

# **SOUTHERN FEDERATION**

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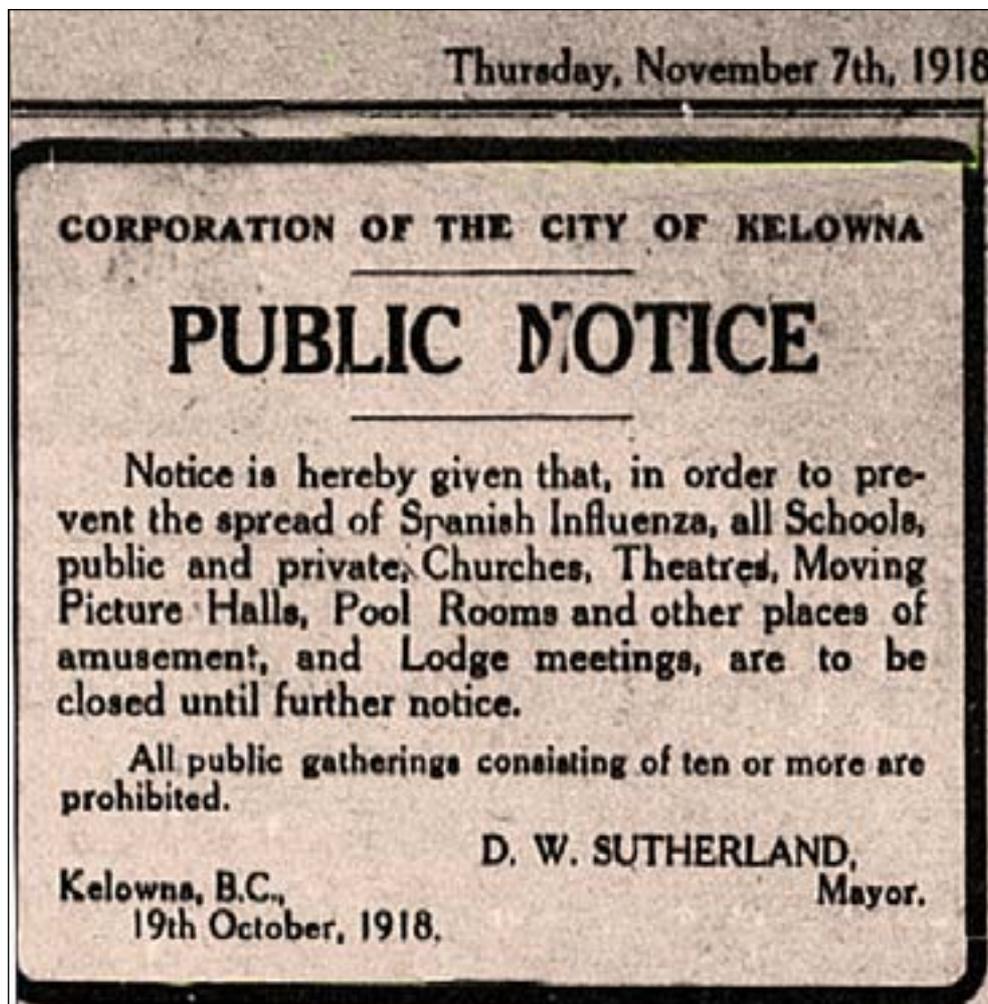
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# **MODEL ENGINEERING SOCIETIES**

Formed from the Federation established in 1970 by Model Engineers for Model Engineers  
A Company Limited by Guarantee in England and Wales No. 9002737  
[www.sfmesc.co.uk](http://www.sfmesc.co.uk)

**We'll make 2021 a good year, won't we?**

**Prepare to be Zoomed to your Southern Federation MES Annual  
General Meeting: 13th March 2021**



**Best wishes for your Christmas and New Year**

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*Views and comments expressed in this publication are not necessarily those of the Southern Federation of Model Engineering Societies*

[www.sfmesc.co.uk](http://www.sfmesc.co.uk)

Volume 10 - Issue 4 - December 2020

## EDITORIAL

**W**e seem to be getting through it all! The vaccine must be the best news for all of us, not just the model engineering fraternity but everyone. It seems many sections of society are getting shutdown fatigued. It is annoying to see 'raves' and the like when the people in our hobby tend to shield and do their best to stay safe. Perhaps it's because so many model engineers are older! Come on young engineers!

Creating a newsletter when little is going on is an interesting challenge with no shows to report, no rallies, no visits. We know what some societies are doing in lockdown and we have heard all the jokes about wine and so on. But we do have a wonderfully rich resource in the member (and non-member) society newsletters from which we are allowed to quote.

Authors are generous with their permissions. It should not be surprising that people who can master making a working model can also write fluently. Their work is of a very high standard and we find some wonderful surprises. We have always wondered

why a simple 5P had become a 5XP. Mike Wheelwright explains it in a masterful article that the Worthing Society has given us permission to quote. Thanks go also to Societies in Leeds and on the Isle of Wight.

We sometimes fail to consider the hobby as a whole so here's a New Year's resolution. We need to hear more from the marine world and the steam road vehicle, traction engine fraternity. We'd like to hear about your adventures. Horology is another very special sector; we trust you enjoyed the visit to the Perth bell tower and need to hear of your accomplishments!

For many it will have been a difficult year. Many readers will know I receive messages from Canada. Toward the end of this newsletter is just such a message. You may think your editor has gone soft in the head; not so, this little story reminds us of the value of families as we head into Christmas and the New Year.

Best wishes for the season and a healthier 2021.

*David Goyder, Newsletter Editor*

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## CHAIRMAN'S CHAT

**M**any of you may already be aware that for health reasons Martin Baker has had to resign from his various roles with Southern Federation, I'm sure you'll wish to join me in thanking Martin for his contribution to the SF and wish him well for the future. We welcome back Peter Squire who has returned to the role of SF secretary and David Goyder, editor of this newsletter, who has also agreed to be the SF's treasurer. Thank you both.

While much of the government's attention has been focused on beating the Covid 19 virus and securing (or otherwise) a post-Brexit deal with the EU, it still seems hell bent on turning us into an all-electric powered nation. As many of us are involved in running miniature railways, traction engines, and the like, how will this affect us? Increasing numbers of battery powered, diesel outline, locos are to be seen on our tracks and I have even heard of battery powered steam loco outline models. But I'm sure the lure of real steam, whether existing or still to be built, will be as strong in the future as it has been in the past, which brings me to the supply of suitable steam coal, or an acceptable alternative.

