



737  
NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**SKIN AND STRINGER SPLICES - CROWN AREA**

**1. Purpose**

- A. To detect cracks in stringers, stringer splices and skin splices in crown area (stringers S6 and above, left and right sides) at BS 360, 500C (737-400), 540, 663, 727, 727G (737-400) and 908. See Figure 1.
- B. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-27
  - (2) Item: S53-27-A
  - (3) Item: S53-27-B
  - (4) Item: S53-27-C
  - (5) Item: S53-27-D
  - (6) Item: S53-27-E
  - (7) Item: S53-27-G
  - (8) Item: S53-27-H

ALL

EFFECTIVITY

**PART 2 53-10-01**

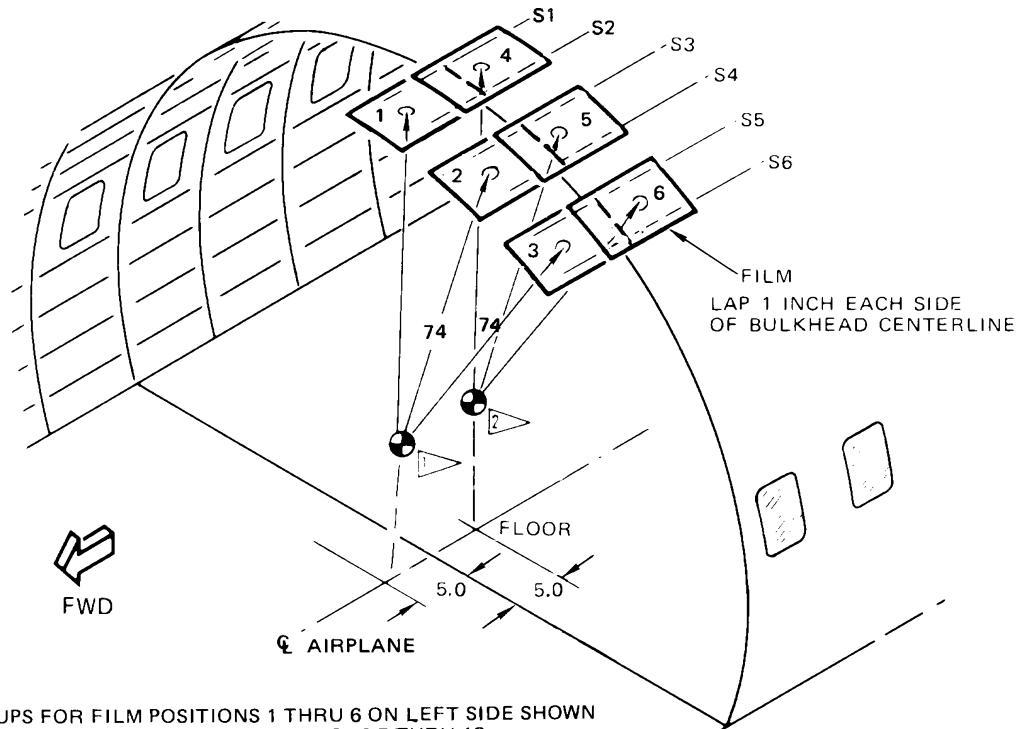
D6-37239

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NOTES

- SETUPS FOR FILM POSITIONS 1 THRU 6 ON LEFT SIDE SHOWN  
USE SAME SETUPS FOR FILM POSITIONS 7 THRU 12  
ON RIGHT SIDE

- ALL DIMENSIONS ARE IN INCHES



X-RAY GENERATOR POSITION

1 ▲ LOCATION FOR EXPOSURES 1 AND 3

2 ▲ LOCATION FOR EXPOSURES 2 AND 4

EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS		
	POSITION	ASTM CLASS	SIZE		KV	MAS	
1	1 THRU 3	I	14X17	74	150	1260	
2	4 THRU 6	I	14X17	74	150	1260	
3	7 THRU 9	I	14X17	74	150	1260	
4	10 THRU 12	I	14X17	74	150	1260	

2157224 S0000470915\_V1

X-Ray Generator and Film Positioning  
Figure 1

ALL

EFFECTIVITY

PART 2 53-10-01

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**PART 2 - X-RAY**

**WINDOW FRAMES - PASSENGER AREA**

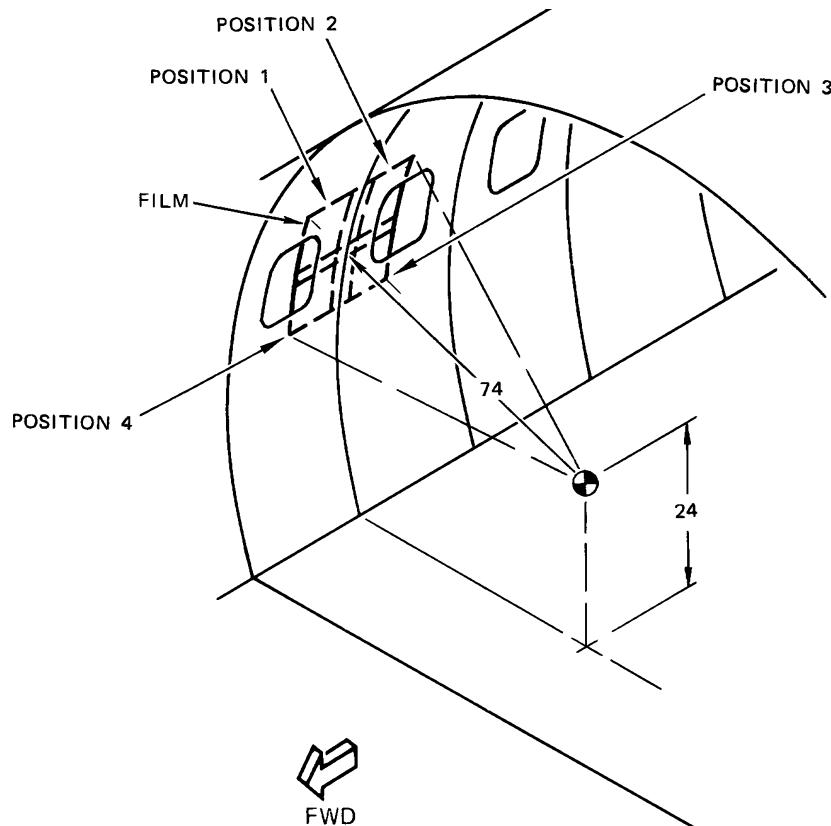
**1. Purpose**

- A. To detect cracks in passenger window frames forgings and doublers fore and aft of BS 540, 663, and 727. See Figure 1.
- B. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-10
  - (2) Item: S53-10-A



**PART 2 53-10-02**

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## NOTES

- ALL DIMENSIONS ARE IN INCHES
- X-RAY GENERATOR POSITION

X-RAY PARAMETERS						
EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1	1 thru 4	I	14X17	74	150	1260

2157226 S0000470917\_V1

X-Ray Generator and Film Positioning  
Figure 1

ALL

EFFECTIVITY

PART 2 53-10-02

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**PART 2 - X-RAY**

**FRAMES - WINDOW AREA**

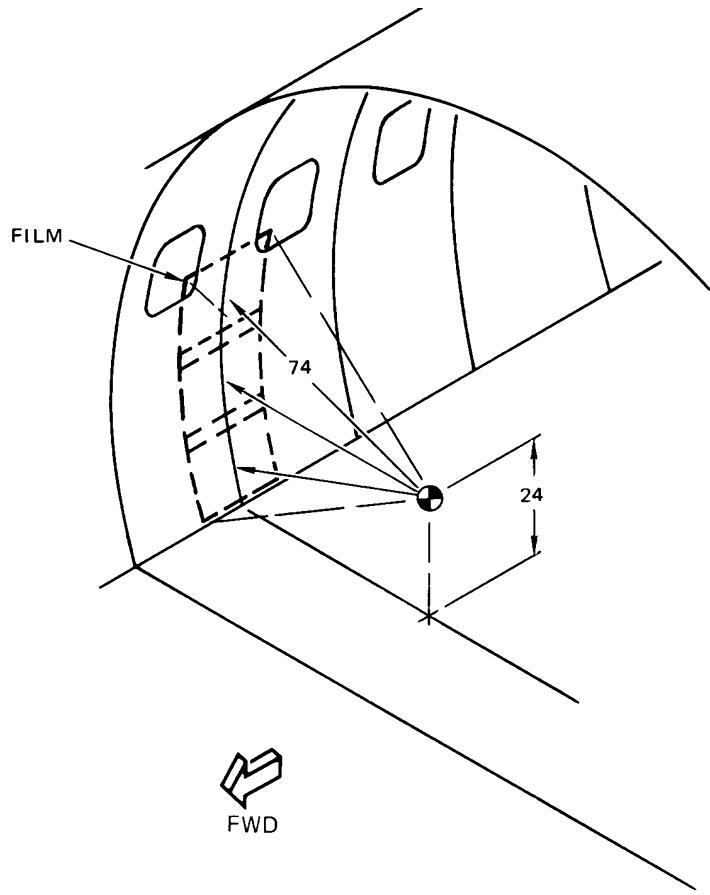
**1. Purpose**

- A. To detect cracks in frames from floor to lower edge of window at BS 559, 578, 597, 616, and 639. See Figure 1.
- B. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-12
  - (2) Item: S53-12-A
  - (3) Item: S53-12-B





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NOTES

- ALL DIMENSIONS ARE IN INCHES



X-RAY GENERATOR POSITION

X-RAY PARAMETERS						
EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1	1 THRU 3	I	14X17	74	150	1260

2157227 S0000470919\_V1

X-Ray Generator and Film Positioning  
Figure 1

ALL

EFFECTIVITY

PART 2 53-10-03

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PART 2 - X-RAY

**FRAMES, STRINGERS AND STRINGER TIE CLIPS - BS 400, 520, 685, 747 AND 887**

**1. Purpose**

- A. To detect cracks in frames, stringers and stringer tie clips at body stations 400, 500B (737-400), 520, 685, 727 (737-400), 747 and 887 from S-6 RH thru S-6 LH and from S-10 to the floor. See Table 1 and Figure 1.
- B. This technique is for surveillance inspection as opposed to an inspection for specific defects and is considered adequate for detecting large cracks and failed members.
- C. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-28
  - (2) Item: S53-28-A
  - (3) Item: S53-28-B
  - (4) Item: S53-28-C
  - (5) Item: S53-28-D
  - (6) Item: S53-28-E
  - (7) Item: S53-28-F
  - (8) Item: S53-28-G

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this technique.

**NOTE:** When a side emission generator is used, one exposure is required for each of the 14 X 17 films positioned at each body station.

**3. Prepare for the Inspection**

- A. Remove seats to accomplish this inspection.

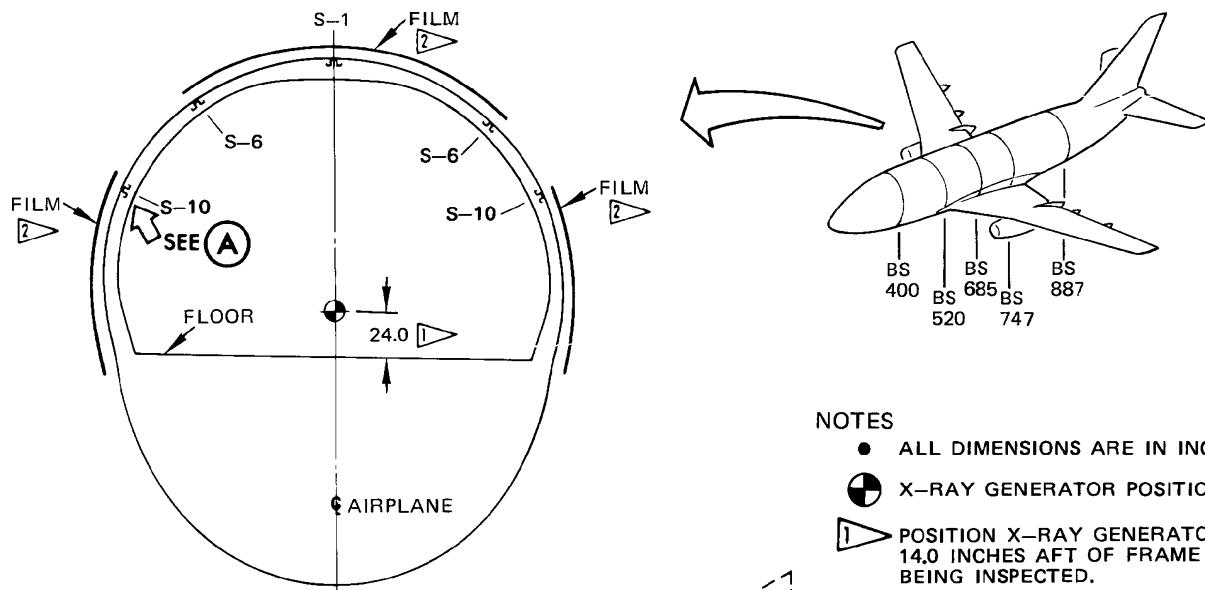
**Table 1: X-Ray Parameters**

EXPOSURE NUMBER	X-RAY PARAMETERS			SFD	GENERATOR SETTINGS		
	POSITION	FILM			KV	MAS	
		ASTM CLASS	SIZE				
1 thru 5	1 thru 5	I	14 X 17	74	145-155	1260	



**PART 2 53-10-04**

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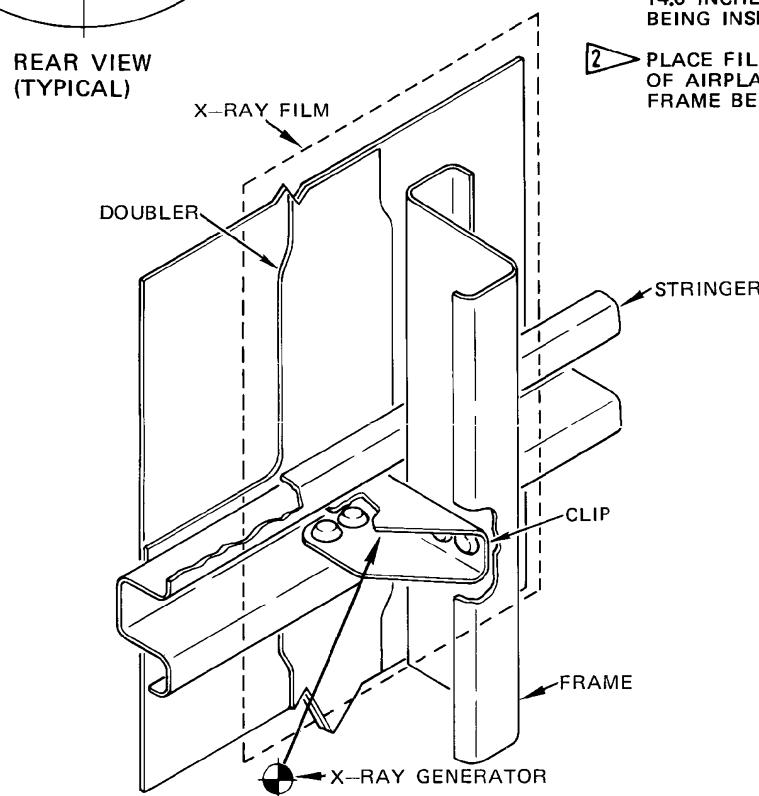
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**NON-DESTRUCTIVE TEST MANUAL**

**NOTES**

- ALL DIMENSIONS ARE IN INCHES

 X-RAY GENERATOR POSITION

 1 POSITION X-RAY GENERATOR 14.0 INCHES AFT OF FRAME BEING INSPECTED.

 2 PLACE FILM ON OUTSIDE OF AIRPLANE. CENTER OVER FRAME BEING INSPECTED.



TYPICAL STRUCTURE ARRANGEMENT  
AND FILM PLACEMENT

**(A)**

2157228 S0000470921\_V1

**X-Ray Generator and Film Positioning**  
**Figure 1**

EFFECTIVITY  
ALL

**PART 2 53-10-04**



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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**FORWARD ENTRY DOOR UPPER HINGE SHAFT SPIGOT**

**1. Purpose**

- A. To detect cracks in the forward main entry door upper hinge shaft spigot. Cracks occur in the radius of the steel spigot just above the splined area. See Figure 1.
- B. This technique is considered adequate for detecting large cracks and failed parts.
- C. Service Bulletin Reference: 737-52-1044
- D. 737 Maintenance Planning Document (D6-17594) Reference:
  - (1) Item: 6-52-03

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

**3. Inspection Procedure**

- A. Perform X-ray inspection. See Figure 1 for X-ray data.

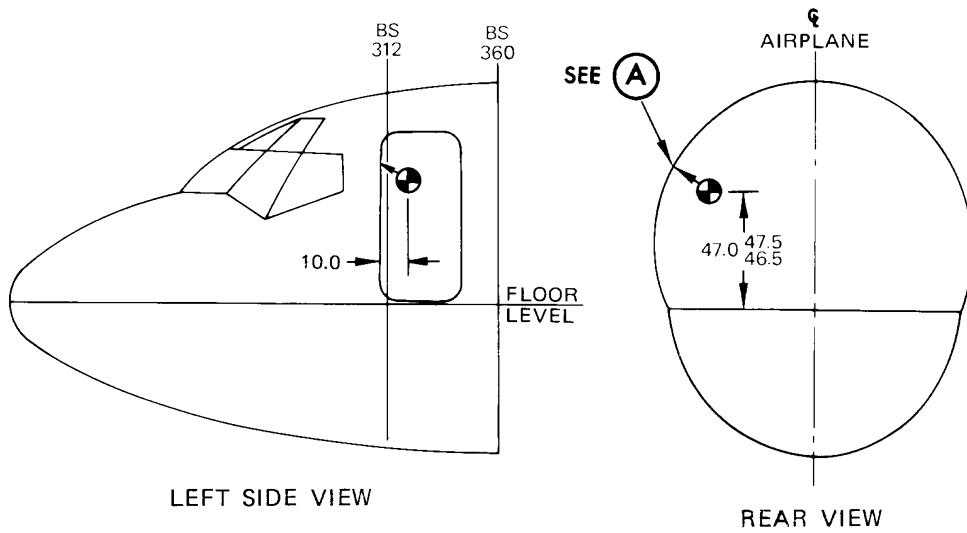
EFFECTIVITY  
ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 325

**PART 2 53-10-05**

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NON-DESTRUCTIVE TEST MANUAL



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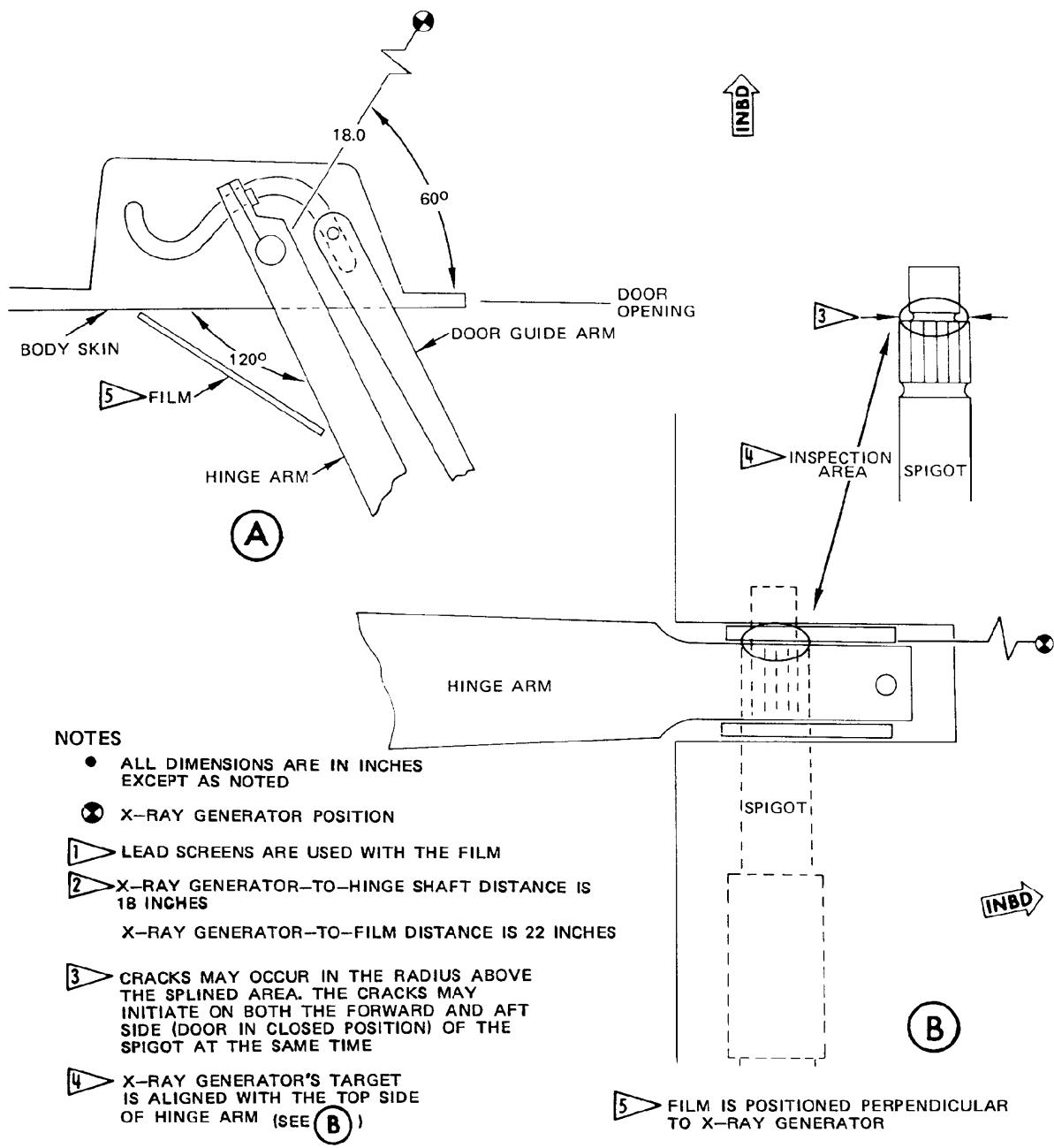
**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 1 of 2)**

