

AUTOCAR

1903 North Eastern Railway Electric Autocar Trust

Newsletter No.35 — Summer 2018

*Launch
date
inside!*



Museums
Libraries &
Archives

The North Eastern Railway 1903 Electric Autocar Trust

Registered Charity No: 1105829
Company Registration No: 05171008
www.electricautocar.co.uk

- Chairman** Stephen Middleton,
Rose Lea House, 23 Brunswick Drive, Harrogate,
North Yorkshire, HG1 2QW.
Tel - 01423 561 965
E-mail - middletonmarketing@btconnect.com
- Secretary** Dave Cullingworth,
29 Beckett Close, Nawton, York, YO62 7SB.
Tel: 01439 771 758
E-mail: david.cullingworth@btinternet.com
- Treasurer** Peter Lund,
41 Penfold Way, Dodleston, Chester, CH4 9NL.
Tel: 01244 661070
E-mail: plund97005@aol.com
- Press,
Publicity
& Editor** Simon Gott,
Tel: 01943 863 440
E-mail: autocar.newsletter@gmail.com
- Membership** Stuart Hiscock,
2 Lairs Crescent, Snainton, N Yorkshire, YO13 9BQ.
- Project Engineer** Steve Hoather M.A., C. Eng., F.I. Mech. E., F.I.E.T.
- Front Cover:** *Dave Sunderland, Steve Hoather & Kathryn pose for a photograph with the engine-room roof cowl, manufactured by Yorkshire Profiles Ltd. Their sales-person Kathryn was so interested in the project she delivered the cowl personally.*
(Alan Chandler)

July 2018

Welcome to the 35th issue of our newsletter. The news we've all been waiting for and what so many have been working towards for up to 14 years. Over the page Stephen announces the launch date. Members and supporters are cordially invited to the autocar's re-entry into service. (RSVP!)

Many thanks to Alan Chandler for his photography. Unless otherwise credited, all photographs were taken by him.

Contents

Chairman's notes	4
Progress report	6
The third engine — a mystery	16



New members

A warm welcome to DS Burman of Hull and K Rutherford of the Isle of Colonsay.

Imprint

A few words on our newsletter printers to answer some members' questions: Imprint (est. 1981) is based in Newtown (Powys) and has printed material for various railway societies and the National Trust. I discovered them when buying books about the Tal-y-llyn Railway. They print using chemical free processes, using vegetable oil based inks and all of the paper used is FSC approved.

Chairman's notes

Stephen Middleton

This issue has an interesting article from member and fervent supporter Martin Barker. Martin has also written a more general piece for another society about the autocar, spreading the word and acting as a good 'primer'.

Progress has been good, with an October launch planned. A huge amount of thought, design, engineering and assembly went in to the roof and technical features above the engine and this is coming together well. As I write, the power car is raised off its bogies on jacks to enable height adjustments and other work to be completed. Once that is down again, testing will be scheduled.

Again, many thanks to our most generous membership. We are really boosted by your support and it is great for the morale of working members. A truly great partnership! Upon completion HLF will pay the retained 18% which is resulting in a small cashflow issue as the design and components of the air brake system of the autocoach is costing more than anticipated. If you are able to help with donations or a short term loan we would be so grateful.

I look forward to meeting many of you in October.

Newsletter Back Issues available:

Numbers 14, 16, 17, 19, 21, 22, 24, 30, 31, 32, 33, 34. £2.50 each.

P&P at cost. Available from the editor.

Opposite:

Sammy shows an interest. Her owner, Chris Hubbs, has done several pieces of work for the autocar and on the day of this photo, was about to shunt the autocar round to another shed, for it to be lifted off its underframe.

