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NATIONAL TRANSPORTATION SAFETY BOARD

AIRCRAFT ACCIDENT REPORT

AIR IOWA, INCORPORATED
BEECH E18S, N310WA
DAVENPORT, IOWA
APRIL 19, 1973

NATIONAL TRANSPORTATION SAFETY BOARD
Washington, D.C. 20591
REPORT NUMBER: NTSB-AAR-73-18

FILE NO. 3-1558

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APRIL 19, 1973

ADOPTED: OCTOBER 3, 1973

NATIONAL TRANSPORTATION SAFETY BOARD
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15. Supplementary Notes

This report contains Aviation Safety Recommendations A-73-16 through A-73-18.

16. Abstract

Air Iowa, Inc., Flight 333, a Beech Aircraft Model E18S, N310WA, scheduled as an air taxi passenger flight, crashed into an open field about 1704 c.s.t., on April 19, 1973, while approaching the Municipal Airport, Davenport, Iowa, for a landing. The pilot and five passengers were fatally injured. There were no injuries to persons on the ground. The aircraft was destroyed by impact.

The National Transportation Safety Board determines that the probable cause of this accident was the in-flight failure of the right wing, which resulted from a preexisting fatigue crack in the lower spar cap of the wing at Wing Station 81. Although the fatigue crack existed and was discernible during inspections conducted over the 6-year period prior to this accident, it was not detected.

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AIR IOWA, INCORPORATED
BEECH E18S, N318WA
DAVENPORT, IOWA
APRIL 19, 1973

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D. C. 20591
AIRCRAFT ACCIDENT REPORT

Adopted: October 3, 1973

AIR IOWA, INCORPORATED
BEECH E18S, N310WA
DAVENPORT, IOWA
APRIL 19, 1973

SYNOPSIS

Air Iowa, Inc., Flight 333, a Beech Aircraft Model E18S, operating as a scheduled air taxi passenger flight, crashed into an open, plowed field about 1704 central standard time, April 19, 1973, while approaching the Municipal Airport at Davenport, Iowa, for a landing. The accident occurred approximately 3 miles southwest of the Davenport Airport. The pilot and five passengers were fatally injured. There were no injuries to persons on the ground. The aircraft was destroyed by impact forces; there was no fire.

The National Transportation Safety Board determines that the probable cause of this accident was the in-flight failure of the right wing, which resulted from a preexisting fatigue crack in the lower spar cap of the wing at wing Station 81. Although the fatigue crack existed and was discernible during inspections conducted over the 6-year period prior to this accident, it was not detected.

As a result of this accident, the Safety Board made three recommendations to the Federal Aviation Administration regarding the quality of present inspection methods and the need for reinforcement of the wing structure of Beech Model 18 aircraft.

INVESTIGATION

On April 19, 1973, a Beech Aircraft, Model E18S, N310WA, was operating as Air Iowa, Inc., Flight 333 (a scheduled air taxi) from Muscatine, Iowa, to O'Hare International Airport, Chicago, Illinois, with a scheduled en route stop at Davenport, Iowa. The flight departed from the Muscatine Airport about 1650 c.s.t., 1/ on a VFR 2/ flight, with no flight plan.

There was no record of any radio communication with Flight 333 before its departure from Muscatine or while it was en route to Davenport. Neither the Muscatine Airport nor the Davenport Airport is controlled.

The witnesses in the vicinity of the impact area generally agreed that when they first observed the aircraft, it was in level flight, clear of the clouds, and flying at an estimated altitude of 1,500 to 2,000 feet above the ground, with gear and flaps retracted. While the aircraft was approaching the witnesses' position, the right wing suddenly folded upward. As the wing folded, the aircraft rolled to the right and nosed down into an uncontrollable dive to the ground. The witnesses stated that there was no visible fire or smoke or separation of any parts from the aircraft before ground impact.

The aircraft struck the ground in a nearly vertical nosedown attitude, and was demolished.

The aircraft was fragmented by impact forces. The wreckage, which was strewn along a ground path approximately 170° magnetic, was confined to an area about 210 feet long and 110 feet wide. All major components and extremities of the aircraft were accounted for near the point of initial impact. There was no evidence of in-flight fire or explosion.

Examination of both engines showed no evidence of in-flight malfunction or failure. The landing gear and flap assemblies were in the fully retracted position. Damage to the upper outboard right wing attach forging showed that the outboard panel had rotated upward about the hinge fitting approximately 115° before impact. This was confirmed by ground impact marks. The left wing structure was attached and in place at time of impact.

On-scene examination of the right wing disclosed a fracture in the tubular lower front main spar cap of the right center section truss assembly at Wing Station (WS) 81. Visual inspection of this separated area showed

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1/ All times are central standard, based on the 24-hour clock.

2/ Visual Flight Rules

that approximately 80 percent of the tube wall had failed in fatigue before final separation.

Metallurgical examination of portions of the left and right wing lower spar caps disclosed the following:

1. The separation of the right wing, lower spar tube at WS 81 resulted from a fatigue crack which originated at the toe of the weld joining the gusset plate to the lower spar tube. The crack progressed transversely in both directions around the spar tube over approximately 80 percent of the tube wall before the final failure occurred in tension overload.