EFFECTIVITY  
ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 325

**PART 2 53-10-05**

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NON-DESTRUCTIVE TEST MANUAL

EXPOSURE NUMBER	X-RAY PARAMETERS				GENERATOR SETTINGS	
	POSITION	FILM		SFD	GENERATOR SETTINGS	
		ASTM CLASS	SIZE		KV	MAS
1	1	I	8X10	2	145-155	900

2157231 S0000470924\_V1

X-Ray Generator and Film Positioning  
Figure 1 (Sheet 2 of 2)EFFECTIVITY  
ALL 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 325

PART 2 53-10-05

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**NON-DESTRUCTIVE TEST MANUAL**

**PART 2 - X-RAY**

**MAIN CARGO DOOR SKIN - HINGE AREA**

**1. Purpose**

- A. To detect cracks in the main cargo door from the lower edge of the steel door hinge downward a minimum of 6 inches.
- B. Primary interest is the row of fasteners below the edge of the cargo door hinge. Particular attention should be given to the fasteners at each frame and the three fasteners on either side. See Figure 1.
- C. Service Bulletin Reference: 737-52-1038
- D. 737 Maintenance Planning Document (D6-17594) Reference:
  - (1) Item: 6-52-06

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

ALL

EFFECTIVITY

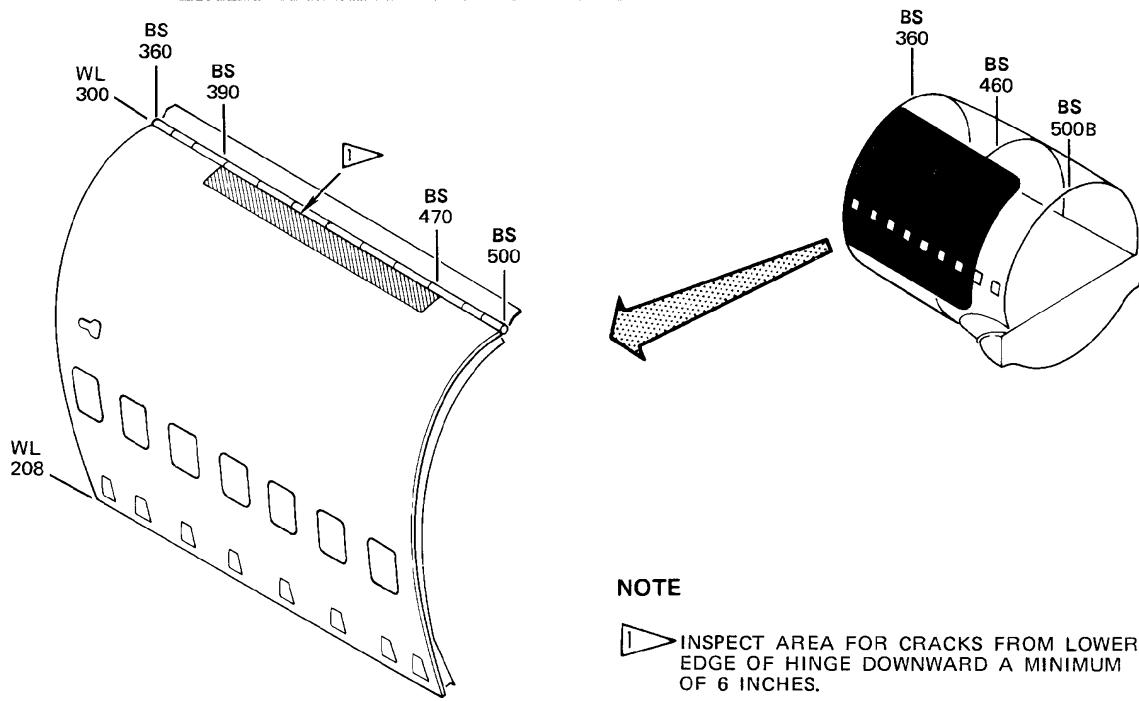
**PART 2 53-10-06**

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X-RAY PARAMETERS						
EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1 thru 5	1 thru 5	I	14X17	70	135	680



2157232 S0000470927\_V1

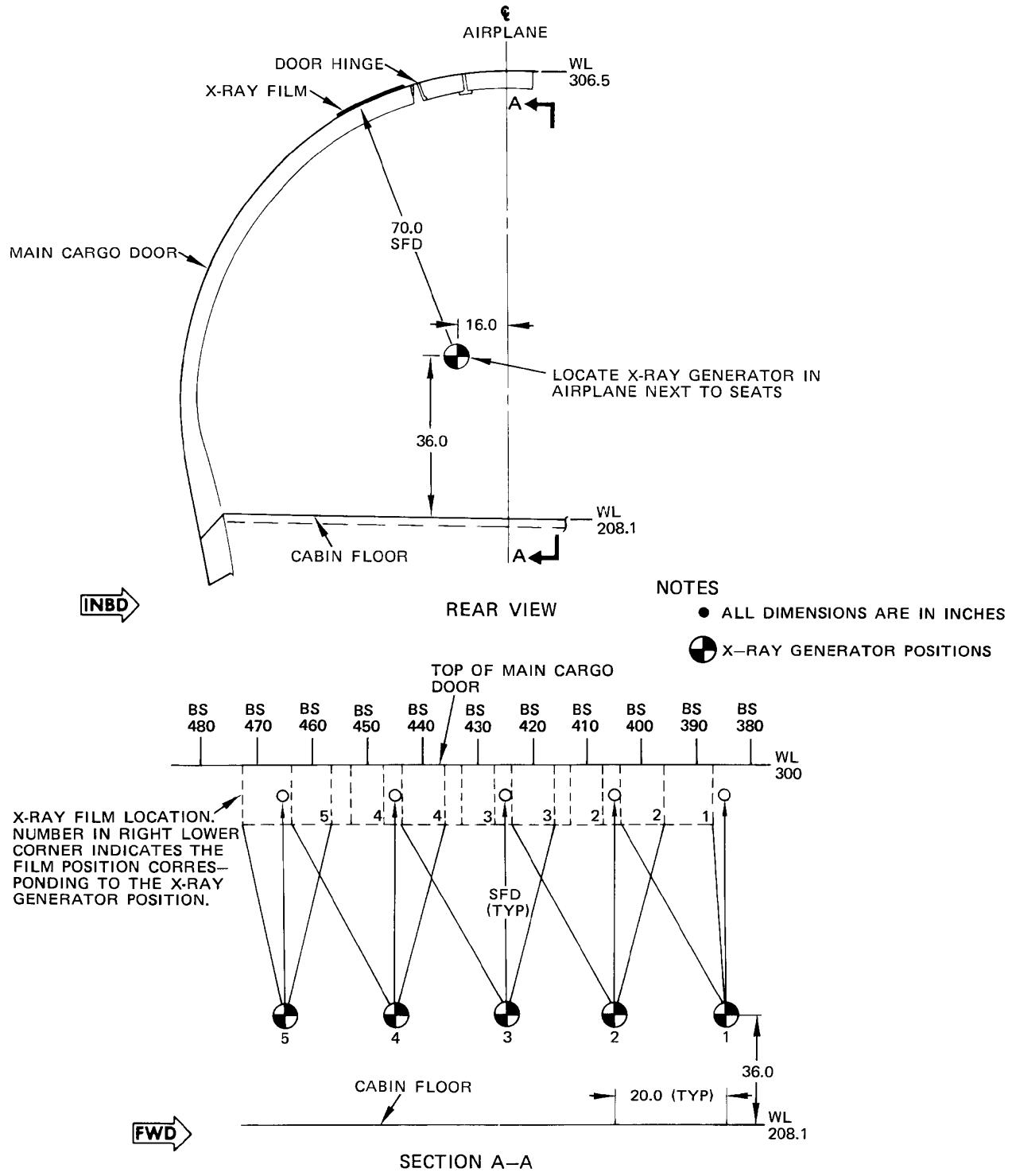
**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 1 of 2)**

EFFECTIVITY  
ALL

**PART 2 53-10-06**

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2157235 S0000470928\_V1

**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 2 of 2)**

EFFECTIVITY  
**ALL**

**PART 2 53-10-06**

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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**MAIN CARGO DOOR SKIN - STRINGER 10 SKIN LAP**

**1. Purpose**

- A. To detect cracks in the main cargo door in the area 6 inches above and 3 inches below the center line of stringer 10.
- B. Primary interest is the three rows of fasteners along the skin lap. Particular attention should be given to the top row of fasteners and to those fasteners where the door frames end above the windows. See Figure 1.
- C. Service Bulletin Reference: 737-52-1038
- D. 737 Maintenance Planning Document (D6-17594) Reference:
  - (1) Item: 6-52-06

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

ALL

EFFECTIVITY

**PART 2 53-10-07**

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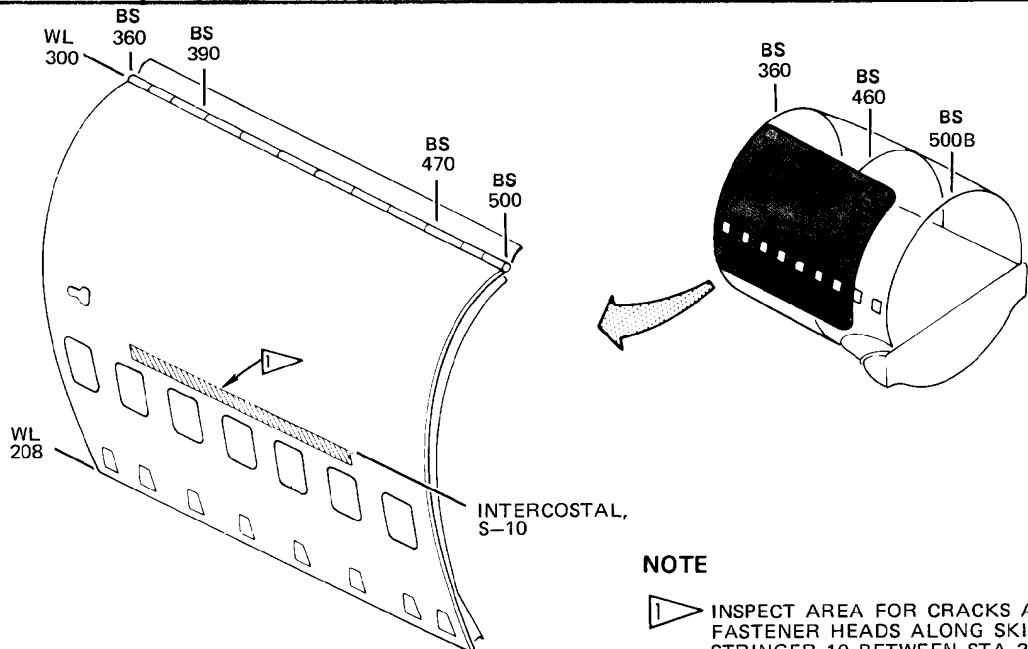
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EXPOSURE NUMBER	X-RAY PARAMETERS			SFD	GENERATOR SETTINGS		
	POSITION	FILM			KV	MAS	
		ASTM CLASS	SIZE				
1 thru 5	1 thru 5	I	14X17	70	135	680	



2157237 S0000470930\_V1

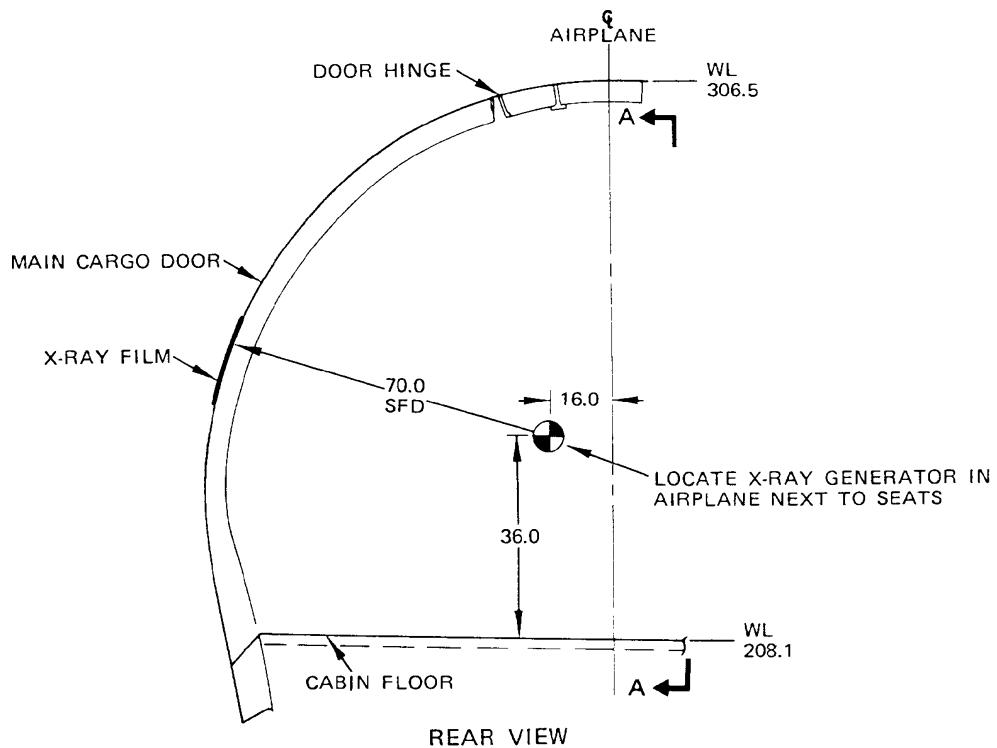
X-Ray Generator and Film Positioning  
Figure 1 (Sheet 1 of 2)

EFFECTIVITY  
ALL

PART 2 53-10-07

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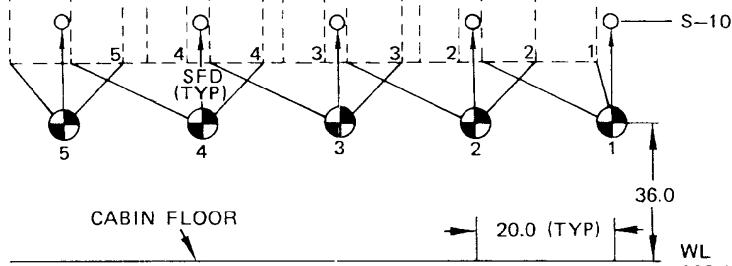
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**INBD**
**NOTES**

- ALL DIMENSIONS ARE IN INCHES

 X-RAY GENERATOR POSITIONS

BS 480 BS 470 BS 460 BS 450 BS 440 BS 430 BS 420 BS 410 BS 400 BS 390 BS 380

X-RAY FILM LOCATION NUMBER IN RIGHT LOWER CORNER INDICATES THE FILM POSITION CORRESPONDING TO THE X-RAY GENERATOR POSITION.


**FWD**

SECTION A-A

2157244 S0000470931\_V1

**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 2 of 2)**
**EFFECTIVITY**  
**ALL**
**PART 2 53-10-07**



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PART 2 - X-RAY

**FORWARD AIRSTAIR DOOR OPENING, BS 351, STRINGER S-20**

**1. Purpose**

- A. To detect cracks in the skin, doubler or strap at the lower aft corner of the airstair entry opening, BS 351, stringer S-20. See Figure 1.
- B. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-22
  - (2) Item: S53-22-J

**2. Equipment**

- A. X-ray Generator - Sperry Portable 160 kV, 5 mA, side emission.

**3. Prepare for the Inspection**

- A. Extend the airstair.

EFFECTIVITY  
ALL 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 598 AND 600 THRU 639

**PART 2 53-10-08**

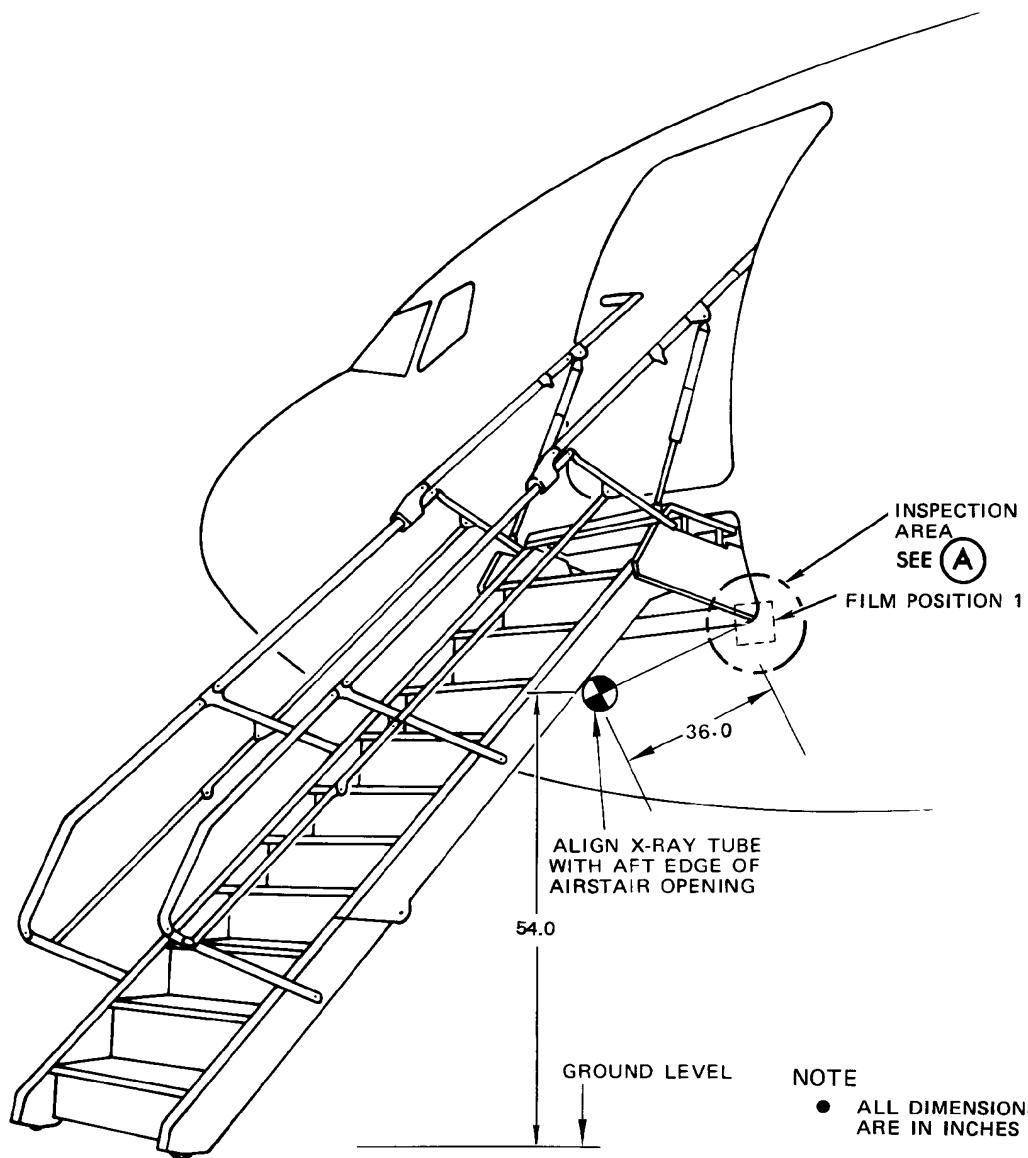
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EXPOSURE NUMBER	X-RAY PARAMETERS			SFD	GENERATOR SETTINGS		
	FILM				KV	MAS	
	POSITION	ASTM CLASS	SIZE				
1	1	I	5 X 7	36	75	300	

2157251 S0000470933\_V1

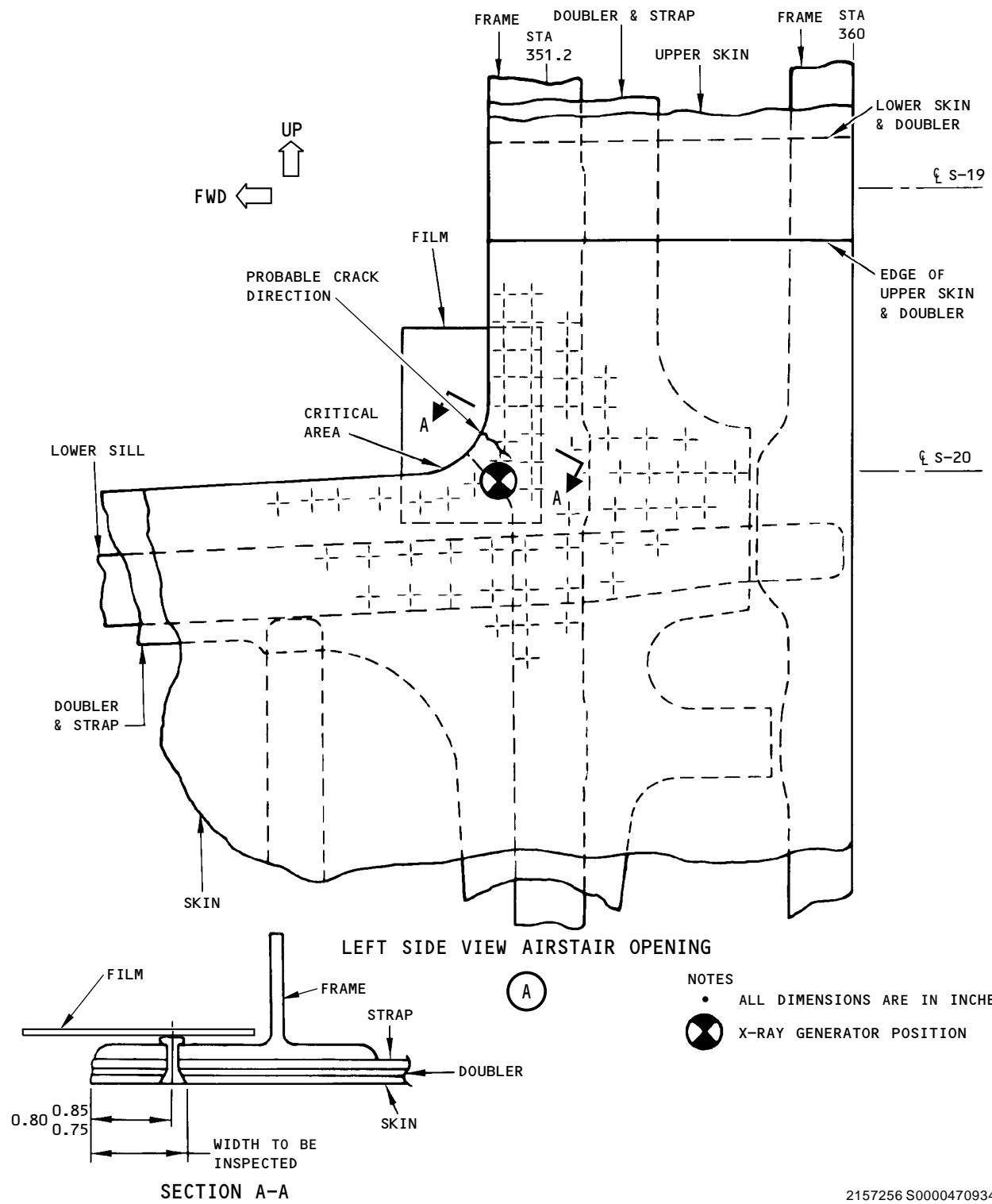
X-Ray Generator and Film Positioning  
Figure 1 (Sheet 1 of 2)

EFFECTIVITY  
ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 598 AND 600 THRU 639

PART 2 53-10-08

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**NON-DESTRUCTIVE TEST MANUAL**


**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 2 of 2)**

EFFECTIVITY  
 ALL: 737-100 AND -200 AIRPLANE LINE NUMBERS  
 1 THRU 598 AND 600 THRU 639

**PART 2 53-10-08**

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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**STRINGERS S-6 THRU S-14, BS 277 THRU 294.5 AND FORWARD OF MAIN ENTRY DOOR**

**1. Purpose**

- A. To detect cracks in the stringers S-6 through S-14 between BS 277 and BS 294.5 and just forward of the main entry door on the left side of the airplane. See Figure 1.
- B. This technique is for surveillance inspection as opposed to an inspection for a specific defect and is considered adequate for detecting large cracks and failed members.
- C. Service Bulletin Reference: 737-53-1040

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

**3. Prepare for the Inspection**

- A. None.

