



THE WAY FORWARD?

IN THIS CLUB EXCLUSIVE, JOHN WICKERSHAM REVEALS A MAJOR CHANGE IN CARAVAN CONSTRUCTION – BUT WILL IT CATCH ON?

ABOVE: It might look like any other caravan, but a Bailey Pegasus is radically different

ITHAS finally happened! A system has been developed that could change the way that caravans are constructed for a long time to come.

I won't be popular when I suggest that for the past 30 years some caravan bodywork has had serious flaws. The principle of constructing a box using prefabricated, insulated boards is fine, but problems can occur where the panels are joined. Let's face a simple fact. Who would build a cabin cruiser with a watertight hull and then drill 124 holes for attaching aluminium strips? Well, that's how my present caravan was built. How many screws secure your awning rails to timber struts embedded in the panels?

Does your caravan have aluminium trims elsewhere along its external panels? Mine does. They add a further 184 holes

and that's not including the ridge trim along the peak of my boat-style roof. Each hole forms a puncture point through an otherwise watertight cladding. The screws on my caravan went rusty because a penny-pinching manufacturer didn't use stainless steel fixings. That hastens the subsequent problems when 'flexible' sealants get brittle.

These issues won't worry those who change their caravan every few years. However, I keep a caravan considerably longer and hours have been spent re-bedding aluminium strips on fresh sealant and replacing their screws. Failing to do this leads to damp patches inside.

Water ingress problems are well documented, particularly in the Club's *Quality & Reliability Survey*. These were first published in 1999 and if their findings seem disappointing, don't forget that the

research sample only consists of caravans aged three years or younger. Monitoring the longer-term performance of older caravans has yet to be tackled.

LOOKING FOR ANSWERS

This begs a question. Is there a better way to create a watertight enclosure? I have certainly been pleased with the weather-resistance of the two coachbuilt motor caravans I built using a monocoque (ie one piece) body of GRP (fibreglass).

Seam-free mouldings make sense and I always liked the one-piece GRP roofs that Avondale fitted. However, a monocoque body shell is heavy, costly to build and difficult to modify when developing models in various lengths. The GRP Voyager Vector caravan launched in November 2005 proved that point. Its 25-year water ingress warranty

was unprecedented but with a £25,000 price tag, this heavyweight beauty has sunk without trace.

Next on the developmental trail is Bailey whose efforts commenced just two years ago. The company set out to develop a construction which would be:

- More weatherproof
- Better insulated
- More robust
- More aerodynamic
- Unburdened by a weight penalty

To achieve these objectives, an eight-strong team was formed under the guidance of Nick Howard, Bailey's Managing Director. Each member was given responsibility for a specific element within the project and additional assistance was sought from the Department of Mechanical Engineering at The University of Bath, Smithers Rapra (Rubber and Plastic Research Association) and Millbrook Proving Ground.

AN IDEA IS BORN

In 'normal' life, Nick Howard is an athletic, outdoor type who recently coated himself in grease and took part in the long-established Windermere swimming race. He is not yet the kind of person to eat bacon butties or drink mugs of tea in lay-bys. Yet it was the construction of refreshment caravans parked in lay-bys that inspired an idea which Bailey pursued. Curiously, in view of his surfing interests, Nick hadn't noticed similarly constructed RNLI Life Guard caravans sited on West Country beaches.

Both products are built using sandwich-bonded panels that are clamped together with interlocking alloy extrusions along the abutment points. No puncture holes, no screws, no obvious places for rain to seep in. One problem, these utility vans are shaped like building bricks. Caravanners wouldn't fall in love with them and their alloy joiners also lack

grooves for the addition of an awning.

Otherwise this constructional system has practical potential, but could someone add awning channels and bend these extrusions to create a less-boxy shape? Could these cappings be powder-coated in colours to match a caravan's walls? These were issues that Bailey resolved.

PROTOTYPES

As you'd expect, Bailey prototype shells were kept under wraps while the company continued its ongoing evaluations of appliances that might be installed in future caravans. Coincidentally, I was looking for a caravan manufacturer who'd be willing to install a new type of heating system as an experiment. Bailey then offered a prototype caravan. When installation illustrations subsequently appeared in the *Magazine* last April, I withheld photos that might let cats out of bags.

