Beech Aircraft Corporation

OVERHAUL SPECIFICATION

ENGINE DRIVEN VACUUM PUMP - MODEL C-45G, C-45H, AND SNB-5

Overhaul Specification 9113

ISSUED May 22, 1953

REVISED November 22, 1954

T. R. Taylor
Writer

R. B. Bosworth
Chief Requirements Engineer

for M. DeLapp
Project Engineer

826

A. S. Odevseff
Chief Project Engineer - Military

M. R. Terry
USAF Quality Control

TITLE ENGINE DRIVEN VACUUM PUMP - MODEL C-45G, C-45H, AND SNB-5

ISSUED 5-22-53

WRITTEN BY T. R. Taylor REVISED 11-22-54

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 Type B-12 vacuum pumps for use on C-45G, C-45H, and SNB-5 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*	11-22-54	Record revision	Record change
2*	11-22-54	Change TO 03-30AH-1 to 9V2-2-6-1C	Record change
3*	11-22-54	Revise Para. 3.3.(a) and 3.3.(b) to require copper plate of worn sleeves	Record change
4*	11-22-54	Revise Para. 3.3.1 and 3.3.2	Record change
5*	11-22-54	Was page 4	
6*	11-22-54	Was page 5	
7*	11-22-54	Was page 6	Record change
8*	11-22-54	Was page 7	Record change
9*	11-22-54	Was page 8	Record change
10*	11-22-54	Was page 9	

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2. APPLICABLE PUBLICATIONS

2.1 Beech.-

FS 302C	Finish Specification for Model SNB-5
FS 370A	Finish Specification for Model C-45H and C-45H Aircraft
OS 7002	Cleaning Procedure for Reconditioned Aircraft
OS 7008	General Acceptable Quality Standards

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

9V2-2-6-1C	Operation, Service and Overhaul Instructions Pesco Engine Vacuum Pumps, dated 4 June 1954
9V2-2-4-1	Operation, Service and Overhaul Instructions Aro Air Pumps, dated April 17, 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, repairs and/or replacement of components, and modifications to incorporate changes in accordance with applicable engineering drawings to assure an operationally safe and serviceable aircraft.

AN6111-1 Vacuum Pump, Type I-22

3.1.3 Parts to be Supplied New.- (See Figure 1)

3.1.3.1 Pesco.-

Part No.	Nomenclature	Index No.
436-5	Seal "O" Ring	12
207-13 or 207-13A	Gasket - .003" thick Gasket - .001" thick	13 13

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3.1.3.2 Arc.-

Part Number	Nomenclature	Index No.
A-501-44	Ring - Seal	7
A-505-A13D	Gasket (.0015 in. thick)	9
A-505-A13E	Gasket (.002 in. thick)	10
A-505-A35D	Gasket	21
A-5026	Ring - Snap	28

3.2 Cause for Rejection.- The following conditions as well as damage or wear which cannot be corrected by one or more of the authorized repairs specified herein are cause for rejection and replacement.

(a) Scrap parts worn in excess of allowable tolerances shown in Figure 2 or Figure 3, as applicable.

(b) Scrap rough turning shaft bearings.

3.3 Reconditioning Operations.-

(a) Completely disassemble the pump. It is not necessary to remove the sleeve from the pump body unless it is badly scored and unserviceable. When it is necessary to replace unserviceable sleeves in Pesco pumps, an interference of 0.001 to 0.002 inches must be maintained between the outside diameter of the sleeve and the inside diameter of the pump body to prevent the sleeve from rotating. Copper plate the outer surface of the new sleeve, if necessary, to maintain this interference. Spray the outer surface of the sleeve with a thin coat of zinc chromate after plating. Worn body and cover bearing retainers may be copper plated to the dimensions specified in Figure 2, if the bearing outer race is loose when installed.

(b) Clean all parts in Stanisol or equivalent. Recondition the bearings in accordance with OS 7003. Give all reconditioned couplings a magnetic particle inspection.

(c) Inspect parts for serviceability.

