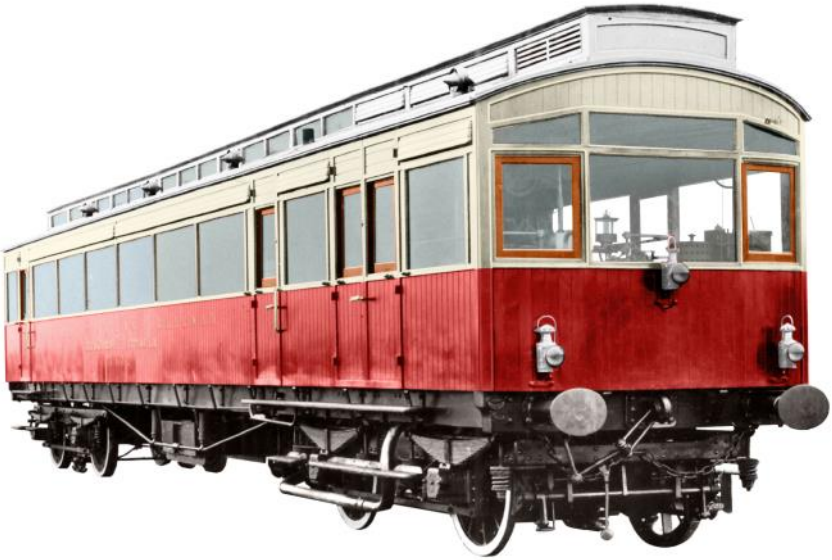
AUTOCAR

1903 North Eastern Railway Electric Autocar Trust

Newsletter No.23 — Summer 2014



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The North Eastern Railway 1903 Electric Autocar Trust

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Front Cover: A colourised picture of the autocar. (Gary Luck)

(See opposite)

July 2014

Welcome to the 23rd issue of our newsletter. Recent developments have affected the scheduling of the newsletter, so this is the delayed spring issue, combined with the summer issue. So we have a bigger newsletter this time and the likelihood of another bumper issue next time as well. As Stephen says, this project is definitely gathering pace…

Contents

New Members

A warm welcome to Mrs. A Dobson of Durham, Mr & Mrs P V Mc Loughlin of Romford and Mr K T Wilson of Whickham (Newcastle-upon-Tyne).

Front cover picture

This colourised version of one of our old black and white photographs was created by Gary Luck. He specialises in colourising black and white images and digitally reliverying railway and motor vehicles. His website is at - *www.flickr.com/photos/northernblue109/* and I would recommend a look. He created this picture (and others) to help us with fund-raising - I hope to use this picture on a mug and possibly other items. Our thanks to him for his work and assistance to the Trust.

Chairman's notes

Stephen Middleton

The Big Bang!

Suddenly everything is falling into place. After years of fund-raising, planning, drawing, acquiring parts, skills and approvals, the basis for the autocar is coming together. As is described in this newsletter, we now have a sturdy underframe able to take the weight and stresses of a modern diesel engine. The engine and associated controls are undergoing tests while brakes are being fitted to the underframe with full working chassis testing expected soon.

This has been a tough time. We are over budget and our timetable may have to be extended. However, we are on the verge of creating a 'new' diesel electric, while conserving the autocar body and restoring the autocoach, all for under £600,000. A bargain yes, but probably up to £50,000 over budget. That will not stop us achieving our aim and keeping our promise to the HLF, PRISM, Ken Hoole Trust and all the kind individuals, members and volunteers who have supported the project. We are appealing for funds with one hand, and with the other, cutting back on 'non essentials'. Autocoach heating, for instance, may wait until the autocar is generating income. I feel sure that with our good progress and the significance of the artefact, we will not be held back.

Thank you to all of you who have been so generous and supported this project.

'Big Bang' - Test installation of the powerunit at Adeys (opposite), moving parts in (top & middle) and out again to the GC (bottom). (Peter Van Houten)

Engineering Progress Report – June 2014

Steve Hoather

Since my last report (which was written just after Christmas) good progress has been made with the work at Loughborough, and we have recently achieved some major milestones.