**4. Inspection Procedure**

- A. Place X-ray generator as shown in Detail I of Figure 1. Four exposures from both position 1 and position 2 are to be exposed from this single generator location.

ALL

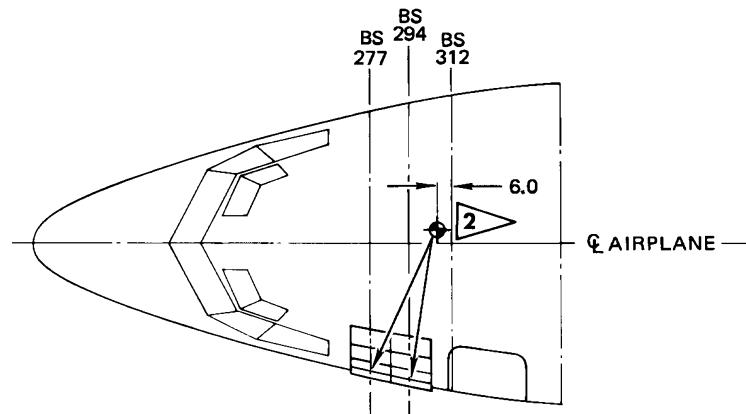
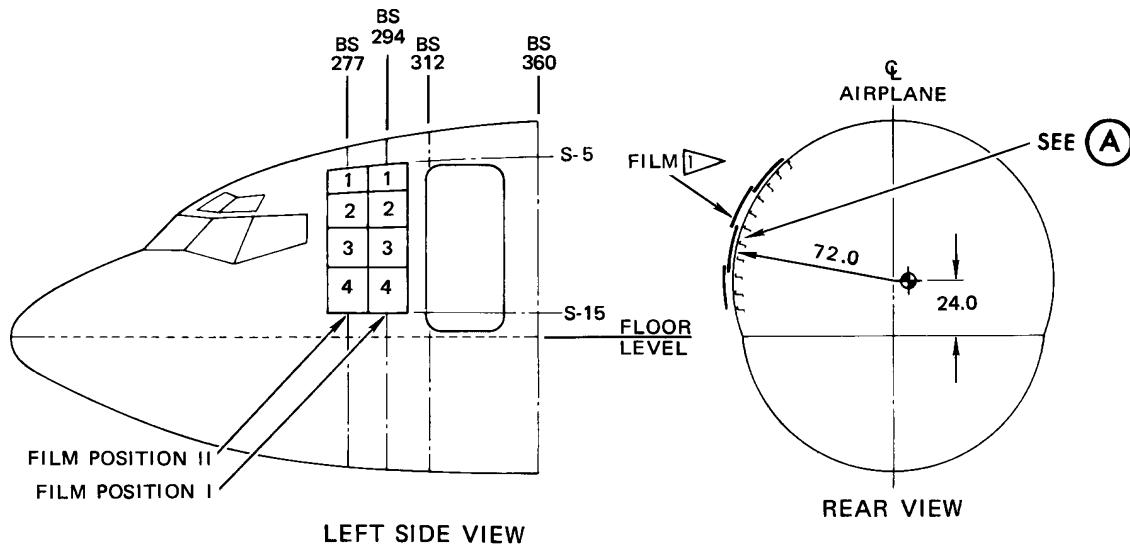
EFFECTIVITY

**PART 2 53-10-09**

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DETAIL I

2157257 S0000470936\_V1

X-Ray Generator and Film Positioning  
Figure 1 (Sheet 1 of 2)

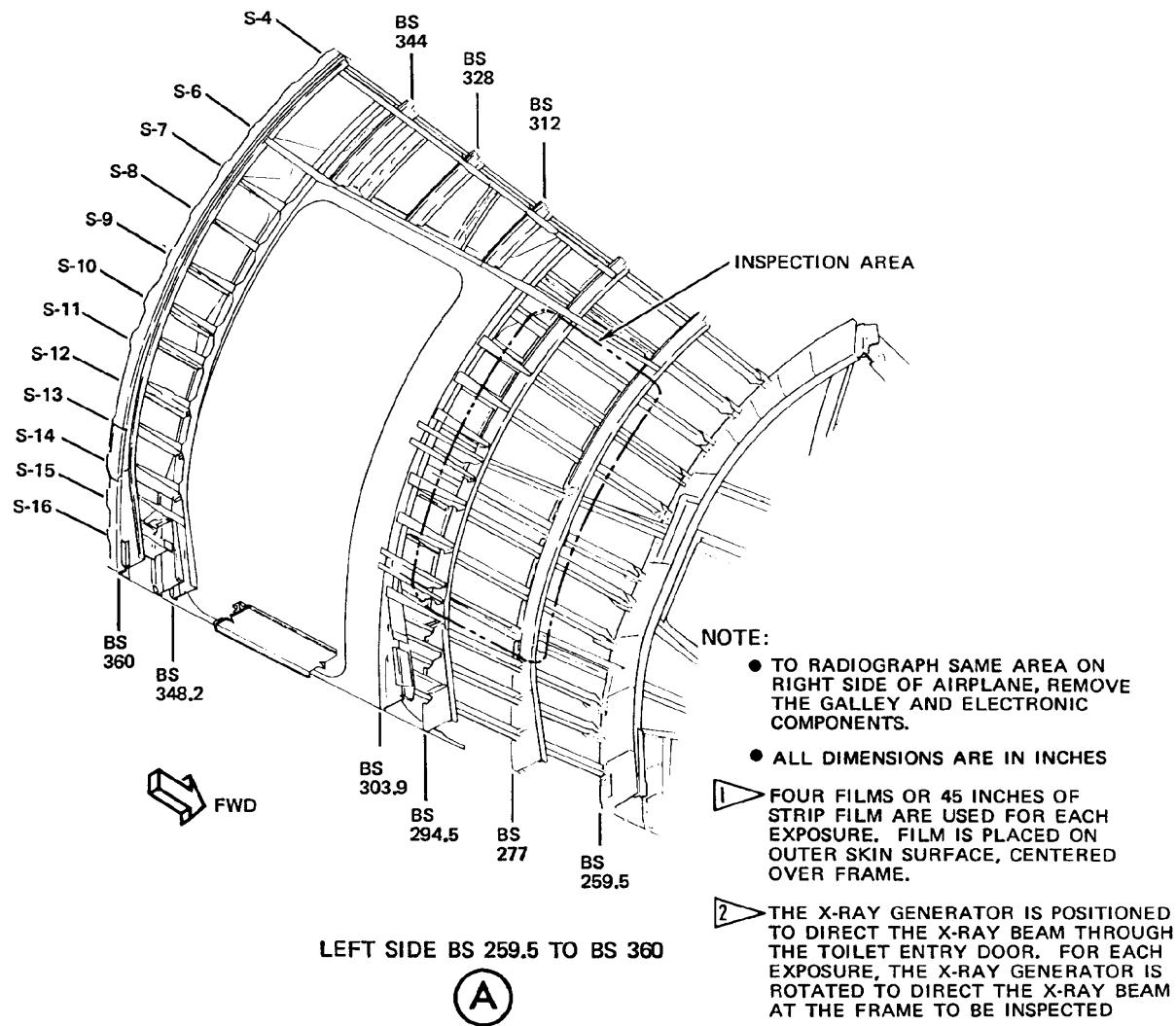
ALL EFFECTIVITY

**PART 2 53-10-09**

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EXPOSURE NUMBER	X-RAY PARAMETERS				GENERATOR SETTINGS	
	POSITION	FILM				
		ASTM CLASS	SIZE	KV	MAS	
1	1, 2	I	14X17	72	115-125	900
2	1, 2	I	14X17	72	115-125	900
3	1, 2	I	14X17	72	115-125	900
4	1, 2	I	14X17	72	115-125	900

2157258 S0000470937\_V1

**X-Ray Generator and Film Positioning**  
**Figure 1 (Sheet 2 of 2)**

**ALL** EFFECTIVITY

**PART 2 53-10-09**



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PART 2 - X-RAY

**FRAME TO SKIN SHEAR TIES, BS 887, STRINGERS S-18 THRU S-25**

**1. Purpose**

- A. To detect cracks in the frame shear ties, skin and doublers at BS 887, stringers S-18 thru S-25. See Figure 1 and Figure 2.
- B. This procedure is for surveillance inspection as opposed to an inspection for a specific defect and is considered adequate for detecting large cracks and failed members.

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

**3. Prepare for the Inspection**

- A. None.

ALL

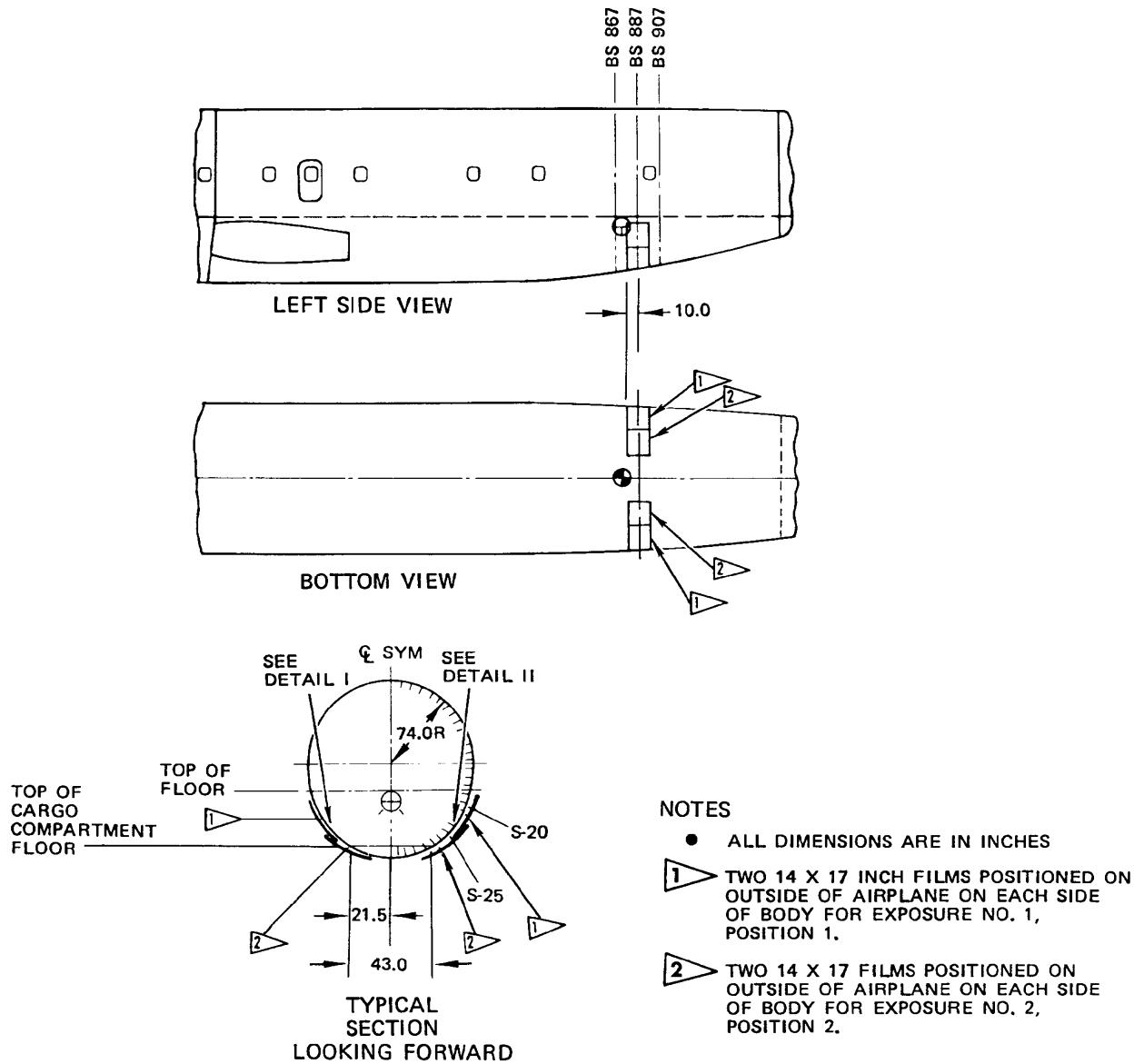
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**PART 2 53-10-10**

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EXPOSURE NUMBER	X-RAY PARAMETERS				GENERATOR SETTINGS		
	POSITION	FILM			SFD	KV	MAS
		ASTM CLASS	SIZE				
1	1	I	14X17	52	150	900	
2	2	I	14X17	47	150	630	

2157259 S0000470940\_V1

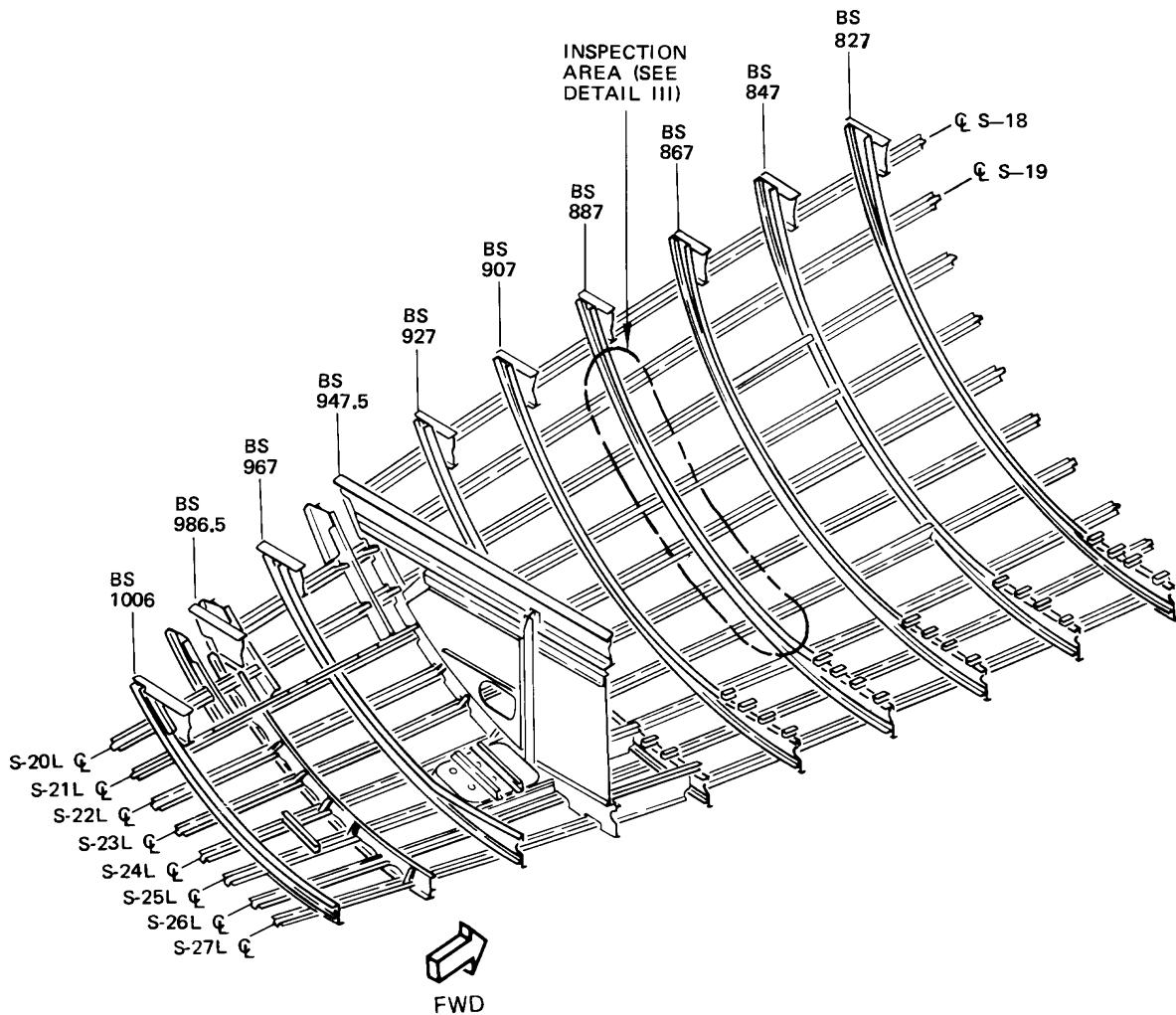
**X-Ray Generator and Film Positioning**  
**Figure 1**

ALL

EFFECTIVITY

**PART 2 53-10-10**

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LOWER LEFT INSIDE VIEW (SEE DETAIL II  
FOR LOWER RIGHT INSIDE VIEW)

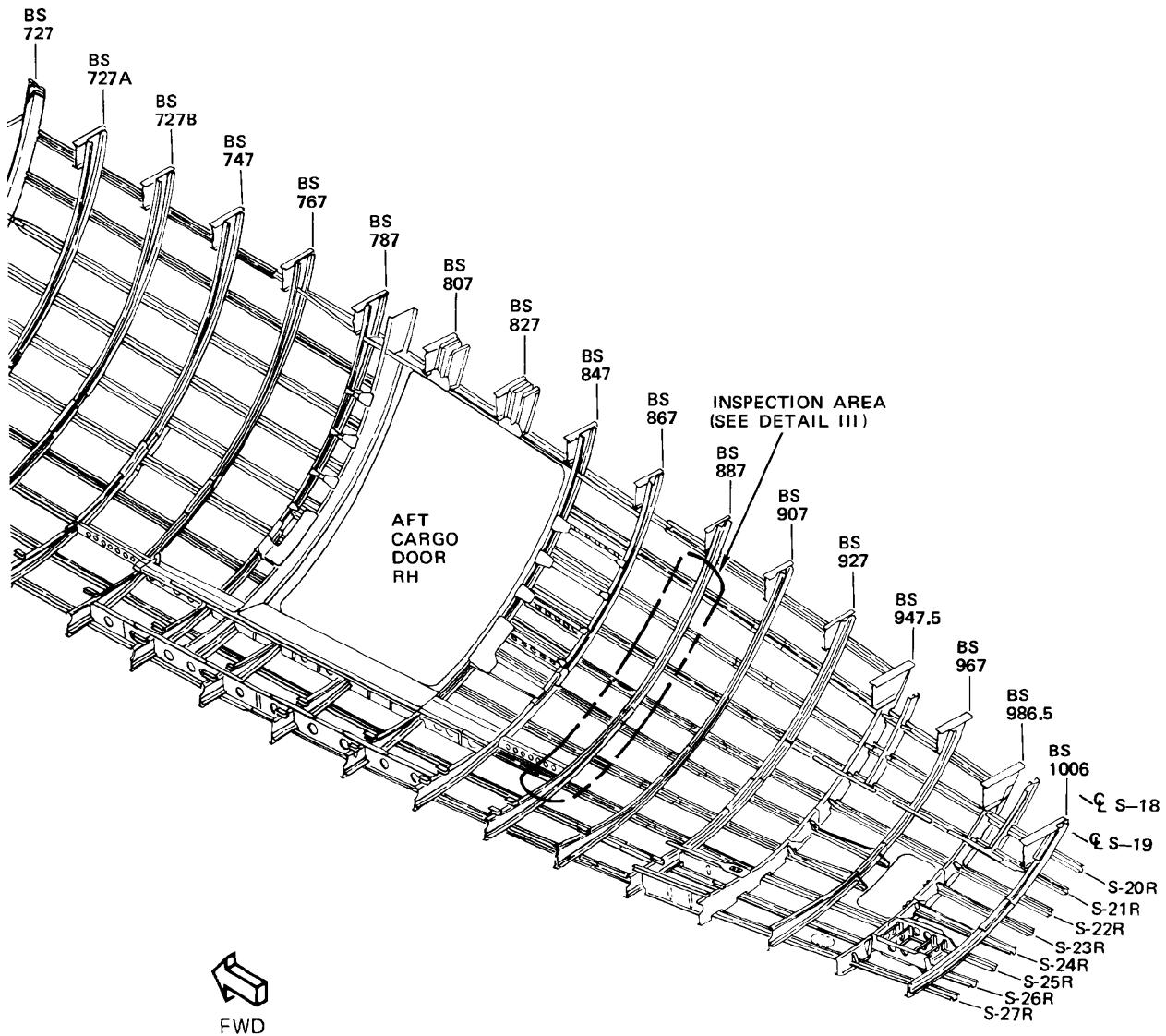
DETAIL I

2157260 S0000470941\_V1

Frame-to-Skin Shear Ties, BS 887 - Inspection Area  
Figure 2 (Sheet 1 of 3)

