

**Issuing Entity:**  
Dartron Industries, Inc

**P. O. Box 13114**  
**Salem, Oregon 97309**  
**Phone: 503-362-2341**  
**Fax: 503-362-2536**

[www.dartronrides.com](http://www.dartronrides.com)

**Bulletin #** SR-5K-810

**Release Date:** 10-06-1998

**Effective Date:** 10-06-1998

**Supersedes:** None

**Completion Date:** 01-01-1999

Page 1 of 5

## SERVICE BULLETIN

Ride Manufacturer: Dartron Industries, Inc.

Affected Production Dates: May 1998-August 1998

Ride Name: Cliff Hanger

Affected Serial #'s 801271-5K and 806081-5K

Model # 1998

**Abstract of Issue:** The following is a procedure for upgrading hardware on the pivot pins of the upper and lower hanger blocks.

**Reason for release:** Dartron has determined that the changes explained below are necessary for the assured safe operation of the Cliff Hanger ride. These changes have been implemented on all new production Cliff Hanger rides.

**Action to be taken:** The changes listed below will be implemented on and modifications made to all effected Cliff Hanger units listed above.

**Sweep and Shaft locating implemented:** Attachment I shows the proper location of the bolt and the proper hardware required to secure the bolt to the shaft. A daily visual inspection of the bolt by the ride operator and ride safety personnel is required. The purpose of the inspection is to insure that the bolt is in position and is fastening hardware is in place and tight.

**Shaft Stops:** Attachment II shows the plate that must be welded to the side of the upper hanger block on all Cliff Hangers. With this plate in place the shaft will be retained in position in the upper hanger block even without the bolt properly located.

**Upper Restraining Strap:** Attachment III shows the addition of a retaining strap that will loop over the end of the sweep and be bolted to the upper hanger block. In the event of a failure of either the shaft, the upper hanger block bore or the sweep ears a connection will still be maintained between the sweep and the upper hanger block.

**Lower Hanger Block Retainer:** Attachment IV shows the installation of a retaining ring that will maintain a connection between the upper and the lower hanger blocks in the event of a failure or loss of the upper and lower hanger block retaining shaft.

INSPECT FASTENERS  
& COTTER PINS ON  
A DAILY SCHEDULE  
BEFORE OPERATING  
RIDE.

VISUAL OBSERVATION TO  
BE FROM END OF SWEEP  
NEAR ENOUGH TO CLEARLY  
SEE FASTENERS & RETAINING  
PINS ARE SECURE.

3/8-16 GRADE 8 NUT

COTTER PIN

IFI# 20376-C8  
3/8-16 GRADE 8  
TOP LOCK NUT

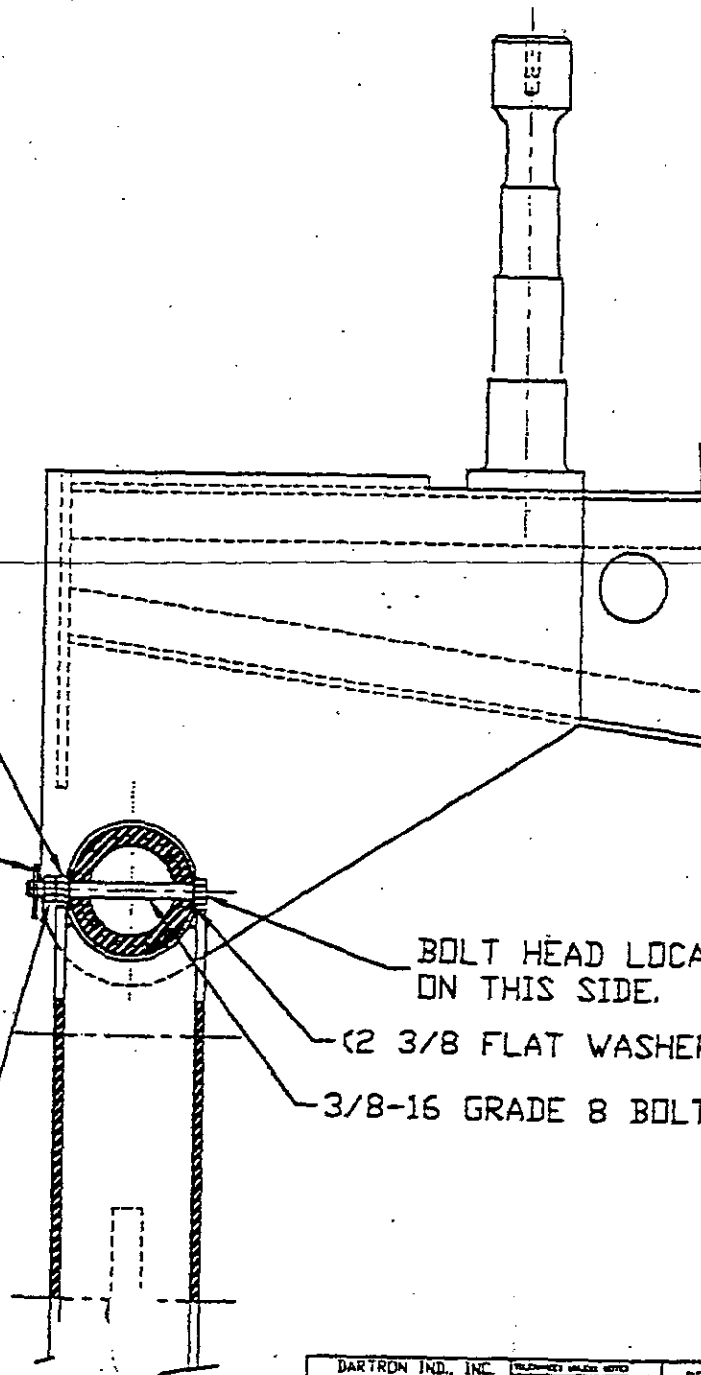
OR

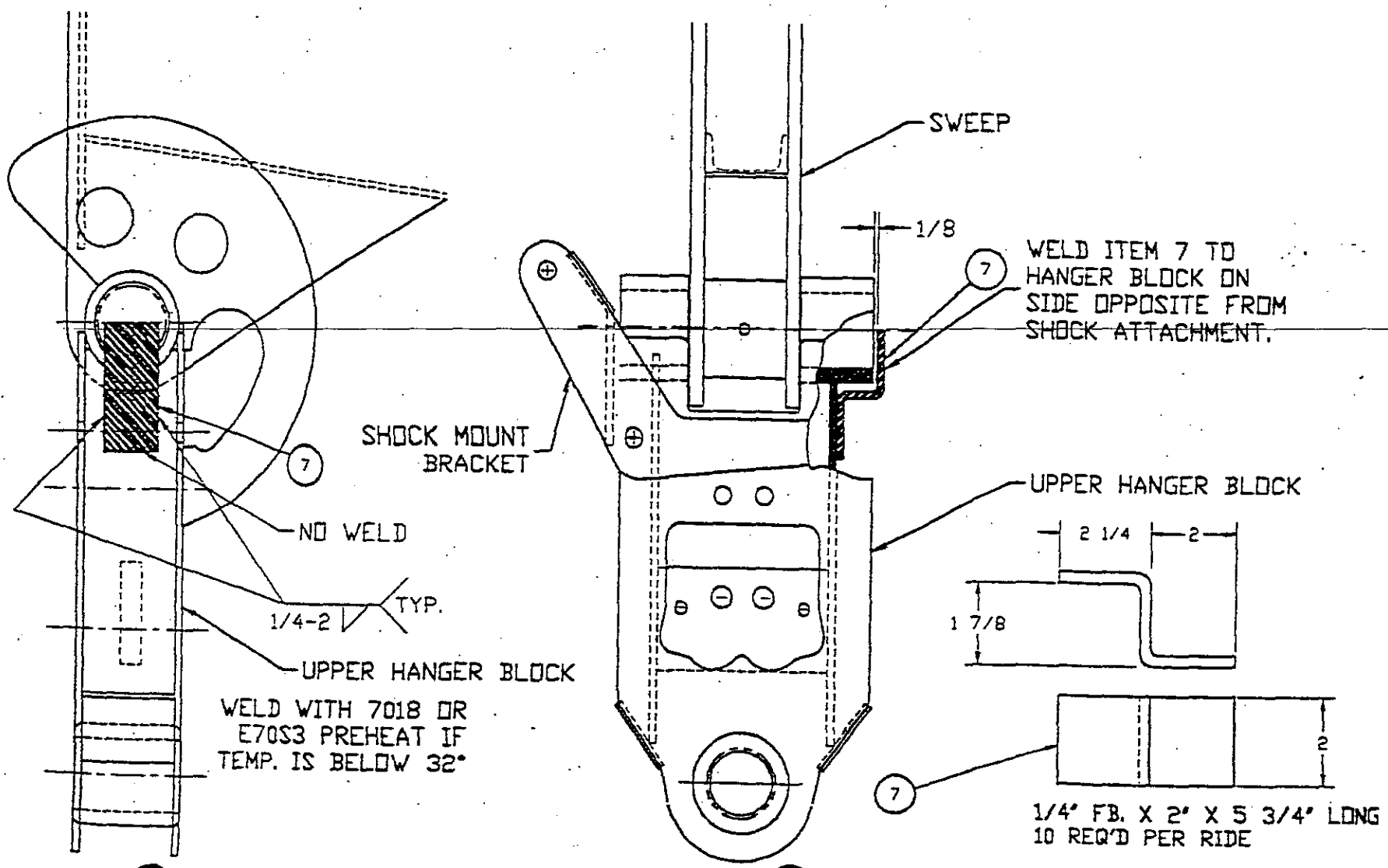
FAST END # 37264  
3/8-16 NUT

BOLT HEAD LOCATED  
ON THIS SIDE.

(2 3/8 FLAT WASHERS)

3/8-16 GRADE 8 BOLT





⑦ PIN STOP FOR UPPER HANGER BL IN

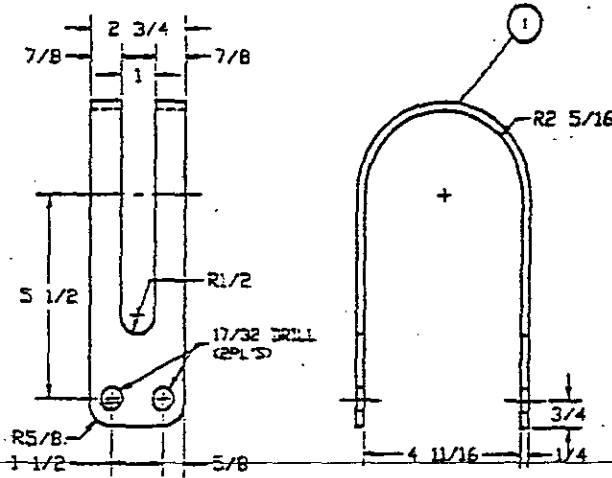
⑦ 1/4" FB. X 2" X 5 3/4" LONG  
10 REQ'D PER RIDE

MAY NEED TO TRIM  
SWEEP PLATE FOR  
CLEARANCE

UPPER HANGER BLOCK  
SAFETY LOOP

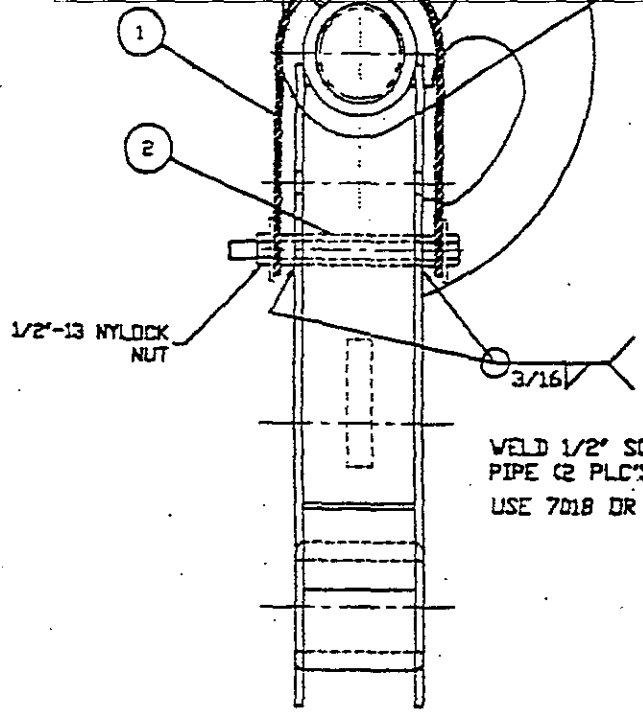
SWEEP

1/8 TYP.

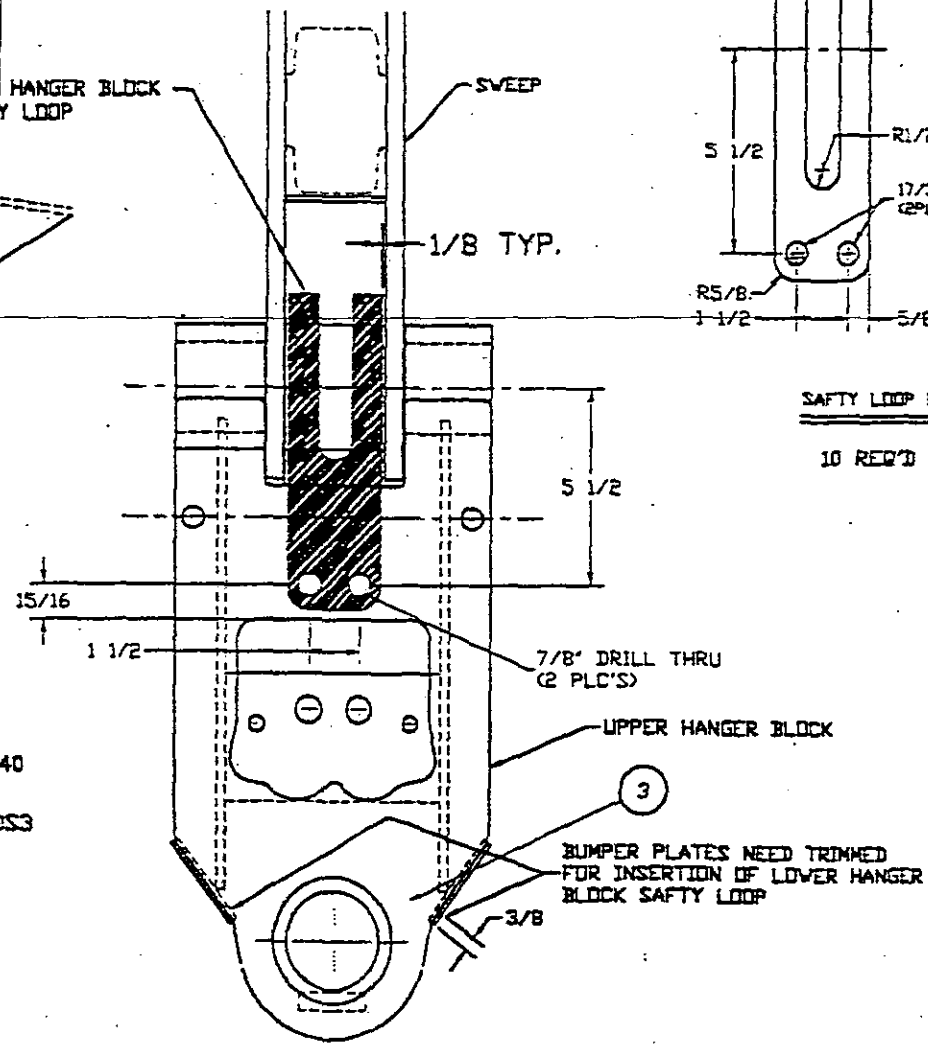


SAFETY LOOP FOR UPPER HANGER BLOCK

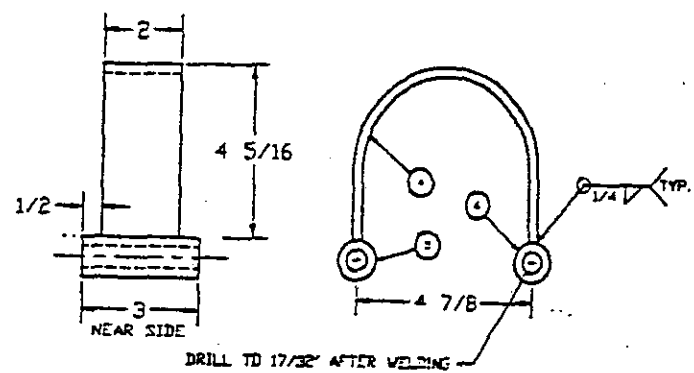
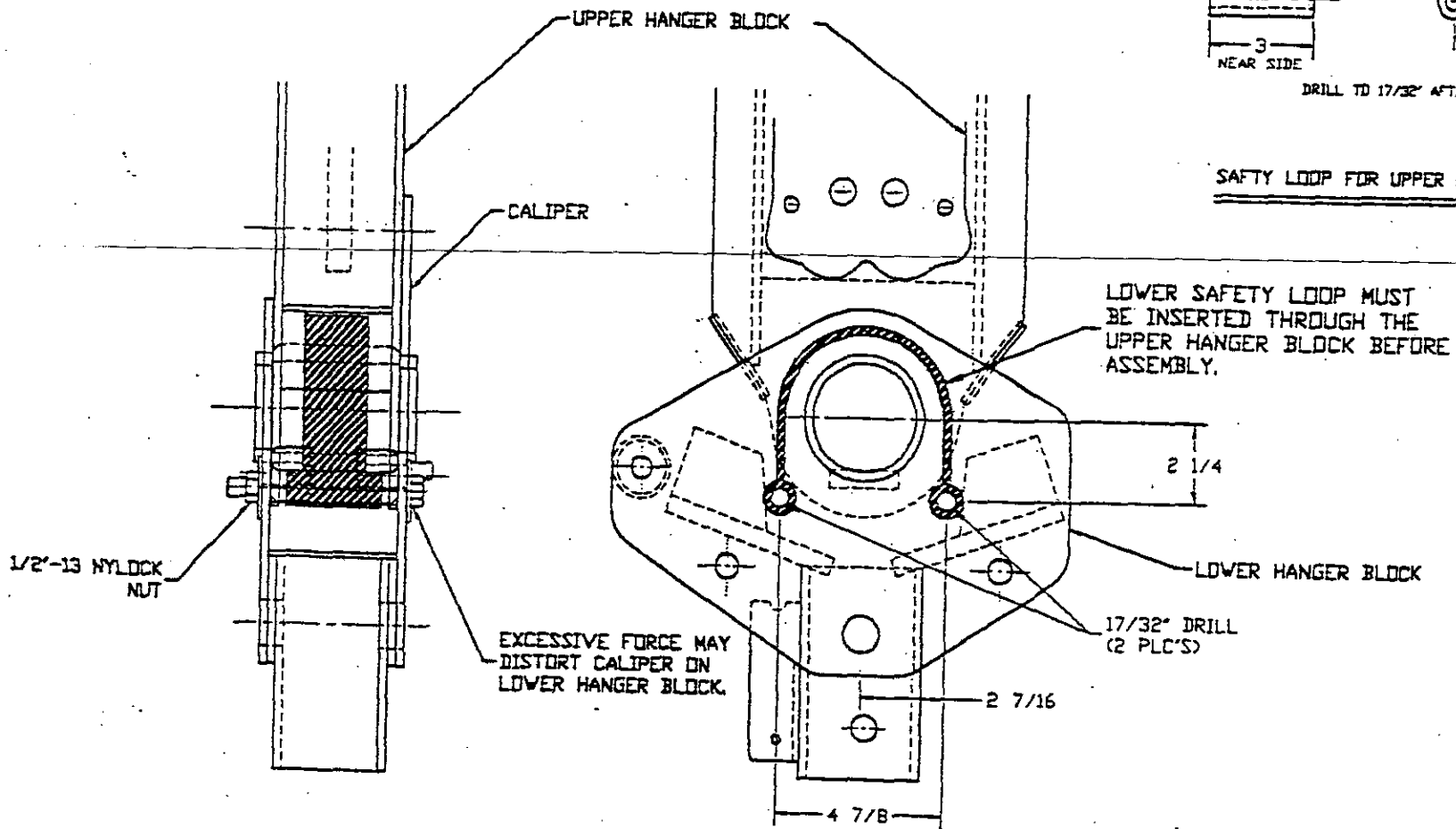
10 REQ'D PER RIDE



WELD 1/2" SCH. 40  
PIPE (2 PLC'S)  
USE 7018 DR E70S3



BUMPER PLATES NEED TRIMMED  
FOR INSERTION OF LOWER HANGER  
BLOCK SAFETY LOOP



SAFETY LOOP FOR UPPER HANGER BLOCK

LOWER SAFETY LOOP MUST BE INSERTED THROUGH THE UPPER HANGER BLOCK BEFORE ASSEMBLY.

17/32" DRILL (2 PLCS)

Dartron

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www.dartronrides.com

Bulletin # SB-5K-002

Release Date: 5-22-00

Effective Date: 5-22-00

Supersedes: N/A

Completion Date: As required

Page 1 of 1

## SERVICE BULLETIN

Ride Manufacturer:	Dartron Industries, Inc.	Affected Production Dates:	All
Ride Name:	Cliff Hanger	Affected Serial #'s	All Cliff Hanger Rides
Model #			

**Abstract of Issue:** Lack of lubrication on Avon bearing ring gear teeth will cause accelerated wear and could result in a costly repair.

**Reason for release:** Dartron has become aware of at least one Cliff Hanger that was operated with insufficient pinion gear to ring gear lubrication.

**Action to be taken:** Inspection and lubrication if warranted.

**Detail of issue:** The ring gear on the Avon bearing on the Cliff Hanger must always have an adequate amount of lubrication between its gear teeth. The approved grease must be applied to the surfaces where the teeth of the pinion gear on the hydraulic motor mesh with the teeth on the Avon bearing ring gear. Normal operation of the Cliff Hanger will deplete this grease so additional grease must be added at a frequency required by your particular operation.

Failure to maintain adequate grease on the Avon bearing ring gear will result in rapid wear of the gear teeth. Operating the ring gear without adequate grease on the gear teeth will first be evidenced by a loud grinding noise and later metal filings will be found.

**WARNING:** Lack of lubrication on the ring gear teeth could result in a costly replacement of Avon bearing.

Approved lubrication: Lubriplate Gear Shield Extra Heavy PN/L0152-000

Do Not use chassis grease. Chassis grease is inadequate for the pressures created by the gear teeth.

Dartron Industries, Inc.

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Bulletin #	SR-5K-001
Release Date	FEB 20, 2001
Effective Date	MARCH 1, 2001
Supersedes	
Completion Date	JULY 4, 2001
Page	1 of 4

# SAFETY ALERT

Ride Manufacturer	Dartron Industries, Inc.	Affected Production Dates	1998 thru 1999
Ride Name	Cliffhanger	Affected Serial #'s	806081-5K, 807121-5K, 810061-5K, 810283-5K, 811201-5K, 901011-5K
Model Number	N/A		902071-5K, 902221-5K, 903021-5K, 903272-5K, 905101-5K, 9060091-5K, 908311-5K, 909201-5K

**Reason For Release:**

Dartron has determined that the two cylinders that raise and lower the car storage storage racks on either the curb or drivers side could move at different speeds. If the rack operator continues the rack movement the rack could twist resulting in the rack rotation shaft being pulled out of the pillow block or the pillow block fracturing. Either situation could cause the cars to fall to the ground.

**Solution**

A flow divider must be added for each car rack.

**Inspection**

Inspect to see if flow dividers have been installed in the hydraulic lines going to hydraulic cylinders of the passenger carrier storage racks.

**Order Parts**

A kit containing all parts needed to add two flow divider valves is available from Dartron. Contact Steve Jones at (503) 362-2341.

**Detail of Issue**

SEE ATTACHED PAGES 2 THRU 4.

**Dartron Industries, Inc.**

P.O. Box 13114- Salem, Ore. 97309

Ph. 503-362-2341 Fax 503-362-2536

**BULLETIN # SR-5K-001**

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**INSTRUCTIONS:**

The flow divider kit should be installed on the Cliff Hanger when the ride is set up, or when the passenger carrier transport racks are in the down position. All passenger carriers must be removed.

**FLOW DIVIDER INSTALLATION INSTRUCTION:**

**Step 1:** Drill holes through the gooseneck deck skin using the layout pattern as showed on page 3 Diagram A.

**Step 2:** Install 2 flow dividers with fittings as showed on page 3 Diagram B.

**Step 3:** Make sure the passenger carrier transport racks are in the down position, all cylinders are fully extended and all passenger carriers are removed.