2. All other fractures in the center section truss assembly were typical of fracture caused by overload.

As a result of previous service experience, the Beechcraft Model 18 wing spar structure was the subject of a number of company service bulletins and of Federal Aviation Administration (FAA) Airworthiness Directives which listed procedures to detect the presence of fatigue cracks.

After this accident, Board investigators reviewed the records of seven radiographic inspections, made by various repair stations dating back to 1967, which related to the area in which this fracture occurred, Crack indications on a number of X-rays, which were clearly visible to Board investigators, had not been reported by the inspecting facilities.

The procedures for detection of cracks in the elliptical front spar cap of the wing center section are outlined in FAA Amendment 39-1526 to Airworthiness Directive 72-20-5, effective September 29, 1972. The radiograph exposure of the X-ray film, also specified in this amendment, should be from 1.5 to 2.8 on the densitometer of the National Bureau of Standards density scale. The radiograph exposures of several of the X-ray films examined were found to be outside the allowable tolerances. The densities of this film ranged from 0.5 to 5.0. The procedures and densities specified in Amendment 39-1526 were also specified in the amendments issued before September 1972.

All of the required inspections were accomplished within the specified flight time limits. The aircraft had been flown approximately 66 hours after the last radiographic and magnetic particle inspection conducted on March 21, 1973.

ANALYSIS AND CONCLUSIONS

The outer panel of the right wing failed in flight and rotated upward approximately 115° before the aircraft struck the ground, which confirms the statement of witnesses that the right wing folded upward in flight. Metallurgical examination of the right wing tubular lower spar cap showed that the wing failure was caused by a fatigue fracture in the lower spar at Right WS 81.

This was the fifth fatal accident since June 1964 that involved wing failure in Beechcraft Model 18 aircraft resulting from a fatigue fracture at WS 81. All of these wing failures occurred in areas where inspections designed to detect fatigue cracks were required by Airworthiness Directives. Again, the problems in detecting fatigue cracks during these required inspections are clearly demonstrated in this accident. Examination by the Safety Board of the X-rays taken during the inspections on May 12, 1967, July 7, 1971, December 14, 1971, May 25, 1972, October 26, 1972, and March 31, 1973, indicated a crack at Right WS 81. However, the crack indication had not been detected by the personnel authorized to perform these inspections, either through examination of the X-ray films or by the other means for inspecting the spar specified in the Airworthiness Directives. The Board noted an indication of the crack which caused the failure at Right WS 81 on the X-ray film dated May 12, 1967. Although the crack was not readily identifiable as a fatigue crack, it was nevertheless visible and should have prompted concerned personnel to make a more thorough inspection of the area. The fatigue crack was identifiable, however, on the X-rays dated July 7, 1971, and on all subsequent X-ray photographs taken from July 7, 1971, to the date of the accident. During that period, the fatigue crack at Right WS 81 should have been detected by any one or all three methods approved for inspection: visual, magnetic particle, and X-ray.

The Safety Board concludes that the concerned repair stations did not comply with the wing spar inspection procedures prescribed in the applicable airworthiness directives and that quality control of their inspection programs was practically nonexistent. As a result, the aircraft was flown with a detectable crack in the elliptical tube of the lower main spar at Right WS 81 until the crack became large enough to cause complete failure. Furthermore, there are no well-defined standards for certifying a repair station as a radiographic facility or for qualifying a technician for nondestructive testing.

The Safety Board recognized these deficiencies early in the investigation and recommended to the Administrator that the FAA take additional actions to assure the continued airworthiness of these aircraft.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the in-flight failure of the right wing which resulted from a preexisting fatigue crack in the lower spar cap of the wing at Wing Station **81.** Although the fatigue crack existed and was discernible during inspections conducted over the 6-year period prior to this accident, it was not detected.

RECOMMENDATIONS

As a result **of** the investigation **of** this accident, the Safety Board, on April **25,** 1973, issued three recommendations (Numbers A-73-16 through **18)** to the Federal Aviation Administration that were intended to increase the surveillance and quality control of all inspections made to ensure detection of fatigue cracks in the wing structure, to incorporate one of several approved kits to reinforce the wing spars **on** all models of this aircraft, and to consider the practicability of licensing aircraft radiographic technicians. Copies of the recommendation letter and the Administrator's response thereto are included in Appendix C.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JOHN H. REED
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ LOUIS M. THAYER
Member

/s/ ISABEL A. BURGESS
Member

/s/ WILLIAM R. HALEY
Member

October 3, 1973

CREW INFORMATION

Captain Charles E. Nixon, aged 37, held Airline Pilot Certificate No. 1453010 with flight instructor and commercial privileges in single- and multiengine land aircraft. He held an FAA first-class medical certificate, issued on February 23, 1973, with no limitations.

He had accumulated a total of approximately 6,000 flight hours, of which 2,000 were in the Beechcraft Model 18; 247 hours were flown in this make and model within the preceding 90 days. According to FAA and to the operator's records, Mr. Nixon was certificated and currently qualified in compliance with applicable Federal Aviation Regulations.

