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 804-187500 and 814-187500 control column and torque shaft assemblies as installed in T-7, T-7C, UC-45B, C-45F, and T-11 aircraft and instructions for modifications required to adapt them for installation in Model C-45G aircraft in accordance with Drawing 734-187500 or C-45H aircraft in accordance with Drawing 894-187500.

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	3-24-53		
2	3-24-53		
3	3-24-53		
4	3-24-53		
5	3-24-53		
6	3-24-53		
7	3-24-53		
8	3-24-53		
9	3-24-53		
10	3-24-53		
11	3-24-53		

APPROVED:

Kenneth O Cope
USAF Quality Control

A66

WRITTEN BY M. D. Davis	DATE ISSUED 3-24-53	OVERHAUL SPECIFICATION CONTROL COLUMN AND TORQUE SHAFT ASSEMBLY - MODEL C-45G & C-45H
PROJECT ENGINEER R. B. Besemer		
APPROVAL	DATE REVISED	Beech Aircraft CORPORATION Wichita 1, Kansas — OVERHAUL SPECIFICATION NO. 5210 — PAGE 1
APPROVAL		

E-338A

2. APPLICABLE PUBLICATIONS

2.1 Specifications:

2.1.1 Military.-

MIL-I-6868	Magnetic Inspection

2.1.2 Federal.-

QQ-P-416	Plating; Cadmium

2.1.3 Beech.-

PS 249	Stress Relief of Steel Parts After Welding or Brazing
FS 370A	Finish Specification for C-45G and C-45H Aircraft
MP 2320	Chromadizing (Chromic Acid Dip)
OS 7002	Cleaning Procedures for Reconditioned Aircraft
OS 7003	Air Frame and Control Antifriction Bearings
OS 7008	General Acceptable Quality Standards

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

01-90-70	Inspection and Replacement of Pilot's and Copilot's Control Wheel Shafts, dated December 6, 1948

3. REQUIREMENTS

3.1 Parts Involved:

3.1.1 Parts to be Scrapped.- All parts listed on Drawings 804-187500 and 814-187500 torque shaft and control column assemblies will be scrapped except those parts listed in Paragraph 3.1.2 of this specification.

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.

AN386-5-16	Pin
187510	Control column assembly
824-187510	Control column assembly
824-187510-1	Control column assembly
804-187504	Arm assembly
187506	Torque shaft, center
*187507	Torque shaft side
187508	Thrust bushing
187516	Collar
187511	Flange, outer
187512	Flange, center
187513	Bushing
AN386-5-15	Pin
AN386-3-18	Pin

*Recondition both 187507 torque shafts from the 814-187500 assembly and only the left hand 187507 torque shaft from the 804-187500 assembly.

3.1.3 Parts to be Supplied New:

3.1.3.1 Torque Shaft and Control Column Assembly 734-187500.- The parts listed below and all parts called out on Drawing 734-187500 except those parts listed in Paragraph 3.1.2 of this specification will be supplied new for C-45G aircraft.

734-187523-2	Wheel assembly
734-187521	Plate
S-21-3	Key
404-187511	Cover assembly

NOTE: The 734-187510 and 734-187510-1 control column assemblies will not be supplied new but will be made from 187510, 824-187510, and 824-187510-1 control column assemblies.

3.1.3.2 Torque Shaft and Control Column Assembly 894-187500.- The parts listed below and all parts called out on Drawing 894-187500 except those parts listed in Paragraph 3.1.2 of this specification will be supplied new for C-45H aircraft.

734-187523-2	Wheel assembly
734-187521	Plate
S-21-3	Key
404-187511	Cover assembly

NOTE: The 734-187510 and 734-187510-1 control column assemblies will not be supplied new but will be made from 187510, 824-187510, and 824-187510-1 control column assemblies.

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 Control Column Assemblies 187510, 824-187510, and 824-187510-1.-

(a) Scrap all 187519 control wheel assemblies.

(b) Scrap all 77-2006 control wheels.

(c) Scrap all cable and chain assemblies

(d) Inspect for nonrepairable conditions.

(e) Clean in accordance with OS 7002.

(f) After reconditioning detail parts as described in Paragraphs 3.3.1.1 through 3.3.1.4, assemble parts in accordance with Drawing 734-187500 for C-45G aircraft or 894-187500 for C-45H aircraft.

3.3.1.1 Weld Assemblies 187510-26 Left and Right Hand, 824-187510-26 and 824-187510-27.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Magnetically inspect in accordance with MIL-I-6868.

(d) Modify the cutout at the sprocket location as shown in View E-E on Drawing 824-187510, CO A27591.

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

3.3.1.1 Weld Assemblies 187510-26 Left and Right Hand, 824-187510-26 and 824-187510-27.- (Continued)

(f) Finish in accordance with FS 370A.

(g) Identify 187510-26 left hand as 824-187510-26. Identify 187510-26 right hand as 824-187510-27.

