



**RETURN RECEIPT
REQUESTED**

"R A I N B O W"

Recommended check procedure after 5000 hours of operation

1. Ball bearing slewing rim:

- a) According to the manual the ball bearing slewing rim should be renewed after 5000 hours of operation.
- b) The ball bearing slewing rim can be used again, if the check of the bearing play acc. to the recommended specification shows a permissible value.
Maximum permissible tilting play = 1 mm, i.e. maximum permissible axial play = 0,5 mm.

The condition of the tooth profile must also be faultless.

2. Coupling at balancer shafts:

If an increase of wear and abrasion at this coupling has been discovered, the coupling has to be renewed.

The reason for an increase of wear and abrasion can be a deficient lubrication.

3. Bevel gear drive:

- a) According to the manual the bevel gears should be renewed after 5000 hours of operation.
- b) Differing from this procedure and according to the experience up to now, the bevel gears can be used again after having been checked and certified by the manufacturer, Carl Hurth, Munich.
This check can also be done by a local specialised company which manufactures the GLEASON-hypoid-tooth system.

4. Balancer shafts (upper and lower part):

The bearings of the balancer shafts are calculated for a life of at least 13900 hours at full load, i.e. full load unbalanced at one side of the gondola provided lubrication has been done sufficiently.
It must also be ensured that dirt and humidity could not penetrate into the bearings.

Since it is not possible to make a check from the outside, a satisfactory control can only be made by completely dismantling the balancer shafts. If possible, the dismantling and re-assembling should be done at the premises of the manufacturing company, as there may arise complications.

It is recommendable to take new bearings for re-assembly.

5. Reinforced new bearing shell for gondola bearing:

In any case, it is recommendable to exchange the existing bearing shell, item # 32 of drawing A1-11.8.A, against a new reinforced bearing shell.

Bremen, January 5, 1990

Böhme/Dreier/rei.

Huss Maschinenfabrik
GmbH & Co. KG.

SERVICE LETTER RB-II



MASCHINENFABRIK

Huss Maschinenfabrik GmbH & Co. KG - Postfach 110204, D-2800 Bremen

Strosemannstr. 58 - Telex 245180 huss d
☎ (0421) 489000 - Telefax 4890040

TO: ALL RAINBOW CUSTOMERS

RETURN RECEIPT
REQUESTED

Ihre Zeichen/Nachricht

Unser Zeichen

Telefon-Durchwahl / Kommission / Tag
August 20, 1992

RE: Boom Arm Axle Cracks

Dear Customer:

During the process of replacing lower bevel gears in the gondola area, we have discovered cracks on the non-accessible boom arm axle (which were older than 8 years).

We have surmised that this is being caused by a combination of factors: frequent one-sided loading on the gondolas; stress caused by unusual hard conditions; erecting and tearing down of the ride.

At this point we want to direct your attention to the ride manual, paragraph 7, point 12, which requires the gondola to be loaded as symmetrically as possible on either side of the center axis.

To avoid any danger to passengers, all Rainbows that have been in operation longer than 5 years, must install a new, reinforced (modified) boom arm axle with bearings. This work must be done at the factory. Therefore, the whole boom arm must be shipped to Germany, at which time an evaluation of the arm will be done, and advisement of any additional repair work will be provided.

A second option is to install a complete new boom, with new housing, new mounting gondola plate, new boom arm axle, new bevel gears, new bearings, and completely new wired slip ring (shipped primed and painted).

Huss Maschinenfabrik
GmbH & Co. KG.

Post-It™ brand fax transmittal memo 7671 (of pages > 1

To	LEGRUY PAFFORD	From	CHRIS GIERSON
Co.		Co.	NORTH AMERICAN REPAIR
Dept.		Phone #	
Fax #	(904) 488-4023	Fax #	



MASCHINENFABRIK

RECEIVED JUN - 4 1997

Firmensitz:
Huss Maschinenfabrik GmbH & Co. KG - Postfach 110208 - D-28082 Bremen

Firmensitz:
Sprengelstr. 56 - D-20207 Bremen
☎ (04 21) 43 90 00 - Telefax (04 21) 4 80 00-40
Telex 7 45 180 huss d

Kentucky Kingdom
Att.: Mr. Ronald H. Berni
Vice President, Operations
P.O. Box 9287

Louisville, Kentucky 40209-0287

by fax and mail

USA

Unsere Zeichen/Nachricht

Ihrer Zeichen

Telefon-Durchwahl / Kommission / Tag

v.M./rei.

