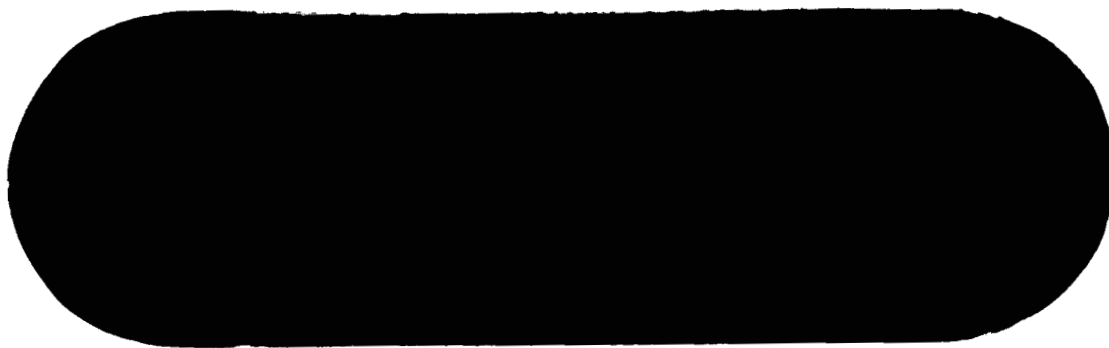


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FD-744-3S-SF

MODEL NO. S-IC CONTRACT NO. NAS8-5608

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ABSTRACT

During an investigation of contact protrusion and misalignment in Methode FD744-3S-SF connectors, many cracks were found in the contacts, originating from the root of the retention tab. Findings revealed that tighter controls would be required, above those in Methode drawings to assure production of satisfactory parts. To this end MBC 455 was issued.

KEY WORDS

Cracks

Methode Contacts

Production Control

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1.0 OBJECT

To determine cause for cracks and misaligned and protruding members in contacts of Methode FD744-3S-SF connectors.

2.0 BACKGROUND

The problem of protruding contact members and misalignment was first noted during fabrication of replacement distributors for the S-IC-501 vehicle. During inspection for this condition the cracked contacts were also noted. Additional investigation revealed that the cracked contacts were prevalent in a large percentage of connectors procured after June, 1965. The misalignment of contact members was prevalent in the majority of connectors; however, few cases were found where the rear contact member actually protruded through the front face of the contact.

Analysis of these conditions indicated that the cracked contacts were probably caused by excessive hardness of the base contact material. The protrusion of rear contact members appeared to be due to the misalignment and inadequate control of contact dimensions. The tests performed herein were initiated to verify this analysis.

The contacts of the FD744-3S-SF connectors are manufactured to Methode drawing 141-1088-00.

3.0 CONCLUSIONS

The cracks in the Q413 test specimens can be definitely attributed to the excessive hardness of the contact base material. Although the dimensions of the contacts of both test groups complied with drawing requirements, utilization of the drawing tolerances ($\pm 1/64$) would permit the protrusion problem when sufficient misalignment was present. No other significant differences were noted between the two groups of test specimens.

4.0 RECOMMENDATIONS

The problems mentioned herein are not design discrepancies but result basically from inadequate control of materials and dimensions, which is inherent with parts procured to vendor part numbers with no control by the procuring activity. It is therefore recommended that a specification be initiated by which proper control of these parts can be maintained.

5.0 PROCEDURES AND RESULTS

Six connectors were measured mechanically for the dimensions shown in Figure 1 and compared with dimensions on Methode drawing 141-1088-00.

5.0 PROCEDURES AND RESULTS (Continued)

Two sets of four contacts each, designated Q400 and Q413, were mounted and checked for hardness and plating thickness.

