

Sparking NEW designs

Electric powertrains are reducing the engineering constraints imposed by internal combustion engines, providing bus OEMs with new design freedom in developing new vehicles. John Kendall explores the new electric world

Rochdale-based Mellor Bus has launched its new electric-only Sigma range of midi-buses, marking the first midi-bus that the company has designed, developed and will build from the ground up at its new facility in Scarborough. The Sigma range will be available in lengths from seven to 12 metres, designated Sigma 7, Sigma 8, Sigma 9, Sigma 10, Sigma 11 and Sigma 12.

The range, spanning gross weights of eight to 19 tonnes, will offer passenger capacities from 30 to 80, depending on model. Sigma models will be available with 'city' and 'rural' specification, and a range of options covering width and passenger door configurations, resulting

in more than 20 individual variants. Component manufacturers will include CATL for batteries, ZF and Dana for axles, as well as WABCO, Webasto and Ventura for other components.

First to reach the market this summer will be the Sigma 7 and Sigma 10, followed by the other models later in the year. The range is available to order now. The fully EU type-approved range will be covered by a three-year vehicle warranty, eight-year battery warranty and a 15-year structural warranty. All vehicles will be equipped with a CCS charging socket. That enables the Sigma 7 to be

DC charged in around 1.5 hours and the Sigma 10 to be charged in around 2.25 hours.

Mellor Bus quotes a range of 160 miles on a full charge for all models, depending on operating conditions.

Of the new designs, John Randerson, chief technology officer for parent company Woodall Nicholson, says: "Because we have no preconceived ideas, no back catalogue of diesel-engined vehicles to have to work around, it allows us to think way outside the box in terms of how we create a range of



ADL PLANS ZERO-EMISSION CENTRE OF EXCELLENCE

Alexander Dennis Limited is hoping to open a zero-emission bus technology centre of excellence in the planned government-funded Falkirk Investment Zone. ADL's vision is to create a centre of excellence to focus on the development, testing and manufacture of zero-emission bus technology. This centre of excellence would be part of a public transport net-zero technology cluster, led by ADL in collaboration with other industry partners, which could also include a high-tech incubator and dedicated flexible carbon-neutral manufacturing space. The next phase of work on the proposals will now begin. Paul Davies, ADL president and managing director, said: "As we continue on the road to net zero, we are excited to build upon nearly a century of manufacturing history in Falkirk with our vision for a new technology centre of excellence for the zero-emission age."





products that meet the needs of UK and European operators, but without the constraint of that frame or chassis design that had a diesel engine, and now we have to put a battery pack there.

"If you have no preceding design and you have a fantastic level of history and expertise in lightweight technology, it allows you to almost roll up into a ball what went before, chuck it, and then come up with something that is entirely different."

The Sigma range is based on an integral stainless steel welded fabricated structure. "Although it's stainless steel, there is less of it and it saves weight," says Randerson. Other materials used in the construction include carbon fibre in the side panels. "The floor structure is not a traditional 18mm or 15mm birch-faced plywood," continues Randerson. "It's a composite, and it's one that we have been using in our vehicles for probably the last 10 years. We have actually got such a degree of experience in how to do this from the smaller

buses, we've been able to adapt and tweak it into these kind of platforms to make them as light as possible.

"We go out of our way to fit lightweight seats; we've got 17.5-inch alloy wheels. Once you start on that journey towards light weight, a 17.5-inch tyre and alloy is a lot lighter than a 22.5-inch or a 19-inch, so there becomes an increasing payback."

Mellor Bus expects the Sigma range to appeal to a wide range of users. "I think we're going from a full range of small local operators running some rural routes where they've just not been financially viable. They now become so because of acquisition costs and maintenance costs," said Mark Clissett, managing director of Mellor Bus. Clissett says that Sigma has changed the total cost of operation model and swung it dramatically in their favour. Other customers are expected to include retail operators through to the larger service bus fleet operators. **TE**

LOW-FLOOR CHASSIS FOR HYVIA ELECTRIC-HYDROGEN CITY BUS

The Renault Master City Bus H2-TECH – an electric-hydrogen city bus based on a Renault Master ZE-h platform, unveiled in Paris in December 2021 – represents the first product development in a partnership between Renault Group's specialist vehicle subsidiary PVI and Promech Technologies, a corporate sibling to Mellor Bus in the Woodall Group.

The bus is branded Hyvia, a joint venture between passenger car and commercial vehicle OEM Renault Group and hydrogen fuel cell manufacturer Plug Power.

The Promech/Renault Group/PVI partnership, the first major OEM collaboration for the recently-formed Promech Technologies company, will also see the development of a wider range of city buses with low-floor battery-electric/hydrogen fuel cell (HFC) technology for UK and European markets. A complete product line-up is expected to be available to order from 2022.

The new Hyvia city bus dovetails the automotive industry's two new energy drive systems – battery electric and HFC – made possible by integration with Promech's low-floor chassis and body transformation. The result provides scope to deliver range-extending, zero-emission vehicles to meet customer requirements across three distinct market sectors including city bus passenger transport, urban distribution, and emergency services, according to the company.

Crucial to its appeal is Promech's structural integration of the battery electric and HFC components. Promech has designed a 250mm single-step access to the passenger area with underfloor positioning of the battery pack for stability. Similarly, novel design and integration of the HFC installation does not compromise passenger-carrying capability or the external vehicle dimensions, Promech says.

The design provides a low, flat floor to all seats and wheelchair accessibility integrated into a monocoque body construction. That monocoque design enables full utilisation of available space, while maintaining internal passenger height and a light, spacious environment complemented by the use of panoramic windows, which is a feature rarely seen on a city bus of this size, adds Promech.

The dual-power drivetrain comprises a 33kWh lithium-ion battery supplemented by a roof-mounted and range-extending 30kW hydrogen fuel cell. The combination delivers a range of 300km between recharging cycles.