Dave Moore, Peter Van Houten and Noel Craigen continued work in February and March in assembling the equipment in the engine housing – the electrical control gear, wiring, fuel and exhaust systems. A temporary exhaust outlet was made to enable the engine to be run inside the workshop, and by the end of March we were ready to start the engine, but before doing so we wanted the Cummins' engineer to examine our installation to ensure they were happy with it in case of any warranty issues in the future. A date was finally arranged for April 15 which suited everyone – Cummins said they were happy with the installation and the engine was run for the first time. The engine ran smoothly with little vibration, and the noise level seemed acceptable, but cannot be finally checked until the power unit is installed in the vehicle. The cooling fan was run off the auxiliary alternator and is certainly effective – several drawings which were fixed to the wall of the workshop with adhesive tape went into orbit as a result of the draught from the fan! The only problem experienced was in priming the fuel system before starting, which took two hours and is more than could be expected from a driver. Since the autocar is likely to spend periods of several days out of use, we are now considering fitting an external fuel lift pump or a fuel header tank.

By May 10, Dave Moore had finished installing the battery charger choke and other components inside the battery box and this was tested successfully (as far as is possible without actually fitting the batteries) just in time for the battery box to be taken to Adey's for fitting to the underframe two days later. Although the initial indications from this test are encouraging, we need to be able to test the power unit under load to ensure the modern Cummins electronic engine management system will work satisfactorily when fed off our 1970s HST first generation load control system. It would be very time consuming to do this 'on the road', as on level track the autocar on its own will be up to full speed in a minute or so. Dave has therefore devised a form of load bank which permits running for longer periods at full power – this is a water tank with electrodes which can absorb the power of the main alternator

Above: *First test run of the engine.* (DJM) Below: *Battery box & spectators*. (SG)

continuously and permit the engine to be run at full power whilst still in the workshop. The value of load testing became clear on the first test on the load bank, since the engine began to overheat and it was apparent that the coolant was not circulating through the radiator. The cause is being investigated, but is probably an air lock which will need an additional bleeder pipe.

In parallel with this, design work on the underframe continued in preparation for 'Big Bang' at Adey's. Because of the number of different engineers involved in the traction and brake design, it proved very useful to have Progress Review meetings, and for me this meant several Friday afternoons spent at Loughborough since this is the only time of the week when everyone was available. Everything was ready at the end of March, and the underframe was lifted off its bogies in the yard on April 14 and moved into the workshop using a telescopic spreader beam which had to be hired specially – photo on page five.

We had originally assumed that, because of the age of the underframe (1921), the carbon content of the steel would be too high to permit welding. However, as design work progressed, this was becoming an increasing problem, so we took a core sample for analysis. This showed the steel had a low carbon content and was weldable. As well as simplifying the method of attaching the strengthening plates to the solebars, this has allowed some of the areas of solebar with the worst corrosion on the top flange to have these areas carefully cut out and new sections welded in.

Battery box and power unit at Adeys. (Peter Van Houten).

The work carried out during 'Big Bang' is as under:

- Weld repairs to the worst sections of solebar as described above.
- Replace end diagonals with channel section to increase strength.
- Manufacture and fit top strengthening plates (1/2" steel plate, profile cut with various apertures, see photo) covering the whole length of the underframe.
- Manufacture and fit bottom strengthening plate in the area of both bogie pivots.
- Manufacture and fit mounting plate for motor bogie, with removable packing to allow adjustment of buffer heights when the body and engine are installed.
- Fit fuel tanks, the mounting frame for which incorporates the air reservoir mounting points.
- Fit battery box. This uses the mounting points built in when the under-frame was originally built!
- Trial fit of engine housing. This sounds simple, but turned out to be a very tricky job. The housing incorporates the handbrake column (recovered from an SR EMU) and space is very tight – the bevel gearbox under the column has to be mounted on one of the underframe members but be clear of the wheels on the sharpest curve.
- Fit speed probes to the traction motors, to drive the wheelspin detection system.
- Swap trailer bogie for the one overhauled at Boston Lodge.
- Paint.

Fuel tank. (SG)

We had hoped to also fit the brake cylinders and some of the mounting brackets for the brake levers, but time beat us, but the holes have been drilled to make it easier to fit them later.

During the course of this work we noticed that one of the truss rods at the motor bogie end was bent, which would exacerbate the problem of the truss rod fouling the brake cross shaft on the motor bogie. This was straightened which gives nearly 2” extra vertical clearance and will hopefully avoid the need to modify the brake cross shaft on the bogie.

