RADOME THICKNESS MEASUREMENT

1. Purpose

A. The electrical properties of radomes are dependent upon accurate control of radome thickness. This technique provides a method of measuring radomes to ensure that the thickness after repair is within tolerance. This is done by observing the changes in the meter response when probe spacing from a conductor is increased or decreased. The conductor is shaped to provide flush contact with the inner curvature of the radome. By calibrating the eddy current instrument on a non-conductive reference standard, a meter response range can be obtained to represent the expected radome wall thickness. Careful calibration and measurement should give radome thickness measurements within ±0.005 inch.

B. Structural Repair Manual (SRM) reference: 53-10-72

2. Equipment

A. Eddy current instruments -- Multifrequency eddy current instruments with manual phase adjustment are required. The following instruments were used in the development of this procedure:

(1) MIZ-10B, Zetec.

(2) Alcoprobe-S, Inspection Instruments (NDT) Ltd.

NOTE: Impedance plane display instruments are also satisfactory.

B. Eddy current probes -- Low frequency surface or ring probes operating in the 100 to 500 Hz range are recommended. Probes should not give interfering responses from normal handling pressure, manipulation, or operating pressure variations on the sensing coil. The following probes were used in the development of this procedure:

(1) Nortec SP-0.1, 100 Hz, 1.250-inch (31.75 mm) OD.

(2) Nortec SP0 1274, 100 Hz, 0.8-inch (20 mm) ID and 1.4-inch (36 mm) OD.

NOTE: These are standard sensitivity probes (absolute probe used in a differential system).

(3) Nortec ARP/13.5/29P, 100 Hz - 10 kHz, 0.54-inch (13.7 mm) ID and 1.15-inch (29.2 mm) OD.

NOTE: This is a higher sensitivity probe (driver pickup probe used in a differential system).

C. Reference Standards

(1) Radome thickness standard -- A stepwedge or block set representing the inspection thickness range constructed of any nonconductive material. See Figure 2.

(2) Conductive Reflector

(a) An aluminum reflector disk constructed of 2024, 7075 or equivalent. See Figure 3.

NOTE: Reflector disk should have an outer radius slightly less than the inner radius of the radome inspection location to assure satisfactory contact of reflector disk with radome inner surfaces.

3. Preparation for Inspection

A. If necessary, remove radome erosion shoe.

B. Identify inspection locations. See Figure 1.

C. Ensure inner and outer inspection surfaces of radome are clean.

4. Instrument Calibration

A. Set the frequency to 500 Hz.

B. Place the reflector and the probe on opposite sides of the radome thickness standard at the 0.320-inch step. Center the probe for a minimum reading from the reflector. See Figure 5.

C. Balance the instrument according to the manufacturer's instructions.

D. Adjust lift-off to obtain maximum upscale needle movement when probe is moved from the thickness standard to air.

E. Reposition the probe on the thickness standard as in Paragraph 4.B. and adjust the meter position control to obtain a meter reading of 10 percent of full scale.

F. Place the reflector and the probe on opposite sides of the radome thickness standard at the 0.380-inch step. Center the probe for a minimum reading from the reflector.

G. Adjust the sensitivity to obtain a meter reading of 80 percent full scale between probe positions from Paragraph 4.B. and Paragraph 4.F.

H. Place the reflector against the probe on the 0.350-inch step, representing the nominal inspection thickness, and note the meter response. Place the reflector and probe on the 0.340- and 0.360-inch steps, indicating the minimum and maximum inspection thickness range, and note the meter response.

I. With the above setting, average at least three readings from each standard step and plot the points. Draw a "best-fit" line through these points to obtain a calibration curve similar to Figure 4.

5. Inspection Procedure

A. Prepare for inspection per Paragraph 3.

B. Perform instrument calibration per Paragraph 4.

C. Place the curved surface of the reflector against the inside of the radome at the location to be measured, but away from any conductive materials which will affect the inspection results.

D. Place the probe on the outside of the radome opposite the reflector. Scan the area over the reflector with the probe until a minimum meter reading is obtained.

NOTE: Some radomes, due to size and configuration, may require a second person to hold the conductor on the inner surface of the radome while the inspector manipulates the probe on the outer surface.

E. Periodically check the instrument/probe calibration response. If the response is found to be unsatisfactory, reinspect all areas inspected since last calibration check.

F. Note any areas outside the 0.340- to 0.360-inch range.

6. Inspection Results

A. A thickness measurement outside the 0.340- to 0.360-inch thickness allowance is an unacceptable condition.

(1) Note thickness measurement in affected area.

(2) Note size of area affected.

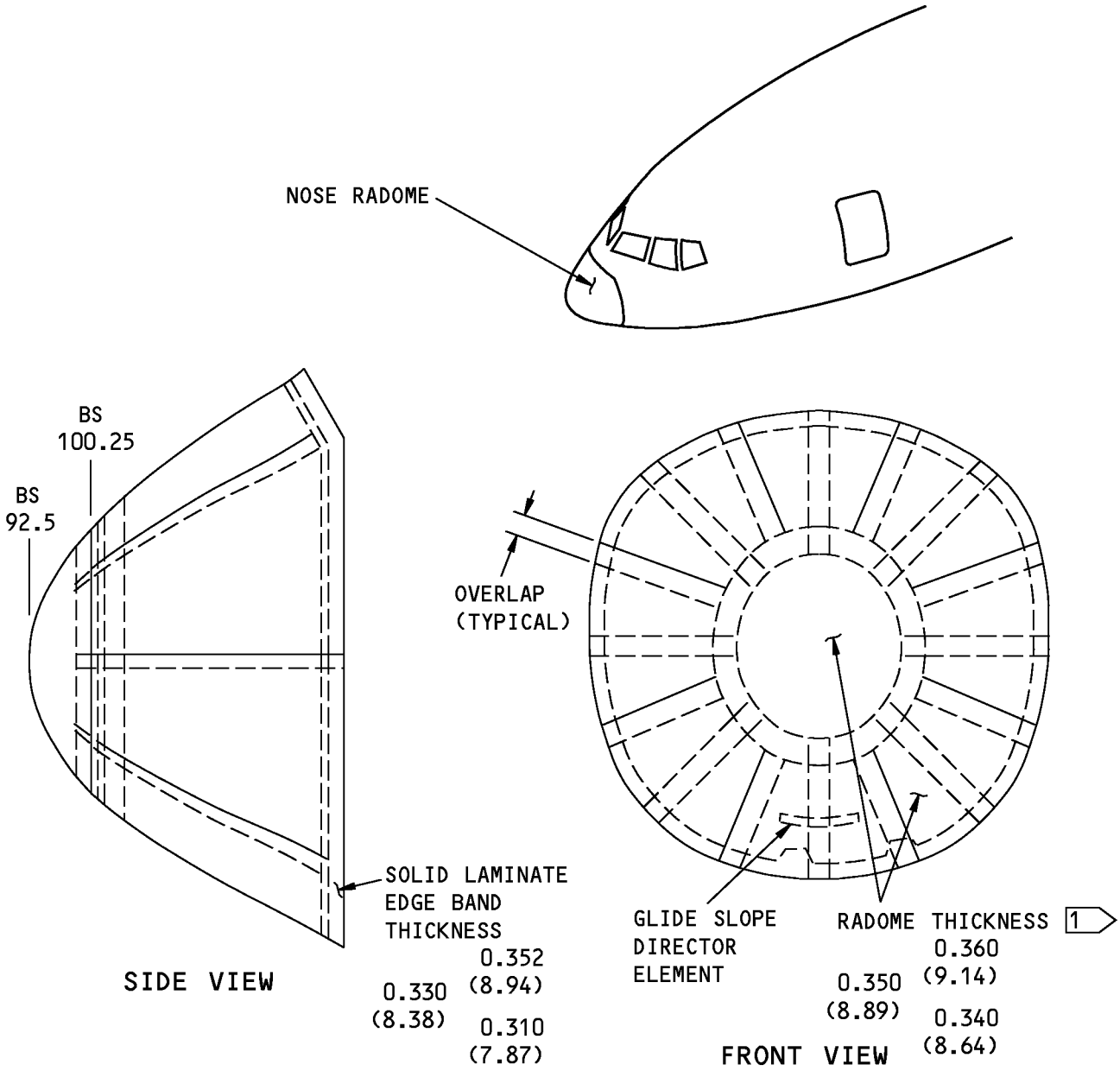
B. Several conditions may give erroneous inspection results.

(1) Reflector does not fit tightly against the radome - position reflector to conform tightly to radome inner surface.

(2) Flat surface probe does not fit tightly against the radome - substitute ring probe for flat surface probe in inspection.

(3) Response interference due to conductive materials - locate and avoid conductive structures in inspection area.

(4) Signal drift due to thermal differences between probe and part - allow test equipment and radome to reach approximately the same temperature before performing calibration and inspection.

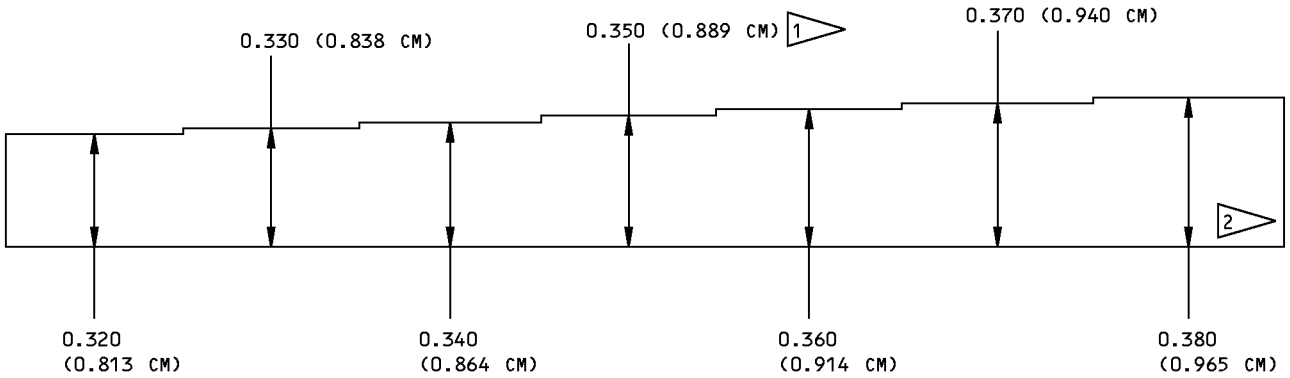


NOTES

- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES).
- THICKNESS' ARE BASED ON CURED SANDWICH THICKNESS BEFORE APPLICATION OF FINISHES OR RAIN EROSION COATINGS.

1 RADOME THICKNESS AT ALL LOCATIONS BUT THE OVERLAPS AND THE EDGEBAND. THE RADOME THICKNESS AT THE OVERLAP LOCATION IS APPROXIMATELY 0.010 (0.25) MORE THAN THE RADOME THICKNESS SPECIFIED.

Reference Standards
Figure 1



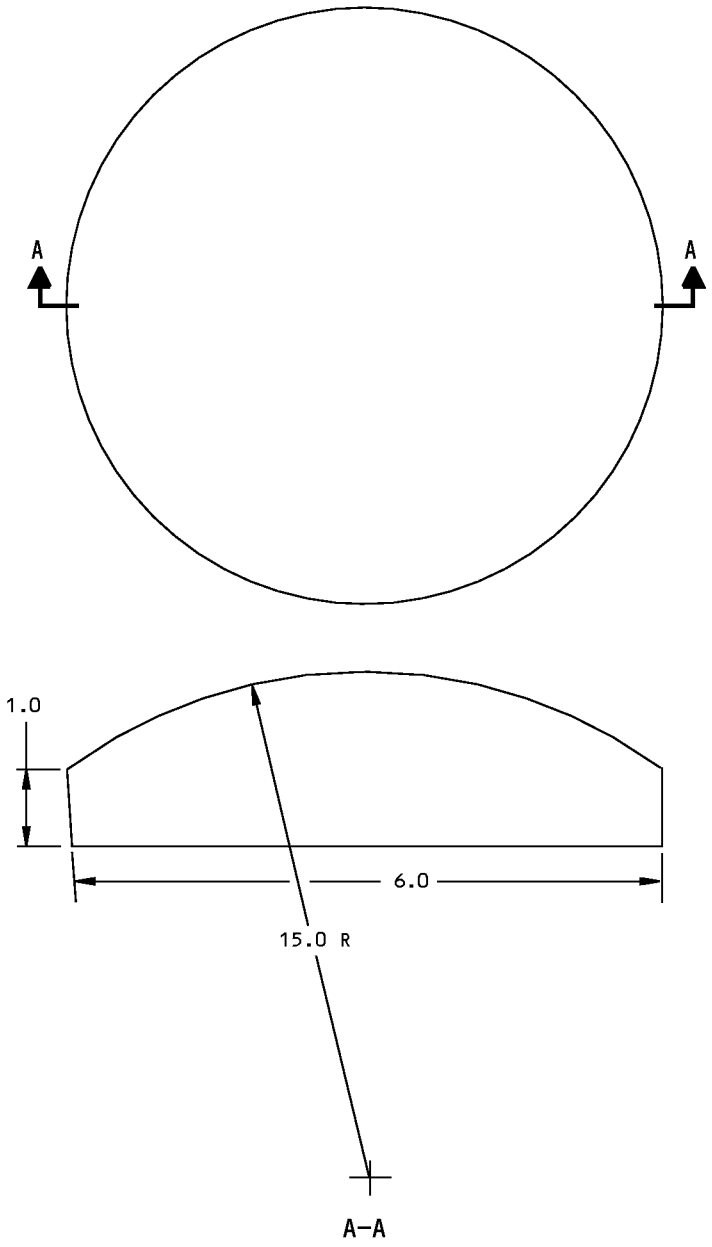
NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- MATERIAL: LUCITE OR ANY SUITABLE NONCONDUCTIVE MATERIAL
- SIZE: EACH STEP IS 2.0 (5.08 CM) LONG BY 2.0 (5.08 CM) WIDE WITHIN ±0.03 (0.076 CM)
- THICKNESS TOLERANCE: ±0.001 (0.003 CM)
- ETCH STEP THICKNESS ON SIDE OF STANDARD

1 NOMINAL THICKNESS OF RADOME TO BE INSPECTED.

2 ETCH OR STAMP THE REFERENCE STANDARD NUMBER 130-350 AT APPROXIMATELY THIS LOCATION.

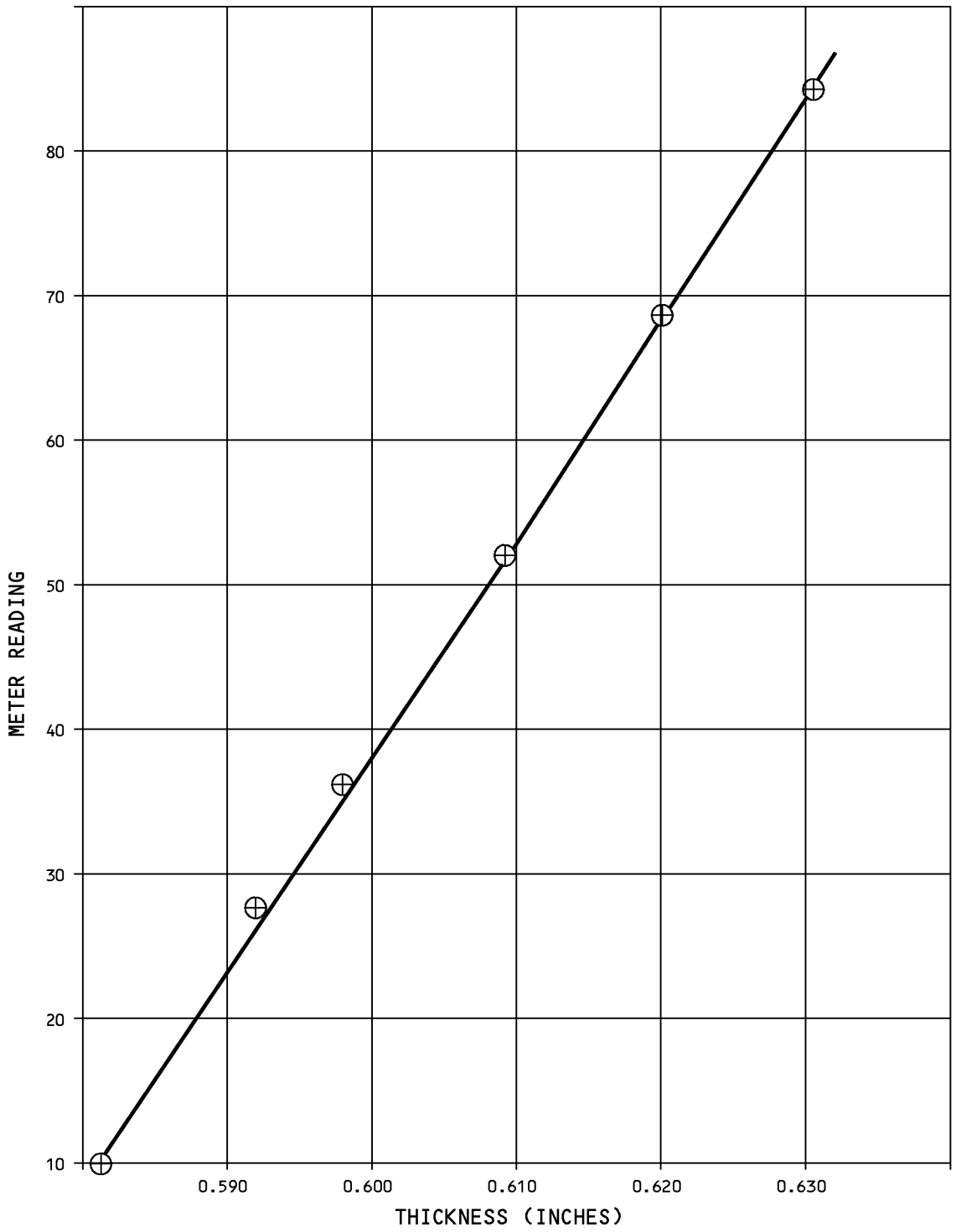
Radome Thickness Standard
Figure 2



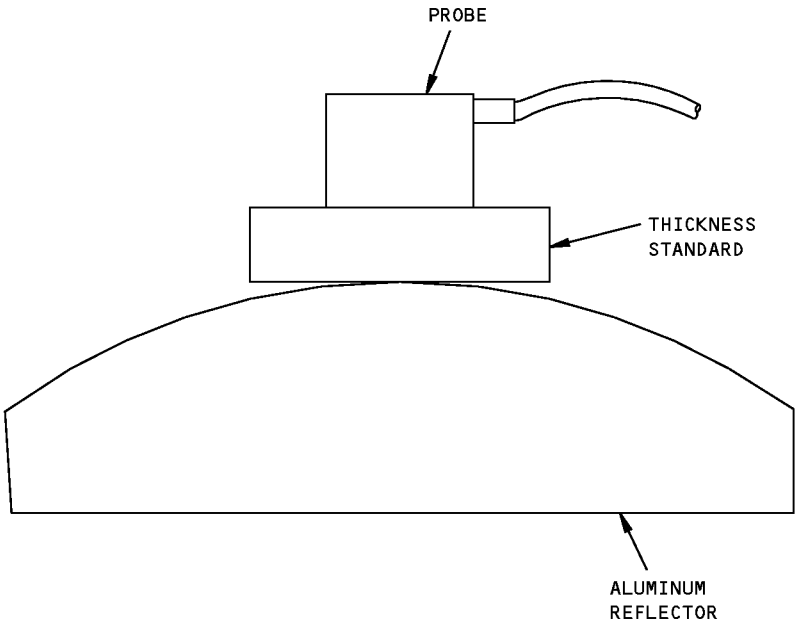
NOTES

- ALL DIMENSIONS ARE IN INCHES
- DIMENSION TOLERANCES: ±0.030
- MATERIAL: ALUMINUM, 2024, 7075 OR EQUIVALENT
- PART NUMBER 130C

Aluminum Reflector (Circular) Disk
Figure 3



Sample Calibration Curve
Figure 4



Probe and Aluminum Reflector Placement on Thickness Standard
Figure 5

HORIZONTAL BEAM AT BODY STATION 287

1. Purpose

A. To find surface cracks in the horizontal beam at Water Line (WL) 159 and Body Station (BS) 287.

B. The inspection area is the lower surface of the horizontal beam between LBL 10 and RBL 10. See Figure 1 for the inspection area.

C. The horizontal beam is on the aft side of the BS 287 nose wheel well bulkhead in the electronics bay.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I21A

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that can satisfactorily do the calibration instructions in Paragraph 4.

(2) The instruments specified below were used to help prepare this procedure.

(a) Mini-Phasec; Hocking/Krautkramer

(b) Locator UH-B; Hocking

C. Probes

(1) Use a right angle, shielded pencil probe as shown in Part 6, 51-00-01, Figure 1, that has the dimensions that follow:

(a) Dimension "A" not more than 0.25 inch (6.4 mm).

(b) Dimension "D" not more than 0.125 inch (3.2 mm).

(c) Use a flexible probe or the dimensions that follow:

1) Dimension "C1" not more than 2.5 inch (63.5 mm).

2) Dimension "theta" of 45°.

(2) The probes specified below were used to help prepare this procedure.

(a) MP902-60FX; NDT Engineering Corp.

(b) MP902-60B; NDT Engineering Corp.

D. Reference Standard

(1) Use reference standard 126. Make or buy reference standard 126 as shown in Part 6, 51-00-01, Fig. 4.

3. Preparation for Inspection

A. Get access to the aft side of the BS 287 bulkhead through the electronics bay hatch.

B. Find the horizontal beam at WL 159 (Figure 1) as follows:

(1) Find the pressure pan at BL 0.

(2) Find the bulge of the pressure pan through the insulation.

(3) The horizontal beam is the first horizontal member below the pressure pan.

C. Remove the insulation, as necessary, to get access to the lower surface of the horizontal beam.

D. Make sure the inspection surface is clean and smooth.

E. Put the inspection equipment a minimum of 10 feet (3 meters) away from all items that cause large magnetic fields, such as large motors, generators, transformers, or power lines.

4. Instrument Calibration

A. To calibrate a meter display instrument, refer to Part 6, 51-00-01, par. 4.

B. To calibrate an impedance plane display instrument, refer to Part 6, 51-00-19, par. 4.

5. Inspection Procedure

A. Find the horizontal beam at WL 159 (Figure 1).

B. Hold the probe against the lower surface of the horizontal beam as shown in Figure 1.

C. Balance the instrument.

NOTE: Do not adjust the instrument gain.

D. Make a scan from LBL 10 to RBL 10 at the forward radius on the lower surface of the beam as shown in Figure 1. During the scan:

(1) Make a mark at the locations that cause fast upscale signals to occur that are more than 50% of the signal you got from the calibration notch.

NOTE: Use markers that will not damage the structure.

E. Do a check of the instrument signal that occurs from the calibration notch in reference standard 126. If the signal has changed by 10% (or more), calibrate the instrument and examine the horizontal beam again.

NOTE: Do not adjust the instrument gain.

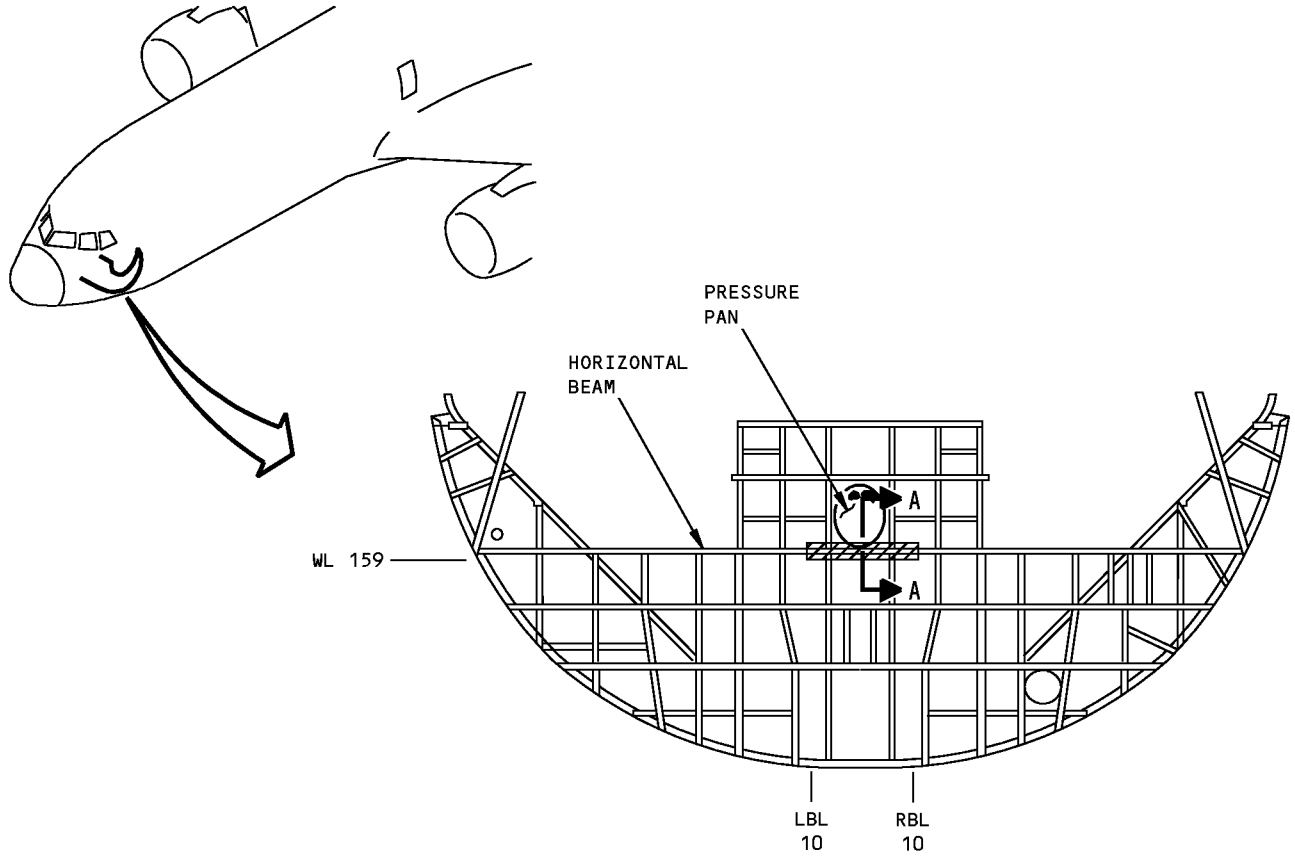
6. Inspection Results

A. A fast upscale signal that is more than 50% of the signal you got from the calibration notch is a sign of a possible crack. To do an analysis of the possible crack signal, refer to the procedures that follow:

NOTE: A small crack can give a fast upscale signal that is less than 50% of the calibration notch. When you do an analysis of the signal, make sure that the signal-to-noise ratio is more than, or equal to, 3:1.

(1) Part 6, 51-00-01, par. 6., for meter display instruments.

(2) Part 6, 51-00-19, par. 6., for impedance plane display instruments.



NOTES

INSPECTION AREA

1 A CRACK CAN START AT A FASTENER HOLE ON THE FORWARD FLANGE OF THE HORIZONTAL BEAM. THE CRACK WILL GROW FROM THE FASTENER HOLE ACROSS THE LENGTH OF THE FLANGE AND RADIUS OF THE HORIZONTAL BEAM. THE CRACK WILL BE IDENTIFIED WHEN IT EXTENDS BEYOND THE FAIL SAFE STRAP.

Inspection Location and Probe Position
Figure 1

OUTER CHORD IN THE CANTED BULKHEAD OF THE NOSE LANDING GEAR WHEEL WELL (HFEC)

1. Purpose

A. Use this procedure to examine the outer chord in the canted bulkhead of the nose landing gear wheel well for cracks. The outer chord is examined at the fastener holes from S-32L to S-32R.

B. The outer chord is examined for cracks that start at the forward fastener holes of the outer chord. The cracks can grow in the forward and aft direction. The fastener holes to examine are shown in Figure 1.

C. You can use an impedance plane display or a meter display instrument to do this inspection.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I18A

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4..

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 kHz to 500 kHz.

(2) The instruments specified below were used to help prepare this procedure.

(a) Locator UH; Hocking, Inc.

(b) NDT-19e; Staveley

C. Probes

(1) Use a right-angle probe. A probe drop of 0.5 inch (13 mm) is recommended so that there is no interference between the collar and the probe as you make a scan around each collar.

(2) Refer to Part 6, 51-00-01, par. 2.B. for data about probe selection.

(3) The probe specified below was used to help prepare this procedure.

(a) MP905-50; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 188A as identified in Part 6, 51-00-19, Fig. 6.

3. Preparation for Inspection

A. Get access to the inspection areas through the access door that is immediately forward of the nose landing gear wheel well.

B. Remove insulation blankets from around the collars of the fasteners to get access to the inspection surface. See Figure 1 for the location of the fasteners.

C. Remove sealant, as necessary, from around the collars.

4. Instrument Calibration

A. For instruments with a meter display, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-01, par. 4. Use reference standard 188A and the aluminum rivet in the reference standard.

NOTE: The fasteners in the inspection area on the airplane are titanium lockbolts with aluminum collars and aluminum rivets. Because you do an inspection around the aluminum collars, the aluminum rivet in reference standard 188A is used during calibration. Keep the probe fully against the aluminum rivet during calibration.

B. For instruments with an impedance-plane display, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-19, par. 4. Use reference standard 188A and the aluminum rivet in the reference standard. See the note in Paragraph 4.A.

5. Inspection Procedure

A. Make a scan around the collar of each inspection fastener identified in Figure 1.

B. For instruments with a meter display, refer to Part 6, 51-00-01, par. 5. for the inspection procedure.

C. For instruments with an impedance-plane display, Part 6, 51-00-19, par. 5. for the inspection procedure.

6. Inspection Results

A. For instruments with a meter display, refer to Part 6, 51-00-01, par. 6. to make an analysis of indications identified during the inspection.

