

NAPIER

HERITAGE NEWS

THE QUARTERLY JOURNAL OF THE NAPIER POWER HERITAGE TRUST

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WEBSITE <http://www.npht.org>

CHAIRMAN'S MESSAGE

Happy New Year to you all. This year is special to us because it marks the 100th anniversary since work commenced on developing the Napier Lion. This engine firmly established the company in the aero industry where it reigned supreme for many years.

On all of our behalf I would like to personally thank Trevor Brockington for all his efforts in arranging transport for the transfer of our Deltic from DPS to its fabulous new home in Wales.

Our Facebook page has steadily grown from strength to strength and is bringing this Trust and the Napier Company to the notice of a much wider and younger audience. I am not sure how many new members will be recruited, but let us hope some will join. This costs us nothing but a little time but does put us in front of a very large and diverse viewing public.

We are now looking towards the next AGM and the election / re-election of the Committee to run your Trust for the next 12 months. We really would encourage you all to make the effort to attend this most important event in the NPHT calendar. We welcome all of your comments and ideas for the Trust but please remember that only fully paid up members can vote so if you are not sure please check with John Street. I look forward to seeing you there.

Finally can I appeal to you all to put pen to paper and contribute something to YOUR Napier Heritage News. It takes time for Nigel to edit NHN every three months and I know he is short of articles. We would welcome anything Napier related including news snippets, memories, through to full blown novels!

Roy Gasson

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CURRENT NEWS

CT18-42K on the move

The Trust's mock-up CT18-42K Deltic engine was delivered to Internal Fire – Museum of Power on 23rd December. Our thanks go to Alastair Ure-Reid for finding the new home for our engine and also to Trevor Brockington for making sure the move went safely. We are also grateful to Graham Clarke and Steve Smedley who were the only people from the DPS who assisted with the loading of the engine at Barrow Hill.

The engine was originally placed in the Trust's care in 1993 by the National Maritime Museum in Greenwich. Since then it has been on display at the British Military Powerboat Trust at Marchwood. After the closure of the site it was put into storage before attending our Powerex event in 2008. After the event it was moved to the DPS to become an exhibit in their proposed museum. In December it was transferred to the **Internal Fire – Museum of Power** museum in West Wales.

Located at Tanygroes, Ceredigion, near Cardigan, the museum's collection is mostly of larger working stationary diesel engines, as used for generating sets and pumping stations. It operates the oldest working diesel engine in the UK, a 1912 single cylinder air-blast injection Sulzer.

The museum consists of nine halls and is in the process of creating a new steam hall which will house a 1903 J & E Wood 500hp tandem compound along with an 1879 John Penn twin cylinder oscillating paddle steamer as well as a number of smaller engines including the only surviving Petter steam engine.



LETTERS

Visit to Sandhurst with the 20 Ghost Club - An appeal to Napier vehicle owners.

On 3rd July we have been invited to attend the 20 Ghost Club at Sandhurst with our Napier vehicles. The day will include RMA driving tests and Concours d'Etat at Sandhurst. Because the location is a military establishment there are restrictions to entry could any Napier vehicle owner who is interested in attending please contact me at cliveboothman@hotmail.com