On completion of this work, the underframe was taken to the Great Central Railway on June 12. It is currently at Quorn, waiting space in the loco shed at Loughborough, where our team will do the following work:

- Fit brake cylinders and rigging.
- Fit the pneumatic valves and air pipework, sufficient for trial running.
- Fit engine housing on completion of further static testing, and connect fuel system, traction motor cables etc.
- Fit sufficient cab controls to permit test running.

In parallel with this the power unit will have the finishing touches applied and have further load bank testing to minimise the track testing time needed, before being refitted to the underframe (the mounting holes are already drilled).
The completed underframe will then undergo static brake tests, and dynamic traction and brake tests before returning to Embsay to fit the body. We estimate this will be in the autumn of this year.

Inevitably, this work has been expensive. The cost of designing, making and fitting the underframe strengthening plates for example, is of the order of £30,000 and we did not know of this need when we applied for our HLF grant, since we had not even found the underframe then. I therefore estimate that the project will need about £50,000 additional funding to complete (about 10% extra), and you will read elsewhere in this newsletter the result of the Trustees’ meeting on 24 May to decide the way forward.

Opposite top: *Underframe at Quorn & Woodhouse during the Great Central’s model railway exhibition 20th—22nd June.* (Dave Moore)

Opposite bottom: *Powerunit in our workshop on the 24th May.* (Simon Gott)


L·N·E·R

The Autocoach

In the meantime, at Embsay, a small team have been working on the autocoach, which is now looking very smart. The coach has now received a coat of gloss maroon, though this can look brown in some light.

Internally, the compartment partitions have been replaced and new plywood panels cut. The seating is due any day now and this will also make a significant difference to the coach's appearance.

Work on the doors and droplights continues. Many of the former are now fitted and the latter are being varnished. We have various fittings, such as doorlocks and vents, to install. Most of these parts have arrived.

As always, we would welcome extra help — if you have some practical skills and can help us get the autocoach into service, please get in touch.

Above & right: *Two views of the doors, showing their construction*. (SG)

Below: *Plywood panels between compartments. The planking below will be covered by the seat backs. The panels have recently been painted.* (SG)

A 7mm model of the autopair

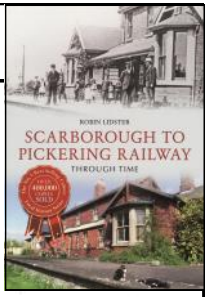
David Hoskins, a 7mm scale modeller, has built a 7mm scale model of the autopair and sent in these photos.

The autocar was constructed using Worsley Works body etches and Wayoh bogies, the autocoach used a D&S etched kit and Cavalier bogies. The former is powered by an integral motor/gearbox on one bogie. The engine pictured below is a model.

A full article has been written for the Gauge O Guild's Gazette.

Photos by David Hoskins.

The Forge Valley line



The picture above comes courtesy of Robin Lidster, the author of various books covering the railways of the old East Riding. It shows the autocar leaving Scarborough and was from an old picture postcard. Robin's latest book (above inset) looks at the Forge Valley line and is available from the Embsay station bookshop (and other good bookshops…).