AIRCRAFT INFORMATION

Beech Aircraft Model E18S, N310WA, Serial No. BA-12, had accumulated a total of 11,339 hours of flight. The last annual inspection was accomplished on July 11, 1972, and the No. 4 inspection of Air Iowa's approved inspection plan, on April 13, 1973. The aircraft had flown approximately 16 hours since the No. 4 inspection.

With the exception of the inspections discussed in the text of this report, the aircraft had been maintained in accordance with the Federal Aviation Regulations.

The wing elliptical front spar lower cap had been inspected within the prescribed 500-hour flight time intervals on March 21, 1973, October 26, 1972, May 24, 1972, December 14, 1971, and July 7, 1971.

No cracks were detected during these inspections.

APPENDIX C

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 25, 1973

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD at its office in Washington, D. C. on the 23rd day of April 1973

FORWARDED TO:

Honorable Alexander P. Butterfield
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATIONS A-73-16 thru 18

The National Transportation Safety Board's investigation of a recent fatal accident involving a Beechcraft Model 18, N310WA, indicates that a fatigue failure occurred in the elliptical lower cap of the right wingspar at wing station 81. The accident occurred on April 19, 1973, when the aircraft crashed during an approach to land at the Davenport, Iowa, airport. All of the six people aboard the aircraft were killed.

This is another in a long series of accidents, dating back to 1947, that have been caused by fatigue fractures in Beechcraft Model 18 wingspars. The Board's staff of investigators and metallurgists have worked closely with Federal Aviation Administration personnel for a considerable number of years on this problem. One of our investigators is currently working with the FAA and Beech personnel at the Beech factory in Wichita, Kansas, where metallurgical and X-ray plate examinations are being conducted.

We wish to commend the FAA for their continued efforts to insure the airworthiness of Beech 18 aircraft. We believe that your efforts, which are reflected by the numerous AD's published on this problem, have prevented many accidents. The latest Airworthiness Directive (72-20-5, Beech) requires a visual, X-ray, and either a magnetic particle or dye penetrant inspection of the lower spar caps at numerous wing stations. We have examined several sets of X-rays taken on N310WA in accordance with this AD. Reexamination of these X-ray plates at the Beech factory has disclosed that there were detectable crack indications in the ultimate failure area dating back to July 7, 1971.

In view of the above, the Board urges the FAA to examine the recommendation for increased emphasis on the training and qualifications of radiograph interpreters which was made in the Board's report on the 1968 Wein Consolidated F27B accident at Pedro Bay, Alaska, with a view toward ultimate FAA certification and licensing of nondestructive inspection technicians.

The Board believes, however, that the continuing catastrophic wing failure accidents and the present state of the art in nondestructive inspection make it unwise to continue to rely on the quality of presently required inspections to assure the airworthiness of these aircraft.

Therefore, the Board recommends that the Federal Aviation Administration:

1. Revise its existing system of surveillance and quality control of all inspections made under AD 72-20-5 to insure the continued airworthiness of these aircraft.

2. Consider a requirement for the incorporation of one of several approved and available kits to reinforce the wingspars on all Beech Model 18 aircraft, which would exempt them from further inspection, if the FAA is unable to implement effectively Recommendation No. 1.

3. Promulgate an advance Notice of Proposed Rule Making soliciting industry views on the practicability of licensing aircraft radiographic technicians.

These recommendations will be released to the public on the issue date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman; McAdams, Thayer, Burgess, and Haley, Members, concurred in the above recommendations.

By: John H. Reed
Chairman

73417

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON. D.C. 20590

OFFICE OF
THE ADMINISTRATOR

MAY 25 1973

Honorable John H. Reed
Chairman, National Transportation Safety Board
Department of Transportation
Washington, D. C. 20591

Dear Mr. Chairman:

This is in response to Safety Recoomendations A-73-16 thru -18 which are concerned with fatigue fractures in the Beech Model 18 wing.

Safety Recommendation No. 1 - Revise its (FAA's) existing system of surveillance and quality control of all inspections made under AD 72-20-5 to insure the continued airworthiness of these aircraft.

FAA Comment - An airmail airworthiness directive amendment to AD 72-20-5 waa issued April 23, 1973. Paragraph D(2) requires that the two most recent copies of X-rays taken in accordance with AD 72-20-5 or predecessor ADs be transmitted to the Federal Aviation Administration, Engineering and Manufacturing Branch, Wichita, Kansas. where evaluation of the inspection facilities' findings will be made. All domestic regions have been notified via telephone to put more emphasis on Beech 18 air taxi operator maintenance, particularly in compliance with AD 72-20-5 and the airmail amendment.

Safety Recommendation No. 2 - Consider a requirement for the incorporation of one of several approved and available kits to reinforce the wingspars on all Beech Model 18 aircraft, which would exempt them from further inspection, if the FAA is unable to implement effectively Recoomendation No. 1.

FAA Comment - Amended AD 72-20-5 requires within 600 hours that wing stations 73 and 81 be modified in accordance with Beech kits 18-4024 and 791, and within 2000 hours, but not later than May 1, 1975, that wing stations 32, 57 and 64 be modified in accordance with Beech kits 18-4024 and 791 or an approved equivalent.

