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SERVICE BULLETIN

Ride Supplier:	Intamin Ltd and/or IntaRide LLC		
Ride Name:	All Roller Coasters & Drop Rides	Model Number:	All delivered
Affected Production Dates:	Original Production	Affected Serial No.	Hydraulic Restraint Locking Cylinders
		All	

Abstract For Issue:

Hydraulic Locking Cylinder Replacements

Reason For Release:

Additional testing and evaluations.

Action To Be Taken: (Inspection, Modification, Replacement, NDT, Order Parts, Manual Revision, **Procedural Change**, etc.)

Based on additional testing and evaluations all hydraulic restraint locking cylinders installed on roller coasters and drop rides supplied by Intamin Ltd and/or IntaRide LLC must be replaced by OEM OHE hydraulic cylinders after 10 years of operation from the date of installation or after 1 Million cycles, whichever comes first.

The above ten year automatic replacement doesn't eliminate the daily, weekly monthly and yearly inspection and testing requirements, which may require the immediate replacement of the defective and/or malfunctioning hydraulic restraint cylinders regardless of the time of installation.

Manual excerpt of three pages for the maintenance and testing of the OEM OHE hydraulic cylinders replacing any and all previous documents on the specific maintenance and testing of the hydraulic locking cylinders are attached to this bulletin.

Detail of Issue: (Text/Drawings/Schematic)

As described above.

RESTRAINT CYLINDER

(DAILY) FUNCTIONAL CONTROL (FC)

The purpose of this test is checking all cylinders of the restraint system. During start-up, **all restraint systems** must be checked for impeccable cycling with a specially designed test box (battery pack). The test must be done seat by seat or coaster vehicle by coaster vehicle. The test box allows checking all cylinders of one individual seat on the Gyro Swing or individual Coaster Vehicles.

NOTE



For description of the test box (evacuation box battery pack) and instructions for use refer to Manual Part THREE, Ride Specific Electrical, Chapter 4, Maintenance Instructions.

- Plug test box with the cable to the socket at the rear of the vehicle or seat.
- Activate the test box mode for testing the left cylinder.
- Pull lap bar thoroughly with approx. 300 N or 60 pounds for 10 seconds at least and try to open it.
- If no movement on the lap bar is monitored the left cylinder is OK.
- If any movements have been monitored, the **left cylinder must be replaced**.
- Repeat this test for the right and/or middle cylinder.
- Activate the test box mode for opening the restraints and make sure that all lap bars are opening.
- Disconnect plug.



Test Box



Test Box Connection on Coaster Vehicle

(WEEKLY) FUNCTIONAL CONTROL (FC) (Creep Test)

Every week, **all restraint systems** must be checked for leakage in the cylinder with a specially designed test box (battery pack) and a creep test device in the following sequence:

- left cylinder on / right cylinder off
- locking of a pre-tensioned (approx. 220 N) creep test device in the seat at lap bar
- measurement of lap bar movement after 5 min.
(start timer earliest 10 sec. after Creep Test setup)
- right cylinder off / left cylinder on
- locking of a pre-tensioned (approx. 220 N) creep test device in the seat at lap bar
- measurement of lap bar movement after 5 min.
(start timer earliest 10 sec. after Creep Test setup)

NOTE

For description of the test box (evacuation box battery pack) and the impact of its switch positions refer to Manual Part THREE, Ride Specific Electrical, Chapter 4, Maintenance Instructions.

Test box and creep test device

Test box



Lap bar extended position



Lap bar closed position – creep measurement

Requirements, Remedial action

Restraint system must lock, a limited movement is allowed according to following limits:

- Movement of lap bar is equal or smaller than 25.4 mm or (1 inch):
Restraint cylinder is good ==> **Test PASS**
- Movement of lap bar is more than 25.4 mm or (1 inch):
Restraint cylinder needs to be replaced ==> **Test FAIL**

(WEEKLY) FUNCTION AND MEASUREMENTS (F&M) test of the creep test device by pressing it against a scale for:

- sufficient pressure/force

Requirements, Remedial action

- Nominal pressure/force of creep test device is 220 N. If the measured pressure/force is less than 200 N replace the gas spring of the creep test device.

(DAILY) VISUAL CONTROL (EVC) of the restraint cylinder

Check the cylinders for:

- Oil leakage / oil spots below the cylinders

(MONTHLY) EXTENDED VISUAL CONTROL (EVC) of the restraint cylinder

Therefore remove back cover of the seat to get access to the cylinders. Check the cylinders for:

- Oil leakage
- Movement of the lap bar. If the lap bar does not open when the lap bar release function is activated with the test box the cylinders must be replaced.

Requirements, Remedial action for daily and monthly checks

NOTE



In case of

- oil leakage
- too less pressure

the cylinder must be replaced immediately. If the cylinder cannot be replaced immediately the seat must be immediately closed/blocked. It is not allowed to operate the seat with a failed or not fully performing cylinder.

Nominal cylinder pressure is approx. 22 bar.

NOTE



Checking and refilling of Nitrogen on the restraint cylinders must be done in accordance with the OHE (HAGENBUCH) Operation Instructions which can be found in Manual PART TWO, Chapter 7 (3rd Party Documentation). No other maintenance is allowed!

REPLACEMENT FOR RESTRAINT CYLINDERS

The lifetime of the restraint cylinder is limited to 10 years. Lifetime counter starts with commissioning of the Ride and restart after every cylinder replacement.

- Replace the restraint cylinders latest 10 years after installation