At the beginning of the year I contacted the appropriate government department for advice and comment on the matter; ten months later I have received a reply stating the government's desire to limit the sale and use of all fossil fuels.

My questions concerning miniature steam locomotives, traction engines, etc. were totally ignored. Until we're told otherwise by the powers-that-be, I suppose we can continue to use fossil fuels in our boilers, but this of course assumes we can obtain suitable fossil fuels.

My questions to folk who run live steam are how are you getting on obtaining coal? How secure is your supply? Are you willing to share details of your supplier with others? Should we produce a list of suppliers, and would you be willing to contribute to such a list?

As an afterthought, I believe many years ago a country with limited coal supply but a plentiful hydro-electric capacity experimented with fitting very large immersion heaters in their steam locomotive boilers with pantographs to collect power from existing overhead wires. I guess the experiment may not have been a success but could this be an interesting idea for someone to try in miniature? (I'm just not sure about the overhead power supply!)

Well it's that time of year again, very nearly the end of what has been a difficult 12 months, so it just leaves me to wish you a merry Christmas and a healthy New Year

*Bob Polley, Chairman*

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***For your own benefit, please keep your email addresses up to date!***

## Boiler Inspectors be aware!

**B**oiler inspectors need to be aware that from 1 Jan 2021, UK pressure vessel manufacturers may be using the UKCA mark instead of the EU CE mark. This new mark shall be treated under the boiler test code as a CE mark, as permitted under the Pressure Equipment Regulations Act. For vessels made after 1 January 2022, the EU CE mark is the only valid mark for boilers made in Europe and the UKCA mark is the only valid mark for boilers made in the UK.

Owners of models should be aware that the position of recognition of the UKCA mark within Europe is not yet clear. This may affect those in the future if they are planning to take their model to Europe or to sell it there.

For the latest information including details of the form of the new mark, visit <https://www.gov.uk/guidance/using-the-ukca-mark-from-1-january-2021>

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## Passenger Carrying Miniature Railway Group

**T**he Passenger Carrying Miniature Railway Group has had to change its website address to [www.pcmrsg.org.uk](http://www.pcmrsg.org.uk) because its original website has been taken over by a Canadian online Casino which doesn't say much for the domain registration process!

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## Are you a Society Secretary?

**A** plea to all Society Secretaries to please check and update as necessary, contact details held in the SFMES membership system.

We don't want you to miss out on the AGM documents!

If you need any help to update details, please contact either [petersquiere@sfmes.co.uk](mailto:petersquiere@sfmes.co.uk) or [paulnaylor@sfmes.co.uk](mailto:paulnaylor@sfmes.co.uk) whose phone numbers are available via the Contact Us section of the SFMES website. We're here to help!

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## Grants?

**D**ue to the latest enforced national lockdown, it is possible that 'business interruption grants' may again be available from your Local Authority. These will be subject to a number of conditions and any interested club should make the appropriate enquiry of their Local Authority. We understand some clubs have been able to secure further support.

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## Wansford Miniature Railway

**W**e welcome Wansford Miniature Railway, a society newly affiliated to Southern Federation MES. Visit <https://nvr.org.uk/article.php/119/wansford-miniature-railway> for information about the group.

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## So you'd like to join the Southern Federation Committee?

**F**ate plays a part in all our lives. Sometimes it's called timing, or luck, or being in the right place at the right time. Just like the time you were doing nothing and that girl walked into the room. Your heart stopped and you knew you would be together for the rest of your lives. Alternatively, the girl walks into the room and you are chatting up someone you shouldn't be and that girl is your wife with an opposite and expensive result.

So, there I was, sitting benignly during a Zoom committee meeting, trying to gather scraps for the next newsletter and our Chairman tells us our treasurer has had to resign due to ill health and we need a replacement *now*. Notice '*now*'. This is not a suggestion to put out a call for someone to volunteer next year perhaps, if they ever do, no, '*now*'!

So what does one do? Duck under the table, plead insanity (probably quite true) or hear the Chairman tell you how good you'll be at the job, smile back painfully and accept the challenge.

The '*now*' needs a little explanation. The accounts for the Federation don't stop just because the treasurer's post isn't filled; life goes on. It had been decided to move the accounts to a separate and independent system. There was a little work to do, so the '*now*'. Actually, we have adopted a Sage application, pretty well the industry standard, and it has been done just in time for the year end.

Back to the newsletter role, I found an old newsletter from 2013 with a front page plea:

*"We desperately need volunteers to serve on the Southern Federation Committee."*

That was seven years ago! The same is being said today leading to the conclusion that some reverse psychology might be best. Contribute to the SF, you must be nuts! No, stay away, they'll roast you and cut you up into small pieces! Don't do something useful for the hobby. Why meet like-minded engineers and find out they are quite dedicated and pleasant. No, spurn the idea of helping, let the some other muggins do it!

There, a little of the opposite view. Perhaps they'll come running!

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## Annual General Meeting: 13 March 2021

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Since the launch of the Southern Federation as a company limited by guarantee (CLG) the venue for the annual general meeting has fluctuated between a visitor attraction and a member's site.

Last year we had an excellent day at Steam, the museum of the Great Western Railway, in Swindon. A highly rated museum that provided first-class meeting room facilities and catering. Although the exhibits were the wrong shade of green for many of the delegates, the access to the exhibits was unprecedented.

2015 was the inaugural AGM for the Company, held at Bursledon Brickworks Industrial Museum, between Southampton and Portsmouth which gave an insight to early mass production techniques and provided a very comfortable meeting venue.

2016 was held at York City & District Model Engineers, located adjacent to the East Coast Main Line which provided several distractions throughout the day!

2017 was a visit to Claymills Victorian Pumping Station near Stoke on Trent where the simplicity of the meeting room was more than compensated for by the magnificent pumping engines on display at the site.

In 2018, the Cardiff Model Engineering Society were our hosts in their magnificent clubhouse and workshop facility.