Clive Boothman

ENGINES

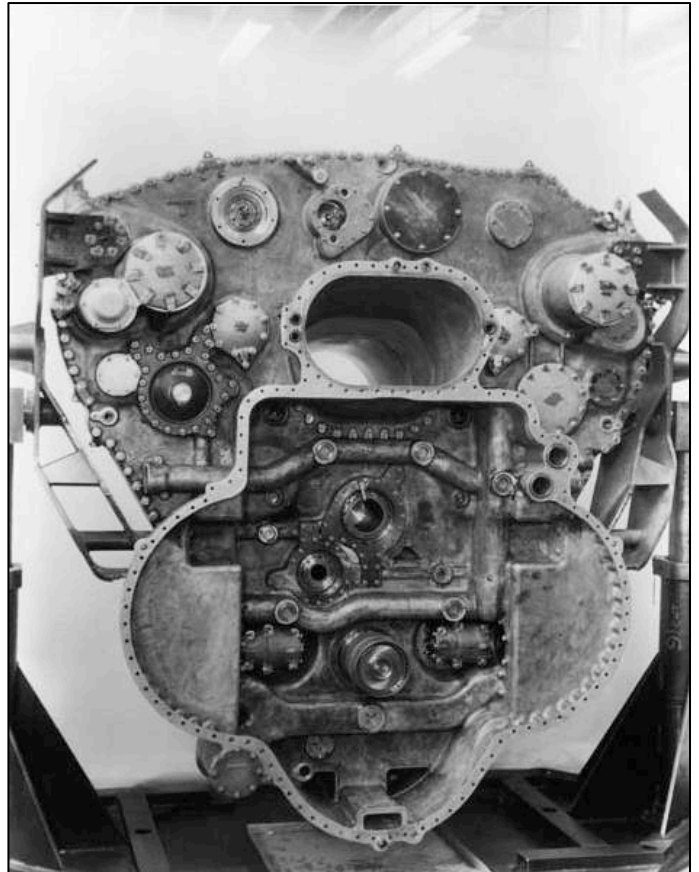
Compounding the Deltic – Part 1

Development work for the E130 Deltic engine commenced in 1946. Right from the outset the Admiralty had recognised the potential of compounding the engine.

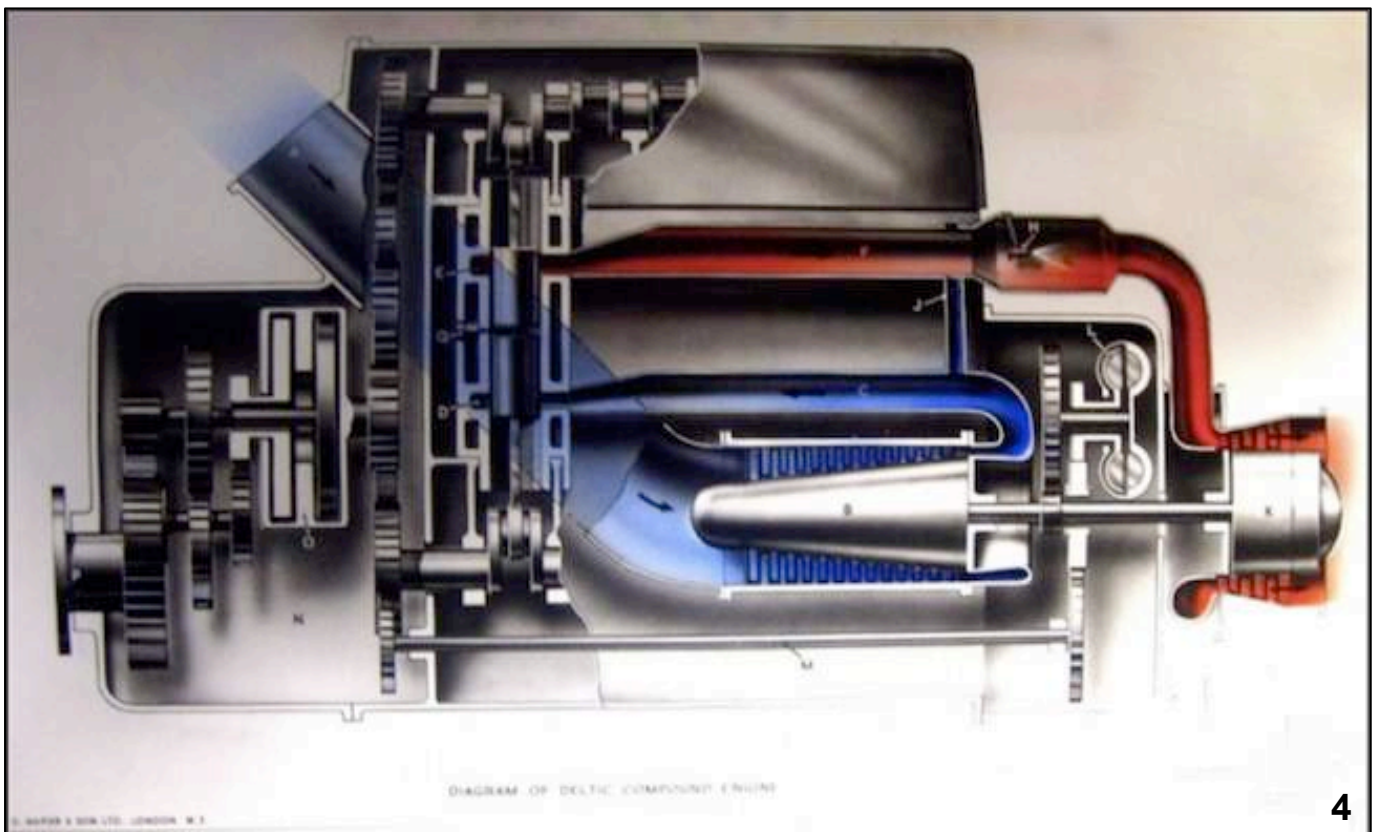
In 1948 the Admiralty placed an initial contract worth £62,500 with Napier to proceed with preliminary development work for the compounded version of the design. The Company had six E130T single cylinder Deltic test units. During April 1949 work commenced on converting the second E130T test unit to compounded conditions. In July 1951 it was of strengthened design to permit the elevated performance of the proposed compound engine and first ran two months later.

