

Rack Safety: Installation

Introduction:

This section addresses considerations that are unique to rack repair or to replacement installations. For general guidance, refer to RMI/ANSI MH 16.1 [1] and the RMI *“Considerations for the Planning and Use of Industrial Steel Storage Racks”* [2].

Straight and Plumb:

The first factor to check is whether the loaded rack structure that is being repaired is plumb and within tolerances that are established by the Supervising Engineer. RMI/ANSI MH 16.1 [1], Section 1.4.11 calls for a minimum plumbness and straightness (both cross and down aisle) of 1/2” per 10’ of height. If the structure’s plumbness or straightness is out of tolerance, it must be plumbed and straightened as part of the repair process. After completion of the repair work, the plumbness and straightness of the repaired rack when loaded must be verified as being within tolerance for the entire height of the frame (Repaired Section + Original Frame Members).

Repair Kit Splice Joint Cut Tolerances:

In cases where a section of an existing rack structure is removed and replaced with a repair kit, the tolerances for the splice joint that are specified by the Supervising Engineer must be maintained in the field. The kit design may require that the existing rack column rest directly on the horizontal surface of the repair kit to generate full rated capacity. (In these cases, the connecting bolts do not have sufficient capacity to carry the load themselves). If there is a gap between the existing column and the repair kit, the gap must be shimmed as specified by the Supervising Engineer.

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Working In Loaded Rack:

In some cases it is possible to repair a damaged rack while it is still loaded by using a jack that is attached to the rack column above the damaged section. Such a jack would temporarily relieve the rack column of the load, allowing the repair work to be completed without having to unload the rack. When using such a jack to support the loaded rack, the jack and its attachment to the column must have a certified capacity that is capable of supporting the actual load on the rack structure. The lifting device must be designed and validated for such an application by a qualified engineer. Special considerations to address include:

- Floor conditions must be considered when selecting a jacking method. For example, jacks that rely on friction to remain in place may not be appropriate for certain floor conditions.
- When a front column is supported by a jack and the existing bracing sections are removed to install a repair kit, the rear column's unsupported height may increase significantly, which may reduce its capacity. The Supervising Engineer must evaluate the load that the unbraced rear column will have to support during such a repair.

Anchoring Repaired Rack:

The Supervising Engineer should consider the location of existing anchor holes and should design the kit for repair or replacement for proper anchoring. It is unacceptable to leave repaired rack unanchored.

Re-Use Of Hardware:

Where specified, bolts shall be installed to the recommended tightening requirements, which may be critical to the structural performance of the connections. The re-use of existing fasteners during rack repairs is not recommended, unless the OEM or Supervising Engineer approves them for the application.