

**75-27-09 R2 BEECH:** Amendment 39-2482 as amended by Amendment 39-2591 is further amended by Amendment 39-3878. Applies to all Beech 18 series airplanes including military counterparts and other counterparts approved by Supplemental Type Certificates (STCs), regardless of the category or categories of airworthiness certification.

COMPLIANCE: Required as indicated. To prevent possible failure of wing structure, accomplish the following for the left and for the right sides of each affected airplane.

A) Within 75 hours' time-in-service after August 22, 1980, either accomplish Subparagraphs A)1. through A)2., below, or accomplish Subparagraphs C)2. through C)9., below.

1. Unless previously accomplished, if Dee Howard STC SA832SW or SA1581SW center section strap is installed, inspect for cracking of the strap in accordance with Dee Howard Service Bulletin SB18-2, either "no" revision or Revision A. Alternatively, to inspect for said cracking, remove paint (other than zinc-chromate primer) from strap portions specified below, apply 68 foot-pounds torque to strap tensioning nuts, then load wings in accordance with Subparagraph C)6., below, and then use penetrant materials as specified by Subparagraph C)8., below. During the latter inspection, examine all portions of the underside, forward edge, and aft edge of the strap that are accessible while the strap is installed.

2. Unless previously accomplished or unless a crack detector is used as specified by Subparagraph C)1., below, inspect for cracking of wing structure at wing station (WS) 60 and 62 sites in accordance with Paragraph C), below, except that removal of steel straps is unnecessary if satisfactory results are achieved without said removal.

NOTE: After one-time inspection(s) as specified above, the same sites must be repetitively inspected along with others as required by Paragraph C), below.

B) At the time of the next inspection of wing structure that is required by this directive, unless previously accomplished, incorporate inspection access provisions in accordance with Figure 2, below, or a Federal Aviation Administration (FAA)-approved equivalent. If additional access provisions are necessary for inspection of sites specified by reports per Subparagraph C)7., below, follow instructions from Beech Aircraft Corporation, and incorporate these provisions.

C) Inspect wing structure and strap components as follows:

1. Conduct repetitive inspections at times which do not exceed the following:

Airplane Configurations	Initial Inspection	Inspection Interval	Applicable Subparagraphs
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(Hours time-in-service)

Strapped	At time strap is installed	1500*	C)2 through C)9
Not Strapped	1500, total	500 and 100	C)3 through C)9 C)8 at WS 73, 81, 90

\*Upon operator's request, FAA Maintenance Inspector may extend this interval (or 3,600-hour interval specified below) by not more than 100 hours to permit compliance at an inspection period established for the operator. If crack detector system is installed, maintained, and used as specified by STC SA1151CE through SA1155CE or other STC which refers to this subparagraph, the 1,500-hours interval becomes 3,600 hours.

2. 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:

<u>STC Holder</u>	<u>Instructions</u>
Aerospace Products, Inc. 5536 Satsuma Ave. North Hollywood, CA 91601	Number 1869, dated May 1980
Airline Training, Inc. P.O. Box 22833 Ft. Lauderdale, FL 33335	Section 7, Document 7132, dated August 1974
Canadian Aerocon, Ltd. Attn: Mr. Dave Saunders 2450 Derry Road East	Maintenance Manual Supplement, dated July 1973

Mississauga, Ontario,

Canada L5S1B2

The Dee Howard  
Company

P.O. Box 17300

San Antonio, TX 78217

Rev. A, Service

Bulletin SB 18-2,

dated July 1980

Hamilton Aviation

P.O. Box 11746

Tucson, AZ 85734

Document D4-74,

dated July 1974

Jourdan Aircraft

11001 E. 59th Street

Raytown, MO 64133

Service Bulletin SB 18-1,

dated July 1980

3. Inspect the front spar of the wing center section and outer wing panel at sites and by methods specified below.

<u>Wing Station (WS)</u>	<u>Site*</u>	<u>Method**</u>
32	Tip of welds at wing splice plate, fore and aft surfaces of cap	Visual, X-ray and either magnetic particle or penetrant
43 to 45	Tip of weld around cluster upper surface of cap	Visual and either magnetic particle or penetrant
46	Outboard ends of splice in cap, upper and lower surface of cap	Visual, X-ray and either magnetic particle or penetrant
57, 64, 63 & 81	Tips of welds at gussets upon	Visual, X-ray and either

