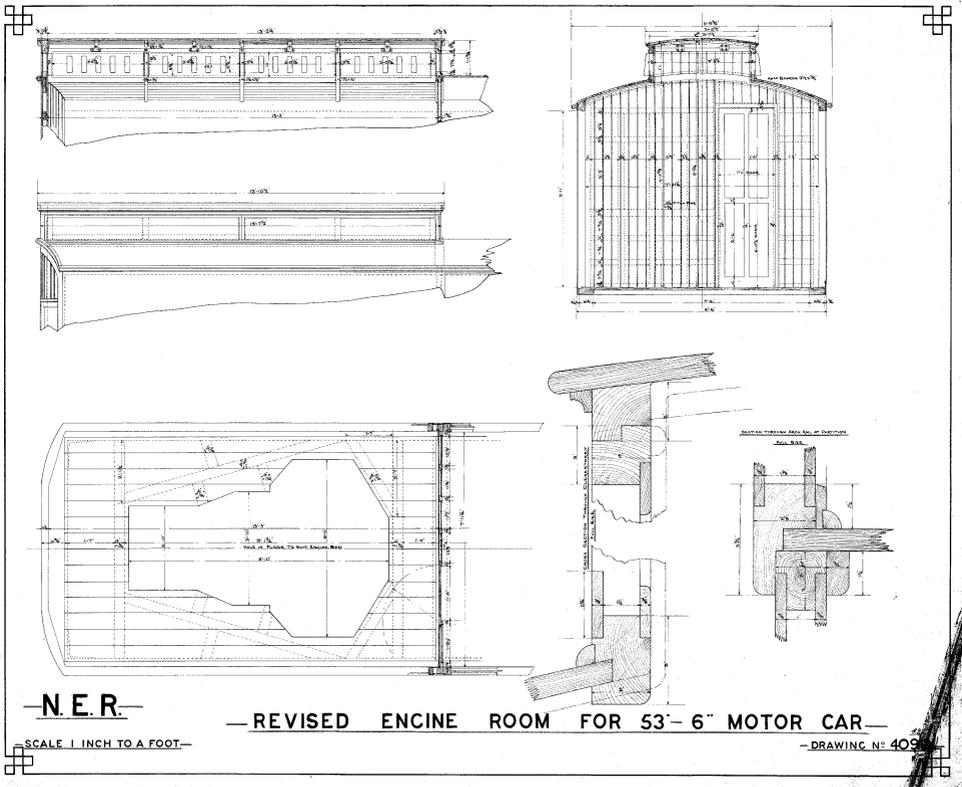


# AUTOCAR

1903 North Eastern Railway Electric Autocar Trust

Newsletter No.15 — Spring 2012



# The North Eastern Railway 1903 Electric Autocar Trust

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**Front Cover:** One of the original NER plans for the autocar, courtesy of the NRM.

## April 2012

Welcome to the 15th issue of our newsletter.

Most of the contents this time are about the mechanical elements of the restoration. We have been continuing the work on the body, though this is now drawing to a close. While we are waiting for the team down at Loughborough to fit the engine and other pieces to the chassis, we will start work on the autocoach.

We also have a five page spread of some original plans of the autocar, courtesy of the NRM. Credit for discovering these goes to Nigel Yule who found them in the Gateshead C+W list. They have been of both historical interest and use in our engineering planning. The NRM has kindly allowed us to reproduce these in this newsletter, and we are very grateful for that.

I have a new address and e-mail for contributions to the newsletter, listed opposite.

### Contents

Chairman's notes .....	4
Project Engineer's report .....	5
NER Original plans .....	10

### New members

A warm welcome to Mr M Chapman of Wetherby, Mr H Peacock of Ilkley, Mr J Stagg of Deganwy and Mr C Jones of Wrexham.

# Chairman's notes

*Stephen Middleton*

The last rivet has been finally driven in to the autocar's underframe and it is now solid and able to bear weight. After Easter it will be fitted with bogies and ready for moving to Loughborough where it will be prepared to receive the engine and brakes. The poor condition of the underframe was not apparent when we inspected it and it was rather a shock to discover how it had suffered over the years. Girders had corroded to almost nothing of substance and the frame had been damaged in at least one collision. All that has now been put right but at a price.

