

CF

# OEAB EVENT TRACKING SHEET

No Sort Specified  
QUERY> "FIELOS" \$ Assigned To & Event Date >= 07/14/94 & Event Date <= 07/14/94 & "SAINT LUCIE" \$ Plant Name

Plant: SAINT LUCIE Unit: Engineer: FIELDS W.  
Event: 07/14/94 Morning Report: 07/14/94 Briefing: 94-25  
50.72#: 0 LER#: 050000009400000 PN#:

Other Notification:

System: Component:

## OPERATING MODE

- 1 - Operation
- 2 - Startup
- 3 - Hot Standby
- 4 - Hot Shutdown
- 5 - Cold Shutdown
- 6 - Refueling
- 7 - Other \_\_\_\_\_

## SIGNIFICANCE

- A - Reactor Protection System
- B - Safety-Related Cooling System
- C - Fuel Cladding
- D - Reactor Coolant Pressure Boundary
- E - Containment
- F - Plant Power
- G - Unexpected Plant Performance
- H - Other:

## CAUSE

- 1 - Equipment Failure
- 2 - Design or Installation Error
- 3 - Operating Error
- 4 - Maintenance Error
- 5 - External
- 6 - Other \_\_\_\_\_

## EVENT TYPE

- SIG - Significant Event
- EOI - Event of Interest
- TBD - To Be Determined
- OTH - Other

POTENTIAL AO: Criterion: \_\_\_\_\_

Proposed By: FIELDS W. *Ernest M. Jule 7/26/94*  
Engineer

Approved: *[Signature]* - 08/02/94  
Section Leader

A. Chaffee  
Branch Chief

EVENTS ASSESSMENT PANEL First Screening:

Significance Description:

FAILURE OF TRIP CIRCUIT BREAKER 5 TO OPEN

*6pp*  
9408230069 *6pp XA\*XB.*

000016

*67*  
NRC FILE CENTER COPY

G:\ETS2.DOC

DOCUMENT LOCATION & NAME:

G:ENF\StLucie.efr

PSE -- NO

EVENT FOLLOW-UP ASSIGNMENT SHEET

ASSIGNMENT DATE: \_\_\_\_\_

ASSIGNED TO: Fields/Koshy \_\_\_\_\_

PLANT & UNIT: St.Lucie \_\_\_\_\_

EVENT DATE: 7-14-94 \_\_\_\_\_

50.72 REPORT NO: \_\_\_\_\_

DAILY REPORT DATE/NO: 2-94-0058 \_\_\_\_\_

OTHER REPORT: \_\_\_\_\_

EVENT SUMMARY AND SPECIFIC FOLLOW-UP ASSIGNMENT

Evaluate the failure, prepare a brief and an info. notice if needed.

**CIRCLE THE APPLICABLE CASE:**

SAFETY SIGNIFICANCE CLASSIFICATION: OTH \_\_\_\_\_ EOI XX SIG \_\_\_\_\_ AO \_\_\_\_\_

GENERIC CONCERN STATUS: YES IN #In prep BUL # \_\_\_\_\_ GL# \_\_\_\_\_

OR BRIEF: YES # \_\_\_\_\_

CLOSEOUT

PROBLEM:

FAILURE OF A REACTOR TRIP BREAKER TO OPEN DURING A SURVEILLANCE TEST.

CAUSE:

BREAKER OPENING PREVENTED BY FOREIGN MATERIAL LODGED IN TRIP LATCH AREA.

SAFETY SIGNIFICANCE:

APPEARS TO BE A GENERIC PROBLEM WHICH MAY BE MORE SIGNIFICANT FOR BREAKERS USED IN OTHER APPLICATIONS OR INSTALLED IN NSSS OF OTHER VENDORS.

#### DISCUSSION:

On July 14, 1994, during monthly reactor protection system (RPS) logic matrix testing, trip circuit breaker 5 (TCB5), GE model AK 2-25, failed to open (Figure 1). Operators unsuccessfully attempted to open the breaker from the control room. The breaker also could not be opened locally by either electrical or mechanical means.

TCB5 had successfully opened on three previous occasions in response to previous steps in the surveillance procedure. TCB5 is one of eight reactor trip breakers in the one-out-of-two taken twice reactor trip coincidence logic. The licensee opened TCB which, with tcb5, forms one channel. The licensee also opened TCB's 2 and 6. A plant shutdown was commenced about 3.5 Hrs. Later at the direction of the licensee's nuclear vice president.

The licensee's and GE representative's inspection of TCB5 found that a small piece of phenolic material from the cutoff switch body (interrupts power to the closing coil as part of the anti-pump circuit) had broken off and become lodged in the trip latch mechanism, preventing its motion (see figures 2 and 3). A machine screw attaching the cutoff switch to its mount was found to be loose. The licensee speculates that this loose screw allowed the switch to migrate such that its body was damaged as a result of component movement during previous breaker cycling.

