Beech Aircraft Corporation

OVERHAUL SPECIFICATION

LANDING GEAR MOTOR - MODEL C-45G, C-45H, SNB-5, AND SNB-5P

Overhaul Specification 8017

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Beech Aircraft Corporation

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TITLE LANDING GEAR MOTOR - MODEL C-45G, C-45H, SNB-5 AND SNB-5P

ISSUED 2-20-53

WRITTEN BY T. R. Taylor

REVISED 7-12-54

1. SCOPE

1.1 Purpose.- The purpose of this specification is to provide instructions for reconditioning and modifying the 84-188590 landing gear operating motor (Type HCS3, Part No. 7535) for use on Model C-45G, C-45H, SNB-5, and SNB-5P aircraft.

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 the pages revised by the current revision.

Page	Date	Description of Revision	Serial Effectivity
1*	7-12-54	Record Revision	Record Change
2	4-24-53	Incorporate C-45H	Record Change
3	4-24-53	Incorporate C-45H	Record Change
4	4-24-53	Incorporate C-45H	Record Change
5	4-24-53	Incorporate C-45H	Record Change
6*	7-12-54	Add Paragraph 3.4.1.(d)	Record Change
7	4-24-53	Incorporate C-45H	Record Change
8	4-24-53	Incorporate C-45H	Record Change

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2. APPLICABLE PUBLICATIONS

2.1 Specifications:

2.1.1 Beech.-

OS 7002 Cleaning Procedures for Reconditioned Aircraft

OS 7003 Air Frame and Control Antifriction Bearings

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

03-5CC-2 Operation, Service, and Overhaul Instructions for Wing, Flap, and Landing Gear Operating Motors, dated August 8, 1952

3. REQUIREMENTS

3.1 Parts Involved:

3.1.1 Parts to be Scrapped.- None

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.

84-188590 Landing Gear Motor (Type HCA3, Part Number 7535)

NOTE: See Pages 7 and 8 of this specification for group assembly parts list of Electric Speciality Type HCA3 landing gear motor.

3.1.3 Parts to be Supplied New.- None

3.2 Cause for Rejection.- The following specific conditions as well as 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.

3.2.1 Bearing WC88503 and WC88501 (New Departure) or Bearing 77017 and 77012 (Norma Hoffman).-

(a) Bearings that are excessively loose, catch when being turned by hand, or are noisy will be replaced.

3.2.2 Brush A4630-4.-

(a) Brushes worn to a minimum length of 7/16-inch or below will be replaced.

3.2.3 Brush Spring A4630-2.-

(a) If less than 2 pounds minimum tension is required to lift each brush from commutator, bursh spring will be replaced.

3.2.4 Armature 7534 or 5109.-

(a) Replace grounded or shorted armature.

3.3 Reconditioning Operations:

3.3.1 Landing Gear Motor 84-188590 (Type HCA3, Part Number 7535).-

(a) Disassemble as follows:

(1) Remove brush opening band assembly, take out all brushes and remove the filister head screws or studs which run through the motor and thread into the end bracket at one end.

(2) The end bracket at the shaft projection end, together with the armature, may then be removed as a unit. If it is necessary to remove the shaft projection end bearing, carefully press the shaft out of the bearing, remove the bearing retainer if used, and then remove the bearing from the end bracket. When bearings have been forced on the shaft, use bearing puller to remove them.

3.3.1 Landing Gear Motor 84-188390 (Type HCA3, Part Number 7535). (Continued)

(a) (Continued)

(3) Commutator end bearing should be removed with a puller. Do not disturb the bearings unless necessary.

(4) Before removing the commutator end bracket from the frame it is necessary to disconnect the leads from the terminal studs. The lead clips are under the heads of the studs and the terminal nuts must be loosened and the open-sided lead clips slipped out.

(5) The pole pieces are held to the frame by flat-head set screws. Unless it is necessary to replace the field coils, do not remove the pole pieces.

(b) Thoroughly clean all parts in accordance with OS 7002. Examine parts for nonrepairable conditions.

(c) Clean and repack Norma Hoffman bearings in accordance with OS 7003. Replace seals and any damaged washers. New Departure bearings may not be cleaned or repacked.

(d) Replace any parts rejected according to Paragraph 3.2 of this specification.

(e) Repair as authorized in Paragraph 3.4 of this specification.

(f) Reassemble as follows:

(1) Insert all terminal studs in commutator end bracket. The nuts must be left loose to receive the lead terminal clips.

(2) Install brush holders and brushes. Put brush holders on long pins and hook tails of springs in groove of the short pins. Then make all brush connections.

(3) Assemble the pole pieces and field coils in the frame. The leads from the field coils must project out the short end of the shell; that is, the pole pieces must be nearest the commutator end of the motor.

(4) Put the commutator end bracket on the frame, taking note of the locating pin and shaft.

(5) Make field connections to field studs.

(6) Put bearing in the flanged end bracket. Put in bearing retainer and screws with safety wire.

(7) Press armature shaft into the bearing, press on commutator end bearing, and place this subassembly in the frame and commutator end bracket subassembly.

3.3.1 Landing Gear Motor 84-188590 (Type HCA3, Part Number 7535).- (Continued)

(f) (Continued)

(8) Replace the fillister-head screws or studs which run through the motor and replace the brushes. The shaft should turn easily.

(9) Assemble pole pieces and field coils in frame. The locating pin in the frame determines the bottom of the motor. The two field coils marked 323X must be placed on the bottom and the two coils marked 323 must be placed at the top.