ALL EFFECTIVITY

PART 2 53-10-10

LOWER RIGHT INSIDE VIEW  
DETAIL II

2157261 S0000470942\_V1

Frame-to-Skin Shear Ties, BS 887 - Inspection Area  
Figure 2 (Sheet 2 of 3)

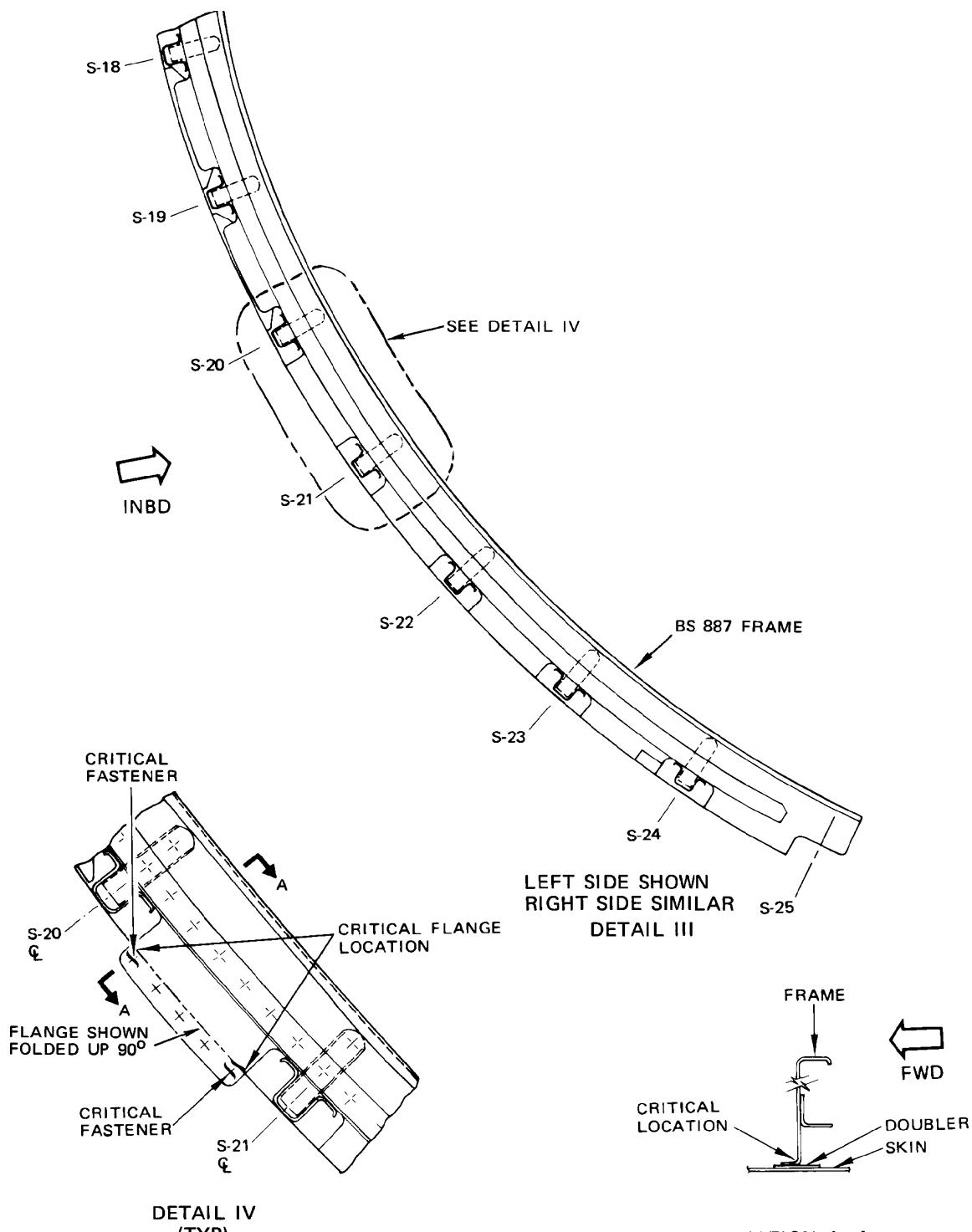
ALL

EFFECTIVITY

PART 2 53-10-10

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Frame-to-Skin Shear Ties, BS 887 - Inspection Area  
Figure 2 (Sheet 3 of 3)

2157264 S0000470943\_V1

EFFECTIVITY  
ALL

PART 2 53-10-10



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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**BODY SKIN AND WING-TO-BODY UPPER TIE ANGLE**

**1. Purpose**

- A. To detect cracks in the fastener holes common to the wing front spar and upper tie angles at critical hole locations shown in Detail III of Figure 2.
- B. This technique is a surveillance inspection as opposed to an inspection for a specific defect and is considered adequate for detecting large cracks and failed members.
- C. Inspect critical holes indicated.
- D. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-18
  - (2) Item: S53-18B

**2. Equipment**

- A. Baltospot portable 150 KVP, 35-degree side emission X-ray generator was used to develop this procedure.

**3. Prepare for the Inspection**

- A. The inspection areas are accessible as follows:
  - (1) Access to the body frame at stringers 21R and 21L are made through the forward cargo door.
  - (2) Access to the wing-to-body upper tie angle is made through the A/C access panels 3302 and 3303. Refer to Chapter 12 of the Maintenance Manual.
- B. Clean inspection area removing all grease, oil and dirt.
- C. Place X-ray film on inside of airplane to cover the two fasteners common to the body frame splice angle and wing-to-body tie angle.
- D. Position the X-ray generator on the outside of the airplane, 40 inches from the wing-to-body tie angle. The X-ray beam is directed normal to the tie angle, being careful to miss the tubing located in this area.

ALL

EFFECTIVITY

**PART 2 53-10-11**

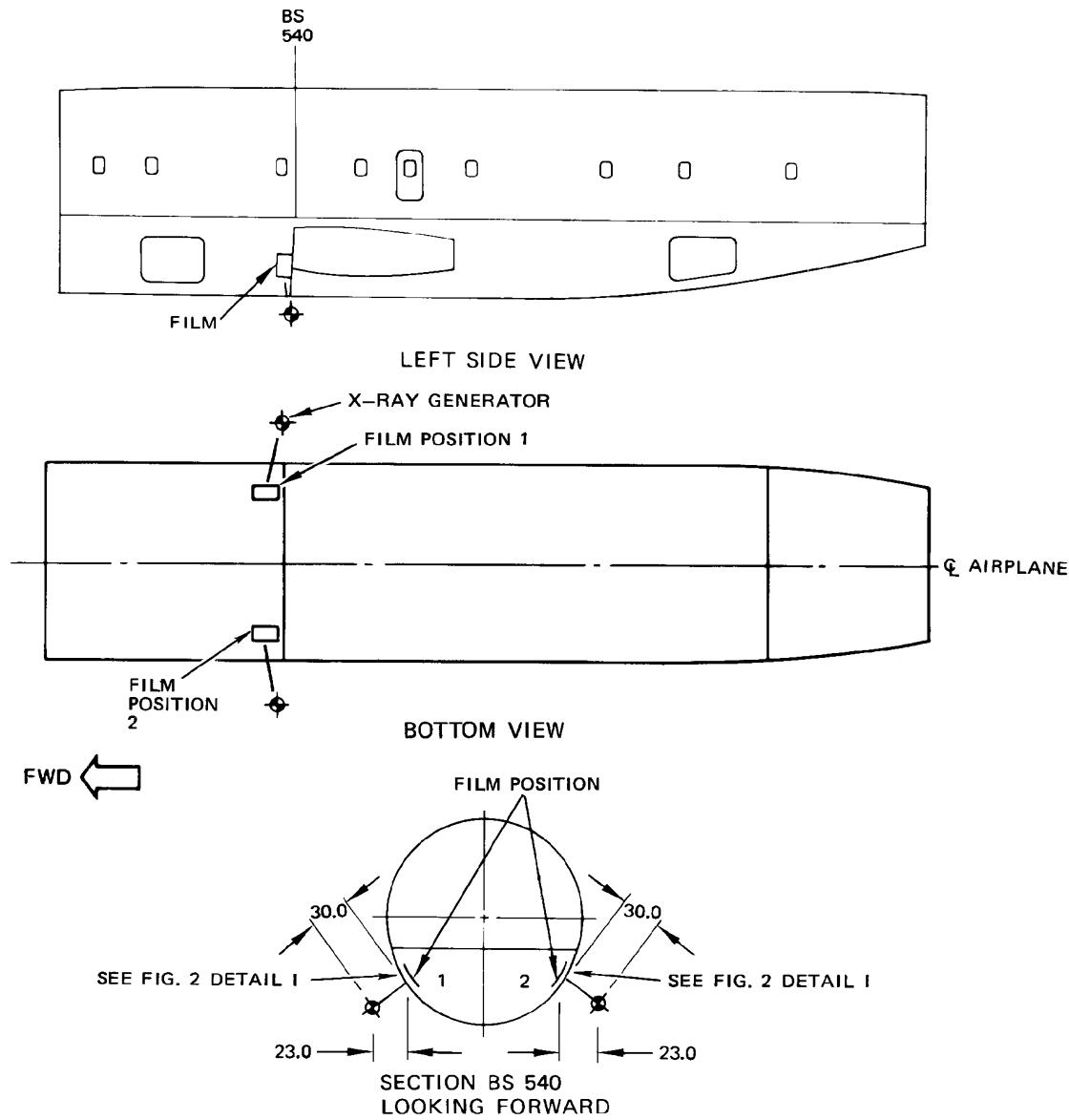
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EXPOSURE NUMBER	X-RAY PARAMETERS				GENERATOR SETTINGS	
	POSITION	FILM		SFD	GENERATOR SETTINGS	
		ASTM CLASS	SIZE		KV	MAS
1	1	I	8 X10	40	120	450
2	2	I	8 X10	40	120	450

2157266 S0000470945\_V1

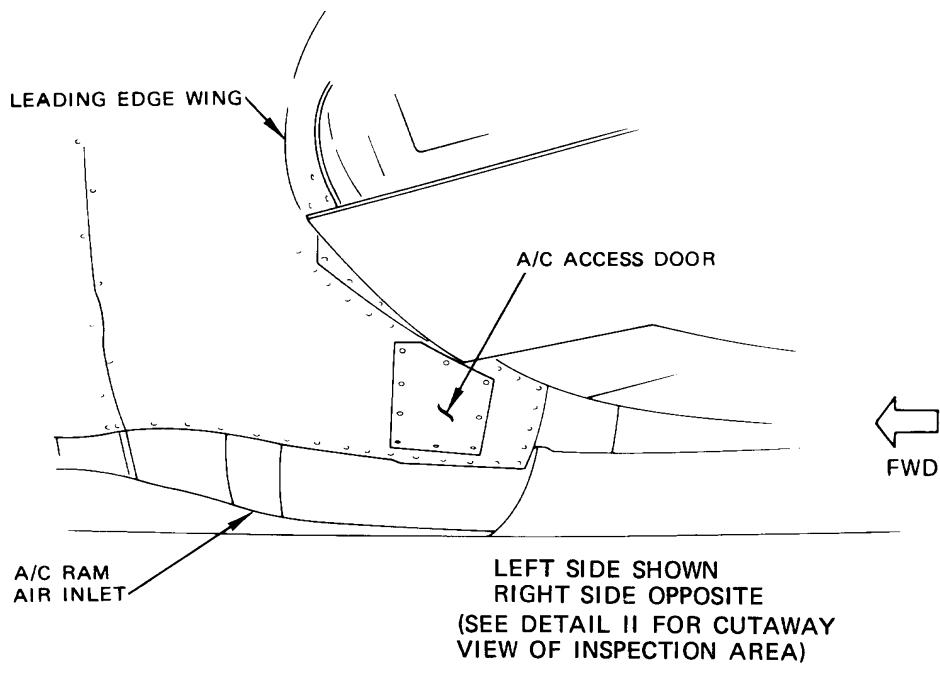
X-Ray Generator and Film Positioning  
Figure 1

ALL

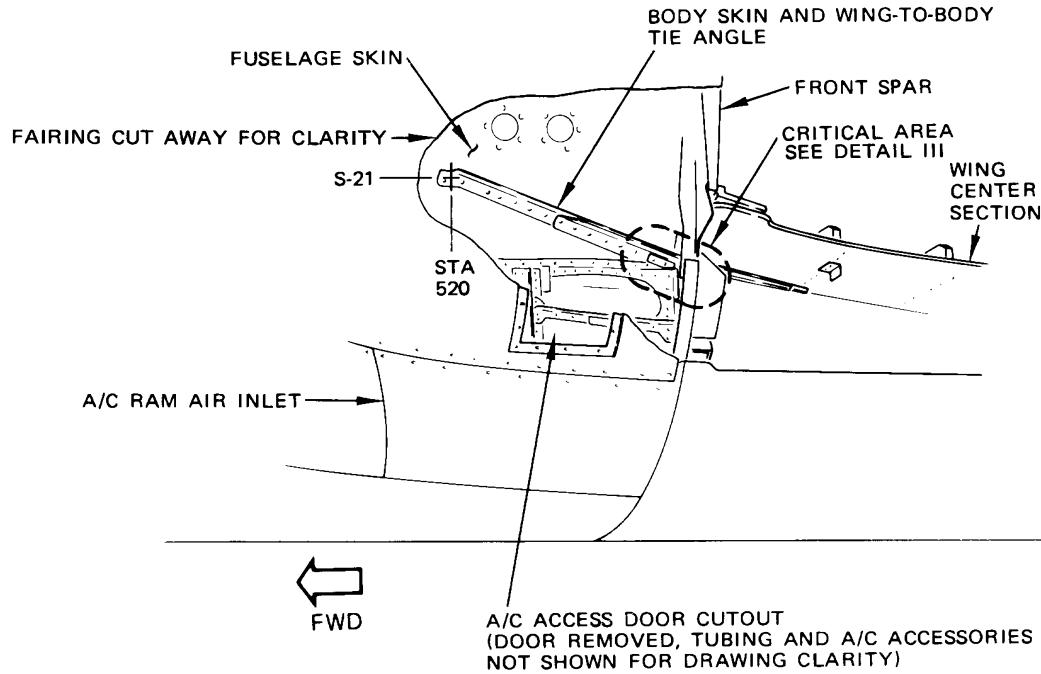
EFFECTIVITY

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NON-DESTRUCTIVE TEST MANUAL

DETAIL I



LEFT SIDE SHOWN (RIGHT SIDE OPPOSITE)

DETAIL II

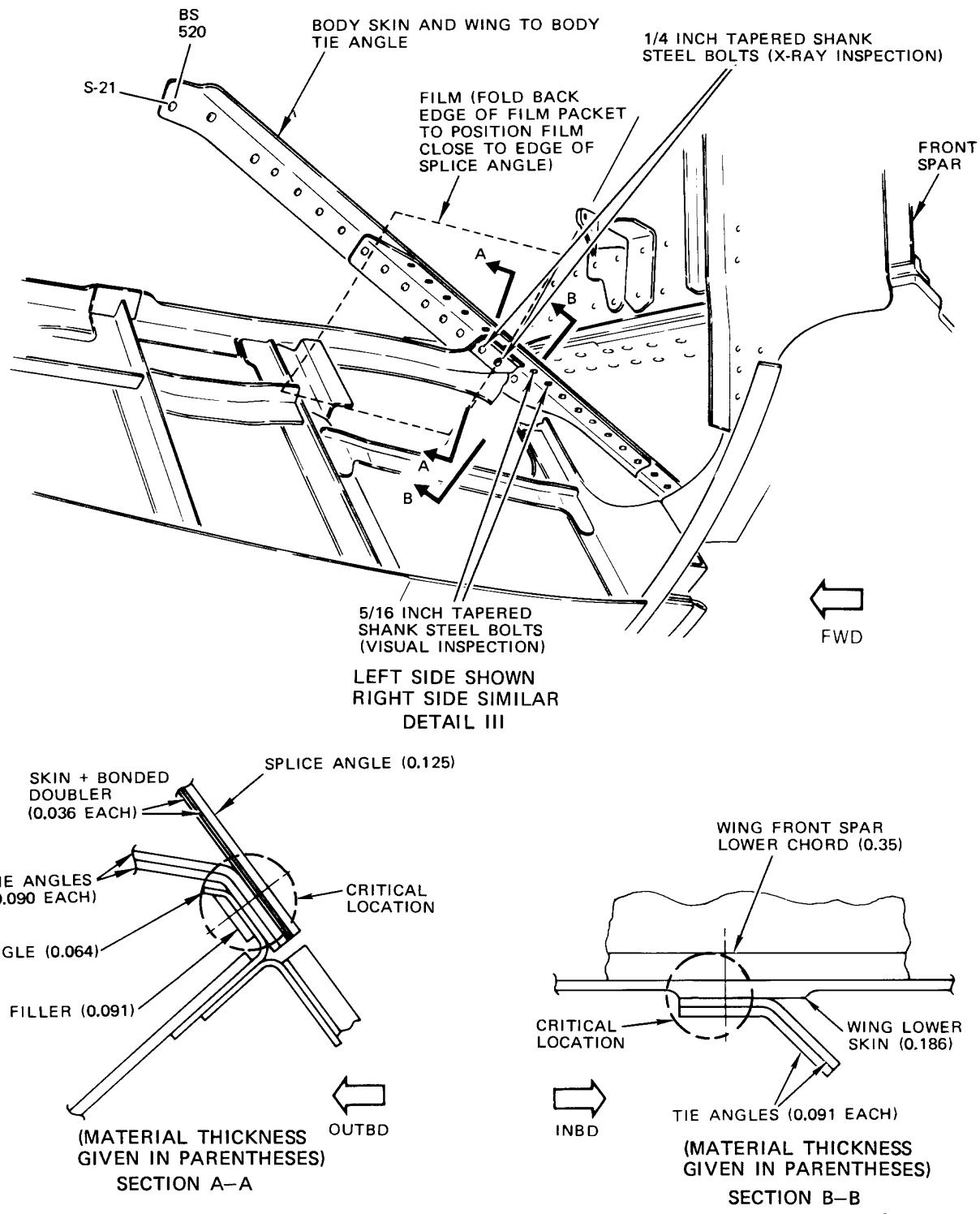
2157267 S0000470946\_V1

**Body Skin and Wing-to-Body Upper Tie Angle - Inspection Area**  
**Figure 2 (Sheet 1 of 2)**

**ALL** EFFECTIVITY

**PART 2 53-10-11**

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**Body Skin and Wing-to-Body Upper Tie Angle - Inspection Area**  
**Figure 2 (Sheet 2 of 2)**

EFFECTIVITY  
ALL

**PART 2 53-10-11**



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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**FRAME TO SKIN SHEAR TIES, BS 500, STRINGERS S-18 THRU S-25**

**1. Purpose**

- A. To detect cracks in the frame shear ties, skin and doublers at BS 500, stringers S-18 through S-25 (see Figure 1 and Figure 2).
- B. This technique is for surveillance inspection as opposed to an inspection for a specific defect and is considered adequate for detecting large cracks and failed members.
- C. 737 Maintenance Planning Document (D6-17594) Reference:
  - (1) Item: 6-53-22

**2. Equipment**

- A. Baltospot 150 kV, 35-degree side emission X-ray generator was used to develop this procedure.

**3. Prepare for the Inspection**

- A. None.

