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Mr. Garnett Bell
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DONALD and BEVERLY STAFFORD

9044 West Center Avenue
Lakewood, CO 80226
(303) 986-6734

July 27, 1992

Mr. Garnett Bell
Special Assistant
JTF-FA
U.S. EMBASSY - BANGKOK
Box 30
APO, AP 96546

Dear Mr. Bell:

First, I want to take this opportunity to thank you for giving us your time, insight and information in regard to the ongoing investigation of incident of the F-111A Aircraft (refno 1948), piloted by USAF Captain **RONALD D. STAFFORD** and EWO Captain **CHARLES J. CAFFARELLI**.

As per our conversation, I am including copies of the information concerning the evaluation of the wreckage from the aircraft that washed up on the beach approximately 30 miles north of DaNang.

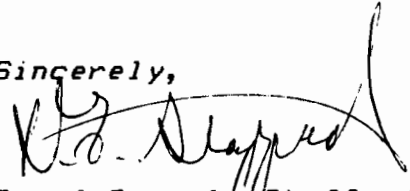
We have also written to General Needham (see copy included) regarding the incident above. We have requested his assistance in allowing you to reopen and proceed with this investigation and to look closely at all F-111 incidents and the possibility of a Soviet connection.

In addition, we have sent a letter to various members of the Senate Select Committee regarding concerns about the credentials of Detachment Commanders in Vietnam. A copy is included.

Our invitation to include you as a primary speaker at the annual meeting of the **COLORADO POW/MIA COALITION** on September 19th is still open. Without exception, every member polled expressed a positive and enthusiastic response.

We look forward to visiting with you in the near future and express our gratitude for your candor and for caring.

Sincerely,



Don & Beverly Stafford

DONALD and BEVERLY STAFFORD

9044 West Center Avenue
Lakewood, CO 80226
(303) 986-6734

July 27, 1992

Brigadier General Thomas H. Needham
Commanding Officer

U.S. ARMY

JOINT TASK FORCE -FULL ACCOUNTING

Box 44

Camp Smith, HI 96861-5025

Dear Sir:

During the **National League of Families 23rd Annual Meeting**, we had the opportunity to speak with Mr. Garnett Bell in regard to the incident of an F-111A Aircraft (refno 1948). The aircraft was shot down 21 Nov 72 near Phu Trach Village in Bo Trach District and apparently crashed about 3 km offshore. Some of the wreckage washed ashore about 30 miles north of Da Nang. The fate of the crew, as related to me and my family, is unknown and has resulted in the loss of my brother, **USAF Captain RONALD D. STAFFORD**.

Since 1986, we have accumulated several volumes of documents pertinent to this incident. Mr. Bell reviewed many of these records and told us that he had personally investigated the case. However, he was unaware of the existence of some of the documents in our possession which he indicated would have been an asset to the investigation.

General, seven of the eight F-111 incidents resulting in the crews being MIA are **STILL UNRESOLVED**. We spoke with Mr. Bell about the possible Soviet connection with the fate of these crews. His response was that this theory should be investigated to the fullest extent.

I am respectfully requesting that Mr. Bell be allowed to go to Vietnam and continue the investigation into my brother's case. This would be appropriate since Mr. Bell has already reviewed the documents mentioned above and is personally familiar with my brother's case from past investigations.

Thank you for your attention into this matter, and I would appreciate a prompt response.

Sincerely,

Donald E. Stafford

c.c.; Senator Hank Brown

DONALD & BEVERLY STAFFORD

9044 West Center Avenue
Lakewood, CO 80226
(303) 986-6734

July 28, 1992

FOIA Monitor

JOINT TASK FORCE - FULL ACCOUNTING

Box 44

Camp H.M. Smith, HI 96861-5025

To Whom It May Concern:

This is a request under the **FREEDOM of INFORMATION ACT**, as amended (5 U.S.C. Section 552).

I am writing to request copies of all files, documents and materials concerning, maintained or indexed under or containing the name of my brother **RONALD D. STAFFORD, Captain USAF**, who is listed as **MIA - KIA/BNC**. In addition to the above, I am requesting any other file, document and materials concerning or associated with the **F-111A aircraft, REFNO 1948** piloted by my brother.

Specifically, three (3) documents missing from my files that I am requesting in an *uncensored form* are:

- A. JCRC LIAISON 081025Z Feb 91
- B. JCRC LIAISON 301822Z Oct 89
- C. JCRC LIAISON 071050Z Feb 89

I am also requesting copies of all files, documents and materials concerning any reports of "live sightings", capture, detention or burial of any MIA which might possibly be correlated with my brother, REFNO 1948 or any F-111 aircraft incident as a result of witness testimonies, intercepted communications, reconnaissance or any other means of information. This is to include any correlated or uncorrelated reports of MIAs within a 25 km radius of the coordinates of the crash site and the coordinates of the wreckage.

Also requested are loss dates *and coordinates* of all unresolved F-111 aircraft incidents.

According to the FOIA, all accumulated fees are permitted to be either waived or reduced for this request. The Department of Defense has previously determined it appropriate to waive all charges for materials and information furnished at the request of family members of Americans unaccounted for in Southeast Asia. Therefore, I request that you waive fees and charges with respect to this FOIA request. In the event that you decide not to waive such fees and charges, please advise me as soon as possible on the amount that you request be paid for the requested documents.

If you determine that some portions of the requested items are exempt from disclosure, please furnish me with the remainder and identify the exemptions which you maintain justify the non-disclosures. I, of course, reserve the right to appeal such decisions.

If you have any questions regarding this request, please contact me.

As provided in the amended Act, I will expect to receive a reply within ten (10) days.

Sincerely,

Donald E. Stafford

c.c.; Senator Hank Brown, Colorado



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SACRAMENTO AIR LOGISTICS CENTER (AFLC)
McClellan Air Force Base, California 95652-5990

REPLY TO
ATTN OF: MMKR

27 OCT 1988

SUBJECT: Request for Information Regarding Loss of F-111A Piloted by Ronald D. Stafford (Your Ltr, 18 Oct 88)

TO: Donald E. Stafford
Beverly A. Stafford
9044 W. Center Ave.
Lakewood, CO 80226

1. Attachment 1 is a copy of the requested report. This report comprises all of the information available at SM-ALC regarding the loss of the aircraft piloted by your brother.
2. Attachment 2 provides operation sequence times for the crew escape module.
3. The crew escape module does not use components called "blow bolts".
4. Any requests for further information regarding this subject should be directed to: Freedom of Information Office
2852 ABG/DADF
McClellan AFB CA 95652-5609


JAMES F. COVIELLO
Chief, Engineering & Reliability Branch
F/FB/EF-111 System Program Management Div
Directorate of Materiel Management

- 2 Atch
1. SMAMA Service Engineering
Report No. 73-511
 2. Operation Sequence Times

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(This is a limited use report not releasable in whole or in part to persons or agencies outside the Air Force without the express approval of the disclosure authorities specified in AFR 127-4.)

AFLC - Lifeline of the Aerospace Team

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FOREWORD

This report summarizes the significant results and conclusions of the wreckage analysis of subject aircraft. This analysis was conducted at the SMAMA Materials Laboratory on 29-31 Dec 1972. The primary objective of this report is to address the specific concerns raised by Mr. W.T. Allen, General Dynamics, and Lt Col John Malone, Norton AFB, both on the CONSTANT SWEEP Team.

Mr. Allen's on-scene analysis of the parts on 4 Dec 72 has been typed and included herein as Section VIII.

Photographs have been taken of the material at SMAMA; however, prints were not available for inclusion in the report. Copies will be available at a later date. Sketches and illustrations have been included throughout the report to describe the pertinent evidence.

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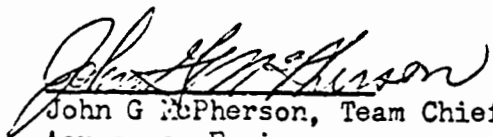
SMAMA SERVICE ENGINEERING REPORT NO. 73-511

Project No. SMENFA 72-5499

Date: 30 December 1972

Analysis of SEA F-111A Wreckage

Analysis Team Members:


John G. McPherson, Team Chief

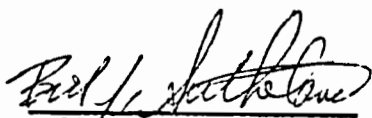
Aerospace Engineer

Service Engineering Division, DMM
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John M. Hayes

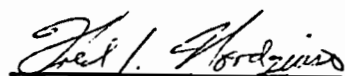
Project Structures Engineer

General Dynamics Corp
Fort Worth, Texas


Bill J. Sutherland

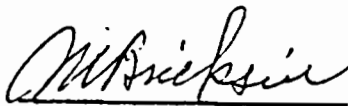
Aerospace Engineer

Service Engineering Division, DMM
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Fred C. Nordquist

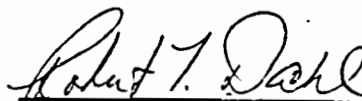
Chief Engineering Metallurgist

General Dynamics Corp
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M. I. Bricksin

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Metalurgist

Physical Sciences Laboratory, DM
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127-4 FOR RESTRICTIONS.

Itch 1

OPERATION SEQUENCE TIMES

Conditions:

Altitude: 0-15000 feet

Low Speed: 0-300 knots

High Speed: 300 - 800 knots

EVENTS:	TIME, SECONDS:			
	Low Speed Low Temp.	Low Speed High Temp	High Speed Low Temp	High Speed High Temp
Ejection handle pulled	0.00	0.00	0.00	0.00
Emerg. oxy. actuates	0.03	0.03	0.03	0.03
Shoulder straps retract	0.25	0.25	0.25	0.25
Rocket fires, crew module severs	0.49	0.28	0.49	0.28
Stab-brake chute deploys	0.67	0.40	0.67	0.40
Stab-brake chute full open	1.07	0.80	0.87	0.60
Rocket motor burn out	1.49	0.98	1.94	1.43
Recovery chute deploys	1.74	1.03	4.39	4.18
Chaff dispenser actuates	4.38	1.98	4.38	1.98
Recovery chute line stretch	3.24	2.53	5.39	5.18
Impact attenuation bag deploys	5.34	3.43	7.99	6.58
Recovery chute disreefs	6.37	4.40	8.52	7.05
Crew module repositions	10.14	6.63	12.79	9.78
Recovery chute full open	9.74	9.02	10.39	10.18
Impact attenuation bag inflated	12.84	7.43	15.49	10.58

I. INTRODUCTION

A. Approximately two dozen pieces of F-111A airframe structure were received at SMAMA from SEA on 29 Dec 72. They were identified as parts from an F-111A lost in SEA operations. An investigation team was formed which included the aforesigned members.

B. The objectives of the investigation was to analyze each part from a metallurgical and structural engineering viewpoint and address the following issues raised by Mr. W. T. Allen and Lt Col Malone.

1. Verify part identification
2. Verify wing sweep position
3. Examine for evidence of crew module separation
4. Examine for evidence of fire damage and assess whether it is pre-or-post impact.
5. Examine for evidence of principal load and direction of impact forces.
6. Other observations as pertinent.

II. PART IDENTIFICATION

A. The parts as received included the following identification:

<u>PART IDENTIFICATION NO.</u>	<u>DESCRIPTION</u>
1.	Panel 3410 - Tunnel Cover
2.	Panel 3410 - Tunnel Cover
3.	12B3211 - Upper Surface, RH, Fwd Fuel Tank
4.	LH #2 Flap
5.	Panel 4426 - Tunnel Cover
6.	Panel 6436 - RH #4 Fixed Trailing Edge
7.	12B3911, LH - Nacelle Deck Panel
8.	12B3911, RH - Nacelle Deck Panel
9.	Burned Piece of Unidentifiable Honeycomb Panel
10.	Panel 2960 - Tunnel Cover

Miscellaneous Parts:

(11 - SMAMA I.D.)	Flap Vane Section Piece of Nacelle Tank Sidenall
(12 - SMAMA I.D.)	LH Horiz Tail Leading Edge Piece 8-10 unidentified pieces.

B. This investigation essentially confirms the on-scene part identification of most of the parts. The exceptions, rated insignificant, are as follows:

1. The flap vane section was identified as being from the right hand #1 vane, approximately one foot outboard of the vane hook. It is identified as #11 on Figure 1.

2. The piece identified as nacelle tank sidewall is believed to be from the nacelle ceiling rather than sidewall. This is based on core depth and skin thickness. Its exact position, however, can not be identified.

3. One of the unidentified panels was identified as a section from the 12B3111 forward fuselage side shear panel. The identification is made through a part number impression in the adhesive from the edge member. Although its location is not exact, the dash numbers, skin thickness, core ribbon direction and core depth indicate it is from the forward bay of the left hand 12B3111 panel. It is identified as number 13 on Figure 1.

4. One part included with the miscellaneous parts cannot be identified as an F-111 part. It is a gray, flat, honeycomb panel approximately two feet long, 1-1/2 feet wide, and 5/8 inches thick. It has perforated aluminum core (punctures with pinholes) and the adhesive has a scrim cloth supporter. Both

of these design features are outside F-111 design specifications. A review of photographs received from SEA indicates that this part was not included in the on-scene analysis. It is therefore assumed that the part was inadvertently shipped with the F-111 parts. It is not included in this analysis. Figure 1 shows the orientation of the identifiable parts on the aircraft.

