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**TECHNICAL BULLETIN TB-158**

**SOLDERING INSTRUCTIONS FOR SWITCH TERMINALS**

The following instructions are for soldering switch terminals of Series 90 switches. There are two categories of instructions. The Category I instructions address those terminals of switch assemblies that are new and supplied by the manufacturer. The Category II instructions address those terminals that may have become contaminated. The content of the following procedures was prepared while considering the requirements and procedural guidelines provided in ANSI/J-STD-001B, High Reliability Soldering Training Manual, and IPC-A-610 revision "C" (Acceptability of Electronic Assemblies).

**Safety Requirements**

It is recommended that during cleaning operations the personnel wears safety glasses, uses protective gloves and takes other protective measures against hazards listed in the corresponding Material Safety Data Sheets for all applicable chemicals.

**Category I: New Switch Terminals Soldering Procedure**

1. Prior to the soldering of the switch terminals, be sure to clean thoroughly the terminals with non-abrasive cleaning brush and alcohol and air-dry them.
2. Add a small drop of flux to the properly formed wire connection to the terminal post. The flux shall be Type ROL1 per J-STD-004 (Kester #186). The flux shall be maintained to a specific gravity of between 0.838 and 0.858 at 25°C and discarded after one week of use. Do not use flux pen.
3. Place the solder on the connection that needs to be soldered. The solder composition shall be Sn60/Pb40 or Sn63/Pb37 per J-STD-005.
4. Place the soldering iron on the solder to form the required heat bridge and watch for the flux to bubble (this indicates the heat bridge is made).
5. Feed solder on the connection side opposite to the soldering iron. Now solder will flow toward heat source (iron) and around the connection.
6. Remove the solder and the soldering iron simultaneously from the connection. Note the duration of the whole soldering operation should not exceed 5 seconds.
7. Remove the excess flux from the soldered connections during the first 30 minutes after completing the soldering operation.

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## Category II: Contaminated Terminals Soldering Procedure

Consider adopting the following procedure, if the switch terminals have become contaminated after delivery from the manufacturer.

1. If the problem terminals have wires soldered to them, unsolder and remove the wires.
2. Clean the terminals by removing excess solder and contamination. Use a soldering iron and solder wicks for this operation.
3. Hold the switch vertically with its terminals pointed downward or hold the switch with 75° downward angle. Thoroughly clean the affected terminals with alcohol using non-abrasive regular (acid) cleaning brush or hog hair cleaning brush. Make sure that flux is completely removed from the affected terminals. Allow the cleaned terminals to air dry.
4. Thoroughly brush clean the above terminals again with Heavy Duty Industrial Cleaner/Degreaser (MG Chemicals), CITRA-SAFE degreaser (manufactured by Inland Technology Inc.), or other similar strong industrial cleaners used for preparing soldering surfaces. Allow the terminals to air dry.
5. Hold the switch vertically with its terminals pointed downward or hold it in an angle of about 75 degrees. Using hog hair cleaning brush or regular (acid) brush, apply and agitate the affected areas of the terminals with tin deoxidizing 5560, SOLDER-NU SOLDER PRECLEANER (manufactured by Litton. Kester Solder) for approximately one minute. Clean the terminals with deionized or distilled water and allow them to air dry.
6. Use the Category I: New Switch Terminals Soldering Procedure for the resoldering of the above terminals prepared for soldering.

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