1. SCOPE

1.1 Purpose.- The purpose of this specification is to authorize the use of reconditioned parts and provide reconditioning instructions for component parts of the wing flap mechanism assemblies 187830 and 84-187750 and instructions for modifications required to adapt them for installation in C-45G, C-45H, and SNB-5 aircraft in accordance with Drawings 187830, 187830-1, or 404-187830 as applicable.

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*	7-17-53	Incorporate SNB-5	Record change
2*	7-17-53	Incorporate SNB-5	Record change
3*	7-17-53	Incorporate SNB-5	Record change
4*	7-17-53	Incorporate SNB-5	Record change
5*	7-17-53	Incorporate SNB-5	Record change
6*	7-17-53	Incorporate SNB-5	Record change
7*	7-17-53	Incorporate SNB-5	Record change
8*	7-17-53	Incorporate SNB-5	Record change
9*	7-17-53	Incorporate SNB-5	Record change
10*	7-17-53	Incorporate SNB-5	Record change
11*	7-17-53	Incorporate SNB-5	Record change

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PROJECT ENGINEER	3-13-53	FLAP MOTOR AND MECHANISM ASSEMBLIES - MODEL C-45G, C-45H, AND SNB-5		
APPROVAL	DATE REVISED 7-17-53	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO. 1611	PAGE 1
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1-2004A

2. APPLICABLE PUBLICATIONS

2.1 Federal.-

QQ-P-416

2.2 Beech.-

FS 302	Finish Specification for Overhauled Navy SNB/JRB Airplanes
FS 370	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

2.3 Technical Orders.- Compliance with this specification constitutes compliance with the technical order listed below.

03-5CC-6	Fractional Horsepower Electric Motors (Dumore) dated March 9, 1948

3. REQUIREMENTS

3.1 Parts Involved:

3.1.1 Parts Not Used.- The parts listed under the sub-headings below will not be re-used and will be disposed of at the direction of the customer.

3.1.1.1 Mechanism Assembly 84-187750.-

187754	Arm
2195DP	Shafts bearing

3.1.1.1.1 Motor Assembly 84-187790.-

187752-1	Universal
187797	Universal
187794	Shaft

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 Mechanism Assembly 84-187750.-

84-187790	Motor assembly
187752-2	Universal
187789	Guard
187812	Arm assembly
187751	Shaft
187755	Stop
187779-3	Guard

3.1.2.2 Mechanism Assembly 187830.-

187090	Clutch and motor assembly
187752-2	Universal
AN201-K12A	Bearing
187825	Shaft
187812	Arm assembly
187755	Stop
187779-3	Guard
187789	Guard

3.1.3 Parts to be Supplied New:

3.1.3.1 Mechanism Assembly 84-187750.-

AN201-K12A	Bearing
*187812	Arm assembly

*This part to replace 187754 arm listed in Paragraph 3.1.1.1 of this specification.

3.1.3.1.1 Motor Assembly 84-187790.-

404-187825	Shaft
187809	Universal
187797	Universal

3.2 Cause for Rejection.- Damage or wear which cannot be corrected by one or more of the authorized repairs listed in Paragraph 3.4 of this specification is cause for rejection.

3.3 Reconditioning Operations:

3.3.1 Mechanism Assembly 84-187750.- Recondition and modify this assembly to conform to Drawing 404-187830 in accordance with Paragraphs 3.3.1.1 through 3.3.1.4 of this specification.

3.3.1.1 Motor Assembly 84-187790.- Modify this assembly to conform to Drawing 404-187835 as indicated in Paragraph (d) below.

(a) Clean all parts except the motor in accordance with OS 7002.

(b) Finish housing and 187793 cover in accordance with FS 370 or FS 302 as applicable.

(c) Recondition bearings in accordance with OS 7003.

(d) Modify this assembly to conform to Drawing 404-187835 by installing a 404-187825 shaft, 187809 universal, and 187797 universal in place of the old 187794 shaft and 187809 and 187797 universals.

(e) Recondition and test 804-182626 motor as follows:

Clean the armature by washing thoroughly in a solution of trichlorethylene. Dipping and stiff brushing is usually sufficient. Do not soak the armature in the solution. Dry with compressed air.

Inspect the armature assembly for condition of shaft, tie string, varnish, commutator, etc. Repair as necessary as authorized herein.

Ground test the armature by connecting one side of a test lamp circuit to the armature core and the other side to the commutator bars. If the test lamp lights, the armature is grounded and must be replaced. The metal slugs found in the armature slots on some armatures should not be removed since they have been installed to obtain the correct static and dynamic balance.

3.3.1.1 Motor Assembly 84-187790.- (Continued)

(e) (Continued)

Give the commutator a continuity test from bar to bar using an ammeter and test points. If there is appreciable difference in ammeter readings and if inspection shows the armature is not shorted across , a high reading would indicate a short circuit and a low reading would indicate an open circuit. The test may also be made by measuring the actual resistance between adjacent commutator segments, a low resistance indicating a shorted circuit and a high resistance indicating an open circuit.