	surface of cap	magnetic particle or penetrant
60 and 62	Tips of welds as shown in Figure 4	X-ray
61	Lower surface of spar cap below tube cluster, as seen from wheel well	Visual and either magnetic particle or penetrant
90	Tips of welds at clevis tangs, upper and lower surface	Visual, X-ray and either magnetic particle or penetrant
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

\*90U is in upper spar cap. All other sites are in lower spar cap. WS 57 and 64 need not be separately X-rayed if these sites are shown by WS 60 and 62 radiographs. Refer to figures of this AD for more detailed information.

\*\*A tube (not isotope) source is required for x-raying unless otherwise requested and authorized under Paragraph H), below.

4. Temporarily remove steel straps, inspection access covers and other equipment as necessary to eliminate interference with required inspections. Also, drain inboard fuel tanks prior to X-ray WS 60 and 62 sites.

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 least 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 MIL-STD-453 or -00453A and the following instructions:

a) Use steel "MIL-STD" 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 cap.

c) Load the wing by applying an upward force at the junction of the number 10 wing rib and the lower forward spar cap of the outer wing panel. Use lumber or other material along and under the rib so as to distribute the force. Apply force equal to the sum of half of the weight of any fuel in outboard wing tanks, plus the weight of fixtures such as lumber, plus 75 to 100 pounds.

d) After the wing is loaded, 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 chordwise and spanwise angles specified by Figure 3 of this directive.

e) 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 inspection sites specified in Figure 4 of this directive. Use the same kinds of film and exposure time for WS 62 sites as for WS 60 sites.

f) 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. The latter will appear as thin ellipses, the thinner being closest to the site.

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 maintenance facility accomplishing the AD showing the location of each indication of cracking and corrosion pitting in unwelded spar cap material.

8. After sites are cleaned, inspect by visual and either penetrant or magnetic particle methods, using materials and procedures as specified below. Inspect for cracking, external corrosion pitting, and holes through spar caps. Pay particular attention to locations specified by the x-ray report. Prior removal of original finish is not necessary, but paint applied in service must be removed unless it is as brittle as original finish.

a) Conduct visual inspection while wing is flexed by applying and relieving a 75 to 100 pound upward force near the wing tip. Use flashlight or other illumination and low power magnifying device for visual inspection.

b) Conduct penetrant inspection, if this method is used, while the wing is flexed as for visual inspection. Use materials shown by the penetrant manufacturer's publications to be eligible for detection of fatigue cracks in steel tubing. Strictly follow the penetrant manufacturer's instructions.

c) Conduct magnetic inspection, if this method is used, while the wing is either flexed as for visual inspection or loaded as for x-ray inspection. Position Magnaflux Corporation Y-5 or YM-5 yoke or equivalent equipment so that magnetic flux will parallel the spanwise centerline of the spar cap. Strictly follow instructions published by the equipment manufacturer for detection of fatigue cracks in steel tubing.

9. Keep all radiographs at an accessible location apart from the airplane.

D) Within three (3) days after discovery, send a written report to FAA on Form 8330-2, or equivalent, showing the length and location of each crack and the location of corrosion or other adverse condition discovered during inspections required by this directive. (Reporting approved by the Office of Management and Budget under OMB No. 04-R0174.)

E) Obtain (unless previously done) and follow the cognizant (aircraft or strap, as appropriate) manufacturer's instructions for repair and/or continued service of each defect that is found during inspections required by this directive. If continued service with corroded wing structure has been previously authorized, field comparison of old and new radiographs must show that no subsequent deterioration has occurred, or remaining strength must be re-evaluated by the aircraft manufacturer.