In 2019, Wolverhampton & District MES opened its workshop doors to a splendid display of model engineering techniques and models, with the business part of the day held in the meeting room above the workshop.

So, the dilemma now is when and where shall we hold the 2021 AGM?

The most likely 'when' will be the second Saturday of March: Saturday 13th March 2021. As for 'where' the current Coronavirus Covid-19 Restrictions are most likely to restrict the where to your front room or, if you prefer, the comfy chair in the corner of your workshop.

2020 has introduced us all to many new words and concepts, one of which is the Zoom Meeting. Although not finalised at the time of writing, it is likely that the AGM will be held using Zoom Video Conferencing. Many societies have successfully held social and formal meetings using this system which allows delegate participation if properly set-up. I have sat in on such a meeting with 90 delegates and it went very well.

More information will be given on the website, [www.sfmesc.co.uk](http://www.sfmesc.co.uk) as arrangements are made, and full details will be in the formal notice due to be issued in late January or early February.

To assist in the smooth distribution of the paperwork, can I please ask that all society secretary's check that the details held on the SFMES membership system about their society are up to date? Please update them where necessary or send me the revised details and I will make the relevant changes to the records.

I would normally close by saying *"I look forward to seeing as many of you as possible at the AGM"* but that's not going to work this time! However, I look forward to seeing lots of familiar faces on the Zoom screen in March!

*Peter Squire, Hon Secretary*

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## When insults had meaning!

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Disraeli: *"Sir, you will either die on the gallows or of some unspeakable disease."*

*"That depends, Sir,"* said Disraeli, *"whether I embrace your policies or your mistress."*

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*"He has all the virtues I dislike and none of the vices I admire."* Winston Churchill.

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*"I am enclosing two tickets to the first night of my new play; bring a friend, if you have one."*

George Bernard Shaw to Winston Churchill.

*"Cannot possibly attend first night, will attend second ... if there is one."* Winston Churchill, in response.

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*"He uses statistics as a drunken man uses lamp-posts ... for support rather than illumination."*

Andrew Lang (1844-1912).

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## Strategy - the Story so far

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Since our last Newsletter, we have been busy on some of the more detailed planning necessary to implement the future strategy for the Federation. As you all suggested (and we recognised) this meant developing the website to address the issues you had previously identified as a priority. We asked for volunteers and were very pleased to receive the assistance of five individuals with wide ranging experience. Some were IT professionals, others were Webmasters in their own right, all had held responsible posts in Model Engineering Societies and were also practising model engineers. This team has completed Phase 1 of the work, an objective, independent assessment of our current IT arrangements, and this has helped us understand the path we need to take for this development. We have already started Phase 2: the next steps of delivering an attractive and modern website.

Unhappily, our IT Manager and Treasurer, Martin Baker, has had to resign for reasons of ill health. It is probably fair to say that this was exacerbated by the long hours under stressful conditions that Martin spent on SFMES activities, support that we all appreciated. We are hopeful that Martin will continue to support the operation of the current website during transition, although I am sure we all understand this might prove difficult and ask for your understanding and patience in these difficult times.

Since the 'website' (or more accurately, its 'back office' functions) included handling SFMES accounts, we have been obliged to deal with this issue very quickly. Our new Treasurer, David Goyder, has stepped immediately into the breach and is in the process of delivering a new accounts package based on Sage, a commercially available package also used by the Federation's Accountants. I am sure that he will have more to say on this subject and what it might mean for the membership in due course. David is currently burning the midnight oil building this critical part of the processes we need to implement.

On the bright side, we had already decided not to seek subscriptions for 2021/22 year owing to the C19 pandemic and its effects and so you will not receive any reminders for subs this year. However, we would appreciate you continuing to try to update the database (or sending changed data to the Membership Secretary).

As a result of these challenges, our endeavours to address this 'website issue' have assumed added impetus and we hope to get on with the project as quickly as we can, commensurate with the need to retain professionalism in our choices and subject to the resources that we have.

The website is the first of the activities we recognised as essential before we could start improving our services and, rightly, has our focus, however, the second activity that has some 'crossover' with the first is the need to improve the way we communicate. This also needs careful thought and attention to detail as it embraces the look and feel of the website and other information as well as getting across the 'image' we wish to portray. We are seeking professional input for this activity too: if anyone has particular interest and ability in this direction we would be delighted to hear from you.

We hope to be able to show you all visible progress during 2021 but, as always, we stress this will only be possible if we have sufficient help. We are making progress with the 'tools' we need, but will then need volunteers to take on the management of specific activities for the future. In due course we will publicise what these could include, but it is fair to say that work on health and safety, boiler testing and junior events and competitions will form a critical part!

*Paul Naylor & Ivan Hurst  
November 2020*

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## Boiler Inspectors' Seminars 2021/2022

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The Joint Southern Federation of Model Engineering Societies and Northern Association Boiler Inspectors' Seminars have been disrupted by the Covid-19 pandemic currently dominating our lives.

Our Secretary, Peter Squire, a leader in the seminars will continue his important contribution with the support of NAME and SFMES.

Due to the continuing virus situation, seminars have been postponed and we are in 'wait and see' mode. We hope to be able to resume seminars later next year. We advise early indication of your interest to Peter Squire at [peter@the-squires.co.uk](mailto:peter@the-squires.co.uk) or by phone to 01327 342167.

Suitable venues are, of course, always welcome.

## Buyer Beware or *Simplex* - A Comedy of Errors

*A story from Colin Bainbridge of Ryedale Society of Model Engineers to provoke discussion.*

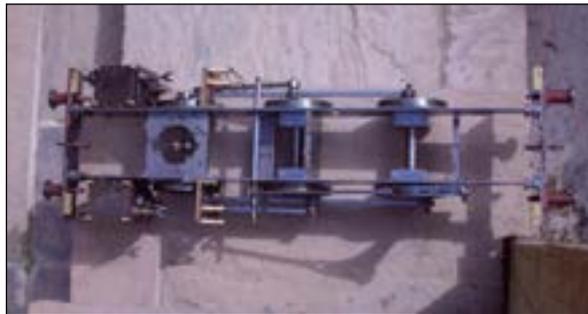
*Disclaimer: Those of a technically nervous disposition are advised not to read this.*

Just after I moved to a village outside Scarborough over ten years ago, I picked-up a chassis for a 5in. gauge *Simplex* from a well known on-line auction site, thinking I might be able to progress it further, maybe even finish it and sell it on. Having rented when I first arrived, this was just at a time when I was about to buy a property and move house.

