

# Voltage & AMP's & Paint by Finn Home Inspectors

The power in the house has two delineations:

1. **Voltage** (typically 120V & 240V)
2. **Amperage** (typically 100AMP or 200AMP)

The voltage is determined by the power company's transformer, if working correctly should be between 114 and 126V on the lower voltage and 228 to 252V on the higher voltage. The inspector can easily determine the voltage in the house.

The amperage is the size of the "service" that was installed in the house. It is the least rating of the power cable down the side of the house, or underground, the service meter, the rating of the main panel or the main breaker. Since it is the least of all these, determining the actual service to the house is not immediately evident, the inspector or electrician can determine the size of the service. Often, we find that the listing sheet says the service is 200AMP but was determined by the physical size of the panel, which often is correct, but can actually be less.

Most houses in our area only need 100AMP service. Buyers often think they need 200AMP. 200AMP would be needed in an all-electric house (including heat), and possibly a house with a central A/C system. The calculations for the need for a 200AMP service involves calculations beyond the scope of a home inspection. Basic logic can help, like if the house is very large or has the items noted above it may need 200AMP. In days past many houses had 100Watt lights, today the same lights if LED's may be only 9Watt and supply the same light and require only 1/10<sup>th</sup> power.

**Voltage Drop:** Is the actual voltage at a receptacle under load. Special devices are needed to determine this. They are plugged in and for an instant the receptacle is loaded with 15 or 20 AMP.

If there are poor contacts somewhere between the plug and the main panel the voltage drop may be excessive. With a large voltage drop it is likely under certain circumstances heat may build up at the poor connection and lead to a fire. Other effects is some devices may not run properly on low voltage, for instance a refrigerator motor which may wear out prematurely by running at a lower voltage. A large voltage drop needs to be corrected.

## Painted Receptacles & Switches.

Painted receptacles and switch's Must be replaced!

Even if the inspector checks a painted receptacle and does not get an excessive voltage drop does not mean it will be safe when you plug into it with some other device; replace all painted receptacles & switch's.

The concern is if paint got inside it may interrupt contact, leading to arcing, heat and possible fire.

Older paint that contains lead (some paints may contain other conductive substances) that are actually conductive and can create contact between the hot and neutral. This contact may be minimal, in that it does not draw enough current to trip the breaker, but rather build up heat, like a small light bulb would, consequences would not be good!

A large number of painted receptacles you cannot plug into, particularly a three-prong plug, you may have experienced this.

## Worn out Receptacles.

If a receptacle is worn it must be replaced.

Worn out receptacles are ones that have very little resistance when you plug in or when pulling the plug out. The contacts inside the receptacle have worn or been damaged. We have seen them where our voltage tester actually falls out under its own weight.

Poor contact is present in a worn receptacle and thus arcing or heat buildup can occur leading to a fire.

Areas we find the worn-out ones are ones that are used frequently, in hall ways where a vacuum is plugged into is the most common. Bathroom receptacles and kitchen are the next common ones we find that are worn out.

A peculiar 3-year-old house had nearly all the receptacles worn excessively, our tester was literally falling out of many of them. We initially thought that the receptacles must have been defective from the manufacturer. However, in one room there were the child protection plugs in an outlet, we found it nearly impossible to pull the plugs out, had to use a screwdriver. It turned out the prongs on the plastic pugs were excessively wide, and consequently damaged the receptacles.