(10) Assemble the brush boxes in the commutator end bracket. Insert through the hole in commutator end bracket the jumper which connects the terminal protector with the brush box. Mount the commutator end bracket on the frame. Make sure that the locating pin on the frame enters the corresponding hole in the end bracket. Solder leads into the receptacle and mound receptacle on commutator end bracket. The guide post in the receptacle must face the commutator end of the motor. Connect the receptacle leads to the field coils. Mount thermal protector on the end of commutator end bracket. Before tightening screws make sure that the clearance between the bottom of the receptacle and face of commutator end bracket is about 1/32-inch. Connect the protector to grounded terminal and brush box.

(11) Press bearings on armature. Place armature in frame.

(12) Mount the brake assembly in the end bracket for the shaft projection end. Pull the two brake leads through the frame and connect to the two bottom brush boxes. Mount the end bracket on the frame and insert the frame bolts. Insert the brushes in the brush boxes. The shaft should turn easily.

(g) Functional test and identify motor as a reconditioned part.

3.4 Authorized Repairs:

3.4.1 Armature Assembly 7534 or 5109.-

(a) Smooth rough or pitted commutator with No. 000 sandpaper. Do not use coarse sandpaper or emery cloth. Be sure and remove all sand and metal particles before assembly.

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3.4.1 Armature Assembly 7534 or 5109.- (Continued)

(b) If the commutator is extremely rough or burned, mount armature in a lathe and take a light cut across the face of the commutator, but do not reduce the commutator below the 1-7/16-inch minimum diameter. The mica should then be undercut and the commutator polished.

(c) Armature shafts with excessive end play will be reworked to Note D on Drawing 824-188895.

(d) Rework armature shafts on which the .374 $^{+.000}_{-.001}$ diameter is undersize or nicked and scratched by machining out scratches and building up diameter with chrome plating. Grind to print dimensions after plating.

3.4.2 Brush A4630-4.-

(a) If new brushes are installed or commutator has been turned, the brushes must be reseated with a piece of No. 000 sandpaper wrapped around the commutator, sanded side to the brush. The pressure of the brush spring is sufficient for sanding. Remove all sand or metal particles.

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.

4.2 Acceptable Standards.-

(a) Brushes are acceptable to 7/16-inch minimum length.

(b) Commutator is acceptable to 1-7/16-inch minimum diameter.

PARTS LIST

LANDING GEAR OPERATING MOTOR, TYPE HCA3

(Electric Speciality)

Part Number	Nomenclature	Units per Assembly
7535	Motor Assembly - Landing Gear Operating	
A4626-1	Frame	1
	Pin - Locating	2
A4622-7	Pole Assembly	4
AN505-416-8	Screw - 1/4-20, 1/2-inch long flathead	8
	Coil - Field Right Hand	2
	Coil - Field Left Hand	2
A4645-5	Clip - Terminal	2
A4625	Bracket - Shaft Projection End	1
A4625-2	Bushing - Bearing	1
A4625-4	Plate - Bearing Retainer	1
A4625-5	Ring - Bearing Retainer	1
500A-12-6	Screw - Filister-Head 12-24 by 3/8 Drilled	4
995-32-4	Locking Wire	2
A4637	Bracket - Commutator End	1
A4632-2	Bushing - Bearing	1
*817313	Pin - Long, Plain	2
*817314	Pin - Long, Insulated	2
*812015	Pin - Short, Plain	2
*812016	Pin - Short, Insulated	2
Commercial	Screw - Filister-Head 1/4-20 by 4-3/4-inch Steel Zinc Plated	4
Commercial	Washer - Lock 1/4-inch Steel Zinc Plated	4
A4645-1	Stud - Terminal	3
A4645-9	Nut - 5/16 - 18 by 5/32-inch Brass	6
A4645-10	Nut - 5/16 - 18 by 5/16-inch Brass	3
AN935-516	Washer - Lock 5/16-inch Steel Zinc Plated	3
AN960-516	Washer - Flat 5/16-inch Steel Zinc Plated	3
A4645-9	Washer - Insulating	2
A4645-11	Tube - Insulating	3
A4645-2	Insulator - Pressboard	1
A4645-3	Insulator - Fibre	1
A4826-1	Jumper - Brush	1
A4645-6	Clip	2
A4645-5	Clip	1
	Wire - No. 10 Bare Copper	7 in.
	Wire - No. 7 by 15 by .005 inch	24 in.
	Spaghetti	1 in.
	Sleeving - Glass No. 4	7 in.
A4630-4	Brush	4

Part Number	Nomenclature	Units per Assembly
*810226	Holder - Brush	4
A4630-2	Spring - Brush	4
AN515-6-8	Screw - Roundhead 6-32 by 1/2-inch	4
AN935-6	Washer - Lock	4
A4651-4	Cover - Short	1
A4651-5	Cover - Long	1
AN515-8-4	Screw - Roundhead 8-32 by 1/4-inch	8
AN935-8	Washer - Lock	8
**7534	Armature Assembly	1
**WC88503	Bearing - Ball, New Departure	1
**WC88501	Bearing - Ball, New Departure	1
A1261	Plate - Name	1
Commercial	Pins - Name Plate No. 51 by 3/16-inch long	4

*Delco Number

**Norma Hoffman numbers 77017 and 77012 bearings are used on some motors, in which case bearing retainer, Part No. A4625-3 is used instead of bearing retainer plate, Part No. A4625-4; and bearing retainer ring, Part No. A4625-5 and armature, Part No. 5109, is used instead of Part No. 7534.

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PROJECT ENGINEER [signature]				
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