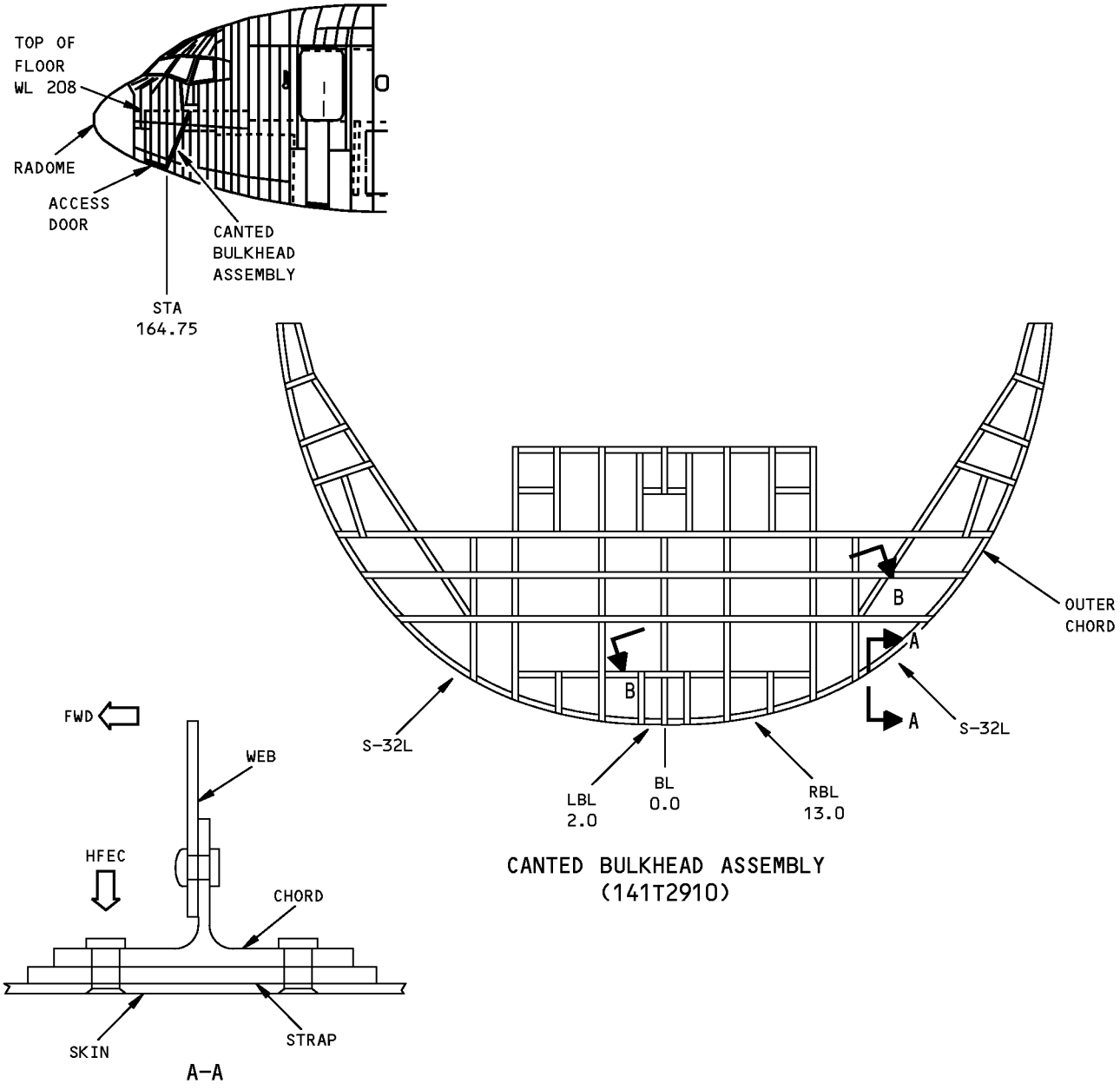
B. For instruments with an impedance-plane display, refer to Part 6, 51-00-19, par. 6. to make an analysis of indications identified during the inspection.

C. Compare the signal you get during the inspection on the airplane to the signal you got from the notch in the reference standard during calibration.

D. Do one of the procedures that follow to make sure that a crack is the cause of a crack-type signal.

(1) Remove the surface finish and do a visual inspection with 10-power (or higher) magnification and sufficient light.

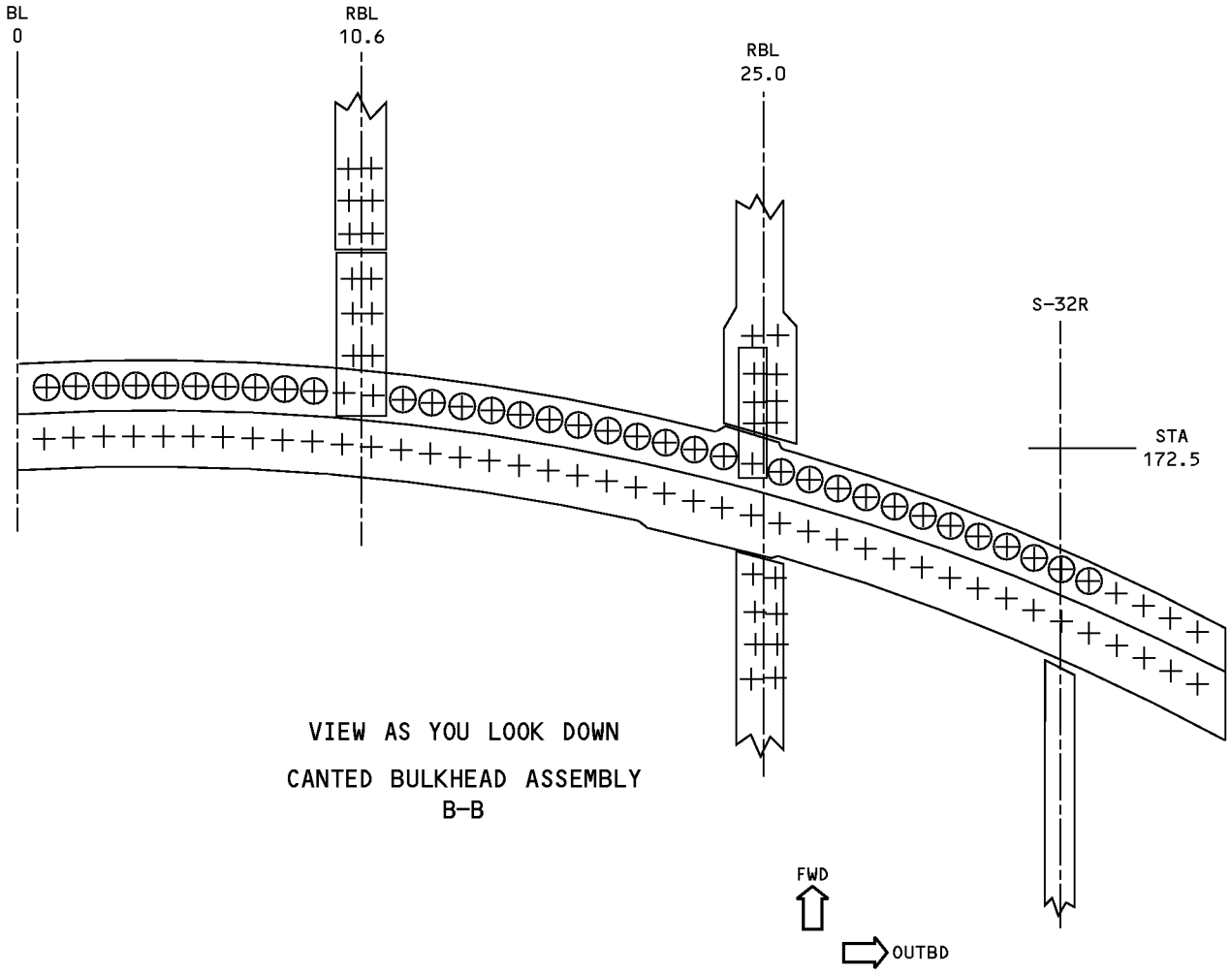
(2) Remove the bolt and do an eddy current inspection of the open hole as specified in Part 6, 51-00-04, Part 6, 51-00-11, or Part 6, 51-00-16.



NOTES

- EXAMINE THE OUTER CHORD AT ALL OF THE FASTENERS ON THE FORWARD SIDE OF THE CANTED BULKHEAD ASSEMBLY FROM S-32R TO S-32L

Inspection Location
Figure 1 (Sheet 1 of 2)



NOTES

- THE RIGHT OF THE AIRPLANE IS SHOWN, THE LEFT SIDE IS ALMOST THE SAME.

⊕ INSPECTION FASTENERS

Inspection Location
Figure 1 (Sheet 2 of 2)

PART 6 - EDDY CURRENT

MID-CHORD OF THE STA 246 FLOOR BEAM - BETWEEN LBL 9 AND LBL 15

1. Purpose

A. Use this subsurface eddy current procedure to examine the mid-chord of the STA 246 floor beam for cracks. The inspection area is shown in Figure 1.

B. The inspection is done from the forward surface of the STA 246 floor beam. Access is through the forward cargo electronics equipment bay.

C. Service Bulletin references: 767-53-0069, 767-53-0093, 767-53-0096

2. Equipment

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

A. Instrument - Use an eddy current instrument with an impedance plane display that can:

(1) Operate at a frequency of 12 kHz.

(2) Be calibrated as specified in the calibration instructions of this procedure. The instruments specified below were used to help prepare this procedure.

(a) NDT 19e - Nortec/Staveley, Inc.

(b) Phasec 1.1 - Hocking

B. Probes - A spot reflection probe with a diameter of approximately 0.30 inch (7.6 mm) that can be calibrated as specified in Paragraph 4. is satisfactory for use. The probe specified below was used to help prepare this procedure.

(1) SPO-5327, (SR/700 Hz-30KHz/.31) - Nortec/Staveley

C. Reference Standard - Make reference standard NDT665 as specified in Figure 2.

3. Preparation for Inspection

A. Gain access to the forward side of the STA 246 floor beam through the electronics equipment bay.

B. Identify and clean the inspection area shown in Figure 1.

4. Instrument Calibration

A. Set the instrument frequency to 12 kHz.

NOTE: The high pass (HP) filter must be set to off or 0 Hz. The low pass (LP) filter must be set to the minimum value that does not decrease the amplitude of the signal at normal scan speeds. If the low pass filter is too low and the scan speed is increased during the inspection, it is possible to not see a crack indication.

B. If the inspection area is painted, use a nonconductive shim (transparent tape) between the probe and the reference standard. The thickness of the nonconductive shim must be within 0.003 inch (0.08 mm) of the paint thickness.

C. Put a nonconductive straightedge on the reference standard and align the straightedge with the top edge of the lower web as shown in Figure 3.

D. Put the probe at position 1 on the reference standard and against the straightedge as shown in Figure 3.

NOTE: Other locations can be used for position 1. However, keep the probe away from the reference notch and the edge of the part to prevent unwanted effects from these areas.

E. Balance the instrument.

F. Adjust the balance point to approximately 50 percent of full screen width (FSW) and approximately 30 percent of full screen height (FSH) as shown in Figure 3, flagnote 1.

G. Adjust the phase control so that the lift-off signal moves horizontally from right to left when the probe is lifted off the reference standard as shown in Figure 3, flagnote 2.

H. Put the probe at position 2 on the reference standard and against the straightedge as shown in Figure 3. Be sure the probe is near the center of the reference notch.

I. Adjust the gain controls to set the maximum signal from the reference notch to 70% of the display as shown in Figure 3, flagnote 3.

J. Make a scan across the reference notch at your usual scan speed to see if the signal from the notch decreases. If the notch signal decreases, increase the setting for the low pass filter until no decrease in signal occurs.

5. Inspection Procedure

NOTE: A nonconductive straightedge is necessary to use from approximately LBL 9-11. From approximately LBL 11 and outboard to LBL 15, the doubler on the lower web can be used as a guide for the probe.

A. Calibrate the instrument as specified in Paragraph 4.

B. Examine the mid-chord of the STA 246 floor beam for cracks at LBL 9 thru LBL 15 as follows:

(1) Align a nonconductive straightedge with the top edge of the lower web at approximately LBL 9 thru LBL 11. The lower web doubler is used as a guide from approximately LBL 11 thru LBL 15.

NOTE: It is necessary to make a 30 degree cut on one end of the straightedge. This will permit the straightedge to get near the upper inboard edge of the lower web doubler as shown in Figure 4.

(2) Put the probe at one end of the inspection surface and against the straightedge.

(3) Balance the instrument.

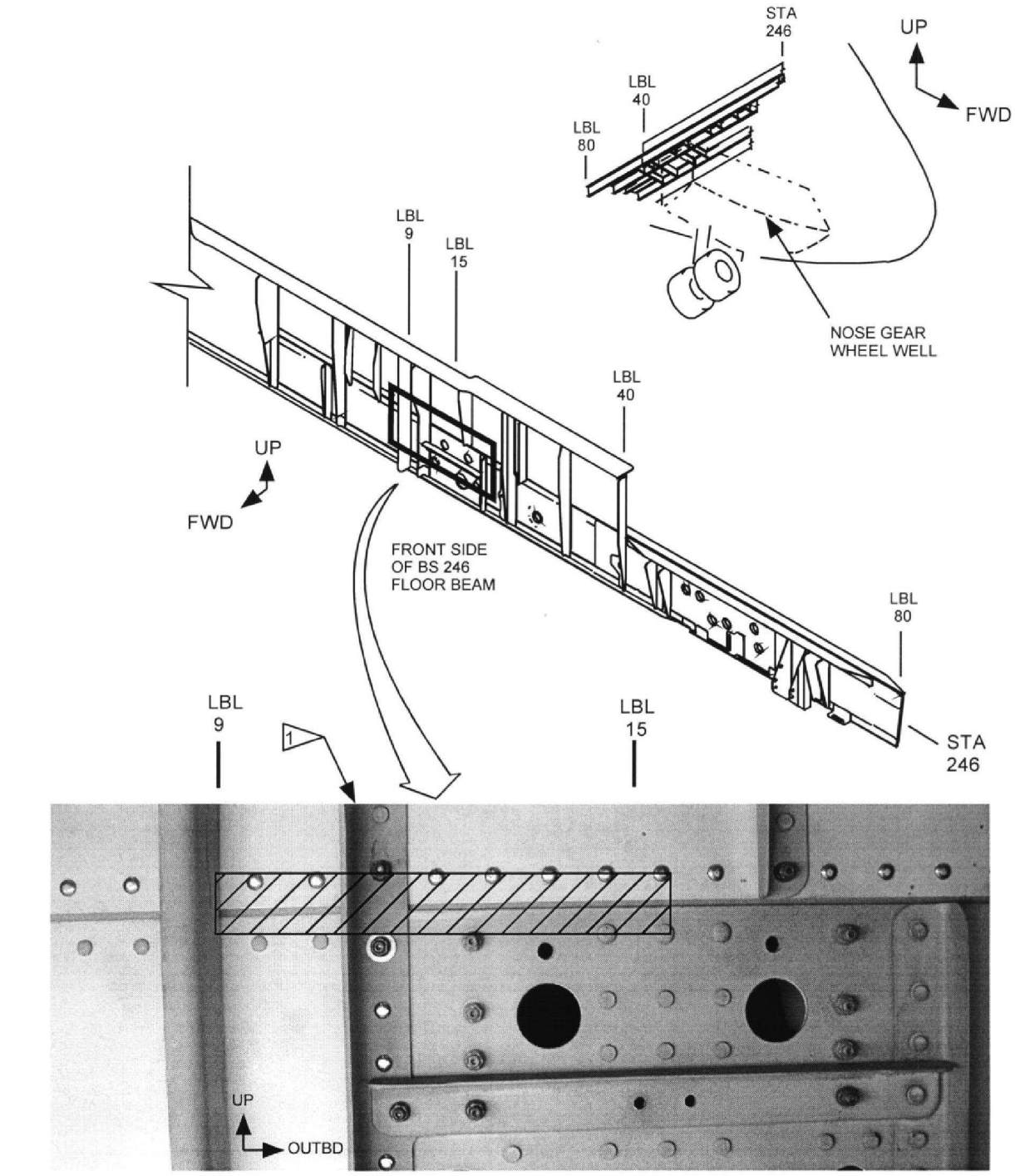
(4) Make a scan of the inspection area (LBL 9 thru LBL 15).

6. Inspection Results

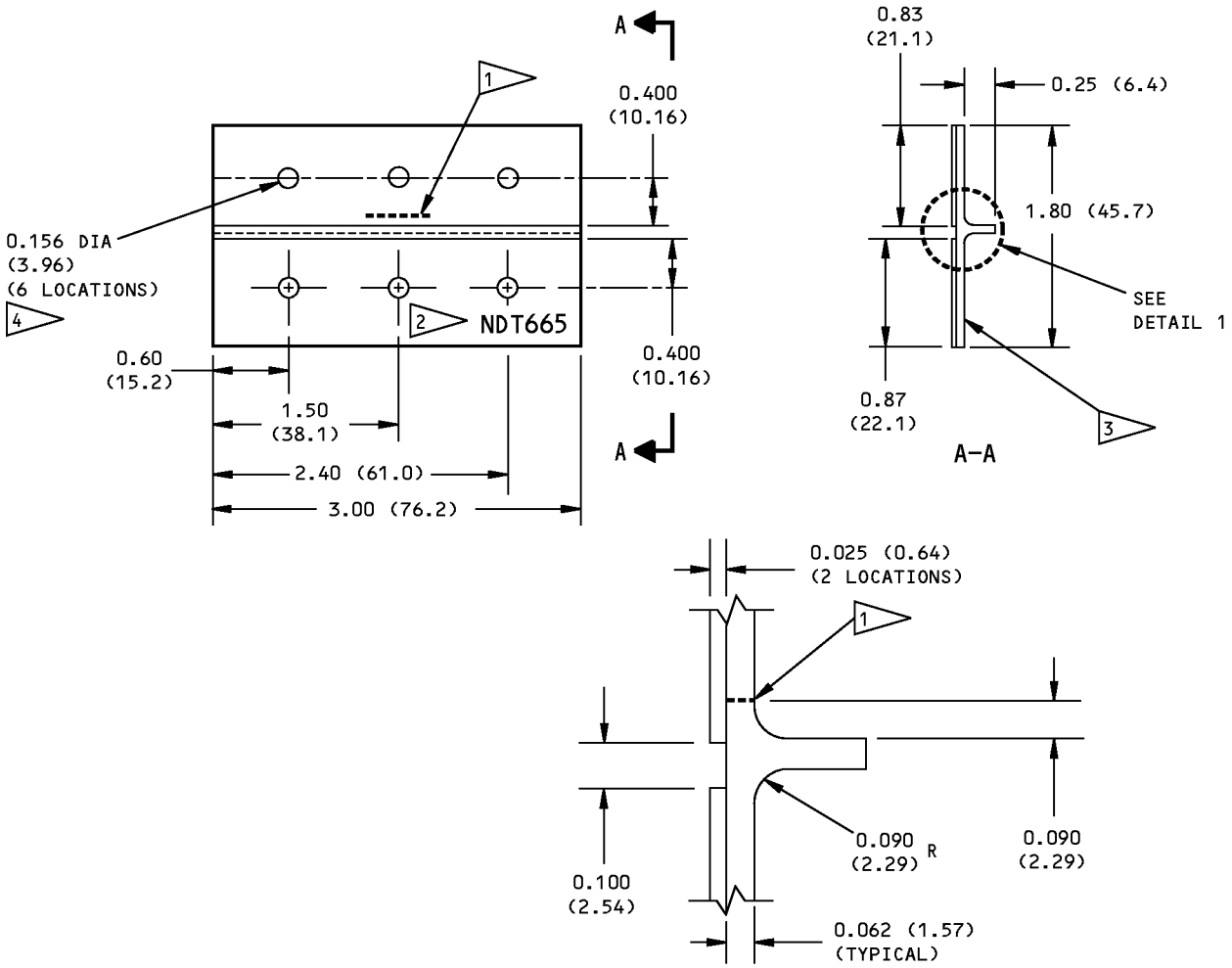
A. A signal that is 50 percent or more of full screen height is a sign of a crack in the mid-chord.

B. Compare the signal that occurs during the inspection to the signal that you got from the notch in the reference standard during calibration.

C. If crack indications are found, get access to the aft side of the floor beam and do a surface eddy current inspection to make sure of the crack indications. Refer to Part 6, 51-00-19.



Inspection Location
Figure 1



DETAIL 1

NOTES

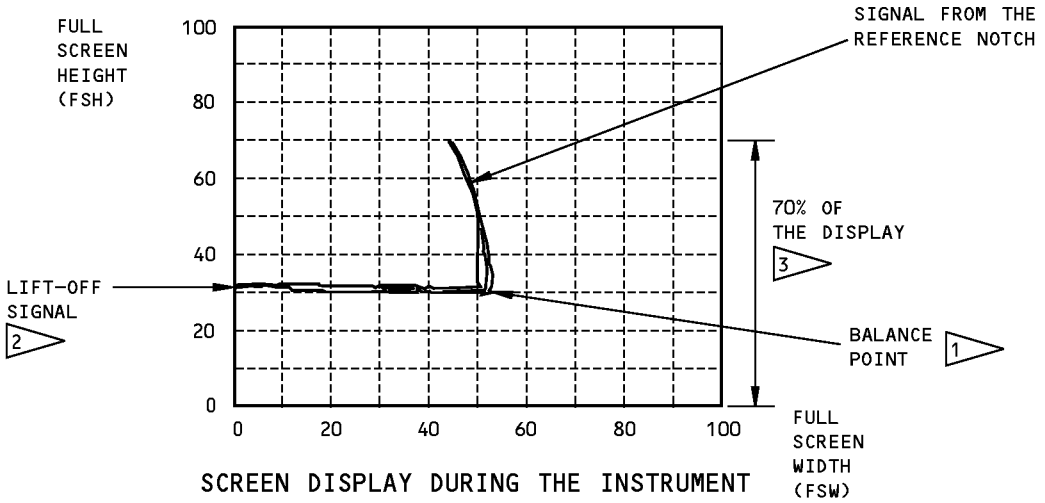
- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCES (UNLESS SPECIFIED DIFFERENTLY):

INCHES	MILLIMETERS
X.XXX = ±0.005	X.XX = ±0.10
X.XX = ±0.025	X.X = ±0.5
X.X = ±0.050	X = ±1

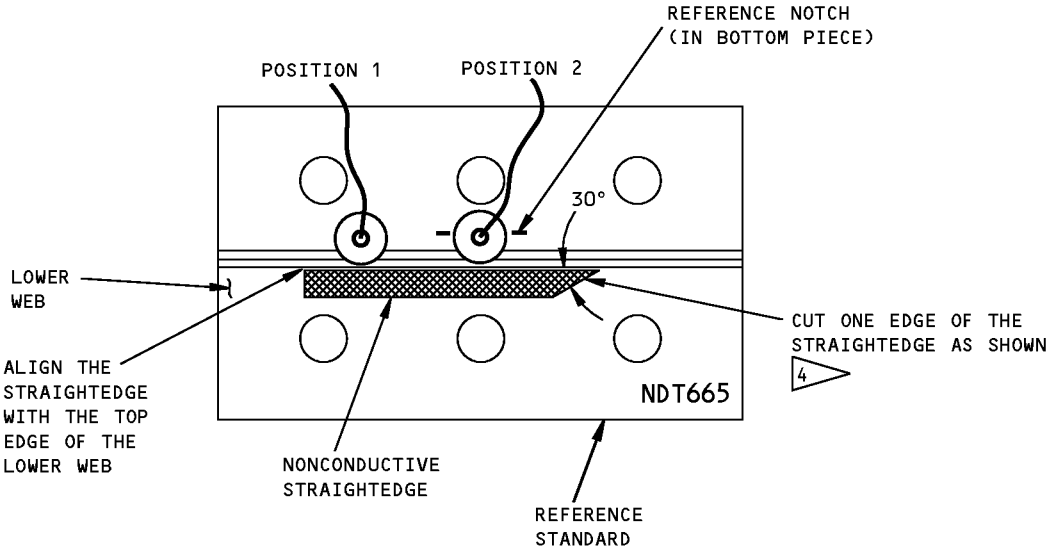
- MATERIAL: 7075-T6. (OPTIONAL: 2024-T3, -T4; 7075-T7X, 7050-T7X)
- SURFACE ROUGHNESS = 125 RA OR BETTER

1. EDM NOTCH (THE NOTCH IS IN THE BOTTOM PIECE ONLY):
   LENGTH: 0.50 (12.7) ±10%
   WIDTH: 0.010 (25) ±0.002 (0.25 ±0.05)
   DEPTH: THROUGH THE THICKNESS
2. ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT665 AT APPROXIMATELY THIS LOCATION.
3. BOEING EXTRUSION BAC1505-100954 CAN BE USED TO MAKE THIS PART
4. INSTALL BACR15FT5AD4 FASTENERS

Reference Standard NDT665
Figure 2

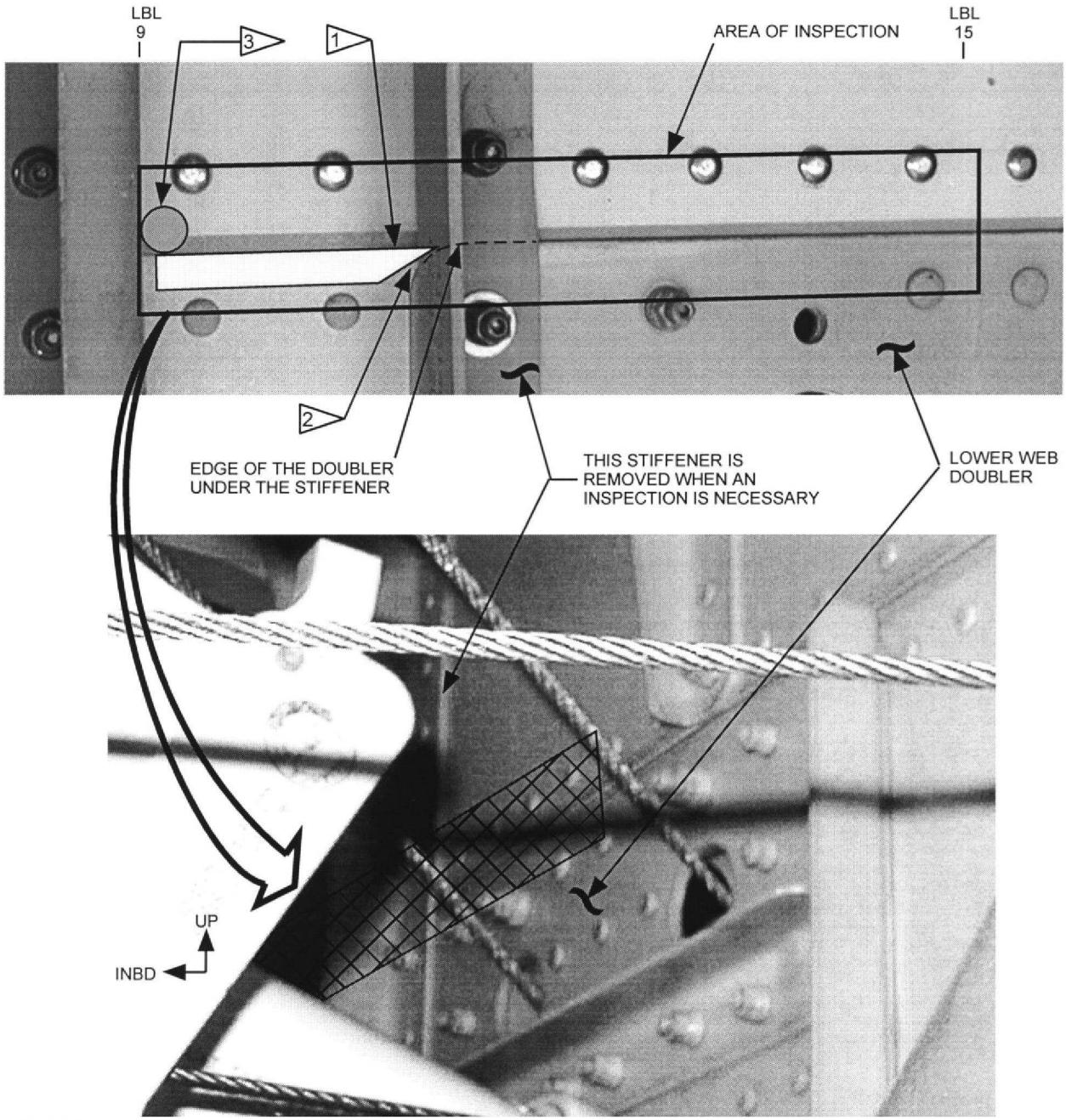


SCREEN DISPLAY DURING THE INSTRUMENT CALIBRATION - REFER TO PAR. 4



1. WITH THE PROBE AT POSITION 1, BALANCE THE INSTRUMENT AND SET THE BALANCE POINT TO APPROXIMATELY 50% OF FSW AND 30% OF FSH.
2. ADJUST THE PHASE CONTROL SO THAT THE LIFT-OFF SIGNAL MOVES HORIZONTALLY FROM RIGHT TO LEFT.
3. WITH THE PROBE SET AT POSITION 2, ADJUST THE GAIN CONTROLS TO SET THE MAXIMUM SIGNAL FROM THE REFERENCE NOTCH TO 70% OF THE DISPLAY.
4. THIS CUT IS NECESSARY TO ALLOW THE STRAIGHTEDGE TO GET AS NEAR AS POSSIBLE TO THE LOWER WEB DOUBLER DURING THE INSPECTION. REFER TO THE TOP PHOTO IN FIGURE 4.

Instrument Calibration
Figure 3



NOTES

- THE TOP PHOTO SHOWS THE INSPECTION AREA DURING AIRPLANE ASSEMBLY
- THE BOTTOM PHOTO SHOWS THE INSPECTION AREA WITH ALL OF THE EQUIPMENT INSTALLED

1 NONCONDUCTIVE STRAIGHTEDGE

2 CUT THE STRAIGHTEDGE AS SHOWN TO ALLOW IT TO GET NEAR THE EDGE OF THE DOUBLER

3 BALANCE THE PROBE AND MAKE A SCAN OF THE INSPECTION AREA. KEEP THE PROBE AGAINST THE STRAIGHTEDGE DURING THE SCAN.

Inspection Details
Figure 4

FORWARD EDGE FRAME OF THE FORWARD PASSENGER/SERVICE DOORS

1. Purpose

A. Use this procedure to do an inspection for surface cracks in the forward edge frame of the forward passenger and service doors.

B. The inspection location is at door station 76.3 between stringers S-7 and S-11 and between S-19 and S-23. See Figure 1 for the inspection locations.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I10A

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments specified below were used to help prepare this procedure:

(a) Phasec 2200; Hocking, Inc.

(b) NDT 19e; Staveley, Inc.

(c) Locator UH; Hocking, Inc.

C. Probes

(1) A straight or a right-angle probe is satisfactory for use.

(2) The probe specified below was used to help prepare this procedure:

(a) MP905-50B; NDT Engineering Corp.

D. Reference Standard

(1) For meter display instruments, refer to Part 6, 51-00-01 for reference standard data.

(2) For impedance plane display instruments, refer to Part 6, 51-00-19 for reference standard data.

3. Preparation for Inspection

A. Remove the interior trim and the insulation blankets as necessary.

NOTE: Get access to the upper frame inspection area from the main cabin area and get access to the lower frame inspection area from the forward cargo hold.

B. Remove sealant, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. For meter display instruments, refer to Part 6, 51-00-01, par. 4 for the calibration instructions.

B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 4 for the calibration instructions.

5. Inspection Procedure

A. Examine the aft side of the upper frame inspection area of the forward passenger door for cracks as follows:

(1) Find the inspection fasteners shown in Figure 1, View A.

(2) At locations where structure does not cover the frame, move the probe 360 degrees around the fasteners to examine the frame for cracks as shown in Figure 1, View A, eddy current scan 1.

(a) For meter display instruments, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

(b) For impedance plane display instruments, refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

(3) At locations where structure covers the frame, put the probe on the frame adjacent to the inspection fastener. Use the structure as a guide and make a scan of the frame for 1 inch (25 mm) above and below the inspection fastener. See Figure 1, View A, eddy current scan 2.

(a) For meter display instruments, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

(b) For impedance plane display instruments, Part 6, 51-00-19, par. 5 for the inspection procedure.

B. Examine the forward side of the upper frame inspection area of the forward passenger door for cracks as follows:

(1) Find the failsafe chord on the forward side of the frame. See Figure 1, View A.

(2) Make a 360 degree scan around all of the inspection fasteners shown in Figure 1, View A. See Figure 1, View A, eddy current scan 3.

(a) For meter display instruments, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

(b) For impedance plane display instruments, refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

C. Examine the aft side of the lower frame inspection areas of the forward passenger door for cracks in the frame as follows:

(1) Do Paragraph 5.A.(1) thru Paragraph 5.A.(3) but use Figure 1, View B, to examine the inspection fasteners from stringers S-19 to S-23.

