

OTTAWA ELECTRICAL

Troubleshooting

Flickering lights, tripping breakers, and diagnosing
problems

10 Expert Answers from Construction Brain

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Q1

Why is one outlet not working but others are fine?

A single outlet not working while others function normally is typically caused by a tripped GFCI outlet, a tripped circuit breaker, a loose wire connection, or a failed outlet. This is usually a straightforward fix, but requires some detective work to identify the root cause.

The most common culprit is a **tripped GFCI outlet** somewhere on the same circuit. GFCI outlets have "Test" and "Reset" buttons and are required within 1.5 meters of sinks, in bathrooms, garages, and outdoor locations under the Ontario Electrical Safety Code. When a GFCI trips, it cuts power to all outlets "downstream" on that circuit. Check every GFCI outlet in your home - press the "Reset" button on each one. You might find the problem outlet starts working again.

Circuit breaker issues are another possibility. Head to your electrical panel and look for any breakers that are in the middle position (tripped) or feel loose when you touch them. A tripped breaker will cut power to everything on that circuit. If you find one, turn it fully OFF, then back ON. However, if a breaker keeps tripping repeatedly, this indicates a more serious problem that requires immediate attention from a licensed electrician.

Loose wire connections inside the outlet box can cause intermittent or complete power loss. This often happens in older homes where wire nuts have loosened over time, or where outlets have been frequently used with heavy plugs. Aluminum wiring, common in Ottawa homes built in the 1960s-70s, is particularly prone to loose connections and creates fire risks.

Safety warning: Never attempt to diagnose wiring issues with the power on. If you're comfortable doing so, turn off the circuit breaker for that outlet before removing the outlet cover to check connections. However, in Ontario, any work beyond replacing outlets "like for like" requires an ESA permit and licensed electrician.

When to call a professional immediately: If you smell burning, see scorch marks around the outlet, hear crackling sounds, or if the outlet feels warm to the touch. These are signs of dangerous arcing that can cause fires. Also, if multiple outlets on the same circuit have failed, or if resetting breakers and GFCIs doesn't solve the problem, you likely have a wiring issue that needs professional diagnosis.

For a thorough electrical inspection and safe repair of outlet issues, Electrical Ottawa's licensed electricians can quickly identify the problem and ensure your home's electrical system meets current safety standards.

Q2

Why does my dimmer switch buzz?

A buzzing dimmer switch is usually caused by incompatible bulbs, an overloaded dimmer, or loose wiring connections. Most buzzing issues can be resolved by switching to dimmable LED bulbs or upgrading to a higher-quality dimmer designed for your specific load.

The most common cause of dimmer buzzing is **bulb incompatibility**. Standard incandescent bulbs rarely cause buzzing, but many LED and CFL bulbs will buzz or hum when used with older dimmer switches. This happens because older dimmers were designed for incandescent bulbs and use a different dimming technology (TRIAC) that doesn't work smoothly with electronic ballasts in modern bulbs. The buzzing sound is actually the bulb's internal components vibrating at 120Hz due to the choppy power delivery from an incompatible dimmer.

Overloading is another frequent culprit. If you've connected more wattage to the dimmer than it's rated for, it will work harder and generate both heat and buzzing sounds. Check the dimmer's maximum wattage rating (usually printed on the device) and add up the wattage of all connected bulbs. For example, if you have a 600W dimmer controlling eight 75W bulbs, you're drawing 600W exactly - right at the limit where buzzing often occurs.

Loose wire connections inside the switch box can also cause buzzing. Over time, wire nuts can loosen or the connections to the dimmer terminals can become loose, creating electrical arcing that produces a buzzing sound. This is more serious as loose connections generate heat and pose a fire risk.

In Ottawa homes, we frequently see buzzing issues when homeowners install big-box store dimmers with cheap LED bulbs. **The solution is usually upgrading to a high-quality LED-compatible dimmer** like Lutron Caseta or Leviton models designed specifically for LED loads. These dimmers use different technology that provides smooth power delivery to electronic bulbs.

