

*Engineered*  
***Rack Repair  
& Protection***  
*Solutions*



SMAC  KIT



# RACK REPAIR SOLUTIONS



## Frontline

### Basic Repair

Reinforced Post Section  
for ADDED IMPACT RESISTANCE.

Kit allows for maximum beam  
adjustability. Most current post  
types are available.

Extended footplate with two 1/2"  
anchors for added impact and  
twist resistance.

Installation:  
Bolted or Welded

Welded Installation  
Available on Frontline and Advantage kits only.



## Advantage

### Basic Repair with Future Impact Resistance

Reinforced Post Section  
for ADDED IMPACT RESISTANCE

12" high Front Deflector is standard.  
Custom deflector heights available.

Available with standard V-Nose deflector or  
non-protruding deflector for narrow aisle  
applications.

Two 3/4" anchors for  
HIGH IMPACT RESISTANCE  
and minimal twisting.

Installation:  
Bolted or Welded

Non-Protruding Deflector (NPD)

# THE ULTIMATE SOLUTION IN PATENTED\* RACK REPAIR

**Exceeds 45,000 lbs.  
of Impact Resistance  
up to 12" High†**

## *Elite Vertical Leg*

The Industry's highest impact resistance in a vertical leg repair kit that maintains the original rack design profile. V-nose deflector is standard.



## *Elite Cantilever*

Heavy-duty cantilever places the bottom front column 9" behind original location for increased outrigger and product clearance. V-nose deflector is standard.



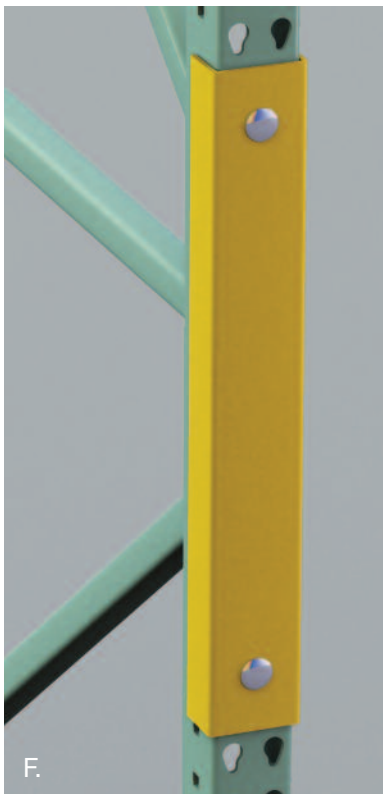
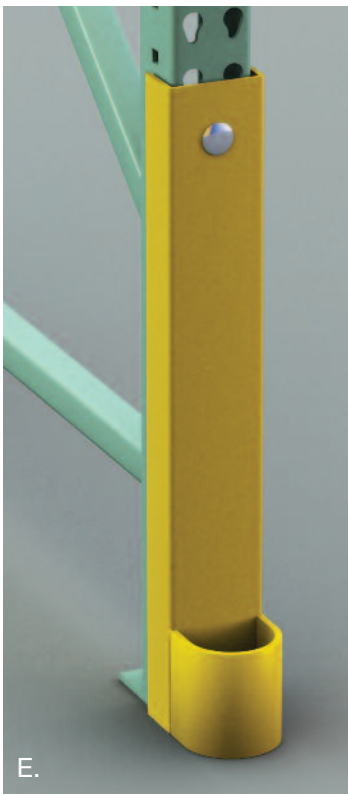
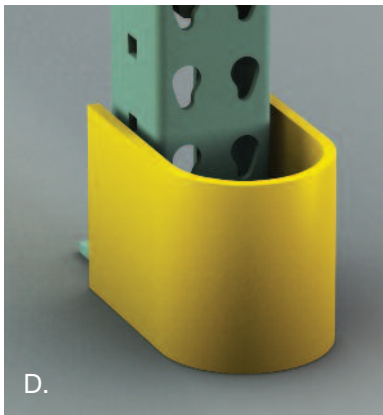
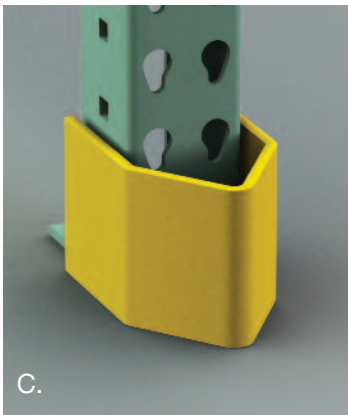
## *Elite Slant Leg*

