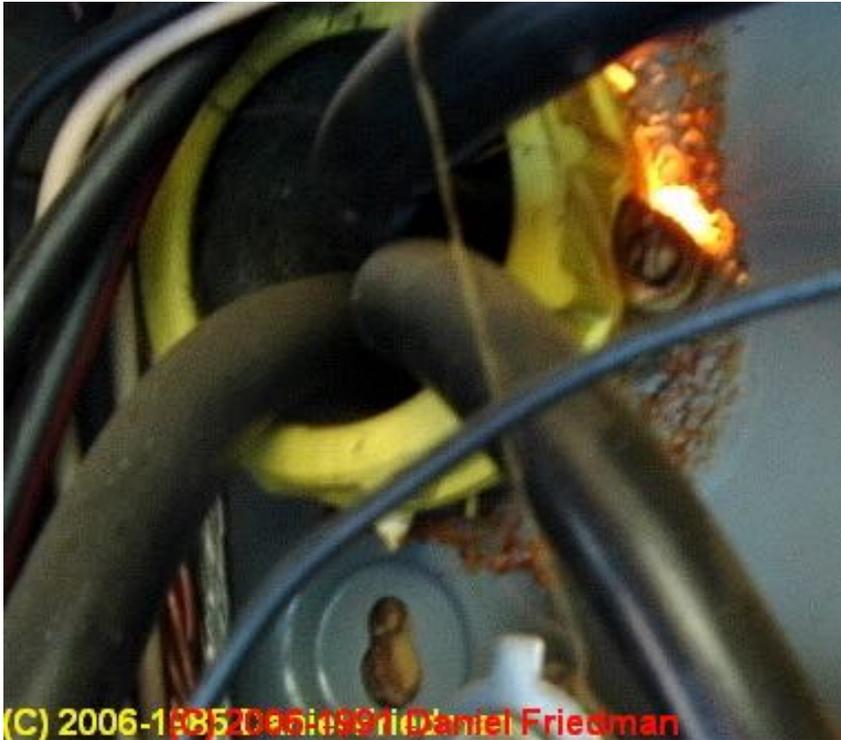


Federal Pacific Electric FPE Stab-Lok Breakers & Panels



Milestone Electric, Dallas/Ft. Worth

<http://www.milestoneelectricdfw.com/>

Dallas TX – 25 March 2010

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See: https://inspectapedia.com/fpe/FPE_Fires_Waiting_to_Happen.php

FPE Failures & Hazards

- **FPE Circuit Breakers Fail to trip** on over-current
 - 33.3% of 2-pole breakers do not trip [1]
 - 20.0% of 1-pole breakers do not trip [1]
 - 80% failure rates in test cases of GFCIs
 - Less than 0.1% of circuit breakers fail in general in the electrical industry
 - *Latent* safety hazard – fail to protect on overcurrent
- Failure to trip risks fire, injury, property loss
- FPE Stab-Lok breakers don't provide circuit protection required by applicable codes & Standards (UL & NEC)



32450dsc_0118.jpg The back side of the Federal Pacific panel cover showing melted debris where the panel touched the circuit breakers. This area was not in direct contact with the fire. The melted debris may have been caused from the failure of the circuit breakers attachment to the buss bar.



FPE Stab-Lok Hazards: not just “theory”

Client suffered burn injuries as a result of an electrically caused fire.

here was a Federal Pacific electrical sub panel installed in the wall of her apartment.

The city of Fremont Electrical Inspector confirmed that there was arcing taking place in the sub-panel and that the arcing was connected to the breaker that tripped

...

I continued to put my arm behind my back and close the breaker with my left hand with my head turned to the left. BAM, a light as bright as the sun and an explosion.

*This knocked us down and blinded us. We were rushed to the hospital. I spent the night in the ER with an ICU nurse and was off of work for 3 weeks and have had to have a stronger prescription. **These FPE panels are all over the building***