Launch date - an invitation

Friday 19th October 2018

At Embsay station, 11.30 for 12.00

All members and supporters of the Autocar

Trust invited. RSVP to Stephen Middleton,

middletonmarketing@btconnect.co.uk

or 01423 561965



Progress Report

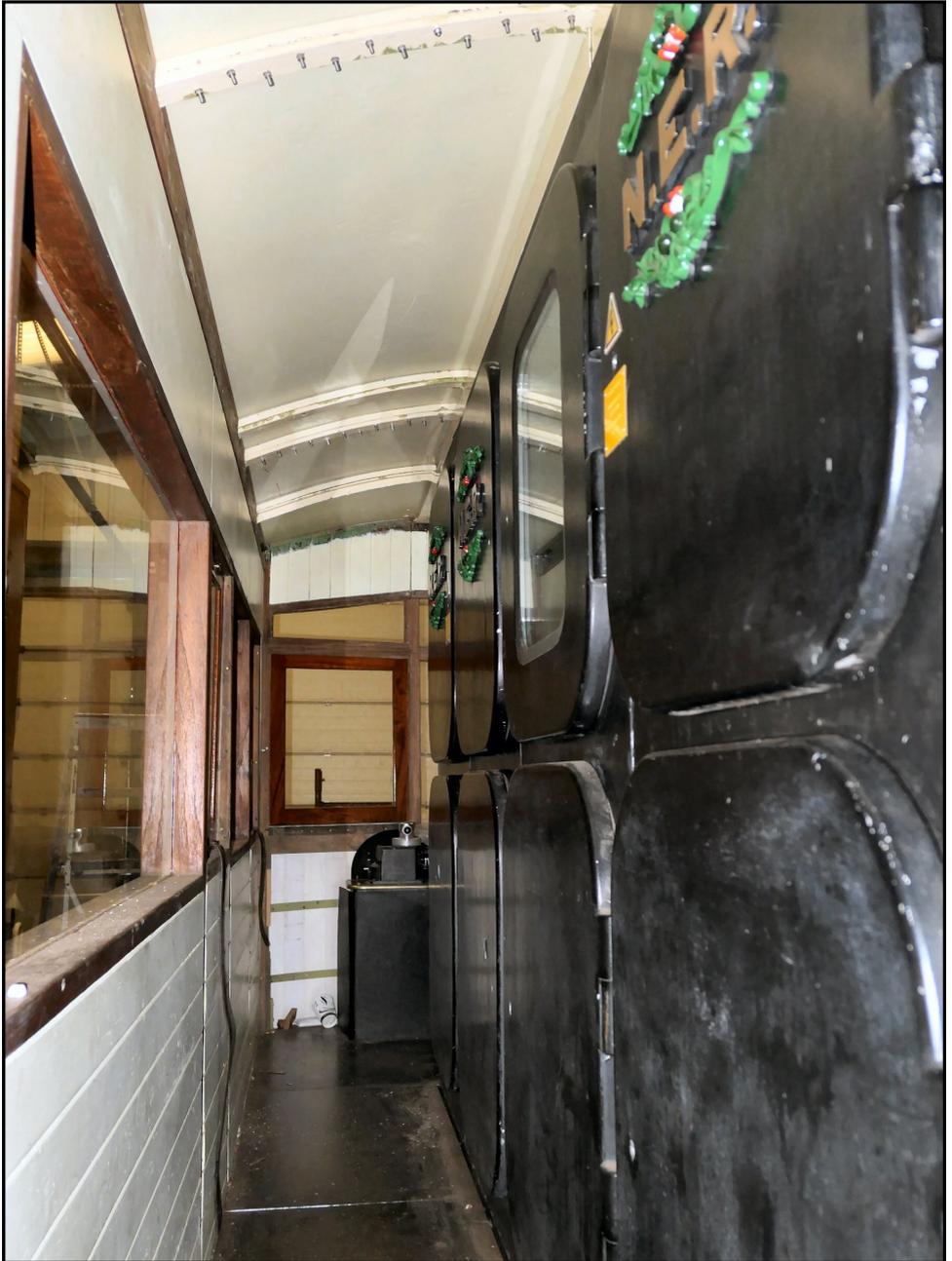
Steve Hoather, pictures Alan Chandler

The priority over the last few months has been to complete the engine room roof. At the time of the last newsletter the new panels for the centre (raised) part of the clerestory had just been delivered, and lifted onto the roof to mark the positions of the fixing holes for drilling. These then had to be lowered again, drilled and painted before being lifted back on to the roof and bolted down – we are not using rivets as the whole of the engine room roof has to be removable in the future for when the engine unit needs to be lifted out, hopefully not in our lifetimes!