Some have questioned the wisdom of procuring this underframe, suggesting others of a similar length may have been appropriate. We agonized over the choice of underframe, inspecting several before choosing this one and agonized again when the extent of repairs became known. There was no choice. We were lucky to find this one, despite its condition. It was the correct width (much slimmer than most), it had the correct style bogies, a rarity in themselves, and it had the correct truss rods, giving sufficient clearance for the motor bogie.

This conundrum and solution is common in all areas of heritage. It is reassuring that we have a team comprising experienced people able to arrive at a solution and progress the work efficiently. Thank you to all concerned.

## **Newsletters**

You will all be aware that second class postage will shortly be 50p; with 120 newsletters to print and mail our costs are increasing. If you are prepared to receive your quarterly Autocar newsletter by e-mail in PDF form it will help us save money - please send your e-mail details to Simon Gott at [autocar.newsletter@gmail.com](mailto:autocar.newsletter@gmail.com)

You will also receive your newsletter around two weeks earlier...

## Engineering Progress Report

*Stephen Hoather*

As Stephen says in his Chairman's Report, the underframe repairs have now been completed at Emsay, and the wooden headstock extensions fitted. This was to have been a six week job starting last summer— in the end it took over six months! After our committee meeting in February we removed the EMU style bogie centre casting from the motor bogie and replaced it with a loco-hauled one for which we have a matching top centre casting, which is now temporarily fitted to the underframe. This was necessary as we could not obtain a top EMU casting, but fortunately the job was facilitated by the fact that the fixing holes are the same. I won't say it was easy, as it was almost impossible to reach the nuts which are inside the bolster! I say the top casting is fitted temporarily, as we needed an adapter plate to get the buffer heights right, and these depend on the spring deflection and load. Although there is a small tolerance, we thought it better to wait until the engine and body are mounted before making the final adapter plate to achieve the correct heights.

**Below: Motor bogie at Emsay in February.**



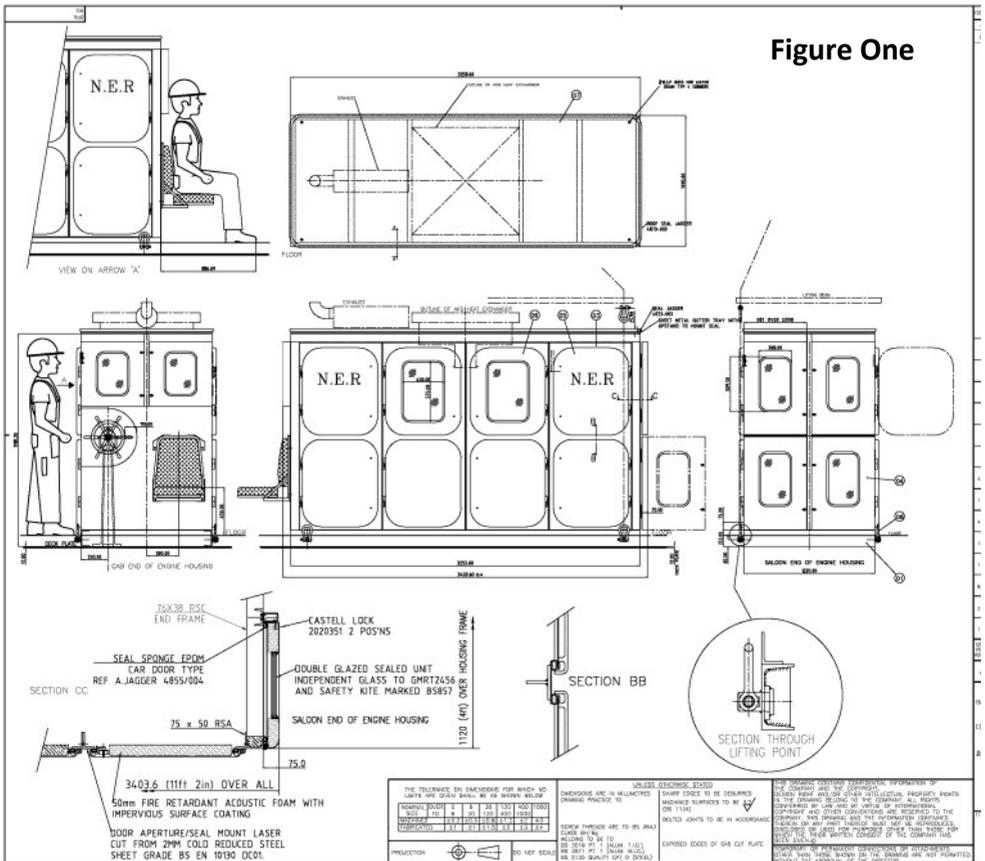
In my last report I said we were taking out a lease on a small industrial unit in Loughborough. This was delayed for various reasons (including the Council sending us the wrong lease!), but we have now obtained the keys, and David Moore has started moving some of our equipment which was stored in his garage (and even his bedroom, much to his wife's relief!).

