

Incident Summary #II-1014540-2020 (#17613) (FINAL)

SUPPORTING INFORMATION	Incident Date	May 17, 2020	
	Location	Armstrong	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	A small electrical fire occurred with the electrical wiring of a fluorescent ceiling mounted fixture in a garage - no structure damage noted
		Damage rating	Minor
	Incident rating	Minor	
	Incident overview	A 2 lamp 4' 120volt ceiling fluorescent light fixture with a magnetic ballast and T-12 lamps installed was operating when wiring overheated melting wires/ cable and shorting out on a pinched cable installation onto the metal enclosure causing a small fire.	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>A surface mounted fluorescent light fixture is used to provide illumination to an area by the connection to a power source, this can be operated in various methods that include switching by manual means or by automatic means with timer controls.</p> <p>To operate, the lamps are supplied with 2x #18guage conductors from a magnetic rapid start pre-heat ballast where a voltage is applied at the ends of the lamps to pre-heat the filament's and excite the gases within the lamps to light up</p>	
	Failure scenario(s)	<ul style="list-style-type: none"> - The fixture was energized for a period of time that allowed the cable to heat excessively that lead to a fault that burnt wiring within the fixture and the cable shorting to the fixture enclosure. The wires and cable became overheated and caught fire 	
	Facts and evidence	<ul style="list-style-type: none"> - Discussion with the owner provided information that the lighting fixtures were existing when he purchased the dwelling approx. 3 years ago, he stated the dwelling was inspected and cleared by a home inspection at the time of purchase - 2 conductor non-metallic sheathed cable (NMSC) was run from an existing ceiling lighting box over to 2x florescent light fixtures added, the cable was 'pinched' between the metal fixture and the metal soffit ceiling at both fixtures and entered the top side of the fixture through a knock out with no connector, the cable provides evidence of shorting at the pinch point of the damaged location. - An adjacent fixture is installed with the same methods and was not affected, photos provides a clear view of how the fixtures were installed 	

	<ul style="list-style-type: none">- Evidence within the fixture provide burnt 120volt wiring from the wire nuts within the fixture to the ballast location, wire nuts show evidence of heating Plus the yellow conductors for lamp pre-heat connections have been burnt from the 120volt wire nut location to the lamp socket direction- The non-metallic sheathed cable installed from the original existing light box to the light fixture shorted between the fixture frame and the metal soffit ceiling at a pinch point causing the cable to overheat and melt- The overcurrent device did not trip during the incident and the Fire Department stated they had de-energized the circuit on site
Causes and contributing factors	<ul style="list-style-type: none">- With the photo evidence provided, the cause was certain to be electrical in nature. The source can be attributed to wiring within the lighting fixture near the 120volt connections where the line voltage wires/ connectors may have fused/ shorted to the extra low voltage lamp conductors acting as a low resistance load preventing the overcurrent device from tripping, over-heating all the line voltage wires to ballast, extra low voltage wires in directions to lamp sockets and non-metallic sheathed cable causing the NMSC to soften and heat, ending up shorting to metal at pinched location, this non-metallic sheathed cables insulation integrity had likely been compromised at the pinch point by the installation itself and years of vibration created form the upper floor being occupied.