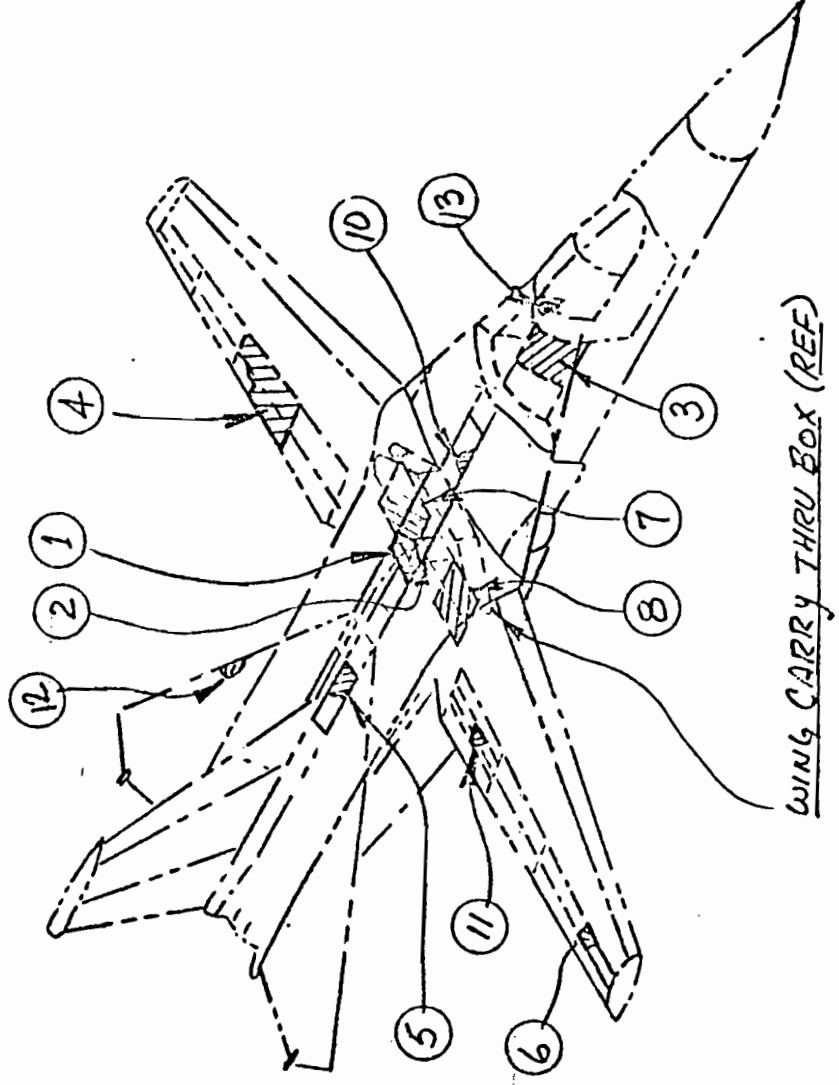


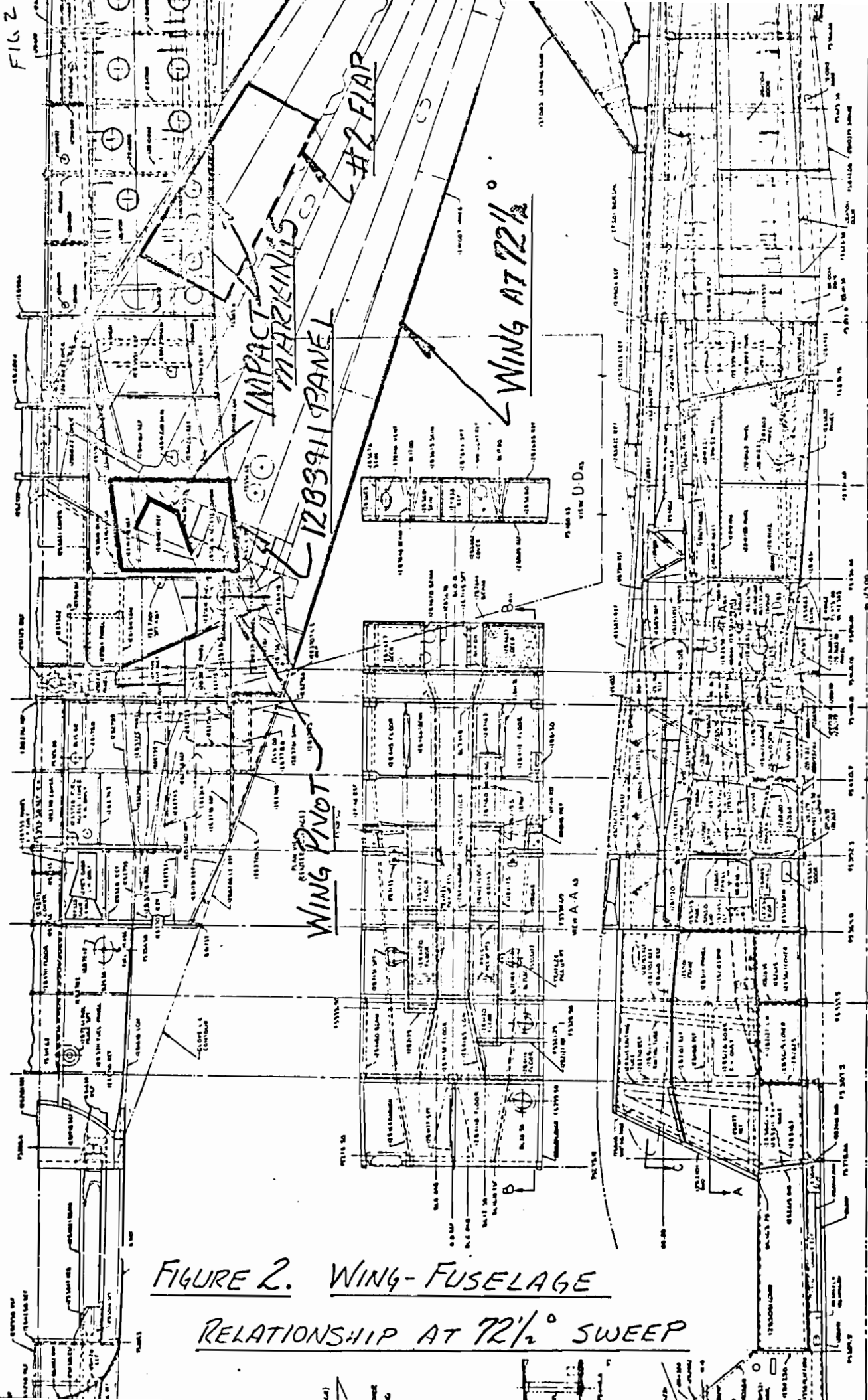
FIGURE 1. LOCATION OF IDENTIFIABLE PARTS

III. WING SWEEP POSITION

A. The on-scene analysis indicated that the wings were positioned at approximately 72°. The indicating evidence was the impressions in the #2 flap from the overwing fairing and underlying fuselage structure. The SMAMA analysis confirms the aft wing sweep by another piece of distinctive evidence along with the #2 flap impressions.

B. The LH 12B3911 panel (identification #7) has markings on its upper surface caused by impact with the lower surface of the wing. The markings are very distinctively caused by the wing rear spar, bulkhead No. 0, and the rear spar of the wing pivot fitting. For the marks to be made at this location on the 12B3911 panel, the wing would be in aft sweep, at or very near 72°.

C. Figure 2 includes a layout of the wing-fuselage relationship with the wing at 72-1/2°. The 12B3911 panel, #2 flap, and impact markings are shown in bold outline. Figure 3 is a blow-up of the wing showing the parts which impacted the 12B3911 panel.



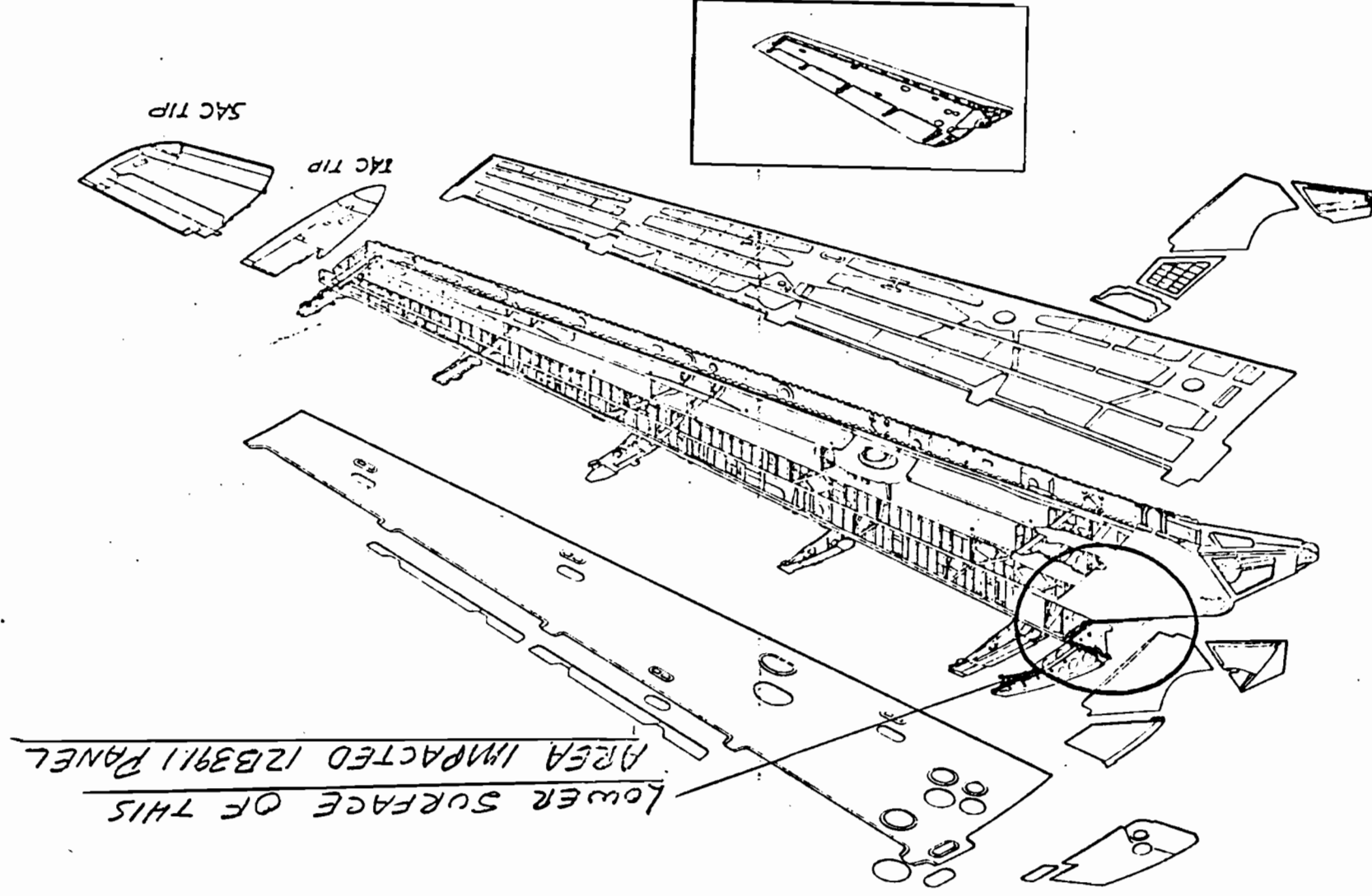


FIGURE 3. WING AREA IMPACTED INTO
12B3911 LH PANEL

IV. CREW MODULE POSITION

A. Part #3, the 12B3211 upper panel over the forward fuel tank contains distinctive evidence that the crew module was on the aircraft at the time of break-up.

B. The 12B3211 panel is located directly beneath the stabilization glove of the crew module. Part #3 is the forward two-thirds of the right hand fuel tank panel. It contained distinctive rivet impact markings in three lateral lines on its rear half. These rivet patterns match the rivet patterns on the underside of a crew module stabilization glove almost exactly. Further, the failure mode of the 12B3211 panel is that it was forced upward into the glove with significant pressure. This is positive evidence that the crew module was structurally intact on the aircraft at the time of break up.

C. Negative evidence that the crew module did not functionally separate was the lack of exhaust or burning on the 12B3211 panel. The panel lies directly in the rocket path during liftoff.