June 4, 1997

Dear Ron,

I was informed by third parties that there was an accident on the "RAINBOW".
I don't know details!

As to your "RAINBOW": all our "RAINBOW" customers were asked to make a revision on the arm in 1990. Please see attached service letter. But on your ride this revision was made in 1992. As to the manual, the bevel gears should be checked after 5000 operational hours by a special service engineer for a control of the guidance of the bevel gear teeth. You will find this lined out in your manual under "Maintenance and Greasing" where it is indicated that the bevel gears should be changed after 5000 operational hours. This has now been revised to do only the check and then decide whether they have to be changed. An expert will be able to judge. At this time I feel that there is no danger for the "RAINBOW" at your site because you will not have reached the 5000 hours of operation, but this is my estimate. You have to see yourself.

Enclosed you will find our brochure about ASR rides. 6 of them are right now completely erected at our site and we cordially invite you to come and see and judge.

Very best regards,

Karl von Winterfeld

Encl.
ASR brochure
copy of service letter R8-11

Vertrieb: Gesamtgesellschaft für Bremen, Angewandte Bremen 1414 10214
Postfach Postfach Postfach Postfach Postfach Postfach Postfach Postfach
Die Deutsche Maschinenfabrik Bremen 1414 10214
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SERVICE LETTER 1 (11-05)

Your reference/communication	Our reference	Tel. direct dial	Date
		+49 (0) 421-499 0051	15.01.99

Dear Customer,

Due to several damages occurred into the bearing system of the gondola caused by not sufficient lubrication of the roller bearing mounted on rear side of gondola arm, we would like to inform you in addition to our operation manual chapter.

Maintenance and Lubrication item #A3 as follows:

The roller bearing shown, also on enclosed drawing, has to be lubricated by using the grease nipple item #100 according to our regulations mentioned in the operation manual.

In case of any disregards there may be caused damages up to DM 150.000,-.

Please take care.

Yours faithfully

Huss Maschinenfabrik
GmbH & Co. KG



Wolfgang Krüger
(Service Department)

Encl.: Drawing (1)

Mike Triplett

From: Richard Osworth <rosworth@dca.state.nj.us>
 To: Michael Triplett <mtriplett@dca.state.nj.us>
 Sent: Friday, July 07, 2000 9:32 AM
 Subject: Fw: Huss - Rainbow

----- Original Message -----

From: Michael W Rinehart <rineham@doacs.state.fl.us>
 To: Ron Brooks <brooks@doacs.state.fl.us>; Randy Fleck
 <flecker@doacs.state.fl.us>; Jerry Callahan <callahj@doacs.state.fl.us>;
 Cliff Groscurth <groscuc@doacs.state.fl.us>; Brad Mosher
 <mosherb@doacs.state.fl.us>; Allan Harrison <harrisa@doacs.state.fl.us>;
 Timothy Simpson <simpsot@doacs.state.fl.us>; Carlos Corvo
 <corvoc@doacs.state.fl.us>; Gary Fisher <fisherg@doacs.state.fl.us>; Hunter
 Lyles <lylesh@doacs.state.fl.us>; Jerry Winters <winterj@doacs.state.fl.us>;
 Charlie Stegall <stegalc@doacs.state.fl.us>; Larry Cook
 <cookl@doacs.state.fl.us>; Keith Garner <garnerk@doacs.state.fl.us>; Isadore
 Rommes <rommesi@doacs.state.fl.us>; Carl Dills <carl.dills@kyagr.com>
 Sent: Thursday, May 25, 2000 1:59 PM
 Subject: Huss - Rainbow