**Step 4:** Identify the hose attached to the rod end of the driver side rear cylinder, and follow it down to the bulkhead tee fitting under the gooseneck.

**Step 5:** Remove all three hoses from this bulkhead tee fitting and replace the tee in the trailer with the straight fitting from the kit.

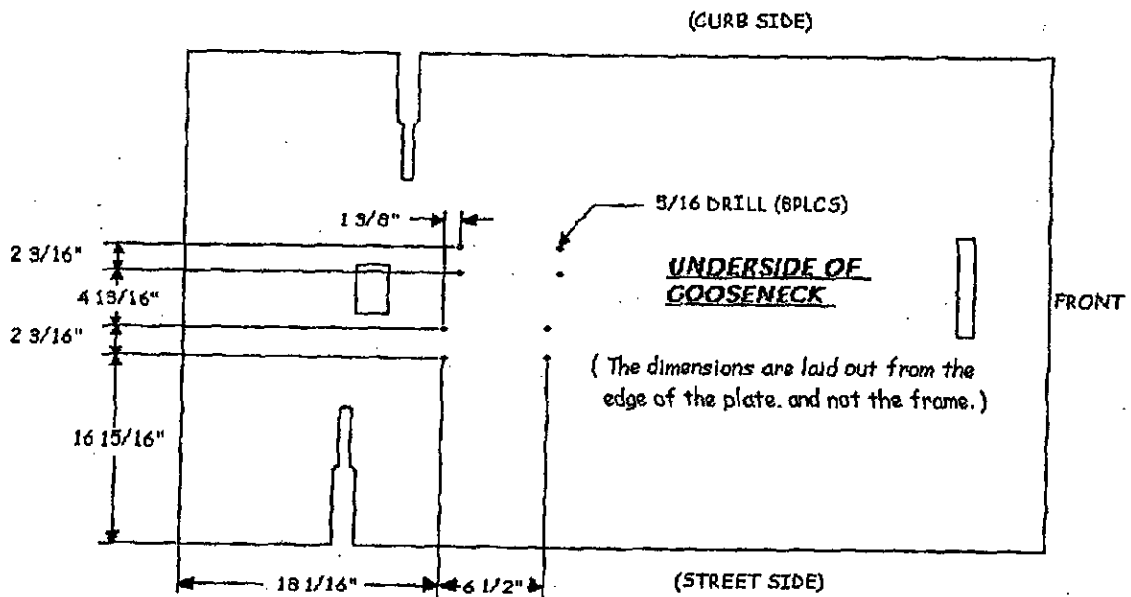
**Step 6:** Extend this bulkhead fitting over to the center port of either one of the flow dividers with one of the hoses from the kit, as shown on page 3 Diagram B.

**Step 7:** Hook up the two hoses from the cylinders to the other side of the flow divider. The flow divider now takes the place of the tee that was removed. See schematic on page 4.

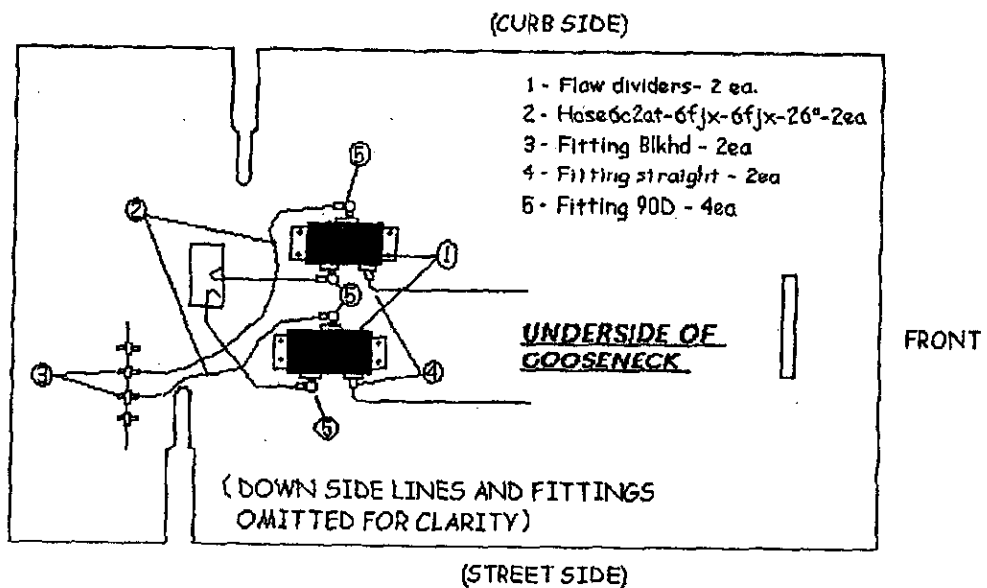
**Step 8:** Repeat steps 4-7 for the other side.

**Step 9:** Remember that you now have air in the lines and the racks may not work quite right until the air is purged. The flow dividers have an internal relief valve, which will allow the cylinders to synchronize. Bottoming the first cylinder out and continuing to apply pressure with the hydraulic controls until the relief opens, which allows the second cylinder to bottom out, achieve this. Raising and lowering the racks once should be enough to purge all of the air out of the lines. The racks can be raised all the way up when the ride is set up, by lifting the boom.





**DIAGRAM A (LAYOUT PATTERN)**



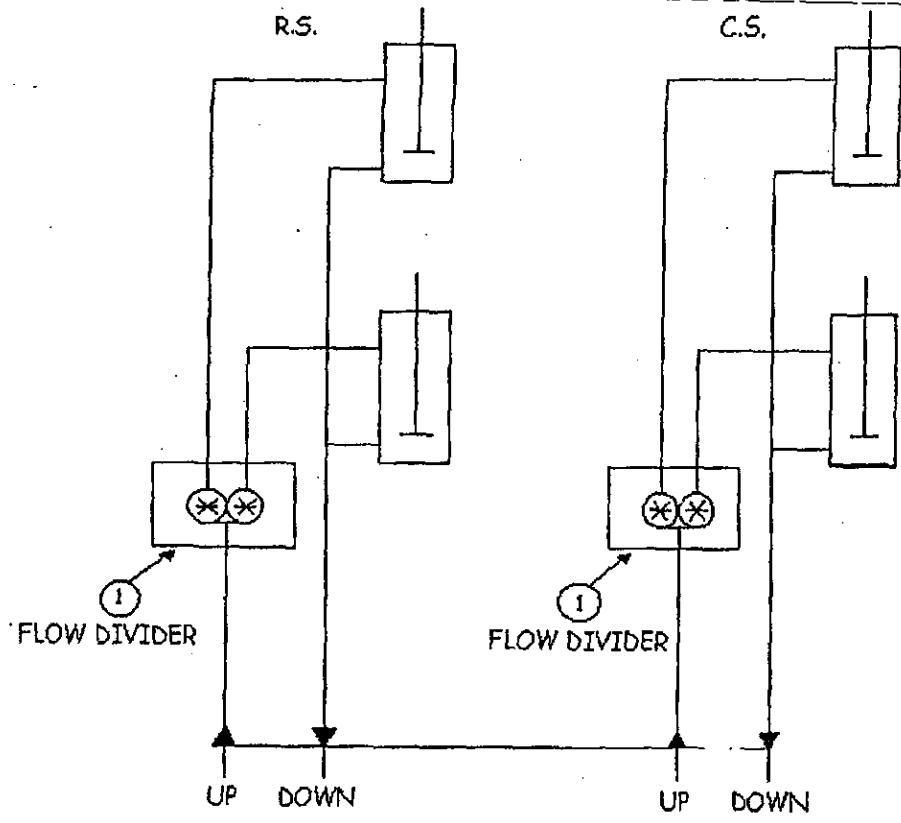
**DIAGRAM B (FLOW DIVIDERS)**

Darttron Industries, Inc.  
P.O. Box 13114 - Salem, Ore. 97309

BULLETIN # SR-5K-001

P.4

FLOW DIVIDER  
HYDRAULIC SCHEMATIC



**Dartron Industries, Inc.**

**DARTRON INDUSTRIES, INC. Bulletin # PI02070K-01**

P.O. Box 13114  
Salem, Oregon 97309  
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Release Date: July 9, 2002  
Effective Date: July 9, 2002  
Supercedes: None  
Completion Date: N/A

Page 1 of 2

## PRODUCT IMPROVEMENT

**Ride Manufacturer: Dartron Industries, Inc**

**Affected Production Dates: Various**

**Ride Name: Cliff Hanger**

**Affected Serial #'s: 0012293-5K, 0012045-5K, 0110013-5K,**

**Model Number: Portable**

**0201147-5K**

### Summary of Issue:

Ontario Hydro, Electrical Inspection Department, in the Province of Ontario, Canada has determined that the mini breakers used to protect relays in the Cliff Hanger light controller is not CSA approved therefore must be replaced with CSA approved fuses.

### Reason For Release:

In the event that electrical inspectors in Ontario, Province of Canada require replacing the mini breaker in the Cliff Hanger light controller with fuses, information required for that change is included herein.

### Action to be taken:

Remove mini breakers, install fuse blocks and fuses and change wiring as needed.

### Detail of Issue:

**Start with the six small breakers in the main distribution panel on the trailer.**

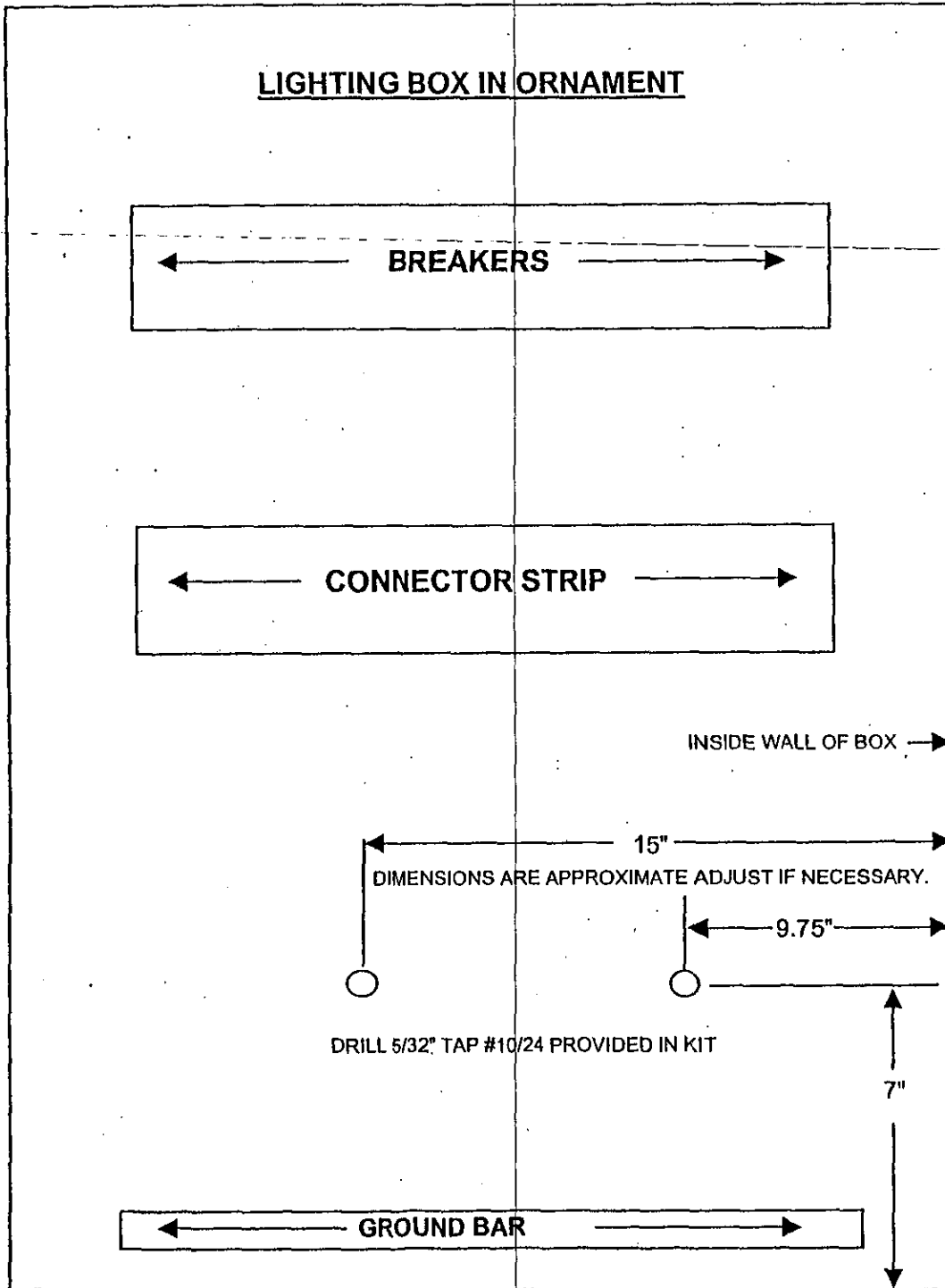
1. Remove the gray spacers-1 found on each side of the 24v power supply. They are unnecessary and their removal will provide room on the din-rail for the wider fuse holders.
2. Slide the 24v power supply all the way to the left.
3. Install the string of six fuse blocks labeled 1-6 in place of the circuit breakers, one at a time to avoid mixing up the wires.
4. Install the appropriate placard to the inside of the panel door.

### **Move to the ornament.**

1. Drill and tap two #10/24 holes in the back panel of the lighting box ( see sketch for location. ) These holes should end up in the open section between the barrier strip and ground bar.
2. Mount din-rail with five fuse blocks 19-23 on the 2" long aluminum tubes (stand off spacers) to these holes.
3. Disconnect and remove the breakers labeled 01-02-03-FDS-FDS one at a time and rewire down to the fuse blocks.
4. When finished tie the wire loom back together.
5. Now remove the remaining breakers one at a time and change out to the fuse blocks labeled 1-18. Room for extra width of these fuse blocks has been provided by moving the fuses (19-23) down below.  
Install placard into the door below the heat sink.

**BULLETIN PI-02070K01**

**CLIFFHANGER FUSE UPGRADE DIAGRAM.**



*Dartron*  
INDUSTRIES, INC.

August 1, 2002

Mr. Rick Reithoffer  
Reithoffer Shows  
New Jersey State Fair  
37 Plains Rd.  
Augusta, NJ 07822  
Fax 973-948-3872

Dear Mr. Reithoffer:

In response to your telephone conversation with our Mike Bell on August 1, 2002, Dartron Industries is issuing the following statement concerning the Cliff Hanger ride Serial Number 902221-5K, owned and operated by Reithoffer Shows.

It has been brought to Dartron's attention that fractures have developed in the vertical welds located at the ends of the aluminum light fixtures on the sweeps. These welds are strictly cosmetic and have no structural value. The structural component of the fixture is the 1/4" x 3" flat bar and the horizontal welds that attach the flat bar to the bottom of the fixture channel. Any sign of fracture in a horizontal weld or next to a horizontal weld is considered a defect and must be repaired immediately. However, the cracks in the vertical welds are not structural and the ride can be operated without repairing those weld cracks.

Dartron Industries is hereby requiring Reithoffer Shows to perform weekly inspections of the Cliff Hanger light bars for the remainder of this season. Dartron must be informed if any additional cracks are observed especially cracks in the horizontal welds that attach the flat bar to the bottom of the fixture channel.

Furthermore, Reithoffer Shows must address the cracks in the vertical welds of the light fixture at the end of this season in accordance with requirements that will be developed by Dartron Industries.

Very truly yours,



J. Robert Coil  
President - Dartron Industries

P.O. Box 13114  
SALEM, OREGON 97309

2725 19TH STREET S.E.  
SALEM, OREGON 97302

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Dartron Industries, Inc.	DARTRON INDUSTRIES, INC.	Bulletin # PI03040K-01
	P.O. Box 13114	Release Date: 04-07-2003
	Salem, Oregon 97309	Effective Date: 04-07-2003
	Phone: 503-362-2341	Supercedes: N/A
	Fax: 503-362-2536	Completion Date: None
		Page 1 of 2

## PRODUCT IMPROVEMENT

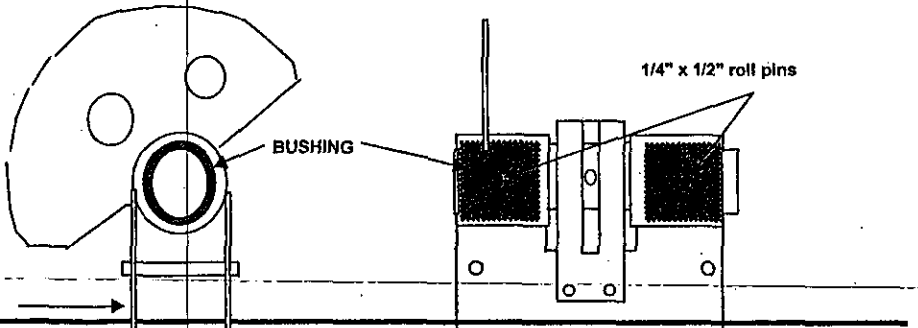
<b>Ride Manufacturer:</b> Dartron	<b>Affected Production Dates:</b> Apply as necessary
<b>Ride Name:</b> Cliff Hanger	<b>Affected Serial #'s:</b> Apply as necessary
<b>Model Number:</b>	
<b>Summary Of Issue:</b> Some Cliff Hanger rides have experienced a squeek noise from the car hanger block shaft and bushing. This bulletin discusses a method to lubricate the hanger block shaft if necessary.	
<b>Reason For Release:</b> The squeek noise is not detrimental to the Cliff Hanger ride. This bulletin is intended to assist those who choose to eliminate the noise.	
<b>Action to be taken:</b> See attached diagram	
<b>Detail of issue:</b> See attached diagram	

**CLIFF HANGER BULLETIN PI03040K-02**  
**LUBRICATION OF UPPER AND LOWER HANGER BLOCK PINS**

**STEP I:**

Use the previously installed 1/4" roll pins as ports to inject lubricant onto the upper hanger block shaft. Lubricate shaft with any chain lubricant that is clear and non-foaming. Lubricant should be similar to Maxima Products Chain Guard which is used for chain care. Using the plastic nozzle extension, spray lubricant into roll pins while rotating the hanger block on its shaft.

UPPER HANGER BLOCK



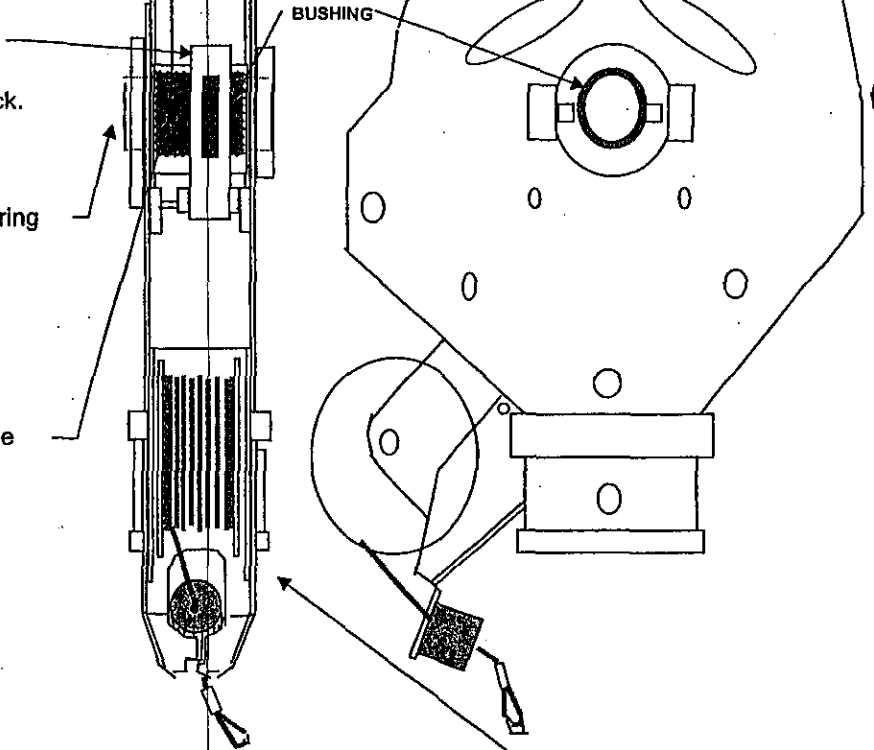
UPPER HANGER BLK

LOWER HANGER BLOCK

**STEP II:**

To lubricate the lower hanger block shaft a roll pin must be installed. To install the roll pin follow the instructions below;

- 1 Remove safety strap held in place with 2 bolts.
- 2 Disconnect shock absorber from lower hanger block.
- 3 Remove hanger block shaft by removing the snap ring and the cotter pin. Remove the hanger block shaft. Remove the lower hanger block.
- 4 Drill 1/4" hole thru the lower hanger block shaft tube and thru its bushing. Drill hole 1" from edge and centered. Insert 1/4 x 1/2" roll pin and re-install lower hanger block.



LOWER HANGER BLK

**STEP III:**

Use the previously installed 1/4" roll pin as a port to inject lubricant onto the lower hanger block shaft. Lubricate shaft with any chain lubricant that is clear and non-foaming. Lubricant should be similar to Maxima Products Chain Guard which is used for chain care. Using the plastic nozzle extension, spray lubricant into roll pin while rotating the hanger block on its shaft.

Dartron

Issuing Entity:  
Dartron Industries, Inc

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Bulletin # SR-5K-002

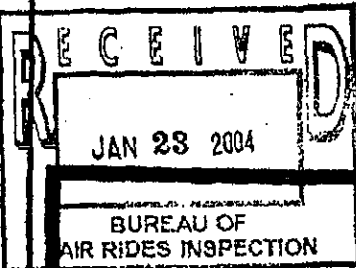
Release Date: January 23, 2004

Effective Date: January 22, 2004

Supersedes: N/A

Completion Date: None

Page 1 of 2



# SAFETY BULLETIN

<u>Ride Manufacturer: Dartron Industries, Inc.</u>	<u>Affected Production Dates: All</u>
<u>Ride Name: Cliff Hanger</u>	<u>Affected Serial #'s: All</u>
<u>Model #'s: All</u>	

**Abstract of Issue:** An incident occurred on a Cliff Hanger ride operating in Florida. The cause of the incident is unknown at this time. The incident resulted from a failure in the Car Hanger Stem. The Car Hanger Stem is shown in Attachment I. As shown the Stem is connected to the Arch Assembly with four gussets that are welded to the Stem and the Arch Assembly. The failure occurred at the attachment point of the gussets to the Stem.

**Reason for release:** At this moment in time Dartron Industries is not able to determine the cause of the failure but to ensure that there is no other occurrence Dartron is requiring all Cliff Hanger owners to take the actions detailed below:

**Action to be taken:**

1. No Cliff Hanger is to be operated until the requirements of steps 2 through 6 are satisfied.
2. All welds and the heat effected areas adjacent to the welds on the gussets that attach the Stem to the Arch Assembly on each of the 10 car hanger Stems must be inspected by a certified Level II NDT Inspector using the Magnetic Particle Method. Contact Dartron at 800-421-5752 for NDT Inspection Forms. Using the Dartron supplied forms the NDT Inspector must submit a written report to Dartron documenting the result of the NDT inspection.
3. Dartron will determine from the NDT inspection report if the structural integrity of the gusset joint has been compromised.
4. If Dartron determines that the structural integrity of the joint has been compromised the defect must be remedied in a manner satisfactory to Dartron before the Car Hanger Stem can be used on the ride.
5. Each Car Hanger Stem must have a Dartron approved back-up system for the stem gusset joint. Dartron approved back-up systems include, a cable inserted inside the stem and attached to the passenger carrier or other Dartron designed and approved devices.
6. After Dartron has determined that the Cliff Hanger stem gusset joints have the desired structural integrity and a Dartron approved back-up the Cliff Hanger will be approved by Dartron as safe to operate and can be reopened subject to requirements of local jurisdictions and your insurance carrier.