We decided to re-use the side roof panels, as they were in reasonable condition, and the bolt holes were already drilled. However, the construction of the framework which supports these is extremely complicated, and many of the securing bolts have to pass through four different steel sections, so careful lining up was necessary before the bolts could be passed through and the nuts fitted – Alan and the team spent many hours on this, and we all learnt some new swear words! The photo opposite top shows the roof partly fitted. There are several redundant holes in these sections, and these have either been plated over, or the small ones filled with bolts, washers and nuts to ensure a watertight seal. Interestingly, it was apparent that one of the old holes above the driver had probably been for the whistle, so we have re-used it for its original purpose. At the time of writing (mid-June) the roof over the left hand side has been completed, as shown opposite top and on page eight. The other side needs the coach to be moved to gain access, but before then, the autocar has been moved to the jacks for lifting, as described later.

The top of the engine housing is a large dished flat surface, incorporating the radiator. One factor to consider is the possibility of snow blowing in when the vehicle is stabled, and forming a large puddle of water when it melts – not good for the electrical equipment below. We therefore have fitted small drain pipes in each corner, and had been on the lookout for some time for suitable strainers to prevent debris entering these drains and blocking them, just like leaves block gutter downpipes. Alan made good use of a holiday in Hong Kong visiting his daughter, and found some Japanese tea strainers, which should do the job admirably. The picture opposite below shows one in place.

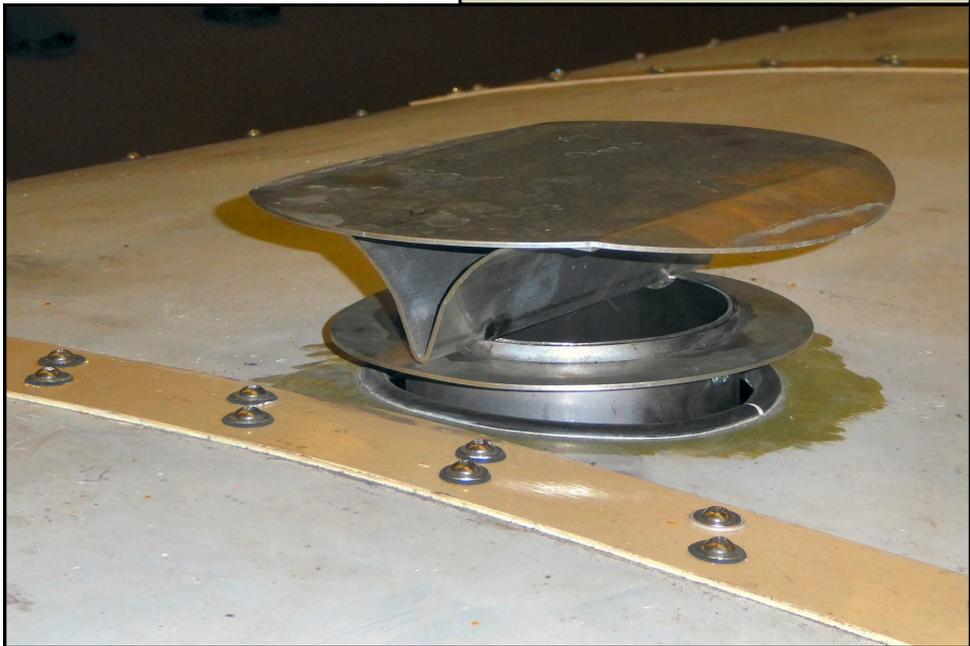
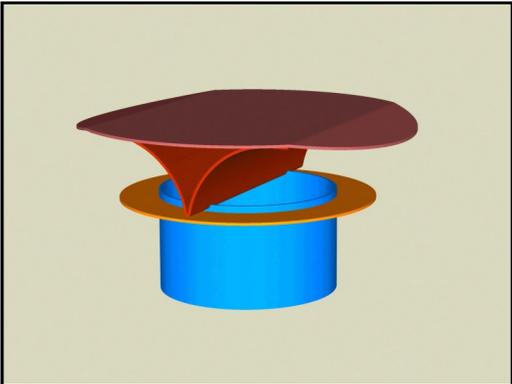




The engine room, showing the work on the ceiling and sides.