3.3.1.2 Sprocket 188564, Spacers 187510-11 and 824-187510-12.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Magnetically inspect 188564 sprocket in accordance with MIL-I-6868.

(d) Repair as necessary as authorized herein.

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

3.3.1.3 Control wheel assemblies 187519 and 187523.-

(a) Scrap all 187519 control wheel assemblies.

(b) Scrap all 77-2006 control wheels from 187523 control wheel assemblies.

(c) Inspect for nonrepairable conditions.

(d) Clean in accordance with OS 7002.

(e) Repair as necessary as authorized herein.

(f) Strip and cadmium plate the 187522 hub assembly in accordance with Specification QQ-P-416.

(g) Assemble in accordance with Drawing 734-187523 using 734-187523-2 wheel assembly and 734-187521 plate.

3.3.1.4 Pulleys 18754-2 and BB-128, and Bearings AN201KP8A and K8A.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Recondition bearings in accordance with OS 7003.

(d) Finish pulleys with clear shellac.

3.3.2 Arm Assembly 804-187504.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Repair as necessary as authorized herein.

(d) Chromadize in accordance with MP 2320.

(e) Finish in accordance with FS 370A.

3.3.3 Center Torque Shaft 187506 and Side Torque Shaft 187507.-

(a) Inspect for nonrepairable conditions.

(b) Clean in accordance with OS 7002.

(c) Magnetically inspect in accordance with MIL-I-6868.

(d) Repair as necessary as authorized herein.

(e) Strip cadmium plating and heat treat 187507 shaft to 125000 - 155000 psi.

(f) Cadmium plate in accordance with Specification QQ-P-416.

(g) Finish in accordance with FS 370A.

3.3.4 Bushing 187508 and 187513; Collar 187516; Flange 187511 and 187512; Taper Pin AN386-5-15, AN386-5-16, and AN386-3-18.-

(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.

3.4 Authorized Repairs:

3.4.1 Control Column Assemblies 187510, 824-187510, and 824-187510-1:

3.4.1.1 Weld Assemblies 187510-26 Left and Right Hand, 824-187510-26 and 824-187510-27.-

(a) Replace by welding all 187510-8 and 824-187510-8 bushings which are .001 or more above print tolerance on the inside diameter.

(b) Replace damaged 824-187510-36, 824-187510-39, 187510-30, and 187510-23 weld and machine assemblies by cutting at weld location and welding in new assembly.

(c) Rework bent or dented assemblies by heating and straightening.

(d) Replace damaged 187510-25 bracket assemblies by cutting at weld locations and welding in new bracket assembly.

(e) Repair cracks by welding.

NOTE: Use welding procedure and rod as specified on Drawing 824-187510. Stress relieve in accordance with PS 249A and magnetically inspect in accordance with MIL-I-6868 after welding. The dimension between the centerline of the BB-128 pulleys and the 188564 sprocket and the dimension between the centerline of the BB-128 pulleys and the 18754-2 pulleys is critical, inasmuch as it affects rigging of the aileron cables. These dimensions must be held within 1/16 inch of those called for on Drawing 824-187510 when performing repairs.

3.4.1.2 Sprocket 188564.-

(a) Rework sprockets having keyways more than .001 above drawing tolerance by placing a drop of copper brazing material in them, rotating the sprocket approximately 90°, and machining new keyways in accordance with Drawing 188564. See Figure 1. Remove brazing material extending above edge of keyway by reaming hole through sprocket $.500^{+.001}_{-.000}$.

(b) Smooth small nicks and scratches in sprocket teeth and hub with a file or emery cloth before plating.

3.4.1.3 Control Wheel Assembly 187523.-

(a) Rework 187522 hub assemblies having keyways more than .001 above drawing tolerance by placing a drop of copper brazing material in them, rotating the hub assembly 120°, and machining new keyways.

(b) Chase damaged 1/4-28NF-3 threads.

(c) Install hub assembly in accordance with Drawing 734-187523.

3.4.1.4 Pulleys 18754-2 and BB-128, and Bearings AN201KP8A and K8A.-

(a) No repairs are authorized.

3.4.2 Arm Assembly 804-187504.-

(a) Replace 804-187505 bushings having inside diameter of .328 or greater.

(b) Replace 804-187506 bushings having inside diameter of .265 or greater.

(c) When the AN386-3-18 taper pin holes in the arm assembly are oversize, use AN386-5-18 taper pins.

3.4.3 Center Torque Shaft 187506 and Side Torque Shaft 187507.-

(a) When the AN386-3-18 taper pin holes are oversize, use AN386-5-18 taper pins.

(b) When the AN386-5-15 taper pin holes are oversize, use OS 5210-1 taper pins. See Figure 2.

(c) When the AN386-5-16 taper pin holes are oversize, use OS 5210-2 taper pin. See Figure 2.

(d) When the holes in the 187507 shaft do not align with the holes in the 187516 collar and 187508 bushing, drill new holes through the shaft approximately 45° to existing holes.