D. Examine the forward side of the lower frame inspection areas of the forward passenger door for cracks in the frame as follows:

(1) Do Paragraph 5.B.(1) and Paragraph 5.B.(2) but use Figure 1, View B, to examine the inspection fasteners from stringers S-19 to S-23.

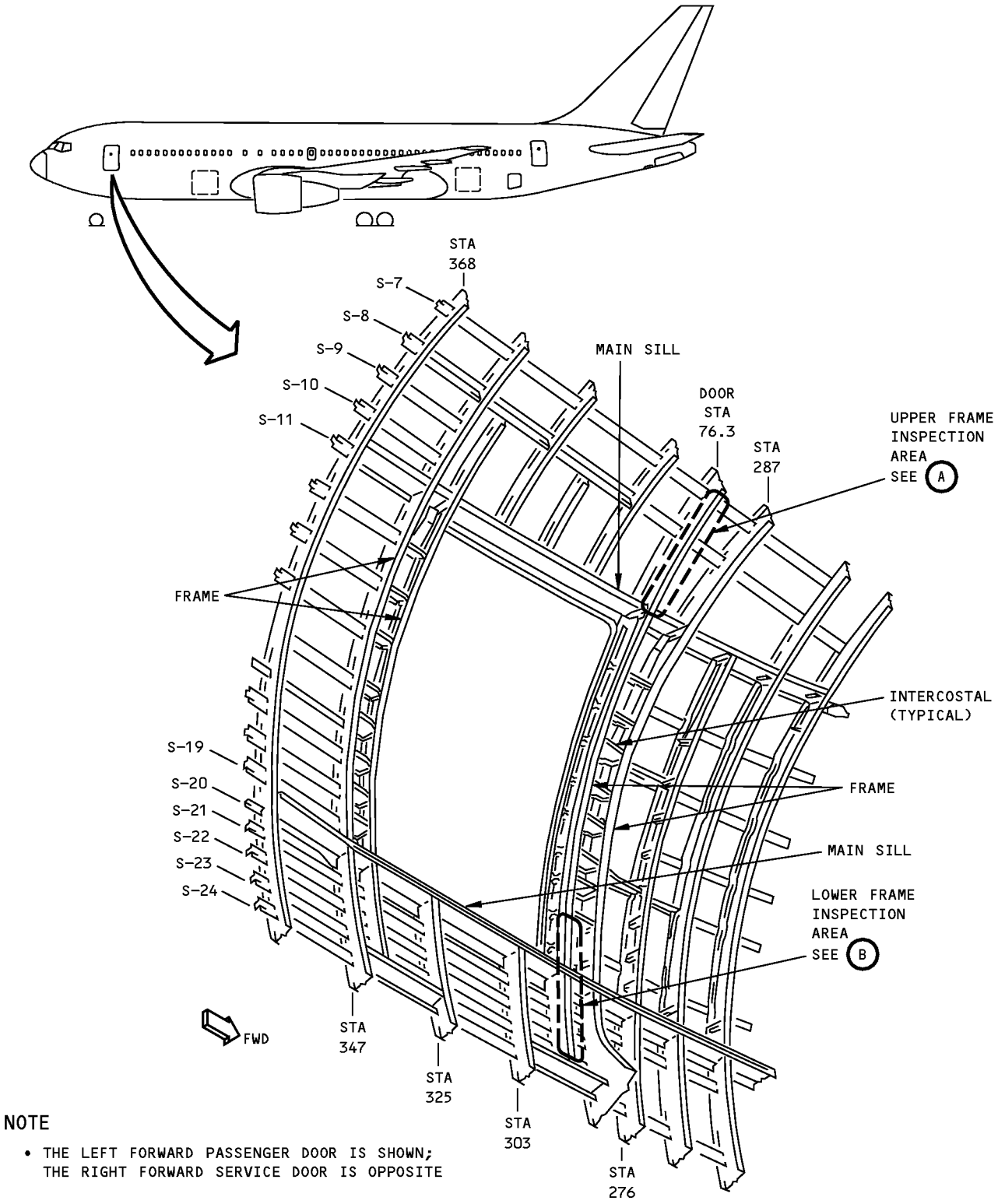
E. Examine the forward service door for cracks in the frame as follows:

(1) Do Paragraph 5.A. thru Paragraph 5.D. for the forward service door.

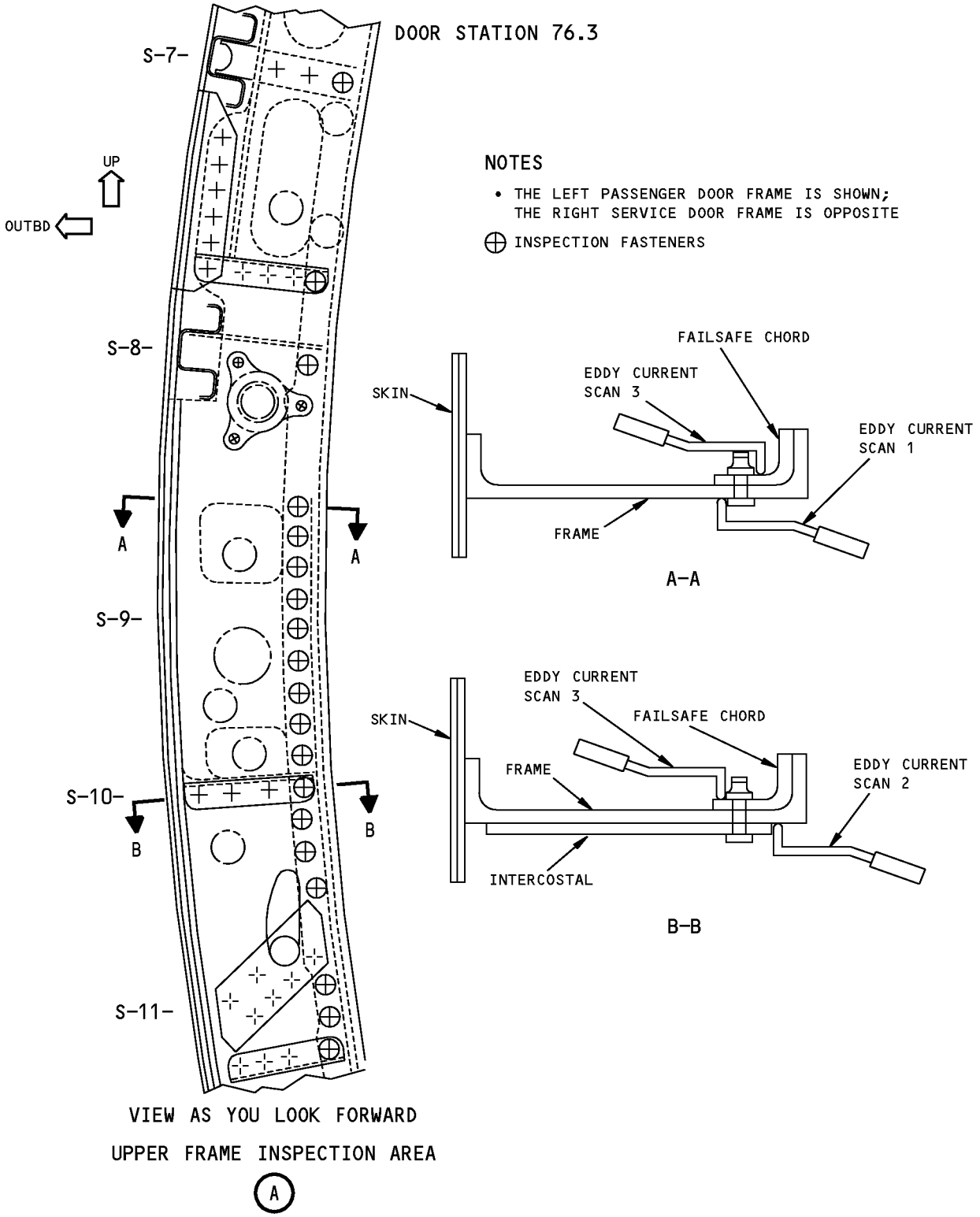
6. Inspection Results

A. For meter display instruments, refer to Part 6, 51-00-01, par. 6 to help make an analysis of the inspection results.

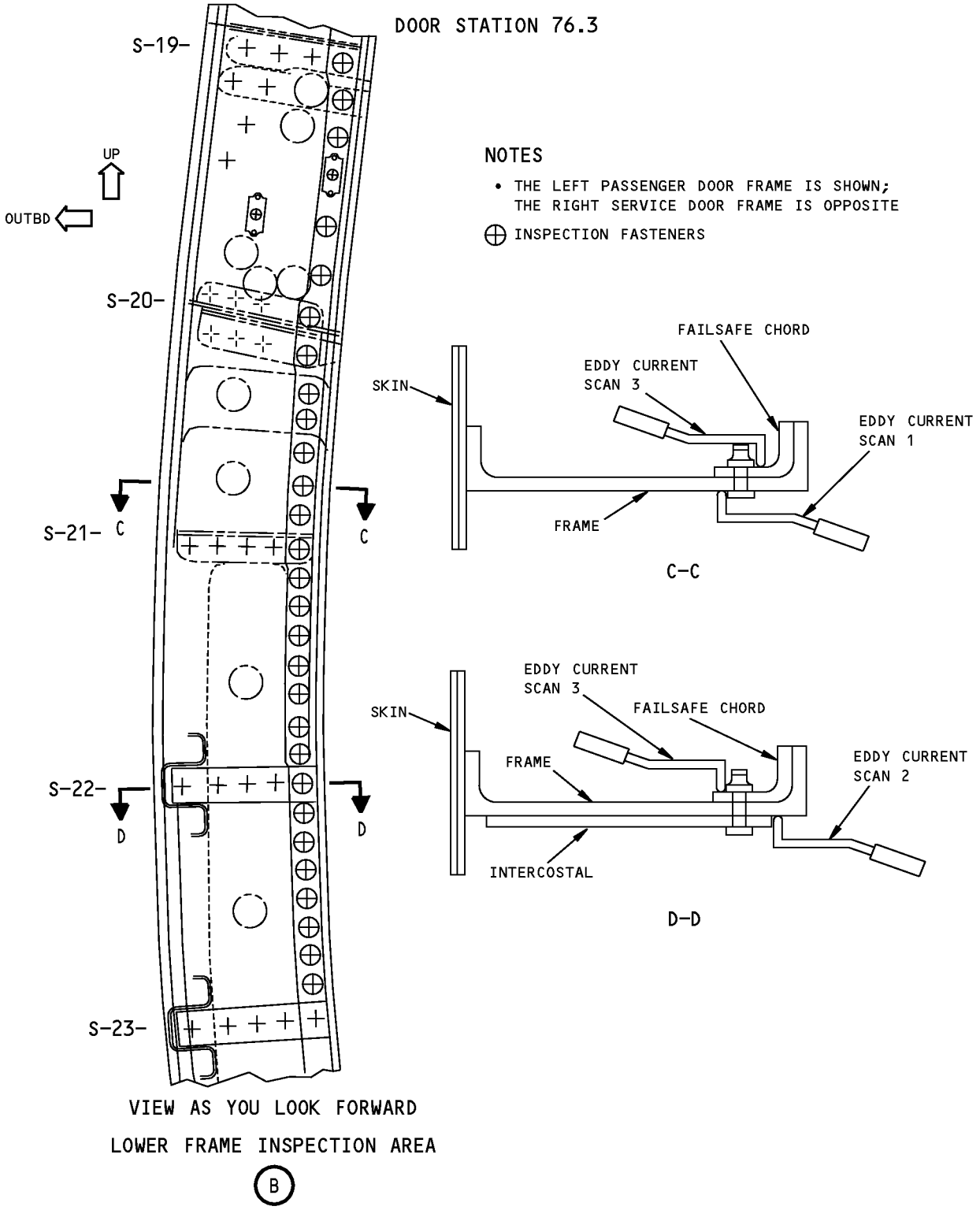
B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 6 to help make an analysis of the inspection results.



Inspection Location
Figure 1 (Sheet 1 of 3)



Inspection Location
Figure 1 (Sheet 2 of 3)



Inspection Location
Figure 1 (Sheet 3 of 3)

UPPER SILL OF THE FORWARD PASSENGER/SERVICE DOORS

1. Purpose

A. Use this procedure to do an inspection for surface cracks in the upper sill of forward passenger and service doors.

B. The inspection location is at the upper sill of the door between Body Station 287 (BS 287) and Door Station 89 (DS 89). See Figure 1 for the inspection locations.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I10B

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments specified below were used to help prepare this procedure:

(a) Phasec 2200; Hocking, Inc.

(b) NDT 19e; Staveley, Inc.

(c) Locator UH; Hocking, Inc.

C. Probes

(1) A straight or a right-angle probe is satisfactory for use.

(2) The probes specified below were used to help prepare this procedure:

(a) MP-30; NDT Engineering Corp

(b) MP905-50B; NDT Engineering Corp.

D. Reference Standard

(1) For meter display instruments, refer to Part 6, 51-00-01 for reference standard data.

(2) For impedance plane display instruments, refer to Part 6, 51-00-19 for reference standard data.

3. Preparation for Inspection

A. Remove the interior trim and insulation blankets as necessary.

B. Remove the Velcro tape if it covers the inspection area.

C. Remove sealant, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. For meter display instruments, refer to Part 6, 51-00-01, par. 4, for the calibration instructions.

B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 4, for the calibration instructions.

5. Inspection Procedure

A. Examine the upper sill of the forward passenger door for cracks as follows:

(1) Find the inspection locations above the forward passenger door.

(2) Do the inspections as follows:

(a) For meter display instruments, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

(b) For impedance plane display instruments, refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

(c) Examine the area for all of the Section A-A fasteners as shown in Figure 1.

(d) Examine the area for all of the Section B-B fasteners as shown in Figure 1.

(e) Examine the area for all of the Section C-C fasteners as shown in Figure 1.

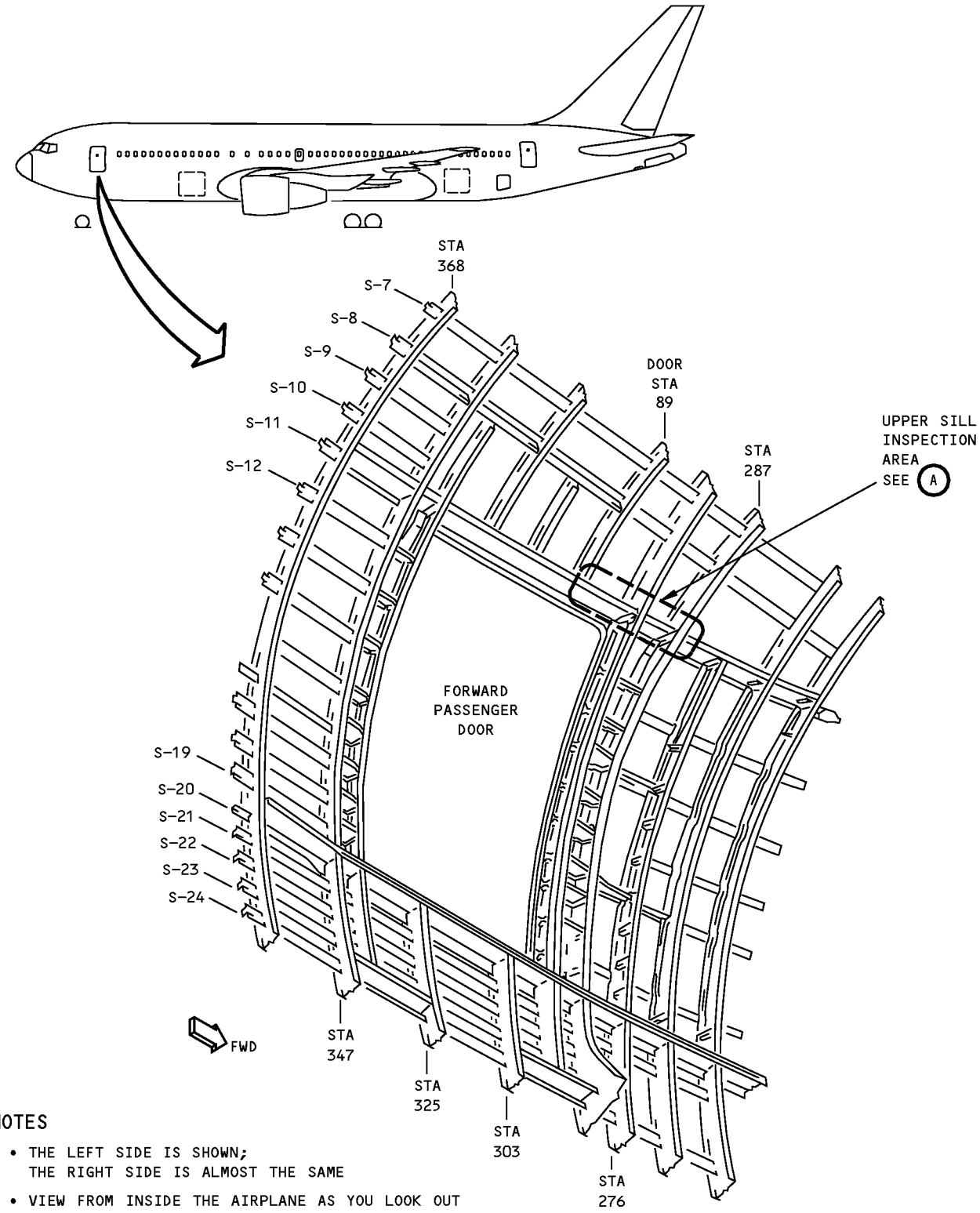
B. Examine the upper sill of the forward service door for cracks as follows:

(1) Do Paragraph 5.A.(1) and Paragraph 5.A.(2) on the forward service door.

6. Inspection Results

A. For meter display instruments, refer to Part 6, 51-00-01, par. 6 to help make an analysis of the inspection results.

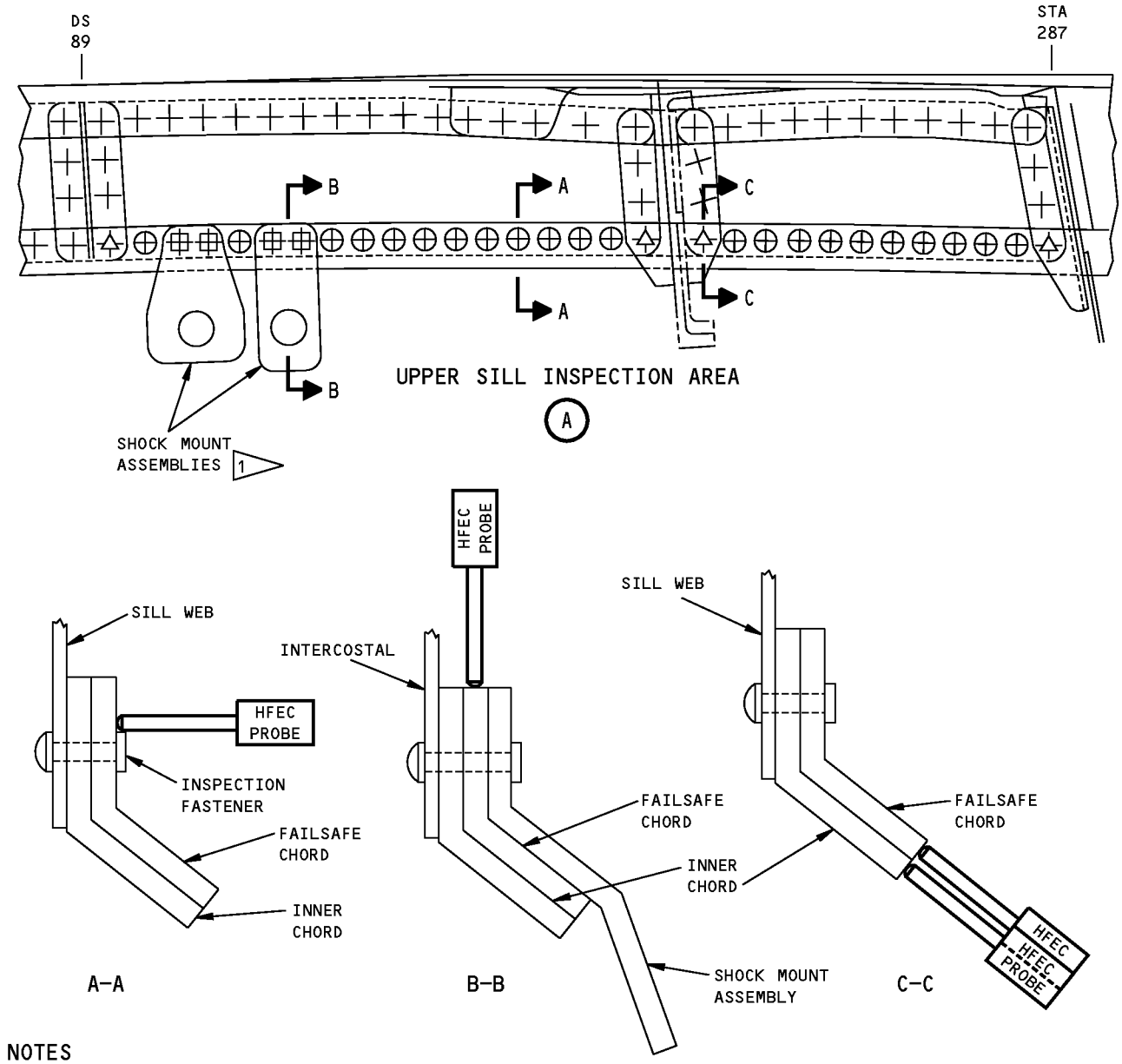
B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 6 to help make an analysis of the inspection results.



NOTES

- THE LEFT SIDE IS SHOWN;
  THE RIGHT SIDE IS ALMOST THE SAME
- VIEW FROM INSIDE THE AIRPLANE AS YOU LOOK OUT

Inspection Locations
Figure 1 (Sheet 1 of 2)



NOTES

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

⊕ EXAMINE THE AREA AROUND THESE FASTENERS AS SHOWN IN SECTION A–A

⊞ EXAMINE THE AREA AROUND THESE FASTENERS AS SHOWN IN SECTION B–B

⏃ EXAMINE THE AREA AROUND THESE FASTENERS AS SHOWN IN SECTION C–C

1 THERE ARE NO SHOCK MOUNTS ON THE DOOR SILL ON THE RIGHT SIDE OF THE AIRPLANE

Inspection Locations
Figure 1 (Sheet 2 of 2)

OUTER CHORD IN THE CANTED BULKHEAD OF THE NOSE LANDING GEAR WHEEL WELL (LFEC)

1. Purpose

A. Use this low frequency procedure to find cracks that can occur in the outer chord of the canted bulkhead of the nose landing gear wheel well. The outer chord is examined at the fastener holes from S-32L to S-32R.

B. The outer chord is examined from outside of the airplane for cracks that start at the fastener holes and grow in a forward and aft direction. The fastener holes to be examined are shown in Figure 1.

C. The fastener locations identified in Figure 1 as 'A' are for MPD Appendix B DTR Check Form Item 53-10-I18A and those identified as 'B' are for Item 53-10-I18B.

D. This procedure uses an instrument with an impedance plane display.

E. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I18A and B

2. Equipment

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

A. Instrument - Use an eddy current instrument with an impedance plane display that can:

(1) Operate at a frequency of 300 Hz.

(2) Be calibrated as specified in the calibration instructions of this procedure. The instruments specified below were used to help prepare this procedure.

(a) MIZ-22; Zetec, Inc.

(b) NDT-19, NDT 19e; Nortec/Staveley, Inc.

(c) Phasec 1.1; Hocking Instruments

B. Probes

(1) Use a reflection ring probe that can operate at a frequency of 300 Hz and that has an inner diameter of 0.40 inch (13 mm). The probes specified below were used to help prepare this procedure.

(a) RR0110-1; NDT Engineering

(b) SPO-2030; Nortec/Staveley, Inc.

C. Reference Standard - Make reference standard NDT657 as specified in Figure 2.

3. Preparation for Inspection

A. Identify and clean the inspection areas shown in Figure 1. The inspection is done from outside the airplane.

4. Instrument Calibration

NOTE: A different reference standard is necessary for each inspection fastener code. An inspection fastener code is used to identify fasteners that have equivalent (approximately) structural conditions. Calibrate the instrument on the applicable fastener type on each reference standard.

A. Identify the correct reference standard (NDT657A or NDT657B) to use during calibration:

(1) For code A inspection fasteners, use reference standard NDT657A.

(2) For code B inspection fasteners, use reference standard NDT657B.

B. Set the instrument frequency to 300 Hz.

C. Visually center the probe on the applicable fastener type at the reference standard hole without a notch as shown in Figure 3, position A.

D. Balance the instrument with the null/balance control.

E. Set the balance point at approximately 20 percent of full screen height (FSH) and 50 percent of full screen width (FSW) as shown in Figure 3.

F. Adjust the phase control so that the signal moves horizontally from right to left when the probe is lifted off the reference standard.

G. Visually center the probe on the applicable reference standard hole with a notch as shown in Figure 3, position B. The signal must move above the balance point.

H. Adjust the instrument gain so the signal is at 80 percent of FSH as shown in Figure 3.

I. Do Paragraph 4.C. thru Paragraph 4.H. again until you get the necessary signals without more instrument adjustments.

5. Inspection Procedure

NOTE: A small amount of movement in the balance point can occur during the inspection because of changes in the material thickness in these locations.

NOTE: During this inspection, it is important that the probe is centered on the fastener of each hole to be examined. If the fasteners are easy to see, look through the hole in the probe and center the probe on the fastener head. If you cannot see a fastener, move the probe on the fastener head until the minimum signal is found.

NOTE: Because of material changes, it is necessary to balance the instrument to examine the forward side of the outer chord and then balance the instrument again to examine the aft side of the outer chord.

A. Identify the inspection area shown in Figure 1.

B. Calibrate the instrument as specified in Paragraph 4. Do a different calibration for each inspection code and fastener type.

C. Put the ring probe on one of the fasteners in the inspection area. Adjust the probe to the center of the fastener and balance the instrument.

D. Examine two adjacent fastener holes that are in the same fastener row. A large difference in the signals from these fastener holes can be caused by a crack at one of the fastener holes. If this occurs, balance the instrument at a different location in the inspection area.

NOTE: Make sure that you center the ring probe on each fastener location.

E. Do an inspection at all the fasteners identified in Figure 1. Examine the forward fastener row, and then continue to examine the aft row. Because the skin thickness changes in the inspection area, the balance point can change a small amount during the inspection. Balance the instrument as necessary to keep the signal at the initial screen location for the balance point. During the inspection:

(1) Make a mark at the locations where a signal occurs that is 40 percent or more of the display.

(2) Frequently do a calibration test of the instrument as follows:

NOTE: Do not adjust the instrument gain.

(a) Put the probe on the reference standard at the position you used during calibration to set the balance point (Figure 3, position A) and balance the instrument.

(b) Put the probe on the reference standard at the position you used to set the instrument sensitivity (Figure 3, position B). Compare the signal you got from the notch during calibration with the signal you get now.

(c) If the signal from the notch in the reference standard has changed 10 percent or more from the signal you got during calibration, do the calibration and inspection again for all the fasteners examined since the last calibration test.

6. Inspection Results

A. A signal that is more than 40 percent of the instrument display is a sign of a crack.

B. Compare the signal that occurs during the inspection to the signal you got from the notch in the reference standard during calibration.

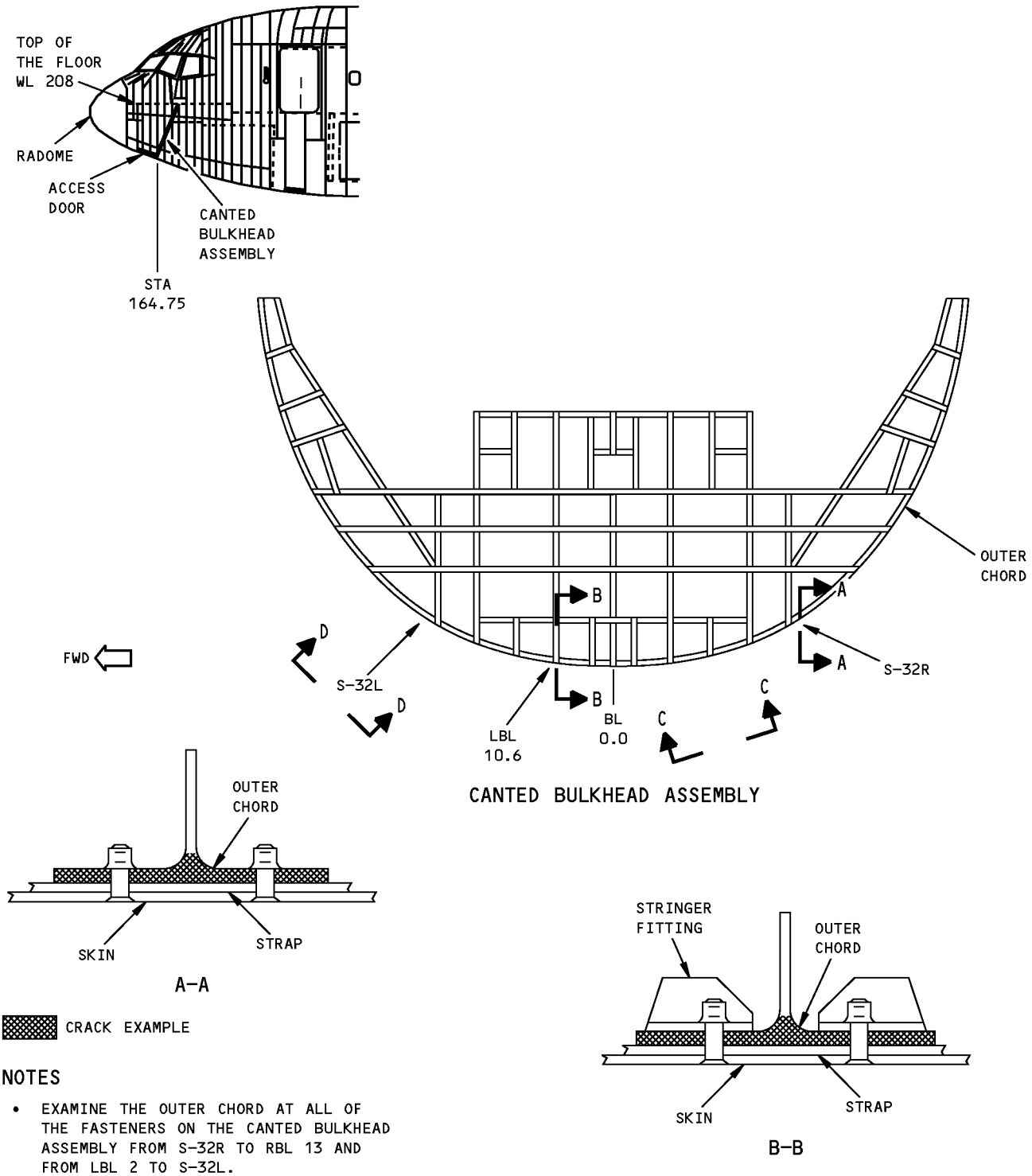
NOTE: The signal from a skin crack can be at a different horizontal screen position (more to the left) than the signal from the notch in the reference standard. Reject a hole location only by the amplitude of the signal.

C. Other conditions that can cause crack type signals to occur are:

(1) A change in the space between fasteners. See if the same location on the opposite side of the airplane has the same amount of space between fasteners and, if so, compare the results from the two locations.

(2) A larger fastener has been installed. See if the same size fastener is installed on the opposite side of the airplane and compare the results with that fastener. If not, make a new reference standard that has the same diameter fastener holes.