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Safety Recommendation No. 3 - Promulgate an advance Notice of Proposed Rule Making soliciting industry views on the practicability of licensing aircraft radiographic technicians.

FAA Comment - We are studying this recommendation and we will advise you of our decision.

Sincerely,

Alexander P. Butterfield
Administrator

72-20-5 Beech. Amdt. 39-1526 as amended by Amendment 39-1632. Applies to all serial numbers of Models C18S, AT-11, C-45, C45A, UC-45B, UC-45F, AT-7, AT-7A, AT-7B, AT-7C, JRB-1, JRB-2, JRB-3, JRB-4, SNB-1, SNB-2, SNB-2C, D18S, D18C, C-45G, TC-45G, C-45H, TC-45H, TC-4SJ (SNB-5), JRB-6, E18S, E18S-9700, G18S, 3N, 3NM, 3TM, D18C-T, and RC-45J (SNB-5P), and H-18 airplanes with Serial Numbers BA-730 and below; and to aircraft of the above models subsequently redesignated under a Supplemental Type Certificate, except those modified under the Supplemental Type Certificates referenced by Paragraph F.

Compliance: Required as indicated, unless already accomplished.

To prevent possible wing failure, for airplanes with 1,500 or more total hours' time in service on the effective date of this AD or airplanes that subsequently accumulate 1,500 total hours' time in service after that date, in order to detect cracks in the elliptical front spar lower cap of the wing center section, except as indicated by Paragraph D, accomplish the following within the next 50 hours' time in service after the effective date of this AD (or 500 hours' time in service after the last complete AD 67-16-I/ 71-11-5 or AD 72-85 inspection, if applicable), and thereafter at intervals not to exceed 500 hours' time in service from the date of the date of the last inspection: (These inspections may be performed at one time or may be staggered, provided that no given area exceeds 500 hours' time in service between inspections.)

A) Modify the lower wing skin in accordance with Figure (1) or Figure (2) or an FAA-approved equivalent to facilitate the inspections specified in Paragraph B.

B. (1) Inspect the front spar lower cap of the wing center section on each side of the airplane by methods specified below, except inspection sites reinforced by Beech Aircraft Corporation Kits 18-4024, 791 or 792 need not be inspected:

Wing Station	Site (See Figure 3)	Method (See Para. C)
90	Tips of welds at clevis tangs, upper and lower surfaces of cap	Visual, x-ray and either magnetic particle or penetrant
81, 73, 64 & 57	Tips of welds at gussets, upper surface of cap	" " "
46	Outboard ends of splice in cap, upper and lower surface of cap	" " "
32	Tips of welds at wing splice plate, fore and aft surfaces of cap	" " "
45 to 43	Tip of weld around cluster upper surface of cap	Visual and either magnetic particle or penetrant
61	Lower surface of spar cap below tube cluster, as seen from wheel well	" " "

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(2) Temporarily move clamps and other equipment as necessary to eliminate interference with the above inspections. Removal of spar cap finish is not necessary.

(3) Flex the wing when specified by Paragraphs C and D by applying and relieving a 75 to 100 pound upward force at or near the wing tip on the (left or right) side being inspected. This may be done by hand.

(4) Load the wing on the side being inspected when specified by Paragraph C by applying a 75 to 100 pound upward force at the junction of wing rib number 10 and the front spar. Place material such as lumber under and along the number 10 rib so as to distribute the force.

C. (1) Accomplish visual inspection beforo and after cleaning. and while thr wing is being flexed. Use a flashlight or other illumination and a low power magnifying device.

(2) When the magnetic particle method is chosen, conduct the inspection while the wing is either flexed or loaded. Conduct the inspection before magnetism is indneed and again while magnetism across the inspection site is induced by a Magnaflux Corp. Model Y-5 or YM-5 yoke or when any equivalent is used in accordance with the manufacturer's instructions.

(3) When the penetrant mrthod is chosen. perform the inspection while the wing is being flexed. Use either dye or fluorescent materials in accordance with the penetrant manufacturer's instructions.

(4) For each site where x-ray inspection is specified by Paragraph B, accomplish x-ray inspection while the wing is loaded. Figure 4 is an aid to the following instruction. Place fine grain film (such as GAF 800, DuPont NDT-65 or Kodak AA) sandwiched between lead screens of 0.005-inch thickness on the upper surface of the spar cap (over an inspection site) with identification symbols for at least the site (e.g. LWS 81 etc.), date, and airplane registration number. Secure a steel prnetrameter of 0.005-inch thickness to the lower surface of the spar cap at a location clear of the inspection ,site. Position the x-ray source approximately 36 inches from and generally below the film so that the center of the x-ray beam will be perpendicular to the major axis of the elliptical spar cap and perpendicular to the spanwise centerline of the spar cap at each inspection site. Use a flashlight and a protractor level as necessary to see that aiming of the x-ray beam compensates for wing dihedral and nose up attitude. At those areas covered by aluminum skin, a locally fabricated jig may be used to position the x-ray source. Expose film so that density of the radiograph of the spar cap material near the inspection site is 1.5 to 2.8 on the densitometer or National Burean of Standards density scale. View film to see that the inspection site, the 0.010 inch diameter hole in the penetrameter, and its entire outline are plainly shown. Using a low power magnifying device, examine the inspection site portion of each radiograph for faint indications of cracks in spar cap material transverse to the spanwise centerline.

