



737
NON-DESTRUCTIVE TEST MANUAL
PART 9 - THERMOGRAPHY

INSPECTION FOR DISBONDS BETWEEN THE FUSELAGE SKIN AND DOUBLERS

1. Purpose

- A. Use this procedure find disbonds between the fuselage skin and the doublers.
- B. Refer to Service Bulletin 737-53-1179 to identify the inspection area for your airplane.
- C. This procedure can be used to find 1 x 1 inch (25.4 x 25.4 mm) disbonds below first layer skins that are 0.08 inch (2.0 mm) thick or less.
- D. This procedure can only be used to find disbonds that are between the 1st and 2nd layers of aluminum.
- E. To do this procedure, it is necessary to use infrared inspection equipment. The general thermography procedures that follow can also be used to find skin to doubler disbonds:
 - (1) Part 9, 51-00-03, Pulsed Thermography Inspection for Disbonds in Bonded Aluminum Structure
 - (2) Part 9, 51-00-04, Lock-In Thermography Inspection for Disbonds in Bonded Aluminum Structure
- F. Service Bulletin Reference: 737-53-1179

2. Equipment

- A. Refer to the general thermography procedures that follow for data about the infrared equipment that is necessary to do this inspection procedure.
 - (1) Part 9, 51-00-03, Pulsed Thermography Inspection for Disbonds in Bonded Aluminium Structure, par. 2.
 - (2) Part 9, 51-00-04, Lock-In Thermography Inspection for Disbonds in Bonded Aluminum Structure, par. 2.

3. Prepare for the Inspection

- A. Refer to Service Bulletin 737-53-1179 to identify the group number for your airplane.
- B. Make a selection of the correct reference standard. Refer to par. 3.A in Part 9, 51-00-03 or Part 9, 51-00-04, as applicable.
- C. Prepare the reference standard for calibration as specified in par. 3 of Part 9, 51-00-03 or Part 9, 51-00-04, as applicable.

4. Instrument Calibration

- A. Calibrate the equipment as specified in par. 4 of Part 9, 51-00-03 or Part 9, 51-00-04, as applicable.
- B. Refer to Service Bulletin 737-53-1179 to identify the Figures for the inspection area that show the skin and doubler thicknesses for the applicable airplane group that you will examine. See Figure 1 for an example of the inspection data that is provided in the Service Bulletin.
- C. Identify the applicable reference standard:
 - (1) Refer to par. 3.A in Part 9, 51-00-03 or Part 9, 51-00-04, as applicable.
 - (2) Figure 1, Sheet 3 shows the three types of doublers that are in the inspection area. Thickness E is the thinnest doubler.

NOTE: It can be necessary to use more than one reference standard to make sure that the thermography system is calibrated correctly.

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5. Inspection Procedure

- A. Refer to Part 9, 51-00-03 or Part 9, 51-00-04, as applicable.
- B. Refer to Service Bulletin 737-53-1179 to identify the Figures for the inspection areas on your airplane that must be examined. Make sure that you refer to the correct inspection area for the group number of the airplane that you examine.
- C. Refer to the production skin drawings, as necessary, to identify the configuration of the bonded structure (doubler and bearstraps) and the substructure for the skin to be examined.

6. Inspection Results

- A. Refer to Part 9, 51-00-03 or Part 9, 51-00-04, as applicable, for the instructions to help make an analysis of the inspection results. Details I and II in Figure 2 show typical 737 structure with results that identify bonded and disbanded areas.
- B. Use an NDT procedure that is specified in par. 6 of Part 9, 51-00-03 or Part 9, 51-00-04, as applicable, to make sure of the results.

