The Generator

Issue 470
August 2020

Palmerston Model Engineering Club

www.pnmec.org.nz - pnmec@trains.net.nz

Managers of the Marriner Reserve Railway - Marriner Street - Palmerston North
PO Box 4132 - Manawatu Mail Centre - Palmerston North 4442

Upcoming Club Nights

Club Nights held at the Hearing Association Hall 435 Church Street Palmerston North. Time 7.30pm

27 August 2020

Robert Edwards will give an introduction to the Computer Aided Design (CAD) software Fusion 360 and why we should all be using it. Please bring along a memory stick if you wish to install software on your PC

24 September 2020

Graham Toms will give a presentation on a not to recent visit to the world famous Oshkosh Air show in Wisconsin USA.

22 October 2020

Project Progress Bring along your recent progress on any of the projects you are currently working on

Marriner Reserve Railway

6 September & 20 September

Railway operations at the Mariner Reserve
Trains in operation from 1pm to 3pm
Weather permitting (Kerry Puklowski 06 353 6189)

Thursdays

Railway operations for club members
Subject to ongoing track maintenance and weather
Contact track manager Richard Lockett 06 323 0948

PRESIDENTS REPORT

The Club Meeting on July 23rd was a well attended event in response to a very interesting guest speaker. The moment the meeting finished there was a congregation around the exhibit tables, and very few people left before we tried to clear the hall three quarters of an hour later. Fellowship is what these club meetings are about. This interaction is pleasing to see.

As many of you will have noticed the “Generator” is a work in progress. The Committee is determined to make the clubs magazine more interesting, and more inclusive of the diverse range of activities our members engage in. Another change in this evolutionary process is about to be implemented. Rather than just providing notification that the Generator is available on our website, the committee is planning to email the Generator direct to the membership. The magazine will be sent out in the form of a PDF email attachment but will also be available on the club website. There is a high probability that this process will be trialled with the next edition. We will be providing the membership with prior warning, so when you receive an email in advance of the next Generator issue, DON’T PANIC. The committee is hopeful that this change in delivery methodology will increase the magazines readership.

On the Covid front. There is a high probability that the current restrictions will limit the operation of the Mariner Reserve Railway for some weekends to come. Members are advised to check whether the railway will be operating before turning up. The decision to run on any weekend will be made by the team leader Richard Lockett.

The “End of Year Dinner” is now rapidly approaching. The committee has decided that the venue for this years event will be Fielding. The date and details of the itinerary are being finalised, and will be published in the Generator.

For general interest. The two photographs I have included are of the electric rack and pinion railway running up a Swiss mountain side between Zermatt and Gornergrat. This is a double rack railway comprising two racks laid side by side half a tooth pitch out of step. This configuration is much smoother running than the more common single rack configuration, and is used for heavy duty applications and on steep inclines.
Photos taken in 2015.

Keep Healthy and Keep Building
David Bell

Club night Thursday 23 July

The meeting was held in the Hearing Association Hall. 23 members and guests were present he meeting opened about 20 minutes late as when we arrived there was a note on the door to the effect that the building was now protected by a monitored alarm. After a couple of phone calls we decided that the alarm had probably been programmed to allow us to have our meeting and we entered with no problems.

Our new President, Dave Bell opened the meeting and welcomed members and guests.

The main event would be Richard Lockett's talk on his participation in the 2020 cycle Tour Aotearoa from Cape Reinga to Bluff (3000 Km). The 2020 event started in waves of 100 people per day spread from 17 February to 8 March

