



Newsletter of THE PALMERSTON NORTH MODEL ENGINEERING CLUB INC

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**August 2005
No 304**

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TRACK RUNNING

This is held on the FIRST and THIRD Sunday of each month, from 1 pm to 4 pm Summer and 1 pm to 3 pm during the Winter. All club members are welcome to attend and help out with loco coaling, watering and passenger marshalling - none of the tasks being at all onerous.

Visiting club members too, are always welcome at the track, at the monthly meeting, or if just visiting and wishing to make contact with members, please phone one of the above office bearers.

Sender:- PNMEC
22b Haydon St,
Palmerston North

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This Months Featured Model



JULY MEETING

The meeting started off with three new members (two accompanied by their wives) being introduced. They were Maurice Job, Tony and Lesley Stott and Graeme and Janice Hall.

There was a good cross section of examples of model engineering on view.

Chris Rogers had the boiler and engine components for the Clayton and Shuttleworth steam wagon he is building.

Barry Parker had his now nearly completed 'Rob Roy' on display.

Stuart Anderson showed us the dummy springs and bearing covers he has been making for his Dh. Diesel locomotive.

Graeme Hall showed us the very nearly completed Bentley 9 cylinder rotary engine that he has been working on for the last few years. Built to the design prepared by Mr. Blackmore of Australia the engine just requires completion of the ignition before it can be run. Graeme's workmanship is of a very high standard and I know the other members at the meeting appreciated the detail and quality of finish.



Doug Chambers had brought along the nearly completed boiler for the 7 1/4" Mogul. Now very heavy, thanks from Doug to Barry and Richard for assisting in getting it from the car to the Hall.

Ian McLellan showed us the boring bar that he had made so that he could bore the 'Maisie' cylinders.

Merv George showed us the applicators he had made for applying an instant type Loctite glue. Made of a piece of plastic for a handle and a small piece of foam. A throw-away item, but it saves you

from sticking your fingers together.

Richard Lockett had some more parts for his NZR 'W' 7 1/4" gauge locomotive. An axle pump and a vacuum dump valve and a pipe bender he made up for bending the pipes leading to and from the pump.

Maurice Job showed us two drawings of operating valve gears with the moving parts of cardboard showing the valve events. Produced in the early part of the last century for teaching purposes by Jones of Manchester, England.

AUGUST MEETING

This will be held in the Hearing Association Rooms, Church Street, Palmerston North at 7.30pm (SHARP) on the 25. 8. 05. Laurie Gudsell will give a talk on the acquiring of the Allison V12 and its subsequent rebuilding to the state that it can now be run on the ground. For those unfamiliar with aircraft engines the Allison was used in Kittyhawk, Lockheed Lightning, Aircobra and Kingcobra aircraft during World War 2.

COMING EVENTS

Mid Week Run at Marriner Reserve Railway

23rd August between 10.00 am and 2:00 pm
Please contact Doug Chambers beforehand.

Track running at Marriner Reserve Railway

4th September 1 - 3 pm
18th September 1 - 3 pm

OPEN WEEKENDS

Havelock North Labour Weekend
New Plymouth Labour Weekend

SUBSCRIPTIONS NOW DUE

Subscriptions remain at \$28 for members.

Juniors and Country members \$14.

You can send your sub to 'The Treasurer' C/o 22B Haydon Street, Palmerston North or hand it to Barry Parker at the August meeting.

Please advise the secretary in writing if you do not want your details published in the club membership list that will be enclosed in the September Generator

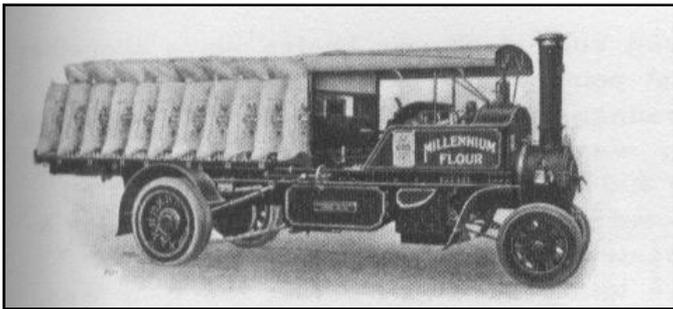
The closing date for the next issue of The Generator is Friday 9 September

