Title: Repairs on bowed down (vertical) understructure components.

Reference: The IICL members have recently noticed an increase on inquiries about the acceptability of vertical straightening of bowed down transverse and longitudinal understructure components.

Purpose: This technical bulletin (TB – 019) aims to clarify the IICL position with regards to vertical straightening of bowed down transverse and longitudinal understructure components. This bulletin applies to dry van and open top containers.

Vertical bowing down of understructure components can occur for various reasons, cargo overloading, improper weight distribution, impact damage, etc. Cargo overloading and improper weight distribution are exacerbated during normal containers lifting operations and at sea when the structure is submitted to gravitational forces (g-force), typically acceleration and deacceleration.

Understructure components that are bowed down, typically crossmembers and fork pocket components, less frequently bottom rails, gooseneck tunnel bolster and rails, have exceeded their material structural yield point. The yield point is the point on a stress-strain curve that indicates the limit of elastic behavior and the beginning of plastic behavior. The material has stretched and entered the plastic behavior where deformations are permanent. Once the material has entered the plastic behavior it is no longer possible to reverse the process or “shrink” the deformation through straightening. The material strength and ability to withstand future loads is then compromised.

The IICL repair recommendation is that bowed down understructure components should be replaced when exceeding IICL tolerances.
The following photos depict some examples of bowed down understructure components.
For questions about this technical bulletin you may contact technical@iicl.org