

Date: October 16, 2019

From: Walter Remmert, Director
Bureau of Ride and Measurement Standards
Pennsylvania Department of Agriculture

Subject: **Investigative Report**
Amusement Ride Reopening Requirements
Amusement Ride: Giant Gondola Wheel
PA Ride ID Number: 2660
7 PA Code § 139.11(c)(2)

I. Overview.

The Pennsylvania Department of Agriculture (the “Department”) is responsible for oversight of amusement rides and attractions throughout Pennsylvania, in accordance with the Amusement Ride Inspection Act.

The subject of this investigative report is the Giant Gondola Wheel (the “Wheel”) – an amusement ride owned and operated by Deggeller Attractions Inc. (“Deggeller”) that was located at York Fair Grounds, York, Pennsylvania at the time of the accident. The Wheel is registered with the Department and has been assigned PA Ride ID Number 2660.

The investigation described in this report was prompted by an incident that occurred on September 13, 2019. A forty-five-year-old male fell from a gondola while the Wheel was in operation. The Department’s Quality Assurance Supervisor and additional Quality Assurance Inspectors immediately responded to the scene on that date and initiated the on-site investigation described in this report.

Deggeller closed the Wheel immediately after the accident, as required by the Amusement Ride Inspection Act (at 4 P.S. § 407(d)). The Wheel has not operated in the Commonwealth since the accident, pending the final determination of the Department.

This report determines the circumstances under which the Department will approve the Wheel to reopen. (See: 7 Pa. Code § 139.11(c)(2)). *It does not determine or assign legal culpability.*

In summary, the Department requires three steps/actions before it will inspect the Wheel to determine whether it is approved to reopen. These are:

1. Verify to the Department that the gondola, related tie rods and support structure are undamaged or replaced to meet manufacturer’s specifications. Verify the rest of the ride was not affected by the incident and is in good repair and working order.
2. Verify the appropriate pins and r-keys for the ride are being utilized along with confirmation of their proper installation.

3. Provide the Department a written description of: (a) any changes to owner's manual concerning the specifications of the proper pins and r-keys to be used for the ride as described above; and (b) any updates to the operator's manual concerning operators being trained properly in emergency procedures and the audit process to ensure they are adhering to the requirements.

II. Investigation.

Ride Information & Conditions:

Ride Name: Giant Gondola Wheel	Serial #: 40003593
Manufacturer: Chance Manufacturing ("Chance")	PA ID #: 2660
Date of Accident: 9/13/2019	Time: approx. 8:03 p.m.
PA Certified Inspector: Richard Warble ("Warble")	Inspector #: 16275
Temperature: approx. 57 degrees	Wind: 0 – 2 MPH

The Giant Gondola Wheel is a mobile (travelling) amusement ride owned and operated by Deggeller. The Wheel has 20 gondolas capable of carrying up to 6 adult riders in each. The manufacturer specifies that riders must be at least 42" tall to ride. The ride requires 2 operators, one stationed at the control panel and the other at the loading/unloading area of the ride.

At approximately 8:43 p.m., September 13th, 2019, the Department's Quality Assurance Inspector Randall Arndt ("Arndt"), received a phone call from a patron at the York Fair concerning the accident involving the Wheel. The patron did not witness the accident but reported that the local police were on scene and the general details of what he believed occurred. He related his understanding that a rider had fallen from a gondola while the Wheel was operating. Arndt immediately notified Quality Assurance Inspector John Jardine ("Jardine"), who was temporarily assigned locally in York for the fair, and also notified the Quality Assurance Supervisor Joseph Filoromo ("Filoromo").

At approximately 8:49 p.m., Arndt received another phone call, this time from Richard Warble ("Warble"), the Pennsylvania Certified Inspector who inspected the Wheel for Deggeller. Warble provided additional details concerning the accident, including information that one of the gondolas had tipped and a rider had fallen out. This constitutes notification of the accident to the Department from a Deggeller representative.