At the end of January we were very fortunate to obtain the services of Peter Van Houten, an Engineer who had been made redundant from his job in Loughborough. Peter is now working for us virtually full time doing detailed CAD design of the engine housing, after which he will move on to the fuel tank and battery box, which also contains other equipment. He is working under the general guidance of David Moore (who has a busy day job on the 'real' railway) and will be able to erect the engine housing at Loughborough as well as generally supervise the underframe reinforcement work at Adeys, also in Loughborough. Indeed, because of the strength of our team at Loughborough and the problems experienced with the work at Embsay, we agreed at our committee meeting in February that we will aim to do as much of the engineering work at Loughborough as possible, including testing the underframe under power on one of the heritage railways in the area, before it goes back to Embsay for the body to be fitted. This is likely to be at the end of the year, and in the meantime the Embsay team can start work on the trailer car which needs some restoration before we can fit compartments and seats.

Although manufacture of the electrical alternators has begun at Cummins' Stamford plant, there are some outstanding issues with the design of the radiator, which will be mounted on top of the engine and close to the clerestory roof. There is some flexibility in the mountings between the power unit and underframe of the vehicle, but we also need to allow for sideways movement of the body at roof level relative to the floor, so that the bellows which contain the hot air have enough flexibility. If anyone has any information on typical movement on wooden bodied vehicles I should be glad to hear of their experience — I have memories of the original Glasgow subway trains in the 1970s which had

longitudinal seats where you could feel your back “racking” relative to the floor as the train rolled along-hopefully this was an extreme case, but it suggests considerable movement!

There are two drawings in this issue which show the design concepts. Figure One is the engine housing, which needs to be both soundproof and fireproof. You will see that the driver’s seat is fixed to this housing, and offset slightly to the left to allow room for the handbrake column. The windows in the sides and passenger end of the housing serve two purposes. They allow passengers to watch the engine in motion (as part of our commitment to education in the HLF bid). We will include some meters to show what is happening to voltage, oil pressure, charge air pressure etc.) for the passengers and also for the driver. If the automatic fire detectors operate the alarm, they can check if there is actually a fire



before manually discharging the extinguishers — just as on a ‘heritage’ diesel loco.

