Federal Pacific Stab-Lok Panels

FPE Federal Pacific Electric Stab-Lok® Electrical Panel & Circuit Breaker Hazards Home Page: here we explain the fire and shock hazards associated with Federal Pacific Electric Stab-Lok® circuit breakers and service panels, provides a complete history of the FPE Hazard, and we provide and cite independent, unbiased research on FPE failures, and recommends replacement of the panels.

Photographs are provided to aid in identification of Federal Pacific FPE Stab-Lok® equipment. The current status of FPE Stab-Lok®equipment hazards, recalls, product safety research, and consumer warnings can be found here.

Replacement FPE Stab-Lok® circuit breakers are unlikely to reduce the failure risk of this equipment. We recommend that residential FPE Stab-Lok® electrical panels be replaced entirely or the entire panel bus assembly be replaced, regardless of FPE model number or FPE year of manufacture. We do not sell circuit breakers nor any other products.

We also provide a MASTER INDEX to this topic, or you can try the page top or bottom SEARCH BOX as a quick way to find information you need.

Federal Pacific Electric Stab-Lok® Circuit Breaker Hazard Current Status, Failures, Research, & History

For information on FPE Stab-Lok® equipment that *can* be copied to any website,
see FPE Stab-Lok® Hazard Summary Page for Public Use

Federal Pacific Electric "Stab-Lok® " service panels and breakers are a latent hazard and FPE circuit breakers can fail to trip in response to overcurrent, leading to electrical fires. The breakers may also fail to shut off internally even if the toggle is switched to "off."

Some double-pole (240-Volt) FPE circuit breakers and single-pole FPE Stab-Lok® circuit breakers simply do not work safely.

There are other FPE panel-defects independent of the breaker problems, panel and panel-bus fires and arcing failures in some equipment. The failure rates for these circuit breakers were and still are significant.

In some cases failure to trip occurs 60% of the time - a serious fire and electrical shock hazard.

Failures are documented in the CPSC study and by independent research. Additional independent testing and research are on-going and are reported here.

FPE Stab-Lok® electrical panels should be replaced. Do not simply swap in some replacement breakers. (Details are

at FPE REPLACEMENT BREAKERS).

A Summary of the Problem: Federal Pacific Stab-Lok® ® Electric Panel and Circuit Breaker Hazards

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Please see FPE HAZARD SUMMARY for the full detail of this FPE topic.

Having reviewed documentation regarding this issue, and having discussed the issue with forensic experts in the field, we are convinced that a latent hazard exists where FPE Stab-Lok® circuit breakers continue in use. The hazard is worst for double-pole breakers.

Published reports of actual tests that were performed indicate that under certain conditions it is possible for one leg of these circuits to attempt to trip the breaker, resulting in a jammed breaker which will afterward not trip under any load condition.

A reader might infer from the CPSC 1983 press release that the manufacturer and some Commission members were of the opinion that these conditions would not occur in the field.

This was and remains an erroneous conclusion. Some very common household appliances operate are powered by a two-pole 240V circuit (protected by the type of breaker under discussion) but use two or more independent 120V sub-circuits inside the appliance.

Two obvious cases are electric clothes dryers and ranges. If, for example, the low-heat (110V) heater in a dryer were to short to the dryer case, a serious overcurrent would occur on one "leg" of the circuit.

Another wiring practice, using a single two-pole breaker to power a split circuit which uses a shared neutral, such as may be installed in kitchens in some areas, 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, in our opinion, a serious fire hazard.

A more careful reading of the *CPSC press release of March 3, 1984* suggests that the authors were careful NOT to conclude that there is no hazard, but simply that the information at hand did not prove the hazard, and that the Commission did not have funds to pursue testing.

In this document, the representation that no real hazard exists is made by the manufacturer of the device - not exactly a neutral party, and even that wording is cautious in tone: "FPE breakers will trip reliably at most overload levels." Readers should see the failure rates cited in the IAEI letter below.

FPE Stab-Lok® Equipment Means Latent Fire Hazards

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It's the exceptions that cause fires. An FPE circuit breaker will appear to "work just fine" in passing along current to the circuit it feeds, *until there is an overcurrent, short circuit, or similar condition.*

When those exceptional conditions occur, this equipment fails to protect the circuit and the building from overheating and fires, in some cases at a failure rate around 60% of the time.

We estimate that the normal industry failure rate on circuit breakers is less than .01%.

Consumers should read and follow the Commission's advice regarding circuit breakers. But this advice is insufficient. The Commission's admonition to avoid overloading circuits and to turn off and have examined devices which seem to be creating a problem is a poor substitute for reliable, automatic, overcurrent protection.

It is precisely because dangerous conditions can and do occur without adequate recognition and action by a consumer that circuit breakers and fuses are installed to provide overcurrent protection in the first place.

Therefore it is hardly an adequate "fix" for FPE breakers to just tell consumers to handle these cases manually.

