AD 75-27-09R*** BEECH
Amendment #, Supercedes AD75-27-09R2 and all previous AD's and Amendments related to this subject.

Applies to all Beech 18 series airplanes, including all military counterparts thereof and those Beech 18 series airplanes modified in accordance with Supplemental Type Certificates (STC's), regardless of the category or categories of airworthiness certification.

COMPLIANCE: Required as indicated. To prevent possible failure of wing and center section due to internal corrosion or structural cracking, accomplish the following for the left and right sides of each affected airplane:

1) Prior to the next flight after October 1, 1980, all Beech 18 series airplanes must incorporate one of the following approved STC's for reinforcement of the wing spars:

SA643CE with SA1206CE; SA832SW with SA895SW; SA1581SW with SA1582SW; SA2000WE: SA962WE; SA814SO; SA1533WE with SA2737WE; SA1192WE with SA3229WE; SA3010WE with SA3021WE, SA3009WE; SA81SO, and any future STC that includes a notation that refers to this directive.

2) Within 1500 hours time in service or 48 months*, whichever occurs first, from the last inspection (AD75-27-09, as revised), inspect the front spar center section and outer wing panel lower spar at sites for the presence of cracks or corrosion within the spar tubes using methods specified below for left and right sides:

WING STATION	SITE	METHOD
12	Bottom Tube Corrosion	X-Ray
20	Bottom Tube Corrosion	X-Ray
32	Tip of welds at wing splice plate, fore and aft surfaces of cap	X-Ray
43 to 45	Tip of weld around cluster upper surface of cap	X-Ray
46	Outboard ends of splice cal, upper and lower surface of cap	X-Ray
57, 63, 64, 73, & 81**	Tips of welds at gussets upon surface of the cap	X-Ray
60 & 62	Tip of weld shown in Figure 4	X-Ray
61	Lower surface of spar cap below tube cluster, as seen from wheel well	X-Ray
90**	Tips of welds at clevis tangs, upper and lower surface	X-Ray
90U	Tips of welds at clevis tangs, upper and lower surface	X-Ray
102 & 111	Tips of welds as shown in Figure 4	X-Ray

*Upon operator's request, and FAA Maintenance Inspector may extend this interval by not more then 100 hours or 30 days to permit compliance at an inspection period established for the operator.

** Multiple sites will appear on one film

3). Temporarily remove steel straps and inspect strap components for corrosion, fretting, cracking, and other defects in accordance with the applicable STC Holder's Instructions, as follows:

STC Holder	Instructions
STC SA1192WE with SA3229WE (Aircraft Specification A-765) VINTAGE AIRCRAFT, INC. (Formerly Aerospace Products, Inc.) 7432 C.E. Dixon Street Stockton, CA 95206	Number 1869, dated May 1980
STC SA81SO (Aircraft Specification A-765) AVIATION FABRICATORS, INC. (Formerly Airline Training, Inc.) 805 N. Fourth Street Clinton, MO 64735	Section 7, Document 7132, Dated August 1974, Revision G, Dated January 22, 1980
STC SA962WE (Aircraft Specification A-765) AVDESIGN, INC. (Formerly Canadian Aerocon, Ltd.) 375B Durley Avenue Carmarillo, CA 93010	Maintenance Manual Supplement Dated July 1973
STC SA832SA with SA895SW (Aircraft Specification A-765) SIERRA INDUSTRIES, INC. (Formerly The Dee Howard Company) 122 Howard Langford Drive Uvalde, TX 78801	Rev. A Service Bulletin SB18-2 Dated July 1980
STC SA2000WE (Aircraft Specification A-765) SOUTHWESTERN AERO EXCHANGE, INC. (Formerly Hamilton Aviation)	Document D4-74, Dated July 1974

18502 E. 108th Street
Owasso, OK 74055
STC SA643CE with SA1206CE Service Bulletin SB18-1
(Aircraft Specification A-765) Dated July 1980

JOURDAN AIRCRAFT
8648 E. 108 Terrace
Kansas City, MO 64134

STC SA3010WE with SA3021WE, SA3009WE
STC SA1581SW With SA1582SW
STC SA1533 with SA2737
(Aircraft Specifications A-757 & A-2-582)

THE TWIN BEECH 18 SOCIETY – A Division of
STAGGERWING MUSEUM FOUNDATION, INC.
P.O. Box 550
Tullahoma, TN 37388

4). Remove all required access covers and other equipment as necessary to eliminate interference with required inspection. Drain inboard main fuel tanks to half full prior to X-Ray of WS 60 and 62.

A). Clean all site areas with solvents or equivalent prior to X-Rays to remove foreign matter that may interfere with the clarity of the X-Rays. Visually inspect the exterior areas of the required sites for signs of corrosion or other defects.