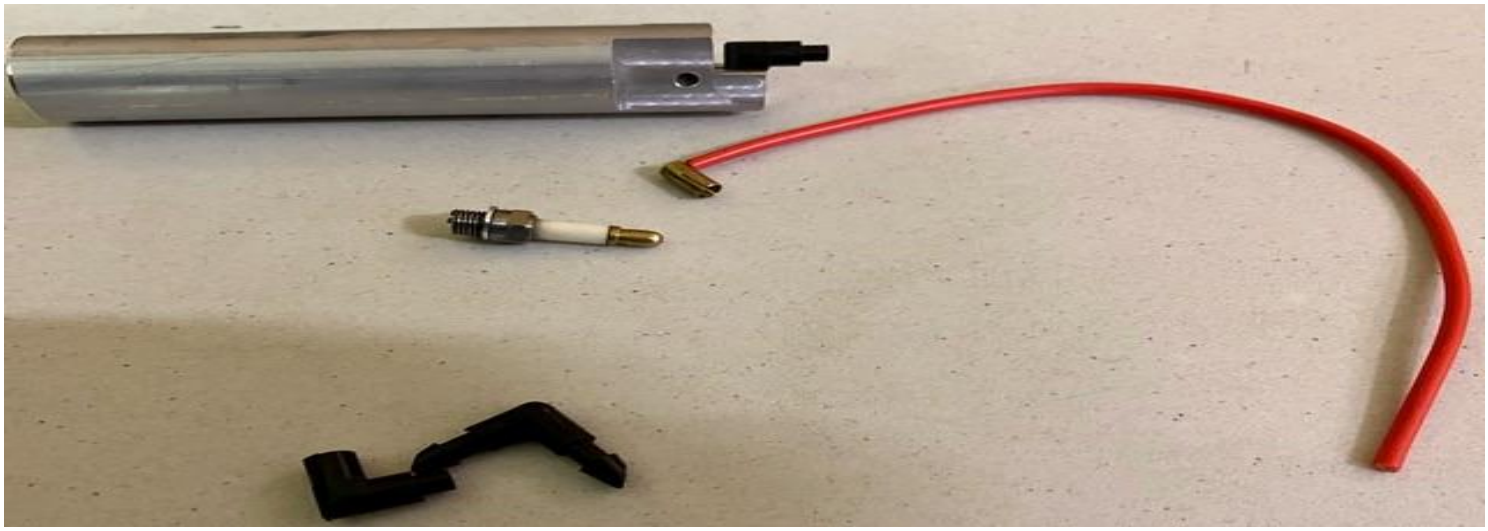
Richard gave a very full account of his experience of this event. He described his feelings of doubt at the start of the event and how these dispersed once he got going. He described the differences in preparation and approach to the ride, ranging from riders like him who were essentially self-sufficient with camping and food preparation equipment, to those who stayed in motels every night and bought meals from cafes etc as they went. (Richard was one of the former!) One participant in his 70's from overseas flew into NZ at Christchurch about 8 weeks before he was due to start and cycled all the way to Cape Reinga to start his tour.

Due to a clothing problem which caused him an injury Richard was forced to take a 12 day break after he reached Mangakino and he returned to Feilding to recover. Cynthia Cooper (our Vice president) agreed to ferry Richard and his gear back to Mangakino where he recommenced his trip. His enforced break meant that he was left with quite a challenging task to reach Bluff within the 30 days allowed for the journey. (The rules stated that participants had to complete the journey in no less than 10 days (300 Km/day) and no more than 30 days (100 Km/day). As it happened Richard reached Wellington at about the time that the Covid19 lockdown regulations were announced and he decided that if he crossed to the South Island that he may find himself stuck there so he opted to pull the plug at this stage. He expressed a wish to try again in a future event. While listening to Richard I felt a feeling that if I was 40 years younger I would have liked to do this. When I expressed this feeling to Richard he said that he felt the same several times on his journey!

Thanks again Richard for an interesting and informative talk.
A "bits and pieces" session followed Richards talk.
Cynthia began by telling members that she had taken on the roll of looking after the club web site and that she received electronic versions of most club newsletters and if members wished to receive these to tell her and she would provide an (electronic) copy.

Club Night Con't

Graeme Hall talked about his snags of making small spark plug connectors for the small IC motors that he likes to build. For some time he has been able to purchase the small garden irrigation sprinklers from one of the suppliers but they have changed their design and the new ones are not suitable. He now makes them from scratch, using a suitable plastic material and a number of fittings he has made to hold the material while he machines it. These demonstrated Graeme's skill in devising machining processes to make the parts he needs. Some of these holders and some of the completed parts are shown in the photograph.



Murray Bold had a G gauge engine and a rake of wagons that had been made largely using a 3D printer. Murray is very skilled in designing the programs to make these items and the fine detail available with the newer 3D printers is pretty spectacular.

