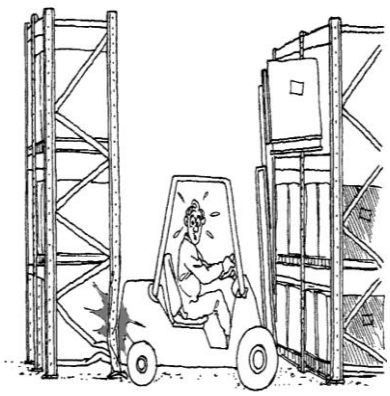
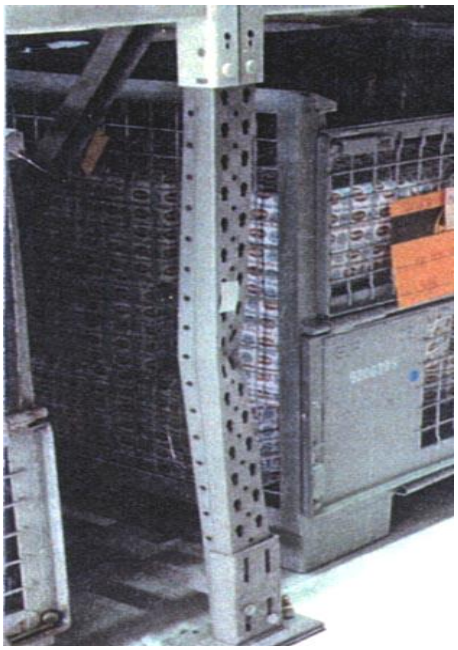
FEM RACKING AND SHELVING PRODUCT GROUP
(European Racking Federation)
Purwell Cottage
Purwell Lane, Hitchin
Hertfordshire SG4 0NF, United Kingdom
Tel: +44 (0)1462 454296

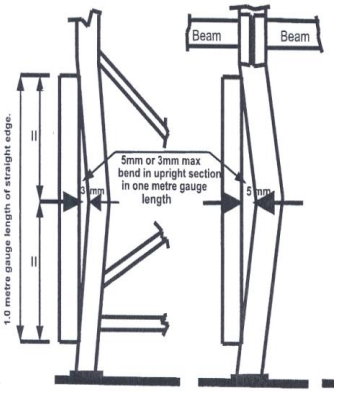
Secretary General : Colin Hinton
Email: colinhinton@tiscali.co.uk Website: www.fem-eur.com

ERF Guide 07 European Racking Federation (ERF) English Version	Storage Equipment Information Bulletin No. 7 March 2016

Rack Repairs by Straightening Damaged Uprights







Rack Repairs by Straightening Damaged Uprights

1. Standards and Codes referred to

Reference is made to the following EN-Standards and Industry Codes of Practice:

- EN 15512:2009, Steel static storage systems – Adjustable pallet racking systems – Principles for structural design
- EN 15635:2008, Steel static storage systems – The application and maintenance of storage equipment
- FEM 10.2.06 - Part 2:2014, The design of hand loaded steel static shelving
- FEM 10.2.07:2012, The design of drive-in and drive-through racking
- FEM 10.2.09:2015, The design of cantilever racking
- ERF Info No 1: 2009, "Responsibilities of suppliers and users of pallet racking".

2. Introduction

The structural design of racking and shelving does not include the consideration of damage to components such as uprights, beams, shelves and bracing due to faulty operation. References EN 15512, FEM 10.2.06, FEM 10.2.07, FEM 10.2.09.

Maintaining the racking in a good condition is, therefore, essential. Regular inspections are specified by the Suppliers and are the User's Responsibility. Identified **RED RISK** damage to be offloaded immediately and **AMBER RISK** damage gradually off-loaded within a maximum of 4 weeks (See Annex A).

With regard to the responsibilities of the End-User in operating racking & shelving, reference should be made to EN 15635, clause 9.2, and to ERF Information Bulletin No 1.

The damage classification and possibly required remedial actions procedure is given in EN 15635. With regard to repair or replacement of damaged components EN 15635 states:

- *9.2 ….normally by the replacement of damaged components with identical parts from the same manufacturer.*
- *9.7.1 ….Repairs to damaged components shall not be allowed unless approved by the equipment supplier*
  NOTE: Damaged components should be replaced rather than repaired as effective quality control is difficult on cold-formed materials.

Acting in accordance with industry guidance will help to ensure the integrity of the racking as required by the original manufacturer.

3. Rack Repairs by Straightening Damaged Uprights

A repair method for damaged uprights sometimes undertaken by the End-User is:

straightening the damaged part, generally using a jig and hydraulic tool, intending to press the damaged part into the original shape in a number of steps.