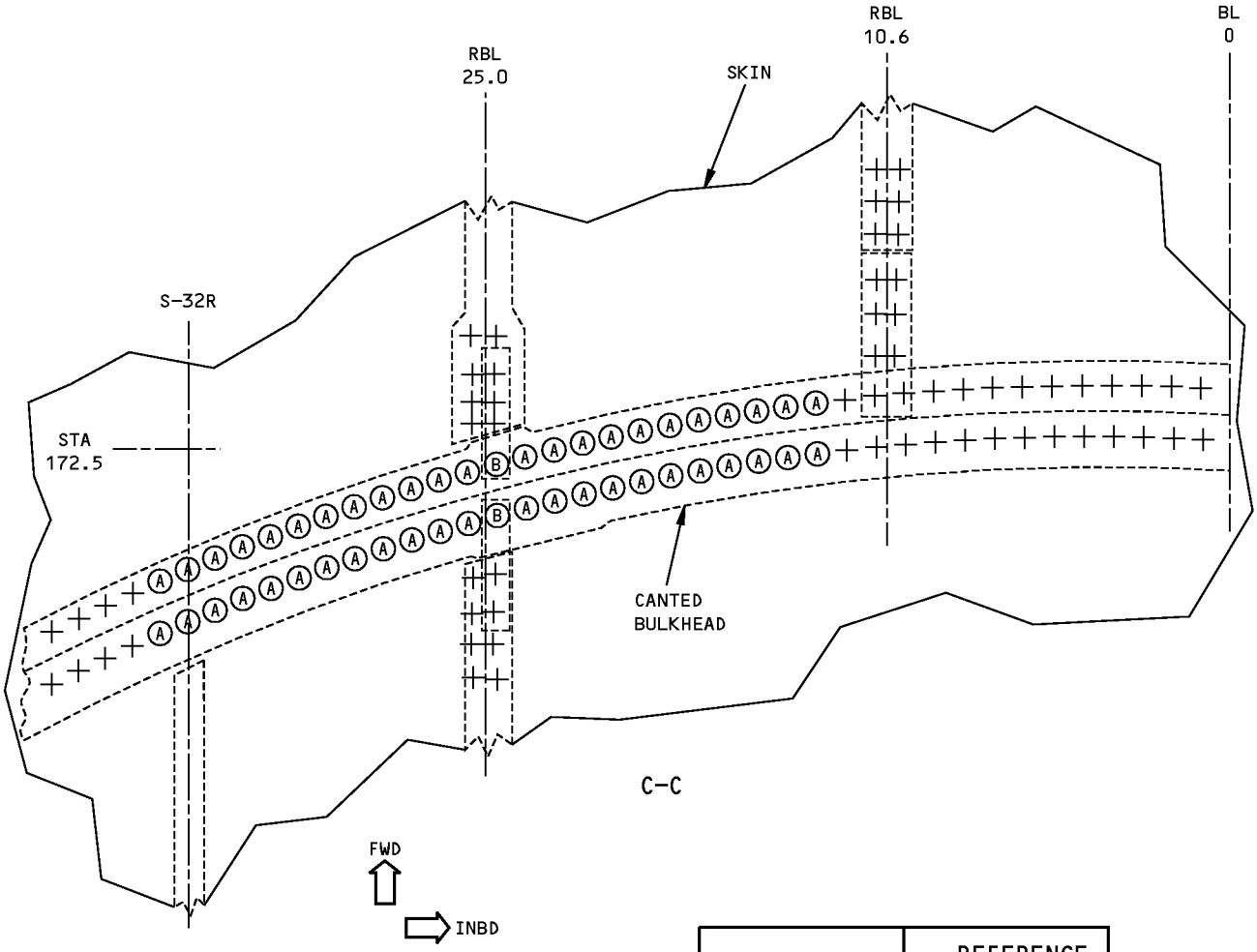
D. If crack indications are found, remove the fastener and do an open hole eddy current inspection as specified in Part 6, 51-00-04, Part 6, 51-00-11, or Part 6, 51-00-16.



NOTES

- EXAMINE THE OUTER CHORD AT ALL OF THE FASTENERS ON THE CANTED BULKHEAD ASSEMBLY FROM S-32R TO RBL 13 AND FROM LBL 2 TO S-32L.

Inspection Location
Figure 1 (Sheet 1 of 3)



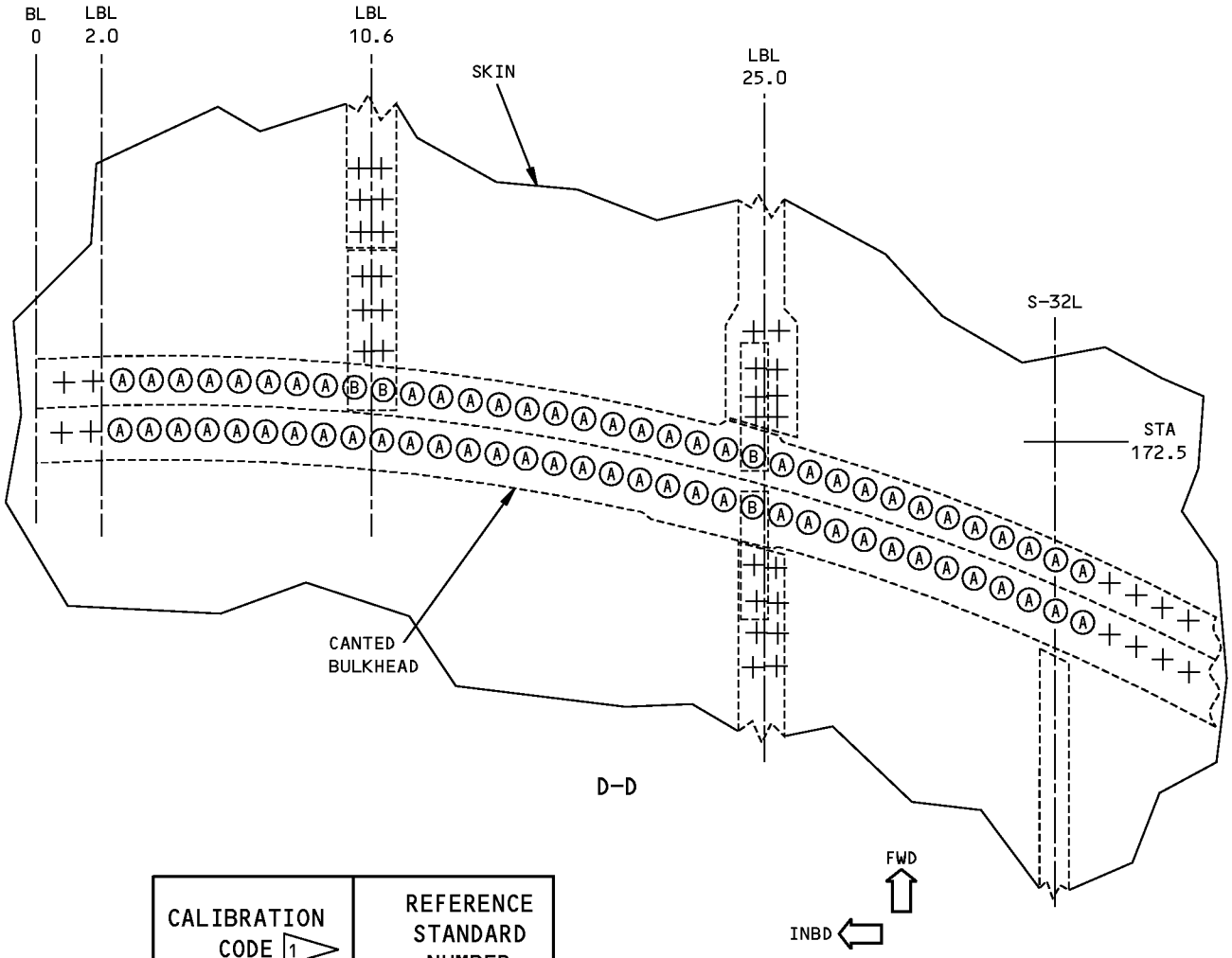
CALIBRATION CODE 1	REFERENCE STANDARD NUMBER
A	NDT657A
B	NDT657B

NOTES

- EXTERNAL VIEW OF THE AIRPLANE AS YOU LOOK UP.
- EXAMINE ALL FASTENERS INDICATED ON THE BULKHEAD ASSEMBLY
- LOCATIONS INCLUDE DETAILS FROM S-32L TO S-32R, DO NOT INCLUDE LBL 2 TO RBL 13

1 USE APPLICABLE FASTENER TYPE WITHIN EACH CALIBRATION CODE

Inspection Location
Figure 1 (Sheet 2 of 3)



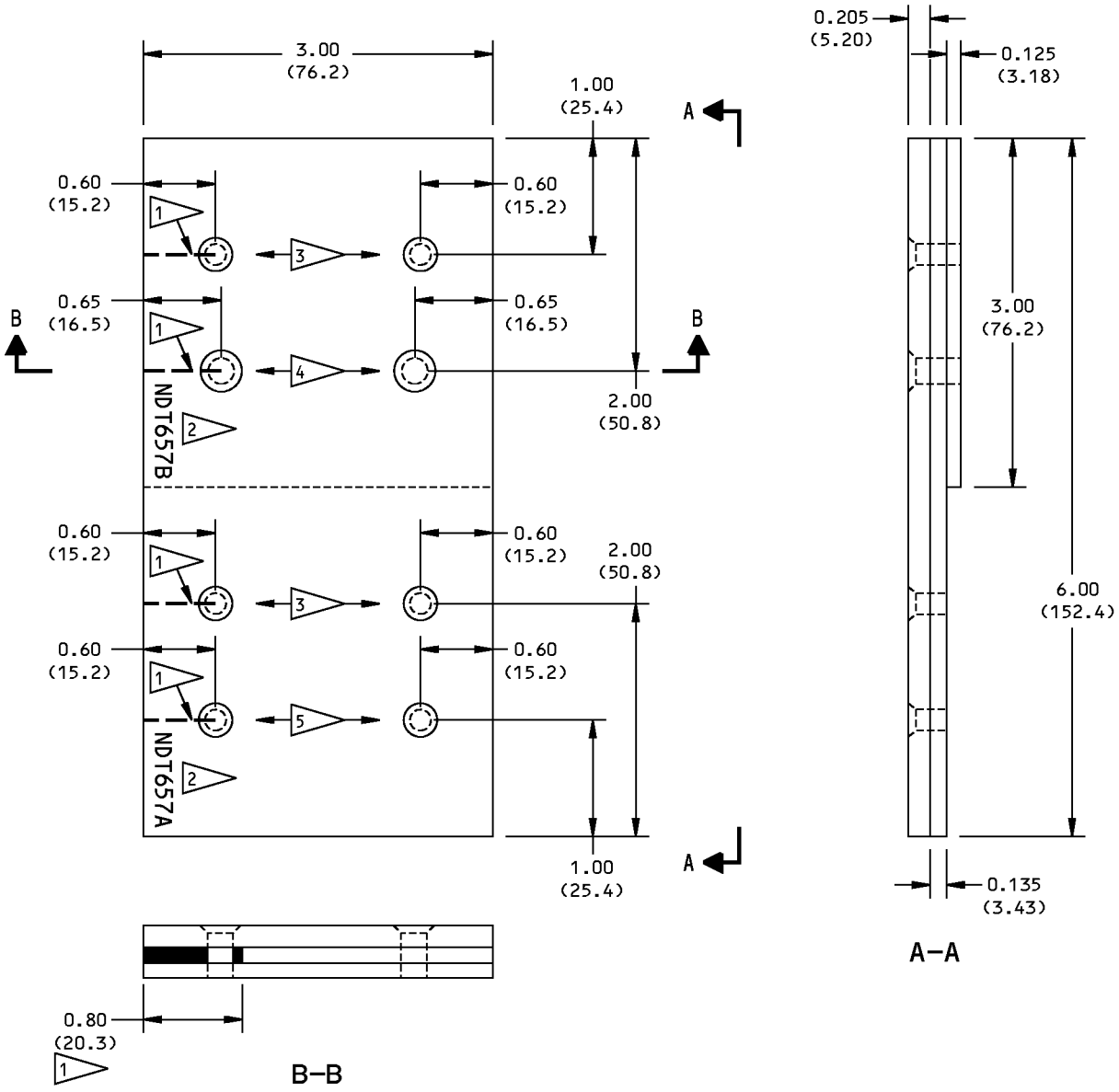
CALIBRATION CODE 1	REFERENCE STANDARD NUMBER
A	NDT657A
B	NDT657B

NOTES

- EXTERNAL VIEW OF THE AIRPLANE AS YOU LOOK UP.
- EXAMINE ALL FASTENERS INDICATED ON THE BULKHEAD ASSEMBLY
- LOCATIONS INCLUDE DETAILS FROM S-32L TO S-32R, DO NOT INCLUDE LBL 2 TO RBL 13

1 USE APPLICABLE FASTENER TYPE WITHIN EACH CALIBRATION CODE

Inspection Location
Figure 1 (Sheet 3 of 3)



NOTES

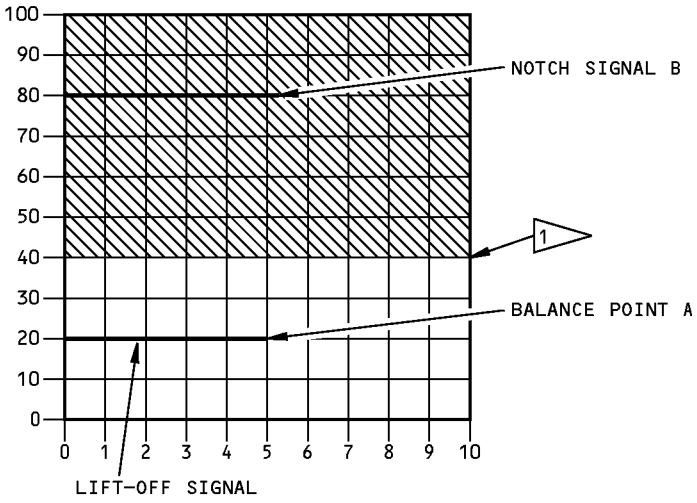
- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCES (UNLESS SPECIFIED DIFFERENTLY):

INCHES	MILLIMETERS
X.XXX = ± 0.005	X.XX = ± 0.10
X.XX = ± 0.025	X.X = ± 0.5
X.X = ± 0.050	X = ± 1

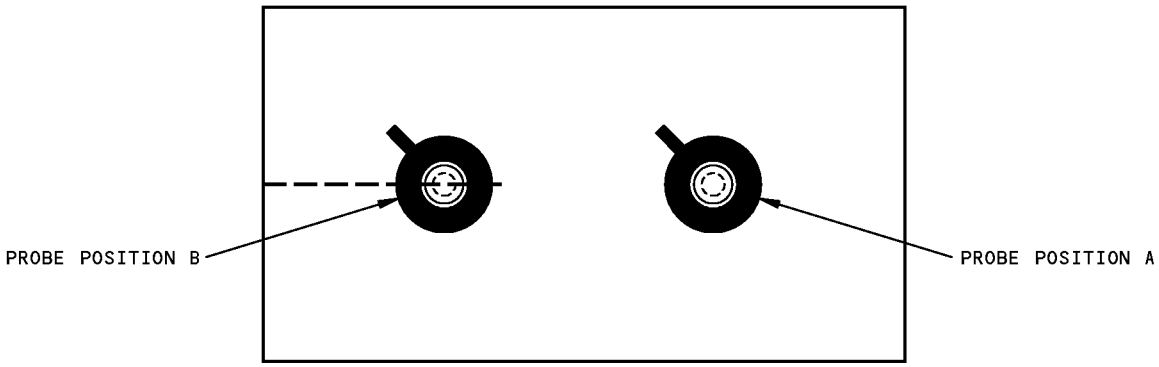
- SURFACE ROUGHNESS = 125 Ra OR BETTER
- MATERIAL: 2024 ALUMIMUM (7075-T6 OPTIONAL)

1. EDM NOTCH OR SAWCUT: 0.80 (20.3) LONG X 0.030 (0.76) WIDE MAXIMUM -- THE LENGTH INCLUDES THE HOLE DIAMETER
2. ETCH OR STAMP WITH NDT657A AND NDT657B
3. INSTALL BACB30NW6K5X HI-LOK FASTENERS AND BACC30M6 COLLARS
4. INSTALL BACB30NW8K HI-LOK FASTENERS AND BACC30M8 COLLARS
5. INSTALL BACR15CE6 RIVETS

Reference Standard NDT657
Figure 2



IMPEDANCE PLANE DISPLAY



1 SIGNALS MORE THAN 40 PERCENT OF THE DISPLAY ARE INDICATIONS OF CRACKS

Instrument Screen Display Examples
Figure 3

PART 6 - EDDY CURRENT

OUTER CHORD OF THE NOSE LANDING GEAR WHEEL WELL AT BS 287 (HFEC)

1. **Purpose**
   - A. Use this high frequency eddy current procedure to find cracks in the outer chord at Body Station 287 from Stringer 24L to 24R. The outer chord at Stringer 36L, 36R and the jack fitting location at Stringer 27R cannot be examined with this procedure.
   - B. The inspection area is the aft flange of the outer chord. This inspection is done from the inside of the airplane. See Figure 1 for the inspection area.
   - C. MPD Appendix B DTR Check Form Reference:
     - (1) ITEM 53-10-I21B and C
2. **Equipment**
   - A. General
     - (1) You can use an impedance plane display or a meter display instrument to do this inspection.
     - (2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.
     - (3) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.
   - B. Instrument
     - (1) For instruments that have a meter display, refer to Part 6, 51-00-01, par. 2 for equipment data.
     - (2) For instruments that have an impedance plane display, refer to Part 6, 51-00-19, par. 2 for equipment data.
   - C. Probes
     - (1) Use shielded high frequency pencil probes as shown in Part 6, 51-00-01, Fig. 1 or Part 6, 51-00-19, Fig. 1. Probes with the dimensions that follow were used to help prepare this procedure.
       - (a) Right-angle pencil probe. Probe dimensions: A = 0.375 inch, C = 8 inches, D = 0.12 inch.
       - (b) Right-angle pencil probe. Probe dimensions: A = 0.25 inch, C = 8 inches, D = 0.12 inch.
   - D. Reference Standard
     - (1) For the inspections around the fastener collars and stringer splices, use reference standard 188A as shown in Part 6, 51-00-01, Fig. 6 or Part 6, 51-00-19, Fig. 6.
     - (2) For the inspections on the outer chord radius, use reference standard 126 as shown in Part 6, 51-00-01, Fig. 4 or Part 6, 51-00-19, Fig. 4.
3. **Preparation for Inspection**
   - A. Identify the inspection areas shown in Figure 1 and Figure 2. Remove interior panels, insulation blankets and electrical equipment as necessary to get access to the inspection areas.
   - B. Remove loose paint, dirt, or sealant from the inspection areas.
4. **Instrument Calibration**
   - A. For instruments that have a meter display, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-01, par. 4.
   - B. For instruments that have an impedance plane display, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-19, par. 4.

5. Inspection Procedure

A. Examine the aft side of the outer chord at Body Station 287 from Stringer 24L to 24R. Make a scan around each fastener, along the outer chord's radius and at the end of the stringer end fittings as shown in Figure 2. The outer chord at Stringer 36L, 36R and the jack fitting location at Stringer 27R cannot be examined with this procedure.

(1) For instruments that have a meter display, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

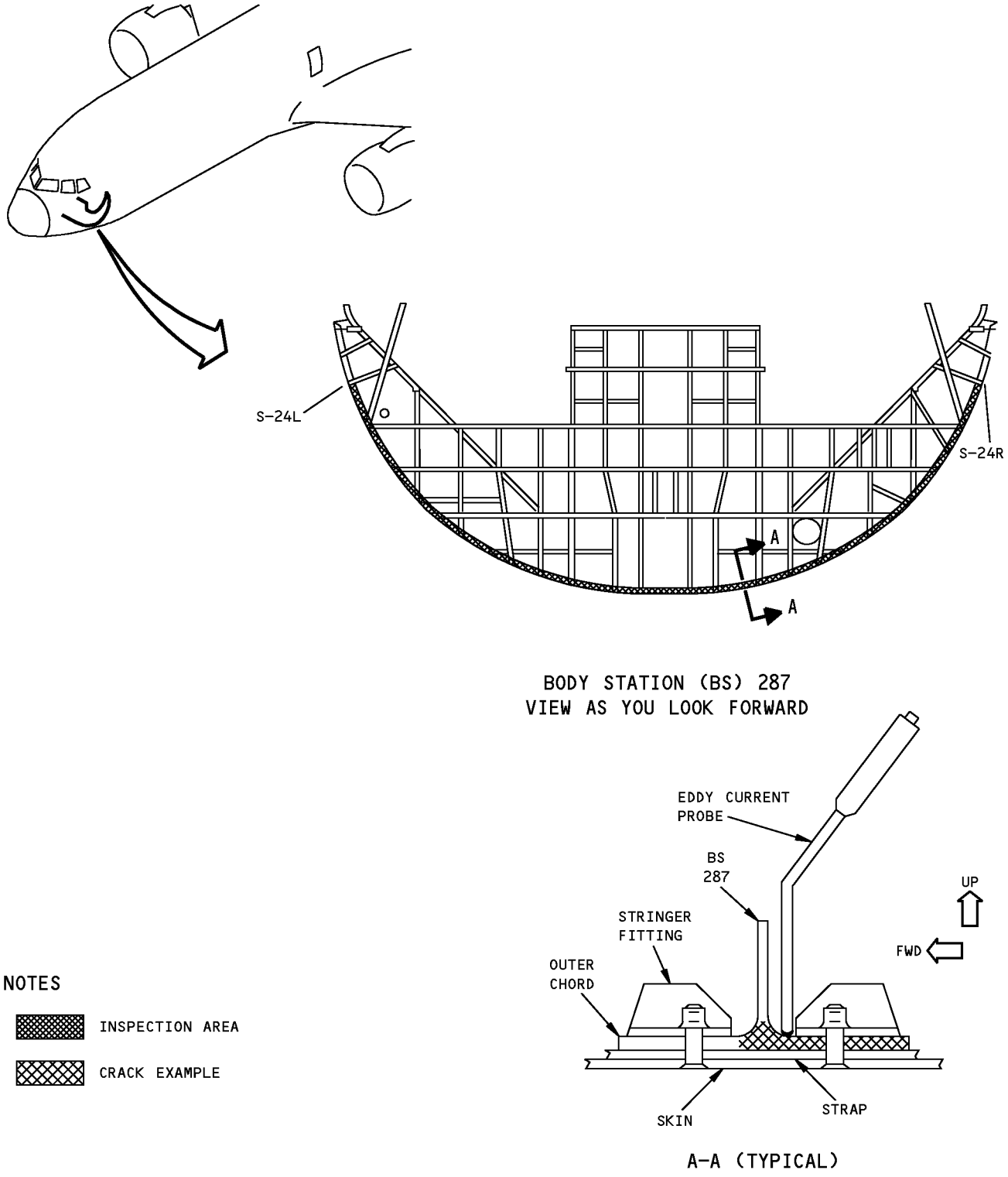
(2) For instruments that have an impedance plane display, refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

6. Inspection Results

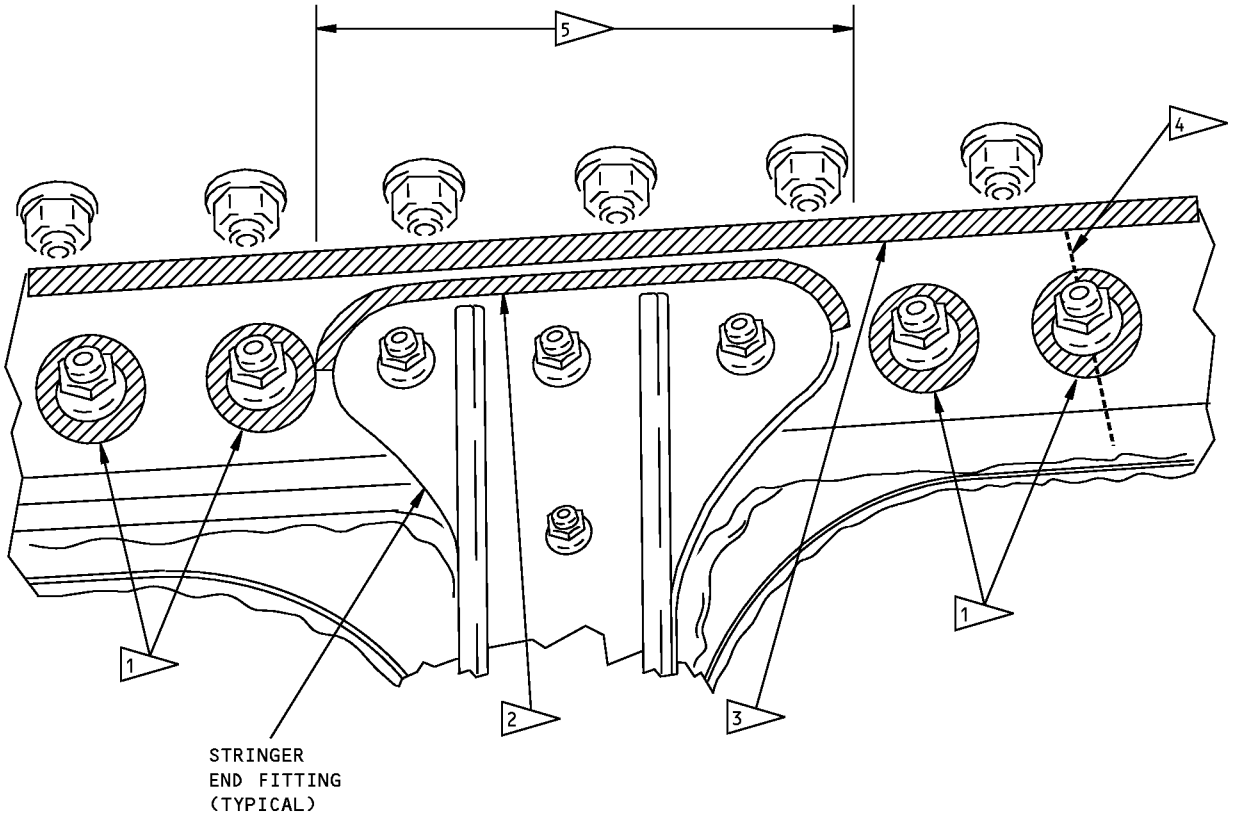
A. For instruments that have a meter display, refer to Part 6, 51-00-01, par. 6, to make an analysis of the indications that occurred during the inspection.

B. For instruments that have an impedance plane display, refer to Part 6, 51-00-19, par. 6, to make an analysis of the indications that occurred during the inspection.

C. If the indication is at a fastener location, remove the fastener and do an eddy current inspection of the open hole as specified in Part 6, 51-00-16.



Inspection Location and Probe Position
Figure 1



NOTES

SCAN LOCATION

- VIEW AS YOU LOOK AT THE AFT SIDE OF THE OUTER CHORD AT BS 287. NOT ALL STRUCTURE IS SHOWN.
- INSPECTION AREA: EXAMINE THE AFT SIDE OF THE OUTER CHORD AT BODY STATION 287 BETWEEN S-24L AND S-24R BUT NOT AT S-36R, S-36L AND THE JACK FITTING LOCATION AT STRINGER 27R. FOR DTR CHECK FROM ITEM 53-10-I21B, EXAMINE AS SPECIFIED IN FLAGNOTES 1 AND 3. FOR DTR CHECK FORM ITEM 53-10-I21C, EXAMINE AS SPECIFIED IN FLAGNOTES 2AND 5.

1. EXAMINE AROUND FASTENERS AT TYPICAL LOCATIONS.
2. WHERE THERE ARE STRINGER END FITTINGS, EXAMINE ADJACENT TO THE FITTING.
3. EXAMINE ALONG THE RADIUS OF THE OUTER CHORD.
4. TYPICAL CRACK DIRECTION
5. EXAMINE ALONG THE RADIUS OF THE OUTER CHORD, ADJACENT TO THE FITTING.

Typical Inspection Area
Figure 2

PART 6 - EDDY CURRENT

FUSELAGE - CREW AB WINDOW POSTS

1. Purpose

A. Use this high frequency eddy current (HFEC) procedure to find cracks that can occur in the crew AB window posts. The posts area made of titanium.

B. This procedure was prepared to examine the AB window posts on the left and right sides of the airplanes at the locations that follow:

(1) Forward side. See Figure 1, Detail II.

(2) Aft side. See Figure 1, Detail III.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I14A

2. Equipment

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

A. Instrument

(1) Use a high frequency instrument that can be calibrated on the reference standard as specified in Paragraph 4. A Locator UH, made by Hocking, was used to help prepare this procedure.

B. Probe

(1) Use a shielded, right angle, pencil probe. An MTF902-50B/2M probe, from NDT Engineering Co., was used to help prepare this procedure.

C. Reference Standard

(1) Refer to Part 6, 51-00-13 for the reference standard data.

3. Preparation for Inspection

A. Remove the left and right No. 1 windows and glare shields. See Figure 1.

B. Make sure the inspection areas are clean.

4. Instrument Calibration

A. Refer to Part 6, 51-00-13, par. 4 for the instructions to calibrate the instrument.

5. Inspection Procedure

A. Examine the forward side of the AB window posts for cracks as follows:

(1) Find the inspection location for the forward side of the AB window post on the left side of the airplane. See Figure 1, Detail II.

(2) Make a scan around the 15 fasteners on the left side of the AB window post. Use a circle template as shown in Part 6, 51-00-13, Fig. 9.

(3) Make a scan around the 15 fasteners on the right side of the AB window post.

(4) Do Paragraph 5.A.(1) thru Paragraph 5.A.(3) for the AB window post on the right side of the airplane.

B. Examine the aft side of the AB window posts for cracks as follows:

(1) Find the inspection location for the aft side of the AB window post on the left side of the airplane. See Figure 1, Detail III.

(2) On the outboard side of the AB window post (on the left side of the airplane), make a scan around the fasteners that are not covered by brackets. Use the head or collar of the fastener as a guide. See Figure 2, Detail I.

