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INTERNAL VISUAL INSPECTION OF RESISTORS

ESA/SCC Basic Specification No. 2044000

space components
coordination group

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DOCUMENTATION CHANGE NOTICE

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1. SCOPE

This specification, to be read in conjunction with ESA/SCC Basic Specification No. 20400 (Internal Visual Inspection), contains additional specific requirements for Resistors. They shall apply, where relevant, to each device inspected.

2. GENERAL REQUIREMENTS

2.1 APPLICABILITY

The following criteria may not be varied or modified after commencing any inspection stage. Any ambiguity, or proposed minor deviation, shall be referred to the Qualifying Space Agency for resolution an approval.

2.2 PROCEDURE

All items shall be examined in such a manner that a minimum of handling and movement of the component is involved.

3. EQUIPMENT REQUIRED

3.1 MAGNIFICATION

All items shall be examined with a binocular or steroscopic microscope adjusted to 4 power (X4) or 5 power (X5) for fixed resistors, wirewound.

3.2 MOUNTING FIXTURES

Suitable fixtures may be used to assist in the inspection process provided they do not of themselves cause damage to the device.

4. DETAILED REQUIREMENTS

4.1 GENERAL

All components shall be inspected prior to any application of coating or moulding. A component shall be rejected if it exhibits one or more of the defects listed in any of the following paragraphs of this Section. Where applicable, drawings have been included to provide additional explanatory material, but they shall be considered as examples only.

4.2 FIXED WIREWOUND RESISTORS

4.2.1 Resistance Body

Holes or cracks in the resistance body.

4.2.2 Resistance Wire (see Figure I)

(a) Bond or joint in winding,

(b) Deformations, nicks, cracks,

(c) Loose wire,

(d) Broken wire,

(e) Any abrasion not authorized by the appropriate approved design.

4.2.3 Winding

(a) Loose winding,

(b) Uneven spacing between turns of the winding,

(c) Average winding pitch exceeding five (5) times the wire diameter,

(d) Effective wire coverage (see Note 1 below) such that more than 20% of the overall winding area remains uncovered.

NOTES

1. The effective wire coverage is the winding length on the body between the points of departure from the normal winding pitch.

4.2.4 Wire Welding

(a) Length of the welding area (dimension 'B' of Figure II) less than 1.5 times the wire diameter (ultrasonic bond).

(b) Lead wire deformed by more than 50% and less than 25% (electrical weld).

4.2.5 Winding - Cap Connection (see Figure II)

(a) Changes in direction of wire before or within the welding area.

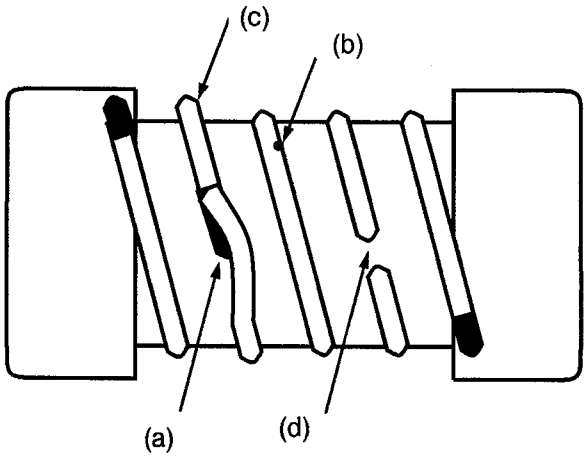
4.2.6 Caps and Leads (see Figure III)

(a) Burrs on the edges of the caps,

(b) Either of the cap edges ('K') deviating by more than 5° from the edge ('B') of the resistance body,

(c) Any damage to the thermal lead reducing its diameter by more than 10%.

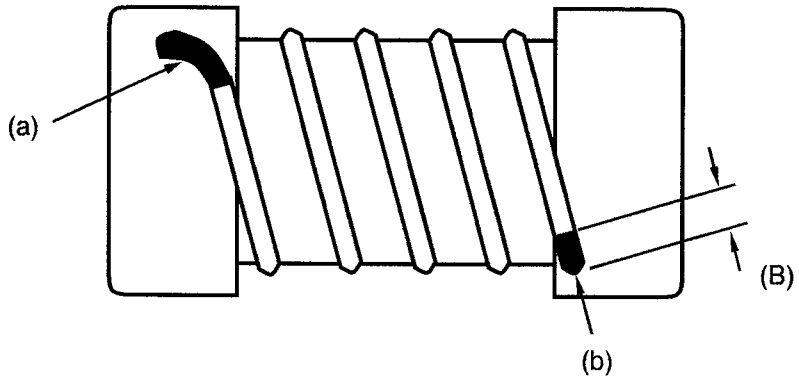
FIGURE I - RESISTANCE WIRE



NOTES

1. (a), (b), (c) and (d) refer to Paras 4.2.2(a) to (d) respectively.

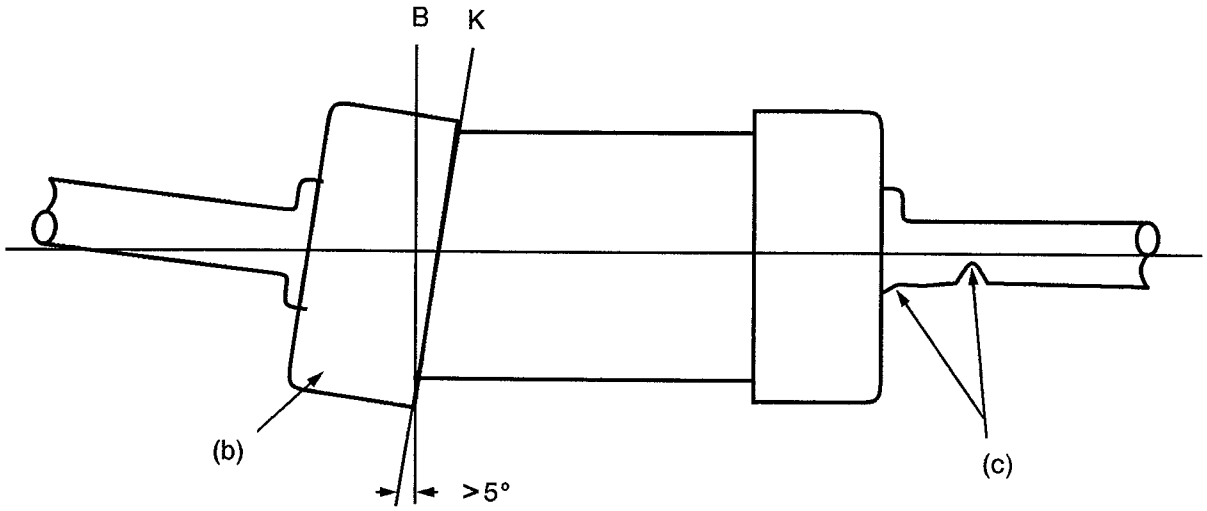
FIGURE II - WINDING-CAP CONNECTION



NOTES

1. (a) and (b) refer to Paras 4.2.5(a) and 4.2.4(a) respectively.

FIGURE III - CAPS AND LEADS



NOTES

1. (b) and (c) refer to Paras 4.2.6(b) and (c) respectively.