It is understood that the main reasons for choosing this method are:

- No need to dismantle the upright frame and to install a new upright.
- No need to unload the upright frame, in cases where the damage level is not “red risk”.
- Resulting in “cheaper” and “less disturbance of the logistic process”.

This method of repair is **not currently recommended** by any racking manufacturers.

4. Items to be considered by the End-User

The End-User is responsible for the safety of his employees and for a safe environment for all visitors and sub-contractors. In this respect the End-User should consider the following:

- After repair the load carrying capacity shall be in accordance with the original capacity specified by the supplier.

  After being straightened, the properties of the racking are altered from the known state on which the original manufacturers approval testing was carried out. In effect the company modifying the rack is responsible for defining the revised carrying capacity of the modified upright and any effect on the overall structure, as the repair method will not currently be accepted by the rack manufacturer.

  The manufacturers warranty and defined load capacity (as displayed on the load notice) may become null and void once any third party has carried out a repair by straightening.

  Any party seeking to have such work carried out should satisfy themselves of the effect of any such repair as well as any potential effect on any insurance cover. Clarification should also be sought from any third party carrying out such work as to whether they will accept liability not only for the workmanship of what has been modified, but also for resultant structural integrity of the racking structure.

- The result after repair is dependent on the quality of workmanship, which is why EN 15635 notes that "damaged components should be replaced rather than repaired as effective quality is difficult on cold formed materials".

- Repairing of a damaged upright while the upright frame is still fully loaded, may be in conflict with Health & Safety regulations. The repairing persons may be working with significant loads above them.

  Undertaking repairs on fully loaded racking is a high risk procedure. It is a fact that a damaged component may result in a delayed collapse or in an immediate collapse when subject to a very insignificant force. A collapse while repairing may therefore be just a function of time from the original impact.

- Serious damage within the **RED RISK** level requires immediate off-loading of the racking (EN 15635), to maintain safe conditions in operational use. **Therefore, when starting the repair of a red risk component, the area concerned should already be offloaded**.

Prof. Dr.-Ing. Dieter Ungermann, TU Dortmund Fakultät Architektur und Bauingenieurwesen, Lehrstuhl Stahlbau, one of the external consultants to the European Racking Federation – ERF/FEM R&S has stated:

"It is relevant, that the load bearing structure after repair still complies with the originally specified capacity and safety in use. This will be always the case when the damaged component is replaced by an original similar one and when, during the replacement work, the structural component concerned is not loaded".

The "Storage Equipment Manufacturers Association" (SEMA/UK) has stated:

The manufacturer's warranty and guaranteed carrying capacity (as displayed on the load notice) becomes null and void once any third party has carried out a repair in this manner. A third party carrying out such work will therefore become liable not only for the workmanship of what has been modified but also for the structural integrity of the racking structure. BS EN 15635 clearly states that the safest way to repair damaged rack components is by replacement with like for like components. BS EN 15635 also notes that "damaged components should be replaced rather than repaired as effective quality control is difficult on cold formed materials". This will ensure the integrity of the racking remains intact and normally can be warranted again by the original manufacturer.

In emphasising this further the Health and Safety Executive Guideline on Warehousing and Storage, HSG 76, states categorically in clause 633 that "all racking systems should be of good mechanical construction, of sound material, adequate strength and installed and maintained in accordance with the manufacturer's instructions."

With regard to any repair methods that claim there is no need to offload pallets in order to carry out the repair, SEMA's opinion is that this is a high risk procedure and advises that such claims runs counter to HSG 76 recommendations. Clause 652 states "where damage is identified that affects the safety of the racking system, the racking should be offloaded and controls introduced to prevent it being used until remedial work has been carried out".

The assumed advantage of a repair without the use of original similar components by the manufacturer becomes less advantageous, if one considers the long-term risks of this decision.

- A proof of the load bearing capacity without an updated structural analysis by an expert is, in general, only possible by the manufacturer.
- A general applicable structural design calculation valid for all types of racking without test data does not exist.
- The design values of damaged components depend on the type of racking system, and are only known by the manufacturer.

Complying with the Technical Standards and industry guidance is one of the methods of providing a safe working environment. Not complying with the Technical Standards and industry guidance may result in an incident (injury) in conflict with the Health and Safety Regulations and insurance conditions for which the company and the relevant company personnel may have liability responsibilities.

Continuous training of operational staff in the use of the storage system in accordance with the user instructions provided by the suppliers of the storage equipment will reduce the amount of damage substantially and reduce repair requirements.

ANNEX A

Inspection procedure for damage classification and actions