

Coach CLASS

Rising customer expectations, but decreasing engine sizes, are squeezing the coach conversion business from both ends. Electric drivetrains are another new trend, reports Steve Banner

Coach passengers increasingly expect to be able to recharge their mobile devices, use onboard Wi-Fi and enjoy a freshly-brewed cup of coffee from time to time during what may be a long journey. As a result, the electrical load coaches must bear is increasing, and designers have had to respond accordingly, says Gotzon Gomez, export director at Spanish bus and coach builder Irizar. "In the past we'd fit one alternator," he recalls. "Now we install two, and increasingly we're talking about three or four."

At the same time, the engines they are mounted on are getting smaller, as manufacturers downsize to save weight and cut fuel usage. "We're seeing a definite move away from 13-litre diesels in favour of 11 litres," he says. "An 11-litre can deliver 464bhp these days, and that's more than enough for a coach."

While some coach operators – especially those on commuter work into city centres – are specifying fully automatic gearboxes mated to those engines, Gomez has his doubts. "Automated manual boxes are generally preferable because they offer better fuel consumption," he observes. "Bear



in mind that whereas an automated box may have up to 12 speeds, an automatic box on a coach is likely to have no more than six."

Minibuses and small coaches are available with eight-speed automatic boxes, however, and do not appear to be suffering a fuel consumption penalty.

For example, Spanish bodybuilder Ferqui is making 29- and 33-seat coach-built midi-coaches available on a 7.2-tonne IVECO Daily 70C18HP platform with a 168bhp 3-litre Euro VI diesel married to an eight-speed Hi-Matic auto box (pictured, p40). Fuel economy is not an issue, says Steve Peach, managing director of Connaught PSV, Ferqui's UK distributor. "We know of one operator who is using a Daily Hi-Matic on local stop-start contract work and is getting 24mpg," he says. "Daily fills a gap in the market now that Mercedes-Benz's Vario is no longer available."

To replace that heavy van chassis often used for mini-coaches, the latest version of Mercedes-Benz's Sprinter, which grosses at up to 5.5 tonnes, is available with a nine-speed automatic box.

Taking weight out of the body can help improve mpg, but has to be done with care. "Using aluminium instead of

steel wherever possible is one option, but you may have to use a lot of it to maintain the vehicle's strength," Gomez observes. "That puts the cost up."

Careful attention to aerodynamics can reduce fuel usage, too. Modifications to the underside of Plaxton's dramatically styled Elite, announced just over a year ago, plus new deflectors on the rear pillars, and speed-dependent chassis lowering, have all helped cut the drag coefficient to 0.33. That in turn translates to a 4% cut in diesel consumption, says Plaxton.

ALTERNATIVE POWERTRAINS

An alternative is to reengineer the engine itself, and go electric. Three years ago, BYD unveiled the C9 in the USA; this a 47-seater all-electric coach said to have a range of over 190 miles between recharges. Last October saw Van Hool announce an agreement with US battery technology specialist Proterra to develop the CX45E, an electric coach with a predicted range of some 200 miles. The initial examples should be delivered to US customers during the first half of 2019, says Van Hool. The company is already well-established in North America, with more than 10,000 coaches and

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buses operating there. Irizar itself has developed a 60-passenger 10.85m battery-powered single-decker bus, which was on display at last October's Coach and Bus 2017 exhibition.

However, Irizar's Gomez is politely sceptical about the real-world viability of electric coaches, at least so far as tour work is concerned. The range remains too short, he says: "As things stand, going up to 250 miles is science fiction, given the amount of power that heating and air-conditioning systems consume." Added to that is the lack of convenient battery pack recharging points for five-day tours of the Scottish Highlands or the Lake District.

Adds Gomez: "We hear a lot of talk about quick-charging systems that give you 80% of the charge after 30 or 40 minutes, but realistically you are probably going to have to plug it in for five hours," he says.

Van Hool, however, is aiming at businesses that may want to use CX45E on short-haul commuter services into city centres with emission restrictions, returning to the same depot each day.

Parallel hybrid technology might be a sensible alternative, Irizar believes. It has developed the i4H, a 57-seater

commuter coach (pictured, p39). The newcomer combines a 296bhp Cummins ISBe 6.7-litre Euro VI diesel with an electric motor/generator. That functions as an engine retarder during hill descents and braking, recovering energy that would otherwise be dissipated and using it to charge the coach's lithium-ion batteries. They are used to propel the coach as it crawls along in congested city centre traffic. The diesel engine is not switched off, however, so it can drive all the auxiliary functions - the aforementioned air-conditioning, Wi-Fi and so on - so the vehicle is not entirely emission-free. On the other hand, European fleets that have put i4H into service are reporting a 20%-plus fuel saving, says Irizar.

Gaseous fuels might be an environmentally sensible alternative, but there is a practical problem, says Gomez. Where do you put the gas tanks? On the roof they block the roof hatches and interfere with air-conditioning system fitment. They also may add too much height, particularly



on double-deckers. The 14.3m 79-seater tri-axle Boa Vista double-deckers CaetanoBus has supplied to National Express are over 4.1m high.

On the other hand, putting the tanks in the luggage compartment reduces the amount of space available for passengers' cases; space which may have already been eaten into by the presence of a wheelchair lift given the need to provide accessibility for all. The rising popularity of heavy electric wheelchairs means that such lifts have to be designed to carry around twice the capacity that would have been necessary in the 1990s.

On the topic of lifts, PLS - Passenger Lift Services - has come up with an upgraded version of its Mega-H mid-mounted cassette-type coach lift with a safe working load of 500kg, up from the 400kg provided by the standard model. It has been installed in a 57-seater Plaxton Leopard operated by Woodstones of Kidderminster in Worcestershire.

PLS also offers a wheelchair lift that can be installed at the bottom of a coach's front steps. Once the lift and its occupant are raised, a bridge is deployed so that the wheelchair user can access the passenger saloon.

That saves luggage space, although luggage lockers appear to be getting bigger. VDL's latest addition to the Futura range, the 13.5m-long 63-seater FHD2-135, offers a cavernous 12m³-plus luggage bay - about the same capacity as a medium-wheelbase high-roof panel van - but still on two axles. Power comes courtesy of a 10.8-litre DAF MX-11 engine at either 365 or 434bhp. [TE](#)