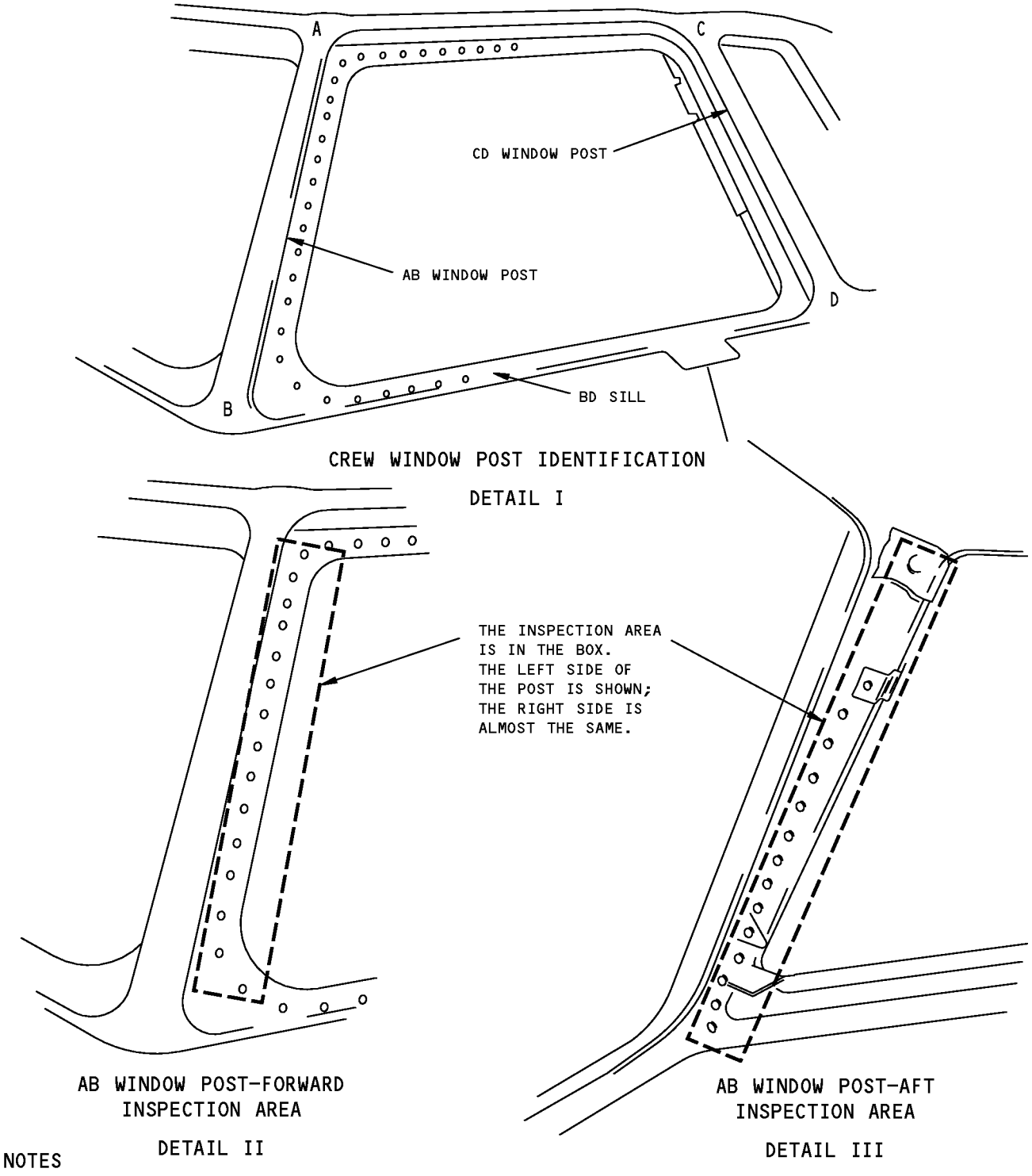
(3) At the three locations where brackets cover the inspection areas, make a scan around the edge of the brackets as shown in Figure 2, Detail II.

(4) Do Paragraph 5.B.(2) and Paragraph 5.B.(3) on the inboard side of the AB window post (on the left side of the airplane).

(5) Do Paragraph 5.B.(1) thru Paragraph 5.B.(4) on the AB window post on the right side of the airplane.

6. Inspection Results

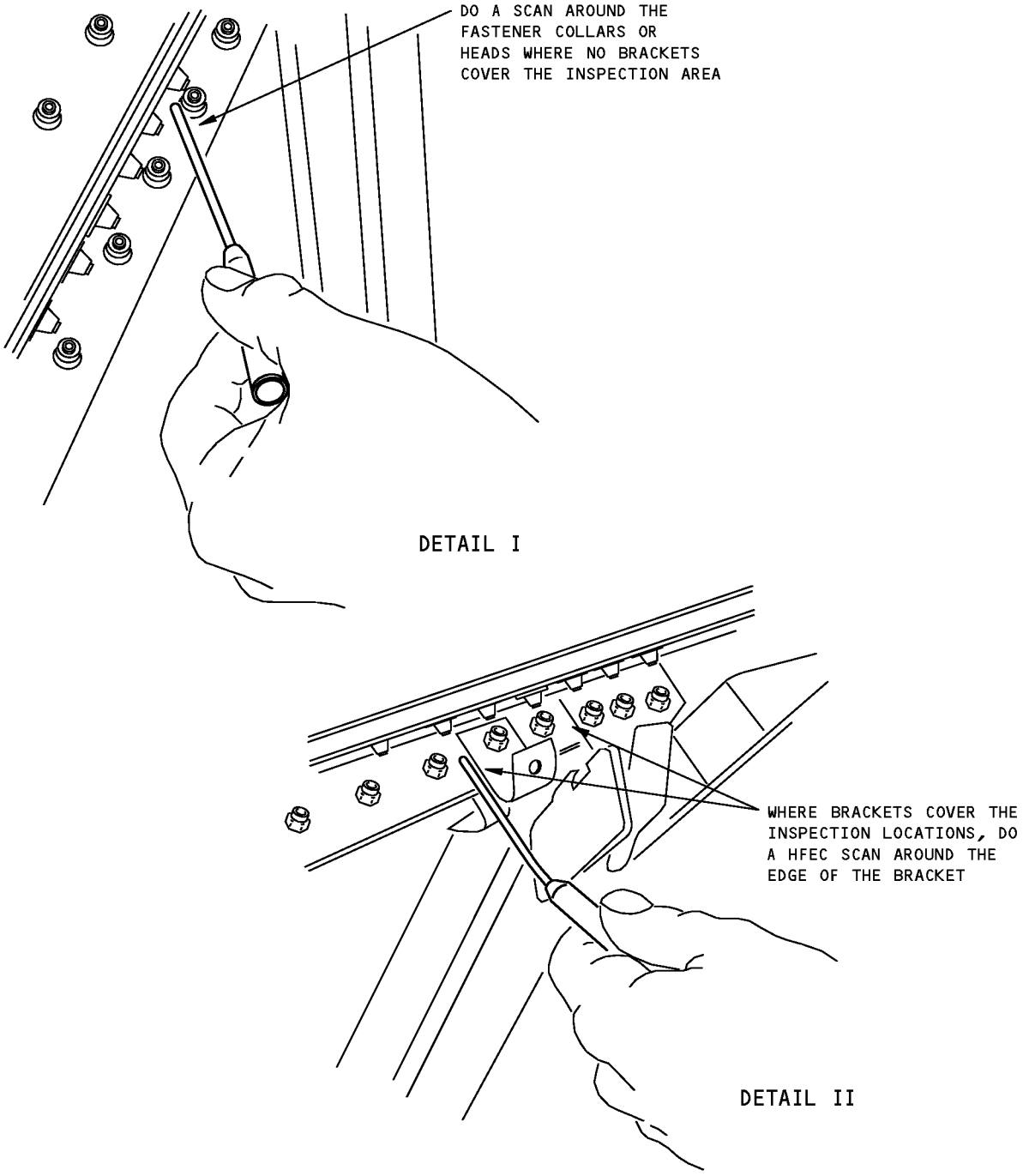
A. Refer to Part 6, 51-00-13, to make an analysis of the indications found during the inspection.



NOTES

- THE LEFT SIDE OF THE AIRPLANE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME

Inspection Locations
Figure 1



INSPECTION SCANS FOR THE AFT SIDE OF THE AB WINDOW POSTS

Inspection Locations
Figure 2

PART 6 - EDDY CURRENT

FUSELAGE - CREW EF WINDOW POSTS

1. Purpose

A. Use this high frequency eddy current (HFEC) procedure to find cracks that can occur in the crew EF window posts. The posts are made of titanium.

B. This procedure was prepared to examine the locations on the aft side of the crew EF window post, adjacent to the nutplate straps. See Figure 1 for the inspection locations.

C. This procedure uses a meter display instrument or an impedance plane display instrument.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I16

2. Equipment

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

A. Instrument

(1) Use a high frequency instrument that can be calibrated on the reference standard as specified in Paragraph 4. A Locator UH, made by Hocking, was used to help prepare this procedure.

B. Probe

(1) Use a shielded, right angle, pencil probe. An MTF902-50B/2M probe, from the NDT Engineering Co., was used to help prepare this procedure.

C. Reference Standard

(1) Refer to Part 6, 51-00-13 for the reference standard data.

3. Preparation for Inspection

A. Remove the interior trim from the window posts. See Figure 1.

B. Make sure the No. 2 crew windows are closed.

C. Make sure the inspection areas are clean.

4. Instrument Calibration

A. Refer to Part 6, 51-00-13, par. 4 for the instructions to calibrate the instrument.

5. Inspection Procedure

A. Find the inspection location at the top of the EF window post on the left side of the airplane. The inspection location is on the aft side of the EF window post as shown in Figure 1.

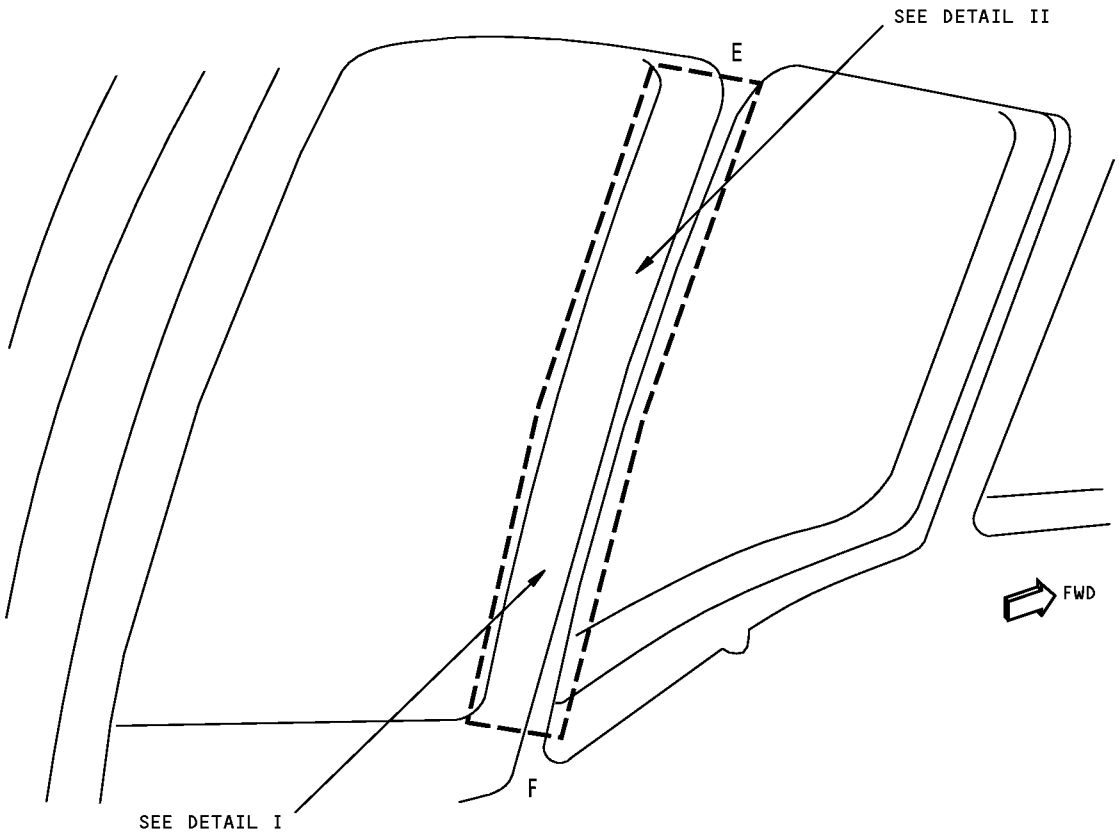
B. Make a scan down the inspection area on the aft side of the nutplate strap. Use the nutplate strap as a guide as shown in Figure 1, Detail I.

C. Make a scan down the inspection area on the forward side of the nutplate strap. Use the nutplate strap as a guide as shown in Figure 1, Detail II.

D. Do Paragraph 5.A. thru Paragraph 5.C. for the EF window post on the right side of the airplane.

6. Inspection Results

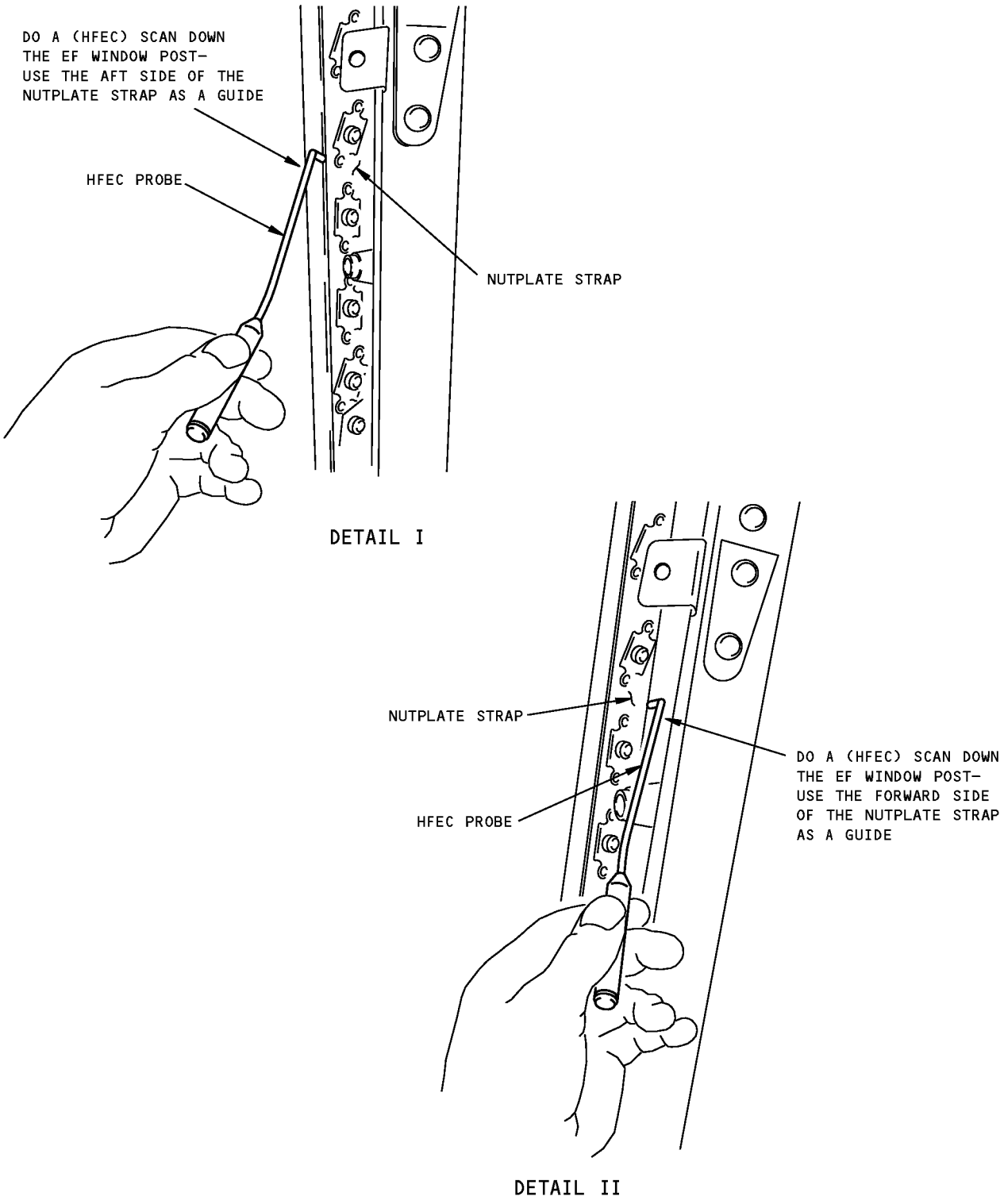
A. Refer to Part 6, 51-00-13, to make an analysis of the indications found during the inspection.



NOTES

- THE INSPECTION AREA IS THE AREA INSIDE THE BOX.
- THE CREW EF WINDOW POST ON THE LEFT SIDE OF THE AIRPLANE IS SHOWN; THE CREW EF WINDOW POST ON THE RIGHT SIDE OF THE AIRPLANE IS ALMOST THE SAME.

Inspection Locations
Figure 1 (Sheet 1 of 2)



Inspection Locations
Figure 1 (Sheet 2 of 2)

PART 6 - EDDY CURRENT

OUTER CHORD OF THE NOSE LANDING GEAR WHEEL WELL AT BS 287 (LFEC)

1. Purpose

A. To find cracks in the outer chord at BS 287 with low frequency eddy current. The outer chord is examined at the fastener holes from S-24L to S-24R.

B. This inspection is done external to the airplane. See Figure 1 and Figure 2 for the areas that are necessary to examine on each airplane.

C. This procedure uses an instrument with an impedance plane display.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I21B, C, D

2. Equipment

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

A. Instrument - Use an eddy current instrument with an impedance plane display that can:

(1) Operate at a frequency of 200 to 300 Hz.

(2) Be calibrated as specified in the calibration instructions of this procedure. The instruments that follow were used to help prepare this procedure.

(a) Staveley 1000; Staveley Instruments

(b) Phasec 1.1; Hocking Krautkramer Branson

B. Probes - To do this procedure, it is necessary to use a ring probe with a minimum inner diameter of 0.4 inch (10.2 mm) and a spot probe. All probes that operate at 200 to 300 Hz and can do the conditions specified in this procedure are acceptable. The probes that follow were used to help prepare this procedure:

(1) Spot probe RS016-5; NDT Engineering

(2) Spot probe DP-750-SP; Zetec, Inc.

(3) Ring probe DP-425/950-R; Zetec, Inc.

(4) Ring probe RR0110-5; NDT Engineering

C. Reference Standards - Make reference standard NDT663A and NDT663B as specified in Figure 3.

3. Preparation for Inspection

A. Identify and clean the inspection area shown in Figure 1 and Figure 2.

4. Instrument Calibration

A. Ring probe calibration.

(1) Set the frequency to 200 Hz.

(2) Put a nonconductive shim on the reference standard. The thickness of the shim must be equivalent (±0.003 inch (0.08 mm)) to the paint thickness on the airplane.

(3) On reference standard NDT663A, visually center the probe on the fastener without a notch as shown in Figure 4, position C.

(4) Balance the instrument as specified in the manufacturer's instructions.

(5) Set the balance point at approximately 20 percent of full screen height (FSH) and 50 percent of full screen width (FSW). See Figure 4.

(6) Adjust the phase control so that the signal moves horizontally from right to left when the probe is lifted off the reference standard.

(7) On reference standard NDT663A visually center the probe on the fastener with a notch, as shown in Figure 4, position D.

(8) Adjust the instrument gain so the signal is at 80 percent of FSH as shown in Figure 4.

NOTE: It can be necessary to adjust the horizontal and vertical gain to get the notch signal at 80 percent of full screen height as shown in Figure 4.

(9) Do Paragraph 4.A.(3) thru Paragraph 4.A.(8) again until you get the necessary signals without more instrument adjustment.

B. Spot probe calibration.

NOTE: The spot probe inspection can only be used for areas specified in Figure 2, flagnote 4.

(1) Set the frequency to 300 Hz.

(2) Put a nonconductive shim on the reference standard. The thickness of the shim must be equivalent (±0.003 inch (0.08 mm)) to the paint thickness on the airplane.

(3) Put the probe on reference standard NDT663B, between the fasteners with no notch. See Figure 4, Position A.

(4) Balance the instrument as specified in the manufacturer's instructions.

(5) Set the balance point at approximately 20 percent of FSH and 50 percent of FSW. See Figure 4.

(6) Adjust the phase control so that the signal moves horizontally from right to left when the probe is lifted off the reference standard.

(7) Move the probe above the notch as shown in Figure 4, Position B. Adjust the position of the probe above the notch to get a maximum signal.

(8) Adjust the instrument gain so the signal is at 80 percent of FSH as shown in Figure 4.

NOTE: It can be necessary to adjust the horizontal and vertical gain to get the notch signal at 80 percent of full screen height as shown in Figure 4.

(9) Do Paragraph 4.B.(3) thru Paragraph 4.B.(8) again until you get a fast upscale signal that is 80 percent of full screen height to occur when you move the probe above the notch.

5. Inspection Procedure

A. Examine the fasteners at Station 287, as shown in Figure 2, flagnote 3, with a ring probe centered on each fastener head as follows.

(1) Calibrate the instrument as specified in Paragraph 4.A.

(2) Identify the fastener locations to examine on the airplane. See Figure 1 and Figure 2.

(3) Use 3 or 4 fasteners to identify a standard signal for an acceptable fastener on the airplane.

(a) Balance the instrument on a fastener from this group.

NOTE: Do not change the instrument sensitivity after you identify the standard signal for an acceptable fastener on the airplane.

(b) During the inspection, refer back to this fastener to make sure that the signal it caused is the same as first recorded. (Signal changes can occur because of instrument drift or probe temperature change).

(c) If the balance point signal changes more than 10%, balance the instrument again.

NOTE: A small amount of movement in the balance point can occur during the inspection because of changes in the material thickness.

(4) Examine the fasteners identified in Figure 2, flagnote 3, from the external side of the airplane. Examine the forward fastener row and then the aft fastener row.

NOTE: Make sure that you center the ring probe on each fastener.

(a) During the inspection, frequently do a calibration test of the instrument as follows:

NOTE: Do not adjust the instrument gain.

1) Put the probe on the reference standard as shown in Figure 4, position C and balance the instrument.

2) Put the probe on the reference standard as shown in Figure 4, position D. Compare the signal you got from the notch during calibration with the signal you get now.

3) If the signal from the notch in the reference standard has changed 10 percent or more from the signal you got during calibration, then do the calibration and inspection again for all the fasteners examined since the last calibration test.

B. Make a scan between the rows of fasteners shown in Figure 2, flagnote 4 with a spot probe as follows:

(1) Calibrate the instrument as specified in Paragraph 4.B.

(2) Put the probe between the rows of fasteners in the inspection area shown in Figure 1 andFigure 2.

(3) Balance the instrument as specified in the manufacturer's instructions.

(4) Move the probe between 3 to 4 fasteners to identify a standard signal for an acceptable area. A large change in the signal that occurs can be caused by a crack at one of the fastener holes. If this occurs, balance the instrument at a different location.

NOTE: Do not change the instrument sensitivity after you identify the standard signal for an acceptable fastener location on the airplane.

(5) Do an inspection along Station 287 as identified in Figure 2, flagnote 4, from the external side of the airplane. Keep the probe centered between the rows of fasteners at all times.

(a) If the balance point signal changes more than 10%, balance the instrument again.

NOTE: The balance point can change during the inspection because of changes in material thickness.

(b) During the inspection, frequently do a calibration test of the instrument as follows:

NOTE: Do not adjust the instrument gain.

1) Put the probe on the reference standard as shown in Figure 4, position A, and balance the instrument.

2) Put the probe on the reference standard as shown in Figure 4, position B. Compare the signal you got from the notch during calibration with the signal you get now.

3) If the signal from the notch in the reference standard has changed 10 percent or more from the signal you got during calibration, then do the calibration and inspection again for all the fasteners examined since the last calibration test.

6. Inspection Results

A. A signal that is more than 50% of FSH is a possible crack indication. Further examination is necessary.

NOTE: The signal from a crack can be at a different angle than the signal from the notch in the reference standard. Reject a crack only by the amplitude of the signal.

B. Compare crack-type signals with the signal that you got from the same location on the opposite side of the airplane.

C. The conditions that follow can cause signals to occur that are almost the same as crack signals:

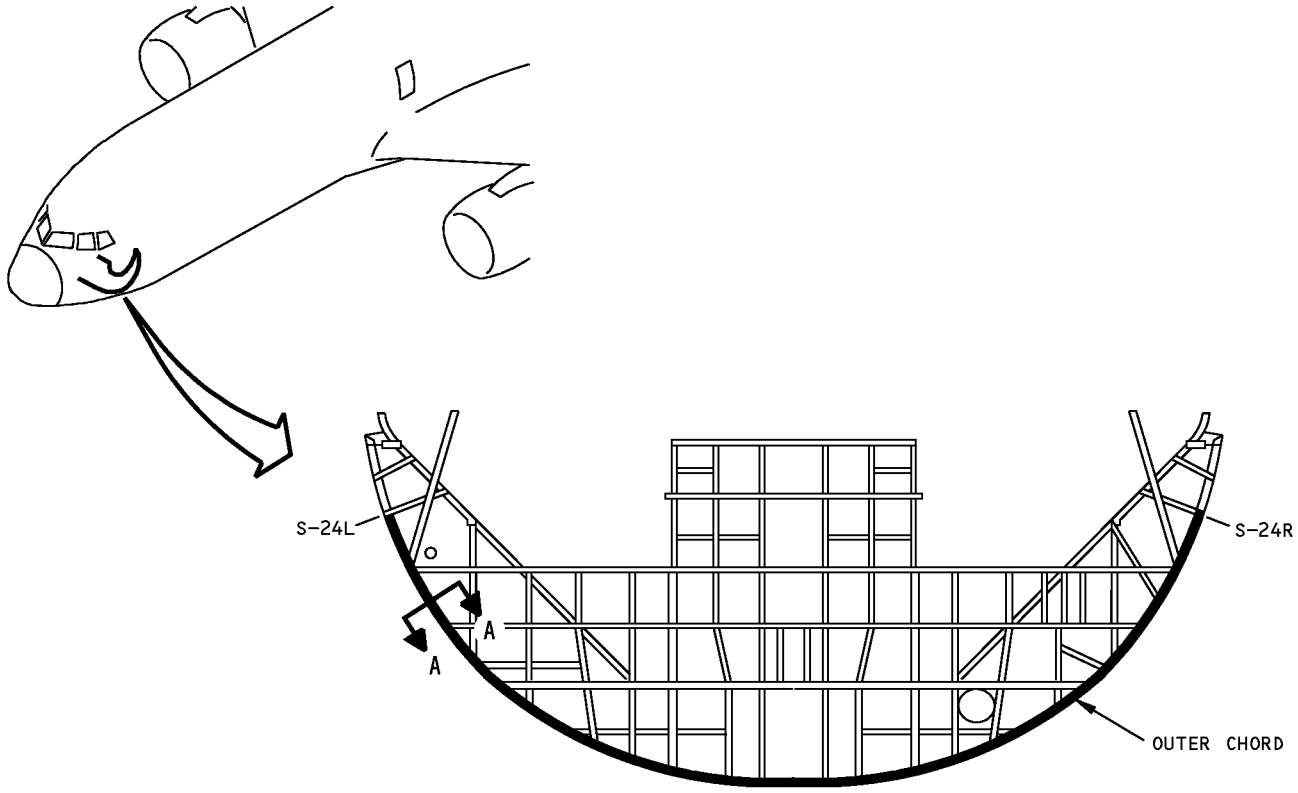
(1) Decreased space between fasteners. Compare with equivalent spaced fasteners on the airplane.

(2) Edge of subsurface structure or skin. At locations shown in Figure 2, flagnote 1, these indications are permitted.

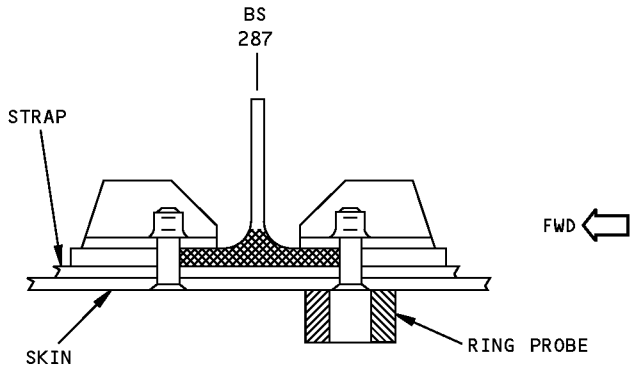
(3) Probe to near to, or above the head of, a fastener.

D. A downscale (lower) signal is an indication of an increase in structural thickness. An upscale signal that stays up is an indication of a decrease in structural thickness.

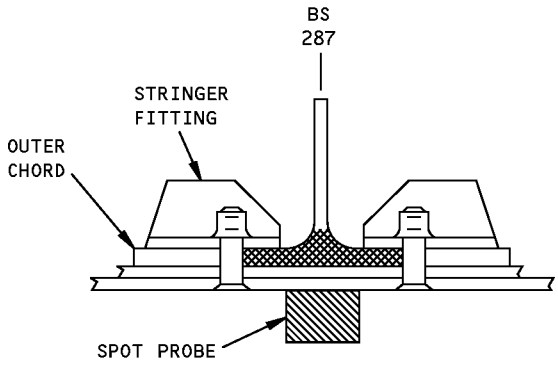
E. If crack indications are found, do an open hole eddy current inspection as specified in Part 6, 51-00-04, Part 6, 51-00-11 or Part 6, 51-00-16.



