PowerCheck
Electrical Safety Services

Overview of PowerCheck

Founded in 2007 by 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 older the home the more likely electrical fire hazards are present and the more likely an electrical fire will occur.

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. This impartiality puts homeowners at ease, knowing that the electrical examiner is solely there to find any electrical fire hazards that may be lurking. PowerCheck is made up of a skilled set 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.

A PowerCheck examiner is near you. Examiners are located in most major centers throughout Western Canada and Southern Ontario.

FAQs

1. **What is a PowerCheck 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 in the house is 90 minutes. The examination is entirely non-invasive. Any electrical tests are done at the panelboard, outlets and switches.

2. **Could the inspectors do the work for the homeowner if the homeowner requests it?**
   PowerCheck is a group of electrical advisors. Our focus is to help customers get their house safe. To make customers comfortable that our exams are impartial, we typically do not engage in any repairs that may be required as a result of our inspection. Often, however, customers specifically ask the inspector to do the repairs. Should this scenario arise, we do allow our examiners to conduct minor repairs independent of PowerCheck. Our inspectors approach this cautiously as our focus is electrical safety evaluations. Some of our inspectors will do minor repairs, if not they can recommend an electrical contractor that the customer can contact directly.

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3. **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.

4. **What are some of the most common types of issues you are finding 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 handymen** (High in houses with illegal suites)
      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)

5. **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.

6. **What tips are there to determine how a home is wired without having an inspection?**
   Best indicator: **Age of home**. Without question older houses typically are at increased risk of fire than 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.

7. **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 sure to be present.

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8. **What is the most common cause of electrical house fires?**
   Hazardous add-on circuits are most prominent in older houses, hence 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 so many more significantly increase the risk of electrical fire.

9. **If cell phone charger is plugged in but phone not into charger, is there any danger?**
   No undue concerns. However chargers do draw small operating current, thus it makes sense to unplug devices when not needed.

10. **Can you mix knob and tube 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.

11. **How does the load of new devices such as projector TV's and sound systems that people install in the basement 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 handyman without electrical permit, then risk of fire is substantially increased.

12. **I am interested in learning the difference between 110V and 220V. Something about 110V and 220V power are really the same thing. The two phases are shifted 180 deg. How does 220V then affect the fire risk?**
    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 volt 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 can certainly be present.

13. **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 1965 to 1975. If the receptacles and light switches are original, they pose 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 create 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.

14. **Wall installed space heaters are becoming more popular. Some are hard wired while others are not. Are the concerns 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 such as knob and tube.

15. **Is there a requirement under current code for homes with 60 amp service to upgrade?**
    If house service size was acceptable at time of construction, and there have been no additions to 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.

16. **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 washing machine and dryer in basement. If the basement is now finished, the basement will likely have been wired at a later date with copper. House can be fine providing all circuits, aluminum and copper are in compliance with Canadian Electrical Code.

17. **Based on today's electrical needs what is a reasonable service size?**
    The correct service size depends on size of house and what electric equipment is in the house. Electric heating, including baseboards, hot tubs, number of ranges and dryers greatly increase 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.

18. **Why do houses today require minimum 100 amp service**
    Beginning in the 1970s, regardless of the calculated demand, if 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.