Although I didn't divulge the esoteric mysticism of Bailey's new baby, I was impressed. To my impartial eye, Bailey's Alu-Tech form of construction – with neither screws nor holes in the sides – would surely address the problems I've reported above. But would an Alu-Tech caravan be rigid? Would its thermal efficiency achieve the standards intended? Answering these questions involved a wet weather week at Millbrook in Bedfordshire.

TESTING TIMES

Club members are probably aware that Millbrook is the venue for the Club's annual Towcar of the Year competition. I often use its tortuous courses when test driving vehicles as dissimilar as the Ferrari 575M Maranello, a Binz Hearse and the Piaggio Porter. That said, I've never sat in a Ford Mondeo pulling a prototype caravan over its Belgian pavé. In prospect, this seemed outrageously cruel... but a professional driver conducted the tests, his teeth clamped tightly together.



Bailey's caravan endured repeated pavé punishments which were only one part of a relentless, round-the-clock testing regime. In boffin-speak, Millbrook's challenges constitute 'a series of accelerated life tests'. Put simply, Project Pegasus passed with flying colours.

Also included in the Pegasus test programme was a sojourn in Millbrook's climate control chamber where the caravan's thermal performance and efficiency was evaluated.

The new caravan was put through its paces at Millbrook – venue for the Club's Towcar of the Year competition

CONSTRUCTION FEATURES

The collective challenges verified the credentials of Bailey's Alu-Tech product. Such is the confidence of its creators, the Pegasus range carries a 10-year bodysell guarantee – subject to the usual terms and conditions. >>



Bailey found a specialist that could curve these structural frame members



This prototype uses a framework with an awning attachment groove



An early experiment shows how the panels are secured before a capping is added



ABOVE: Nick Howard demonstrates that a Pegasus is robust... but don't try this at home!

RIGHT: The climate control chamber at Millbrook yielded notable insulation data



LEFT: All panels that form a Pegasus enclosure are thicker than usual



BELOW: Light interiors and 1.95m (6ft 5in) of headroom are found in each model



So let's summarise its technical features

- Since the interlocking, colour-coded body framework reduces the number of external joints and fixings by around 90%, there are far fewer potential water access points
- Low absorbency 'buffer zones' are constructed around window and door apertures to offer further defence against water ingress
- Instead of using timber battens, the manufacturer is mounting internal

- struts in the body panels made from a composite plastic
- To achieve an improved thermal performance, thicker-than-usual high grade insulants are used in the core of the bonded panels: sides 37mm, roof 31mm, floor 44mm
- Thermal performance is enhanced by insulating the pipe runs and wheel

- boxes. This strategy proved its value during the cold chamber testing
- Data from the cold chamber tests indicates that Pegasus is probably the only UK caravan to achieve EN 1645-1 Grade III Classification of Thermal Insulation. This means it is well equipped to keep out intense heat in summer while also retaining heat in winter
- The front wall and roof are formed using a single, seam-free panel. That's important because most of the rainwater collecting on a caravan roof discharges forwards over the front panel
- Two wet locker storage compartments have been added at the front and all four grab handles have weatherproof LED lighting integrated within their mouldings.

INTERIOR/EXTERIOR DETAILS

Although I only slept in a Pegasus prototype for one night, I approved of the clean styling with its lack of tassels, frills and fussy woodwork. However, the 'fluffy features' will be reported in detail after live-in tests are conducted in the very near future.

Externally, the gas locker lid is different from usual. What's more, some traditionalists might bemoan the absence of moulded front and back panels, probably unaware what they cost to replace if their plastic gets damaged. Far more important than cosmetic detailing is a tough, leakproof body with flush-fitting windows.

WHAT NEXT?

Pegasus will be unveiled to the public at October's International Caravan & Motorhome exhibition, at Birmingham's NEC. Meanwhile I've arranged to see its production line in action and to join an Alu-Tech technician repair course. Only one more question remains in the back of my mind. Would this interlocking framework system work on coachbuilt motor caravans, too? Water ingress isn't the sole preserve of tourers. ■

See the News pages to read more about the design and layout attributes of the Bailey Pegasus

i See baileypesagus.co.uk. The Pegasus model range uniquely employs the Alu-Tech system