

Part 21 (PAR)

Event # 51109

Rep Org: ABB MEDIUM VOLTAGE SERVICE		Notification Date / Time: 06/01/2015 10:30 (EDT)	
Supplier: ASEA BROWN BOVERI		Event Date / Time: 06/01/2015 (EDT)	
Last Modification: 06/01/2015			
Region: 1	Docket #:		
City: Florence	Agreement State: Yes		
County:	License #:		
State: SC			
NRC Notified by: JAY LAVRINC		Notifications: PART 21/50.55 REACTORS	EMAIL
HQ Ops Officer: DANIEL MILLS		RAY POWELL	R1DO
Emergency Class: NON EMERGENCY		KATHLEEN O'DONOHUE	R2DO
10 CFR Section:		DAVE PASSEHL	R3DO
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE		JACK WHITTEN	R4DO

PART 21 - DEFECTIVE CIRCUIT BREAKER SECONDARY CLOSE LATCH

The following is an excerpt of communication received via email:

"This letter provides notification of a failure to comply with specifications associated with a secondary close latch, part number 716610K01, used in K-Line 225/800 and 1600/2000 amp electrically operated Model 7 circuit breakers.

"Nature of the deviation: During installation of a primary close latch and subsequent bench testing at a nuclear utility, mechanical binding was observed between the primary and secondary close latches. This binding prevented the breaker from operating. Inspection of both latches by ABB showed that the issue lies with the secondary close latch. It was determined that the secondary close latch dimension from the centerline of the hub that the latch rotates about, to the edge of the secondary latch surface with the half pin on the primary latch, was oversized. The failure to comply condition of binding was identified when replacing latches and verified with a calculated dimension.

"The additional length from the center of the hub in the secondary close latch to the corner of the latch surface caused an interference between the pin cam interface and the half pin on the primary close latch, where it rolls off of the latch surface on the secondary close latch.

"It is recommended that affected licensees with this latch in inventory, ensure that bench testing is performed prior to installation to verify that the primary and secondary close latches work together, without any evidence of binding.

"ABB currently cycles K-Line breakers that are refurbished approximately 55 close/open operations before they ship from the Florence facility. New breakers get at least the same number of close/open operations before

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shipment. This level of operational testing validates that there is no binding between the primary and secondary close latches.

"Questions concerning this notification should be directed to the Quality Manager at the Medium Voltage Service Center in Florence, SC at (843) 413-4727 or Fax (843) 413-4853."



June 1, 2015

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001
FAX 301-816-5151

Subject: 10 C.F.R. Part 21 Notification of Deviation re. K-Line Circuit Breaker Secondary Close Latch

1. This letter provides notification of a failure to comply with specifications associated with a secondary close latch, part number 716610K01 (see Figure 1), used in K-Line 225/800 and 1600/2000 amp electrically operated Model 7 circuit breakers. This does not affect previous models of these same breakers that have not been upgraded to include the interlocking primary and secondary close latches. It also does not affect manually operated K-Line breakers or K3000/4000 circuit breakers. Information is provided as specified in 10 C.F.R. 21 paragraph 21.21(d) (4).

