Incident Summary #II-1570402-2023 (#36471) (FINAL)

SUPPORTING INFORMATION	Incident Date		June 14, 2023
	Location		New Westminster, BC
	Regulated industry sector		Elevating Devices
	Impact – Injury	Qty injuries	1
		Injury description	Worker stated they had a panic attack, pain on right leg and feeling pressure on head.
		Injury rating	Minor
	Impact – Damage	Damage description	2 suspension ropes severed.
		Damage rating	Moderate
	Incident rating		Moderate
	Incident overview		While a person was travelling in an elevator in a retail business, 2 suspension ropes severed causing the elevator to engage the safeties which stopped and secured the elevator car. The person in the elevator car lost balance and fell onto a shopping cart in the elevator car and was trapped and rescued by fire department.
INVESTIGATION CONCLUSIONS	Site, system and components		• The elevator type is 2-stop Savaria/Concord LULA (Limited Use, Limited Application). • The LULA is a hydraulic lift utilizing two 3/8inch steel suspension ropes attached to the elevator car and the guide rail pit steel that is fastened to the pit floor (Image 1). • A hydraulic cylinder is used to provide motion in the up and down direction. • The LULA uses an overspeed governor (Image 2) that will trip and engage the elevator type A safeties if the elevator over-speeds beyond the rated speed of the governor. • The rated speed of a LULA is a maximum 30 fpm (0.15 m/s). • The maximum rated load of a LULA is 1400 lbs (635 kg). • The LULA is in close proximity to external facing automatic sliding doors, with potential for exposure to weather elements.
	Failure scenario(s)		Over time the steel ropes began to corrode, and no warnings or indications were found during routine elevator maintenance. While the elevator was traveling in the up direction, both 3/8inch suspension ropes (Image 3 and image 4) were severed allowing the elevator car to fall in the down direction (Image 5). The overspeed governor tripped due to an overspeed fault which engaged the Type A safeties, stopping the elevator car movement. The elevator car was supported by the type A safeties. There was one person in the elevator car during the incident that was reported to have minor injuries as the person in the elevator car lost balance and fell onto a shopping cart in the elevator car and was trapped and rescued by fire department.

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Facts and evidence	• Both 3/8inch suspension ropes were severed and were no longer connected to the elevator car. • The elevator overspeed governor was tripped indicating an overspeed event. • The elevator car type A safeties were engaged and were supporting the weight of the elevator car. • At the section of the elevator suspension ropes where they were both severed, there was a significant amount of damage to the ropes due to rust (rouging) (Image 6, image 7, and image 8). • Due to the rust forming in the inner core of the suspension ropes (Image 9 and image 10), most of the steel ropes did not show any indication of rust on the outer layers of the steel cables. • There was an excessive amount of rouging (rust) present on the top of the elevator car and car sling. • Review of the maintenance log entries showed no indication that there was rust or rouging on the elevator suspension ropes.
Causes and contributing factors	It is very probable that rouging of the suspension ropes over time led to the failure. It is probable that the car top was not checked during routine maintenance to notice the excessive rust and dust, therefore the suspension ropes were not noticed as deteriorating. It is possible that exposure to weather led to the suspension ropes beginning to rust and rouge from the inside.

Image 1 - Elevator car from below.

Image 2 - Overspeed governor rope & suspension rope.

Image 3 - Severed suspension ropes.

