Incident Summary #II-818656-2019 (#10666) (FINAL)

SUPPORTING INFORMATION	Incident Date		January 16, 2019
	Location		Vancouver
	Regulated industry sector		Elevating devices - Elevator
	Impact – Injury	Qty injuries	0
		Injury description	None
		Injury rating	None
	Impact – Damage	Damage description	The rubber washer inside the machine brake plunger assembly disintegrated.
		Damage rating	Minor
	Incident rating		Minor
	Incident overview		As the passenger was entering the elevator, the elevator cab began to drift up which caused the passenger to trip into the elevator.
INVESTIGATION CONCLUSIONS	Site, system and components		Traction elevators use machine brakes to ensure the elevator does not move when passengers are entering and exiting the elevator. The brakes use a plunger system to engage/disengage brake pads. A rubber washer is installed on one end of the plunger to reduce the impact of the plunger against its housing. Elevator and hoistway sills are metal tracks that guide the bottom of the elevator and hoistway doors. They also act as part of the floor as you enter and exit elevators. When an elevator is at a landing and the doors are fully open, the elevator sill must be substantially flush with the hoistway sill and remain flush until the elevator doors are fully closed. During this time the machine brake is set ensuring no movement of the elevator.
	Failure scenario(s)		After the elevator doors opened, with the car and hall sill substantially flush, the brake plunger caused a delay in the brakes engagement. The elevator started to drift up approximately 4” before the brakes were fully engaged and the elevator stopped.
	Facts and evidence		• Video obtained from the building security camera captured the incident. • Safety Officer arrived on-site and mechanic had started repair job. Brake plunger assembly was already disassembled. • Mechanic stated they were not aware the repair was due to an incident so they did not wait for a Safety Officer prior to starting the repair job. • Mechanic stated the disintegrated rubber washer had been replaced during a brake upgrade that occurred in the last 12 months. • Brake upgrade was performed by mechanics with proper training (**photo 1**) • Disintegrated rubber washer left contaminants in the plunger housing (**photo 3 and 4)** • No clear evidence for what caused the rubber washer to disintegrate.

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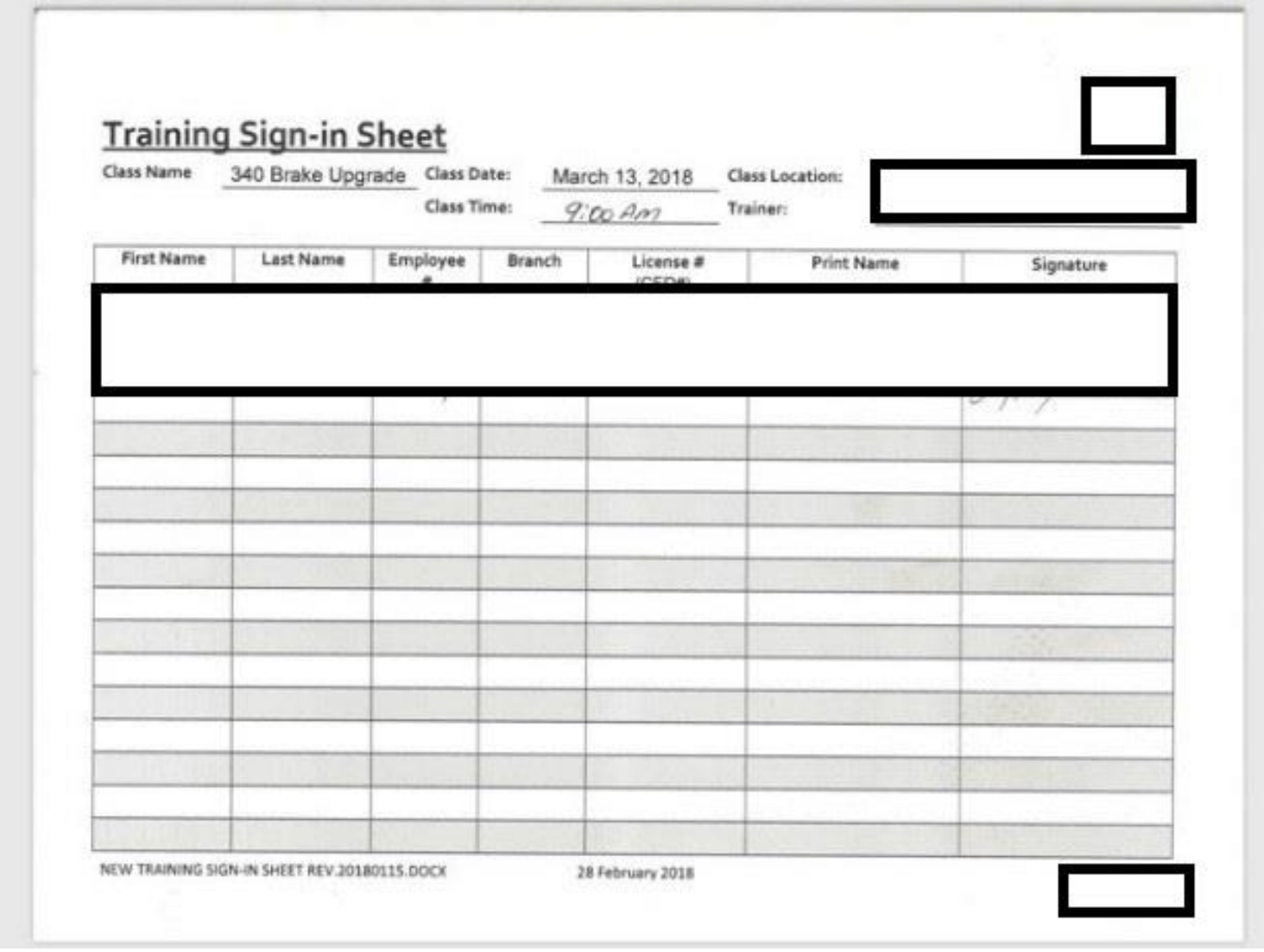
Causes and contributing factors	It is likely that the rubber washer disintegrated inside the brake plunger assembly. It is possible the rubber washer was not installed correctly causing abnormal stress on the washer resulting in the washer disintegrating. It is probable pieces of the disintegrated washer impeded the plunger, causing a delay in the brake engaging.



Training Sign-in Sheet

Class Name: 340 Brake Upgrade Class Date: March 13, 2018 Class Location: [redacted]

Class Time: 9:00 Am Trainer:

First Name	Last Name	Employee #	Branch	License # (CEP#)	Print Name	Signature
[redacted]						

NEW TRAINING SIGN-IN SHEET REV.20180115.DOCX 28 February 2018 [redacted]

Photo 1 Training sign off sheet for the 340 machine brake upgrade

Photo 2 Machine brake assembly with a new rubber washer

Photo 3 Machine brake assembly with rubber washer disintegrated to small pieces

Photo 4 Brake brass sleeve with remnants of the rubber washer