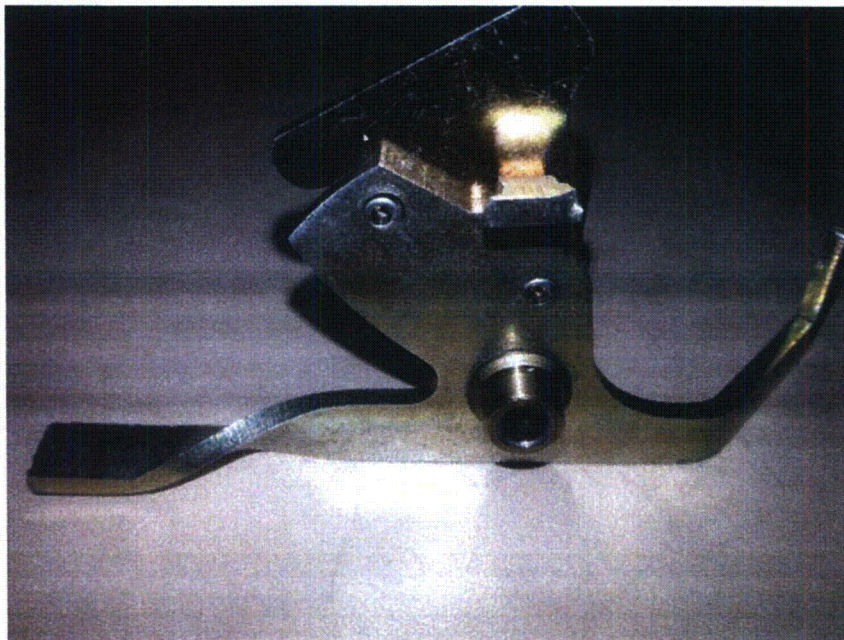


Figure 1 - Secondary Close Latch

2. Notifying individual: Jay Lavrinc, Vice President & General Manager, ABB (Medium Voltage Service), 2300 Mechanicsville Road, Florence, SC 29501
3. Identification of the Subject component: ABB part number 716610K01 secondary close latch. This secondary close latch is used on new legacy K-Line Model 7 electrically operated circuit breakers. It is also used during breaker refurbishments when a secondary close latch is required to

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be replaced because of damage or wear. The secondary close latch is available as a component part and is also used in K-Line Model 7 up-grade kits.

4. If a breaker is sent in for refurbishment the primary and secondary latches are not replaced unless it is required in the customer PO.
5. Nature of the deviation:

During installation of a primary close latch and subsequent bench testing at a nuclear utility, mechanical binding was observed between the primary and secondary close latches. This binding prevented the breaker from operating. Inspection of both latches by ABB showed that the issue lies with the secondary close latch. It was determined that the secondary close latch dimension from the centerline of the hub that the latch rotates about, to the edge of the secondary latch surface with the half pin on the primary latch, was oversized. The failure to comply condition of binding was identified when replacing latches and verified with a calculated dimension.

The additional length from the center of the hub in the secondary close latch to the corner of the latch surface caused an interference between the pin cam interface and the half pin on the primary close latch, where it rolls off of the latch surface on the secondary close latch. (see Figures 2 & 3)

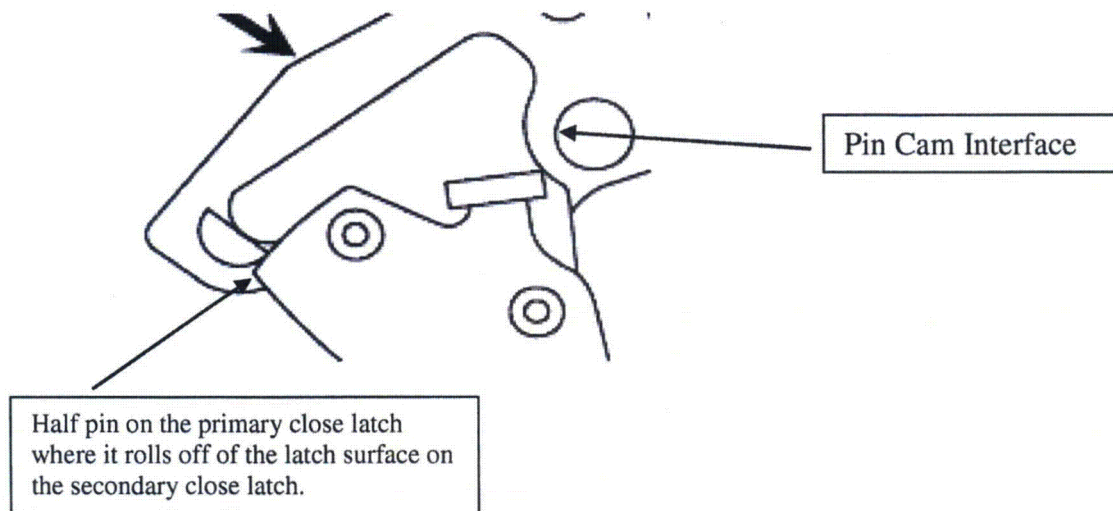


Figure 2 – Pin Cam Interface

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Bound condition shown below.