Jardine arrived at the fair at approximately 9:20 p.m. Arndt and Filoromo arrived at approximately 11:00 p.m. The following information was gathered:

- A forty-five-year-old male rider ("Rider 1") fell out of Gondola 1. The extent of his injuries was not known at the time and he was transported to a local hospital for evaluation and treatment.
- A forty-eight-year-old female rider ("Rider 2"), also in Gondola 1, was able to stay in the gondola and may have sustained injuries when the gondola righted itself and she fell to the floor. Rider 2 was also transported to the hospital for evaluation and treatment.
- The ride's loading/unloading operator ("Operator 1") was said to have sustained injuries while trying to aid Rider 1. Operator 1 reported that he fell from the deck of the ride injuring his hand and knee. No further information was provided as to the extent of his reported injuries.

The Department closed the ride and remained at the fair to conduct interviews, secure the scene and conduct an initial review and inspection of the ride. Arndt and Filoromo obtained information from both ride operators, and several of the ride assistants. Rider 1 and Rider 2 were interviewed later in the week, adding details and

confirming many of the details already gathered. The information assisted with determining the timeline of events and provided information concerning possible factors in the accident.

Additionally, both operators and the assistant stated they heard a loud noise originating from the Wheel but could not identify the origin of the noise. The operators stated that they decided to unload the Wheel when they noted Gondola 1 (containing Rider 1 and Rider 2) entering the station (the loading/unloading area). As Gondola 1 entered the station it was sideways. Normal orientation is upright, Gondola 1 was not swinging freely and appeared jammed, causing it to be 90 degrees from normal, or on its side. The operators further stated that they attempted to brake the Wheel and Operator 1 attempted to right Gondola 1, injuring himself in the attempt.

Rider 1 and Rider 2 noted that a large metal bar (part of the structure of the Wheel) became detached at one end of the Wheel and swung to the side of Gondola 1 just prior to the accident. Both stated that they called out repeatedly to the operators during the last rotation of the Wheel just prior to the accident. Rider 1 took a photograph of the metal bar near the top of the Wheel, see **Fig. 2**.

For the next two days the Department's amusement ride safety staff remained at the York Fair investigating the accident. Activities included:

- A detailed inspection of the Wheel
- Interview of Warble, the Pennsylvania Certified Inspector who inspected the Wheel at the York Fair
- Additional interviews with the ride operators and Deggeller management
- Attempts to solicit information from patrons that may have witnessed the accident
- Review of testimonial and photographic evidence
- Attempt to recreate the circumstances of the event leading up to the accident

Over the next several weeks the Department inspected five Giant Gondola Wheels, registered and operating throughout Pennsylvania, comparing information from the accident to information found at each of the Giant Gondola Wheels. The Department had regular communication with Chance, the ride manufacturer, with additional details that appear later in this report. The Department had issued a bulletin concerning the use and inspection of pins and r-keys on August 16, 2019 and reissued the bulletin on September 18, 2019. Both were sent by e-mail, the first to all owners and the second to all owners and inspectors of registered Pennsylvania amusement rides. The Department also sent a bulletin to owners of Giant Gondola Wheels on October 10, 2019, requiring them to verify the size, type and proper installation of pins and r-keys for their specific amusement ride.

Investigative Details:

- Gondola 1 was jammed in place during the accident, which caused it to tip (fail to swing freely and maintain an upright position while the wheel rotated) after a loose tie rod contacted the canopy (bonnet) of the gondola.
- The tie rod (described as the metal bar by Rider 1 & 2 and pictured in **Fig. 2**) is designed to be held in place by a pin and hairpin (a.k.a. r-key, "Hairpin" is Chance's terminology used in the manufacturer owner's manual), commonly known as a pin and r-key.
- The pin, Hairpin or pin and Hairpin combination failed causing the tie rod to come loose. The pin and Hairpin were not recovered so it is unclear if the failure occurred because of a missing Hairpin, a Hairpin that was pulled accidentally/intentionally, a faulty (also referred to as "sprung") Hairpin, a faulty pin, or that a pin or Hairpin that came in contact with the adjacent steel bearing block of the ride causing it to become dislodged.
- A faulty Hairpin was removed from one of the other tie rods during the initial investigation on the evening of the accident. See **Fig. 1**.