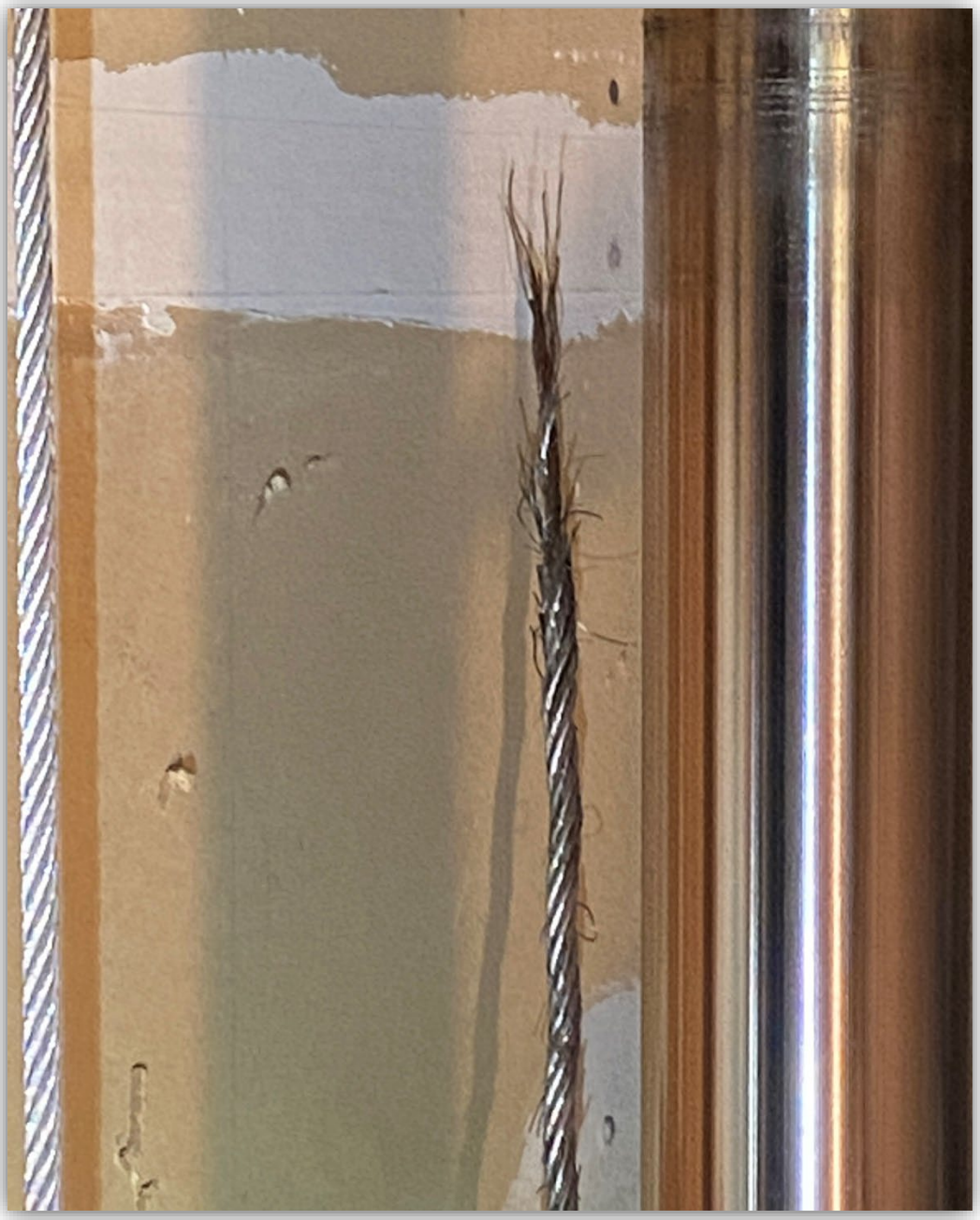

Image 4 - Severed suspension ropes.

Image 5 - View from car top.

