

1.0 Introduction

G-IV s/n 1225, N450KK is currently operated by La Venezolana de Seguros y Vida CA.

Total Time: 7473.1 Hrs., Landings: 3511

Empty Weight: 53,000 lbs. Fuel on Board: 1505 lbs.

On April 24, 2015, G-IV s/n 1225 conducted a flight from Maiqueita Airport Carracas, Venezuela (CCS) to Fort Lauderdale, FL (FLL). The flight loading consisted of a pilot and co-pilot and no passengers. The flight crew and aircraft experienced an over pressurization incident enroute. The pilots followed the Aircraft Flight Manual (AFM) procedures and executed a successful landing at FLL. An initial visual inspection performed by the flight crew did not reveal any indications of damage. The plane was then flown to Reliable Jet Maintenance (RJM) at Boca Raton, FL (BCT) airport.

GAC Field Rep [REDACTED] and RJM provided initial photos to GAC showing a cracked floor beam, damaged wing link(s) and dimpled areas in the floorboards.

Gulfstream Aerospace Corporation (GAC) Representatives, [REDACTED], Service Engineering-Structures and [REDACTED] Service Engineering-Stress were dispatched to BCT to evaluate the aircraft on the 2-JUN-2015 at which time they met with GAC Field Rep [REDACTED] and RJM representative [REDACTED].

This report will address:

- The findings from the structural evaluation of damage to the aircraft.
- Identification of discrepant parts.
- GAC's recommendations for parts replacement and/or possible repair options.



Fig. 1-1
G-IV s/n 1225, N450KK

2.0 Initial Findings

- A. review of the Flight Data Recorder download by GAC provided the following information:
- i. The flight from CCS to FLL lasted 182.4 minutes.
 - ii. 136658 Take-off (rotation).
 - iii. 143839 Amber Caution Capsule ON, probably the Cabin DFRN- 9.6 Amber message (not recorded by the FDR). Message was not acknowledged by Crew for 89 seconds.
 - iv. 143860 Cabin DFRN- 9.8 Red CAS message and Master Warn capsule illuminate. 43K AT/AP ON Eng bleeds 23/23 PSI.
 - v. 143928 Red warn and Amber Caution capsules acknowledged 68 seconds after Red warn activation and 89 seconds after Amber Caution activation. This means that the crew acknowledged the message by pressing the Red W. CAS messages are still active. Seems like a long time to listen to the double (Amber Caution) and triple (Red Warn) chime.
 - vi. 143995 A/C starts to descend. Eng bleed pressure drops to 19 PSI.
 - vii. 144066 Amber Caution capsule illuminates and the Crew acknowledged in 5 seconds.
 - viii. 144388 RED warning is triggered. Crew acknowledged in 10 seconds. Red "DOOR" CAS message?
 - ix. 144476 Amber CAS message. Acknowledged 24 seconds later. Possible Amber "CABIN PRES MANUAL" CAS message?
 - x. 144564 Cabin DFRN-9.8 warn extinguishes. A/C flying level at 20K. Eng bleeds 42/43 PSI.
 - xi. 144633 Amber Caution capsule illuminates. Acknowledged or message cleared 1 second later. Possibly Cabin DFRN- 9.6 Amber message.
 - xii. 144676 Cabin DFRN-9.8 RED CAS messages and Master Warn capsule illuminates.
 - xiii. 145012 Cabin DFRN- 9.8 message goes out and stays off.
 - xiv. 145110 Cabin pressure low Red CAS message illuminates. A/C descending thru 13K. Eng bleed 42/42 PSI.
 - xv. 145111 Master Warning capsule illuminates for 45 seconds before acknowledged.
 - xvi. 145117 The emergency checklist activates. Cabin Pressure LOW.
 - xvii. 146731 Cabin pressure low extinguishes and remains out.
 - xviii. 147605 A/C lands (touchdown) 62.7 minutes (3766 seconds) after the first Amber CAS message.
- B. Comments on FDR download:
- i. Lateral acceleration is not recording properly
 - ii. Reviewed the FDR and did not see any exceedances with vertical G's or with pitch and roll rate. Maximum vertical G's was less than +/- 0.5 G's. Could not find any indication that the aircraft had high lateral or vertical G's or any high (roll or pitch) rate of change.
 - iii. No FDR data to support if the safety valve operated correctly.
 - iv. The FDR does not record Cabin Pressure/Altitude.
 - v. The FDR shows that the first over pressure 9.8 message was on for 704 seconds and 336 seconds the second and final time with a 112 second gap.
 - vi. 98 seconds after the over pressure 9.8 message goes out the second time, the Cabin pressure Low message illuminates.
 - vii. Bleed air pressure was normal and never selected off (based upon engine performance and aircraft altitude).
 - viii. The Crew did not follow the AFM recommend steps for an Amber "Cabin DFRN 9.6" or a Red "Cabin DFRN 9.8" CAS message.
 - ix. The over pressurization message does not appear to be an indication failure.
 - x. Recommend a Chapter 5 "Pressure Differential Exceedance – Inspection". It is unknown if the safety valve operated correctly.

G-IV S/N 1225 Structural Evaluation-Over Pressurization Event

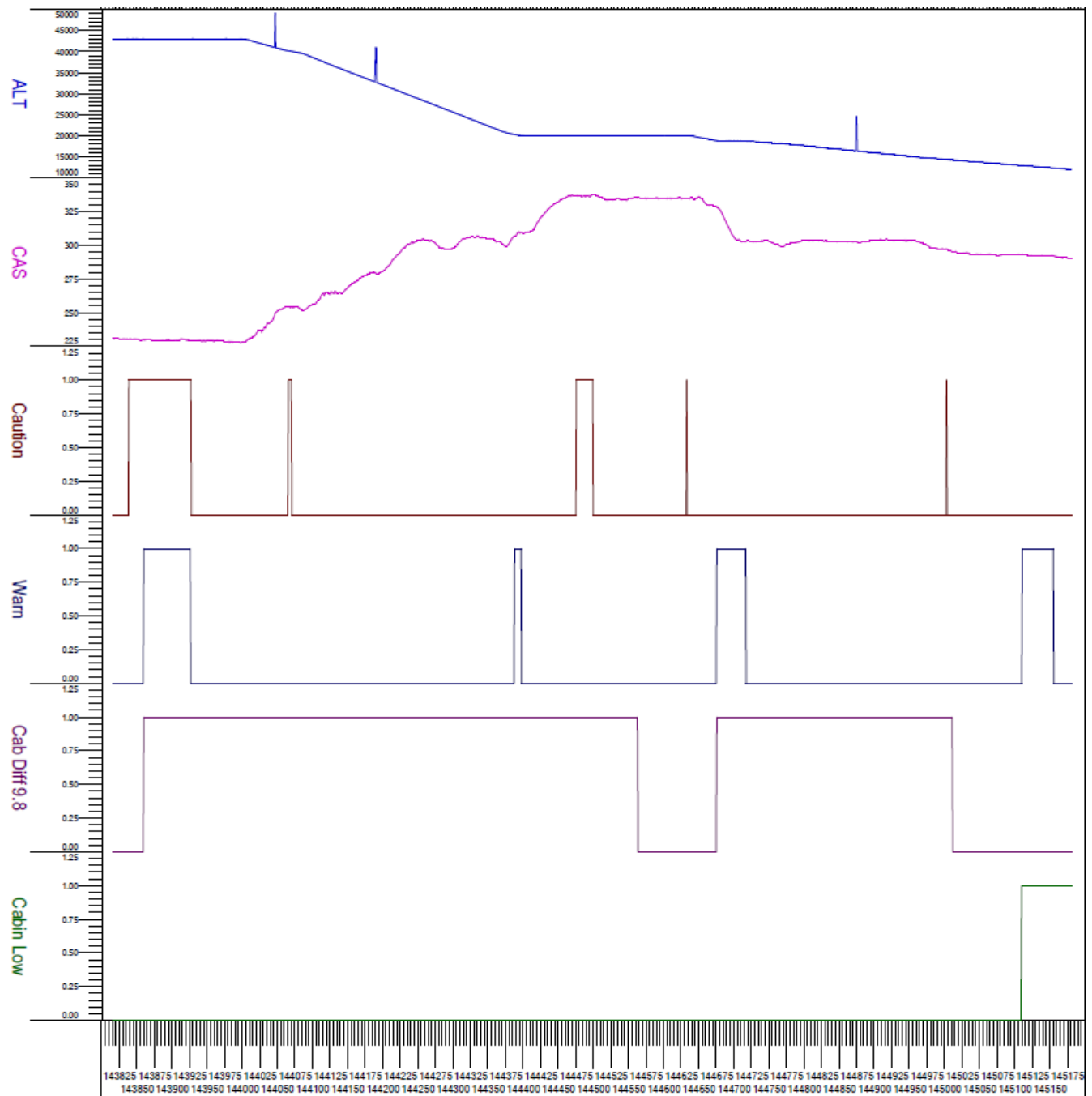


Fig. 2-1

Download of FDR Data

- C. An initial inspection of the aircraft by RJM personnel provided the following information:
- i. The Aural Warning Speaker showed evidence of deterioration.
 - ii. The Aural Warning Speaker volume was not functioning properly.

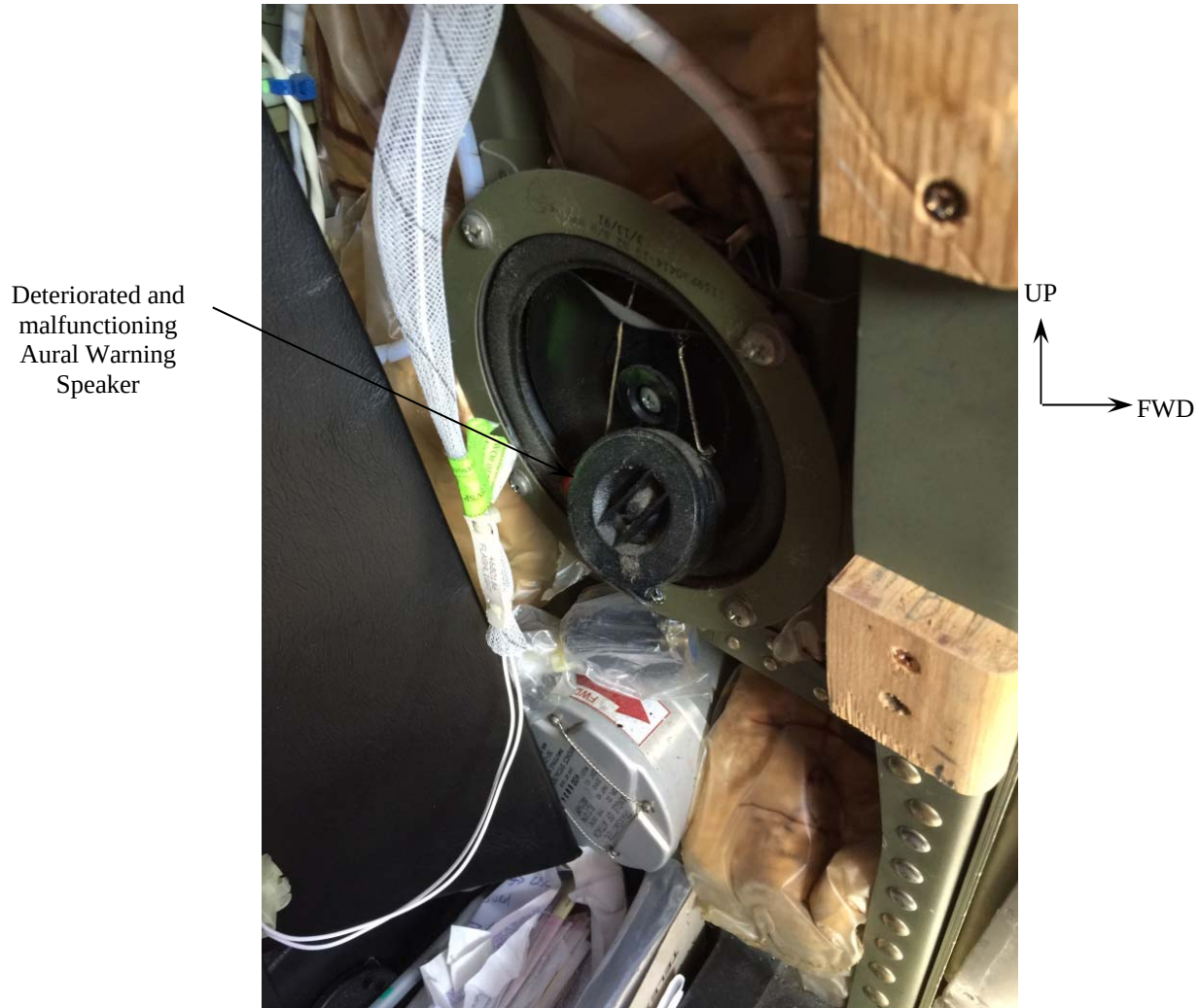


Fig. 2-2
Aural Warning Speaker with covering removed.

- iii. A photo of the Cabin Pressure Altitude settings at the time of arrival at the RJM facility were provided.



Fig. 2-3

Cabin Pressure Altitude settings at the time of arrival at RJM.

- iv. The Outflow Valve Safety Port was plugged with mud and bug residue and was not functioning.



Fig. 2-4

View looking inboard at the Outflow Valve and Safety Port

2. Repair/Resolution:

- iii. Trouble shoot the Aural Warning Speaker system to determine the cause of the volume problem.
 - a. Replace parts and adjust the system as required to obtain proper function..
 - iv. Clean and remove the Foreign Object Debris (FOD) from the Outflow Valve Safety Port system in accordance with Chapter 21-02-05 of the G-IV MM and/or the applicable CMP Card.
 - a. After cleaning the Outflow Valve Safety Port system, perform a functional test of the system in accordance with Chapter 21-02-05 of the G-IV MM and/or the applicable CMP Card.
- Note: RJM Personnel initially tried to clear the Safety Port by using the air pressure procedure but were unsuccessful. The Safety Port was ultimately cleaned out by using flexible wire prior to GAC Representatives arrival. While on-site, it was observed that the Safety Port was again plugged with “Mud Dobber” debris

3.0 Floorboards

A. Parts Involved:

- i. 1159BH21001-407 Floorboard
- ii. 1159BH21001-201 Floor Instl, FS 321.50-395.00
- iii. 1159BH21002-201 Floor Instl, FS 395.00-452.00
- iv. Numerous other small parts and associated hardware was damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.