Our next meeting is Thursday 27th August and the main topic is from Robert Edwards who will give an introduction to the Computer Aided Design (CAD)

Report by John Tweedie

MEMBERS PROJECT REPORT

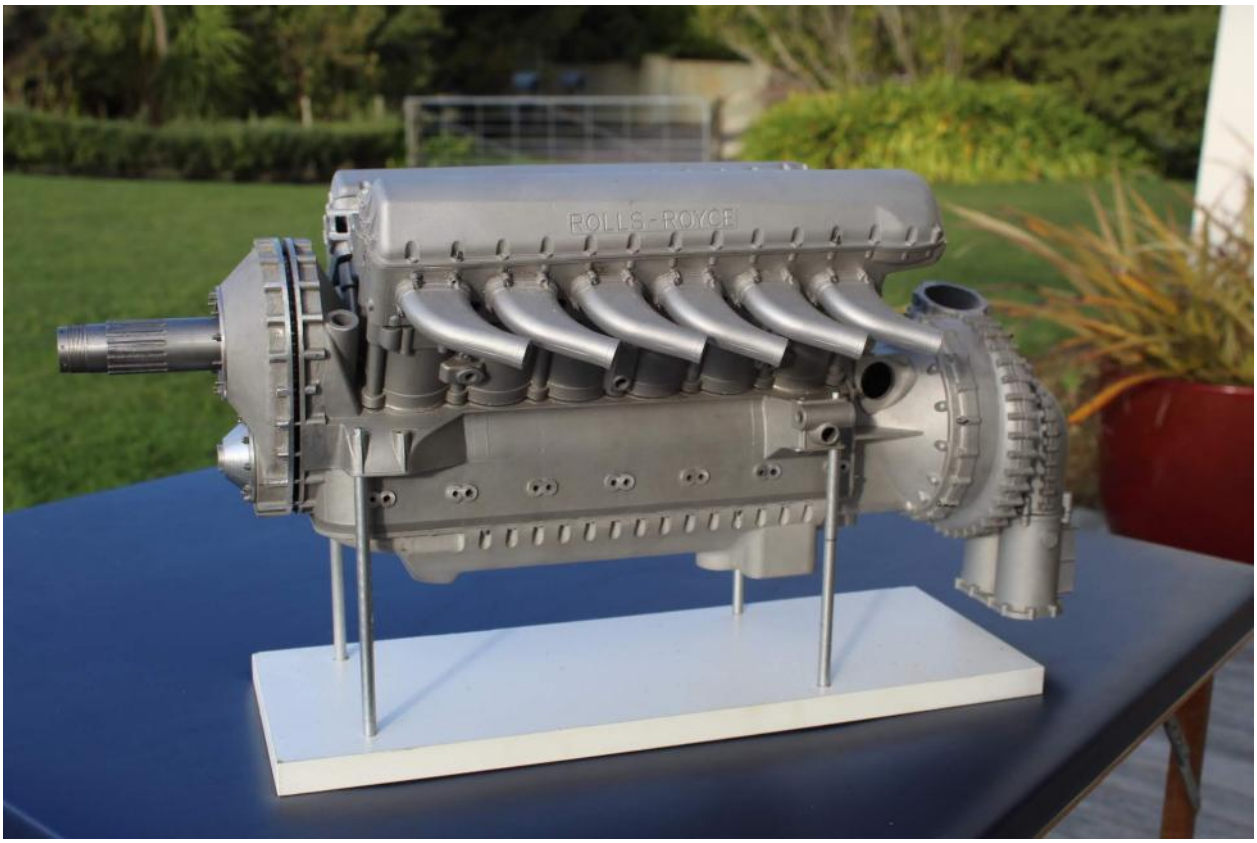
High in the hills overlooking Palmerston North something very special is taking place. This is the story of an exceptional model engineering project, being built by a man with the patience and the skill necessary to do justice to this work.

FIN MASON AND HIS 1/4 SCALE ROLLS ROYCE MERLIN ENGINE

Prior to retirement, Fin was a Civil Engineer with the Palmerston North City Council for over 30 years specialising in drainage, flood protection, sewage reticulation, and storm water works. Despite the dedication and technical knowledge that his chosen profession demanded Fin always harboured a passion for things mechanical, and in particular high performance engines and aircraft. With retirement looming on the horizon the building of a scale high performance engine moved from a dream to potential reality. Realising a different skill set would be required, Fin enrolled in evening classes at the local polytech to learn the techniques and the basic engineering skills required to undertake this work.