Safety warning: If the buzzing is accompanied by flickering lights, burning smells, or the dimmer feeling hot to the touch, shut off the circuit immediately and call a licensed electrician. These symptoms indicate dangerous loose connections or an overloaded circuit that could cause a fire.

For DIY-capable homeowners, you can try replacing obviously incompatible bulbs first, but dimmer replacement requires working with live wires and should be done by a licensed electrician to ensure proper installation and ESA code compliance.

Q3

Why does my circuit breaker keep tripping?

A circuit breaker that keeps tripping is doing its job - protecting your home from electrical overload, short circuits, or ground faults. The key is identifying why it's tripping so you can address the underlying issue safely.

Circuit breakers trip for three main reasons, each requiring different solutions. **Overloaded circuits** are the most common cause, especially in older Ottawa homes with 15-amp circuits trying to handle modern electrical demands. If you're running a space heater, microwave, and coffee maker on the same kitchen circuit, you'll likely exceed the 15-amp capacity and trip the breaker. The solution is redistributing the load across different circuits or having a licensed electrician install additional circuits.

Short circuits are more serious and occur when hot and neutral wires touch, creating a dangerous surge of electricity. This often happens due to damaged wire insulation, loose connections, or faulty appliances. You'll typically hear a loud pop when the breaker trips, and you might notice burn marks or a burning smell around outlets. **Ground fault issues** happen when electricity finds an unintended path to ground, often through water or damaged equipment. GFCI breakers are especially sensitive to this and will trip to prevent electrocution.

In Ottawa's older homes, particularly those built before 1980, **aging electrical systems** contribute significantly to breaker problems. Federal Pacific and Zinsco panels, common in homes from the 1960s-80s, are known for breaker failures and should be replaced immediately as they pose serious fire risks. Even standard breakers can wear out after decades of use, becoming overly sensitive or failing to trip when they should.

To troubleshoot safely, first unplug everything on the affected circuit and try resetting the breaker. If it stays on, plug devices back in one at a time to identify what's causing the overload. If the breaker trips immediately upon reset with nothing plugged in, you likely have a short circuit or ground fault that requires professional attention. **Never force a breaker that won't reset or ignore one that feels hot to the touch** - these are signs of serious electrical problems.

Under the Ontario Electrical Safety Code, investigating electrical faults beyond basic troubleshooting requires a licensed electrician. ESA regulations exist because electrical problems can cause fires or electrocution. If your breaker trips repeatedly, especially with burning smells or sparking, **shut off the circuit and call for emergency electrical service immediately.**

For persistent tripping issues in Ottawa homes, expect diagnostic costs around \$150-250, with repairs ranging from \$200-800 depending on the problem. Panel upgrades, if needed, typically run \$2,000-3,500 for a 100A to 200A upgrade. Don't ignore frequent tripping - it's your electrical system warning you of a potentially dangerous situation that needs professional attention.

Why do my lights turn on dim then get brighter?

Your lights are likely experiencing voltage drop or have loose connections, which can be a fire hazard that needs immediate professional attention. This dimming-then-brightening pattern indicates an electrical problem that could damage your fixtures or create dangerous conditions.

Voltage drop is the most common cause of this issue. When you first turn on a light, especially high-wattage fixtures or multiple lights at once, the electrical circuit experiences a temporary voltage reduction. This happens when your home's electrical system can't immediately supply the full power demand, causing lights to start dim and gradually reach full brightness as the system stabilizes. This is particularly common in older Ottawa homes with undersized electrical panels or circuits that are overloaded with too many devices.

Loose electrical connections are another serious cause that requires immediate attention. Loose wire connections at outlets, switches, or in your electrical panel create resistance, which reduces voltage to your lights. These loose connections generate heat and are a leading cause of electrical fires. If you notice this dimming pattern along with flickering lights, warm switch plates, or a burning smell, shut off the circuit immediately and call a licensed electrician.