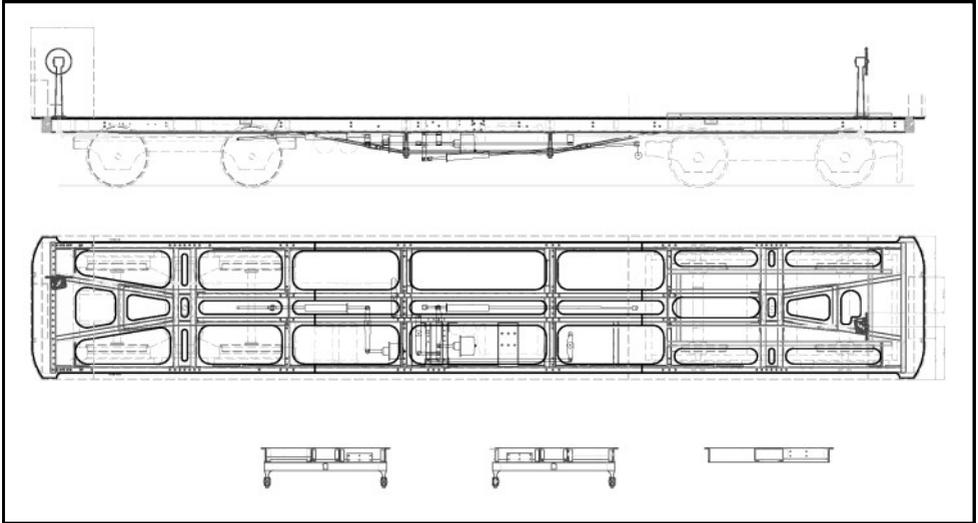
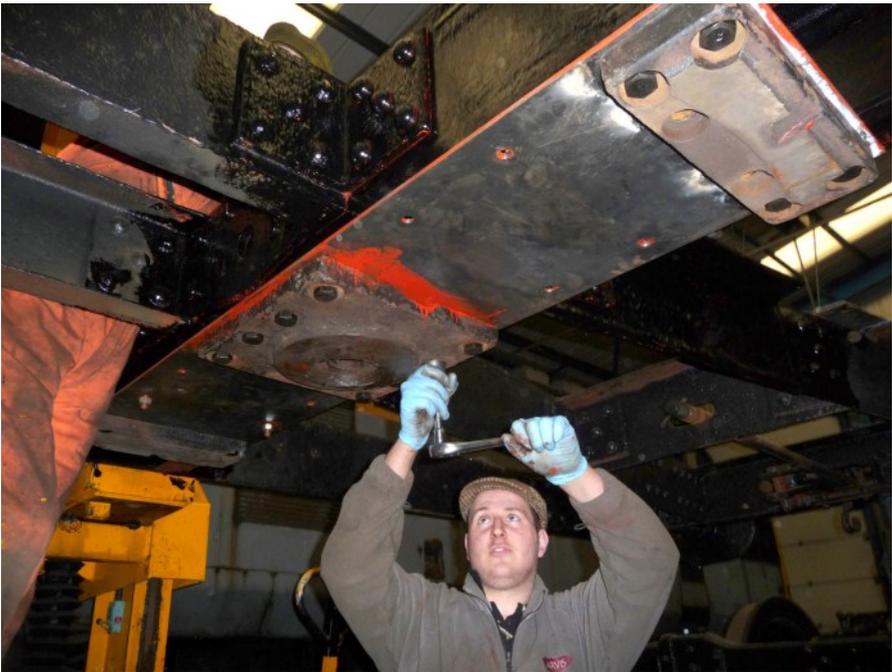


Figure Two (above) shows the underframe reinforcing top plate. This replaces the gusset plates which were riveted across where cross members joined the solebars and also replaces the strength lost by corrosion of the top of the solebars and provides extra strength to support the power unit. It also provides a base of good steel for welding mounting points for the brake cylinders and other underframe mounted equipment. Although this drawing looks complicated, modern CAD techniques allow it, when complete, to be fed into the cutting machine at Adeys, which will then automatically cut the 12mm (1/2") sheet to profile.

There has been little progress with the brake system over the last few months. The vehicles from which we hope to obtain the majority of the equipment are gradually being phased out of service, and the major outstanding item is a 12" cylinder. These were fitted to BR Post Office vehicles, and Stuart Hiscock has compiled a list of those preserved. We are approaching several owners to see if they are prepared to sell us a cylinder, and although initial approaches have not yet borne fruit, there are several others yet to approach.

On the approval front, our Independent Competent Person, John Payne, has accepted the first submission I sent him, which was on glazing. One more (Motor bogie pivot load) has recently gone to him, and I estimate there are at least 15 more, but most of these cannot be written until the detailed design is more advanced. In addition to these, there will be detailed reviews by specialist engineers of the brakes and structural calculations.

