Instructions for Type CIL Indoor Current Limiting Capacitor Fuses

ABB

I.L. 38-851-7

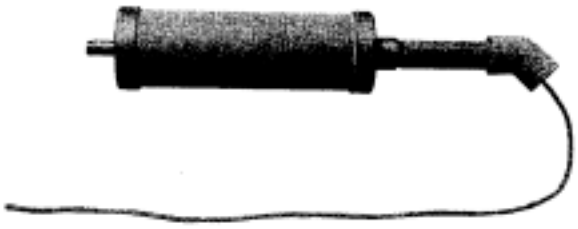


Fig. 1a
Type CIL Fuse

Fig. 1b
Type CIL Fuse
with Installation Hardware

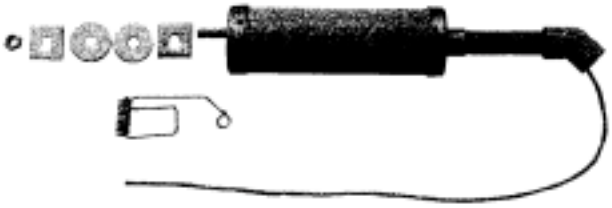


Fig. 1c
Type CIL Fuse
Field Replacement Fuse

GENERAL DESCRIPTION/APPLICATION

The Type CIL Fuse is a full range current limiting capacitor fuse. *It is designed for indoor use only.* CIL fuses exist in voltage classes of 5.5 kV, 8.3kV, and 15.5kV. The primary application of these fuses is individual capacitor unit fusing for metal enclosed equipments. The CIL fuse is current limiting, indicating and disconnecting.

CIL fuses are shown in Fig. 1.

The basic CIL fuse with a 1/2-13 stud and gas deflector is shown in Fig. 1a.

Fig. 1b shows the CIL fuse with the fuse mounting hardware and special indicating spring.

Fig. 1c shows a *special* CIL fuse with mounting hardware, wedge and flat washers and indicating spring. This kit is intended for use as a replacement fuse for previous designs. This CIL fuse differs in that the fuse stud is 3/8-16 and offset by .25 inches from centerline permitting special fuse mountings in existing equipments.

The nameplate information on the high current fuse body gives the style and rating data of the CIL fuse only. Ordering by style on the fuse will provide the basic CIL fuse.

Each CIL fuse is completely assembled with the low current link, tested and ready for installation.

INSTALLATION INSTRUCTIONS

Actual installation of the CIL fuse will vary slightly depending on the capacitor equipment. Figures 2 and 3 show the complete mounting for two typical indoor capacitor fusing applications.

Figure 4 shows the fuse mounting of the *CIL replacement fuse* into an existing metal enclosed equipment with an edge mounted capacitor. Refer to Figure 4 for the details on the use of the wedge and flat washers supplied.

Pertinent details are included in each figure for the installation; otherwise, the following instructions are common to each.

All possible contingencies which may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding his particular installation, operation or maintenance of his equipment, the local ABB Power T&D representative should be contacted.