BODY STATION (BS) 287
VIEW AS YOU LOOK FORWARD



RING PROBE INSPECTION
A-A



SPOT PROBE INSPECTION
A-A

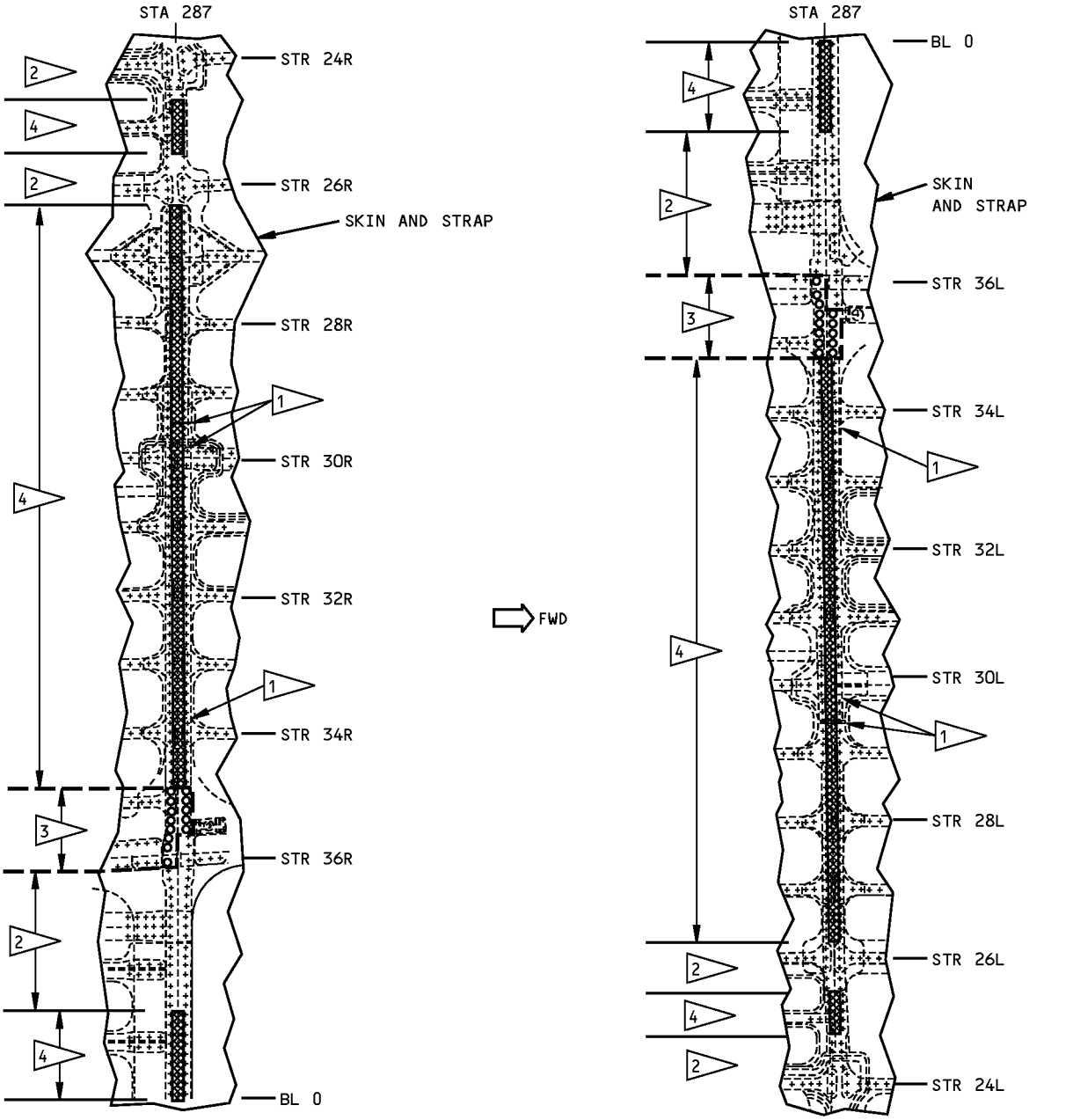
NOTES

- EXAMINE THE OUTER CHORD AT BODY STATION 287 FROM S-24L TO S-24R

CRACK EXAMPLE

INSPECTION AREA

Inspection Area and Probe Positions
Figure 1

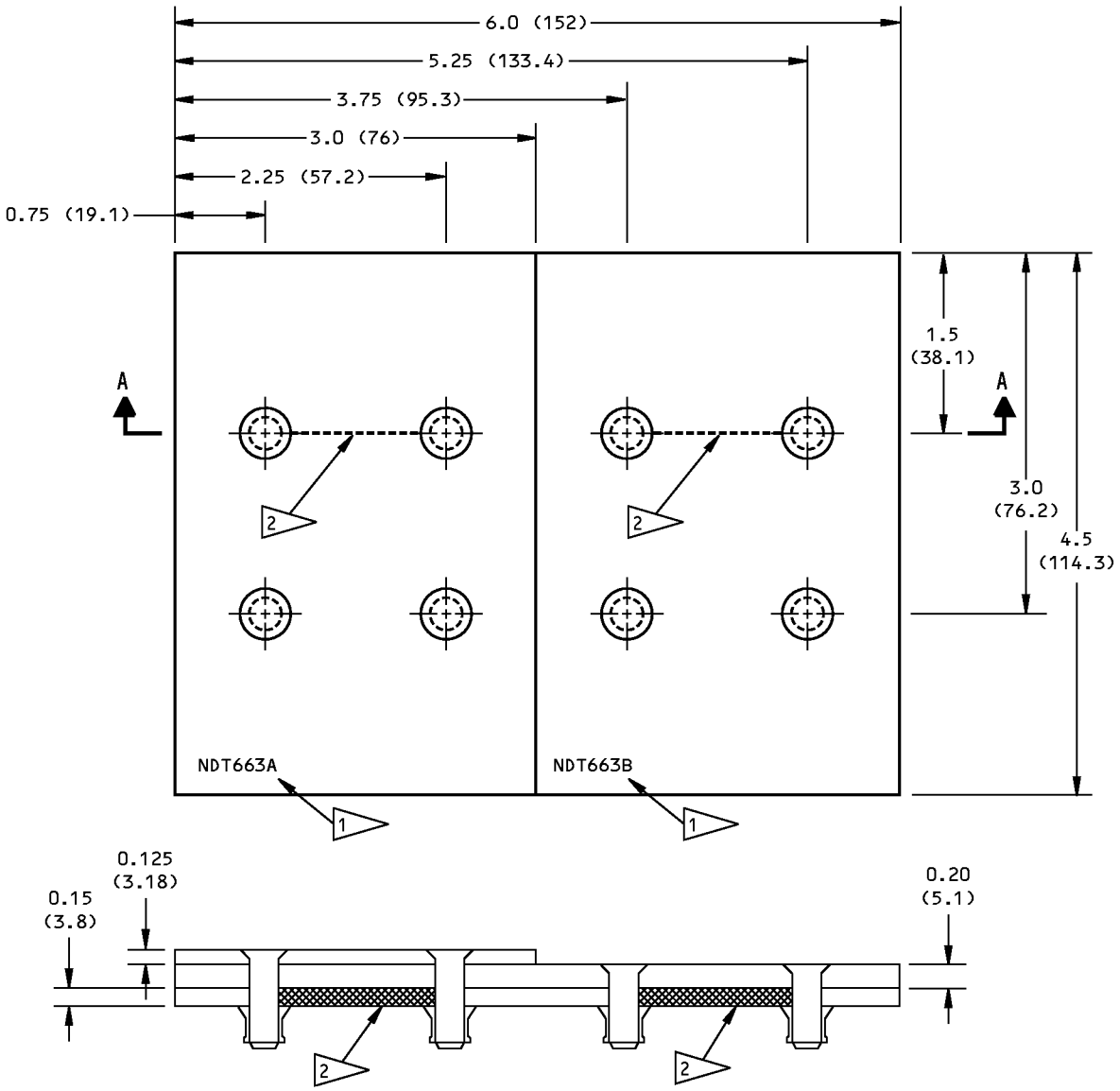


NOTES

- • EXTERNAL VIEW
- ○ INSPECTION FASTENERS FOR THE RING PROBE
- INSPECTION AREA FOR THE SPOT PROBE. MOVE THE PROBE DOWN THE CENTER OF THE FASTENERS TO DO THE SCAN IN THESE ARAES

1. EDGE OF SUBSURFACE STRUCTURE CAUSES CRACK INDICATION AT THESE LOCATIONS.
2. INSPECTION NOT POSSIBLE BECAUSE OF SUBSURFACE EDGE EFFECTS AND THICKNESS CHANGES.
3. USE REFERENCE STANDARD NDT663A AND THE RING PROBE.
4. USE REFERENCE STANDARD NDT663B AND THE SPOT PROBE.

Station 287 Inspection Area
Figure 2



A-A

NOTES

- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCE (UNLESS SPECIFIED DIFFERENTLY):

INCHES	MILLIMETERS
X.XXX = ± 0.005	X.XX = ± 0.10
X.XX = ± 0.025	X.X = ± 0.5
X.X = ± 0.050	X = ± 1

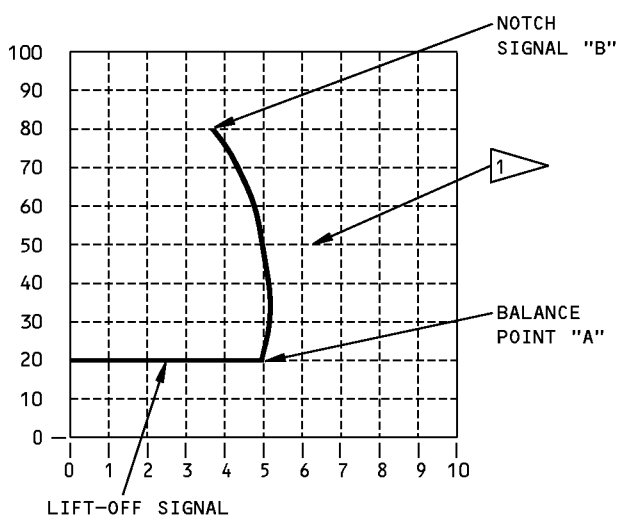
- MATERIAL: ALUMINUM 2024-T3,-T4 OR 7075-T6, -T735,-T76
- SURFACE ROUGHNESS: 125 Ra OR BETTER
- INSTALL BACB30NW8K HI-LOK FASTENER AND BACC30M COLLAR OR EQUIVALENTS (8 LOCATIONS).

1 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT663A AND NDT663B AS SHOWN AT APPROXIMATELY THIS LOCATION.

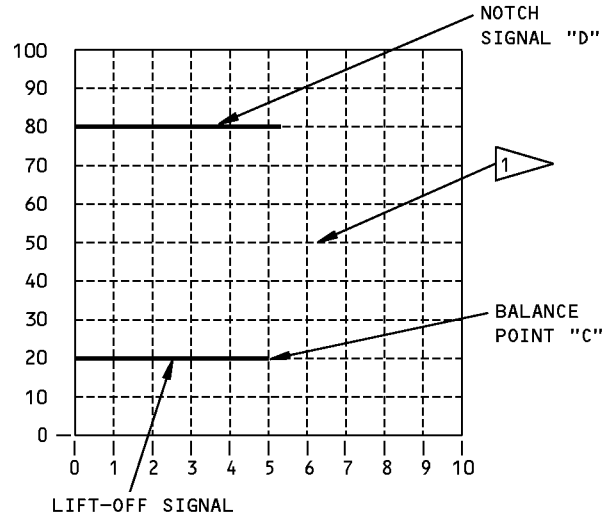
2 EDM OR JEWELER'S SAWCUT, THE NOTCH MUST BE WITHIN +0.005 (0.13) OF THE CENTERLINE OF THE HOLE AS SHOWN.

NOTCH DIMENSIONS AND TOLERANCES:
WIDTH: 0.030 (0.76) MAXIMUM
LENGTH: HOLE-TO-HOLE

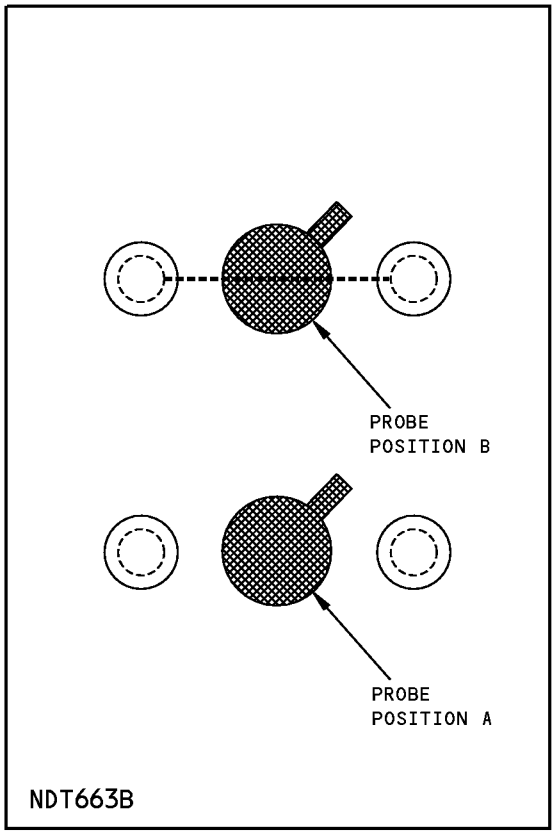
Reference Standard NDT663A and NDT663B
Figure 3



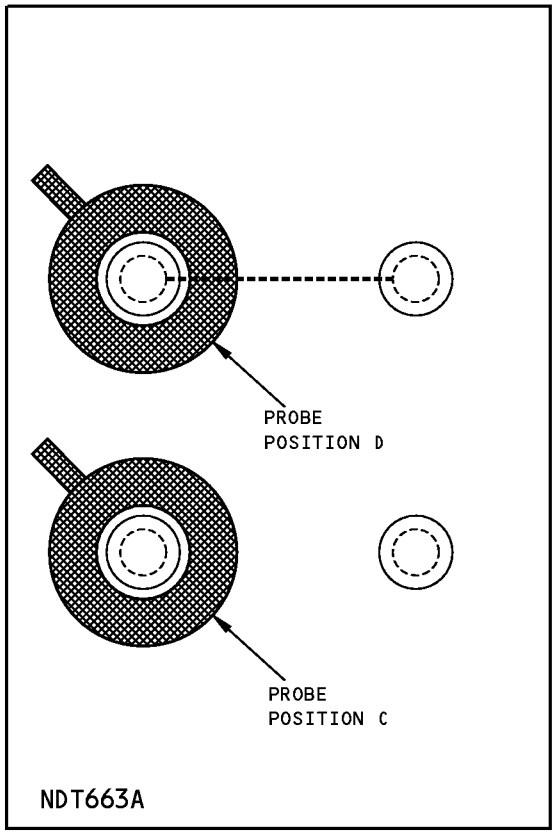
IMPEDANCE PLANE DISPLAY



IMPEDANCE PLANE DISPLAY



SPOT PROBE



RING PROBE

1 SIGNALS MORE THAN 50 PERCENT OF THE DISPLAY ARE INDICATIONS OF CRACKS

Instrument Screen Display Examples
Figure 4

TOP PANEL BEAM ATTACHMENT OF THE NOSE LANDING GEAR TRUNNION SUPPORT FITTING

1. Purpose

A. Use this surface eddy current inspection procedure to find cracks in the free flange radius of the nose landing gear trunnion support fitting where it attaches to the top panel beam.

B. This inspection procedure examines the outboard radius of the trunnion support fitting for possible cracks at BS 276, WL 181 to 189, BL 30, on the left and right sides of the airplane. See Figure 1 for the inspection areas.

C. This procedure uses a pencil probe with an impedance plane display or a meter display instrument to find surface cracks.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I20B

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments that follow were used to help prepare this procedure.

(a) Phasec 2200; Hocking Krautkramer

(b) Nortec 19e; Staveley Instruments

(c) Locator UHB; Hocking

C. Probes

(1) Use a 0.125 inch (3.17 mm) diameter pencil probe. Refer to Part 6, 51-00-01, par. 2.B. for data about probe selection.

(2) The probes that follow were used to help prepare this procedure.

(a) MP903-50/L2M; NDT Engineering Corp.

(b) MT-50FX/50K-300K; NDT Engineering Corp.

D. Reference Standard

(1) For meter display instruments, refer to Part 6, 51-00-01, par. 2.C. for reference standard data.

(2) For impedance plane display instruments, refer to Part 6, 51-00-19, par. 2.D., for reference standard data.

3. Preparation for Inspection

A. Get access to the inspection area at BS 276 through the main equipment center access door. See Figure 1.

B. Identify all the inspection areas. See Figure 1.

C. Remove blankets as necessary to get access to the inspection area.

D. Remove sealant, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. For meter display instruments, refer to Part 6, 51-00-01, par. 4, for the calibration instructions.

B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 4, for the calibration instructions.

5. Inspection Procedure

A. Calibrate the instrument as specified in Paragraph 4.

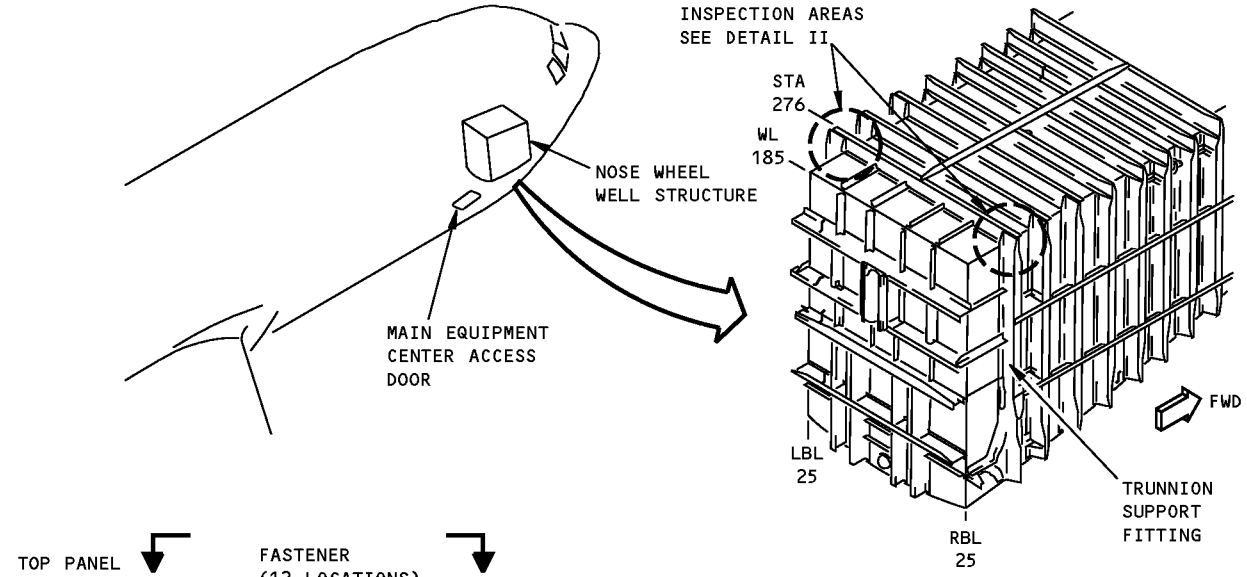
B. For instruments with a meter display, refer to Part 6, 51-00-01, par. 5 for the inspection procedure. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

C. Make a scan of the entire radius of the trunnion support fitting flange as identified in Figure 1, Detail II, on the left and right sides of the airplane. Keep the probe against the surface of the trunnion support fitting during the scan.

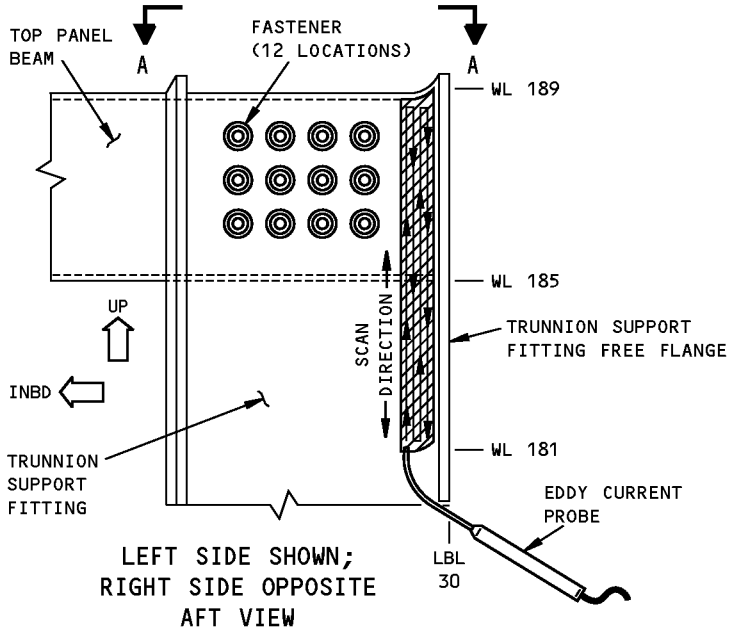
NOTE: If the radius of the trunnion support fitting flange is blocked by a bracket, it is permitted, in that area only, to do a scan along the aft side of the trunnion support fitting flange as shown in Figure 1, Section A-A, Flagnote 2.

6. Inspection Results

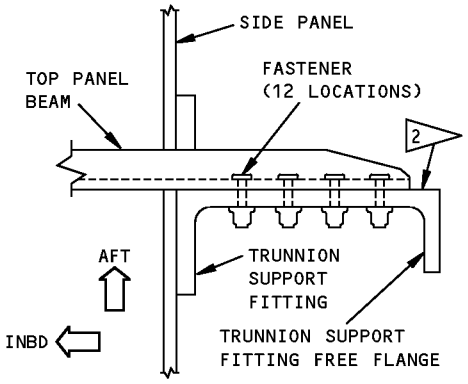
A. For instruments with a meter display, refer to Part 6, 51-00-01, par. 6 for data to help make an analysis of the inspection results. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6 for data to help make an analysis of the inspection results.



INSPECTION AREA
NOSE LANDING GEAR WHEEL WELL
TRUNNION SUPPORT FITTING TO
TOP PANEL BEAM ATTACHMENT
DETAIL I



LEFT SIDE SHOWN;
RIGHT SIDE OPPOSITE
AFT VIEW
TRUNNION SUPPORT FITTING
DETAIL II



TOP VIEW

TRUNNION SUPPORT FITTING TO
TOP PANEL BEAM ATTACHMENT
A-A

NOTES

INSPECTION AREA

1 THE INSPECTION AREA IS THE FULL RADIUS OF THE TRUNNION SUPPORT FITTING. THE SCAN PATH MUST BE IN THE UP AND DOWN DIRECTION AS SHOWN TO DO A CHECK FOR HORIZONTAL CRACKS.

2 IF THE RADIUS OF THE TRUNNION SUPPORT FITTING FLANGE IS BLOCKED BY A BRACKET, IT IS PERMITTED, IN THAT AREA ONLY, TO DO A SCAN ALONG THE AFT SIDE OF THE TRUNNION SUPPORT FITTING FLANGE. THE SCAN MUST BE IN THE UP AND DOWN DIRECTION TO DO A CHECK FOR HORIZONTAL CRACKS.

Inspection Area
Figure 1

PART 6 - EDDY CURRENT

NOSE LANDING GEAR TRUNNION SUPPORT FITTING AT THE ATTACH STRAP

1. Purpose

A. This inspection procedure uses surface eddy current to find cracks in the free flange radius and flange of the trunnion support fitting for the nose landing gear.

B. This inspection procedure examines the outboard radius and six fastener locations of the trunnion support fitting for possible cracks at BS 276, WL 165 to 169, BL 30, on the left and right sides of the airplane. See Figure 1 for the inspection areas.

C. This procedure uses a pencil probe with an impedance plane display to find surface cracks.

D. MPD DTR Check Form Reference:

(1) ITEM 53-10-I20C

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00, for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments that follow were used to help prepare this procedure.

(a) Phasec 2200; Hocking Krautkramer

C. Probes

(1) Use a 0.125 inch (3.17 mm) diameter pencil probe. Refer to Part 6, 51-00-19, par. 2.C., for data about probe selection.

(2) The probes that follow were used to help prepare this procedure.

(a) MP903-50/L2M; NDT Engineering Corp.

(b) MT-50FX/50K-300K; NDT Engineering Corp.

D. Reference Standard

(1) Refer to Part 6, 51-00-19, par. 2.D., for reference standard data.

3. Preparation for Inspection

A. Get access to the inspection area at BS 276 through the main equipment center access door. See Figure 1

B. Identify all the inspection areas. See Figure 1.

C. Remove blankets as necessary to get access to the inspection area.

D. Remove sealant, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. Calibration for the radius inspection.

(1) Refer to Part 6, 51-00-19, par. 4, for the calibration instructions. Use reference standard 126 or an equivalent.

B. Calibration for the inspection around the fasteners.

(1) Refer to Part 6, 51-00-19, par. 4, for the calibration instructions. Use reference standard 188A and the aluminium fastener. It is acceptable to use an equivalent reference standard.

5. Inspection Procedure

A. Refer to Part 6, 51-00-19, par. 5 and Fig. 12 (Protruding Head Fastener Inspection) and Fig. 13 (Radius Inspection) for the inspection procedures.

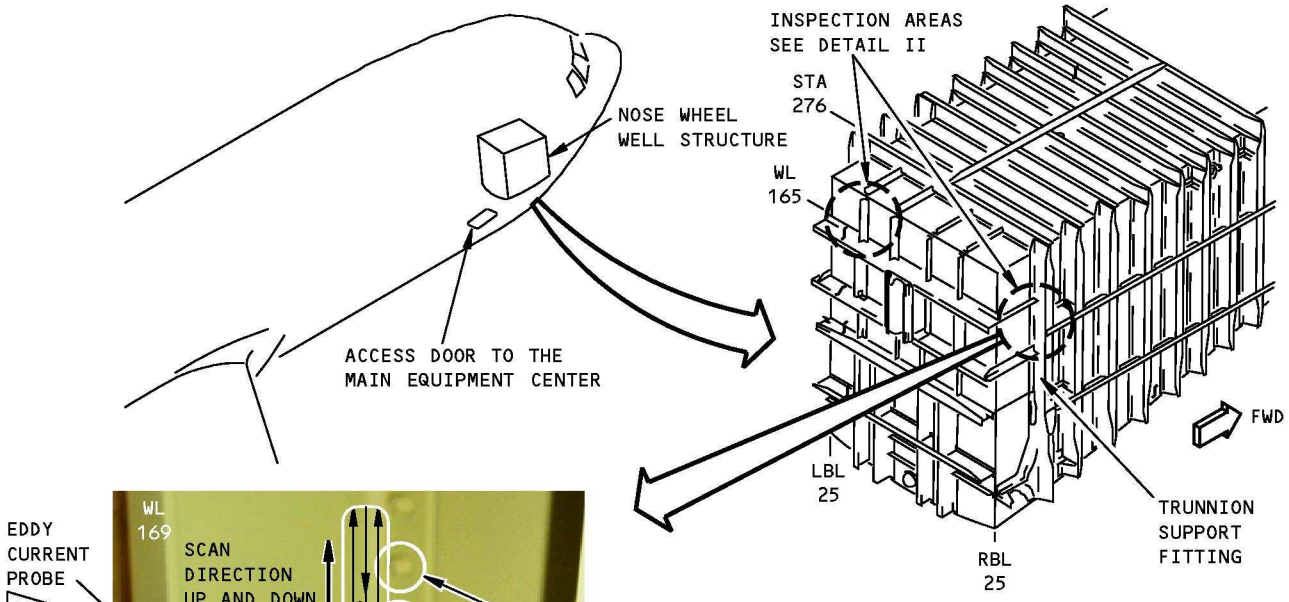
B. Calibrate the instrument as specified in Paragraph 4.A. and make a scan of the radius of the trunnion support fitting flange as shown in Figure 1, Detail II, on the left and right sides of the airplane.

NOTE: Where the radius of the trunnion support fitting flange is blocked by the bracket, it is permitted to do a scan along the aft side of the trunnion support fitting flange.

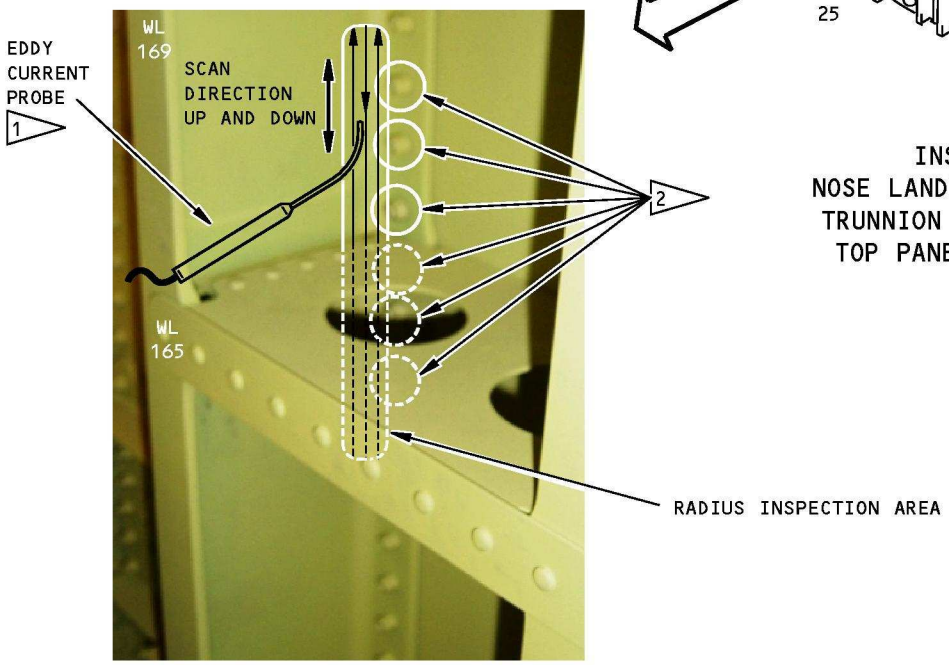
C. Calibrate the instrument as specified in Paragraph 4.B. and make a scan around the six fasteners shown in Figure 1, Detail II, on the left and right sides of the airplane.

6. Inspection Results

A. Refer to Part 6, 51-00-19, par. 6, for data to help make an analysis of the inspection results.



INSPECTION AREA
NOSE LANDING GEAR WHEEL WELL
TRUNNION SUPPORT FITTING TO
TOP PANEL BEAM ATTACHMENT
DETAIL I



DETAIL II

NOTES:

1. THE INSPECTION AREA IS THE FULL RADIUS OF THE TRUNNION SUPPORT FITTING FROM WL 165 TO WL 169. THE SCAN PATH MUST BE IN THE UP AND DOWN DIRECTION AS SHOWN TO DO A CHECK FOR HORIZONTAL CRACKS. WHERE THE RADIUS OF THE TRUNNION SUPPORT FITTING FLANGE IS BLOCKED BY THE BRACKET, IT IS PERMITTED TO DO A SCAN ALONG THE AFT SIDE OF THE TRUNNION SUPPORT BRACKET FLANGE. THE SCAN MUST BE IN THE UP AND DOWN DIRECTION TO DO A CHECK FOR HORIZONTAL CRACKS.

2. MAKE A SCAN AROUND THE SIX FASTENERS SHOWN HERE. TWO OF THE FASTENERS ARE HIDDEN FROM VIEW.

Inspection Area
Figure 1

ACCESS DOOR CUTOUT OF THE FORWARD EQUIPMENT BAY

1. Purpose

A. This inspection procedure uses surface eddy current to find surface cracks in the doubler at the corner fastener locations and along the edge of the access door cutout for the forward equipment bay.

B. This inspection procedure examines the doubler for possible cracks in the four corners of the cutout and at the corner fastener locations at BS 143.5 and BS 169.75, at LBL 10.6 and RBL 10.6. See Figure 1 for the inspection areas.

C. This procedure uses an impedance plane display or a meter display instrument to find surface cracks.

D. MPD DTR Check Form Reference:

(1) Item 53-10-I13

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00, for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments that follow were used to help prepare this procedure.

(a) Phasec 2200, Phasec 2 (impedance plane display); Hocking Krautkramer

(b) Nortec 19e, 1000, 2000 (impedance plane display); Staveley Instruments

(c) Locator (meter display); Hocking

C. Probes

(1) A shielded 0.125 inch (3.18 mm), straight or right-angle pencil probe is satisfactory for use.

(2) The probes that follow were used to help prepare this procedure.

(a) MP-30; NDT Engineering Corp.

(b) MP903-50/L2M; NDT Engineering Corp.

D. Reference Standard

(1) For meter display instruments, refer to Part 6, 51-00-01, for reference standard data for the applicable reference standards.

(2) For impedance plane display instruments, refer to Part 6, 51-00-19, for reference standard data for the applicable reference standards.

3. Preparation for Inspection

A. Identify all the inspection areas. See Figure 1.

NOTE: The corner fasteners can be protruding or flush. If there are flush fasteners, then use a circle template as a probe guide. If there are protruding fasteners, then use the fastener tail as a probe guide.

B. Get access to the doubler of the access door cutout for the forward equipment bay. See Figure 1.

C. Remove sealant, leveling compound, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. For meter display instruments, refer to Part 6, 51-00-01, par. 4, for the calibration instructions.

B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 4, for the calibration instructions.

5. Inspection Procedure

A. Calibrate the instrument as specified in Paragraph 4.

B. For instruments with a meter display, refer to Part 6, 51-00-01, par. 5, for the inspection procedure.

C. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 5, for the inspection procedure.

D. Make a complete scan of all the inspection areas identified in Figure 1, at all four corners of the access door cutout from inside the airplane.

