Vivarail’s D-Train on track

A prototype diesel multiple-unit converted from former London Underground metro cars is now on test in the UK, with a three-car set expected to begin carrying passengers next year. Chris Jackson takes a ride.

By the end of this year, a three-car prototype D-Train should be undertaking test running on the UK rail network, according to Vivarail Chairman Adrian Shooter. With at least one train operator interested in testing the concept, he expects the train to be carrying passengers in the first quarter of 2016 as part of an extended trial.

As described in RG 5.15 p50, the project involves converting former London Underground D78 metro trains into lightweight DEMUs, to overcome a shortage of diesel vehicles in the UK. With the first vehicle running on the 4 km ring at the Quinton Rail Technology Centre near Birmingham, Vivarail hosted open days last month for around 200 potential customers, including rolling stock leasing companies, train operators, regional transport authorities and the Department for Transport.

Designated as Class 230, the prototype is being converted in the Motorail UK Ltd workshops at QRTC. One driving motor car has been completed, and a second is underway. At this stage the interior changes are largely limited to reupholstered seats and LED lighting, but an intermediate trailer car is being mocked up to demonstrate a variety of possible interior configurations.

Although the aluminium bodyside is retained, the D-Train has been extensively re-engineered. Using ‘service proven state-of-the-art’ components, Shooter says it is ‘effectively a new train’, with virtually all underfloor equipment replaced and the whole vehicle rewired. The driving ends have been ‘substantially strengthened’ with a steel protection cage, and operations manager Andy Hamilton confirms that safety regulator HMRI has been ‘very supportive of the project’. The flexible motor bogies, supplied by Adtranz about a decade ago, have been overhauled by Wabtec, although the traction motors ‘needed very little work’.

Each motor car has a centrally-mounted fuel tank with capacity for at least three or four days’ operation. This is flanked on one side by the traction control modules from Strukton Rail and on the other by a pair of diesel power packs which meet the emissions requirements without exhaust additives. Emphasising that the D-Train has been designed for reliability and minimum maintenance, Shooter points out that the underframe brackets are designed to allow an engine module to be exchanged in 10 min.

Shooter told Railway Gazette International on August 19 that development is to start later this year on an energy storage module to be mounted under the trailer car, to permit regenerative braking and hybrid operation. Asked by potential customers about an electro-diesel bi-mode capability, he said this was technically feasible, but not in the current development budget.

The Class 230 has a maximum speed of 96 km/h, but with two 400 hp engines in each 31 tonne motor vehicle it is expected to have rapid acceleration, even with a 19 tonne trailer car. It will be available with two or four wide doorways per car, which should help to reduce station dwell times. The units are being equipped for driver door control, allowing the conductor to focus on customer service and revenue protection. Inter-car gangways are being fitted within each set, and up to three units will be able to operate in multiple.

Vivarail has purchased enough vehicles to assemble up to 76 two-car or three-car sets; around 40 cars are already on site. Shooter believes that once series production ramps up the company could be delivering two sets per month, or more if some work is outsourced.

As well as providing additional capacity on busy routes, and potentially replacing Pacer railbuses, the D-Train is seen as an ‘entry-level’ unit for new operators, at a significantly lower cost than £2m/car for a modern DMU. DfT insiders report that local authorities are interested in reviving passenger services on freight-only or disused rail routes, including March – Wisbech and Bristol – Portishead. Used on existing routes, the units could also release conventional DMUs for redeployment elsewhere.