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Causes of bolt failure/bulkhead failure

There has been **much** discussion over the years on the causes of bulkhead separation issues. The following are the most likely to cause an issue.

- Leaks in the wet bay. Could be from something as simple as bad gasket in the fresh water fill fitting.
- Rust jacking from liquid de-icers (which are Hygroscopic) or parking long-term on the beach and not washing it off.
- Water that gets in around the head of the Rolok bolts. This one affects ALL OF US. Remember, the 1/4" front of front bulkhead and rear of rear bulkhead is OVERDRILLED so that the Rolok will thread into the 1 1/2" box beam inboard of it. Water can enter the bulkhead area around the threads.

The bulkhead issue is one of galvanic corrosion and tensile stress fracture/failure of the fasteners due to the forces imposed by rust jacking. Pictures of failed fasteners don't show evidence of radial or shear loading failures, only tensile and galvanic corrosion failures.

"Rust-jacking" can occur with any joined-components that are made up of iron or steel. The only requirements are iron (Fe), oxygen (O₂) and a physical connection (bolt, spot weld, etc).

The "jacking" is the result of the chemical change that takes place when iron oxidizes (corrodes or rusts). As the iron rusts, it changes from iron to iron oxide and the resulting iron oxide occupies more volume than the original iron. It will exert **tremendous** force in doing so, if it is confined and the oxidation continues.

Depending upon a number of factors, the "swelling" of the iron oxide, can surpass the tensile, yield and fracture strengths of the physical connection (bolt or spot weld, etc.). Dependencies include the presence and concentration of things that aid in the oxidation process (presence of water or moisture, chlorides, heat, affected surface areas vs. bolting cross sectional area, affected surface preservatives, strength of the bolting, corrosion resistance of the bolting, galvanic cell values, etc.).

The nature of this volumetric expansion of the iron oxide is more than strong enough to force iron and/or steel joined-components apart and cause stress fractures of bolts in bridgework, skyscraper foundations, utility structures (and the frames of over the road vehicles) to the tune of multi-million's of dollars of annual damage nationwide. It is of particular significance to the trucking, utility transmission and distribution and salt water marine industries.

Many, if not most, coaches with bulkhead bolting failures have seen more failures in the vicinity of the fresh water tank overflow (or other long duration wet bay leaks). Don't forget that even though you may not overfill the tank, if it is anywhere near full, it will wet that side down each time you turn in that direction, until the volume is reduced sufficiently to prevent re occurrence.

If caught early, the fixes are simple and inexpensive. This is ROUTINE PREVENTIVE MAINTENANCE AND THE ROLOKS NEED TO BE CHECKED ANNUALLY.

Additional Forces

Towing has nothing to do with bulkhead separation.

The bulkhead(s) is forward of the rear drive wheels. When accelerating with a heavy trailer, the rear drive wheels are forcing the bulkhead together. When braking with a heavy trailer, the trailer is forcing the bulkhead together.

So, what tries to separate the bulkhead, especially the rear one?

It is the retarder. The retarder is slowing the rear wheels but not the front wheels as would the brakes. So the rear bulkhead transfers the slowing effort to the front of the coach. This is the force that tries to open the bulkhead joint.

The only way a heavy trailer could apply the same type of force is to slow the coach by using trailer brakes only, no retarder and no coach brakes.

Hope this helps you all understand the way forces are applied to the bulkhead and what might be the source of those forces.

Required Reading



- [Bulkhead Blues](#)
- [Bulkhead Repair](#)
- [My bulkhead experience](#)
- [Foretravel Bulkhead Issue](#)
- [Making sure the fresh water tank is completely full](#)
- [Bulkhead Separation Photos](#)

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