NOTE: Fourteen radiographs are normally adequate for one complete inspection.

D) 1. A special inspection at wing station 73 and 81 is required within 25 hours' time in service after the effectivr date of this amendment regardless of previous time in service since last inspection and thereafter at intervals not to exceed 100 hours' time in service. Visual and either magnetic particle or penetrant methods mnst be used while the wing is simultaneously flexed.

(2) Within 48 hours after the effective date of this amendment, transmit by most rapid means copies of X-rays of the two most recent inspections taken in accordance with AD 72-20-5 or predecessor ADs to DOT/FAA, Engineering and Manufacturing Branch, Hangar #10, Wichita Municipal Airport, Wichita, Kansas 67209. Evaluation of inspection facility's findings will be transmitted to sender as soon as possible.

(3) Within 600 hours' time in service after the effective date of this amendment,

modify wing stations 73 and 81 in accordance with Beech Aircraft Corporation Kits 18-4024, 792 or any equivalent approved by the Chief, Enginecring and Manufacturing Branch, FAA, Central Region.

(4) Within 2,000 hours' time in service after the effective date of this amendment, but not later than May 1, 1975, modify wing stations 32, 57 and 64 in accordance with Beech Aircraft Corporation Kits 18-4024 and 791, or any equivalent approved by Chief, Engineering and Manufacturing Branch, FAA, Central Region.

E. If a crack is found as a result of any inspection required by this AD, prior to further flight, repair or replace the nffcctcd part in accordance with Beech Aircraft Corporation SAR 59-705 (for w.s. 90), or Kits 791 (for w.s. 32), 792 (for w.s. 81 and 73), and 18-4024 (for w.s. 57. 64, 73, and 81) or any equivalent approved hy the Chief, Engineering and Manufacturing Branch, FAA, Central Region.

F. An airplane is exempt from requirements of this AD if it is altered so as to incorporate STC SA1192WE, SA1533WE, SA832SW, SA2000WE or SA643CE, or any other STC which specifically exempts affected airplanes from compliance with this AD.

G. Written notification mnst be sent to the Chief, Enginecring and Manufacturing Branch, FAA, Central Region, stating the location and length of any cracks discovered during inspections required by this AD, and the total operating time of the airplane at the time of the discovery. In addition, for airplanes not previously inspected per .AD 67-16-1 or AD 72-8-5 results of the initial inspection must be reported as above, even if no cracks are discovered. (Reporting approved by the Bureau of the Budget under No. 04-R0174.)

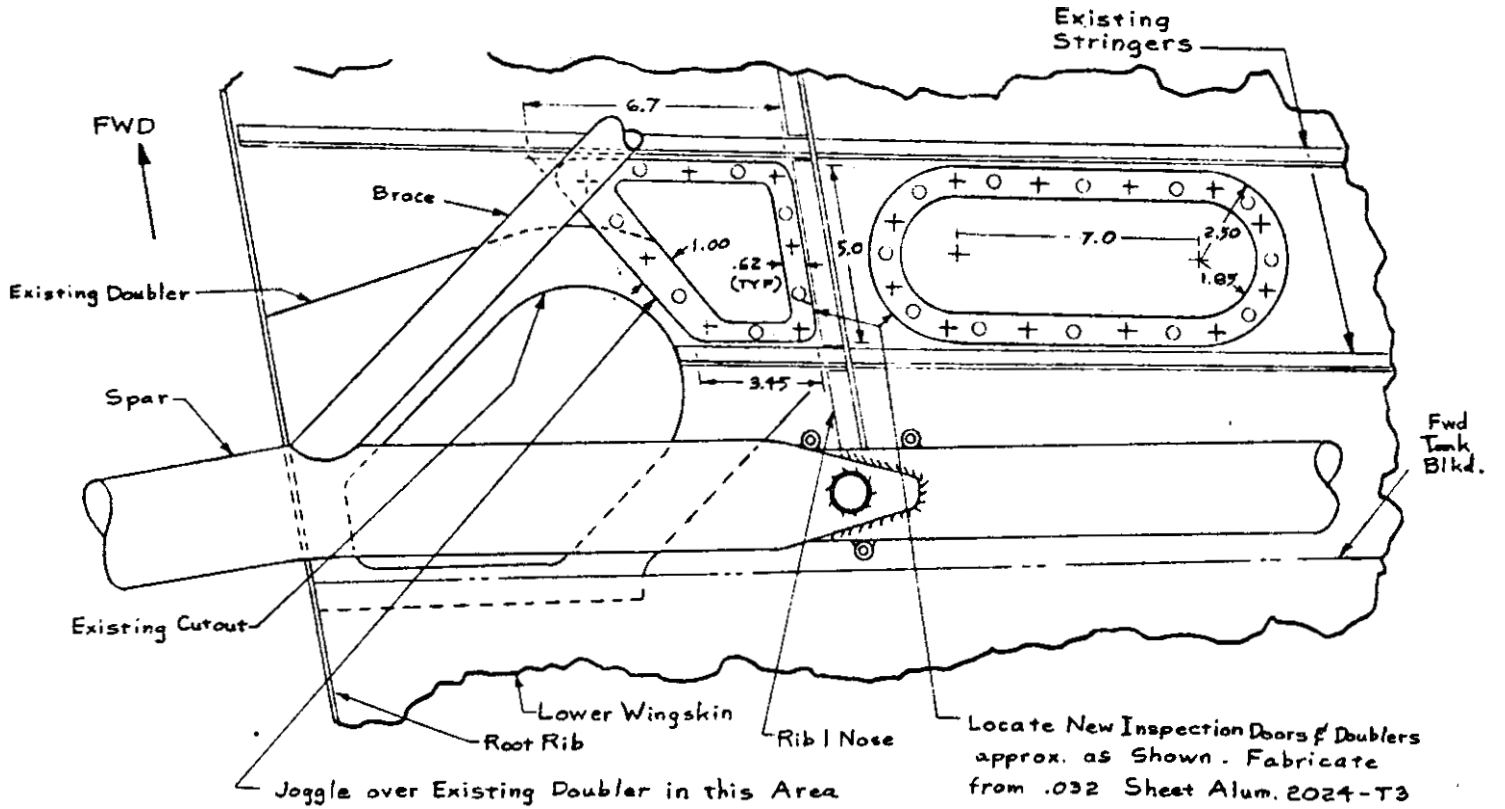
Currently rffective Beech Aircraft Corporation's Service Bulletins 64-15, 61-16, 64-17 and 66-10 and MIL-STD-453 consider this subject, bnt this AD takes precedence in any conflicting detail.