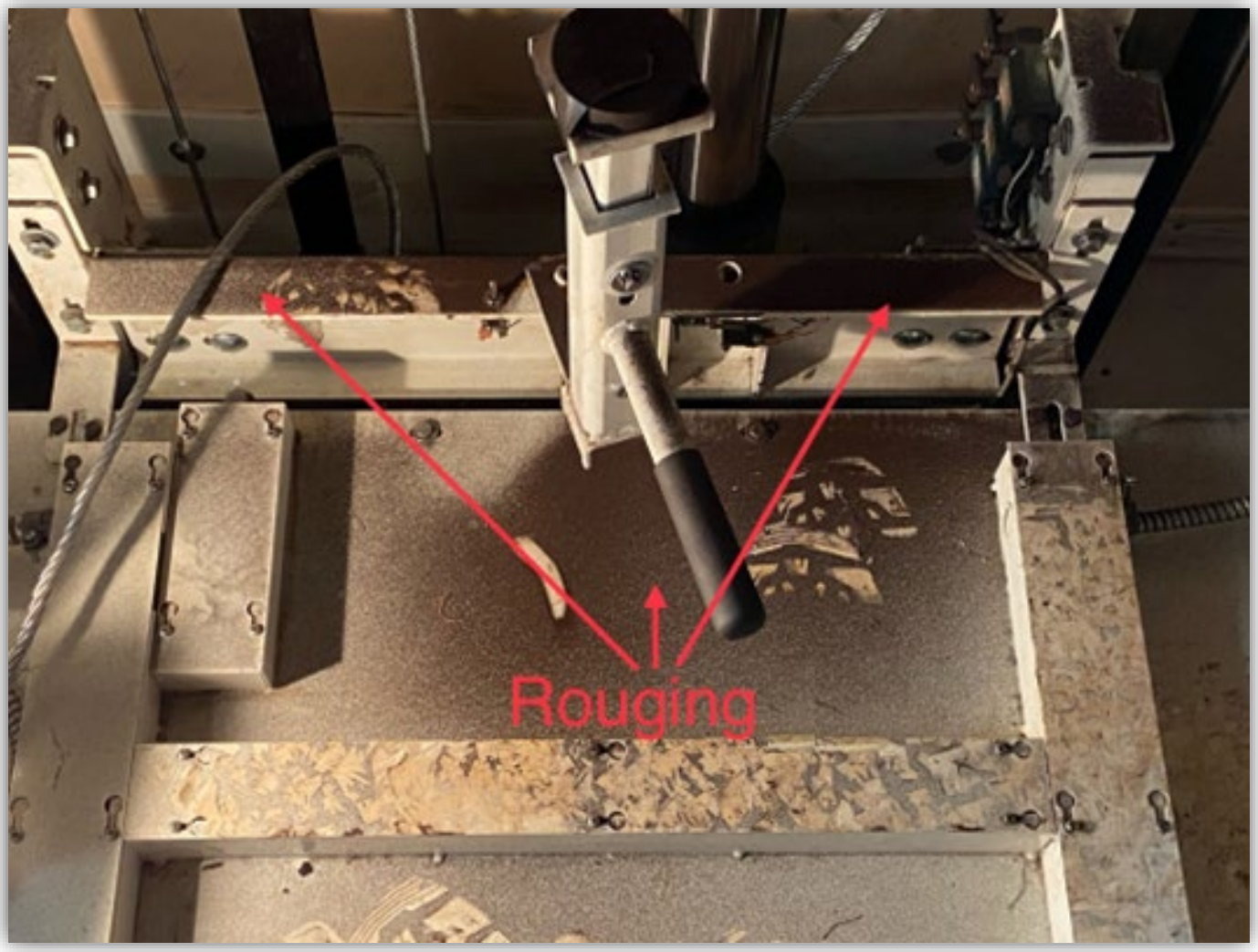

Image 6 - Rouging on car top.