ALL

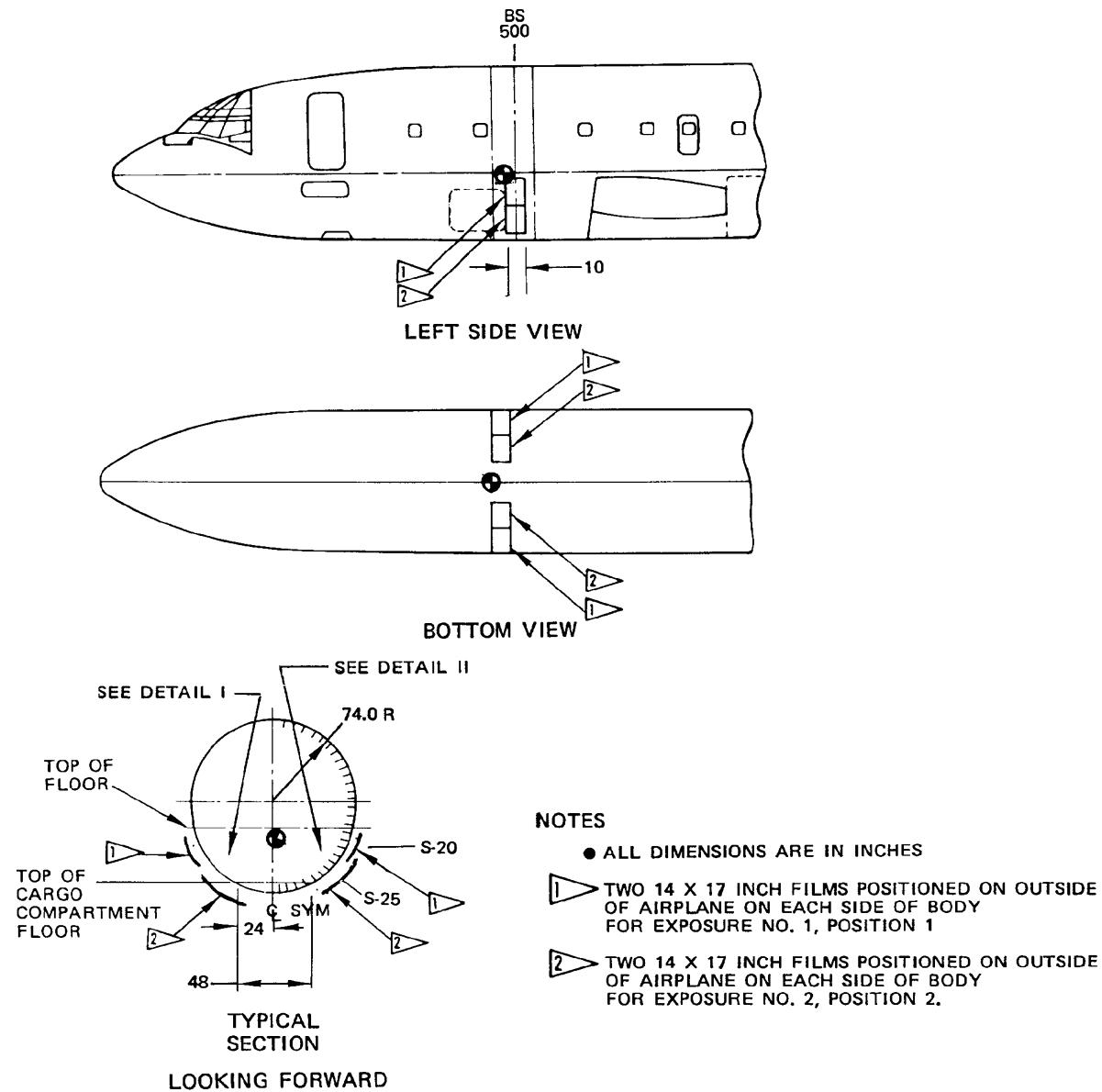
EFFECTIVITY

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EXPOSURE NUMBER	X-RAY PARAMETERS				SFD	GENERATOR SETTINGS		
	POSITION	FILM		SIZE		KV	MAS	
		ASTM CLASS	SIZE					
1	1	I	14X17	65		150	900	
2	2	I	14X17	48		150	630	

2157274 S0000470949\_V1

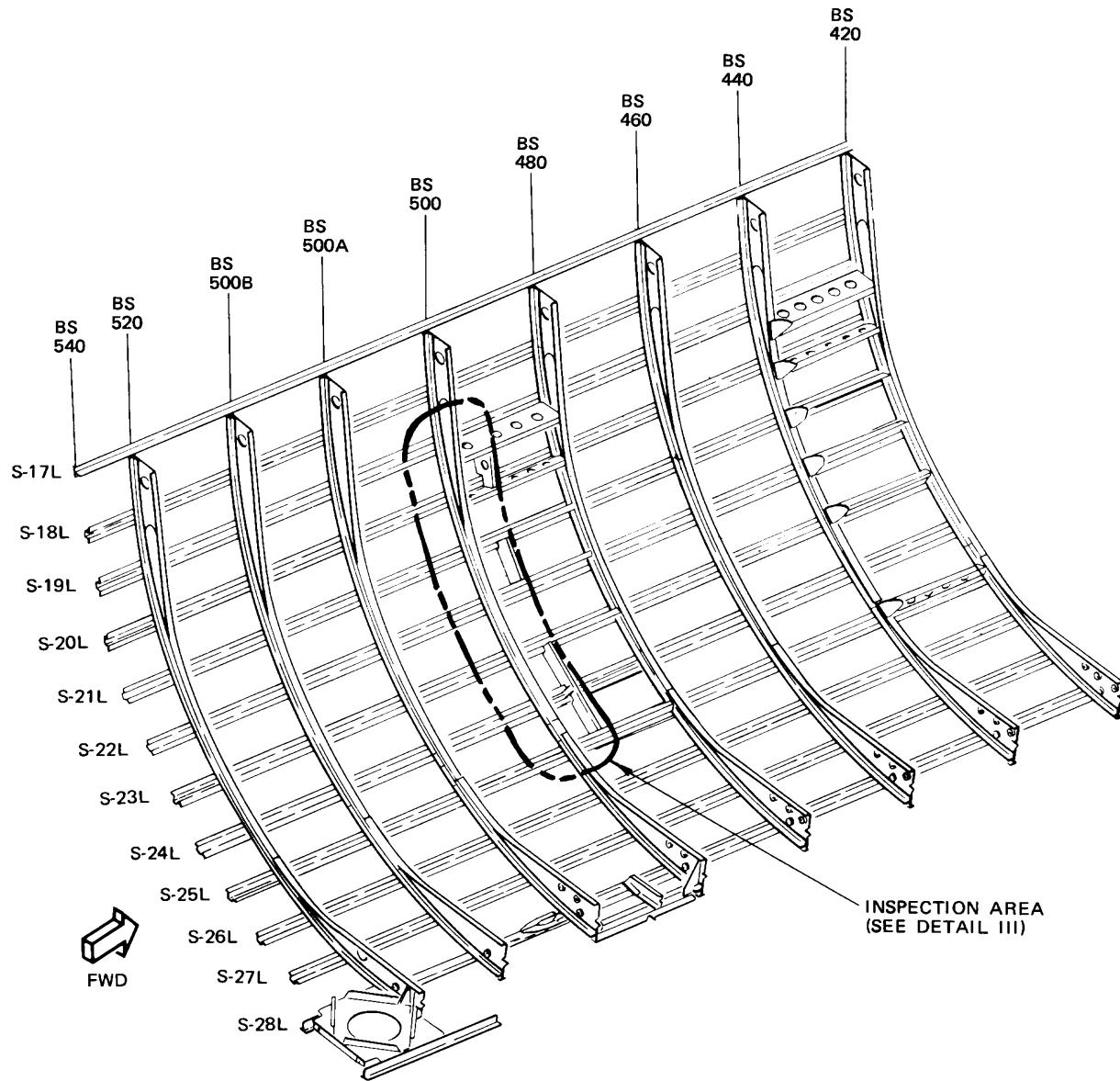
X-Ray Generator and Film Positioning  
Figure 1

— EFFECTIVITY —  
ALL

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**NON-DESTRUCTIVE TEST MANUAL**


LOWER LEFT INSIDE VIEW (SEE DETAIL II  
FOR LOWER RIGHT INSIDE VIEW)

**DETAIL I**

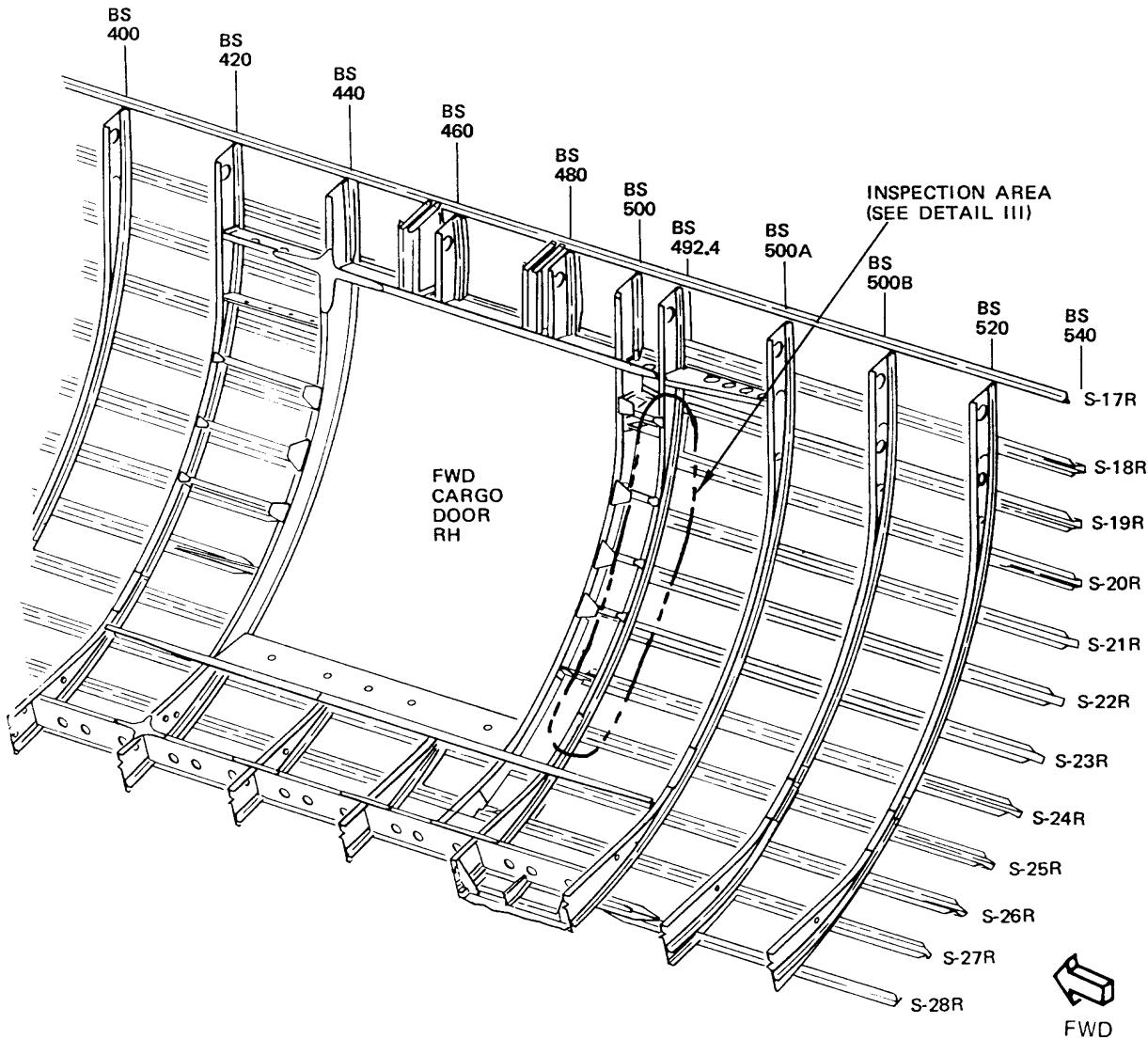
2157281 S0000470950\_V1

**Frame-to-Skin Shear Ties, BS 500, S-18 thru S-25 - Inspection Area**  
**Figure 2 (Sheet 1 of 3)**

**ALL** EFFECTIVITY

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LOWER RIGHT INSIDE VIEW

DETAIL II

2157285 S0000470951\_V1

Frame-to-Skin Shear Ties, BS 500, S-18 thru S-25 - Inspection Area  
 Figure 2 (Sheet 2 of 3)

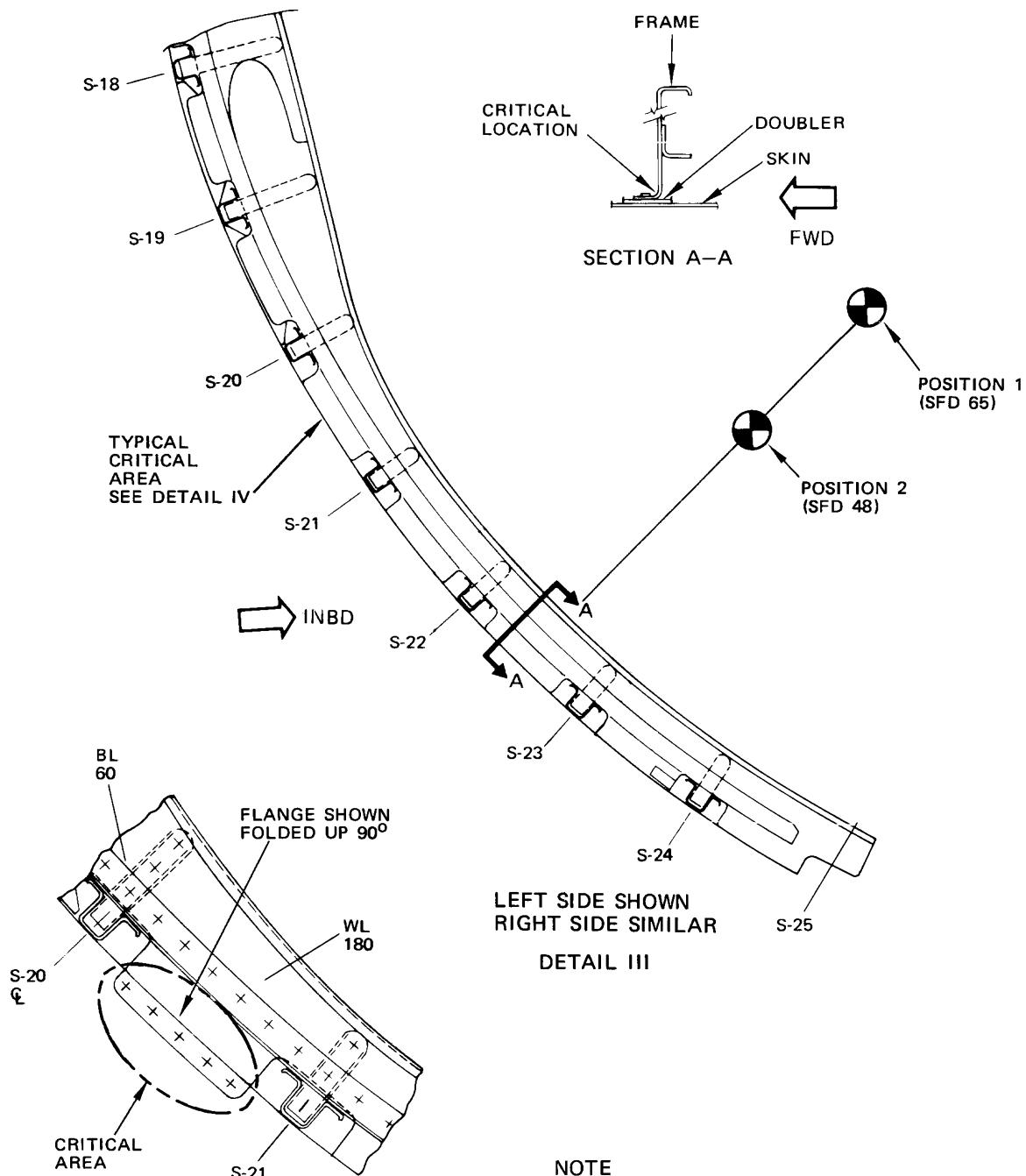
ALL

EFFECTIVITY

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**NON-DESTRUCTIVE TEST MANUAL**

**CRITICAL AREA (TYP)  
DETAIL IV**

2157286 S0000470952\_V1

**Frame-to-Skin Shear Ties, BS 500, S-18 thru S-25 - Inspection Area  
Figure 2 (Sheet 3 of 3)**

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**PART 2 - X-RAY**

**WINDOW FRAMES - PILOT COMPARTMENT**

**1. Purpose**

- A. To detect cracks in cockpit window frame E-N posts and surrounding structure.
- B. A different set of conditions are necessary for airplanes that have been changed per Service Bulletin 737-53-1023.
- C. 737 Maintenance Planning Document (D6-17594, D6-38278) Reference:
  - (1) Item: 6-53-09
  - (2) Item: S53-09-A

**2. Equipment**

- A. All equipment that meet the necessary conditions of this procedure is permitted. The following equipment was used to develop this procedure:
  - (1) Baltospot 150 kV, side emission X-ray generator
  - (2) ASTM Class I, Class I lead pack and Class II film

**NOTE:** Refer to Part 1, 51-01-00, for information on equipment manufacturers.

**3. Prepare for the Inspection**

- A. Remove all equipment necessary to position generator shown in Figure 1.
- B. Clean the external surface of posts.

**4. Inspection Procedure**

- A. Position the film and the X-ray generator per Figure 1 and Figure 2.
- B. Set instrument settings per Table I in Figure 1 for airplanes that have not been modified per SB 737-53-1023 and per Table II in Figure 1 for airplanes that have been modified per the bulletin.
- C. A film density of between 2 and 3.5 is necessary in the area of interest.

**5. Inspection Results**

- A. Give special attention to possible cracks that run in front and behind the fastener holes through the edge of the members.

ALL

EFFECTIVITY

**PART 2 53-10-13**

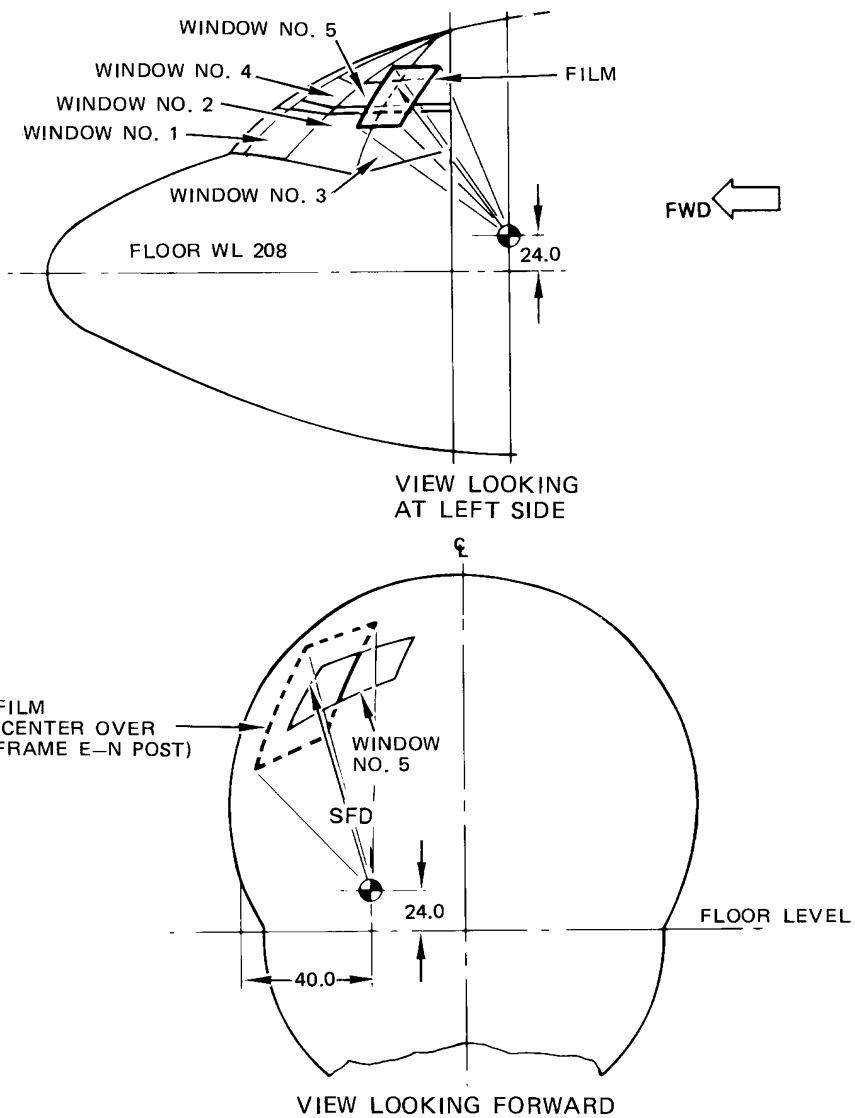
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2157287 S0000470954\_V1

X-Ray Generator and Film Positioning  
Figure 1 (Sheet 1 of 2)

ALL

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X-RAY PARAMETERS						
EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1-3	1-3	I AND II *[1]	5 X 7	56	145-155	1440

X-RAY PARAMETERS - AIRPLANES WITH NO EXTERNAL STEEL STRAP (AUTOMATIC PROCESSING) - PAR. 1.A. AIRPLANES  
TABLE I

NOTES

- ALL DIMENSIONS ARE IN INCHES
- USE SIMILAR TECHNIQUE FOR OTHER WINDOW FRAMES
- TECHNIQUE MAY HAVE TO BE ALTERED DUE TO INTERFERING WIRES, ETC., AGAINST WINDOW FRAMES

\*[1] CLASS I (LEAD PACK) AND II FILM LOADED IN SAME CASSETTE

X-RAY PARAMETERS						
EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1	1	I AND II	5 X 7	42	115	975
2	2	I AND II	5 X 7	42	110	900
3	3	I AND II	5 X 7	42	110	900

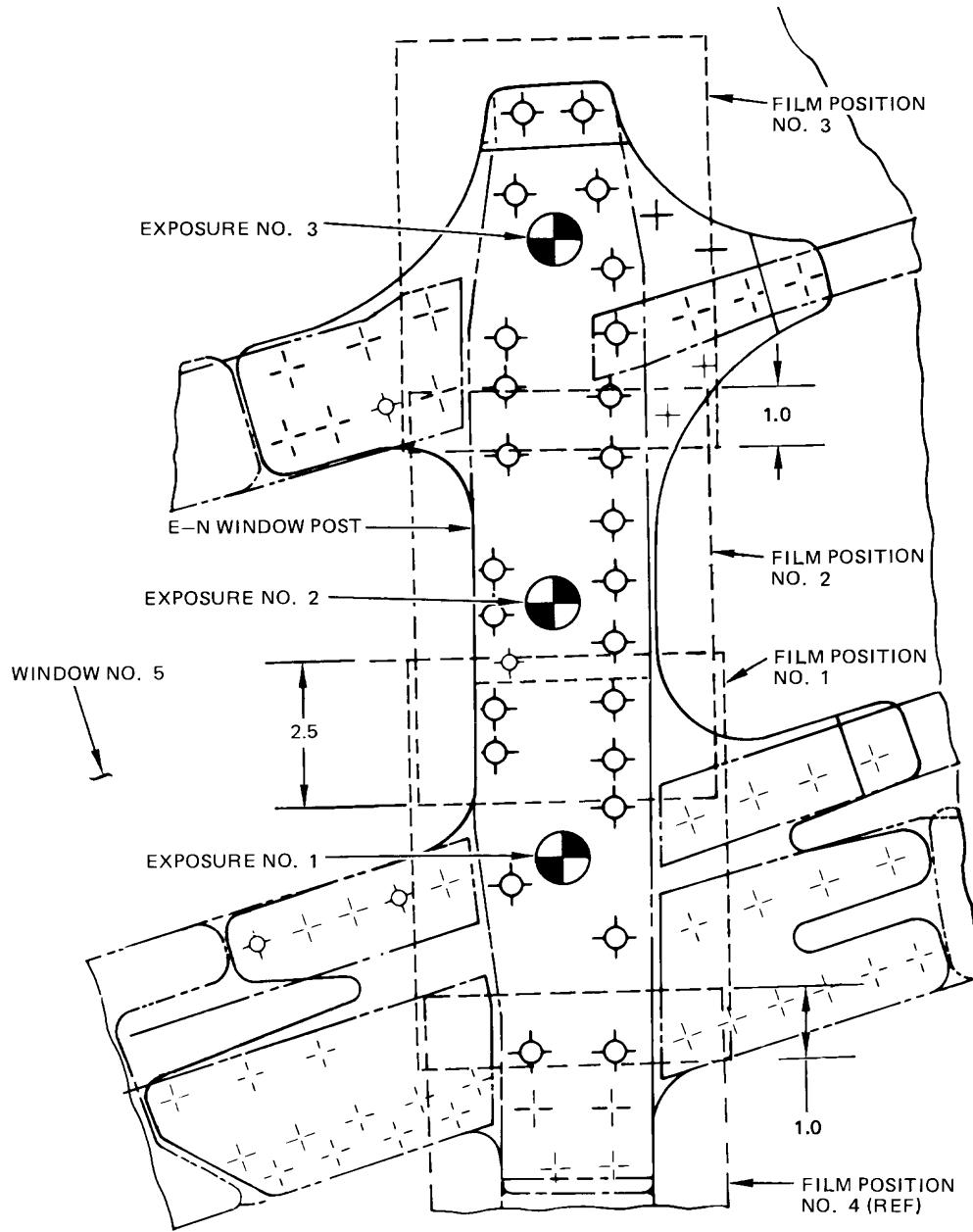
X-RAY PARAMETERS - AIRPLANES WITH EXTERNAL STEEL STRAP (AUTOMATIC PROCESSING) - PAR. 1.B. AIRPLANES  
TABLE II

2157288 S0000470955\_V1

X-Ray Generator and Film Positioning  
Figure 1 (Sheet 2 of 2)

ALL EFFECTIVITY

PART 2 53-10-13

**NOTES**

- ALL DIMENSIONS ARE IN INCHES
- LEFT SIDE SHOWN, RIGHT SIDE SIMILAR
- X-RAY GENERATOR POSITION

2157290 S0000470956\_V1

**Film Positions No. 1, 2 and 3**  
**Figure 2**

ALL

EFFECTIVITY

**PART 2 53-10-13**

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PART 2 - X-RAY

E-F WINDOW POSTS - PILOT COMPARTMENT

**1. Purpose**

- A. To find cracks in the E-F window posts for airplanes as specified by SSID Item F-45C.
- B. To find cracks in the E-F window posts for airplanes specified in Service Bulletin (SB) 737-53-1023 which have not been changed.
- C. To find cracks which break through the edge of members in the E-F window post for airplanes changed as specified in SB 737-53-1023.