Fig. 1 – Faulty Hairpin removed from Wheel

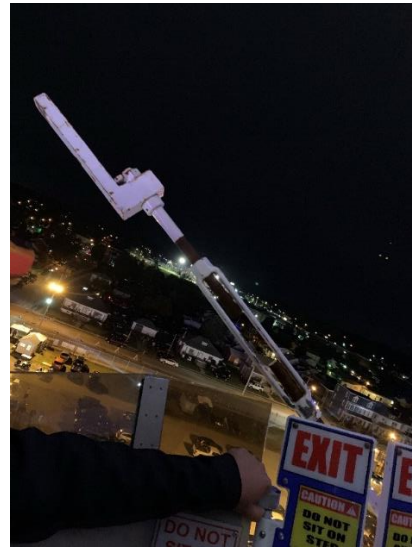


Fig. 2 – Loose tie rod photographed by Rider 1

- The tie rod came loose before the gondola was locked in place. This is detailed by several witness accounts and photographs. See **Fig. 2** and **Fig. 7**.
- Documentation showed that the Wheel was inspected by Warble as required by the Department¹ prior to opening of the ride. Additional documentation showed that the Wheel was inspected daily by Deggeller.
- The location of the connection points for the tie rod to the sweep is not easily accessible and it is unlikely that pins or Hairpins were removed accidentally or intentionally. See **Fig. 3**, **Fig. 4**, and **Fig. 5**.



Fig. 3 and Fig. 4 – Tie rod connection points not easily accessible by patrons.

- The tie rod pins are located away from patrons and are located next to the bearing block for the T bar to which the gondolas are mounted. There is very little room between a Hairpin and the bearing block. If the pin rotates, a sprung Hairpin could contact the bearing block. See **Fig. 5** and **Fig. 6**.

¹ A Pennsylvania Certified Inspector must inspect the ride, which must pass the inspection, after the ride is set up on location and prior to its operation. The ride must be inspected every 30 days thereafter if it remains in place.