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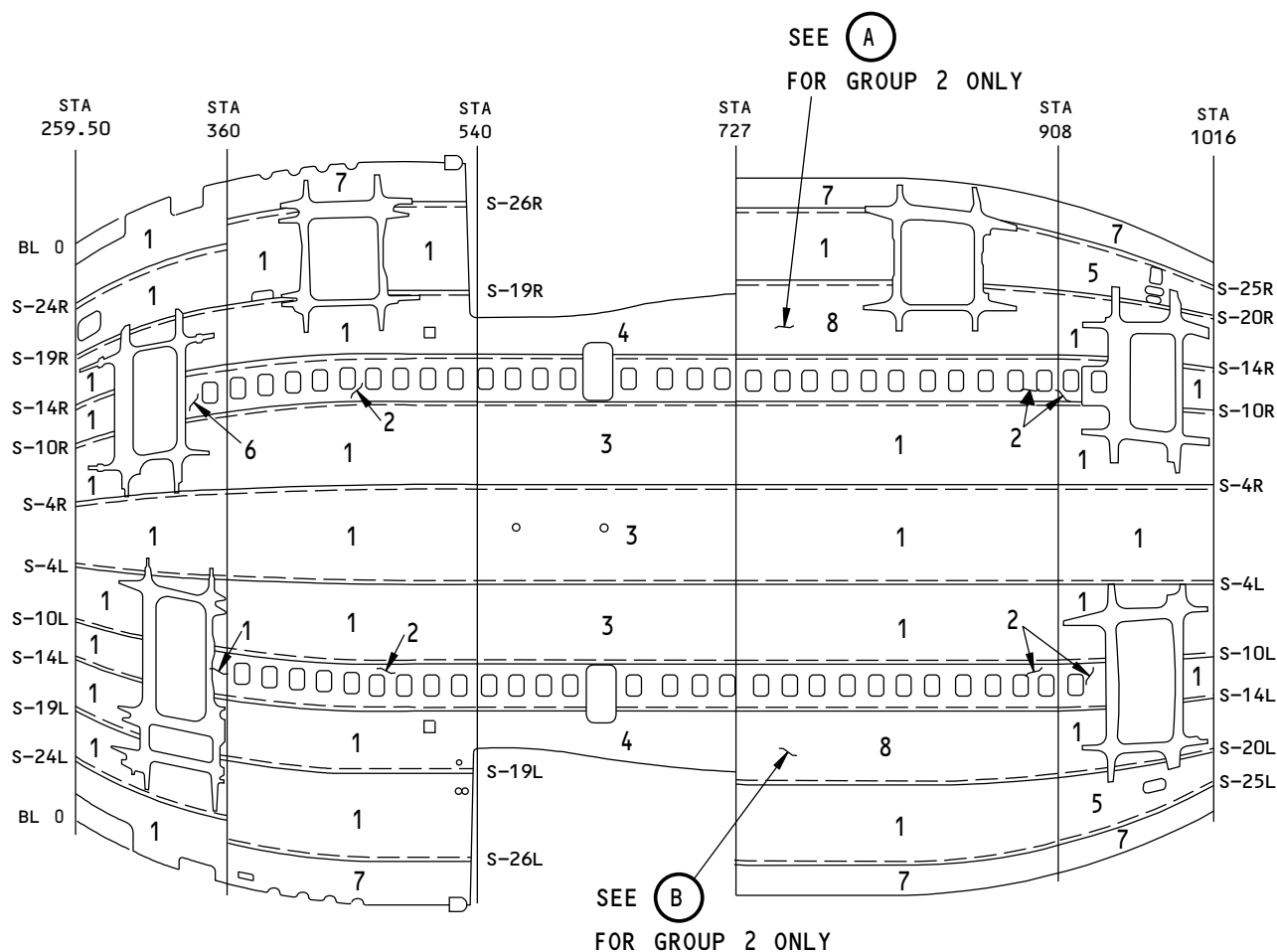
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THICKNESS (INCHES)			
ZONE	SKIN	DOUBLER	LINE NUMBERS WITH BONDED PANELS
1	0.036	0.036	ALL LINE NUMBERS GROUPS 1, 2, 18
2	0.040	0.040	ALL LINE NUMBERS GROUPS 1, 2, 18
3	0.040	0.036	ALL LINE NUMBERS GROUPS 1, 2, 18
4	0.063	0.056	ALL LINE NUMBERS GROUPS 1, 2, 18
5	0.032	0.036	ALL LINE NUMBERS GROUPS 1, 2, 18
6	0.040	0.040	FOR GROUP 18
	0.036	0.036	FOR GROUP 1 AND 2
7	0.063 (a)	---	---
8	0.036	0.036	ALL LINE NUMBERS GROUP 1, 18
	SEE DETAIL A FOR GROUP 2		ALL LINE NUMBERS GROUP 2

(a) SOLID SKINS FOR ALL LINE NUMBERS FOR GROUP 1, 2, AND 18 AIRPLANES. NO DISBOND INSPECTIONS ARE NECESSARY ON SOLID SKIN PANELS.