In June 1951 the first 18-cylinder Deltic, D18/1, had successfully completed 250 hours of a 500 hour cyclic endurance test run. This was the longest test run of any Deltic engine to that point and the Admiralty considered this progress sufficient to place a revised contract worth £2.5 million to complete the development of the compounded engine.

By October 1951 the build standard of E130T No.2 development engine comprised Bi-metal pistons running in a dense chrome bore, 118°/141° inlet / exhaust liner having 7 exhaust ports. Both crankshafts had cast iron flywheels incorporating Bibby type couplings to their respective drive gears. However it was to take a further six years before the 18-cylinder development prototype compound Deltic was operational.



The phasing case of the Compound Deltic engine was unique in having the air intake for the compressor passing through the centre



Compounding the Deltic – cont'd

The "Compound Deltic" consisted of an 18-cylinder Deltic engine coupled to a gas turbo compressor driven by exhaust gas from the diesel engine, which acted as a turbo supercharger and which provides some excess power to the output shaft at high speeds. In order to provide a good supercharge at low speeds, fuel is supplied to a combustion chamber between the diesel exhaust and turbine inlet to boost the supercharger.

The air supply to the diesel engine followed two stages of compression. The first stage was by axial flow type compressor and second by centrifugal compressor. These were fitted within the triangle of the Deltic engine and based on the compressor fitted in the Napier Nomad compound aero engine also being developed at the same time. Exhaust gas from the generator was fed through a turbine whose power was taken to drive the axial compressor and also supplement the power the output shaft. The power developed by the diesel engine was absorbed in driving the final shaft and additionally provided the drive for the centrifugal compressor. The combined pressure ratio of the compressor was 6:1 and helped increase the b.m.e.p. of the Deltic to 188 psi and doubled the power output to 5,000 H.P. along with a further 500 H.P. contributed by the gas turbine at full output.

NAPIERIANS

From The Shop Floor – Memories from John Street (NPHT Membership Secretary)

D-Day starts you thinking! Going to school, war over, leaving school, and then going to work at D. Napier & Son.

Who do I remember ?

Well it would be too much to recall all the names from all the departments that a Napier apprentice went through so I shall leave out all the friends I made on the way over to PR2 (we do catch up at the reunions).

The Blade Section

Management - Bill Mitchell Superintendent,

Foremen - George Wright, George Woollett, Percy Clarke & Les Brennan.

Inspection - Bill Frid, Tommy Bull (Not Tom Bull from the Fitting Shop).

Machine Shop - Len Palmer, Eddie Masters, Jimmy Finnis & Ted Sylvester.

Electrical - Bob Inman.

Sub Toolroom - Les Brennan, David Spooner & Malcolm May, who went to Acton Toolroom.

We had a West Indian called Gordon. I can't remember his surname but he was a weightlifter. I remember him putting John Sawkins and Alan Dodsworth on his shoulders. I can see more faces but no names.

If you worked at PR2 Blade Shop Dept 107 and you can enlighten me with more names then please do so.