Most diesel locomotives and railcars have the exhaust pipe unprotected, which can allow rain water to enter the silencer when the engine is shut down. Since the autocar will spend most of its time shut down, we thought it wise to fit some form of flap to prevent rain going down the pipe. Our first idea was to use a flap which is pushed open by the exhaust gases, as fitted to some lorries, however, the one we fitted for tests on the chassis whilst on the Great Central was too high, making the vehicle out of gauge. We therefore designed a cowl which has a cover plate to prevent rain entering directly, but allows free exit of the exhaust gases, which are deflected sideways. Although it is difficult to describe, the drawing and photo below should make it clear. Even after shortening the exhaust pipe as much as possible, the cowl is only just within the loading gauge.

The cowl was manufactured by Yorkshire Profiles Ltd. Our order was taken by Kathryn, who delivered the cowl personally, giving us this issue's cover picture.



The control desk in No 2 cab is now wired up and most of the air pipes connected – Roger and I came in one Saturday so that we could run the engine to test the controls without getting in the way of other volunteers working on the roof (which is the critical path). The brake controller in this cab cannot be fully tested until the remaining air pipes are connected, which is now in hand with the vehicle lifted off its bogies.

At the beginning of June, the jacks in the lifting shed at Embsay became available, so the power car was shunted round in preparation for lifting, which took place on 5th June. In order to get the vehicle sitting level and at the desired buffer height, a steel packer has to be made and fitted under the centre casting of the trailing bogie. Also, by fitting thinner packing pieces under the side bearers so that there is a small clearance, most of the weight will be on the centre casting rather than the side bearers as before: this is important to keep what is known as ‘Bogrot’ – the bogie rotational stiffness - to an acceptable level. If this is not done, there will be excessive flange contact on entering curves, and in extreme cases this can contribute to a derailment. The photo opposite top shows the autocar lifted and resting on stools at each corner. The photo opposite below shows the motor bogie end whilst lifted – the large cables supply the electric current to the motors which are axle hung on the bogies – we had to be careful not to lift the body too high and damage the cables by stretching them. Whilst the body was lifted, we had a look round to see if any parts of the body had been fouling the bogies, and found two brackets which secure the handbrake pull rod to the underframe had been scraping on the bogie, so these are being modified to increase the clearance.





Early in June, Dave Moore came up from Loughborough with some more components for the trailer car air brake conversion – two reservoirs with their mountings and the distributor bracket. We managed to fit one of the reservoirs on the underframe, and part of the distributor bracket – the top photo opposite shows Dave drilling the solebar and the photo underneath shows the reservoir mounted on the underframe. The brake rigging on the trailer has yet to be overhauled, and the mounting plate for the air brake cylinders is being assembled by the Great Central at Loughborough and the photo below shows some of the parts after Peter van Houten painted them with primer.

Dave was also able to check the dimensions for the raised pedestal for the cab desk in this vehicle, described in the last issue – the photo on page 14 shows the mock up.

As soon as the underframe work is finished, we will lower the body on to its bogies again, and the next jobs are to fit the lower part of the clerestory roof on the second side, fit the remaining air pipes to no 2 desk and then commence the static brake testing.



PVH





Above: Mock-up of the driving position in the autococh.

Below: The autocar roof with louvres, without panels.





This page: The roof panels being installed.



The third engine — a mystery?

