



NEWSLETTER

July 2023

Editorial

Welcome to the July edition of the FMES Newsletter. At the time of writing most, if not all of us have had some pretty warm weather. Hopefully there more weeks of summer to enjoy – particularly around 16th September for the FMES Rally at Frimley & Ascot Locomotive Society. We hope to see many of you there either as competition entrants or just observers. Details are later in this newsletter.

In this issue we report on the presentation of the FMES Certificate of Commendation and Polly voucher to James Barrett from Peterborough. James is the third recipient; we reported the presentations to Spencer and Tom in the last newsletter.

Peter Kenington's review of Young Engineers in Model Engineering has provoked some reaction, which we welcome. There will be more to say on that in a future newsletter.

Julia Atkins-Thomas has kindly taken the time to write and give us a bit more insight into Julia and Matt's decision to take on the running of Polly Model Engineering. She describes some of the effort required to move and reorganise the business as well as their ideas for the future.

I have taken (with permission) articles from three club newsletters. Rob Hitchcock from Plymouth has written Part 1 of his experience of purchasing and commissioning a 7¹/₄" Wren loco. We look forward to Part 2 in the fullness of time! Dennis Holmes from Worthing relates some of his experiences of others misusing tools. Those of us old enough to have been brought up at a time when making and repairing was the norm may find some of them unbelievable but perhaps that is another imperative to encourage Young Engineers! Ron Barson from Bournemouth writes about Bulleid's "Leader" project with information sourced from the books of Kevin Robertson.

There are a few items of interest seen at recent local shows and I also offer my experience of obtaining and commissioning a deadweight tester.

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Chairman's Chat

Looking through some old (1950/60s) copies of model engineering magazines I was struck by some of the adverts. There were adverts for components to build your own refrigerator, transistor radio, petrol engines to power a hand lawnmower, cultivator and much more besides. It set me thinking how times have changed and how our hobby has changed. Folk of my age (yes I am a "senior citizen") possibly started with Meccano, moving on to a small lathe and hand tools and made all the components of their model by hand. Nowadays we can buy many components from suppliers, even kits to build a model without the need for major workshop equipment. Does it matter that things are different nowadays, I do not think it does. So long as folk enjoy our hobby, whether it be building from scratch, from a kit, buying a model built by a third party, etc the fact enjoyment is had is what matters.

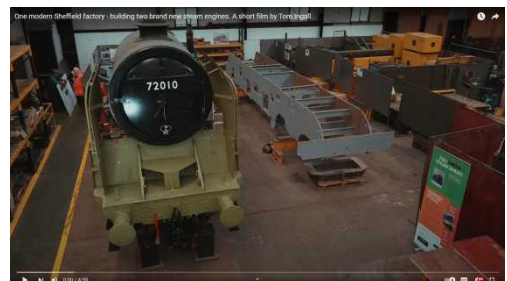
Some of the enjoyment of our hobby can be had from reading newsletters. So can I thank those who are the primary contacts for the Fed's newsletter for passing it onto their club's members and remind others who maybe currently do not that I am sure their club's member would appreciate the chance to read it. The newsletters, including back copies can be found on the Fed's website.

Whatever your involvement with model engineering can I wish you many happy hours enjoying our hobby.

Bob Polley
FMES Chairman

The YouTube clip below is a report on an open day held at CTL Seal in Sheffield who have given over space in their factory for two locomotive new builds - a BR Std Class 6 "Clan" and an LNER B17. CTL Seal are manufacturers of components for the renewable energy sector which is perhaps slightly ironic!

<https://www.youtube.com/watch?v=OG9B00mqWE>



FMES Autumn Rally 2023

16 September 2023 at Frimley Lodge Park, Surrey

Kindly hosted by Frimley and Ascot Locomotive Club

This is a great opportunity to bring your locomotive to an extensive ground level multi-gauge track with adjacent raised track both to enjoy the experience and to enter for two competitions.

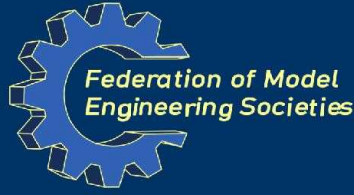
More details can be found at <https://fmes.org.uk/> including how to book: if you would like to come, please let the host club know by booking as soon as you can: we look forward to seeing you there!

We hope that you are able to attend the rally this year and experience the excellent multigauge track at Frimley Lodge Park as announced on our website in the news and the events pages. There is the chance to enter two competitions this year, as well as of course just enjoying driving around the one kilometre long track or meeting fellow model engineers.

To find out more please see the website <https://fmes.org.uk/fmes-2023-rally/> or visit the club website at <https://www.flmr.org/>.



The brochure issued by Frimley for the FMES Rally and other activities that weekend follows:



FMES Rally 2023

hosted by
Frimley and Ascot Locomotive Club
Operating Frimley Lodge Miniature Railway

Saturday 16th September 10am till late
with
Club Running Day on Sunday 17th September 10am-4pm



Members of clubs affiliated to FMES,
along with their families,
are welcome to attend.

Pre-booking of your attendance is required.

