. Access to a lathe can greatly improve the finish of a model and make the manufacture of accurate parts much easier. Given some additional accessories the lathe can also be used for drilling, facing, milling and sawing, making it one of the most versatile of machine tools.

Lathe Choice

The greatest influence on which lathe to purchase is to ask what it is to be used for. A typical mid-range, hobby lathe will have a centre height of 3.5". This would be suitable for building a locomotive of up to 5" gauge. Larger lathes can obviously machine larger parts but they are less sensitive, so if you are looking to make clocks or watches then a smaller, lighter lathe would be more suitable. When reviewing lathe specifications also consider the height

over the cross slide which will inevitably be much less than the centre height. If the lathe has a 'gap bed' then it will be able to produce larger diameter parts of a limited length. Overall Length of the lathe bed is less important, as 90% of turning is done within 6" of the headstock, so only consider a long bed machine if you are sure you need it. The cross slide on the other hand can't be too long; a longer cross-slide can hold more accessories, such as a rear tool post or a milling table.

Old English lathes can be a good buy; they are often well made and can last a long time. However they may be imperial unless converted and may have suffered wear or a hard life. New imported lathes can offer good value for money and there is a nice selection of sizes to choose from. These are invariably metric but are often only able to turn small parts because of the diminutive motor specifications.

A note about Spindle speeds. These typically don't need to be very high. High speeds are needed in woodwork but when cutting metal, having a rigid machine and a sharp tool is much more important. In appropriate high speeds can generate heat and just cause tool wear.

A few lathe features that are worth considering are.....

A back gear. This is a reduction gear which can enable a lathe to run much slower and turn much larger parts. If the lathe has a gap in the bed then a back gear is needed to make full use of it. A variable speed drive is a good alternative. The low speeds are also needed for safe screw cutting.

A gap bed as already mentioned will allow the lathe to turn larger diameter parts of a limited thickness. The majority of items turned on a lathe tend to be long and thin, such as crankshafts, spindles and columns; or short with a large diameter such as flywheels, driving wheels, pulleys and cover plates. The headstock spindle will typically be hollow to allow long thin bar to be worked on without cutting to length to fit it in the chuck. The larger this hole is, the less you will need to pre-cut bar stock before turning and consequently less material will be wasted.

Chucks.

Both a 3-jaw self-centering and 4-jaw independent chuck will give the greatest flexibility on the lathe. It is also worth noting that the 4-jaw can do everything a 3-jaw can do and more - it is just that there is more set up time involved. However for getting started and provided you are not using castings, a 3-jaw chuck is a nice starting point. It will clamp hex and round bar roughly central to the lathe axis and should enable basic machining to commence without

lengthy set up. However it is worth ensuring that the 3-jaw comes with both internal and external jaws for added flexibility. When upgrading to a 4-jaw independent, a DTI will also be needed to enable parts to be centred accurately. 4-jaw chucks are useful for holding irregular shapes and turning castings.

A tailstock chuck is needed to drill holes along the centerline of the lathe. A chuck of 1/2" capacity is adequate for most jobs, anything requiring a larger hole can often be bored. The larger chucks also have a disadvantage that they cannot grip very small drills. The Tailstock chuck can be used to hold threading taps, when the machine is turned by hand.

Vertical slide

A vertical slide enables small milling operations to be carried out on the lathe. It is a very useful accessory, although facing operations (if not too big) can be clamped in the 4-jaw and machined that way. However, the vertical slide can also do co-ordinate drilling using the handle dials, and cut slots and steps which is not possible with the chuck.

Drill press

A small outlay compared with the lathe should allow ownership of a drill press/pillar drill. The options are floor mounted, or bench mounted and there are machines with more or less spindle speeds. Again it is a case of selecting a machine which best suites your proposed projects in terms of capacity.

My pillar drill is bench mounted with a 1/2" chuck. This is good for most jobs and, for the small outlay, is worth every penny. A range of speeds is needed to use both small drills and larger tools such as hole cutters, but 3 to 5 speeds should be adequate. My drill is used on a middle speed for 80% of the time. As with the lathe, a drill with some low speeds but no high speeds is more useful in metal work than a drill with really high speeds, but no lower speeds. You will also need to add in the cost of a drill set to get started. Go for HSS drills where possible and they cut much better and last much longer than high carbon drills.

Bench Grinder

A bench grinder is a useful machine for making punches and grinding your own lathe tools, as well as sharpening drills. They are not a large investment and the usage will depend on what sort of projects you work on.

Somewhere to work

Not to be overlooked is the cost required in gaining somewhere to use the machine tools. A workbench is a must to mount a vice on and as a place to work!

Windows are not needed as they are not secure and use up valuable wall storage space. You will need some lighting and power sockets though.

Milling Machine

If after this initial investment you should be well equipped to make lots of interesting models and tools, but should further machine tools be required then next on the list of things to have, would probably be the Milling machine. Unlike the lathe which, with suitable gap and back gear, can handle work outside of its normal range, the milling machine is almost the opposite and can only produce work well within its capacity. Milling machines although often very heavy with a large table area, can often have a fairly short range of movement.

The other reason milling machines have to be so substantial is that they use a multi-point cutting tool rather than the single point of the lathe; this means the power of the machine is divided into the number of edges cutting at any one time.

The cut on each tooth is intermittent which is a source of vibration and there is also a certain amount of tool rubbing involved which further loads the machine frame. All of this means that milling machines have to be quite large to be rigid enough to avoid vibration and produce a good surface finish.

A vertical milling machine is more flexible than a horizontal and is more suited to the work required in model engineering. Some machines have interchangeable heads and can do both vertical and horizontal operations and this gives the best of both. Vertical machines can be used for co-ordinate drilling and can be combined with a rotary table to cut curved slots. If a dividing head is available, then gear cutting also becomes possible, although both the cutters for this and the dividing assembly can be expensive. The greatest advantage over milling in the lathe is simply that the capacity is much greater and this means you can mill things like locomotive frames, and long connecting rods. If a mill is purchased then you will almost certainly need a clamp set and a milling vice of a reasonable size to get the most from it. A wobbler is also useful for finding datums.

When looking at milling machines pay close attention to the table travel and also the clearance available in the Z-axis. As already mentioned a large

machine can be quite limited and these numbers define the working area more accurately. Rotary tables and large vices take up a lot of the Z-axis so this must be factored in as well.

In summary Milling machines are not needed to get started in model engineering. They are very useful and if you are able to include one in your workshop then you won't regret it, but it is certainly not essential to get started.

Extracted from 'On Historical Lines' Facebook post

The railways were, and are, a dangerous place. But, thanks to the Regulation of Railways Act (1840) there is a noticeable reduction in the number of accidents to members of the public, and travelling public on the Liverpool & Manchester Railway after 1841. Sadly, accidents to railway personnel remain stubbornly high, and the cause of death or injury also remain the same from 1830 to 1845: over-familiarity and complacency. For example, brakesmen walking over the top of a train of wagons and falling off; porters and guards trying to alight whilst a carriage is still in motion; platelayers (who worked at



night) being run down (even when standing in the 'six foot', because the six foot then was considerably less than six feet). Plus idiotic things, like trying to uncouple an engine whilst it was moving. Then again, the L&M Board refused to adopt a recommendation

from the Board of Trade that it pass a Regulation prohibiting members of staff either walking between vehicles which were moving, and attempting to alight from the same. Laissez-faire management at it's finest.

Club Notices

- The next **General Meeting** will be a **Video Evening** in the clubhouse on Monday 17th September at 19h45.