Martin Barker

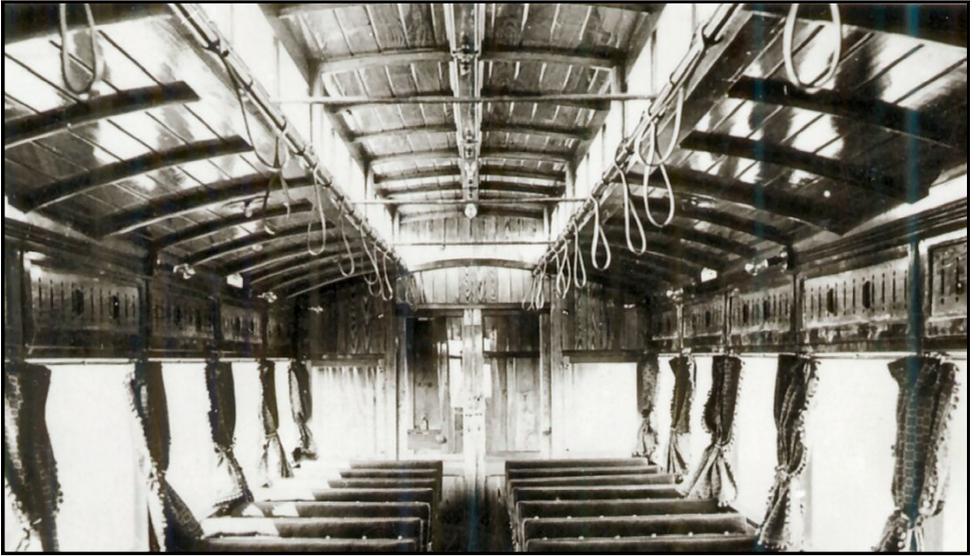
I was fortunate enough to be given a guided tour of our favourite autocar (and other, not insignificant, vehicles) by Stephen Middleton in early June and, as ever, although some questions were answered by seeing the vehicle, others also arose.

Firstly, I was struck by the absence of the cross-tie rods at the base of the clerestory. These are clearly visible in the official 1903 NER photograph of the interior (probably of no. 3171). Stephen pointed out the substantial angle irons holding the sides together and supporting the roof — not as shown in the NER official photograph. Stephen assured me that, “*This is how we got it*”, so there had to be a reason somewhere and after some consideration, I believe I may have come up with one.

When re-engined in 1923, additional cooling capacity was provided by fitting more radiators on the roof, alongside most of the length of the clerestory. Hence, it is logical to assume that additional support and stiffening would be required to cope with the added weight of the radiators and piping and the water contained therein. The cross-stays at the base of the clerestory, becoming superfluous, were removed.

Mention of 3170's 1923 engine led me to consider its origins. We know it had six cylinder, developed 225hp and was purchased for £339/10/0 from Slough Estates Trading Co. Ltd. which was handling war surplus disposals and was rumoured to come from a tank. The phrase ‘rumoured to be’ are a red flag to most historians but even such an authority as the late Ken Hoole apparently accepted this at face value without seeking further verification. (See *North Eastern Railway Buses, Lorries and Autocars* published by Nidd Valley Narrow Gauge Railways Ltd. In February 1969—page 45).

Obviously, the first place to go and look into was the subject of World War One tanks, a phrase which conjures up images of those rhomboid-shaped early vehicles trying to negotiate Passchendaele mud. But there was rather more to them than that. There were eight developments of these early tanks, plus the light medium A ‘Whippet’ tanks which came out in March 1918. These were quite fast for their time, but since they only had two 45hp engines, could be dismissed as a potential source of locomotion for the autocar.



Above, with cross-tie rods in the official 1903 photograph, below, some early restoration work, showing the angle-irons.



This left the rhomboid tanks. Marks I and II had the steerable wheels stuck out at the back but these created more problems than they solved, so were mitted from the Mark III and subsequent models, which relied purely on their tracks to change direction. All these types and the Mark IV has 105hp Daimler petrol engines, so again, could be dismissed. These were followed by the Marks V, VI and VII, which had six cylinder 150hp engines designed by Ricardo, again, not powerful enough for the autocar.