In fact it would help if all you Napierians from the shop floor wrote to us with names, recollections, etc of the Departments you worked in. This way we may be able to add more names to our employee list and improve our record of what it was like to work for the Company. Please write to us.



L – R Ernie ?, Bill Frid, Les Brennan, Jimmy Finnis and John Street

NAPIER MEMORIES

S.F. Edge In His Own Words

October 1911.

“Should be an engineer of some sort and is a very masterful, impatient and reckless man. Furious at sloth or incompetence, never satisfied except with perfection and ought to love making records of any sort – never should be still but he must beware of heart trouble. Must be master (or apparently so). A wonderfully magnetic, ambitious & forceful personality, but likely to come to grief – a sort of Icarus, whose ambition may prove his own undoing – but he ought to go very far. Can be absolutely twisted round a woman’s finger who is clever enough to study him as he is developed on one side only (if you can get a specimen for me please do). He’s a kind of modern pirate – it reminds one of ‘Treasure Island’ and that ilk.”

Throughout his life, S. F. Edge kept scrapbooks, mostly consisting of press cuttings from journals of the day. These were bequeathed to the Veteran Car Club after his death by Mrs Edge. In amongst this wealth of material is an intriguing book of handwriting analysis (graphology), including this analysis of Edge himself. Now dismissed as ‘pseudo-science’, the first English book on the subject was published in the 1880’s which presumably allowed a number of people to expand their repertoire from psychic into this area. The scrapbook recording this entry has been quite heavily edited although a couple of dozen such ‘readings’ remain. In preserving his own reading, one must therefore assume Edge saw something in it? Whether this was a ‘cold or ‘warm’ reading (i.e. did the graphologist know or guess the identity of their subject) we cannot now know. Interestingly, when Edge finally retired he cited “strain on the old ticker” as one of his reasons, so perhaps this had some continuing resonance. The thumbnail caricature above appears in the scrapbook at about this date – not overly flattering but Edge felt it worth preserving and it has a certain naïve charm.



Clive Boothman

APPLICATIONS

Volkel Air Base Museum

Napier Heritage News is read by volunteers of the Volkel Air Base museum “Typhoon”. Although this isn’t a specific Hawker Typhoon / Tempest museum, several parts of these aircraft are on display or in storage in this museum, where the history of Volkel Air Base is shown.

Volkel was once a quiet village in the south-eastern part of the Netherlands. Soon after the German occupation of the country, construction commenced of a new Luftwaffe airbase on the heath fields east of the village around May 1940. Two runways, several taxi tracks, over forty hangars and a base camp with accommodation for the men were built within two years. Day fighters commenced operations there from 1943 and the following year the latest Junkers 88 night fighters were also stationed on the field. In July 1944 one of these Junkers JU 88’s landed in Woodbridge (by accident!!!) giving away the latest Luftwaffe secrets on radar and homing devices.



APPLICATIONS Cont'd

Some of the first Messerschmitt 262 jet aircraft were flown from this field in August 1944. Allied bombings of August 15th and September 3rd 1944, in preparation for Operation Market-Garden put an end to the Luftwaffe's use of Volkel. A few days later the Luftwaffe blew up all but one building.

In late September Volkel was visited by a British recce team and after a few days RAF and Royal Engineers together with local workmen were repairing the runways ready to take Hawker Typhoons of 121 Wing, 2nd Tactical Air Force. Shortly after Wing Commander "Bea" Beaumont followed with his Hawker Tempests of 122 Wing. Also in October Spitfires of 126 Wing Royal Canadian Air Force joined making Volkel became a very busy airfield. Autumn rains made Volkel a very muddy and foggy place giving it the RAF-name of "Volkel Spa". A very cold and snowy winter followed, which made it very difficult for the technical men to work outside without adequate protection from the weather. The freezing temperatures caused lots of problems for the Napier Sabre engines, which did not like cold starting. Once the allies crossed the Rhine near Wesel on March 24 1945, the 121 and 122 Wings moved to airfields in Germany and in August 1945 the last RAF aircraft of the 2nd Tactical Air Force left Volkel airfield.