D. Figure 4 illustrates the position of the 12B3211 panel and the location of the rivet impact markings.

① MODULE BOOM UNDERSTRUCTURE
 SHOWN ON LEFT SIDE
 PART # 3 (RIGHT HAND)
 RIVET PATTERN DEPRESSIONS
 ON UPPER SURFACE OF
 12B 3211

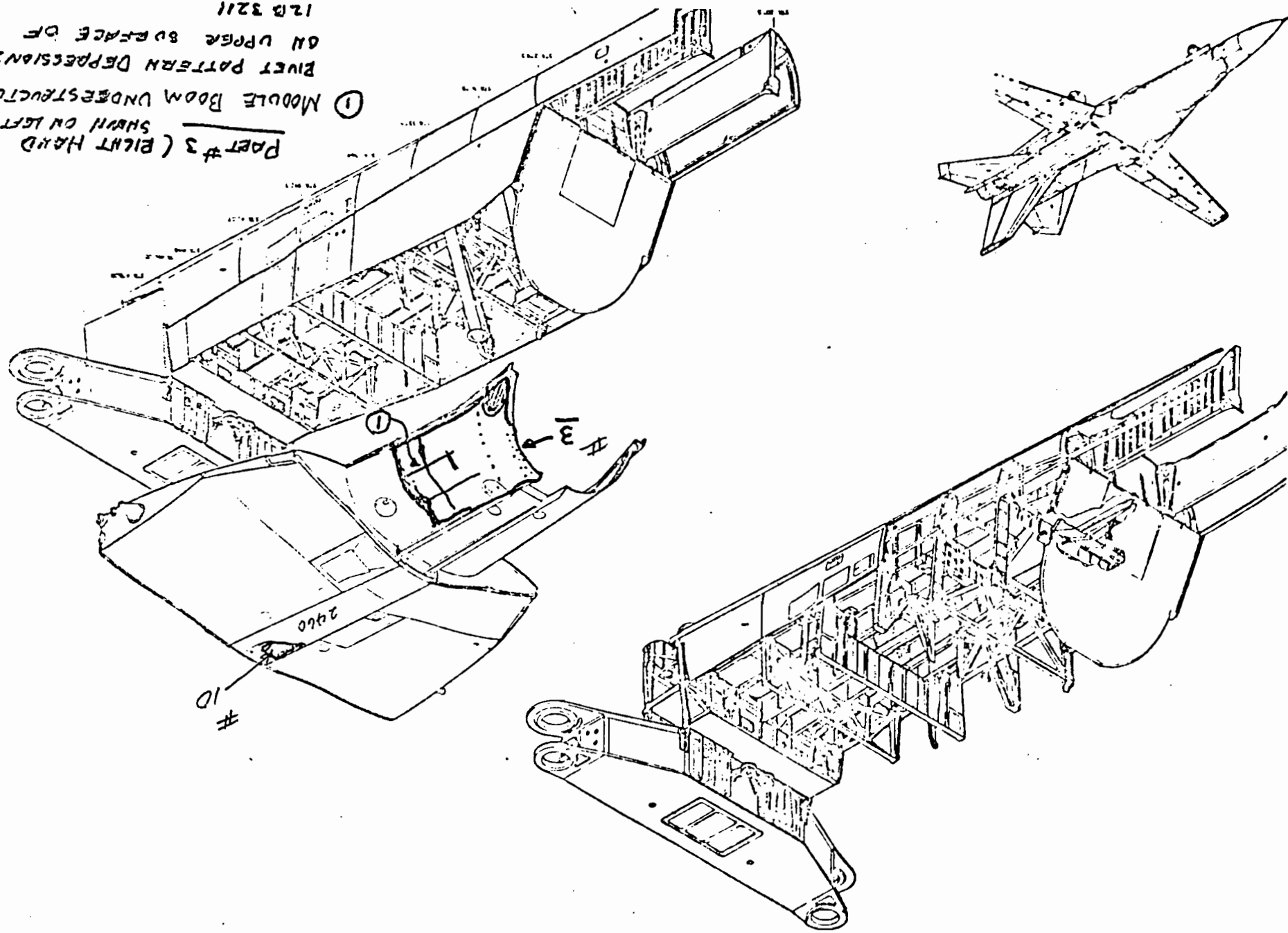


FIGURE 4. LOCATION OF 12B3211 PANEL

V. FIRE DAMAGE

A. There exists no evidence of an inflight fire.

B. The fire damage that does exist indicates these parts were heated to temperatures in excess of 600°F and that the heat exposure was probably of short duration due to lack of penetration of the materials.

C. Description of fire damage per part:

1. Part Number 2 - Uniform heat exposure over the exterior surface and over the adhesive on the inner surface of the core. Some fringes of the fiberglass were broken from the main part of the panel are scorched. Temperatures of higher than 500°F were probably experienced. Due to the recovery of a mating part (Part #1) which has no fire damage, the fire to which Part #2 was exposed was a post impact, post-disintegration fire.

2. Part Number 5 - Heat exposure was found around three-fourths of the perimeter of this part and is limited to the adhesive in the areas where the inner surface was delaminated from the core. Due to the lack of penetration of the heat damage the heat was in excess of 600°F but of short duration occurring after aircraft disintegration.

3. Part Number 9 - This part showed the greatest amount of heat damage with the primer paint on the inner surface blistered and the paint on two edges was discolored indicating temperatures in excess of 600°F. Penetration of heat on the two edges was the greatest of any of the above parts. All damage to this part due to heat occurred after disintegration of the aircraft.

VI. FAILURE MODE OF INDIVIDUAL PARTS

A. A general discussion of the failure modes, evidence of fire evidence of pre-impact failure, and cause factors follows for each of the identifiable parts. Only general comments are included for the miscellaneous parts which could not be identified.

B. Part No. 1. 3410 Panel (REF: Figures 5 and 6)

1. Examination of fractures in the aft flange steel doubler, compression and bearing failures in the aft and side holes indicate the panel was separated basically by an upward force with a slight loading to the left and aft.

2. There was no evidence of any heat damage.

3. There was no evidence of damage prior to break up.

C. Part No. 2. 3410 Panel (REF: Figures 5 and 6)

1. Examination of the four holes in this part indicates the principal loading was basically upward with a slight inward and forward force.

2. The pience showed uniform heat damage to the exterior paint on the top surface and a uniform heat damage to the glue on the core on the inner surface, as if the part was hanging free when it was exposed to the heat. The layers of epoxy or paint under the outer paint was not damaged indicating short time exposure. For the heat damage present, temperatures in excess of 500°F were required.

3. There was no evidence of damage prior to break up.

4. The cause of failure of both pieces of 3410 panel is believed to be very high internal pressure blowing the panel upward. Skins and core are still relatively intact on the aft piece and it's contour has not changed.

D. Part No. 3. 12B3211 Fuel Tank Panel (REF: Figures 4, 7 & 8).

1. A line of core shear exists 2 to 3 inches forward of station 307.5 indicating high internal pressure prior to separation from the attach frame. Failure of the attach frame was basically a tensile-bending loading failure propagating from the outboard end. The shear direction of the inboard rivets indicate a lateral outboard movement of the panel. The only other significant mark on the lower surface was a raised ridge caused by impact with the module stabilization beam on the opposite side.

The upper aft surface of the panel has a rivet indentation pattern which matches up with the rivets in two beams and three frames on the module stabilization glove.

2. No evidence of fire damage prior to impact or from rocket motor blast.

3. No evidence of damage prior to impact.

4. The cause or failure is believed to be high uniform internal pressure causing panel section to be blown upward into lower surface of crew module stabilization glove while module glove was solidly attached to fuselage structure.

E. Part No. 4. #2 Flap (REF: Figures 9, 10 & 11)

1. Observations

a. Area A - The flap appears to have been thrust upward into the overwing fairing. The abrasions show a gray residue from the non metallic sealing material. The area coincident to this area on the lower skin (E) shows very severe damage from the lower fuselage being thrust into the flap.

b. Area F shows compressing of the honeycomb structure from $1/4$ to $1/2$ in. in depth on the lower skin indicating that this area of the flap impacted in a flat manner. This core compression occurred only outboard of the section protected by the fuselage.

c. At impact the flap was torn loose in a direction outward along the length of the wing failing in tension at area G and bending in area D.

d. At area G it was noted that sometime after the crash an amount of chromate primer was splashed onto the fracture surfaces. This primer was also observed to be covered by sand in the area sheared honeycomb.

2. There was no evidence of fire or heat damage.

3. There was no evidence of prior damage.

4. It is believed that the fuselage crushed into the flap from below at the same time that a relatively uniform high pressure hit the lower surface of the flap portion which was not inside the fuselage. The upper surface marks from the overwing fairing are believed to be caused as a reaction to the upward forces.

F. Part No. 5. 4426 Panel (REF: Figures 12 & 13)

1. Examination of fracture patterns, folds and hole deformations indicate this panel failed from an upward force. Failure started on the inboard forward corner and propagated both aft and outboard. Except for the forward three holes in the outboard hole pattern, no deformation was present to indicate other than an upward load. The outboard fold occurred prior to separation of the panel from the outboard structure.

2. Evidence of heat or fire damage is present on the lower surface of this panel, mainly on the inboard and aft end of the remaining section. Where separation of the core from the skin occurred, both the adhesive remaining on the core and on the skin show the same heat or fire damage. No evidence of heat is present on the top skin. The presence of fire damage on the delaminated section indicates the damage occurred after break up.

3. There is no evidence of prior damage to this part.

4. Cause of failure is believed to be from a high uniform pressure on the internal side of the panel blowing the panel upward.

G. Panel No. 7. 12B3911 LH Panel (REF: Figures 5, 16 & 17)

1. On the upper surface of the panel, the only section of skin remaining was that which impacted the lower surface of the wing rear spar, pivot fitting and bulkhead zero. The skin beyond this area was missing with the core showing relatively little damage from subsequent impact with other pieces. The section of the top skin remaining showed no other impact damage.

The lower skin contained score marks similar to those found on the lower skin of part no. 8, except to a lesser extent. The uniformity of the depth and width of these score marks indicate the panel was relatively flat at the time they were made. The score marks are caused by a rivet pattern.

2. There was no evidence of fire damage.

3. There was no evidence of prior damage.

4. Cause of failure is believed to be from the nacelle structure and high pressure blasting upward into the bottom of the panel. The panel broke loose from the edge members and hit the lower wing surface with high force.

H. Part No. 8. 12B3911 RH Panel (REF: Figures 5 & 18)

1. During initial break up, panel was relatively flat and free of folds as scrape marks from rivets in lower structure are continuous. Damage in the form of torn holes and indentations was caused during break up.

The uniformity of the depth and width of the scrapes from rivets in the lower structure indicates the lower structure came up to meet this panel before it could be deformed.

The upper skin was missing.

2. There is no evidence of fire damage.

3. There is no evidence of prior damage.

4. Cause of failure is believed to be the same as for part No. 7. The nacelle structure and high pressure hit the lower surface. The main difference from Part No. 7 is that the impact with the wing is not as clearly indicated on the upper surface. The panel is deformed, but positive impact evidence is lacking.

I. Part No. 10. 2460 Panel (REF: Figures 1 & 20)

1. Examination of hole deformation patterns, fracture edges and secondary fractures indicates that initial separation of the panel from the surrounding structure occurred by a forward and upward force. Subsequent impact with other pieces caused further break up of the panel.

2. There is no evidence of fire or heat damage.

3. There is no evidence of prior damage.

4. Cause of failure is believed to be high uniform pressure on the internal side of the panel blowing it upward.

J. Miscellaneous Parts.

1. Three additional parts have been identified which were not identified in the preliminary report. These have been identified as follows:

a. Part #11 - A section of #1 vane of the RH wing just outboard of the vane hook. Of the section recovered,

part of the upper skin was torn away which the remainder of the skin was delaminated from the core. The leading edge of the section received severe aft compression.

(1) No evidence of fire damage.

(2) No evidence of pre-impact damage.

(3) Damage sustained by this part is due to aircraft disintegration.

b. Part #12 - A section of the LH stabilizer leading edge. The upper skin of this section was partially delaminated in an aft to forward direction with multiple bending to the remainder of the section. Severe corrosion is present in the 2024 aluminum of the core material.

(1) No evidence of fire damage.

(2) No evidence of pre-impact damage.

(3) Damage sustained by this part is due to aircraft disintegration with corrosion subsequent to that action.

c. Part #13 - A section of the lower LH forward fuel tank wall. The exterior skin surface was completely delaminated and is gone. A single major bend in this part is bent away from the interior skin although there are no delaminations of the interior skin from the core material.

(1) No evidence of fire damage.

(2) No evidence of pre-impact damage.

(3) Damage sustained by this part is due to aircraft disintegration with a uniform high pressure applied to the interior surface.

2. The remainder of the parts are small bits and pieces of honeycomb structure which could have come from many different areas of the aircraft. All the failures appear to have been caused by impact forces. They are considered to be insignificant in causal determination.

