

# AUTOCAR

1903 North Eastern Railway Electric Autocar Trust

Newsletter No.26 — Spring 2015



# 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:** *The autocoach outside of the Embsay shed, during a shunt.*  
(Wendy Anderson)

## May 2015

Welcome to the 26th issue of our newsletter. The engineering continues and people are starting to talk of testing. The cover photo of the autococh shows our progress at Embsay.

I'm pleased to say that we're back to 20 pages this issue. I have the material to fill the space and our members contribute so much to the project, we like to be able to give them something back.

Due to various changes in my life, I'm no longer looking after the Embsay bookshop. I've also had a reshuffle of work and phone numbers - please note the changes in my contact details, should you wish to get in touch.

### Contents

|                                 |    |
|---------------------------------|----|
| Chairman's notes .....          | 4  |
| Project Engineer's report ..... | 6  |
| The autococh headstocks .....   | 12 |
| Traction Design .....           | 14 |
| Autocar — nomenclature .....    | 17 |
| Miscellany .....                | 18 |

### New Members

A warm welcome to Mr PR Johns of Penkridge, Mr SD Goswell of Halifax, Mr DR Powell of Ferrybridge, Mr MW Clark of Harrogate and Mr AJ Dowland of Winchester.

#### Not yet a member?

We know many non-members support us and make valuable contributions to the restoration. These are very welcome — you would be equally welcome to join the Trust and take full advantage of membership.

# Chairman's notes

*Stephen Middleton*

We are at an interesting stage. The autococh is just about finished; there's the vacuum brakes, underneath to check and grease and passenger communication chain to fit and we are there. Air brakes will be fitted later. That means all hands to the deck on the autocar. The only problem is that the powered underframe is not yet at Emsay. It should be with us soon but the engineering challenge has been enormous and the priority is to get it right and fully tested at Loughborough so that it does not present problems at Emsay. However, we have to complete by March next year. We are planning to do work that is not going to be at risk during the crane move. Doors and ends can be panelled, the interior can be improved and varnished etc. If anyone is patient and relishes carefully cleaning down old pitch pine, please volunteer, your work will reflect in the quality of the project once finished.

It is a tough project. We are pushing the boundaries with many tasks never before attempted in preservation. The money is tight and so many of you have made donations that really are touching and making a difference. We are continuing our efforts to raise money so that once finished the autocar is not mired in debt and will have a sustainable future.

Thank you all for your support and generosity.

Stephen Middleton

## **'Situations Vacant':**

Practical, skilled people to work on restoring the autocar at Emsay.

A fundraiser, both to solicit donations and to generate finance through sales.

A social media enthusiast, to support our publicity efforts and broaden our reach to the public.

A researcher, to seek out historical information about the autocars.

If you can help with any of these roles, do please contact us.

### **Newsletter Back Issues available:**

Numbers 7, 9, 11— £1.50 each

Numbers 14, 16, 17, 18, 19, 20, 21, 22, 24. — £2.50 each. Postage at cost.

Available from the editor. Embsay station bookshop also has *some* newsletters.

### **York Show**

The publicity stand attended York Model Railway Show over Easter and attracted interest from members and other supporters. Thankyou to those who made donations and complimentary comments. Thankyou also to the York team for inviting us and looking after us over the weekend and to my father, Steve Hoather and Graham Collett for manning the stand. Our attendance undoubtedly helped raise our profile and membership figures.

