

NAFLIC

National Association For Leisure Industry Certification

Standards & Related Documents Committee

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372. Fabbri Booster – Build-Up Drive Failure

An incident has occurred on a Fabbri Booster which has highlighted a possible design weakness.

The ride consists of two opposite arms with a passenger carrying gondola on the end of each. The arms spin in a vertical plane about a central point at the top of a main support tower. The rotation is achieved by a slewing ring, mounted ‘on its side’, incorporating gear teeth to enable the device to be driven. The motive power is provided by two motors acting directly on the slewing ring.

In addition to the main drives for the arms, two smaller drives are provided to assist with assembling the ride. These ‘build-up’ drives enable one arm to be lifted prior to the second arm being attached. This is achieved by driving through the main motor with a reduction gearing apparently capable of providing a 1,200 to 1 ratio. The result is that the heavily unbalanced load of one arm can be driven, slowly but with a huge torque.

The problem in the design of the device comes when one of the two ‘build up’ drives fails, or underperforms and the other drive continues, potentially working against the first drive. The result, and the incident recorded herein, is an enormous force that causes the pinion acting on the slewing ring to break, which may allow the single arm to swing down through the vertical position, with little or no warning. This presents a considerable hazard to any persons who may be in the vicinity and has the ability to cause significant damage to the slewing ring itself.

The ‘build up’ drives need to be monitored and a link between them provided to ensure that, should one drive fail, the other ceases operation instantly. This can be done by linking the overload protection on both drives. It is not known if this problem occurs across all Booster devices but where it does, a modification of this nature needs to be agreed with the manufacturer and all IB’s should insist on this change being implemented. Owner/operators are reminded that Safety Critical Modifications such as this should be subject a suitable Independent Design Review before they are implemented.