F) Within 200 hours' time-in-service after January 5, 1976, but prior to the next flight after October 1, 1980, unless previously accomplished, incorporate an STC-approved strap installation which reinforces the lower forward cap between at least left and right wing stations 181. Note: Eligible strap installations are SA643CE with SA1206CE, SA832SW with SA895SW, SA1581SW with SA1582SW, SA2000WE, SA962EA, SA814SO, SA1533WE with SA2737WE, SA1192WE with SA3229WE, SA3009WE, SA3010WE, SA3021WE, and any future STC that includes a notation that refers to this directive.

G) Aircraft may be flown in accordance with FAR 21.197 to a location where alterations and inspections required by this directive can be performed.

H) Alternate methods of compliance with this directive must be approved by the Chief, Aircraft Certification Program, Room 238, Terminal Building 2299, Mid-Continent Airport, Wichita, Kansas 67209, telephone (316) 942-4219.

I) X-ray inspections herein required must be accomplished by:

1. A certificated repair station holding a "limited airframe - Beech 18 series aircraft -wing and center section spar X-ray inspections" rating and

2. Either a certificated mechanic or repairman in the employ of the above repair station, who is currently authorized to accomplish said X-ray inspections pursuant to a letter of authorization issued by the FAA GADO or FSDO having certificate authority over that repair station.

J) The authorized person performing any X-ray inspection required by this AD shall, in addition to the information required by FAR 43.9 and 91.173, list the date of the letter of authorization under which he performed said inspection in the aircraft maintenance records specified in FAR 91.173(a)(2).

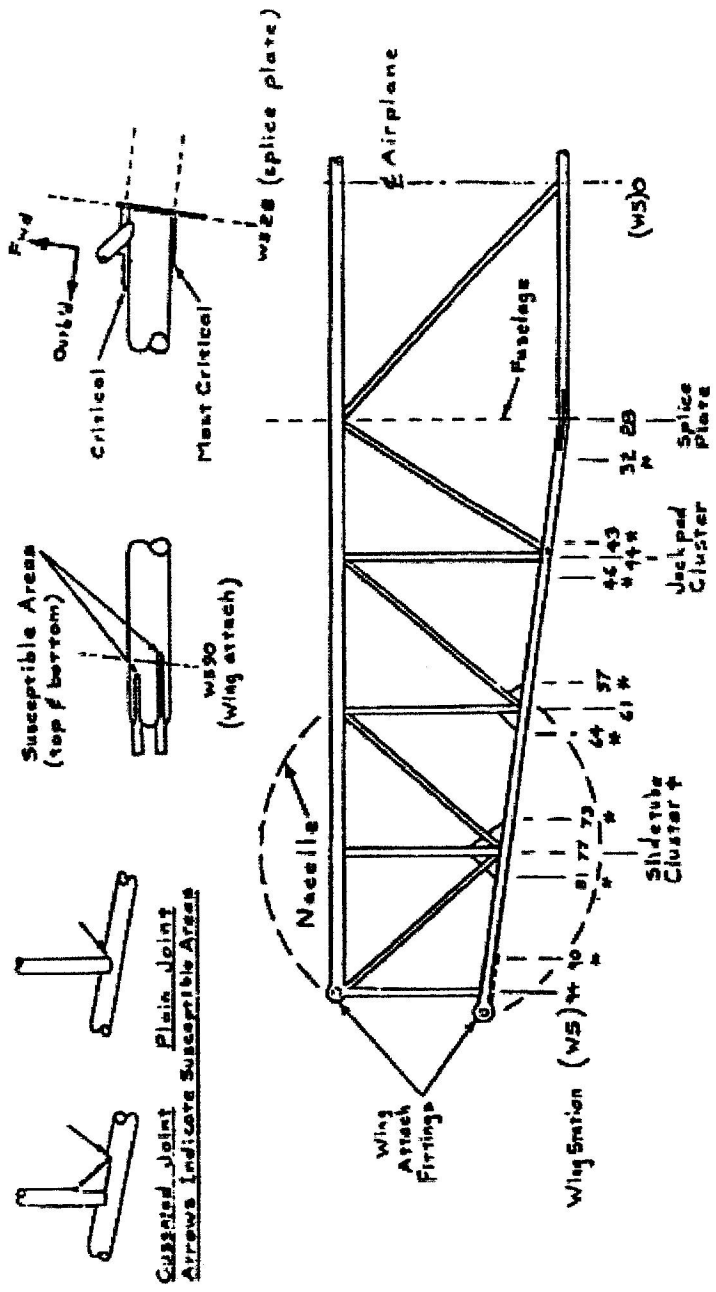
Currently effective Beech Aircraft Corporation's Service Bulletins 64-15, 64-16, 64-17 and 66-10 and Strap STC-Holder's Publications consider this subject but this AD takes precedence in any conflicting detail.