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Typical Inspection Areas
Figure 1 (Sheet 1 of 3)

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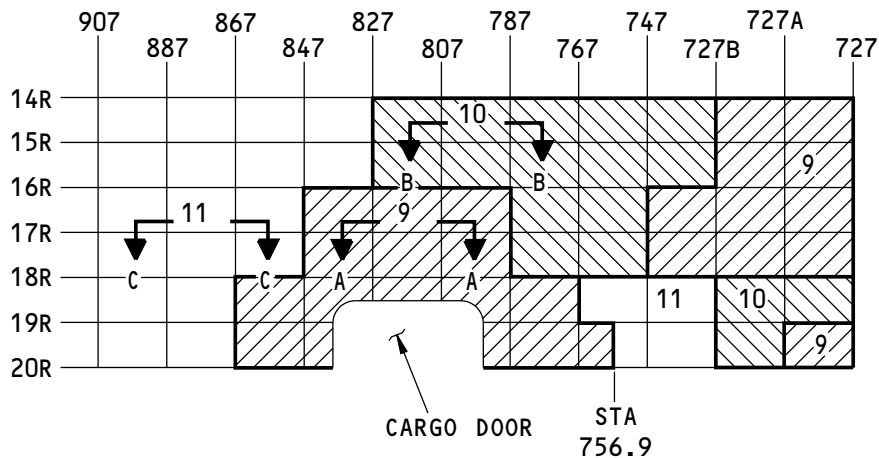
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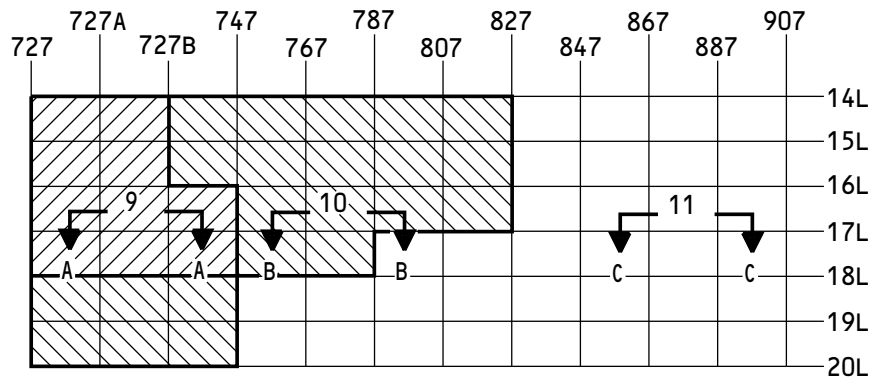


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A

GROUP 2 AIRPLANES ONLY



B

GROUP 2 AIRPLANES ONLY

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Typical Inspection Areas
Figure 1 (Sheet 2 of 3)

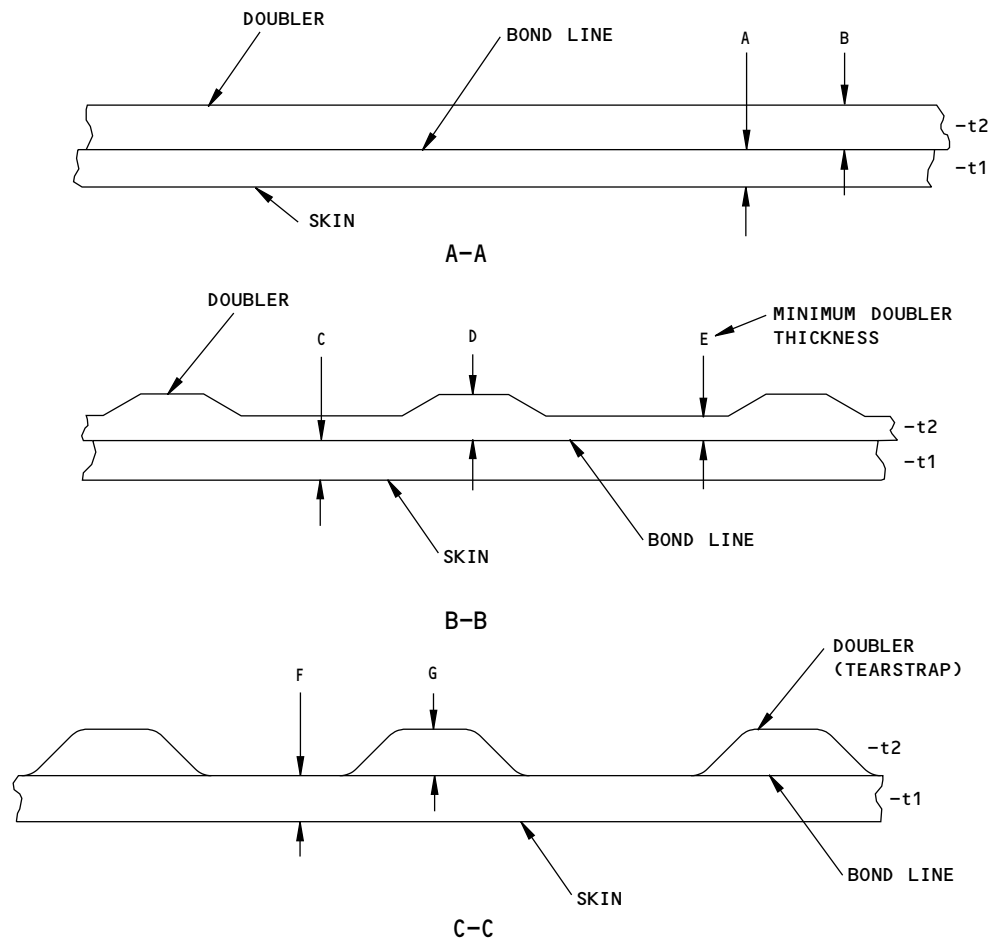
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LOCATION		SKIN AND DOUBLER THICKNESS (INCHES)						
ZONE	SECTION	A	B	C	D	E *	F	G
9	A-A	0.036	0.036	---	---	---	---	---
10	B-B	---	---	0.036	0.036	0.014	---	---
11	C-C	---	---	---	---	---	0.036	0.036