GE service advisory letter (SAL) 303.0, Issued April 6, 1989, informed owners of ak 25-1 breakers of the potential for the armature of the cutoff switch developing cracks that could lead to switch failure with the potential for burning up the closing coil. The SAL did not mention any problem with cracking in the body of the switch.

#### Followup:

- licensee and a vendor representative inspected all similar unit 2 breakers. Switches were found with scratches or "mold marks" but none of the conditions were judged significant. None of the cutoff switches were found with loose screws.
- Region II is reviewing the event and licensee actions in light of their compliance with appropriate technical specification action statement.
- Region II will draft an information notice describing this event.

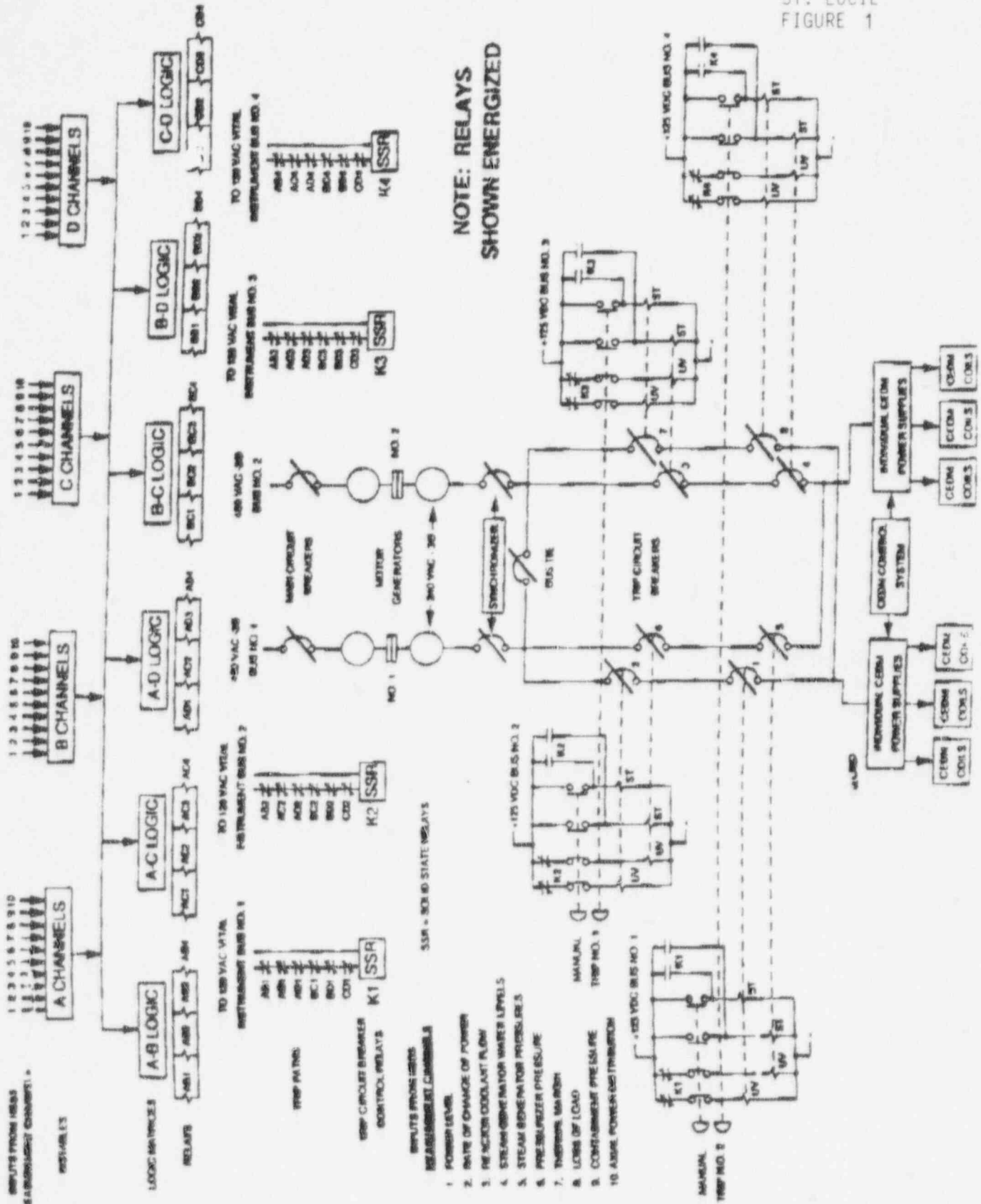
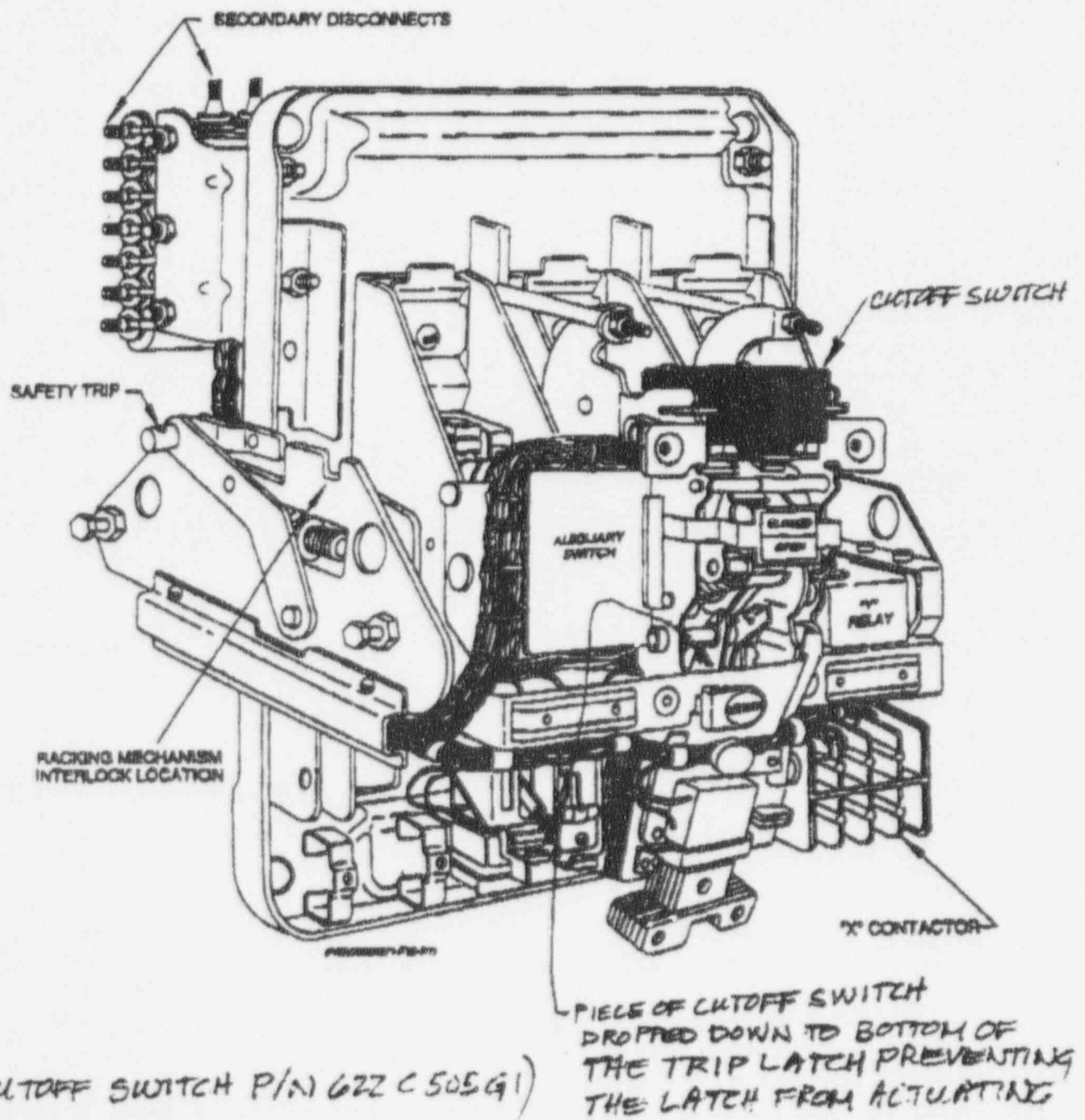