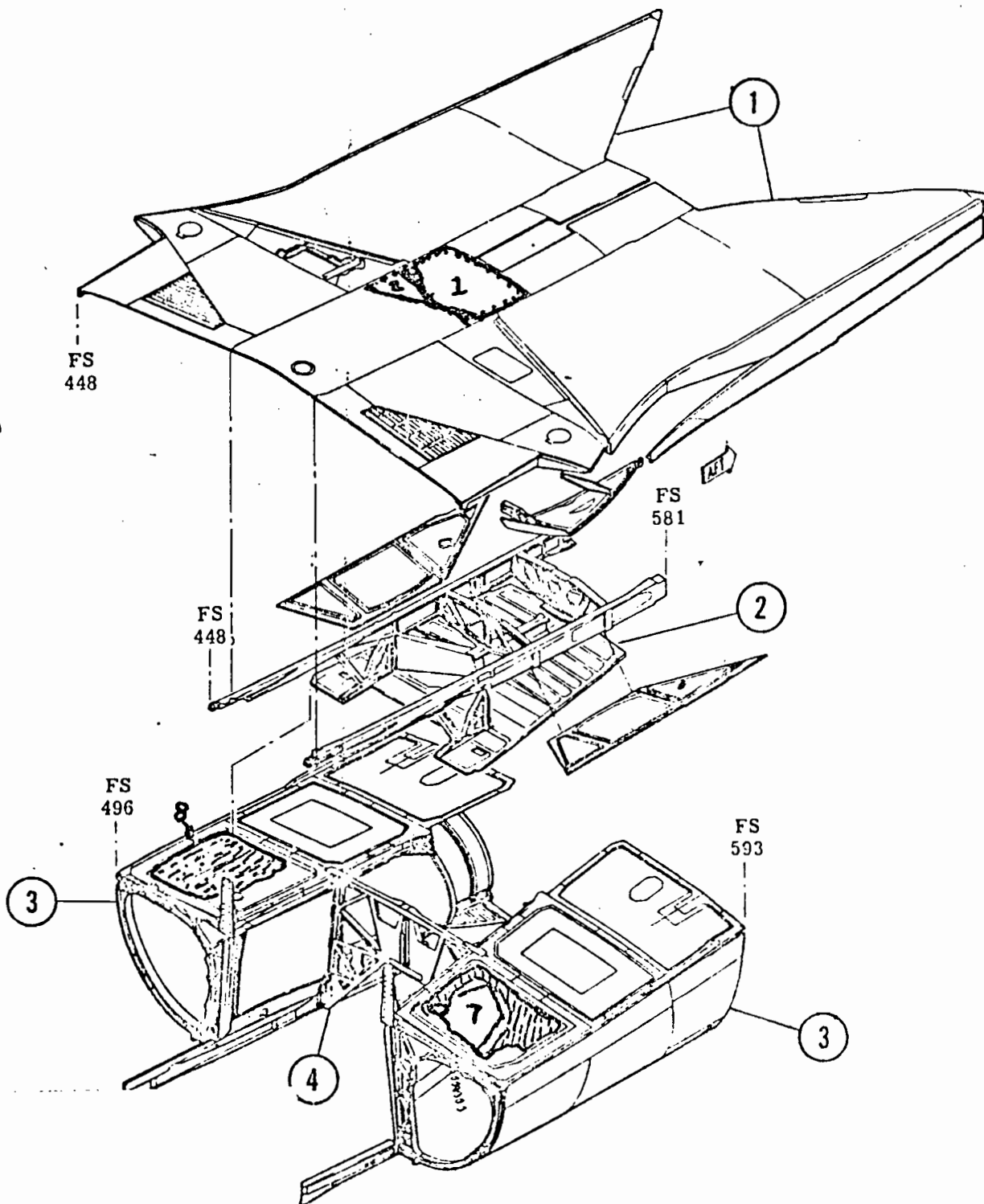
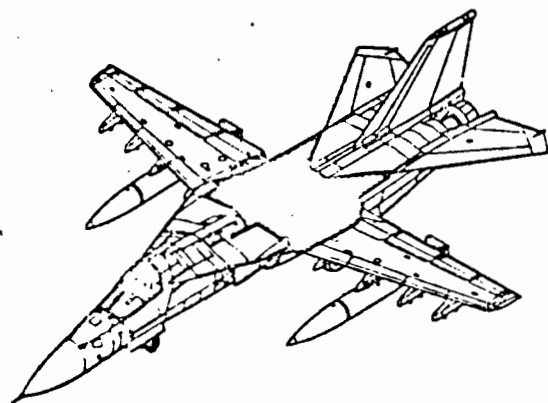


FIGURE 5. LOCATION OF PARTS 1, 2, 7, 38

1.	Overwing Fairing
2.	Aft Center Fuselage - Upper
3.	Aft Center Fuselage - Side
4.	Bulkhead F.S. 531

(91)

GENERAL -
 PANEL MOVING UP WARD
 WITH RESPECT TO
 SUB STRUCTURE

FWD

HEAT DAMAGE

NO
 HEAT
 DAMAGE

PART
 #2

BEARING
 DIRECTION
 IN FIBER GLASS
 (LOWER SURFACE)

PANEL
 DIRECTION
 WITH
 RESPECT
 TO
 FASTENERS

BEARING
 DAMAGE
 TO
 FIBERGLASS
 (top &
 BOTTOM
 SURFACE)

also-up

PART
 #1

COMPRESSION FIBER GLASS Buckle

BEARING DIRECTION

FRACTURE DIRECTIONS
 IN STEEL DOUBLER

STEEL MISSING

MISSING

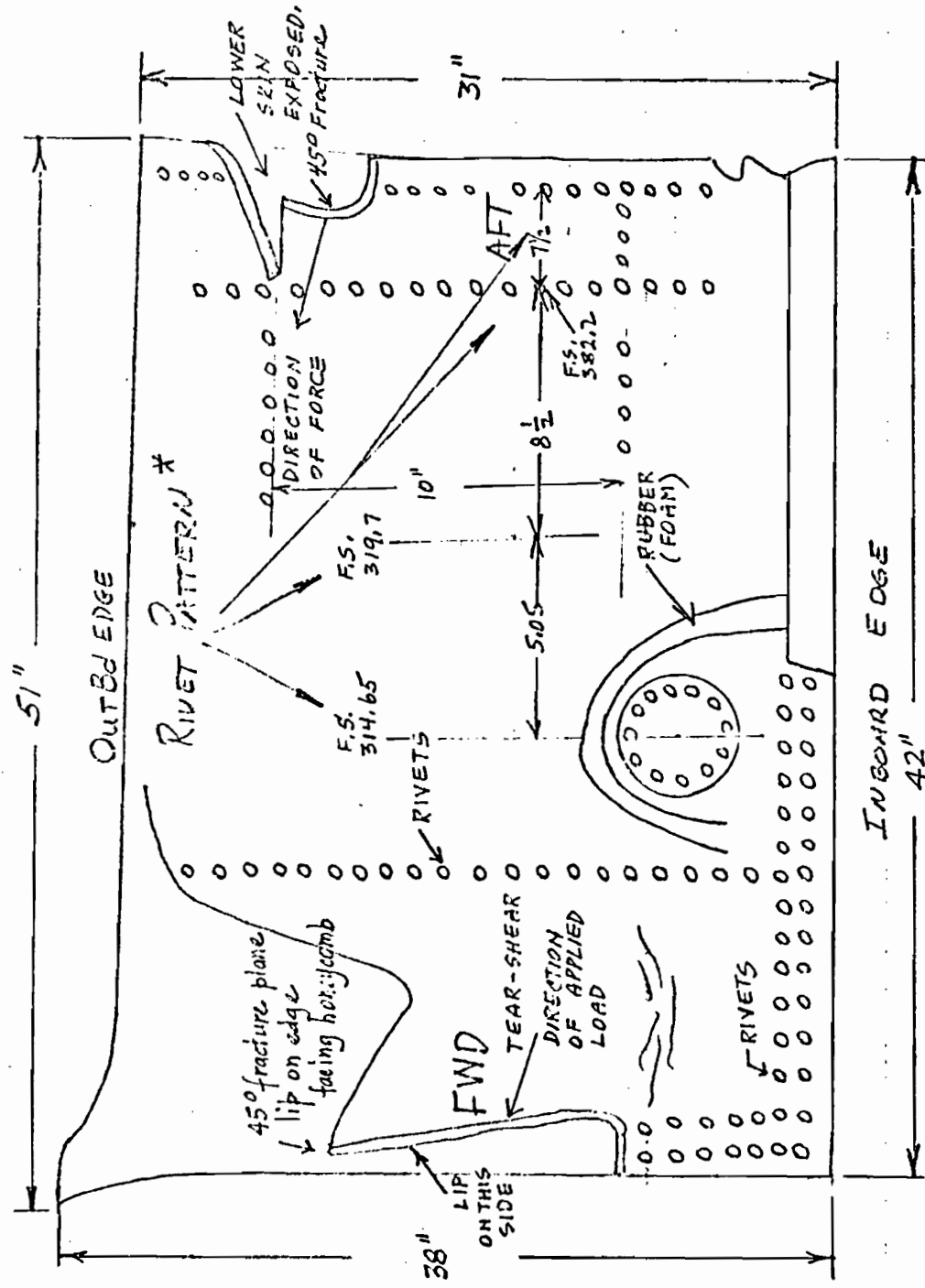
BEARING
 PULL OUT
 DIRECTION
 IN FIBER GLASS

STEEL BENT UP

SHEAR PULLOUT

FIGURE 6. FAILURE DESCRIPTIONS OF PARTS 1 AND 2

PART marked #3. P/N 12B3211.
Fwd Fuel Tank Upper R.H. side. TOP VIEW.



Honeycomb between two aluminum skins (.036" thick, approx.)
No fire or heat damage.

Direction of load AFT to FWD direction (see the sketch).

*THE RIVET PATTERN (AN IMPRESSION OF RIVET HEADS) MATCH THE RIVET PATTERN OF THE CREW MODULE IN THE AREA SPECIFIED ON THE SKETCH.

FIGURE 7. FAILURE DESCRIPTION - UPPER SURFACE, PART 3.

PART #3 P/N 12B3211

FWD. FUEL TANK UPPER RIGHT HAND SIDE - BOTTOM VIEW

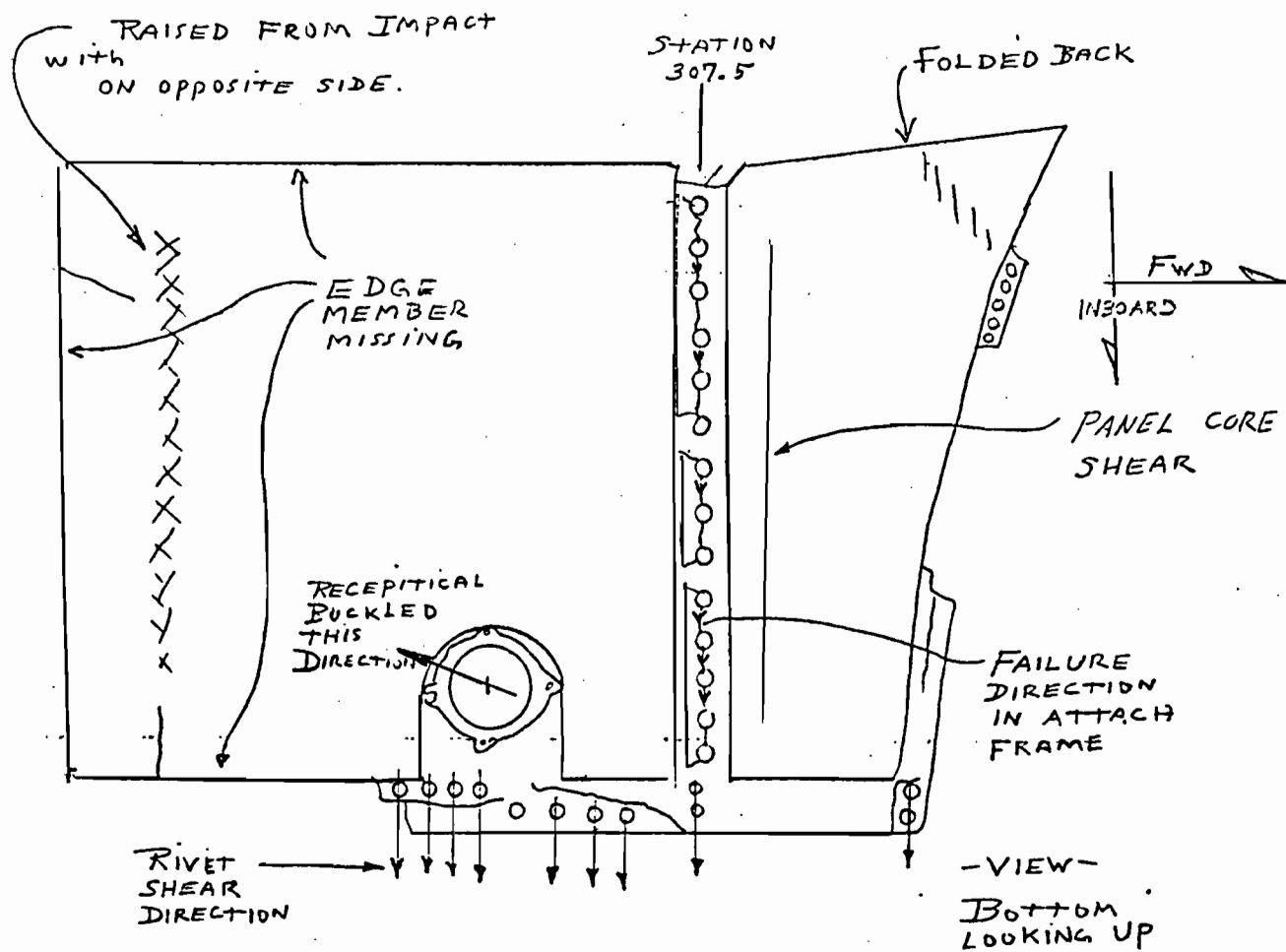
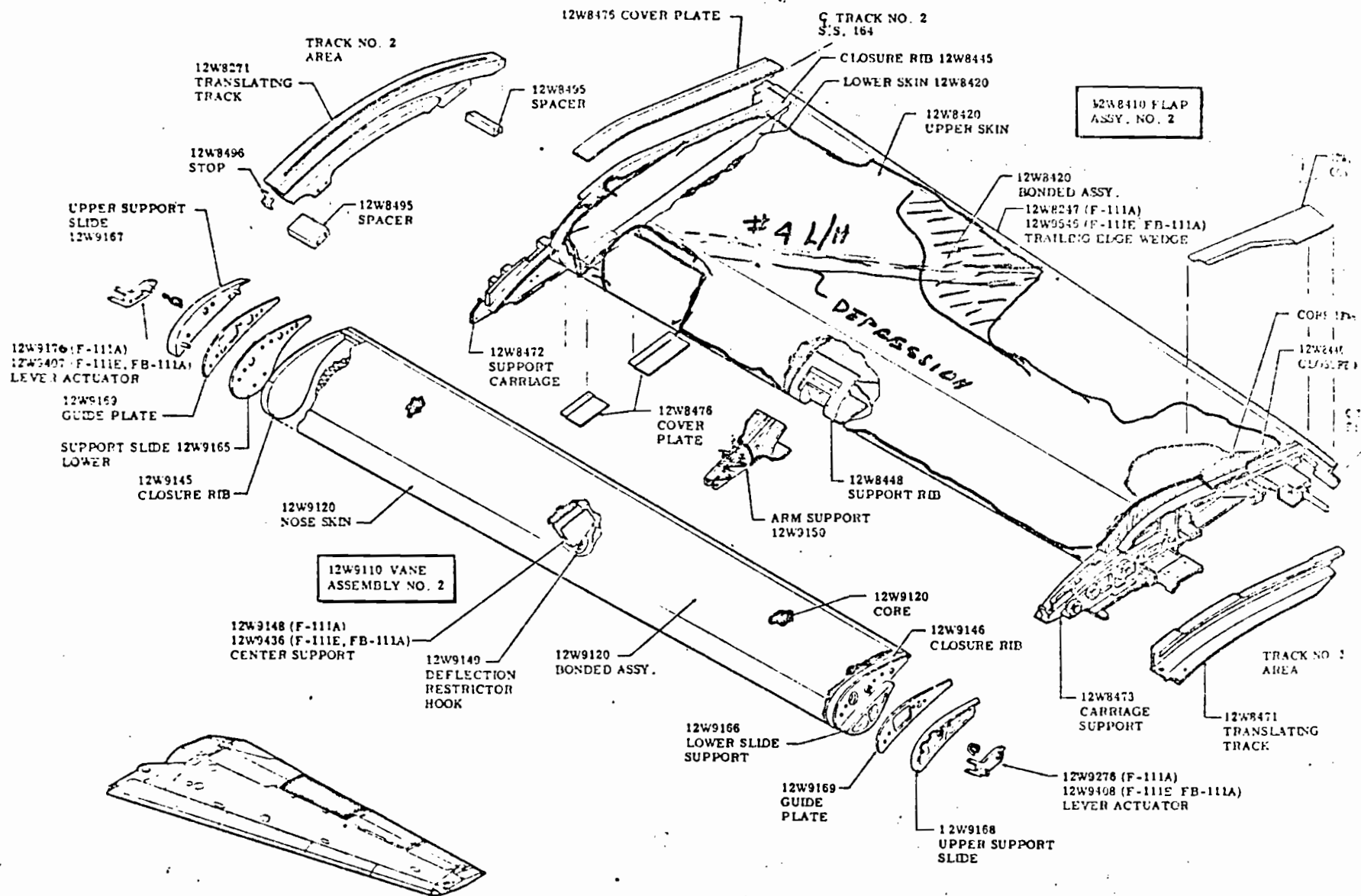


