



COMMONLY ASKED QUESTIONS

What is a “Powercheck” electrical examination?

The electrical system of the house is checked for electrical safety, from incoming cables and electrical panels to receptacles and connected loads. If any fire hazards are identified they are listed clearly in the report. Typical examination time by a Powercheck certified electrician in the house is 90 minutes. The examination is entirely non-invasive as any electrical tests are done at the panelboard, outlets and switches.

What are some of the most common types of issues in older homes?

- a. Problems caused by animals
 - i. Chewed cables
 - ii. Build-up of debris in electrical boxes (e.g., spider webs, dead bugs)
- b. Problems caused by previous work
 - i. Hazardously installed new circuits (e.g., circuits without grounding, reverse polarity outlets, hazardous/ loose/exposed electrical connections)
 - ii. Undersized extension cords used as permanent wiring
 - iii. Hazardously installed light fixtures (without junction box behind fixture)
 - iv. Oversized circuit breakers
 - v. Hazardously installed panelboards (installed without permits)
 - vi. Aluminum houses: Original outlets swapped for outlets not-rated for aluminum
- c. Problems caused by other trades
 - i. Plumbing repairs of copper water pipe done with PEX (breaks the ground circuit)
 - ii. Hot water tank replacement electric to gas (electrical cable left live & dangling)

What are the different types of wiring and the years they were most prevalent?

Pre-1950: Knob-and-tube.

1950 – 1962: Ungrounded cables. Grounded receptacles did not become code until 1962.

1965 – 1975: Aluminum wiring.

What tips are there to determine how a home is wired without having an inspection?

The best indicator is often the age of the home. Older houses can be at an increased risk of fire over newer houses. Older houses had fewer outlets installed at time of construction, hence are more prone to hazardous add-ons having taken place over the years. Houses with an illegal suite are particularly prone to hazardous add-ons.

Is there a requirement under current code for homes with 60 amp service to upgrade?

If the house service size was acceptable at the time of construction, and there have been no additions to the house, then existing 60 amp service remains acceptable. If however the electrical demand has increased, such as the addition of a basement suite, then service should be upgraded to meet the new, increased electrical demand.

Why do modern houses require minimum 100 amp service?

Beginning in the 1970s, regardless of the calculated demand, if the area of house is 80 square metres (861 square feet) or more, the Canadian Electrical Code requires a minimum service size of 100 amps. This rule was added to assure that sufficient power was available in the home should additional electrical equipment be added at a future date (e.g., basement suite, second range, additional electric heating). This addition to the code makes sense, as at the time of new construction the extra cost to install a 100-amp instead of a 60-amp service was minimal.

To bring 60 amp service up to 100 – 200 amp what needs to be done?

The electrical service is the main feed of electricity to the house. It consists of the “service drop” (the overhead wires from pole to house), the metal piping on the side of the house, the electrical meter and “main disconnect” (the main electrical switch, usually located beside or inside the main panelboard). A service upgrade to 100 or 200 amps involves replacing this entire system with larger components. Typical cost today is between \$3500 and \$4500.



Based on today's electrical needs what is a reasonable service size?

The correct service size depends on the size of house and what electrical equipment is present. Electric heating including baseboards, hot tubs and the number of appliances has greatly increased the required service size. A calculation called the "Demand Calculation" presented in the Canadian Electrical Code outlines the steps to determine minimum service size in a home. An old house with 60 amps may be fine as is. The demand calculation determines this.

What is the difference between 110V and 220V?

Nearly all single family houses in Canada are supplied with "single phase" electrical power. This means the power for the house comes from one secondary winding of the transformer on the pole. This power is available in the electrical panel as both 120 volts and 240 volts. 120 volt circuits are used for standard outlets and lighting. 240 volt circuits are used for heavy loads and electric heating. Regarding fire risk, if the circuits were installed by a licensed electrical contractor under permit then both 120 and 240 volt circuits pose no undue concerns. Should either be installed incorrectly, then fire hazards may be present.

What is the most common cause of electrical house fires?