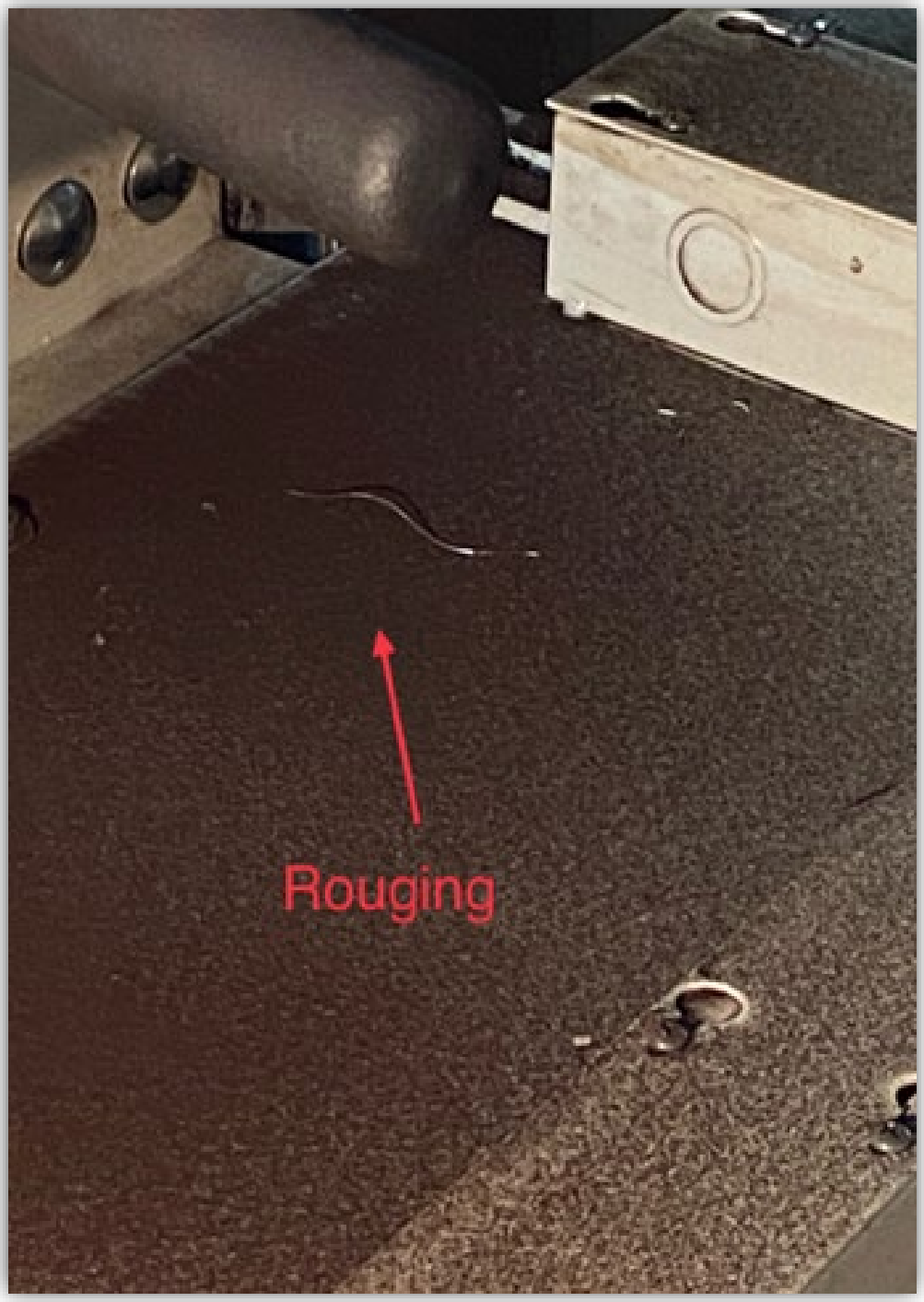

Image 7 - Rouging on car top.

