

Incident Summary #II-713160-2018 (#7838) (FINAL)

SUPPORTING INFORMATION	Incident Date	7/5/2018	
	Location	Coquitlam	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	None
		Injury rating	None
	Damage	Damage description	Damage to the main distribution panelboard in a single family dwelling.
		Damage rating	Minor
	Incident rating	Minor	
Incident overview	A homeowner working on an energized panelboard caused an arc flash while attempting to relocated the system ground conductor within the panelboard.		
INVESTIGATION CONCLUSIONS	Site, system and components	A panelboard with a main circuit breaker rated for service entrance is common in most single family dwellings. The panelboards are installed and manufactured with covers and barriers to prevent contact with energized electrical conductors, busing and terminals and to contain any electrical faults that may occur. The panelboard enclosure cover is removable to provide access to the electrical components for installation or alteration but it is not to be removed unless the main circuit breaker is locked out in the off position as no repairs or alterations are to be carried out on energized equipment. Inside the panelboards enclosure there is an internal barrier containing the service box which is the line side connection to the main circuit breaker and the consumer service conductors which are the conductors from the service box up to the point of attachment for connection to the supply authority conductors. This barrier is provided so the panelboard can be safely worked on when the main circuit breaker is locked in the off position as the conductors and line side connections underneath the barrier can only be disconnected by the supply authority.	
	Failure scenario(s)	The panelboard cover and service box barrier were removed on an energized panelboard by the homeowner while trying to relocate the system ground conductor entry into the panelboard from the top of the enclosure to the side. While moving the bare copper ground conductor it accidentally came in contact with one of the energized phase line side connections to the main circuit breaker in the service box causing a ground fault and subsequent arc flash damaging the panelboard.	
	Facts and evidence	Homeowner statement: The homeowner stated they were trying to move the system ground conductor from its existing entry location in the top of the panelboard enclosure to the side when it accidentally came in contact with one of the energized main circuit breaker termination lugs.	

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	<p>Physical Evidence:</p> <p>There was visible damage to the panelboard (See photo's) and knockouts missing in the enclosure (See photo #1) that indicate that the damage was caused while trying to move the system ground conductor.</p>
Causes and contributing factors	It is very likely that the damage was caused to the panelboard by the homeowner performing electrical alterations on the energized equipment.

Photos or diagrams (if necessary)

