

PEEMS NEWSLETTER: 21 February 2017

Comment

A new year and a new editor for the PEEMS newsletter.

A big 'Thank You' to Paul Hayward for the previous newsletters, which were both informative and interesting regarding the engineering details of members' projects, workshop meetings, lectures and visits undertaken. Importantly the news was presented with a wry humour, which the new editor may find difficult to replicate! The new editor would also like to thank Paul for taking the time to explain the "rules of engagement" for presenting the newsletter.

Looking at the calendar for 2017, the Club has some very interesting meetings, visits, lectures and functions, many still to be confirmed, but we will always keep you up to date in the newsletter.

The new editor would like to take this opportunity to ask members for articles, relevant to the engineering interests of members, which could be included in the newsletters. If possible, the articles should be brief, so the newsletter remains readable and manageable. The contact for any information is provided at the end of this newsletter.

Certain members have asked if the jokes are to be continued. I will just say that for the new editor's first newsletter, a certain decorum is required, but for future newsletters..... we shall see. *Nevile*

Recent Activities

Workshop Morning, Tuesday 17th January.

Once again, a well-attended workshop morning where members could see the additional equipment installed, and which is available for members to use. The existence of the workshop morning, seems to have had the effect of attracting invited guests in to discuss their engineering problems with the experts! Someone turned up for advice as how to accurately machine motorcycle tappets. There was also a discussion about 3D printed plastic components. The milling machine has now been moved from George's to the workshop. Photographs are included at the end of the newsletter to show you the dedicated endeavours of certain members to effect this. The photos show the mounting of the milling machine on the trailer at George's using the innovative lifting arm, and its position in the workshop.

Club Meeting, Wednesday 1st February.

The new year began with a very informative talk by Roger Taylor. The talk was probably mistitled "Modern Fuel Injection Systems", because we were treated to a comprehensive excursion around a modern engine management system, with its attendant benefits and risks. The talk was well attended by members, and in addition we had three guests.

Roger explained how modern control configured vehicles relied on data fed to the engine management system (EMS), by various sensors at critical points in the vehicle. This ensured that the correct amount of fuel was fed to the cylinders by the injectors during the cycle, and aided by valve control technology, this ensured increased performance, lower emissions and higher mpg. Roger gave as an example his own "analogue" Triumph TR6 (2.5 litre), and an equivalent modern BMW Z3 (2.5 litre). The latter with its EMS, provided better performance, better fuel economy (up to two times), and lower emissions than the Triumph. We learnt how emissions regulations and tax eventually "killed" the mechanical/analogue controls on cars.

Roger compared the Triumph and Z3 with regard to expected MPGs. The official factory figure for the Triumph was 22mpg, but it wasn't specified under what driving conditions this was achieved. Currently, mpg is based on urban and extra urban (town and motorway) travel. A resulting "combined" mpg is now quoted. For the Z3 this is 34 mpg

Roger took the Triumph on a 100 mile mixed driving run, including town and country roads, dual carriageway, and with standing traffic to 70mph stages. 33mpg was achieved. However, the Triumph can never better this "combined" mpg, and if driven hard, the mpg will fall into single figures. The Z3 will do better, achieving up to 40mpg, and driven hard, fuel consumption won't fall below 20mpg.

The first component featured was the Lucas PI (petrol injector). A metering and distribution unit was handed around. The Bosch injector system apparently worked out better for conversion to an electronic system than the Lucas. The Bosch K Jetronic system was introduced in the 1980s, and a Hall Effect Distributor was used to trigger the primary circuit (fire the coil) and to monitor engine rpm. With a fuel injector, the fuel is finely atomised. Sometimes two injectors are used per cylinder to deliver the same amount of fuel, but more finely atomised to improve fuel economy and performance.

Roger then talked about the “Common Rail Diesel” fuel system and its problems with emissions. As the big fuel rail operates at pressures of 200bar there are Health and Safety issues. Roger’s workshop experience provided a scary example of what can go wrong!

Modern EMSs require computer diagnostic equipment to analyse faults, and various error codes were described. For example, PO325, indicates a “Knock Sensor” malfunction. This means that the knock sensor has detected pinking or engine knock, and has told the Engine Control Unit (ECU) to retard the ignition to resolve the pinking. However, in the example given, the pinking/knocking was still being detected after the ECU had fully retarded the ignition. The ECU then thought the sensor was faulty and put the management light on. In fact, the fault was caused by the engine oil level being too low which had starved the hydraulic lifters of oil. This caused the cam shaft to rattle, which no amount of ignition retard would resolve. Roger brought in the reams of computer output that had been produced to locate the source of a fault such as PO325. As shown, some problems are not straight forward and require careful investigation.

