1. SCOPE

1.1 Purpose.- The purpose of this specification is to provide instructions for reconditioning the AN3025-1 generator control relay switch 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	4-27-53		
2	4-27-53		
3	4-27-53		
4	4-27-53		
5	4-27-53		
6	4-27-53		
7	4-27-53		
8	4-27-53		
9	4-27-53		

APPROVED:

Kenneth Case
USAF Quality Control

A61

WRITTEN BY M. D. Davis	DATE ISSUED 4-27-53	OVERHAUL SPECIFICATION GENERATOR CONTROL RELAY SWITCH - MODEL C-45G, C-45H, SNB-5, AND SNB-5P	
PROJECT ENGINEER			
APPROVAL	DATE REVISED	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO. 3615 / PAGE 1
APPROVAL			

2. APPLICABLE PUBLICATIONS

2.1 Specifications:

2.1.1 Beech.-

OS 7008 General Acceptable Quality Standards

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

03-5AJ-8 Generator Control Relay Switch, dated December 13, 1948

00-35A-40 Inspection and Functional Test of USAF Material and Equipment, dated October 30, 1952

3. REQUIREMENTS

3.1 Parts Involved:

3.1.1 Parts Not Used.- 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.

AN3025-1 Generator control relay switch

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 methods described herein is cause for rejection.

3.2.1 Coils.-

(a) Scrap coils if resistance is not within specified limits. (Refer to Paragraph 3.3.(g).)

(b) Scrap coils with broken leads and open coils.

3.2.2 Main Contacts.-

(a) Scrap fused or melted main contacts.

3.2.3 Contact Spring.-

(a) Scrap contact springs which are discolored from heat or broken.

3.2.4 Core Rod.-

(a) Scrap bent or damaged core rods.

3.3 Reconditioning Operations.-

(a) Bench test the relay as a unit as described in Paragraph 3.5 of this specification. Disassemble only those subassemblies that fail to meet test values and cannot be corrected by adjustment.

(b) If necessary, disassemble as follows:

(1) Remove insulating base plate and cover.

(2) Remove relay assembly. Remove voltage and differential relay coils.

(3) Disassemble relays as follows:

(a) Remove voltage relay permanent magnet armature. Remove contact tipped screw.

(b) Remove differential relay permanent magnet armature. Remove contact tipped screw.

(4) Remove contactor assembly from base. Remove insulating plate. Remove generator contact post, main short stationary contact assembly, and series coil.

(5) Disassemble base as follows:

(a) Remove guide base, base gasket, space washers and seat washers.

3.3 Reconditioning Operations.- (Continued)

(b) (Continued)

(6) Disassemble contactor as follows:

(a) Remove main movable contact, including lead assembly and contact loading spring.

(b) Remove movable core, core rod, and spring. Remove contact insulating bushing from core rod.

(c) Remove tie plates and stationary core assembly.

(c) Inspect parts for nonrepairable conditions.

(d) Clean small contacts by rubbing on paper. No cleaning of the large contacts is necessary.

(e) Demagnetize, clean, and remagnetize the magnets. In remagnetizing, care should be taken to remagnetize in the same direction (north and south) as originally magnetized. Do not permit any two magnets to get together after magnetization.

(f) Blow off relays with an air hose held about one foot away.

(g) Check resistance of each coil as shown below at normal room temperature.

	MAXIMUM	MINIMUM
Main Contactor	100 OHMs	86 OHMs
Voltage Relay	512 OHMs	445 OHMs
Differential Relay	5.5 OHMs	4.5 OHMs

(h) Do not use any fungi or corrosion preventive compounds on any relay parts.

(i) Reassemble. During reassembly the folling operations will be performed and precautionary measures noted.

(1) Be sure that groove in the core assembly is free of dirt and varnish.

(2) Leave 3/32-inch gap between shoulder of movable core and tie plate.

(3) Be sure that no dirt or bakelite particles get between contact posts and links which would cause a poor connection.

(4) Tie "sw" terminal lead, red lead from voltage relay coil, and "app" terminal lead together with linen cord.

3.3 Reconditioning Operations.- (Continued)

(i) (Continued)

(5) Adjust relay as outlined in Paragraph 3.6 of this specification before assembling into cover.

(6) Place a small drop of glyptal or suitable cement on the base of every exposed screw head and nut within the relay in such a fashion as to prevent screw or nut from loosening. Use only enough glyptal to seal properly.