3.4.4 Bushing 187508; Collar 187516; Flange 187511 and 187512; and Taper Pins AN386-5-15, AN386-5-16, and AN386-3-18.-

(a) When reconditioned 187508 bushings and 187516 collars are used with new 187507 shafts, rotate bushing and collar approximately 90° and drill new attaching holes.

(b) When the holes in reconditioned 187508 bushings and 187516 collars do not align with the holes in reconditioned 187507 shafts, rotate the collar and bushing approximately 90° and drill new attaching holes.

(c) When taper pin holes through the 187511 flanges are oversize, use OS 5210-1 taper pins.

(d) When taper pin holes through the 187512 flanges are oversize, use OS 5210-2 taper pins.

(e) Chase damaged threads on AN386-5-15, AN386-5-16, and AN386-3-18 taper pins.

4. INSPECTION

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

4.1.1 Control Column Assemblies 187510, 824-187510, and 824-187510-1.- The cable routing over the two upper pulleys in the control column assemblies may be reversed from the routing shown on Drawing 734-187500 or 894-187500 when necessary to prevent the chain from rubbing the sides of the control column. Cable routing over the two lower pulleys must conform to Drawing 734-187500 for C-45G aircraft and 894-187500 for C-45H aircraft.

4.1.1.1 Weld Assemblies 187510-26 Left and Right Hand, 824-187510-26 and 824-187510-27.

(a) The inside diameter of the 187510-17 and 824-187510-34 tubes is acceptable up to and including 1.632.

(b) The outside diameter of the 187510-17 and 824-187510-34 tubes is acceptable up to and including 1.809.

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	DATE ISSUED 9-24-53	**OVERHAUL SPECIFICATION** CONTROL COLUMN AND TORQUE SHAFT ASSEMBLY - MODEL C-45B & C-45H	
	DATE REVISED	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO. 5210 PAGE 10

FIGURE 1

OVERHAUL SPECIFICATION

CONTROL COLUMN AND TORQUE SHAFT ASSEMBLY - MODEL C-450 & C-451

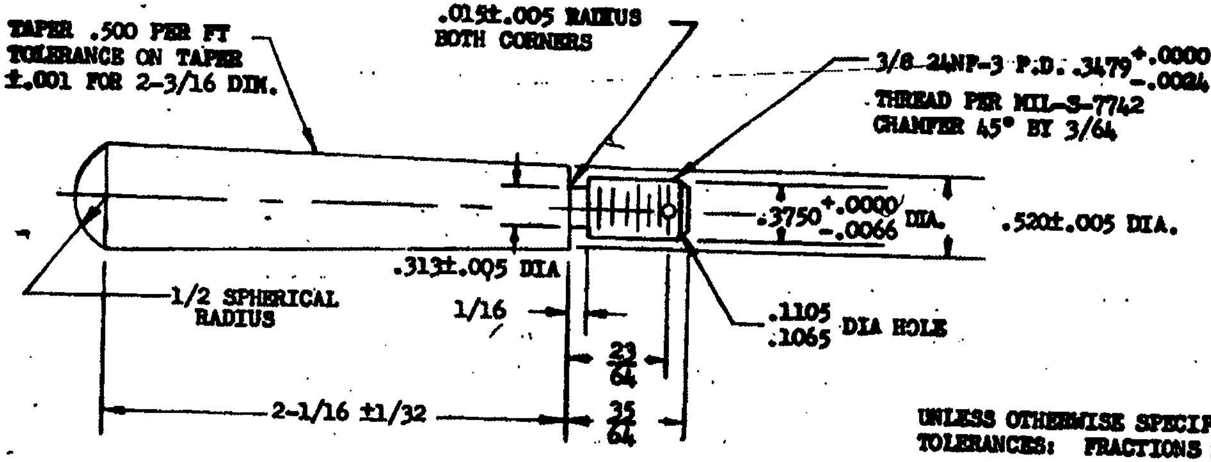
Beech Aircraft Corporation, Wichita 1, Kansas

OVERHAUL SPECIFICATION NO. 5210

WRITTEN BY | PROJECT ENGINEER | APPROVAL | APPROVAL | DATE ISSUED 3-24-53 | DATE REVISED

OS 5210-1 AND OS 5210-2 TAPER PIN

NOTE: The OS 5210-2 taper pin is the same as the OS 5210-1 taper pin except the 2-1/16 ±1/32-inch dimension shall be 2-3/16 ±1/32 inch. The OS 5210-2 taper pin is identical to the MRB A29417 taper pin.



UNLESS OTHERWISE SPECIFIED
TOLERANCES: FRACTIONS ±1/64

MATERIAL - 5/8 DIA BAR BY 3 LONG
CHROME-MOLY STEEL MIL-S-6758 CONDITION E-4
HEAT TREAT - 125000 to 145000 PSI
CAD. PLATE PER QQ-P-416 TYPE I CLASS C

OS 5210-1 SHOWN

FIGURE 2