- > As previously reported, Lewis Merz with American Specialty has found
- > more cracks, at the same location mentioned earlier, on a different
- > Huss Rainbow's hub or shaft (directly behind where the gondola attaches
- > to the arm) that's inside of the beveled gear. Remember you have to
- > remove the inspection door at the bottom of the boom and the heavy
- > grease in order to look in. Two and a half to three inch long cracks
- > have been found around the weldments of that shaft and one larger four
- > inch crack was found when the boom was rotated and inspected while in
- > the up position by someone on a cherry picker or lift. Lewis advises
- > the cracks are generally found in the 3, 6, 9 and 12 o'clock positions.
- > There is a diagram available with arrows pointing to the cracked areas:
- >
- > Mike Rinehart
- > Florida Fair Rides Inspection



MASCHINENFABRIK

Postanschrift:
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Firmensitz:
Stresemannstr. 56 D-28207 Bremen
Tel. 0421-49900-0 Fax 0421-49900-56
E-mail: w.krueger@hussrides.com
Internet: http://www.hussrides.com

Ihre Zeichen/Nachricht

Unser Zeichen
SER-KR

Telefon-Durchwahl
0421-4990051

Datum
20.06.2001

Service Letter 11-06

Dear Sirs,

According to our records, you are the owner/operator of a HUSS amusement ride, type "RAINBOW". We have occasion to draw your attention once more to Chapter V (Maintenance and Lubrication) of our Operating Instructions. In particular, we wish to draw your attention to the sub-item A Parallel Guiding, A1 Bevel Gear Drive.

"1 bevel gear drive (68) is located in the rotating structure (19), which is accessible via a door. The second bevel gear drive (70) is located in the lower boom (18), which is accessible through a hinged flap (71). The gear teeth must be lubricated daily - but at the latest as soon as shiny metal surfaces appear on the tooth profiles - using gear grease MOLYKOTE 165 BR. In addition, the overall condition and lubrication of both bevel gears must be kept under observation. The bevel gear wheels must be exchanged at the latest after 5000 hours of operation."

From our records we have been able to ascertain that many of our customers fail to comply with the instruction to exchange the bevel gear wheels after 5000 hours of operation. We are well aware of the fact that such a measure is a cost factor that is not to be underestimated. For this reason, we wish to point out that you also have the possibility of having the bevel gear wheels examined after the first 5000 hours of operation by a specialist company authorised by HUSS. If this examination is accomplished without any objection being raised to the condition of the gear wheels, this specialist company will release the bevel gear wheels for operation for a further period depending on the degree of wear found. On expiry of this extension period, it is then absolutely necessary to have further examinations carried out and, if necessary, to exchange the gear wheels.

We expressly point out that the bevel gear wheels are of crucial importance for the safety of the ride and of the passengers (a wheel break would inevitably result in a serious accident with possibly many people injured or even killed) and we must ask you to devote the necessary attention to this system in accordance with our instructions.

Please contact HUSS Service directly with regard to an exchange or examination of these gear wheels.



MASCHINENFABRIK

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Stresemannstr. 56 D-28207 Bremen
Tel. 0421-49900-0 Fax 0421-49900-56
E-mail: w.krueger@hussrides.com
Internet: <http://www.hussrides.com>

Ihre Zeichen/Nachricht

Unser Zeichen
SER-KR

Telefon-Durchwahl
0421-4990051

Datum
20.06.2001

Service Letter 11-07

Important safety information!! Do not fail to observe the following !!

To whom it may concern,

According to our records, you are the owner/operator of a HUSS amusement ride Type "RAINBOW".

HUSS rides are designed and manufactured in accordance to German standards governing amusement rides (DIN 4112) and welding related engineering issues (DIN 15018). By the pertinent certification authorities and insurance bodies we are required to review whether safety critical components of existing rides are in compliance with the latest engineering and design criteria.

Since the above mentioned ride was introduced in 1982, the entire drive train recently had to be checked for compliance with the latest, allowable load bearing properties and the stress concentration factors of certain weld joints. The latest computer-aided calculation methods (finite elements model incl. the static analysis program ESA-Prima Win) have been employed for this verification.