(d) Some Pesco pumps will be found without "O" ring seal recess at cover plate oil hole. These pumps will be rejected and referred to Liaison Engineering for disposition.

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3.3 Reconditioning Operations.- (Continued)

(e) Assemble the pump and test for freedom of operation by turning the coupling with the fingers.

(f) Finish in accordance with FS 370A.

3.3.1 Operational Test.- During all of the following runs, the oil pressure at the vacuum pump should be maintained at 50 psi.

(a) Subject the pump to 30 minute break-in run at 1500 rpm with inlet and outlet valves open.

(b) Run the pump as indicated in the capacity test chart until the pump temperature reaches its terminal value, then check the pump capacity. Discharge temperature shall not exceed 375°F.

NOTE: Manometer should be attached as close to pump as possible.

CAPACITY TEST CHART - TYPE B-12
VACUUM PUMP

Speed rpm	Suction in HG	Pressure in HG	Rated Capacity C.F.M.
1500	4.0	1.0	7.5
2250	4.0	16.0	8.0

3.3.2 Temperature Rise and Oil Flow Test.- Adjust the pump speed suction and pressure to the values given below, and when the outlet temperature stabilizes, check the oil flow. The oil flow must be within the limits specified, and the maximum temperature rise must not be exceeded.

rpm	Inlet Suction	Outlet Pressure	Maximum Temperature Rise	Oil Flow
3750	6.0" HG	16.0" HG	150° C or 307° F	.16 to .37 lb/hr or 85 206 cubin cm/hr

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3.4 Authorized Repairs.-

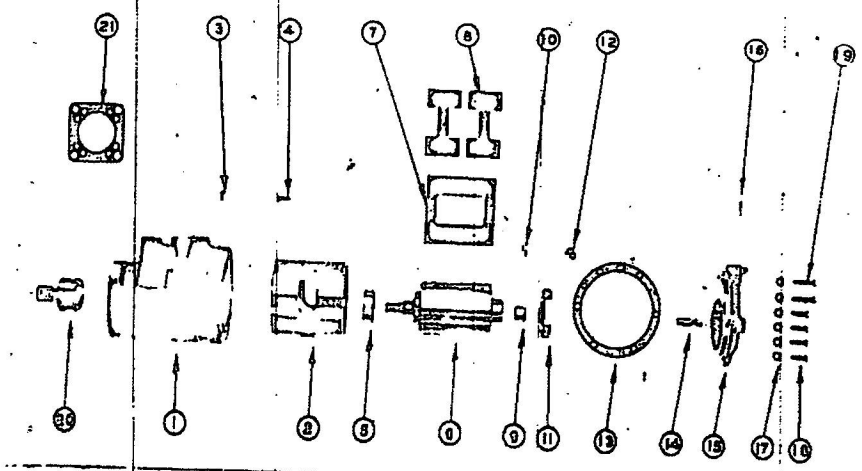
(a) Rough or slightly scored blades may be dressed down on a flat oil stone. Be sure to maintain original radius.

(b) Chase threads in pump body as necessary to clean.

(c) Damaged sleeves can be removed and replaced by forcing out the anchor pin and heating the body to about 121° C or 250° F in an oil bath.

4. INSPECTION

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



INDEX NUMBER	PART NAME	OLD MODEL 207-JA / NEW MODEL 3P-207-JA TYPE B-12
1	Body Assembly	
2	Sleeve	207-15C
3	Anchor Pin	207-10
4	Cover Dowel	172-12
5	Ball Bearing	172-24
6	Rotor Assy.	177-23B
7	Blade (Whole)	207-3A
8	Blade (Half)	207-4
9	Metering Collar	207-5
10	Anchor Pin	207-8
11	Ball Bearing	207-9
12	Seal Ring	172-21
13	Gasket - .003"	436-5
	Gasket - .001"	207-13
14	Metering Pin	207-13A
15	Cover Assy.	207-6
16	Cotter Pin	207-25
17	Washer	177-19
18	Screw	194-22
19	Screw	194-21
20	Coupling Assembly	230-34
21	Gasket - Flange	207-16D
		194-20

