



Issuing Entity:	Bulletin No.: SB-033_00
Vekoma Rides Parts & Services B.V.	Release Date: 12-01-2015
Schaapweg 18	Effective Date: immediately
6063 BA VLODROP	Supersedes: N.A.
The Netherlands	Completion Date: next monthly maintenance in accordance to owner's manual
CoC Number: 12049585	

Service Bulletin

Original Ride Manufacturer: Table 1	Affected Production Dates: All
Ride Name: Various	Affected Serial Nos: Table 1
Model No: Various	

Abstract of issue:

Action required in relation to attention items as described by Hoerbiger Micro Fluid GmbH.

Reason for release:

The release of safety related document of Hoerbiger Micro Fluid GmbH about hydraulic locking units.

Action to be taken:

As described in this document.

Date	Revision date	Comment
01-2015	00	Initial version

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IB-nr.	Original Ride Manufacturer	Project number
10505	Vekoma Rides Manufacturing B.V. (train), Arrow (ride)*	91178
10507	Vekoma International B.V./ Vekoma Manufacturing B.V.* (train), B&M (ride)	91028/29/30/31
27505	Vekoma International B.V./ Vekoma Manufacturing B.V.*	91685
27521	Vekoma International B.V./ Vekoma Manufacturing B.V.*	89605
27526	Vekoma International B.V./ Vekoma Manufacturing B.V.*	95115
27546	Vekoma Rides Manufacturing B.V.*	60022
27547	Vekoma Rides Manufacturing B.V.*	60392
27548	Vekoma Rides Manufacturing B.V.*	60393
27550	Vekoma Rides Manufacturing B.V.*	60542
27551	Vekoma Rides Manufacturing B.V.*	60543
27552	Vekoma Rides Manufacturing B.V.*	60559
27541	Vekoma International B.V./ Vekoma Manufacturing B.V.*	99269
29003	Vekoma International B.V./ Vekoma Manufacturing B.V.*	78830
29501	Vekoma International B.V./ Vekoma Manufacturing B.V.*	80880
29504	Vekoma International B.V./ Vekoma Manufacturing B.V.*	84535
32003	Vekoma International B.V./ Vekoma Manufacturing B.V.*	93137
32010	Vekoma International B.V./ Vekoma Manufacturing B.V.* (1 train)	94136
32012	Vekoma International B.V./ Vekoma Manufacturing B.V.*	96398
32041	Vekoma Rides Manufacturing B.V.*	60450
34501	Vekoma International B.V./ Vekoma Manufacturing B.V.*	86760
34502	Vekoma International B.V./ Vekoma Manufacturing B.V.*	86700
36501	Vekoma International B.V./ Vekoma Manufacturing B.V.*	20121
36502	Vekoma International B.V./ Vekoma Manufacturing B.V.*	20160
36503	Vekoma Rides Manufacturing B.V.*	91086
36504	Vekoma Rides Manufacturing B.V.*	91091
36505	Vekoma Rides Manufacturing B.V.*	91152
36506	Vekoma Rides Manufacturing B.V.*	60001
36507	Vekoma Rides Manufacturing B.V.*	60024

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IB-nr.	Original Ride Manufacturer	Project number
38058	Vekoma Rides Manufacturing B.V.*	60588
38501	Vekoma International B.V./ Vekoma Manufacturing B.V.*	94138
39505	Vekoma Rides Manufacturing B.V.*	91116
39509	Vekoma Rides Manufacturing B.V.*	90350
40008	Vekoma Rides Manufacturing B.V.*	60114
40009	Vekoma Rides Manufacturing B.V.*	60123
40010	Vekoma Rides Manufacturing B.V.*	60159
40011	Vekoma Rides Manufacturing B.V.*	60237
44501	Vekoma Rides Manufacturing B.V.*	60004/13
44502	Vekoma Rides Manufacturing B.V.*	60031
44503	Vekoma Rides Manufacturing B.V.*	60054
44504	Vekoma Rides Manufacturing B.V.*	60157
45001	Vekoma Rides Manufacturing B.V.*	60102
45002	Vekoma Rides Manufacturing B.V.*	60071
45003	Vekoma Rides Manufacturing B.V.*	60178
45004	Vekoma Rides Manufacturing B.V.*	60440
45005	Vekoma Rides Manufacturing B.V.*	60459
45007	Vekoma Rides Manufacturing B.V.*	60507
50501	Vekoma Rides Manufacturing B.V.*	60327
50502	Vekoma Rides Manufacturing B.V.*	60356
50504	Vekoma Rides Manufacturing B.V.*	60343
50505	Vekoma Rides Manufacturing B.V.*	60584
51001	Vekoma Rides Manufacturing B.V.*	60338
39510	Vekoma Rides Manufacturing B.V.*	60428
44507	Vekoma Rides Manufacturing B.V.*	60386
45009	Vekoma Rides Manufacturing B.V.*	60565
45501	Vekoma Rides Manufacturing B.V.*	60160
50001	Vekoma Rides Manufacturing B.V.*	60195
55001	Vekoma Rides Manufacturing B.V.*	60195

Table 1: Affected serial Nos.

