1. SCOPE

1.1 Purpose.- The purpose of this specification is to authorize the use of reconditioned parts and provide reconditioning instructions for components of the 84-189678 and 804-189678 deicing system installations, the I180481 wing deicing boot installation, and the I180482 stabilizer deicing boot installation as installed in T-7, T-7C, UC-45B, C-45F, and T-11 aircraft and instructions for modifications necessary to adapt them for installation in C-45G and C-45H aircraft in accordance with Drawing 694-189678 deicing system installation, Drawing I180481 wing deicing boot installation, and Drawing I180482 stabilizer deicing boot installation.

1.2 Application.- All reconditioning operations and repairs covered by this specification may be accomplished where required without further authorization. Repairs not authorized by this specification cannot be performed without further authorization.

1.3 List of Pages and Revisions.- This specification consists of the pages listed below. An asterisk (*) denotes pages revised by the current revision.

Page	Date	Description of Revision	Serial Effectivity
1	5-19-53		
2	5-19-53		
3	5-19-53		
4	5-19-53		
5	5-19-53		
6	5-19-53		
7	5-19-53		
8	5-19-53		
9	5-19-53		
10	5-19-53		
11	5-19-53		
12	5-19-53		
13	5-19-53		

APPROVED:

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WRITTEN BY L. M. Taquet	DATE ISSUED 5-19-53	OVERHAUL SPECIFICATION DEICING SYSTEM - MODEL C-45G AND C-45H		
PROJECT ENGINEER				
APPROVAL	DATE REVISED	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO. 5711	PAGE 1
APPROVAL				

E-3188A

2. APPLICABLE PUBLICATIONS

2.1 Military.-

MIL-B-7883	Brazing of Steels, Copper, Copper Alloys, and Nickel Alloys

2.2 Air Force - Navy.-

AND 10375	Color Coding

2.3 Federal.-

QQ-P-416	Cadmium Plating

2.4 Beech.-

FS 370A	Finish Specification for Model C-45G and C-45H Aircraft
OS 7002	Cleaning Procedures for Reconditioned Aircraft
OS 7003	Air Frame and Control Antifriction Bearings
OS 7008	General Acceptable Quality Standards
OS 7010	Removing Corrosion from Aluminum Parts

2.5 Technical Orders.- Compliance with this specification constitutes compliance with the technical orders listed below.

03-1-6	Aircraft Accessory Equipment, Chapter 51, Part C, dated December 26, 1947

3. REQUIREMENTS

3.1 Parts Involved:

3.1.1 Parts Not Used:

3.1.1.1 Deicing System Installations 84-189678 and 804-189678.- All parts called out on Drawings 84-189678 and 804-189678 deicing system installation will be disposed of at the direction of the customer except the parts listed in Paragraph 3.1.2 of this specification.

3.1.1.2 Wing Deicing Boot Installation I180481 and Stabilizer Deicing Boot Installation I180482.- None of the parts called out on Drawings I180481 wing deicing boot installation and I180482 stabilizer deicing boot installation will be re-used on the C-45G or C-45H. They will be disposed of at the direction of the customer.

3.1.2 Parts to be Reconditioned.- The following parts are to be reconditioned in accordance with the instructions contained herein. "Reconditioned" means the disassembly, cleaning, inspection, and correction of discrepancies, repair and/or replacement of components, and modifications to incorporate changes in accordance with applicable engineering drawings to assure an operationally safe and serviceable aircraft.

3.1.2.1 Deicing System Installations 84-189678 and 804-189678.-

84-189576	Tube assembly
84-189577	Tube assembly
84-189578	Tube assembly
84-189579	Tube assembly
84-189594	Tube assembly
84-189595	Tube assembly
84-189596	Tube assembly
84-189597	Tube assembly
900-189717	Tube assembly
900-189718	Tube assembly
900-189719	Tube assembly
189419	Tube assembly
189477	Tube assembly
189476	Tube assembly
189475	Tube assembly
189474	Tube assembly

3.1.2.1 Deicing System Installations 84-189678 and 804-189678.- (Continued)

189464	Tube assembly
189465	Tube assembly
189466	Tube assembly
189467	Tube assembly
189469	Tube assembly
189470	Tube assembly
189471	Tube assembly
189472	Tube assembly
189473	Tube assembly
189478	Tube assembly
189415	Tube assembly
189416	Tube assembly
189417	Tube assembly
189418	Tube assembly
189420	Tube assembly
189421	Tube
189422	Tube assembly
189423	Tube assembly
189424	Tube assembly
189447	Tube assembly
189414	Tube assembly
189428	Tube assembly
189429	Tube assembly
189431	Tube assembly
84-189569	Tube
I189678	Bracket
84-189598	Support
84-189677	Block
181763-1	Clamp
181763-2	Clamp