FIGURE 1

WRITTEN BY J. W. Cooper	DATE ISSUED 5-22-53	OVERHAUL SPECIFICATION ENGINE DRIVEN VACUUM PUMP - MODEL C-45G, C-45H, AND S-B-5	
PROJECT ENGINEER			
APPROVAL	DATE REVISED 11-23-54	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO. 9113 / PAGE 6
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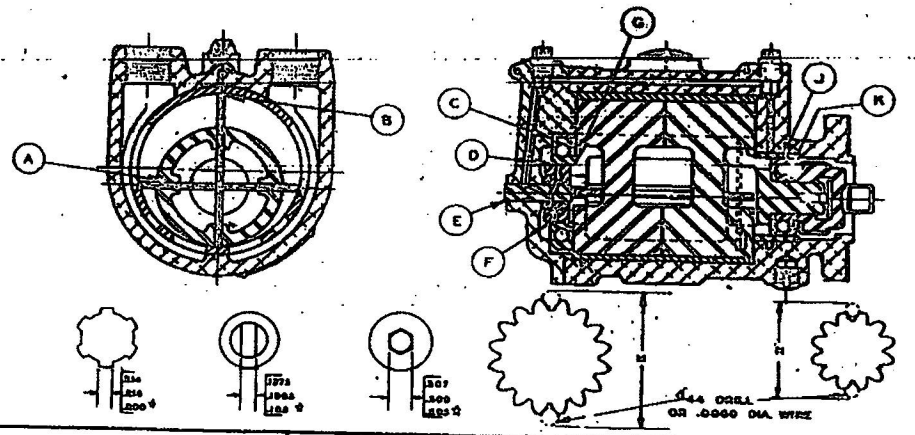
E-522A

FITS AND CLEARANCES FOR PESCO VACUUM PUMPS

TYPES B-3, B-4, B-7, B-8, B-12, & B-13



LET.	PART FIT	MIN.-MAX. WHEN NEW		MIN.-MAX. WHEN NEW	
		B-3, B-7, & B-12		B-4 & B-8	
A	ROTOR SLOT	.095	.096	.095	.096
B	BLADE THICKNESS	.0933	.094	.0933	.094
C	BLADE WIDTH	2.244	2.247	2.244	2.247
D	SLEEVE BORE	2.751	2.753	2.2530	2.2532
E	SLEEVE I.D.	2.0000	2.0005	2.1250	2.1255
F	BEARING O.D.	1.0997	2.0000	2.1235	2.1245
G	SHAFT DIA.	1.0000	1.0003	1.1250	1.1253
H	BEARING I.D.	.0007	1.0000	1.1244	1.1250
J	COVER HOLE	.3120	.3125	.3120	.3125
K	METERING PIN DIA.	.3140	.3142	.3140	.3142
M	COLLAR I.D.	.3147	.3150	.3147	.3150
N	SLEEVE LENGTH	3.003	3.004	4.003	4.003
	ROTOR LENGTH	2.9995	3.0000	3.999	4.000

LET.	PART FIT	MIN.-MAX. WHEN NEW	
		B-3 B-7 & B-12	B-4 & B-8
M	BLADE LENGTH	2.9995 3.0002	3.9970 3.9977
J	SLEEVE I.D.	1.3750 1.3755	1.3748 1.3754
K	BEARING O.D.	1.3775 1.3780	1.3743 1.3748
	SHAFT DIA.	.5906 .5908	.6693 .6695
	BEARING I.D.	.5903 .5905	.6690 .6693
M	28 TOOTH SPLINE	.0114 .0177	.0114 .0177
N	32 TOOTH SPLINE	.7112 .7174	.7112 .7174

8 OSX GASKETS AS REQUIRED FOR PROPER CLEARANCE AT (C) & (N)

PUMP ENGINEERING SERVICE CORP.

