

## Incident Summary #II-1216024-2021 (#22613) (FINAL)

SUPPORTING INFORMATION	Incident Date	June 21, 2021	
	Location	Whistler	
	Regulated industry sector	Passenger ropeways - Above surface ropeway	
	Impact	Qty injuries	0
		Injury description	NA
		Injury rating	NA
	Damage	Damage description	Haul rope damage, roughly 40cms long going over 8 strands. On 2 strands there are 6 damaged wires. On the others there are 4-5 damaged wires.
		Damage rating	Minor
Incident rating	Minor		
Incident overview	While conducting line work, maintenance staff were moving the work carrier in reverse from T1 into the return station. The work carrier came to a dead stop as it entered the station while the haul rope was moving. The ropeway was stopped immediately. The damaged section of rope is 40cm in length, going over 8 strands.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>4 passenger carrier, Detachable Grip (Doppelmayr, DS 104 Grip). This same grip is utilized with the maintenance carrier.</p> <p>Maintenance carrier consists of 2 decks (one deck at a lower and one deck at an upper level).</p> <p>Incident occurred at the bottom return station of the ropeway</p> <p>The grip utilizes an inside movable jaw and dog configuration (dog is utilized in lifting or inverting the movable jaw linkage into its open position). See photo 1</p> <p>Ropeway is designed and capable of running in reverse.</p> <p>Grips detach from the haul rope as they enter the station (either in the forward or reverse direction). The grip/carrier is then transported through the station by a configuration of belt driven tires and guided by a set of rails. The running wheel rail (channel type configuration in which the grip wheels are situated in the vertical position). The running wheels support the weight of the carrier. A second rail ("trumpet wheel rail" or guide rail) is located on the outside of the grip path and maintains the grip in a level position by supporting the trumpet wheel (a horizontal positioned conical shaped wheel located on the grip). (Image 1,4).</p>	
	Failure scenario(s)	Grip jammed and failed to open (detach from haul rope) as it entered the station	
	Facts and evidence	Narrative of events based on report provided by the operator:	

-Ropeway maintenance personnel conducting lift line maintenance work ran the ropeway maintenance carrier out of the bottom station in the forward direction to retrieve some new spare sheaves that were being transported on a carrier situated 2 carrier lengths behind the maintenance carrier.

- After retrieving the sheaves from carrier, the ropeway was reversed to bring the maintenance carrier back into the station. In the report provided by the operator it is indicated, that as the maintenance carrier was reversed and it passed under the tower 1 sheave assembly (tower 1 is a hold down tower) the work carrier could have developed a swing as it entered the station. Upon entry to the station the maintenance carrier came to a sudden stop with the haul rope still moving.
- Reports provided by operator indicates that the ropeway was running at 0.5 m/s - 1 m/s when the grip jammed
- Based on the observed damage to haul rope it is estimated that the haul rope moved approximately .4 m through the closed jammed grip. The operator reports the damage to the haul rope to consist of compression damage to several wires of multiple strands.

At the far outgoing end of the running wheel rail a deformity (pre-existing condition) was noted to the inside steel upright of the channel (Image 1,2,3).

A witness mark was noted to the dog of the grip movable jaw. Report from the contractor indicates that this was consistent with a scenario where the movable jaw dog made contact with the deformed section of the running wheel rail (Image 1).

In a report provided by the operator, it was indicated that the grip trumpet wheel was in a less than ideal state. Photo of the trumpet provide evidence that it was significantly worn (multiple cracks with flattened and partially separated sections) (Image 4).

#### Causes and contributing factors

The combination of the worn grip trumpet wheel and the deformity noted to the running wheel rail likely could have resulted in the condition where the movable grip jaw dog of the swinging maintenance carrier made contact with the deformed section of running wheel rail. This contact, while the haul rope was running in reverse would likely have caused the sudden stop of the moving maintenance carrier grip.