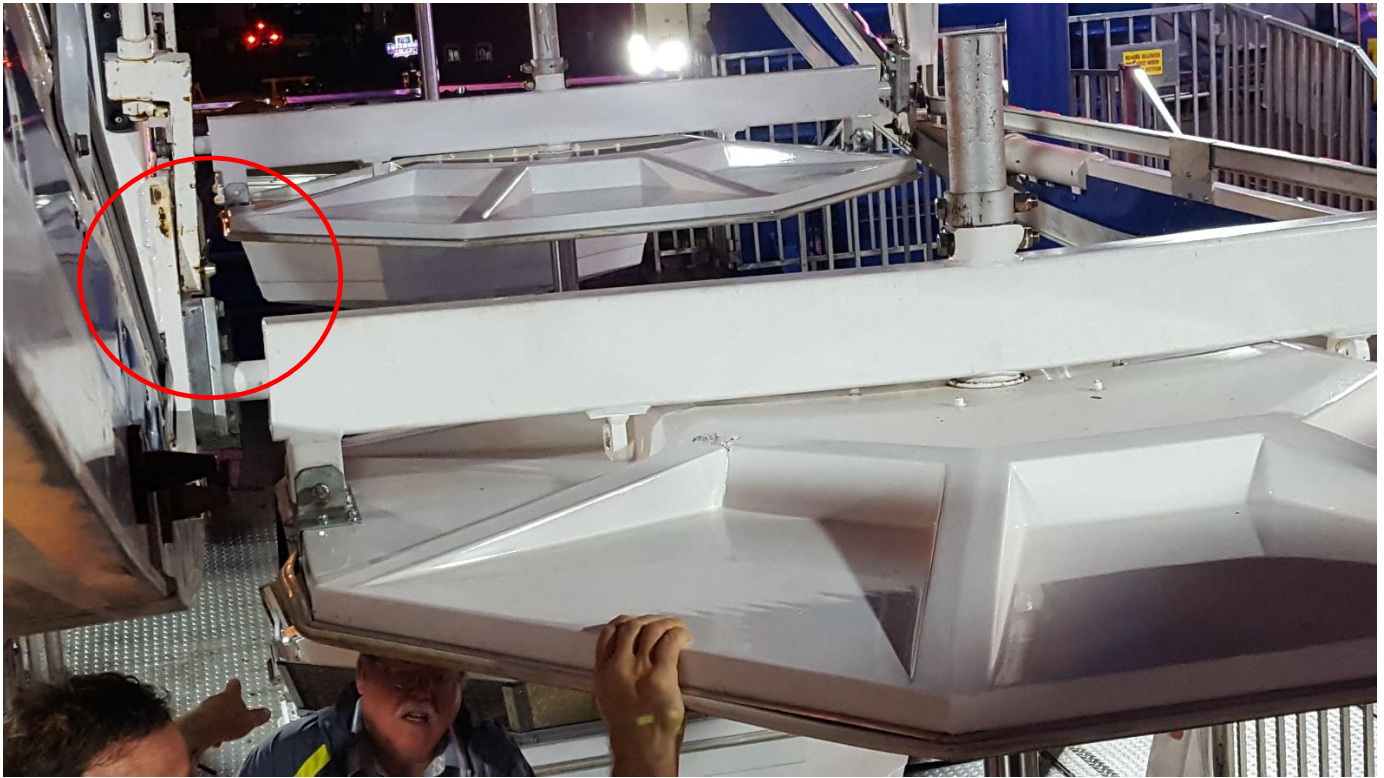


Fig. 5 – Tie rod pins location away from patrons and are very close proximity to bearing block.