Hazardous add-on circuits are the most significant cause of electrical fire. In houses where an illegal suite is present it is common to find circuits not grounded, extension cords stapled to walls, hazardous wire connections, incorrect cables and oversized circuit breakers. These hazards and others significantly increase the risk of electrical fire.

Wall-installed space heaters are becoming more popular. Some are hard wired while others are not. Are the concerns the same as baseboard heating?

Wall installed space heaters share the same concerns as baseboard heaters. Some units draw high current, as such the connections on these circuits must be correct and tight. In addition, as with baseboard heaters these units do require ground protection, thus are not suitable to be installed on old ungrounded wiring types.

How does the load of new devices such as projection TV's and sound systems affect fire risk?

If the receptacles for these appliances are installed by a licensed electrical contractor under permit there should be no concerns. If however the receptacles were installed by an unlicensed handyman without electrical permit, then the risk of fire is substantially increased.

If a cell phone charger is plugged in without a phone attached, is there any danger?

There are no undue concerns, however chargers do draw small operating current, so it makes sense to unplug devices when they are not needed.

Is aluminum wiring being installed in new construction? If so, how does this compare to older homes with aluminum wiring regarding fire safety?

Aluminum cables are still often installed today providing power to the panelboards and receptacles for major appliances. These cables pose no undue concern as the equipment is designed for both copper and aluminum. The aluminum wiring peril concerns the wiring of 15-amp branch circuits (receptacles and lights) which was installed in the majority of houses built from 1965 to 1975. If the receptacles and light switches are original, they pose no undue concern. The hazard lies if the receptacles and switches have been swapped for modern receptacles and switches not compatible with aluminum. The connections can get loose and cause a fire. Fortunately there is a simple solution: "Approved copper-pigtailing". Approved copper-pigtailing entails short pieces of copper wire added to the modern devices. The copper wire is then connected to the aluminum wire with a special wire connector designed to connect aluminum and copper together.

Can you mix knob and tube wiring with the new electrical system?

Yes. It is common in an older house to find a new panelboard with new cables feeding original knob and tube circuits. If this work is done to code and under permit there is no undue concern. Modern circuits however cannot be added on to the knob and tube.



What happens when there is a mix of different wiring in one building?

Many older houses have a mix of wiring in the house. In houses built 1965 to 1975 for example it is common to find aluminum wire on the main and top floors and to the washing machine and dryer in the basement. If the basement was later finished, the basement will likely have been wired with copper. The house can be fine providing all circuits, aluminum and copper are in compliance with Canadian Electrical Code.

What can we expect to see in the next 10 years? Any concerns?

Due to increasing house prices illegal suites continue to flourish. If the installation work is done by unqualified people without an electrical permit, electrical fire hazards are more likely to be present.

OVERVIEW OF POWERCHECK ELECTRICAL SAFETY SERVICES

Founded in 2007 by electrical contractor and Field Safety Representative Brian Cook, PowerCheck Inc. was established to provide unbiased electrical risk assessments of older homes for homeowners and the insurance industry. It is extremely important that electrical systems in our homes are checked regularly to confirm they are safe. Electrical fires can easily break out from seemingly innocuous scenarios.

The key point of PowerCheck is that the examiners, though qualified to do electrical work, do not conduct the repairs that may result from the electrical examination of the home. The electrical examiner is solely there to find any electrical fire hazards that may be lurking. PowerCheck is made up of over 50 master electricians across Western Canada and Southern Ontario that have banded together to provide insurers and homeowners with safer houses. In 2013, Brian Cook was awarded the Lieutenant Governor's Safety Award by BC Safety Authority for his contribution to improving public safety through the work of PowerCheck.

Powercheck Electrical Safety Services
www.powercheck.ca
info@powercheck.ca
604 684-3630

Insurers with programs in place to insure houses with knob and tube electrical systems:

- BCAA - direct seller of insurance
- Westland - direct seller of insurance
- Optimum West - work closely with Powercheck, available through your insurance broker
- Intact - work closely with Powercheck, available through your insurance broker
- Wawanesa - work closely with Powercheck, available through your insurance broker

All the above electrical information has been provided by PowerCheck Electrical Services.