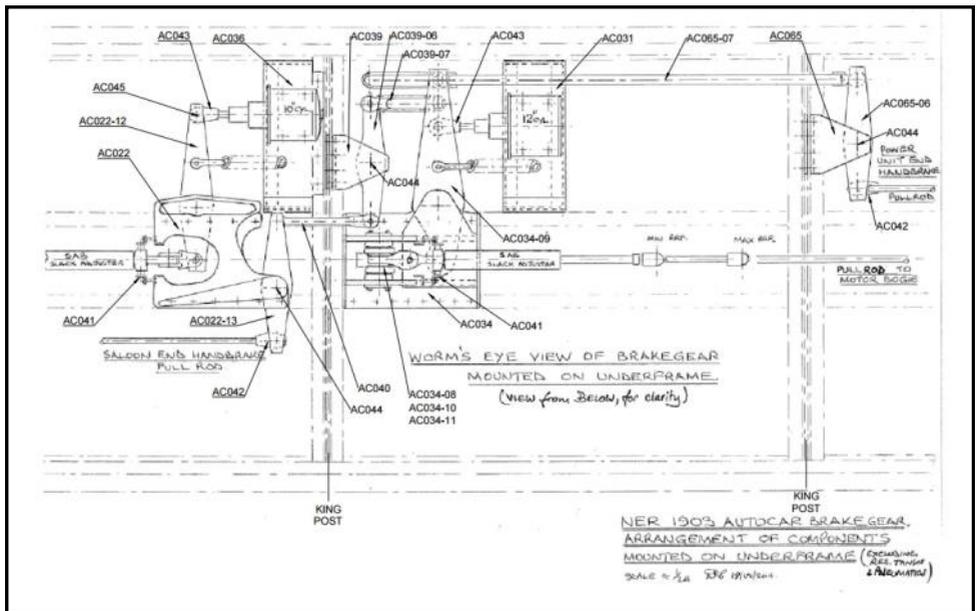
Below: One of the autocoach compartments, showing seating work in progress.



# Engineering Progress Report – May 2015

Steve Hoather

Since my last report, which was written in early February, Peter and Dave have made solid progress in assembling the various pieces of equipment on the underframe. In order to transmit the braking forces from the cylinders to the bogies, there are various levers and brackets as shown in the 'Worm's Eye View' sketch in issue 24, which is reproduced below.

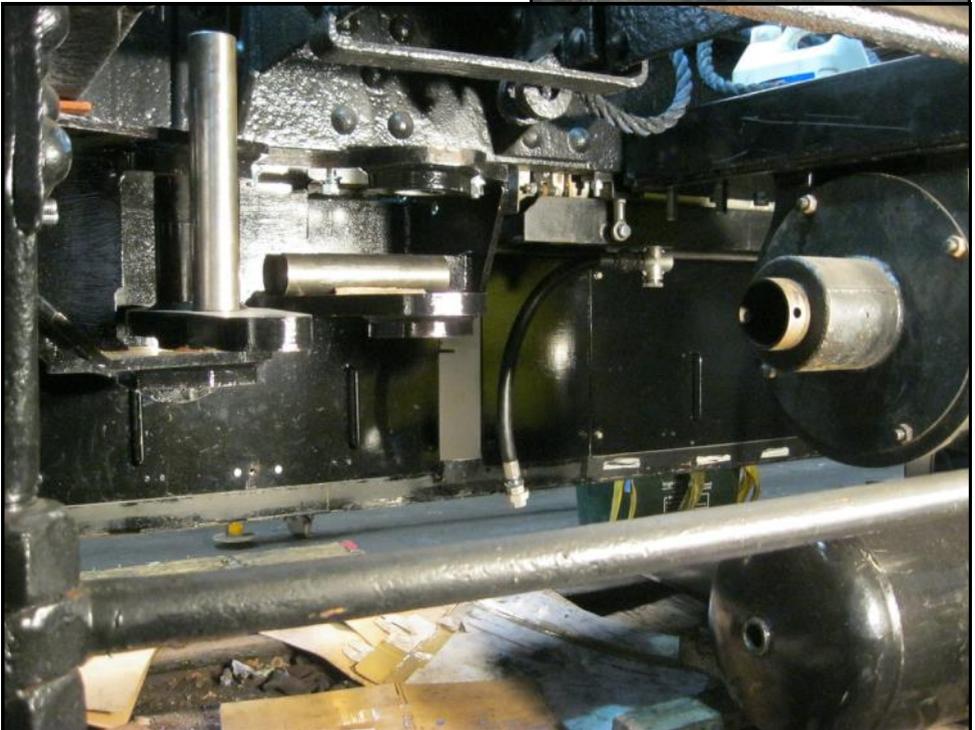


An example is bracket AC034 in the photo opposite – at this stage it was in red primer, and the photo shows two of the “Orkot” bushes waiting to be fitted and bonded in the holes, together with the stainless steel pin and retaining plate. The adhesive will not cure at very low temperatures, so the cold weather in February caused some delays before Peter could fit the bushes. Along with most of the other brackets, AC034 is now fitted to the underframe and can just be seen in the lower photo opposite at the back in the middle, behind the truss rod and 12” brake cylinder. Most of the brackets are too heavy to lift manually when their

levers have been fitted, so Peter devised a number of ingenious ways of lifting them from the floor to their positions on the underframe so they could be bolted up.