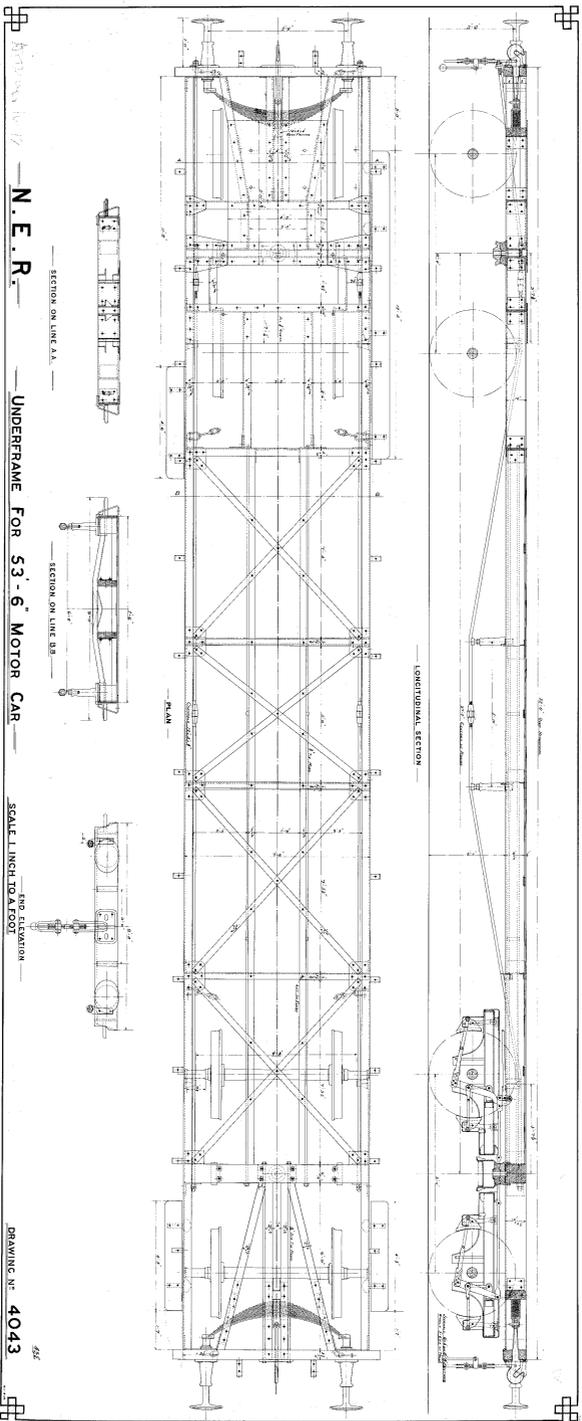
Before we actually start cutting any steel, David Moore and Peter will come up to Embsay to check their designs on the actual vehicle, as any mistakes are much easier to rectify at this stage. Then the action really starts!

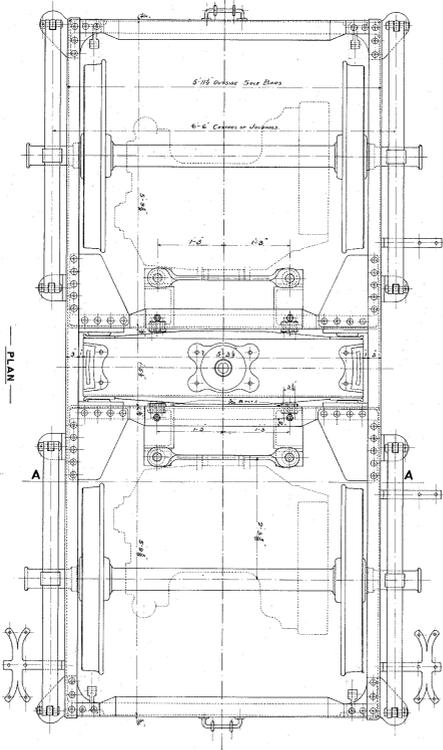


**Ryan Whitaker is tightening the bolts which secure the non-power bogie centre casting to the chassis. (Alan Chandler)**