Inspect the threaded sections, shoulders, and key slot for cleanliness and damage or wear. Inspect the shaft for alignment and straighten before assembly according to standard practice to within .0005 inch.

Inspect the field assembly for condition of leads, varnish, and lead clips or terminals. Measure the resistance of the field windings and compare them with the values shown in Table 1. Any appreciable deviation from the values shown in the table indicates the necessity for field assembly replacement. Inspect all soldered connections and resolder if an apparent high resistance joint or loose connection is indicated.

Ground test the field by connecting one side of a test lamp circuit to one field lead and touching the field core with the other side of the lamp circuit. If the lamp lights the fault should be corrected or the field replaced.

Inspect the brush assembly and repair as necessary as authorized herein. Make certain that the brush holder has not been cracked or chipped in any manner. Inspect the inside of the brush sleeve and make sure that the surfaces are smooth and that there are no burrs which might prevent the brush from sliding freely in the holder. When the brush holder is assembled, make certain that it is in the correct position so that the brush rides the commutator properly. Clearance between the commutator and brush sleeve should be from 1/32 to 1/16 inch. The correct initial length of brushes and minimum length for replacement is indicated in Table 1.

When brushes are removed, wipe them clean with a dry cloth, and when replaced, assemble in the same brush holder and in the same relation to the brush holder as before so the brush seat will not be changed. The brush pressure is not adjustable. The brush spring has been designed to give proper

3.3.1.1 Motor Assembly 84-187790.- (Continued)

(e) (Continued)

pressure and is sufficient for the life of the brush. (If the brush spring appears to have lost its resiliency, it may have become annealed in operation, and the brush assembly should be replaced.)

Replace all wire leads with cracks in insulation and make certain that abrupt bends which might rupture the insulation are avoided.

Inspect bearings and recondition in accordance with OS 7003.

Reassemble motor and test as follows:

Spin the armature shaft by hand to make sure it is free.

Run the motor with the correct voltage, as indicated on the name plate, under no-load conditions for ten minutes to seat the brushes. If the motor does not come up to rated no-load speed, lightly tap the ends of the housing with a fiber mallet to line up the housing fit. This should result in proper armature speed if the fault was due to slight misalignment of the motor housing. The no-load speed should not be more than 10 percent below the rated value. Test to see that the direction of rotation is correct for the indicated connections.

Make sure that the commutator does not show excessive sparking. The brushes should ride in the proper position on the commutator. The commutator stoning cap orifice allows an inspection of the commutator on motors equipped with a stoning cap. Motors equipped with a stoning cap should have the commutator stoned lightly if speed is below 12,000 rpm under no-load conditions or if the brushes spark excessively.

Ground test the electrical circuit of the motor using a 500 volt (RMS) 60 cycle source.

After the motor has been tested and found to be in proper operating condition, the brush plug will be safety wired as follows: Drill two 45° holes through each brush holder assembly, one hole at each end of slot in fiber brush plug, using a No. 52 to 60 drill. Thread a 2-1/2-inch piece of safety wire through the hole from outside of the brush holder. Wrap the long end around the brush holder and twist the ends of the safety wire together. Cut off, leaving 1/4-inch to be positioned around the brush holder.

3.3.1.1 Motor Assembly 84-187790.- (Continued)

(e) (Continued)

Motors with stud type screws shall have the screw heads staked by using a piece of metal or screw driver the thickness of the slot in the screws and the approximate width of the screw head. Place this in the screw slot so that a portion of the blade protrudes beyond the edge of the screw head onto the surface of the plain end housing. Strike the tool sharply, bending the housing metal into the screw slot.

(f) Reassemble motor and mechanism in accordance with Drawing 404-187835.

3.3.1.2 Universal 187752-2.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Pack with grease conforming to Specification MIL-G-3278.

3.3.1.3 Guards 187789 and 187779-3 and Arm Assembly 187812.-

(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 Shaft 187751.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Rework 187751 shaft to conform to Drawing 187825 by cutting 9/32-inch from the end opposite the sprocket to make the overall length $8\text{-}23/32^{+0}_{-1/32}$. Machine to remove the threads through the 3/4-dimension shown on Drawing 187825, maintaining the $.623^{+.0000}_{-.0002}$ diameter. Chamfer the machined end 1/64 by 45°. The old attaching hole for the universal is acceptable without rework. When the universal is reinstalled, drill a new attaching hole through the shaft 90° from the old hole.

(d) Chase threads to straighten.

(e) Strip and cadmium plate in accordance with Specification QQ-P-416 and Drawing 187825.

3.3.1.5 Stop 187755.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Repair as necessary as authorized herein.

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

3.3.2 Mechanism Assembly 187830.- Recondition and modify to conform to 187830-1 in accordance with Paragraphs 3.3.2.1 through 3.3.2.6 of this specification.

3.3.2.1 Clutch and Motor Assembly 187090.- Recondition and modify to conform with Drawing 187090-1 as follows:

(a) Clean all parts except the motor in accordance with OS 7002.

