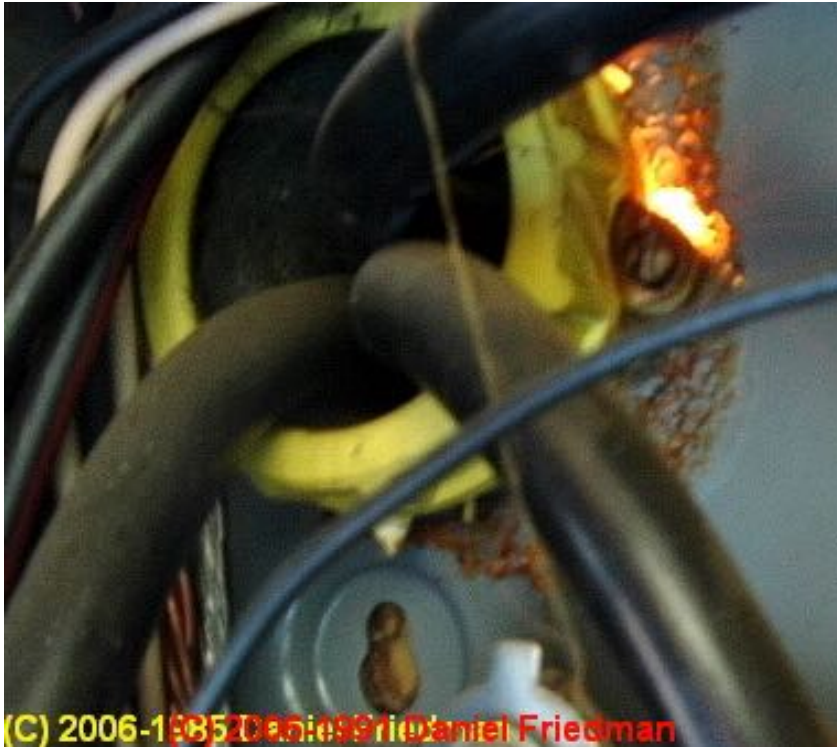


Federal Pacific Electric FPE Stab-Lok Breakers & Panels



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)





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

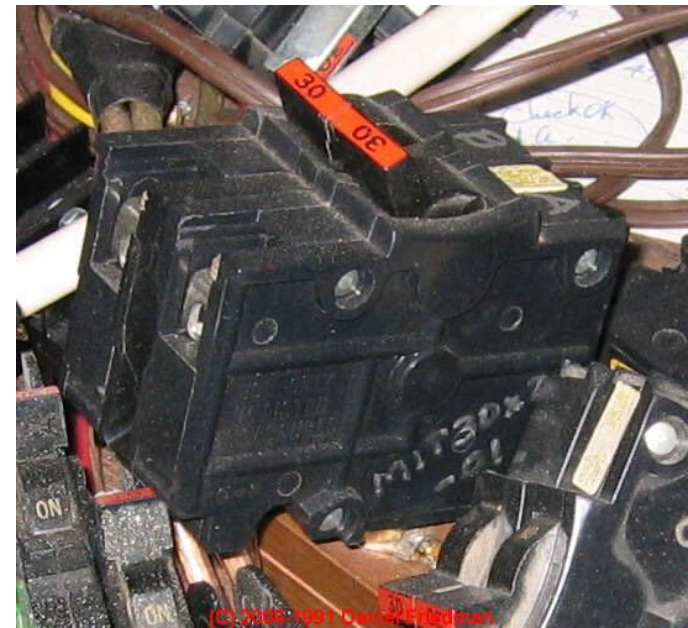
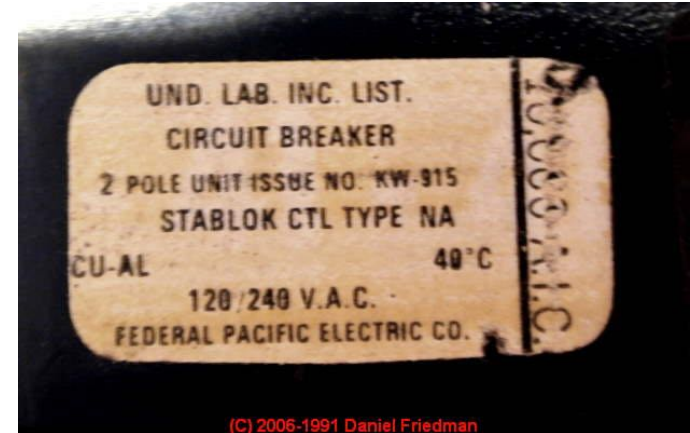
- Tests showed highest no-trips on 2-pole units
- Overcurrents can occur on 1 pole of 2-pole breakers: electric dryers, ranges, water heaters, air conditioners
- Overcurrent on one side of a 2-pole jams breaker; won't trip at all under future loads
- Switching an FPE Stab-Lok breaker “off” may leave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