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).

Amendment 39-2482 became effective January 5, 1976.

Amendment 39-2591 became effective May 3, 1976.

This Amendment 39-3878 becomes effective August 21, 1980.

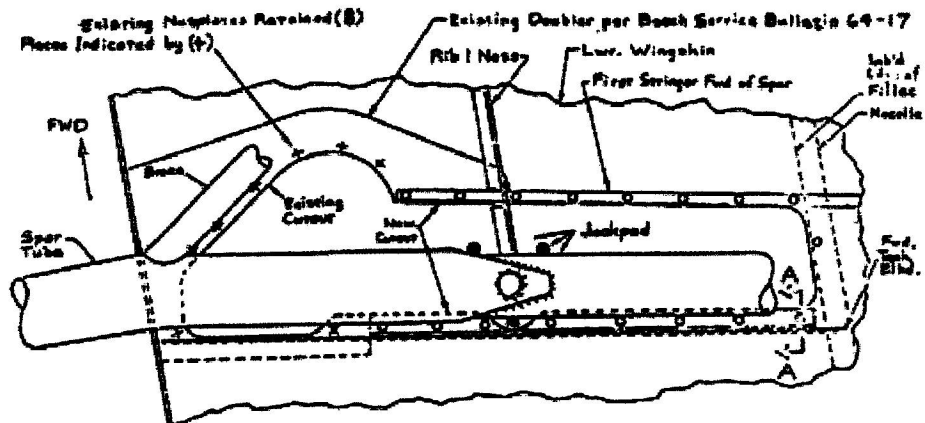


Half of Main Spar Center Section Truss

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

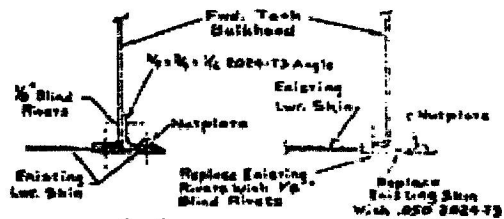
FIGURE 1 AD 75-27-09





VIEW LOOKING DOWN ON LOWER WINGSKIN AND SPAR TUBE  
by Bob Grober

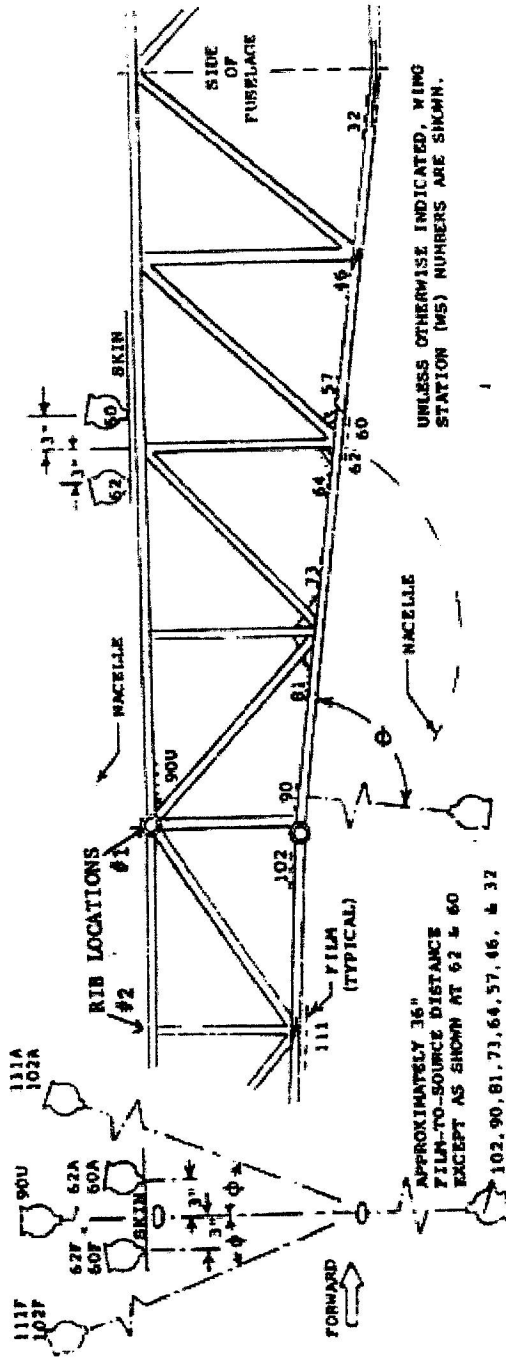
Attach MK1000-3 Nuts (or equiv.) (7 places) as shown by (N). Cut inspection door from .032 2024-T3 Alum. Allow  $\frac{1}{8}$ " edge margin around all screws (sic). Install door on lower side with #10 screws (25 places); cut three holes for jacked nuts. Inspection door not shown.



