

FEDERAL PACIFIC ELECTRIC PANELS

Federal Pacific Electric "Stab-Lok" service panels and breakers are dangerous and can fail, leading to electrical fires. The problem is that some 240-Volt FPE circuit breakers and possibly also some 120-Volt units simply may not work. These panels were commonly installed from the mid 1950's until the mid 1980's and there are thousands of them in the Denver area.

These breakers can fail to trip at an alarming rate. Product testing of two pole FPE breakers has shown that at a modest overload (135% of rating) breakers that had never been touched (never mechanically switched) failed 25% of the time, followed by a lockup that meant the breaker would never trip in the future at any overload. Once these breakers had been flipped on and off (mechanically energized), failures increased to 36%. Worse, when individual poles on these breakers were energized under the same conditions, 51% of the "virgin" switches failed, and for switches that had been mechanically energized, a whopping 65% of them failed!

When a circuit breaker will not trip in response to an overload there is a serious risk of fire. The circuit breakers do not directly cause an electrical fire. Some other failure must occur, which in turn causes an overload of the circuit "protected" by the FPE breaker. When this issue was examined in the early 1980's, FPE's position was that the chances of an overload occurring on only a single pole of a 240-volt breaker were very small. In our view there are some very common real-world examples where single-pole loading in a 240-volt breaker might include failures: electric clothes dryers and ranges where one of the heating elements shorts to the steel case of the appliance are good examples.

Another wiring practice, using a single two-pole breaker to power a split circuit which uses a shared neutral, which is commonly found in kitchens in this area, is nearly certain to have each leg of the circuit loaded independently and thus subject to single-leg overloading and subsequent breaker jamming. A breaker which jams and then fails to trip under this condition is a serious fire hazard.

There are also significant problems with the FPE bus design and the way in which the breakers attach to the bus bar. In most panels this connection improves as the breaker heats up. In the FPE design the breakers loosen as they heat and there is the potential for arcing. There are also many instances in which installers have improperly modified breakers to fit into the "Stab-Lok" bus design and in doing this created a potential fire hazard.

The fact that "there has never been a problem" with an FPE panel does not indicate that there is no potential for one. Electrical circuit breakers are in place to prevent a circuit from overheating if and when it is overloaded. Breakers that do not provide reliable protection under these conditions are essentially worthless.

For these reasons we recommend the replacement of Federal Pacific panels whenever we encounter them at an inspection. The typical cost of panel replacement is \$1200 to \$2000 depending on the size of the service and the logistics of the panel replacement. For more information on these panels, please visit the websites listed below.

- [Federal Pacific Electric Panels - a Summary of the Issues](#)
- [Schneider Canada Federal Pioneer circuit breaker recall](#)
- [Reliance Electric Co. Press Release](#): improper practices used to obtain UL Listing for most of FPE's circuit breakers and notes testing which indicates "possible defects." 1980, Reliance Electric Co.
- [Home Inspection Reporting Language and discussion for FPE panels](#)
- [Federal Pacific Electric Panel - CPSC press release](#)
- [The Home Inspection & Construction Diagnosis Website](#)