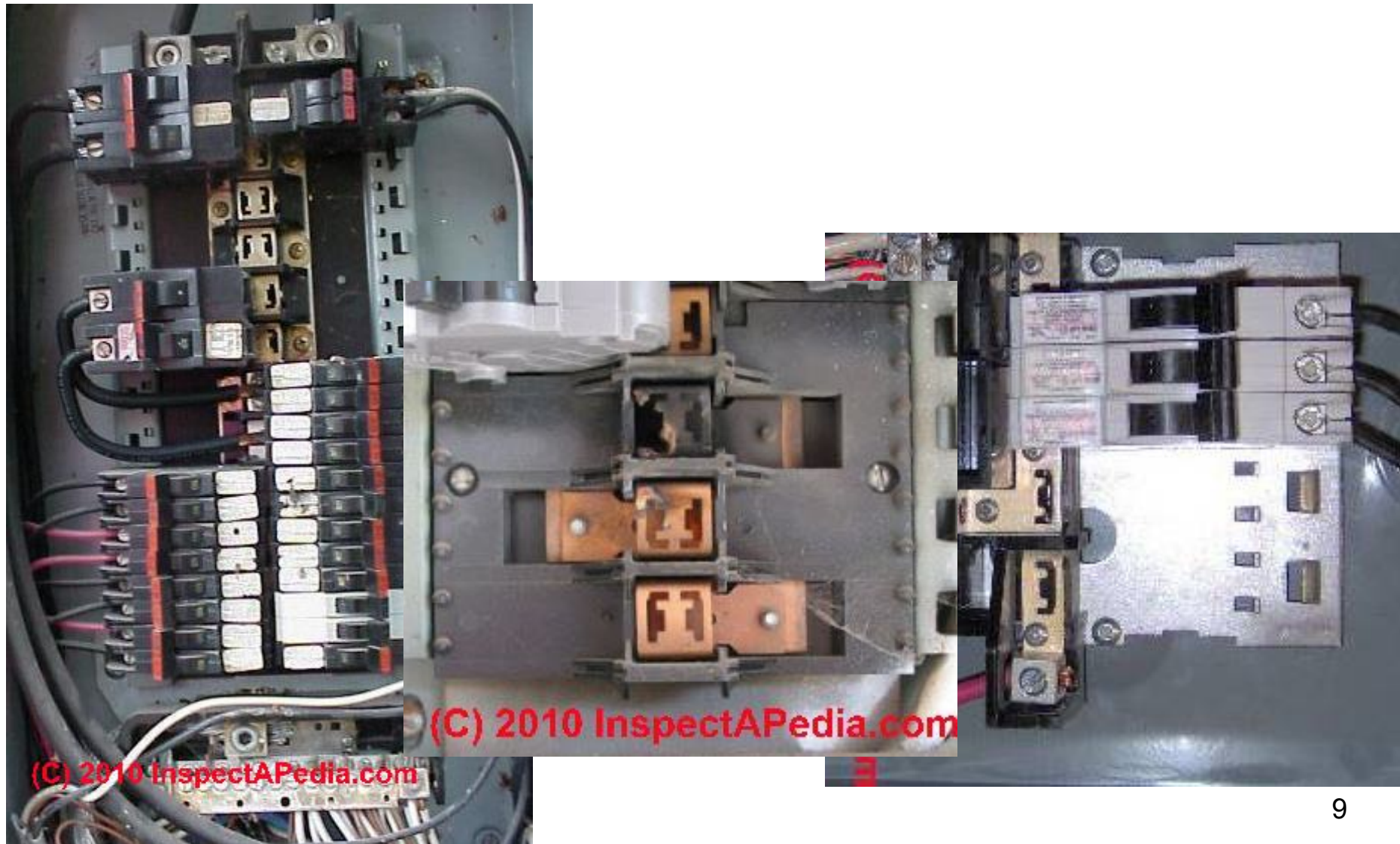
How to Spot FPE Stab-Lok Equipment



FPE Stab-Lok Labeling



FPE Panel Bus Details



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



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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>



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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>
- [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>