3.1.2.1 Deicing System Installations 84-189678 and 804-189678.- (Continued)

I189668	Clamp
181762	Channel
84-189570	Angle
84-189571	Angle
I189662	Brace
I189679	Gusset
I189692	Gusset
I189684	Bracket
I189693	Bracket
I189697	Bracket
I189698	Plate
I189673	Nipple
I189666	Plug assembly
94-189682	Valve Assembly
Type 558	Model 1A oil separator
I189669	Deicing valve control assembly
AAF 811-FT-10	Nipple
AAF 811-FT-4	Nipple
AAF 811-CT-10	Elbow
AAF 811-CT-45°10	Elbow
AAF 811-T-10CS	Sleeve
AAF 811-ET-10D	Elbow
AAF 811-CT-10D	Elbow
AAF 811-RT-10D	Tee
AAF 811-JT-10D	Tee
AAF 811-HT-10D	Union
AAF 811-BT-10D	Nut

3.1.3 Parts to be Supplied New:

3.1.3.1 Deicing System Installation 694-189678.- All parts called out on Drawing 694-189678 deicing system installation are to be supplied new except the parts listed in Paragraph 3.1.2 of this specification.

3.1.3.2 Wing Deicing Boot Installation I180481 and Stabilizer Deicing Boot Installation I180482.- All parts called out on Drawing I180481 wing deicing boot installation and Drawing I180482 stabilizer deicing boot installation are to be supplied new.

3.2 Cause for Rejection.- Damage or wear that cannot be corrected by one or more of the authorized repairs listed in Paragraph 3.4 of this specification and the specific conditions listed below are cause for rejection.

(a) Tubing will be rejected if dented so that the inside tube diameter is less than 90 percent of the original inside diameter.

(b) Reject tubing that is scratched to a depth that exceeds 10 percent of the wall thickness of the tube.

(c) Reject tubing with scratched, cracked, or bent flared ends.

(d) Reject tubing with stripped or nonuseable threads in the end fittings.

3.3 Reconditioning Operations:

3.3.1 Deicing System Installation 84-189678 and 804-189678:

3.3.1.1 All Tubing Listed in Paragraph 3.1.2.1 of this Specification.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Finish when required in accordance with FS 370A.

(d) Replace color code markings in accordance with AND 10375.

3.3.1.2 Bracket 1189678, Support 84-189598, and Block 84-189677.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002. Care must be taken to keep these parts in matched sets.

3.3.1.3 Clamps 181763-1, 181763-2, and 1189668.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Strip and cadmium plate in accordance with Specification QQ-P-416.

3.3.1.4 Channel 181762; Angles 84-189570 and 84-189571; Brace 1189662; Gussets 1189679 and 1189692; Brackets 1189684, 1189695, and 1189697; Plate 1189698; and Nipple 1189673.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Remove corrosion in accordance with OS 7010.

(d) Finish in accordance with FS 370A.

3.3.1.5 Valve Assembly 94-189682.-

(a) Inspect for nonrepairable conditions.

(b) Clean before disassembly in accordance with OS 7002.

(c) Remove the 1189711 control arm. Strip and cadmium plate in accordance with Specification QQ-P-416.

(d) Silver solder the existing taper pin hole in the control shaft in accordance with MIL-B-7883 using silver solder conforming to Specification QQ-S-561, Class 4.

(e) Disassemble. Clean and inspect all parts. Refer to Table 1 of this specification for tolerance chart. Clean the parts of the electrical system with trichlorethylene and dry with compressed air. Do not soak parts such as the motor armature and field windings in the solution. Clean the inside of the valve assembly and all metal parts in accordance with OS 7002.

Inspect the armature of the motor visually for damage to the windings. Check the commutator for wear and pitting. The minimum allowable worn diameter for the commutator is 55/64 inch. Repair the armature as necessary as authorized herein.

3.3.1.5 Valve Assembly 94-189682.- (Continued)

Inspect the bearing surfaces of the armature shaft for excessive wear or damage. Check the shaft for alignment and straighten in accordance with shop practice to within .0005 inch full indicator reading. Check the condition of the worm gear on the armature shaft.

