CRANE® HYDRO-AIRE
A SUBSIDIARY OF CRANE CO.

SERVICE BULLETIN

BOEING DC-10 (SERIES 10, 30, AND 40), KC-10A, DC-10-30F (KDC-10), MD-10 (SERIES 10 AND 30), AND MD-11

Bulletin No. 60-847-28-2
ATA 28-22

FUEL BOOSTER PUMP — PUMPING UNIT — INSPECTION TO DETECT IMPROPER FUEL PUMP INTERNAL LEAD WIRE ROUTING

1. PLANNING INFORMATION

A. EFFECTIVITY

This Service Bulletin is applicable to the Hydro-Aire Fuel Booster Pump pumping units given below.

60-847-1A
60-847-2
60-847-3

B. CONCURRENT REQUIREMENTS

None.

C. REASON

Hydro-Aire has identified a potentially hazardous condition on the model pumps referenced above due to the improper routing of the lead wires connecting the pumping unit stator to the pump connector during assembly of the pumping unit. If a lead wire becomes caught under the bearing housing of the connector support during assembly, the wire may be forced into the gap between the stator end windings and the bearing support. The wire could become lodged in such a way as to contact the rotating assembly of the pump. This contact can cause the wire insulation to wear to the point of allowing an electrical short.

It has been determined through analysis and testing that wires that are properly routed upon assembly will not migrate into the cavity by forces as a result of in-service operation due to vibration or fluid flow through that area of the pump. One time inspection of stator lead wires for proper routing will eliminate the possibility of the wires chafing against the rotor.

D. DESCRIPTION

This Service Bulletin provides supplemental inspection instructions to ensure proper routing of the lead wires connecting the pumping unit stator to the pump connector. The procedures supplement procedures provided in the Component Maintenance Manual (CMM) referenced in paragraph 1.L.

E. COMPLIANCE

(1) For Spare Pumps In Inventory

Effective immediately, all pump part numbers referenced in paragraph 1.A that are assembled and not installed on aircraft are to be inspected in accordance with paragraph 2. The inspection will ensure that the lead wires are properly routed. This procedure is to be done before the pumps can be installed on any airplane.

(2) For Pumps Removed From Aircraft

Effective immediately, all pump part numbers referenced in paragraph 1.A that are removed from the aircraft are to be inspected in accordance with paragraph 2 to ensure that the lead wires are properly routed before being re-installed on an airplane.

(3) For Pumps Overhauled Or Disassembled In The Future

Effective immediately, all pump part numbers referenced in paragraph 1.A that are disassembled and re-assembled from the date of issue of this Service Bulletin and forward must be inspected per paragraph 2 to ensure that the lead wires are properly routed before being installed on an airplane.

(4) Rejected Units

A pump that does not meet the acceptance criteria specified in paragraph 2 must be disassembled and the lead wires must be examined for any evidence of damage or wear. If any damage or wear is present, the assembly must be reworked in accordance with CMM 28-22-03. After repair, the pump must be reinspected in accordance with paragraph 2 to ensure the lead wires are properly routed.

F. APPROVAL

This Service Bulletin has been reviewed by Boeing and the Federal Aviation Administration (FAA). The repairs and modifications herein comply with 14CFR25 and are on record at Boeing as FAA approved for installation on the Model DC-10 (Series 10, 30, and 40), KC-10A, DC-10-30F (KDC-10), MD-10 (Series 10 and 30) and MD-11 aircraft.

NOTE: FAA approval for installation of the modified equipment on a particular airplane is provided by FAA-approved Boeing Alert Service Bulletins DC10-28A239 and MD11-28A120.

G. MANPOWER REQUIREMENTS

Approximately 20 to 30 minutes are required to examine the lead wire routing.

H. MATERIAL - COST AND AVAILABILITY

The materials required to accomplish this Service Bulletin are given in CMM 28-22-03. Refer to paragraph 1.L.

I. TOOLING - COST AND AVAILABILITY

See Figure 4 for the suggested measurement tool.

J. WEIGHT AND BALANCE

Not affected.

K. ELECTRICAL LOAD DATA

Not affected.

L. REFERENCES

Hydro-Aire Component Maintenance Manual, ATA 28-22-03 for Fuel Booster Pump P/N 60-847-1A, -2, -3, Revision 4, dated Dec 15/01.