RECEIVED  
 JAN 28 2004  
 BUREAU OF  
 FAIR RIDES INSPECTION

JAN 23 04 02:52P

DARTRON INDUSTRIES

503 362 2536

P.3

SWEDGE

STEM

GUSSET

ARCH ASSEMBLY

FORWARD

SAFTY  
CABLE

AJUSTMENT  
LUG

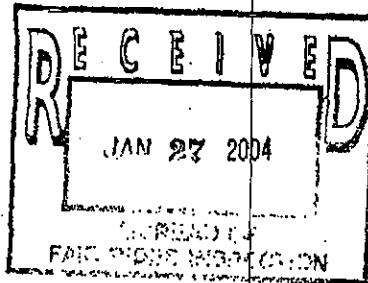
STRUT

REAR

PAGE 2 OF 2 BULLETIN # SR-5K-002

DARTRON IND., INC. P.O. BOX 1000 1000 W. 10TH ST ST. LOUIS, MO 63103	REVISIONS AND CHANGES			DATE 08-02-04	DRAWN BY NTS	CHECKED BY SM
	NO. OF REVISIONS 2	REVISIONS 1	DATE 08-02-04			
TITLE CLIFFHANGER CAR			PART NO. SR-5K-002	QUANTITY 2/2	DRAWN BY NTS	CHECKED BY SM
MANUFACTURED BY DARTRON			PART NO. SR-5K-002	QUANTITY 2/2	DRAWN BY NTS	CHECKED BY SM

**Dartron**  
INDUSTRIES, INC.



January 26, 2004

Mike Rineheart  
Ride Safety  
State of Florida

Dear Mike,

I am responding to your e-mail on the safety back up for the Cliff Hanger stem. Some of the drawings I am sending are too large to be sent as e-mail so I am faxing the information.

The joints that Dartron determined needed back up on the Cliff Hanger before this incident were:

**Upper Hanger Block to Sweep** - (See Page 1 Number 1 and Passenger Carrier Inspection Guide balloon # 1) The Upper Hanger block is suspended from a shaft located in the sweep. A hole is drilled through the sweep and the shaft and a bolt is inserted through the sweep and the shaft. The bolt is held on by locking hardware and has a cotter pin in the end of the bolt to assure the bolt does not come out.

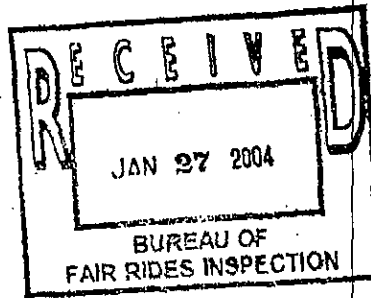
If the ride were to be worked on by a ride operator and reassembled without the bolt the shaft could not work its way out because the shock absorber mounting bracket blocks its movement in one direction and a welded tab block its movement in the other direction. (See Page 2 Number 2 and Passenger Carrier Inspection Guide)

If for a reason I can't imagine the shaft would come out the Upper Hanger block would be suspended from the sweep by a steel loop. (See page 3 Number 3 and Passenger Carrier Inspection Guide balloon # 1) We have tested this loop on a ride and it is more than adequate to support a loaded car for many cycles.

None of the components discussed above are removed as part of ride setup or tear down.

**Upper Hanger Block to Lower Hanger Block** The Lower Hanger Block is attached to the Upper Hanger Block with a shaft that passes through both components. The shaft is retained on one end by a roll pin and by a bolt on the other end. Snap rings installed on either end of the shaft back up these devices. This results in three back up devices for each direction of movement of the shaft. (See Passenger Carrier Inspection Guide balloon # 4)

If, for a reason I can't imagine the shaft were to work its way out the Lower Hanger Block would be suspended from the Upper Hanger Block by a safety strap. This strap has been tested and is more than adequate to support a loaded car for many revolutions. (See Page 4 Number 4 and Passenger Carrier Inspection Guide balloon # 3)



Page Two  
Mike Rineheart

January 26, 2004

**Lower Hanger Block to Car Hanger Stem** This is the only connection that the Carnival worker assembles as part of set up and tear down. The Car Hanger Stem is attached to the Lower Hanger Block with a primary pin. The primary pin is held in place with a linch pin. The back up is a secondary pin below the primary pin that is secured with an R key. (See Page 5 No. 5 and Passenger Carrier Inspection Guide balloon # 5)

To create a solid pin location Dartron welds a piece of pipe inside the stem that the primary pin passes through. The pipe is welded inside and out. (See page 5 number 5)

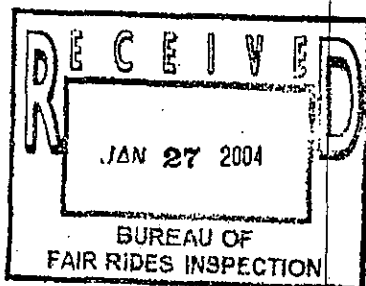
This is the only attaching point that is assembled and disassembled in the set up and tear down process.

**Car Hanger Arch Assembly to Car** This is a bolted joint that is not taken apart by the Carnival worker. The joint consists of a four-point joint. It includes the two struts and the two ends of the arch assembly bolted to the car. (See Page 5 Number 6 and Passenger Carrier Inspection Guide balloon # 6)

The first Cliff Hangers manufactured backed up the Arch Assembly to Car connection with a chain attached to the adjustment lug (See Page 5 number 7) and the car frame. At a later point in the manufacturing process we changed from the chain as a back up to the Arch Assembly to Car connection to a factory installed cable back up. (See Passenger Carrier Inspection Guide balloon # 10) To allow the cable to be inserted into the Arch Assembly a hole must be cut in the Arch Assembly. The cable is then routed over the top of the pipe that is welded inside the stem. One cable end is routed down the inboard Arch Assembly tube and the other cable end is routed down the outboard Arch Assembly tube. Both cable ends exit the Arch Assembly and are attached to the car using a crimped oval sleeve.

If a failure occurs the cable that is supported by the primary stem pin and the welded tube will suspend the car. This condition has been tested and the cable will safely suspend the car and its passengers.

**Stem to Arch Assembly Gusset Joint** This is an over-designed joint in which we never anticipated a failure. All ride-induced stresses were carefully analyzed and, as a safety factor, the joint was designed much stronger than required. We strengthen the joint further by welding on both sides of the gussets. However, events occurred that we did not anticipate that resulted in a failure of the gusset joint. Therefore, it needs a back up device. At our plant we have simulated a failure of both sets of gussets. The factory installed cable functions effectively to safely suspend the car and its passengers after a complete detachment of the gussets. Based on these tests we have determined that the factory-installed cable is an excellent back up to the Stem to Arch Assembly Gusset Joint.



Page Three  
Mike Rineheart

January 26, 2004

**Retrofit Arch Assembly Support Strap and Cable** The chain back up device for the Arch Assembly to Car connection does not back up the Stem to Arch Assembly Gusset Joint. Cliff Hangers with the chain require the addition of a back up device. Units with a chain back up do not have holes coped into the Arch Assembly that are required to allow the factory installed cable to be routed as explained above. For this reason we are requiring Cliff Hanger rides that do not have factory installed cables to install a steel strap under the Arch Assembly and to attach the strap to the stem and the welded pipe. Additionally, cables must be inserted into the Arch Assembly and attached to the car frame with a cable clamp. The retrofit cable cannot loop around the pipe welded into the stem as does the factory installed cable but, with the retrofit cable routed through the retrofitted strap all parts of the Car Hanger Stem and Arch Assembly are backed up by a Dartron tested and approved back up device. This device will back up all Stem failures. (See Page 6 for pictures of the retrofit strap and cable)

**Inspection For Back Up Devices**

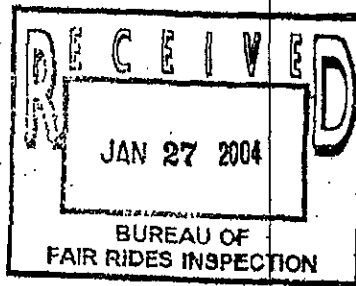
Inspection to determine the ride has a factory installed cable.

- 1) The cable will exit the bottom of the tube.
- 2) The cable is connected to the car with oval sleeves.
- 3) If in doubt unpin and drop the car and look inside the stem. The cable must be visible routed around the welded pipe in the stem.

Inspection to determine that the retrofit Arch Assembly Support Strap and cable are installed.

- 1) Visually check for the external strap under the Arch Assembly.
- 2) Unpin and drop the car to verify that the top portion of the support strap is installed.
- 3) Visually inspect for a cable exiting the small hole at the bottom of the Arch Assembly. The cable must be attached to the car using Cable Clamps as shown in Page 6.

A visual inspection will easily identify the presence of a cable and it is easy to tell the factory-installed cables from the retrofit cables.



Page Four  
Mike Rineheart

January 26, 2004

**Dartron Bulletins**

<u>Bulletin #</u>	<u>Status</u>	<u>Subject</u>
SR-5K-002	Released	Requires NDT inspection and Dartron Approved Back up for Gusset joint.
SR-5K- (Page 6)	In Process	Describes Retrofit Back Up Arch Assembly and Cable.

**Cliff Hangers in Florida That Must Install Retrofit Back Up**

Eight Cliff Hangers in the United States will require the retrofit strap and cable. Of that number three are currently operating in Florida and AOA may come to Florida:

Amusements of America (They have two. The one in Miami with Billy Bob has a factory-installed cable. The one in Puerto Rico need the retrofit)

Astro Amusements Needs the retrofit

Reithoffer Amusements Needs the retrofit

Bluegrass Shows Needs retrofit

**NDT Inspection Reporting Forms**

I have attached three pages of our 12 page NDT requirements document. The additional nine pages are for the remaining nine sweeps.

Mike, I am sorry this letter is so long but I wanted to get as much information to you as rapidly as possible. Please call me if you have questions.

Best regards,

J. Robert Coil  
President - Dartron Industries

Attachments: Page 1 thru 6 & Passenger Carrier Inspection Guide



PAGE 1

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INSPECT FASTENERS  
 & CUTTER PINS ON  
 A DAILY SCHEDULE  
 BEFORE OPERATING  
 RIDE.

VISUAL OBSERVATION TO  
 BE FROM END OF SWEEP  
 NEAR ENOUGH TO CLEARLY  
 SEE FASTENERS & RETAINING  
 PINS ARE SECURE.

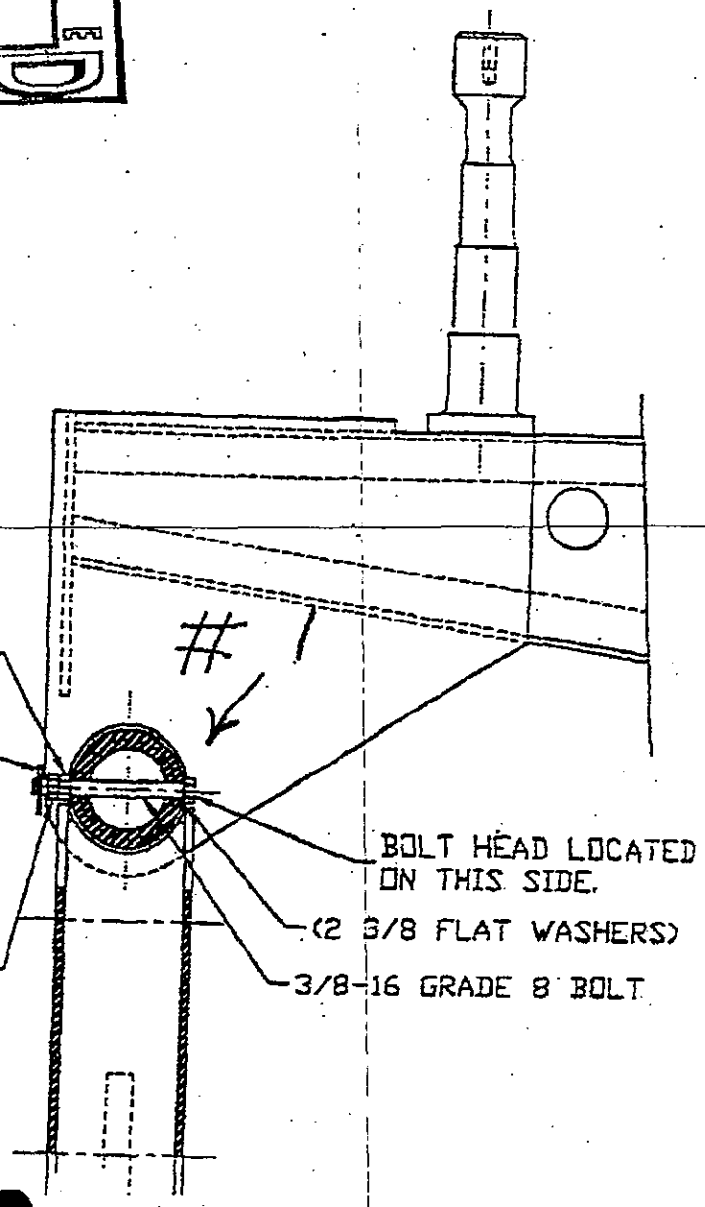
3/8-16 GRADE 8 NUT

COTTER PIN

IFI# 20376-C8  
 3/8-16 GRADE 8  
 TOP LOCK NUT

OR

FAST END # 37264  
 3/8-16 NUT

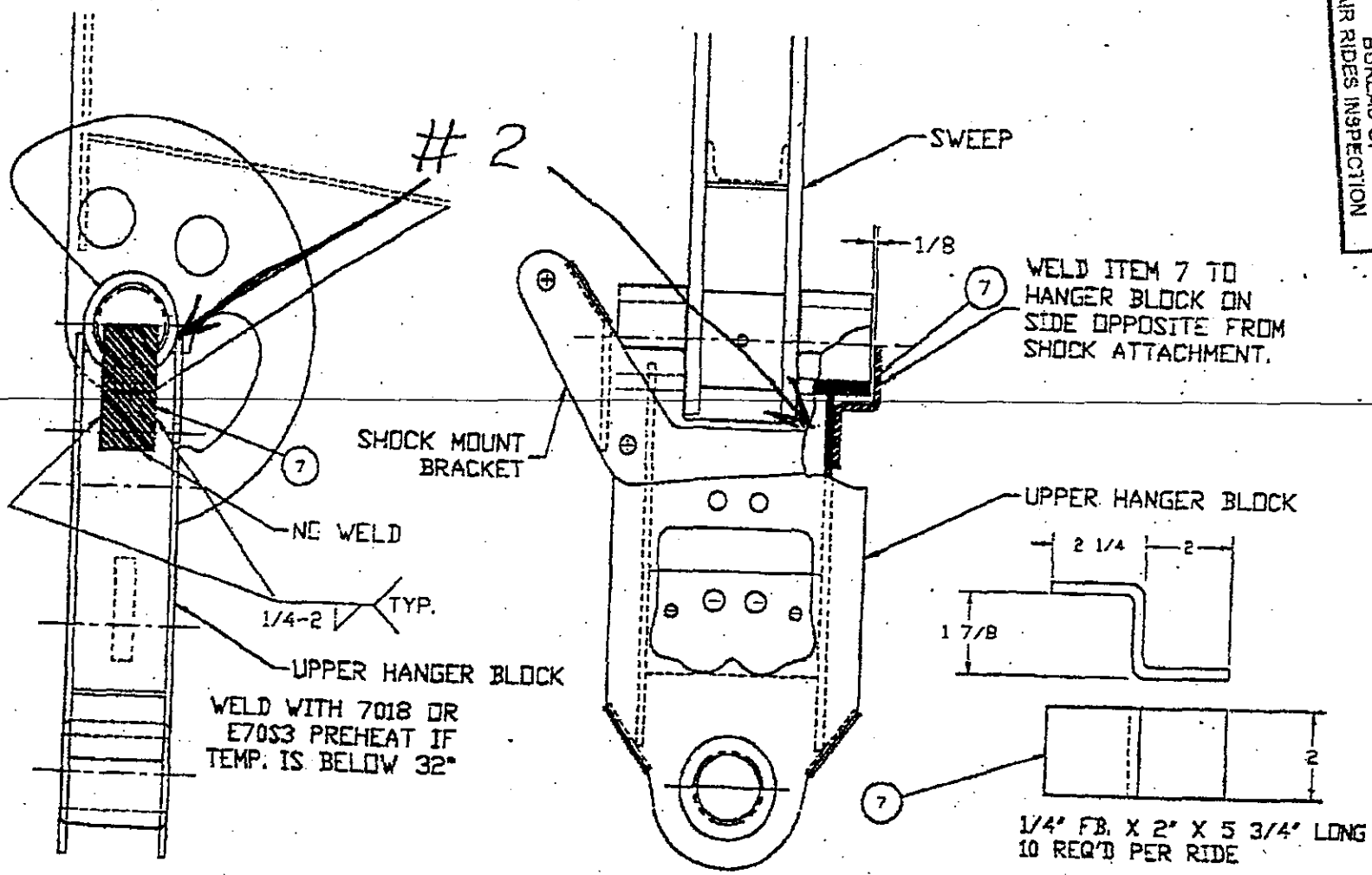


BOLT HEAD LOCATED ON THIS SIDE.

(2 3/8 FLAT WASHERS)

3/8-16 GRADE 8 BOLT.

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WELD WITH 7018 OR E70S3 PREHEAT IF TEMP. IS BELOW 32°

7 PIN STOP FOR UPPER HANGER BLOCK PIN



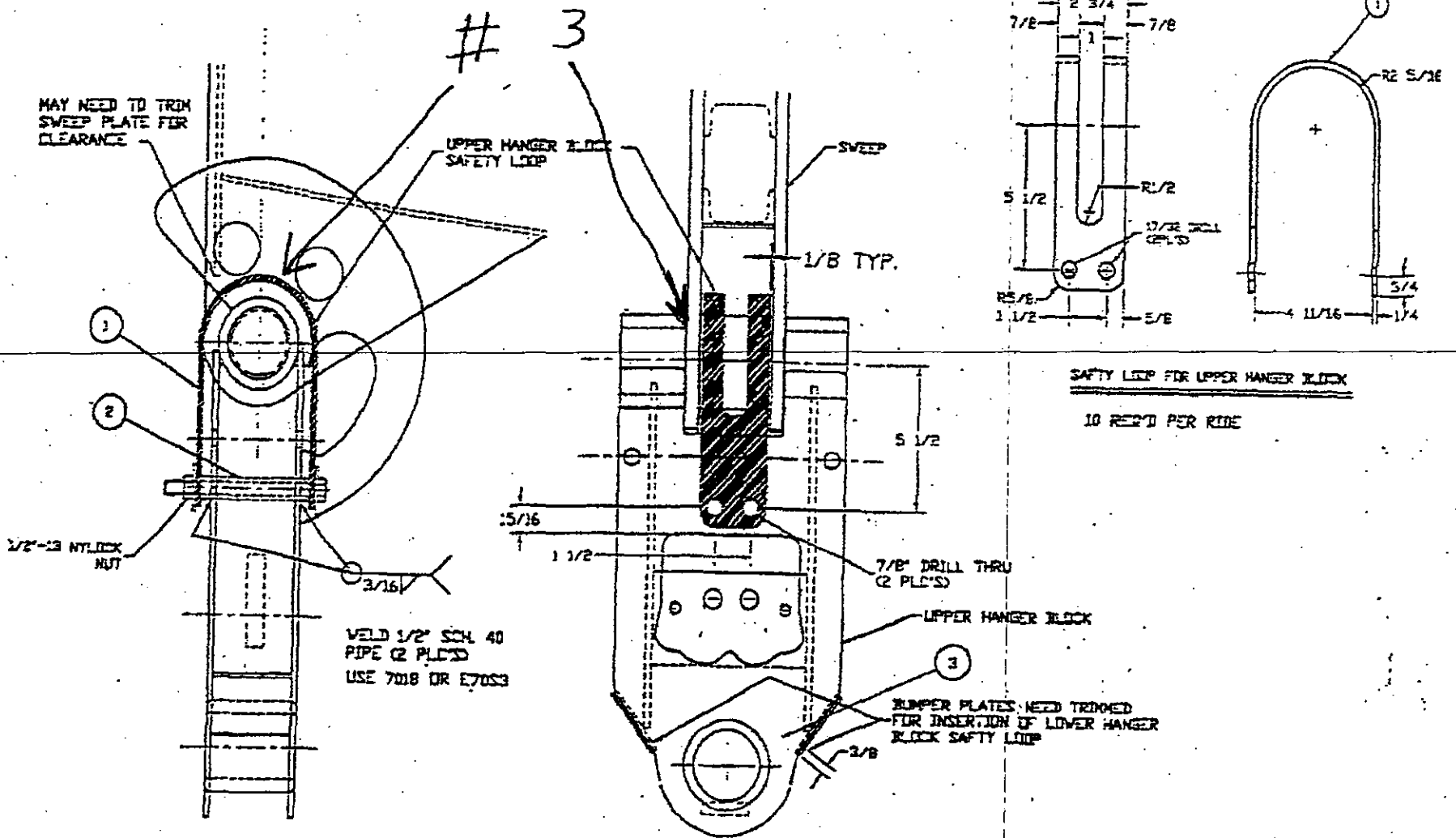
**RECEIVED**  
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 FAIR RIDES INSPECTION