Arrangements will be on our
website, or you can email us at
fmesrally2023@flmr.org
and we will send you full details.



www.flmr.org

Friday 15th

Pre-booking opens
Running slots allocated
Documentation and wheel tolerance checks

Saturday 16th

10am Rally starts

Details of the Competitions will be announced in due course on the FMES website.

Competition results will be announced during supper at 4pm.

Sunday 17th

Club Running Day

All participants and their families are welcome to come along and enjoy our facilities with rides available.



Further Details

Refreshments

Breakfast Baps

Light Lunches

Saturday Early Supper

Tea and Coffee served all day

Please let us know any dietary requirements on the booking form



Accommodation

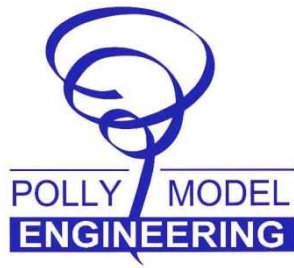
Details of B&Bs and hotels will be on our website soon.

Caravan and Camper Van accommodation is available at the Canal Centre (GU16 6DD). Pre-booking is advised.

Parking

Car parking available on-site. Note there is a height restriction for large vehicles.

If your vehicle is taller than a standard car then please indicate your vehicle height (including any roof mounted attachments) on the booking form.



Polly 2023 & beyond...

When Andy Clarke called the staff into the office last September & told us he was retiring, taking no more orders & closing down, the future was uncertain. Matthew & I were certain though that we didn't want it to be the end of our story with Polly Models.

Matthew had worked for the company for over 12 years at this point, running the practical scale department & cutting out all of the platework for the Polly Locomotives & fine scale too. Matt had invested a huge amount of time in drawing, production & designing many of the parts as had his father before him. He didn't want these years of work to go to waste.

I had been working for the company for less time. When Andy had his accident, I had offered to help out for a bit. This led to my being offered a permanent position, initially picking & packing orders & answering phones. I had progressed to the workshop where I did everything from cutting metal, putting parts through machines, sandblasting, finishing, soldering & assembling many stock items etc... I had enjoyed my varied job of the last five & a half years & didn't want to give it up & do something else. I had learned many skills I wanted to improve upon.

Quite quickly we came up with a proposal to go forward with practical scale & after a few days began to look at the business as a whole & if we could somehow take that on too.

For years we'd talked to customers with integrity, telling them "We'll be here to support you" Neither of us wanted to default on that. The model engineering supplies alone were a big part of the business & needed preserving.

In a big whorl of talks, activity & meetings over the next few months we worked through the necessary parts of taking on the business. We'd approached Tristan of 17D with view to getting a few parts machined for the practical scale part of the business, now he became a business adviser & partner. The decision was also made to move the business to Bonsall in Derbyshire, on the Via Gellia Road. This would mean that our new partner was downstairs & that we'd have a more suitable & manageable building for the new business.



Actually moving the business was a bit of a mammoth task... I lost count of the van loads, it seemed to go on forever. Matt & I had worked at the old Polly up to Christmas, then we'd started to move machinery & office parts & some of the practical scale in early January. We'd worked on fitting out the unit from the beginning of November, building benches, a storage room & an entrance hallway/trade counter. The paperwork took forever to complete, finally going through at the very end of February 2023, two months later than we had hoped to start trading. We moved the stock less than a week before the Harrogate Show.

So many people are asking what's going on? What remains & what's gone? Who works for Polly Models now? The take over took so long no wonder the stories were so numerous & speculative. So here it is.

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Matthew & I have formed a new company, A T Model Engineering Ltd. The company consists of Matthew, myself & Tristan Dengate of 17D Ltd. We have bought all of the rights so that we are legally trading as Polly Model Engineering. The email, phone number & website remain the same. Only our location has changed in that sense.

We are still providing the full range of model engineering supplies that people are used to. We aim to extend this range & have had a retail website built that we plan to launch later this summer. We will always be here at the end of the phone though to help anyone who doesn't get on with technology. We will still be present at the rallies & exhibitions that we've always attended.

The practical scale/fine scale locomotives department is still in operation, headed still by Matt, you can still purchase the usual supplies associated with this part of the business. This includes drawings, lazer cut frames, castings & custom cut plateworks, nameplates & the popular range of Anthony Mount stationary engine kits.



With the initial focus on getting the supplies side of the business up & running, new Polly Model locomotive kits are not currently being manufactured. However, we have a large range of spares & intend to support & help Polly customers into the future. We also have some plans in this area so please like our new Facebook page & look out for new developments.



We have not taken the big machines with us from the old business as we now have a machining partnership with 17D, so we can still produce the parts needed. We do however still run a small workshop where I continue to make up & finish off machined parts as I did in the old business. So, items like the cylinder draincocks & Gordon Smith safety valves are still available. I mention these parts as we have had a lot of people asking about them!

Andy & Jayne Clarke have of course retired & judging by their posts on Facebook are enjoying their time especially with their grandchildren. We wish them well & hope that they have a good retirement.

All of the former Polly Models employees went on to find other jobs, straight from one business to the next, taking their various skill sets along with them. We wish them all the best for the future too.