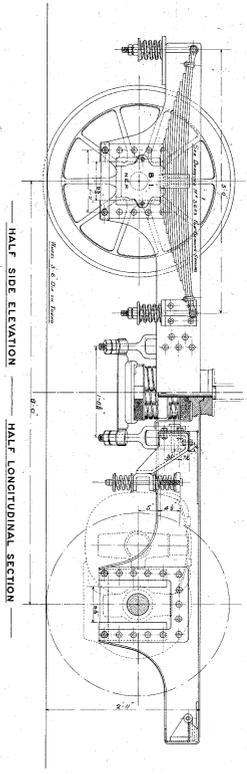






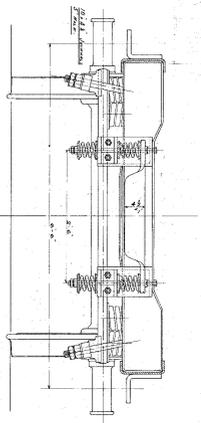


PLAN



HALF SIDE ELEVATION

HALF LONGITUDINAL SECTION



CROSS SECTION ON LINE A A

N. E. R.  
 FOUR WHEELED BOGIE  
 FOR  
 53-6" MOTOR CAR

SCALE 1/4" INCHES TO A FOOT

DRAWING No. 4095

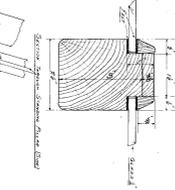
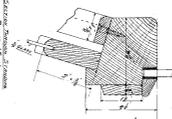
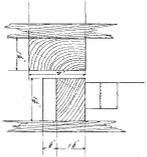
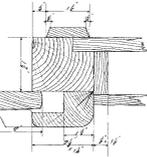
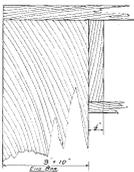


FULL SIZE SECTIONS OF FRAMING FOR 53-6" MOTOR CAR

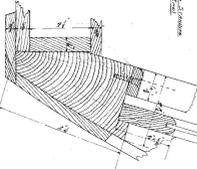
DRAWING NO. 4017

N.E.R.

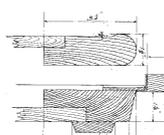
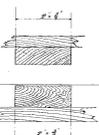
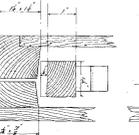
Vertical Section Through Front Floor Lintel



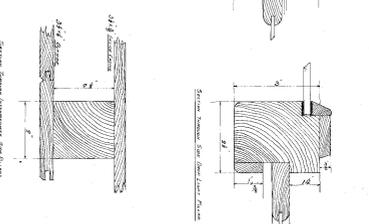
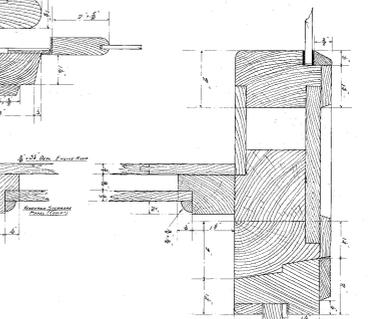
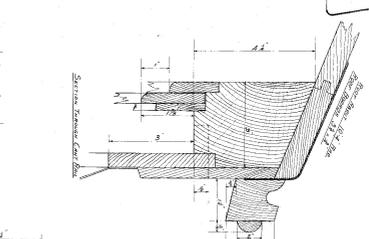
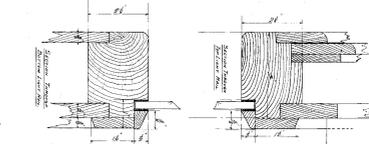
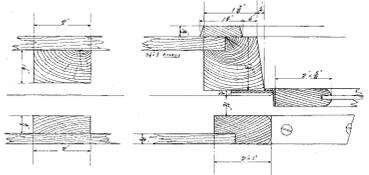
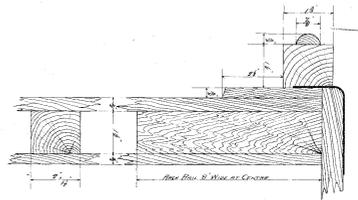
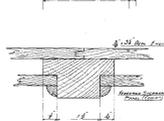
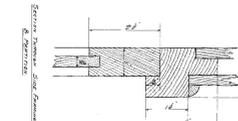
Section Through Front Floor Joist



Section Through Front Floor Joist



Section Through Side Floor Joist & Sill





Two views of the headstocks on the chassis. (Simon Gott)





**Top: The two Steves with the centre casting (Peter Lund)**  
**Below left: Oliver cleaning off old paint (Alan Chandler)**  
**Below right: The headstock before fitting (Simon Gott)**