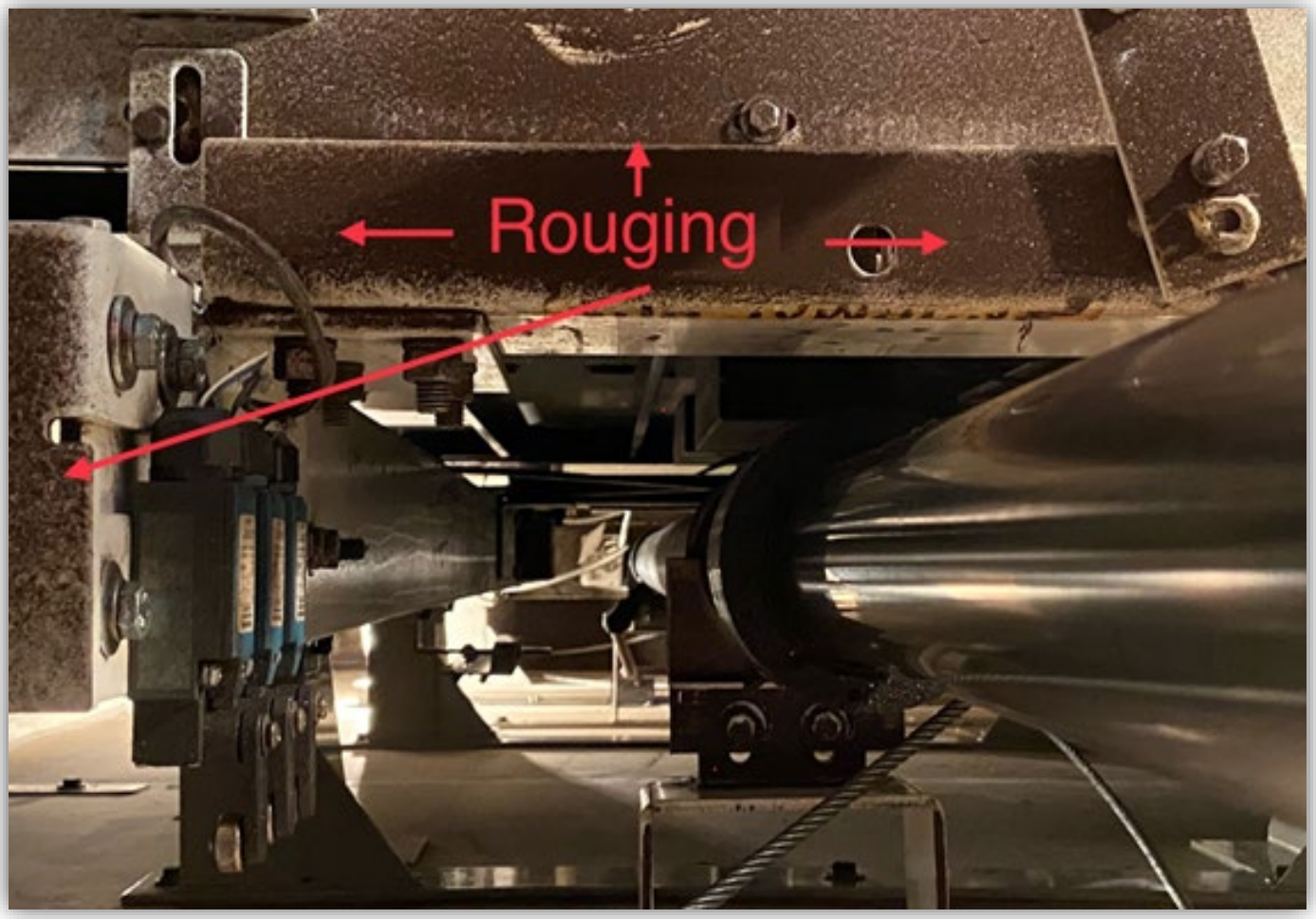

Image 8 - Rouging on car top.