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Table of contents

Table of contents	4
1. Introduction	5
2. Main points of attention	5
2.1 Connection of the piston rod at joint head.....	5
2.2 Connection of the threaded screw assembly	6
2.3 Connection of the accumulator	8
2.4 Contaminated oil in the cylinder	8
3. General remark	9

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1. Introduction

Through Hoerbiger Micro Fluid GmbH (hereafter referred to as "Supplier") we received a safety related document that gives information about mainly 3 possible issues with their hydraulic locking units (hereafter referred to as "HLU") which are produced before June 2014.

After reviewing the information from the Supplier, VRP&S' would like to provide their advice on the items mentioned. In chapter 2 these items as well as an additional clarification are further illustrated and the VRP&S' advice is included for both the LE 25 and LE 32 HLU's.

2. Main points of attention

The Supplier document mainly describes 3 points of attention on which they propose to take action, with the additional clarification of VRP&S' (item 3) the following 4 items are mentioned:

1. Connection of the piston rod at joint head
2. Connection of the threaded screw assembly
3. Connection of the accumulator
4. Contaminated oil in the HLU

In the next paragraphs you will find more information and advice.

2.1 Connection of the piston rod at joint head

Issue	: In the past the Supplier could not guarantee that the piston rod could not come loose at the joint head.
Action Supplier	: With the newly delivered HLU's, the production process was changed by adding Loctite 243, a locknut and torque striping. This way they are able to guarantee that the piston rod can not come loose at the joint head.
VRP&S' advice	: Add torque striping to the piston rod at the joint head (see figure 1) and perform a weekly check on this area. HLU's that are not installed yet (such as spare cylinders) need to be checked for Loctite 243 before installation. See the remarks next to Table 2 for the correct torque values of the rod ends for both the LE 25 and LE 32 units.

Note: *in case of old configuration HLU (without locknut).*

Apply Loctite 270 and torque striping. In case no locknut is applied, the torque values for the LE 25 and LE 32 unit are respectively 25 ±5Nm and 30 +5Nm.

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Figure 1: how to apply torque striping on the rod end.

2.2 Connection of the threaded screw assembly

- Issue : The supplier added an additional requirement on the length of the threaded screw assembly. Due to the adjustment function of this connection it is not guaranteed that the threaded screw assembly is within the specified range.
- Action VRP&S' : Checking this connection was included during installation of the HLU in the vehicle.
- VRP&S' advice : Check the length of the threaded screw assembly. If applicable it needs to be corrected. For the correct settings, please refer to the text below for the LE32 units and table 2 for the LE25 units (these values are created from the Supplier's document). Add torque striping to the connection (see figure 2) and perform a weekly check on this area.

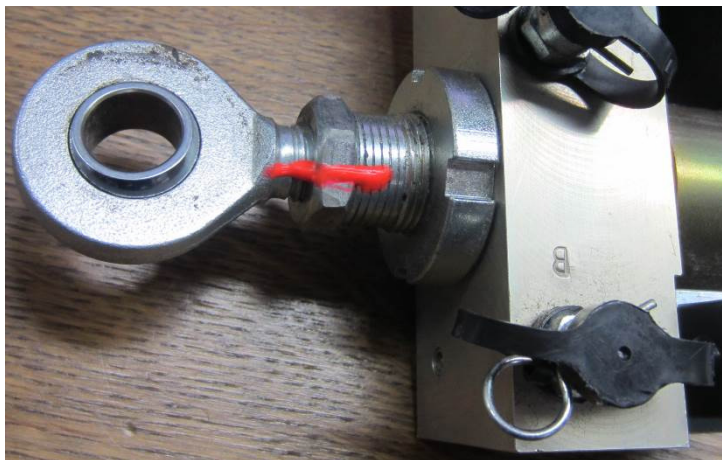


Figure 2: how to apply torque striping on the threaded screw assembly at the bottom.