M. OTHER PUBLICATIONS AFFECTED

The improved assembly techniques, inspection, and identification given in this Service Bulletin will be incorporated into CMM 28-22-03.

2. ACCOMPLISHMENT INSTRUCTIONS

A. INSPECTION OF LEAD WIRES

NOTE: The pumping unit must be removed from the outer housing mounted in the aircraft fuel tank before inspection. Refer to the Aircraft Maintenance Manual (AMM) for pump removal instructions.

NOTE: Use strong light and magnification if necessary to aid the visual inspection.

(1) Visually check the stator lead wire routing through the four (4) slots in the connector support assembly as shown in Figure 1.

(2) The preferred routing will have the lead wires coiled and resting on top of the stator windings (some wires may be obscured by the outer edge of the connector support) and not protruding down into the cavity between the bearing housing on the connector support assembly and the stator end windings (See Figure 1). Pumps with the lead wires in this condition are acceptable.

(3) Pumps with a portion of the wires routed over the cavity and not protruding down into the cavity between the bearing housing on the connector support assembly and the stator end windings are acceptable (See Figure 1).

(4) On pumps with a wire or wires protruding down into the cavity (Figure 2), determine the extent to which the wire(s) protrude down into the cavity, as follows:

(a) If there are multiple wires in the cavity, the lower-most one must be visible and accessible for inspection. Use a non-metallic, non-wooden tool (because of the possibility of splintering) to gently move the upper wires so the lowest wire is exposed. Use care not to damage the wire insulation. IF THE WIRES ARE ROUTED SUCH THAT THEY CANNOT BE MOVED TO ALLOW ACCESS TO THE LOWEST WIRE IN THE CAVITY, THE ASSEMBLY MUST BE REJECTED AND THE LEAD WIRE ROUTING CORRECTED.

CAUTION: USE CARE NOT TO PUSH THE WIRE(S) FURTHER INTO THE CAVITY WITH THE MEASURING TOOL.

(b) Carefully use a non-metallic, non-wooden measuring tool similar to that shown in Figure 4 to verify that the lowest portion of the loop on the lowest wire does not protrude down into the cavity between the bearing housing on the connector support assembly and the stator end windings more than 0.825 inch (20.96 mm) maximum when measured from the surface of the retaining nut down to the top of the lead wire (see Figure 3). Any lead wire that protrudes down into the cavity less than 0.825 inch (20.96 mm) is acceptable.

(c) ANY LEADWIRE THAT PROTRUDES DOWN INTO THE CAVITY BETWEEN THE BEARING HOUSING ON THE CONNECTOR SUPPORT ASSEMBLY AND THE STATOR END WINDINGS MORE THAN 0.825 INCH (20.96 MM) WHEN MEASURED FROM THE SURFACE OF THE RETAINING NUT DOWN TO THE TOP OF THE LEADWIRE IS UNACCEPTABLE AND MUST BE REJECTED AND THE LEAD WIRE ROUTING CORRECTED.

(d) IF THE LOWEST POINT OF THE WIRE PROTRUDING DOWN INTO THE CAVITY CANNOT BE MEASURED, THE PUMP MUST BE REJECTED AND THE LEAD WIRE ROUTING CORRECTED.

(5) Visually inspect the visible lead wires (some wires may be obscured by the outer edge of the connector support) for evidence of arcing or other damage.

(6) If any lead wire protrudes down into the cavity below the limits allowed above or any damage is found, the pumping unit must be disassembled, repaired, and functionally tested in accordance with CMM 28-22-03. Removal and repositioning of the stator may be required to provide an adequate service loop for proper wire routing. The pump must be re-inspected in accordance with this Service Bulletin after repair.