Ground test the armature using a 110-volt test lamp circuit. Connect one terminal of the test lamp circuit to the armature shaft and the other side to the commutator. If the lamp lights, the armature is grounded and must be replaced. Give the armature a bar-to-bar continuity test using an ohmmeter. Take comparative resistances around the commutator. A high resistance would indicate an open coil and a low resistance would indicate the coil was shorted.

Check the condition of the motor housing. Replace the housing if cracked or broken. Check the field coil windings for condition of varnish and lead in wires. Ground test the field coil windings using a test lamp circuit. Connect one side of the test lamp circuit to the lead-in wire and the other side to the motor housing. If the lamp lights, the coil is grounded. Check for open field coils by connecting the test lamp circuit across the two outlet leads. If the lamp fails to light, the field is open and should be replaced. If it is necessary to replace the field coils, the complete assembly of motor shell and field coils should be replaced.

The minimum permissible brush length is 13/32 inch. Brushes should be replaced before their maximum wear limit is reached in order to assure satisfactory operation until the next inspection period.

Worms and worm wheels in the gear box should be replaced if worn to the extent that the edges of the teeth are sharp.

Check the switch contact boards. Replace these parts if the Bakelite is burned or charred or if the inserts molded into the assembly are loose. The rivets which hold the switch contacts to the board should be tight.

Recondition the ball bearings in accordance with OS 7003. Lubricate all gear teeth, valves, and valve bore with a light film of oil conforming to Specification MIL-L-7870.

(f) Reassemble the unit, installing new gaskets, oil seals, grommets and electric wire. The following should be noted:

3.3.1.5 Valve Assembly 94-189682.- (Continued)

When assembling the brush boxes use an aligning bar made from a straight piece of metal .246 by .122 by 8 inches long. Insert the bar through both boxes before tightening the set screws. After tightening the set screws, make sure the brush boxes are held securely.

Ball bearings should be assembled so that the sealed side will be adjacent to the armature.

When assembling the oil seal which goes in the gear housing, an aligning bar made from a round bar .270 in diameter should be used to be sure that the oil seal is in the center of the bearing bore before tightening the retainer plate screws. These retainer plate screws should be staked in after tightening.

The worm wheels are fixed on their shafts by two set screws. The one which has the straight unthreaded end should be assembled into the hole in the shaft which is not countersunk. The cone-point set screw should then be tightened into the countersunk hole in the worm shaft. The worm gear set screws should be staked after tightening. The thrust adjusting screws should be set so that the Bakelite worm gear engages with the armature shaft. Bring both screws up tight against the shaft then loosen one screw 1/6 to 1/4 of a turn. This will provide sufficient end play to operate the unit before the final setting of the adjustment screws when the unit is tested.

Use care when assembling the armature in order to prevent injury to the oil seal. The spacer which is assembled on the commutator end of the armature shaft is easily confused with the thrust washers used on either side of the brass worm gear. The spacer used on the armature shaft is .057 thick while the washers used on the brass worm gear are .0625 thick.

Press the field leads to the brush boxes as close to the motor shell as possible to prevent the armature from rubbing them.

Before assembling the valve housing to the motor and gears assembly, connect the motor to a 24-volt battery with an ammeter and switch in series. Rotation of the valve driving shaft should be clockwise for an observer looking at the valve end of the gear housing. An .020 shim washer should be assembled on the brass worm wheel shaft between the thrust washer and the bearing and plate assembly which supports the end of the shaft, if necessary. Assemble the shim and bearing and plate assembly on the shaft. Press the bearing plate against the housing and rotate it. If the bottom of the bearing plate does not touch the housing all around, the .020 shim is not necessary.

3.3.1.5 Valve Assembly 94-189682,- (Continued)

Back out the thrust adjusting screw which is farthest from the exterior lead spout, two or three turns. With the motor running, adjust the thrust adjusting screw closest to the exterior lead spout so that the current used by the motor as indicated by the ammeter is a minimum.

After the thrust adjusting screws have been set so that the motor draws minimum current, tighten their locking nuts and check to see that the motor current remains the same. With the motor not running, tighten the adjusting screw which was backed off during the adjusting procedure described above until it comes in contact with the worm shaft. Then back the screw out 1/6 to 1/4 of a turn (60 to 90 degress) and tighten the locking nut.

Before assembling the switch cover, check the switch rotation. The switch contacts should be closed when the operating shaft is rotated clockwise and open when operated counter-clockwise.