Aging electrical infrastructure in many Ottawa homes built before 1980 often contributes to this problem. Homes with old 60-amp or 100-amp panels may struggle to provide consistent power to modern electrical loads. The Ontario Electrical Safety Code requires adequate electrical capacity, and many older homes need panel upgrades to 200-amp service to handle today's electrical demands safely.

Aluminum wiring, common in Ottawa homes built between 1965-1975, can also cause voltage drop issues as connections loosen over time. This creates the exact dimming pattern you're experiencing and poses significant fire risks. Insurance companies often require aluminum wiring remediation due to these safety concerns.

What you should do immediately: Stop using any circuits where you notice this pattern, especially if accompanied by warm outlets or switches. Check if the problem occurs on multiple circuits - if so, this suggests a main panel issue that needs urgent professional attention. Never ignore electrical symptoms, as they typically worsen over time and can lead to fires or electrocution.

Professional diagnosis required: A licensed ESA electrician needs to test your electrical system with proper equipment to identify whether you're dealing with voltage drop, loose connections, or inadequate electrical capacity. They can measure voltage levels, check all connections, and determine if your panel or circuits need upgrading to meet current Ontario Electrical Safety Code requirements.

For immediate electrical concerns like this, Electrical Ottawa provides emergency service throughout Ottawa and can quickly diagnose and resolve voltage issues before they become dangerous. Don't wait - electrical problems rarely fix themselves and always pose safety risks.

Q5

Why do I hear buzzing from my electrical panel?

A buzzing electrical panel is a warning sign that requires immediate attention from a licensed electrician.

While some very faint humming can be normal, audible buzzing typically indicates loose connections, overloaded circuits, or failing components that pose fire and electrocution risks.

Common causes of panel buzzing include loose wire connections at breakers or the main lugs, which create electrical arcing and heat buildup. Overloaded circuits force breakers to work harder, generating vibrations and buzzing sounds. Aging breakers, especially in panels over 20 years old, can develop internal component failures that cause buzzing. Federal Pacific and Zinsco panels are particularly notorious for this issue due to their poor connection design.

The buzzing sound occurs when electrical current jumps across loose connections, creating small arcs. This arcing generates heat that can melt wire insulation, damage panel components, and potentially ignite surrounding materials. Even if the buzzing seems minor, the underlying electrical fault is progressively worsening each time current flows through the loose connection.

In Ottawa's older homes, panel buzzing is especially common in properties with original 1960s-80s panels that have never been upgraded. The freeze-thaw cycles we experience can cause thermal expansion and contraction in electrical connections, gradually loosening them over time. Additionally, many older Ottawa homes have had electrical loads added over the decades without proper panel upgrades, leading to overloaded circuits.

Immediate safety steps include avoiding touching the panel or attempting any DIY repairs - electrical panels contain live 240V connections that can be fatal. Don't ignore the buzzing hoping it will resolve itself, as loose electrical connections only worsen over time. If you notice any burning smells, visible sparking, or the buzzing becomes louder, shut off your main breaker and call for emergency electrical service immediately.

Professional diagnosis is essential because the exact cause requires safely removing the panel cover and testing connections with specialized equipment. An ESA-licensed electrician can identify whether you need simple connection tightening, breaker replacement, or a complete panel upgrade. In many cases, buzzing panels indicate it's time for a 100A to 200A upgrade, especially if your current panel is over 25 years old.

ESA requirements mandate that any panel work beyond basic breaker replacement requires permits and inspection. This protects you from improper repairs that could create bigger safety hazards. The typical cost for addressing panel buzzing ranges from \$200-500 for connection tightening to \$2,000-3,500 for a complete panel upgrade in Ottawa.

Don't wait on electrical panel issues - buzzing panels have caused house fires throughout Ottawa. For a free assessment of your panel's condition and safety, request a consultation from Electrical Ottawa's ESA-licensed electricians.