Life got a bit more complicated for a while so I put it under the bench for later; this then progressed to moving house a second time and eventually storing the chassis. Recently I dug it out and started to look it over with a view to selling it in the condition I bought it, as by now I realise I'm a slow builder and have found that when it comes building, 3½ in. gauge as is as big I wish to handle. I'm easily frightened by big lumps of metal!

Still a country member of my old club and thinking the Club Newsletter might be a good place to advertise said item, I was prompted to 'look it over'. I would then be in an informed position to advise any potential purchaser of its good points and maybe some of its weaknesses, as no one wants to knowingly sell something 'dodgy' to another member. The photos I have taken show it in pretty much the state I bought it though now without its rather garish paint job on the frames.

Unless you're very lucky, when you buy something already started, it's only to be expected, you'll not like everything you find and may have to remake a part or two. If, however, you discover an inaccuracy you also have to ask yourself 'is it an important error or can it be lived with?'



As I progressed with my quest to establish the truth in this particular case I didn't realise the answers to these questions would be so challenging.

At this point take a moment to look at the pictures and I am sure, like me, you'll think it doesn't look too bad.

The following is a list of what I have found.

### Frames - the foundation of everything

I think one plate is slightly longer than the other causing the buffer beams to be out of square to either plate. The spacing of the slots in the two buffer beams, with angles riveted either side of the frame plates, are different and neither are correct to drawing (both being under dimension) and introduce a taper of 0.030 in. end to end. This is further complicated as all the stretchers are a touch over size causing the plates to bulge out slightly.

Only the middle horn slots appear to agree in spacing and size across the frame. The front set has a slight difference from one side to the other and the rear set a larger difference one to the other.

Putting a straight edge along the inside length of plates produced further interesting findings. As far as I could make out, the front half of the frames were roughly straight (bearing in mind the

buffer beam issue) but the rear section became progressively more offset peaking at around 1/8 in. offset on arrival at the rear buffer beam. This appears to start around the middle stretcher point.

### Axleboxes

Most of the axle boxes (fixed, i.e. non split) are bespoke and fitted to each horn slot with a variation of over 1/16 in. from the largest to the smallest. Not quite sure why, but all are a loose(ish) fit on the axles as if worn, which they can't be as they are all new build.

### Cylinders

Surprisingly, the cylinders aren't too bad, that is they are square all round and to length; however the tapped stud holes for attaching the steam chests on both cylinders in the area located over the recessed end of the ports (cylinder ends), have broken through into the port. Similar story with the guide bar fixing points on the rear cylinder covers, that is the tapped drilling has broken into the top of the threaded gland hole.

The location of each cylinder on the frames caused some consternation as I found one cylinder was nearly 1/16 in. closer to the driving axle than the other. The fixing holes in the frames are okay but a check of the fixing holes in the cylinders revealed the left cylinder to be offset by about this amount to the other. Interesting!

### Motion brackets

With paint removed, the motion brackets seemed quite presentable. Both are castings. However, looking straight-on to one (top to bottom) it looked bent. Straight edge again, and yes it was bent but I can't decide if was always like this and has been machined in this state. Same story with the casting's rear fixing, slightly bent along its length. The other motion bracket has another oddity for, when screwed home, the inner pivot support for the expansion link is offset to the front one; meaning the pivot points are out by about 1/32 in. one to the other.

### Weigh shaft bearings

These phosphor bronze bearings are a surprisingly good fit on the shaft suggesting they have been reamed to size and may be in line. I say surprising because there's no sign of binding on the shaft indicating they're happily in line with one another and could suggest the frames left / right are as currently affixed, in alignment and possibly proving all the frame errors up to now have been ignored.

### Coupling rods

This is where the story becomes interesting. With all I'd found, I thought I'd be able to prove the two sets of rods wouldn't match. But no! With accurately sized rod (to represent the crankpins) put into all the three bushes

simultaneously, both sets came together nicely. I was unable to disprove this when I checked the wheel centres as they too appeared okay.

### Summary

So where does this lead us? While there is no doubt this chassis is a mess, it still prompts the question: could it still work? When is something really unusable?

Let me say straight away I have no intention of trying to find out but, for the sake of discussion, I've always maintained there is and should be a wide range of ability and accuracy among model engineers, and I think this chassis proves it. For although what I have found puts this firmly at the dodgy end of the scale, what is there is fairly competently made. My investigations have identified a catalogue of errors, but the indications are the builder has (at times) tried to overcome some of these shortcomings. The problems appear to stem from the inaccuracy of the frames and subsequently putting bits together and trying to work round this known deficiency.

The obvious place to start rebuilding would be to use a new straight, properly dimensioned and square set of frames. This though would upset the axle boxes as they appear to have been machined to fit what already exists. Therefore re-machining the axle boxes (assuming enough meat is available) would probably upset the wheel spacing necessitating new coupling rods. If the slight looseness of the axle boxes is to be corrected, then one wheel would have to come off and new axle boxes made.

The alternative (controversial – and not for me, guv) solution would be to ask yourself:

- Are all the wheels the same diameter? Yes.
- Is the wheel spacing correct? Yes.
- Do the wheels rotate freely with rods connected? Yes.
- Are the cylinders correctly located, well nearly, or could they be corrected to be so?

Therefore, as long as the boiler locates front to back correctly, the stretchers reduced slightly and with the dubious guide bar brackets remade, the rest could be made to work or ignored. Or could it? What do you think?

As to its future, watch out for a box of *Simplex* bits being advertised on a certain well known on-line auction site!

*Colin Bainbridge*  
*(I did warn you this article was not for the purist!)*



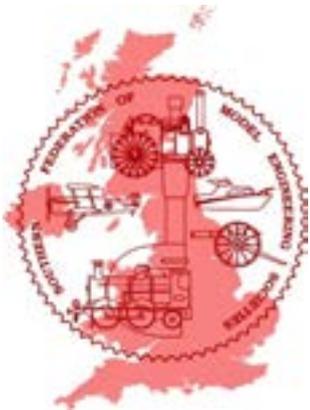
# SOUTHERN FEDERATION TROPHY AND POLLY MODEL ENGINEERING LTD. PRIZE

Any active young member of any Club or Society affiliated to the Southern Federation of Model Engineering Societies is eligible provided he or she is no more than 24 years of age at nomination, is an active member of his or her Club or Society and has demonstrated skills in the use of equipment typically associated with the hobby of model engineering.