In our future we look forward to growing & developing the business & getting out & about as much as possible to see our customers. People are welcome to drop by our trade counter as well... we do ask that you call first to check we're about & availability of stocks. We want to thank all of our customers for your continued support.

Many Thanks Julia & Matthew Atkins-Thomas



Commendation for Youngest Member

The youngest member of Peterborough Society of Model Engineers, James Barrett, has been awarded a Certificate of Commendation by the Federation of Model Engineering Societies.

As an additional prize, James was also awarded a voucher from Polly Engineering.

The presentations were made at a meeting of the Society on Monday June 5th 2023

The award was for his activities within the Society and for his project, which was to make an adaptor to enable ER40 collets to be used in a milling machine with an INT40 taper.

Once the machining had been completed the tapers were blued and scraped to ensure a perfect fit.



James being awarded his Certificate of Commendation by Bob Polley of FMES and being presented with his Polly Engineering voucher by Peter Squire of FMES

James was sponsored by the Society

Marion Parker told us about James. The following is based on her comments and James' own notes.

Apprenticed with Baker Perkins, food processing equipment suppliers, James acquired, cleaned, checked and aligned a Milnes lathe under guidance from his mentor Howard Lewis. He's made a tool height setting gauge and has learned how to grind lathe tools. Marion says "his progress has been exceptional."

James tells us his workshop now includes a Cincinnati 0-8 milling machine that arrived in need of tool holding facilities. He explains his reasons for choosing to make an adaptor to mount ER-40 collets in its ISO-40 spindle nose and how he prepared a 3D model using Autodesk Inventor software. With access to machines in a college workshop, he describes the processes and pitfalls encountered during its manufacture and how Howard was able to guide him to solutions. James notes how much he's learned about the importance of rigidity, concentricity and process planning.

An active Peterborough member, at 20 years old James is currently a Committee member and the Society's youngest member. It became evident that the Society's well used portable track was in need of repair and modification. It was anticipated that the work would take some time but James suggested maintenance that could be (and was) completed in a couple of hours!

He's offered help with the bookings and operation of the Society's portable track events and exhibitions and runs a successful raffle at meetings to raise funds for the Society. Marion says "his input to Society activities has been outstanding."

Members of the Federation Committee were unanimous in recognising James' contribution to Peterborough Society's activities and for his progress with his projects. We wish him success in his engineering career and pleasure with his model engineering activities.

Ladies and gentlemen, please join with me in congratulating James who receives a Certificate of Commendation and a £50 Polly Model Engineering Ltd. voucher.

Mike Chrisp

Federation Trophy and Polly Model Engineering Prize 2024

Closing Date 31st December 2023

This is a prestigious competition for Young Engineers who have discovered the pleasures of Model Engineering both by making models and by contributing to a club as a member.

Details can be found at: <https://fmes.org.uk/young-engineers-2/> including the application form and some frequently asked questions to help you.

If you are a young engineer (up to 24 years old), or know of one who might be interested, why not enter? We want entries from all aspects of model engineering!

WE DON'T KNOW WHAT WE NEED TO KNOW

(With permission from the author and Worthing & District SME)

I have just finished watching Tipping Point on the tele and it has inspired me to put a few words down about how different people and different generations view the world into which they have been delivered.

Tipping point, if you haven't seen it, is a simple game where, when questions of different complexity are given, if answered correctly, the contestant can put a disc into the top of the machine with the aim of pushing £50 discs out at the bottom level. This is the same as the moving penny arcade game as I am sure most of you played at the seaside in your younger years.

On this particular occasion, there was a young person, (gender doesn't matter), probably in their early twenties and the question went thus. "Give the name of a British wartime leader whose initials were W.C." The first one of the four contestants to press the button has the opportunity to answer the question. This young individual (I might say they looked bright, sounded intelligent, sensible and nicely dressed), gave the answer William Churchill. So, 50% right, but still entirely the wrong answer.



I know this is a long introduction to my thoughts but it does sum up some of the experiences I had as a secondary school teacher of Design Technology, just before I retired.

As older folk, it is extraordinarily easy for us to forget that knowledge, information, technique, skills and other attributes of life are not automatically bred into the new young person, the next generation, but have to be taught carefully and with sensitivity so that the student, on acquisition of this knowledge, has a broader, but more importantly, a useful perspective of the knowledge acquired.

With the removal of skills from the National Curriculum, note, I didn't say any particular subject, students are now primarily concerned with factual knowledge. This will allow a student to achieve their G3CSE and everyone will be happy. The student has the qualification and the school ticks the box marked success.

A major problem is, if the smallest bit in that chain of knowledge style of teaching is missing, the greater mastery of the subject appears very fragile and indeed very odd to witness. This brings me to examples I have personally experienced.

Now, before I start, I must explain that all the individuals that were involved here were nice folk, of different ages, trying to do the best job they could. No messing about was involved and were thinking and being engaged and constructive.

The first occasion I wish to recall for you is the time when I had three sixteen olds who had asked me, at lunch time, to show them a little woodwork, and perhaps I could show them how to cut a small joint. This used to be a normal classroom activity at one time but now is in the past. In this school the tools were still all there so I said "see you at lunchtime" and we met after morning lessons.

