



May 7th, 2021

IICL Technical Bulletin - TB-021 (Revised March 2022)

Title: Repair limitations on understructure components

Reference: Further to the release of the Technical Bulletin 019 addressing repairs on bowed down understructure components, the IICL members received inquiries and request for clarification since Technical Bulletin 007 also addresses limitation on crossmembers and forklift pocket repairs. After reviewing the IICL Technology Committee decided to merge Technical Bulletins 007 and 019 under this Technical bulletin, TB-021.

Purpose: Technical bulletin (TB-021) compiles and supersedes the information from technical bulletins 007 and 019. It also clarifies repair limitations to understructure components in addition to the ones shown on the Repair Manual for Steel Freight Containers, 5th Ed. This bulletin applies to dry van and open top containers and amends “section 8.2.3 crossmember Inserting” and “section 8.4.3 Forklift Pocket Side Inserting” of the Repair Manual for Steel Freight Containers, 5th edition.

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 deceleration.

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 when the IICL limits are exceeded. 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 using heat or not. The material strength and ability to withstand future loads is then compromised.

The IICL repair recommendation is that bowed down understructure components, in excess of IICL tolerances, should be repaired through:

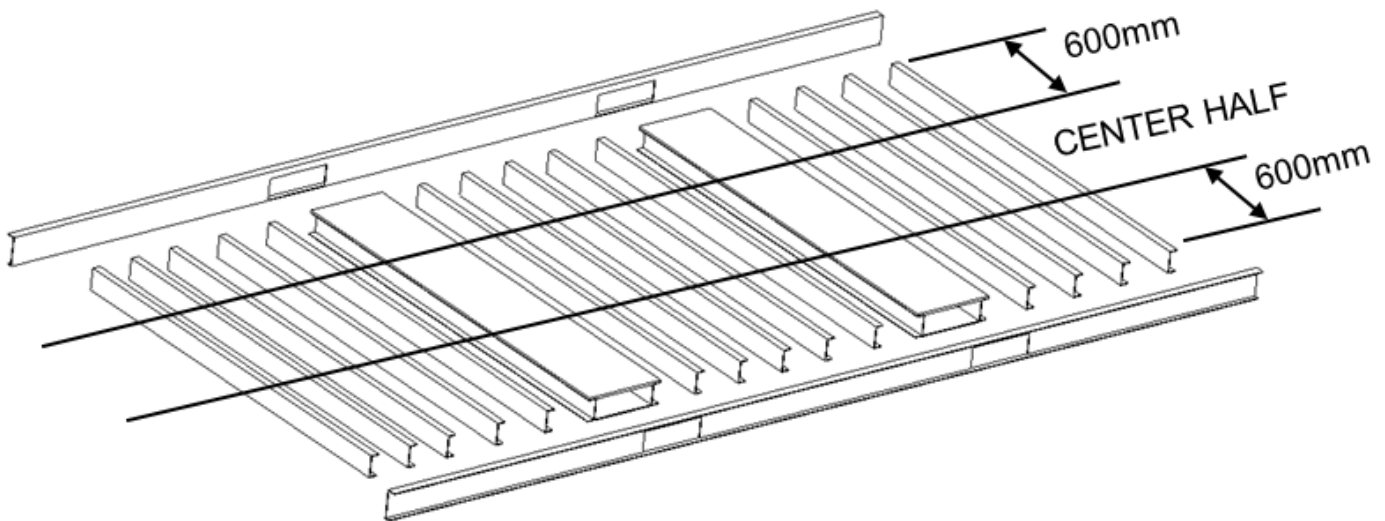
1. Full Replacement
2. Insert within the limitations specified on page 2.

Note: Cutting relief notches for straightening understructure components or straightening bowed down understructure components are considered non-conforming repair methods. Normal alignment work required to fit inserts is acceptable.

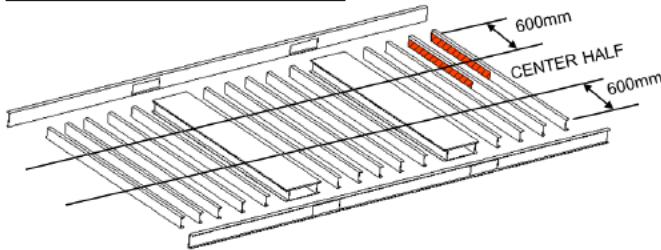
Insert Limitations: Crossmember & Forklift Pocket Side Walls

A proper repair should restore the profile of the damaged component and surrounding areas as close as possible to the original profile.