CLAYTON and SHUTTLEWORTH STEAM WAGONS

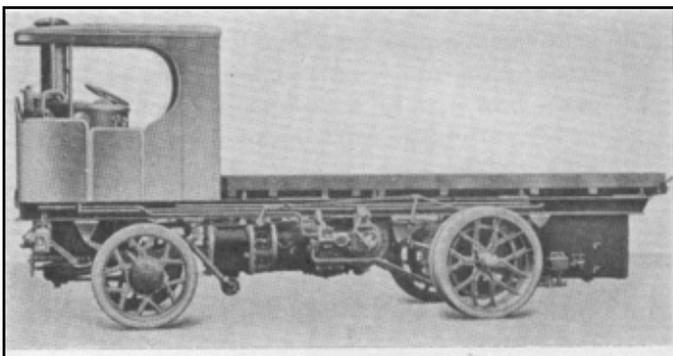
By Doug Chambers

There were two basic types of steam wagon, the overtyp and the undertyp.

The overtyp was a development of the traction engine. The boiler was a conventional locomotive type with the engine mounted on top of the boiler barrel. The gearing was also similar to that found on a traction engine and the drive to the rear axle was usually via a heavy chain.



The undertyp steam wagon was normally fitted with a 'pot' boiler although these varied in design a lot. Some had curved tubes and high superheat and were better steam producers than the older locomotive design. The engine was mounted between the frames behind the cab and often had features such as poppet valves instead of the slide valves on the overtyp.

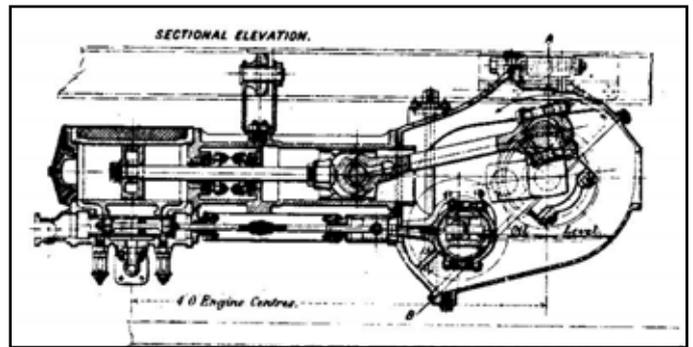


The steering on the overtyp followed traction engine practice where the whole axle pivots at the centre and a worm arrangement rotates a drum with chains activating the axle. The undertypes lent themselves to having an 'Akerman' type steering fitted. This is the type of steering fitted to today's cars and

trucks. A major feature of this that the vehicle is much easier to steer at higher speeds. The early overtypes had steel wheels and progressed to solid rubber tyres. The undertypes following the overtyp designs went from solid rubber tyres to pneumatic tyres.

The first Clayton and Shuttleworth wagons were built in their Titanic Works in Lincoln in 1912. They were overtypes. Boiler pressure was 200psi. The engine was a standard compound with a piston valve on the high pressure side and a slide valve on the low pressure. Cylinder bores were 4" and 7 1/4" with a 7" stroke.

Valve gear was Stephenson and drive to the rear axle was by chain. A differential was

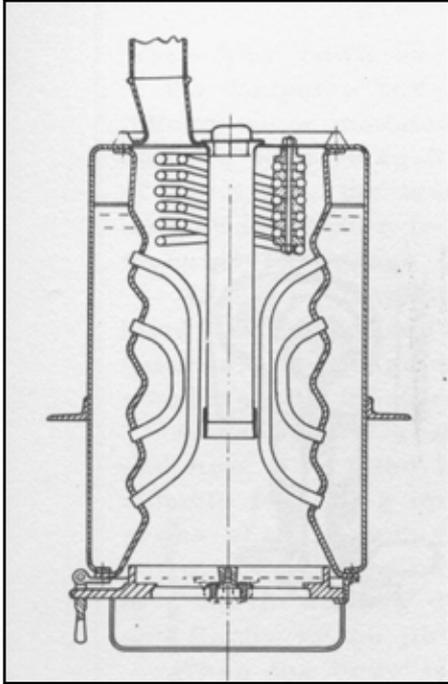


incorporated in the rear axle.

As early as 1920 Clayton and Shuttleworth had built and were testing their first undertyp steam wagon. The engine was a twin high pressure with cylinders of 7" and a stroke of 10". Both cylinders were supplied with steam from piston valves which were driven by a layshaft under the crankshaft. The transmission is very simple, there being a chain drive from the crankshaft to the rear axle with compensating gear within the rear sprocket. Thus it can be seen that there was only one speed and variation of speed was controlled by throttle and valve cut-off.

