

## Incident Summary #II-934425-2019 (#15805) (FINAL)

SUPPORTING INFORMATION	Incident Date	October 24, 2019	
	Location	Mara	
	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 fire was found on an exterior wall of a dwelling where a Generator was located with a coolant heater cord plugged in. The fire extended to within the wall space and damaged various electrical and structure
		Damage rating	Minor
	Incident rating	Minor	
	Incident overview	A fire that caused damage to an exterior receptacle where a 1500watt generator coolant heater was plugged into burnt the exterior and interior wall with additional interior wiring for a Hot Tub, exterior Air Conditioning unit and speaker wiring were badly damaged	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>A dwelling had</p> <ul style="list-style-type: none"> <li>A- a 17kw 120/240volt back up Generator installed that had a 1500watt 120volt coolant heater with thermostatic control installed to keep the Generator block warm to allow the Generator to start within a safe operating temperature to provide backup power to various electrical within the dwelling during a power outage.</li> <li>B- A 60amp 240volt fed Hot Tub used for leisure pleasure for persons. A Hot Tub has pumps and a heater on board that maintain a set temperature when power is constantly applied.</li> </ul>	
	Failure scenario(s)	<ul style="list-style-type: none"> <li>- Witnesses stated there was a power outage for approx. 6-7 hours to which the generator should/ would have been operating, the block coolant heater was not energized from the backup power panel and therefore was not operational during this power outage</li> <li>- Power was restored and the fire was noted by an neighbor from the exterior of the dwelling</li> <li>- the call into Fire Rescue was received within an approx. 1-1.5 hours after the power was restored</li> </ul>	
	Facts and evidence	<ul style="list-style-type: none"> <li>- Site assessment performed 5 days after incident, Restoration company disturbed various evidence prior to ESO coming to site. Air quality was good for site review</li> </ul>	

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- The exterior wall was constructed of wood siding approx. 4' high behind Generator with stucco siding above
- A power outage of approx. 6-7 hours had the backup generator operating, the power to the exterior receptacle with coolant heater connected was not energized during this timeframe
- Power was restored which re-energized the exterior receptacle with coolant heater circuit and fire was found by a neighbor approx. 1 hour from power restored .
- Call was received by Fire/Rescue approx. 1-1.5 hours after power was restored
- The location of the exterior receptacle was no longer attached however pics of the receptacle provided significant damage with receptacle completely destroyed however a green tinge was noted on the bonding conductor which applies evidence of possible oxidization
- Other typical exterior receptacles on site utilize weather proof 'flip' covers that do not provide protection of cord connected equipment from adverse weather conditions when connected 24 hours/day
- Interior wiring of speaker wiring not applicable
- Interior wiring of Hot Tub feeder cable badly damaged Approx 4-5'. The damage to the Hot Tub feeder is significant with excessive signs of heat/ arcing noted. The armour of the cable is missing approx. 600-900mm, conductors shorted.
- First on scene Fire Chief Dave Schurek stated that when on scene he noted: A- the fire was all outside and low approx. 18" from grade, B- the fire was not through the interior drywall until the Fire Department opened the wall for access purposes, C- the fire acted like it had an accelerant and believed the Hot Tub cable was likely the issue (possible shorting of conductors? At time of attack), D- he checked the Generator coolant heater cord as it melted back into the generator enclosure but was unable to find any area the cord may have shorted

### Causes and contributing factors

From the evidence provided by interview with witnesses, Electrical contractor and pics provided, the fire was possibly 1 of 2 scenarios.