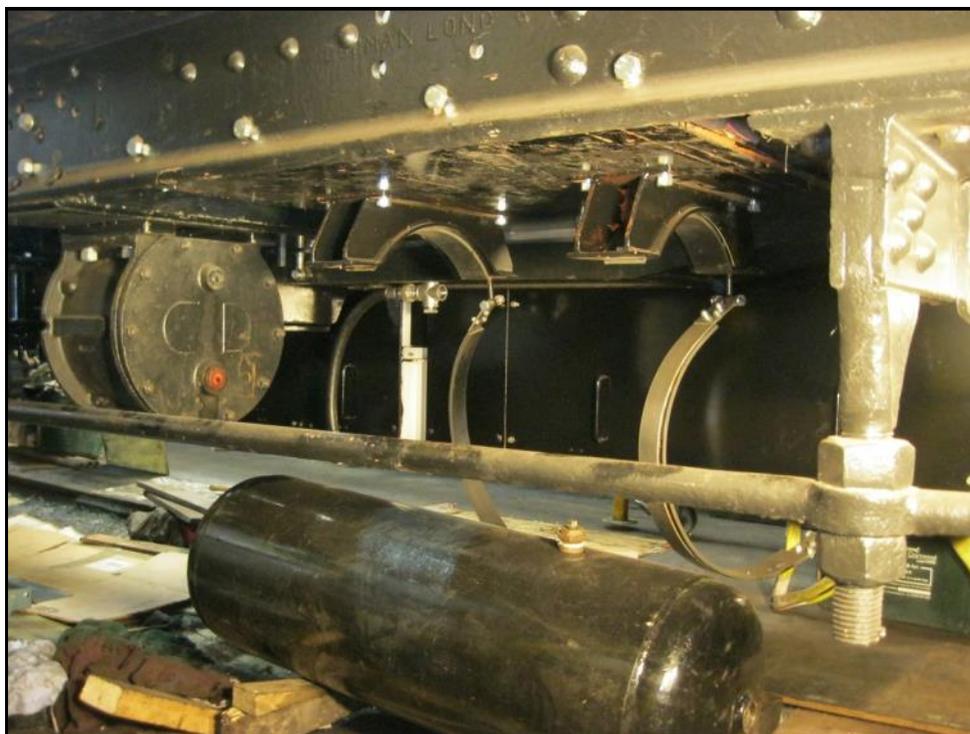
Many thanks also to Peter Van Houten for his photos for this newsletter, taken under very difficult conditions.

All photos in this report by Peter.



The clearance between the bogie headstocks (at both ends) and the underframe is very limited, and some minor damage was done when the underframe was offloaded from the road vehicle at Quorn. To prevent further damage, Dave has modified the air intake grille on top of one of the motors, and we will also need to make some packing pieces for use in transit, because the bogie tips up when it is being loaded or unloaded onto a road trailer, more so than in normal running.

Before the air reservoirs were fitted they needed hydraulically testing – they had already been examined internally by Dave with an endoscope. Hydraulic testing involves filling the reservoir with water and then pumping up to a pressure 1½ times the working pressure with a hand pump to check for any signs of distress. Best practice is for such tests to be witnessed by an Engineer who is independent, so Nigel Tilly, who is an old colleague of mine and volunteers on a Bulleid Pacific at Loughborough, very kindly took time out to fulfil this role. All five of the reservoirs passed the test.



In parallel with this, Dave Moore has continued work on the first cab desk and this should be finished in about two weeks. He has also connected the cables to the engine housing, but they cannot be fitted along the length of the underframe until the air pipework is fitted first.

At the time of writing (24th May) there is still several more weeks of work before the brake system is ready for test, after which running tests are needed to check the traction system before the underframe is returned to Embsay ready for fitting the body.