FIGURE 8. FAILURE DESCRIPTION - LOWER SURFACE, PART 3.



PART # 4 - #2 FLAP

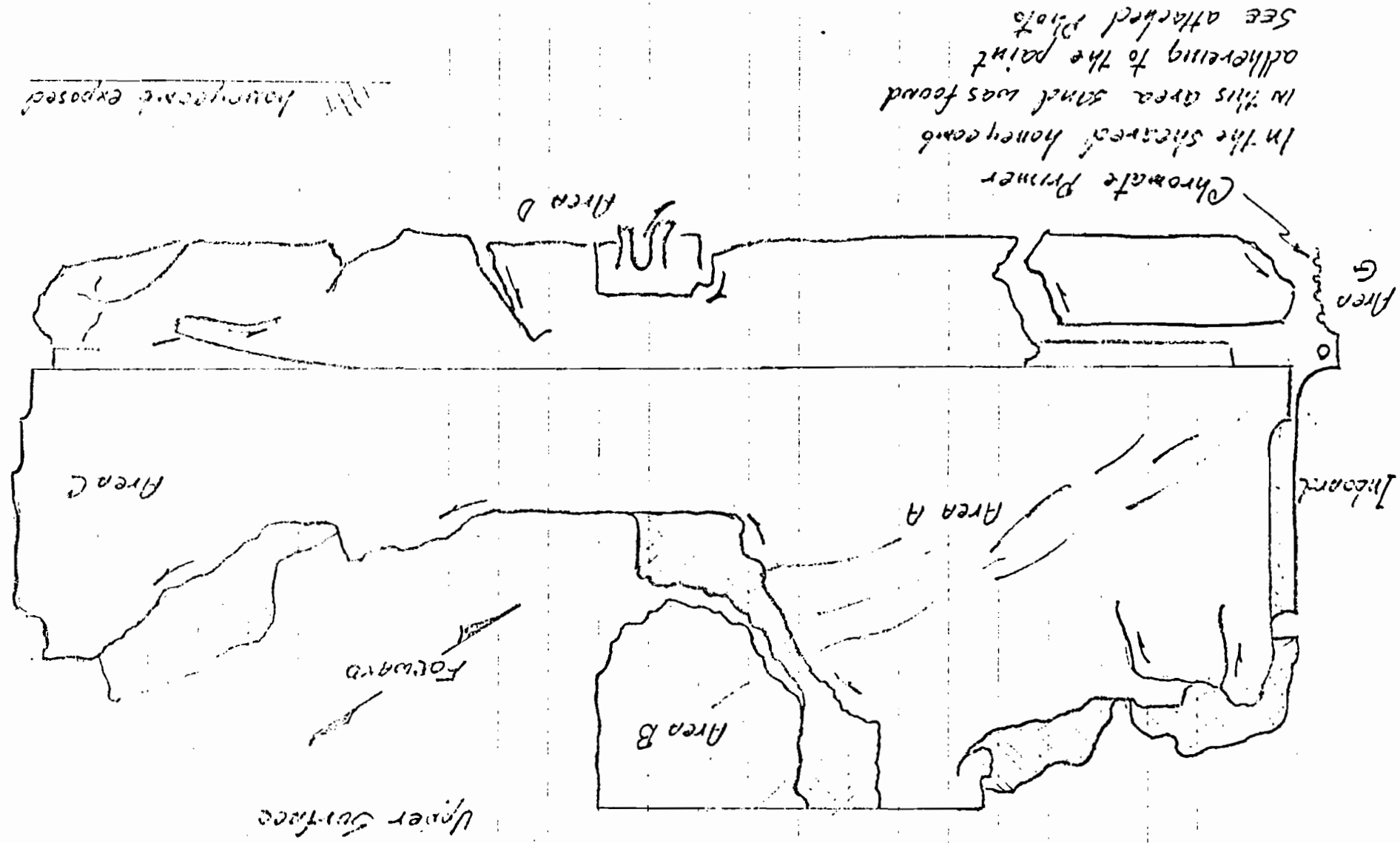


FIGURE 10. FAILURE DESCRIPTION - UPPER SURFACE, PART 4

FIGURE 11. FAILURE DESCRIPTION - Lower Surface, Part 4

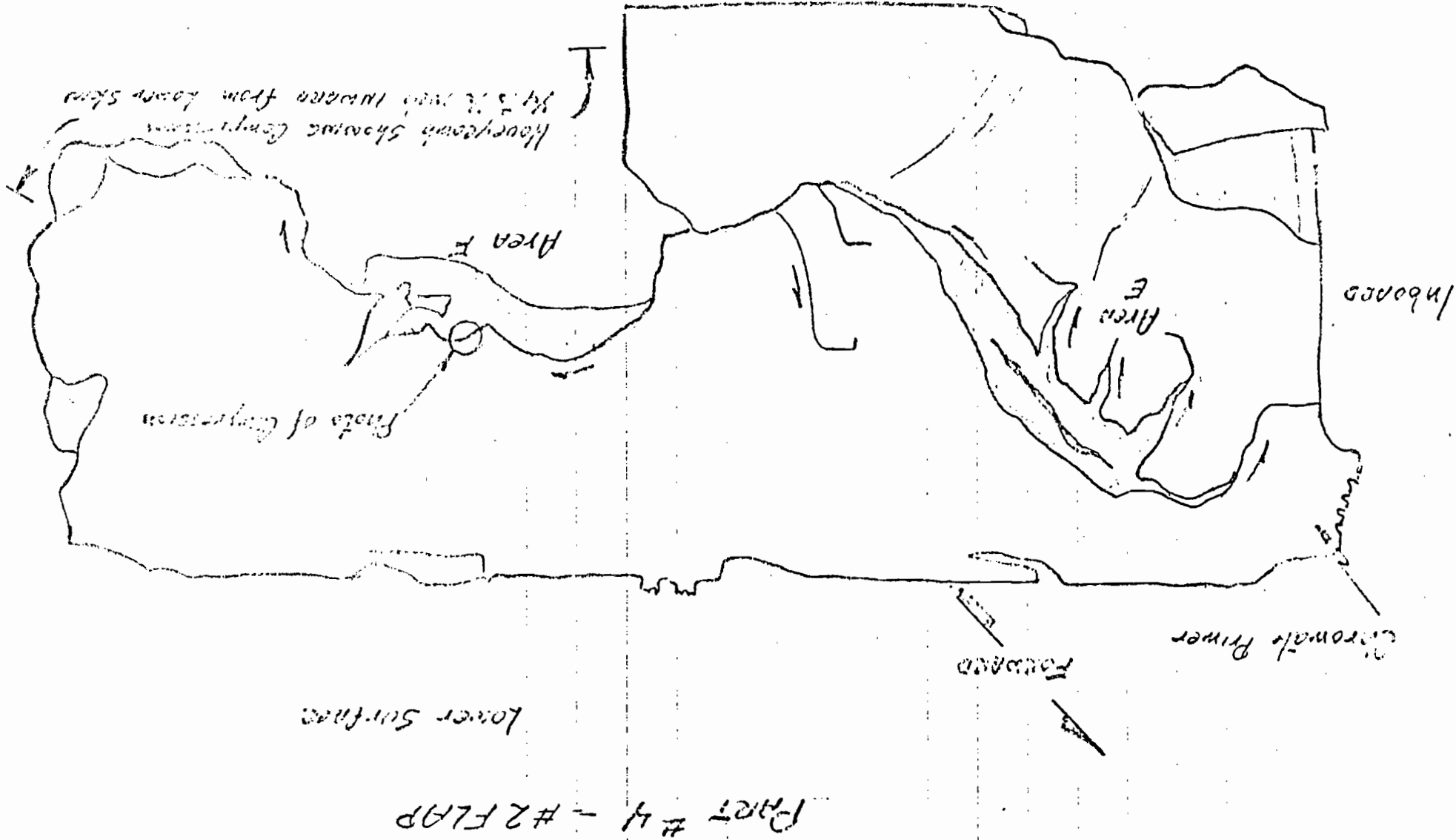
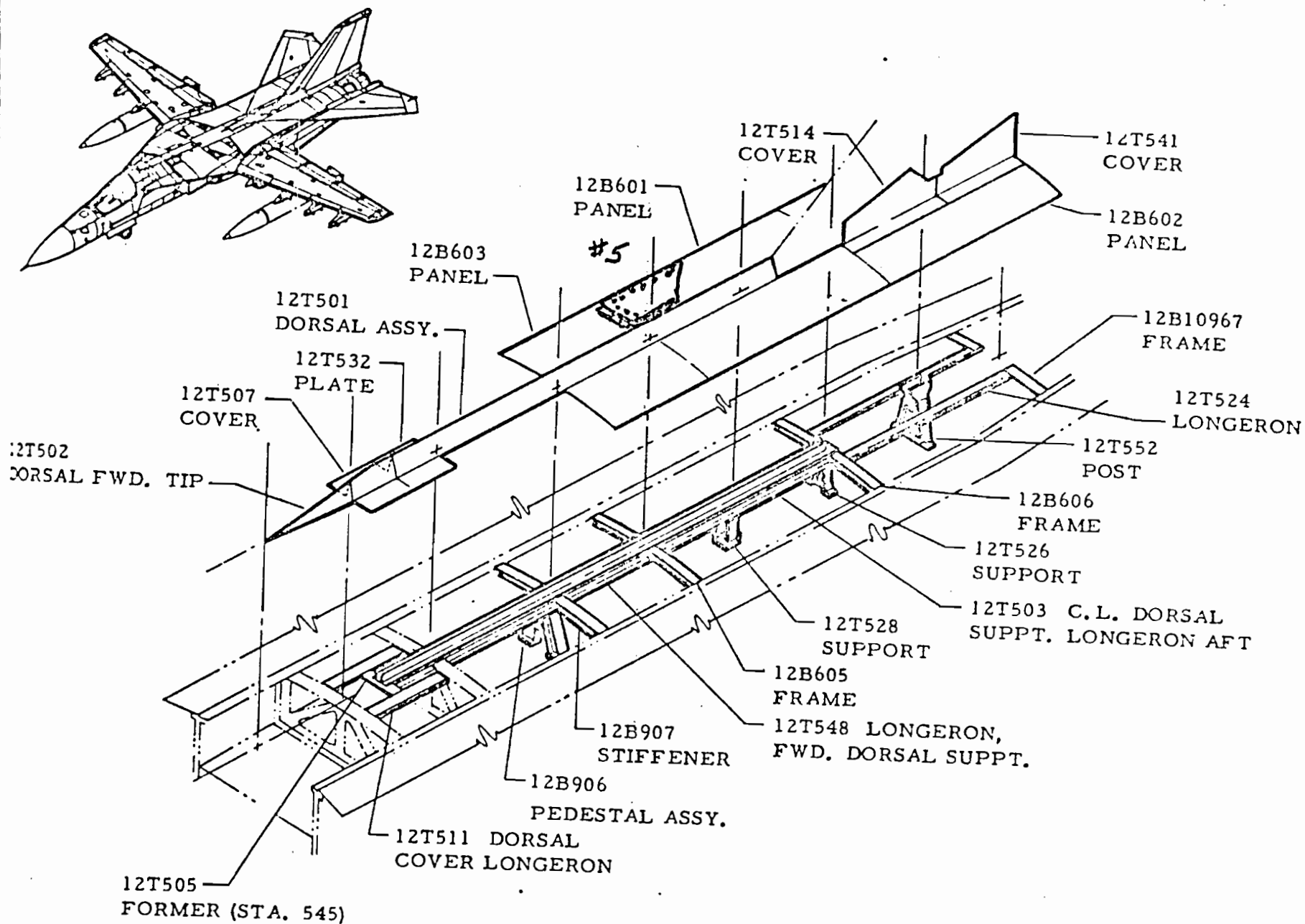
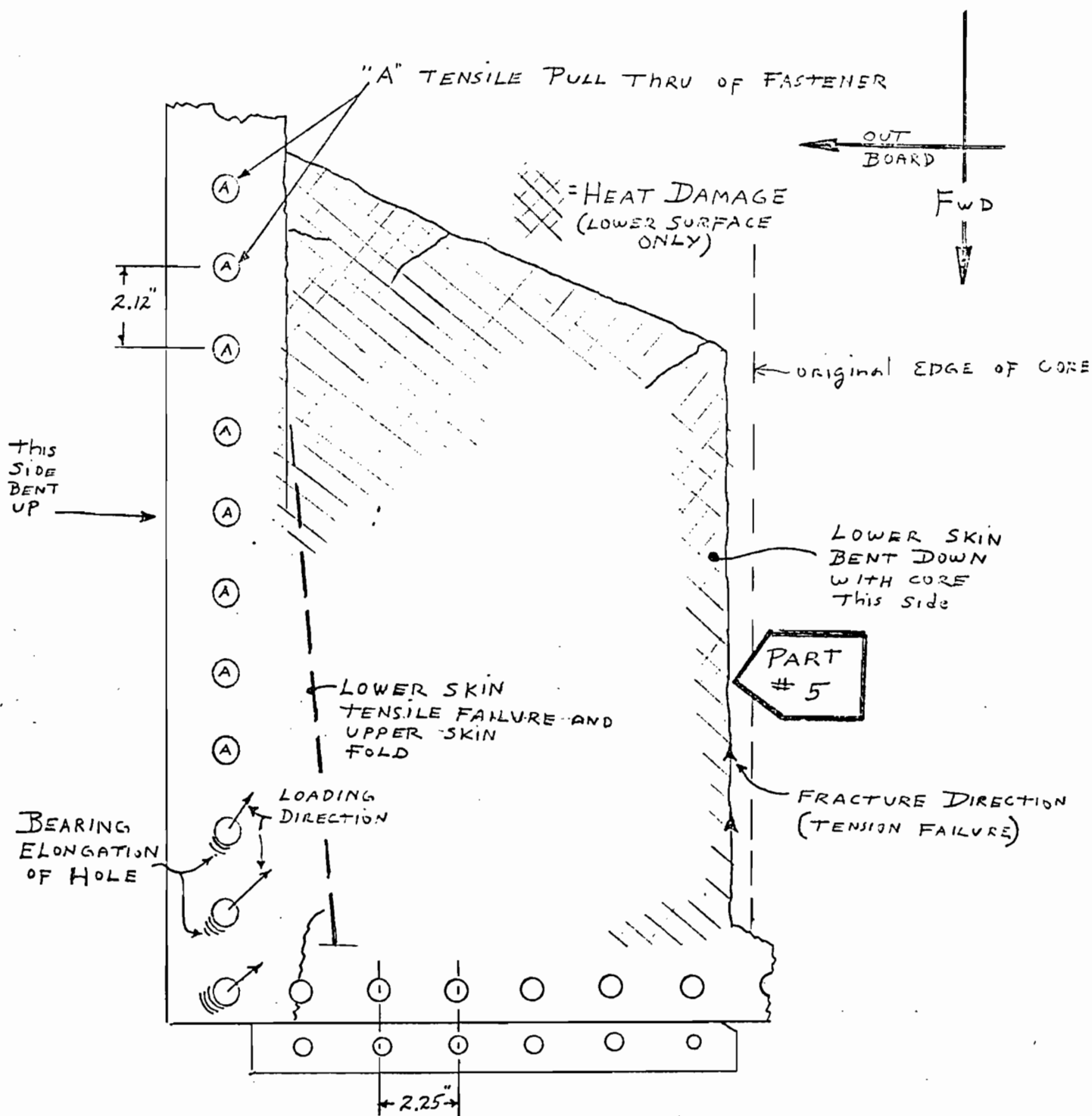