1- EXTERIOR RECEPTACLE (A) initiated by an faulty cord connection to the exterior receptacle. The damage of the receptacle has slight green tinge noted on the conductor and this may have been evidence that the cord connection 24hours/ day created some oxidization from moisture and this could have led to a poor electrical contact on the receptacle and/or (B) the heater 'was' utilizing power and overheated the cord connection or

2- HOT TUB BRANCH CIRCUIT CABLE, The option of the Hot Tub cable is less likely the issue but cannot be ruled out due to the damage of the cable was significant in comparison to the wood structure damage. Once the power was restored, the Hot Tub was cooled and required the 44amps of power when the cable faulted within the wall shorting and causing the fire fitting with the time frame of the fire starting

The timing of the incident comes into question as while the Generator was operational and the utility power was de-energized, there was no power to the exterior receptacle for the coolant heater PLUS once the power was restored- the need for the thermostatically controlled coolant heater should not have been required as the Generator block and engine would still have been heated to the point the coolant heater was not required

Photos or diagrams (if necessary)



Interior view of wall, various pieces of evidence have already been disturbed. Exterior wall has plywood installed to close off the exterior.



photo provided by Contractor showing pic from exterior of dwelling. The Hot Tub cable is burnt off at below right side of photo and the exterior receptacle branch circuit cable is strung through burnt stud



Hot Tub feeder 'line side' of cable melted with approx. 600-900mm of armour melted away and cables fused together



remains of exterior receptacle box. Slight tinge of green noted on copper conductor near the bottom of the pic showing possible signs of oxidization.



Exterior view of installed Block heater receptacle 'not used' opened up, and Air Conditioning cable damaged



Air Conditioning disconnect location next to Generator, load side cable fire damaged



downward view between the generator and exterior wall. Cables damaged shown include the generator power feed (larger one) and the Air Conditioner cable (smaller one). The Generator location is approx. 10"-12" from dwelling exterior wall



general view down side of house past point of ignition. Generator shown at bottom of picture

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**KOHLER Power Systems** Engine Block Heater Kits



Block Heater Kit, typical

**Applicable Models**

- 1530RES,RESA
- 1530RYG,REYG
- 24RCL
- 30RCL
- 38RCL
- 38RCLB
- 48RCL
- 48RCLA
- 60RCL

**Description**

The engine block heater kit heats the engine coolant, making starting easier and warm-up quicker. The thermostat, built into the base of the block heater, automatically turns off the heater when coolant temperature reaches 27-28 °C (80-100 °F).

- Provides an extra degree of weather protection
- Keeps a generator performing in harsh conditions

The block heater is recommended for ambient temperatures below 0 °C (32 °F).

Model 30RCL, 38RCL, 38RCLB, 48RCL, 48RCLA, and 60RCL generator set engines are equipped with valves that eliminate the need to drain the cooling system before installing the block heater. Model 24RCL generator sets built on or after January 24, 2017 (serial number 50M32559) are also equipped with valves. A retrofit kit is available for 24RCL units built before this date without the valves.



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**Specifications**

Generator Set Models	Block Heater Kit Number	Volts	Watts
1530RES,RESA and 1530RYG,REYG	GM32877-KP1	120	1000
	GM32877-KP2	240	1000
24RCL (built before 1/24/17)	GM101015-KP1	120	500
	GM101015-KP2	240	500
24RCL (built on or after 1/24/17)	GM90235-KP1-GS	120	500
	GM90235-KP2	240	500
30RCL and 38RCLB	GM90235-KP1-GS	120	500
	GM90235-KP2	240	500
38RCL	GM84997-KP1-GS	120	1000
	GM84997-KP2	240	1000
48RCL, 48RCLA, and 60RCL	GM78529-KP1-GS	120	1500
	GM78529-KP2	240	1500

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Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator distributor for more information.



Typical heater specifications c/w  
thermostatic control to maintain a  
coolant temperature at around 80-100  
degrees F





Generator Coolant heater cord burnt



Typical style outdoor receptacles installed, GFCI protection provided by exterior receptacle located in walkway outside by main electrical panel. Heater cord would be inserted 24 hours/ day 7 day/ week which would



Hot Tub specification label: 44amps @240volt, feeder cable 3c #4 Al ACWU cable c/w 2p 60amp GFCI breaker in main electrical panel- NOT operational during power outages



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Main Electrical Panel located in garage.

- Existing 15amp 120volt exterior receptacle circuit used to power generator coolant heater
- Sub-feed for back up power panel
- 2p60amp GFCI for Hot Tub



Back up power Auto-transfer Switch and panelboard located just inside door exiting to Generator location.