Slant Leg "Elite" places the bottom front column 9" behind original location for increased outrigger and product clearance. Available with or without V-nose deflector.

All Elite kits are custom manufactured to meet your exact specifications. Seismic Compliant Elite Kits are also available.

\*U.S. Patent No. 6,332,549  
† Due to three 3/4" anchors

# COLUMN PROTECTION



## *Bulldog*

### **Impact Resistance**

A. Maximum protection for the lower bottom end of the front frame column. 12" high front deflector with two 3/4" anchors for HIGH IMPACT RESISTANCE and minimal twisting. Requires 4"-6" of post removal.

## *MAX Guard Force*

### **Maximum Impact Resistance**

B. Standard 4" high to 12" high. Custom made to accommodate all footplate sizes with two 3/4" internal anchors provided.

## *MAX Guard*

### **Impact Resistance**

C. & D. 4" high Max Guards are an excellent choice to prevent outrigger damage. Available in Round or "V" Nose with one 3/4" internal anchor.

## *MAX Guard Plus*

### **Impact Resistance**

E. Available in 12", 18", or 24" heights on column guard and choice of 4" high Round or "V" Nose. Bolts to column & anchors with one 3/4" internal anchor.

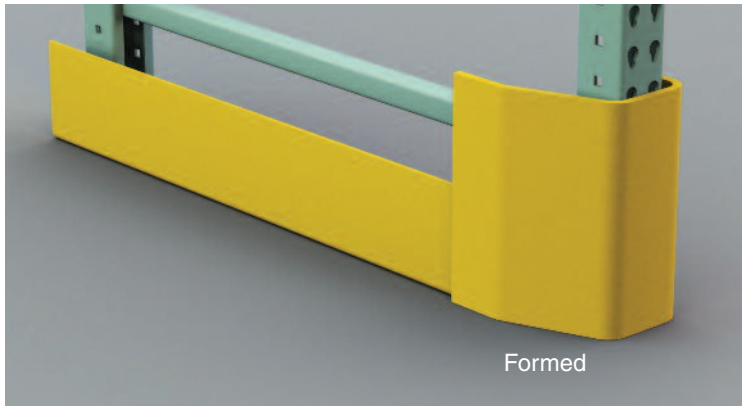
## *MAX Guard Shield*

### **Impact Resistance**

F. Bolts to column above beam levels to protect against abuse from forklifts and products.

All Mac Rak Column Protectors are custom manufactured to meet your exact specifications and have anchors that are placed internally or behind column to be clear of outriggers.

