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Tivoli Manufacturing Ltd. Extreme (ReMix II) seat side rails

NAFLIC has received a safety bulletin from Tivoli Manufacturing Ltd. relating to an incident on one of the company's Extreme (ReMix II) rides. The incident took place at Cambridge Town Fair in the UK and on initial examination of the device it appeared that one of the passenger outer stainless steel side restraint bars had become detached from the passenger vehicle. During consultation with the ride operator, it was determined that this occurred midway through a ride cycle.

The safety bulletin published by Tivoli Manufacturing indicates the requirement for a safety critical modification to be made to the side restraint bars on such rides, which would result in the requirement for a design review on completion of the work.

The information contained within is that of the manufacturer and not NAFLIC. When following the advice from the manufacturer, you are reminded of your duties and responsibilities under HSG175 regarding modifications.

Committee Members: Mr. D Dadswell (Chairman), Mr. A Mellor (Secretary), Mr. P Smith, Mr. J Green, Mr. D Cox, Mr. I Davies, Mr. J Shilling, Mr. D Inman & Mr. R Hiscoe

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Supported By:



Tivoli Mfg. Ltd.

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Safety Bulletin

Bulletin No: RMSA007

Ride Type: Re-Mix II
(aka. Extreme)

Date: December 29, 2017

Page: 1 of 1

Rides Included: All Rides

Pages: 1 of 2

Parts supplied: On Request

Purpose: Inspection and Reinforcement of Seat Side Rails

On Friday December 22, 2017 Tivoli Mfg. Ltd. was notified of an incident on a Tivoli MFG. Ltd. Manufactured Extreme (ReMix II) amusement ride at Cambridge Town Fair in England.

A representative from Tivoli Mfg. Ltd. visited the location the following morning in order to determine and access the cause and extent of the incident.

On initial examination of the device, it appeared that one of the passenger outer stainless steel side restraint bars had become detached from the passenger vehicle. During consultation with ride operator, it was determined that this occurred midway during a ride cycle.

Tivoli's representative, following further examination became aware that the securing bolt/fastener used to hold the side restraint bar in position, located on the side of the vehicle had fractured allowing the side restraint to detach from the vehicle.

During further investigation, it was noted by that several other similar bars were found to be slightly loose and showing signs of corrosion around the fastening point. It was also noted that these side restraint bars had noticeably more movement at the point where it entered the lower seat point.

From initial assessment, it was determined by Tivoli Mfg. Ltd., that loosening of the upper fastening / securing bolt of the side restraint bar, allowed excessive

movement in the lower part of the side restraint bar, causing leverage effect and twisting effect on the upper fastener.

Further investigation is under way on the failed parts to determine if fatigue had any bearing on the failure

In order to rectify the issue, Tivoli Mfg. Ltd. made a full inspection of the ride, replaced all the side bar restraint fasteners, making sure they were all fastened correctly.

Tivoli Mfg. Ltd also added extra security fasteners to the lower end of the side bars, below the seat, as to ensure that if in the future the situation occurred unchecked, it would not allow any movement or leverage due to excessive movement at the lower end of the side restraint.

On the following page of this bulletin are the inspection procedures and modification requirement for the side lap restraint bars. These procedures should be completed before the ride is allowed to operate for the public.

Important
Fully test ride prior to opening to the public

Inspection procedure for stainless steel side restraint bars

Remove rear light panel from each vehicle.

Check tightness of bolt securing side restraint bar.

If any bolts are found to be loose, all side restraint bar bolts on all vehicles must be replaced. Correct bolt size is 10mm x 1.5 grade 8.8 Torque to 51Nm (37ft/lb)

Install additional securing bolts on bottom side of restraint bar. This is to be done on all seats.

- Cut two 1 ¼" (30mm) access holes with hole saw on bottom of fiberglass seat as indicated on attached picture (see figure 1). These holes are 1 ¾" (45mm) off each side of the centerline on the seat bottom, in line with the center of the side bars.
- Drill and tap two holes (See figure 2 & 3) for an 8mm 1.25 x 25mm (grade 8.8) socket head bolt with washer.
- Install bolts with Loc tite (blue) and tighten snugly



Figure 1



Figure 2

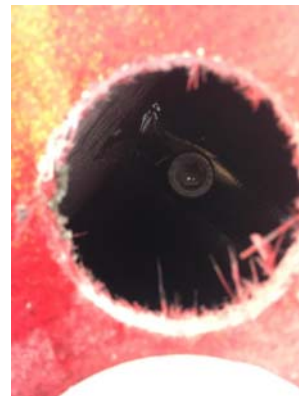


Figure 3

The following parts are necessary to complete the inspection and modification.

- 48 10mm x 1.5 x 25mm Grade 8.8 Hex bolts for upper bars if replacement is necessary.
- 48 8mm x 1.25 x 25mm grade 8.8 (12.9 is acceptable) socket head bolts for bottom side restraint bars.
- 1 8mm x 1.25 Tap
- 1 17/64" Drill bit

Please Contact Tivoli Mfg. Ltd. or in USA, WorldRide Service & Supply Inc. at 817-641-5045 if you have any Questions

Tivoli Mfg. Ltd.