I began by showing them all the tools involved, explained everything to be done, then in front of them cut and chiselled out a simple halving joint. The three students were on a table to my right. I had some pre-cut wood, so, two pieces each, "go on, take your time and see how you get on!" After a short time, I looked up and was pleased to see that one student was very carefully lining up their Tennon Saw in preparation to cut on a correctly marked out piece of wood.

Then, with the two others watching on and a concentrated look on his face he lifted the Tennon Saw directly above his head and with as much force as he could muster brought the saw down three or four times onto the piece of wood in a chopping action before I could get my senses together to scream across the room "What do you think yer doing". They stopped immediately. I had six wide-open eyes and three open mouths. It was in that split second that I realised that they were not mucking about. I felt the need to apologise for shouting and they were all right about it, however, it soon became apparent that they simply didn't know what a saw was! Amazing, but true, in the sixteen years each that these students were alive, not one of them had any knowledge of the operation of a saw. The only "Tool" operation, method or technique known for this sort of tool, they thought, was a chopping motion. At the end, I held up a Tennon Saw directly in front of their eyes showing the little hooky teeth which when pushed forward with a pushy forward motion, cuts the wood. They didn't know this, had never used a junior hack saw, had never come across this sort of thing – ever. It's not their fault!

If we don't as a nation teach skills in schools or in their own families, how on earth can we expect young people to learn? However, this really is only the tip of the iceberg. It is not only the young that are susceptible to this lack of a fuller knowledge.

A friend asked me to do repairs on their house and amongst other items to sort out was the simple task of putting a hook on the back of a bedroom door, which my friend apparently was unable to do. On enquiry as to what the problem was, it became apparent that my friend had been trying to use an electric drill that their brother had kindly given to them as a birthday present on moving into this nice new house.

This was the tool of choice, present from brother, will solve all problems, nice and expensive; will do the business – no problem. This was the thinking involved. I will now explain exactly what was happening.

Job, - fix hook, - tool, - ah! New electric drill - Push button on drill - Drill works, Vrummm, nice wizzy sound - Touch drill chuck when whizzing on hook when in contact with door - Hook falls on floor.

This story is a serious observation of how, when the basic ABC of a practical life in the modern world is not taught. The student of life can only run with knowledge acquired up to that point

This has nothing whatsoever to do with intelligence but to do with fundamental knowledge omitted by schools from the portfolio of life skills. The other angle to all this, which is interesting to think about, is that the brother hadn't supplied any drill bits. This was the thinking. The electric drill is the best tool, the electric drill will do the job, I will buy the posh one, my family deserve the best, they will like this for their nice new house.

All are excellent sentiments we can all agree but these are based on the modern concept that the tool/equipment will resolve the problem. It is not expected any concession is given to the skills of a person behind the tool having to contribute to the successful conclusion of the project.

Whilst students are required simply to acquire knowledge in a vertical form and to acquire more and more information to obtain higher and higher qualifications, we will have people with holes in their knowledge that will be increasingly a problem the older they get or more senior they become in later life.

I have taught students of thirteen years of age who didn't know what a pair of scissors were and as a department we were all instructed to wear goggles to use them. Sixteen-year-olds that absolutely had no idea or even concept of what a screwdriver was. I have stopped students of fourteen years of age using ring spanners and marking gauges as hammers, and witnessed a whole school department that had every single chisel intentionally blunted/rounded off by order of senior management as it was considered dangerous to have all these sharp dangerous things in a school.

The final example I will recall for you is when I was briefly out of the room for a moment at the start of a lesson and on returning the noise was amazing and I choked in horror as to what was to be seen. One of the teaching assistants had "started the lesson". None of the current work had been retrieved from their boxes and "starting work" had entailed every student just grabbing any tool in sight and bashing it as hard as they could on a work bench.

Now just think about this, all these students were NOT mucking about. After talking to them I discovered that they thought making things needed tools and workshops and so that creating noise and hitting stuff was what was required. As they were young and had no experience of either, they genuinely thought they were doing a grand job. The worst thing about all this was that the teaching assistant naturally thought the same!!!!

This does show how long this malaise has been in the system. While we go down the route of total reliance on the machine/tool to do the task, the interface of input from the individual on the outcome diminishes. Skill, if only the knowledge that skill is required at a point when a tool should be used is always going to be a vital ingredient to modern life. The absence of this leads to partial knowledge and incomplete function.

Well, I'm just glad that William Churchill won the Second World War for us.

Dennis Holmes
Worthing & District SME



The YouTubelink below is about the locomotive new build - the LNER P2 "Prince of Wales," showing the move from its initial workshop to the new facilities in Darlington. Setting the steering geometry of the trailer wheels must be interesting but no doubt all done with computers these days.

<https://www.youtube.com/watch?v=Lrz3T3k3Ywo>



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A Deadweight Tester Saga

Over recent years our Club has been fortunate to have had access to a facility that provided pressure gauge calibration at no cost to us, but that arrangement has now come to an end. As our Club is small in number of members and our only means of income is through membership subscription, we were faced with having to make a decision on whether it is viable to continue to provide a boiler inspection service with its attendant costs when not necessarily relevant for all members. This was of personal concern as I expect to have boilers to test, so I decided to investigate what, if any, possibilities existed for us to calibrate our boiler testing pressure gauge.