The boiler was a vertical with a corrugated firebox having twenty curved water tubes in rows of ten. Each tube then is exposed to the same amount of heat and being curved is less likely to leak where it is expanded into the

firebox. Working pressure was 230 psi and coke or coal were suitable fuels.



The Clayton and Shuttleworth undertype steam wagons were not able to compete with the more sophisticated rivals from Sentinel and Foden and production of the Clayton and

Shuttleworth steam wagons appears to have ended before 1939.

In 1976 your editor drove a Clayton and Shuttleworth overtype steam wagon at Lake Goldsmith in Victoria, Australia. It was still under restoration by the owner, John Norris and although the boiler and engine were overhauled, there was still a lot to do on the body and cab. The steel front wheels had been replaced during the wagons working life with pneumatic truck tyres. The steering was by chains and the truck was not very manoeuvrable. They must have been a handful in the narrow streets of the English cities. I estimate that the top speed would have been about 6mph or 10kph. And I don't believe that it would make any difference to the speed whether the truck was fully laden or empty.

BUILDING THE CLAYTON STEAM WAGON

By Verdon Heath

During 1980 while recovering from some injuries, I spent some time reading back issues of Model Engineer and gradually the idea of a traction engine took shape. After much reading and inquiries I thought that the idea of a traction engine was a bit much as everything

was on display so to speak.

After discussions with Don Dudley and George Dowd the idea of a Clayton and Shuttleworth undertype steam wagon developed. Seeing some plans and a series published in the Model Engineer during the 1970s a start was made. I will have to say that to me the original design by R. Dyer was OK, but I doubt if it was built before the design was published, hence my Clayton evolved into something very similar but different in detail.

The Clayton was constructed from materials that were available, no castings being used, wheels made from old well casings and the chassis was made from two angle irons welded in box form. The engine received a make-over with a fully enclosed one piece sealed crankcase; the crankshaft was assembled from discs with ball races for all bearings. The valve gear appeared a 'work of art' but it worked very well. The boiler is gas fired, with no centre firing tube and the barrel is a bit bigger in diameter and height.

A couple of designs of gas fire took place before mastering the heating department. The auxiliaries took shape and were attached. The original wagon was a tractor unit with an articulated trailer towed behind, but I required a better arrangement. I cut the chassis and added several inches to its length and built up a flat deck. A rudimentary cab was built and followed by boiler tests and a fire up. The results of four years work appeared to go rather well.

One day in New Plymouth watching the trains working the containers at the port, I saw an NZR Isuzu 5 ton truck with its road wheels still in place, driving along the steel rails on powered flanged steel wheels underneath. The Clayton was similarly modified and much pleasure has been had from its construction and use on several Club Tracks, with a realisation that we don't have to rigidly follow someone else's design or ideas to have a lot of fun.

THE ALLISON V12 and the AIRCRAFT it POWERED

By Doug Chambers

As Laurie Gudsell is to give us a talk on the history and restoration of his Allison V12 at this months meeting perhaps members would like to know a little in advance of what the Allison V12 was used for.

The Allison V12 was in production in the early to mid 1930s. The first aircraft to make use of it was Curtis P40, later variants were known as the Kittyhawks and the RNZAF had large numbers of them during the 1940-5



period.

Bell Aircraft also used the Allison V12 in first their Aircobra and later in their Kingcobra. Where the Curtiss P40 was of



conventional layout, engine in front and a tailwheel at the tail, the Aircobra was one of the first aircraft with tricycle undercarriage

and the engine was mounted behind the cockpit with a long driveshaft forward to the propeller passing between the pilots legs!!!! The Allison used in both these aircraft delivered about 1200 horsepower for take-off and due to the engine having only a single stage supercharger performance above 12000 feet was very poor.