FIGURE 12. LOCATION OF PART 5.





- VIEW - Top Side
LOOKING DOWN.

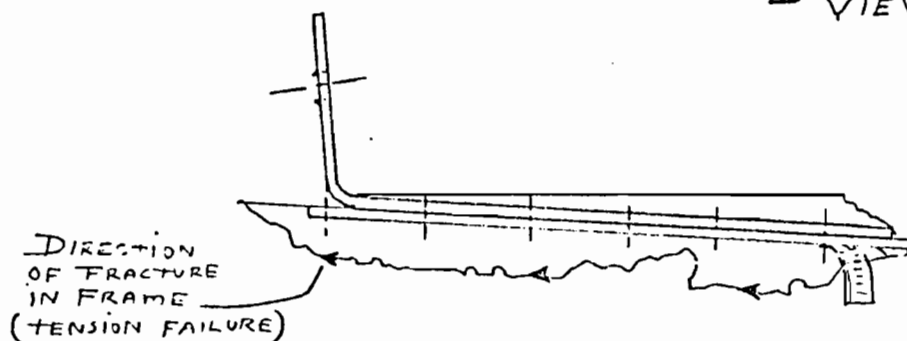
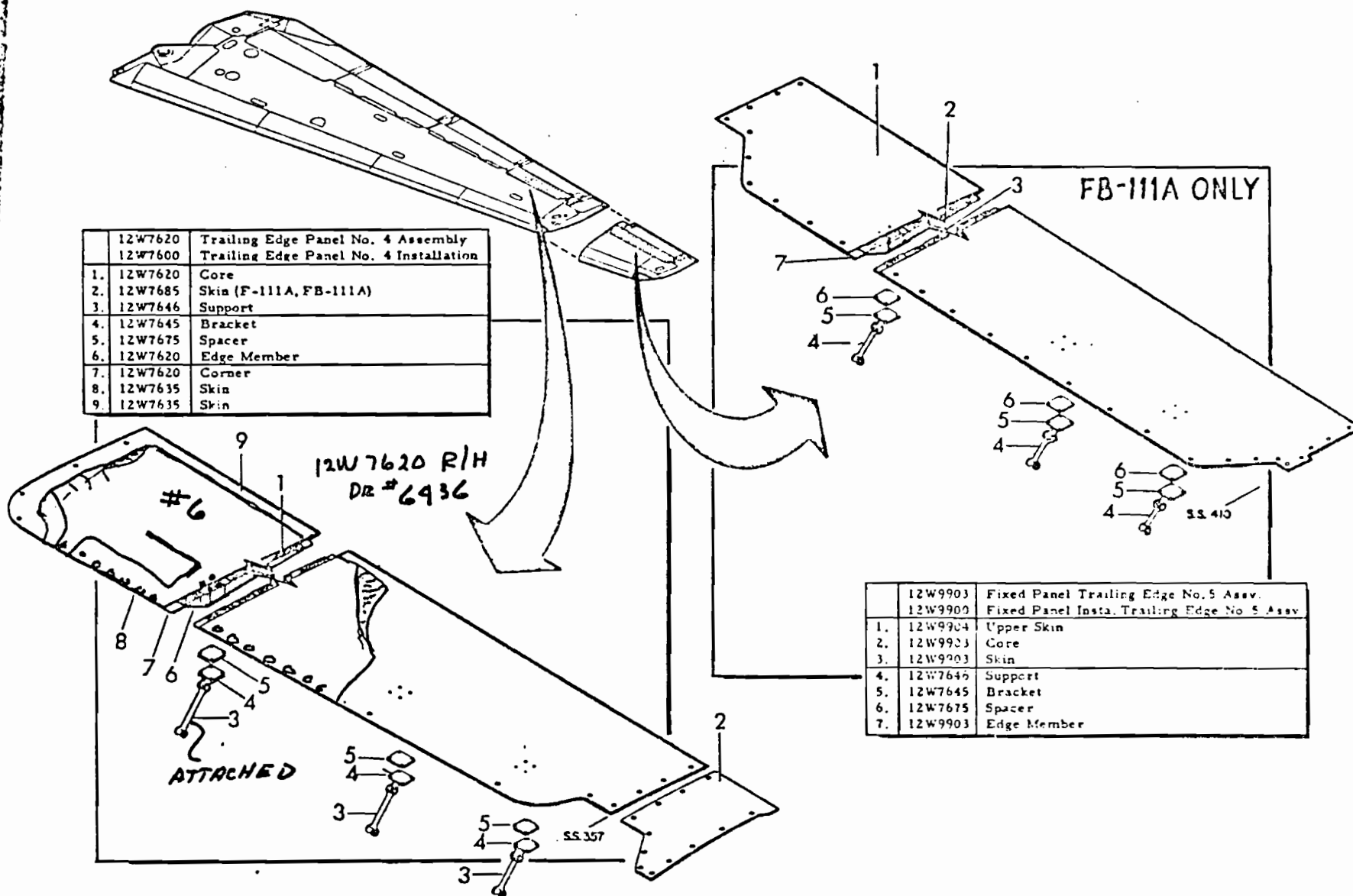


FIGURE 13. FAILURE DESCRIPTION - PART 5. (74)

FIGURE 14. LOCATION OF PART 6.



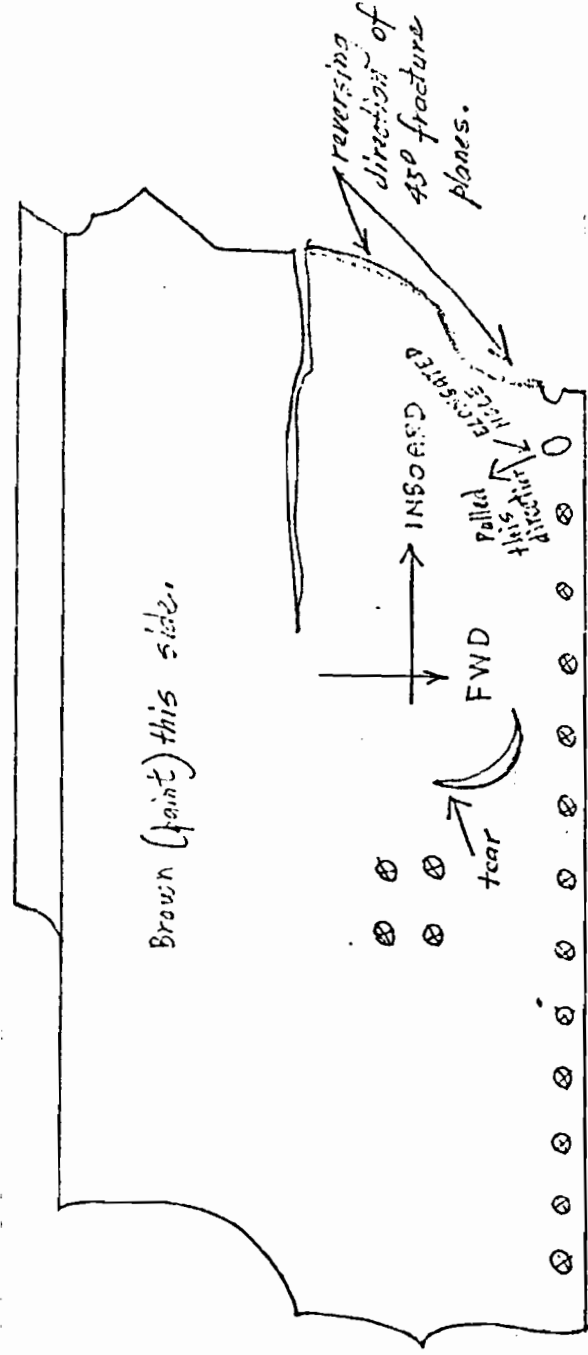
PART MARKED #6

R/H 6436 panel, DWG 12W7620.