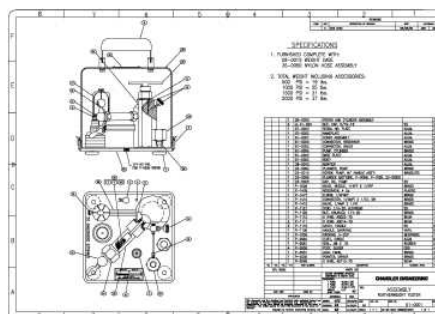
It very quickly became apparent that buying new calibration equipment was out of the question as prices start at four figures and only go up from there. Secondhand/used/pre-loved was therefore the only option. I focussed on deadweight testers as they are a technology that's been in use for a very long time and raised the possibility of finding something affordable. However, the market in the UK does not appear to be particularly big; I did put a bid on one that appeared on Ebay but it went for more than I thought it was worth (little did I know!).

I turned my attention to international offerings – again on Ebay because it's easy; there were quite a number of listings of deadweight testers mainly in the USA, ranging from very old (almost museum pieces) to more up to date. On the face of it prices were reasonable but the costs of shipping and duties soon made them less attractive. However, one did catch my eye, it was cheap but the description was not encouraging. It included comments of “parts missing”, “lid doesn't fit”, “not tested” and an admission from the vendor that they didn't know how it worked.

The listing included a number of photos. Close examination showed that the oil reservoir was missing, but apart from that I couldn't see anything obviously wrong with it. The tester was manufactured by Chandler Engineering in the USA and I found on-line a copy of their deadweight tester manual dated 2006 that included the specification and parts list for the listed tester. Finding that added to my possibly misplaced confidence and after much weighing up of potential risk v. cost/benefit (the cost of shipping/duties in effect doubled the cost) – suddenly the deed was done and it started its journey from Wichita to North Oxfordshire.

Deadweight Testers
and Scales
Instruction Manual
Revised 11 January 2006

AMETEK
CHANDLER
ENGINEERING



Checking it on arrival confirmed that the oil reservoir was missing but its platform and pipework were OK; the lid fitted perfectly once an oversized knob on one of the valves was changed, the pump's screw shaft had quite a lot of play in its bronze nut and there weren't enough weights to give the testing range we need. Importantly, the piston assembly moved freely and showed no signs of leakage or other wear.

Renovation started with the reservoir. I discovered that the plastic pot of an individual cheesecake dessert was just the right size and was completed with a 3D printed cap. The pump was next and its cup seal replacement was sourced from a heritage car parts supplier as a Girling rear brake cylinder is the same size. The thread on the screw shaft did not seem to match any listed thread. I eventually discovered it to be American USS thread which I gather predates and was largely superseded by the UNF/UNC threadforms. I was pleased to find a supplier in Coventry who had stock of the required USS tap, so perhaps not as obsolete as I thought, and I could replace the threaded bronze bush in the pump body.

The weights that came with the tester were only sufficient to test up to 60psi (the capacity of the tester is 2,000 psi) so additional weights were machined from 2" round brass bar. The original weights were used a basis and with an old laboratory balance (10 quid off Ebay) the machined weights were sized and adjusted to give proper increments up to a total that provides a test capacity of 460psi.

So, things were going very well until, on attendance at last year's Seminar for Boiler Inspectors, the assembled throng were told in no uncertain terms that a deadweight tester without UKAS certification is of no use. This caused a few sharp intakes of breath, not least from me and some ponderings on the drive home. But, as I didn't want to be left with just a large table ornament, investigations resumed, this time into UKAS certification.

I found there is a UKAS accredited metrology company just 15 miles from home and they were helpful in explaining the process. The condition of the tester is examined, the weights are also certified and each weight has to be individually marked. The certification process tests combinations of weights to cover increments throughout the range rather than each weight individually. There is no expiry date on the UKAS certificate for a deadweight tester as its accuracy in normal use doesn't degrade with time. It is up to the operator to decide if any incidents of wear or damage to the tester or weights warrants re-certification. The cost of certification doubled the total outlay so far but if the tester and weights are treated with care, it could be years before that cost would need to be repeated. On that basis, and digging the hole ever deeper, the tester and weights were submitted for certification.

AS RECEIVED RESULTS		NORMAL	PRESSURE	ERROR	ERROR
		UNIT SETTING	GENERATED	%	% OF VALUE
MARKER USED ON UNIT	psi	psi	psi	psi	psi
Piston + D4	30	29.917	0.083	0.28	0.28
Piston + D4,I,J	60	60.045	0.045	0.10	0.10
Piston + C,D,H,I,J	100	99.931	0.069	0.10	0.10
Piston + A,C,D,H,I,J	200	199.952	0.048	0.24	0.24
Piston + A,B,C,D,H,I,J	300	299.919	0.081	0.19	0.19
Piston + A,B,C,D,I,J	400	399.967	0.033	0.16	0.16
Piston + A,B,C,D,E,H,I,J	400	399.981	0.019	0.15	0.15
Piston + A,B,C,D,E,F,H,I,J	400	400.072	0.072	0.18	0.18
Piston + A,B,C,D,E,F,H,I,J,K,L,M,N	400	400.057	0.043	0.10	0.10

Uncertainties
From 30 psi to 400 psi
0.01%
0.012%

2000000.uk

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a confidence level of approximately 95%. The uncertainty includes but is not limited to measurement and UKAS measurement. The results obtained with this certificate relate solely to the unit under test identified on page one.