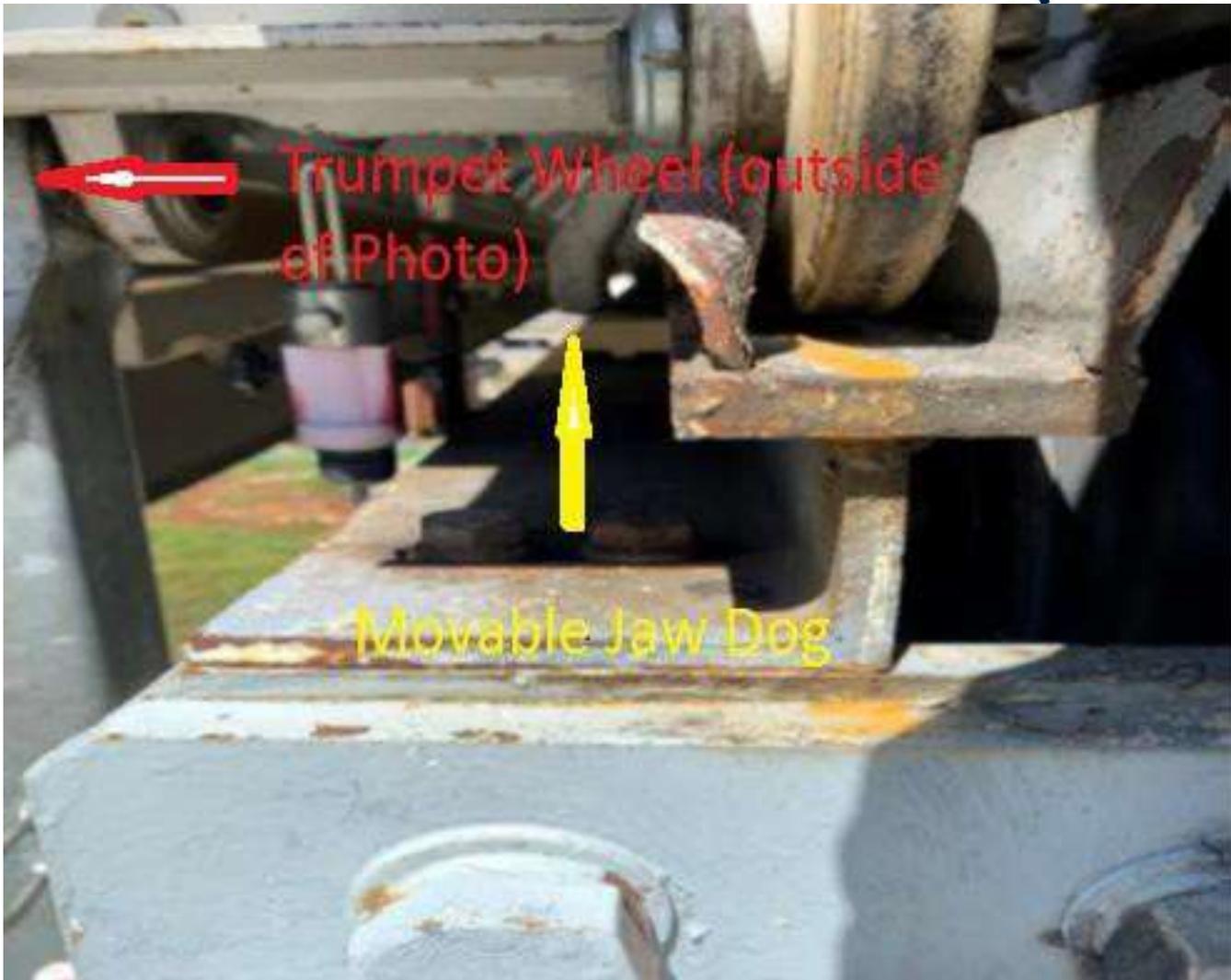


Image 1 - Deformity to Running Wheel Track Front View with Grip in View



Image 2 - Deformity to Running Wheel Track Side View



Image 3 - Deformity to Running Wheel Track Top View



Image 4 - Grip Trumpet Wheel