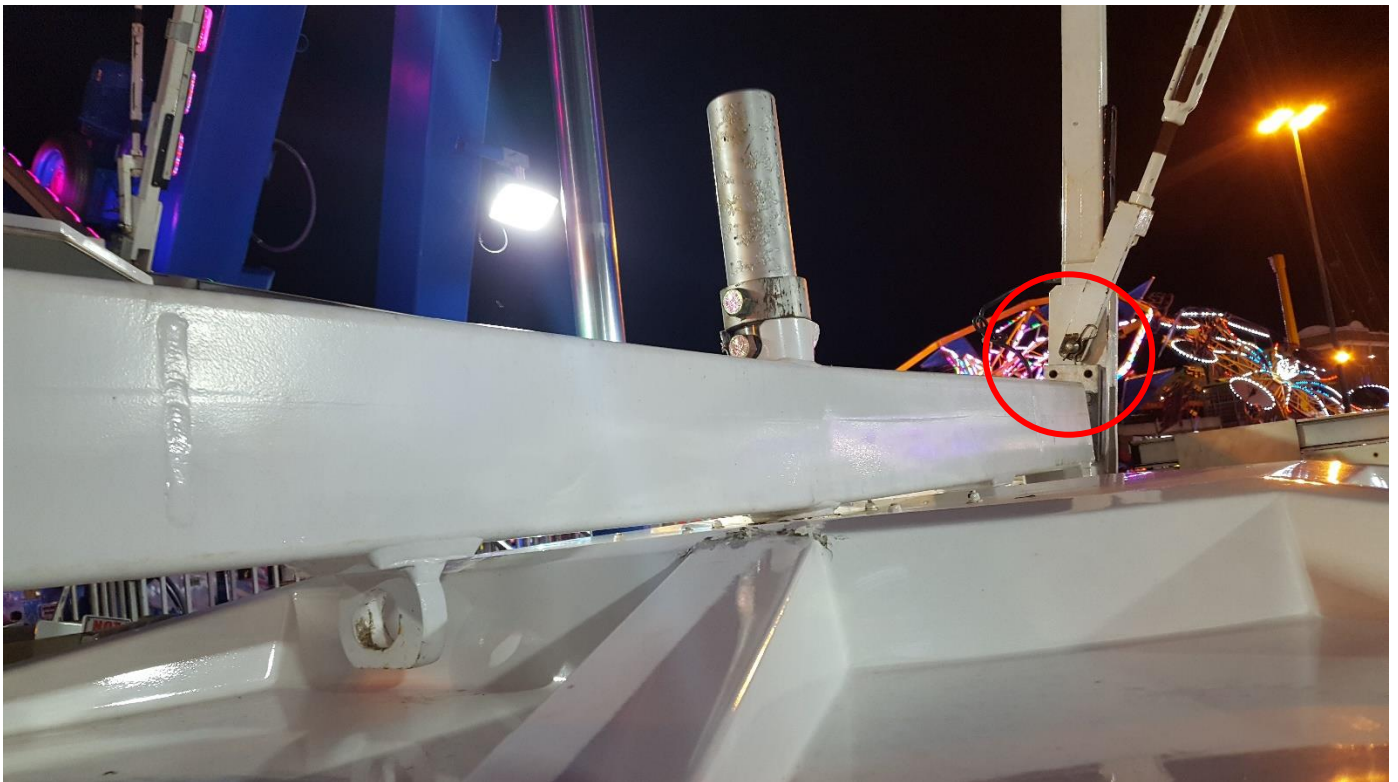


Fig. 6 – A tie rod pin connection is shown, note how close the Hairpin is to the bearing block

- Local media assisted by providing a bystander's video of the ride after the accident. Please note the captured still picture from the video details the loose tie rod that caused Gondola 1 to tip. See **Fig. 7**.