Page 3

JAN 27 04 06:40a  
 DRRIRON INDUSTRIES

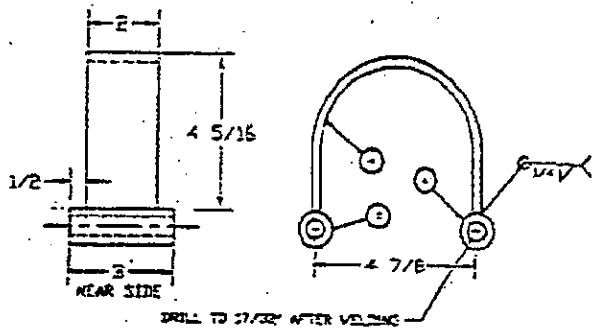
503 362 2536

P.8

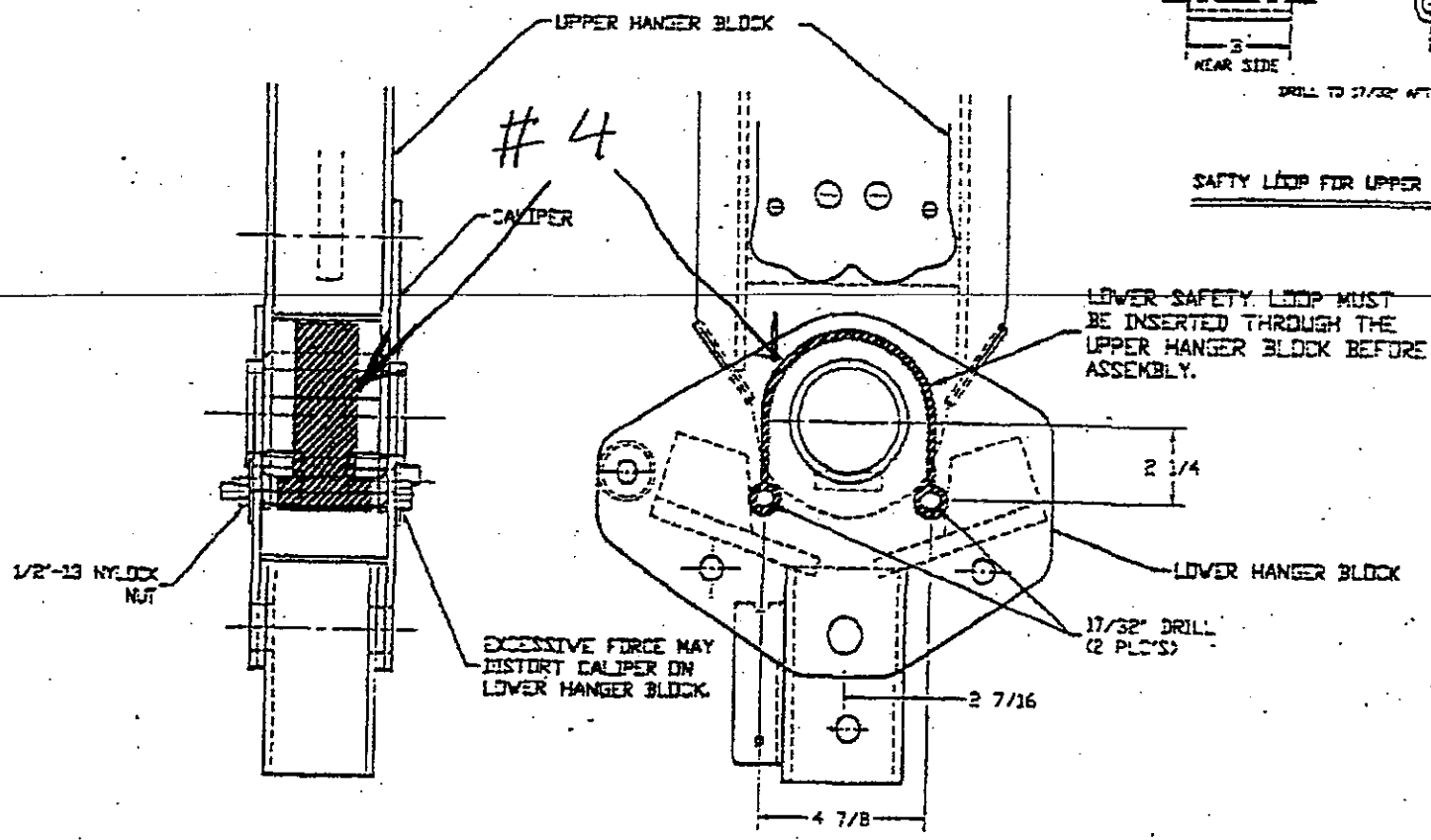


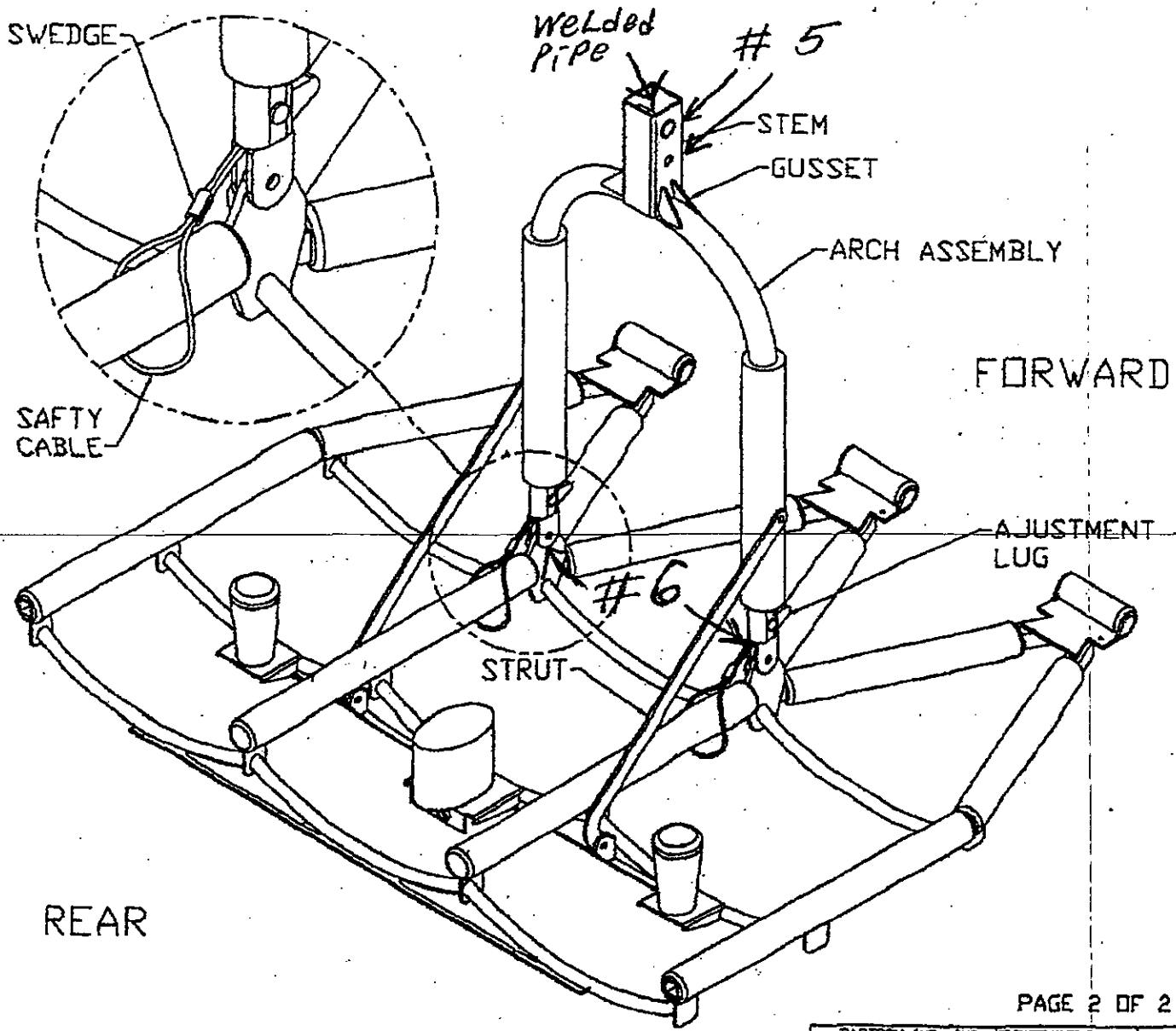
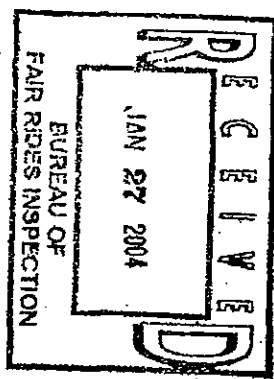
Page 4

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 JAN 27 2004  
 BUREAU OF  
 FAIR RIDES INSPECTION



SAFETY LOOP FOR UPPER HANGER BLOCK



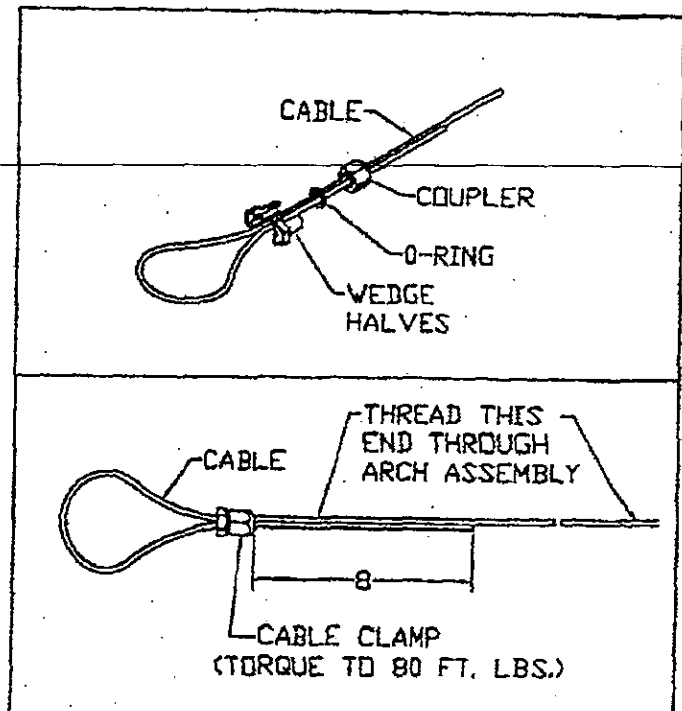
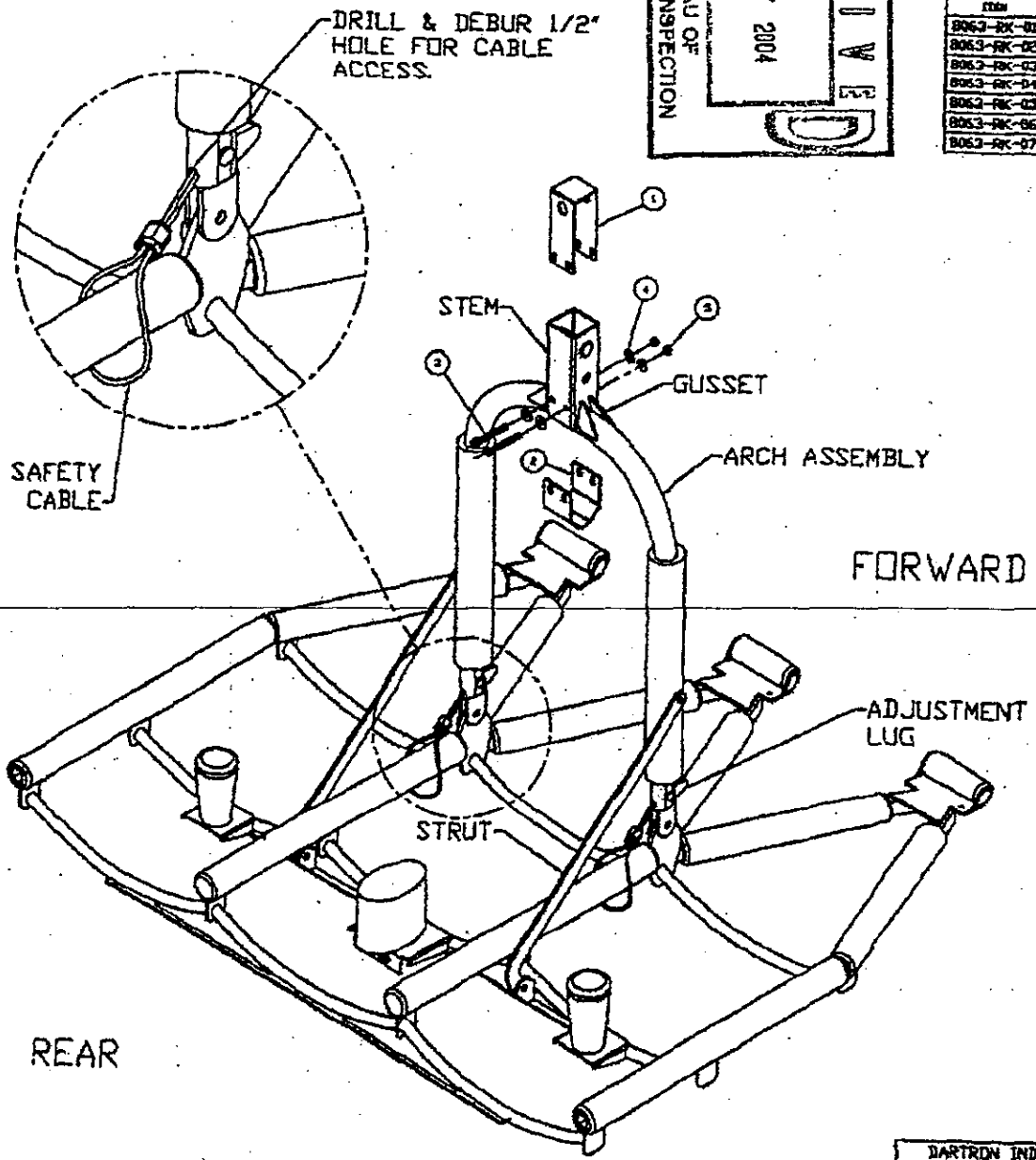


PAGE 2 OF 2 BULLETIN # SR-5K-002

DARTRON IND., INC. P.O. BOX 1000 SALEM, OR 97308 DIV. OF INTERNATIONAL FERRIS WHEEL CO., P.O. BOX 1000, SALEM, OR 97308	PLANNED MAINT. WORK REPAIRS PARTS OTHER	CLIFFHANGER CAR DARTRON	DATE 01-27-04	BY [Signature]	CHECKED BY [Signature]
	SR-5K-002	2/2	0		

BUREAU OF  
 FAIR RIDES INSPECTION  
 JAN 27 2004

ITEM	QTY.	DESCRIPTION	LENGTH	OPER.	COMMENTS	USED
8063-RK-01	1	10 GA SHEET X 2 1/2"	15 5/8"		FORM	
8063-RK-02	1	10 GA SHEET X 2"	8 7/8"		FORM	
8063-RK-03	2	3/8 NC-16 GRADE 8 BOLTS				
8063-RK-04	4	3/8" STAINLESS STEEL FLAT WASHER				
8063-RK-05	2	3/8 NC-16 NUT				
8063-RK-06	2	3/16 STAINLESS STEEL AIRCRAFT CABLE				
8063-RK-07	2	3/16 WIRE ROPE CLAMP				



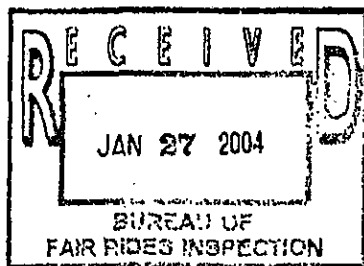
DARTRON IND., INC. P.O. BOX 6244 WILKINSON, DE 19789		MANUFACTURED UNDER PATENT PATENT NO. 6,877,899	PASSENGER CARRIER	DATE: 01-26-04	SCALE: N/A	DRAWN BY:
MADE IN THE UNITED STATES OF AMERICA 100% U.S. CONTENT		1 3/8" 1/2"	DARTRON	PART NO.: 8063-RK	SHEET: 2/2	REV: 0

Attention NDT Inspector:

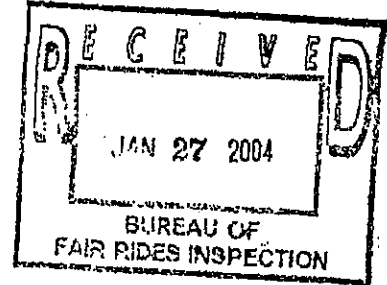
Perform a Mag-particle inspection procedure on the welds and heat-affected zones on the four gussets that attach to the stem (3" square tube) and the arch assembly (formed 1 1/2" pipe).

Included in this packet, you will find an NDT inspection report form and ten diagram sheets. Use these forms to record your findings. Use a separate diagram sheet for each stem that is found to show any defects. We ask that you include as much detail as possible in order to help us to evaluate the condition. If no indications are found on a particular stem, it is not necessary to submit a diagram sheet for that stem. Please identify the stem by the number of the car it is attached to in the space provided on the diagram sheet.

Thank you for your cooperation.



DARTRON INDUSTRIES INC.  
NDT INSPECTION REPORT  
CLIFFHANGER HANGER STEM



DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_

CUSTOMER NAME: \_\_\_\_\_

SERIAL NUMBER OF CLIFFHANGER: \_\_\_\_\_

DATE OF MANUFACTURE: \_\_\_\_\_

MT Results: Surface Preparation: \_\_\_\_\_

Instrument Make: \_\_\_\_\_ Model: \_\_\_\_\_ Serial # \_\_\_\_\_

Dry \_\_\_\_\_ Wet \_\_\_\_\_ Visible \_\_\_\_\_ Fluorescent \_\_\_\_\_

Residual \_\_\_\_\_ Continuous \_\_\_\_\_

AC \_\_\_\_\_ DC \_\_\_\_\_ Permanent Magnet \_\_\_\_\_

Procedure \_\_\_\_\_ Code \_\_\_\_\_

Discontinuities Discovered on: (Number of Stems) \_\_\_\_\_  
(Indicate location & dimensions of discontinuities on supplied diagrams)  
(Please use a separate sheet for each stem)

Inspector: Name: \_\_\_\_\_ SS#: \_\_\_\_\_

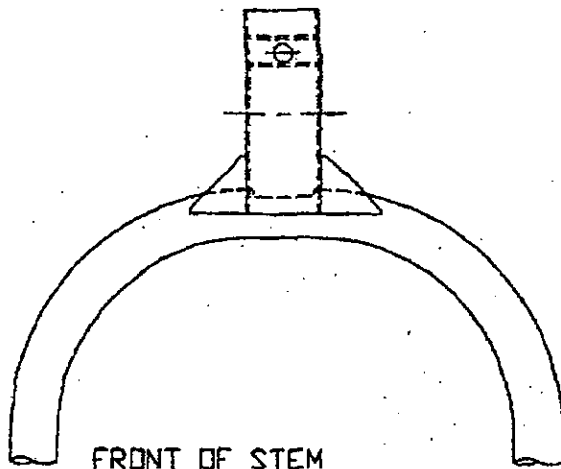
Certification Level: \_\_\_\_\_ Certification Date: \_\_\_\_\_

Employer: \_\_\_\_\_ Supervisor's Name: \_\_\_\_\_

I, the undersigned, certify that the statements in this report are correct and that the test areas were prepared and tested in conformance with the requirements of AWS D1.1 (\_\_\_\_\_) (year)

Inspector's Signature: \_\_\_\_\_

STEM # \_\_\_\_\_



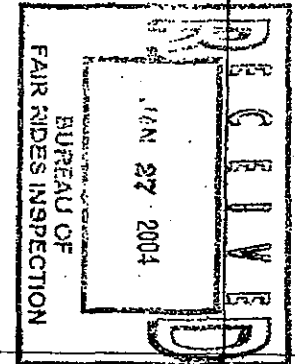
FRONT OF STEM  
FACING TOWARD CHIN REST

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



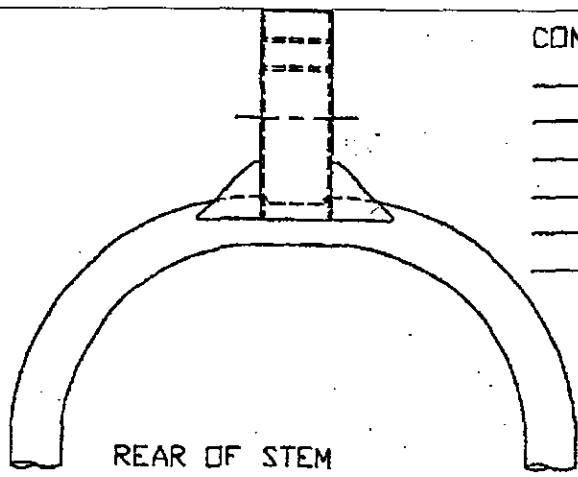
INBOARD OF STEM  
FACING TOWARD RIDE

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



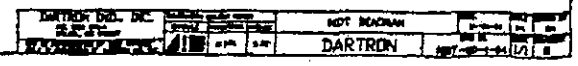
OUTBOARD OF STEM  
FACING AWAY FROM RIDE

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



REAR OF STEM  
FACING TOWARD LATCH

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



04-01A

Dartron

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114  
Salem, Oregon 97309  
Phone: 503-362-2341  
Fax: 503-362-2536

www.dartronrides.com

Bulletin # SR-5K-003

Release Date: January 27, 2004

Effective Date: January 27, 2004

Supersedes: N/A

Completion Date: Before Operating

Page 1 of 3

## SAFETY BULLETIN

Ride Manufacturer: Dartron Industries, Inc.  
Ride Name: Cliff Hanger

Affected Production Dates: 08/98 - 08/99  
Affected Serial #'s: 806081-5K, 807121-5K, 810061-5K,  
810283-5K, 901011-5K, 902221-5K, 903021-5K,  
903272-5K, 905101-5K.

**Abstract of Issue:** As a result of an incident involving a Cliff Hanger ride in Florida Dartron is now aware that after a combination of events the Car Hanger Stem to Arch Assembly joint could fail. For this reason Dartron is requiring that all Cliff Hanger rides have a back up device that will support the car and its passengers in the event of a separation of the Arch Assembly from the Stem. Tests conducted by Dartron demonstrate that the factory-installed Arch Assembly to Car joint back up cable will safely suspend the car and its passengers in the event of a failure of the Stem to Arch Assembly joint. To identify the joint see Page 2 of this Bulletin and for more information on the factory installed cable see Page 3 of this Bulletin.

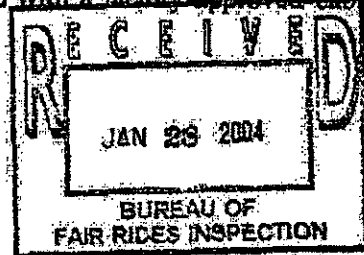
The factory-installed cable is an approved back up device for the Stem to Arch Assembly joint. No action is required for Cliff Hanger rides with a factory-installed cable.

The Cliff Hanger rides listed above have a different back up device for the Arch Assembly to Car joint and do not have factory-installed cables. The above listed Cliff Hanger rides must install the back up device described in this Bulletin as a back up for the Arch Assembly to Stem joint.

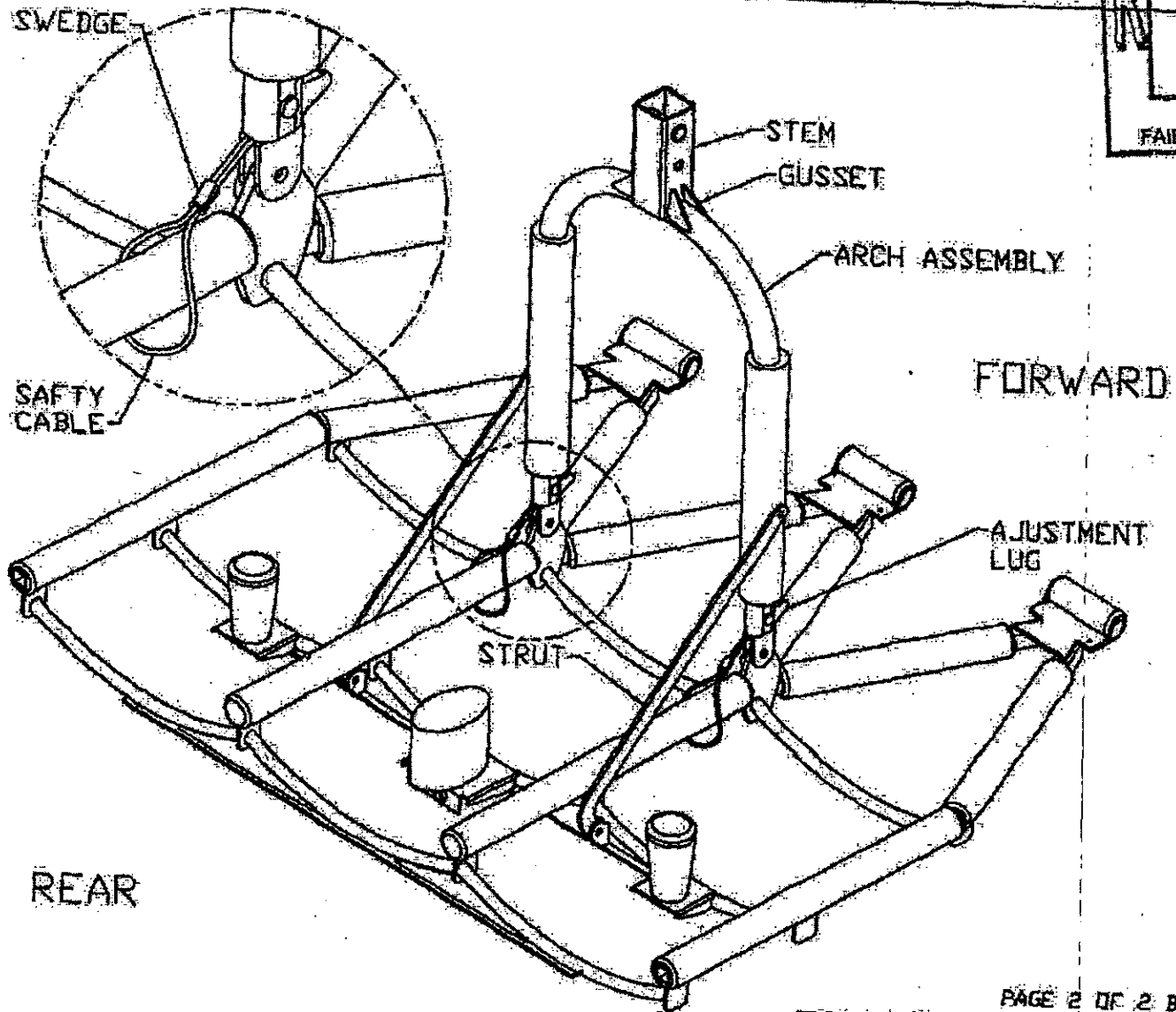
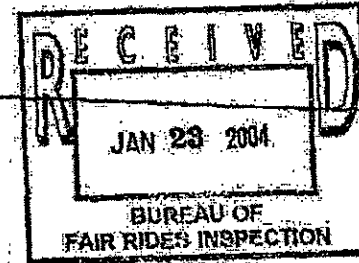
**Reason for release:** To ensure that the Cliff Hanger rides not equipped with a factory approved cable retrofit the Dartron approved back up device described herein.

**Action to be taken:**

1. The retrofit back up device must be ordered from Dartron Industries.
2. The back up device consists of:
  - a) Arch Assembly to Stem strap.
  - b) Stem to Welded Pipe strap.
  - b) Cable that is inserted through the Arch Assembly and attached to the car. Cable does not enter the stem.
3. Install the Back Up device as shown on Page 2 of this Bulletin.





