NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Committee

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205. Sellner Tilt a Whirl + Maxwell & Jackson Waltzer Accidents

There have now been 3 instances in Great Britain this year of Waltzer cars (or Tilt a Whirl, which is similar) becoming separated from their platforms.

In the Tilt a Whirl one of the vertical pins, about which the car rotates, came adrift. The car came to rest on it's back on the walkway of the ride with the pin on which the car swivels laying on the ground to the side of the ride. Although we don't know whether it occurred in this case, we do believe that there is a known long-term design limitation - failure occurs by bending fatigue in the main pin (away from any stress raiser).

The Maxwell Waltzer has not, in our experience, suffered from a regular fatigue problem but the recent accident occurred because the retaining nut was probably not properly secured - this enabled the car to come off.

The third accident involved a fatigue failure of one of the older of (at least) 2 types of Jackson Waltzer car pins. It was 18 years old. When the car came free, at least 10 people were injured. It is thought that at least 2 had broken bones. The most recent Jackson Waltzer pin type probably has long fatigue life. However, this cannot be guaranteed if the housing is significantly worn.

Accidents resulting from Waltzer cars coming free from their platforms are not a new phenomenon. For instance, there was an accident involving 2 fatalities some years ago at New Brighton when a car struck passers-by. The utmost care in the maintenance of Waltzers, their pins, car retention, etc. is crucial since the severity of an accident could easily involve multiple fatalities.

On Waltzers the main potential causes of car loss are rotten platform, rotten base of car, securing nuts coming undone, and pin fracture - although the first two of these are now thought to be largely a thing of the past. When replacement pins are specified, it is our view that a design review report will be required since there is unlikely to be one in existence, and any design maturity argument will be unreliable. The designer should also provide advice for fitting / inspection / care and maintenance etc.

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In the absence of proof (including design review) of the long term adequacy of a Waltzer pin and related components, periodic removal for inspection is considered essential. Most often, NDT monitoring is likely to need to be by the magnetic particle method although some designs may lend themselves to ultrasonic.

On the Maxwell Waltzer, failure occurs at or near the retaining thread root. Although it may be possible to develop a satisfactory ultrasonic technique for the Tilt a Whirl, it is our view that it is difficult for the Maxwell Waltzer and car removal / magnetic is likely to be essential.

Other areas on Waltzers which require periodic examination include axles, and centre balls and their couplings.