After the war it became a training station for thousands of Dutch Marines who received their basic military training, before moving to the Netherlands East-Indies, now Indonesia. In 1951 the base was taken over by the Royal Netherlands Air Force (RNLAf) as a new tactical air force base. The first aircraft were F-84E and G Thunderjets and also some Gloster Meteors. The latter soon disappeared to air defence bases in the country. In 1955 the Thunderjets were replaced by three squadrons of F-84F Thunderstreaks which were later replaced by F-104G Starfighters in 1965. In 1982 these squadrons received the General Dynamics F-16A/B aircraft (now Lockheed-Martin). At present Volkel is one of the main operating bases of the RNLAf with two squadrons, 312 and 313, equipped with Mid-Life Updated F-16's.

In 1992 a group of volunteers opened a small museum, a *Traditiekamer* (Tradition room) in one of the buildings at the airbase. This was in honour of Typhoon pilots who had lost their lives in the last year of the war. The museum was named "*Traditiekamer Typhoon*" and divided in three large rooms. The first depicts the construction of the airfield and the Luftwaffe day and night fighter operations. The second covers Operation Market-Garden, the liberation of the region, the arrival and operations of the 2nd Tactical Air Force at Volkel and the use of the base by the Dutch forces. The final room covers the post 1960 period and includes a J-65 jet engine, a F-104G Starfighter cockpit with its avionics and a F-16 simulator cockpit.

Over the years several parts of Hawker Typhoon / Tempest aircraft have been collected, including main wheels with tyres, part of a Sabre carburettor, engine exhaust pipes, wing rocket rails, part of a propeller mechanism and several smaller parts.

The museum has a 1/6th scale model of a Hawker Typhoon 1B on display which is on loan from the Napier Power Heritage Trust since 2010. This had been restored by NPHT members Bill Mongar and Ken Finding.

Some years ago a complete Typhoon Sabre engine was dug up not far from the base and put on a stand. At present this is in storage in a hangar at the airbase.

The museum has a small library with copies of the RAF Operation Records Books of all the Wing/Squadrons of the 2nd Tactical Air Force that were stationed at Volkel from September 1944 – April 1945.



Visiting the museum airbase is possible but by appointment only. For information about visiting the museum please e-mail vk1.traditiekamer@mindef.nl or telephone 0031 413 276135 on Tuesday / Wednesday / Friday 09.00 to 17.00 hrs. The address is Vliegbasis Volkel, Zeelandsedijk 10, 5408SM Volkel, Netherlands.

ENGINE CONSTRUCTION

Inside the Sabre – An Engineering Appreciation Part 1

My name is Clen Tomlinson and I am the NPHT Committee member listed as having responsibility for “Models” . . . I wish! I am not a true Napierian, that is, I have never worked for any Napier Company. My initial contact with NPHT came some ten years ago when seeking drawings and detail information for the Sabre engine. This had been prompted by the sudden passing of my wife and the need to find something to fully occupy my mind. I have been an Engineer all my working life and have always had a comprehensive machine shop which includes a 3D CNC lathe and mill. I also have a range of older more conventional machines including lathe, universal mill, surface and cylindrical grinders, honing and grit blasting machines. There is also a range of welding equipment including MMA, MIG TIG. Most of the machining work involves the production of complex 3D forms. Much of this involves the production of 2 and 3D CAD drawings from which to pick off co-ordinates to write the lines of code to input into the machines. I do not use any CAM software.

I had built / modified many cycles, motor cycles, cars and live steam locomotives over the years and set about building a small scale fully functional replica of a complex internal combustion engine. The Aero Engines of Rolls Royce and F1 Engines from Ferrari, BRM and Cosworth etc however a number of examples of these already existed. If you want something really complex you should look no further than D Napier and Son Ltd, my inspiration being taken from the reference book entitled “Some Unusual Engines” by L. J. K. Setright. From here I produced a short list of three Napier engines: The Sabre, the Nomad and the Deltic. The Nomad was rejected as it is a compounded engine and I am not that interested in gas turbines! The Sabre was the first choice being the most complex but I had no design details. The Deltic is relatively simple geometrically and LJK’s book gave an accurate cross section drawing from which to scale the dimensions.

Geometrically the Deltic engine is straight forward and dimensions like bore and stroke are known so an accurate set of drawings was straight-forward. So, project 1 was the Deltic in 1/8 linear scale. The results of my efforts are shown left.



