Beech Aircraft Corporation
Wichita, Kansas

SPEC. NO. BS 3898
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SPECIFICATION

BONDING AND SHIELDING ON THE COMMERCIAL MODEL 18, 35 AND 50 AND THE USAF L-23A AIRPLANES

CONTENTS

1. SCOPE

1.1 Purpose.- The purpose of this specification is to supplement the bonding and shielding instructions given on engineering drawings and to provide information for inspecting the completed airplanes for adequate bonding and shielding.

1.2 Purpose of Bonding and Shielding.- An airplane must be bonded to maintain good electrical conductivity between the component parts of the airplane. This bonding reduces the hazard to personnel by preventing metal parts of the airplane from being insulated from each other and possibly electrically charged with respect to each other. It reduces hazard to personnel and the airplane from lightning discharges. It also provides power return paths and helps to eliminate radio interference.

DATE ISSUE	DATE REVISED	WRITTEN	APPROVED	CHIEF DRAFTSMAN	CHIEF ENGINEER
4-19-51	4-2-53	SCHEGEC			

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2. APPLICABLE SPECIFICATIONS

2.1 None

3. REQUIREMENTS

3.1 Application of Bonds:

3.1.1 Remove any insulating coating where the bond is to be installed with Minnesota Mining 3M No. 600 grit, emery cloth or equivalent. Clean surfaces with P-S-661 solvent after emery cloth has been used. Except for bonds applied to normally bare surfaces, refinish the area surrounding the bond with primer and/or other finish in accordance with the finish specification applicable to the model.

3.1.2 Install bonding connections so vibration, expansion or contraction, or relative movement incident to normal service use will not break or loosen the bonding connection.

3.1.3 Install bonding clamps on flexible metallic conduit or hose so it will not crimp or damage the conduit or hose.

4. INSPECTION

4.1 General.- The resistance of bonding shall be measured on the first airplane in such a manner as to determine that the bonding meets the requirements of this specification. Thereafter one aircraft in each group of twenty-five shall be tested. Visual inspection shall be conducted on all other aircraft to determine that no change in methods or material has been made that would affect conformance with this specification.

4.2 Allowable Resistance Values.- The maximum over-all resistance values allowable as measured across the bond from the object to the basic structure are specified in Table I below. For the purpose of this specification the wings, fuselage, and fixed empennage are considered basic structure. Since the flaps, ailerons, and elevators of the Model 18

4.2 Allowable Resistance Values.- (Continued)

are fabric covered, resistance measurements should be made from the basic structure to the metal identification tags installed on those surfaces.

Table I, Index Of Objects To Be Grounded And Applicable Requirements

Objects to be Grounded	Resistance Values
1. Ailerons	.0025 ohm - from aileron
2. Conduit (electrical) (metallic)	1.0 ohm - or less conduit to basic structure
3. Control cables and rods	.01 ohm - from cables and rods to basic structure
A. To aileron	
B. To elevator	
C. To rudder	
D. To flaps	
4. Cowling (nacelle)	.004 ohm - cowling to basic structure
5. Doors (and inspection plates)	500,000 ohms - from doors and inspection places through hinges, locking, latching, or fastening mechanisms to basic structure
6. Elevators	.0025 ohm - from elevator to basic structure
7. All equipment items such as electric motors, lamp assemblies, heaters etc.	.0025 ohm - from equipment mounts to basic structure

4.2 Allowable Resistance Values.- (Continued)

Objects to be Grounded		Resistance Values
8.	Engine shock mounts	.001 ohm - from mounts to basic structure
9.	Flaps	.0025 ohm - from flaps to basic structure
10.	Instrument boards	.01 ohm - to basic structure
11.	Landing gears	.01 ohm - from gear to basic structure
12.	Lines	
	A. Anti-icer fluid	500,000 ohms to basic structure
	B. Metallic fittings and couplings in metallic fuel lines	500,000 ohms from metallic fittings and couplings to basic structure
	C. Metallic fittings and couplings in nonmetallic fuel lines NOTE: 500,000 ohms = 1/2 megohm	500,000 ohms to basic structure
13.	Radio racks, brackets and shelves	.0025 ohm - equipment mounting plate to basic structure
14.	Radiators	.0025 ohm - to basic structure
15.	Rudders	.0025 ohm - from rudder to basic structure
16.	Tabs	.01 ohm - to basic structure

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4.2 Allowable Resistance Values.- (Continued)

Objects to be Grounded		Resistance Values
17. Tanks		
A.	Gas - metal and rubber tank fittings	.0025 ohm - to basic structure
B.	Oil	.01 ohm - from tank to basic structure
C.	Anti-icer fluid	.01 ohm - from tank to basic structure
D.	Receptacle installation - fuel nozzle and 10439 resistance value	.0025 ohm to basic structure

Approved:

USAF Quality Control

DATE ISSUE	DATE REVISED	WRITTEN	APPROVED	CHIEF DRAFTSMAN	CHIEF ENGINEER
4-13-51	4-2-53	SCHERER			

FORM 5-28