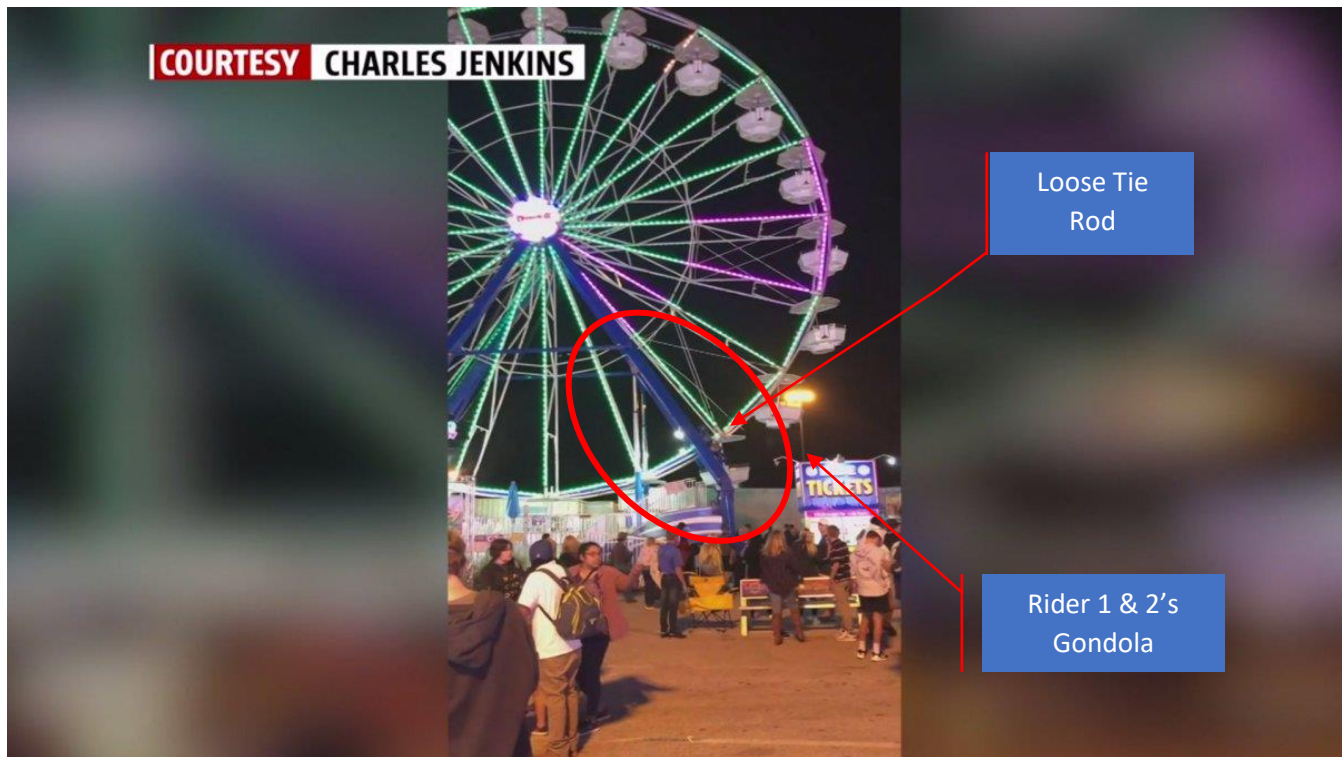


Fig. 7 – The Wheel shortly after the accident, note the loose tie rod

- Rider 1 fell out of the gondola as the gondola was stuck in a position that was 90 degrees from normal (almost parallel to the deck) as it rotated through the station area. The Wheel travels a portion of a rotation to stop, which accounts for Rider 1's fall of approximately 25 feet as the Wheel slowed to stop. Rider 1 was said to have landed on power cables and asphalt. See **Fig. 8**.



Fig. 8 – The area on the side of the wheel where Rider 1 landed

- The generator power plant for the midway was located behind the Wheel. The noise from the power plant may have been enough to hinder communication between the operators, assistants and patrons. Riders 1 & 2 emphasized that they attempted to shout to the operators prior to the accident. The power plant was in operation during the investigation and the noise was as described by Riders 1 & 2 and made it difficult to communicate during the investigation. See **Fig. 9**.



Fig. 9 – Notes the location and proximity of the power plant to the Wheel. The slats shown are to let air into the power plant but also do little to muffle the noise of the power plant

- Different size Hairpins have been found on the Wheel and the other Giant Gondola Wheels inspected by the Department.
- The Department has also found a variation in the size of pin being used to hold tie rods to the sweep on several of the inspected Giant Gondola Wheels.
- The Wheel has the tie rod pins installed from the outside pointing in toward the center. This places the hairpin close to the bearing block.
- Three of the other Giant Gondola Wheels inspected by the Department had the pins installed from the inside pointing out (this configuration places the Hairpin away from the bearing block and away from possible tampering).
- The Department has issued a bulletin dated October 10, 2019 to Pennsylvania owners of Chance's Giant Gondola Wheels requiring them to confirm with the manufacturer the proper installation of pins and Hairpins.
- Chance's owner's manual for the Wheel shows pin and Hairpin installation as follows, see **Illustration 1**.