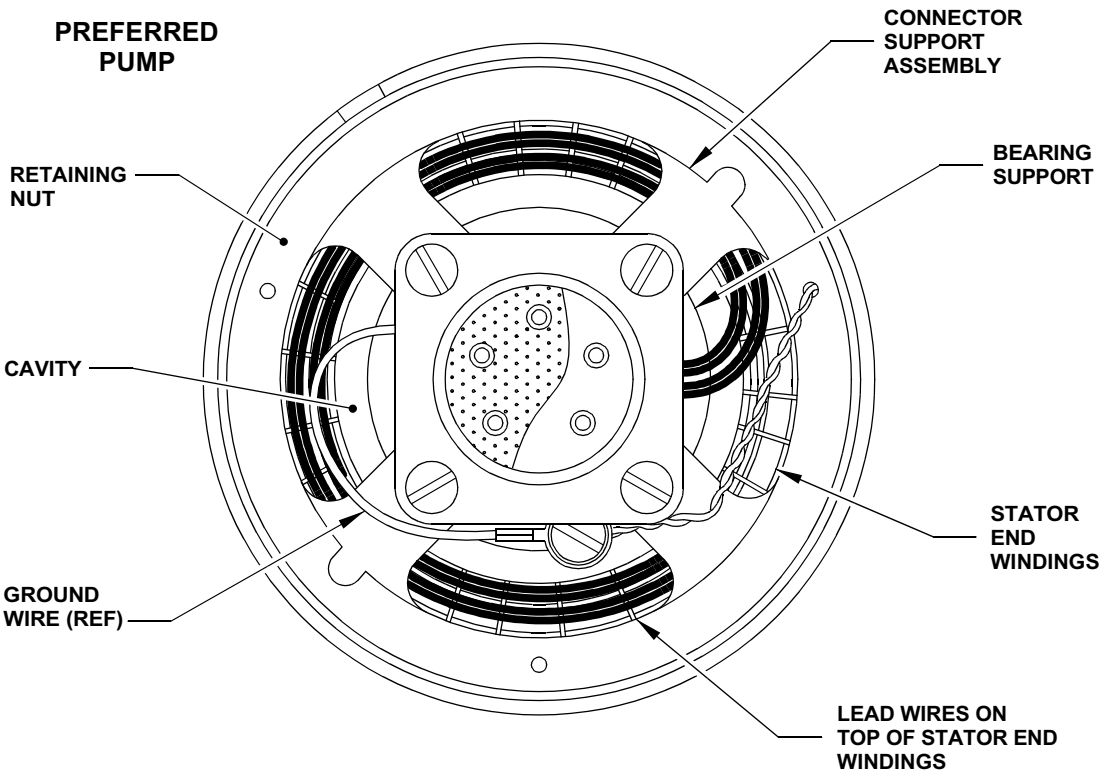
NOTE: If any chafing of the lead wire or arcing is present, Hydro-Aire requests that the hardware (preferably the assembled unit) be returned to Hydro-Aire for the purpose of examination by Boeing and Hydro-Aire.