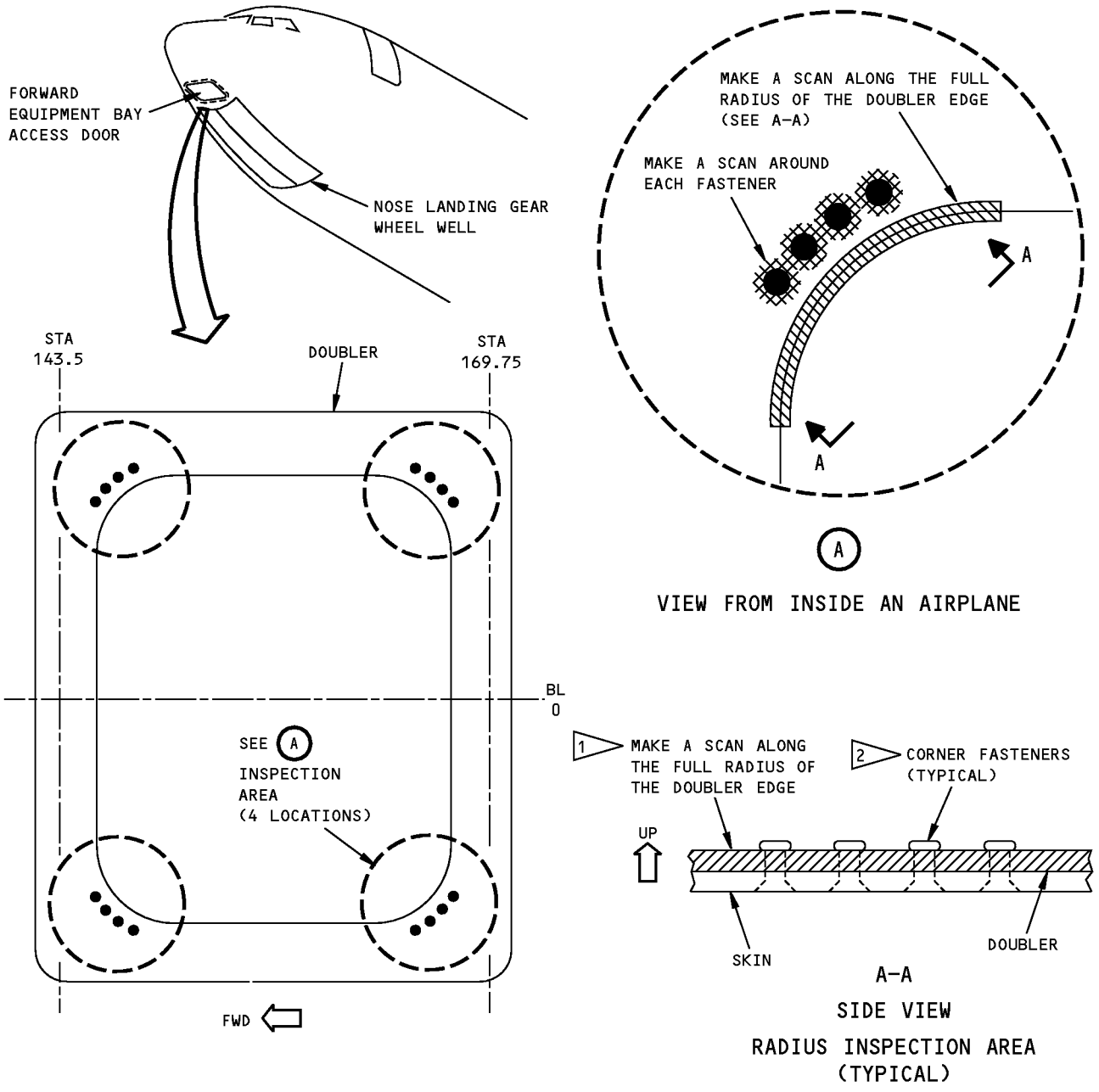
(1) Examine the inspection areas around the fastener locations as identified in Figure 1.

(2) Examine the inspection areas at all four corner edges of the doubler cutout as identified in Figure 1. Make a scan from the start of the radius in the doubler cutout to the end of the radius at all four locations. Keep the probe against the edge of the doubler radius during the scan.

6. Inspection Results

A. For instruments with a meter display, refer to Part 6, 51-00-01, par. 6, for data to help make an analysis of the inspection results.

B. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6, for data to help make an analysis of the inspection results.



1 MAKE A SCAN FROM THE START OF THE RADIUS IN THE DOUBLER CUTOUT TO THE END OF THE RADIUS AT ALL FOUR CORNER LOCATIONS.

2 CORNER FASTENERS CAN BE PROTRUDING OR FLUSH. IF THERE ARE FLUSH FASTENERS, THEN USE A NONCONDUCTIVE CIRCLE TEMPLATE AS A PROBE GUIDE. IF THERE ARE PROTRUDING FASTENERS, THEN USE THE FASTENER TAIL AS A PROBE GUIDE.

Inspection Area for the Access Door Cutout of the Forward Equipment Bay Door Cutout
Figure 1

PART 6 - EDDY CURRENT

ACCESS DOOR CUTOUT OF THE MAIN EQUIPMENT CENTER

1. Purpose

A. This inspection procedure uses surface eddy current to find surface cracks in the doubler at the corner fastener locations and along the edge of the access door cutout for the main equipment center.

B. This inspection procedure examines the doubler for possible cracks in the four corners of the cutout and at the corner fastener locations at BS 303 and BS 325, at LBL 13.1 and RBL 13.1. See Figure 1 for the inspection areas.

C. This procedure uses an impedance plane display or a meter display instrument to find surface cracks.

D. MPD DTR Check Form Reference:

(1) Item 53-10-I12

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00, for data about the equipment manufacturers.

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display or a meter display.

(b) Operates at a frequency range of 50 to 500 kHz.

(2) The instruments that follow were used to help prepare this procedure.

(a) Phasec 2200, Phasec 2 (impedance plane display); Hocking Krautkramer

(b) Nortec 19e, 1000, 2000 (impedance plane display); Staveley Instruments

(c) Locator (meter display); Hocking

C. Probes

(1) A shielded 0.125 inch (3.18 mm) straight or right-angle pencil probe is satisfactory for use.

(2) The probes that follow were used to help prepare this procedure.

(a) MP-30; NDT Engineering Corp.

(b) MP903-50/L2M; NDT Engineering Corp.

D. Reference Standard

(1) For meter display instruments, refer to Part 6, 51-00-01, for reference standard data for the applicable reference standards.

(2) For impedance plane display instruments, refer to Part 6, 51-00-19, for reference standard data for the applicable reference standards.

3. Preparation for Inspection

A. Identify all the inspection areas. See Figure 1.

NOTE: The corner fasteners can be protruding or flush. If there are flush fasteners, then use a circle template as a probe guide. If there are protruding fasteners, then use the fastener tail as a probe guide.

B. Get access to the doubler of the access door cutout for the main equipment center from inside the airplane. See Figure 1.

C. Remove sealant, leveling compound, dirt, or grease from the inspection surfaces.

4. Instrument Calibration

A. For meter display instruments, refer to Part 6, 51-00-01, par. 4, for the calibration instructions.

B. For impedance plane display instruments, refer to Part 6, 51-00-19, par. 4, for the calibration instructions.

5. Inspection Procedure

A. Calibrate the instrument as specified in Paragraph 4.

B. For instruments with a meter display, refer to Part 6, 51-00-01, par. 5, for the inspection procedure.

C. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 5, for the inspection procedure.

D. Make a complete scan inspection of all the inspection areas identified in Figure 1, at all four corners of the access door cutout from inside the airplane.

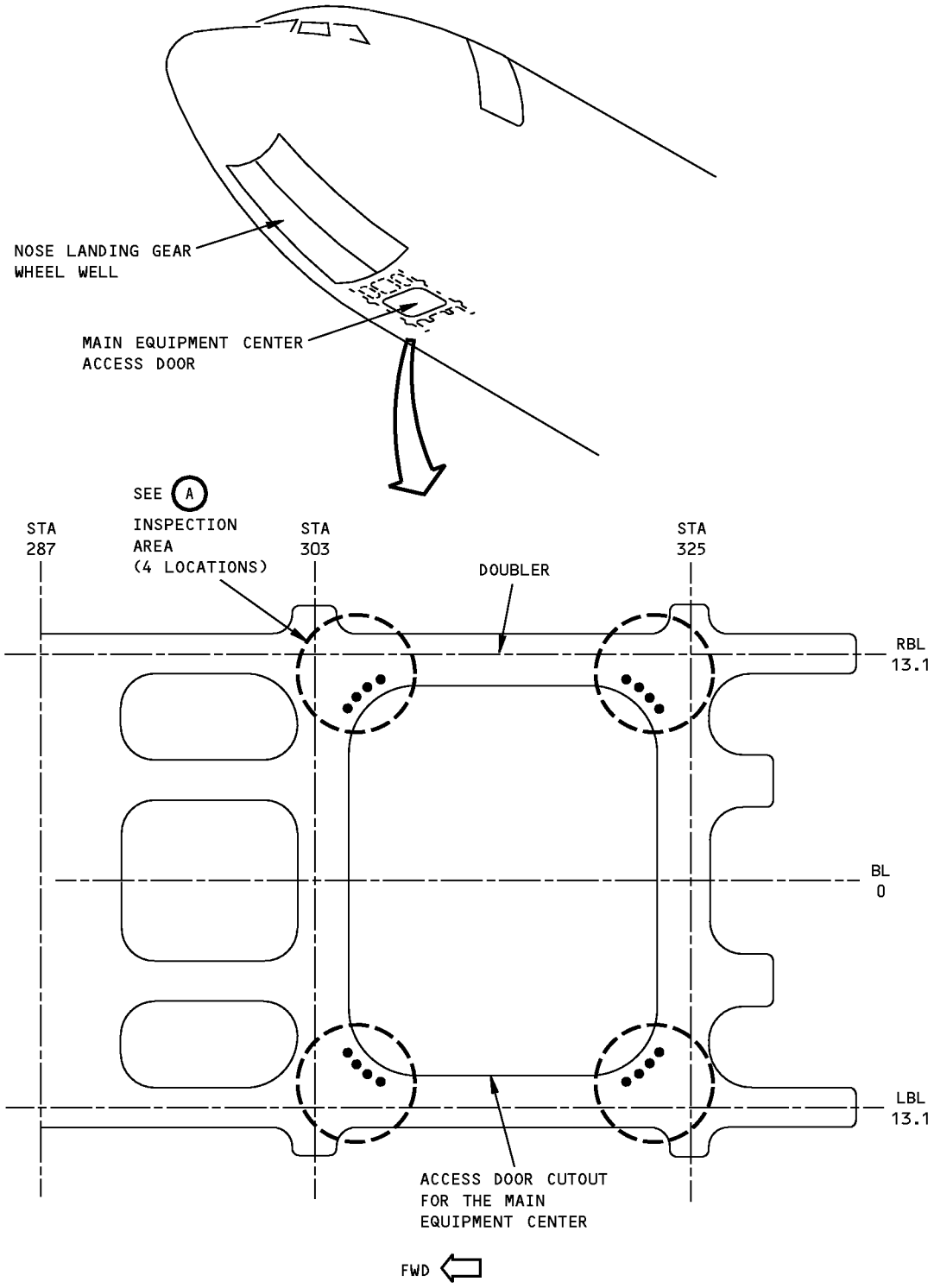
(1) Examine the inspection areas around the fastener locations as identified in Figure 1.

(2) Examine the inspection areas at all four corner edges of the doubler cutout as identified in Figure 1. Make a scan from the start of the radius in the doubler cutout to the end of the radius at all four locations. Keep the probe against the edge of the doubler radius during the scan.

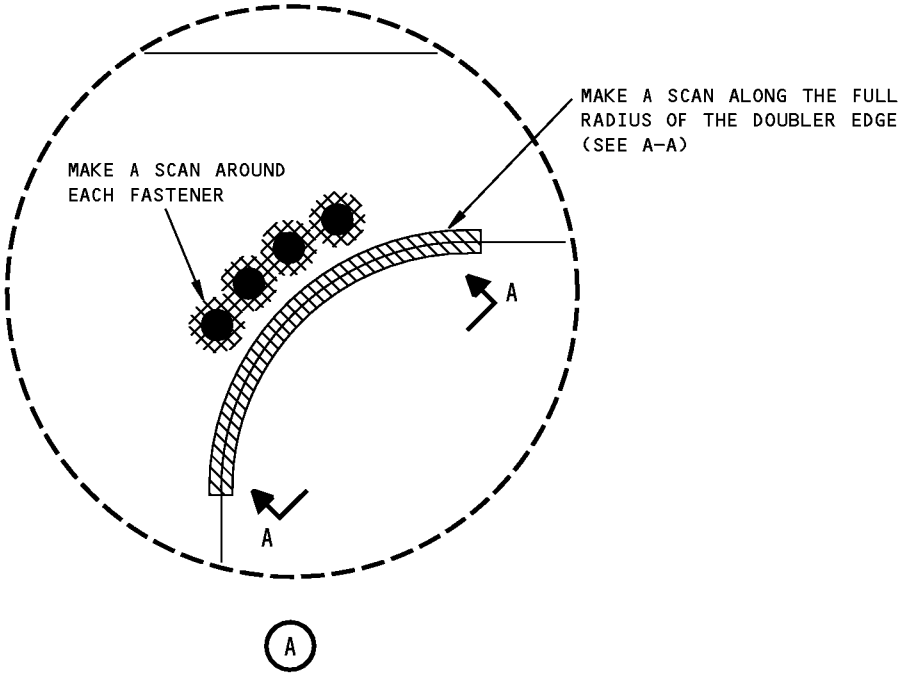
6. Inspection Results

A. For instruments with a meter display, refer to Part 6, 51-00-01, par. 6, for data to help make an analysis of the inspection results.

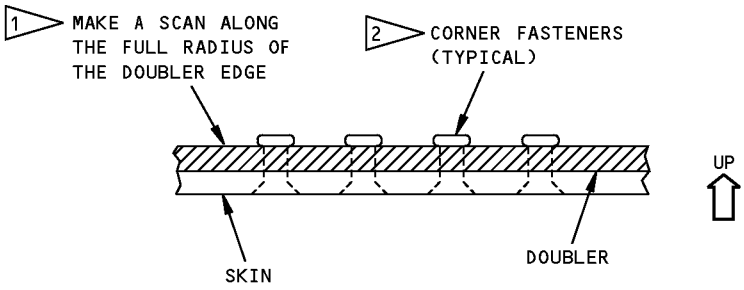
B. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6, for data to help make an analysis of the inspection results.



Inspection Area of the Access Door Cutout for the Main Equipment Center
Figure 1 (Sheet 1 of 2)



VIEW FROM INSIDE AN AIRPLANE



A-A

SIDE VIEW

RADIUS INSPECTION AREA
(TYPICAL)

1 MAKE A SCAN FROM THE START OF THE RADIUS IN THE DOUBLER CUTOUT TO THE END OF THE RADIUS AT ALL FOUR CORNER LOCATIONS.

2 CORNER FASTENERS CAN BE PROTRUDING OR FLUSH. IF THERE ARE FLUSH FASTENERS, THEN USE A NONCONDUCTIVE CIRCLE TEMPLATE AS A PROBE GUIDE. IF THERE ARE PROTRUDING FASTENERS, THEN USE THE FASTENER TAIL AS A PROBE GUIDE.

Inspection Area of the Access Door Cutout for the Main Equipment Center
Figure 1 (Sheet 2 of 2)

UPPER ROW OF THE LAP SPLICES (HFEC)

1. Purpose

A. Use this eddy current procedure to find cracks in the longitudinal lap splices of the fuselage skin along the upper row of fasteners. See Figure 1.

B. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I07

(2) ITEM 53-30-I04

(3) ITEM 53-60-I05

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an impedance plane display instrument that operates at a frequency range of 100 kHz to 500 kHz.

(2) A Nortec 2000 eddy current instrument was used to help prepare this procedure.

C. Probe

(1) Use a shielded pencil probe that can operate at a frequency between 100 kHz and 500 kHz.

(2) The probe that follows was used to help prepare this procedure.

(a) Right angle, shielded, pencil probe with 0.20 inch (5.0 mm) drop and a 6.0-inch (154 mm) bent handle. Part number MTF902-60B; made by NDT Engineering.

NOTE: If you order a probe, make sure you tell the probe manufacturer the eddy current instrument you will use. The above probe has a Triax Fisher connector. A probe cable will have to be ordered separately.

D. Reference Standard

(1) Make or buy reference standards NDT685 as shown in Figure 2.

NOTE: You can also use reference standard NDT1048. Refer to Part 6, 51-00-19 for data about the reference standard.

3. Preparation for Inspection

A. Find the inspection areas on the airplane. See Figure 1.

B. Get access to the upper fastener row of the skin lap splice from outside the airplane.

C. Remove dirt, grease and loose paint from the inspection area that the probe will touch.

4. Instrument Calibration

A. Calibrate the equipment to examine the upper fastener row of the skin lap splice for cracks in the skin as follows:

(1) Connect the probe to the instrument and adjust the instrument frequency to between 100 and 500 kHz.

(2) If the part to be examined is painted, put a nonconductive shim on the reference standard. The thickness of the shim must be equivalent (± 0.003 inch (0.08 mm)) to the paint thickness on the airplane.

(3) Put the probe on the reference standard, adjacent to the fastener head at probe position 1 as shown in Figure 3.

NOTE: Use a circle template to keep the probe at the same distance from the fastener head.

(4) Balance the instrument as specified by the manufacturer's instructions.

(5) Set the balance point at approximately 20% of full screen height and 80% of full screen width as shown in Figure 3.

(6) Set the lift-off (phase) so that the signal moves from right to left as shown in Figure 3 when the probe is lifted off the reference standard.

(7) Move the probe around the fastener head and stop it when the probe is above the EDM notch as shown in Figure 3, probe position 2.

NOTE: Use a circle template to keep the probe at the same distance from the fastener head when you move the probe around the fastener head.

(8) Monitor the signal from the notch at probe position 2 that occurs on the instrument screen display.

(9) Adjust the instrument gain to get a notch signal that is approximately 60% of full screen height as shown in Figure 3.

(10) Do Paragraph 4.A.(3), Paragraph 4.A.(4) and Paragraph 4.A.(7) again to make sure that the notch signal is 60% of full screen height.

(11) Do Paragraph 4.A.(3) thru Paragraph 4.A.(10) again if the notch signal is not approximately 60% of full screen height.

5. Inspection Procedure

A. Identify the areas to be examined. See Figure 1.

B. Examine the skin lap splices for cracks along the upper fastener row(s) as follows:

(1) Calibrate the instrument as specified in Paragraph 4.

(2) Put the probe adjacent to the fastener head of a fastener in the upper row of the skin lap splice. See Figure 4.

(3) Balance the instrument.

(4) Do a 360 degree scan around the fastener head. Use the same circle template hole that you used during calibration to make sure the probe stays at the same distance from the fastener head.

(a) Monitor the instrument screen display at the same time you move the probe.

(b) Make a record of the fastener hole location if it causes a signal to occur that is 50% (or more) of the calibration notch signal.

(5) Examine all the fasteners in the upper row(s) of the skin lap splice in all the inspection areas specified in Figure 1.

6. Inspection Results

A. A signal that is 50% (or more) of the calibration notch signal is an indication of a possible crack.

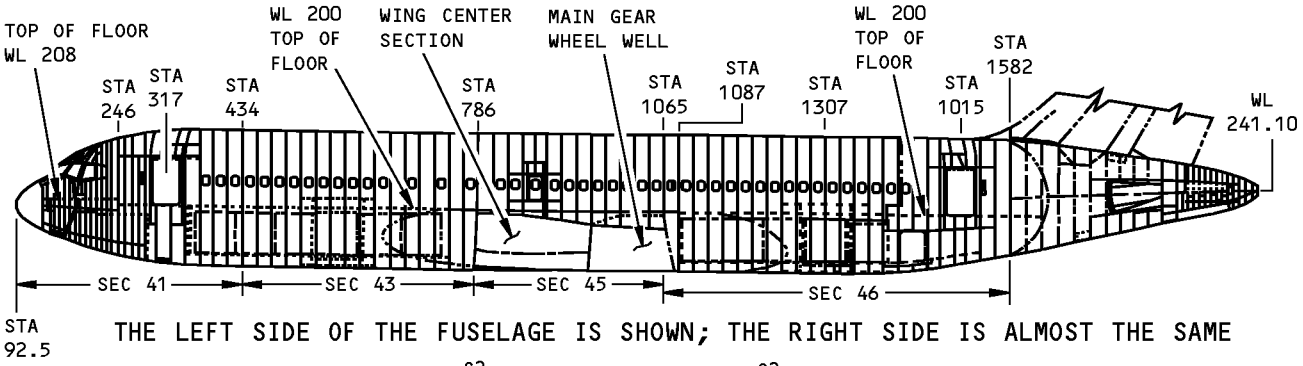
(1) Compare the signals you get during the inspection to the signals you got from the reference standard during calibration.

B. Do one of the procedures that follow to make sure a signal is the result of a crack:

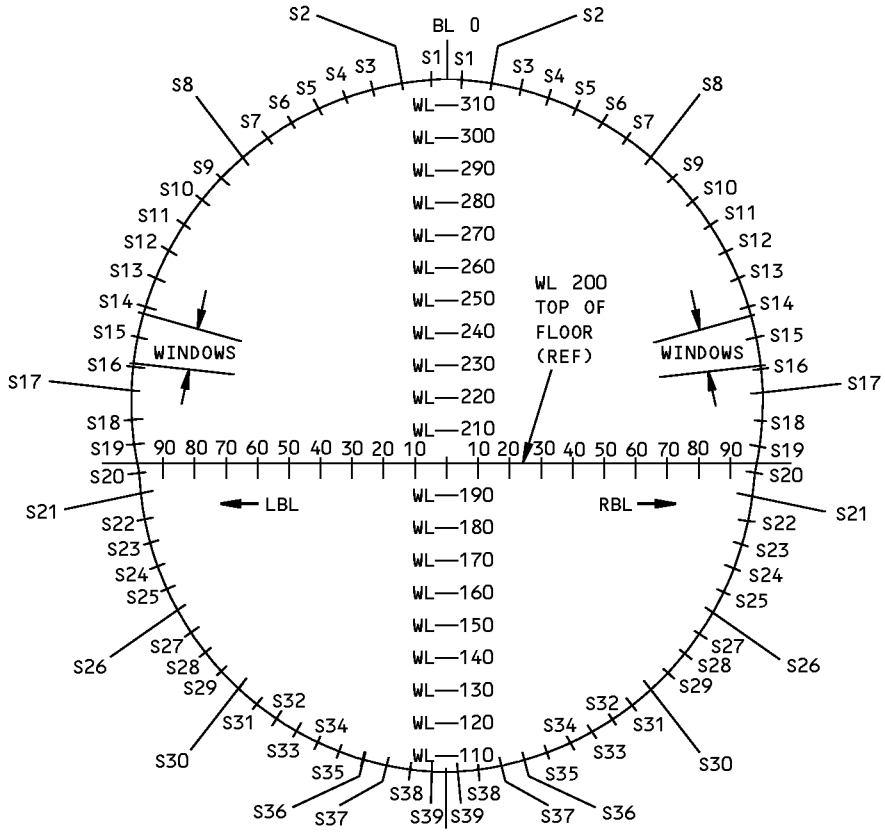
(1) Remove the surface finish and do a visual inspection with a 10-power (or higher) magnification and sufficient light.

(2) Remove the fastener and do a penetrant inspection as specified in SOPM 20-20-02.

(3) Remove the fastener and do a countersink inspection as specified in Part 6, 53-30-01, Part 6, 53-30-02, or Part 6, 53-30-03.



THE LEFT SIDE OF THE FUSELAGE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME

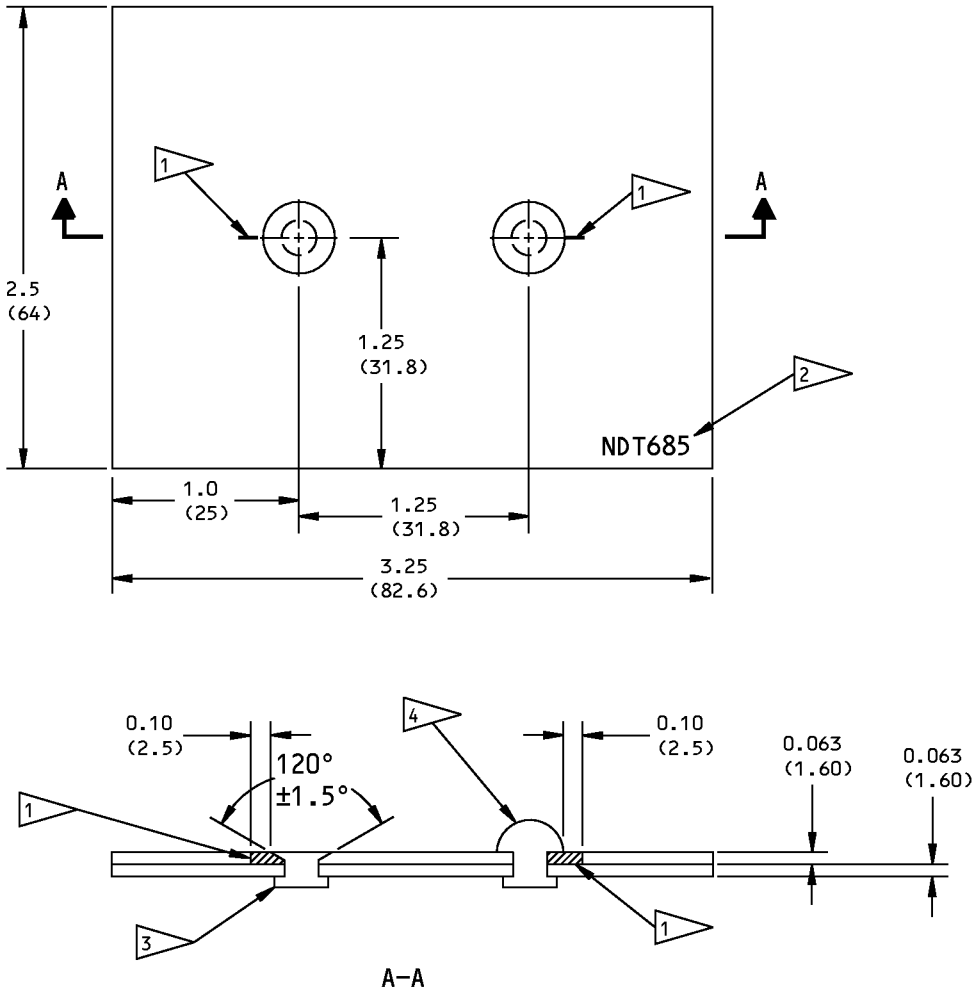


FORWARD VIEW OF A CONSTANT SECTION OF THE FUSELAGE

NOTES:

- EXAMINE THE LONGITUDINAL LAP SPLICES OF THE SKIN ALONG THE UPPER FASTENER ROW FROM OUTSIDE THE AIRPLANE AS FOLLOWS:
  - S-2 (RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-8 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-17 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-21 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-26 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-30 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-36 (LEFT AND RIGHT) FROM STA 434 TO STA 786 AND STA 1065 TO STA 1582
  - S-37 (LEFT AND RIGHT) FROM STA 287 TO STA 434

Fuselage Skin Longitudinal Lap Splice Inspection
Figure 1



NOTES:

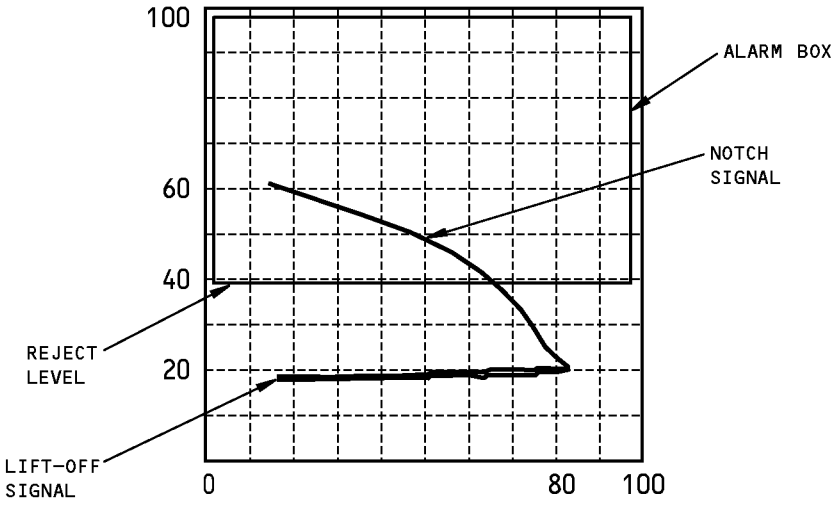
- DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCE (UNLESS SPECIFIED DIFFERENTLY):

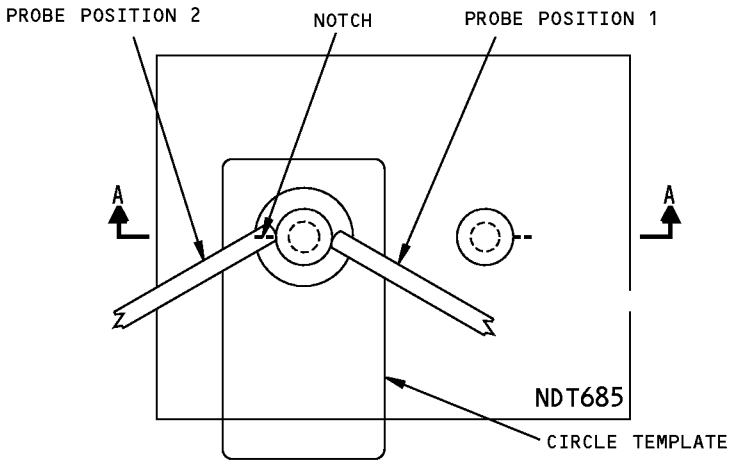
INCHES	MILLIMETERS
X.XXX = ±0.005	X.XX = ±0.1
X.XX = ±0.025	X.X = ±0.5
X.X = ±0.050	X = ±1

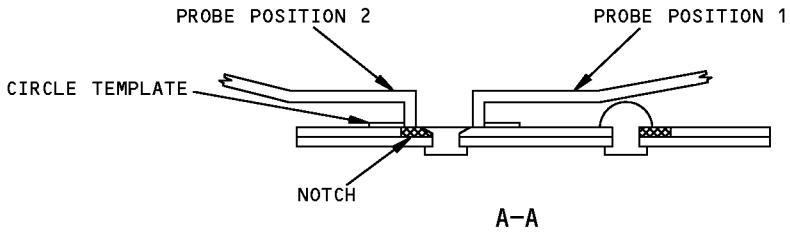
- SURFACE ROUGHNESS: 12 Ra OR BETTER
- MATERIAL: 2024-T3,-T4 ALUMINUM CLAD

1. EDM NOTCHES: 0.100 (2.5) X 0.010 (0.25) X THROUGH THE THICKNESS
2. ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT685 AT APPROXIMATELY THIS LOCATION.
3. FASTENER - BACR15FV6KE5 (BRILES RIVET)
4. FASTENER - BACR15BB6AD5

Reference Standard NDT685
Figure 2



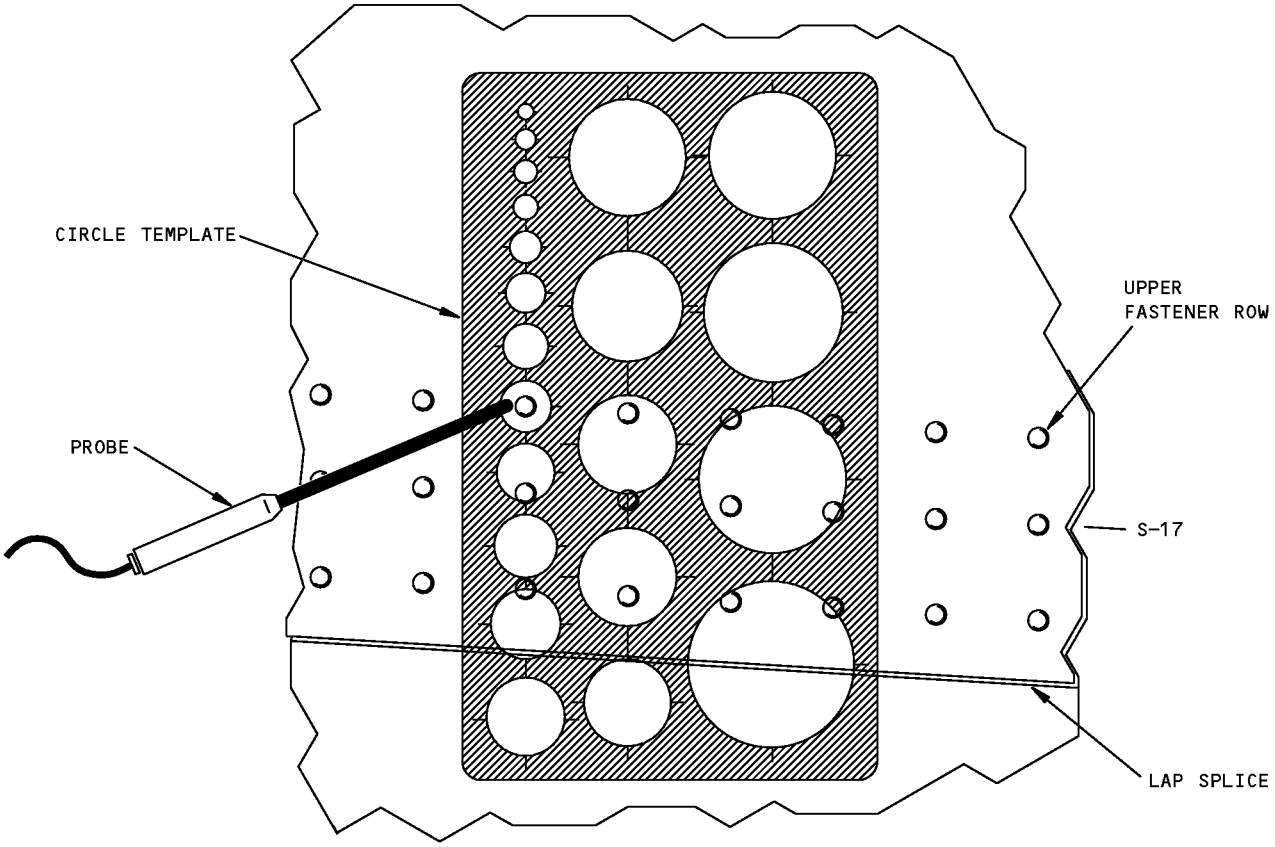




NOTES:

- PROBE POSITION 1 - PUT THE PROBE ADJACENT TO THE FASTENER HEAD ON THE REFERENCE STANDARD SO THAT IT IS ON THE SIDE THAT IS AWAY FROM THE NOTCH.
- SLOWLY MOVE THE PROBE AROUND THE SIDE THAT IS AWAY FROM THE NOTCH.
- PROBE POSITION 2 - THE PROBE IS ABOVE THE NOTCH.
- USE THE TEMPLATE AS A GUIDE TO KEEP THE PROBE AT THE SAME DISTANCE FROM THE FASTENER HEAD WHEN YOU MOVE THE PROBE AROUND THE FASTENER HEAD.