**NOTE:** Service Bulletin 737-53-1023 is applicable to 737 airplane line numbers 1 thru 447 only.

- D. Service Bulletin Reference: 737-53-1023
- E. 737 Supplemental Structural Inspection Document (D6-82669) Reference:
  - (1) Item: F-45C

**2. Equipment**

- A. The equipment that follows was used to help prepare this procedure.

**NOTE:** Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

- (1) Sperry Portable 160 kV, side emission X-ray generator
- (2) ASTM E 1815 Class I, Class I lead pack, and Class II film
- (3) Automatic film processor

**3. Prepare for the Inspection**

- A. Remove the pilot and the copilot seats.
- B. Remove the pilot and the copilot sliding windows.
- C. When applicable, move the engineer's seat to the full outboard position.
- D. Clean the exterior surface of the E-F window posts.

**4. Inspection Procedure**

- A. Identify the inspection area shown in Figure 3.
- B. For exposures 1 thru 5, put the film on the outside skin as shown in Figure 4. Position the X-ray generator as specified in Figure 5.
- C. Prepare the equipment as specified in Figure 1 for SSID Item F-45C and SB 737-53-1023 airplanes that have not been changed. Prepare the equipment as specified in Figure 2 for airplanes that have been changed as specified in SB 737-53-1023.

**NOTE:** The X-ray parameters specified in this procedure are for guidance only. Adjust the X-ray parameters when necessary for differences in X-ray tube performance, radiographic film type, and developer conditions.

- D. The inspection area for each exposure must be in the center 10 degrees of the X-ray beam.
- E. The optical density of developed radiographs must be within a range of from 2.0 (minimum) to 3.5 (maximum) in the area of inspection.

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**5. Inspection Results**

- A. Give special attention to possible cracks that run in front and behind the fastener holes through the edge of the members.

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**ALL**

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**NON-DESTRUCTIVE TEST MANUAL**

EXPOSURE NUMBER 	FILM			SOURCE TO FILM DISTANCE	GENERATOR SETTINGS		
	POSITION	ASTM E 1815 CLASS 	SIZE		KV	MAS 	
1	1	I AND II	5X7 (13X18)	52 (132)	140	1410	
2	2	I AND II	5X7 (13X18)	49 (124)	140	1290	
3	3	I AND II	5X7 (13X18)	46 (117)	140	1140	
4	4	I AND II	5X7 (13X18)	43 (109)	140	990	
5	5	I AND II	5X7 (13X18)	41 (104)	140	990	

**NOTES:**

- ALL DIMENSIONS ARE IN INCHES  
(CENTIMETERS ARE IN PARENTHESES)
- EXPOSURES 1 THRU 5 ARE SHOWN FOR THE E-F  
POST ON THE LEFT SIDE OF THE AIRPLANE; THE  
E-F POST ON THE RIGHT SIDE OF THE AIRPLANE  
IS ALMOST THE SAME.

- USE AS MANY EXPOSURES AS NECESSARY TO  
EXAMINE THE INSPECTION AREA.
- THE TWO FILMS ARE LOADED IN THE SAME  
CASSETTE. INDIVIDUAL DAYLIGHT PACK FILMS  
CAN ALSO BE USED.
- ADJUST AS NECESSARY TO GET THE NECESSARY  
FILM DENSITY.

TABLE 1

X-RAY PARAMETERS FOR PARAGRAPH 1.A AND 1.B AIRPLANES  
(SSID AND SB 737-53-1023 WITHOUT EXTERNAL STEEL STRAP MODIFICATION)

2157293 S0000470958\_V2

**X-Ray Parameters for Paragraph 1.A and 1.B Airplanes**  
**Figure 1**

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EXPOSURE NUMBER 	FILM			SOURCE TO FILM DISTANCE	GENERATOR SETTINGS	
	POSITION	ASTM E 1815 CLASS 	SIZE		KV	MAS 
1	1	I AND I	5X7 (13X18)	52 (132)	140	1650
2	2	I AND I	5X7 (13X18)	49 (124)	140	1650
3	3	I AND I	5X7 (13X18)	46 (117)	140	1050
4	4	I AND I	5X7 (13X18)	43 (109)	140	1050
5	5	I AND I	5X7 (13X18)	41 (104)	140	1050

**NOTES:**

- ALL DIMENSIONS ARE IN INCHES  
(CENTIMETERS ARE IN PARENTHESES)
- EXPOSURES 1 THRU 5 ARE SHOWN FOR THE E-F  
POST ON THE LEFT SIDE OF THE AIRPLANE; THE  
E-F POST ON THE RIGHT SIDE OF THE AIRPLANE  
IS ALMOST THE SAME.
- A** LEAD PACK FILM. USE LEAD PACK OR LEAD  
INTENSIFYING SCREEN (0.002 INCH MAXIMUM  
THICKNESS) ON THE FILM THAT IS THE FURTHEST  
AWAY FROM SKIN.
- 1** USE AS MANY EXPOSURES AS NECESSARY TO  
EXAMINE THE INSPECTION AREA.
- 2** THE TWO FILMS ARE LOADED IN THE SAME  
CASSETTE. INDIVIDUAL DAYLIGHT PACK FILMS  
CAN ALSO BE USED.
- 3** ADJUST AS NECESSARY TO GET THE NECESSARY  
FILM DENSITY.

**TABLE 2**  
**X-RAY PARAMETERS FOR PARAGRAPH 1.C AIRPLANES**  
**(WITH SB 737-53-1023 EXTERNAL STEEL STRAP MODIFICATION)**

2157295 S0000470959\_V2

**X-Ray Parameters for Paragraph 1.C Airplanes**  
**Figure 2**

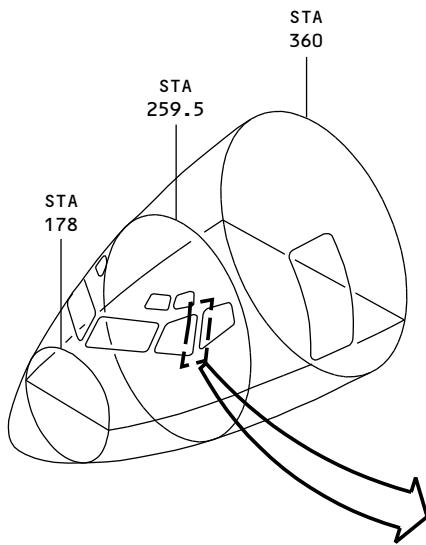
— EFFECTIVITY —

ALL

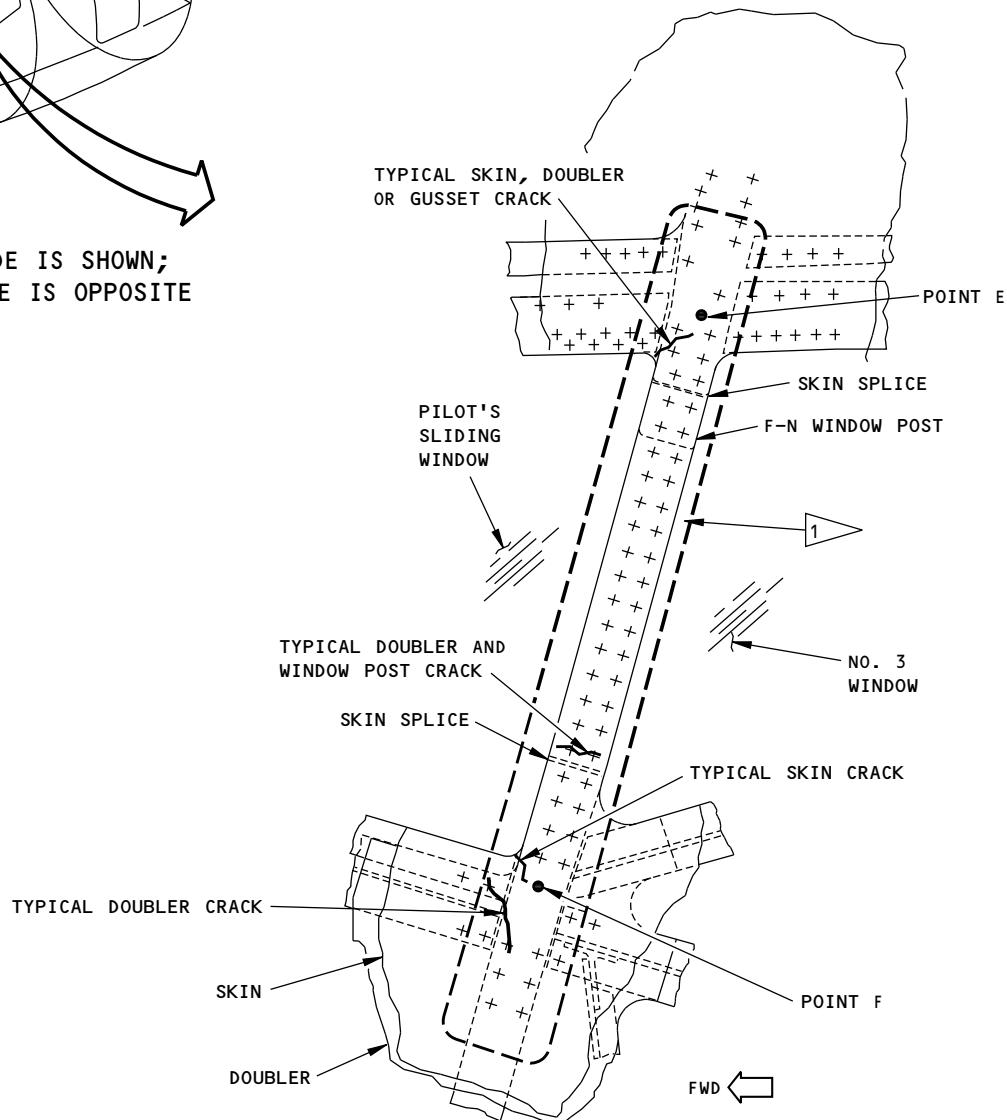
**PART 2 53-10-14**

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THE LEFT SIDE IS SHOWN;  
THE RIGHT SIDE IS OPPOSITE



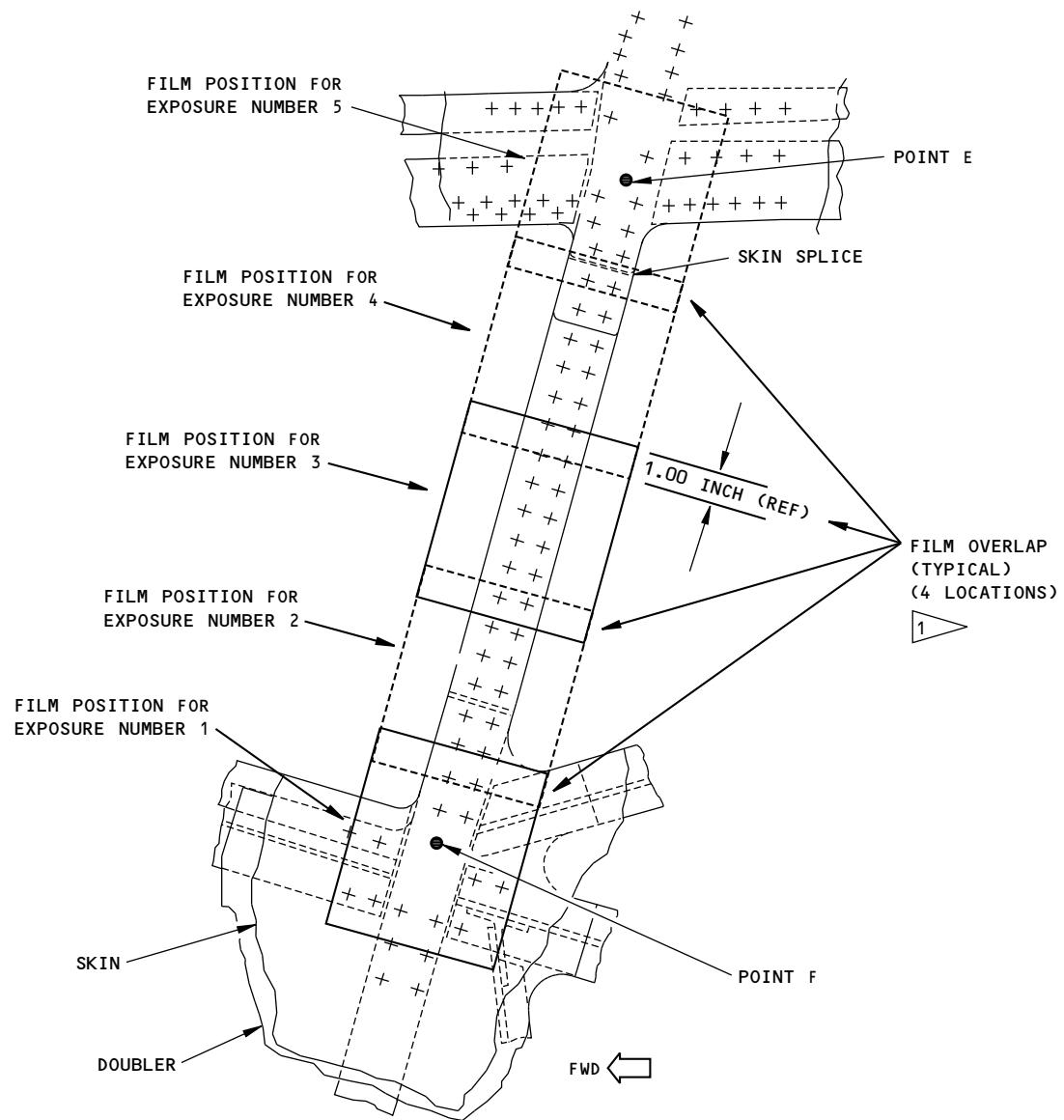
2157296 S0000470960\_V1

Inspection Location  
Figure 3



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**NON-DESTRUCTIVE TEST MANUAL**

**NOTES:**

- THE LEFT SIDE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME.

 FILM POSITIONS FOR EXPOSURES 2 THRU 5 MUST OVERLAP AT LEAST 1 INCH OF THE AREA X-RAYED IN THE ADJACENT EXPOSURE.

2157297 S0000470961\_V1

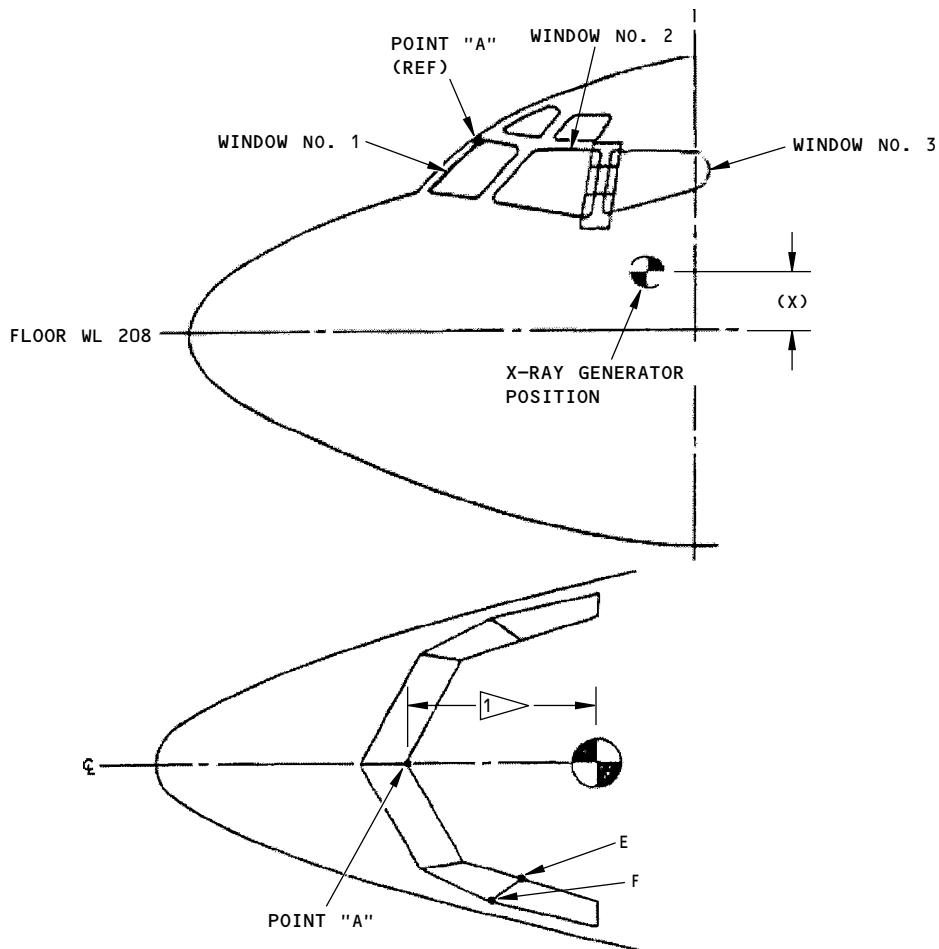
**Radiographic Film Positions**  
**Figure 4**

**ALL**

**EFFECTIVITY**

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**NON-DESTRUCTIVE TEST MANUAL**


X-RAY GENERATOR BEAM-WINDOW POSITION			
EXPOSURE NO.	DISTANCE FROM THE FLOOR (X)	AFT DISTANCE FROM POINT A 	DISTANCE FROM THE CENTER OF FILM (FFD)
1	14 (35)	56 (142)	52 (132)
2	20 (51)	53 (134)	49 (124)
3	27 (68)	51 (129)	47 (119)
4	33 (84)	48 (122)	44 (112)
5	40 (101)	45 (114)	41 (104)

**NOTES:**

- ALL DIMENSIONS ARE IN INCHES  
(CENTIMETERS ARE IN PARENTHESES)
- THE LEFT SIDE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME.

2157298 S0000470962\_V1

**X-Ray Generator Position**  
**Figure 5**

**PART 2 53-10-14**



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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**FORWARD AND AFT CARGO BAY LOWER LOBE FRAME INNER CHORD FLANGES**

**1. Purpose**

- A. To detect cracks in the inner chord flanges of the 737 lower lobe frames in the forward and aft cargo bays.
- B. This procedure satisfies the requirements of Service Bulletin 737-53A1027, Rev. 3.
- C. Service Bulletin Reference: 737-53A1027

**2. Equipment**

- A. X-ray Generator - Any equipment which will effectively penetrate 0.3 inches of aluminum and satisfy the requirements of this procedure may be used. The procedure was developed using a Baltospot 150 KV Panoramic (360°).
- B. Film - Any low speed, fine grain, high contrast (ASTM Class I and Class II) film may be used. The procedure was developed using Kodak M and AA film.

**NOTE:** Film was developed by automatic processor.

**3. Prepare for the Inspection**

- A. Remove the fairing where the wing-to-body fairing obstructs the placement of film.
- B. Remove any baggage slings that obstruct the inspection area.
- C. Before placing the film, wipe the skin clean.

**4. Inspection Procedure**

**WARNING:** X-RAY RADIATION IS A POTENTIAL HEALTH HAZARD. CARRY OUT STANDARD RADIATION SAFETY PRECAUTIONS.

- A. 737-100 Airplanes.
  - (1) Refer to Figure 1 for generator settings and film requirements.
  - (2) Refer to Figure 3 and Figure 4 for inspection areas, generator and film locations.
- B. 737-200 Airplanes.
  - (1) Refer to Figure 2 for generator settings and film requirements.
  - (2) Refer to Figure 3 and Figure 5 for inspection areas, generator and film locations.
- C. Expose film to obtain 2.0 to 3.5 H & D density on the inner chord flanges of the frames.