B. Findings:

- i. Floor panels FLR-44, FLR-46, FLR-50 and FLR-51 (Ref. Fig 3-1) were unfastened and removed from the aircraft to gain access to accomplish an under floor inspection of the fuselage floor structure.
- ii. Floor panel FLR-44 (1159BH21001-407) exhibited evidence of crushed core and insert damage around the fasteners attaching the panel to FS 379 Intercoastal Installation.
- iii. Floor panels FLR-46, FLR-50 and FLR-510 did not visually exhibit any evidence of crushed core or pulled/working inserts.
- iv. A visual evaluation of the floor boards between FS 345 thru 452 indicated mismatches and distortion at the fastener rows attaching the floor boards to the floor beams at LBL 6.0, LBL 18 and LBL 30.5. The floorboards located between RBL 6 to RBL 30.5 appeared to be flat.
- v. See Section 4.0 for the findings related to the floor beams and underlying structure.

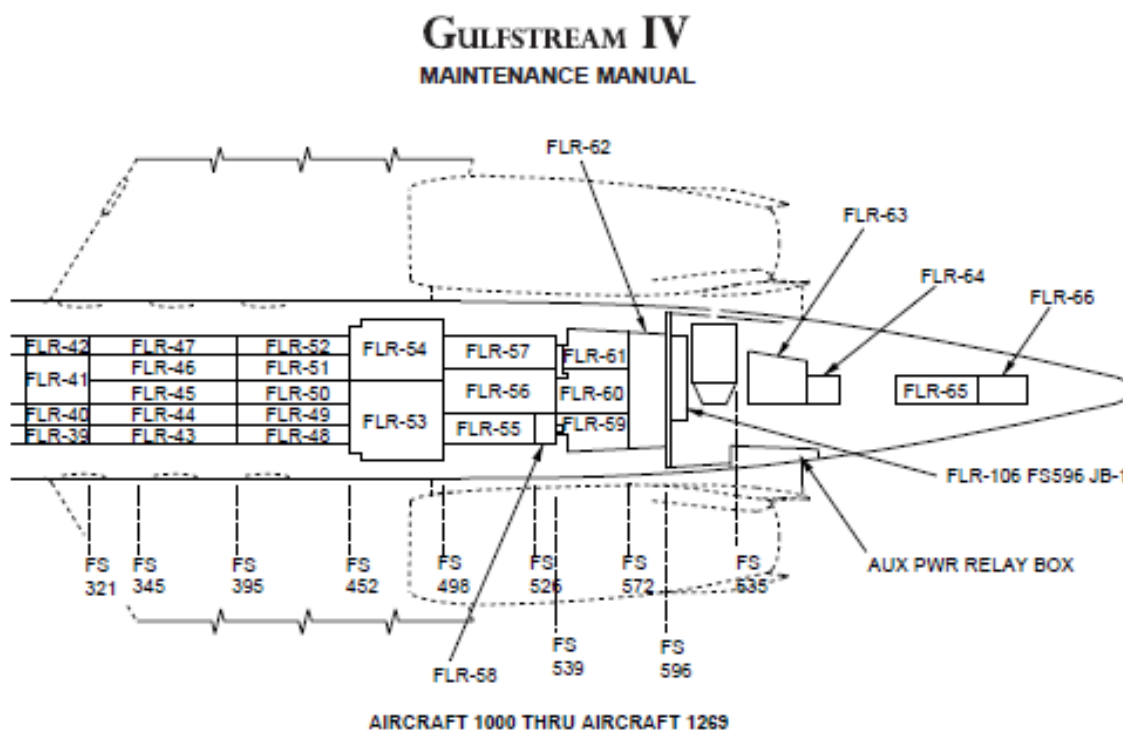


Fig. 3-1

Ref. G-IV MM Chap. 53-30-00



Fig. 3-2

View looking down on 1159BH21001-407 Floorboard



Fig. 3-3

View looking at the lower surface of the 1159BH21001-407 Floorboard

C. Repair/Resolution:

- i. Replace the 1159BH21001-407 Floorboard and associated hardware with new parts in accordance with Chapter 53-30-00 of the G-IV MM and/or applicable CMP Cards.
- ii. Visually and NDT Inspect floor panels FLR-43, FLR-45, FLR-46, FLR-47, FLR-48, FLR-49, FLR-50, FLR-51, FLR-52, FLR-53, FLR-54 (ref. Fig. 3-1) for 10isbanding, crushed core, elongated holes, loose/working inserts and any other discrepant condition(s).
- iii. Visually inspect the adjacent and underlying structure as instructed in Sections 4, 5 and 6.
- iv. Document any discrepant conditions identified and submit to GAC Technical operations for further evaluation.
- v. If no discrepancies are found on a panel, it may be reused and installed in accordance with Chapter 53-30-00 of the G-IV MM and/or applicable CMP Cards.

Note: It is GAC's recommendation not to re-use or re-install any hardware that was involved in the incident.

4.0 FS 379.00 Intercostal Installation

A. Parts Involved:

- i. 1159B21298-3 Intercostal Instl
- ii. 1159B21298-11 Intercostal
- iii. 1159B21298-15 Intercostal
- iv. 1159B21298-16 Intercostal
- v. 1159B20005-5 Structure Instl
- vi. 1159B20005-7 Structure Assy
- vii. Numerous other small parts and adjacent structure were damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation

B. Findings:

- i. The 1159B21298-11 Intercostal between LBL 30.5 and LBL 18.0 was deformed and bent.
- ii. The 1159B21298-15/-16 Intercostals between LBL 6.0 and RBl 6.0 was deformed and bent. The 1159B21272-23/-24 brackets attaching the 1159B21298-15/-16 Intercostals to the LBL 6.0 Floor Beam were cracked.
- iii. Due to the interior and floor board installations, the remaining areas of the 1159B2198-3 Intercostal Instl were inaccessible to be viewed. A complete inspection will be required to determine the full extent of the damage to the 1159B21298-3 Intercostal Instl..
- iv. Numerous other small parts and components may be damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.



Fig. 4-1

View looking aft at FS 379.00 between LBL 18.0-LBL 30.5

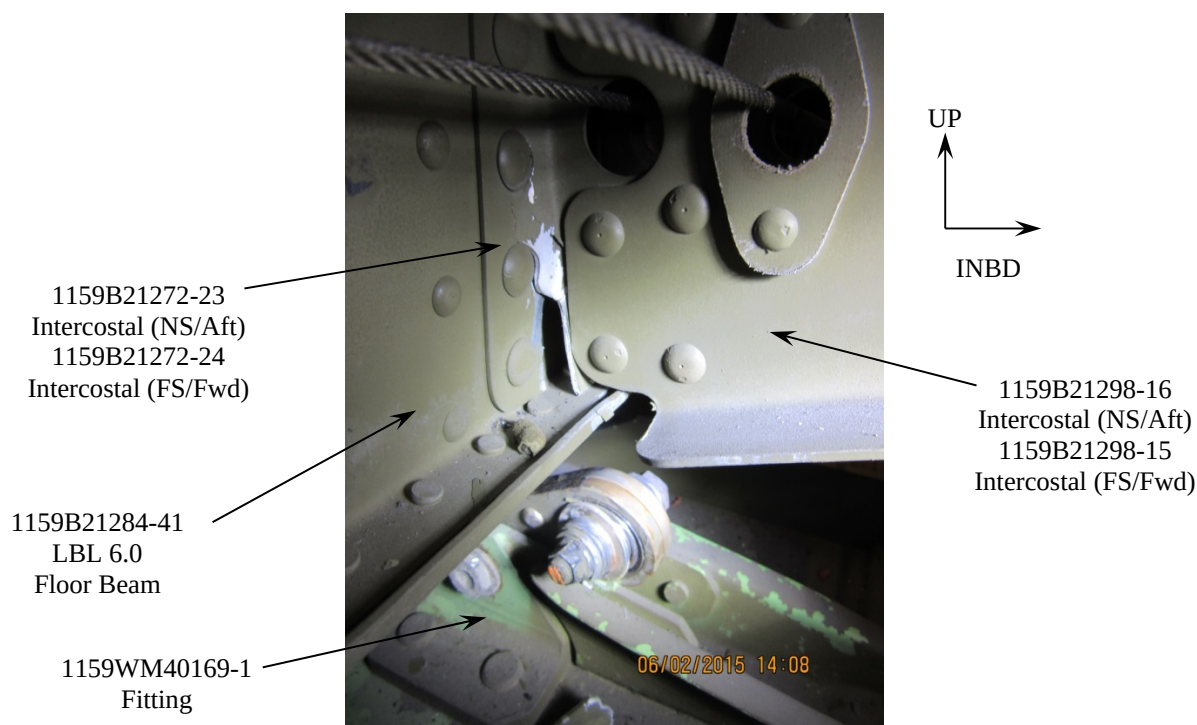


Fig. 4-2

View looking fwd at FS 379.00 at LBL 6.0

C. Repair/Resolution:

- i. Do a complete visual inspection of the 1159B21298-3 Intercostal Instl
 - a. Identify and replace any discrepant parts with new parts as required.
Note: Section 5.0 of this report identifies the replacement of the Floor Beam(s) and associated components and should be worked in conjunction with the requirements of this section.
 - b. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation.

5.0 Floor Beams

A. LBL 6.0

i. Parts involved:

- a. 1159B21284-41 Beam Instl
- b. 1159B20005-5 Structure Instl
- c. 1159B20005-7 Structure Assy
- d. Numerous other small parts and adjacent structure were damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.

ii. Findings:

- a. The 1159B21284-41 Beam Installation was cracked and distorted at the following locations:
 - (a) FS 360 - (Inboard and Outboard Sides) (Fig. 5-1).
 - (b) FS 388 - (Outboard Side) (Fig. 5-2).
 - (c) FS 391.5 - (Inboard Side) (Fig. 5-2).
 - (d) FS 452.50 - The attachment joint had indications of diagonal buckling on the aft 6" of the web on the inboard and outboard side of the beam (Fig. 5-3).
 - (e) The FS 379.00 Wing Link Attach Fittings were fractured (Fig. 5-4 to 5-6).



Fig. 5-1

View looking up at the cracks at FS 360 in the 1159B21284-41 Floor Beam



Fig. 5-2

View looking up at the cracks at FS 388/391.5 in the 1159B21284-41 Floor Beam



Fig. 5-3

View looking aft/inbd at the outboard face of the web of the LBL 6 Floor Beam at FS 452.50
(The outboard web exhibited similar conditions)

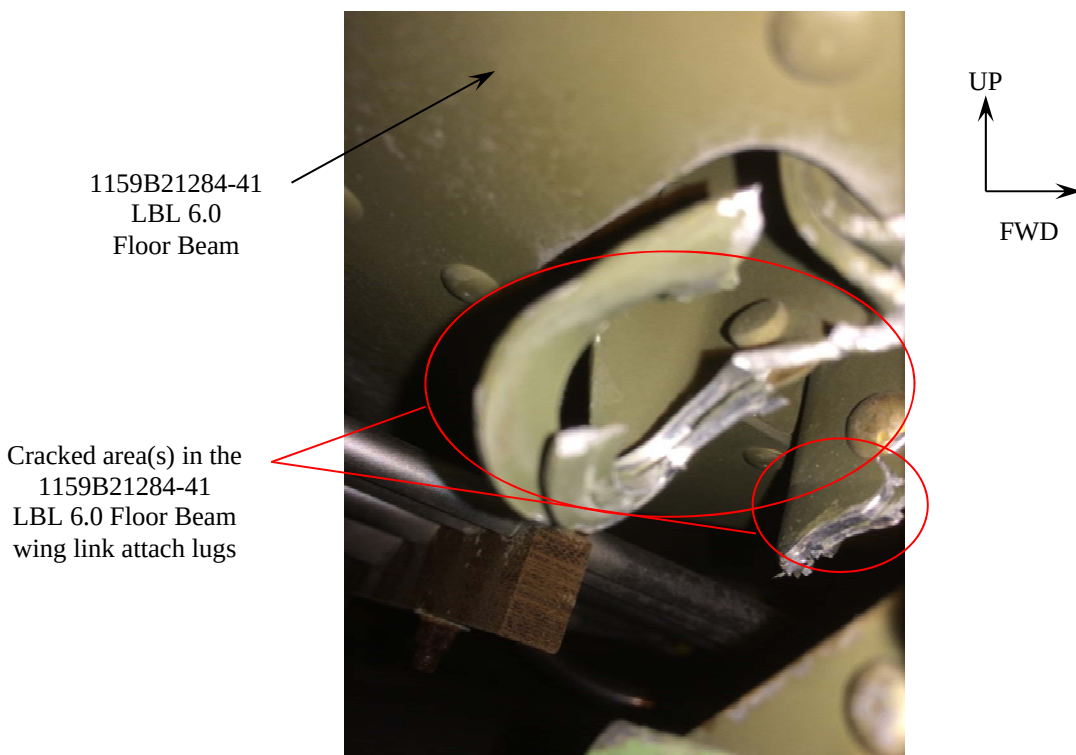


Fig. 5-4

View looking fwd at the FS 379.00/ LBL 6.0
wing link attach point in the Floor Beam

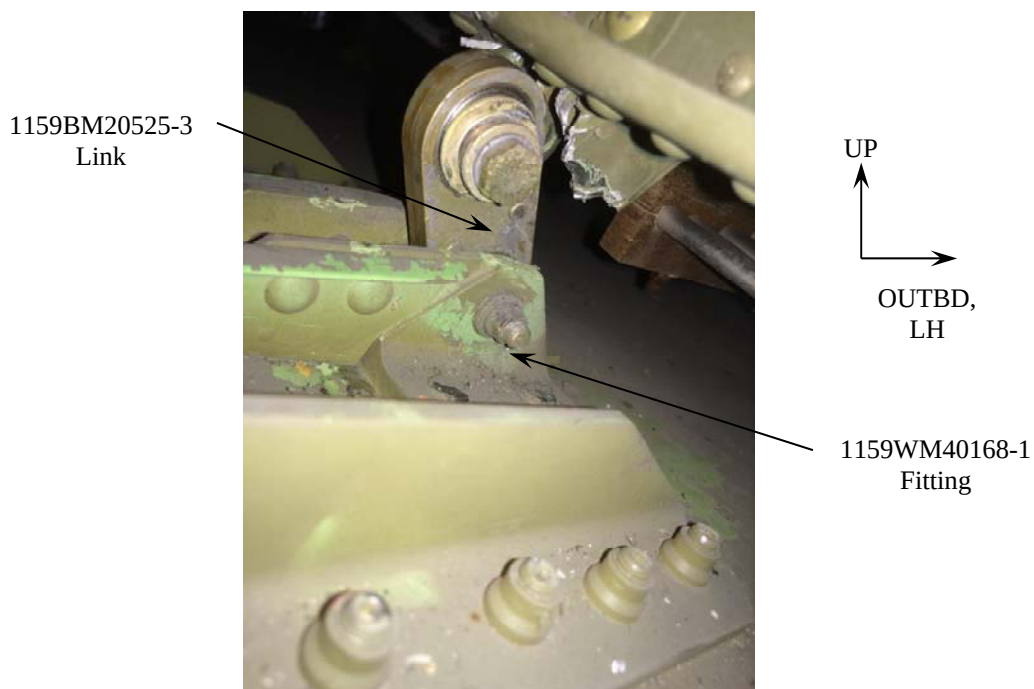


Fig. 5-5

View looking aft at the FS 379.00 /LBL 6.0 Link Instl



Fig. 5-6

Fractured material from the FS 379.00/LBL 6.0
Floor Beam wing Link Attach Fitting

e. An initial evaluation of the fractured surface(s) of parts 1, 3 and 6 under a 50X Power microscope indicated a “Ductile Overload Failure” of the surface.