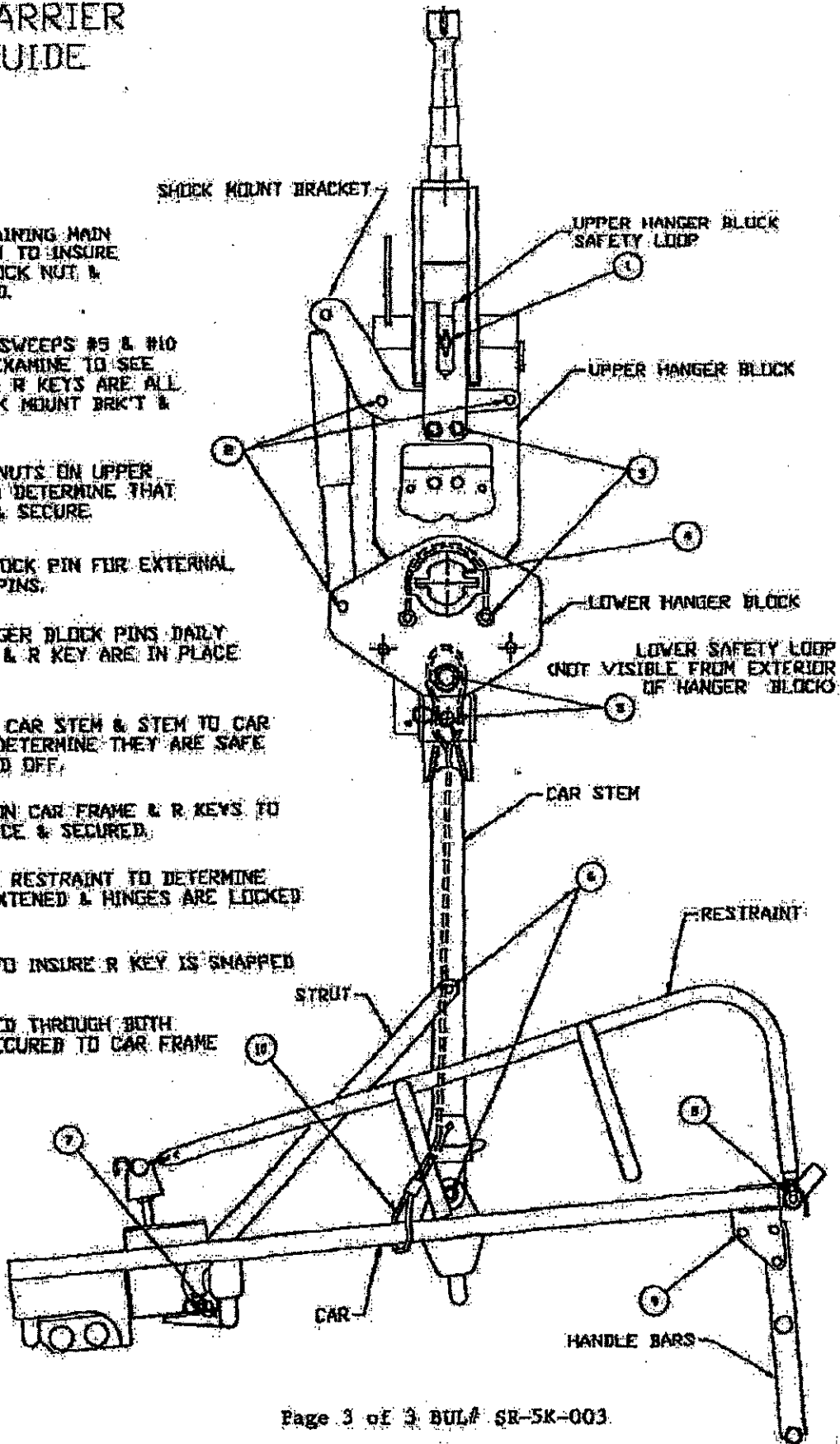


PAGE 2 OF 2 BULLETIN # SR-5K-002

DARTRON IND., INC. 40 1ST ST MILWAUKEE, WI 53212 TEL: 414-224-1100 FAX: 414-224-1101	REVISIONS		CLIFFHANGER CAR	REV. NO.	DATE	BY	CHKD BY
	NO.	DESCRIPTION					
	1	ISSUE	DARTRON	SR-5K-002	1/2/04		

# PASSENGER CARRIER INSPECTION GUIDE

- 1 INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO INSURE 1/2" BOLT JAM NUT, NYLOCK NUT & CUTTER PIN IS INSTALLED.
- 2 SHOCK MOUNT BRK'TS ON SWEEPS #9 & #10 HAVE REMOVABLE PINS, EXAMINE TO SEE THAT PINS ARE SECURE & R KEYS ARE ALL INSTALLED IN BOTH SHOCK MOUNT BRK'T & LOWER HANGER BLOCK.
- 3 CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFETY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.
- 4 CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.
- 5 CHECK CAR STEM TO HANGER BLOCK PINS DAILY VERIFY THAT LYNCH PIN & R KEY ARE IN PLACE & PINS ARE SECURE.
- 6 CHECK MODIFIED BOLT IN CAR STEM & STEM TO CAR BOLT & NYLOCK NUT TO DETERMINE THEY ARE SAFE & NUTS HAVE NOT BACKED OFF.
- 7 CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURED.
- 8 EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & HINGES ARE LOCKED IN PLACE.
- 9 CHECK CAR HANDLE PIN TO INSURE R KEY IS SNAPPED IN PLACE.
- 10 SAFETY CABLE IS THREADED THROUGH BOTH SIDES OF CAR STEM & SECURED TO CAR FRAME



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 JAN 28 2004  
 BUREAU OF  
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AFTER 02-01		CARRIER INSPECTION SHEET		INSPECTOR	DATE
INSPECTOR	DATE	INSPECTOR	DATE	DATE	TIME
INSPECTOR	DATE	INSPECTOR	DATE	DATE	TIME
INSPECTOR	DATE	INSPECTOR	DATE	DATE	TIME

04-03

Dartron

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114  
Salem, Oregon 97309  
Phone: 503-362-2341  
Fax: 503-362-2536

www.dartronrides.com

Bulletin # SR-5K-004

Release Date: January 27, 2004

Effective Date: February 1, 2004

Supersedes: N/A

Completion Date: April 1, 2004

Page 1 of 2

# SAFETY BULLETIN

RECEIVED  
JAN 20 2004

BUREAU OF  
FAIR RIDES INSPECTION

Ride Manufacturer: Dartron Industries, Inc.

Ride Name: Cliff Hanger

Model #'s: All

Affected Production Dates: All Cliff Hanger Rides

Affected Serial #'s: All

**Abstract of Issue:** Dartron is aware that some Cliff Hanger operators have experienced bent car Hanger Stems. Bent stems can result from lowering the car transport rack without removing pins that attach the Car Stabilizer Cross Tube to the car transport rack. See Page 2 of this Bulletin. Using the damaged stems can result in a failure of the stem and possibly injury to guests.

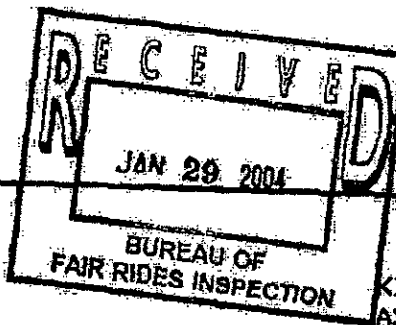
A damaged Car Hanger stem must be replaced if two people manually lifting the car cannot insert it into the receiver tube on the lower hanger block. Forcing the stem into and out of the receiver tube by the use of extreme force can damage the stem joints and in expensive repairs and possibly an injury.

**Reason for release:** The chain of events that can result in a failure of the Car Hanger Stem starts with the failure to remove pins from the Car Stabilizer Cross Bar before lowering the car rack. This Bulletin requires the use of different Car Stabilizer Cross Bar pins that are difficult not to remove before lowering the Car Rack.

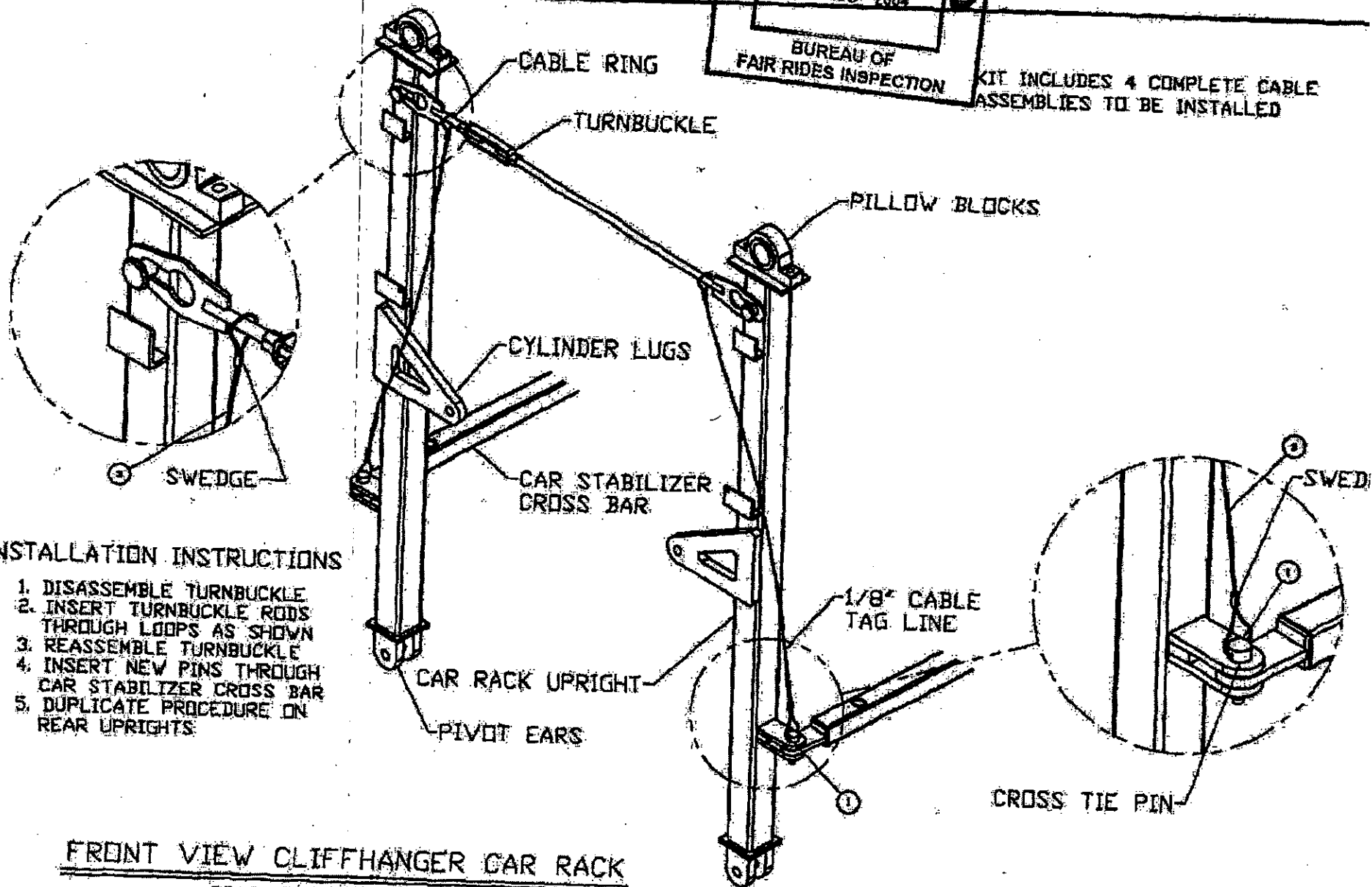
The Bulletin also prohibits the use of damaged Car Hanger Stems that must be forced into and out of the Hanger Blocks.

**Action to be taken:**

1. Four new Car Stabilizer Bar pins with cables attached must be purchased from Dartron.
2. The cables must be attached to the car rack turnbuckles as shown on Page 2 of this Bulletin.
3. After April 1, 2004 the Cliff Hanger car racks must not be operated unless the Car Stabilizer Cross Bar pins are attached to the turnbuckles as shown on Page 2.
4. Damaged Car Hanger Stems must not be used if two individuals manually lifting the car cannot insert them into the Lower Hanger Block.
5. Until the new pins/cables are installed inspection should be especially vigilant against the use of stems that do not fit correctly into the receiver tubes.



KIT INCLUDES 4 COMPLETE CABLE ASSEMBLIES TO BE INSTALLED



### INSTALLATION INSTRUCTIONS

1. DISASSEMBLE TURNBUCKLE
2. INSERT TURNBUCKLE RODS THROUGH LOOPS AS SHOWN
3. REASSEMBLE TURNBUCKLE
4. INSERT NEW PINS THROUGH CAR STABILIZER CROSS BAR
5. DUPLICATE PROCEDURE ON REAR UPRIGHTS

FRONT VIEW CLIFFHANGER CAR RACK  
REAR UPRIGHTS NOT SHOWN

**Lichter, Andreas**

**From:** Rinehart, Michael [rineham@doacs.state.fl.us]

**Sent:** Tuesday, January 27, 2004 4:29 PM

Winchester HI Buzz; Al "CA" Tafazoli; Al (Wiz Fest NJ) Belmont; Andrew (Busch) Damon; Beauford Larry (OK); bwitt@dol.state.ne.us; usaleh@labor.state.ny.us; Lichter, Andreas; amusementrides@buildings.nyc.gov; amusementevaluation@msn.com; RaGlenn72@aol.com; Simon, Jeffrey CPSC; Steve NV Shutt; Steven (PVT P.E.) Elliott; Susan "CPSC" Gabriel; Terry WI Clark; Tim (PVT) Lundy; Tom "CSpc" Carey; Tom CA Allen; Wagner "NC" Clyce; Walt (KY) Dill; waltreiss@shumomo.com; William WI Brann; TOM UK Bartlett; Belmont, Al (Wiz Fest NJ); Bill (AofA) Castgliola; Bill PVT Avery; Bill PVT Carson; Bob "LA" Cate; Brian CANADA Hudson; Charles AMU CLMS Landrum; Charles NE Talbitzer; Cy TSSA Gray; Dan KY Bates; Danny PVT Abner; Dave NV Durkee; Dave NY Rupert; Debbie OH Skufca; Dennis IA Miller; Don OK Hankins; Doug KY Rathburn; Earl NY Logan; Ed NY McQuin; Frank FX Guenther; Gary NE Hirsh; Gary WA Gooler; Gord TSSA Kanani; Herman (NAVAHO) Shorty; Jack CEDAR PT Fletcher; Jack PA Silar; James CA Borwey; James CPSC DeMarco; Jerry SC Butler; Jim (Conklin) Caskey; Jim (PVT) Barber; Joe Gallagher; Joe PA Filoromo; John NE Sheaff; John TSSA Steele; Jonathan NC Brooks; Ken PVT Martin; Lamont PA Peter; Lenny NAARSO Cavalier; Les (HA) Kuratsu; Lewis PVT Merz; Limberg, AL "CPSC"; Linda (Reithoffer) Mason; Magdy RI Guirguis; Marc TSSA Tevyaw; Marcus GA Lovelady; Marion OK Holloway; Mazumdar TSSA Rupak; Michael NJ Triplett; Michael NY Buttino; Mike (Universal) Melhorn; Mike AR Watson; Mike MAH Hupalo; Milt NE Stromer; Mindy (Reithoffer) Dolbus; Mooney MA Mark; Nancy CA Medieros; Penny TSSA Connors; Peter NY Piech; R (NE) Banks; R. Wayne (Shark) Pierce; Ray NAARSO Rieger; Renae NE Hartley; Robert MD McGeeney; Susan CPSC Gabriel; Thomas CPSC Caton

**Subject:** Dartron "Cliffhanger" Bulletin SR-5K-002 and explanation (attached)

We have determined that the Dartron Cliffhangers will be allowed to operate in Florida subject to the following inspection requirements and criteria.

1. we accept the fix as the manufacturer suggests, (copy is attached with bulletin, .tif format, see below)
2. In order to remove a Red Tag, or approve any previously un-inspected Dartron Cliffhanger to operate, in each case we will:
  - a. Obtain a copy of the completed NDT Inspection Report on Dartron's form (blank is attached) even on the newer reconfigured rides an NDT is required for it to operate.
  - b. Obtain a copy of Dartron's written approval of the fix, or that it is safe to operate, on each ride
  - c. Our inspectors will visually verify the fix has been accomplished as described in the bulletin or that the ride is already configured properly.

The exact cause of the failure is still under investigation and that information will be released when it becomes public record.

If you have any questions regarding this please don't hesitate to write or call me.

Mike Rinehart

Florida Bureau of Fair Rides Inspection

(850) 922-2330

<<Dartron Industries\_Cliffhanger.TIF>>

**Dartron**  
Salem, Oregon 97309

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114

Phone: 503-362-2341

Fax: 503-362-2536

www.dartronrides.com

Bulletin # PI-04020K-02

Release Date: February 27, 2004

Effective Date: February 26, 2004

Supercedes: N/A

Completion Date: April 1, 2004

Page 1 of 2

## PRODUCT IMPROVEMENT

Ride Manufacturer: Dartron Industries, Inc.	Affected Production Dates: All
Ride Name: Cliff Hanger	Affected Serial #'s All
Model # All	

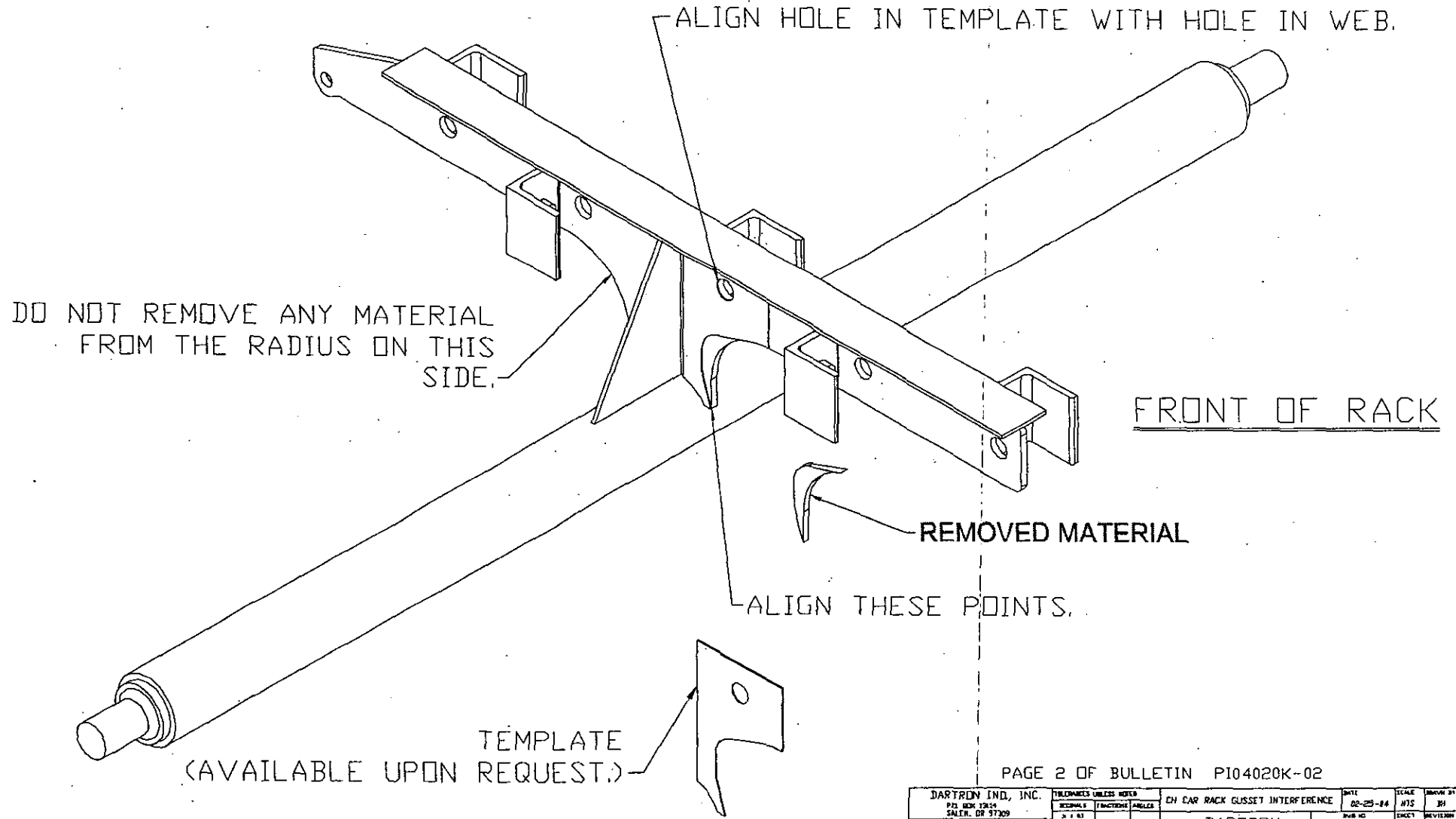
**Abstract of Issue:** Dartron has designed a more robust car hanger for the Cliff Hanger ride. The more robust car hanger locates the gussets on the front and rear faces of the square and round tubes. At one location in the car transport rack this gusset configuration creates an interference with the car transport rack. The only location where this interference is experienced is the third position in on both the driver and passenger side car transport racks. To be able to transport the more robust car hanger in the third position in either transport rack a modification must be made to the rack.

**Reason for release:** To inform Cliff Hanger owners who receive the more robust car hanger of the interference problem and to provide information on the procedure to be followed to correct the interference.

### Action to be taken

1. Dartron will provide a template to be used to identify the material that should be removed from the car transport rack.
2. Place the template on the web of a transport rack. See Page two.
3. Align the hole in the template with the hole in the web and align the bottom point of the template with the similar point on the web. See Page two.
4. Mark the material to be removed.
5. Material can be removed by use of a grinder or by either an Oxygen Acetylene or Plasma-arch cutting system.
6. The edge that is cut must be ground or sanded smooth to remove any slag or gouging from the cutting process.
7. A clean smooth surface of the cut area is essential to avoid stress risers that, over time, could result in cracking.

REAR OF RACK



PAGE 2 OF BULLETIN PI04020K-02

DARTRON IND., INC. P.O. BOX 1284 SALT LAKE, UT 84142	TOLERANCES UNLESS NOTED FRACTIONS DECIMALS DIMENSIONS IN THIS DRAWING UNLESS OTHERWISE SPECIFIED	CH CAR RACK GUSSET INTERFERENCE	DATE 02-25-84	SCALE NFS	DRAWN BY JH
DATE OF REVISION 02-25-84	BY JH	DARTRON	PI04020K-02	2/2	0

Dartron

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114  
Salem, Oregon 97309  
Phone: 503-362-2341  
Fax: 503-362-2536

[www.dartronrides.com](http://www.dartronrides.com)

Bulletin # PIB-5K-0204-001

Release Date: February 27, 2004

Effective Date: February 27, 2004

Supercedes: N/A

Completion Date: N/A

Page 1 of 6

## PRODUCT INFORMATION BULLETIN

Ride Manufacturer:	Dartron Industries, Inc.	Affected Production Dates:	All Cliff Hangers
Ride Name:	Cliff Hanger	Affected Serial #'s:	All
Model #	All Cliff Hangers		

**Abstract of Issue:** On January 17, 2004, an incident occurred on a Cliff Hanger ride operating in Florida. As a result of the incident, Dartron required Cliff Hanger ride owners to cease operation of Cliff Hangers until they complied with the requirements of Dartron Safety Bulletin SR-5K-002. Additionally, the US Consumer Product Safety Commission recommended that Cliff Hanger rides not be operated until their investigation was complete. On February 27, 2004, CPSC accepted Dartron's Action Plan and approved Cliff Hanger rides to operate but only upon approval by Dartron of measures taken by the owners/operators in accordance with Dartron Bulletins SR-5K-002, 003, and 004 (see [www.dartronrides.com](http://www.dartronrides.com)).

**Reason for release:** To inform Cliff Hanger owners/operators, inspectors and State authorizing authorities of Dartron requirements that must be met before a Cliff Hanger ride can operate. Page 2, 3, 4 and 5 of this bulletin provide a guide for inspecting the Cliff Hanger car suspension components.

