



AD 2008-13-17

Circuit breaker-type switch replacement

Update 8/21/2008

ABS has learned several things as a result of our investigation into AD 2008-13-17. This Update gives the most current information we have at this time.

Failure modes and fixes: A look inside the breakers

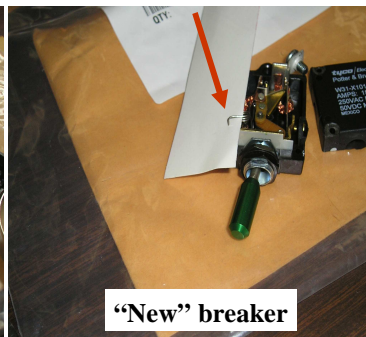


“Old” breaker

This unused, original Beech part circuit breaker is of the type required to be replaced under the AD. Note the straight end of the spring, indicated by the red arrow. According to Beech technical support and breaker manufacturer Tyco Electronics, the end of this spring scratches insulative material inside the breaker when the switch is cycled, and as the aircraft subpanel vibrates in flight. Eventually, they say, the spring will wear through the insulation, creating the alternative electrical path that leads to overheating and the potential for fire.



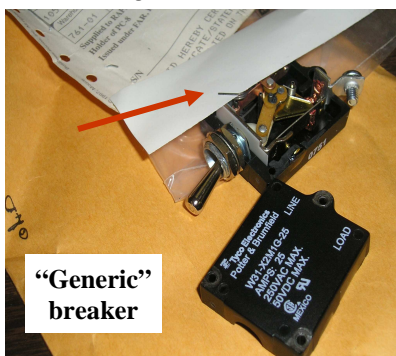
“New” breaker



“New” breaker

ABS purchased two new breakers from RAPID (two different Beech parts numbers) of the type called out as replacements in the AD. We discovered the spring in each of these parts is bent so that it does not rub against the inside of the breaker when the switch vibrates or is turned on and off.

Tyco says this modification eliminates the failure mode that caused FAA’s concern, and the new-design breaker has been tested to 50,000 cycles without failure.



“Generic” breaker

ABS also purchased a new Tyco breaker from an aircraft parts supply house that carries the same Tyco part number as the Beech part, but does not have the additional Beech part number or the color-coded switch handle that Tyco adds to parts it supplies to RAPID. Note this new, “generic” circuit breaker does *not* have the modified spring design. According to Tyco, parts without the Beech part number do *not* address the failure modes that led to AD 2008-13-17 even though they share a common Tyco W31-series part number.

Consequently, ABS recommends that, if you have a circuit breaker-type switch that gets hot to the touch in operation, that generates smoke in the cockpit, that continually pops under a load, or that you replace to comply with AD 2008-13-17 or for any other reason, that you **only use Beech part number breakers purchased through RAPID** to ensure you have the new-design spring. Note that only Beech part number breakers are called out as AD replacements.

More

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Update 8/21/2008 (continued)

Need for the Airworthiness Directive

ABS is still speaking with the FAA about the need for AD 2008-13-17, given the very small number of reported failures in service, the fact that none of those failures led to a mishap, and that in all cases failed breakers were detected and replaced using existing pilot and maintenance practices. We consider all our 2007 comments to the Notice of Proposed Rulemaking (NPRM) that preceded the Airworthiness Directive to remain valid at this point. We have learned, third-hand and without verification, of only two additional incidents of switch-type breaker “smoke” in flight, both in late-model A36s with one reportedly involving a landing light circuit breaker, the other an unidentified switch. As a result of these unconfirmed reports ABS on August 12th posted this request on our website:

Although there have been no reported mishaps as a result of overheating circuit breakers, and virtually no Service Difficult Report (SDR) report of circuit breaker overheats, ABS is beginning to get additional reports from members that some of these breakers may have overheated in flight. To help us better address this issue on your behalf we ask that, **if your airplane is subject to AD 2008-13-17 and you have had a switch-type circuit breaker overheat or become “spongy” [does not snap crisply on and off] in service**, please tell us:

- What model aircraft was involved (e.g., A36, V35B, B55, etc.),
- Which breaker(s) overheated (e.g., pitot heat, landing light, etc.), and
- Did the switch(es) merely get hot or become spongy, or did the overheat generate smoke?

Please send your responses to absmail@bonanza.org. **All replies will be kept confidential.** Also, if you have replaced circuit breakers that have overheated or become spongy and you still have the failed breaker, please send the removed breaker(s) to ABS.

To date we have received no confirmation of the two A36 reports, or any other response to this request.

ABS recommends any breaker that loses its crispness, overheats in operation or in any other way fails in flight be immediately replaced with the proper Beech part number breaker obtained through RAPID. Deadline for replacement of all switch-type circuit breakers in airplanes affected by AD 2008-13-17 is August 6, 2009. Watch ABS NEWS at www.bonanza.org for additional updates on AD 2008-13-17.