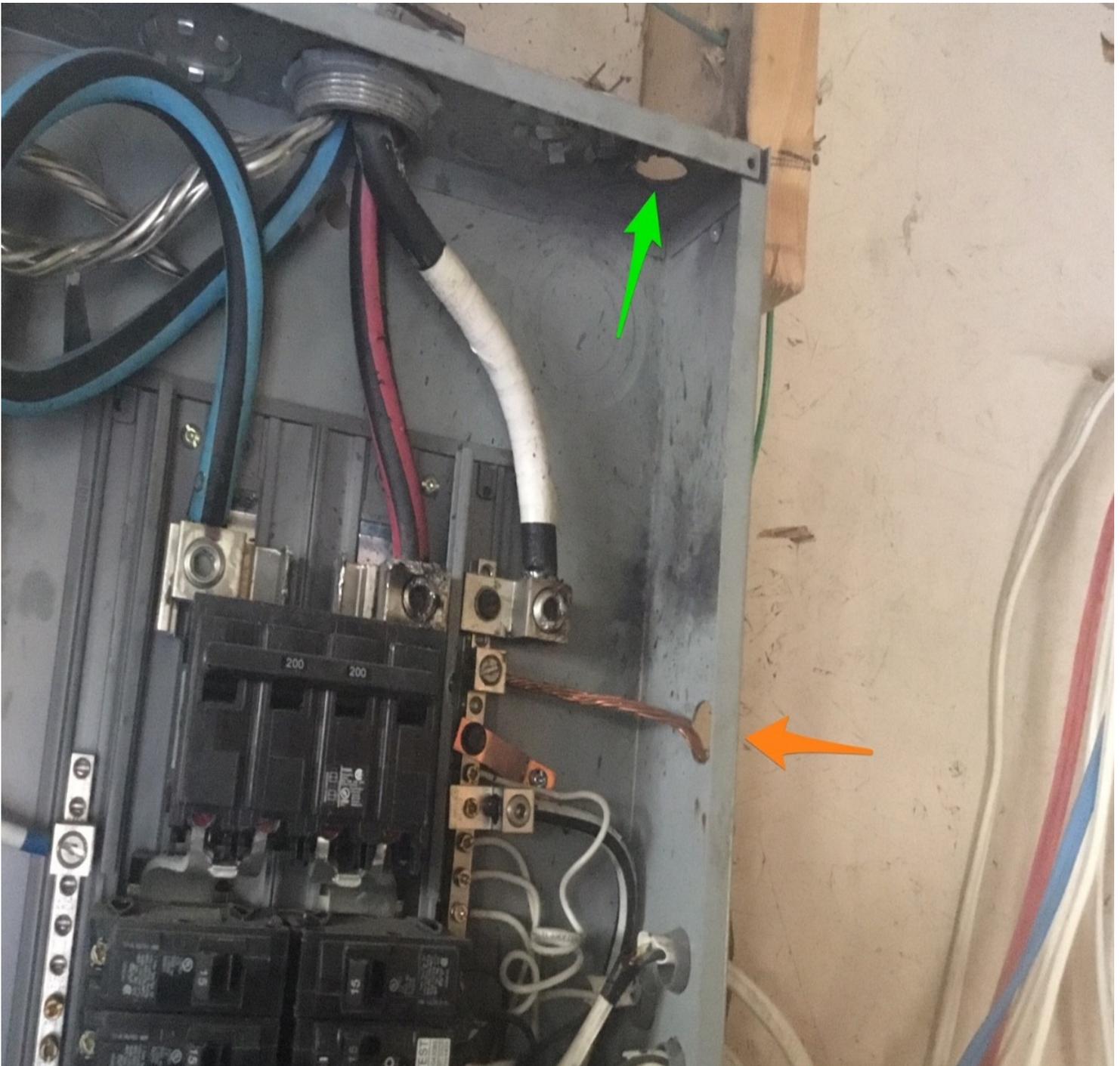


Photo #1

Green Arrow: The green arrow is pointing to the knockout missing in the top of the panelboard enclosure where the ground conductor was originally entering through.

Orange Arrow: The orange arrow is pointing to the new location of entry for the ground conductor. When the homeowner was moving the ground conductor into the new location it came in contact with the energized phase termination lug.

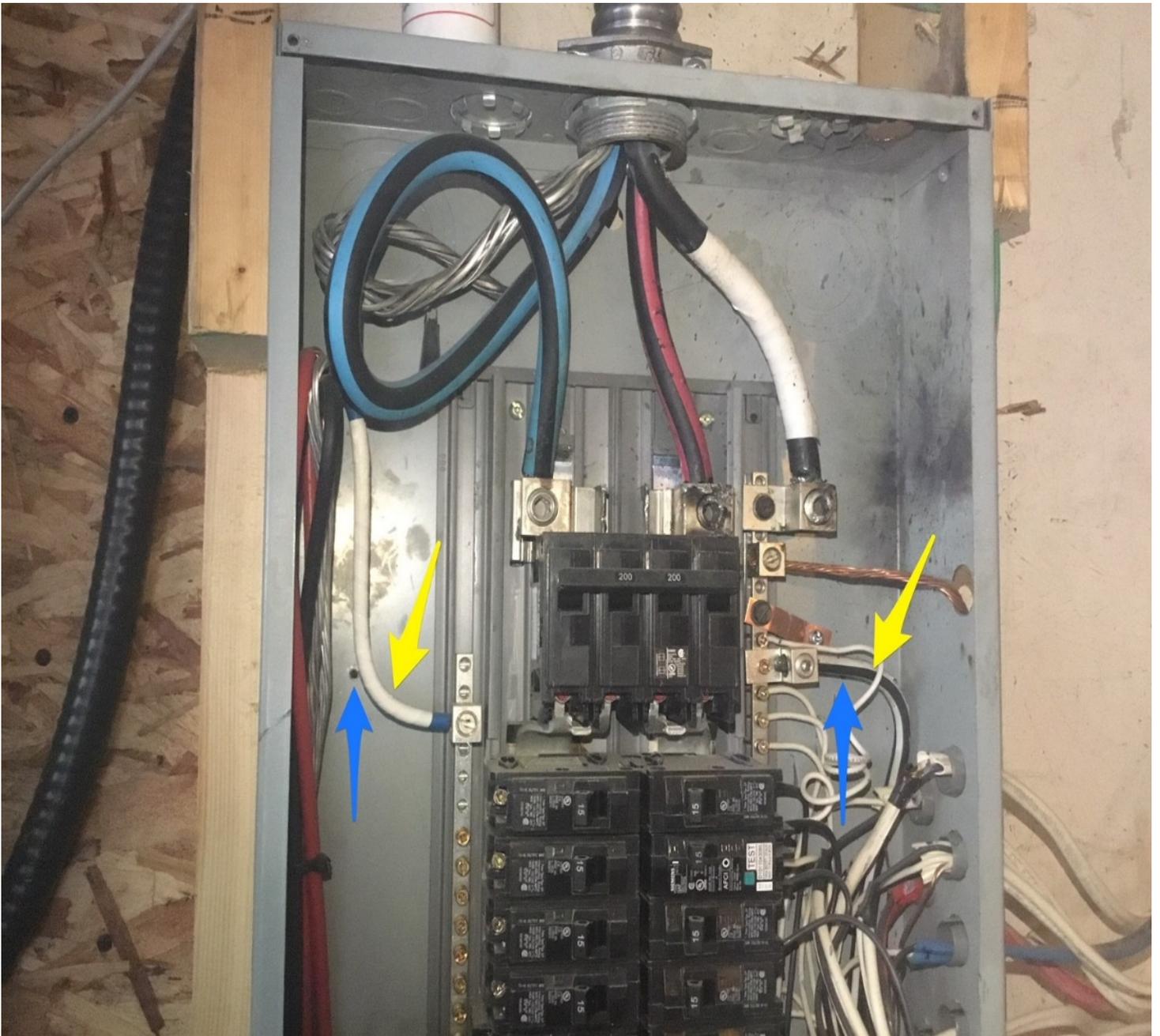


Photo #2

Blue Arrows: The blue arrows are pointing to the mounting holes for securing the service box barrier.