(7) Seal cover so that relay will not be opened for inspection.

3.4 Authorized Repairs.- Necessary repairs will consist of replacing any unserviceable parts with serviceable parts.

3.5 Test Procedure.- Mount the following parts on a suitable panel and wire as shown in Figure 1 of this specification.

Number Required	Parts Required
1	30-Volt DC voltmeter
1	1-Volt DC voltmeter
1	Ohmmeter (any range)
4	Double-pole, on-off-on switches (SW1, SW2, SW3, SW4, AN3027-1, or equivalent)
1	Potentiometer rated approximately 50 OHMs, 1.5 amps (R1)
1	Potentiometer rated approximately 100 OHMs, .25 amps (R2)
1	2-Volt battery supply
1	26-Volt battery supply
16	Binding posts

Care must be taken in wiring the switches so that Positions 1 and 2 are marked on the panel to correspond with the internal connections of the switches. These switches are so constructed that when the handle is in the up position, the internal connections are on the down half of the switch. Therefore, the markings on the panel will be opposite the diagram markings; that is, Position 1 will be in the upper set of terminals on the switch when the handle is in the down position. Stamp correct markings on each binding post and stamp Position 1 and Position 2 for each switch. Set all switches in open position before connecting relay and batteries to panel.

3.5.1 Differential Voltage and Reverse Current Operation.-

(a) The differential relay will close or open only if the voltage or its coil is of the correct polarity. This relay will continue to remain in its last operating position, so after each operation it is necessary to reverse the polarity of the impressed voltage by means of SW4 before another trial can be made.

(b) Place SW1 and SW3 in Position 2 and SW4 in Position 1. The ohmmeter will now read approximately 550 OHMs if the differential relay is open; if closed, the ohmmeter will read zero resistance. The voltage reached at the time of closing is the "differential voltage" and should be from .35 to .65 volt.

(c) If the ohmmeter already read zero resistance, the differential relay was closed and SW4 should be placed in Position 2. In this case, the voltage should be slowly raised from zero to a point where the ohmmeter reads 550 OHMs. Application of .30 to .42 volt in reverse direction on the differential coil is equivalent to a reverse current flow of 16 to 25 amperes.

(d) Several trials should be made each way and the last trial made so that the contacts remain open.

3.5.2 Testing Voltage Relay.-

(a) Place SW1 and SW3 in Position 2 and check to see that the ohmmeter reads approximately 550 OHMs.

(b) Then with SW1, SW2, and SW3 in Position 1, raise the voltage by means of R1 until the ohmmeter goes to zero resistance. This is the voltage relay closing voltage and should be between 20 and 24 volts. The opening voltage is measured by decreasing the voltage until the ohmmeter shows an open circuit condition. This voltage should be above 18 volts.

3.5.3 Testing Contactor.- This test should be made with the four mounting holes of the cover flat on the table. The position of the relay will have some effect on this operating voltage even though the relay may be mounted in the airplane in any position.

3.5.3 Testing Contactor.- (Continued)

(a) Place SW2 in Position 2 and SW1 and SW3 in Position 1. Raise the voltage by means of R1 from zero until the ohmmeter reads zero resistance. This is the closing voltage of the contactor and should be under 15 volts before the coil has become heated.

(b) Continue to raise the voltage to about 20 volts, then decrease it until the ohmmeter indicates an open circuit. This is the opening voltage of the contactor and should be below 5 volts.

CAUTION: The differential relay contacts should be left in the open position after completing tests.

(c) For compiled data, use Table 1 of this specification.

3.6 Adjustments.- For adjusting, connect relay to test panel as shown in Figure 1 and follow procedure as outlined in Paragraph 3.5 of this specification.

3.6.1 . Differential Voltage Relay.-

(a) Adjust the end play of magnet to about .005 inch by bending the pivot bridge.

(b) Set closing differential voltage until relay closes between .45 to .55 volt.

(c) Adjust so that relay opens between .33 and .36 volt.

3.6.2 Voltage Relay.-

(a) Adjust end play of magnet to about .005 inch by bending the pivot bridge.

(b) Set relay armature gaps equal.

(c) Adjust until relay closes at 23.5 volts.

(d) Adjust until relay opens at 18.5 volts.

(e) Contact gap should not be less than .020 inch.

3.6.3 Contactor.-

(a) Adjust gap between core rim and frame to .093 inch.

(b) Adjust contact over-travel to approximately .020 inch.