
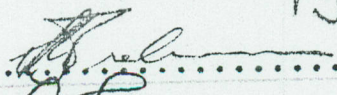


BEECH D18 ROOF HATCH DATA

E.R. 69029

BEECH D18 ROOF HATCH DATA


Prepared by ..... (M.H.)  ..... Date ..... APR 24/69 .....

Project Leader .....  ..... Date ..... Apr 28/69 .....

Approved by ..... W.R. Torrance ..... Date ..... APR 28/69 .....



..... Date .....

PREPARED BY .....  
CHECKED BY .....  
APPROVED BY .....

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DATE April 24, 1969

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<u>ISSUE</u>	<u>PREPARED BY</u>	<u>APPROVED BY</u>	<u>DATE</u>
A Original Issue			
B Page 2: 112-21021 Rev D was C 112-21024 Rev B was A 112-21032 Rev B was A			Oct./69


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BEECH D18 ROOF HATCH DATA


INTRODUCTION

This report has been prepared to record data relating to the Cockpit Roof Hatch for the Beech D18S. The original information for this design came from R.L. Liesenfeld Drawings C-129 (2 sheets) and Report No. 159 dated May 10, 1961. F.A.A. approval of the Liesenfeld data at that time resulted in the issuance of STC-1074, applicable to the Beech C18S only.

In conjunction with Bristol's float installations on D18S aircraft the Liesenfeld drawing was productionized on the Bristol drawings listed herein and approval sought from the F.A.A. for application to Beech Models D18S, C45G, C45H, TC45G and TC45H. Structural analysis required for this current F.A.A. certification is included herein.

NOTE: Correspondence pertaining to this subject is filed under 1160-00 (F.A.A.) Floats D18S.

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APPLICABLE INFORMATION


<u>Drawings</u>	<u>Rev.</u>	<u>Title</u>
112-21021	D	Roof Hatch Installation
112-21022	A	Angle - Roof Hatch Hinge
112-21023	C	Bracket - Side Pulley Support
112-21024	B	Bracket - Center Pulley Support
112-21025	A	Zee Section - Seal Retainer
112-21026	A	Channel - Frame Side
112-21027	A	Channel - Frame Fwd
112-21028	A	Channel - Frame Aft
112-21029	A	Clip - Frame Corner
112-21030	A	Bracket Assy - Rudder Trim Crank
112-21031	B	Hatch Assembly
112-21032	B	Block - Roof Hatch Lock
112-21033	A	Cable Assy - Rudder Trim
112-21034	A	Seal - Roof Hatch

Ref. Drawings: Liesenfeld C-129, Sheets 1 & 2

Ref. Report: Liesenfeld #159

(Note: Liesenfeld data applicable only to Beech C183 aircraft,  
Ref. STC-1074)

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## STRUCTURAL DATA

### 1.0 General

The installation of the roof hatch (112-21021) makes it necessary to re-route the rudder trim cables and reposition the trim crank assembly (Beech Dwg. No. 187730).

The rudder trim crank is repositioned aft and to port of the original location and supported by bracket 112-21030. The cable is therefore re-routed in this area and brackets 112-21023 and 112-21024 support pulleys for this purpose.

### 2.0 Loads Applied To Mounting Structure

2.1 Cable tension is pre-set to  $10 \pm 2$  lbs.  
(Ref. T.O. 1C-459-2, Section II, Para 2-197)

2.2 In normal operation a load between 5 and 10 lbs. is required to operate the crank handle.

2.3 The maximum load which can be applied to the crank handle before slipping occurs is estimated to be 40 lbs.

The maximum load of 40 lbs. will be considered the design criterion.

### 3.0 Bracket Assembly 112-21030

Crank handle load	=	40 lbs.
Reacting cable load	=	80 lbs.
Av. load/fixing bolt (crank assy to bracket)	=	20 lbs.
Av. load/fixing rivet (bracket to skin)	=	4 lbs.

Since the moment effect in the horizontal plane is self-balancing within the crank assembly and the moment effect in the vertical plane is negligible, the mounting of the crank assembly is satisfactory.

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4.0 Bracket 112-21023

- Resultant load applied to bracket = 80 lbs.
- Lug tensile stress = 1116 psi.
- Lug shear stress = 835 psi.
- Lug bearing stress = 3324 psi.
- Av. load/fixing bolt to channel 112-21026 = 20 lbs.

The bracket and fixings are satisfactory by inspection. Since the moment effect is negligible and the channel 112-21026 is supported by the bulkhead at Sta. 5 and stabilized by the skin and transverse channel 112-21028, the support of bracket 112-21023 is considered adequate.

5.0 Bracket 112-21024

- Resultant load applied to bracket = 113 lbs.
- Lug strength is satisfactory.
- Bearing stress = 4695 psi.
- Mean compressive stress = 512 psi.
- Av. load/fixing bolt to bulkhead at Sta. 5 = 57 lbs.

Since the moment effect is negligible and the bulkhead at Sta. 5 is relatively stiff in the fore and aft direction, being stabilized by the skin and door frame, the support of bracket 112-21024 is considered adequate.

6.0 Conclusions

Due to the small loads involved in the operation of the trim mechanism and the adequate support of the structure, the re-routing of the trim cables and the additional brackets are considered entirely satisfactory.