NOTE: Part (b) of AD 64-21-1 and Part (b) of AD 64-21-3 requiring inspection of other portions of the center section and AD 67-8-2 requiring inspection of outer wing panels remain in effect for only some of the airplanes affected by this AD.

This AD (Amendment 39-1526) supersedes AD 72-8-5 (Amendment 39-1432) and AD 72-16-1 (Amendment 39-1493).

Amendment 39-1526 became effective September 29, 1972.

This amendment 39-1632 becomes effective May 7, 1973, to all persons except those to whom it was made effective by letter dated April 24, 1973.



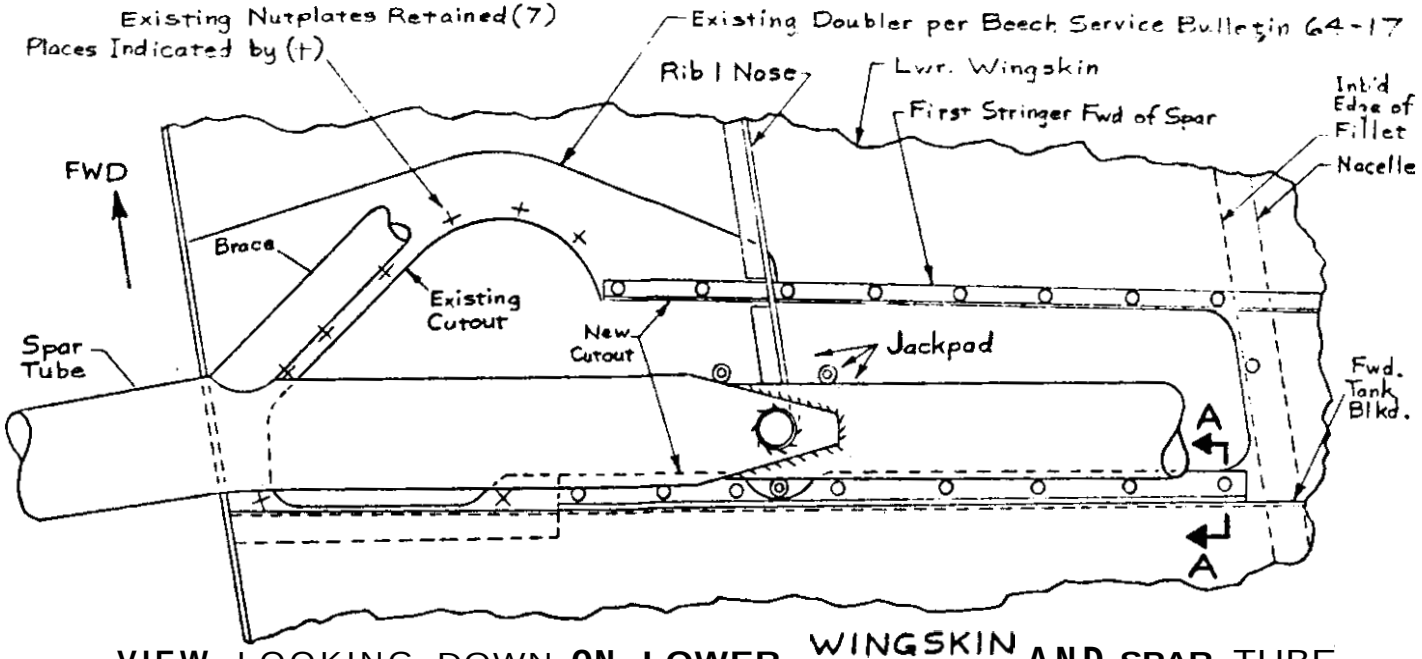
OPERATIONS :

Drill #10 $(^{.200}_{.193})$ hole thru new doors, wingskin & doublers as shown by (O) 19 places (approx. 24" spaces).
Attach (19) nutplates to doublers with countersunk AD3 rivets. (MK1000-3 Nutplates Recommended).
Attach doublers to skin with AD4 rivets shown by (+) 19 places (approx. 2.4" spaces).
Install doors on lower side with #10 screws 19 places.