Above: Brackets AC065 and AC034 (middle), far right 12" cylinder.

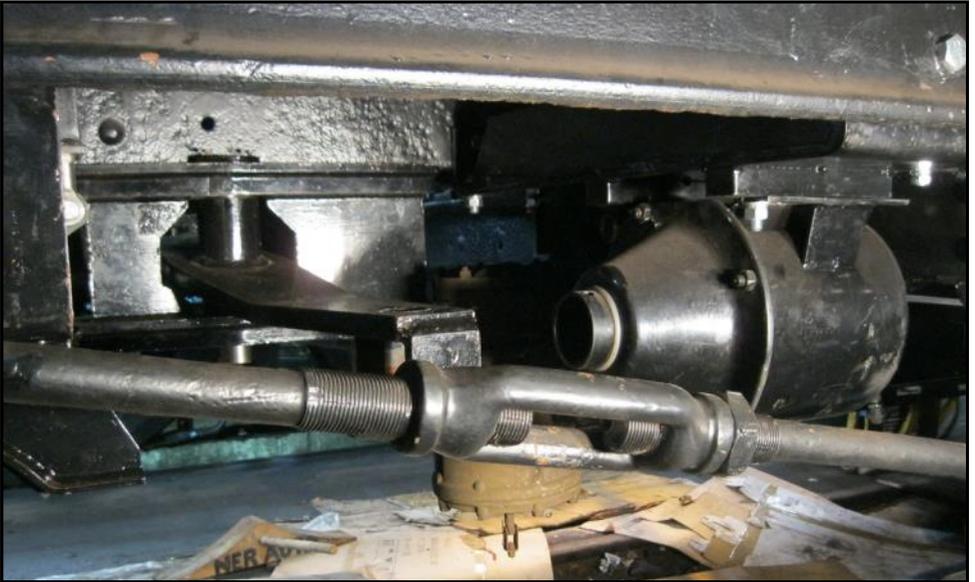
Opposite bottom: The mounting for the main [brake] reservoir.



Above: Drivers side showing battery box and AC022, the pale red rod is from the trailer end hand brake.

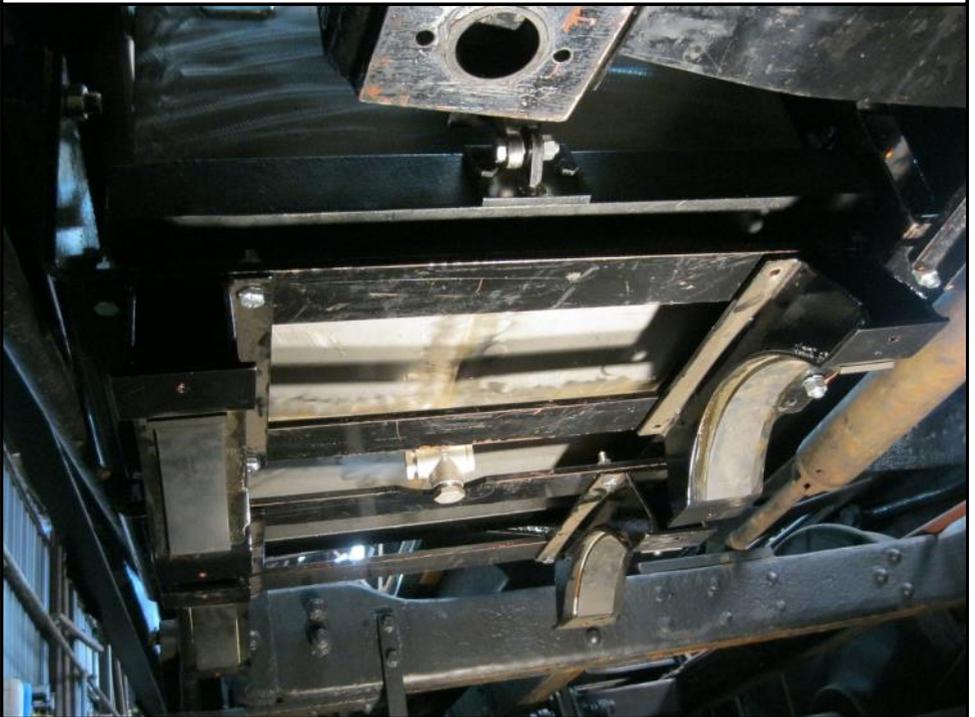
Below: To the left is bracket AC039, right 12" cylinder, middle back is AC034.