**Action to be taken:** Before a Cliff Hanger ride is allowed to operate, it must comply with the following:

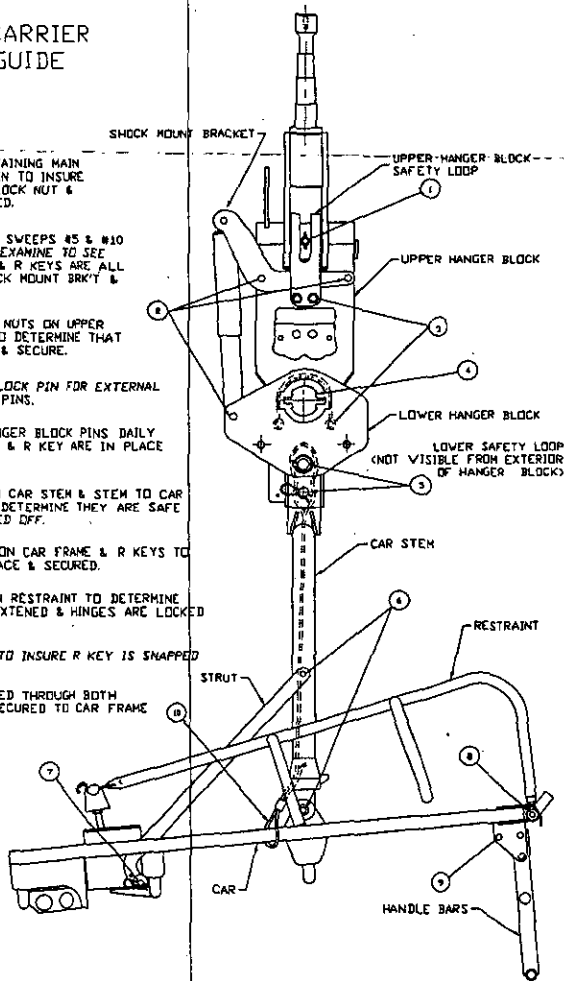
1. The owner/operator must present a Dartron-approved Safe To Operate form (see page 6). The Dartron Safe To Operate Form verifies that the Cliff Hanger complies with Dartron requirements including NDT inspection and that the structural integrity of the gusset joint has not been compromised. It also verifies that a Dartron-approved back-up device is in place. These requirements are found in Safety Bulletins SR-5K-002 and SR-5K-003.
2. Car hangers must be capable of insertion into lower hanger blocks without force, and by April 1, 2004, all Cliff Hangers must have car rack pins cabled to rack turnbuckles (see Bulletin # SR-5K-004).
3. When the Cliff Hanger meets the requirements of numbers 1 and 2 above, it is approved to operate. The Cliff Hanger can be inspected to the drawings attached as Pages 2, 3, 4 and 5 of this bulletin. Any configuration shown is approved if installed correctly and not showing any indications of distress.

**tail of issue:** Page 2, 3, 4 and 5 provide inspection guides for approved back-up devices and approved gusset joint configurations. Page 6 is a sample Dartron Safe To Operate form.



# PASSENGER CARRIER INSPECTION GUIDE

- ① INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO INSURE 1/2" BOLT JAW NUT, NYLOCK NUT & COTTER PIN IS INSTALLED.
- ② SHOCK MOUNT BRK'TS ON SWEEPS #5 & #10 HAVE REMOVABLE PINS, EXAMINE TO SEE THAT PINS ARE SECURE & R KEYS ARE ALL INSTALLED IN BOTH SHOCK MOUNT BRK'T & LOWER HANGER BLOCK.
- ③ CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFETY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.
- ④ CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.
- ⑤ CHECK CAR STEM TO HANGER BLOCK PINS DAILY, VERIFY THAT LYNCH PIN & R KEY ARE IN PLACE & PINS ARE SECURE.
- ⑥ CHECK MODIFIED BOLT IN CAR STEM & STEM TO CAR BOLT & NYLOCK NUT TO DETERMINE THEY ARE SAFE & NUTS HAVE NOT BACKED OFF.
- ⑦ CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURED.
- ⑧ EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & HINGES ARE LOCKED IN PLACE.
- ⑨ CHECK CAR HANDLE PIN TO INSURE R KEY IS SHIPPED IN PLACE.
- ⑩ SAFETY CABLE IS THREADED THROUGH BOTH SIDES OF CAR STEM & SECURED TO CAR FRAME

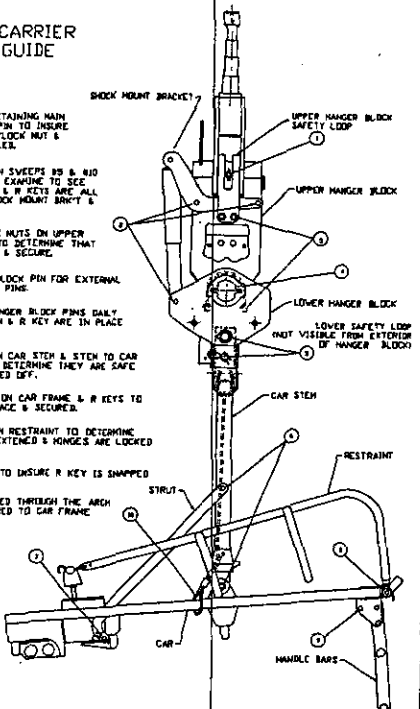


PAGE 2 OF 6 BULLETIN #P13-5K-0204-001

DARTRON, INC.	REVISION	CARRIER INSPECTION GUIDE	0-000	01	01
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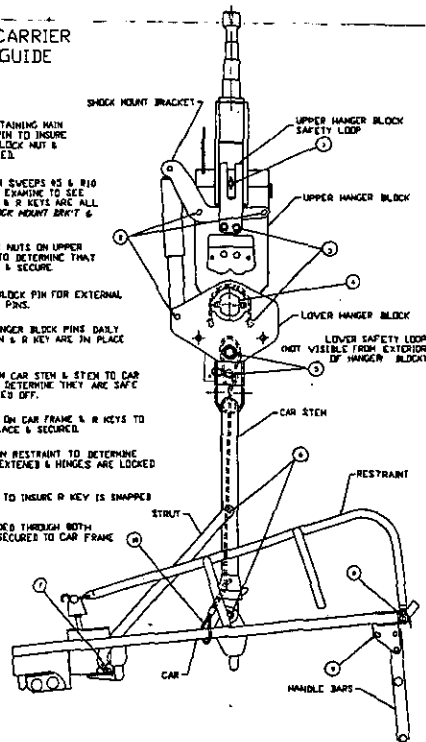
PASSENGER CARRIER  
INSPECTION GUIDE

- ① INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO INSURE 1/2" BOLT JAM NUT, NYLOCK NUT & COTTER PIN IS INSTALLED.
- ② SHOCK MOUNT BRKTS ON SWEEPS 89 & 910 HAVE REMOVABLE PINS. EXAMINE TO SEE THAT PINS ARE SECURE & W KEYS ARE ALL INSTALLED IN BOTH SHOCK MOUNT BRKT & LOWER HANGER BLOCK.
- ③ CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFETY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.
- ④ CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.
- ⑤ CHECK CAR STEM TO HANGER BLOCK PINS DAILY. VERIFY THAT LYNCH PIN & R KEY ARE IN PLACE & PINS ARE SECURE.
- ⑥ CHECK MODIFIED BOLT IN CAR STEM & STEM TO CAR BOLT & NYLOCK NUT TO DETERMINE THEY ARE SAFE & NUTS HAVE NOT BACKED OFF.
- ⑦ CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURE.
- ⑧ EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & HONGES ARE LOCKED IN PLACE.
- ⑨ CHECK CAR HAWKLE PIN TO INSURE R KEY IS SNAPPED IN PLACE.
- ⑩ SAFETY CABLE IS THREADED THROUGH THE ARCH ASSEMBLY DAILY & SECURED TO CAR FRAME.



## PASSENGER CARRIER INSPECTION GUIDE

- ① INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO INSURE 1/2" BOLT, WASH NUT, NYLOCK NUT & COTTER PIN IS INSTALLED.
- ② SHOCK MOUNT BRKTS ON SWEEPS AS & R10 HAVE REMOVABLE PINS. EXAMINE TO SEE THAT PINS ARE SECURE & R KEYS ARE ALL INSTALLED BY BOTH SHOCK MOUNT BRKT & LOWER HANGER BLOCK.
- ③ CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFETY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.
- ④ CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.
- ⑤ CHECK CAR STEM TO HANGER BLOCK PINS DAILY. VERIFY THAT LYNCH PIN & R KEY ARE IN PLACE & PINS ARE SECURE.
- ⑥ CHECK MODIFIED BELT IN CAR STEM & STEM TO CAR BELT & NYLOCK NUT TO DETERMINE THEY ARE SAFE & NUTS HAVE NOT BACKED OFF.
- ⑦ CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURED.
- ⑧ EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & HINGES ARE LOCKED IN PLACE.
- ⑨ CHECK CAR HANDLE PIN TO INSURE R KEY IS SNAPPED IN PLACE.
- ⑩ SAFETY CABLE IS THREADED THROUGH BOTH SIDES OF CAR STEM & SECURED TO CAR FRAME.

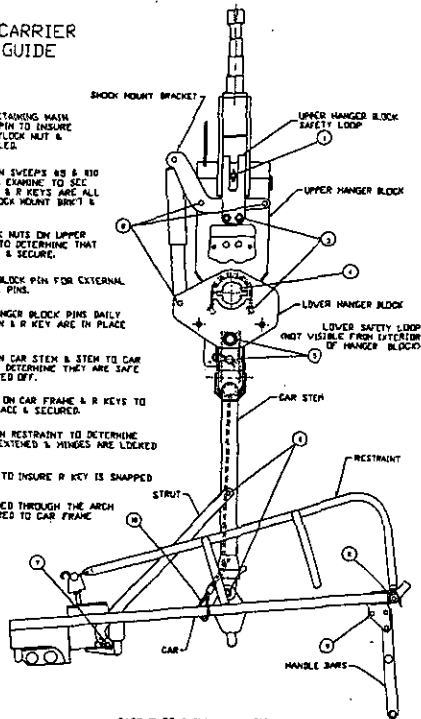


PAGE 4 OF 6 BULLETIN BP18-DK-0204-001

DATE	BY	CHECKED	APPROVED

### PASSENGER CARRIER INSPECTION GUIDE

- ① INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO ENSURE 1/2" BOLT, JAW NUT, NYLOCK NUT & COTTER PIN IS INSTALLED.
- ② SHOCK MOUNT BRACKETS ON SWEEPS AS & B10 HAVE REMOVABLE PINS. EXAMINE TO SEE THAT PINS ARE SECURE & R KEYS ARE ALL INSTALLED IN BOTH SHOCK MOUNT BRACKET & LOWER HANGER BLOCK.
- ③ CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFETY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.
- ④ CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.
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- ⑦ CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURED.
- ⑧ EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & JINGLES ARE LOCKED IN PLACE.
- ⑨ CHECK CAR HANDLE PIN TO INSURE R KEY IS SHAPPED IN PLACE.
- ⑩ SAFETY CABLE IS THREADED THROUGH THE ARCH ASSEMBLY ONLY & SECURED TO CAR FRAME.



**Dartron Industries, Inc.**

**In accordance with Safety Bulletin # SR-5K-002 Dartron has received a NDT Magnetic Particle and a Back Up Device Report for Cliff Hanger Serial Number \_\_\_\_\_.**

**The Mag Particle Report provided the below information about the gusset to Stem joint:**

Gusset Joint Uncompromised on car: 1 2 3 4 5 6 7 8 9 10 none

Allowable defects were found on cars: 1 2 3 4 5 6 7 8 9 10 none

Action Required \_\_\_\_\_

Action Required \_\_\_\_\_

Action Required \_\_\_\_\_

**Rejected car hanger stems were found on cars:**

1 2 3 4 5 6 7 8 9 10 None

**Rejected car hangers must be replaced with a new car hanger purchased from Dartron Industries.**

**Summary of NDT action taken:**

Successfully Completed Inspection: \_\_\_\_\_

Rejected: \_\_\_\_\_ Status of Rejected Stems: \_\_\_\_\_

**Summary of Back Up device installation:**

Original Cable \_\_\_\_\_

Retrofit Strap \_\_\_\_\_

Information provided by: \_\_\_\_\_

Cliff Hanger S/O # \_\_\_\_\_ owned by \_\_\_\_\_ complied with the NDT and backup device requirements of Safety Bulletin # SR-5K-002 on the date of \_\_\_\_\_ and is determined by Dartron Industries, Inc. to be safe to operate.

\_\_\_\_\_  
J. Robert Coil – President  
Dartron Industries, Inc.

*The information below is for use by State Amusement Ride Officials Only - It is being provided to you under Section 29(e) of the Consumer Product Safety Act, 15 U.S.C. 2078(e), which allows the Commission to share certain information with state and local governmental authorities. It should not be released to the public.*

*The information listed below is based upon information we have obtained, including information provided to us by the Florida Bureau of Fairs and Expositions, Department of Agriculture.*

**AMUSEMENT RIDE SAFETY BULLETIN**  
**Cliff Hanger Mobile Amusement Ride**  
**March 1, 2004**

The U.S. Consumer Product Safety Commission (CPSC) staff is notifying state and local authorities having jurisdiction over amusement rides that we have completed our investigation of the Dartron Cliff Hanger mobile amusement ride. CPSC staff has accepted Dartron's Corrective Action Program to inspect and correct as necessary existing Cliff Hangers, and to make prospective changes in the design of future Cliff Hangers.

On January 22, 2004, CPSC staff issued a safety bulletin alerting amusement ride officials of an incident that occurred on January 17, 2004 at the Florida Citrus Festival in Winter Haven, FL, involving a Cliff Hanger. A car was thrown from the sweep, injuring the three passengers in that car.

The cause of the failure has been determined to be a combination of design and operational factors, leading to fracture of the welded joint between the hanger stem and the hanger arch, at the point where the gussets are welded to the stem. The hanger stem can be overloaded and bent if the cars are lowered from the transport rack without removing the pins that attach the Car Stabilizer Cross Tube to the transport rack. If the hanger stem is bent and difficult to insert into its socket, and is forced into the socket by hammering, the welded joint may be damaged and subsequently fail during operation.

Dartron has developed a sequential program including magnetic particle inspection of all Cliff Hanger stems, certification of backup safety device installation, installation of a redesigned Car Stabilizer Pin assembly, and prospective design and manufacturing changes to the hanger stem assembly and backup device. Before Dartron will allow a Cliff Hanger to operate, the owner/operator must present a Dartron-approved Safe To Operate form verifying that the above measures have been taken.

Details of the Dartron program are described in Dartron Bulletin PIB-5K-0204-001, which is attached to this bulletin.

CPSC staff has accepted the Corrective Action Plan proposed by Dartron. Based upon this action, we are withdrawing our earlier recommendation that you not allow Cliff Hangers to operate, on the condition that they meet the requirements of the Dartron program. Please contact me if you have any questions or comments on this matter.

Roy W. Deppa  
Associate Director  
Office of Compliance  
301-504-7514

Dartron

Issuing Entity:  
Dartron Industries, Inc

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www.dartronrides.com

Bulletin # PI-5K-003

Release Date: March 14, 2004

Effective Date: March 14, 2004

Supercedes: N/A

Completion Date: July 14, 2004

Page 1 of 9

## PRODUCT IMPROVEMENT BULLETIN

Ride Manufacturer: Dartron Industries, Inc.

Affected Production Dates: All Cliff Hanger Rides

Ride Name: Cliff Hanger

Affected Serial #'s: All

Model #'s: All

**Abstract of Issue:** Dartron is aware of Cliff Hanger rides that have developed cracks in the bearing base. Dartron Bulletin SB-5K-001 requires a visual inspection of the Bearing Base. If cracks are found the cracks must be repaired and reinforcing plates must be installed.

**Reason for release:** To communicate instructions for Bearing Base crack repairs and installation of reinforcing plates.

**Action to be taken:**

1. Contact Dartron and arrange for shipment of the reinforcing plates.
2. Arrange for a certified welding technician to perform this procedure who holds a current certificate for 7018 in the 2G, 3G, and 4G positions or equivalent. This certificate can be issued by any state.
3. Welding to be performed using 7018 stick electrode DC reverse polarity.
4. Allow approximately eight hours for the welding operation. Allow approximately four hours for cleanup and re-painting after the welding is complete.
5. Prepare the Cliff Hanger for the repairs as explained on Page 2.
6. Repair the cracks according to the procedure explained on Page 3.
7. Install the reinforcing plates as explained on Page 4.

Bulletin # PI-5K-003

Release Date: March 14, 2004

Page 2 of 9

### Prepare Cliff Hanger for Bearing Base Crack Repairs

**Step 1:** The ride must be at least partially set up. The front car-racks must be down and the wheel must be pinned together.

**Step 2:** Material required includes:

- a) Support for the bearing base such as blocking stacked on the ground.
- b) A tarp or tent to place over the work area in the event of wet weather.

**Step 3:** Using the ride hydraulics lift the boom enough to provide a comfortable working height for the repairmen. This height will be approximately 3 feet above the boom rest pad.

**Step 4:** Support must be provided under the Bearing Base to prevent the boom from dropping during the repair process. This support can be blocking or a similar material stacked on the ground under the Bearing Base. Remove the grease line and the fitting [Page 5, Item 7] from the bottom of the drag link pivot. The support should be provided directly under the pivot pin ears that attach the Drag Link to the Bearing Base. Do not support the 6" square drag-link tube, [See page 5, Item 3], as it will bend.

Another method of supporting the Bearing Base is to build a cross member bridge. The cross member bridge can be placed across the trailer frame behind the boom rest and will support the Drag Link Pivot Pin Ears.

**Step 5:** Disconnect the hydraulic hoses to the two drive motors. [Page 5, Item 4] Caps and plugs must be installed on the hoses and motor ports to avoid leakage of hydraulic fluid. Mark the motor hoses so they will not get crossed during reassembly. Fold the hoses back out of the way. It is not necessary to remove the two hydraulic drive motors.



Bulletin # PI-5K-003

Release Date: March 14, 2004

Page 3 of 9

### Cliff Hanger Bearing Base Crack Repair Procedures

Step 1: The welding technician performing this procedure must hold a current certificate for 7018 in the 2G, 3G, and 4G positions or equivalent. This certificate can be issued by any state.

Step 2: The welding technician must use 7018 stick electrode DC reverse polarity. The 7018 rod must be stored in a rod heater to prevent moisture absorption.

Step 3: V groove the crack until cracked material is removed or until the root of the weld is reached.

Step 4: Fill the exposed area back to flush or to the original fillet size with 7018 DC filler rod.

Step 5: Sand or grind welded area to match as closely as possible the original finish of the part.

## **Cliff Hanger Bearing Base Reinforcing Plate Installation**

**Step 1:** The welding technician performing this procedure must hold a current certificate for 7018 in the 2G, 3G, and 4G positions or equivalent. This certificate can be issued by any state.

**Step 2:** Hold the reinforcing plates to the sides of the bearing base in the position shown on Page 7. Mark around the plates and note any place where weld prep is required.

**Step 3:** Remove the reinforcing plates and prep the surfaces of the bearing base by removing paint, weld bulges and other small interferences allowing the plates to fit snugly.

**Step 4:** All surfaces of the reinforcing plates must fit within 1/16" of flat. A very tight fit is always best. Warning: Do not use hydraulic motors to hold plates. Pressure on the motors could cause damage.

**Step 5:** Remove the bottom access plate on the bearing base to allow the use of C-clamps to hold the reinforcing plates tight.

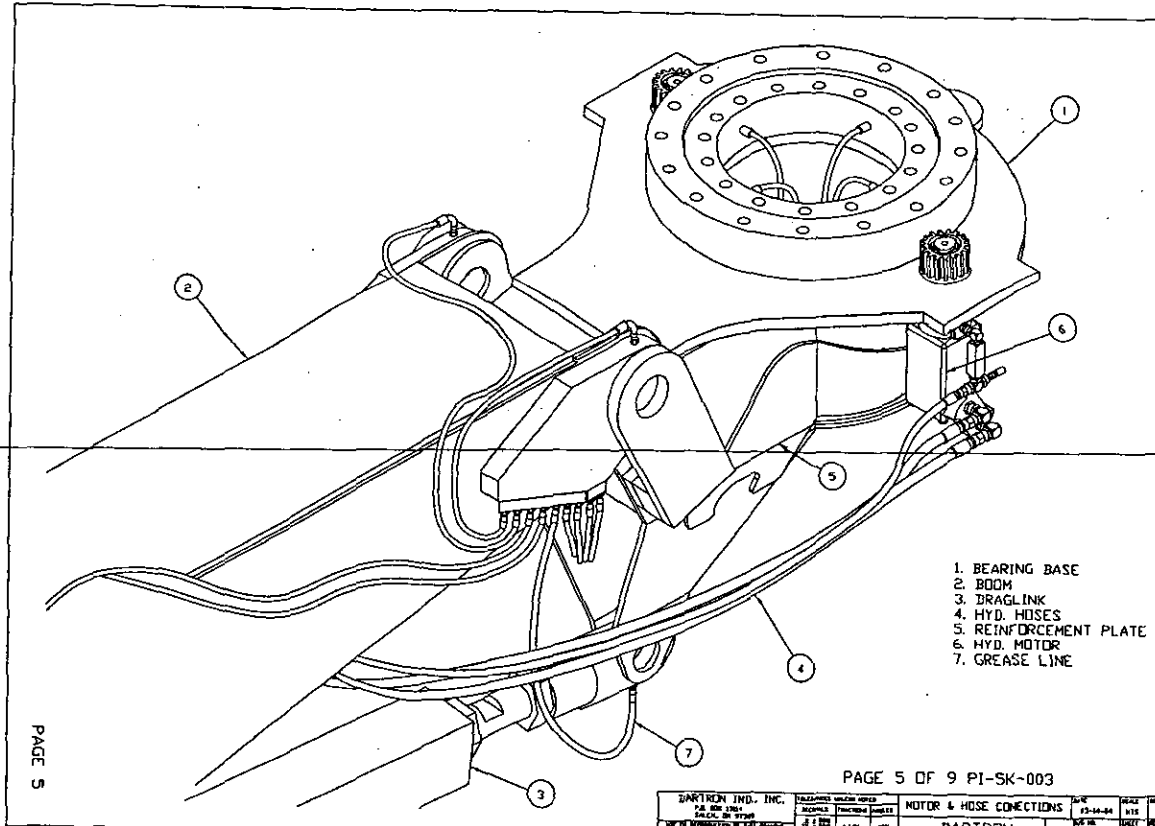
**Step 6:** Fit the Separator web reinforcing plate in position as show on Page 8. The inside edges of the separator web reinforcing plate must be beveled to clear the existing weld. Weld the reinforcing plate to the separator web as shown on Page 8.

**Step 7:** Weld the reinforcing plates to the bearing base using Page 9 for reference details.

**Step 8:** Complete the installation of the reinforcing plates. Clean and prepare for painting all unpainted surfaces.

**Step 9:** To seal out water and provide a good paint surface seam sealer should be applied to all unwelded edges of the reinforcing plates.

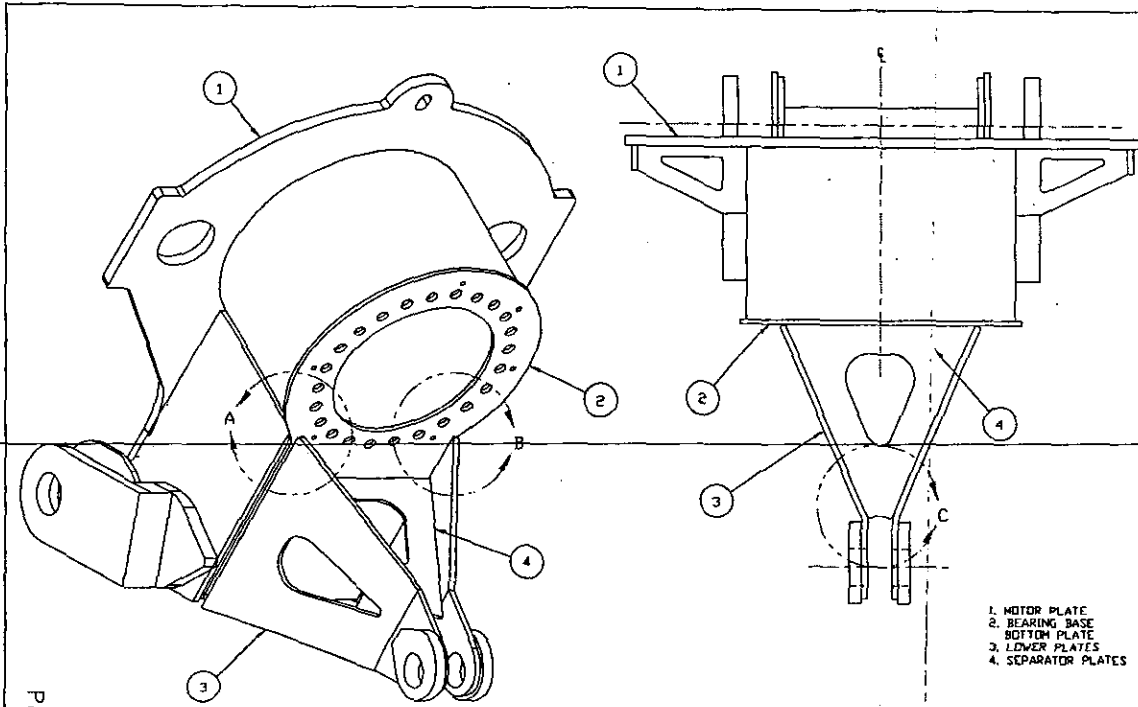
**Step 10:** Primer and paint to as close to original color as possible. Original paint colors are available from any Dupont Centari paint dealer.