Roger then described the Diesel Particulate Filter (DPF). This traps soot particles and burns them off, with 20 minutes on the motorway at 2000rpm sufficient to accomplish this. With the added sophistication, however, EMS warnings can be prevalent if the DPF sensor malfunctions, and these units are expensive to replace. If, for example, the EMS light is on, the DPF will not regenerate (burn out the soot), so if the light is ignored, the DPF will block up to level where it cannot regenerate. Also, the use of incorrect oil will seriously damage this component’s life due to ash build up from any oil burnt (low ash/SAPS oil must be used with DPFs).

The Dual Mass Flywheel (DMF) was described next. This absorbs shock loading in the engine, especially at idle. The DMF can last as long as the clutch, providing the engine isn’t laboured.

Another component in the system, the Exhaust Gas Recirculation (EGR) valve was examined. This reduces NOx emission, but can become clogged if there is a lot of stop/start town driving. EGR is also used when an engine has very little or no valve overlap. EGR allows exhaust gas to mix with the new charges to promote a complete burn (cylinder scavenging).

Systems such as Variable Valve Timing and the Mass Airflow Meter, and sensors such as the Manifold Absolute Pressure Sensor (MAP), and Throttle Position Sensor (TPS) were then discussed. A number of components were handed around for people to touch and feel.

The talk also covered how modern traction control systems can be confused by, for example, a reduced tread of only 3mm on one tyre (thus reducing the rolling radius relative to the other wheels), and how the control system does not like being “electrically spliced into” for the amateur installation of tow bars.

A very interesting talk which reinforces the fact that while EMS is to be welcomed, fault diagnosis needs thorough forensic investigation by honest engineers such as Roger, otherwise replacement components can prove to be very expensive. (Thanks to Roger for proof reading this article and providing details. ed.).

Workshop Morning, Tuesday 21st February, 10.00am to 12 noon.

It was revealed to members that permission had been given for the Club to use the whole of the building which houses the Club Workshop. Members attending the workshop morning helped to remove items stored, and to dismantle the racking. The space was soon cleared so that John Powell and George Gibbs (our Workshop leaders) could start planning how best to use the new space.

It was also found that the position of the new milling machine was completely unsuitable, as it did not allow the access needed to change V-belt positions for the horizontal arbour. This simple oversight requires a complete re-shuffle of the machines in the workshop.

John, George and David Hick have taken this task in hand, and work will begin next Tuesday, 28th February. On the same day it is planned to start insulating and under-drawing the ceiling of the additional space. We do need your help, but we also need to properly organise the order of work so please contact John Powell or Mike Sayers if you intend to volunteer.

It is hoped that members will realise the opportunity that the Club now has, thanks to the generosity of some members, to have a truly comprehensive and co-ordinated workshop that we can all enjoy. *Mike*

Member Information.

Paul Windross is currently in Ward 31 of York General Hospital. This is his second session and he remains cheerful. In fact, the nursing staff really like him because his cheerful personality brightens up all the people around him, and keeps the ward in high spirits. He would welcome visits from PEEMS members and friends, but please ring beforehand if planning a visit. The hospital number is 01904 631313. When prompted, ask for Ward 31, and a phone will be taken to him. If you just want to telephone him, his mobile number is 07763 833181, however, if his phone is switched off, the hospital can be contacted as explained above.

One of the highlights of his previous stay was Mel taking a hot air engine into the ward and set it running with the help of the nursing staff for all to see.

Forthcoming Events.

- **Club Meeting, Wednesday 1st March, from 7.00pm.**

The Club meeting will be a “Bring and Brag” where members are encouraged to bring completed and “work in progress” projects. It would be appreciated if a presentation of the projects is given, so questions can be asked. “Bring and Brag” meetings reflect the main ethos of the Club, which is to inspire personal engagement in practical scale or full scale engineering. The purpose of these meetings is also to show case the many specialist skills and knowledge in the Club, and the help available. Members are therefore encouraged to bring guests.

- **Club Annual Dinner, Friday 10th March**

Three venues had been short listed for the Club dinner, and quotes were asked for, around a similar format. The restaurant that came out top was “Oscar’s” at Norton. Of the three, “Oscar’s” were more flexible to our needs, presented the best menu choice, and were far more competitive. The acoustics are also very good, a point that is becoming increasingly important for our members.