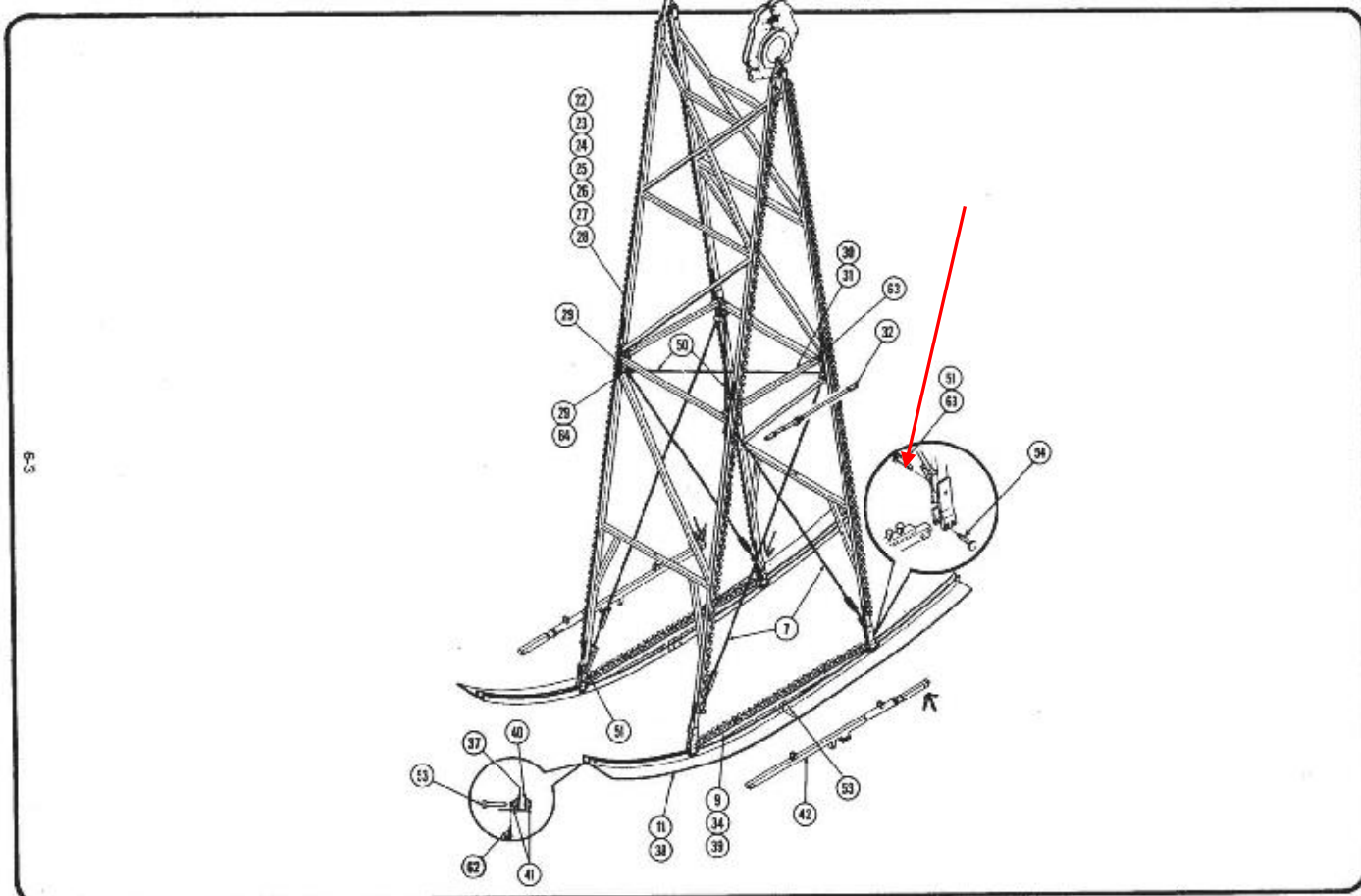


Illustration 1 – Excerpt from Chance Wheel owner’s manual, the diagram depicts the proper installation of pins and Hairpins

- The Department had ongoing communication with Chance and requested clarification on the proper pinning of the tie rod to the sweeps. **Illustration 2**, below, was received by the Department on October 1, 2019 from Chance. This depiction conflicts with the Chance Wheel owner’s manual, **Illustration 1**.

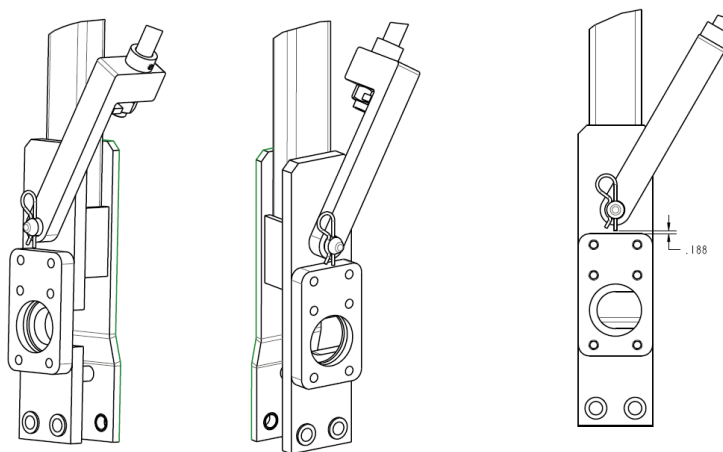


Illustration 2 – Chance’s initial depiction of proper pinning of the tie rods received by the Department on October 1, 2019. Note this diagram depicts the pins installed from the outside pointing inward

- The Department has gathered conflicting information from operators, experienced industry members and from Chance. Post-accident, representatives from Chance provided both pinning methodologies: one on October 1, 2019 (**Illustration 2**) and the most recent on October 10, 2019 (**Illustration 3**).