B). The person performing any X-Ray inspection required by this AD shall, in addition to providing the information required by 14 CFR 43.9 and 91.417, have as a minimum, Level II qualification in the method of radiographic inspection used. A Level II person qualified in the method of radiography performed, may perform the specific evaluations for acceptance or rejection determinations according to written instructions, and to record the results. The NDT Certification Level of the person making the final determination must be included as a part of the maintenance record entry required by 14 CFR 43.9 and 91.417.

C). In the event a determination is made that a fault appears on the radiograph, the procedures stated in Paragraph 8) of this document must be followed.

5). Temporarily or permanently install metallic tape, wire or “hose" clamps squarely around the spar cap (existing clamps, etc., may be used) as necessary to provide two X-ray beam alignment indicators near WS 32, 73, and 81 sites, and near WS 57 and 64 sites if the latter are to be separately x-rayed. Each indicator must be

at lease one inch from the nearest inspection site, at least two inches from the companion indicator, and perceptible in the related radiograph.

6). Taking only one radiograph at a time, accomplish X-ray inspection in accordance with ASTM E1742, or an equivalent published standard and the following instructions:

a) Use ASTM E1742 approved penetrameters of sizes specified by figures of this directive except at WS 90U and 62 sites where no penetrameter is required. Secure penetrameters to source-side surface of the spar cap, except film-side placement is permitted at WS 102 and 111 sites if access does not allow source-side placement.

b) At each site, use GAF 800, DuPont NDT-65, Kodak AA, or equivalent film, sandwiched between lead screens of 0.005-inch thickness. Additionally, at WS 60, 62, and 111 sites, use a second film in multi-film technique, which provides film speed ratio of Kodak M/Kodak AA. With each film pack, use small identification symbols for at least the site (e.g., LWS 81, RWS 90U, LWS 60A, etc.), date, and airplane registration number. Position each film pack close to the site, using figures of this directive for guidance.

NOTE: It is advisable to secure a “back-up” lead plate of 0.12-inch thickness at all sites, especially where film is beneath the spar tube.

c) Ascertain that the X-ray source is secured against the upper wing skin for WS 60 and 62 sites and approximately 36 inches from the film at all other sites, at chord-wise and span-wise angles specified by Figure 3 of this document.

d) Ascertain that neither the airplane nor the source will be moved by wind or other influences, and expose the film so as to obtain 1.5 to 2.8 radiographic density near the inspection sites specified in Figures 4 and 5 of this document. Use the same kinds of film and exposure time for WS 62 sites as for WS 60 sites.

e) Retake any radiograph which evidences unsharpness, missed or obscured site, improper density, improper beam alignment, or in which at least two penetrameter holes are not perceptible.

NOTE: Beam alignment indicators are either structural features such as top and bottom tangs, or indicators specially installed such as hose clamps and metallic tape.

7). Using a low power-magnifying device, examine each radiograph under viewing conditions, which show penetrameter holes. Look for evidence of corrosion pitting and transverse cracking in unwelded spar cap material. Pay particular attention to unwelded spar cap material adjacent to discontinuities such as screw holes, corrosion pits, and tips and edges of welds. Submit a report to the maintenance facility accomplishing the AD showing the location of each indication of cracking and corrosion pitting in all spar tube material. Use FAA

Advisory Circular AC43-4A, “Corrosion Control for Aircraft” as a guide for the classification of corrosion.

8). If any indications, corrosion, or cracks are noted on the X-Ray film, those areas are to be inspected by appropriate means to confirm those indications. Indications that are confirmed as cracks or corrosion that is classified as greater then “moderate” must be evaluated by a person that has a Level III in radiography for concurrence. The results of that evaluation will be made a part of the aircraft permanent records. Obtain (unless previously done) and follow the cognizant (aircraft or strap, as appropriate) manufacturer’s instructions for repair and/or continued service of each crack that is found during inspections required by this directive. The repair and/or continued service of each crack may also be evaluated by a qualified structures Designated Engineering Representative (DER) for repair.

9) The spar must be re-inspected for cracks in accordance with the hourly requirements of Paragraph 2 of this Airworthiness Directive.

10) If corrosion that is classified as “light” was detected on the X-Ray film, the spar is to be treated in accordance with the provisions of Appendix A of this document. The spar must be re-inspected for corrosion in accordance with the requirements of Paragraph 2 of this Airworthiness Directive.

11) If at the next inspection, no propagation of the corrosion is detected, the spar may be re-inspected in accordance with the calendar provisions of Paragraph 12 of this Airworthiness Directive.