Instrument Calibration
Figure 3



TYPICAL INSPECTION AREA

NOTES:

- THE UPPER FASTENER INSPECTION ROW AT THE STRINGER -17 LAP SPLICE IS SHOWN; ALL OTHER UPPER FASTENER ROW INSPECTION AREAS OF THE LAP SPLICES ARE ALMOST THE SAME.
- PUT THE PROBE ADJACENT TO THE FASTENER HEAD AND DO A 360 DEGREE SCAN AROUND THE FASTENER HEAD.
- EXAMINE ALL THE FASTENERS IN THE UPPER FASTENER ROW IN ALL OF THE INSPECTION AREAS.
- USE THE SAME CIRCLE TEMPLATE HOLE THAT WAS USED DURING CALIBRATION.

Scan Pattern
Figure 4

PART 6 - EDDY CURRENT

LOWER ROW OF THE LAP SPLICES (INTERNAL)

1. Purpose

A. Use this high frequency eddy current (HFEC) procedure to find cracks in the longitudinal lap splices of the fuselage skin along the lower row of fasteners. See Figure 1 for the inspection areas.

NOTE: This inspection is done from inside the airplane.

B. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I07

(2) ITEM 53-30-I04

(3) ITEM 53-60-I05

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an impedance plane display instrument that operates at a frequency range of 100 kHz to 500 kHz.

(2) A Nortec 2000 eddy current instrument was used to help prepare this procedure.

C. Probe

(1) Use a shielded pencil probe that can operate at a frequency between 100 kHz and 500 kHz.

(2) The probe that follows was used to help prepare this procedure.

(a) Right angle, shielded, pencil probe with a 0.20 inch (5.0 mm) drop and a 6.0-inch (154 mm) bent handle. Part number MTF902-60B; made by NDT Engineering.

NOTE: If you order a probe, make sure you tell the probe manufacturer the eddy current instrument you will use. The above probe has a Triax Fisher connector. A probe cable will have to be ordered separately.

D. Reference Standard

(1) Make or buy reference standards NDT685 as shown in Figure 2.

NOTE: You can also use reference standard 188A. Refer to Part 6, 51-00-19 for data about the reference standard.

3. Preparation for Inspection

A. Find the inspection areas on the airplane. See Figure 1.

B. Get access to the lower fastener row of the skin lap splice from inside the airplane.

C. Remove dirt, grease and loose paint from the inspection area that the probe will touch.

4. Instrument Calibration

A. Calibrate the equipment to examine the lower fastener row of the skin lap splice for cracks in the skin as follows:

(1) Connect the probe to the instrument and adjust the instrument frequency to between 100 and 500 kHz.

(2) Put the probe on the reference standard, adjacent to the fastener head at probe position 1 as shown in Figure 3.

(3) Balance the instrument as specified by the manufacturer's instructions.

(4) Set the balance point at approximately 20% of full screen height and 80% of full screen width as shown in Figure 3.

(5) Set the lift-off (phase) so that the signal moves from right to left as shown in Figure 3 when the probe is lifted off the reference standard.

(6) Move the probe around the fastener head and stop it when the probe is above the EDM notch as shown in Figure 3, probe position 2.

(7) Monitor the signal from the notch at probe position 2 that occurs on the instrument screen display.

(8) Adjust the instrument gain to get a notch signal that is approximately 60% of full screen height as shown in Figure 3.

(9) Do Paragraph 4.A.(2), Paragraph 4.A.(3) and Paragraph 4.A.(6) again to make sure that the notch signal is 60% of full screen height.

(10) Do Paragraph 4.A.(2) thru Paragraph 4.A.(9) again if the notch signal is not approximately 60% of full screen height.

5. Inspection Procedure

A. Identify the areas to be examined. See Figure 1.

B. Examine the skin lap splices for cracks along the lower fastener row(s) as follows:

(1) Calibrate the instrument as specified in Paragraph 4.

(2) Put the probe adjacent to the driven end (tail) of a fastener in the lower row of the skin lap splice. See Figure 4.

(3) Balance the instrument.

(4) Do a 360 degree scan around the fastener tail.

(a) If the fastener is near the stringer so that you cannot do a 360 degree scan around the fastener, do the scan around the fastener as much as possible. The scan is satisfactory if the center of the probe can be moved at least 45 degrees above the centerline of the fasteners.

(b) Monitor the instrument screen display at the same time you move the probe.

(c) Make a record of the fastener hole location if it causes a signal to occur that is 50% (or more) of the calibration notch signal.

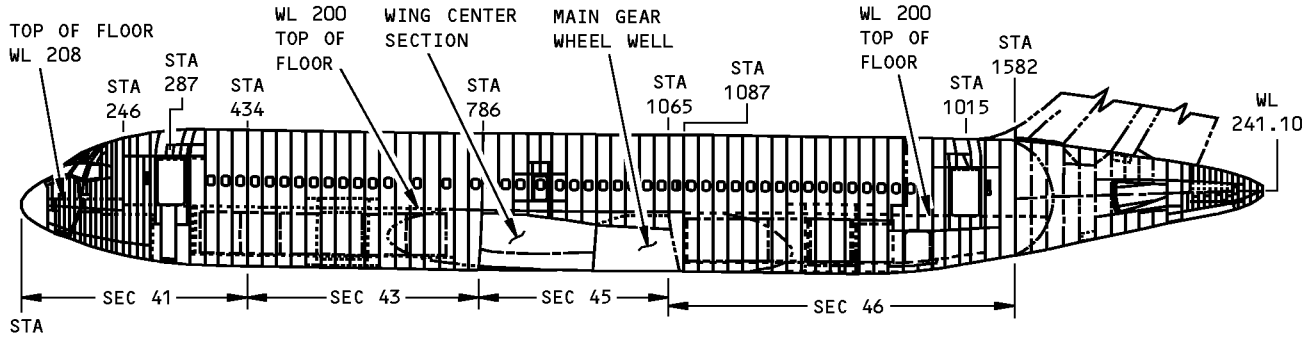
(5) Examine all the fasteners in the lower row(s) of the skin lap splice in all the inspection areas specified in Figure 1.

6. Inspection Results

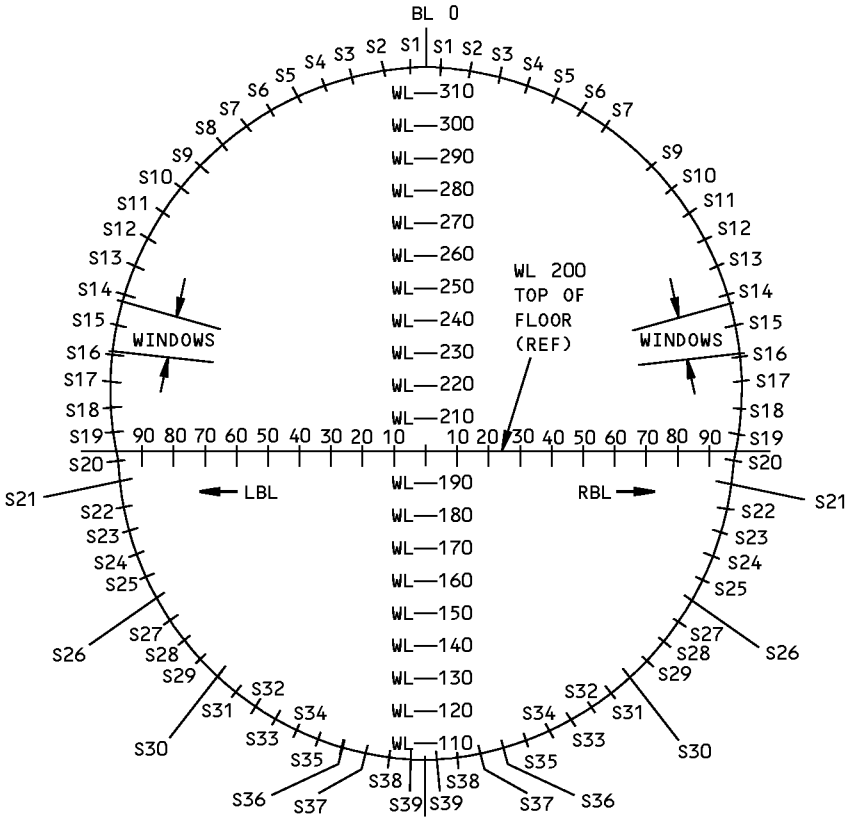
A. A signal that is 50% (or more) of the calibration notch signal is an indication of a possible crack.

(1) Compare the signals you get during the inspection to the signals you got from the reference standard during calibration.

B. To make sure the signal is the result of a crack, remove the fastener and do an open hole inspection as specified in Part 6, 51-00-16.



THE LEFT SIDE OF THE FUSELAGE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME

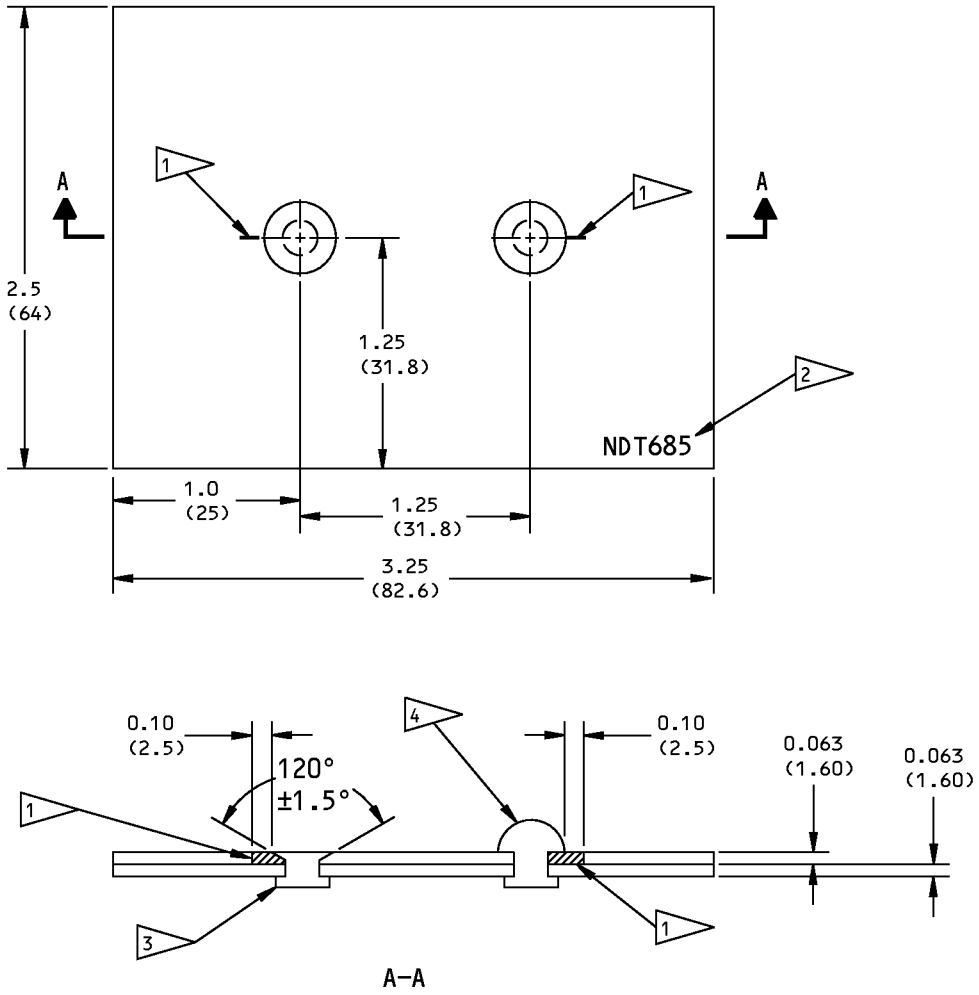


FORWARD VIEW OF A CONSTANT SECTION OF THE FUSELAGE

NOTES:

- EXAMINE THE LONGITUDINAL LAP SPLICES OF THE SKIN ALONG THE LOWER FASTENER ROW FROM INSIDE THE AIRPLANE AS FOLLOWS:
  - S-21 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-26 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-30 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-36 (LEFT AND RIGHT) FROM STA 434 TO STA 786 AND STA 1065 TO STA 1582
  - S-37 (LEFT AND RIGHT) FROM STA 287 TO STA 434

Fuselage Skin Longitudinal Lap Splice Internal Inspection
Figure 1



NOTES:

- DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCE (UNLESS SPECIFIED DIFFERENTLY):

INCHES	MILLIMETERS
X.XXX = ±0.005	X.XX = ±0.1
X.XX = ±0.025	X.X = ±0.5
X.X = ±0.050	X = ±1

- SURFACE ROUGHNESS: 12 Ra OR BETTER
- MATERIAL: 2024-T3,-T4 ALUMINUM CLAD

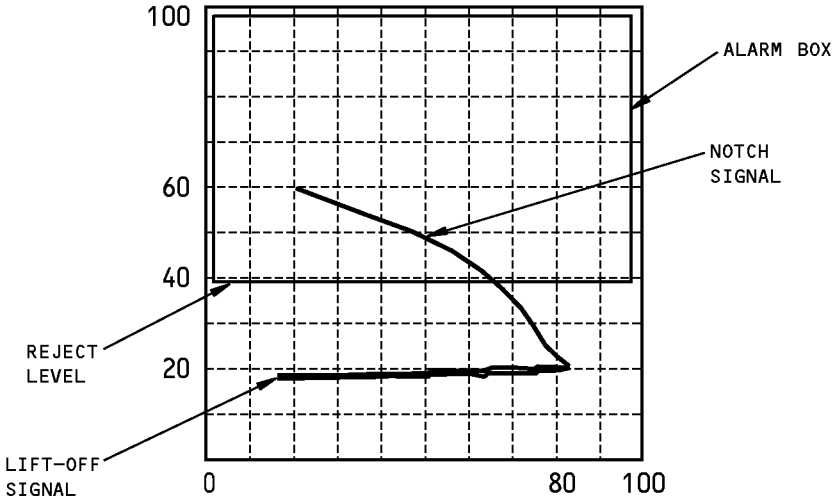
1 EDM NOTCHES: 0.100 (2.5) X 0.010 (0.25) X THROUGH THE THICKNESS

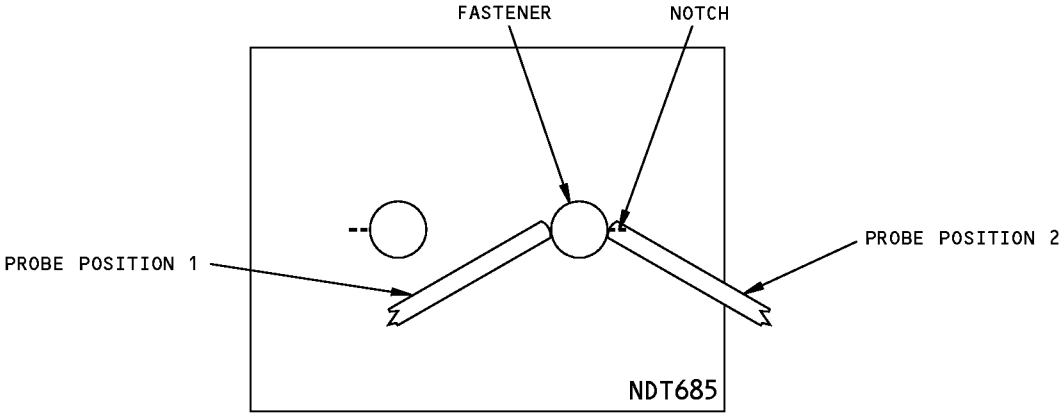
2 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT685 AT APPROXIMATELY THIS LOCATION.

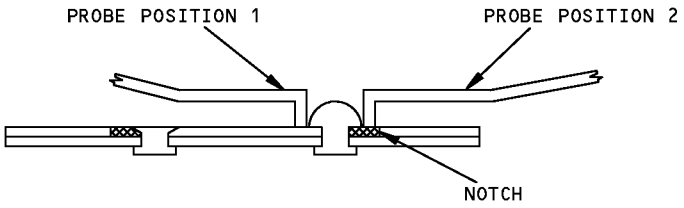
3 FASTENER - BACR15FV6KE5 (BRILES RIVET)

4 FASTENER - BACR15BB6AD5

Reference Standard NDT685
Figure 2





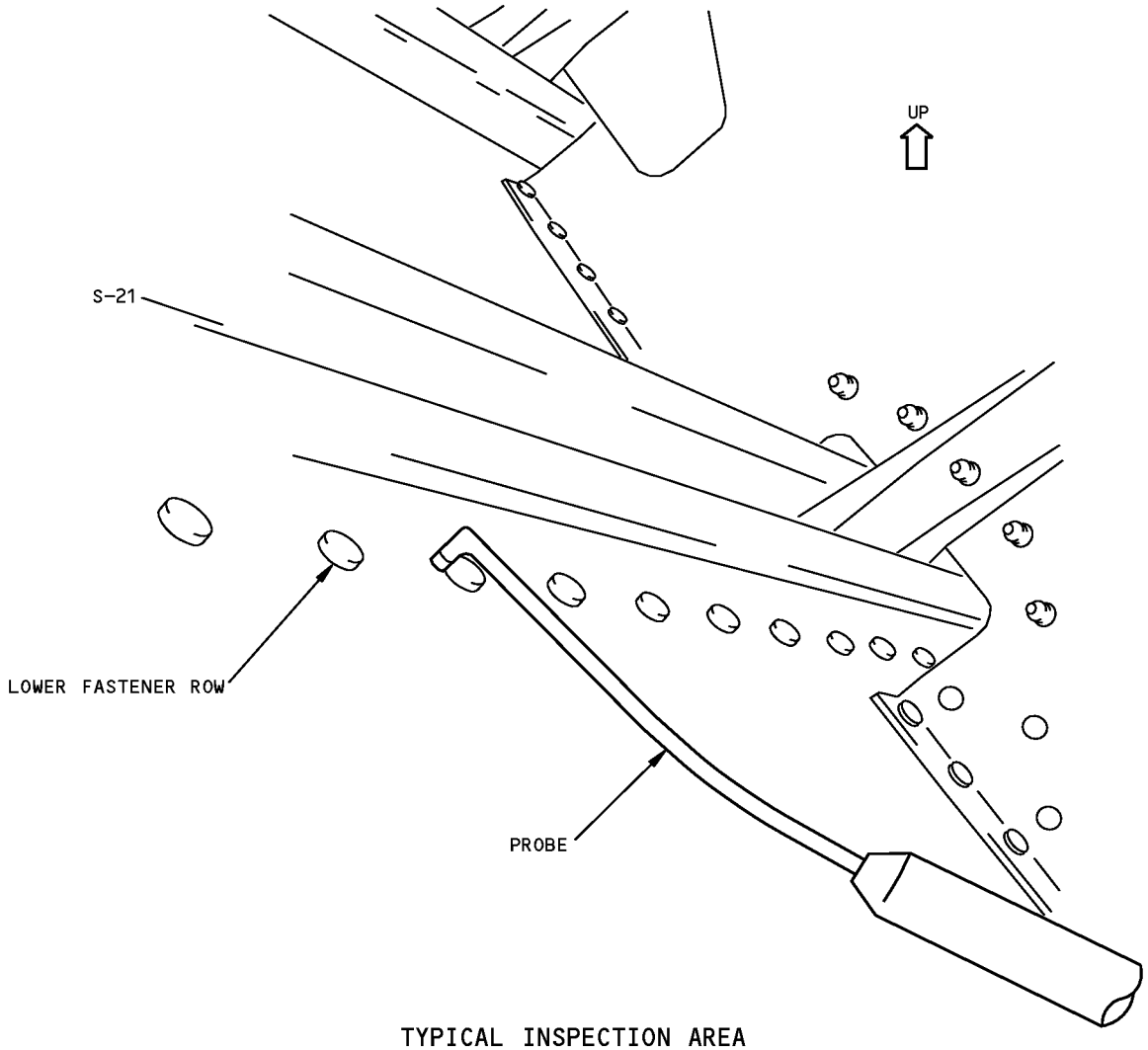


A-A

NOTES:

- PROBE POSITION 1 - PUT THE PROBE ADJACENT TO THE FASTENER TAIL ON THE REFERENCE STANDARD SO THAT IT IS ON THE SIDE THAT IS AWAY FROM THE NOTCH.
- SLOWLY MOVE THE PROBE AROUND THE FASTENER TAIL TO PROBE POSITION 2
- PROBE POSITION 2 - THE PROBE IS ABOVE THE NOTCH.
- USE THE FASTENER TAIL AS A GUIDE TO KEEP THE PROBE AT THE SAME DISTANCE FROM THE FASTENER WHEN YOU MOVE THE PROBE AROUND THE FASTENER.

Instrument Calibration
Figure 3



TYPICAL INSPECTION AREA

NOTES:

- THE LOWER FASTENER INSPECTION ROW AT THE STRINGER 21 LAP SPLICE IS SHOWN; ALL OTHER LOWER FASTENER ROW INSPECTION AREAS OF THE LAP SPLICES ARE ALMOST THE SAME.
- PUT THE PROBE ADJACENT TO THE DRIVEN BUTTON END OF THE FASTENER AND DO A 360 DEGREE SCAN AROUND THE FASTENER.
- EXAMINE ALL THE FASTENERS IN THE LOWER FASTENER ROW IN ALL OF THE INSPECTION AREAS.

Scan Pattern
Figure 4

PART 6 - EDDY CURRENT

LOWER ROW OF THE LAP SPLICES (EXTERNAL)

1. Purpose

A. Use this procedure to find cracks in the inboard skin along the lower row of fasteners in the skin longitudinal lap splices of the fuselage. This inspection is done from outside the airplane. See Figure 1 for the inspection areas.

B. Use the dual frequency eddy current inspection procedure, Part 6, 53-00-11, to calibrate your instrument and examine your airplane.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-10-I07

(2) ITEM 53-30-I04

(3) ITEM 53-60-I05

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Paragraph 4.

(2) Refer to Part 1, 51-01-00 for data about the equipment manufacturers.

B. Instrument

(1) Use an impedance plane display instrument that:

(a) Can operate in a dual frequency mode

(b) Operates in a frequency range of 1 kHz to 20 kHz

(c) Has a permanent screen adjustment (screen persistence). The permanent screen adjustment is necessary so that signals stay on the screen until manually erased.

(2) Refer to Part 6, 53-00-11 for instruments that can be used with this procedure.

C. Probe

(1) Some probes give unusual signals on the airplane because of the distance between the fasteners and other structure conditions. To get the correct results from this procedure, it is necessary to use a specific probe.

(a) NEC-4039; NDT Engineering Corp.

(b) TEC-1504; Techna Corp.

D. Reference Standard

(1) Make or buy reference standard NDT1087-6 (see Part 6, 53-00-11, Fig. 2).

3. Preparation for Inspection

A. Find the inspection areas on the airplane. See Figure 1.

B. Refer to Part 6, 53-00-11, par. 3.

4. Instrument Calibration

A. Calibrate the equipment as specified in Part 6, 53-00-11, par. 4, for reference standard NDT1087-6.

5. Inspection Procedure

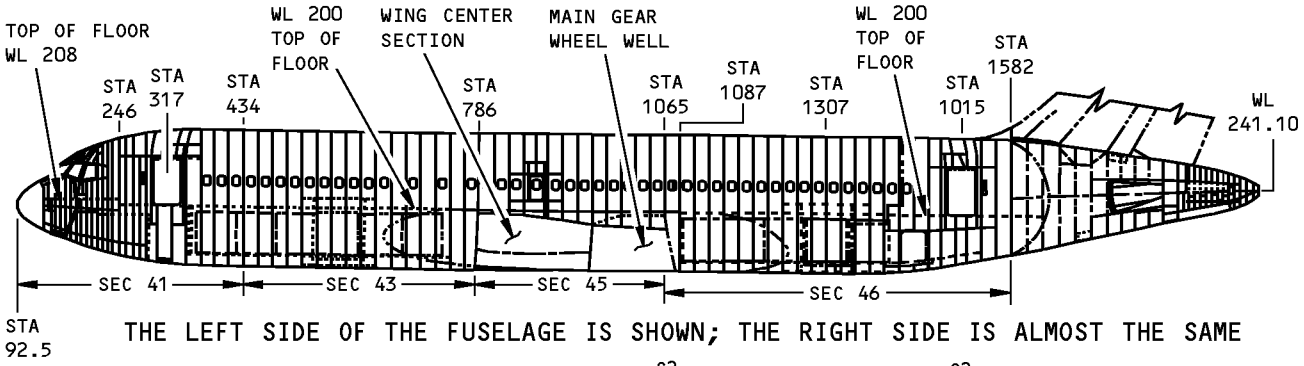
A. Identify the areas to be examined. See Figure 1.

B. Calibrate your instrument as specified in Paragraph 4.A.

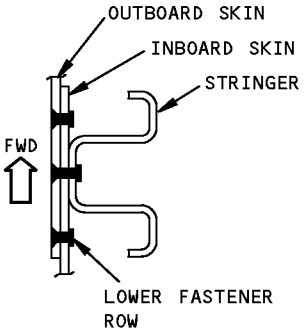
C. Examine the inboard skin lap splices for cracks along the lower fastener row(s) from outside the airplane. See Part 6, 53-00-11, par. 5, for the inspection procedure.

6. Inspection Results

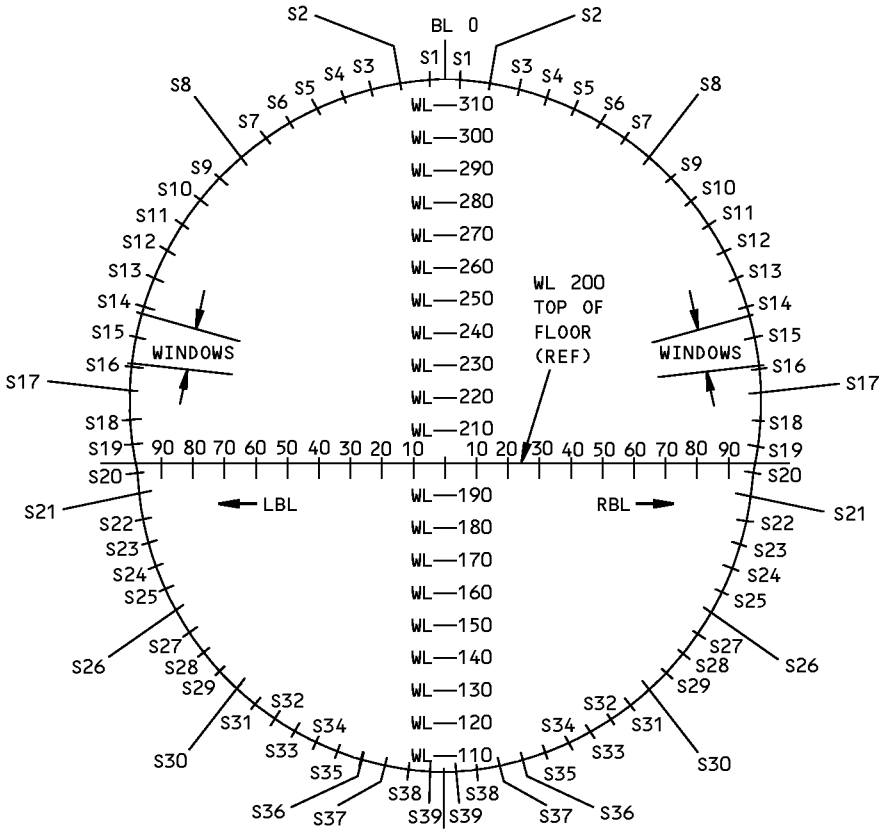
A. Make an analysis of the inspection results (see Part 6, 53-00-11, par. 6).



THE LEFT SIDE OF THE FUSELAGE IS SHOWN; THE RIGHT SIDE IS ALMOST THE SAME



TYPICAL LAP SPLICE
CROSS SECTION



FORWARD VIEW OF A CONSTANT SECTION OF THE FUSELAGE

NOTES:

- EXAMINE THE LONGITUDINAL LAP SPLICES OF THE SKIN ALONG THE LOWER FASTENER ROWS AS FOLLOWS:
  - S-2 (RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-8 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-17 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-21 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-26 (LEFT AND RIGHT) FROM STA 246 TO STA 786 AND STA 1065 TO STA 1582
  - S-30 (LEFT AND RIGHT) FROM STA 132.5 TO STA 246
  - S-36 (LEFT AND RIGHT) FROM STA 434 TO STA 786 AND STA 1065 TO STA 1582
  - S-37 (LEFT AND RIGHT) FROM STA 287 TO STA 434

Fuselage Skin Longitudinal Lap Splice Inspection
Figure 1