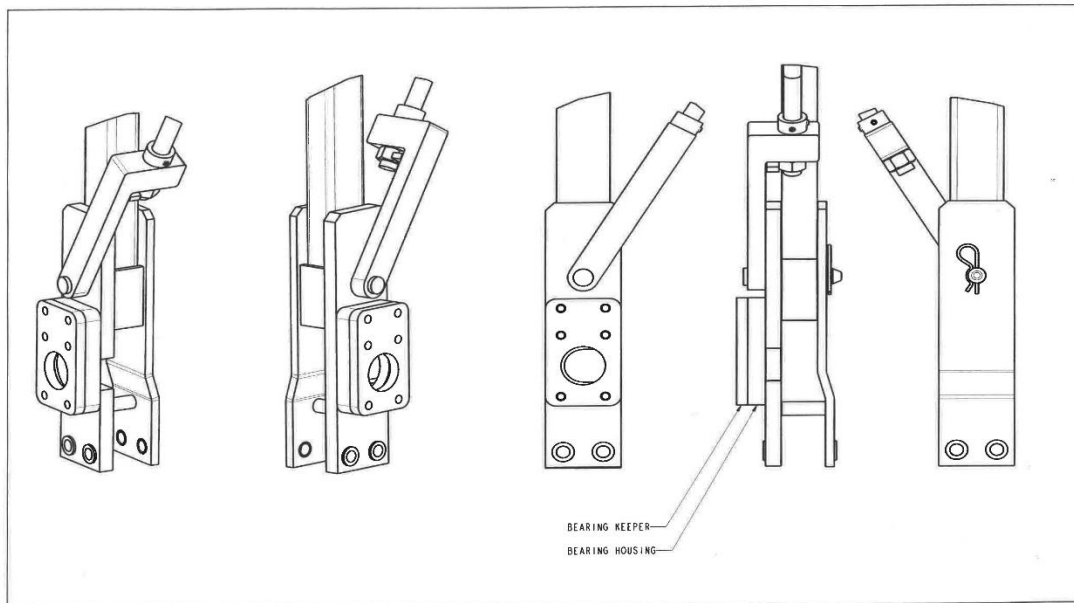


Illustration 3 – Chance’s 2nd submission to the Department depicting the proper pinning of the tie rods received on October 10, 2019, note this diagram depicts the pins installed from the inside pointing outward

III. Summary:

The following is a list of factors that (whether individually or in combination) may have contributed to Rider 1 falling from a gondola of the Wheel as it underwent normal operations at the York Fair on September 13, 2019:

- **Operations.** The power plant’s proximity to the Wheel and noise level may have inhibited the operators from identifying the danger of the tie rod as it broke free from the Wheel’s superstructure and the subsequent calls from Riders 1 & 2.
- **Maintenance/structural considerations.** As part of its on-site investigation the Department noted several maintenance/structural conditions that it brings to Deggeller and Chance’s attention. The extent (if any) to which these contributed to the accident is not known and the Department offers no opinion in this regard. These conditions are as follows:
 - Pin installation. The Department has noted the discrepancies in the proper installation of pins as they relate to the tie rods. As part of the reopening requirements Deggeller will need to confirm and adhere to Chance’s pinning requirements.
 - R-key serviceability. The Department has sent out bulletins to all Pennsylvania amusement ride owners and inspectors reminding them to pay attention to this detail.

IV. Reopening Requirements.

The Department is prepared to conduct an inspection of the Wheel to determine compliance with the requirements for reopening. The following steps should be taken before the inspection occurs.

1. Verify to the Department that the gondola, related tie rods and support structure are undamaged or replaced to meet manufacturer's specifications. Verify the rest of the ride was not affected by the incident and is in good repair and working order.
2. Verify the appropriate pins and r-keys for the ride are being utilized along with confirmation of their proper installation.
3. Provide the Department a written description of: (a) any changes to the owner's manual concerning the specifications of the proper pins and r-keys to be used for the ride as described above; and (b) any updates to the operator's manual concerning operators being trained properly in emergency procedures and the audit process to ensure they are adhering to the requirements.