Please visit

[www.sfmes.co.uk](http://www.sfmes.co.uk)

for details and a nomination form



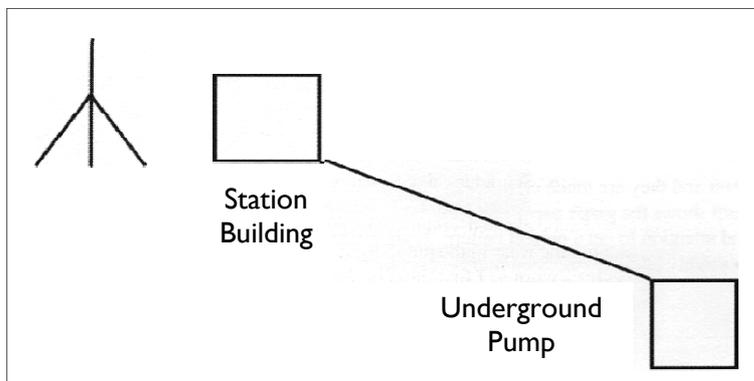
## A Problem for Engineers to Solve - but how was it done?

By John Shelton, Isle of Wight Model Engineering Society

Chillerton Down Transmitting Tower is a very high TV transmitting tower in the middle of the Isle of Wight.

Some years ago I worked at the Chillerton Down transmitting station on top of the Down near Bowcombe. We had a problem with the water supply which was pumped up from Chillerton Village. The issue was high meter readings: when this was checked the water meter showed discharge when no water was being drawn at the transmitter.

Our records showed that the pipe was made of plastic and it was a wet summer so, walking up the long Down, there was no indication of greener grass.



At that time there was no method of detecting a buried plastic pipe and we did not know the track where the pipe was buried between the pump and the transmitter building.

The problem was how to calculate the location of the leak to within a few metres. We had access to the

pump which was in an inspection pit that included a tank. The pump was controlled by a pressure switch so it only pumped when the pressure dropped when a tap was open.

*How did John find the leak?*

*The solution is somewhere in this newsletter.*

## Not all Thieves are stupid!

### Long term parking

Someone broke into a car left in the long-term parking at an airport while the owners were away. Using the information on the car's registration document in the glove compartment, the car was driven to the owner's home and the house robbed. So, I guess if we are going to leave the car in long-term parking, we should NOT leave the registration / insurance documents in it or your garage remote door key. Something to think about with all our new electronic technology!

### GPS

Someone had their car broken into while they were at a football game. Their car was parked on the green adjacent to the football stadium and specially allotted to football fans. Items stolen from the car included a garage door remote control, some money and a GPS prominently mounted on the dashboard. When the victims got home, they found their house had been ransacked and just about everything worth taking had been stolen. The thieves had used the GPS to guide them to the house then used the garage remote control to open the garage door and gain entry to the house. The thieves knew the owners were at the football game, knew what time the game was due to

finish and so knew how much time they had to clean out the house. It appears they had brought a truck to empty the house of its contents. Something to consider if you have a GPS - don't put your home address in it. Put a nearby address (like a store or gas station) so you can still find your way home if you need to, but no one else would know where you live should your GPS be stolen.

### Cell phones

I never thought of this! The lady concerned has now changed how she lists the names on her cell phone after her handbag was stolen containing her cell phone, credit card, wallet, etc. Twenty minutes later when she called her hubby from a pay phone to tell him what had happened, hubby said: "I received your text asking about our pin number and replied a little while ago." When they rushed to the bank, the staff told them all the money had already been withdrawn. The thief had actually used the stolen cell phone to text 'hubby' in the contact list and got hold of the pin number. Within twenty minutes all the money had been withdrawn from their bank account.

Continued on page 13 

## What the 5XP is that?!

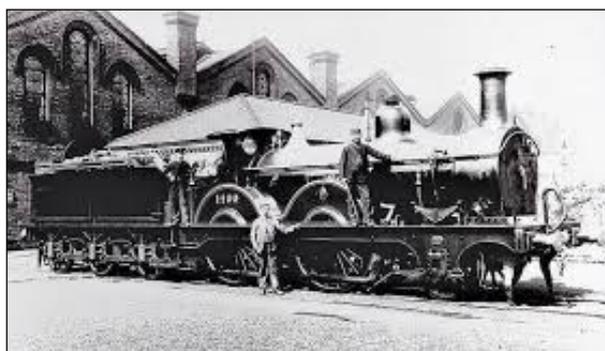
By Mike Wheelwright, Worthing & District Society of Model Engineers

I am acquainted with two people currently building models of LMS Taper 5XPs, maybe they don't recognise their engines by this class name but it was the official title of the engines train spotters called 'Jubilees'. The term comes from their power classification, 5XP, and as there were two other types of engine similarly rated, the reference to their taper boiler identified them uniquely.

But how the heck can you get a classification called 5XP? Well as you might imagine it all goes back a long way, not as far as to Stephenson but certainly to 1896, half-way through the steam era. The Midland Railway had a passion for organising things to a greater extent than other companies and it occurred to the Operating Dept that passenger engines should be grouped according to power output to facilitate deciding which type of engine should be used for each duty. The most powerful type (in 1896) was referred to as Class 1 with weaker engines identified as Classes 2 & 3, being more-or-less decided by their tractive effort and perceived performance. Each train service was designated as requiring an engine of a particular class according to the difficulty of working, taking into consideration the load, route and timing. The Shed Master just had to supply an engine of the correct classification for each job, or else double-head: no thinking allowed! It was not long before the first snag appeared with the introduction of a more powerful type of locomotive which then being at the top of the league table was designated Class 1, so the others were pushed back by one class. In 1905 the order was reversed to accommodate newcomers more easily so that the weakest engines became Class 1 with the Compounds and '990' Class 4-4-0s assigned to Class 4. As everyone knows the Midland had a small engine policy, so apart from the Lickey Banker the railway had nothing more powerful, and no more than four categories were necessary.