See: <http://InspectAPedia.com/fpe/fpepanel.htm>

Stab-Lok Failure Details

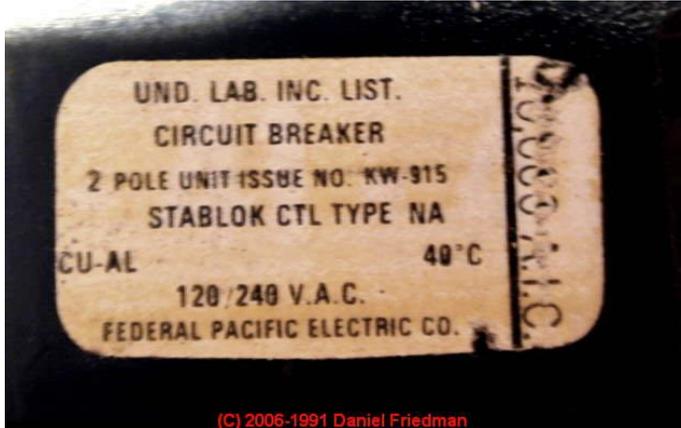
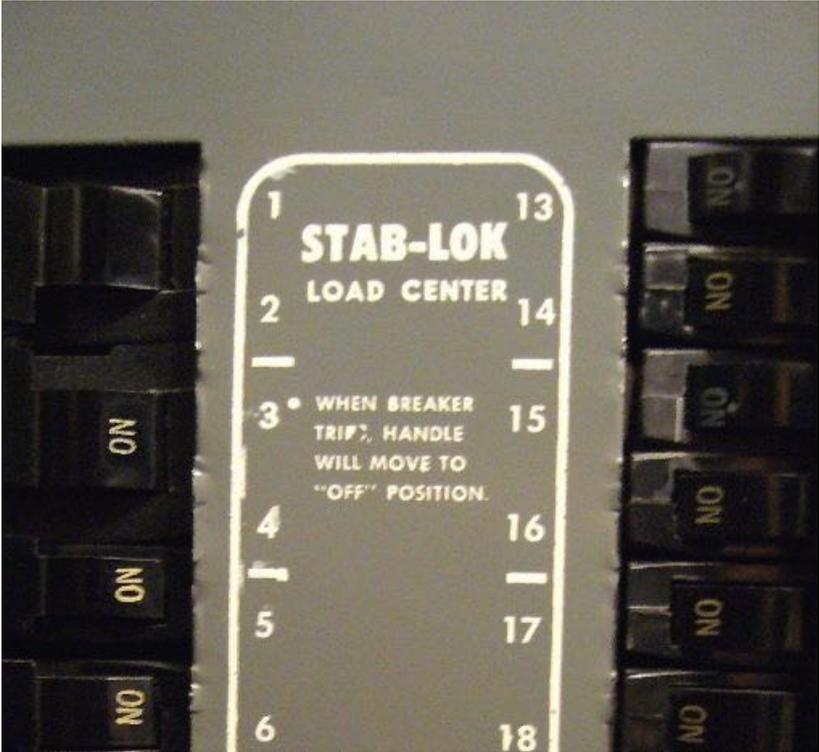
- Tests showed highest no-trips on 2-pole units
- Overcurrents can occur on 1 pole of 2-pole breakers: electric dryers, ranges, water heaters, air conditioners
- Overcurrent on one side of a 2-pole jams breaker; won't trip at all under future loads
- Switching an FPE Stab-Lok breaker “off” may leave it “on” internally

Other FPE Stab-Lok Concerns

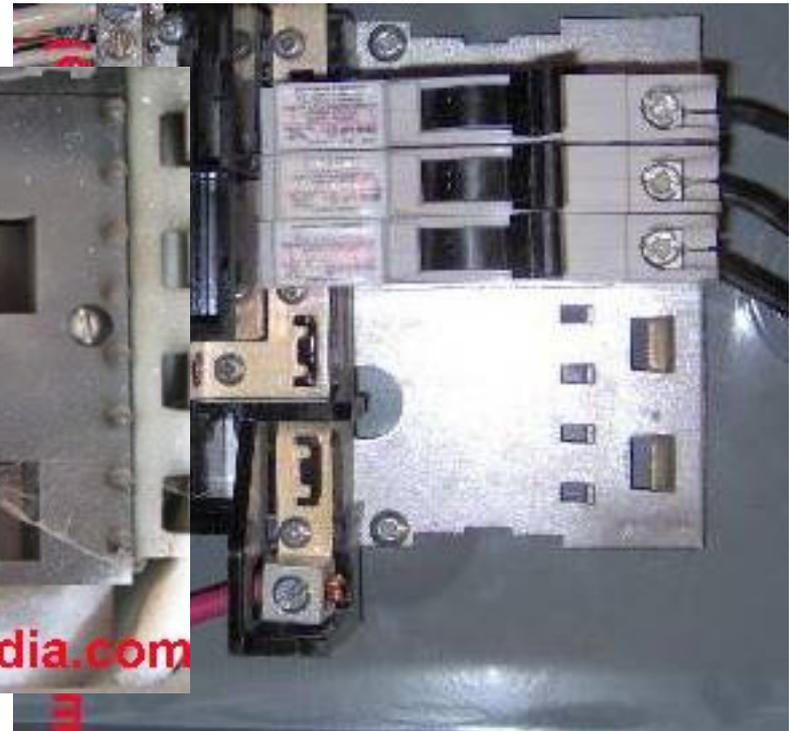
- Panel Bus melt and bus burn-ups observed
- Circuit-breaker to panel bus connections
 - Burning, arcing
 - Loose, breakers may fall out
 - F-bus breakers forced onto E-bus openings