The first stage in the construction process was the procurement of workable drawings and materials. In response to a magazine article, contact was made with an American Engineer who was preparing working drawings and castings for an accurate 1/4 scale Merlin Engine. Once this preparatory work was completed, a full set of drawings and castings were purchased and the serious work of building the model began.

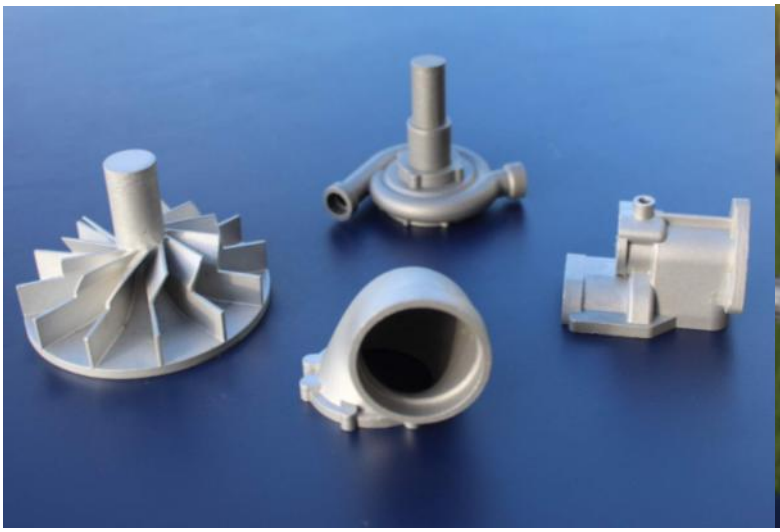
The Rolls Royce Merlin was a 27 litre V12 liquid cooled engine built by Rolls Royce, and a number of other engine manufacturers in the UK and the United States. Prior to the cessation of production in 1956, over 149,000 engines in 50 variants had been produced. This particular model is based on the single speed supercharged variant produced between 1937 to 1942. The engineering drawings for the model are based on actual works drawings. However Fin has additional support in the form of technical information and assembly photographs from an original RR Merlin Overhaul and Maintenance Manuals that he has procured.



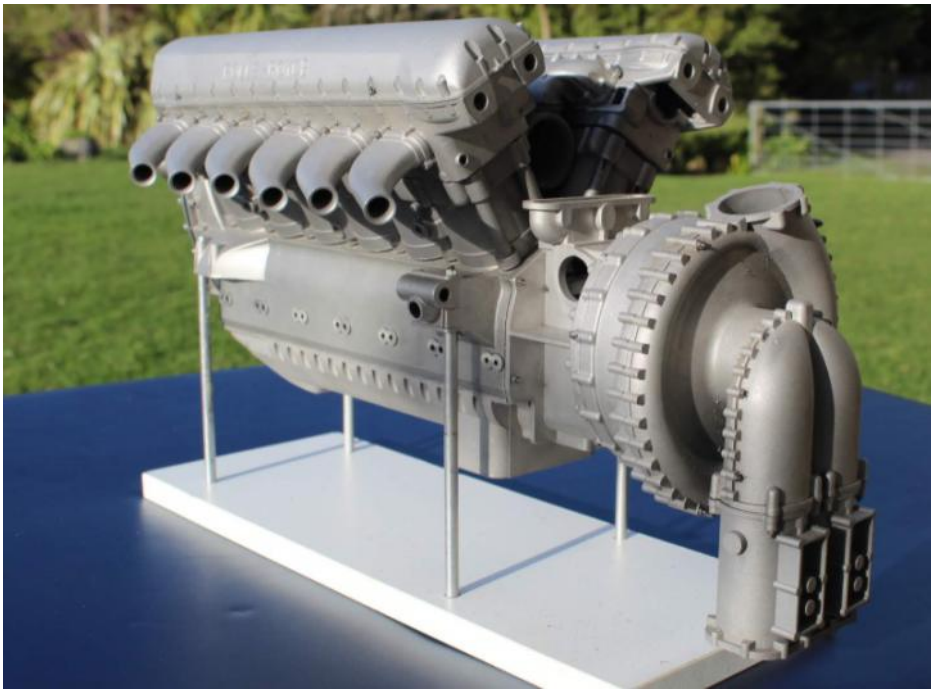
The Merlin con't

The lost wax castings purchased for this construction are of an exceptional quality but this has introduced a complexity into the build that was not foreseen. They are irreplaceable. The opportunity to purchase replacement castings (if required) has expired as the originator has moved on to other projects leaving this work as an orphan behind him. One cut or hole in the wrong pace and there is a problem.