FIGURE 10.1-1 SIMPLIFIED RPS

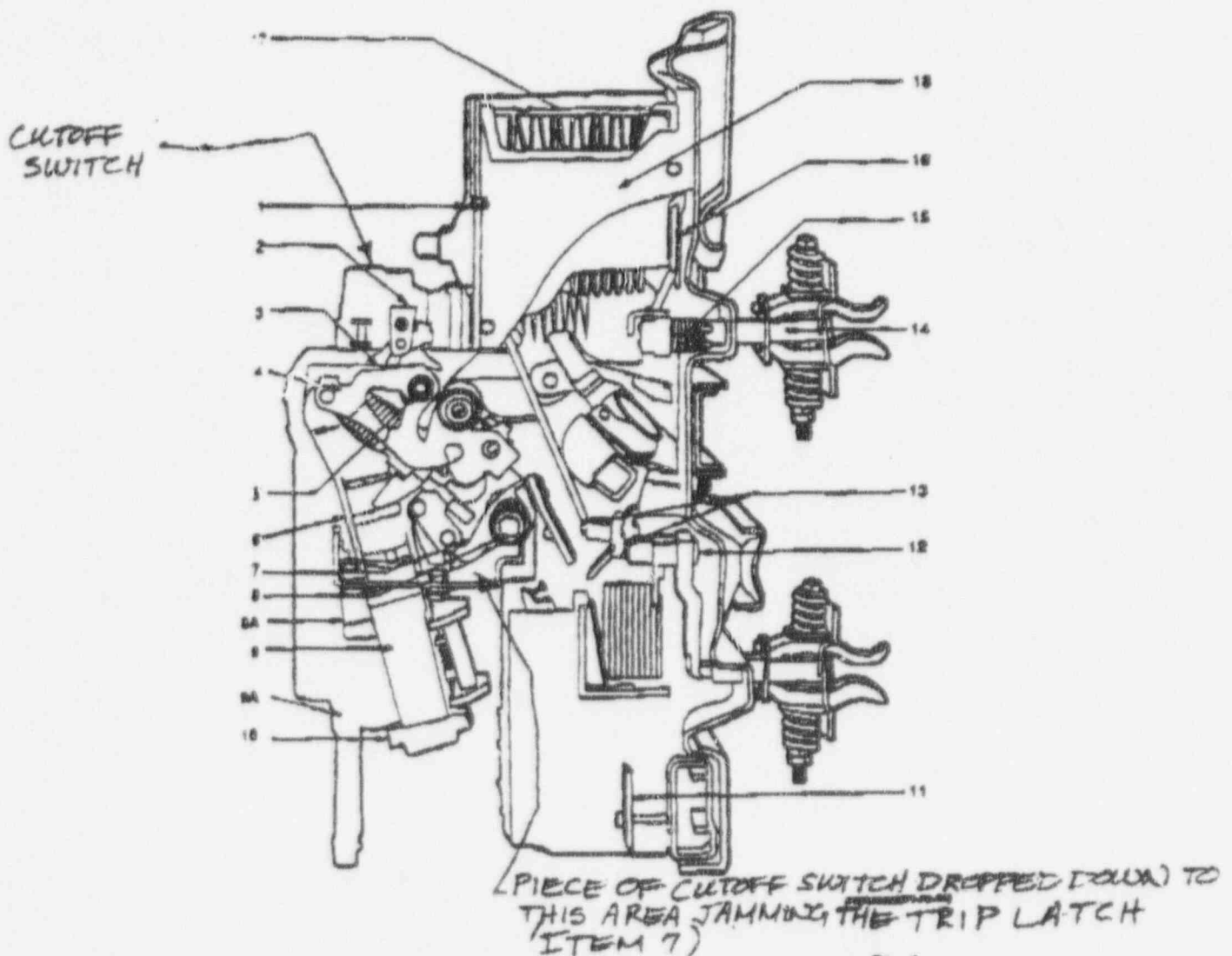
ST. LUCIE PLANT  
MAINTENANCE PROCEDURE NO. 0920071, REVISION 2  
PERIODIC MAINTENANCE OF REACTOR TRIP SWITCHGEAR AND BREAKERS

**FIGURE 12**  
**AK-2 BREAKER FRONT VIEW**



ST. LUCIE PLANT  
MAINTENANCE PROCEDURE NO. 0920071, REVISION 2  
PERIODIC MAINTENANCE OF REACTOR TRIP SWITCHGEAR AND BREAKERS

**FIGURE 2**  
**CUT AWAY OF ELECTRICALLY OPERATED AK-2 CIRCUIT BREAKER**  
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- |                           |  |                                     |
|---------------------------|--|-------------------------------------|
| 1. Arc Quencher Retainer  | 8. Trip Shaft                                | 14. Upper Stud                      |
| 2. Cutoff Switch          | 9A. Front Escutcheon                         | 14A. Lower Stud                     |
| 3. Cutoff Switch Actuator | 9. Closing Solenoid                          | 15. Stationary Contacts and Springs |
| 4. Spring Carrier         | 9A. Location of slots for Maintenance Handle | 16. Arc Runner                      |
| 5. Shoulder Pin           | 10. Closing Solenoid Armature                | 17. Arc Quencher Muffler            |
| 6. Connecting Link        | 11. Cover Retainer or Overload Device        | 18. Ceramic Side Plates             |
| 7. Trip Latch             | 12. Lower stud                               |                                     |
| 7A. Latch Roller          | 13. Socket Head Screws                       |                                     |