5XP No 5593 Kolhapur built December 1934



Midland Railway Class 1

The next event in the story was the grouping of 1923 when the Midland became part of a much bigger concern called the London Midland & Scottish Rly. Operations in the new company were headed by ex-MR men so the power classification system was extended to the engines inherited from other lines as well as incorporating freight locomotives and tank engines previously left

outside the scheme. The existing classification was regarded as too simplistic for application across the entire range of engines and further work was done to find something more suitable than tractive effort alone. When reduced to a very simplified level it can be said that the power output of a steam locomotive depends on the size of its cylinders and its boiler pressure since the work

produced during a piston stroke is equal to the swept volume multiplied by the average pressure. This view is enshrined in the standard formula for Tractive Effort that multiplies the total swept volume per revolution ( $4 \times \text{cylinder vol. for a 2-cylinder engine}$ ) by 85% of boiler pressure and divides it by the circumference of the coupled wheels so as to give an imaginary figure of so many pounds of pull.

Your old Ian Allan ABC told you that a 'King Arthur' had a TE of 25,320 lb (11.3 tons) which might lead you to believe SR No. 453 could pull a train of about 2300 tons at 60 mph on the level. Of course it could not, but if easing forwards with cylinders full of steam at a pressure of about 170 psi it might register a pull of something like the nominal TE if the rail were well sanded. In practice the average pressure in the cylinders, called the Mean Effective Pressure (MEP), is not anything like 85% of boiler pressure and depends on things such as steam passages, ports and their openings, valve design and cut-off. With a bit of clever design 20% is more likely but even then the boiler has to be capable of supplying the quantity of steam needed at full working pressure for the rate of working.



*The Editor's locomotive, a 4P similar in power to a Compound.*

It was all a bit too complicated to do real calculations for each type of engine but the LMS realised it needed something better than simple TE. Help was to hand courtesy of the Lancashire & Yorkshire Rly through a bit of investigation into cylinder performance at Horwich that threw up some approximate figures expressing the MEP as a percentage of boiler pressure at different piston speeds. This was used to calculate another version of the pulling force at the wheels at any defined speed; for typical passenger work figures were based on 50 mph and for freight engines 25 mph was used as being more suitable. All this ignores whether the boiler can supply the steam required and whether the steam circuit can get it to the cylinders without impeding the flow. However they did have a go at calculating the theoretical capacity of the boiler based on grate area estimating an output of 800 lb/hr of steam per sq. ft. and checking it against the nominal requirement of 25 lb per HP hour (20 lb for superheated boilers) for each type of engine. The table shows the tractive effort range by class.

Taking examples at the specified 50 mph, the TE quoted for Class 5 equates to about 900 DBHP and that for Class 6 about 1000 DBHP. They are reasonable but cautious figures as well they might be considering the generalisations used in the calculations.

Some engines would do better; Scots classed as 6 normally worked continuously at this speed on the 1-in-330 up to Tring requiring 1250 HP at the wheels.

At the formation of the LMS the ex-MR operating people regarded the Compound as the 'bee's knees', and on the passenger side it continued to be Class 4 along with George Vs from Crewe, but a higher class number was needed for the Claughtons. The MR 'Big Goods' 0-6-0 was classed as 4 for freight but the existence of considerably more powerful 0-8-0s from the LNWR and L&YR did require classes numbered up to 7. From 1928 the letters P (passenger) and F (freight) were attached to the class designations so Compounds became '4P', Claughtons '5P' and the Big Goods were '4F'.

**LMS engine power classes**

	<b>Passenger Engines At 50 mph</b>	<b>Goods Engines At 25 mph</b>
<b>Class</b>	<b>TE tons</b>	<b>TE tons</b>
1	1.5 – 2.0	2.8 – 3.6
2	2.0 – 2.5	3.6 – 4.3
3	2.5 – 3.0	4.4 – 5.1
4	3.0 – 3.5	5.1 – 5.8
5	3.5 – 4.0	5.8 – 6.6
6	4.0 – 4.5	6.6 – 7.3
7	4.5 – 5.0	7.3 – 8.1

In 1927 something significantly smarter appeared for passenger work and the 'Royal Scots' were designated Class 6P and finally the 4-6-2s carried a 7P classification. In an attempt to upgrade the Claughtons, several of them had been fitted with a larger boiler, although the result was questionable some sort of differentiation of power was needed, so they were given an 'X' suffix, making them 5XP, a sort of class 5½. In the event they were replaced by new engines with Scot type frames and cylinders carrying the big Claughton boiler (colloquially 'Baby Scots') so these were of course also 5XPs. While the engines were being turned out, a Mr Stanier appeared on the scene promoting taper boilers which were duly fitted from the 53rd engine thereby creating a new class called Taper 5XP. So, the old Midland power classification eventually passed to British Railways and was continued by the new management which, despite being ex-LMS, had the forethought to reclassify Scots as 7P and 4-6-2s as 8P leaving space for the 5XPs to become 6Ps. It is interesting to note that the engine pictured as MR Class 1 lasted for so many years that for a short time it ran concurrently with class 7P No. 6230 on the LMS. Quite a contrast.

*Mike Wheelwright*

## Nilfisk - Bless you!

by Ian MacDonald, Leeds Lines, 2014  
Leeds Society of Model and Experimental Engineers

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‘Oh, woe are we!’ - the typical cry from my sister’s household when a domestic appliance disappoints or malfunctions. Then: *“I’ll put it in the car for you when we come down.”* “How kind.”

‘It’ was an elderly Nilfisk vacuum cleaner which, in its youth, had been virile and hearty; now it was feeble and tiresome. In its palmy days it could lift gravel from a foot away, now ancient and asthmatic it could be defeated by anything more substantial than thistle-down. *“If it’s shot, just bin it”* was her parting injunction.

A very fine engineer of my acquaintance once said firmly, *“If something’s been made, it can be mended.”* Being well-stricken with years I empathise with decaying technology and took it outside to try to find what ailed this hitherto punchy pensioner.