CLEARANCES		
LET.	B-3,7,12	B-4 B-8
A	.001	.001
	.0027	.0027
	.003 ☆	.004 ☆
B	.004	.006
	.009	.0082
	.011 ▽	.011 ☆
C	.0006	.0008
	.0006	.002
	.0025 ☆	.0025 ☆
D	.0008 T	.0010 T
	.0000	.0000
	.001 ☆	.001 ☆
E	.0022 T	.0022 T
	.0015 T	.0015 T
F	.0005	.0005
	.001	.001
	.0012 ☆	.0012 ☆
G	.0015	.0015
	.0025	.0025
	.007 ☆	.007 ☆
H	.0015	.0015
	.0025	.0025
	.007 ☆	.007 ☆
J	.0000	.0000
	.0011	.0011
	.0025 ☆	.0025 ☆
K	.0003 T	.0005 T
	.0001	.0001
	.001 ☆	.001 ☆

☆ MAXIMUM WEAR

FIGURE 2

WRITTEN BY: [illegible]
PROJECT ENGINEER: [illegible]
APPROVAL: [illegible]
DATE ISSUED: 5-22-53
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OVERHAUL SPECIFICATION
FIGHT DRIVEN VACUUM PUMP - MODEL C-45B, C-45H, AND S.B.-4

Beech Aircraft CORPORATION
Wichita 1, Kansas

NO. 9113

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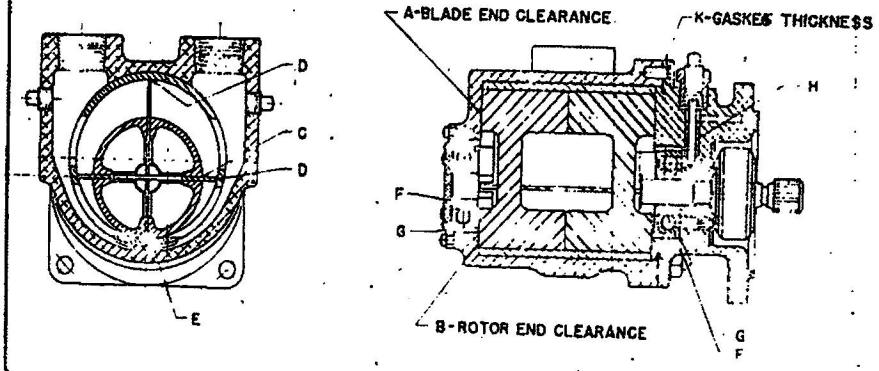
	A	B	C	D	E	F	G	H	J	K
NORMAL CLEARANCE	.0015 .003	.0025 .0035	.001 .0025	.008 .012	.0013 .0033	.0001L .0005T	.0006L .0003T	.001 .0023	.0065 .009	.003 .006
MAX. CLEARANCE.	.005	.004	.0035	.015	.0043	.0003L	.001L	.0025	.010	.007



CLEARANCE CHART ARO PUMP
FIGURE 3

TITLE ENGINE DRIVEN VACUUM PUMP - MODEL C-45G, C-45H, AND S-5

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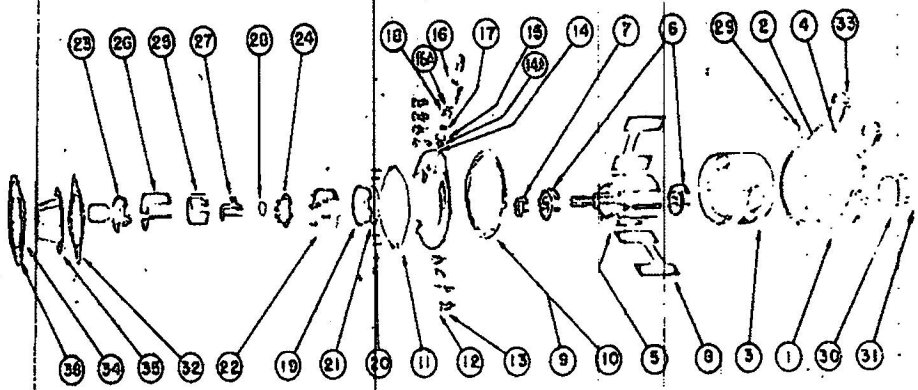