Yellow Arrows: The yellow arrows are pointing to conductors terminating to the neutral buss that would prevent the service box protective barrier from being installed and appears to have been removed before the branch circuit and feeder conductors were installed into the panelboard.

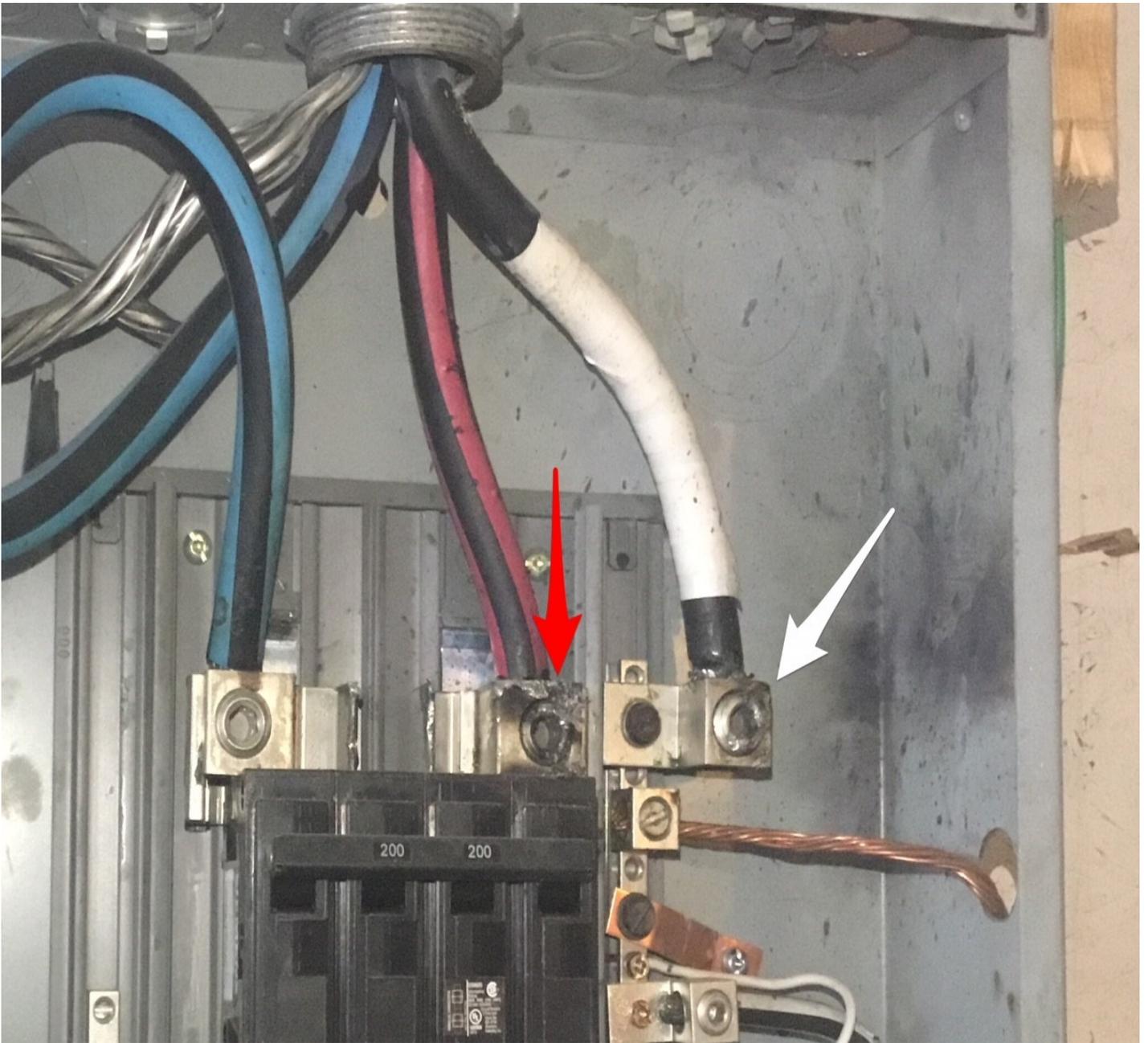


Photo #3

Red Arrow: The red arrow is pointing to the damage caused by the ground fault to one of the consumer service phase conductor termination lugs.

White Arrow: The white arrow is pointing to the damage cause by the ground fault to the lug for the consumer service conductor neutral termination.

On the right of the panelboard enclosure you can see black smoke / burn marks caused by the heat produced during the arc.