See <http://inspectapedia.com/fpe/FPESummary.htm>

How to Spot FPE Stab-Lok Equipment



FPE Panel Bus Details



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More FPE Stab-Lok Buses

- Z-clip clamped, 10-32 screw
- Punched
- Stab Socket



Shut Down Unsafe Equipment?

- **You are responsible** whether you touch or not
 - Liable for *failing* to act, detect, warn
 - “Not inspected” disclaimers are inadequate
 - Report why, the hazard, what to do
- **Last Person In rule:** you were there, you are responsible
- **What to tell the Judge** – no heat, frozen pipes, vs. dead people



Should You Field Test FPE Stab-Loks

NO. Do not field test the equipment.

There is no practical way that a licensed electrician, inspector, or engineer can determine which breakers are defective internally. Functional & life tests would be needed, not in the training nor equipment of the above. - Aronstein

More on Don't Field Test FPE Stab-Loks

- Field testing risks **increasing the risk of a future no-trip** of the tested equipment
- Exercising breakers (switch on/off) also increases future no-trip probability
- Field testing increases risks of building fire during or after testing
- *For the test at 135% of rated current, 51% of the breakers failed with individual poles tested, and the failure rate was 25% with both poles tested simultaneously. The **failure rates increased** to 65% and 36%, respectively, **after 500 operations of the on/off toggle handle.**[2]*

Proper FPE Stab-lok Repair

- Replace the entire electrical panel
- Or
- Replace the FPE Bus Assembly & Breakers with another brand, retaining the steel panel enclosure (saves wiring time)
 - Eaton Corp., Cutler Hammer Products (E-CH) replacement panel bus assemblies: <http://inspectapedia.com/fpe/fpereplace.htm>

Can't Afford a New Panel?

- “Fine up to now” is no assurance of “OK” – an overcurrent may never have occurred
- **Assure working smoke detectors**
- Become informed, get bids;
- Avoid overloading circuits
- Turn-off & have electrician disconnect unsafe circuits (don't rely on breaker “off”)
- Review insurance coverage
- http://inspectapedia.com/fpe/FPE_Replacement_Plan.htm

What About Replacement FPE-Stab-Lok Breakers

- Do not “repair” by replacing individual FPE Stab-Lok circuit breakers
 - Same design and failure rates as OEM
 - Some made in China, appear un-tested
 - Panel bus hazards remain
 - Federal Pioneer (Schneider Canada) ??
 - <http://inspectapedia.com/fpe/FPEBreakers.htm>



No FPE Recall in U.S.

- 1983 CPSC Press Release: testing stopped, funding stopped
- FPE Attorneys argued failures don't happen – e.g. never have overcurrents on 1-leg of 2-pole breakers?
 - CPSC management overruled engineers
- 1983-86 FPE-bankrupt sold by UV to Reliance Electric. Sale price budgeted for recall; not performed.

FPE Class Action Suit

- **2002 New Jersey** Middlesex County Docket L02904-97
 - *“FPE knowingly and purposefully distributed circuit breakers which were not tested to meet UL standards as indicated on their label. This constitutes an unlawful practice ...”*
 - Extensive evidence included FPE’s own documents, long standing practices
 - Minimal financial benefit, only to original owners
 - Court documented fraudulent practices, defective product
 - <http://inspectapedia.com/fpe/FPEJudgement8-15-02.pdf>

FPE Stab-Lok References

- [FEDERAL PACIFIC FPE HAZARDS](http://inspectapedia.com/fpe/fpepanel.htm) - <http://inspectapedia.com/fpe/fpepanel.htm>
- [1] “Hazardous FPE Circuit Breakers and Panels”, Dr. J. Aronstein, updated study tested more than 500 Stab-Lok breakers from homes across the U.S. 2008 <http://inspectapedia.com/fpe/FPE-Hazards-Revised-070525.pdf>
- [2] Hazardous FPE Circuit Breakers and Electrical Panels, Dr. J. Aronstein, 2004-2007 <http://inspectapedia.com/fpe/fpestlouis.htm>