PAGE 5

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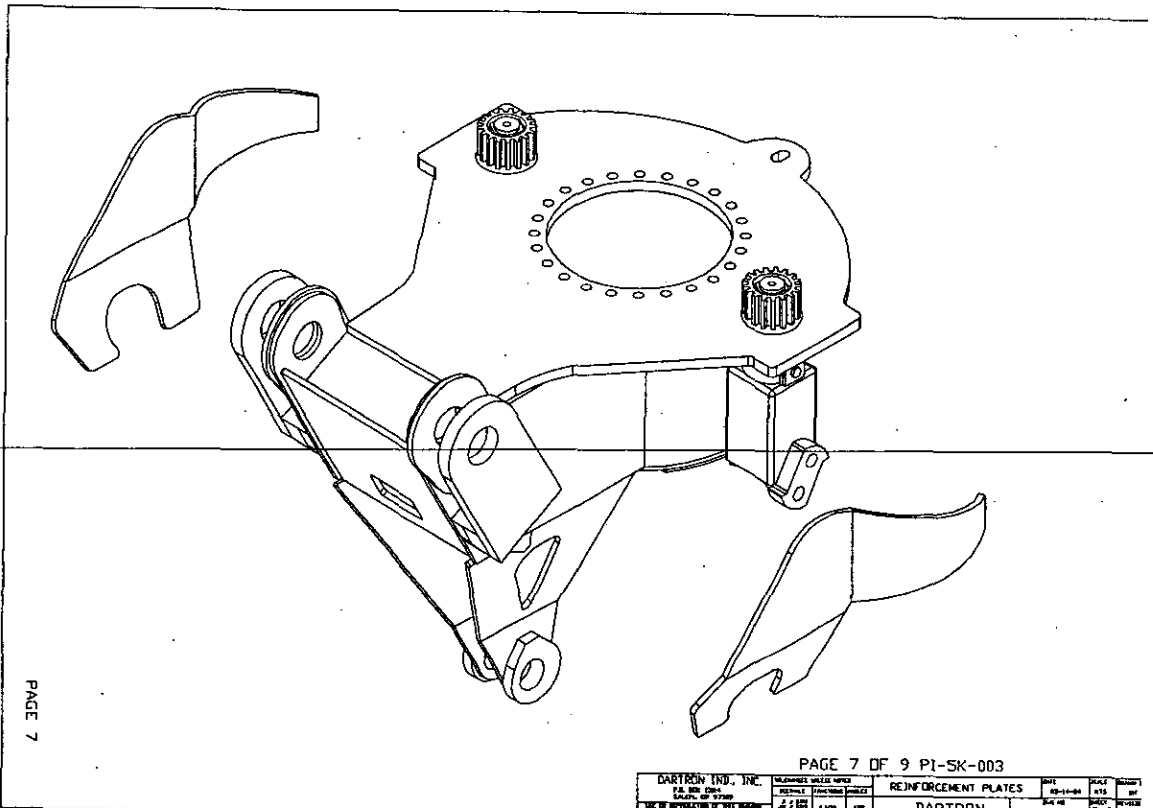
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PAGE 6

PAGE 6 OF 9 PI-5K-003

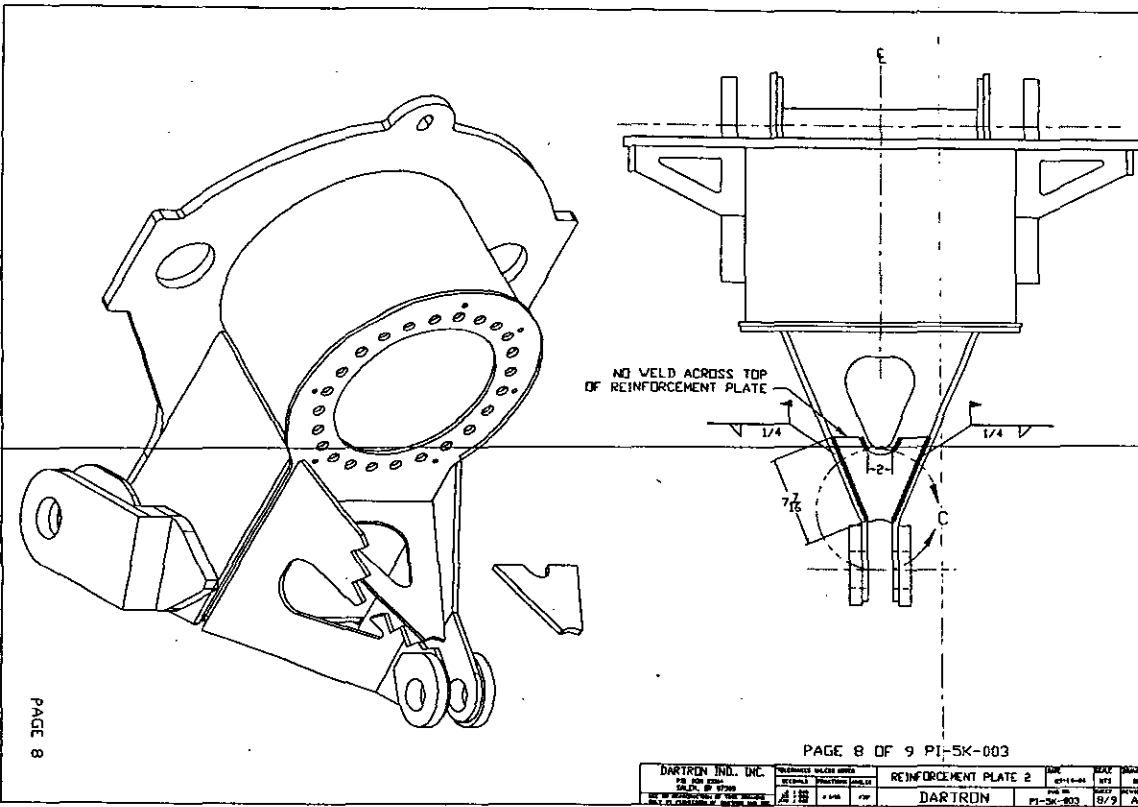
DARTRON IND., INC. P.O. BOX 13114 SALEM, OR 97209 USE OR REPRODUCTION OF THIS DRAWING ONLY BY PERMISSION OF DARTRON IND., INC.	TOLERANCES UNLESS NOTED DECIMALS FRACTIONS ANGLES		STRESS OR FAILURE POINTS DARTRON	DATE 03-14-84	SCALE NTS	DRAWN INH
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PAGE 7

PAGE 7 OF 9 PI-SK-003

DARTRON IND., INC. P.O. BOX 9700 DALLAS, TEXAS 75209	REINFORCEMENT PLATES		REV	PLATE	QUANTITY
	REV	DATE	BY	NO.	
	1	11/18	AM	PI-2K-003	17/9
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PAGE 8

PAGE 8 OF 9 PI-5K-003

DARTRON IND. INC. PO BOX 8700 MILWAUKEE, WI 53211	REVISED DRAWING	REINFORCEMENT PLATE 2	DATE	BY
	DATE	BY	DATE	BY
DATE	BY	DARTRON	PI-5K-003	8/9 A



Dartron

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114  
Salem, Oregon 97309  
Phone: 503-362-2341  
Fax: 503-362-2536

www.dartronrides.com

Bulletin # SB-5K-001

Release Date: May 1, 2004

Effective Date: May 1, 2004

Supercedes: N/A

Complete Inspection by June 15

Page 1 of 7

## SERVICE BULLETIN

Ride Manufacturer: Dartron Industries, Inc.

Affected Production Dates: All Cliff Hanger Rides

Ride Name: Cliff Hanger

Affected Serial #'s: All

Model #'s: All

**Abstract of Issue:** Dartron is aware of Cliff Hanger rides that have developed cracks in the bearing base. The cracks may result from or be aggravated by transporting the Cliff Hanger without adequately supporting the sweeps and/or from unbalanced ride loading.

**Reason for release:** Failure to eliminate the cracks could eventually result in the bearing base not adequately supporting the center bearing causing an expensive failure of the bearing. Failure to adequately support the sweeps while transporting the ride will continue to introduce unintended forces into the bearing base and bearing and can damage sweeps. Corrective action steps are included. Loading the Cliff Hanger in an unbalanced manner could shorten the life of major components. Dartron requires that the passenger load be balanced before Cliff Hanger operation.

**Action to be taken:**

1. Before operating a Cliff Hanger a one time visual inspection must be conducted to inspect for cracks in the Bearing Base and Separator Plates as detailed on Page 2 and 3 of this Bulletin.
2. As soon as the one time visual inspection is complete the Bearing Base Inspection Form (Page 4) must be completed and faxed to Dartron.
3. If no cracks are found the following action is required:
  - a. A visual inspection for cracks must be conducted every 30 days until instructed otherwise by Dartron or until the reinforcing plates are installed. There is no inspection reporting requirement unless cracks are found.
  - b. The sweep support jack must be modified as described on Pages 5 and 6 of this Bulletin.
4. If cracks are found the following action is required within 120 days of discovering a crack unless Dartron determines from the crack description that action should be taken sooner:
  - a. Cracks must be repaired as described in Dartron Product Improvement Bulletin PI-5K-003.
  - b. Reinforcing plates provided by Dartron must be installed as described in Bulletin PI-5K-003.
  - c. The sweep support jack must be modified as described on Pages 5 and 6 of this Bulletin.



Bulletin # SB-5K-001

Release Date: March 07, 2004

Page 2 of 7

### Procedure For Visually Inspecting Cliff Hanger Bearing Base

Step 1: If the ride is in the racked position the aluminum set up decks must be removed from their transport rack to allow access to the bottom of the Bearing Base.

Step 2: If the ride is set up proceed to Step 3.

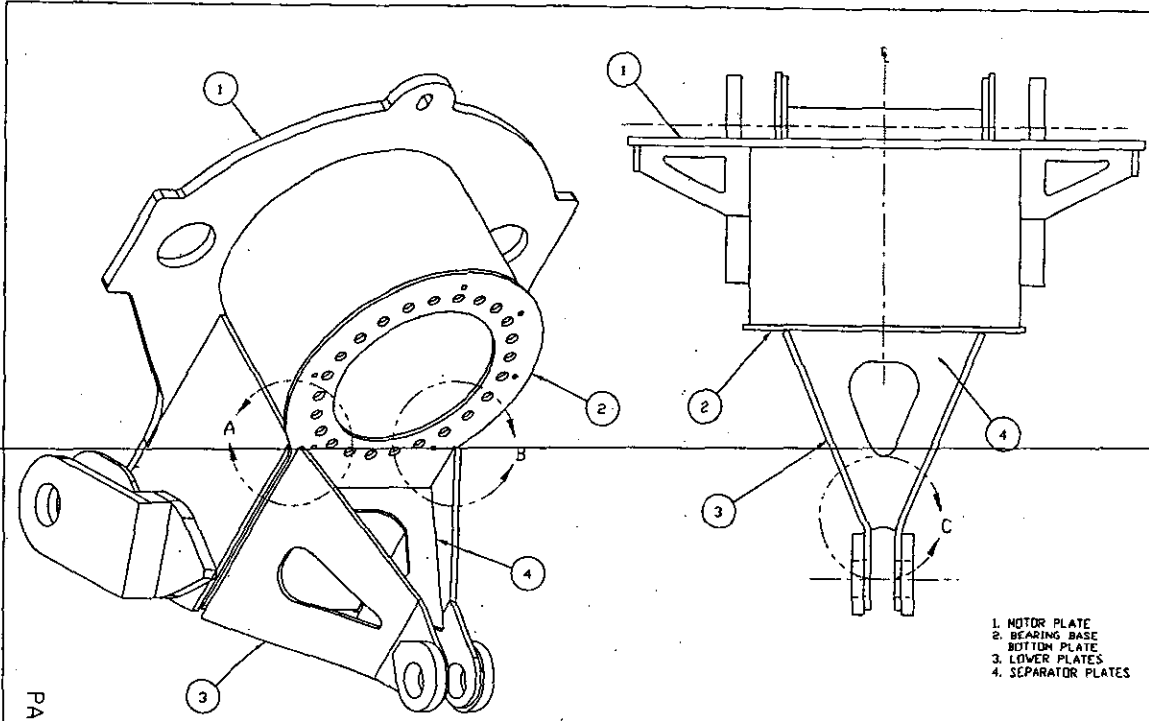
Step 3: Three areas must be visually inspected. Those areas are shown on Page 3 as Detail A, B and C.

Step 4: The areas to be inspected must be cleaned so that they are free of dirt and grease.

Step 5: Visually inspect the three areas for cracks or broken paint.

Step 6: If broken paint is found, the paint must be removed to allow a more through visual crack inspection.

Step 7: If a crack is discovered describe the crack on the form found on Page 6 & 7 of this Bulletin. Fax the form to Dartron at 503-362-2536. Dartron will coordinate a time to perform the repairs.



- 1. MOTOR PLATE
- 2. BEARING BASE
- 3. LOWER PLATES
- 4. SEPARATOR PLATES

PAGE 3

PAGE 3 OF 7 SB-5K-001

DARTRON IND., INC. P.O. BOX 13114 SALT LAKE, UT 84113	TOLERANCES UNLESS NOTED			STRESS OR FAILURE POINTS	DATE	SCALE	DRAWN BY
	DECIMALS	FRACTIONS	ANGLES		09-06-03	NTS	DM
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Bulletin # SB-5K-001

Release Date: March 07, 2004

Page 4 of 7

### Procedure For Installing Sweep Support Rack Jacking Instructions

1. Install the sweep support beam on the trailer and raise it until the sweeps are all properly meshed in their mating shoes on the beam.
2. Continue to raise the sweep support beam until the proper height is achieved. The proper height [tightness] is the point at which an average man of average strength can barely continue to turn the crank handle. [Item #6] The crank handle also has to rack in the angle iron clip on the jack tube. The crank handle can also be turned on the shaft if necessary to achieve the correct tightness and rack the handle. To do this remove the bolt that connects the crank handle to its drive shaft, turn the handle 180 degrees and then re-install the bolt.
3. Visual references for the following steps are found on page five (5) of this document.
4. After the correct height is achieved, drill a 3/8 hole [Item #4] through the inner tube sleeve [Item #1] of the jack as indicated. The lower edge of the 3/8 hole should be even with the top edge of the outer jack tube.
5. Use a center punch or other permanent marking device and install an arrow [Item #3] on the outer sleeve [Item #2] of the jack as indicated.
6. Install the warning label [Item #5] below the arrow on the outer jack sleeve. Warning labels are available from Dartron Parts and Service.



**Visual Inspection Report Cliff Hanger Bearing Base**

Date: \_\_\_\_\_

Cliff Hanger Owner/Operator Name: \_\_\_\_\_

Serial Number of Cliff Hanger: \_\_\_\_\_

Indicate Locations of cracks on supplied diagrams

**Describe (in as much detail as possible) location and dimensions of cracks.**

**Diagram A** \_\_\_\_\_

\_\_\_\_\_

**Diagram B** \_\_\_\_\_

\_\_\_\_\_

**Diagram C** \_\_\_\_\_

\_\_\_\_\_

**Diagram D** \_\_\_\_\_

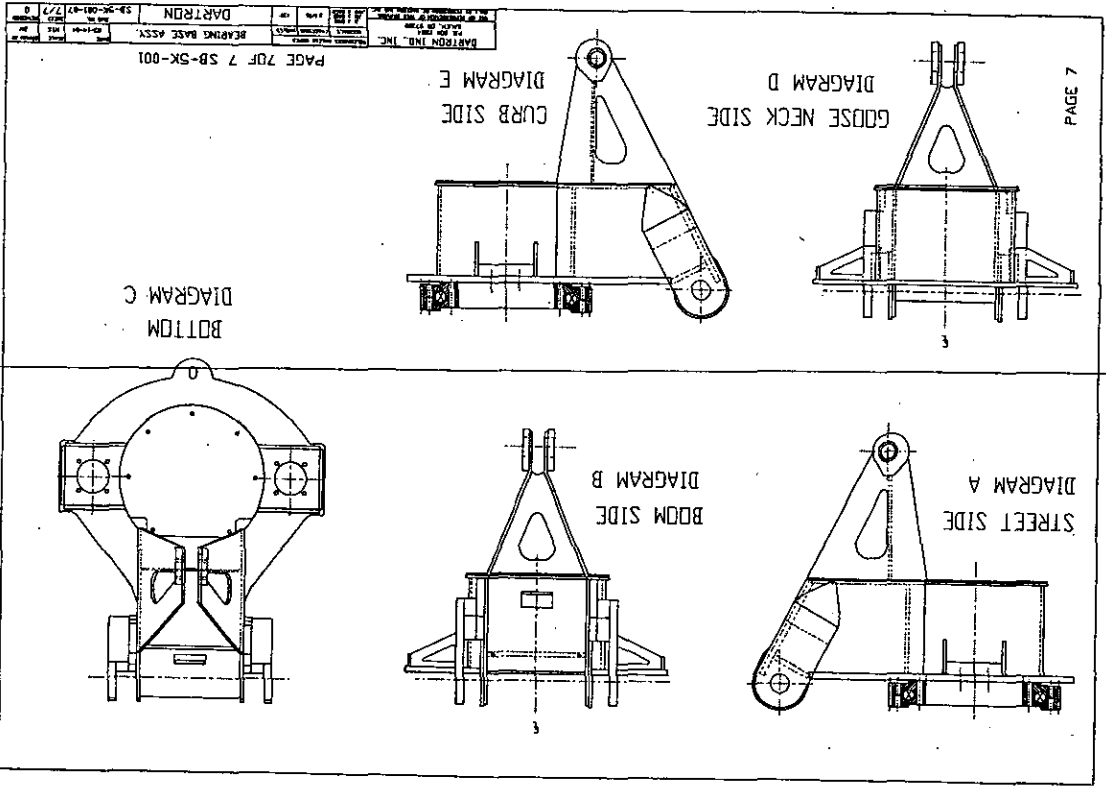
\_\_\_\_\_

**Diagram E** \_\_\_\_\_

\_\_\_\_\_

**Inspectors Signature** \_\_\_\_\_

**Title** \_\_\_\_\_



PAGE 7

PAGE 7 OF 7 SB-SK-001

DARTRON IND. INC.		REARMS BASE ASSY.		DARTRON	
DATE	REV.	BY	CHK.	APP.	QTY.
11/11/77	1				1
PART NO. SB-SK-001		REV. 0		DARTRON	

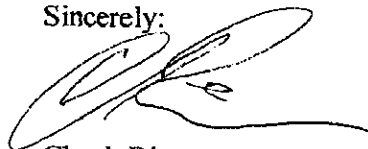


April 12, 2005

To: Dave Hewitt and Mike Triplet  
New Jersey Ride Inspection  
Re: Cliffhanger Car Hangers

In response to our conversations this morning, this will serve as written verification that Dartron does not require an annual MT inspection on Cliffhanger Car Hangers. We are currently drafting a Bulletin addressing this issue and our requirement for an annual visual inspection. This bulletin will be forwarded to your office upon release. In the specific case of Cliffhanger Serial Number 0111265-5K owned by Skelly's Amusements, Dartron has verification that the ride passed an MT inspection on 3/15/04, and is only asking that Skelly's amusements verify that a visual inspection has been performed after 3/15/05 and that no indications were noted. We further ask that you give us thirty days to release this bulletin and allow Skelly's thirty additional days to comply with its documentation requirements.

Sincerely:



Chuck Risor  
Quality Assurance Manager  
Dartron Industries Inc.



Dartron

Issuing Entity:  
Dartron Industries, Inc

P. O. Box 13114  
Salem, Oregon 97309  
Phone: 503-362-2341  
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Bulletin # SR-5K-005

Release Date: April 29, 2005

Effective Date: May 1, 2005

Supercedes: N/A

Completion Date: Annually

Page 1 of 7

## SAFETY BULLETIN

Ride Manufacturer: Dartron Industries, Inc.	Affected Production Dates: All Portable Cliff Hangers
Ride Name: Cliff Hanger	Affected Serial #'s: All Portable Cliff Hangers
Model #'s: All Portable Cliff Hangers	

**Abstract of Issue:** An incident occurred on a Cliff Hanger ride operating in Florida during 2004. The incident resulted from a failure in the Car Hanger Stem at the location of the four gussets that are welded to the Stem and the Arch Assembly. As a result of investigations into the incident Dartron Industries, Inc. is requiring that an annual inspection of the Cliff Hanger ride be conducted.

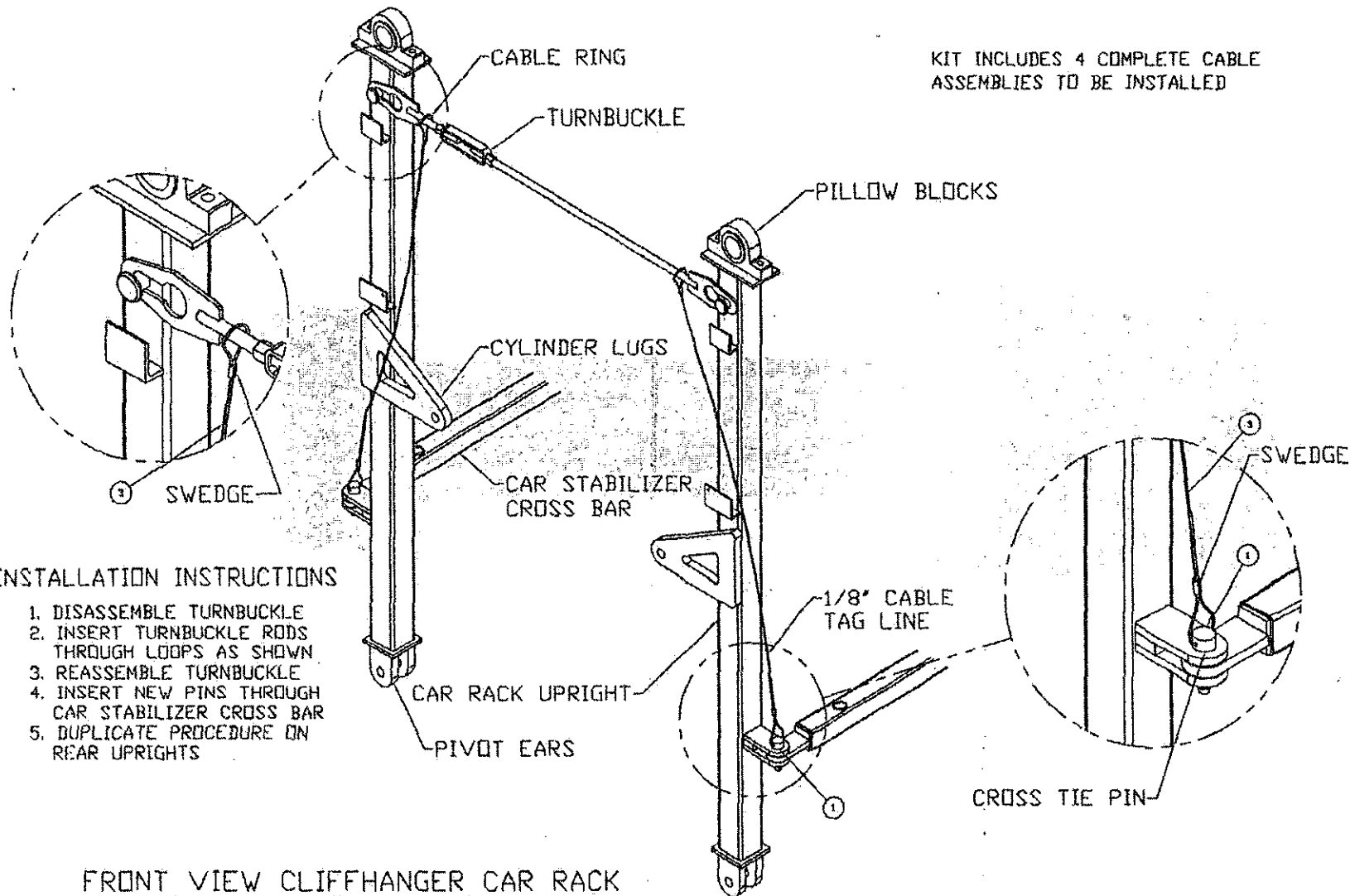
**Reason for release:** The requirements for the Cliff Hanger inspection that Dartron is requiring all Cliff Hanger owners to undertake annually are included in this Bulletin. Dartron Industries, Inc. does not require an MT inspection but does require a visual inspection in the four locations described below:

**Action to be taken:**

1. No Cliff Hanger is to be operated in a new calendar year until the requirements of steps 3 through 6 are satisfied.
2. The results of the inspection must be attested to by the owner of the Cliff Hanger Ride and recorded on the attached form. During the calendar year following the inspection the Inspection Record form must be available at the ride location and when requested shall be presented to inspecting authorities.
3. A visual inspection must be performed to ensure that the Cliff Hanger is using four Car Stabilizer Bar pins with cables attached. The cables must be attached to the car rack turnbuckles as shown on Page 3 of this Bulletin. The Cliff Hanger car racks **must not** be operated unless the Car Stabilizer Cross Bar pins are attached to the turnbuckles as shown on Page 3.
4. Car Hangers Stems must be visually inspected for damage caused by lowering the rack without removing the Car Stabilizer Cross Bar pins. See Page 4. Damaged Car Hangers **must not** be used if two or three individuals manually lifting the car cannot insert the Stem into the Lower Hanger Block.
5. All car hangers must be visually inspected for any indication of cracking or other damage. Particular attention should be paid to the welds and their heat affected zones of the four gussets that are welded between the Stem and the Arch Assembly. See Page 4.