Q6

Why does my GFCI outlet keep tripping?

GFCI outlets trip when they detect even tiny electrical leaks (as little as 5 milliamps) between the hot and neutral wires, which could indicate dangerous ground faults that risk electrocution. This safety feature is working as designed, but frequent tripping usually means there's an underlying electrical issue that needs attention.

Common causes of GFCI tripping include moisture infiltration, worn appliances with internal ground faults, overloaded circuits, or wiring problems. In Ottawa's climate, moisture is often the culprit - especially in bathrooms, kitchens, and outdoor outlets during our wet springs and humid summers. Even small amounts of water getting into outlet boxes or appliance cords can trigger the GFCI.

Appliances are another frequent cause. Hair dryers, space heaters, and older appliances often develop internal ground faults as they age. The GFCI detects these micro-leaks and trips to protect you. Sometimes the issue is as simple as a damaged extension cord or an appliance that's been dropped, causing internal wire damage you can't see.

Wiring issues can also cause nuisance tripping. If multiple outlets are protected by one GFCI (common in older installations), problems anywhere downstream can trip the main GFCI. Loose wire connections, damaged insulation, or improper wiring during previous renovations can create intermittent ground faults.

Under the Ontario Electrical Safety Code, GFCI protection is required within 1.5 meters of sinks, in bathrooms, outdoors, garages, and unfinished basements. If your GFCI is tripping frequently, **never ignore it or bypass the protection** - it's preventing potential electrocution.

To troubleshoot safely, first unplug everything from the GFCI outlet and any outlets it protects downstream. Reset the GFCI and see if it holds. If it trips immediately with nothing plugged in, you likely have a wiring problem that requires a licensed electrician. If it stays reset, plug in devices one at a time to identify the problematic appliance.

When to call a professional: If the GFCI trips with nothing plugged in, trips repeatedly with the same appliance, or if you're uncomfortable doing any electrical troubleshooting, contact a licensed electrician immediately. In Ottawa, this type of diagnostic work typically costs \$150-250, but it's essential for your safety. **Never attempt to bypass or disable a GFCI** - that's both dangerous and illegal under ESA regulations.

For persistent GFCI issues in your Ottawa home, Electrical Ottawa's licensed electricians can diagnose the problem and ensure your electrical system meets current safety standards.

What causes the lights to flicker throughout the entire house?

Whole-house light flickering typically indicates a problem with your main electrical service, loose connections at the panel, or issues with Hydro Ottawa's supply line. This is usually more serious than flickering in just one room and often requires immediate professional attention.

Electrical Service Issues are the most common cause of house-wide flickering. Your main electrical service brings power from Hydro Ottawa's lines into your home's panel. If there are loose connections where the service lines connect to your meter or main panel, the entire house can experience voltage fluctuations that cause flickering. This is particularly dangerous because loose connections create heat and can cause fires.

Utility Supply Problems from Hydro Ottawa can also cause whole-house flickering. This might be due to issues with transformers, power lines, or voltage regulation equipment. If your neighbors are experiencing similar issues, it's likely a utility problem. However, if only your house is affected, the problem is probably on your property.

Overloaded Electrical Panel or undersized service can cause flickering when large appliances kick on. If you have an older 100-amp service and multiple high-draw appliances (electric heat, air conditioning, electric dryer), your system may struggle to provide consistent power. This is common in Ottawa's older neighborhoods where homes still have original 100-amp services.

Loose Main Panel Connections are extremely dangerous and a leading cause of electrical fires. The main breaker, service entrance cables, or bus bar connections can become loose over time due to thermal expansion and contraction. These connections carry the full electrical load of your home, so any looseness creates dangerous arcing and heat buildup.

In Ottawa, the **Ontario Electrical Safety Code** requires that any work on main panels or service equipment be performed by ESA-licensed electricians. This isn't DIY territory - working on main panels can be fatal, and the power company needs to coordinate any service disconnections.