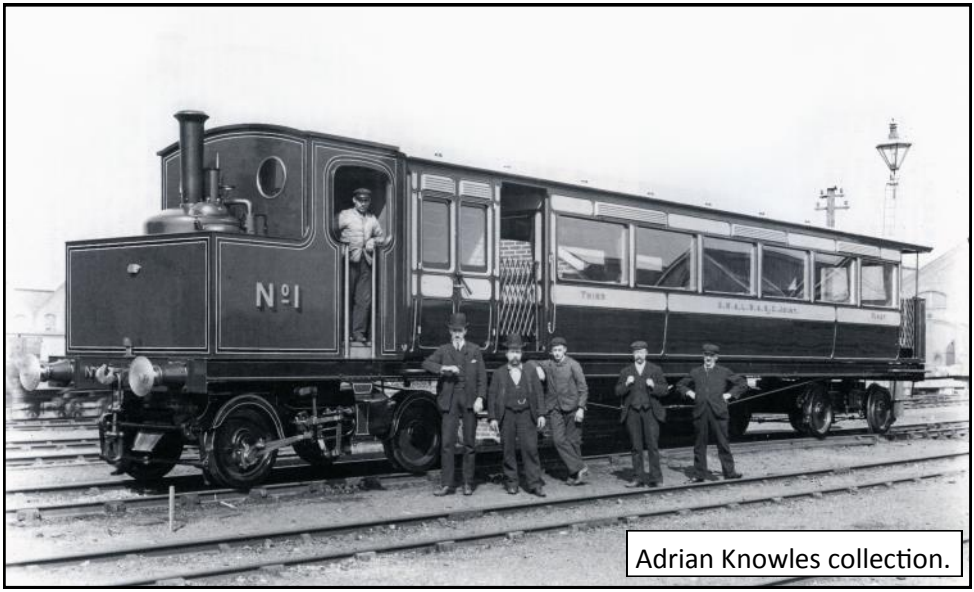
Left: *Drivers controller.*

Right: *Centre casting at the motor bogie end.*

Autocar Cousins: LSWR & GWR railmotors

Simon Gott

The 1902 LSWR railmotor was the first practical railcar seen on Britain's railways. The idea of combining an engine with a carriage had been around for decades but all the prototypes had been unsuccessful experiments or fairground novelties. Dugald Drummond, engineer to the LSWR, turned the idea into a practical proposition.



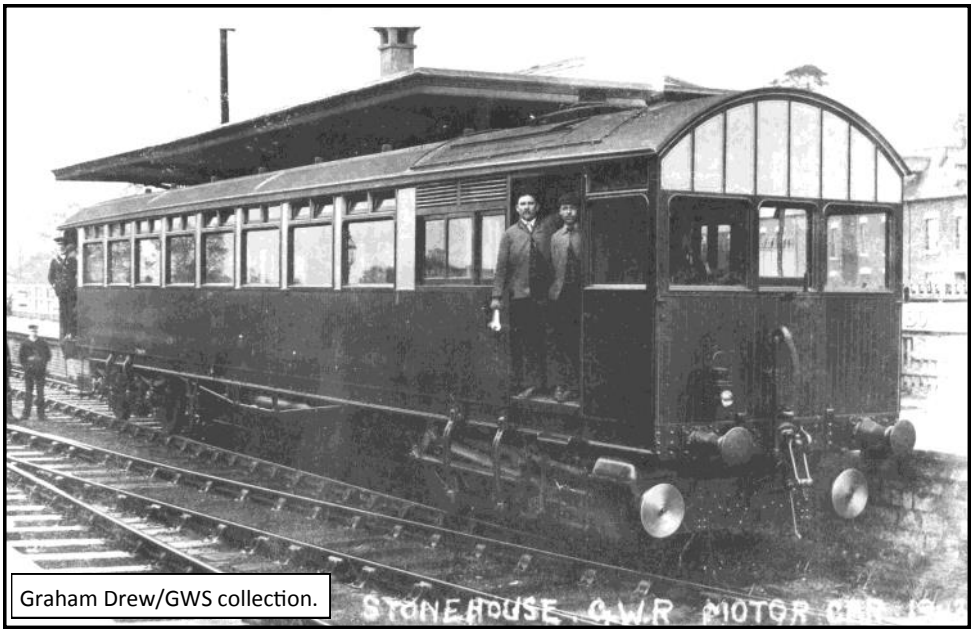
Adrian Knowles collection.

Powered by a small, vertically boilered steam engine, the vehicle was 56 feet long. Like the autocar, it was originally built to serve a short branch-line (near Portsmouth) where rapid reversal would be useful. Before it entered service with the LSWR in the summer of 1903, it was loaned to the GWR for trials. The GWR were also looking at using railmotors and it seems the LSWR railmotor influenced their designs.

As with most railcars, the LSWR railmotor was an attempt to reduce operating costs on lightly used services and improve turn-around times when reversing direction. Some lines would use them as the principal

passenger stock, as there would be a significant cost saving on infrastructure. Some of the photos of these vehicles show them standing at small halts, often wooden platforms.

The GWR's first two railmotors entered service in October 1903. As with the autocar, the power unit was in a separate compartment to the passenger space. The railmotors were wooden bodied. They operated a clockface timetable in the Frome Valley in the Cotswolds and were very popular with the travelling public and passenger numbers increased nearly tenfold. Ironically, their popularity resulted in the services being taken over by loco-hauled trains to cope with the extra passengers.