6. Each Car Hanger Stem must be inspected to ensure that one of the two Dartron approved back-up systems is installed on each car hanger stem. Dartron approved back-up systems include; 1) a cable inserted inside the Arch Assembly and Stem and attached to both sides of the passenger carrier. The cable can be visually inspected in the Stem by looking into the top of the Stem when the Car Hanger is not attached to the Hanger Block. 2) A cable inserted inside the Arch Assembly and attached to both sides of the passenger carrier but not routed through the stem combined with a Dartron-supplied-formed stainless-steel safety strap around the Stem and Arch Assembly. See Pages 5 and 6.
7. An Annual Inspection Form is attached. See Page 7. Contact Dartron at 800-421-5752 for additional Annual Inspection Forms.

KIT INCLUDES 4 COMPLETE CABLE ASSEMBLIES TO BE INSTALLED



INSTALLATION INSTRUCTIONS

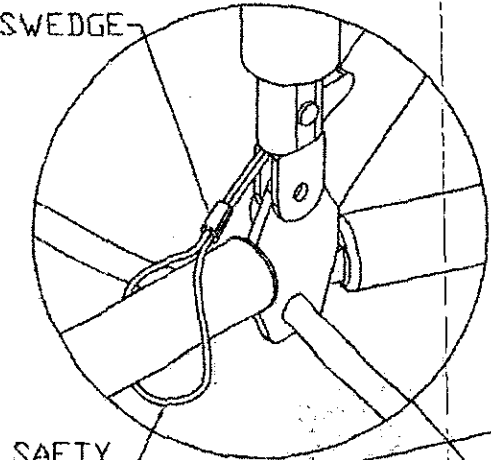
1. DISASSEMBLE TURNBUCKLE
2. INSERT TURNBUCKLE RODS THROUGH LOOPS AS SHOWN
3. REASSEMBLE TURNBUCKLE
4. INSERT NEW PINS THROUGH CAR STABILIZER CROSS BAR
5. DUPLICATE PROCEDURE ON REAR UPRIGHTS

FRONT VIEW CLIFFHANGER CAR RACK

REAR UPRIGHTS NOT SHOWN

DARTON INC. INC.	THIS LINE ATTACHMENT	REV	DATE
1000 W. 10TH ST.		100	10/10/50
WILSON, N.C.	DARTON	100	10/10/50

SWEDGE



SAFTY CABLE

STEM

GUSSET

ARCH ASSEMBLY

FORWARD

AJUSTMENT LUG

STRUT

REAR

PAGE 4 OF 7 BULLETIN # SR-5K-005

DARTRON IND., INC. P.O. BOX 13114 CHICAGO, ILL 60612	TELEPHONE (AREA CODE) 312-421-1111	CLIFFHANGER CAR	DATE 04-28-05	REVISION NTS	QUANTITY 251
	USE OR REPRODUCTION OF THIS BULLETIN IS BY PERMISSION OF DARTRON IND., INC.	SERIALS (COUNTING) ANGLES 1 1/2 1/2 1 1/2 1/2 1 1/2 1/2	DARTRON	DRAWING SR-5K-005	SHEETS 4/7

# PASSENGER CARRIER INSPECTION GUIDE

① INSPECT FASTENERS RETAINING MAIN HANGER BLOCK PIVOT PIN TO INSURE 1/2" BOLT JAM NUT, NYLOCK NUT & CUTTER PIN IS INSTALLED.

② SHOCK MOUNT BRK'TS ON SWEEPS #5 & #10 HAVE REMOVABLE PINS, EXAMINE TO SEE THAT PINS ARE SECURE & R KEYS ARE ALL INSTALLED IN BOTH SHOCK MOUNT BRK'T & LOWER HANGER BLOCK.

③ CHECK BOLTS & NYLOCK NUTS ON UPPER & LOWER SAFTY LOOP TO DETERMINE THAT FASTENERS ARE INTACT & SECURE.

④ CHECK LOWER HANGER BLOCK PIN FOR EXTERNAL RETAINING RING & ROLL PINS.

⑤ CHECK CAR STEM TO HANGER BLOCK PINS DAILY VERIFY THAT LYNCH PIN & R KEY ARE IN PLACE & PINS ARE SECURE.

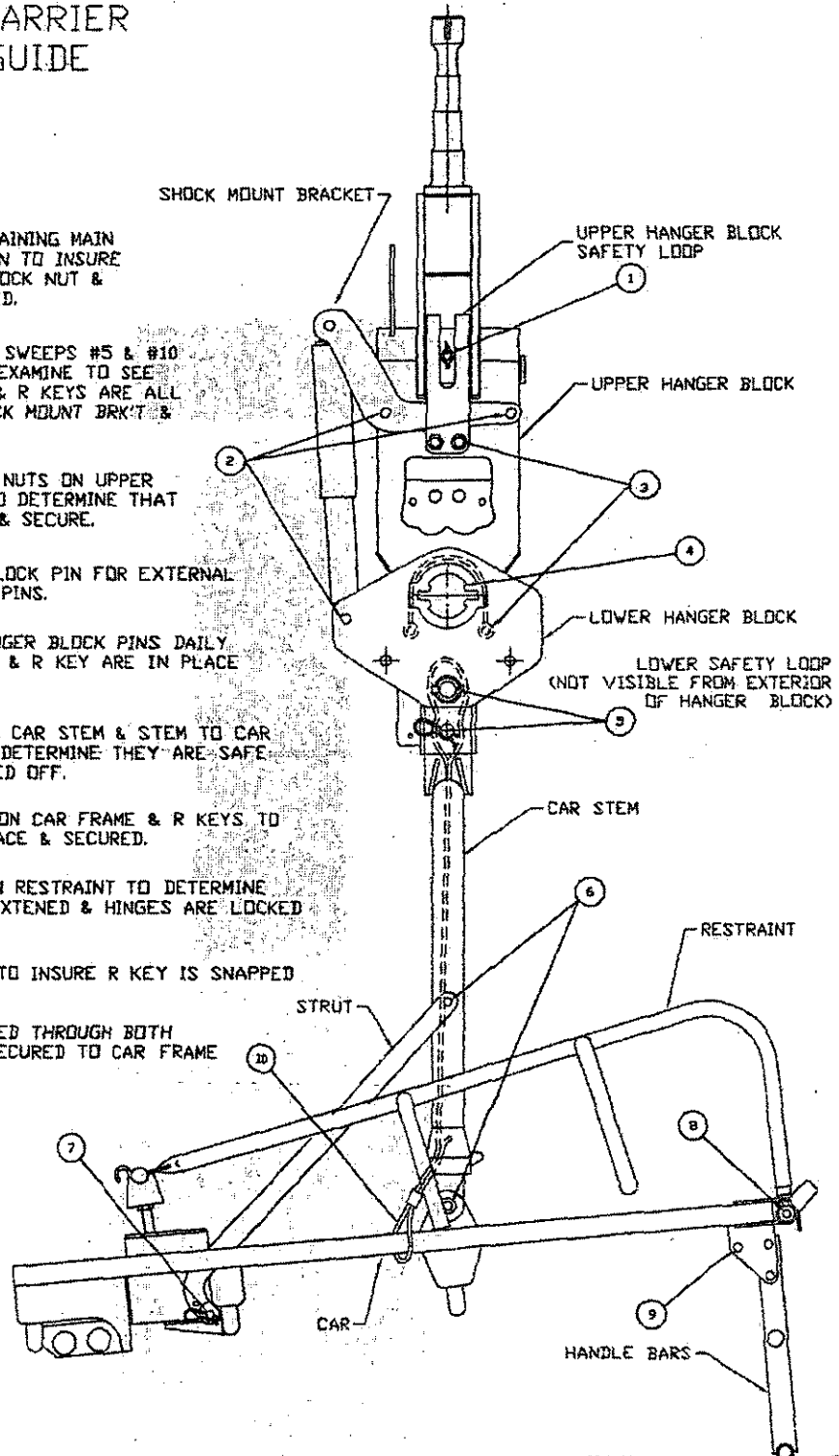
⑥ CHECK MODIFIED BOLT IN CAR STEM & STEM TO CAR BOLT & NYLOCK NUT TO DETERMINE THEY ARE SAFE & NUTS HAVE NOT BACKED OFF.

⑦ CHECK CAR STRUT PINS ON CAR FRAME & R KEYS TO INSURE THEY ARE IN PLACE & SECURED.

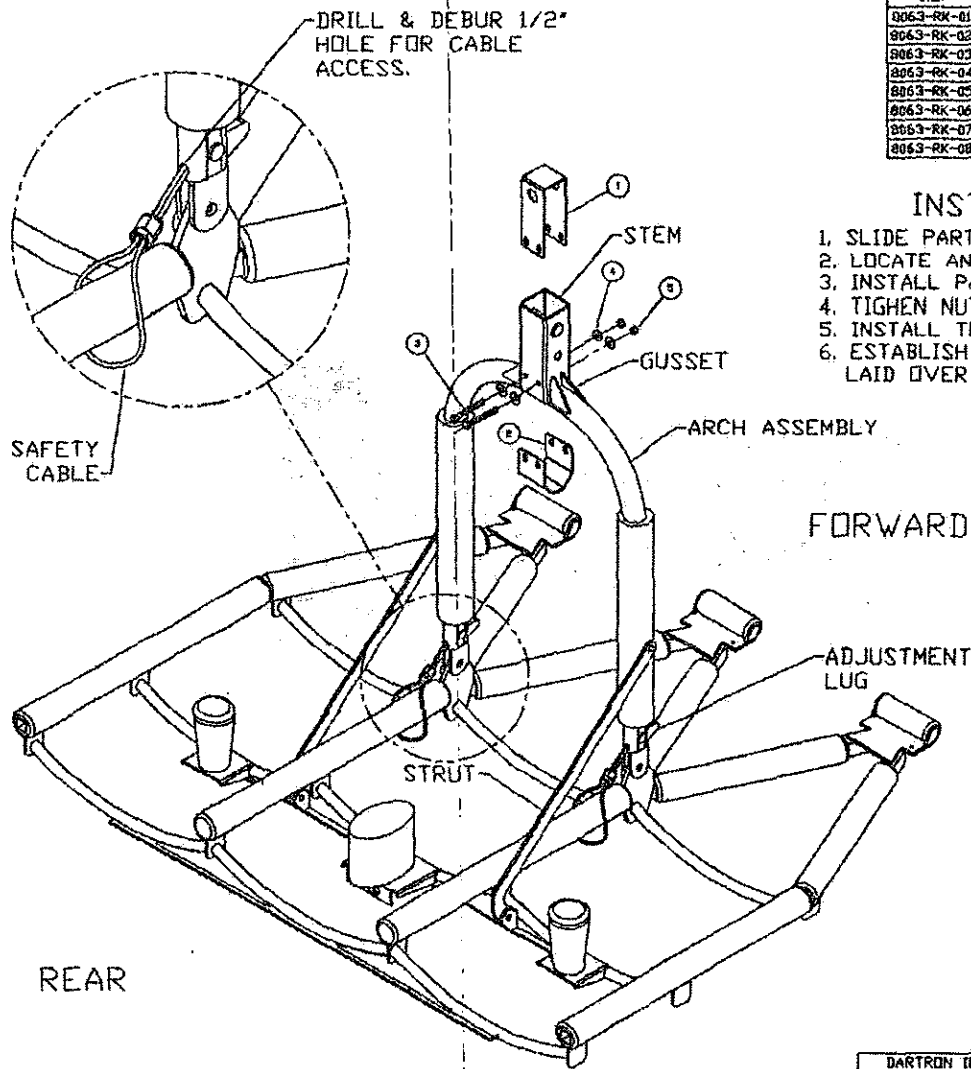
⑧ EXAMINE PIVOT POINT ON RESTRAINT TO DETERMINE THAT ALL SHAFTS ARE EXTENDED & HINGES ARE LOCKED IN PLACE.

⑨ CHECK CAR HANDLE PIN TO INSURE R KEY IS SNAPPED IN PLACE.

⑩ SAFTY CABLE IS THREADED THROUGH BOTH SIDES OF CAR STEM & SECURED TO CAR FRAME



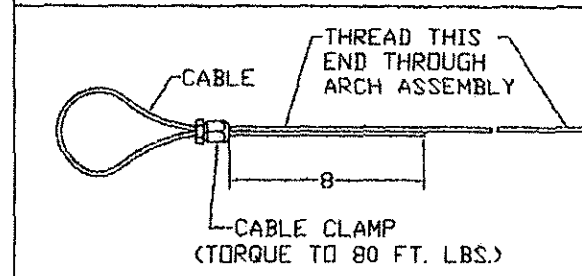
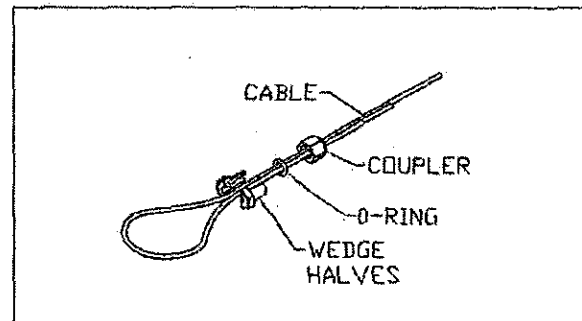
PAGE 9 OF 7 BULLETINER-2K-823



ITEM	QTY.	DESCRIPTION	LENGTH	APPL.	COMMENTS	USED
8063-RK-01	1	10 GA. SHEET X 2 1/2"	15 3/8"		FORM	
8063-RK-02	1	10 GA. SHEET X 3"	8 7/8"		FORM	
8063-RK-03	2	3/8 NC.-16 GRADE 8 BOLTS				
8063-RK-04	4	3/8" STAINLESS STEEL FLATE WASHER				
8063-RK-05	2	3/8 NC.-16 NUT				
8063-RK-06	2	3/16 STAINLESS STEEL AIRCRAFT CABLE				
8063-RK-07	2	3/16 WIRE ROPE CLAMP				
8063-RK-08						

### INSTALLATION INSTRUCTIONS

1. SLIDE PART # 2 UP UNTIL IT TOUCHES THE ROUND TUBE.
2. LOCATE AND DRILL HOLES IN THE STEM. 13/32 DIA THRU.
3. INSTALL PARTS #1 THROUGH #5 AS SHOWN.
4. TIGHTEN NUTS #5 180 DEGREES PAST SNUG.
5. INSTALL THE CABLE THROUGH THE ARCH AS SHOWN.
6. ESTABLISH THE FINAL LENGTH OF THE CABLE WITH THE ARCH LAID OVER FLAT. (CRACKED POSITION).



PAGE 6 OF 7 BULLETIN # SR-5K-005

DARTRON IND., INC. P.O. BOX 12614 SALINA, KS 67409	TELEPHONES		MAILING		PASSENGER CARRIER	DATE	NO.	BY
	2 2 21	2 2 21	2 2 21	2 2 21		04-06-65	1175	DM
LOC. OF DEPOSIT	DATE	BY	BY	BY	DARTRON	SR-5K-005	6/7	0

**Cliff Hanger Annual Inspection Form**

	1	2	3	4	5	6	7	8	9	10
No Cracking										
No Impact Damage										
No Other Damage										
Safety Backup Intact										
Easily Inserted Into Lower Hanger Block										

Car Rack Stabilizer Bar Pins With Cables Are Installed and Intact

Cliff Hanger S/O # \_\_\_\_\_

Date Of Inspection \_\_\_\_\_

Inspectors Name (Print) \_\_\_\_\_

Inspectors Signature \_\_\_\_\_

Inspectors Title \_\_\_\_\_

Dartron

Issuing Entity:  
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Bulletin # PIB-5K-005

Release Date: May 12, 2006

Effective Date: Not Required

Supercedes: N/A

Completion Date: Not Required

Page 1 of 1

## SERVICE BULLETIN

<b>Ride Manufacturer:</b>	Dartron Industries, Inc.	<b>Affected Production Dates:</b>	All Cliff Hangers
<b>Ride Name:</b>	Cliff Hanger	<b>Affected Serial #'s:</b>	All Cliff Hangers
<b>Model # :</b>	All Cliff Hangers		

**Abstract of Issue:**

Dartron has determined based on observation of Cliff Hangers in service that the upper and lower hanger block bushing wear rate will require changing the bushings after ten years of operation.

**Reason for Release:**

To provide a recommended interval for replace of the upper and lower hanger block bushings, and the safety backup bolt for the upper hanger block pin. If the bushings are not changed possible damage to the hanger block or pin could result. Also, the cars and passengers could experience excessive movement resulting in discomfort and possible injury.

**Action to be Taken:**

After 10 years of service, the upper and lower hanger block bushings, and the safety backup bolt for the upper hanger block shall be replaced. All bushings and safety backup bolts must be factory original to assure design performance and safety.

**Detail of Issue:**

**Parts to be replaced:**

Upper Hanger Block Bushing – Part # 08271-2 Qty. 20  
Lower Hanger Block Bushing – Part # 08271-1 Qty. 10  
Safety backup Bolt – Part # 032-88SB Qty. 10



Dartron

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Bulletin # PIB-5K-004

Release Date: May 16, 2006

Effective Date: May 16, 2006

Supersedes: N/A

Completion Date: N/A

Page 1 of 1

## PRODUCT IMPROVEMENT

Ride Manufacturer: Dartron Industries, Inc.	Affected Production Dates: All
Ride Name: Cliffhanger	Affected Serial #'s: All
Model # All	

**Abstract of Issue:** The Cliff Hanger uses two spherical bushings and pin joints to attach the bearing base to the boom and additional spherical bushings and pin joints at either end of the drag link. Steel bushings are used on both ends of the pins used in these joints. Dartron has received reports that the steel bushings next to the bolt side of the pin have backed out. Without the steel bushing in place the pin could drop the width of the bushing. Since the pin is no longer perpendicular to the teardrop plate on the other end of the pin the teardrop plate could fracture.

**Reason for release:** To prevent the steel bushing from backing out Dartron will provide a retainer sleeve to be installed on the pin between the safety bolt and the steel bushing. Adding the retainer sleeve to the two boom to bearing base pin joints and to the two drag link pin joints will prevent the bushings from backing out.

**Action to be taken:**

1. Make sure the boom is on the boom rest and power is removed from the ride.
2. Remove the Nyloc Nut from the safety bolt on the boom to bearing base pin.
3. Remove the bolt.
4. Install the Dartron supplied retainer sleeve onto the pin.
5. Re-install the safety bolt with a new Nyloc Nut. DO NOT REUSE THE ORIGINAL NYLOC NUT.
6. Repeat on opposite boom to bearing base pin.
7. Remove the Nyloc Nut from the safety bolt on the lower/rear draglink pin.
8. Remove the bolt.
9. Install the Dartron supplied retainer sleeve.
10. Reinstall safety bolt with a new Nyloc Nut. DO NOT REUSE THE ORIGINAL NYLOC NUT.
11. Repeat on the pin on the opposite end of the drag link.

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Bulletin # SR-5K-0107-02

Release Date: 01/07/2007

Effective Date: 01/07/2007

Supersedes: N/A

Completion Date: 05/30/2007

Page 1 of 1

## SERVICE BULLETIN

Ride Manufacturer: Dartron Industries, Inc.	Affected Production Dates: All Cliff Hanger Rides
Ride Name: Cliff Hanger	Affected Serial #'s All
Model # All	

**Abstract of Issue:** Dartron is aware of Cliff Hanger rides that have developed cracks in the bearing base. Dartron bulletin SB-5K-001 requires a visual inspection of the bearing base and Dartron bulletin PI-5K-003 communicates the procedures for repairing bearing base cracks and the installation of reinforcing plates.

**Reason for release:** Enough cracks have been discovered that Dartron has decided to make the installation of the reinforcing plates mandatory regardless of cracking in the bearing base.

**Action to be taken:** Dartron requires that all Cliff Hanger rides must have reinforcing plates installed on the bearing base before May 30, 2007. After 05/30/07 Cliff Hanger rides without reinforcing plates installed should not be allowed to operate.

**Detail of issue:**

1. Contact Dartron and arrange for shipment of the reinforcing plates.
2. Visually inspect for cracks as outlined in Dartron Service Bulletin SB-5K-001.
3. If cracks are discovered repair as described in Dartron Product Improvement Bulletin PI-5K-003.
4. If no cracks are discovered, install reinforcing plates as described in Dartron Product Improvement Bulletin PI-5K-003.

Dartron

Issuing Entity:  
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Bulletin # PI-5K-0107-03

Release Date: 01/07/2007

Effective Date: 01/07/2007

Supersedes: N/A

Completion Date: N/A

Page 1 of 2

## PRODUCT IMPROVEMENT

Ride Manufacturer: Dartron Industries, Inc.	Affected Production Dates: All Cliff Hanger Rides
Ride Name: Cliff Hanger	Affected Serial #'s: All
Model #: All	

**Abstract of Issue:** Dartron is aware that some owner/operators of the Cliff Hanger ride are experiencing breakage of the car beds.

**Reason for release:** A new version of car beds is now available that addresses the breakage problems by allowing the car bed fasteners to float in the car bed holes to accommodate heavier loads and thermal expansion. Additionally, there will only be a single replacement bed that can be used for any of the three positions. The car bed will have 'cut-out' making it usable in either the inside, outside or center locations.

**Action to be taken:** Replacement car beds will now be shipped with the new configuration and required hardware.

### Detail of issue:

NOTE: This will only need to be done the first time the new style bed is installed into the frame. All new beds will have the same configuration in the future.

1. Determine which cutout will need to be removed to give you the proper configuration for the car bed being replaced.
  - a. For the center car bed, drill the holes at the end of the slots beside the latch assembly with a 5/8" drill. A 1/16" pilot hole is provided.
  - b. For the left and right car beds, determine which side cutout will need the clearance for the pivot point and remove the corresponding notch at the perforations.
2. Place the passenger carrier bed into the approximate location on the car bed frame.
3. At position A; bolt down the crotch pad on the side beds or the latch assembly on the center, depending on which one is being replaced; as illustrated on the attached sheet. Use this to align the holes.

4. Place the aluminum grommets into the approximate center of the slots on the bed.
5. The rear four holes (Position B) should be at the right location for new drilling. Mark the location of this point on the metal tabs with a transfer punch or similar device. Do not attempt to use the existing holes unless they are centered in the slot.
6. For the front three holes (Positions D and E), try to put some weight/pressure into the front area of the car at Position C. Apply enough pressure to locate the grommet for position D into the center of the slot. See attached drawing.
7. Place the grommets into the approximate center of the slots at position D.
8. Again, mark the location of this point on the metal tabs with a transfer punch or similar device. Do not attempt to use the existing holes unless they are centered in the slot.
9. Remove the bed.
10. Drill new 1/4" diameter holes in the metal tabs on the car at the marked location. **CAUTION: DO NOT DRILL INTO THE TUBULAR FRAME.** In the event of partial hole, a slot from existing hole to the new hole location is acceptable.
11. Re-install the car bed using the grommets to fasten the bed down. **DO NOT OVERTIGHTEN**, it will mash the aluminum insert and not let the bed 'float'.
12. See following drawing/diagram.