Fin has made considerable progress on his works including some hard to make parts: piston liners, pistons, con rods, reduction gear drives, cam shafts, and crank shaft (part machined). When all parts are laid out on a bench one starts to realise the scale of the works and appreciate the effort and skill that has gone into this project to date.



Research Note: The Merlin consumed an enormous amount of air at full power: equivalent to the volume of a double decker bus per minute. With the exhaust gases exiting the engine at high velocity it was realised that useful thrust could be gained by simply angling the exhaust gases backwards. During tests of exhaust ejectors, it was found that 70 pounds force of thrust at 300 mph or roughly 70 HP was produced, enough to increase the maximum level flight speed of the Spitfire by 10 mph to 360 mph. The round exhaust nozzles on Fin's engine represent the first version of these ejectors. (Information Wikipedia)



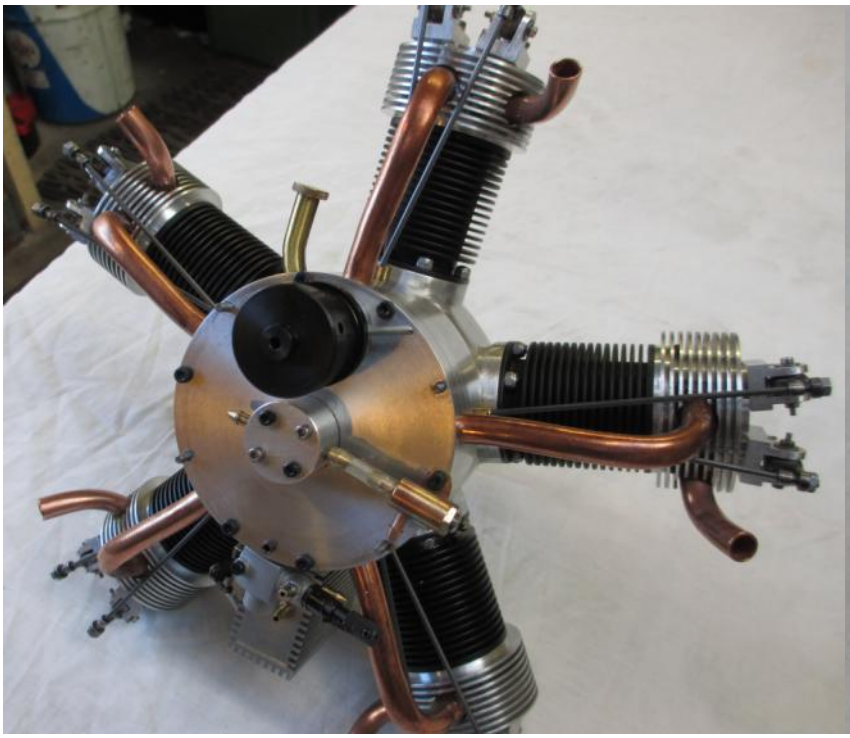
Story David Bell / Fin Mason

Kinner K5 – Part 4

Next part of project – the copper tube intake and exhaust pipes.

A length of 3/8” copper tube was obtained from a plumbing firm, straightened from a coil and annealed.
A very tight bend required at the cylinder head end could not be obtained by my tube bender – a simple home-made bender, borrowed from a friend, did the trick!
Five intake pipes made, all exactly the same, threaded ¼ NT thread to screw into the cylinder head ports. Exhaust pipes – a simple bend facing rear.
A mounting plate cut from 8mm aluminium plate stretched the capacity of my mill when boring the centre hole and top radius. The tube steel mounting bracket attached the engine to the plate which is fixed to a plywood base.
An ignition distributor with contacts, rotor and cap were made up and fitted to the rear of the gearcase and driven by a no.1 camshaft extension.
A suitable model aero carburettor I had on hand was attached to the rear gear cover which acts as a manifold for intake pipes.
The oil tank which attaches to the bottom of the crankcase supplies oil to the pump which feeds to the rear of the crankshaft and then drains back to the tank.
A fuel tank made from copper waste pipe was attached to the rear mounting plate.
Throttle and carburettor mixture controls were fitted.
Five more spark plugs were made.

Completion is in sight!!
By Graeme Hall



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