FIGURE 4

Aro Vacuum Pump

TITLE ENGINE DRIVEN VACUUM PUMP - MODEL C-45G, C-45H, AND C-45-5

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WRITTEN BY T. R. Taylor

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INDEX FOR FIGURE 4

FIGURE & INDEX NUMBER	PART NUMBER 1 2 3	NOMENCLATURE	UNITS PER ASS'Y.	PROPERTY CLASSIFICATION U.S. ARMY	U.S. NAVY	BRITISH
28- 1	A-505-A10D	Body Assembly				
	*A-505-C1D	Body	1	4847		
	*A-505-A38D	Bushing	1	4847		
28- 2	A-513-16	Pin—Dowell	1	4847		
28- 3	A-505-B4D	Sleeve	1	4847		
28- 4	A-505-A12D	Pin—Anchor	1	4847		
28- 5	A-505-B5D	Rotor	1	4847		
	*A-505-B9D	Body—Rotor	1	4847		
	*A-505-B6D	Shaft—Rotor	1	4847		
28- 6	9103-K	Bearing—Ball Radial	1	4847		
28- 7	A-501-44	Ring—Seal	2	6700		
28- 8	A-505-A8D	Blade	1	4847		
28- 9	A-505-A13D	Gasket—(.0015 in. thick)	2	4847		
28-10	A-505-A13E	Gasket—(.002 in. thick)	AR	4847		
28-11	A-505-A11D	Adapter--Assembly	AR	4847		
	*A-505-C2D	Adapter	1	4847		
	*A-505-A38D	Bushing—Bearing	1	4847		
	*A-505-A32D	Bushing—Plunger	1	4847		
	*A-505-A15D	Plug—Taper	1	4847		
28-12	AN73-A5	Screw—Hexagon head No. 10-24 thread x 1½ in.	5	4847		
28-13	AN960-10L	Washer—Plain No. 10	8	6500		
28-14	A-505-A13D	Plunger	8	6700		
28-14A	A-501-A60	Filter—Pad oiling	1	4847		
28-15	A-513-30	Gasket	1	4847		
28-16	A-505-A16D	Cap—Oiler	1	4847		
28-16A	A-501-A59	Filter—External oiling	1	4847		
28-17	A-505-A30D	Retainer—Spring	1	4847		
28-18	A-513-28	Spring	1	4847		
28-19	A-505-A33D	Seal Assembly	1	4847		
	*A-505-A34D	Flange	1	4847		
	*A-501-49A	Ring—Nose	1	4847		
	*A-501-52	Bellows	1	4847		
28-20	A-501-51	Spring	1	4847		
28-21	A-505-A35D	Gasket	4	4847		
28-22	A-505-B39D	Nut--Seal	1	4847		
	A-506-BA	Coupling Assembly	1	4847		
28-23	A-506-B1B	Flange—Drive	1	4847		
28-24	A-506-B2B	Flange—End	1	4847		
28-25	A-506-A3B	Spring	1	4847		
28-26	A-506-A4B	Shell	1	4847		
28-27	A-506-B5A	Driver—Center	1	4847		
28-28	A-502-6 Cont'l	Ring—Snap	1	4847		
28-29	AN913-1S	Wire—Lock, No. 22 (.0253) x 6 in. (stainless steel)	48 in.			
28-30	A-505-A40D	Plug—Pipe ⅛ in.	3	6500		
28-31	AN535-00-2	Plate—Name	1	4847		
28-32	AN4045	Screw—Drive No. 00 x ⅛ in.	4	6700		
28-33	A-505-A17D	Gasket	1	4847		
28-34	A-505-A18D	Plug—Pipe silica-gel dehydrating ½ in.	2	4847		
28-35	A-505-A19D	Guard—Cone	1	4847		
28-36	A-505-A20D	Cone	1	4847		
		Wire—Clip	4	4847		

*Indicates non-procurable parts