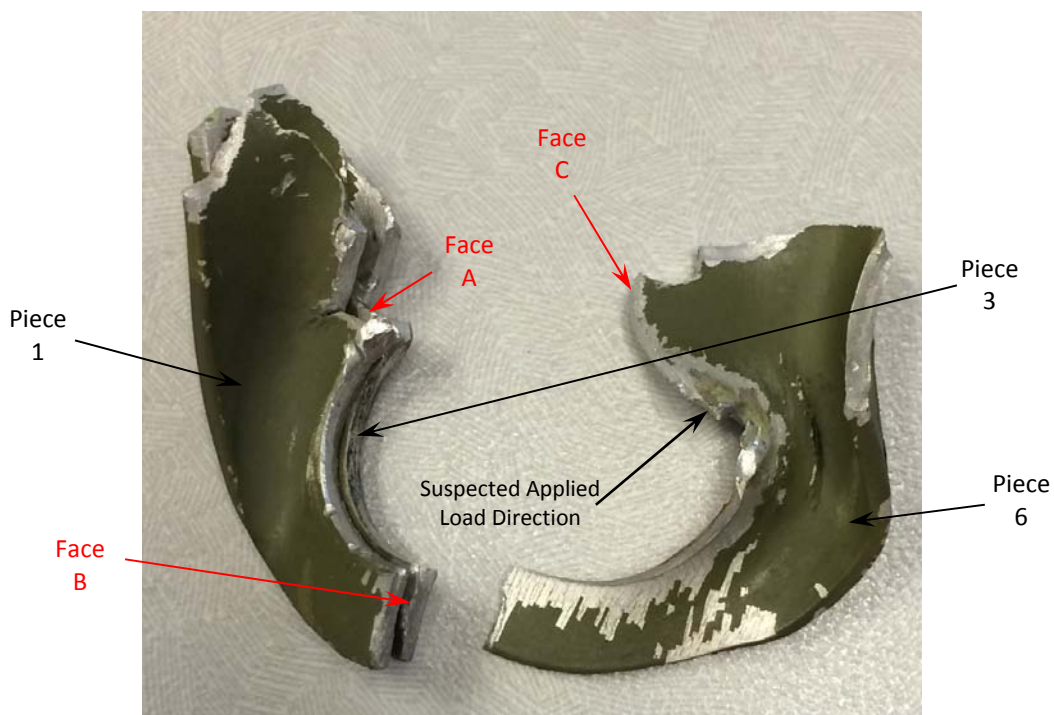


Fig. 5-7

Fractured material from the FS 379.00

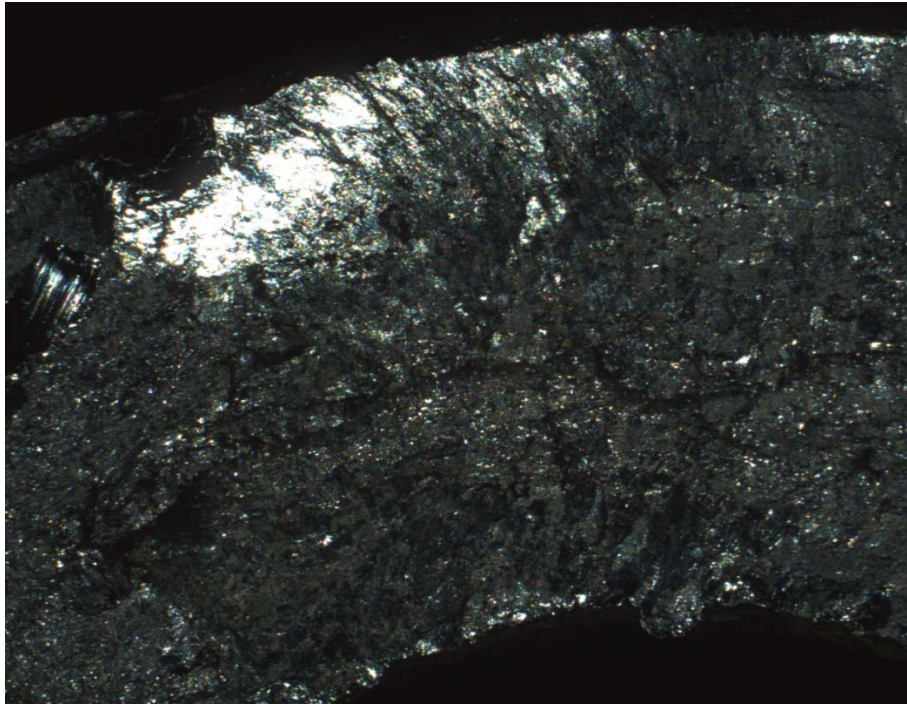


Fig. 5-8

Face A-Crack Opened Mechanically To Reveal Crack Face
Tearing from Elongation. Failure Mode: Ductile Overload

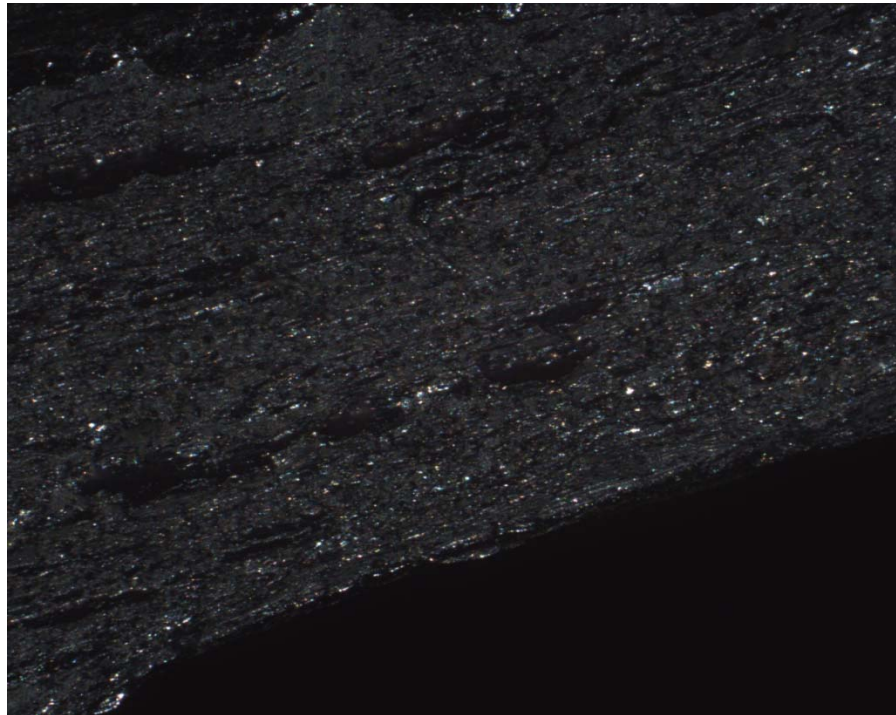


Fig. 5-9

Face B-Net Section Tension Failure
Failure Mode: Ductile Overload

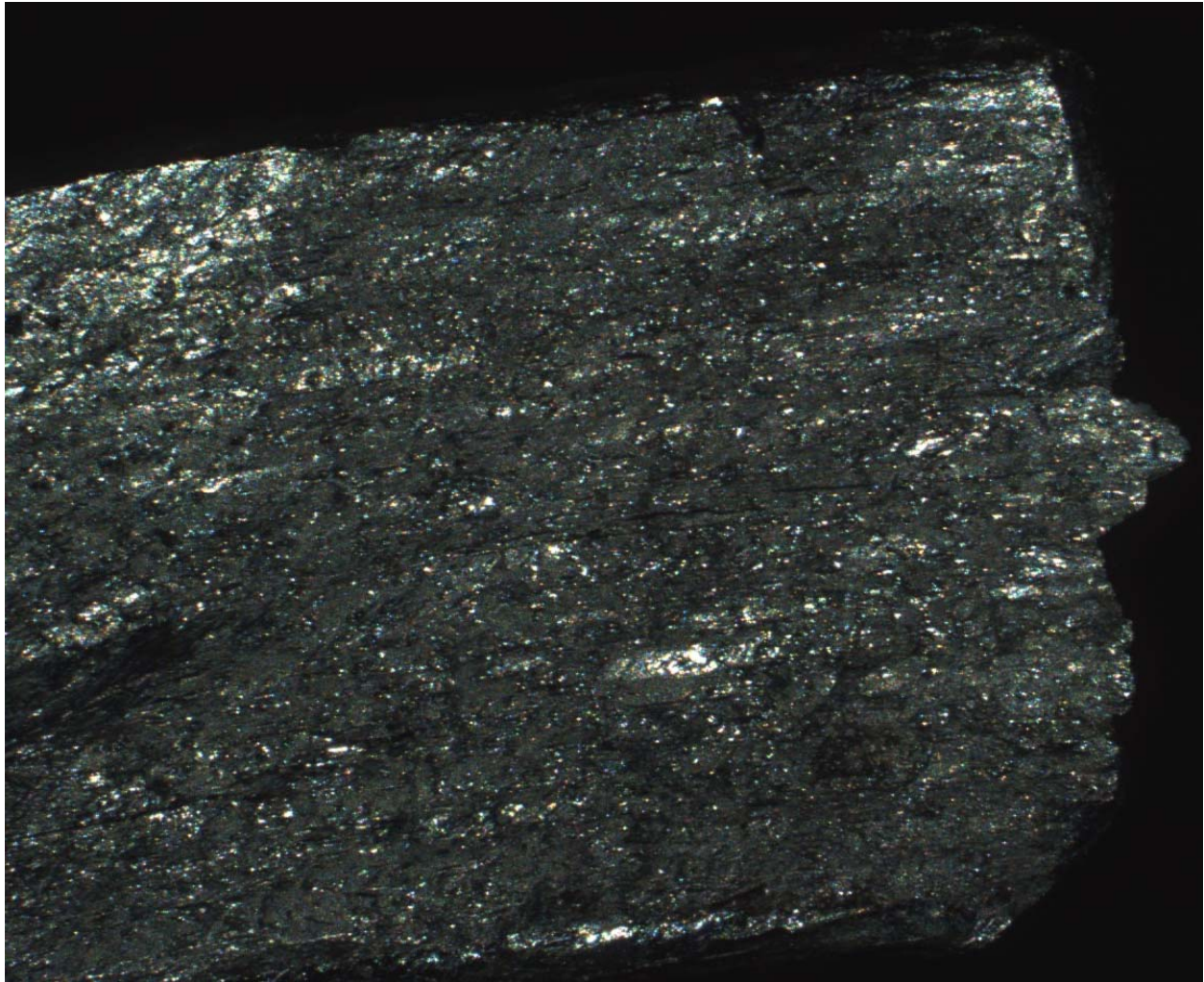


Fig. 5-10

Face C-Failure area adjacent to applied load
Failure Mode: Ductile Overload

- iii. Repair/Resolution:
 - a. Remove and replace the 1159B21284-41 Floor Beam to the requirements of the 1159B20005-7 Structure Assy and 1159B20005-5 Structure Instl.
 - b. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation

B. LBL 18.0

i. Parts involved:

- a. 1159B21284-43 Beam Instl
- a. 1159B20005-5 Structure Instl
- b. 1159B20005-7 Structure Assy
- c. Numerous other small parts and adjacent structure were damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.

ii. Findings:

- a. The 1159B21284-43 Beam Installation was cracked and distorted at the following locations:
 - (a) FS 360.00 - (Inboard and Outboard Sides) (Fig. 5-11 and 5-12).
 - (b) FS 373.00 - (Inboard Side) (Fig. 5-13).
 - (c) FS 384.00 - (Inboard and Outboard Side) (Fig. 5-14).
 - (d) FS 412.00 - (Inboard and Outboard Side) (Fig. 5-15).
 - (e) FS 452.50 - The attachment joint had indications of diagonal buckling on the aft 6" of the web on the inboard and outboard side of the beam. (Fig. 5-16).