Weld repairs to members (crossmember / forklift pocket side wall) are not allowed within the center one half of two adjacent members. The center one half of a member is defined as that part of the member that is greater than 600mm from the nearest bottom side rail. If two adjacent members have weld repairs within the center halves, either one of the members must either be replaced or the inserts must be lengthened such that they do not terminate within the center half of the member.

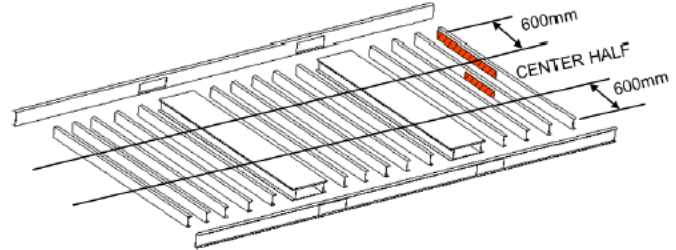


NOT ACCEPTABLE



NOT ACCEPTABLE

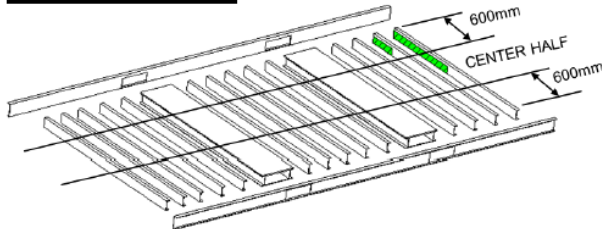
The insert on the right side is acceptable because it is the 1st crossmember with an insert. But the 2nd insert on the left is not acceptable because the weld seam terminates in the center half of the container.



NOT ACCEPTABLE

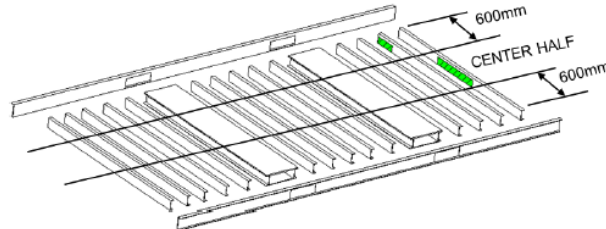
The insert on the right side is acceptable because it is the 1st crossmember with an insert. The 2nd insert on the left is not acceptable because the weld seams terminate in the center half of the container.

ACCEPTABLE



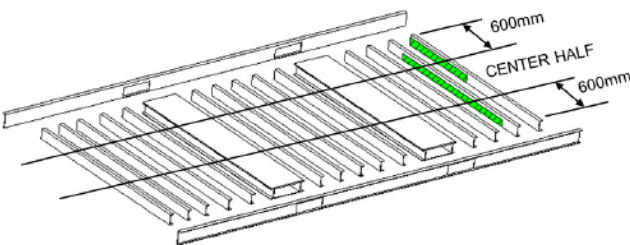
ACCEPTABLE

The insert on the right side is acceptable because it is the 1st crossmember with an insert. The 2nd insert on the left is also acceptable because the weld seams terminate within 600mm from the bottom side rail.



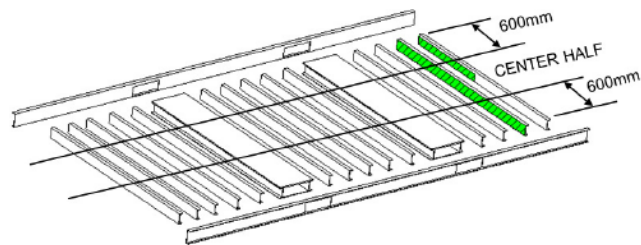
ACCEPTABLE

The insert on the right side is acceptable because it is the 1st crossmember with an insert. The 2nd insert on the left is also acceptable because the weld seams terminate within 600mm from the bottom side rail.



ACCEPTABLE

The insert on the right side is acceptable because it is the 1st crossmember with an insert. The 2nd insert on the left is also acceptable because the weld seams terminate within 600mm from the bottom side rails.

