



Issuing Entity:	Bulletin No.: 1-SB-006-14052009
Vekoma Rides Parts & Services B.V.	Release Date: 20-May-2009
Schaapweg 18	Effective Date: 20-May-2009
6063 BA VLODROP	Supersedes: -
The Netherlands	Completion Date: 03-July-2009
CoC Number: 12049585	

Service Bulletin

Original Ride Manufacturer: Vekoma International BV Vekoma Manufacturing BV	Affected Production Dates: 1999 and earlier
Ride Name: Suspended Looping Coaster	Affected Serial Nos: see table 1
Model No: 01201	688-1

Abstract of issue:
Reason for release: Components of the first generation SLC train systems are subject to fatigue after more than 10 years of operation. The theoretical life time of Suspended Looping Coaster has exceeded for the systems produced earlier than 1999.
Actions to be taken: Extensive examination and repairs when indications are discovered. The extensive examination will be described in this document. <u>Keep in mind that we advise to examine the sections vehicle by vehicle, so that the ride can still be in operation, however this will be with reduced capacity. The vehicle which should be examined first, will be the vehicle with the highest number of rides cycles.</u>

IB-nr.	Project number	IB-nr.	Project number
32002	93144	32014	95170
32004	94103	32015	96362
32005	94117	32016	96350
32007	94119	32017	96344
32008	94124	32018	96356
32009	94133	32020	96275
32010	94136	32021	97103
32011	95107	32022	97163
32012	96398	32026	97332
32013	95164		

Table 1 Affected serial Nos.

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Introduction

The Vekoma Suspended Looping Coaster (SLC) has been produced since 1994. Worldwide there are 40 SLC ride systems in operation. The theoretical lifetime of train components for all SLC rides is 10 years (unless otherwise stated, for example wear parts).

In the last period of time some owners encountered fatigue cracks in the suspended frame. The trains in which the fatigue cracks occurred are the first generation SLC trains and older than 10 years. The cracks were examined by an external material laboratory. The cracks are a result of fatigue. The theoretical lifetime of 10 years has exceeded for the systems in which the cracks occurred. Because these are fatigue cracks the cracks announce the end of lifetime for the specific train components in which they have propagated. In case the cracks are not noticed in time this could result in fracture of the components and thus in dangerous situations. This Bulletin describes the actions that need to be taken to prevent dangerous situations.

Some owners have already replaced parts by upgraded designs. In case of any doubt or uncertainty about the history of components Vekoma Rides Parts and Services B.V. (VRP&S) can be contacted for support. For each specific main component there are upgraded designs available based on the latest technology and according to the latest EN – ASTM standard.

This bulletin is written because Vekoma Rides Parts & Services B.V. wants to inform our customers in a proper way to prevent serious incidents.



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How to proceed?

In response to the situation as described in the introduction Vekoma Rides Parts & Services B.V. strongly recommends performing NDT examinations according to the inspection plan as presented in this chapter. Vekoma Rides Parts & Services B.V. strongly recommends that all welds will be examined before the Completion Date as mentioned in the header of this document. The outcome of this inspection plan gives a good reflection of the condition of the train construction in relation to fatigue.

Keep in mind that we advise to examine the sections vehicle by vehicle, so that the ride can still be in operation, however this will be with reduced capacity. The vehicle which should be examined first, will be the vehicle with the highest number of rides cycles.

The design calculations show that the Suspended seat frame (01201-66-0132) becomes critical after 10 years of operation. The drawing number has to match with the information as provided by the original ride manufacturer at installation of the ride.

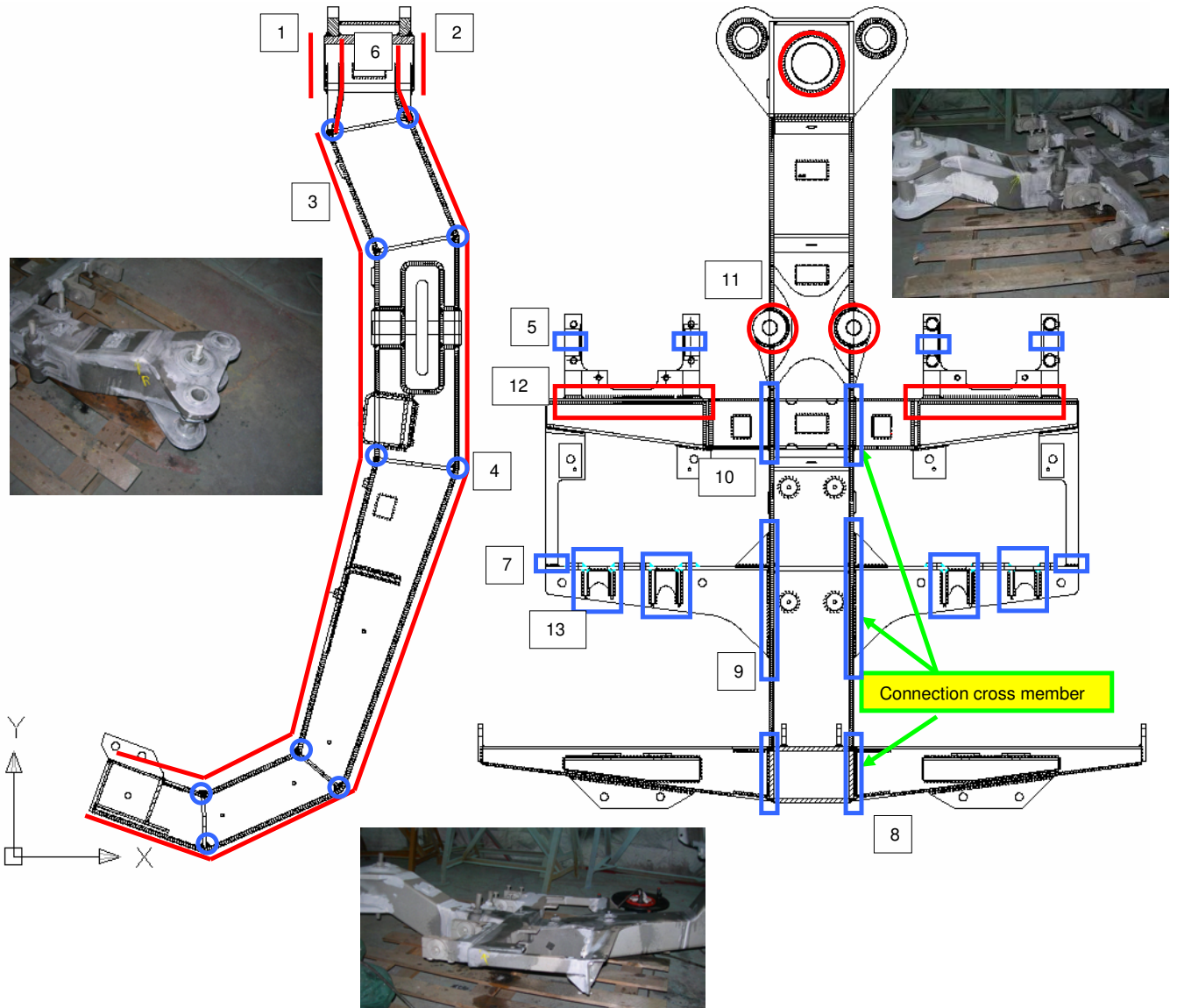
For the Suspended seat frame the critical locations are determined. The construction of a SLC (first design) mainly consists out of welded plates. Weld seams are more sensitive to fatigue loading than solid "unaffected" material. Therefore the inspection plan will only consist out of NDT weld inspections. 100 % of the critical sections pointed out need to be investigated for all trains.