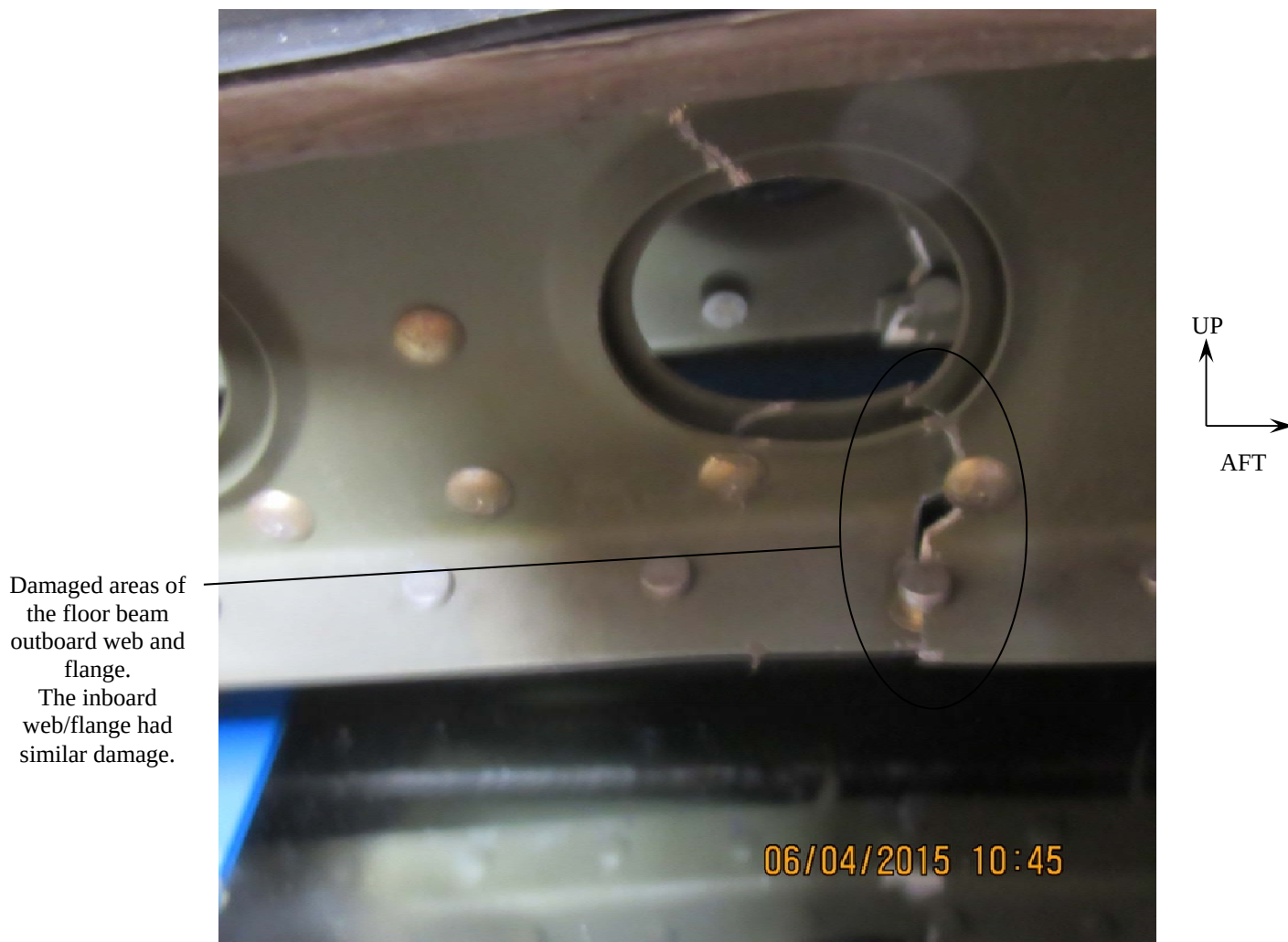


Fig. 5-11

View looking inboard at the outboard web/flange of the LBL 18 Floor Beam at FS 360

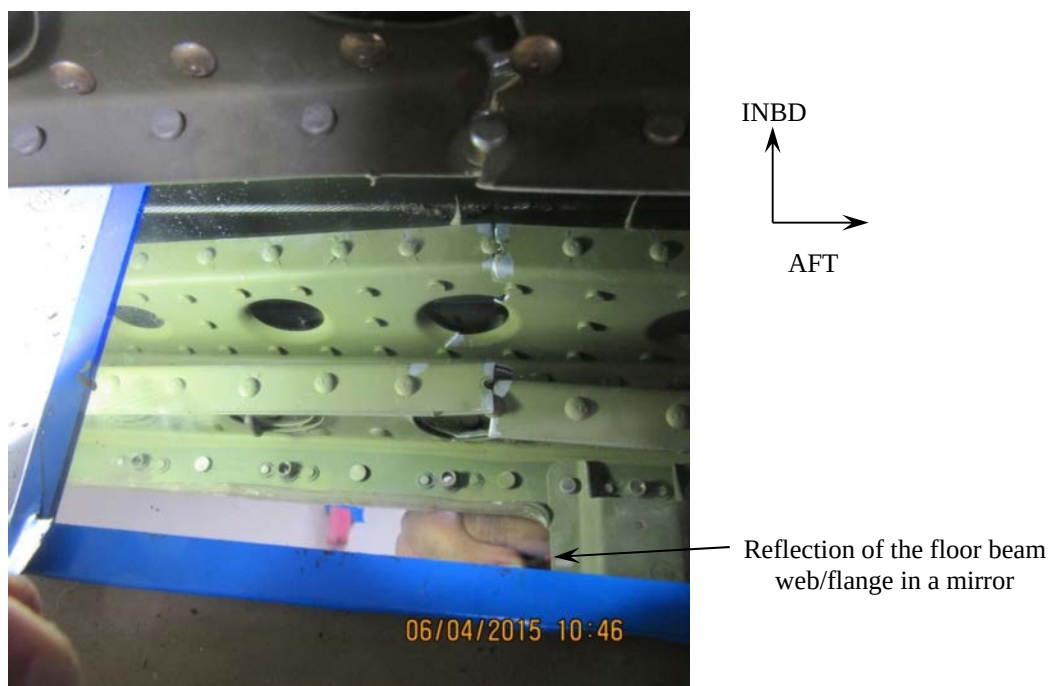


Fig. 5-12

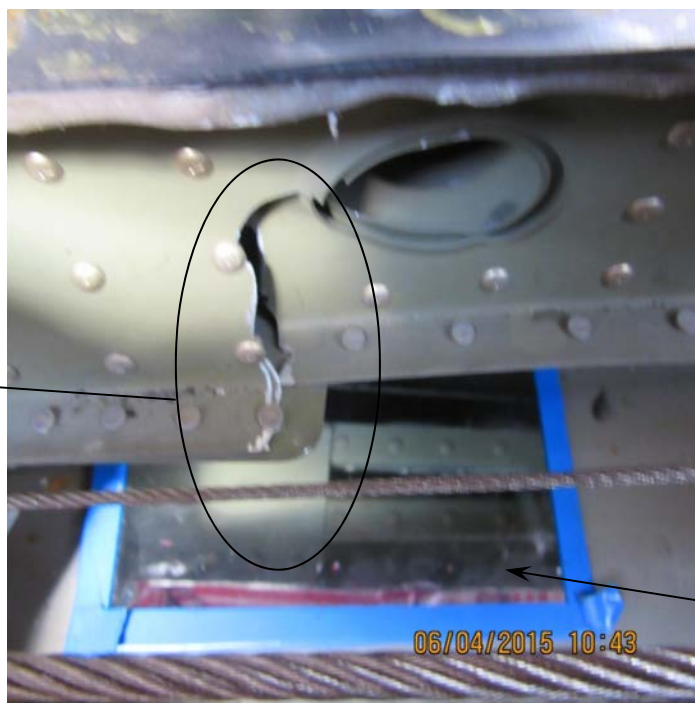
View looking up at the lower web/flange of the LBL 18 Floor Beam at FS 360.00



Fig. 5-13

View looking inboard at the outboard web/flange of the LBL 18 Floor Beam at FS 373.00

Damaged areas of the floor beam outboard web and flange. The inboard web/flange had similar damage.



UP
AFT

Reflection of the floor beam web/flange in a mirror

Fig. 5-14

View looking inboard at the lower web/flange of the LBL 18 Floor Beam at FS 384.00

Damaged areas of the floor beam inboard/outboard web and flanges.



UP
AFT

Reflection of the floor beam web/flange in a mirror

Fig. 5-15

View looking up at the lower web/flange of the LBL 18 Floor Beam at FS 412.00



Fig. 5-16

View looking outboard at the inboard face of the
LBL 18.0 Floor Beam Web at FS 452.50
(The inboard web exhibited similar conditions)

- iii. Repair/Resolution:
 - a. Remove and replace the 1159B21284-43 Floor Beam to the requirements of the 1159B20005-7 Structure Assy and 1159B20005-5 Structure Instl.
 - b. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation

C. LBL 30.5

i. Parts involved:

- a. 1159B21284-45 Beam Instl
- b. 1159B20005-5 Structure Instl
- c. 1159B20005-7 Structure Assy
- d. Numerous other small parts and adjacent structure were damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.

ii. Findings:

- a. The beam was deflected (twisted) outboard of location between FS 359.00 to FS 384.00 (Fig. 5-18).
- b. The inboard flange of the web was buckled forward of the FS 412 wing link (Fig. 5-19).

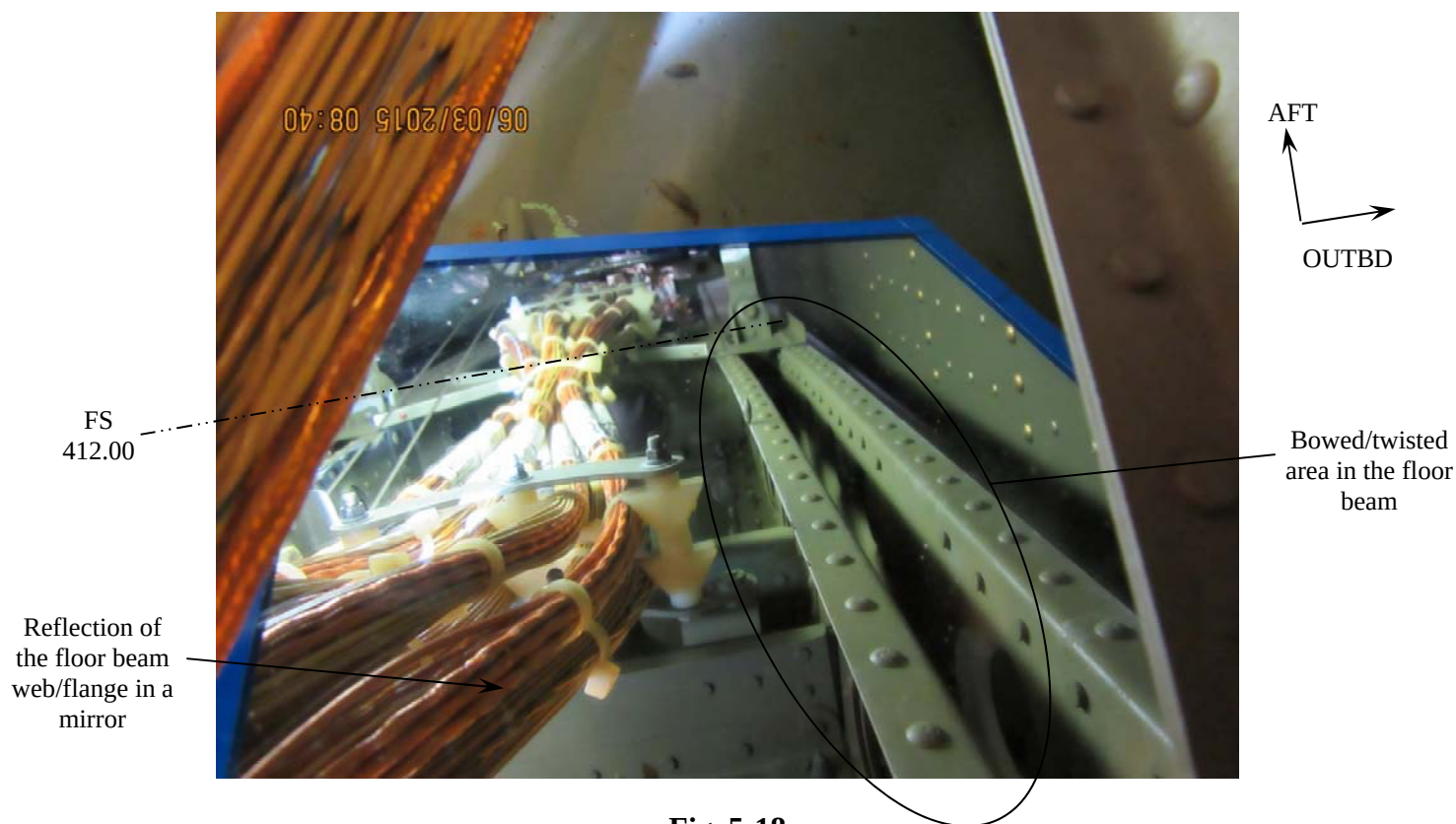


Fig. 5-18

View looking aft at FS 359.00 at LBL 30.5

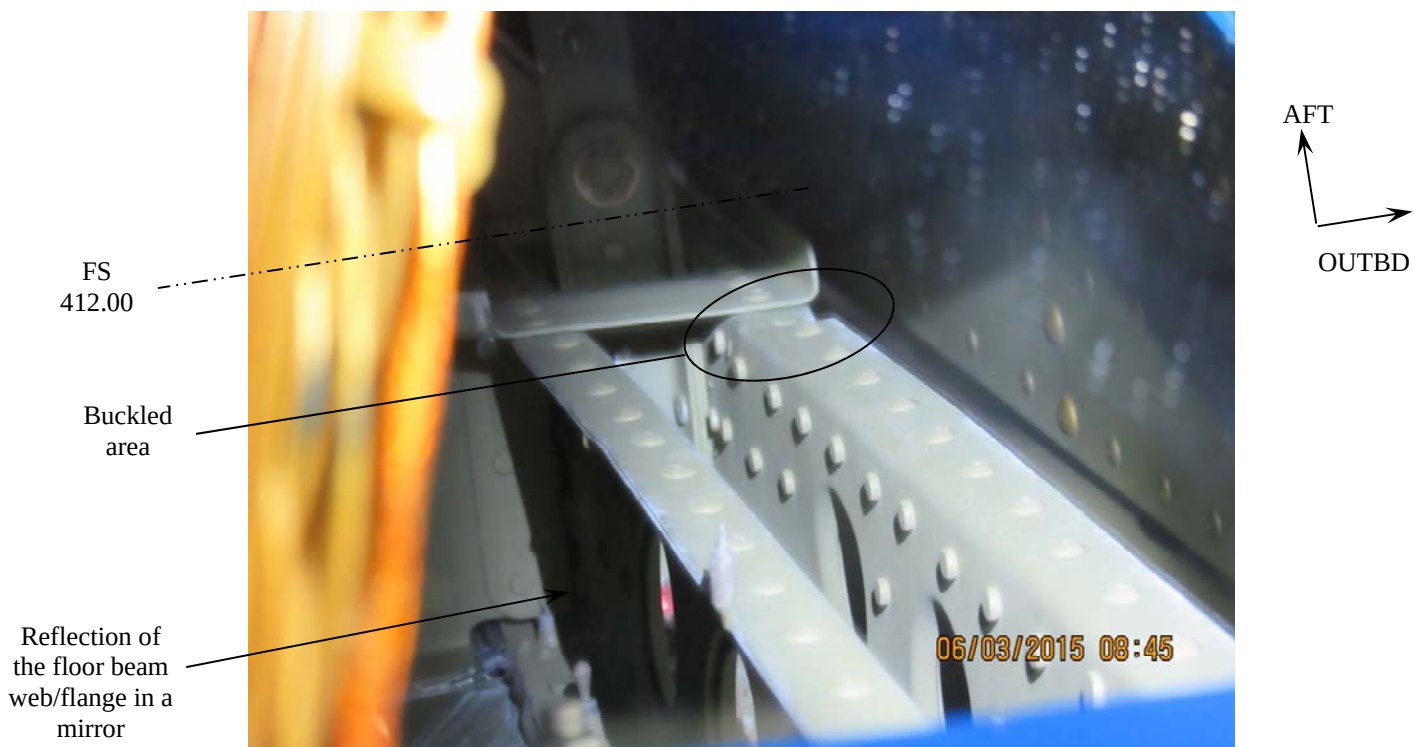


Fig. 5-19

View looking aft at FS 412.00 at LBL 30.5

iii. Repair/Resolution:

- (a) Remove and replace the 1159B21284-45 Floor Beam to the requirements of the 1159B20005-7 Structure Assy and 1159B20005-5 Structure Instl.
- (b) Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation

D. RBL 18.0

i. Parts involved:

- a. 1159B21284-44 Beam Instl
- b. 1159B20005-5 Structure Instl
- c. 1159B20005-7 Structure Assy
- d. Numerous other small parts and adjacent structure were damaged but not identified in this report. They will need to be identified and documented during the detailed inspection and evaluation.

ii. Findings:

- a. FS 452.50-- The attachment joint had indications of diagonal buckling on the aft 6" of the web on the inboard and outboard side of the beam.

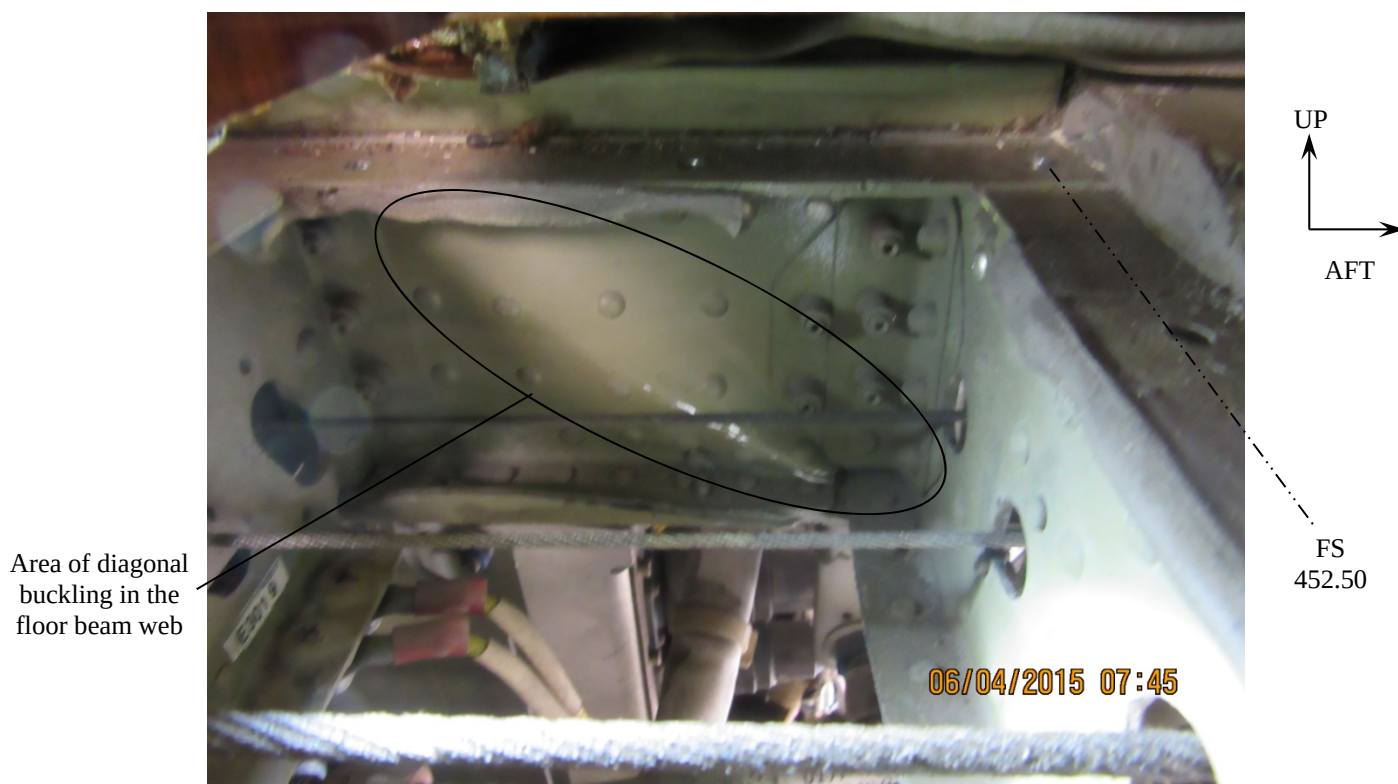


Fig. 5-20

View looking outboard at the inboard face of the RBL 18.0 Floor Beam Web at FS 452.50

iii. Repair/Resolution:

- a. Remove and replace the 1159B21284-44 Floor Beam to the requirements of the 1159B20005-7 Structure Assy and 1159B20005-5 Structure Instl.
- b. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation

6.0 FS 452.50 Structure

A. Parts involved:

i.	1159B21281-1	Beam Instl
ii.	1159B21281-41	Beam Assy
iii.	1159B21281-43	Beam Assy
iv.	1159B20005-5	Structure Instl
v.	1159B20005-7	Structure Assy
vi.	1159B43011-1	Frame Instl, FS 452.50
vii.	1159BH21011-27	Panel Instl (FLR-54)
viii.	1159BH21011-29	Panel Assy
ix.	1159B21211-31	Skin Instl, FS 345.875 – 452.50, LH
x.	1159B21211-29	Skin Assy, LH
xi.	1159B21211-32	Skin Instl, FS 345.875 – 452.50, RH
xii.	1159B21211-30	Skin Assy, RH
xiii.	1159B41311-1	Skin Instl, FS 452.50 – 498.00B, LH
xiv.	1159B41311-45	Skin Assy, LH
xv.	1159B41311-2	Skin Instl, FS 452.50 – 498.00B, RH
xvi.	1159B41311-46	Skin Assy, RH

B. Findings:

- The interface between the 1159B21281-41 Beam Assy and the 1159BH21011-29 Panel Assy exhibited an area of separation between the matting surfaces.
- See Section 5.0 for the floor beam findings at FS 452.50
- On both the LH and RH side of the aircraft, between Stringer #9 and the top edge of the wing to body fairing, the forward row of rivets attaching the 1159B41311 Skin exhibited evidence of cracked/lifting paint on the rivet heads (See Fig.'s 6-2 to 6-5).



Fig. 6-1

View looking up/forward at the interface of the Floorboard, Intercoastal and Floor Beam at FS 452.50 and RBL 6.0