Yes, there was a noise when it was switched on, so the motor seemed to be alive. Yes, there was a smidgeon of suction at the end of the hose. Hmm. Out of curiosity I disconnected the hose from the main machine and switched on again. The motor sounded a little less strained and there was certainly more suction at the hole. *“Not dead yet,”* to borrow a phrase.

If the hose was not especially kinked why couldn’t the machine draw dirt through it? The Nelson test revealed no light passing down the tube so I cut a straight stick and poked. Halfway and no further. The blunt end could do no better. Take a run up and ram it in, there’s nothing to lose. A couple of attempts certainly dislodged something; further poking and shaking extracted an industrial sized fur ball and some component parts of a dead mouse which I didn’t fancy examining too closely. It may have been made but certainly I couldn’t mend it.

Re-assembled, the Nilfisk worked less badly but hardly aspired to the gravel lifting feats of yore. Even rinsing the filter and fitting a fresh paper dust bag released only some of its old elan. Out of curiosity and before binning it as per instructions I wiped the inside of the chamber wherein the dust bag sat; what looked like dirty metal definitely had some ‘give’. Closer examination revealed that a seal was attached to this dirty metal, and that this dirty metal was actually cotton. I prised off the seal and released a cloth bag impregnated with dust to the point of rigidity. At this point I must have lost my presence of mind because I shook the bag. Most of the garden vanished in a cloud of domestic dust and I found myself coughing for Britain. My next ploy was to kick the bag round the garden, but still the dust came. I banged it on the wall and the supply seemed inexhaustible.

Complaints from over the fence seemed jolly unsporting. In time the clouds parted and the sun came out to reveal a pale grey lawn and surrounding vegetation while a ghostlike figure still smote the side of the house with the bag and dust still flew. Nothing if not a good neighbour I stopped my smiting and called up the cavalry by putting the bag in the washing machine.

Eighty minutes passed on the clock and much mud passed down the drain before I was able to hang a gratifyingly clean dust bag out to dry. Reassemble, test and glow with smugness. Normal service had certainly been restored but it’s a pity that the revived Nilfisk has to rely on an unsightly bungee cord because eSpares don’t seem to stock the over-centre clips that hold the two parts of the mighty machine together.

*Ian MacDonald*

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## A Miniature Railway Problem

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You are driving a lovely Great Central 4-6-0 at the head of a train of five coaches on a 7¼ in. scenic railway with several stops where passengers can get on and off while they enjoy the gardens.

You start with a train load of twelve passengers, At the first station six get off and eight get on. At the second nine get off and six get on. One person has a small dog.

At the third station you have a short rest stop; seven passengers get off and four get on. Then one of the passengers who got off changes their mind and gets back on. The route back to the main station is quite steep and it is a slow slog but eventually you breast the incline and arrive on time.

Now, without looking back, how old is the driver?

## Adventures from North Norfolk Model Engineers

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I hope you are well and that these notes will help you understand how North Norfolk Model Engineers are coping with lockdown.

Our situation is complex in some ways. We have agreed with the Mid Norfolk Railway (Wymondham to Dereham line) to build a track on land they have at County School Station. Although narrow and on a rising gradient we can put our layout in situ. We began moving everything with five lorry loads from our old site at Holt to the new at CS. Clearance to help the lorries get on site cost us more but an excellent digger driver / operator helped. The ground was cleared of brambles and prepared for track. That got us to about February 2020. Rain delayed delivery of the two containers we decided to purchase. We got one in by the end of February and the other arrived on Friday 20 March just before lockdown.

Sunday saw us transport most of the remaining club goods from Holt. There's a couple of car loads to shift then the North Norfolk Railway is to take on the 30 x 12 ft. shed we've left them which they aim to move to a new location to help with their works dept. So the move is halted and the station master at CS is keeping an eye on our palletted goods and sheds while we keep our distance. The move has cost us several thousands so far; luckily a recent bequest has covered much of this. Much of our fleet and valuable equipment is in store with a member.

I'm producing a simple monthly newsletter for members and the good weather has meant a few who are good with info tech have kept me supplied with pictures. We're a general club and cover ships, wagon details and locomotives

Our meetings at High Kelling have stopped but we understand we will be given replacement meeting dates next year to compensate for those we've missed. We have a visiting speaker booked for November and hope that by then we can still go ahead with that one. Some of our summer meetings are planned for outside using Sheringham pond and a barbecue at CS, so maybe a little less disruption than might otherwise be the case.

The club demographics are mainly members in their 60s and 70s with a few beyond and a number under 40 in our small group. The move quite quickly cost us a good half dozen although we hope more might join when we feel fully on site and advertise our track once it's up and running. I'm keen to get back to work on site and make a good finish on what we have begun.

Eventually I hope as more of our members feel safe perhaps they'll come out and help once again.

Best wishes.

*Gordon Ford (Chairman NNMEC)*

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## Not all Thieves are stupid!

*Continued from page 9*

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### Purse in the grocery cart

A lady went shopping for groceries at a local mall and left her purse sitting in the child's seat of the cart while she reached for something on a shelf. Wait till you read the WHOLE story! Her wallet was stolen, and she reported it to the store personnel. After returning home, she received a phone call from the Mall Security to say they had her wallet and that although there was no money in it, it did still hold her personal papers. She immediately went to pick up her wallet, only to be told by Mall Security that they had not called her. By the time she returned home again, her house had been broken into and burglarized. The thieves knew that by calling and saying they were Mall Security, they could lure her out of her house long enough for them to burglarize it.

### Moral lesson

- DON'T disclose the relationship between you and the people in your contact list. Avoid using names like Home, Honey, Hubby, Sweetheart, Dad, Mum, etc.
- And very importantly, when sensitive info is being asked through texts, CONFIRM by calling back.
- Also, when you're being texted by friends or family to meet them somewhere, be sure to call back to confirm that the message came from them. If you don't reach them, be very careful about going places to meet 'family and friends' who text you.

2020 has been a difficult year for many, especially those who have lost those close to them. This story from a friend of ours in Canada seemed to shine a little hope for the future and even hard nosed model engineers may feel it gives us hope for a better 2021.

Her hair was up in a pony tail,  
her favourite dress tied with a bow.

Today was Daddy's Day at school,  
and she couldn't wait to go.

But her mommy tried to tell her,  
that she probably should stay home.  
Why the kids might not understand,  
if she went to school alone.