Fixed Trailing Edge Panel NO. 4

Honeycomb between two skins.

22" span (approx).



Opposite side painted red.

Panel is severely bent (damaged) in multiple directions

The inner skin (painted red) was detached in several locations.

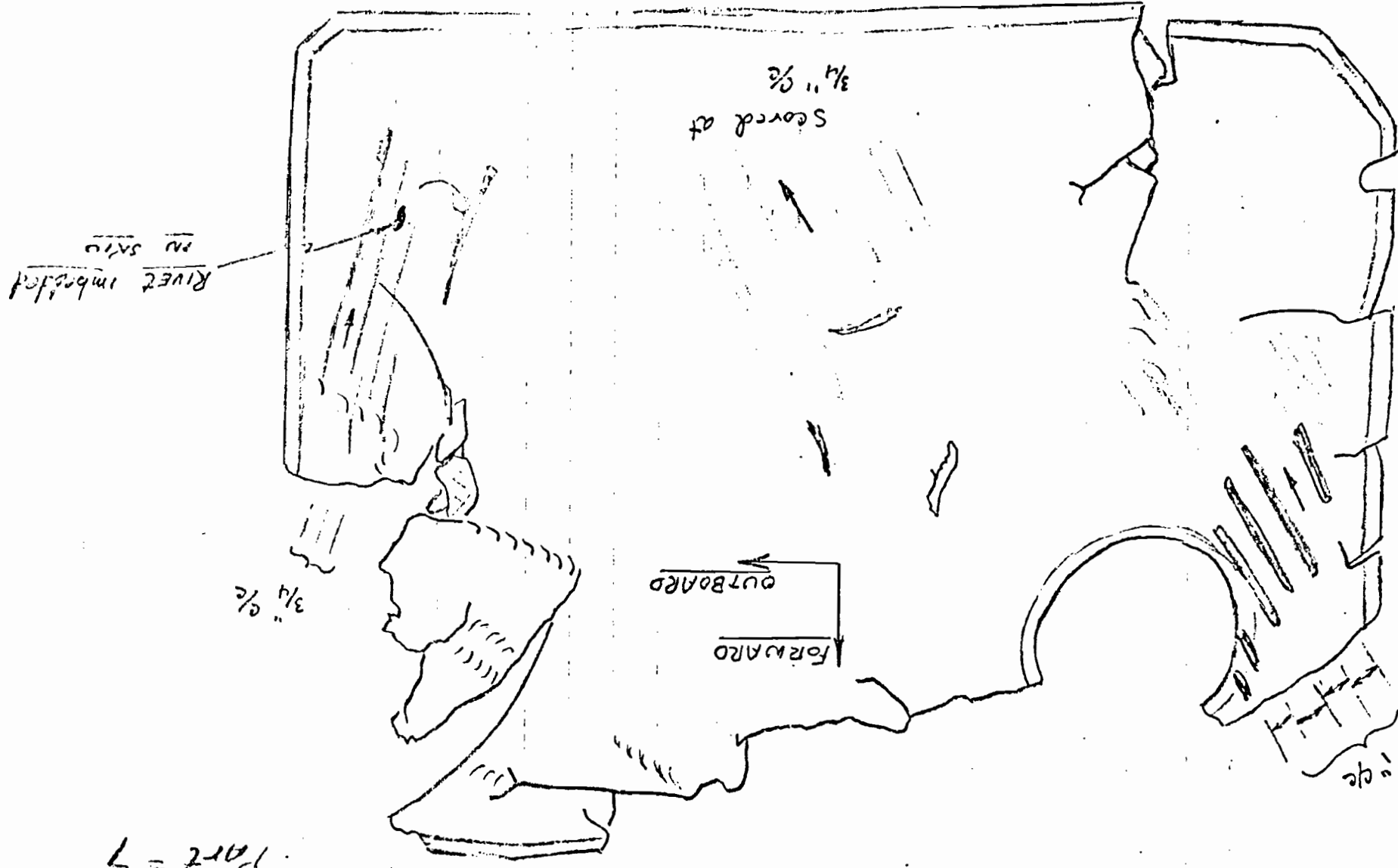
No fire damage observed.

Fracture is overload (tear). 45° fracture planes were reversing directions.

Applied load was FWD to AFT direction at angle from inboard to outboard.

Cause of failure is impact damage.

FIGURE 15. FAILURE DESCRIPTION OF PART 6.



Bonded Assy

P/S 1283911-189

S/N P584110

View looking upward

FORWARD
OUTBOARD

FIGURE 16. FAILURE DESCRIPTION - LOWER SURFACE, PART 7

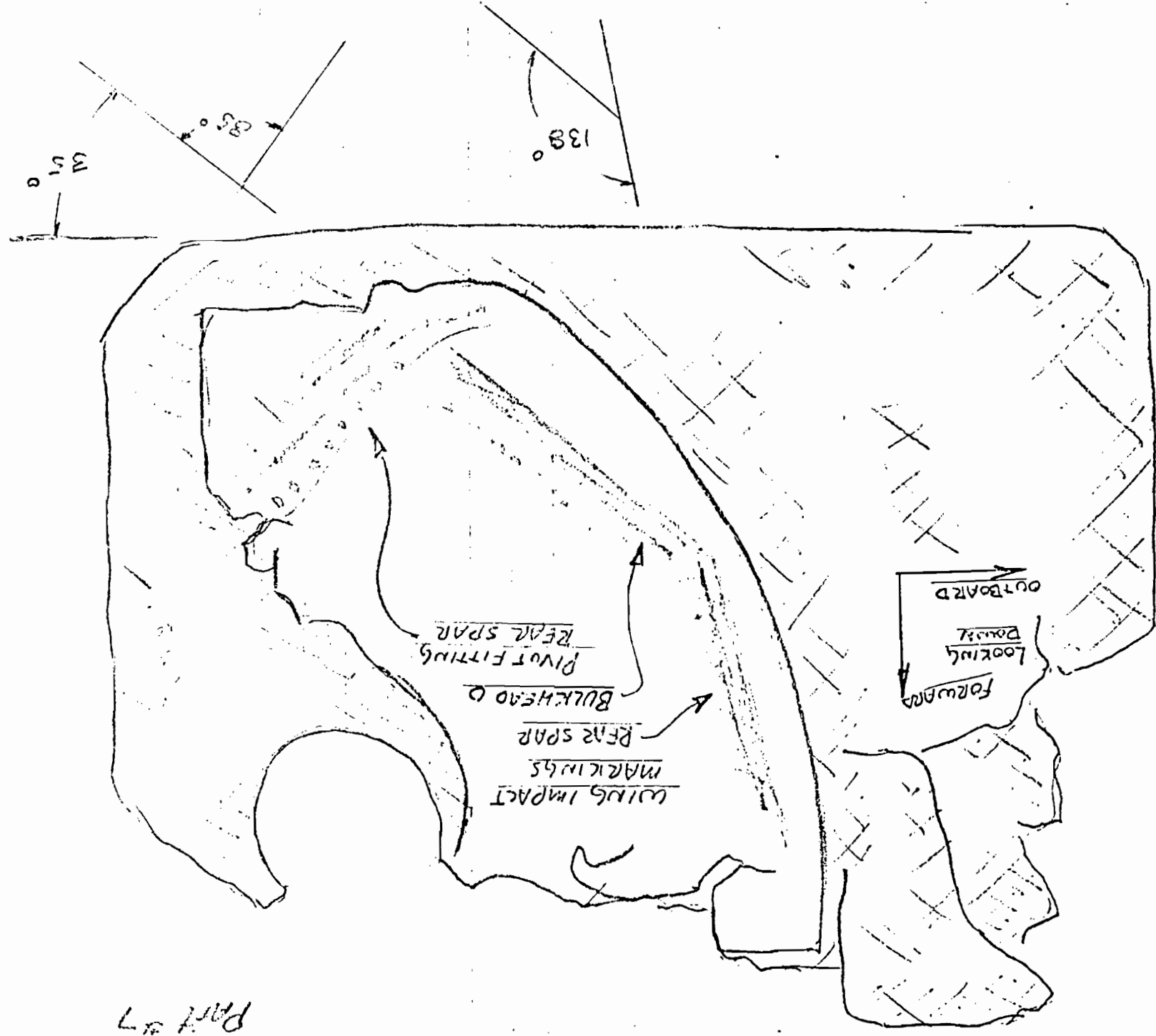


FIGURE 17. FAILURE DESCRIPTION - UPPER SURFACE, PART 7

BOTTOM SURFACE
LOOKING UP

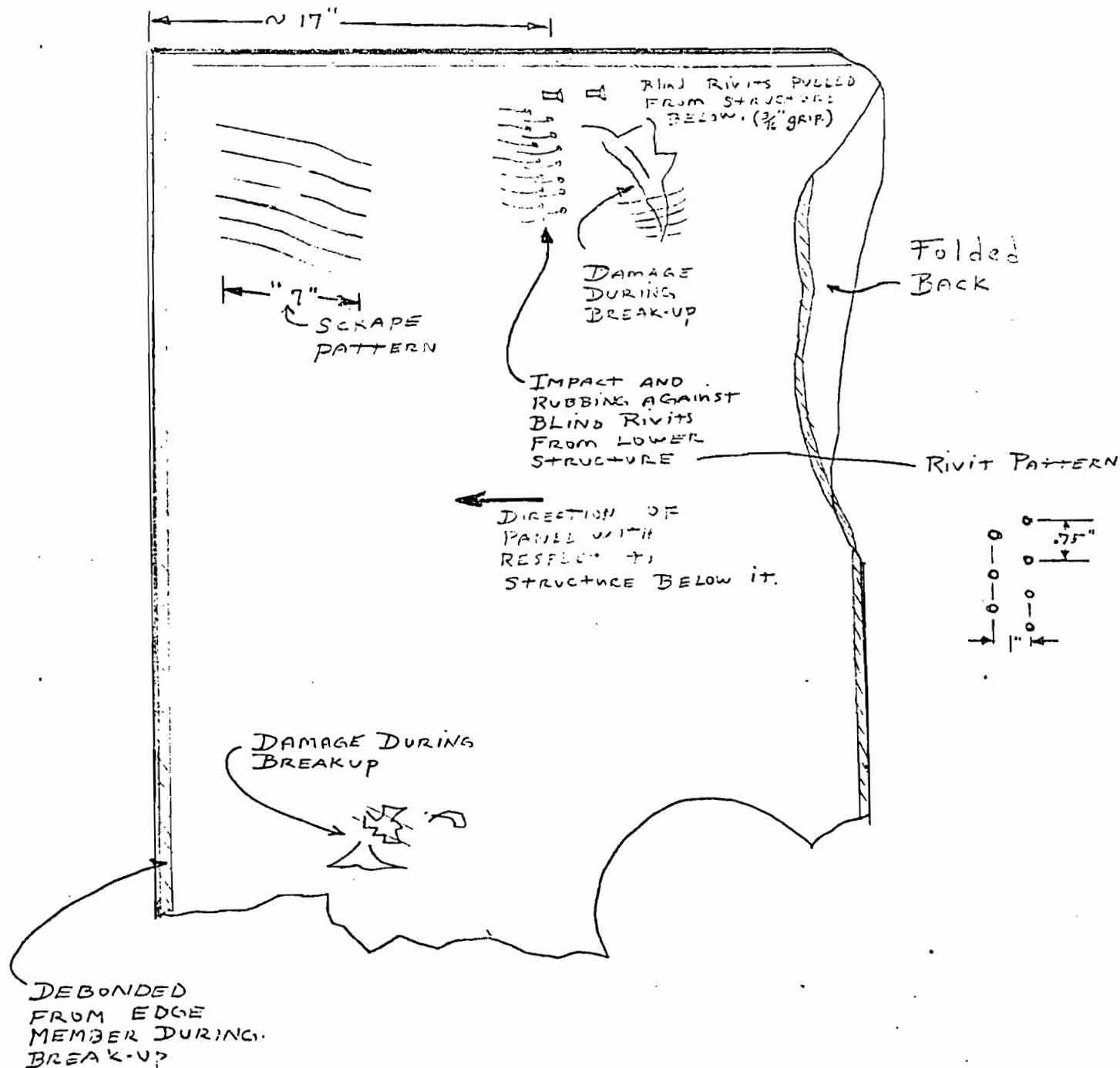
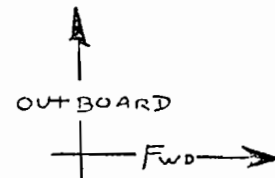


FIGURE 18. FAILURE DESCRIPTION -
LOWER SURFACE - PART 8.