During this time I continued to search for information on the Sabre engine and eventually found the Trust. As is normal with such things, in the process of gathering the specific Sabre information I developed an interest to all things Napier. Over the subsequent years I have been asked to make presentations to a variety of groups, clubs and organisations both in the UK and abroad, on the process of making these fully functioning small scale replicas. The most common questions arising from these meetings are “How does the sleeve valve work?”, “How do the valve ports in the sleeve and cylinder work?”, and “How does the valve timing work?”

I intend to begin to describe these and other aspects of this remarkable engine in subsequent articles.

Clen Tomlinson

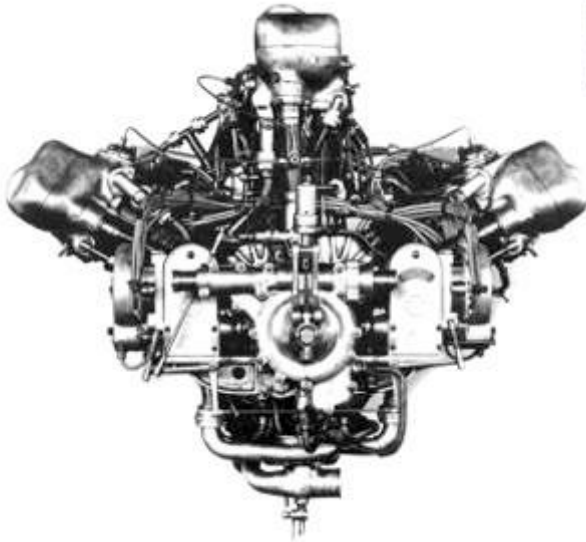
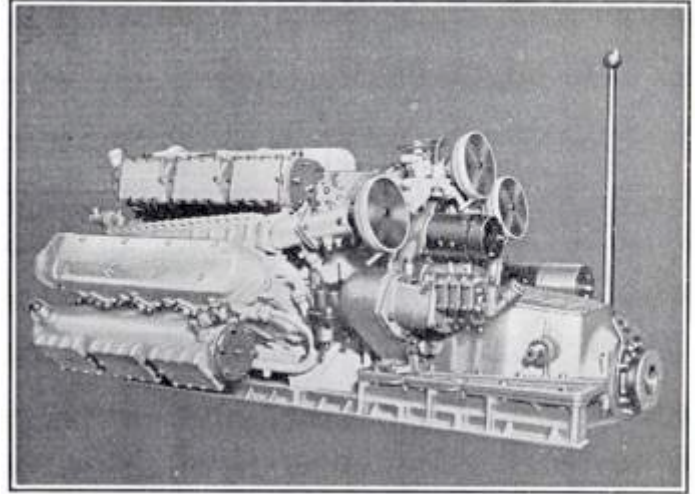
ARMCHAIR ARCHIVES

"Monty's Masterpiece" -

from Alan Vessey.

Which Napier engine came out in twenty forms and series types, ranging in power output from 400 to 1,400 brake horsepower? Further, it had powered 130 aircraft types over 20 years; it then introduces fast Motor Torpedo Boats to the Royal Navy and hundreds of Air Sea Rescue Launches to the RAF.

As a sportsman's power unit, either singly or in multiple, it propelled marine hydroplanes and land record cars, as much as it did many racing aircraft for a 10 year period. Yes, you've got it – The Napier "Lion" – this always a 24 litre petrol engine, compact in its broad-arrow layout, and having an indestructible 4 throw slab crankshaft mounted in huge roller main bearings!