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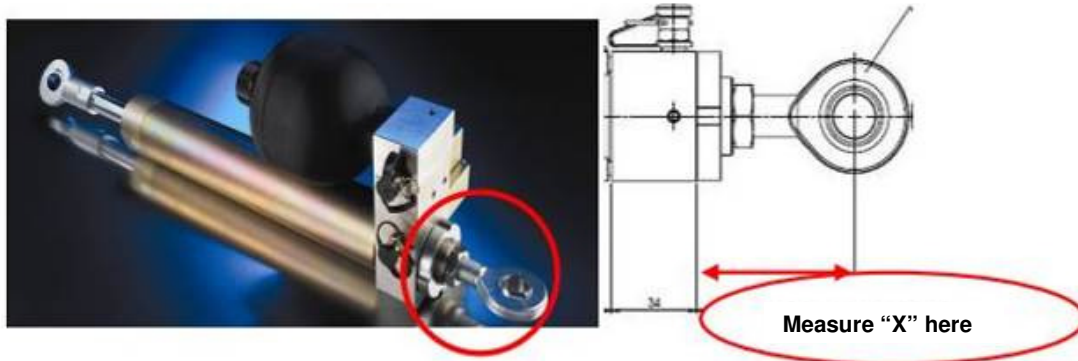


Figure 3: information for LE32 and LE25 screw connection at the bottom.

The following data apply for all LE32 versions:

For the LE 32 versions the screw thread depth is correct when the rod end length "X" is below 65 mm. ($X < 65\text{mm}$)

The following data apply for all LE25 versions:

For the LE 25 versions the screw thread depth is correct if the rod end length "X" is below the value as stated behind the product number in de table below. The small x at the end of the product number indicates the version number.

Product number	Maximum screw thread depth "X"	
850-7001-x	68	mm
850-7002-x	68	mm
850-7003-x	68	mm
850-7004-x	68	mm
850-7010-x	68	mm
850-7013-x	65.5	mm
850-7015-x	68	mm
850-7016-x	68	mm
850-7018-x	68	mm
850-7019-x	68	mm
850-7020-x	63.25	mm
850-7021-x	63.25	mm
850-8002-x	66	mm
850-8003-x	66	mm
850-8007-x	65.5	mm
850-8008-x	68.25	mm
850-8009-x	68.25	mm

We strongly urge you to immediately check the measurement set out above on all Personal Restraint Systems in your possession and advise your technicians to adjust and maintain the measurements specified when installing the unit into a Personal Restraint System or during routine maintenance.

We recommend that the joint rod heads be secured at the specified dimensions and tightened with a torque wrench. The LE 25 version should be tightened to **80 Nm ±10 Nm**. The LE 32 version should be tightened to **90 Nm ±10 Nm**.

The correct measurement must be set and checked when installing or performing maintenance on the Cylinder Accumulator unit. In this way the required minimum screw thread depth engagement (as set out in VDI 2230) is maintained.

Table 2: LE25 screw connection lengths at the bottom and additional text box from Supplier's document.

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2.3 Connection of the accumulator

- Issue** : After reviewing all connections and the Hoerbiger safety related document, below actions are taken to reduce the risk of a loosening accumulator.
- Action Supplier** : Checking the accumulator connection was included in the assembly process.
- VRP&S' advice** : Add torque striping between the connection of the accumulator and the manifold block (see figure 4) and perform a weekly check on this section.



Figure 4: how to apply torque striping on the accumulator.

2.4 Contaminated oil in the cylinder

- Issue** : During assembly of the cylinder the Supplier could not guarantee that small particles would not get stuck in the valve. This could affect the functionality of the HLU.
- Action Supplier** : The Supplier changed the production process by using an improved flushing system for the manifold blocks. Besides that, they added a 1050 cycle test for all new manufactured HLU's, to convince themselves the HLU is not contaminated.
- VRP&S' advice** : For all HLU's in the field it is our advice to clearly instruct your operators to follow the instruction in the Owner's Manual: always check that the restraint is being closed as tightly as possible to the passenger's body. All restraints must be checked manually by pulling to see if they remain closed. Always check the restraint for locking before dispatch.
For all HLU's which were installed in the ride, no additional action is required besides the checks described in the Owner's Manual.
For all cylinders that are kept in stock: please return them to our facilities for general inspection and cycle test.

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3. General remark

Our advice is to clearly instruct your operators to follow the instruction in the Owner's Manual. Always check that the restraint is being closed as tightly as possible to the passenger's body. All restraints must be checked manually by pulling to see if they remain closed. Always check the restraint for locking before dispatch.

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According to the ASTM F853/ F1193 latest revision:

Supplemental bulletins delivered by the manufacturer to the owner / operator that were not provided at the time of hand over of the amusement ride 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.
- “Notification” For notifications that do not necessarily recommend future action but are promulgation of information.



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