# END OF ROW GUARD

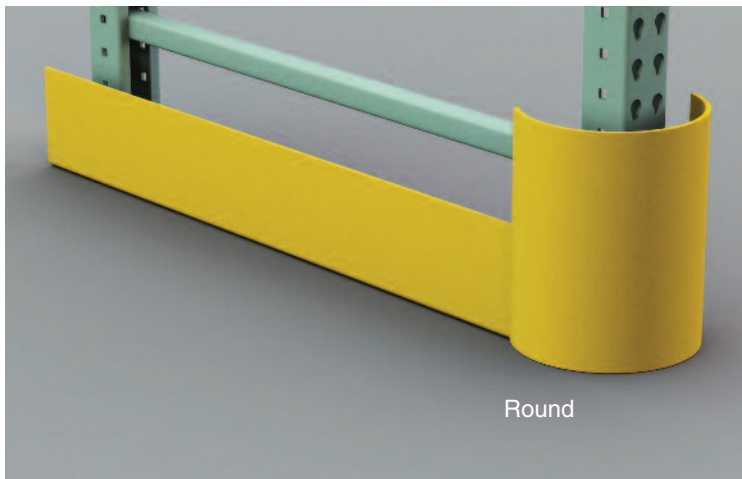


## **Impact Resistance**

Our custom designed formed end of row guards are the ultimate protection. The 1/2" thick, 12" high guard wraps tightly around the frame to increase aisle clearance. Welded to a 4"x6" angle with holes punched for 3/4" anchors.

Available with or without anchors.

Traditional round guard style is also available.



## **We Customize**

Mac Rak custom manufactures guards to accommodate all footplate sizes.

## **Rack Lifting Jack**

Mac Rak's rack lifting jack and custom designed lifting heads are critical components in the rack repair process. Our jack saves time and money by eliminating the need for complete product removal during repair.

Contact your dealer or call Mac Rak directly for more information.

## *The Mac Rak Edge*

1. Mac Rak Inc. Guarantees its repair kits will meet or exceed the original rack manufacturers specifications.
2. All products are warranted for 10 years on materials and workmanship.
3. All material is new material, not used frames of varying gauge cut and welded together.
4. All post material is manufactured using 50,000 PSI minimum yield high strength 12 gauge or heavier steel. All post material is the heaviest gauge available.
5. All backer channels are un-punched formed channels, not punched post materials.
6. All repair kits are powder coat painted to the customer color choice.
7. All materials manufactured, sold and installed by Mac Rak Inc. are welded by A.W.S. certified welders.
8. Our repairs kits are proudly made in America and custom manufactured to your specs.

Mac Rak maintains a national network of the finest dealers. They are specialists that represent our full product line. Please call us for a dealer in your area.

Mac Rak and our national dealer network supplies all materials and can provide complete turnkey repair services using qualified labor subcontractors located throughout the country.



# Mac Rak Meets all ANSI/RMI MH16.1 Industry Standards for Rack Repair

## **Storage Rack System Maintenance and Repair**

The storage rack system operator is responsible for the maintenance and repair of the storage rack system.

## **Repair and Replacement of Damaged Components**

Damaged components should be repaired by qualified persons, following qualified and documented procedures. Repaired components should be at least as strong as undamaged components.

## **Additions, Alterations and Reconfigurations**

Additions, alterations and reconfigurations should meet the same requirements as the original installation.

## **Owner maintenance**

The owner shall maintain the structural integrity of the installed rack system by assuring proper operational, housekeeping, and maintenance procedures.

Regularly inspect for damage. If damage is found, immediately unload the affected area and replace or repair damaged column, beams, other structural components.

## **Rack Damage**

Upon any visible damage, the pertinent portions of the rack shall be unloaded immediately by the user until the damaged portion is repaired or replaced.

## **Out of Plumb Limit**

The maximum top to bottom out of plumb ratio for loaded rack column is 1/240 (for example 1/2" per 10' feet of height). Columns whose out-of-plumb ratio exceeds this limit should be unloaded and re-plumbed. Any damaged parts must be repaired or replaced.

## **Out-of-Straight Limit**

The maximum out of straight ratio for a loaded rack column is 1/240 (0.05" per foot or 1/2" per 10 foot of height). Columns whose out-of-straight ratio exceeds this limit should be unloaded and re-plumbed. Any damaged parts must be repaired or replaced.

## Does it matter if rack frame braces are damaged?

Yes. The rack frame bracing consists of horizontal and/or diagonal members that join the front column to the rear column. These members are very carefully designed by the rack manufacturer to stabilize the rack frame in the cross-aisle direction and to support each of the individual columns, also, in the cross-aisle direction. Any damage to these components could jeopardize the stability of the frames and could degrade the strength of the column.