In 1917/18 came the last of the rhomboid tanks, the Mark VIII, a joint Anglo-American development. They came out very late in WW1, with very few produced in or for the UK but the US Army retained theirs in service until 1929/30. These Mark VIIIs had V12 'Liberty' engines, a type produced for aircraft use and which produced 300hp—ironically, too powerful to have been the engine used in no. 3170.

So I decided it was worth looking at other users of internal combustion engines, the RAF and Royal Navy. Initially, the Royal Flying Corps machines used engines of less than 100hp but by 1917, fighter such as the Sopwith Camel were using radial engines, whilst the big Handley Page O/100 and O/400 bombers has two 250hp Rolls Royce engines. Aircraft such as the SE5A and Bristol F2B fighters didn't seem to fit the bill either, so aeroplanes were ruled out, pending further investigation, which left the Navy.

Initially I considered submarines. The earliest Holland type boats had 160hp Otto petrol engines but these were soon superceded by Class A, B & C boats, all of which had petrol engines of 12 or 16 cylinders and Class D boats had diesel engines—so I felt all submersible vessels could be discounted.

The only other possible vessels listed in *Jane's Warships of WW1* were motor boats and launches. At the time, the fast Air-Sea Rescue launches had not come into being, nor had the fast motor torpedo boats associated with WW2, torpedo boat destroyers (now simply 'destroyers') were fast, steam-driven vessels meant for patrols, hit and run raids and countering similar enemy raids. There were two varieties of naval motor vessels in WW1, coastal motor boats and ordinary motor launches.

The former could be dismissed as possible sources of the autocar's engine as they had single Thorneycroft engines of 375hp. The latter were more likely candidates, having two engines, giving a total of 440-450hp, with one engine producing around 225hp—exactly the quoted power rating for 3170. there were three varieties of motor launch, '*Jane's*' gives us the details applied to the

second type, ML51-550 but simply says 'no details of the 1st and 3rd types, but similar. It also states that the vast majority of these boats had been scrapped by 1920, having 'rotted out' so clearly there would be many surplus engines available for disposal. Probably more from boats than from tanks? Also, it's reasonable to assume boat engines would be water cooled and 3170's engine was.

Thus, in the light of existing evidence, we can discount all tanks (unless an odd prototype for test purposes has escaped the records but I doubt it) as a source of 3170's third engine and aircraft engines also seem very unlikely.

In 1927, the LMS fitted a Beardmore Tornado diesel engine in a four coach electric train set of ex Lancashire & Yorkshire Railway stock from the Manchester area. The experiment was not a success, after a year the engine was returned to the makers and the set broken up. (*I have an article on this unit as part of the 'autocar cousins' series for a future issue.* Ed.) The Tornado engine had been designed for use with airships and was tried out on the ill-fated R101 in 1929, together with an arrangement for enriching the diesel fuel by introducing hydrogen bled off from the buoyancy gas-bags — which seems rather a fraught idea. As it was, the R101 met a spectacularly tragic end on a French hillside in 1930.

Years later, English Electric fitted two Napier 'Deltic' engines as used in RN minesweeper into a locomotive of that name and 22 were put to work on the East Coast Main Line, replacing scores of Gresley Pacifics - until they in turn were replaced by HSTs. Multiple unit sets powered by internal combustion engines with electric transmission — sounds familiar, doesn't it?

Anyway, it is my strong belief that 3170's third engine had its origins in marine use but would welcome any further - or contradictory - evidence which could help us get to the truth of the matter.

An early response from Alan Chandler: *The Mark V** variant of the Mark V tank had a Ricardo engine bored out to give 225hp. As 700 were ordered in 1918 and only 25 were built, the chances of one of these engines being available on the second hand market seems high.*

(Ed.) *I follow both Martin and Alan's logic, but we seem to be dealing with laws of probability and circumstantial evidence. Do any readers have evidence one way or another to indicate the origin of 3170's third engine?*



Poppleton Junction, 1923. We hope 95 years later, we will soon have a modern version of this frame.