**NOTE:** Each exposure covers a range of focal distances (Refer to applicable table).

**5. Inspection Results**

- A. Evaluate film paying particular attention for cracks running in a fore and aft direction in the lower lobe frame inner chord flanges.

**ALL**

EFFECTIVITY

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**NON-DESTRUCTIVE TEST MANUAL**

EXPOSURE NUMBER	BODY STATIONS	FILM			SFD	GENERATOR SETTINGS	
		POSITION	ASTM CLASS	SIZE		KV	MAS
1	400	1 thru 8	I	7 x 14.5 (18 x 43)	49 to 62 (125 to 157)	100	900
2	420	1 thru 8					
3	440	1 thru 8					
4	460	1 thru 4					
5	480	1 thru 4					
6	500	1 thru 8					
7	747	1 thru 8	I	7 x 14.5 (18 x 43)	49 to 65 124 to 165)	100	900
8	767	1 thru 8					
9	787	1 thru 8					
10	807	1 thru 8					
11	827	1 thru 8	I	7 x 14.5 (18 x 43)	46 to 63 (117 to 160)	100	838
12	847	1 thru 4					
13	867	1 thru 4	I	7 x 14.5 (18 x 43)	44 to 62 (112 to 157)	100	778
14	887	1 thru 4	I	7 x 14.5 (18 x 43)	41 to 61 (104 to 155)	100	720
15	907	1,5	II	7 x 14.5 (18 x 43)	39 to 59 (99 to 150)	100	665
		2,3,4 6,7,8	I				
16	927	1,5	II	7 x 14.5 (18 x 43)	35 to 57 (89 to 145)	100	536
		2,3,6,7	I				

**NOTES**

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- GENERATOR SETTINGS SHOULD ONLY BE USED AS A GUIDE. EQUIPMENT, FILM AND PROCESSING DIFFERENCES CAN SIGNIFICANTLY AFFECT GENERATOR SETTINGS.
- A DENSITY OF BETWEEN 2 AND 3.5 IS REQUIRED IN THE AREAS OF RADIOGRAPHIC INTEREST.

2157301 S0000470964\_V1

**737-100 Lower Lobe Frame X-Ray Parameters**  
**Figure 1**

— EFFECTIVITY —

ALL

**PART 2 53-10-16**



**737**  
**NON-DESTRUCTIVE TEST MANUAL**

EXPOSURE NUMBER	BODY STATIONS	FILM			SFD	GENERATOR SETTINGS	
		POSITION	ASTM CLASS	SIZE		KV	MAS
1	400	1 thru 8	I	7 x 14.5 (18 x 43)	49 to 62 (125 to 157)	100	900
2	420	1 thru 8					
3	440	1 thru 8					
4	460	1 thru 4					
5	480	1 thru 4					
6	500	1 thru 8					
7	500A	1 thru 8					
8	500B	1 thru 8					
9	727A	1 thru 8	I	7 x 14.5 (18 x 43)	49 to 65 (124 to 165)	100	900
10	727B	1 thru 8					
11	747	1 thru 8					
12	767	1 thru 8					
13	787	1 thru 8					
14	807	1 thru 4					
15	827	1 thru 4	I	7 x 14.5 (18 x 43)	47 to 63 (117 to 160)	100	838
16	847	1 thru 4					
17	867	1 thru 8					
18	887	1 thru 8	I	7 x 14.5 (18 x 43)	39 to 59 (99 to 150)	100	665
19	907	1,5 2,3,4 6,7,8	II I	7 x 14.5 (18 x 43)	35 to 57 (89 to 145)	100	586
20	927	1,5 2,3,6,7	II I	7 x 14.5 (18 x 43)	33 to 55 (84 to 140)	100	536

**NOTES**

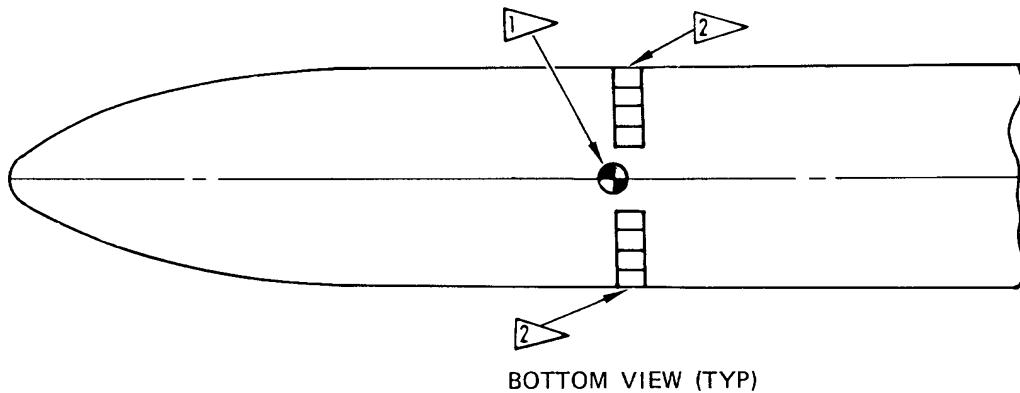
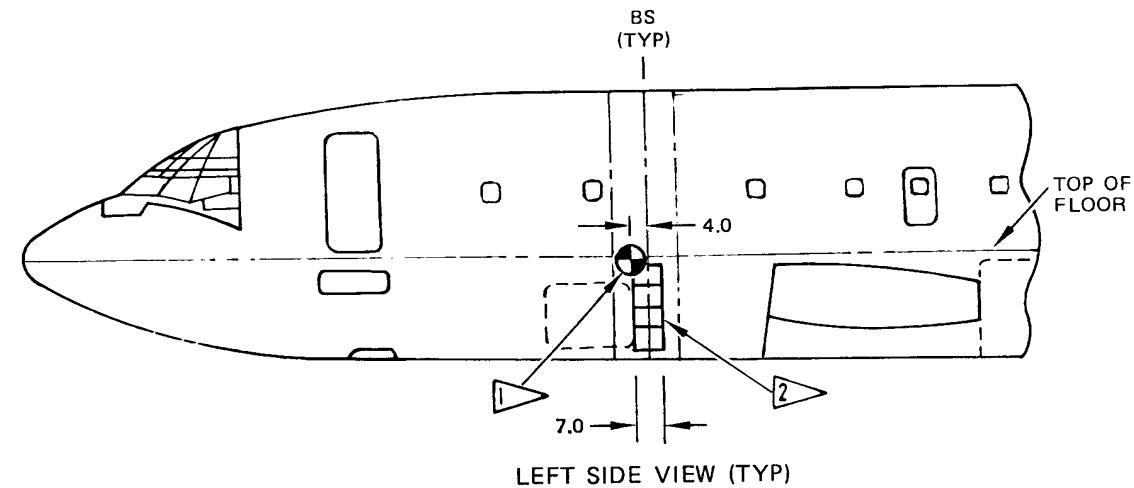
- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- GENERATOR SETTINGS SHOULD ONLY BE USED AS A GUIDE. EQUIPMENT, FILM AND PROCESSING DIFFERENCES CAN SIGNIFICANTLY AFFECT GENERATOR SETTINGS.
- A DENSITY OF BETWEEN 2 AND 3.5 IS REQUIRED IN THE AREAS OF RADIOGRAPHIC INTEREST.

2157303 S0000470965\_V1

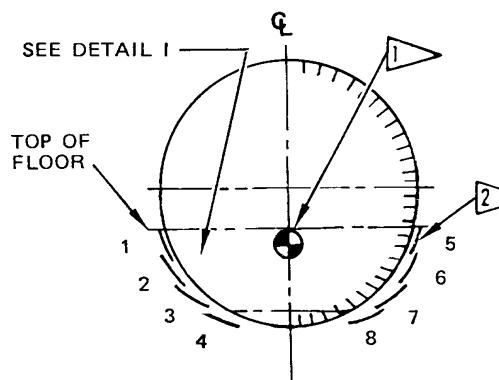
**737-200, -200C Lower Lobe Frame X-Ray Parameters**  
**Figure 2**

ALL EFFECTIVITY

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**737**  
**NON-DESTRUCTIVE TEST MANUAL**

**NOTES**

- ALL DIMENSIONS ARE IN INCHES



TYPICAL SECTION  
VIEW LOOKING FORWARD

- 1 POSITION X-RAY GENERATOR AGAINST CARGO BAY CEILING (MAIN DECK FLOOR) AT CENTERLINE, FOUR INCHES FORWARD OF FRAME BEING INSPECTED
- 2 FOUR 7 X 14.5 INCH FILMS POSITIONED OUTSIDE OF AIRPLANE ON EACH SIDE OF BODY EXCEPT AT DOORS - REFER TO FIGURE 1 OR 2 FOR FILM USAGE AND EXPOSURE INFORMATION

2157308 S0000470967\_V2

**Lower Lobe Frame X-Ray Generator and Film Positioning**  
**Figure 3 (Sheet 1 of 2)**

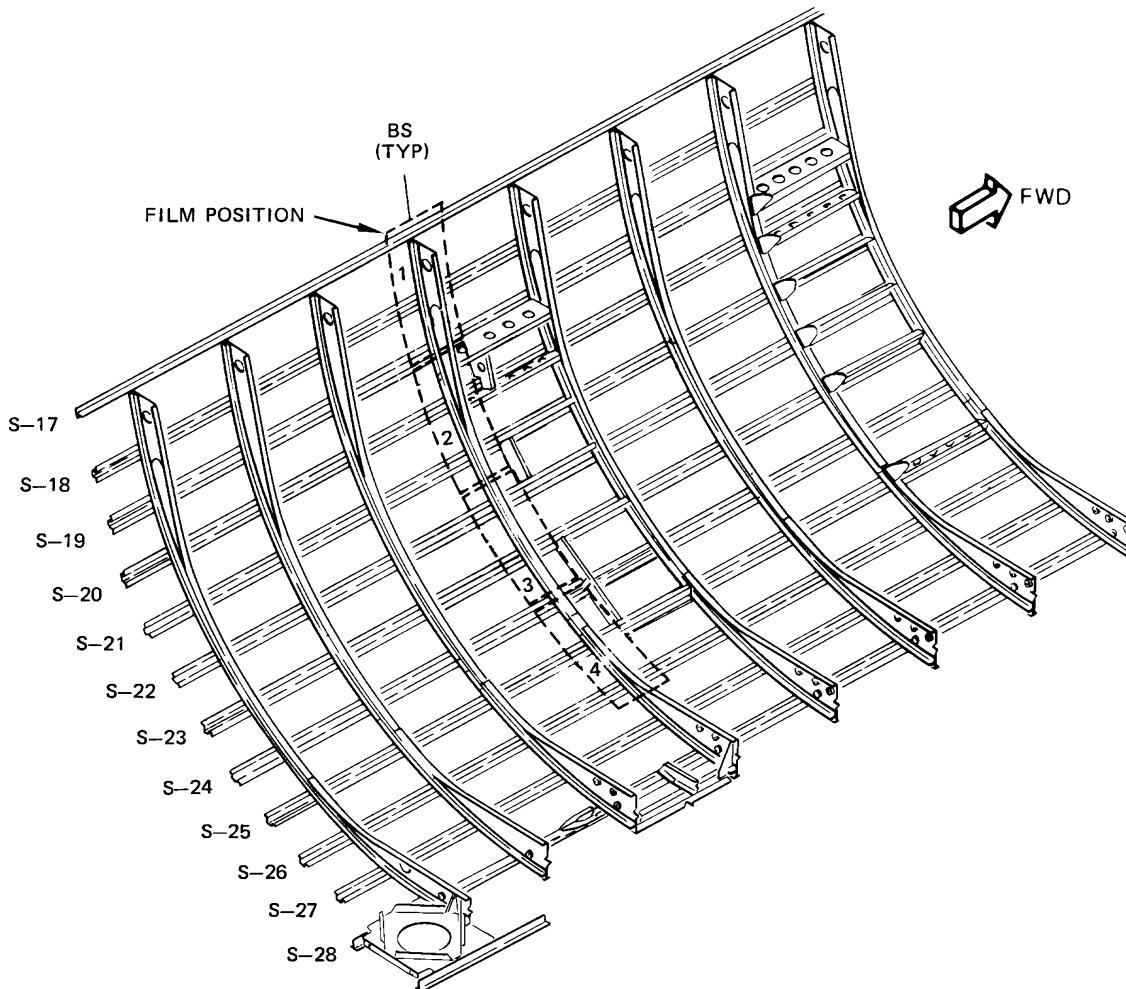
EFFECTIVITY  
ALL

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NON-DESTRUCTIVE TEST MANUAL



LOWER LEFT INSIDE VIEW (TYP)

DETAIL I

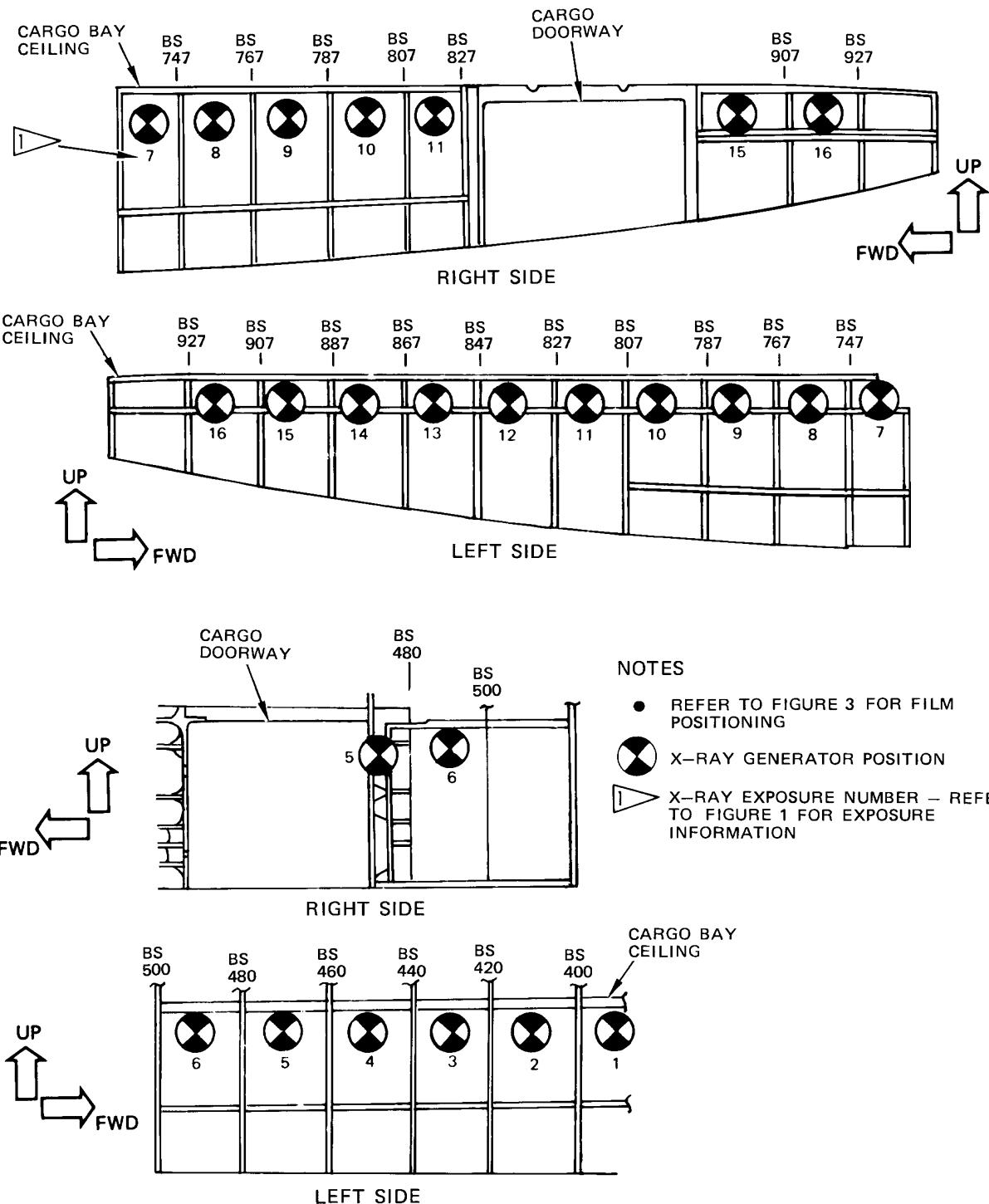
2157315 S0000470968\_V1

Lower Lobe Frame X-Ray Generator and Film Positioning  
Figure 3 (Sheet 2 of 2)

ALL EFFECTIVITY

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**737**  
**NON-DESTRUCTIVE TEST MANUAL**


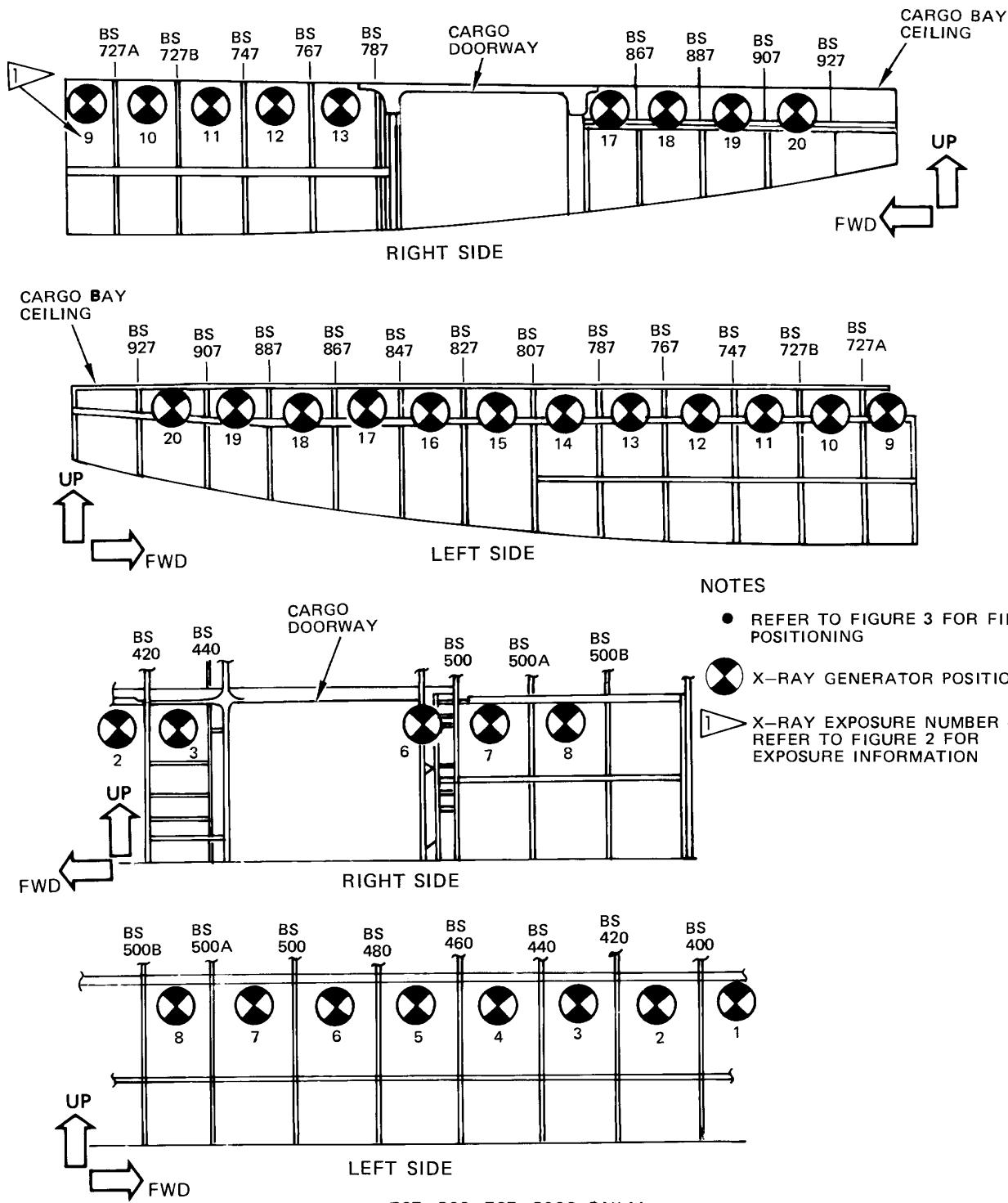
2157316 S0000470969\_V2

**737-100 Lower Lobe Frames Inspection**  
**Figure 4**

 EFFECTIVITY  
 ALL

**PART 2 53-10-16**

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**NON-DESTRUCTIVE TEST MANUAL**


2157317 S0000470970\_V2

**737-200, -200C Lower Lobe Frame Inspection**  
**Figure 5**
**ALL** EFFECTIVITY

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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**FORWARD AIRSTAIR DOOR OPENING, BS 351, STRINGER S-20**

**1. Purpose**

- A. To detect cracks in the P/N 65-91127-1 and -2 or -1, -2 and -3 (external doubler modification), skin, doubler, and/or strap at the lower aft corner of the airstair entry opening BS 351, stringer S-20, for Line No. 1 thru 598 and 600 thru 639.
- B. 737 Supplemental Structural Inspection Document (D6-37089) Reference:
  - (1) Item: F-14

**2. Equipment**

- A. Sperry portable 160 kV, 5 mA, side emission X-ray generator was used to develop this procedure.
- B. Film - Any ASTM Class II film may be used.

**3. Prepare for the Inspection**

- A. Extend the airstair.
- B. Clean exterior and interior surfaces.

**4. Inspection Procedure**

- A. Place film in lower aft corner of airstair door cutout with edges against frame and sill.  
**NOTE:** Cutting corner of film to clear fastener collar is optional.
- B. Position X-ray generator per Figure 2.
- C. See Figure 1 for exposure parameters.
- D. Give particular attention to potential cracks originating in the corner radius and moving toward a fastener hole.