A few days later I collected the tester and its UKAS certificate. The results show that the variance was generally around 0.5psi across the whole range up to 460psi, well within the accuracy appropriate for our use.

The tester is now on permanent loan to the Club and operated only by those trained to use it. We keep a log of its use and the weights are kept in a small padded case. Hopefully that level of care will put off any need for re-certification for a very long time.

Was this a cost effective solution – probably not but it does save the Club from having to cover another expense arising every year or two and removes an uncertainty about the continued viability of boiler testing in the Club. It was a gamble that has turned out OK although at greater cost than originally contemplated, but has certainly been an interesting and enlightening process to go through.



*Tony Lee
Banbury & District MES*

Stoke Row Steam Fair June 2023

Last year's fair was good, so my wife and I decided to go again this year. As she said, it is neither too large nor too small and good day's mouthful. Steam fairs generally follow a fairly practised routine and Stoke Row is no different, so rather than add photos of 'the usual' attendees, here is a selection of photos that seemed to me to be unusual or quirky.

By the gate there was this US roller...very nice condition and reminiscent in design of Cherry Hill's model:

Next, a 'sidewinder' engine (1911 Aveling and Porter Shay drive):



Crying out for a caption competition is this >>
(I still don't know how many trailers there are.
Is there one in the top one?):



<< Still only a four seater.....



Versatile, these stationary engines: >>

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<< One twist of the throttle causes a pants change
(with apologies to an old custom car magazine):

Somewhere there is an unpowered tractor
with four steered wheels (and one young man's
idea of tractor design blown to bits): >>



Made to be used:



And finally, the flypast (guess which one was easier to take):



It's a red kite, by the way: very common (now) around the Chilterns.
<http://stokerowsteamrally.com/>

Paul Naylor

“Mabel” a 7 1/4” Wren engine

(Part 1) – By Rob Hitchcock

(With permission of the author and Plymouth Miniature Steam)



They say that everyone succumbs to a momentary period of insanity in their life, mine occurred in 2022 when I purchased a dilapidated and elderly 7 1/4” Kerr Stuart “Wren” which obviously needed a lot of work. The engine had originally belonged to a public school and was used on their own railway within the grounds, it had some minor rust associated with the platework and a water tender which is sat upon to drive the locomotive, it appeared to be minus the internal tank. The tender was not the original and had ride height and suspension issues. The engine was well used although despite its age, the boiler appeared sound apart from a known water leak from the regulator outlet joint in the smokebox. There was a certificate with the boiler but I would not like to leave myself open to legal action by discussing it. I intend to recertify the boiler before public running such that this issue becomes redundant, hopefully I will not find any other major issues. There was no superheater on this engine although there were two large flues containing restrictor spirals in the boiler to accommodate one, I think this was an option from Swann’s original design as I seem to remember “Hernias” first boiler having the same arrangement. The wheels were several millimetres under the design diameter which although shows some wear would be serviceable but need some attention in the future. It appeared as though the engine has had a mixture of inexpert maintenance together with some good work which had



not been finished, for example the boiler is held up by copper brackets on the boiler and should rest on manufactured metal spacers to level the boiler rather than two pieces of firewood wedged in.

The capable looking boiler hand pump was seized up and much of the pipework needs attention, I also discovered much later that the safety valves were in danger of blowing out due to slackness in the threads, curiously the threaded holes were correct in size but the valve body threads look as though they had been manufactured more than .020" undersize. I have a scheme to remedy this but have not yet done it, more later. I think you can now imagine the type and scope of the repairs to be done and I am aware I took a calculated risk in not tackling the boiler issues first rather than working on the tender, this was because if the boiler would not come up to scratch there was no way in which the engine would be a runner in 2023 anyway and without the tender, I could not run the engine on the track.



The tender also took quite a lot of refurbishment. When examined closely each buffer beam was only held on by four 2BA bolts in shear. I had to reinforce the suspension, buffer beams and frames, also replace and increase all the brass 2BA bolts and nuts with steel, make four new couplings and two new spring buffers, also repaint and provide a new seat. Most of this is now



complete apart from the painting of the plating and the seat. One of the most interesting tasks was the couplings, I had already decided that as this engine had been commercially built there were several items that did not strictly conform to the original design intent which in this case would have required a fabricated hook and chain restraint, I decided not to be too pedantic and make a non-standard pin type drawbar capable of adapting to varying height stock, this was made from 6mm plate and designed to be interlocking from laser cut parts, it is remarkable how well and precisely laser cut parts fit without much fettling. The parts were all tig welded, and retained by six 6mm bolts providing a very strong attachment. For the buffer heads I used a similar technique and rather than turn down 3" diameter bar, used laser cut discs welded to the buffer piston. I mentioned earlier that the tender did not appear to have an internal tank, I had assumed that at some time it had one but it is possible that it held

water without, indicated by an excess of rusty bits. If it was designed to have no internal tank it must have been a very leaky one. I decided to fabricate a new 1.5mm thick stainless internal tank, which will sit on a new 2mm thick laser cut deck, the tank has a bottom outlet and a filler neck under the seat. This has been completed and seems to be about 15 litres capacity. while I was making the bottom outlet, I incorporated a mesh strainer which can be pulled out through the top filler for cleaning.