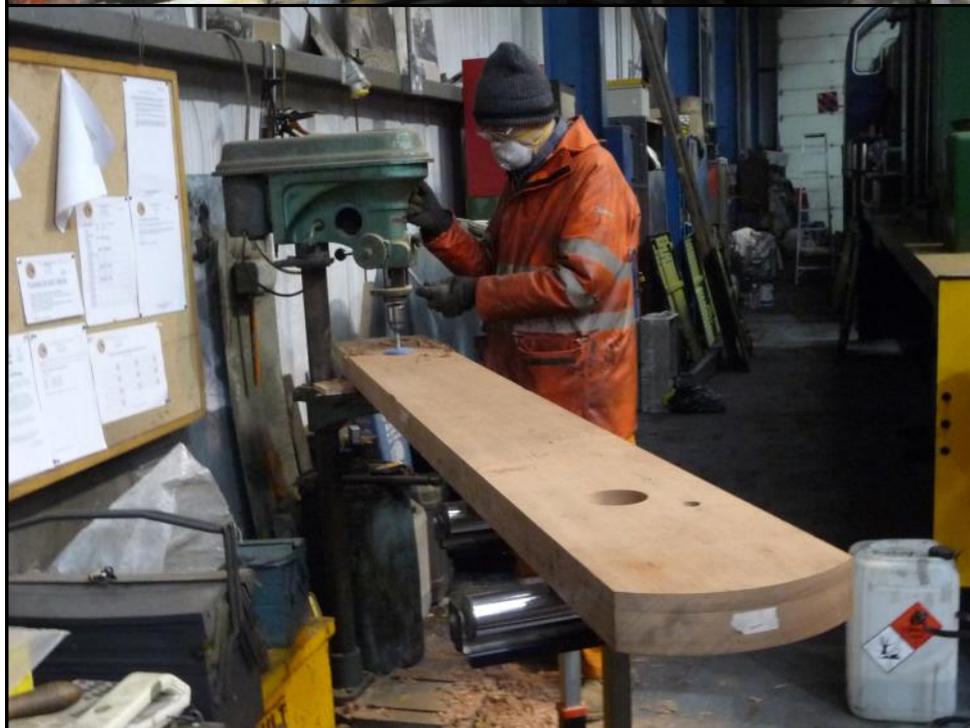
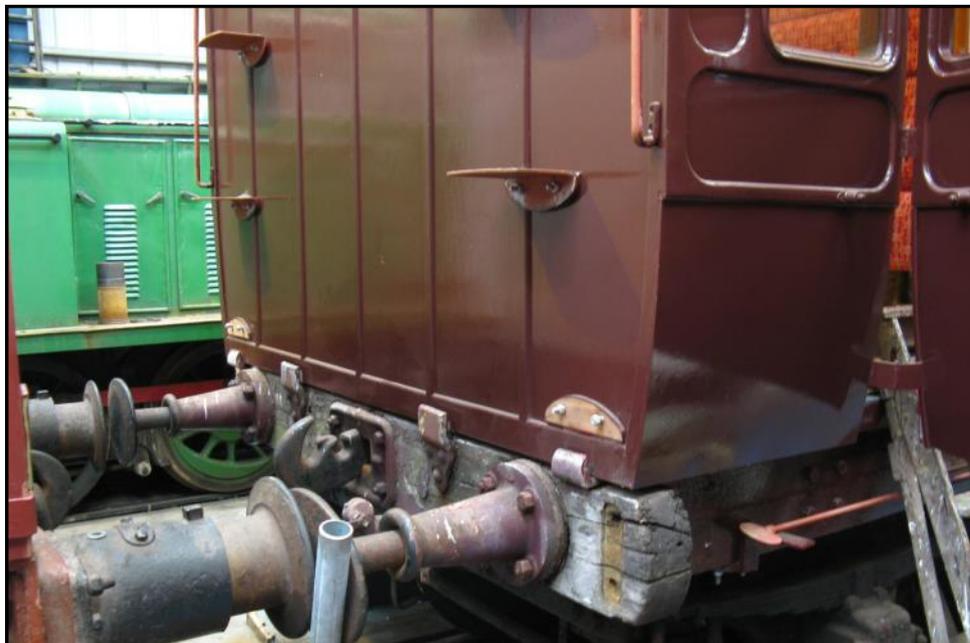


Above: View of bracket AC022 and to the right the 10" cylinder.