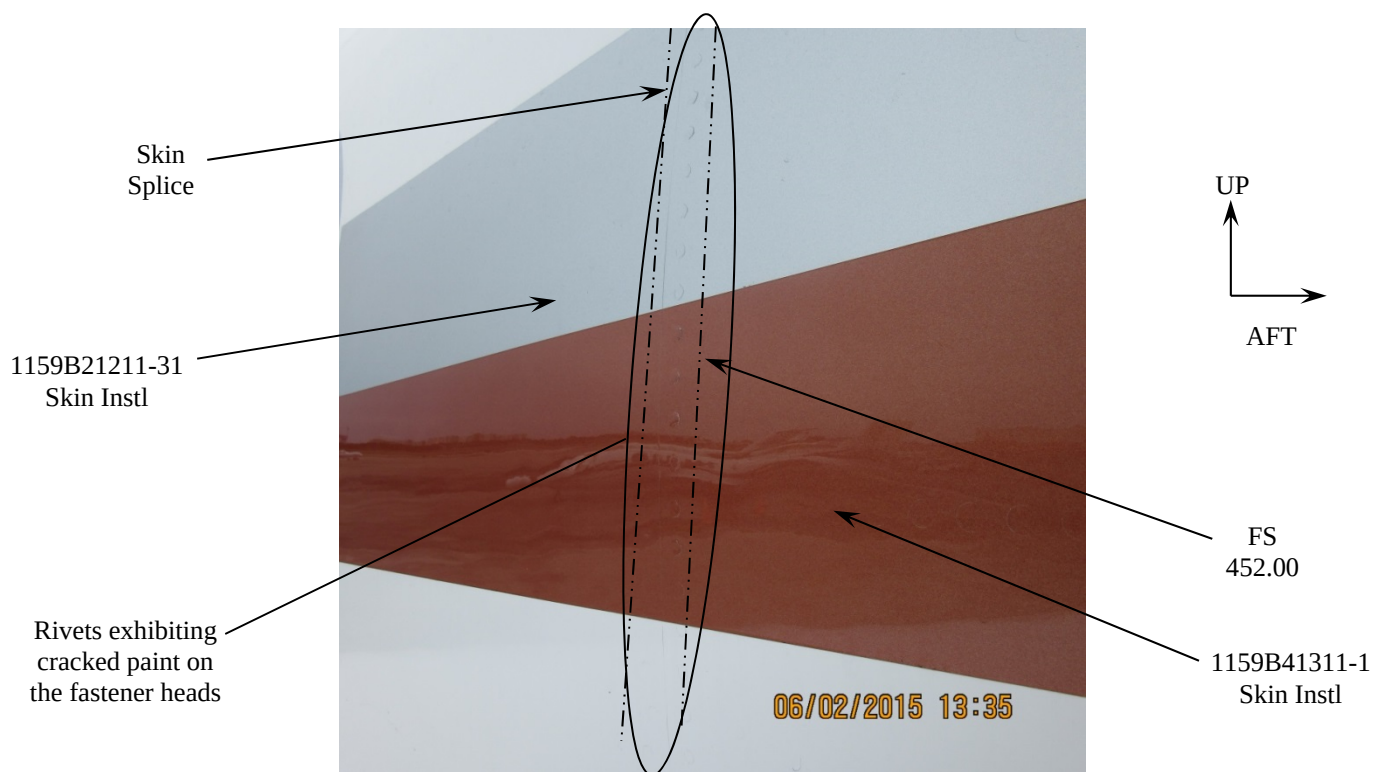


Fig. 6-2
View looking inboard at the LH Skin

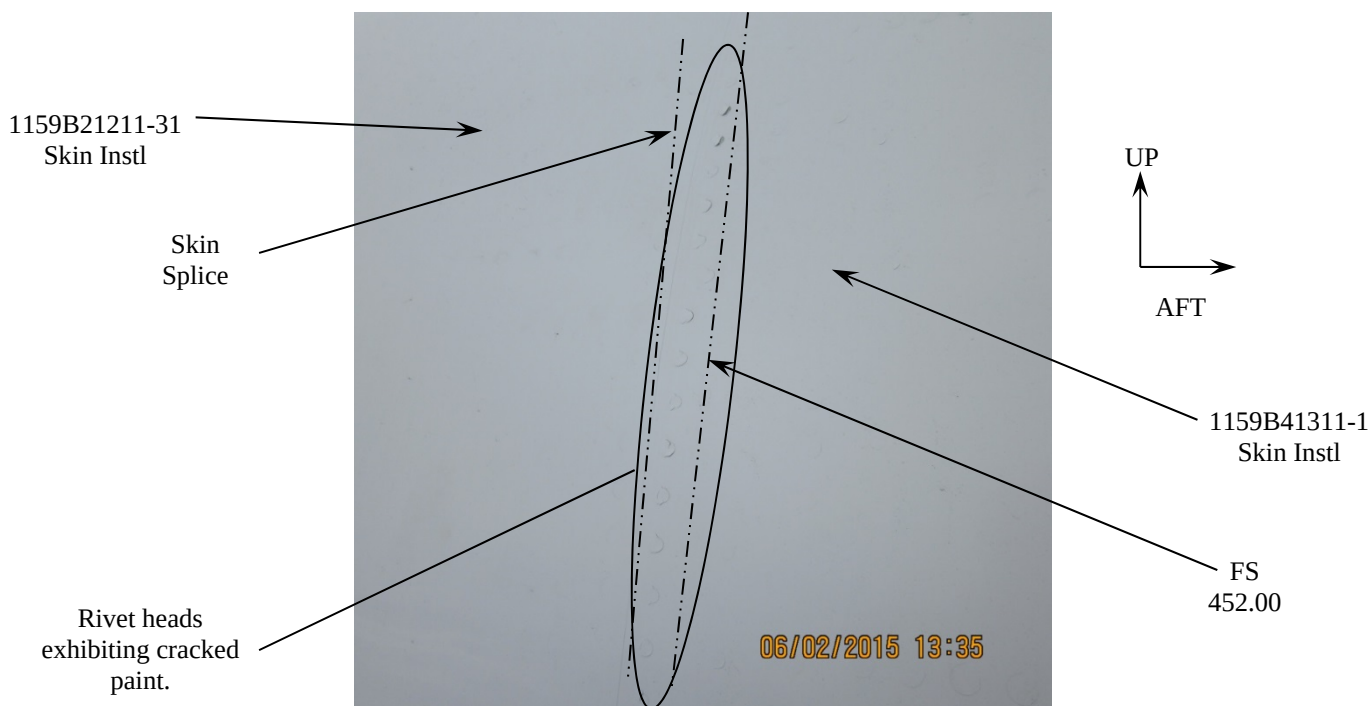


Fig. 6-3
View looking inboard at the LH Skin

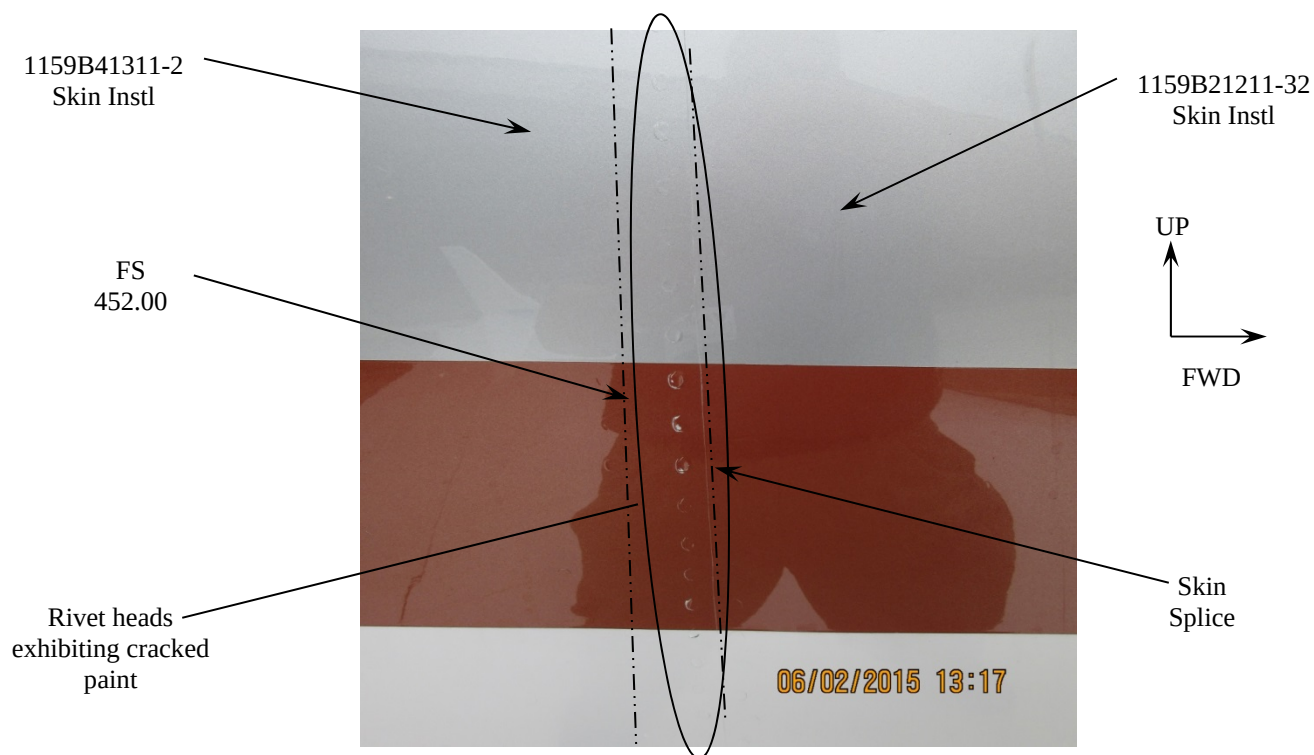


Fig. 6-4
View looking inboard at the RH Skin

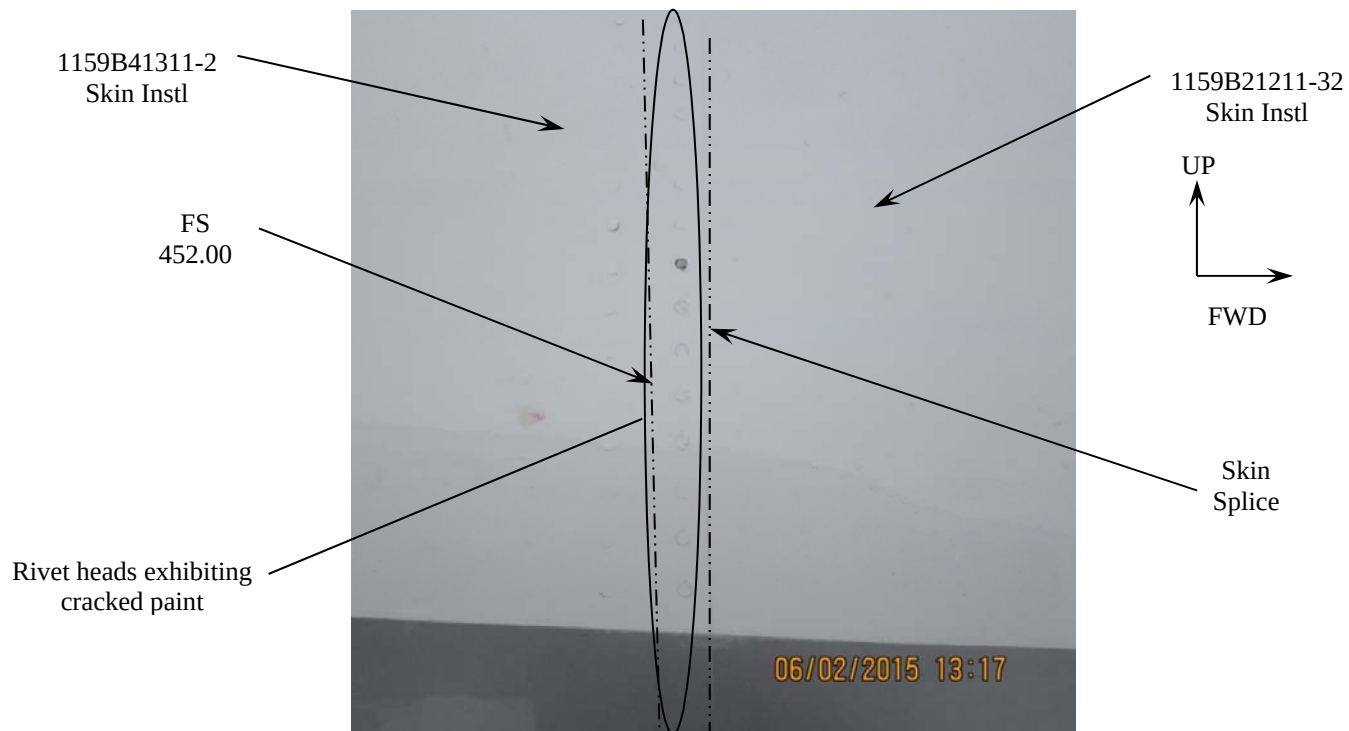


Fig. 6-5
View looking inboard at the RH Skin

C. Repair/Resolution:

- i. Perform a complete visual inspection of the 1159B21281-1 Beam Instl. At FS 452.50.
- ii. Perform the Pressure Differential Exceedance Inspection in Accordance with the G_IV MSG-3 MM, Section 05-50-00, Section 13.
- iii. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation

7.0 Wing Links

A. Parts Involved:

- | | | |
|-------|----------------|---------------------------------|
| i. | 1159BM20524-15 | Link, FS 345.875/LBL 6.0 |
| ii. | 1159BM20525-3 | Link, FS 379.00/LBL 6.0 |
| iii. | 1159BM20525-1 | Link, FS 379.00/LBL 18.0 |
| iv. | 1159BM20525-3 | Link, FS 379.00/LBL 30.5 |
| v. | 1159BM20526-19 | Link, FS 412.00/LBL 6.0 |
| vi. | 1159BM20526-21 | Link, FS 412.00/LBL 18.0 |
| vii. | 1159BM20526-23 | Link, FS 412.00/LBL 30.5 |
| viii. | 1159BM20527-13 | Link, FS 445.50/LBL 6.0 |
| ix. | 1159BM20527-25 | Link, FS 445.50/LBL 18.0 |
| x. | 1159BM20527-25 | Link, FS 445.50/RBL 18.0 |
| xi. | 1159W40054-1 | Fitting Instl-Floor Support, LH |
| xii. | 1159W40054-2 | Fitting Instl-Floor Support, RH |

B. Findings:

- i. FS 345.875:
 - a. LBL 30.5 No link at this location.
 - b. LBL 18 The link appeared to be vertical and installed properly.
 - c. LBL 6 The link exhibited cracked finish on multiple faces (Fig. 7-1).
 - d. RBL 6 The link appeared to be vertical and installed properly.
 - e. RBL 18 The link appeared to be vertical and installed properly.
 - f. LBL 30.5 No link at this location.
- ii. FS 379.00:
 - a. LBL 30.5 The link was attached at the upper and lower points. The upper attachment was leaning outboard (Fig. 7-3).
 - b. LBL 18 The link was attached at the upper and lower points. The upper attachment was leaning outboard (Fig. 7-2).
 - c. LBL 6 The link was attached at the lower point. The upper attach point was broken off from the beam attachment. The link was leaning inboard (Fig. 7-2).
 - d. RBL 6 The link appeared to be vertical and installed properly.
 - e. RBL 18 The link appeared to be vertical and installed properly.
 - f. LBL 30.5 The link appeared to be vertical and installed properly.
- iii. FS 412.00:
 - a. LBL 30.5 The link was attached at the upper and lower points. The upper attachment was leaning outboard (Fig. 7.6).
 - b. LBL 18 The link was attached at the upper and lower points. The upper attachment was leaning outboard (Fig. 7-5).
 - c. LBL 6 The link was attached at the upper and lower points. The upper attachment was leaning outboard (Fig. 7-4).
 - d. RBL 6 The link appeared to be vertical and installed properly.
 - e. RBL 18 The link appeared to be vertical and installed properly.
 - f. LBL 30.5 The link appeared to be vertical and installed properly.
- iv. FS 445.50:
 - a. LBL 30.5 No link at this location.
 - b. LBL 18 The link was vertical, but visibly twisted to the left when looking forward (Fig. 7-7).
 - c. LBL 6 The link was vertical, but visibly twisted to the left when looking forward (Fig. 7-8).
 - d. RBL 6 The link appeared to be vertical and installed properly.
 - e. RBL 18 The link was vertical, but visibly twisted to the left when looking forward (Fig. 7-9).
 - f. LBL 30.5 No link at this location.