Having wrestled the engine with assistance onto a trailer to bring it home I began to realise that this is not an engine one can manhandle very easily, and having had a slipped disc last year (not related) decided that I had to design and build a handling system to move "Mabel" from home to track etc. this now consists of a rail bridge from my hydraulic lift onto the trailer which will have a set of rails on a board in the trailer bottom so that the engine can be fixed down for transportation. I will also need to modify the trailer with additional lashing points and legs. I have just finished testing a new "Steaming up" blower which I made from kind donations of various bits and pieces namely a metal tumble drier fan casing and a 1960's car heater motor. I also made a coal shovel and poker to suit the firebox hole. (See photos.) I hope to let you have some more detail in part 2. in which I will start to look at the boiler, having already rebuilt the handpump and made new mounting spacers and sourced some stainless plate to make a new ashpan. On purchase I knew there was a water leak around the top steam outlet to the cylinders this may be just a gasket issue caused by a lack of clamping force as the number and size of bolts holding it down appear inadequate, or it could be something more sinister. I have yet to expose and understand the regulator design which is vastly different to the original, consisting it would appear of a screw down conical valve and seat. I am hoping the regulator "bullet" is not seating on the outside part of the steam outlet in the smokebox as this will put the regulator screw down forces in competition with the bolts holding the outlet, it would then be fairly obvious why the leak is occurring. Anyway, more later when I can make time.



Rob Hitchcock
Plymouth Miniature Steam

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Too many degrees of freedom!

(with permission of the author and Bournemouth & District SME)

I trained as an analytical chemist and so was unable at school to do hands on practical studies like woodwork and metalwork after year 7 (second year in senior school). As budding scientists we were expected to have a rounded academic schooling. There was no place for art etc.!

I have just read a book by Kevin Robinson about the prototype steam locomotive 'Leader' designed by Oliver Vaughan Snell Bulleid, a New Zealander born in Invercargill, southerly end of South Island to British parents who had emigrated from Britain 4 years earlier. He turned out to be an outstanding mechanical engineer. OVS Bulleid was elected President of the Society of Mechanical Engineers and was awarded an Honorary Doctorate of Science by Bath University 3 years before his death in 1970.

OVS was kept under a tight rein when working under Nigel Gresley and he attained a wealth of knowledge before being let off the leash when he became Chief Mechanical Engineer for the Southern Railway at the age of 55. OVS was wanting to put his innovative ideas into practice. But this isn't a biography of Bulleid. It is about what can happen when prototyping.

In 1907 a prototype steam engine was designed and built with sleeve valves to control the admission and exhaust of steam from the cylinders. These had been introduced and used extensively since 1901 by many famous manufactures. Paget's 1907 2-6-2 locomotive was never fully developed and after many trials was eventually mothballed and broken up. OVS used sleeve valves in the 'Leader' motor power bogies some 40 years later.

'Leader' was a complete departure from accepted steam locomotive concepts, leading the way for power units more like electric and diesel locos. It was a C-C type (0-6-0 0-6-0) with a driving cab at each end giving excellent visibility. Unfortunately the fireman was located in the middle of the locomotive with only one door to enter and exit on the "port" side of the loco.

'Leader' had an unconventional dryback boiler and was originally designed with a 43sqft dry-back firebox heating a 6ft 3" diameter boiler. This boiler was offset by 6" from the centre line! The boiler was designed to run at 280psi, the steam being used to run the two triple cylinder sleeve-valved engines converting the generated propulsion via asymmetrical chain drives of the centre camshaft axle. The whole of the valve gear was bathed in oil rather like the sump on an internal combustion car/lorry engine. The power bogies had pivot pads rather than a centre pivot to improve riding.

Unfortunately, the firebricks collapsed several times requiring remedial action during early trials. The final solution found the grate area reduced to 25.5sqft, only 5sqft larger than the 'M7' tank engine it was intended to replace.

The 'M7' tank engine was built around 1900. There were 105 engines the majority of which were built at Nine Elms and rated at a nominal tractive effort of 1 9,755lbs. The last was finally withdrawn in January 1960.

The water capacity of the 'Leader' was originally around 3000 gallons, sufficient for perhaps 50

miles. Routes and weights of trains to be hauled at a nominal speed of 50 – 60 miles per hour required stops of 60miles to take on water and 120 miles for coal.

