



APPLICATION CASE HISTORY NO. XXX



Body Maker Cuts Manufacturing Costs, Warranty Service, Improves Product with Loctite® H8000™

Product Line Designed with Adhesive Bonds Instead of Aluminum Weldments Boosts Company's Sales to Ambulance Market



SITUATION

One of the oldest and largest truck body manufacturers in the United States produces a wide range of general-purpose and specialized bodies for service and delivery vehicles, including a line of ambulance bodies for a well-known manufacturer of emergency vehicles.

In an effort to provide the ambulance manufacturer with better products, the truck body manufacturer took a fresh look at the design of several of its Type I and Type III ambulance body types. One design feature that appeared to leave room for improvement was the joint between the aluminum body panels and the aluminum door framing. Frame members were skip-welded to the outer skin, with a small amount of framing left exposed in the door opening. Over time, part movement would cause paint separation at the joint, allowing moisture to penetrate between the skin and the framework and leading to corrosion.

The ambulance builder needed to reduce warranty costs associated with this problem, and demanded a

response. At the same time, the truck body manufacturer had its own reasons for wanting to redesign elements of the ambulance body. Quality specialists had noted that skip-welding resulted in unsightly buckling of the outer skin, and that the spaces between welds represented a second path through which moisture could penetrate the joint. The entire welded-assembly design appeared to be problematic, and it was hoped that these problems could all be eliminated by switching to adhesive assembly. The company contacted its local Henkel representative for consultation.

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Loctite® H8000™ adhesive is used in the production of ambulance bodies like this Type III model.



Older body styles used skip-welding to join the aluminum skins and frames. This permitted moisture to penetrate, causing paint and corrosion problems and excessive warranty claims.

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Loctite® H8000™ is used to bond the ambulance bodies' aluminum skin to frame members. The process is quick and economical.

SOLUTION

Henkel® sales engineers worked closely with the body manufacturer on the redesign of the ambulance bodies, reengineering the skin/frame joints as well as the bodies' underlying aluminum frameworks for adhesive assembly. In the new design, the outer skin wrapped around the door framing extrusions, eliminating overlapping or exposed edges. Together, Henkel and the body maker identified Loctite® H8000™ structural adhesive as the ideal product for the application.

H8000™ is a non-sagging, two-part methacrylate bonding system that cures at room temperature. It features very high impact, peel, and shear strength, and extremely high tensile strength on a wide range of materials, including metals, plastics, and composites. H8000™ requires minimal surface preparation, has excellent environmental resistance, and maintains resilient bonds over wide temperature ranges.

Henkel also provided bulk application equipment and training to assembly personnel. Adhesive is applied over 100% of the length of each skin/frame joint, compared to the roughly 50% bonding achieved previously by skip-welding. In addition, aluminum structural reinforcements are bonded rather than welded to main structural members. Parts are fixtured for about 25 minutes following application.



(left) This ambulance looks better on the outside too because of Loctite® H8000™ adhesive

RESULTS

The truck body manufacturer achieved numerous objectives through the body redesign and switch to adhesive bonding with H8000™:

- The adhesive bond between body panels and door frames is stronger than the welded connection. The redesigned ambulance bodies support 55,000-pound test loads on the roof and sides, exceeding federal standards by more than 200%.
- The full-length bond provides a resilient, water-tight seal against moisture penetration. This eliminated the problems of paint separation and corrosion and drastically reduced the ambulance maker's warranty costs.
- Buckling and dimpling of the skin was eliminated, resulting in improved cosmetic appearance.
- Production time on the door/skin joints was reduced by about 20%.
- Lower-skilled labor can now reliably produce excellent skin/frame joints, reducing labor by \$3 to \$4 per hour compared to the cost of trained welders.

"Without the use of Loctite® H8000™ structural adhesive, the current body design would not have been possible," said the body maker's production engineer. "It allowed us to think outside the box and, with the help of the Loctite team, develop a design that is more cost-effective to build and that meets our customer's critical requirements. This new production method has been a tremendous factor in the growth of our emergency vehicle business."



(above) The redesigned full-length adhesive joint is stronger than the earlier skip-welded joint and it excludes moisture, eliminating a source of corrosion.