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## From DC to Diesel: a transformation devoutly to be wished?



Railfuture East Anglia (Peter Wakefield, Paul Hollinghurst and Peter Risebrow) were guests of Vivarail on 18th August to see the prototype "D-Train", an inspired project to convert redundant D-78 District Line trains into Diesel Multiple Units for the National Rail network. This comes at a vital time, where severe rolling stock shortages are leading to overcrowding, delays to new services, and where the movement of a small number of DMUs between TOCs can make national news.

Vivarail have bought all the D-78 driving motor carriages and a number of intermediate trailers so they can produce up to 75 two and three car trains, and have the option of buying more intermediate motors and fitting cabs if there is extra demand.

The trains are over 35 years old, but the bodyshells are lightweight and in very good condition with no sign of corrosion, and the bogies are only 10 years old and still sold by Bombardier. The photograph below shows the three stages of external appearance: the original on the left; the intermediate stage on the right, and centre, completed.



There are 2 main parts to the conversion, a new diesel drive chain and the new interior. The project aims to deliver a train which is cheap to buy, operate and maintain but gives the passenger a comfortable and modern interior.

Three interior variants are offered, 'City', 'Commuter' and 'Country'. 'City' is essentially a heavy overhaul of the existing interior with its longitudinal seating and retains 4 doors a side. 'Commuter' reduces the doors to two per side (with inward encroaching door pillars being removed) and reconfigures some of the seating to transverse with headrests, while 'Country' provides new seating based on a more comfortable variant of seating seen in new generation EMUs, and adds a retention toilet. New passenger information displays will be added, and reused parts will be deep cleaned to return them to new condition, with, for example, drop-lights being replaced by new parts.



Artist's impression of the interior

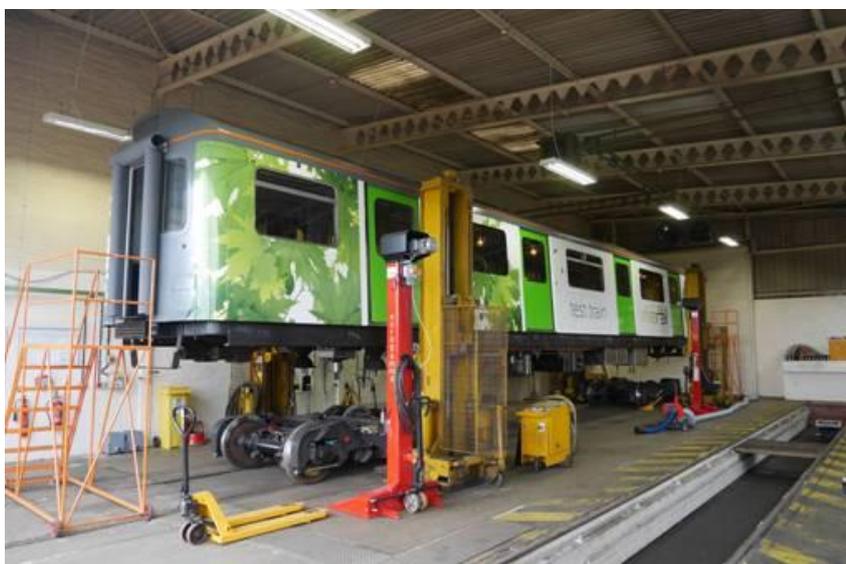
Under the floor each carriage has a pair of engine rafts with diesel engine and generator which can be unbolted and removed by forklift in 10 mins to allow rapid engine swaps in case of failure, but also for overhaul. This work can be performed without the need to take the train back to a maintenance depot.

It is intended that the raft will be maintenance free between overhauls so the units will just require refuelling and emptying of the retention tank, both of which will have three days' capacity. Vivarail didn't stop there and plan to demonstrate a world first for DMUs by fitting an energy recovery unit to the train (battery or flywheel) to allow regenerative braking.

The day started with an introduction to the project by Adrian Shooter, previously Chairman of Chiltern Railways, who is heading the team. We also met Colin Flack who runs the entire Long Marston operation, Andy Hamilton (Vivarail engineering), Neil Bates (Vivarail design) and Alice Gillman (Vivarail PR/Comms).

We were then taken to meet the train for a ride round the 4km test track. A single vehicle is now operational, still with its original interior but in a bright new green and white Vivarail livery, and able to travel round the 4km test track at up to the line speed of 25mph.

We were then shown round the workshops where the other motor and intermediate trailer are being worked on. The motor carriage was up on jacks showing the 3 inch spacers which have been added to the bogie pivot and secondary suspension to lift the body as the LT floor height is too low for the main railway network.



So what did we make of the train? The unit was stable over the rough track at Long Marston and accelerated well although only operating using a single engine raft, and the engine noise was not obtrusive, although final judgement on these will only be possible in January when it starts operating on the mainline, initially during overnight possessions from Honeybourne. The interiors were harder to judge as a complete interior is as yet unfinished, so there were only small test sections to view. We felt that the 'City' variant would have only limited appeal, possibly for an application where they were used for crowd-busting services for special events. The 'Commuter' and 'Country' variants have similar seating density so we thought the new train feel from the completely new transverse seating in the 'Country' variant would be the one operators and passengers would want. Our vote is for the 'Country'.

What was clear from the day was just how experienced and knowledgeable the team are and how they want to produce a high quality product which passengers will welcome as a new train and TOCs will find compelling. The interiors include attention to detail in seating comfort and storage which is sadly lacking in many new train designs.

Many thanks to the team at Vivarail for our chance to see this project first hand, and to Peter Risebrow (PR) for organising our invitation. PH/PW/ PR

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