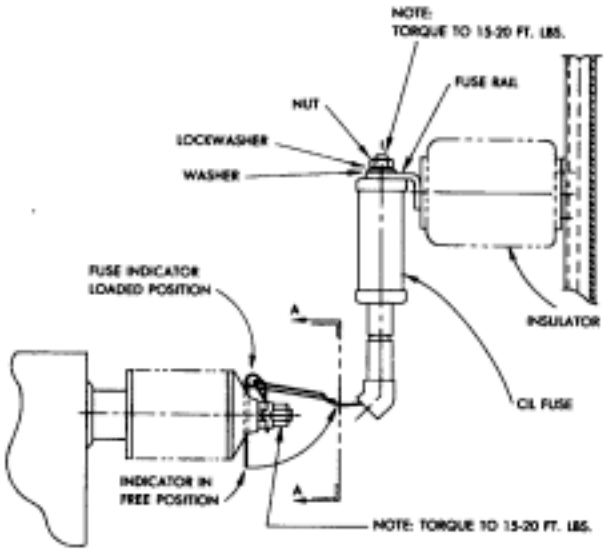


Fig. 2
Indoor Installation
Type CIL Fuse/Capacitor Edgemount

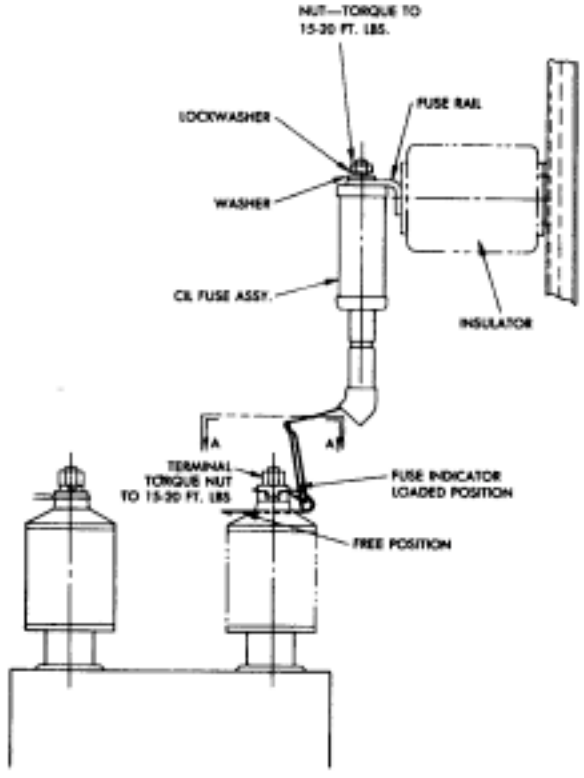


Fig. 3
Indoor Installation
Type CIL Fuse/Capacitor Upright

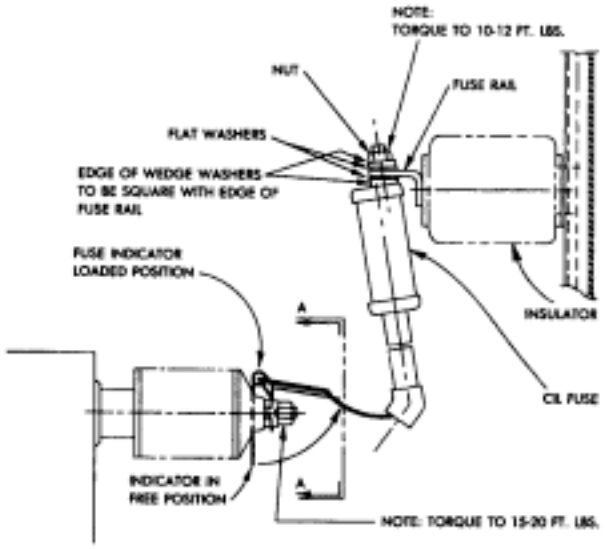
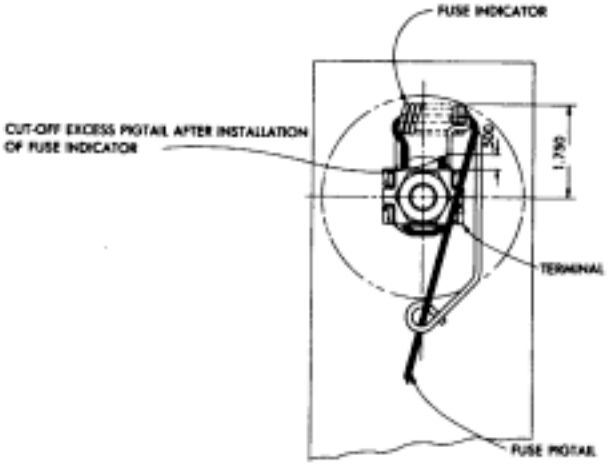


Fig. 4
Indoor Installation
Field Replacement CIL Fuse/Capacitor Edgemount



Section A-A

SHOCK HAZARD

Before inspecting or working on capacitors, power must be removed from the capacitors by a visible disconnect. After disconnecting the power, the capacitors will generally be left with a charge which must be removed before handling. The charge may be removed by the following:

1. Most power capacitors have internal discharge resistors which will reduce the voltage after the capacitors are disconnected from the power source from rated voltage to 50 volts in 5 minutes or less.

2. **After disconnecting the capacitors from the power source, wait at least 5 minutes, then short and ground the capacitor equipment and individual capacitors using an insulated grounding stick. Shorting should be terminal-to-terminal and terminal-to-case.**

3. Individual units should be shorted because equipment shorting is ineffective in case of a fuse operation or other disconnection of a capacitor.

Units which do not or may not contain discharge resistors should be discharged as above except shorting should be accomplished using an external discharge resistor. The resistance in ohms should be about equal to the maximum peak voltage that may have been on the capacitor. The resistor should have a peak voltage capability greater than the maximum peak voltage which may be on the capacitor and an energy absorbing capability greater than the energy stored in the capacitors. **After discharging, a shorting connection should be installed between terminals and removed just prior to re-energization.**

INSTALLATION

Remove dirt and foreign substances from contact surfaces. Coat aluminum contact surfaces thoroughly with No-ox-id compound or equivalent. Abrade these surfaces through this coating with a wire brush or medium emery cloth. Assemble the joint without removal of compound.

Mount the CIL fuse to fuse rail using hardware as shown; the fuse deflector *must* be positioned such that the opening points to the capacitor unit. Tighten nuts on the fuse to 10-12 ft. lb. for the 3/8-16 stud and 15-20 ft. lb. on the 1/2-13 stud.

Thread the fuse pigtail through the fuse indicator and onto capacitor unit bushing terminal as shown.

Place the fuse indicator in the "loaded" position; pull the fuse pigtail tightly around terminal such that the fuse indicator "loaded" position is maintained. NOTE: The indicator travel must be sufficient to insure the low current link is completely ejected from the low current tube if the fuse operates.