The results reveal that the load on the gondola connecting structure (please see our drawing 1-11.8.B) exceeds the limits of the latest stress concentration factors. Therefore the gondola connecting structure can no longer be considered fatigue-resistant in respect to the welded connection. In a worst case scenario, this could lead to cracks, which could then cause the gondola to tear off with the corresponding consequences.

For this reason, the connecting structure has now been completely re-designed and must be exchanged **immediately** in all rides of this type. As this component is safety critical, operation of all RAINBOW rides in the 2001 season can only be approved on condition that the connecting structure is exchanged before the start of the season. This can only be done by a HUSS service technician and entails disconnecting the gondola and the gondola arm.

We draw your attention to the fact that, in view of the age of your ride and of the gondola arm, this procedure is not covered by the HUSS' manufacturers warranty unless the ride/gondolaarm is less than one year old or has been rebuilt by HUSS within the last 12 months. However, to assist you with the costs involved, you can order the exchange of the connecting structure via our Service Department for a once-only special lumpsum price. Please contact our Service Department in this matter. We will then also be pleased to answer any further questions you may have.

Yours sincerely,

HUSS Maschinenfabrik GmbH & Co. KG
- Technical Service Department -
Wolfgang Krüger



Huss Maschinenfabrik GMBH
& CO. KG
P.O. Box 110206
Bremen Germany

Bulletin No: Rainbow Service
Letter 6
Release Date: June 17, 2002
Effective Date: June 17, 2002

Phone: +49 421 499 0000
Fax: +49 421 499 0040

Page 1 of 3

www.hussrides.com
e-mail: service@hussrides.com

Service Bulletin

Ride Manufacturer: Huss Maschinenfabrik
Ride Name: Rainbow
Model Number: All

Affected Production Dates: All
Affected Serial #: All

Abstract of Issue:

A review of safety issues involved with the Rainbow gondola restraint system has been conducted and as a result the following upgrades to the safety system are being recommended.

Reason for Release:

Following a review of the ride's safety system we are now of the opinion that the ride's safety system could be significantly improved with the installation of seat belts, moulded rubber seat inserts and the installation of a hydraulic pressure switch to monitor restraint system pressure.

Action to be Taken:

1. A pressure switch and nitrogen accumulator system should be installed in the gondola's electrical circuit and set to a minimum of 26 Bar to ensure that the ride cannot be started without the minimum hydraulic pressure.
2. Lap belts should be installed on each bench seat.
3. Moulded foam rubber seat inserts should be installed on each bench seat to minimize guests sliding from side to side.
4. The gondola's hydraulic restraint system pressure should be checked on a monthly basis to ensure that it is exerting a minimum of 30 Bar of pressure and the testing of the pressure should be documented in the attractions ride log book on a regular basis.
5. In addition, consideration should be given to installing gates on the gondola. A gondola retrofit package is available from the Huss Service department as an option; see Service Letter circa January 1990.

According to our records you are the owner/operator of a HUSS amusement ride. If this is no longer the case, please return this letter to us together with the name, address and contact information of the current owner.



