

By Andrew Saunders Tuesday,

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Upcycled London Underground trains could be back at work on the railways



Credit: Julian Dodd

Converting old tube trains for use on regional rail routes may sound like an eccentric idea, but Vivarail's Adrian Shooter thinks he's on the right track.

If you want to take a ride on a London Underground train, you have to go to London, right? Not for much longer, if the former MD and chairman of Chiltern Railways, Adrian Shooter, and his gang of silver-topped rail iconoclasts get their way.

Because Shooter and his team of industry veterans have come up with a novel wheeze to reuse (one might say upcycle) old District Line rolling stock, by converting them into cheap and efficient diesel-powered trains for use by the cash-strapped operators of ordinary, non-electrified suburban rail routes such as those around Manchester, Leeds and Newcastle. Exactly the kind of increasingly overcrowded routes that Chancellor George Osborne wants to revamp as part of his much-vaunted Northern Powerhouse.

So Underground trains originally designed to ferry the working masses beneath the capital's streets could live again, shipping



THE D-TRAIN IN DETAIL

Weight: Circa 35 tonnes per car

Power: 2 x 200hp Ford turbo-diesels driving 2 x 750v DC traction motors

Cost: Circa £650,000 per car, one third the

cost of a traditional diesel multiple unit

Special features:
Stop-start engine tech.
Remote monitoring for maintenance.
Lightweight aluminium construction

commuters into and out of our regional cities above the ground.

(And before the trainspotters out there get to licking their pencils, yes we do know that old Underground rolling stock is already used on the Isle of Wight's Island Line, but at a mere eight and a half miles long that is the exception that proves the rule.)



Working on the D-Train prototype at Vivarail HQ

It may resemble the plotline from a 1950s Ealing comedy, but inspired by the Japanese concept of making trains that are half the weight, half the price, and have half the operational life of traditional rolling stock, the idea is nothing like as incongruous as it first sounds, says Shooter. 'In the railway industry, we tend to make things that last for 40 years, and then complain that they are out of date for the last 20 of them. So the Japanese came up with the idea of the half-weight, half-life, half-price train. It's a brilliant idea.'

It's also one whose time just might have come. Delays and squabbles have already caused the planned electrification of many regional rail routes to hit the buffers. So more diesel trains are required, and quickly. 'It's become stunningly obvious that we will be short of diesel trains for suburban and rural routes. There's been a huge growth in the number of passengers, and in complaints of overcrowding and poor quality trains, especially in the North.'

With annual passenger rail journeys nationally doubling in the past 20 years to 1.6bn, that shortage is already severe. The current operator of the Northern Rail franchise (up for tender in 2016, of which more later) has been forced to reintroduce 50-year-old ex-British Rail diesel locomotives and slam-door carriages from the 1970s to meet demand, the only available diesel-hauled units it could lay its hands on. 'Our message is that there are no more trains left in the UK,' said the bald accompanying statement.

So 66-year-old Shooter, an engineer with 45 years of industry experience, who officially retired in 2011, has put together a small, highly experienced team 'of old buggers, like me' to form Vivarail, based out of an old train shed at the Quinton Rail Technology Centre in Warwickshire.

With him as chairman, they plan to convert a couple of hundred specimens of ex-District Line D78 class rolling stock, by fitting Ford Transit diesel engines and state-of-the-art alternators

to power the existing electric traction motors, modern high-tech, zero-maintenance control gear and cleverly refitted interiors. The result? A practical 'new' train that can be produced quickly and cheaply to plug the gap - but only if they can persuade passengers, operators, leasing companies and the government that it's a viable and politically palatable solution. With backing from an old mate of Shooter's, US transport investor Henry Posner III, they are working on a prototype and have signed up to buy no fewer than 156 'driving motors' as the power cars are known, plus 70 unpowered 'trailer' carriages.

With two power cars for every three, the 'D-Train' will be available in rakes of two or three, which can be coupled together to make trains of up to nine carriages in total. And whereas a conventional brand-new diesel multiple unit (DMU) costs up to £2m per carriage, the D-Train will sell for around a third of that figure.

There's an engaging whiff of the English potting-shed eccentric about the whole exercise, not least because Shooter himself is only too pleased to don overalls, roll up his sleeves and get his hands dirty. He's also a lifelong rail enthusiast who drives steam engines in his spare time, and has a narrow gauge railway in his back garden.

But the concept is sound, and he and his team - a roll call of top industry talent, including one of the original designers of the D78 - are out to prove a point. Since the first trains began arriving from the District Line earlier this year, they have been busy. A crumpled specimen outside the Vivarail HQ is testament to a successfully passed crash test, and by the time you read this, prototype D-Train should be trundling around the site's 4km test track, laden with 'influencers' of all kinds, from train company execs and civil servants to journalists and commuter group reps. Subject to other required approvals for carrying fare-paying passengers (expected before Christmas), the D-Train could be in production as early as mid-2016, he says.