EFFECTIVITY  
ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 598 AND 600 THRU 639 WITH AIRSTAIRS

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X-RAY PARAMETERS FOR FORWARD AIRSTAIR DOOR CUTOUT						
EXPOSURE	FILM			SFD (INCHES)	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE (INCHES)		KV	MAS
1	1	II	5 X 7	36.0	90	600
2	1	II	5 X 7	36.0	110	600

NOTES

- 1 ► USE THESE PARAMETERS FOR THOSE AIRCRAFT WITH P/N 65-91127-1 AND -2 EXTERNAL DOUBLER MODIFICATION
- 2 ► USE THESE PARAMETERS FOR THOSE AIRCRAFT WITH P/N 65-91127-1, -2 AND -3 EXTERNAL DOUBLER MODIFICATION

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X-Ray Parameter Table  
Figure 1

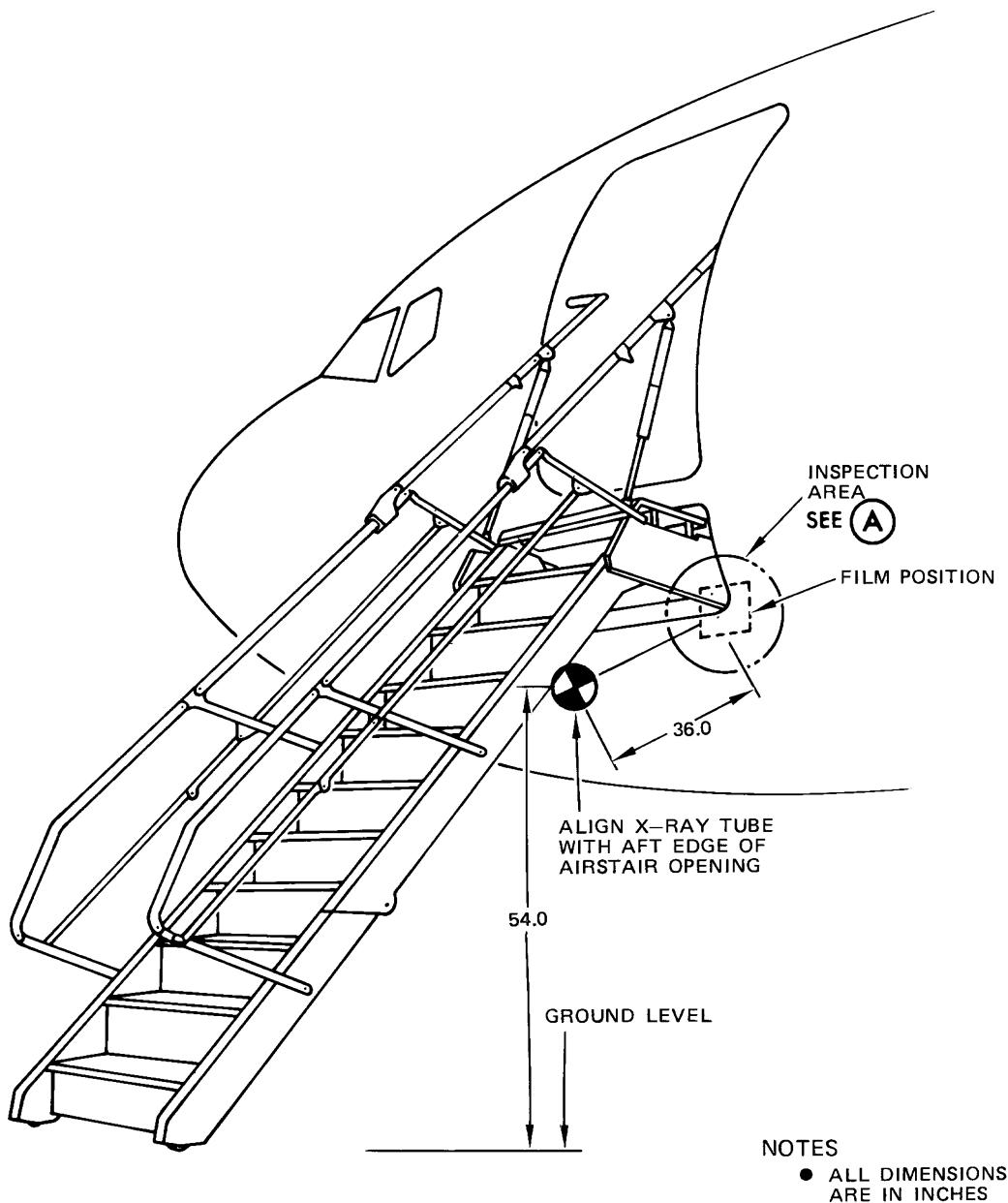
EFFECTIVITY  
ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 598 AND 600 THRU 639 WITH AIRSTAIRS

PART 2 53-10-17

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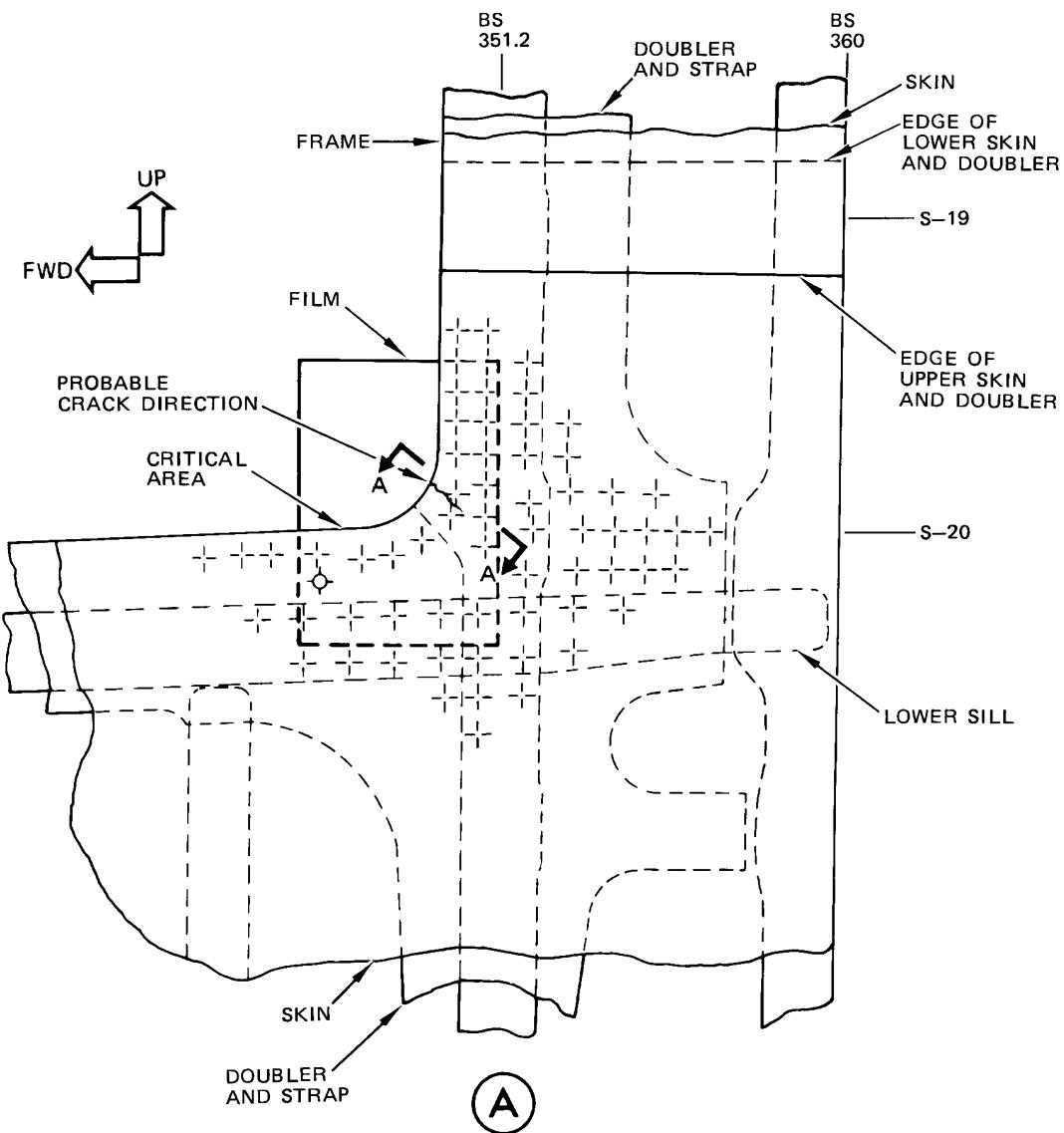
2157320 S0000470973\_V1

**X-Ray Generator and Film Positioning**  
**Figure 2**

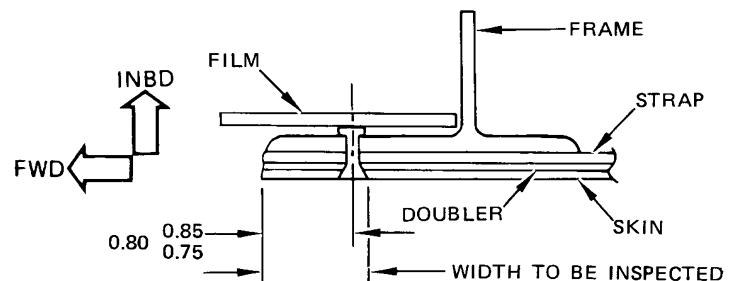
EFFECTIVITY  
ALL 737-100 AND -200 AIRPLANE LINE NUMBERS  
1 THRU 598 AND 600 THRU 639 WITH AIRSTAIRS

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**NOTES**

- LEFT SIDE VIEW OF AIRSTAIR OPENING
- ALL DIMENSIONS ARE IN INCHES


**SECTION A-A**

2157321 S0000470974\_V1

**Forward Airstair Door Opening, BS 351, Stringer S-20**  
**Figure 3**

EFFECTIVITY  
 ALL; 737-100 AND -200 AIRPLANE LINE NUMBERS  
 1 THRU 598 AND 600 THRU 639 WITH AIRSTAIRS



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NON-DESTRUCTIVE TEST MANUAL

PART 2 - X-RAY

**FORWARD GALLEY DOOR CUTOUT - BS 291.5 AND 332.1**

**1. Purpose**

- A. To detect cracks in skins, doublers, frame and strap common to skin splices at stringer S-10 and stringer S-14 on the frames at BS 291.5 and 332.1 of the forward galley door cutout using X-ray inspection.
- B. 737 Supplemental Structural Inspection Document (D6-37089) Reference:
  - (1) Item: F-15

**2. Equipment**

- A. The equipment used to develop this procedure is as follows:
  - (1) Sperry Portable 160 kV, 5 mA, side emission X-ray generator
  - (2) ASTM Class I and Class II lead pack film

**3. Prepare for the Inspection**

- A. Remove forward galley, trim panels and insulation blankets. Move wire bundles (if applicable) from inspection area to forward of BS 332.1.
- B. Clean inspection area and remove loose paint.

**4. Inspection Procedure**

- A. Position X-ray generator per Figure 2.
- B. Place film per Figure 3 and Figure 4.
- C. See Figure 1 for exposure parameters.

ALL

EFFECTIVITY

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EXPOSURE NUMBER	FILM			SFD	GENERATOR SETTINGS	
	POSITION	ASTM CLASS	SIZE		KV	MAS
1 THRU 4	1 THRU 4	CLASS I, CLASS II LEAD PACK	4 X 10  	60.0	110	600

NOTES

- ALL DIMENSIONS ARE IN INCHES
-  CUT AND TAPE 8 X 10 FILM

 TAPE READYPACK FILM  
HOLDERS TOGETHER WITH THE  
CLASS I FILM POSITIONED  
CLOSEST TO THE X-RAY  
GENERATOR

2157325 S0000470979\_V1

X-Ray Parameters  
Figure 1

ALL

EFFECTIVITY

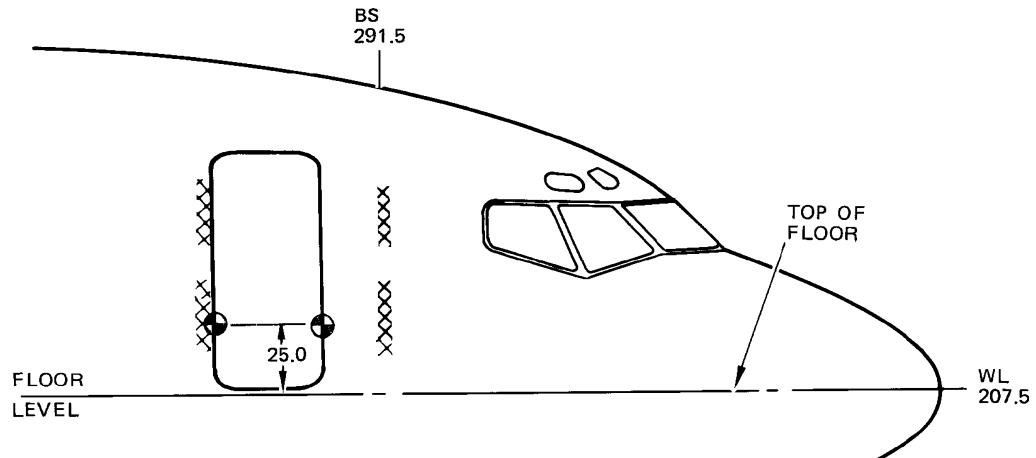
PART 2 53-10-18

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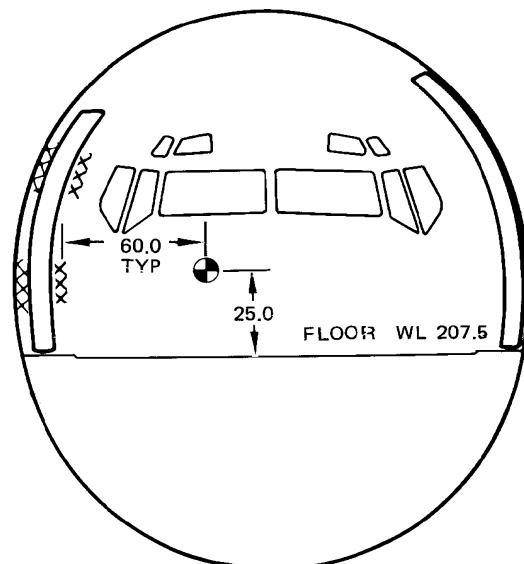
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NON-DESTRUCTIVE TEST MANUAL



RIGHT SIDE VIEW



FRONT VIEW

NOTES

- ALL DIMENSIONS ARE IN INCHES
- SEE FIGURE 3 AND 4 FOR FILM POSITIONING (XXX TYP)
- X-RAY GENERATOR POSITION

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X-Ray Generator Positioning  
Figure 2

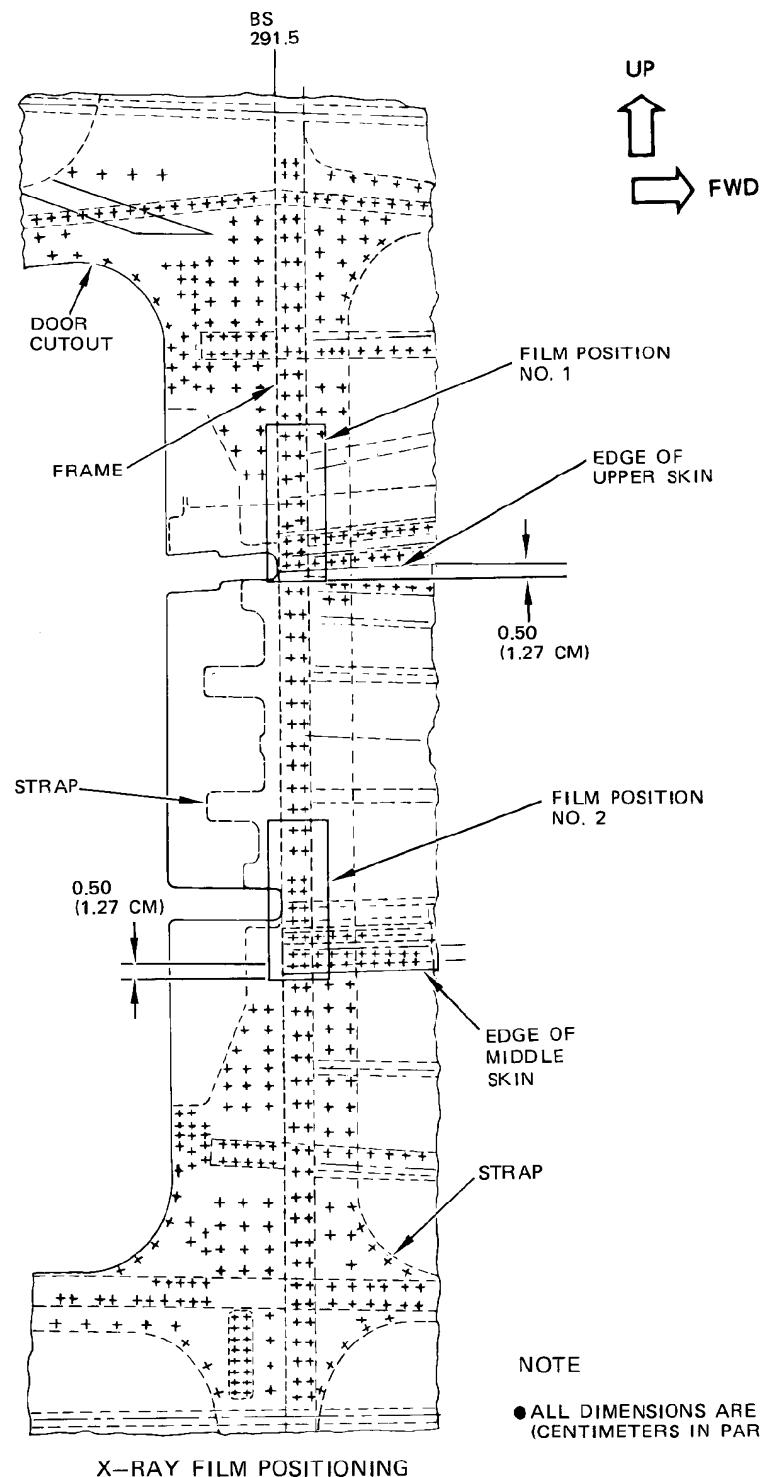
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EFFECTIVITY

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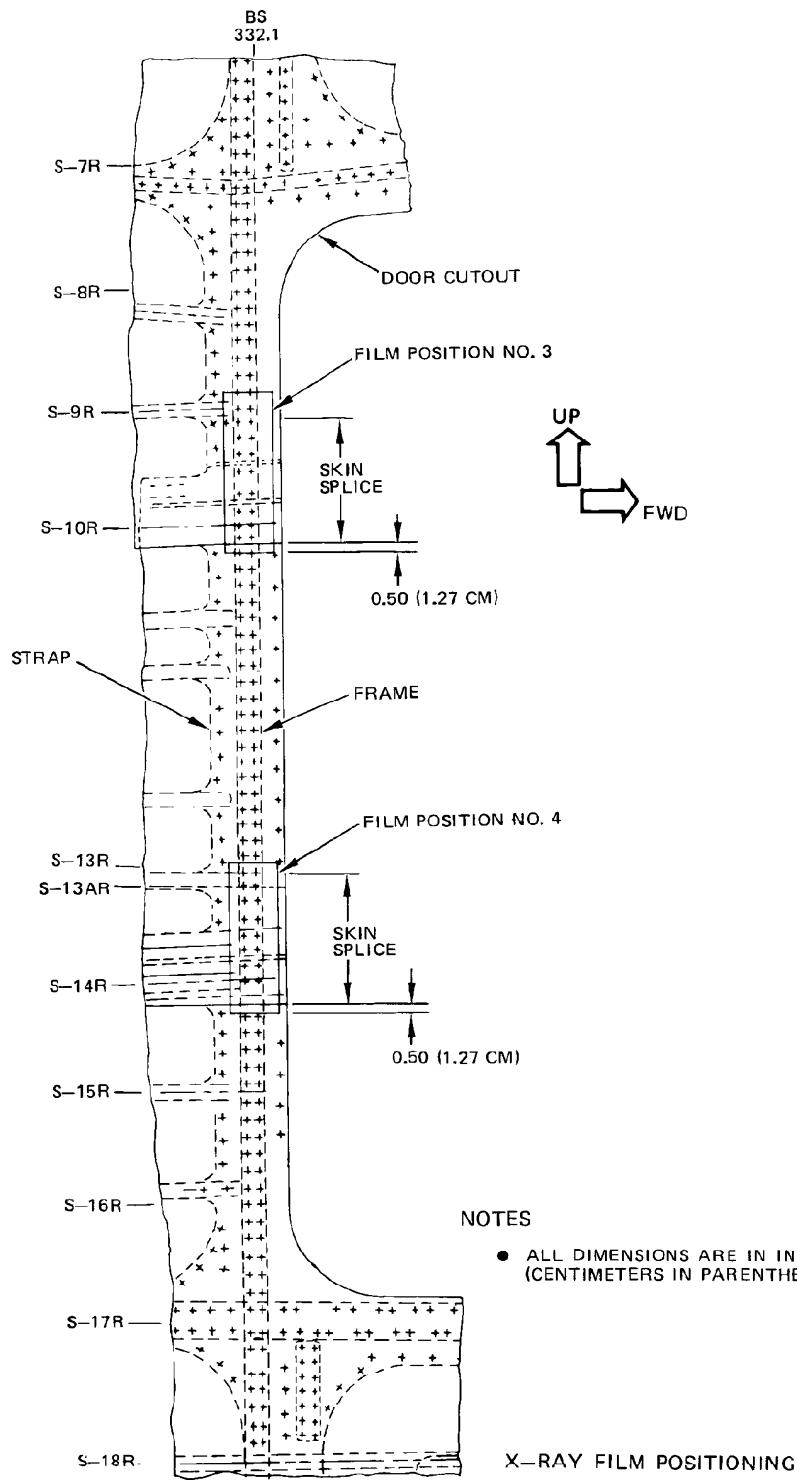


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**Forward Galley Door Cutout - BS 291.5**  
**Figure 3**

EFFECTIVITY  
ALL

**PART 2 53-10-18**

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Forward Galley Door Cutout - BS 332.1  
Figure 4

EFFECTIVITY  
ALL

PART 2 53-10-18