A menu has been attached with the newsletter, along with an order form for members and guests. This is in case some-one has not already received them. Cheques and orders will be received on the Club evening 1st March, or can be sent to the address at the bottom of the order form before the 1st of March.

“Oscar’s” is situated in the Ryedale Indoor Bowls Club at Norton and the holding Company RCLC has appointed Julie Copland to run the catering and function suite. She is a very capable lass and provides good food at a very reasonable price. A few of the Club members went to try it out on Saturday 4th February. The opinion was that it was the best place for the club this year, and the hope is that it will be well supported.

- **Visit to Newark Air Museum, Friday 7th April.** Details will be given at the Club Meeting on the 1st March.

- **24th National Model Engineering and Modelling Show, Doncaster, 12/13/14 May**

This runs from Friday 12th May to Sunday 14th May, and the exhibitors list has to be submitted early April. As was mentioned earlier, it would be good to feature models or items which are still work in progress, as this often stimulates questions or comments from visitors. So do not be put off if your item is not finished.

Richard Gretton is co-ordinating our display so please get in touch with him either at the club meeting or by email. Richard’s telephone is 01944 710275 and his e-mail jrcgretton@btinternet.com

- **The Railway.**

The railway has an extensive season this year with six outings, and volunteers are required for setting up, running the railway and dismantling.

- 20th to 21st May (Sat/Sun) ~ Levisham Station during their “Behind The Scenes Family Weekend”. This event is already featured on the NYMR web site.
- 13th June (Tues) ~ Welburn School
- 24th/25th June (Sat/Sun) ~ Wolds Vintage Rally ~ Fangfoss. This will be the first time at this rally.
- 2nd July (Sun) ~ Malton Show. The railway will be setup on the Saturday afternoon and evening.
- 25th July (Tues) ~ Ryedale Show
- 12th/13th August (Sat/Sun) ~ Driffeld Steam Rally. It should be noted that this is still tentative.

We are hoping to make at least £200 from each event, except obviously Welburn School.

A Rallying Call!

A Child’s Passionate Longing.

For new readers’ information, I will briefly repeat that it was extreme poverty that prevented a golden-haired girl-like kid whose age had not attained double figures, satisfying his passionate longing to possess a tiny railway engine that would go by steam; and with a few simple tools which had belonged to a deceased grandfather, he set to work on the corner of the kitchen table to build a caricature. It had a lead oscillating cylinder mounted on top of a cocoa tin boiler, the wheels were four tin lids, and the drive was a cotton belt. It went; and to such good purpose that, running up the passage, it tried to climb the mat at the street door, overturned and decanted blazing methylated spirit on the before-mentioned mat, which didn’t improve its personal appearance! Anyway, it is a good omen, augury, or whatever you like to call it; for from that day back in the eighties [That is the eighteen-eighties] to the present day, Curly has never built an engine that didn’t “go.”
(From “L.B.S.C. Looks Back”, *The Model Engineer*, 7th December 1945.)

What a start! We could do with some youngsters in our club to reduce the average age a tad. I don't know about nine year-olds; it would make Health & Safety a bit of a problem. But how things have changed. I wonder if Curly was in trouble for the damaged mat. I would be surprised if not!

However, our club needs new blood; indeed younger blood. How about looking out for friends and neighbours coming up for retirement. Ten years younger than that would be even better! Although it is much more difficult these days to interest young people in a hobby that takes much time to produce results, assuming you are not using a cocoa tin and jam pot wheels, there are a few young people out there that with some encouragement from you, could kindle a life-long hobby. That would benefit them and your club. Don't keep your hobby to yourself and don't leave it to other members. *Your club needs you to do the looking out!* Tony

Photographs.

The removal of the Milling Machine from George's.



The Milling Machine in the Workshop.



Requests For Parts And Items For Sale

- Have you seen the red home-made compressor (pictured) which stands in the club workshop next to the tea table? Due to a generous donation, this one is now surplus to the club's requirements. Its unloader valve needs servicing or replacing, but otherwise it appears to be serviceable. Offers are invited on an "as seen" basis. You are welcome to inspect it. To do so please contact Tony on 01751 474 291.
- The club workshop lathe (Myford ML7) is short of change wheels. Do you have any surplus to your requirements? If you do please contact Mike or Tony with details and price required.



Contact

If you would like to make a contribution in the Newsletter, the contact is: Neville Foster Tel 01751 474137 or e-mail nevf123@outlook.com