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

FIGURE 2

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UNLESS OTHERWISE INDICATED, RING STATION (MS) NUMBERS ARE SHOWN.

APPROXIMATELY 16" FILM-TO-SOURCE DISTANCE EXCEPT AS SHOWN AT 62 & 60

102, 90, 81, 73, 64, 57, 46, & 32

THE CHORD-WISE AIMING ANGLE,  $\phi$ , IS BETWEEN PLANE OF SPAR AND X-RAY BEAM CENTERLINE. POSITION TAIL OF AIRPLANE AND/OR USE FIXTURE (AND C. CK WITH PROTRACTOR OR FLASHLIGHT) TO KEEP ANGLE  $\phi$  AT:

NOMINAL OF 0° (NO ABSOLUTE LIMIT) FOR MS 32, 46, 57, 64, 73, 81, 90, & 102. MS 102 MAY BE TAKEN WITH SOURCE EITHER ABOVE OR BELOW THE LOWER SPAR CAP. MS 57 & 64 NEED NOT BE TAKEN SEPARATELY IF PLAINLY SHOWN BY MS 60 & 62 FILMS.

BETWEEN 20° AND 45° FOR FORWARD AND AFT SHOTS OF MS 111 & (OPTIONALLY) 102.

AS DRAWN FOR FORWARD & AFT SHOTS OF MS 60 & 62.