R.H. WING SHOWN - VIEW LOOKING DOWN ON LOWER WINGSKIN & SPAR
L.H. Opposite (Upper Wingskin Omitted for Clarity)

FIGURE 1

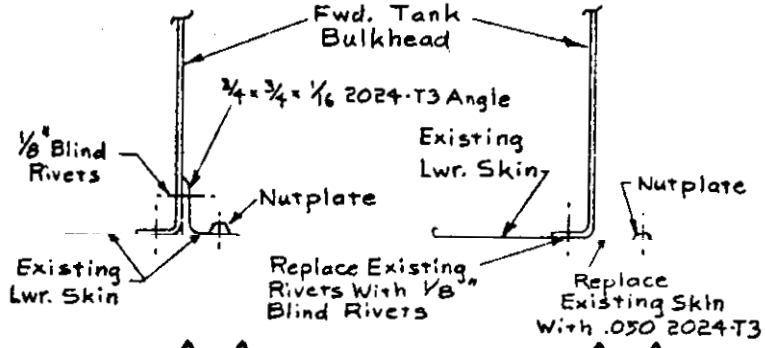
(AD 72-20-5)



VIEW LOOKING DOWN ON LOWER WINGSKIN AND SPAR TUBE

by Bob Crober

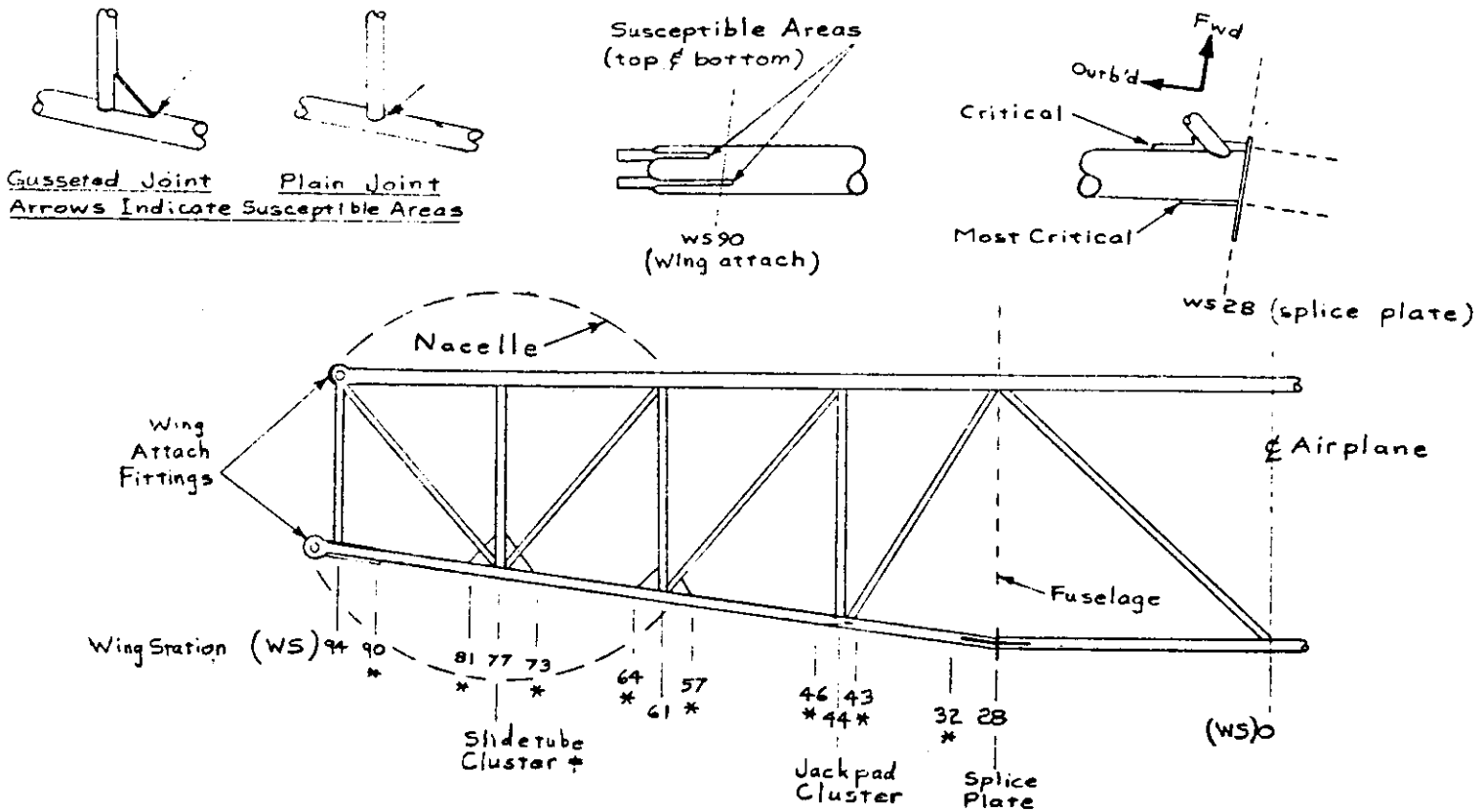
Attach MK1000-3 Nutplates (or equiv.) (17 places) as shown by (O). Cut inspection door from .032 2024-T3 Alum. Allow 1/2" edge margin around all screws (min). Install door on lower side with #10 screws (25 places): cut three holes for jackpad access. Inspection door not shown.