When to Call Emergency Service: If flickering is accompanied by burning smells, warm outlets, or sparking sounds from your panel, shut off your main breaker and call for emergency electrical service immediately. If you smell burning but can't locate the source, consider leaving your home and calling 911.

What You Should Do: First, check if neighbors are experiencing similar issues - if so, call Hydro Ottawa at 613-738-6400. If it's isolated to your home, contact a licensed electrician immediately. Document when the flickering occurs (does it happen when appliances turn on?) and note any patterns.

For whole-house electrical issues like this, Electrical Ottawa provides emergency service throughout Ottawa and can quickly diagnose whether the problem is with your panel, service entrance, or requires coordination with Hydro

Ottawa. Don't wait on electrical service issues - they rarely fix themselves and often worsen over time.

Q8

Why does only half my house have power?

Your home likely has a split electrical service where one of the two main power legs (120V lines) feeding your electrical panel has failed. This is a common issue that affects roughly half the circuits in your home while leaving the other half working normally.

Most homes in Ottawa receive 240V electrical service through two 120V "legs" or phases. Your electrical panel distributes these across alternating circuits - so circuit 1 might be on leg A, circuit 2 on leg B, circuit 3 back to leg A, and so on. When one leg fails, approximately half your circuits lose power while the other half continue working normally.

Common causes include:

- **Loose connection at the meter** - where Hydro Ottawa's service connects to your home
- **Failed main breaker** - one side of your double-pole main breaker has failed
- **Damaged service entrance cable** - the thick cables bringing power from the street
- **Utility transformer issues** - problems with Hydro Ottawa's equipment
- **Corroded connections** in older electrical panels, especially Federal Pacific or older panels

The pattern you'll notice is specific: certain rooms or circuits work fine while others are completely dead. Your 240V appliances (electric dryer, stove, hot water heater) may not work at all since they need both legs to function properly.

Immediate safety steps: Turn off your main breaker and avoid using any electrical appliances until the issue is resolved. A lost neutral or single-leg failure can cause dangerous voltage fluctuations that damage electronics and create fire risks.

This requires immediate professional attention - it's not a DIY repair and involves working with live service entrance equipment that can be lethal. The problem could be on Hydro Ottawa's side (their responsibility) or your home's electrical system (your responsibility). A licensed electrician can quickly diagnose whether the issue is with the utility connection or your electrical panel.

First, check if your neighbors are experiencing similar issues. If they are, call Hydro Ottawa's emergency line at 613-738-6400. If it's isolated to your home, this is likely an electrical system issue requiring immediate professional

service.

For emergency electrical service in Ottawa, Electrical Ottawa provides 24/7 response for situations exactly like this. Half-power situations can damage appliances and create safety hazards, so don't wait - get it diagnosed and repaired immediately.

Q9

Why do my lights flicker at night but not during the day?

Lights flickering at night but not during the day typically indicates voltage fluctuations caused by increased electrical demand on your home's circuits or the utility grid. This pattern suggests your electrical system is being stressed when more lights and appliances are running simultaneously.

During the day, you're likely using fewer lights and different appliances than at night. When evening arrives, you turn on multiple lights throughout the house, plus evening appliances like TVs, computers, space heaters, or other devices. This increased electrical load can cause **voltage drop** - where the voltage supplied to your lights decreases slightly, causing them to dim or flicker.

Common causes of nighttime flickering include:

Overloaded circuits are the most frequent culprit. If multiple lights and outlets share the same 15-amp circuit, adding evening loads can push the circuit near its capacity. This is especially common in older Ottawa homes where circuits weren't designed for today's electrical demands. You might notice flickering gets worse when certain appliances kick on - like a space heater, microwave, or hair dryer.

Loose electrical connections become more apparent under load. During the day with minimal electrical usage, loose connections in your panel, outlets, or light fixtures might not cause noticeable problems. But when current increases at night, these loose connections create resistance, leading to voltage fluctuations and flickering lights.

