

SOLDERLESS CONNECTORS INSPECTION

1. GENERAL

1.01 This section covers the inspection of solderless connectors.

1.02 This section is reissued to specify proper gloves for protecting personnel against electric shock and to change the method of making temperature tests.

1.03 Solderless connectors are generally employed in making connections to multi-strand power conductors, including battery feeders. Because of the gradual "setting" of the mass of individual wires after initial tightening, there is normally a tendency for the bond to loosen, sometimes sufficiently to develop an increasing resistance. The process can be aggravated by temperature variations which accompany changing load currents. For this reason the installer will usually retighten such connectors before turnover.

1.04 Occasionally solderless connectors will develop appreciable resistance with respect to the feeder conductor after being placed in service, by the processes described in 1.03. The poor connection may then lead to service interruptions, transmission noise or power failures, and may even constitute a fire hazard.

1.05 In view of the normal tendency of the bonds to loosen after initial tightening, it is expected that the connections of new installations would be inspected within 9 to 12 months after cutover unless otherwise prescribed by local instructions. Analysis of this inspection would be the basis for determining future inspection requirements. It may be desirable to recheck connections until they are found to be tight on two consecutive inspections.

2. LIST OF TOOLS AND MATERIALS

CODE OR SPEC NO. TOOLS	DESCRIPTION
R-2670	Allen Wrench, 3/32"
R-2671	Allen Wrench, 1/8"
R-2485	Allen Wrench, 5/32"

CODE OR SPEC NO. TOOLS

R-3028 or R-2812
R-2672 or R-2865
R-2486
R-2673

DESCRIPTION

Allen Wrench, 3/16"
Allen Wrench, 1/4"
Allen Wrench, 5/16"
Allen Wrench, 3/8"
Thermometer, Fisher Scientific Company 14-990, 2-degree graduations, 0° to 230° F.

CODE OR SPEC NO. MATERIALS

DESCRIPTION

Friction Tape
Insulating Gloves, per specification AT-6697 to protect personnel from electric shock (See Section 075-141-501.)
Small pieces of canvas as required to insulate fuse clips
Rubber mat (obtained locally)

3. METHOD

3.01 When leads are carrying appreciable currents, the presence of a poor connection will be indicated by a temperature difference between the solderless connection and a point on the wire at least 3 feet from the connector. This can best be checked by feeling the conductor first at least 3 feet from the solderless connector, then at points along the conductor toward the connector. It must be kept in mind that if a poor connection does exist, the temperature of the conductor near the connector may become high enough to constitute a safety hazard. If a temperature rise is detected, the hand should be removed from the conductor. If it is desired to continue the test beyond this point the thermometer should be used.

Caution: *This test should not be made on uninsulated current-carrying parts or on any part where hazardous voltages may be present.*

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3.02 The temperature tests of 3.01 will not be effective in verifying connections which are in "cold" or lightly loaded circuits. A manual and visual inspection or tightening will be necessary.

Caution: Never apply force in manually testing a current-carrying connection for tightness. Should the connector be loose, a pull on the conductor might cause an arc and result in injury to personnel.

3.03 In tightening solderless connectors it should be kept in mind that a slight additional tightening does no harm. Do not use padding on the wrench or a wrench extension to develop pressure beyond that which can be applied by the gloved hand. Further tightening by such means approaches the danger point where either the wires or the connection may be injured. Where there is a possibility of the Allen wrench handle contacting adjacent framework or conductors carrying other potentials, it may be necessary to open the appropriate circuits during the tightening operation.

Caution: Do not remove fuses, open switches, or disturb any apparatus until a careful check has been made to insure that there will be no interruption to service.

3.04 If ac power connections are to be inspected and all circuits carrying dangerous potentials can not be readily opened or disabled to insure safe working conditions, it will probably be desirable to employ an electrical contractor to perform this work. *In trying to prevent power failure, any procedure which endangers personnel shall be avoided.*

3.05 When fuses are removed or switches are opened in a live circuit in order to permit work on the circuit, it is advisable to attach clean canvas to, or otherwise insulate the fuse clips, or secure the switches in an open position so as to prevent the circuit from being accidentally closed while being worked on. In addition to these measures, warning tags should be placed on the fuses or switches, and removed only by the person responsible for the operation. The fuses should be replaced or the switches closed only by the person responsible for the operation, after it is determined that it is safe to do so.

3.06 A rubber mat may be used as a means of protection on concrete or damp floors while performing work on or near live ac equipment.