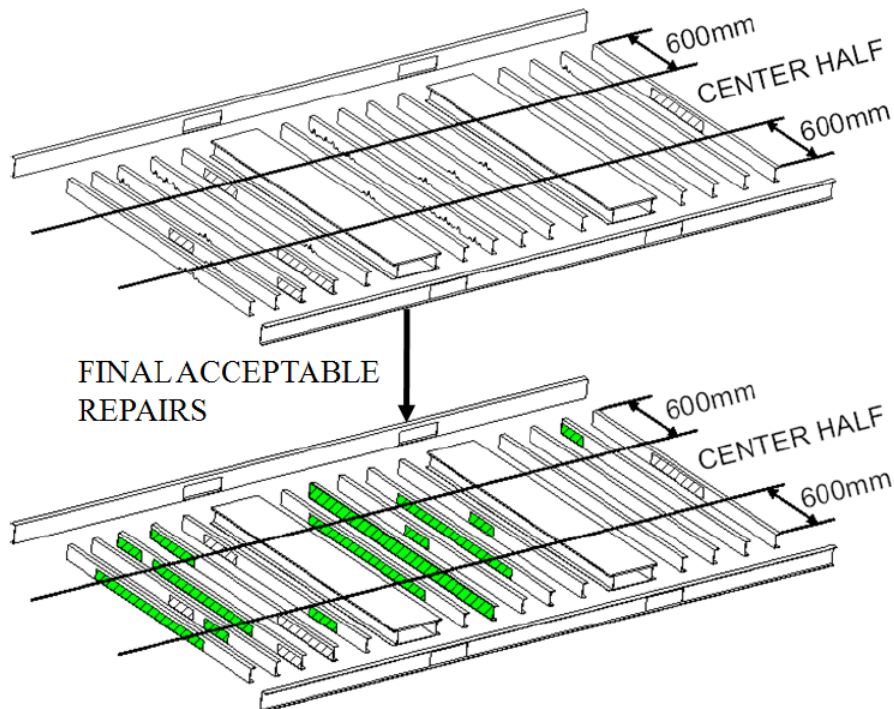


ACCEPTABLE

The insert on the right side is acceptable because it is the 1st crossmember with an insert. The 2nd cross member is also acceptable because it is actually a full replacement.

FULL CONTAINER EXAMPLE

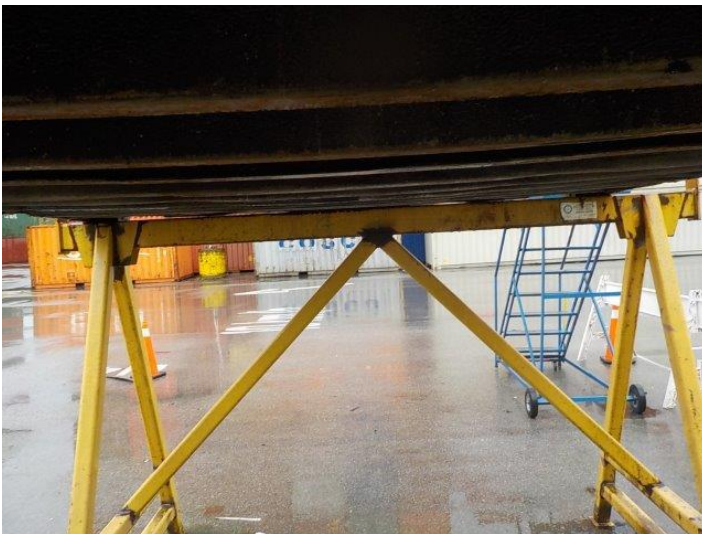
AN EXAMPLE of new damage locations and pre-existing inserts.



Acceptable inserts based on new damage locations and pre-existing inserts, as shown above. It is important to note that this is one EXAMPLE of a possible combination of damage and acceptable repair inserts. There may be many different possibilities. This drawing should only be used as a guide to determine the safest and most economical type of repair on a case-by-case basis.

In addition to the above limitation requirements and illustrations for weld repairs to ADJACENT members, crossmember and forklift pocket inserting to also continue to follow other insert repair instructions per paragraph 8.2.3 and 8.4.3, IICL Repair Manual for Steel Freight Containers, 5th edition. IICL

The following photos depict some examples of bowed down understructure components.





INSTITUTE OF INTERNATIONAL CONTAINER LESSORS



For questions about this technical bulletin, you may contact technical@iicl.org