As testing method for the NDT inspections magnetic testing (MT) and ultrasonic testing (UT) will be used. Table 3 shows the procedures including the rejection criteria (Acceptance Level) for Magnetic Testing (MT) and for Ultrasonic Testing (UT).

The next paragraphs give a schematic illustration of the weld seams to be tested. The weld seams which are marked in blue symbols need to be tested using MT. The weld seams which are marked in red symbols need to be tested using UT.

1.1 Suspended Seat (01201-66-0132)

In this section a schematic illustration of the suspended seat with the sections to be tested is presented.





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No	Description	Test Method
1	Bush hanger pivot point PP (front)	UT (check weld depth with welding dwg)
2	Bush hanger pivot point PP (rear)	UT (check weld depth with welding dwg)
3	V-welds total hanger main beam FP (4x)	UT
4	Horizontal welds in main beam hanger FP	MT
5	Ratchet blocks	MT
6	Weld seam op Vertical plates Top part FP	UT
7	Weld seams stiffener (square profile – stiffener plate)	MT
8	Connection welds lower horizontal bars FP (L+R)	MT
9	Connection welds middle horizontal bars FP (L+R)	MT
10	Connection welds top horizontal bars FP (L+R)	MT
11	Weld seams damper connection bushing FP	UT
12	Weld seam ratchet block PP (L+R)	UT (check weld depth with welding dwg)
13	Weld seam stiffener geometry ratchet connection PP	MT

Table 2: Examination of weld seams

1.2 Related codes and standards

Vekoma Rides Parts & Services B.V. recommends the NDT examination codes and standards, as mentioned in table 3. Equivalent NDT procedures or standards can be used as well.

NDT Methode	Codes (Examination)	Codes (Acceptance level)	Acceptance Level	Procedure
MT	ISO 17638	EN 1291	Level 1	MT 21203 (RTD)
MT	ASME Code Section V Art. 7, edition 2007	ASME Code Section VIII Div. 1, app 6, edition 2007	-	MT 21203 (RTD)
UT	ISO 17640 or EN 1713	EN 1712	Level 2	UT 21112 (RTD)
UT	ASME Code Section V Art. 5	ASME Code Section VIII Div. 1, app 12	-	

Table 3: Related codes and standards

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1.3 NDT Personnel

- ▼ **To be sure about correct testing and evaluation, NDT personnel shall be:**
 - Qualified and in the possession of a valid certificate of competence, in accordance with EN 473 or SNTC-TC-1A, level II, like mentioned in the NDT procedures as referenced in table 3.

The certificate number of the person who has carried out NDT must be filled out on the written report.

1.4 Inspection procedure

- ▼ **In order to check and evaluate train parts, proceed as follows:**
 - 1 Remove the paint, moisture, oil or grease and dirt.
Remove the paint by means of e.g. sand blast or a liquid paint remover.
Note:
Do not use steel grid blast.
 - 2 Remove any slag and spatter work (if still present) from welded joints.
 - 3 Carry out the required inspection to the sections as mentioned in paragraph 1.1 of this Service Bulletin.



If cracks are found, contact an experienced party and / or Vekoma Rides Parts & Services B.V.



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According to the ASTM F853-04 standard:

Supplemental bulletins delivered by the manufacturer to the owner / operator that were not provided at the time of hand over of the attraction and contain new information or newly recommended inspections or testing, or both, will be released as a Safety Alert, Service Bulletin or an Notification, with the following criteria in order to carry the force and effect of this practice:

“Safety Alert” For notifications that recommend immediate action.

“Service Bulletin” For notifications that do not recommend immediate action but do recommend future action, pay attention to the completion date. Before the completion date has expired the future recommendation needs to be completed.

“Notification” For notifications that do not necessarily recommend future action but are promulgation of information.

For additional information contact the Vekoma Rides Parts & Services B.V.:

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