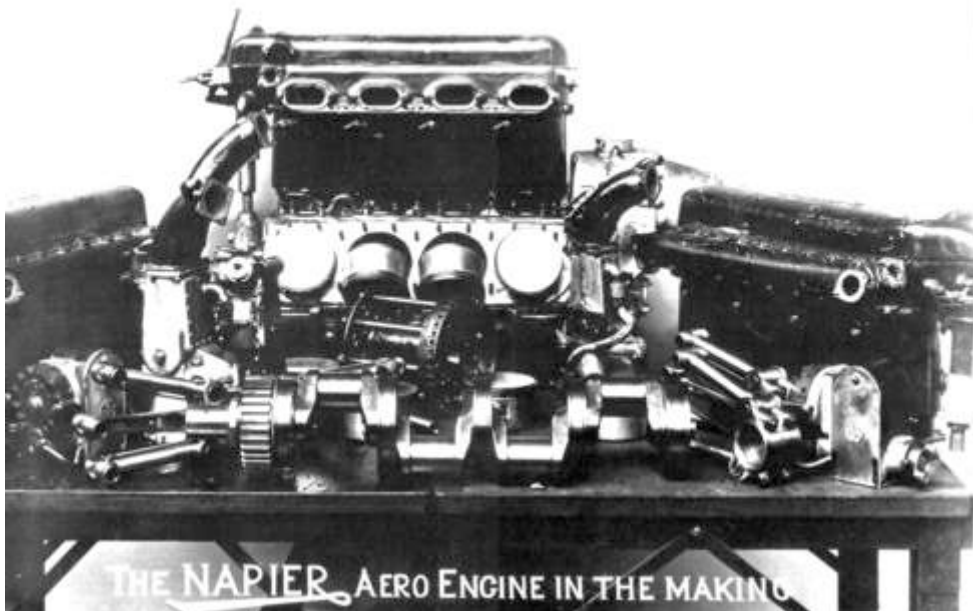
This is the centenary year after 1916 from when it was developed, at first with the help of A.J. Rowledge, and then from 1922 under Captain George Wilkinson. So confident was its designer, Montague Napier, about his "masterpiece", that he was prepared to sacrifice Napier car production in favour of this "Triple Four" aero engine, the manufacture of which he personally financed for the first 300.

Over the next 30 years the "core 24 litre" engine often became masked by many assorted external alterations and additions,

even being wholly inverted as the "Lioness" – this not too successful, as the "Lion" was clearly to be a male engine!

The "Racing Lion" – of Series VII – were externally smaller units but still of 24 litre capacity in the cylinders. They produced higher power outputs from using higher compression ratios up to 3,600 rpm, and then supercharging.

For fullest details of all "Lions" we now await the publication of the Centenary story of the engine and its users gaining many awards, entitled "**Napier Lions at Large**".



GENERAL MEETING

Notice is hereby given of the 21st Annual General Meeting of the Napier Power Heritage Trust at 12 noon on Thursday 28th April 2016, in the Napier Room at the Institute of Mechanical Engineers, No.1 Birdcage Walk, Westminster, London.

All current members of the Trust are welcome and eligible to attend and vote at this AGM.

AGENDA as follows:

- 1) Apologies for absence.
- 2) Approval of Minutes of the 20th AGM.
- 3) Matters arising from the Minutes*.
- 4) The Chairman's 2015/16 report.
- 5) Treasurer's statement of accounts.
- 6) Membership secretary's report.
- 7) Election of Officers.
- 8) Election of Executive Committee.
- 9) Any other business.

* Copies will be available on the day.

All nominations for Officers and Committee members should be sent ASAP to:

Hon. Secretary, Trevor Brockington, c/o Unit 12, Furnston Court, Icknield Way, Letchworth, Herts, SG6 1UJ or e-mail him via secretary@npht.org

As usual this popular occasion will be followed by a buffet & a Napier related presentation.

DIARY DATES

Thursday 5th April (20.00 – 22.00) – TALK The Napier Deltic Engine and Locomotive

The Hertford and Ware Railway Society

Richard Hale School, Hale Road, Hertford. SG13 8EN

ALL WELCOME

Thursday 28th April – NPHT AGM

I.Mech.E, No.1 Birdcage Work, Westminster, London. See notice above.

11.00 Coffee & Tea for 12.00 AGM. Buffet afterwards.

Shuttleworth Flying Days

Please contact us about our attendance at these event secretary@npht.org

Saturday 1st October – Luton Reunion

Further details available from Trevor Brockington secretary@npht.org

Thursday 27th October – Acton Reunion

12 noon at the Old Company Sports Ground, Gunnersbury, London.

All welcome, a small charge for the Buffet will be made.

Further details from John Street 01903 366954 napier_duk@yahoo.co.uk

Napier Power Heritage News No.91 very kindly printed and distributed by **Trevor Brockington**

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President : Mr Geoffrey McGarry

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