It is possible that some individual FPE Stab-Lok® circuit breakers may perform with adequate reliability, possibly those manufactured after the companies discovered safety defects and improper practices in listing the product, and possibly those manufactured in Canada.

However, at least some "new" and "replacement" FPE breakers are actually new old stock that was never modified in design nor manufacture or appears as new stock made on the same production equipment, to the same specifications, and/or of the same design as old stock and failing breakers.

In absence of an explicit statement from the manufacturer and/or the US CPSC indicating that newer stock equipment is defect free, and considering that defects occur in both breakers and the panels themselves, and finally, that testing showed failures in both in-use equipment and new off-the-shelf devices, our advice to consumers and electricians is that these panels be replaced with newer equipment, particularly those which use 240-volt double-pole breakers described in the literature.

In our opinion, if a fire or other hazard occurs with this device, neither the manufacturer nor the Commission, who have suggested in the press release that data was inconclusive or inadequate to establish a hazard, will accept responsibility for losses that may ensue.

However a building inspector, home inspector, or contractor who makes any warranty of safety, by virtue of his/her position close to the consumer, is certain bear this very liability.

Canadian FPE Stab-Lok® panels and Federal Pacific or Federal Pioneer Circuit Breakers

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Please see FEDERAL PIONEER ELECTRIC PANELS for the full version of this article series on Canadian FP panels.

In May 1999 we learned from Schneider Canada that Federal pioneer circuit breakers sold by that company are re-named from Federal Pacific circuit breakers and that two 15-amp single-pole models NC015 and NC015CP made between August 1, 1996 and June 11, 1997 have been recalled.

The SCHNEIDER AND FEDERAL PIONEER AS WELL AS SOME SQUARE-D RECALL NOTICES are available.

We asked the company engineer with whom we spoke if he could determine if Federal Pioneer and Federal Pacific components sold in Canada were made in the U.S. or if tooling used to produce them was identical with that used in the U.S.

If this is the case (as one might expect based on economies of production) one should consider the possibility that other defects reported in the U.S. may also appear in Canadian installations.

As we report at FPE STAB-LOK HISTORY, quoting information from legal cases from 2005, all Stab-Lok® breakers are essentially identical.

The Federal Pioneer Warranty Alert was issued by the Ontario New Home Warranty program in October 1997 and provides for circuit breaker replacement. Schneider Canada is an electrical supplier whose product lines combine those previously marketed under the names Federal Pacific Electric, Federal Pioneer, Square-D, Tele Mechanique, Modicon, and Merlin Gerin.

Carl Grasso, an attorney who researched FPE failures for the New Jersey class action suit explains that since a portion of the safety defect with FPE breakers may be due to variations during manufacture, and since Canadian breakers may be manufactured in a different plant from those made in the U.S., it is possible that the field performance of Canadian breakers may be different than the U.S. design.

Schneider Canada, the Federal Pioneer parent company, has not provided information regarding design or manufacture changes over the U.S. design, nor provided test data regarding the product.

As of May 2008 we have had a few reports of failures in the Canadian Federal Pioneer (Stab-Lok®) equipment and also reports of failures of "replacement" FPE circuit breakers installed in U.S. panels. Having inspected some Canadian FPE (Federal Pioneer-brand) electric panels, we observed two ongoing concerns:

1.) the same bus design was used as in the U.S. equipment. I've seen very poor retention of breakers in the bus - in one house the breaker was held in place by duct tape, as the spring design in the contact of the breaker where it plugs into the special opening in the bus appears not to have held the breaker in place.

We have also seen breakers modified with their inserting pins bent and modified to fit a breaker into a slot where it did not belong - a step that is impossible with other breaker designs.

2.) A similar or identical panel design may expose consumers to panel arcing and fires regardless of changes in the breakers themselves.

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Also see FEDERAL PIONEER PANEL SAFETY

Back of the envelope cost-benefit analysis of replacing an FPE Stab-Lok® electrical panel

Aronstein/Lowry (2012), estimate that the potential savings from a ten-year replacement program for FPE Stab-Lok® electrical panels in the U.S. alone would result in

- Reduction of 5,212 building fires
- Reduction of 214 injuries
- Reduction of 25 deaths
- Reduction of $74.4 million in property losses [12]

  [Incidentally, $74.4M / 5,212 fires = $14,275 average loss per event - a figure which may not include all losses such as cost of alternative lodging, time lost, etc. and it does not address the costs of injuries or deaths - Ed.]

These figures are difficult to translate into the cost/benefit of FPE Stab-Lok® electrical panel replacement for an individual building owner. Worse, some building owners, particularly home sellers, may figure that electrical panel replacement is an avoidable cost that is of more benefit to future owners than to themselves.

The cost to replace an electrical panel is basically the cost of materials and labor: the cost of the new panel and breakers and the labor to remove the old panel and connect existing electrical circuits into the new one.