Utility grid issues can also cause this pattern. In residential neighborhoods, electrical demand peaks in the evening when everyone's home using lights and appliances. If Hydro Ottawa's transformer serving your area is undersized or there are issues with the distribution lines, you might experience voltage fluctuations during peak usage times.

Aging electrical panels struggle to maintain consistent voltage under varying loads. If you have an older panel - especially Federal Pacific or Zinsco brands - the internal components may not be distributing power evenly to your circuits. These panels are known fire hazards and should be replaced immediately.

Safety concerns with flickering lights include potential fire risks from loose connections, overloaded circuits, or failing electrical components. Never ignore persistent flickering, as it can indicate dangerous electrical problems that could lead to fires or electrocution.

What you should do: First, note which lights flicker and what appliances are running when it happens. Try turning off some evening loads to see if the flickering stops. However, this is typically a job for a licensed electrician who can measure voltage levels, check connections, and determine if your electrical system needs upgrades.

For persistent flickering issues in Ottawa, Electrical Ottawa can diagnose the problem and recommend solutions - whether that's redistributing circuits, upgrading your panel, or coordinating with Hydro Ottawa for utility-side issues. Most flickering problems require professional attention to ensure your family's safety.

Why do my lights dim when I use the microwave?

Your lights dimming when you use the microwave indicates your electrical system is struggling to handle the power demand. This is typically caused by an overloaded circuit, undersized wiring, or an aging electrical panel that can't properly distribute power throughout your home.

Microwaves are power-hungry appliances, typically drawing 1,000-1,500 watts (8-12 amps) when operating. When your microwave starts up, it creates a sudden demand for electricity. If your electrical system can't supply this power efficiently, the voltage drops slightly throughout nearby circuits, causing lights to dim. This is especially noticeable with incandescent bulbs, which are very sensitive to voltage changes.

The most common causes include:

Shared circuits - Your microwave and lights are likely on the same 15-amp or 20-amp circuit. When the microwave draws its full power, there isn't enough capacity left to maintain proper voltage for the lights. Kitchen appliances should ideally have dedicated circuits, especially microwaves over 1,000 watts.

Undersized electrical panel - Older homes with 60-amp or 100-amp panels often struggle with modern electrical demands. If you have an older panel (especially Federal Pacific or Zinsco brands), it may not be distributing power effectively. These panels are also fire hazards and should be replaced immediately.

Voltage drop from long wire runs - If your electrical panel is far from your kitchen, or if the wiring is undersized (14 AWG instead of 12 AWG for 20-amp circuits), resistance in the wires causes voltage drop under heavy loads.

Loose connections - Loose wire connections at outlets, switches, or in the panel create resistance, which becomes more apparent under heavy electrical loads. This is a serious fire hazard that needs immediate attention.

In Ottawa, this issue is particularly common in older homes built before 1980, when electrical codes didn't require as many dedicated circuits for kitchen appliances. The Ontario Electrical Safety Code now requires dedicated 20-amp circuits for countertop appliances in new construction.

When to call a professional: If lights dim significantly (more than a subtle flicker), if you smell burning, hear crackling sounds, or if outlets feel warm, shut off the circuit immediately and call a licensed electrician. Never ignore electrical issues - they can cause house fires.

A licensed electrician can diagnose whether you need a dedicated circuit for your microwave (\$300-600), a panel upgrade (\$2,000-3,500 for 100A to 200A), or repairs to loose connections. Most electrical work requires ESA permits in Ontario, so ensure any electrician you hire is properly licensed.

For a professional assessment of your electrical system's capacity, Electrical Ottawa offers free consultations to help Ottawa homeowners identify and resolve power distribution issues safely.

Disclaimer: This guide is provided for informational purposes only by Ottawa Electrical. It does not constitute professional advice. Always consult qualified, licensed contractors and your local building authority before starting any construction or renovation project. Information is current as of March 15, 2026 and may change. Visit electricalottawa.ca for the latest answers.