PART #9

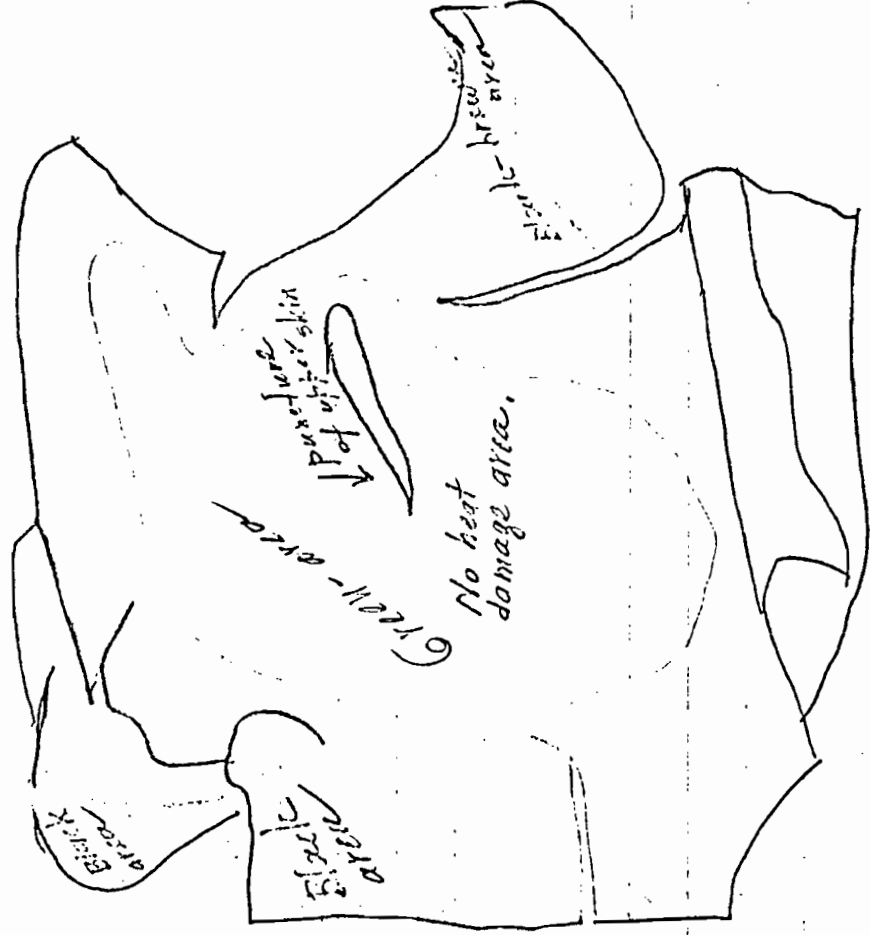
Burred piece of unidentified part.

NOTES: Fire damage, yellow green paint turned black,
size: 7"x8" approx., core = honeycomb

SKIN 0.019" thick, both sides.

Fire damage both sides.

Temp. $\approx 600^{\circ}\text{F}$ or GREATER.

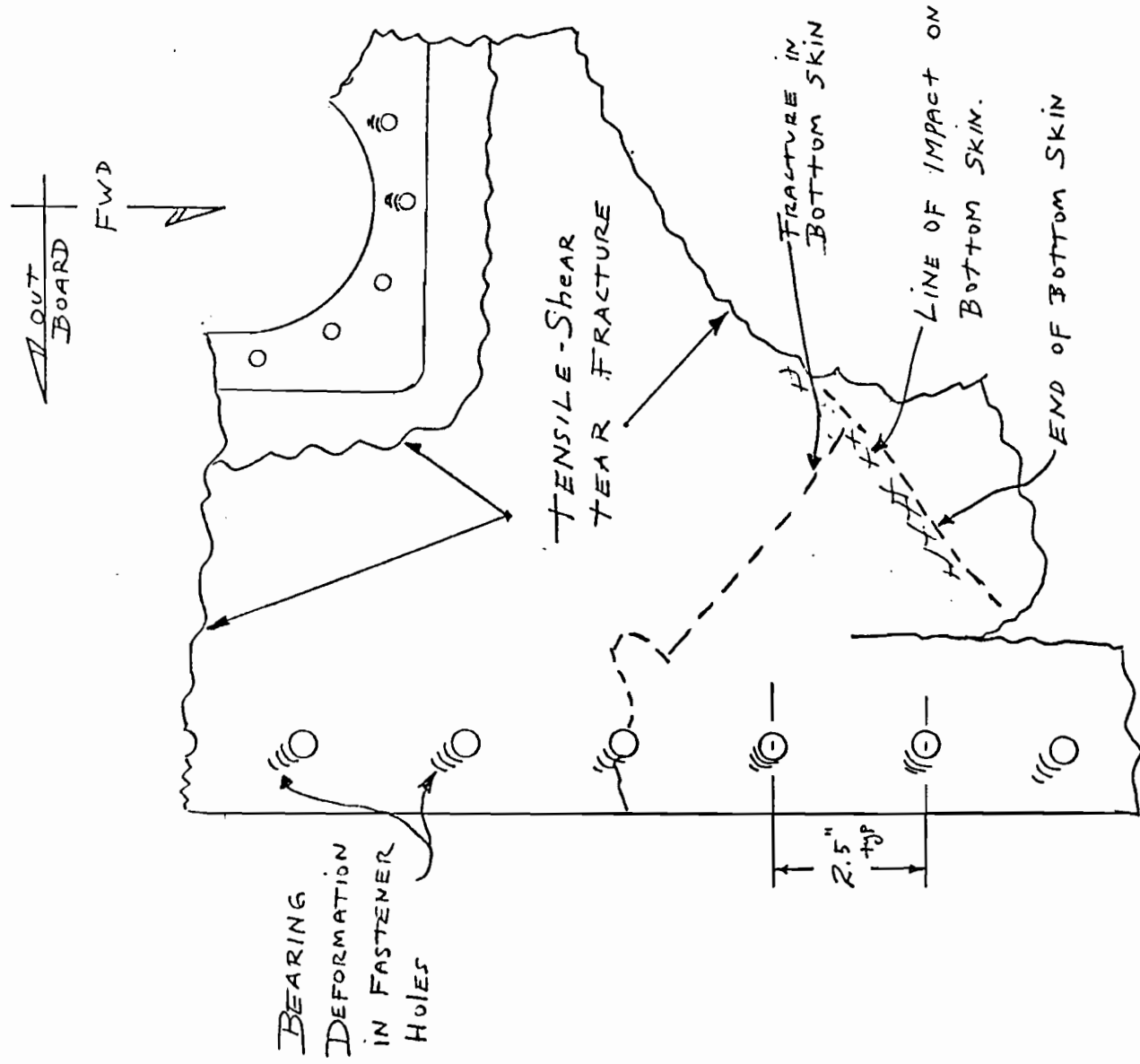


TEARS AND BLISTERS ON OPPOSITE SIDE.

This part was squashed (impact-compression).

Fractures @ 45° (vertical).

FIGURE 19. FAILURE DESCRIPTION - PART 9



VIEW
TOP OF PANEL
LOOKING DOWN

FIGURE 20. FAILURE DESCRIPTION - PART 10.

VII. SUMMARY AND ADDITIONAL COMMENTS

A. Location of parts on aircraft planform in Figure 1 indicates aircraft was intact prior to impact. This assumes all parts noted are from the same aircraft. The crew module was an integral part of the airframe. From the pieces investigated, there is no evidence of pre-impact fire or battle damage.

B. Probable aircraft attitude at impact is wings almost level, positioned at aft sweep, high vertical velocity, with nose and left wing slightly down. This impact attitude would generate very high internal pressures within the fuselage shell causing upper surface panel sections to escape and some upper internal panel sections to also escape post impact fire. There were no lower fuselage surface panel sections present. It is also assumed that only a small percentage of parts that could "float" were recovered.

C. In summary, damage to recovered parts investigated is believed caused by aircraft impact only.

VIII. ON-SCENE ANALYSIS BY MR.ALLEN

Tuesday AM
Parts Listing & Description

1. 3410 Panel - Aft Section

Aft section with RTV sealing marks remaining from dorsal fin LE. 3" x 2" upward puncture top aft LH side. All fasteners and bevel retainer pulled thru the bottom except the next to aft RH, 3rd and 4th from the RH aft edge. Also, 3rd from aft LH on aft edge and the second on LH side from LH aft corner. Part of the attach structure was retained with the 2 aft RH fastener. No evidence of heat or fire.

2. 3410 Panel - Small section RH side piece which matches the RH aft breakline. 14" on RH edge - Part shows heat damage primarily on the lower side which has the inner surface peeled off. Light surface heat damage on top side. All four fasteners and retainers pulled thru bottom.

3. 12B3211 F-1 Fwd Fuel Tank Upper RH Side

S/N 5647446

38" Fwd RH edge - 31" on aft edge
42" long on RH, 51" on lower LH edge.

Part shows no evidence of heat or fire. Distinct rivet and frame pattern imprinted over the aft top side downward.

4. LH No. 2 Flap (5439)

LE 70" - 40" TE - 30" inbd chord. Upper surface has distinct diagonal impression lines which correspond to impact marks that would be made by the overwing fairing. Comparison on an aircraft indicate wing sweep would be approx 72°. Faint line or marks that would be caused by wing seal evident and parallel to deeper more distinct marks caused by the overwing fairing. LE is crushed inward and aft on most of the inbd half. Outbd end has the top skin peeled up with the inbd LH crushed principally downward. Both the inbd and outbd rib closures are missing. Lower surface has a large upward damage area with the core compressed flat against the upper skin. The damage area is along and aft of a diagonal line corresponding to the approx 72° wing position line. White scuff marks are evidenced on the aft inboard corner were most probably caused by impact with the upper deck of the wing cavity.

5. 4426 Panel

25" on edge - 17" on edge (Edge strip is missing) 14" on end.

5. 4426 Panel (cont'd)

Part has some light heat damage on the diagonal severed edge, on edges, skins and core; all evidence of post impact fire.

Back side of panel has stamped marking "Ship No. 137" and also grease pencil marks "092." The _____ edge has the attachment frame with fasteners still in place.

6. 6436 Panel - RH upper False Spoiler measure approx 22" span. Both the inbd and outbd section is missing. The section has the support link and fitting was attached. Lower end was broken at the clevis. Panel is severely bent in several directions with the inner skin is peeled and buckled in a down and aft direction.

7. P/N 12B3911-189 #

S/N P584110

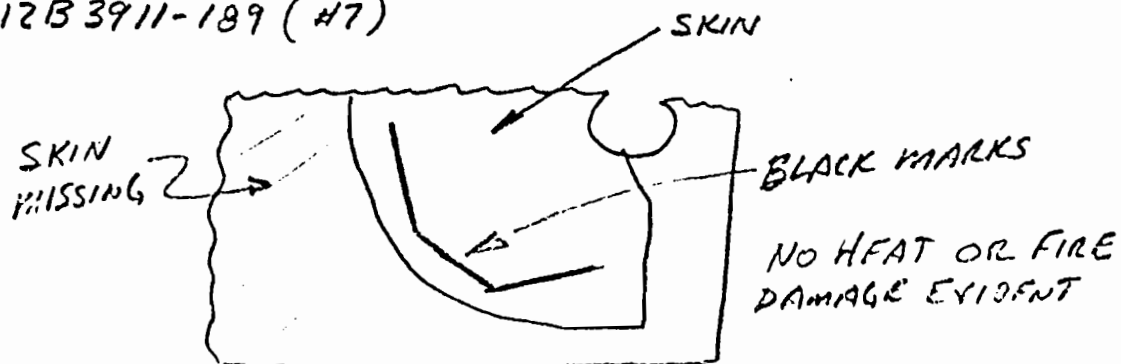
Approx 32" x 42" - Bonded assembly painted white on both sides. Skin on one side remains on approx 35-42% of the core. This area has a distinct (but unidentified pattern) black marked depression.

8. Unidentified

Part is bonded assembly very similar in shape and size as part #7 (33" x 34"). One of the skins is completely missing leaving predominately open honeycomb and a small amount (est 2-3%) glue line closed cells. Assume part had the skin side up with air trapped in the open cell side allowing part to float.

9. Unidentified - Burned honeycomb piece. Size approx 7" x 8" with core-panel-thickness estimated to be at least 1". Item is torn segment with crushed torn edges on all four sides. One side is primer color with fire predominately on the edges. i.e., predominately free of heat/fire damage. Other side shows significant heat damage over the entire surface. Fire on fractured edges, core, and both inside and outside of skins.

* 12B3911-189 (#7)



10. 2460 Panel

External skin - brown color with prime inner color.
3/8" core. Irregular shaped part 12" x 15". No evidence of
heat or fire damage.

Miscellaneous Parts

- a. Bonded piece - 12" x 18" x 3/4 core - no fire/heat
- b. Bonded piece - 12" x 4 x 1/2"
- c. Flap vane LE - 14" span 12" inbd chord
- d. Engine Nacelle aft tank wall - 12" x 12"
- e. Piece of Horz Tail - LE or TE - Green-Black 12 x 18
- f. Tapered Phenolic Honeycomb - Fiberglass Skin 4 x 4
- g. Aluminum Honeycomb - Fiberglass Skin 6" x 10 (3/4 core)