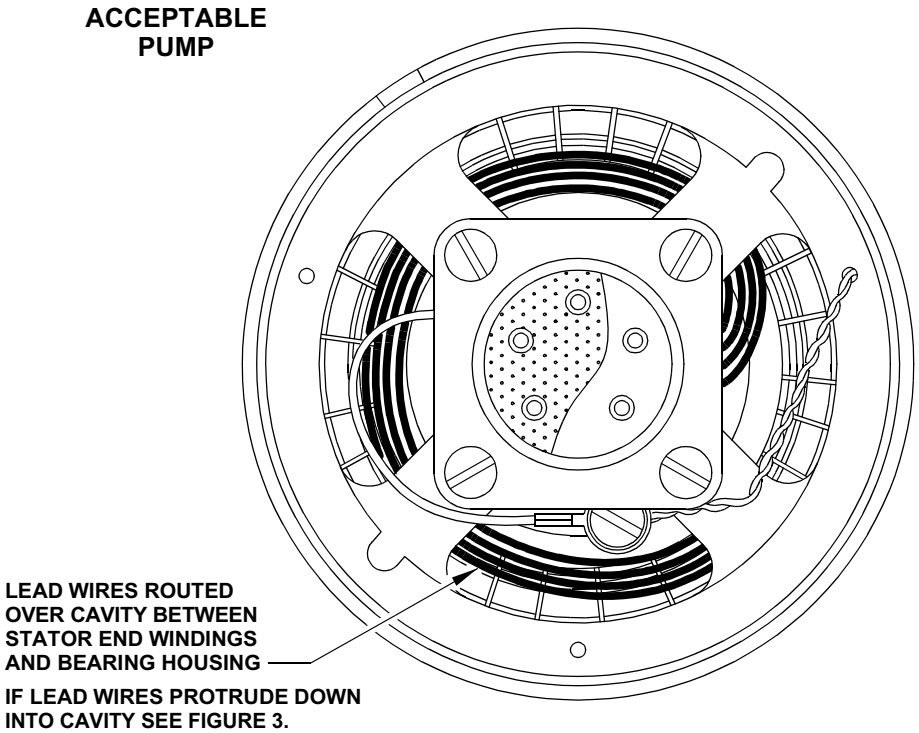
B. IDENTIFICATION

(1) Upon successful verification of the proper assembly of the motor-impeller assembly by inspection, identify the pumping unit as follows.

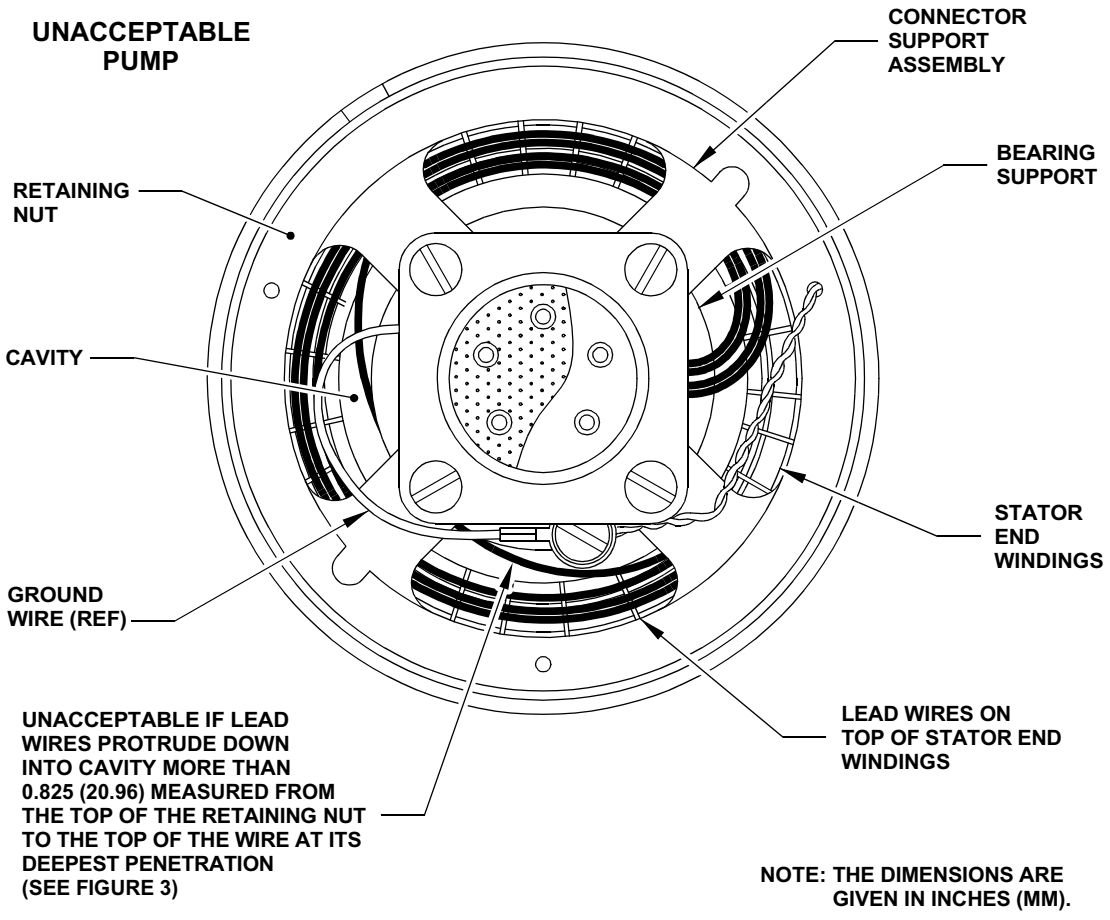
(2) Stamp the letter "T" on the pump handle as a suffix to the serial number adjacent to the serial number block. This can be done with an impression stamp, rubber stamp, or other legible and permanent method. If an impression stamp is used, take care to properly support the handle to prevent damage.

