

## 503.

# Intamin overhead restraint cracking

NAFLIC has been made aware that fatigue cracking has been identified in the abdominal wrap-around region of numerous overhead restraints on an Intamin multi-inversion coaster (see images on following page).

Cracks propagate from the edge of the weld at the interface between the steel tube and the plate that wraps around the passengers abdominal region, which form the internal structure of the padded restraint (refer to upper and lower regions of a single restraint radiograph below). It is understood that the manufacturer has revised the restraint design to improve longevity.

Comment(s): Suitable NDT techniques such as radiographic (x-ray) inspection should be performed periodically to identify internal failures on safety critical restraint components, taking note of any stipulations made by the device manufacturer, design reviewer and inspection body. In this example, it was possible to detect completely failed components through increased flexing of the abdominal wrap-around 'wings' of the restraint. However, this is not recommended as a method of in-service inspection as it may accelerate restraint failure.



ABDOMINAL REGION SHOWN  
IN RADIOGRAPHS BELOW



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