* PLUS OR MINUS 0.005

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**Typical Inspection Areas
Figure 1 (Sheet 3 of 3)**

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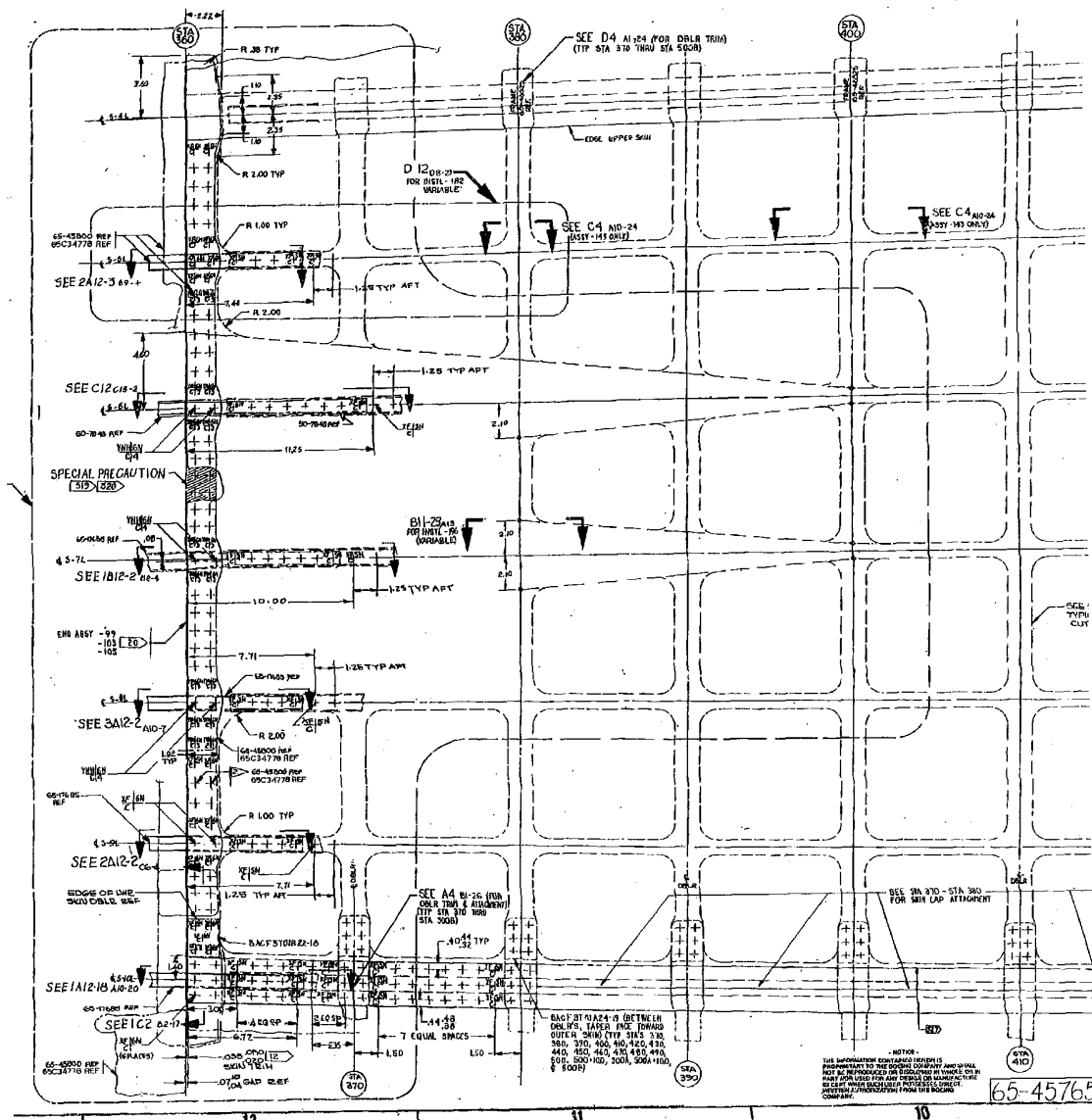
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NOTE:

- DRAWING OF SKIN PANEL SHOWN IN FIGURE 2, SHEET 2

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Infrared Inspection Results
Figure 2 (Sheet 1 of 2)

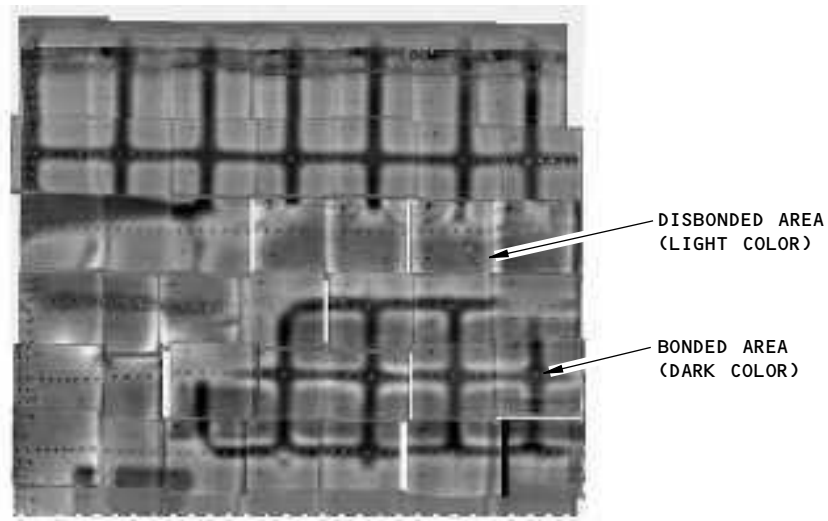
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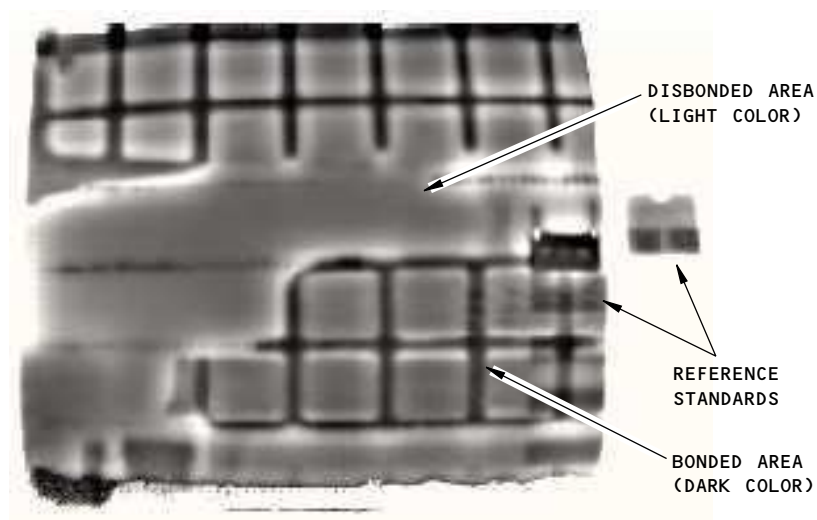
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DETAIL I
TWI THERMOGRAPHY IMAGE



DETAIL II
LOCK-IN THERMOGRAPHY IMAGE

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Infrared Inspection Results Figure 2 (Sheet 2 of 2)

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