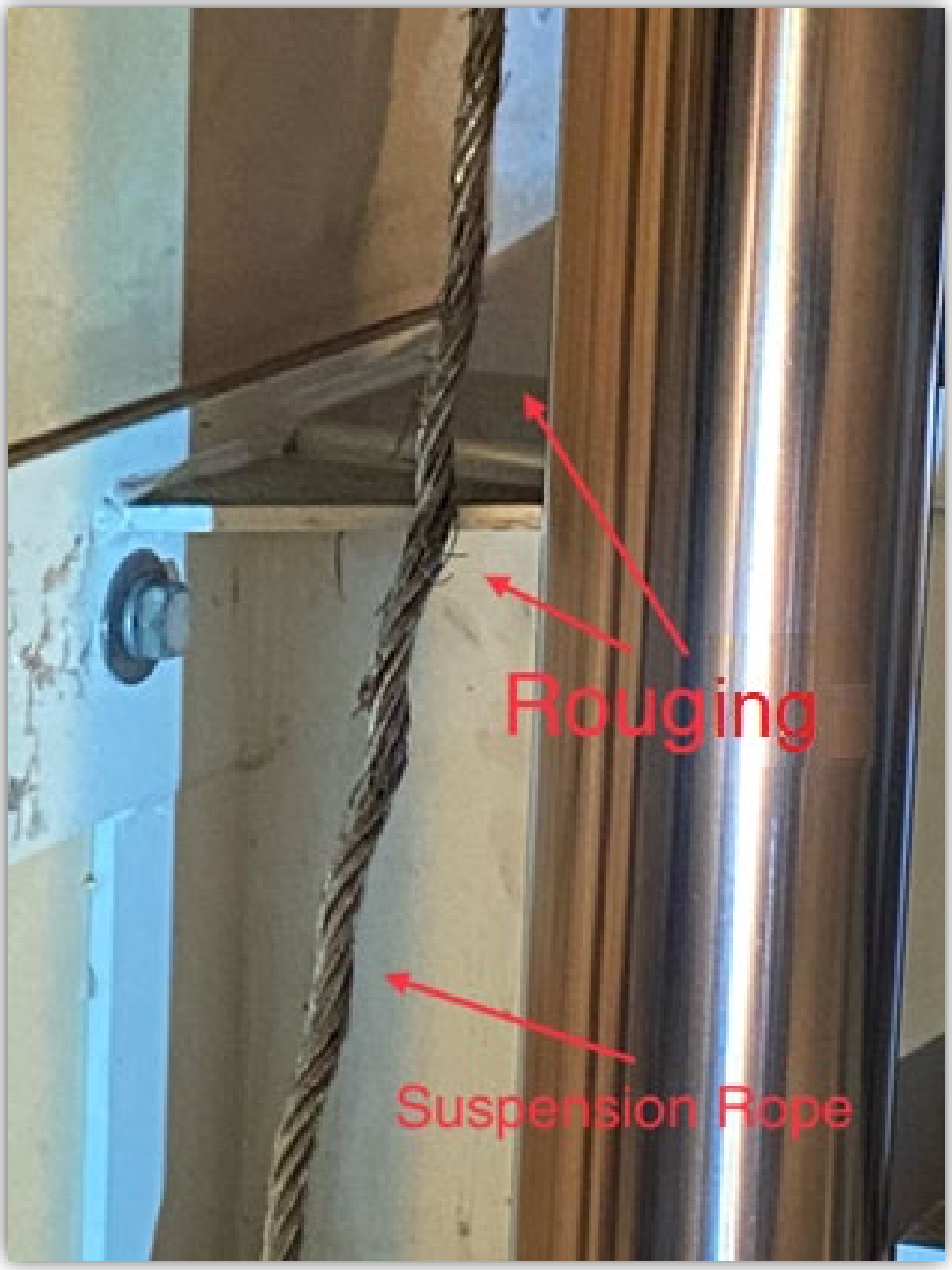

Image 9 - Rouging inside suspension ropes.