12) If no corrosion is detected on the X-Ray film, the calendar inspection interval required by Paragraph 2 of this Airworthiness Directive may be increased to 60 months. The spar is to be treated internally in accordance with Appendix A of this document.

13) Corrosion damage must be classified as light, moderate, or severe, in accordance with FAA Advisory Circular AC43-4A, “Corrosion Control for Aircraft.” External corrosion must be treated in accordance with AC43-4A. Internal corrosion must be treated as stated in Appendix A of this document. Corrosion that is classified as greater then “light” must be evaluated by a qualified structures Designated Engineering Representative (DER) for repair.

14) Any equivalent method of compliance with the inspection required by Paragraphs 10, 11 and 12 of this AD must be approved by the Chief, Engineering and Manufacturing Branch, FAA, Central Region.

This AD supersedes AD 64-01-01, Amdt. 810 of Part 507 and any other amendments applicable to said AD, AD 64-21-03 (Amdt. 812 of Part 507 and any other amendments applicable to said AD). AD 64-21-03 (Amdt. 812 of Part 507 and any other amendments applicable to said AD), AD 73-18-04 (Amdt. 39-1708 and any other amendments applicable to said AD), and AD 75-09-18 (Amdt. 39-2241 and any other amendments applicable to said AD).

APPENDIX A

INTERNAL TREATMENT FOR BEECH 18 SERIES SPAR AND INTERNAL SPAR CORROSION THAT IS CLASSIFIED AS “LIGHT”

- VOLPAR (TRI-GEAR) AIRCRAFT

Remove two bolts from each attach point of the VOLPAR truss to Beech spar truss assembly, one at the lowest point and one at the highest point of attachment. Blow warm air (max 300°F) for a period of 30 minutes through each tube with an air nozzle applied at the upper bolt hole.

> **NOTE:** Drive screws located at a point lower than the lower most bolt hole should also be removed.

Remove the two AN3-17A bolts from the lower elliptical spar tube and the 299-2 drag strut at the point just inboard of the outer wing attach fitting. (See Appendix Figure No.3)

Inspect the bolts for indications of corrosion and pitting and the edge of the bolt hole through the elliptical spar tube for indications of moisture and/or corrosion.

Remove the drive screw from the elliptical spar tube at a point just outboard of the side of the fuselage. Blow warm air (max 300°F) through the elliptical spar tube by introducing the air at the bolt hole in the spar tube in one nacelle and out at the other nacelle.

Seal all remaining bolts and attach points with Pro Seal Compound 890, or equivalent.

To prevent the recurrence of corrosion, treat the internal spar using Lear Chemical Corp. ACF-50 (MIL-C-81309) corrosion treatment, or equivalent, per ACF-50 Procedure Methods Manual,

Replace all bolts and nuts removed and seal with Pro Seal Compound 890

> **NOTE:** Pro Seal Compound 890 available from Coast Pro Seal Company, Compton, California 90221. An equivalent sealer to Pro Seal Compound 890 may be used.

> **NOTE:** All reference in this Appendix was made concerning the left side of the aircraft spar truss. The inspection also applies to the right side spar truss assembly.

- CONVENTIONAL GEAR AIRCRAFT

- ALTERNATE METHOD TO PARAGRAPH 1 WHEN REMOVAL OF THE DRIVE SCREW AT THE ELLIPTICAL SPAR CANNOT BE ACCOMPLISHED

NOTE: Aircraft with conventional landing gear spar tube access can be gain through the existing Linoil drain holes. These holes can be enlarged to a maximum diameter of 5/32". In the upper spars, the drain holes are located in the upper surface. Where holes are not accessible, new holes of no larger the 5/32" can be drilled in the lower surface at each end of the center section upper spar. The hole must be at least ½" away from the end of a gusset or end of a wing attach forging weld.

Access to the outer panel lower spar cap can be obtained by first marking a ½" hole in the skin centered under the spar, near the inboard and outboard ends (Approx. WS 102 & 177), and then drilling the (5/32" max) holes in the spar.

After the treatment processes are completed, these holes must be closed by installing a blind rivet, drive screw, or tapping the hole to accept a AN525-10R6 screw. The blind rivet or screw must be sealed using Pro Seal Compound 890 or equivalent. The holes in the skin can be closed using a ½ flush plug (metal or synthetic material).

1. Blow warm air (max 300°F) for a period of 30 minutes through each tube with an air nozzle applied at the upper bolt hole or Linoil drain hole.

2. Treat the internal spar using Lear Chemical Corp. ACF-50 (MIL-C-81309) corrosion treatment, or equivalent, per ACF-50 Procedure Methods Manual.

3. Close and seal the access hole as stated in the above NOTE.

Nothing Follows