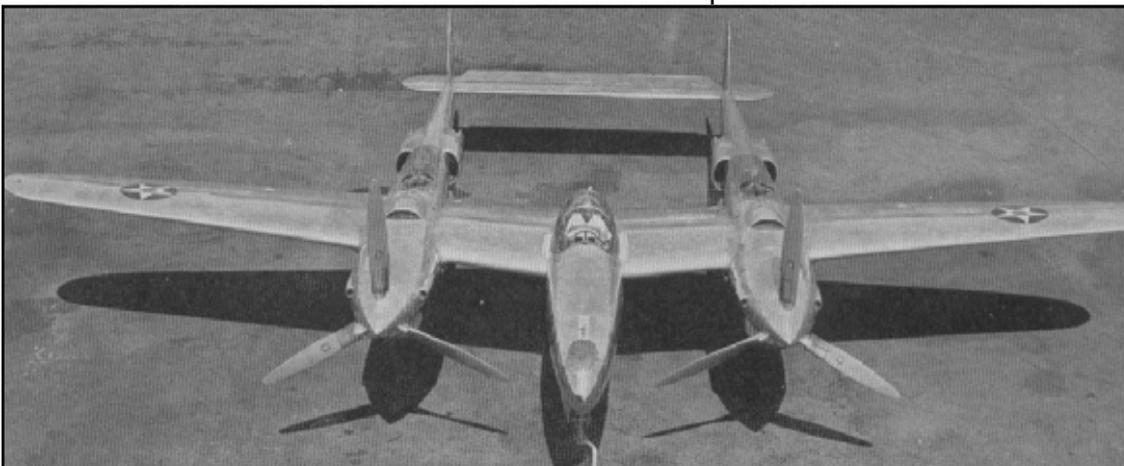
The Aircobra's were sold in great numbers to the Soviet Air Force who used them as ground attack aircraft, a role at low altitude in which they excelled.

When Lockheed produced their new twin engine fighter it varied from conventional design in many ways. The egg-shaped cockpit in the centre of the wing and the two Allison engines (one rotating to the left, one to the right) each had a boom which carried the tail fins and elevator. Like the Aircobra the Lightning had tricycle undercarriage.

To increase power and improve performance at altitude the engines were fitted with turbochargers and intercoolers and a service ceiling of 40,000 feet was available. All these extras were fitted down the boom behind the engine. The engine layout continued to have a very small head-on cross section, which of course is a benefit as there is less drag.

The radiators too were placed well down the boom.

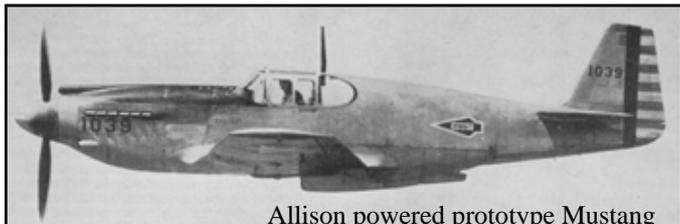
Each engine produced a maximum wartime rating of 1600 hp The Lightnings were very popular in the Pacific Theatre where long distances over the sea were flown. There was that second engine to get you home if one failed.



North American produced the Mustang at the request of the British Air Purchasing Commission to replace the Kittyhawk,

which was unsuited to the European Theatre. The first Mustangs were produced with Allison engines with the single stage supercharger that restricted them to operations below 12,000 feet.

Soon after introduction to the RAF four Mustangs were given to Rolls Royce who fitted them with Merlins having two stage superchargers. The new engine gave the Mustang the altitude performance that it required to combat with the German fighters.



Allison powered prototype Mustang

The Americans were naturally reluctant to have their aircraft fitted up with a British engine and Allison were asked if they had an engine suitable for the job. Allison did, the engine used in the Lockheed Lightning but due to all the extra components being added on behind the engine and down the tail boom the only way that it could be fitted to the Mustang was if the pilot and cockpit was left out!!!!!!

Rolls Royce were already unable to supply enough engines for the British Aircraft industry and this is why Packard in the USA were instructed to produce Merlins under licence.

In 1945 some of the last Mustangs and the Twin Mustangs were fitted with Allison's with two stage superchargers. These engines proved very successful and they could be used for longer periods before engine overhauls than the Packard Merlins.

FOR SALE

Myford ML7 lathe. 4 and 3 jaw chucks , faceplate, travelling steady .

Very good condition.

Being sold on behalf of retiring model engineer. \$1700

Apply to Barry Parker Phone (06) 354 5972

FOR SALE

12"x12" cast iron marking out table with wooden cover. \$90 ono

Contact Laurie Jenson Phone (06) 368 6223

WANTED TO BUY

A Rodney Mill-drill of the type that will fit on a Myford ML7 or Super Seven lathe

Contact Bernie Coyne Phone (06) 753 4528.

SEPTEMBER MEETING

This is to be held at Ohakea Air Force Base on Thursday evening 22 September 2005.

A Bus will leave the Hard of Hearing hall at 7:30pm **Sharp** and will also pick up members and guests outside the Shell Garage in Sanson at 7:50pm.

NOTE:-

You will only be able to enter Ohakea in the Bus due to Air Force security.

The fare is \$3.00 per person, payable to the driver or his assistant.

Please notify the secretary if you are coming and if you are bringing a guest.