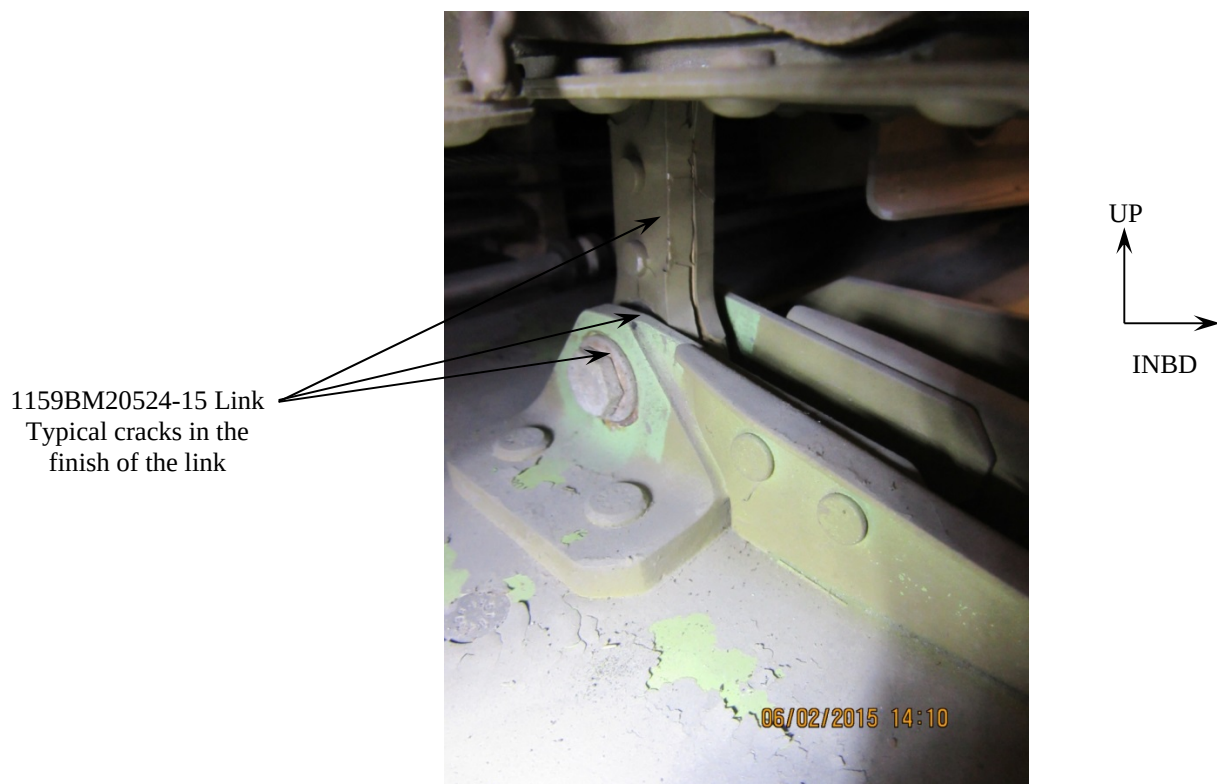


Fig. 7-1

FS 345/LBL 6.0 Wing link exhibiting cracked finish on multiple surfaces



Fig. 7-2

View looking forward at FS 379/LBL 18 and LBL 6 Wing Links

1159BM20525-3
Link, LBL 30,0-
Canted outbd

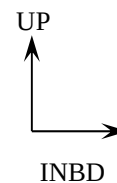


Fig. 7-3

View looking forward at FS 379/LBL 30.5 Wing Link

1159BM20526-19
Link, LBL 6.0-
Canted outbd

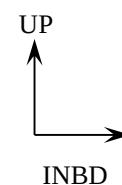


Fig. 7-4

View looking forward at FS 412/LBL 6.0 Wing Link

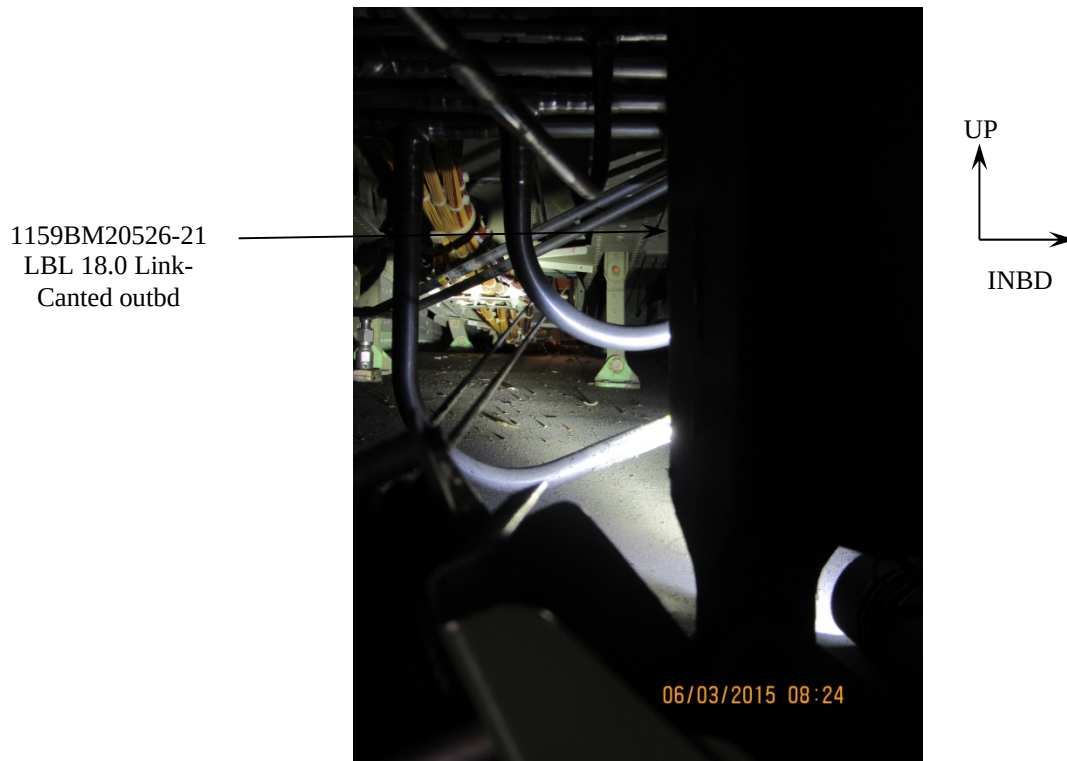


Fig. 7-5

View looking forward at FS 412/LBL 18.0 Wing Link

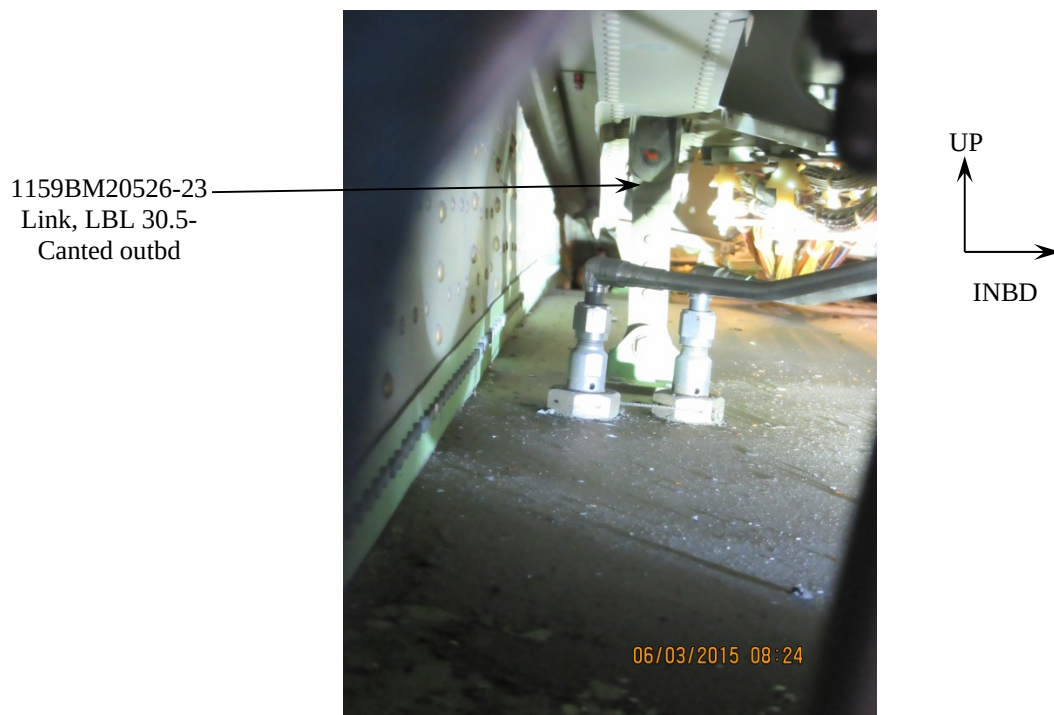


Fig. 7-6

View looking forward at FS 412/LBL 30.5 Wing Link

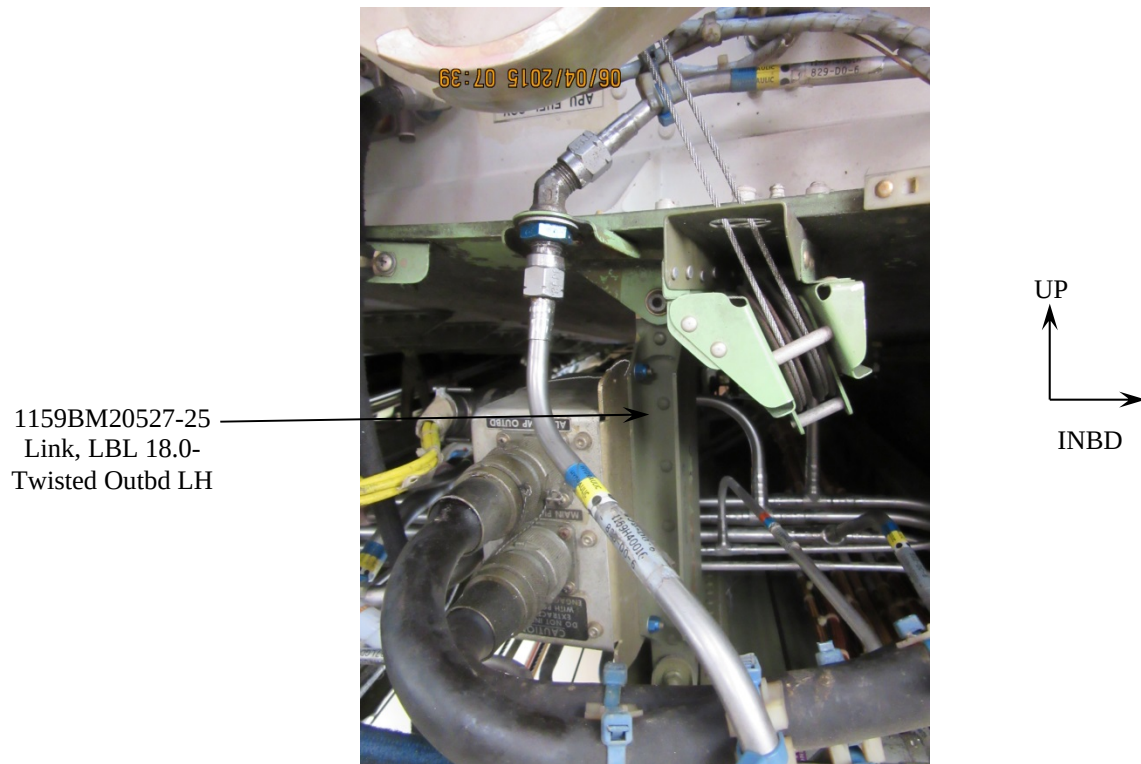


Fig. 7-7

View looking forward at FS 445/LBL 18.0 Wing Link

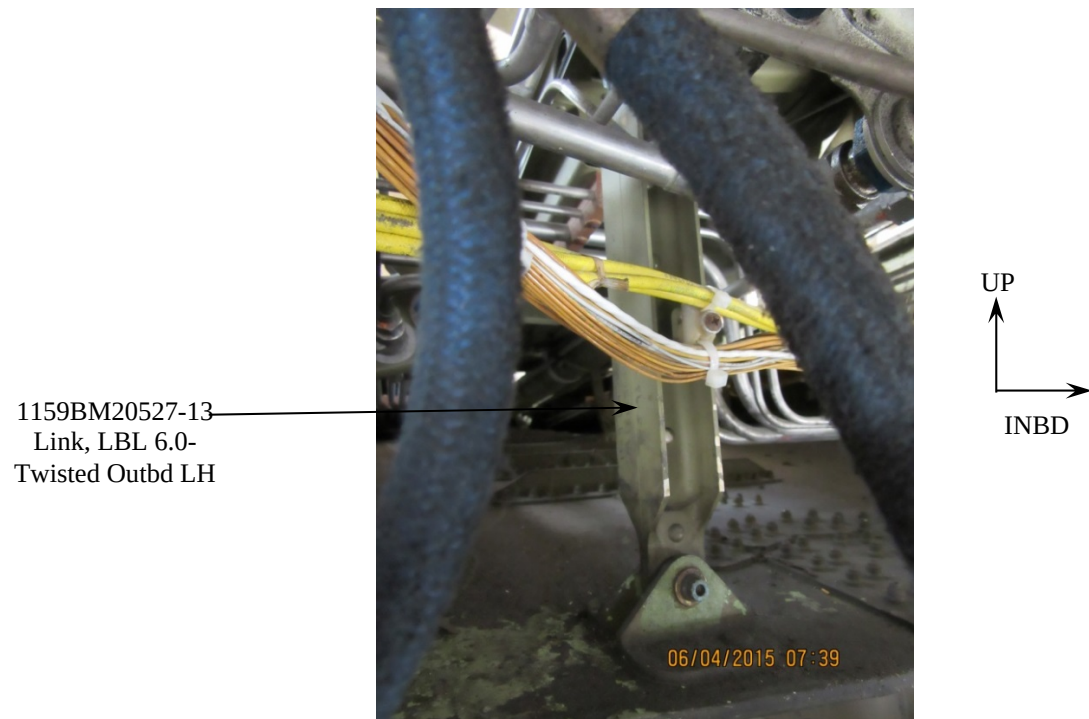


Fig. 7-8

View looking forward at FS 445/LBL 6.0 Wing Link

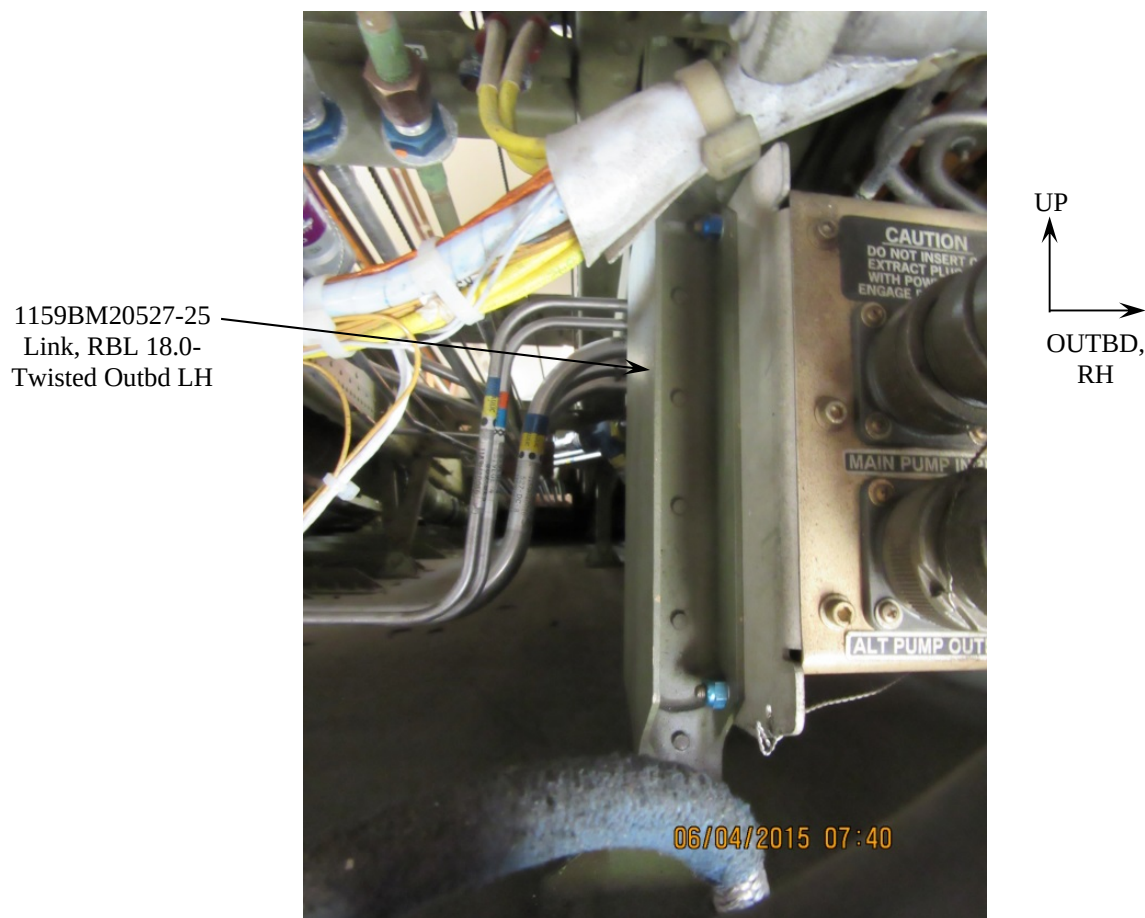


Fig. 7-9

View looking forward at FS 445/RBL 18.0 Wing Link

C. Repair/Resolution:

- i. At each identified link location, remove and replace the noted link(s) and install with new hardware in accordance with Chapter 53-30-00 of the G-IV Illustrated Parts Catalog (IPC):
- ii. Prior to installation of the new links, High frequency Eddy Current (HFEC) Inspect the associated attach fittings on the wings for cracks in accordance with the G-IV Non-Destructive Testing (NDT) Manual. Pay particular attention to the lugs, holes and the fillet radii of the vertical legs.
- iii. Inspect the hole diameters of the associated attach fittings on the wings (Ref. Fig. 7-10):

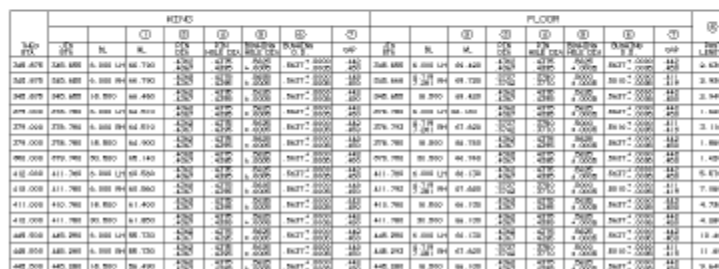
TABLE I
WING AND FLOOR ATTACHMENT DATA

Fig. 7-10

Ref. 1159W40054

- iv. Perform an external and internal inspection of the fittings and the fasteners attaching the fittings to the wings for working, looseness or other signs of damage (Ref. 1159W40054).
- v. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation.