Tighten the capacitor unit bushing terminal to 15-20 ft. lb.

Cut off the excess fuse pigtail as shown in section A-A.

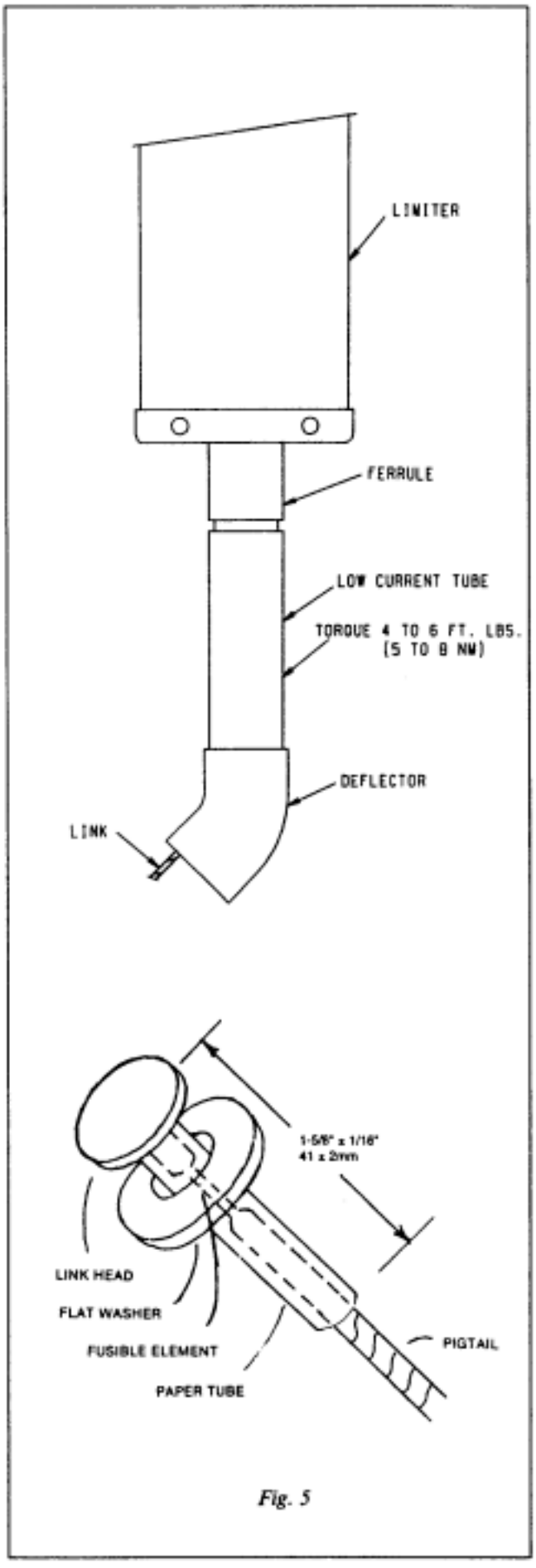


Fig. 5

MAINTENANCE

Normally fuses that have been properly installed will not require any maintenance. If the fuse has operated, take the following precautions upon refusing:

1. CAUTION: DISCHARGE THE CAPACITOR BANK AND ESPECIALLY THE CAPACITOR THAT IS BEING REFUSED. REFER TO "SHOCK HAZARD" SECTION.

2. Measure the capacitance of the capacitor with a low voltage device. Replace the capacitor unit if it has failed. If a fuse is to be disconnected in order to measure the unit capacitance, it is much better to unbolt the fuse from the fuse rail, removing the entire fuse assembly. Any action which may cause twisting of the fusible element is undesirable.

3. Check electrical continuity of the limiter. Discard the limiter if it measures open circuit. If the limiter has continuity, then proceed as indicated below.

4. Remove the link connection at the capacitor terminal and remove the low current tube from the fuse. Discard the old link. Refer to Fig. 5.

5. Examine the low current tube. Replace with a new low current tube if:

   a. The low current tube has been previously refused once.

   b. Excessive erosion or carbonizing is present inside the bore of the tube.

6. Obtain a new fuse link of the same rating.

7. On fuse designs manufactured before 1990, remove and discard the link paper tube (a paper liner is glued into the low current tube). On some distribution links this tube is attached to the link head and must be cut off at a point just below the link head. DO NOT CUT INTO THE FUSIBLE ELEMENT. On fuses manufactured since 1990, cut the paper tube 1-5/8 ± 1/16 inch below the link head. Remove and discard the remainder of the tube. DO NOT CUT INTO THE FUSIBLE LINK (See Fig. 5). In all cases, the fuse link paper **must** be present around the fusible element to ensure proper operation of the fuse.

8. Insert this link assembly into the threaded end of the low current tube. Carefully start the threads, tighten into the ferrule applying 4 - 6 ft. lbs. (5 - 8 NM) to insure good electrical contact.

9. Refer to the Installation Instructions above for proper adjustment of the spring indicator.

ABB Power T&D Company, Inc.
Bloomington, Indiana 47404

Printed in U.S.A.