The property owner or an electrician can buy a new electrical panel complete with circuit breakers for a cost ranging from under $100. U.S. to around $200. (depending on panel ampacity and number of circuit breakers) at most building supply stores. The cost of panel installation/replacement varies widely depending on where you live but typically ranges from $1000. to $2,500. .

Also there may be financial relief for seniors or people of limited means in some communities or according to some readers, even from some insurance companies. Check with your local senior citizens state, town, or county agencies and with your insurer.

A expert reviewer pointed out that:

- [we should] keep in mind that the 1/6000 per year is the *added* risk of an electrical fire due to FPE breaker defects [not the total risk]
- I think it is folly to propose a cost-benefit analysis on a safety item that people think "has been working fine all these years". The incentive to change an FPE panel is not based on saving money.

We agree that there is a lot of folly in how individuals approach safety and risk. Here we address viewers who may be open to a more accurate understanding of the risk of fire, shock, etc.

In my OPINION [DF], considering the significant contribution of FPE Stab-Lok® equipment to house fires, replacing the equipment is likely to be less costly than the cost of a fire.

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If we wanted to make a completely emotionless assessment of the cost-benefit of replacing an unsafe electrical panel that is associated with about 2.5% of all of the annually reported electrical panels in the U.S. and is present in about 17 million homes in the U.S. as well as in many other buildings, or if we wanted to consider that there is about one fire per year for every 6000 FPE Stab-Lok® Panels in homes, let's say that your

- Annual risk of a house fire in a home with an FPE Stab-Lok® panel = 1/6000 or one chance in 6000, *per year* [12]
- Guess at a house fire cost in lost property, building repairs etc = $60,000
- Guess at number of years of a home having an FPE Stab-Lok® panel = 40 years
- Calculated guess at cost of not replacing an FPE Stab-Lok® panel = (1/6000) x ($60,000) x 40 = $400
- A serviceable replacement electrical pa nell cost at Home Depot for a 125A replacement electrical panel = $85.00 * To the panel cost we must add installation labor and licensing fees, making typical electrical panel replacement total cost about $1000 - $2500. or more.

  (For details see FPE REPLACEMENT PANEL COSTS)

To the costs you are avoiding, add

- An assessment of how risk averse you are and what you will pay to reduce or eliminate a particular risk of fire, loss, and risk of injury or death.
- An assessment of the impact on home resale; few home buyers will accept a home with an FPE Stab-Lok panel without asking for an allowance of panel replacement cost - a stumbling block to negotiate if you are a home seller.

  Why not replace the panel while you are living in the home, enjoying the reduced risk and addressing what you otherwise are likely to have to pay at time of home resale?

In my OPINION, one might infer that even if we were not willing to pay one cent to reduce the risk of the time, trouble, or even injury or death that might ensue from a house fire caused by an FPE Stab-Lok® electrical panel or breaker failure, that is, if we just consider the cost of a replacement electrical panel, replacing the panel is a good deal.

* GE PowerMark Gold 125 Amp 12-Space 24-Circuit Main Breaker Load Center Contractor Kit, Model # TM1212RCU1K, Internet # 100182490, Store SKU # 393844, retrieved 10/2/2012

For people who are unable to promptly replace an FPE Stab-Lok® electrical panel we recommend that you should be sure you have working smoke detectors properly installed and at least you will be able to sleep at night.

Also see CAN'T AFFORD A NEW ELECTRIC PANEL?

Federal Pacific Electric FPE Stab-Lok® Panel Replacement Financial Aid?

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There is no financial recourse, no product recall, no financial help, no warranty claim, no replacement fund currently available for FPE Stab-Lok® electrical panels except for a very limited class action result in the state of New Jersey.

New Jersey residents can see FPE CLASS ACTION SETTLEMENT for more information.

For more information about the cost of panel replacement, FPE replacement options, electricians, and an approach that can save part of replacement cost in some cases: see the articles listed just below

- FPE REPAIR ELECTRICIANS
- FPE REPLACEMENT PANELS
- FPE REPLACEMENT PANEL COSTS
- CAN'T AFFORD A NEW ELECTRIC PANEL?

How to report your FPE Stab-Lok® panel or circuit breaker Failure - Reporting Federal Pacific and Federal Pioneer Equipment Problems

Please see ELECTRICAL PANEL / BREAKER INCIDENTS, HOW TO REPORT for full details of reporting FPE Stab-Lok® ™ and other electrical product failures

We invite voluntary field failure reports from readers who are aware of or who experience failures of Federal Pacific and Federal Pioneer equipment order to add to the existing data base.

In addition to informing us of an FPE Stab-Lok® or Federal Pioneer electrical panel or breaker event so that we can add this incident report to the data base we maintain, we encourage readers to report such events also to the US Consumer Product Safety Commission - it's easy: you can use a simple form at the CPSC's website: https://www.cpsc.gov/incident.html or you can send the CPSC email on incidents to: info@cpsc.gov

There is no *requirement* that failures be reported to us for tabulation here. This website is not a government or other official document, nor does it receive nor request funding.

Contact the author.

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