8.0 Misc. Findings

The following were general observations/findings of items on the aircraft that may or may not be related to the over pressurization incident:

A. Findings:

- i. Except as noted in the previous sections of this report, a visual inspection of the aircraft did not exhibit or reveal any of the traditional indications of an over pressurization, hard landing or over loading of the structure. The following items were not found:
 - a. Pulled, working or sheared fasteners.
 - b. Wrinkled, buckled or bulging skins.
 - c. Mis-aligned/binding doors, escape windows, interiors.
 - d.
- ii. The seal around LH Cabin Window #4 was hanging loose along the top edge of the window.
- iii. Multiple areas of corrosion were observed on the aircraft. Some of the locations exhibiting corrosion were:
 - a. The fasteners on the LH lower wing common to the aileron hinges.
 - b. The LH and RH engine inlets.
 - c. The flap trailing edge.
 - d. Light surface corrosion on multiple locations on the fuselage.



Fig. 8-1
View looking inbd at LH window #4

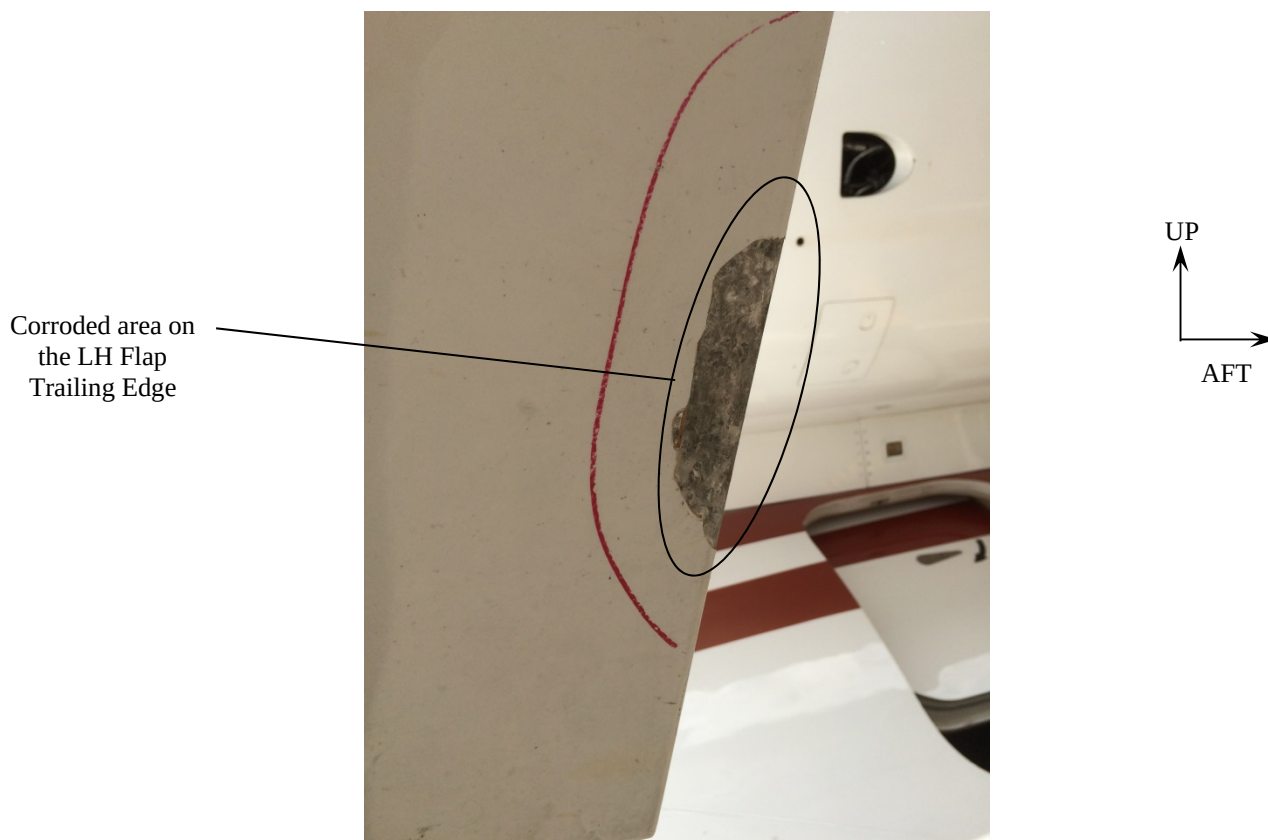


Fig. 8-2

View looking up at the lower surface of the LH Flap Trailing Edge



Fig. 8-3

View looking into the engine inlet

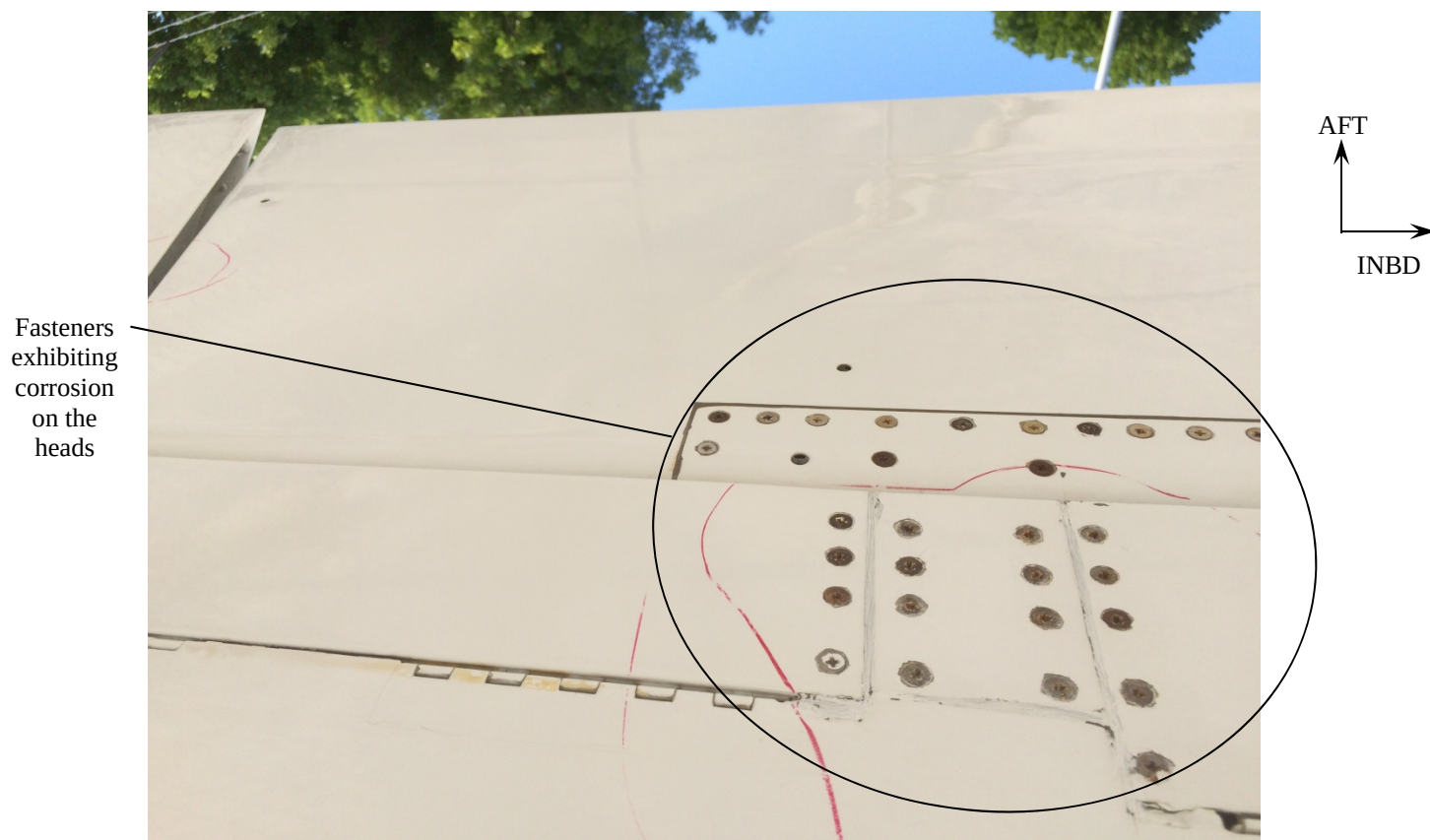


Fig. 8-4

View looking up at the lower surface of the LH Aileron

- B. Repair/Resolution:
- i. None required for the over Pressurization Incident. Document and rework discrepancies in accordance with RJM and the owners requirements.
 - ii. Document and submit to GAC Technical Operations any structural damage identified with a full description and digital photos for evaluation as necessary.

9.0 General Notes:

- A. The observed damage will require replacement of the 1159B20005-5 Floor Structure Instl. between FS 345.875-452.50. This structure is built as a unit and requires special tooling for the proper location of all the interfacing components. A demate of the aircraft along with special tooling will be required to accomplish this task. It will also include the removal and reinstallation of the wiring bundles, hydraulic lines, control cables and other components.
- B. All Primary Structural Element (PSE) Inspection Requirements contained in the G-IV MM 53-34 pertaining to the Wing Attach Frames and the Pressure Floor must be accomplished.
- C. This document does not create or authorize the installation of repairs for the discrepant conditions found.
- D. This document does not authorize the aircraft to be repositioned in its current condition.
- E. All part numbers defined in this document is the Type Design Requirements that the aircraft was manufactured to.
- F. After completion of all parts replacement and permanent or interim repairs, all applicable system and operational checks must be completed and signed off.
- G. The repairs defined in this document are conceptual only. The final requirements will be defined on the generated repair drawings and may vary from what is shown due to any additional damage found and/or analysis requirements.
- H. Special shoring and tooling will be required.

10.0 Re-Positioning Flight Requirements and Recommendations:

- A. The current damage to the Fuselage precludes the aircraft from returning to service or being repositioned to another facility.
- B. The parts identified in this document are damaged beyond being able to develop temporary repairs for a ferry flight.

Appendix A - AFM Procedures

A. Cabin DFRN-9.6 Procedure:

CABIN DFRN-9.6	Cabin differential pressure has reached 9.6 psi.	Raise cabin altitude. Increase cabin rate of climb, if required. Switch to manual pressurization control, if required. See Section 3-22-30: Loss of Automatic Pressurization Control.
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3-22-30: Loss Of Automatic Pressurization Control:

1. AUTO/MANUAL Switch MANUAL
2. DADC Selector Switch OPPOSITE DADC (DADC 1 or 2)
3. AUTO/MANUAL Switch AUTO

If automatic pressurization control is not regained:

4. AUTO/MANUAL Switch MANUAL
5. Rate of Climb MANUALLY CONTROL TO ± 500 FPM

CAUTION: CLOSELY MONITOR CABIN DIFFERENTIAL PRESSURE. DO NOT ALLOW IT TO EXCEED 9.8 PSID.

NOTE: When operating in manual, the rate of change should be monitored to maintain a maximum of 500 feet per minute UP or 300 feet per minute DOWN. Care should also be taken to land unpressurized with the outflow valve indicator in the full OPEN position.

If manual pressurization control is not successful and if cabin differential pressure will exceed 9.8 psid:

6. RAM AIR Switch RAM

WARNING: SELECTING RAM WILL SHUT OFF BLEED AIR FOR PRESSURIZATION AND THE AIRPLANE WILL DEPRESSURIZE.

7. Crew Oxygen Masks DON
8. Altitude DESCEND TO A SAFE ALTITUDE
9. Passenger Oxygen Masks MANUALLY DEPLOY

Upon reaching a safe altitude attempt to regain control of the pressurization system:

10. RAM AIR Switch OFF
11. AUTO or MANUAL Control ATTEMPT TO RESTORE

NOTE: Avoid excessive throttle movements while attempting to regain control of the pressurization system.

B. Cabin DFRN-9.8 Procedure:

CABIN DFRN-9.8	NONE	Cabin differential press approaching upper limit (9.8).	Raise cabin altitude. Increase rate of climb of cabin, if required.
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C. Cabin Pressure-Manual Procedure:

CABIN PRES MANUAL	Cabin pressurization controller has been switched to manual control automatically or manually.	Cycle AUTO/MANUAL switch to AUTO; check system. If OK, leave switch AUTO. If not, switch to MANUAL and control cabin pressurization with MANUAL CONTROL knob. See Section 3-22-30: Loss of Automatic Pressurization Control.
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D. Cabin Pressure Low Procedure:

CABIN PRESSURE LOW	CAB PRESS LOW	Cabin altitude has climbed above limits (9250 ft. $\pm$ 750 ft).	Check cabin pressure indicator and controls. Descend as necessary. Use oxygen, as appropriate. See section 4-22-10: Loss of Pressurization.
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