But she was not afraid;  
she knew just what to say.  
What to tell her classmates  
why he wasn't there today.

But still her mother worried,  
for her to face this day alone.  
And that was why once again,  
she tried to keep her daughter home.

But the little girl went to school  
eager to tell them all.  
About a dad she never sees  
a dad who never calls.

There were daddies along the wall in  
back, for everyone to meet.  
Children squirming impatiently,  
anxious in their seats

One by one the teacher called a student  
from the class.  
To introduce their daddy, as seconds  
slowly passed.

At last the teacher called her name,  
every child turned to stare.  
Each of them was searching,  
for a man who wasn't there.

*"Where's her daddy at?"*  
She heard a boy call out.  
*"She probably doesn't have one,"*  
another student dared to shout.

And from somewhere near the back,  
she heard a daddy say,  
*"Looks like another deadbeat dad,  
too busy to waste his day."*

The words did not offend her,  
as she smiled up at her Mom.  
And looked back at her teacher,  
who told her to go on

And with hands behind her back,  
slowly she began to speak.  
And out from the mouth of a child,  
came words incredibly unique.

*"My Daddy couldn't be here,  
because he lives so far away.  
But I know he wishes he could be,  
since this is such a special day.*

*"And though you cannot meet him,  
I wanted you to know.  
All about my daddy,  
and how much he loves me so.*

*"He loved to tell me stories  
he taught me to ride my bike.  
He surprised me with pink roses,  
and taught me to fly a kite.*

*"We used to share fudge sundaes,  
and ice cream in a cone.  
And though you cannot see him.  
I'm not standing here alone.*

*"Cause my daddy's always with me, even  
though we are apart  
I know because he told me, he'll forever  
be in my heart."*

With that, her little hand reached up,  
and lay across her chest.  
Feeling her own heartbeat, beneath her  
favourite dress

And from somewhere here in the crowd  
of dads,  
her mother stood in tears.  
Proudly watching her daughter,  
who was wise beyond her years.

For she stood up for the love  
of a man not in her life.  
Doing what was best for her,  
doing what was right.

And when she dropped her hand back  
down,  
staring straight into the crowd.  
She finished with a voice so soft,  
but its message clear and loud.

*"I love my daddy very much,  
he's my shining star.  
And if he could, he'd be here,  
but heaven's just too far.*

*"You see he is a Canadian soldier  
And died just this past year  
When a roadside bomb hit his convoy  
and taught Canadians to fear.*

*"But sometimes when I close my eyes,  
it's like he never went away."  
And then she closed her eyes,  
and saw him there that day.*

And to her mothers amazement,  
she witnessed with surprise.  
A room full of daddies and children,  
all starting to close their eyes.

Who knows what they saw before them,  
who knows what they felt inside.  
Perhaps for merely a second,  
they saw him at her side.

*"I know you're with me Daddy,"*  
to the silence she called out.  
And what happened next made believers,  
of those once filled with doubt.

Not one in that room could explain it,  
for each of their eyes had been closed.  
But there on the desk beside her,  
was a fragrant long-stemmed rose.



And a child was blessed, if only for a  
moment,  
by the love of her shining star.  
And given the gift of believing,  
that heaven is never too far.

Send this to the people you'll never  
forget and remember to send it also to  
the person that sent it to you. It's a short  
message to let them know that you'll  
never forget them.

If you don't send it to anyone, it means  
you're in a hurry and that you've  
forgotten your friends.  
Take the time ... to live and love.  
Until eternity. God bless!

## Fancy a little colour?

Several versions of this information are in circulation, this thanks to a Google search

### Railway colour

BR coach carmine  
BR coach cream (well worn)  
BR coach cream  
BR diesel blue  
BR diesel light green band  
BR loco yellow warning panel  
BR maroon  
BR steam loco blue  
CR dark blue  
CR steam loco  
GWR coach cream  
GWR or Pullman coach brown  
GWR/BR loco green  
GWR/BR loco green  
LBSCR umber  
LMS Coronation blue

### Halfords spray can colour

Ford Rosso Red  
Peugeot Antelope Beige  
Vauxhall Gazelle Beige  
VW Pargas Blue  
Ford Highland Green  
Vauxhall Mustard Yellow  
Ford Rosso Red  
Peugeot Royal Blue  
Rover Midnight Blue  
Peugeot Royal Blue  
Rover Primula Yellow  
Rover Russet Brown  
Ford Laurel Green  
Rover Brooklands Green  
Vauxhall Brazil Brown  
Rover Pageant Mid-blue

### Railway colour

LNER garter blue  
LNER garter blue/BR diesel blue  
LNWR coach bluey-white upper panels  
LNWR/LYR coach plum lower panels  
LYR coach upper panels  
MR/LMS/BR red  
N. Staffs maroon  
NER coach red  
Roof grey  
SDJR blue  
SR dark olive green  
Stanier Coronation blue  
Stroudley LBSCR ochre

### Halfords spray can colour

VW Pargas Blue  
but slightly more blue  
Ford Fjord Blue, less Green  
Daewoo Casablanca White  
Daewoo Dark Red  
Plastikote Nut Brown  
Rover Damask Red  
Vauxhall Gambia Red  
Vauxhall Gambia Red  
Halford's plastic bumper  
Rover Midnight Blue  
Land Rover Coniston Green  
Peugeot Royal Blue  
BMC Tan

## Solution to John Shenton's puzzle

**T**urn off the pump and leave overnight for the water to drain down to the location of the leak.

Go to the pump at the bottom of the hill, disconnect the pipe from the pump's non-return valve and drain into a suitable container.

Measure the amount of water collected in Litres.

Measure the internal diameter of the pipe in cm.

Radius = diameter divided by 2

Volume of water in Litres =

$$\pi \times \text{radius squared (area of pipe)} \times \text{length in cm.}$$

Therefore length (cm) = Litres divided by area

From the pump, measure the length up the hill. Mark the spot.

Dig down into the soil from this location to the left and the right to locate the pipe, turn the pump back on with the pipe reconnected and check for water soaking.

The leak was located to within a metre.

The volume of the pipe is taken from the Transformed Density Formula.

We were surprised how accurately the procedure solved the problem.

**The Engine Driver's Age? You're the driver - I hope you know your own age!**

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