Below: Looking up at the assistant's side fuel tank and mountings for the two brake supply reservoirs – one for each bogie.



## The Autocoach - replacing the headstocks





Opposite left: *The old headstocks.*    Opposite right: *Alan drilling holes in a new headstock.*

Above: *A view of the coach showing the various parts we needed to drill holes for. These hold items such as the buffers and couplings in place.*

Below: *A new headstock in place.*



## An Engineer's Perspective - Traction design: the engine

*Dave Moore — Volunteer Engineering Advisor to the Trust*

As the chassis now comes together with its Power Unit, namely the Engine Housing, the heavyweight mechanical work now centres on the brake apparatus manufacture and assembly, whilst in parallel, effort is also focused on electrical control and the air brake pneumatics. These latter two aspects come together in the Drivers Control Desks, of which there are three, two identical ones for the low-down seated Autocar driving positions, and a remodelled version for the Autocoach with its porthole windows. All three have the same basic combination of driver's air brake and traction power controls, and have the instrumentation and indicators for both combined on the central instrument panel.

For ease of operation, the Autocar plus Autocoach is designed to run up and down all day with the driver 'changing ends' at the point of return, just like all modern passenger trains. To do this, the electrical and air controls of each cab control desk are duplicated in each driving position and are then connected by pipework and wiring running the lengths of both vehicles and jumping the gap between them. Being electrically controlled anyway, the diesel-electric vehicle lends itself to this straightforward method of 'remote control' and this is why multiple working of modern vehicles with only one driver became commonplace from their introduction.

The air brakes require the air supply and control pipes to run the length of both vehicles, jumping the moving gap between them with hoses fitted with BR style quick release couplings and isolating cocks. The electrical control signals use a 36 Pin Jumper plug with a flexible multicore cable to carry the mostly 110 volt DC control signals between the vehicles. This is the basic method employed on most 'classic modern traction', going back 60 years. The Autocoach's equipment is powered from the Autocar through the jumper as it has no battery of its own, and behaves as a slave to the master powered Railcar equipment. Because these two vehicles never need to multiple work with any other type of traction, they have a protocol of their own and hence do not fall into the old BR categories, such as Blue Star as many of the BR diesel-electric locos did.

Opposite top: *Buffer Beam Jumper Plug open at left, Main Reservoir and Brake Pipe Couplings and Cocks to the right.* (DJM)



*Below: Buffer Beam Jumper - the 36 Way remote control plug (DJM)*



The Driver's Control Desk (pictured below) has the brake for the left hand and traction power control for the right hand, which is conventional practice for two handed driving controls. This is along the lines of how it was in NER days. The brake controller regulates the brake pipe pressure supplied to both vehicles, and controls the brakes on both simultaneously. The Selector and Power Controller handles govern the direction and amount of traction power. The instrument panel displays the reservoir and brake pipe pressures, and both bogie brake cylinder pressures. The Speedometer and Traction Ammeter, accompanied by the Engine Stop, Wheelslip and Fault Indicator lamps complete the electrical picture. The Desk has Engine Stop, Fire Alarm Test and Driver/Guard pushbuttons. A Buzzer is fitted to act as dual Driver/Guard alert, and Handbrake Applied Warning. The lighting switches and footwarmer switch are on the instrument panel, the Whistle Valve and Windscreen Wiper Valve are on the Desk.

More modern methods are now involved in controlling many mainline multi vehicle trains, but the discrete 'wires down the train' approach has given so much reliable service that it will be around for many years to come.



## Autocars – nomenclature

*R A S Hennessey*

*Following an exchange of e-mails with Roger on the subject of names and the origin of 'Autocar' and 'autotrains', he wrote the following:*

You raise an interesting question!