If a frame brace is damaged, the first priority should be to immediately unload the area supported by the damaged component and to prevent placement of loads into that area. In the case of the frame braces, it may be the bays on either side of the upright which are damaged.

Contact a qualified representative for an evaluation of the effects of the damage to the structural integrity of the rack. Only after such an evaluation (after repairs if necessary are competently completed, and after approval of the work is done) should the rack section be returned to service.

## What is an acceptable repair of a damaged rack component?

The detail used to make an acceptable repair should be designed or reviewed by a qualified design engineer and installed by people who are qualified to make the repair. The rack repair should be reviewed for compliance to the ANSI/RMI MH 16.1 Specification. A good repair will result in a structural member or connection that is at least as strong as the original.

When welding is prescribed, the welders must be certified for the types of welded joint required.

# COMPARE

## Frame Replacement

VS.

## Mac Rak Repair

- Replacing Frame is **3 Times Slower**
- **Total Operational Disruption** to Facility
- **No Future Impact Protection** Gain with Standard Replacement Frame

- Repairing is **3 Times Faster**
- **Minimal Operational Disruption** to Facility
- All Repair Kits Provide Additional **Future Impact Protection**

### Cost Savings Analysis

The following example breaks out the cost for the process of totally replacing the frame versus repairing the damaged frame with a Mac Rak "Frontline" repair kit.

Description	42" Deep Frame Replacement	Mac Rak 36" Frontline Repair
Labor (unload/load)	\$108 <sup>1</sup>	\$12 <sup>1</sup>
Frame/Repair Kit	\$225 <sup>4</sup>	\$125 <sup>2</sup>
Scissors Lift	\$14 <sup>5</sup>	\$0
Installation	\$140 <sup>3</sup>	\$100 <sup>6</sup>
<b>Total Cost</b>	<b>\$487</b>	<b>\$237</b>



Over  
**200%**  
Savings!

Note: Frame replacement example is for one frame with 4 beam levels and 96" beams.

1. 18 pallets need to be moved twice (unload & reload) which equals 36 separate operations involving customer's labor and equipment. Each operation takes 3 minutes for a total of 1.8 man hours (1 man, 1 forklift) @ \$60 per hour = \$108.00. A Frontline repair kit reduces the number of pallets that are required to be moved to 2 pallets at floor position (which equals 4 separate operations equal to 12 minutes) when Mac Rak's rack lifting jack is used.
2. Approximate cost for a 2' high "Frontline" repair kit weighing 26 lbs.
3. Approximate cost per frame for contractor to do replacement (providing frame has no in-rack sprinkler or is not part of a module with pallet flow components or a push back system). Price is based on replacing 7 frames per day with a 2 man crew and typical daily labor rates for 1 foreman and 1 experienced laborer.
4. Current price as of September 2011 for a 42" Deep, 288" tall, 11 gauge standard 3x3" Tear Drop Frame FOB Illinois (larger quantities will be discounted).
5. Scissors lift will be required to comply with the OSHA 6'-0" rule. Price is based on typical weekly rental price plus pick up and delivery and divided by 35 frames to be replaced in one week.
6. Price based on typical local installation.

# **Engineered Rack Repair & Protection Solutions**

**WE REPAIR ALL TYPES  
OF STORAGE RACKS.**

**Mac Rak Inc. Repair Kits  
are engineered to  
the highest standards.**

Mac Rak Inc. produces the highest quality, highest future impact protection products available.

Mac Rak Inc. guarantees all products against defects in manufacturing or material workmanship for 10 years.

All repair products are powder coat painted. All necessary hardware and anchors are included. All repair products may be installed without complete unloading of the rack when a rack-lifting jack is used.

Mac Rak is a registered trademark of Mac Rak Incorporated.

(Information contained in this brochure is subject to change without notice.)



*For more information  
contact your local dealer,  
or contact Mac Rak directly*  
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**info@macrak.com**



**www.macrak.com**