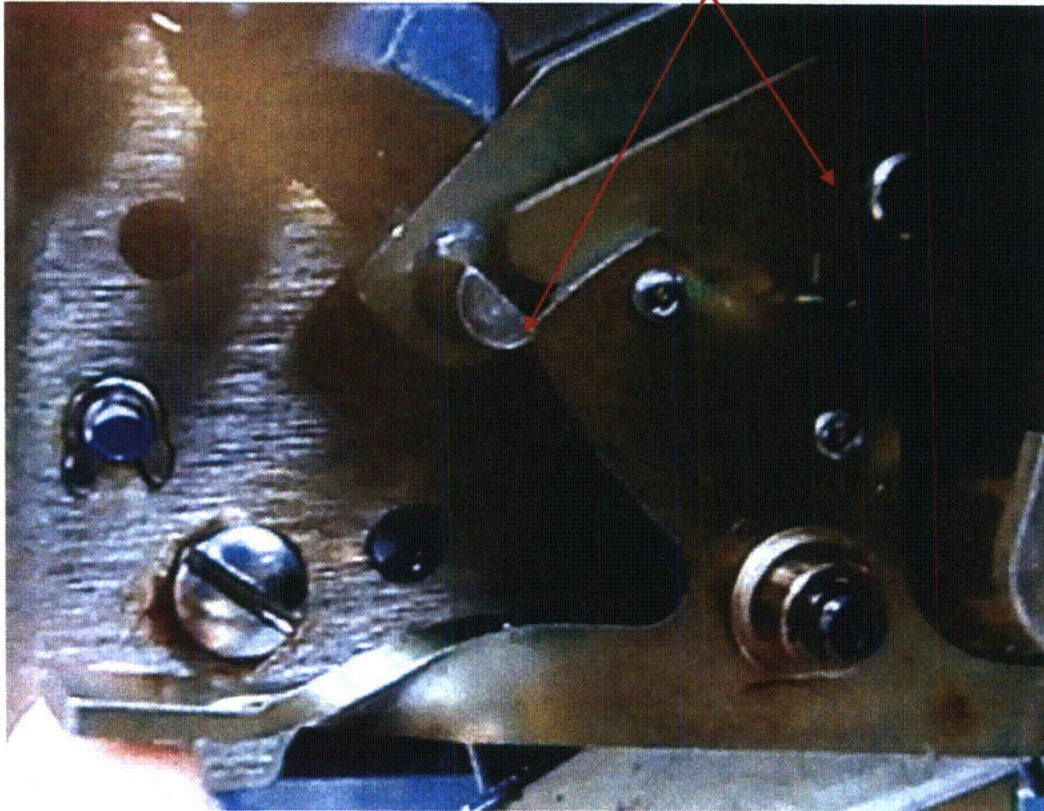


Figure 3 – Bound Condition Illustration

6. Corrective actions include:

- a. Develop a method for testing primary and secondary close latches together to ensure proper operation when obtained as components. (Action complete)
- b. Quarantine all primary and secondary close latches in Florence until they can be tested as pairs. (Action Complete)
- c. All future sales of the primary and secondary close latches will be as matched sets that have been tested together at ABB. New part number for matched set – P/N: 716252T01 (Action Complete)

7. Recommendations:

Based on our investigation and analysis, it has been determined that the failure mode reported is not intermittent in nature. Additionally, there have been no reported in-service field failures due to the oversized feature. Thus, a breaker that is currently operating in switchgear or on the test bench can be left in service with the installed latches.

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ABB does not foresee that continued operation with a currently installed secondary close latch will result in any type of wear or degradation that would result in binding between the primary and secondary close latches.

It is recommended that affected Licensees with this latch in inventory, ensure that bench testing is performed prior to installation to verify that the primary and secondary close latches work together, without any evidence of binding.

ABB currently cycles K-Line breakers that are refurbished approximately 55 close/open operations before they ship from the Florence facility. New breakers get at least the same number of close/open operations before shipment. This level of operational testing validates that there is no binding between the primary and secondary close latches.

Questions concerning this notification should be directed to the Quality Manager at the Medium Voltage Service Center in Florence, SC at (843) 413-4727 or Fax (843) 413-4853.

Very truly yours,

A handwritten signature in blue ink, appearing to read "J. Lavrinc".

Jay Lavrinc
VP & GM ABB MVS

ABB Inc.

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FLORENCE, SC 29501 USA

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