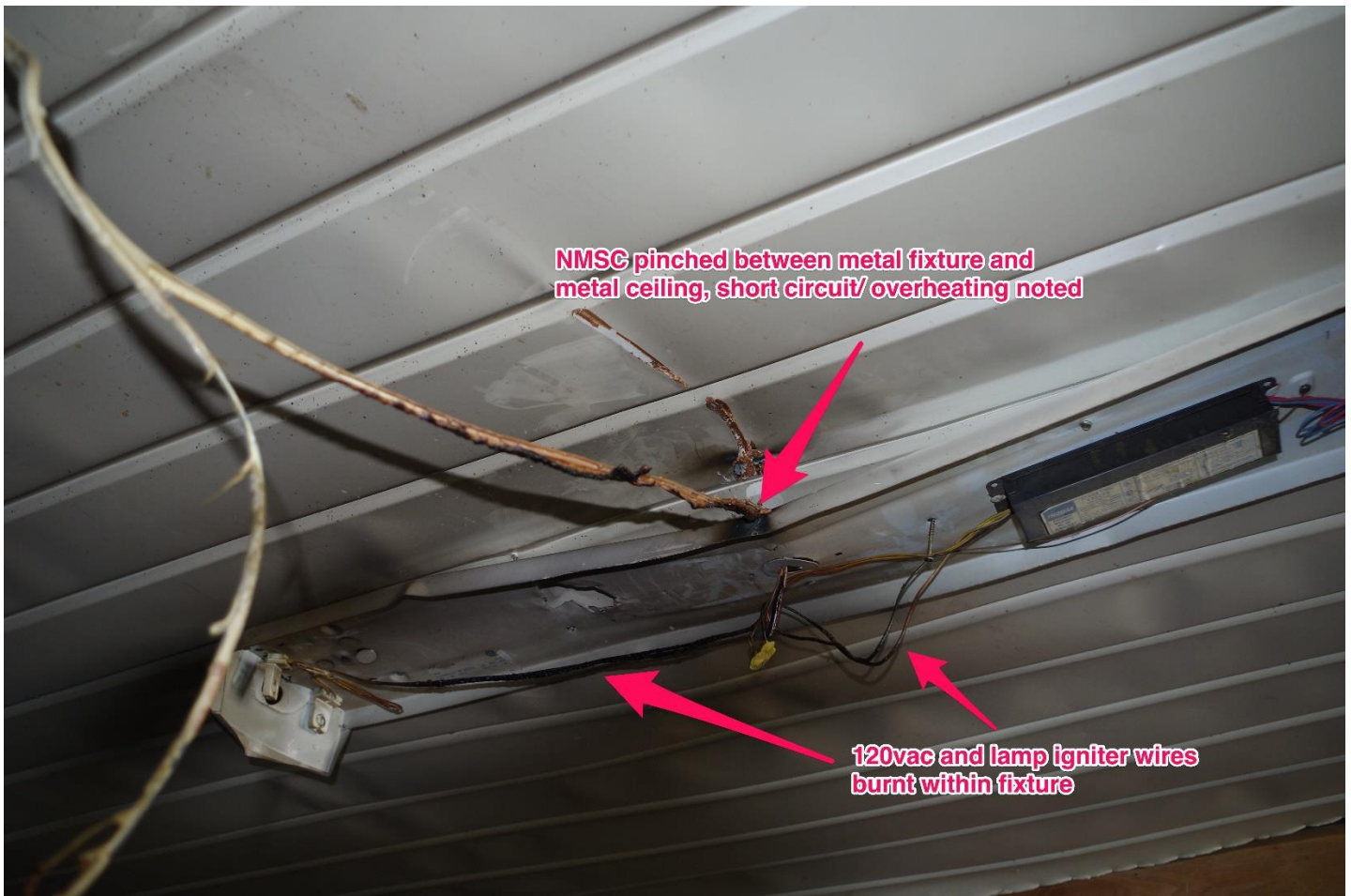
General interior view of garage



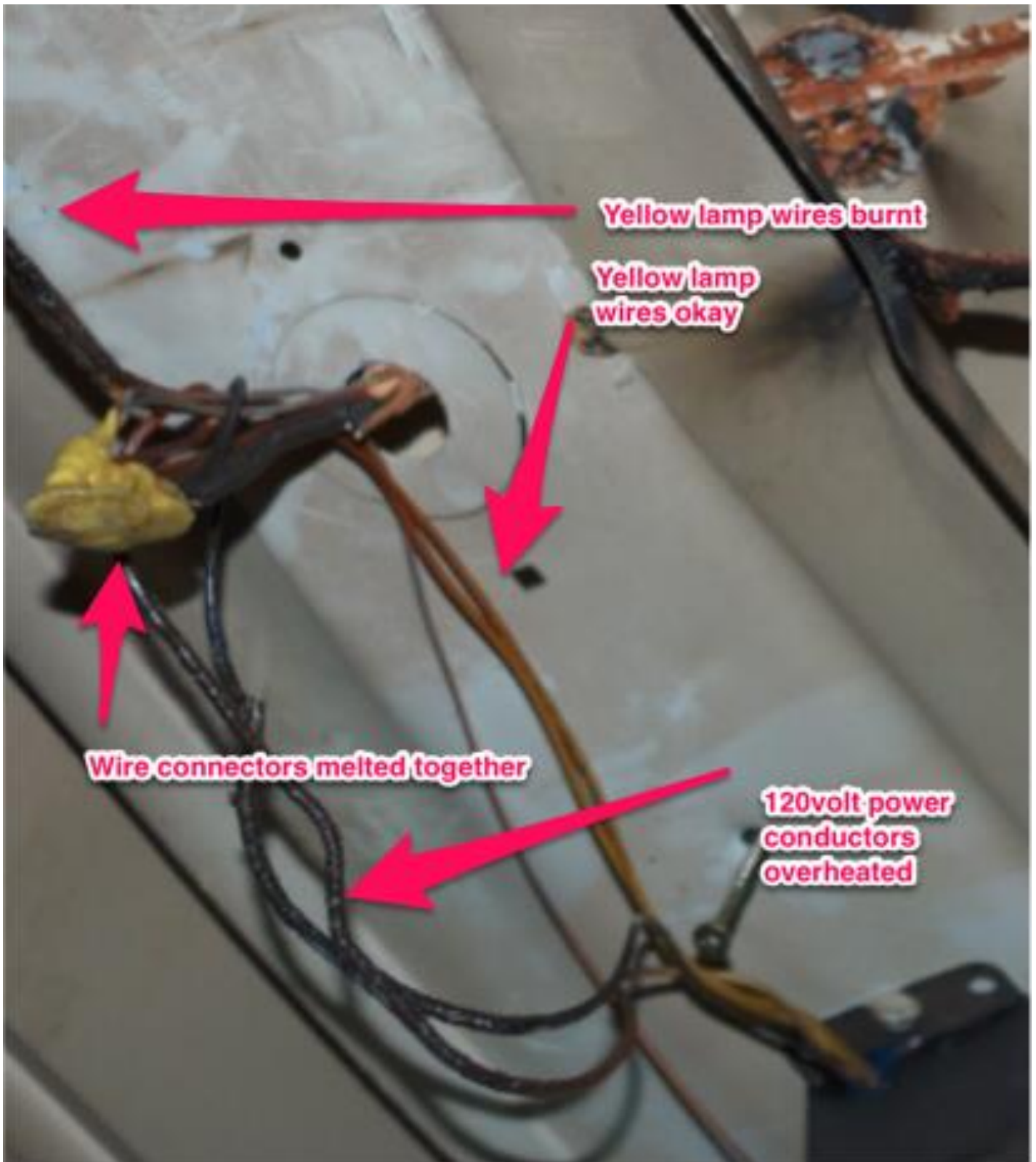
Connection of 2x ceiling mounted surface mounted lights to 'original' existing ceiling light junction box



View #1 of melted damaged NMSC



View #2 of melted damaged NMSC with notes



Internal fixture connections view with notes