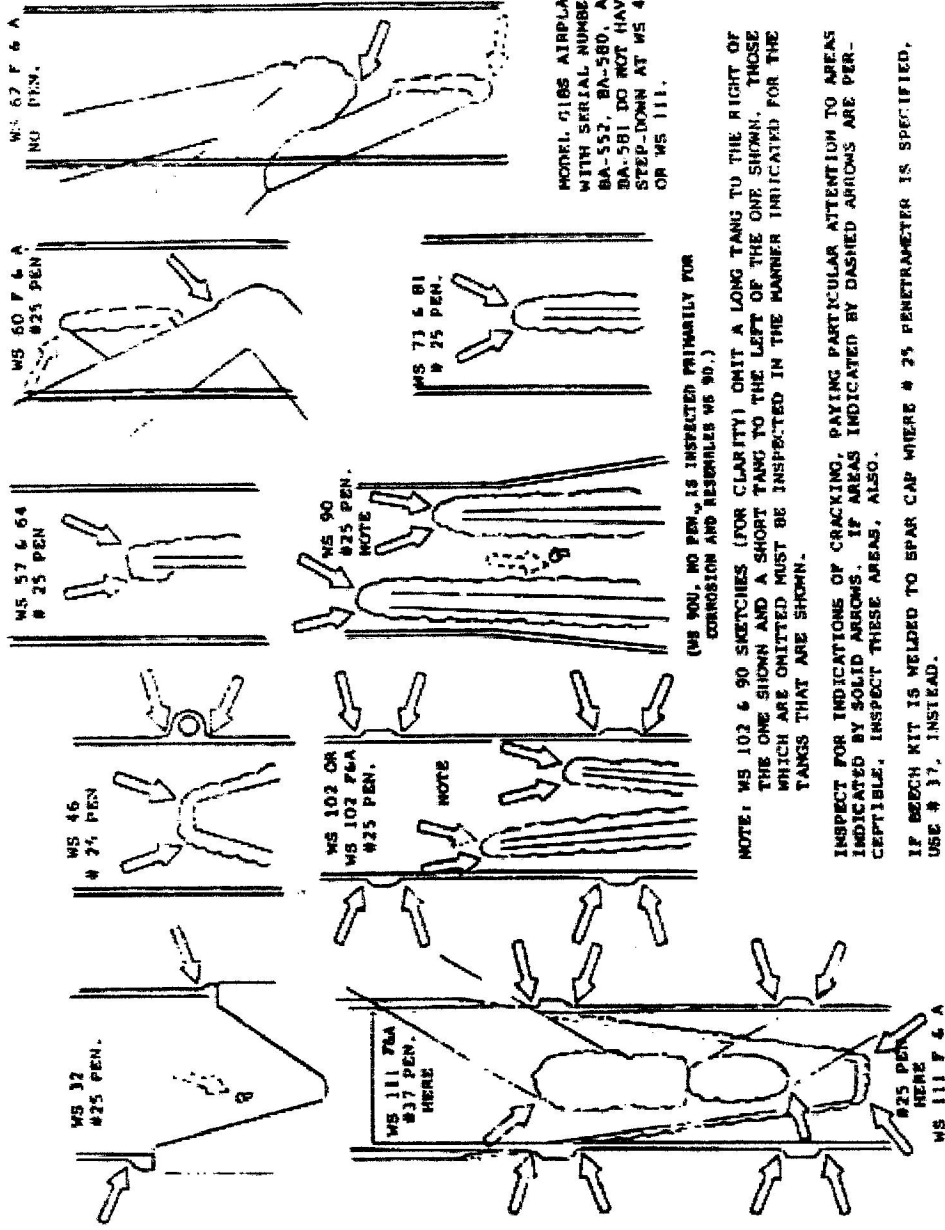
THE SPANNISE AIMING ANGLE,  $\phi$ , IS BETWEEN THE SPAR CAP AND X-RAY BEAM CENTERLINE, AS SHOWN. POSITION AIRPLANE MAIN WHEEL AND/OR USE FIXTURE TO KEEP ANGLE  $\phi$  AT:

BETWEEN 85° AND 95° FOR MS 32, 46, 57, 64, 73, 81, 90, 102, AND 111.

NOMINALLY 90° (NO ABSOLUTE LIMIT) FOR MS 90U

AS DRAWN FOR MS 60 & 62

FIGURE 3 AD 75-27-09



MODEL 5185 AIRPLANES WITH SERIAL NUMBERS BA-552, BA-580, AND BA-581 DO NOT HAVE STEP-DOWN AT MS 46 OR MS 111.

(MS 90, NO PEN., IS INSPECTED PRIMARILY FOR CORROSION AND RESORLES MS 90.)

NOTE: MS 102 & 90 SKETCHES (FOR CLARITY) OMIT A LONG TANG TO THE RIGHT OF THE ONE SHOWN AND A SHORT TANG TO THE LEFT OF THE ONE SHOWN. THOSE WHICH ARE OMITTED MUST BE INSPECTED IN THE MANNER INDICATED FOR THE TANGS THAT ARE SHOWN.

INSPECT FOR INDICATIONS OF CRACKING, PAYING PARTICULAR ATTENTION TO AREAS INDICATED BY SOLID ARROWS. IF AREAS INDICATED BY DASHED ARROWS ARE PERCEPTIBLE, INSPECT THESE AREAS, ALSO.  
IF BEECH KIT IS WELDED TO SPAR CAP WHERE # 25 PENETRATOR IS SPECIFIED, USE # 37, INSTEAD.

FIGURE 4 AD 75-77-09