(b) Inspect all parts for nonrepairable conditions.

(c) Repair or replace parts as necessary as authorized herein.

(d) Finish 404045 housing, 304127 cap, and 104156 cover in accordance with FS 370 or FS 302 as applicable.

(e) Recondition bearings in accordance with OS 7003.

(f) Recondition 804-182626 motor in accordance with Paragraph 3.3.1.1.(e) of this specification.

(g) Pack 187809 and 187797 universals with grease conforming with Specification MIL-G-3278.

(h) Assemble and adjust to conform to Drawing 187090-1.

3.3.2.2 Universal 187752-2.- Refer to Paragraph 3.3.1.2 of this specification for reconditioning operations on 187752-2 universals.

3.3.2.3 Guards 187789 and 187779-3 and Arm Assembly 187812.- Refer to Paragraph 3.3.1.3 of this specification for reconditioning operations on these parts.

3.3.2.4 Bearing AN201-K12A.- Recondition in accordance with OS 7003.

3.3.2.5 Shaft 187825.-

(a) Clean in accordance with OS 7002.

(b) Repair as necessary as authorized herein.

3.3.2.5 Shaft 187825.- (Continued)

(c) Strip and cadmium plate in accordance with Specification QQ-P-416 and Drawing 187825.

3.3.2.6 Stop 187755.- Refer to Paragraph 3.3.1.5 of this specification for reconditioning operations on this part.

3.4 Authorized Repairs:

3.4.1 Mechanism Assembly 84-187750:

3.4.1.1 Motor Assembly 84-187790:

3.4.1.1.1 Motor 804-182626.-

(a) When the armature of a motor is not oil-free after cleaning in trichlorethylene it shall be baked for three 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 until all brush pits are removed. 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 it is found necessary to turn the commutator beyond the recommended minimum diameter as shown in Table 1 to remove the brush pits, replace the armature.

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

(c) Shaft bearing seats that are not perfectly smooth may be polished with No. 000 sandpaper. (Do not polish too much or they will become undersize.)

(d) Replace housings that are cracked or deformed.

(e) Replace all threaded parts having unsatisfactory threads that cannot be corrected by chasing.

3.4.1.2 Universal 187752-2; Guards 187789 and 187779-2; and Arm 187812.- No repairs are authorized.

3.4.1.3 Shaft 187751 and Stop 187755.- Chase damaged threads.

3.4.2 Mechanism Assembly 187830:

3.4.2.1 Clutch and Motor Assembly 187090.-

(a) Replace universals 187797 and 187809 that have an end play in excess of .010. When the universals are replaced, install a new 203904 shaft. This will be done due to the difficulties encountered in relocating the taper pin holes.

3.4.2.1.1 Motor Assembly 804-182626.- Refer to Paragraph 3.4.1.1.1 of this specification.

3.4.2.2 Universal 187752-2; Bearing AN201-K12A; Arm Assembly 187812; and Guards 187779-3 and 187789.- No repairs are authorized.

3.4.2.3 Shaft 187825 and Stop 187755.- Chase damaged threads.

4. INSPECTION

4.1 General.- The parts will be inspected to the general acceptable quality standards of Overhaul Specification 7008 and the specific quality standards listed below.

(a) Reconditioned universal joints will be acceptable for use if

(1) End play is within .010.

(2) Torsional play is within .015.

(3) Side play is within .010.

(b) The old universal attaching hole through the 187751 shaft in the end opposite the sprocket is acceptable without rework.

(c) The new attaching holes for the 187755 stops which are drilled through the 187825 shaft or through the modified 187751 shaft are acceptable when drilled approximately 90° to the old attaching holes.

(d) Wear tolerance not to exceed .010 will be allowed on the 3/4UNF16 threads in the 187812 arm.

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OVERHAUL SPECIFICATION
FLAP MOTOR AND MECHANISM ASSEMBLIES - MODEL C-45G, C-45H, AND SNB-5

Beech Aircraft CORPORATION Wichita 1, Kansas

OVERHAUL SPECIFICATION NO. 1611

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TABLE 1

MOTOR NO.	VOLTAGE	ORIGINAL BRUSH LENGTH	MINIMUM BRUSH LENGTH	ORIGINAL COMMUTATOR DIAMETER	MINIMUM COMMUTATOR DIAMETER	OHM RESISTANCE OPPOSITE COMMUTATOR BARS AT 70°F	OHM RESISTANCE FIELD COILS
Dumore							
SP-5162	24	3/4+1/64 Shldr.	1/2 inch	1-1/8 inch	15/16 inch	0.26	0.370
SP-5162A	24	3/4 + 1/64 Shldr.	1/2 inch	1-1/8 inch	15/16 inch	0.26	0.370
SP-5367	24	3/4 + 1/64 Shldr.	1/2 inch	1-1/8 inch	15/16 inch	0.26	0.370
Lamb, Black, & Decker							
13820	24	3/4 inch	1/2 inch	1-1/16 inch	15/16 inch		0.205 (This does not include field coil lead in wires - total resistance is 0.230)

FIGURE 1