(g) Functional test the unit to assure that no leakage exists in the valve assembly. The unit should be operated under simulated conditions for 30 minutes using an air pressure of 7-1/2 psi. Check the motor for over-heating and the valve for sticking. With the operating shaft rotated to the "off" position, air should come out the port marked "off outlet". With the switch in the "on" position, air should be distributed to the five deicing ports in the sequence 1, 2, 3, 4, 5. A complete cycle of distribution should take 35 to 45 seconds. Maximum current draw for the units should be less than 2 amperes.

(h) Redrill the taper pin hole for the control arm and install the arm in accordance with Drawing 94-189682.

(i) Finish the unit in accordance with FS 370A.

3.3.1.6 Oil Separator Type 558, Model 1A.-

(a) Inspect for nonrepairable conditions.

(b) Disassemble and clean all parts thoroughly in accordance with OS 7002.

(c) Check the relief valve parts for wear or damage. Lap the valve to the valve seat, using a fine lapping compound, to obtain proper seating. Check the valve spring and replace if the free length is less than 29/32 inch.

3.3.1.6 Oil Separator Type 558, Model 1A.- (Continued)

(d) Reassemble the unit. Install a new housing gasket. The relief valve adjusting screw should be assembled in the extreme outward position.

(e) Test the unit and adjust the pressure regulator to maintain an operating pressure of 7-1/2 psi.

(f) Finish in accordance with FS 370A.

3.3.1.7 Deicing Valve Control Assembly 1189669.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Repair as necessary as authorized herein.

3.3.1.8 Plug Assembly 1189666; Nipples AAF 811-FT-10 and AAF 811-FT-4; Elbows AAF 811-CT-10, AAF 811-CT-45°-10, AAF 811-ET-10D, and AAF 811-CT-10D; Sleeve AAF 811-T-10CS; Tees AAF 811-RT-10D and AAF 811-JT-10D; Union AAF 811-HT-10D; and Nut AAF 811-BT-10D.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

3.4 Authorized Repairs:

3.4.1 Deicing System Installations 84-189678 and 804189678:

3.4.1.1 Valve Assembly 94-189682.-

(a) When the armature of the motor is not oil free after cleaning in trichlorethylene, it shall be baked for 3 hours at 93° C (200° F).

(b) If the commutator bars are worn or pitted to an extent requiring resurfacing, turn the outside diameter of the commutator on a lathe until all brush pits are removed. If it is found necessary to turn the commutator beyond the recommended minimum diameter of 55/64 inch to remove pits and damage, the armature

3.4.1.1 Valve Assembly 94-189682.- (Continued)

will be replaced. After turning the commutator, undercut the mica to the recommended minimum depth of 1/64 inch and clean and burr the slots to eliminate any possibility of short circuits.

If the commutator is not worn or damaged too much, polishing with fine sandpaper is sufficient. Do not give the commutator a high polish as this produces a very high contact voltage drop. Blow off with compressed air to remove all sand and metal particles.

(c) Chase all threads that are slightly damaged.

3.4.1.2 Deicing Valve Control Assembly 1189669.-

(a) Chase threads that are slightly damaged.

4. INSPECTION

4.1 General.- The parts will be inspected to the general acceptable quality standards of OS 7008.

TABLE 1

Part Name	Allowable Diameter Minimum	Maximum	Clearance with Mating Part
Ball Bearing - Outside Diameter	.9445	.9449	.0000L - .0007L
Ball Bearing - Inside Diameter	.2753	.2756	.0002T - .0004L
Motor Housing - Bearing Bore - Inside Diameter	.9449	.9452	.0000L - .0007L
Armature Shaft - Outside Diameter	.2752	.2755	.0002T - .0004L
Worm Shafts - Outside Diameter	.3115	.3120	.0010L - .0020L
Worm Shaft Bearings - Inside Diameter	.3130	.3135	.0010L - .0020L
Gear Housing - Bearing Bore - Inside Diameter	.9449	.9452	.0000L - .0007L
Switch Operating Shaft - Outside Diameter	.3090	.3120	.002L - .007L
Switch Operating Shaft Bearing - Inside Diameter	.3140	.3160	.002L - .007L
Distributor Valve - Outside Diameter	1.4350	1.4360	.0015L - .0035L
Distributor Valve Liner - Inside Diameter	1.4375	1.4385	.0015L - .0035L
Four-way Valve - Outside Diameter	1.7470	1.7475	.0025L - .0040L
Four-way Valve - Housing - Inside Diameter	1.7500	1.7510	.0020L - .0040L