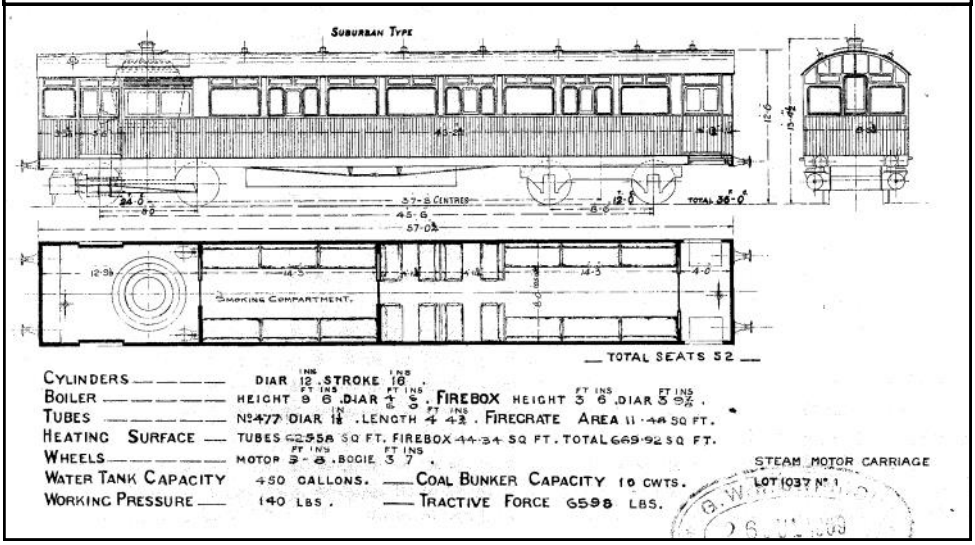
Graham Drew/GWS collection.

The GWR built 99 railmotors, more than any other railway company. Various types were built, with differing seating and luggage space. They saw service all over the GWR network. The best known railmotor is probably No. 93, the railmotor restored by the Great Western Society and pictured overleaf. No. 93's history and restoration is described in Robin Jones' book '*Railmotor*', published by Halsgrove (and is also available from the Embsay station bookshop).

I would like to thank Adrian Knowles, Frank Dumbleton and Graham Drew for their help and permission to use their photographs.

Top: *No. 93 & trailer* - Frank Dumbleton.

Above & below: *GWR railmotors* - Graham Drew/GWS collection.



Restored GWR Railmotor No. 93 and trailer on the Llangollen Railway - Adrian Knowles.

Autocar Shop

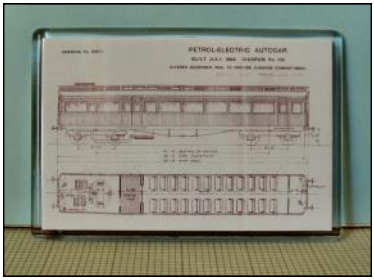
To help fund-raising we have some autocar themed items for sale.

- Fridge magnets (acrylic c90 x 60mm) showing the autocar at various places. £2 each (please say which picture(s) you would like)
- Travelling mirror (unbreakable and with case). £5
- DVD (a short film introducing the autocar). £ 10

Post and packing for up to six of these items is 80p.

- Sweat-shirt - £14.50 + P&P of £3 (sizes: large & XL)
- Fleece - £22.50 + P&P of £5 (sizes: large (44-46”) & XL (48—50”))

To order: Please send written orders and a cheque (payable to NER 1903 Autocar Trust) to NER 1903 Autocar Trust, Rose Lea House, 23 Brunswick Drive, Harrogate, North Yorkshire, HG1 2QW.



Fundraising

We have registered the Trust as a charity on E-Bay. This means that if you are selling items, you can choose to donate a percentage of your sale price to us. No commission fees are payable on that percentage.

For the full explanation: http://pages.ebay.co.uk/ebayforcharity/sell.html

We are listed as “NER 1903 Electric Autocar Trust” and are described at:
http://www.ebay.co.uk/egw/ebay-for-charity/charity-profile/?NP_ID=68471