(3) Rubber stamp the letter "T" on the pump housing as a suffix to the serial number adjacent to the serial number using a legible and permanent method. DO NOT USE IMPRESSION STAMP ON THE PUMP HOUSING.

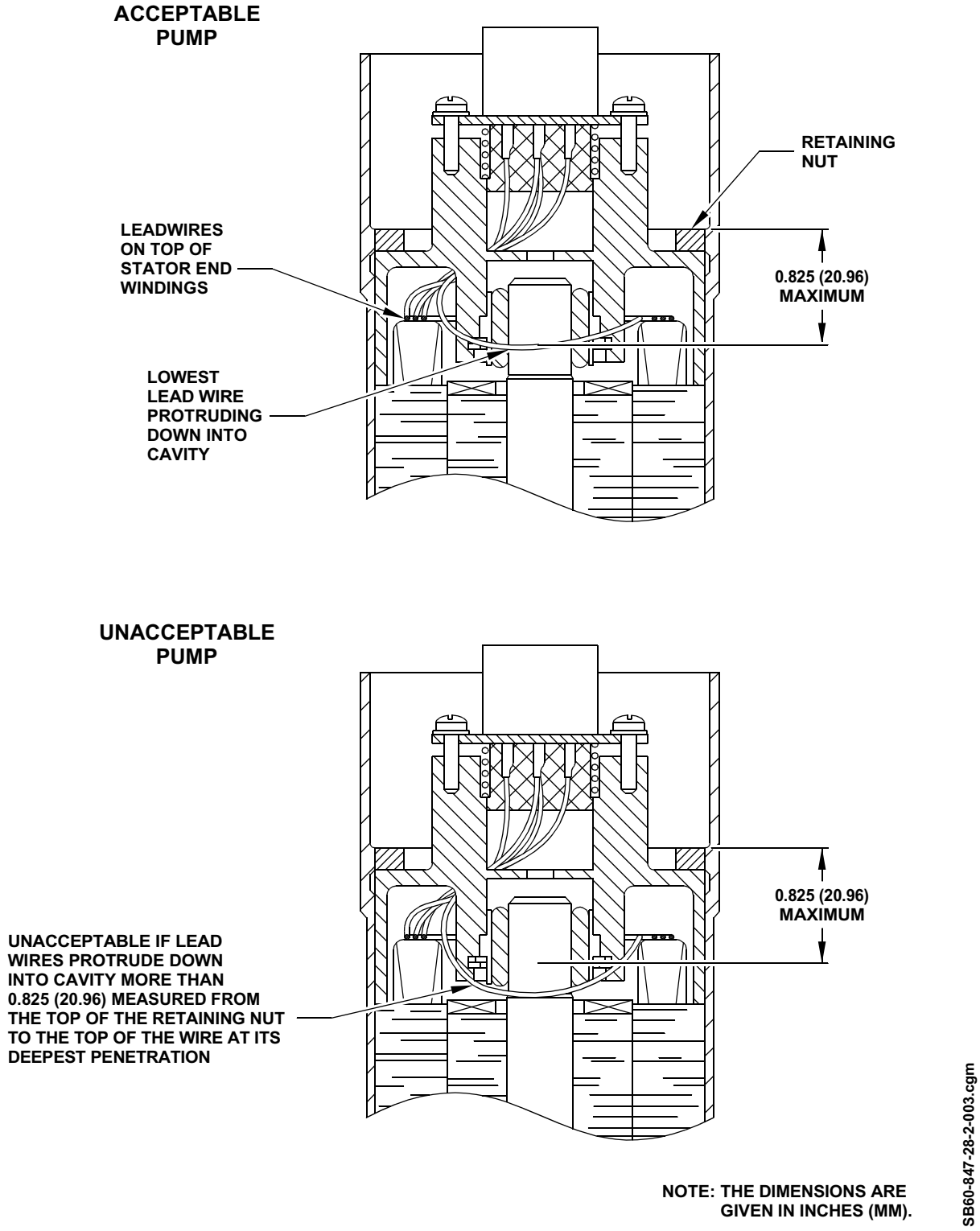




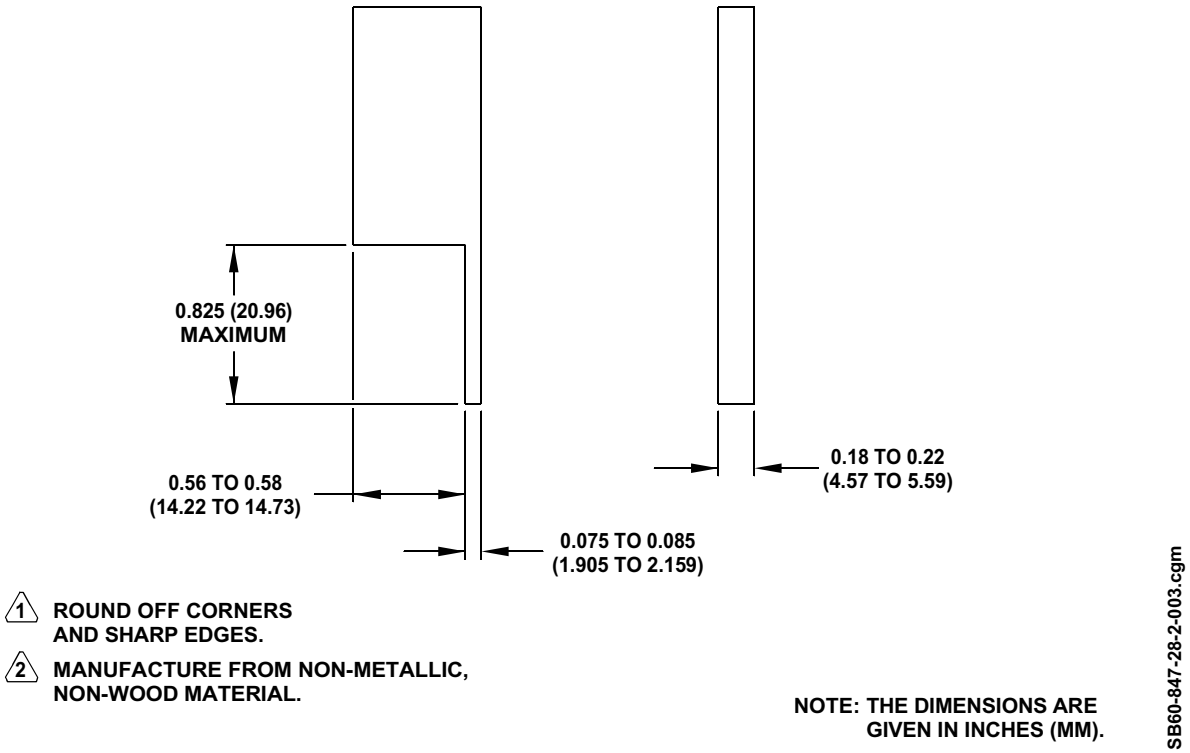
Acceptable Pumping Units
Figure 1



Unacceptable Pumping Unit
Figure 2



Measurement of Lead Wire Position
Figure 3



Measurement Tool
Figure 4

3. MATERIAL INFORMATION

A. COMPONENTS

None.

B. MATERIALS AND EQUIPMENT

None.

C. WARRANTY

NOTE: ANY CLAIMS UNDER THIS WARRANTY PROVISION MUST BE ACCOMPANIED BY THE PART NUMBER AND SERIAL NUMBER OF THE UNIT FOR ACCOUNTABILITY PURPOSES.

(1) For a period of 36 months from the date of issue of this Service Bulletin, Hydro-Aire will, for a one-time visual inspection of the pumping unit for units installed on aircraft, reimburse the operator for 2 hours labor at a rate of $55.00 US per hour for the removal and reinstallation of each pump to perform the inspection.

(2) If rejected units are found during the inspection, Hydro-Aire will perform any rework to properly route the wires, re-inspect, and retest free of charge. If the operator elects to perform the rework, Hydro-Aire will reimburse the operator for an additional 1.5 hours labor at a rate of $55.00 US per hour for the rework, re-inspect, and retest.

(3) Any additional incidental repairs or overhaul over and above those required to correct the wire routing will be separately quoted.

(4) For information regarding repairs, availability of spares, and warranty information please contact:

Hydro-Aire Repairs
Phone: 818-526-2400
FAX: 818-526-2284
E-mail: repairs@hydroaire.com