I have by now collected various names for railcars, thus:

Doodlebug — USA, the name first given to the McKeen petrol-mechanical car, it caught on,

*Benzinelektrischer Triebwagen* – German, very precise nomenclature. The diesel variety is a *dieselelektrischer Triebwagen*, both are a type of *verbrennungs Triebwagen* (driving carriage propelled by internal combustion motors).

Incidentally, your 'autocoach' would be in German a *Beiwagen* if it has no controls, but a *Steuerwagen* if it has duplicate controls, i.e. a control trailer.

*Automotrice* – France.

*Benzin-villamos motorkocsija* – Hungary, a major user of the type, contemporary with the NER, literally 'petrol-electric motor coach'.

Having got all of that out of the way, back to the NER. I doubt that anyone would now know who actually gave the Autocars their title, but the usage is quite logical. 'Auto' means 'self', hence an Autocar is a car or carriage that moves by itself, not requiring a locomotive to shift it.

'Car' was catching on in the early 20<sup>th</sup> century. It was standard American usage and came to the UK with American technology. Thus they were always Pullman 'cars'. The London Tube system, American financed and depending heavily on American technology and, to some extent, operations management always used car right from the start, and still does. 'Please move down the car', etc. And, as you say, 'tramcar' had already caught on, a UK modification of the US 'streetcar'.

Hence the NER usage was right up to date. 'Motor car' was already in use, but referred to road vehicles. *Autocar: a carriage that propels itself.*

As I see it, 'Auto-train' was what linguists refer to as a back-formation. Strictly they were not 'auto' at all since they used a locomotive, but I suppose they were self-contained in one sense, but the name probably reflected the original NER 'Autocar' usage. Which, oddly enough, failed to catch on outside the North-East. 'Railcar' became the British norm.

(Ed:) Next issue, I'll look at some of these autotrains and how they are 'cousins' of the autocar.

\* \* \*

### **Publicity:**

We are due to attend the Scarborough MRS exhibition (held at Pickering) on the 22nd & 23rd August and the Leeds MRS' exhibition on the 31st October & 1st November. We'd recommend both shows and if you can come along, we'll have the latest photos and be able to update you on our progress.

#### ***N.E.R. Buses. Lorries & Autocars* by Ken Hoole**

British Transport Treasures <http://www.britishtransporttreasures.com/> is a website offering historic transport books & ephemera as fully printable downloads. They now have available *N.E.R. Buses. Lorries & Autocars* (Hoole, 1970) for £2.95. This features 3170. The download is not the paperback edition, but a special hardcover edition for libraries with a coloured plate of the NER coaching stock arms.

It is listed in ROAD TRANSPORT and in LNER GROUP on their site. For each sale, they will donate 50p to us for each copy sold.

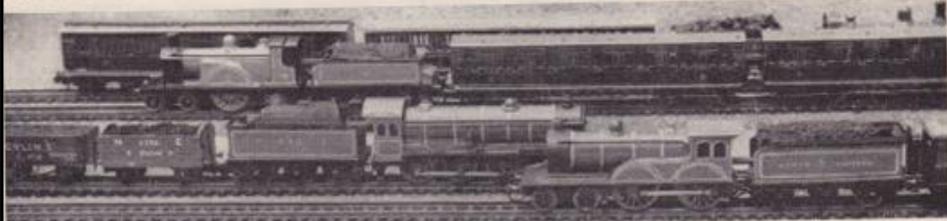
### **An N Gauge model of the Autocar**

Back in the early 1960s, Stephen's late father, Peter Middleton, constructed some N Gauge (1:148 scale) models. The *Railway Modeller* featured some of his models, including an autocar, shown opposite.

Should anyone know what happened to this model, we would like to hear from them.

This page is reproduced courtesy of *Railway Modeller*.

SEPTEMBER 1964



## MANY LAYOUTS AT DORKING SHOW

### September 3—5, Dorking Halls

THERE will be working layouts galore at this year's Surrey Hills model railway exhibition, covering all popular scales. At one extreme we have the massive trams from the Tramway and Light Railway Society, while at the other there is Peter Middleton's 2mm-scale layout, incorporating a model of Belah viaduct. Peter Middleton called to see us recently with some of the models he will be running at the show, and we took the opportunity of arranging some photographs, which we reproduce on this page.