‘Leader’ was designed with much welded construction being involved. The gross weight was intended to be around 110 tons. The prototype No. 36001 turned out from the works at Brighton when weighed at Eastleigh was 130.5 tons (over 21 tons per axle). This weight would seriously restrict route availability. When the engine was prepared for dynamometer car trials it was discovered that the true axle weight of the engine verged on 25 tons. This meant that the test runnings on the Central section of the Southern Railway were promptly banned. ‘Leader’ never made it to London.

In the dynamometer trials the coal used per hour was between 1564 and 2250 lbs per hour giving a figure of Coal lbs per mile of 45.65 – 55.00, and water gallons per mile of between 33.35 and 40.89. The maximum weight of the trains hauled on the dynamometer tests was 325.5 tons at the drawbar.

	‘U’ Class No 31630	‘Leader’ No 36001	% difference (U Class = 100%)
Boiler Press. (psi)	187	240	28.3% greater
Coal (lbs/mile)	29.75	50.17	68.7% greater
Water (gals/mile)	25.44	37.78	48.5% greater
Evaporation (lbs water/lbs coal)	8.554	7.532	12% less
Boiler efficiency (%)	78.29	71.22	9.0% less
Overall efficiency	4.75	2.82	40.25% less

In conclusion the ‘Leader’ comparative performance of No 36001 compared with ‘U’ Class 31630 is shown above.

The official record shows that the total costs of the Leader project taken from Riddles reports of March and November 1950 was £47,200 for No 36001 and £131,653 for No 36002-5 which were never completed to running condition.

OVS Bulleid went on to become CME in Ireland where he continued to develop the ‘Leader’ concept using turf to fuel the engine, but that is another story.

Recently, Sir Clive Sinclair’s obituary was printed in the newspapers. He along with all experimental scientists and engineers made mistakes. If you don’t try then you never know what might be. Changing too many parameters at once when prototyping makes it impossible to scientifically assess the success of each change. Was Bulleid given too much freedom, or too little time to develop his ideas. Genius or a man on a mission?

References - ‘LEADER: Steam’s Last Chance’

ISBN 0-86299-376-8 published 1988

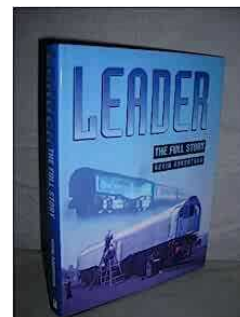
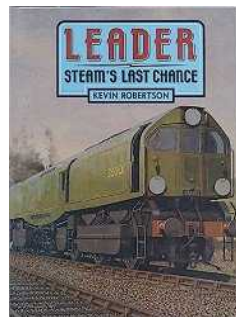
‘LEADER: The Full Story’

ISBN 0-0750910038 pub. 1995

both by Kevin Robertson

Ron Barson

Bournemouth & District SME



A steam powered mini-roller

This steam powered mini-roller was exhibited at the recent Banbury Steam Rally. The notes accompanying this exhibit seen on the photo alongside are typed below:



Arthur Trotter of Bakers Hill, Coleford built this unique steam roller in 1933 to roll the gravel paths and driveway around his house. He used flatbelt pulleys for the rolls and steel angle for the frame. The original boiler was built by Tom Goodhand of Gillingham, Kent and it's single cross tube produced an impressive 40psi! The engine is something of an unknown, it has one manufacturer's marking on one of the crankwebs - an ornate C which had been assumed to be Clarkson of steambus fame, but the engine isn't like any known design from that company. Trotter actually bought two identical engines from the widow of a man who'd died during WW1 but she was reluctant to give any information about their origins. What we do know is that we have two high pressure cylinders 2 1/4" bore x 3 1/2" stroke. Each piston has four rings and the slide valves are worked by Joy valve gear. The crankshaft has gunmetal, lead filled balance weights. The crankshaft and connecting rods are hollow. The engine stands on turned pillars and incorporates two plunger pumps driven from the crossheads.

Trotter died in 1977 and his collection of steam engines and models passed at his request to Gloucester Folk Museum. It was soon discovered that after 40+ years of work the boiler was badly corroded and the roller was left in store until 1989 when the museum started an eight year restoration, this included sending the boiler back to Coleford for Fred Watkins Engineering Ltd to repair. Museum volunteers then ran the roller at various local events between 1997 and 2004 when it was discovered that the boiler was now beyond economic repair. Over the next couple of years a new, higher pressure boiler was designed and built by Bell Boilers. This boiler has 72 vertical fire tubes and a working pressure of 125psi. This was delivered to the museum but for various reasons, never fully fitted.

In March 2016 following lengthy discussions with the museum the roller left Gloucester and returned to the Forest of Dean to her new home at Procrastination Works in Littledean following a full rebuild and commissioning of the new boiler. She made a joyous return to steam in August 2017 and continues to visit many rallies and events around the country as well as rolling the occasional driveway!

“Arthur Trotter of Bakers Hill, Coleford built this unique steam roller in 1933 to roll the gravel paths and driveway around his house. He used flatbelt pulleys for the rolls and steel angle for the frame.

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Vol 1: 3 bar litres to 1100 bar litres; Vol 2: under 3 bar litres; Vol 3: LPG tanks under 250 ml.	
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