

The TRANSIT-LINER™ C2

# strength



## A powerful way to build a bus.

When we started to engineer the Transit-Liner™ C2, we wanted it to be strong. Very strong. So we looked at a number of new technologies, including those in the aerospace industry, searching for the strongest, most advanced and most efficient way to build our buses. And what we found led us to something completely new for the bus industry: adhesives and self-piercing rivets.

By combining these technologies, we were able to create joints that are incredibly flexible, with a strength nearly double current joining methods. In fact, testing shows the adhesive joints, in some cases, are stronger than the side sheet itself. Which is impressive, considering these joints will maintain their integrity throughout the life of the bus.

And, because self-piercing rivets don't require pre-drilled holes and are compatible with adhesives, this combination also results in fewer fasteners for a sleek look and fewer potential leak points. Then, to make sure the C2 is as tough as possible, the floor, rafters and stringers are welded together so, when the shell is bonded to this frame, you get a single, cohesive unit that is extremely strong, stable and durable. But the only way to see how it all works together is to visit your nearest dealer. They'll be glad to show you.

### Advantages of Self-Piercing Rivets

- Join a range of materials such as steel, aluminum and plastics
- No hole required, no leak path
- Don't damage zinc or painted coatings
- Nearly flush with the surface for better aesthetics
- Repeatable quality, visually checkable joint with one-shot operation
- Compatible with adhesives and lubricants



Because every mile matters.™

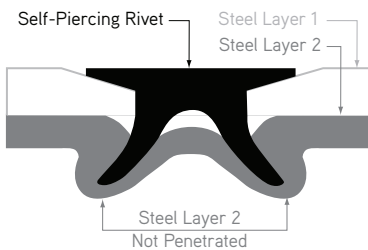
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### IMPROVEMENTS

#### Adhesive Joint Features

- Stronger
- More durable
- More fatigue-resistant
- Continuous sealing
- Smooth, clean seaming
- Reduces number of body rivets and fasteners by more than 65%
- Nearly two times stronger than current riveted joint in tensile lap shear
- Significantly exceeds FMVSS 221 joint strength requirements

#### Cross Section of Self-Piercing Rivet Joint



Visit [www.thomasbus.com](http://www.thomasbus.com) to locate your dealer for a test drive.

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## The proof is in the testing.

In our search for the safest, strongest way to build a bus, we tested the use of adhesives to reinforce joints and reduce rivets. The first test (A and B) demonstrates the performance of a current FMVSS-compliant 8" rivet body joint with a 3.5" overlap. The section is pulled to measure the amount of force it can withstand. The maximum force is achieved just as the joint begins to separate. This performance is one of the many features that contribute to the admirable safety record of today's buses.

### Better is better

The second test (C and D) is constructed with a 2" overlap and a structural adhesive with

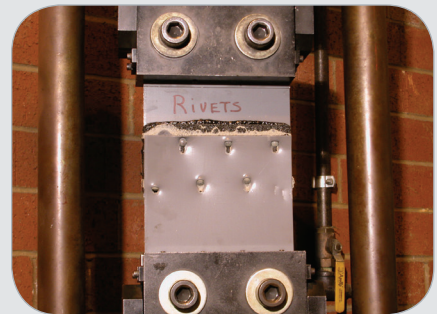
proven success in aerospace and automotive applications. As the peak force of the previous joint is exceeded, the joint holds firm and proves to be stronger than the side sheet itself. The results are impressive, to say the least. These tests show how adhesives can help enhance the structural integrity of a commercial bus. And, when it comes to safety, better is better.

To find out more about the Transit-Liner™ C2's strength, you'll have to, well, see it for yourself. Visit [www.thomasbus.com](http://www.thomasbus.com) to locate your dealer for a test drive.

**A RIVETS BEFORE:** Rivets before pull test. Adhesive line showing.



**B RIVETS AFTER:** Rivets after pull test. Rivets at 3.5" overlap, joint tears at an average of 8,154 lbs.



**C ADHESIVE BEFORE:** Adhesive before pull test.



**D ADHESIVE AFTER:** Adhesive after pull test. Adhesive at 2" overlap, metal tears at an average of 14,475 lbs. (joint did not break).



Because every mile matters.™

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