The hand-built models reveal the simplicity of 2mm scale, masses of detail which in larger scales is obligatory can be safely omitted. The principal requirements are accuracy of outline and careful painting. The object is to produce something which

looks right from a few feet away. The Tri-ang X500 ("Rocket") motor provides the motive power in most cases.

In the commoner gauges, Crawley will be present with a large OO system covering 35ft x 15ft; Twickenham and District will be showing its cabinet TT line, which can be erected in under a minute from the word go; Norwood M.R.C. is showing three layouts, one of which is under construction with all parts duly labelled—the sort of exhibits all shows should include.

In last December's RAILWAY MODELLER Ronald Mitchell described an "1830" layout based on the Liverpool and Manchester, which will be one of the highlights of the show. J. G. Bishop's Grahamsbridge, second prize winner at last year's Hobby Show, and Denis Howe's colourful Sante Fe layout will

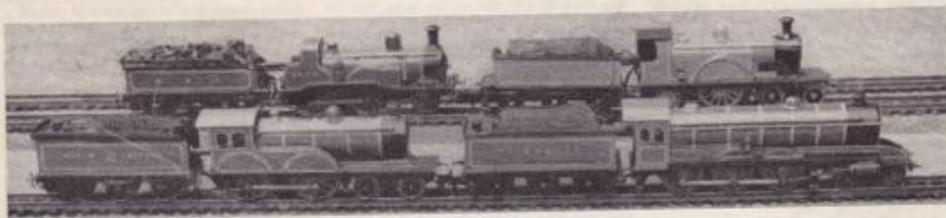
be other items well worth seeing. Finally, the Surrey Hills club will have its own OO layout on show.

Trade support has been promised; Eames of Reading have a very large stand and will be able to supply most needs from stock. Refreshments will be available in the halls.

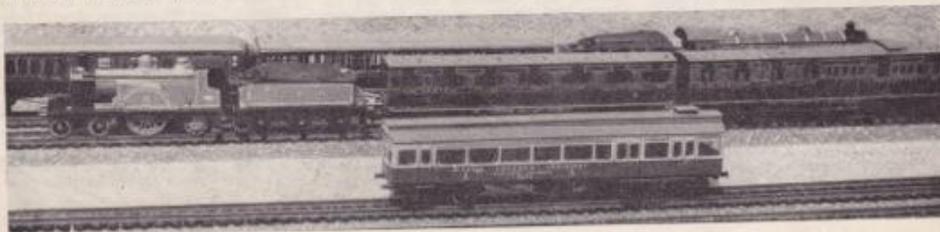
If this is not enough, there will be an indoor lake with model power boats!

The show will be opening from 2 to 9.30 p.m. on the Thursday and Friday, and from 10 a.m. to 9.30 p.m. on the Saturday. Admission will be 3/- for adults and 2/- for children under 16.

If you are in any doubt, last year's October issue contained a sketch map showing the location of the hall, but it is hoped that the route will be signposted.



Some of Peter Middleton's 2mm-scale models. All the locos work, even the Caley single (which cheats, the trailing wheel is also driven, making it a 4-4-0). We hope to persuade him to reveal his methods in an early issue of the RAILWAY MODELLER.





The autococh and assorted parts. Stepboards are primed and stacked on their brackets, whilst Geoff is working on beading for inside the compartments. Your editor had just finished painting some door and doorframe edges whilst Dave (out of shot) was busy priming the [white] door panels.

The autococh is being restored with one first class compartment (the first open door on the lhs) and six third class compartments (the seating with red upholstery). It will contrast with the open saloon of the autocar and allow us to illustrate the two different styles of passenger accommodation in one train.

## **E - Bay**

We have registered the Trust as a charity on E-Bay. If you are selling unwanted items, please consider donating some or all the proceeds to the Trust. I list some things of mine when I have time but obviously we'll raise more money and it improves our profile if items for sale come from more than one member.

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](http://www.ebay.co.uk/egw/ebay-for-charity/charity-profile/?NP_ID=68471)