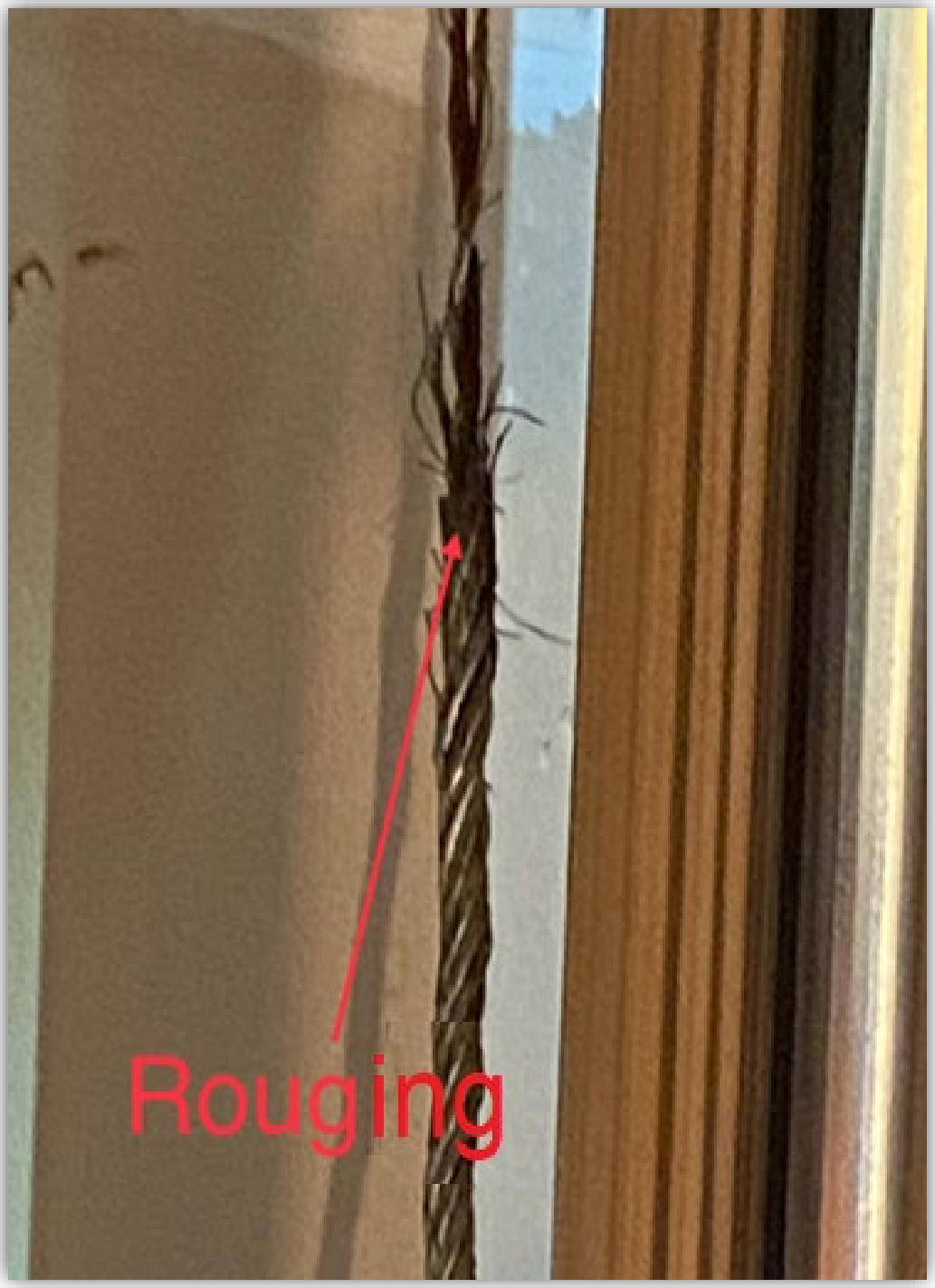

Image 10 - Rouging inside suspension ropes.