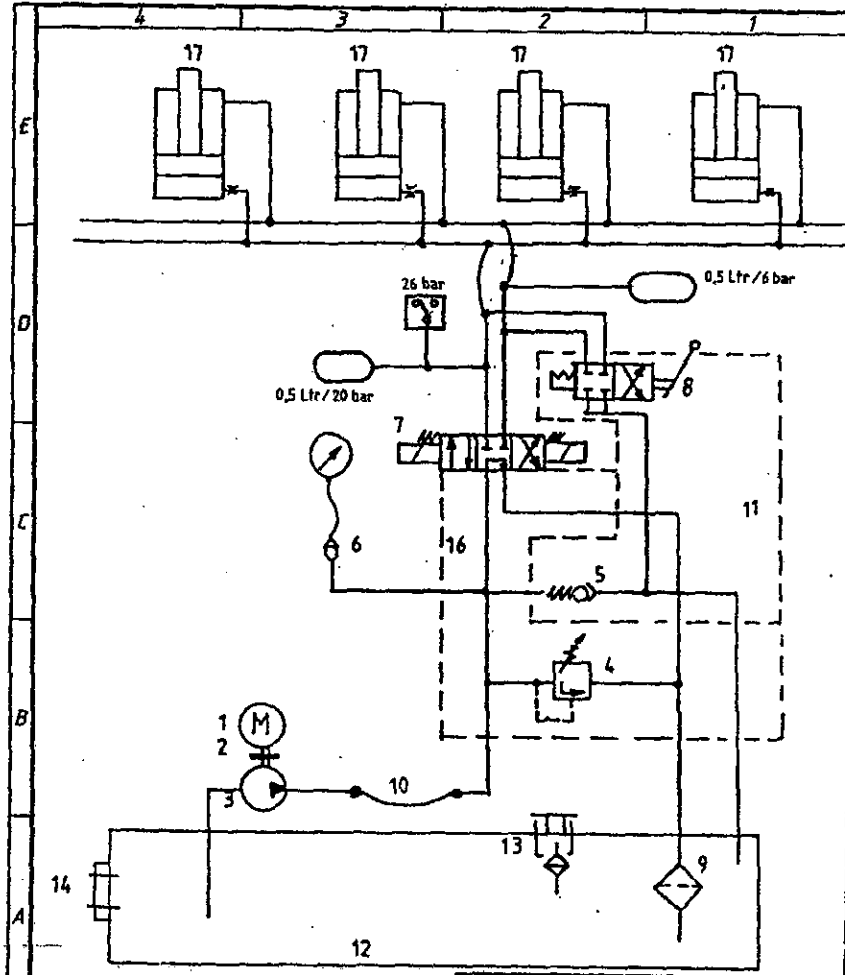
Huss Maschinenfabrik GMBH
 & CO. KG
 P.O. Box 110206
 Bremen Germany

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 Letter 6
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Page 2 of 3

www.hussrides.com
 e-mail: service@hussrides.com



Art. Nr.: 3066916

Freizeitanlagen: 1. Allgemein, DIN ISO 2768 T1 (mit Maß) 2. Breitenlinie, DIN 2516, Tabelle 3/6 und 2/3 3. Schweißanleitungen, DIN 6579 Blatt 1 (Bl. 3/5)		Urheberrechtsvermerk nach DIN 34 beachten		Maßstab Verzeichnis Halbzugs, Rohmaß-Nr. usw.)	
Datum Name		Datum Name		Besenung Esquisse der Zylinder in der Lage für die Sperre Hydraulic scheme for lock Hydraulik - Schema für Verriegelung	
Zeichnungsnummer 11.048.A-4		Blatt 11		Zeichnungsnummer 11.048.A-4	
Zusf. Änderung Datum Name		HUSS MASCHINENFABRIK GMBH & CO. KG D 28062 Bremen, Postf. 11 01 04 Tel. 04 21 / 4 99 00-4, Fax 04 21 / 4 99 00 44		Ers. durch:	

According to our records you are the owner/operator of a HUSS amusement ride. If this is no longer the case, please return this letter to us together with the name, address and contact information of the current owner.



Huss Maschinenfabrik GMBH
& CO. KG
P.O. Box 110206
Bremen Germany

Bulletin No: Rainbow Service
Letter 6
Release Date: June 17, 2002
Effective Date: June 17, 2002

Phone: +49 421 499 0000
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Page 3 of 3

www.hussrides.com
e-mail: service@hussrides.com

Should you have any questions regarding the above or if you would like to order the spare parts require to complete these upgrades please contact the Huss Service department in Bremen Germany at 011 49 421 499 0000.

In North America you can also order spare parts through North American Parts Inc. at 716-839-4791.

In Asia, you can also order spare parts through Melcher's GMBH & Co at +65 (3559) 272

Best regards

HUSS Maschinenfabrik GmbH & Co. KG
- Department for technical services -

According to our records you are the owner/operator of a HUSS amusement ride. If this is no longer the case, please return this letter to us together with the name, address and contact information of the current owner.