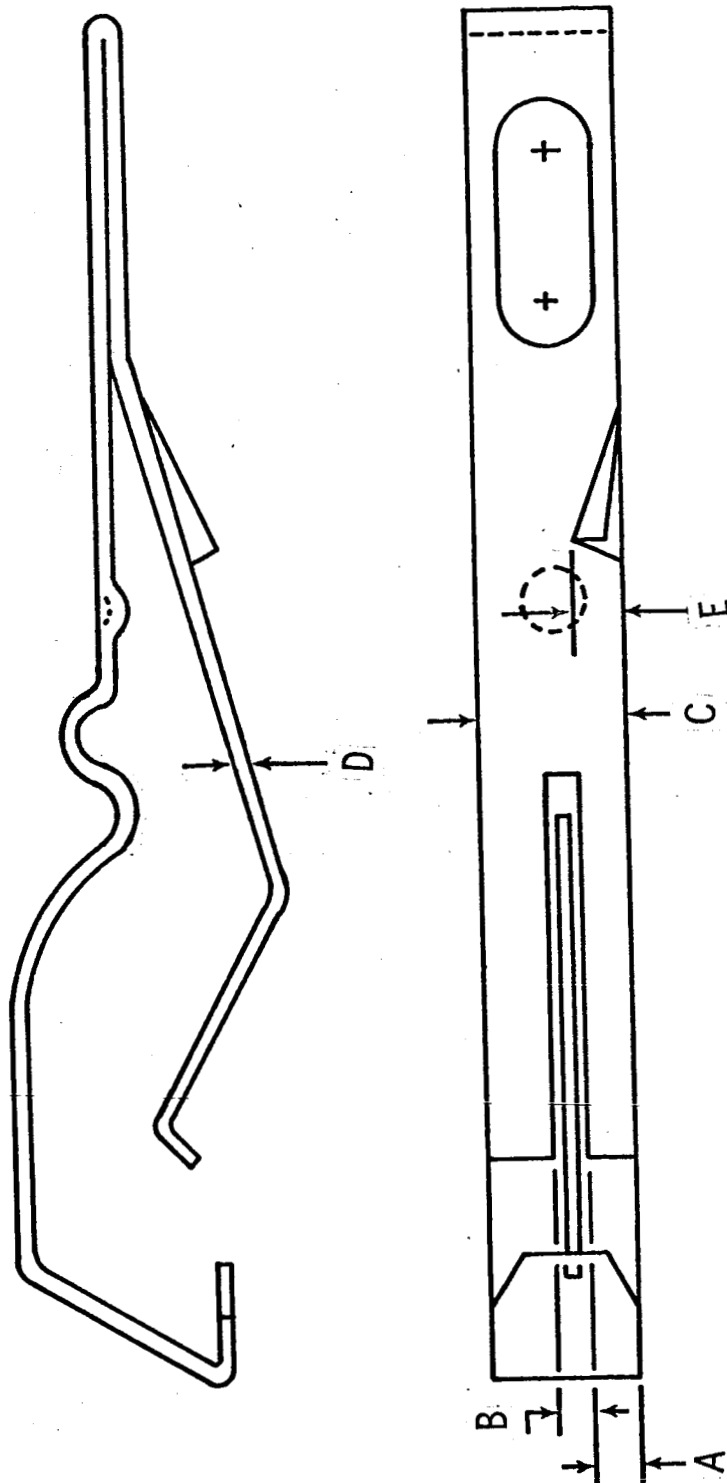
Spectrographic analysis was performed to determine base metal and plating materials.

The following summarizes the results of tests on contacts used in Methode FD744-3S-SF connectors:

- a. Dimensions - The dimensions of all test specimens were within tolerances specified on Methode contact drawing 141-1088-00. Dimensions verified are shown in Figure 1.
- b. DPH Hardness Survey - The 88 to 96 Rockwell B readings on the Q400 test specimens fall within the 1/4H to 1/2H range of QQ-C-533, Table II. The 34 to 38 Rockwell C readings on the Q413 test specimens fall within the hardness range for heat treated material as specified in Table IV of QQ-C-533.
- c. Plating Material and Thickness - The spectrographic and microscopic results showed the contact to be gold plated with an average thickness of 65 microinches and a silver flash underplate.
- d. Base Material Identification - The spectrographic analysis indicated that the base material is a beryllium copper alloy. (See Quality Assurance LSR 0243).
- e. Detail results are contained in Engineering Test Staff Progress Report TPR 237.

6.0 REFERENCES

- a. Engineering Test Staff progress Report TPR 237 Methode Dwg. 141-1088-00.
- b. MBC 455
- c. Quality Assurance LSR 0243.
- d. Methode Dwg. 41-1088-00



CONTACT DIMENSIONS CHECKED

FIGURE 1