Refurbishing the old District Line carriage interiors

But hang on a minute. The Underground trains on which it is based are over 30 years old and in the process of being withdrawn. Surely they are only fit for the scrapheap after trundling between Upminster and Ealing Broadway, Wimbledon and Edgware Road for all those years?

Not so, he reckons. 'At school I ran the railway club with Malcolm Dobell, who went on to become chief engineer at London Underground. He told me what good trains these were. The bodies are all aluminum - they are lightweight and don't suffer from corrosion - they are basically as good as new. And they had brand new bogies fitted 10 years ago.'

Since these components between them account for around 60% of the cost of a new train, the D78s make an excellent starting point for a 'new' train, he says. By reusing bodies and bogies, and adding an innovative dollop of 21st-century automotive technology, Vivarail hopes to provide a product much better suited to the needs and tight budgets of regional rail operators. 'Modern cars are computer controlled and don't need servicing very often. The computer knows when anything is wrong. This train is the same.'

So the Vivarail D-Train will include automotive features like stop-start engine technology for fuel efficiency, as well as automatic remote monitoring to minimise maintenance

requirements. The interiors will include options for two or four doors per carriage, tables, toilets, Wi-Fi and smart lighting. Unlike many existing old DMUs they will have full disabled access, and even a special seat with built-in storage for Brompton folding bicycles will be available.

In an industry known for a cautious approach to novelty, it all counts as a pretty radical departure, but it's one inspired by Shooter's own experience. 'I bought the last new diesel multiple units for Chiltern and I had bought many others before that. It seemed to me that trains were getting more and more complicated and expensive, and not offering value for money. The real price of cars, for example, comes down while the utility goes up. That's not so much the case with trains.'

Such disruptive business models are all the rage these days, but more usually associated with friction-free tech outfits like Uber, Airbnb and Apple Pay. Shooter's challenge is to show

that it can also work in the traditionally slow-moving rail industry, with its long capital cycles and complicated interplay between rolling stock leasing companies, train operators, Network Rail and the government.

'The rail industry is conservative but there should always be room for innovation and change. We are giving them a gentle shove with this product. Basically we are making new trains, and it's entirely down to us to convince people that they are good trains. If we can do that, and I think we will, then we will sell a few alright.'

Maybe so, but public reaction to the idea has been less than entirely favourable. In a nation where the economic divide between the prosperous South East and everywhere else grows daily larger, the prospect of asking the North to put up with London's cast-offs while the capital enjoys the megabucks rewards of Crossrail is proving a hard sell.



How a transformed D-Train will look inside

An early win could make all the difference - the obvious candidate being whichever train operating company wins the aforementioned Northern Rail franchise next year. The invitation to tender is already out, and involves an order for at least 120 new carriages. However the wording of the document seems to rule out the use of rolling stock rebuilt from old trains. And in response to a recent question from Colne Valley MP Jason McCartney in the House of Commons, transport secretary Patrick McLoughlin apparently confirmed this, saying 'It was made clear that once we got rid of the Pacers (the existing rolling stock) they would be replaced by new trains, and that is what is in the invitation to tender.'

Of course, the minds of government officials have been changed before, and they no doubt will be again. But all the same, Shooter and his team at Vivarail have an awful lot riding on how well the prototype D-Train is received. So why - at an age when many would be settling down into a life of tranquil ease - is he putting himself through it? 'I like to find interesting things like this to do. Usually things that make other people start off by saying, "You'll never be able to do that,"' he replies.

The trains have been criticised for being slow - they max out at a modest 60mph. But with two 200hp Ford Transit diesel engines under the floor of each power car and their lightweight aluminum construction, they will make up for that, says Shooter, with sparkling acceleration.

'When you start looking, you find that on a hell of a lot of routes the trains don't get over 60mph.' On a comparison of the route from Huddersfield to Sheffield, for example, Vivarail estimates that the D-Train would be four minutes faster than the existing rolling stock despite its lower top speed.

All the same, the politics are emotive and have the potential to derail the scheme before it's left the sidings. 'I understand that, which is why we are showing this off as a brand new train, but one which we've made affordable by keeping down the initial cost, using less fuel and reducing maintenance.'

But he is optimistic that the acuteness of the rolling stock shortage, compounded by yet more electrification delays (leading wags to rechristen the 'Northern Powerhouse' the 'Northern Powercut') will play into Vivarail's hands. 'The need to do something is urgent, but the Department for Transport is not as flush with cash as anyone would like. If I were a politician, what I would be saying is that by having these, for any given amount of money you can have twice as many trains. In the context of overcrowding that's not a bad message.'

If he can get that message across to a wider audience, and convince all those stakeholders that they really ought to climb aboard, then the sight of Underground trains on the overground might very well become a reality. Mind the gap.

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