VIEW A-A

VIEW A-A
OPTIONAL MEANS OF ATTACHING INSPECTION PLATE AFT EDGE

FIGURE 2
(AD 72-20-5)



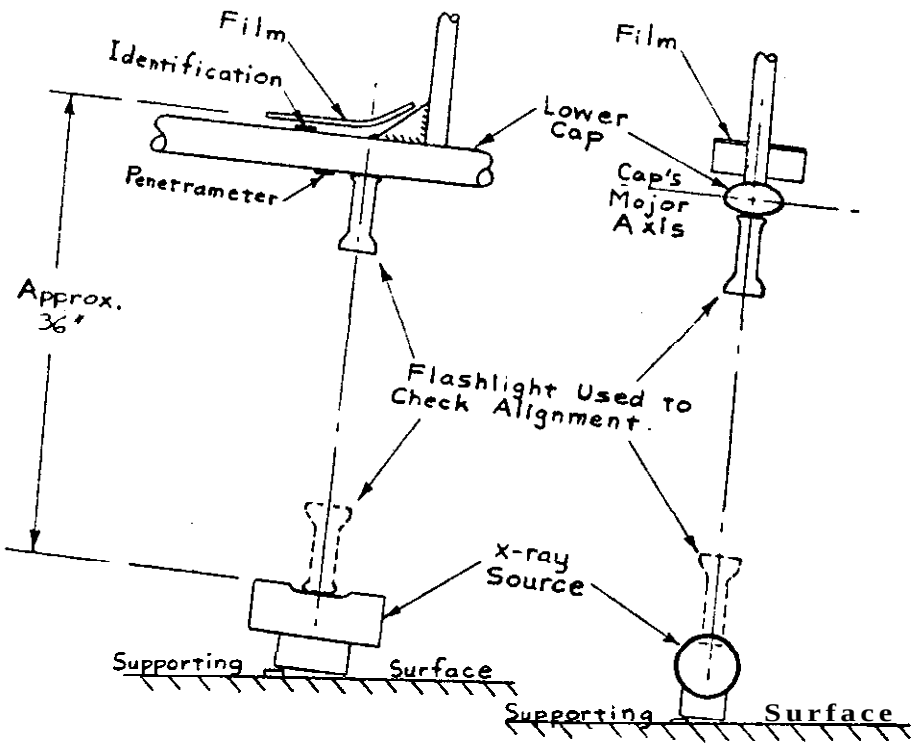
Half of Main Spar Center Section Truss

* INDICATES AREAS TO BE INSPECTED PER THIS A.D.

† SEE AD 64-21-1, part (b) and AD 64-21-3, part (b) .

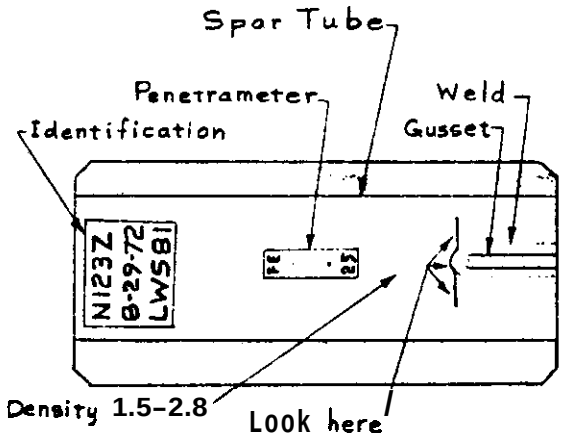
FIGURE 3

(AD 72-20-5)

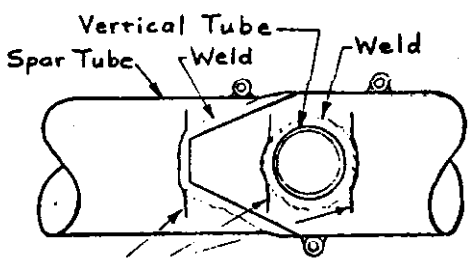


FRONT **VIEW**
SHOWING SETUP FOR DIHEDRAL - TYPICAL GUSSETED JOINT

SIDE VIEW
SHOWING SETUP FOR NOSE-UP ATTITUDE



EXAMPLE of RADIOGRAPH TYPICAL CRACK *SHOWN* GUSSETED JOINT



JACKPAD & SPLICE

FIGURE 4

(AD 72-20-5)