PART 6 - EDDY CURRENT

VERTICAL FIN - PRIMARY CHORD OF THE REAR SPAR

1. Purpose

A. Use this procedure to do a surface eddy current inspection to find cracks in the primary chord of the rear spar of the vertical fin. The inspection areas are from Fin Sta 59.86 to Fin Sta 232.4 on the left and right sides of the vertical stabilizer. See Figure 1 for the inspection areas.

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

C. 737 Supplemental Structural Inspection Document (D6-37089) Reference:

(1) Item: E-4

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, Probes and Reference Standard

(1) Refer to Part 6, 51-00-00, Procedure 4, for the equipment instructions if a meter display instrument is used and Part 6, 51-00-00, Procedure 23, if an impedance plane display instrument is used.

C. Probe Guide

(1) Use a nonconductive straightedge as a probe guide.

3. Prepare for the Inspection

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

B. Clean the inspection area. Remove sealant as necessary. Remove paint only if it is loose.

4. Instrument Calibration

A. Refer to Part 6, 51-00-00, Procedure 4, for the calibration instructions if a meter display instrument is used or Part 6, 51-00-00, Procedure 23, if an impedance plane display instrument is used.

5. Inspection Procedure

A. Calibrate the instrument as specified in Paragraph 4.

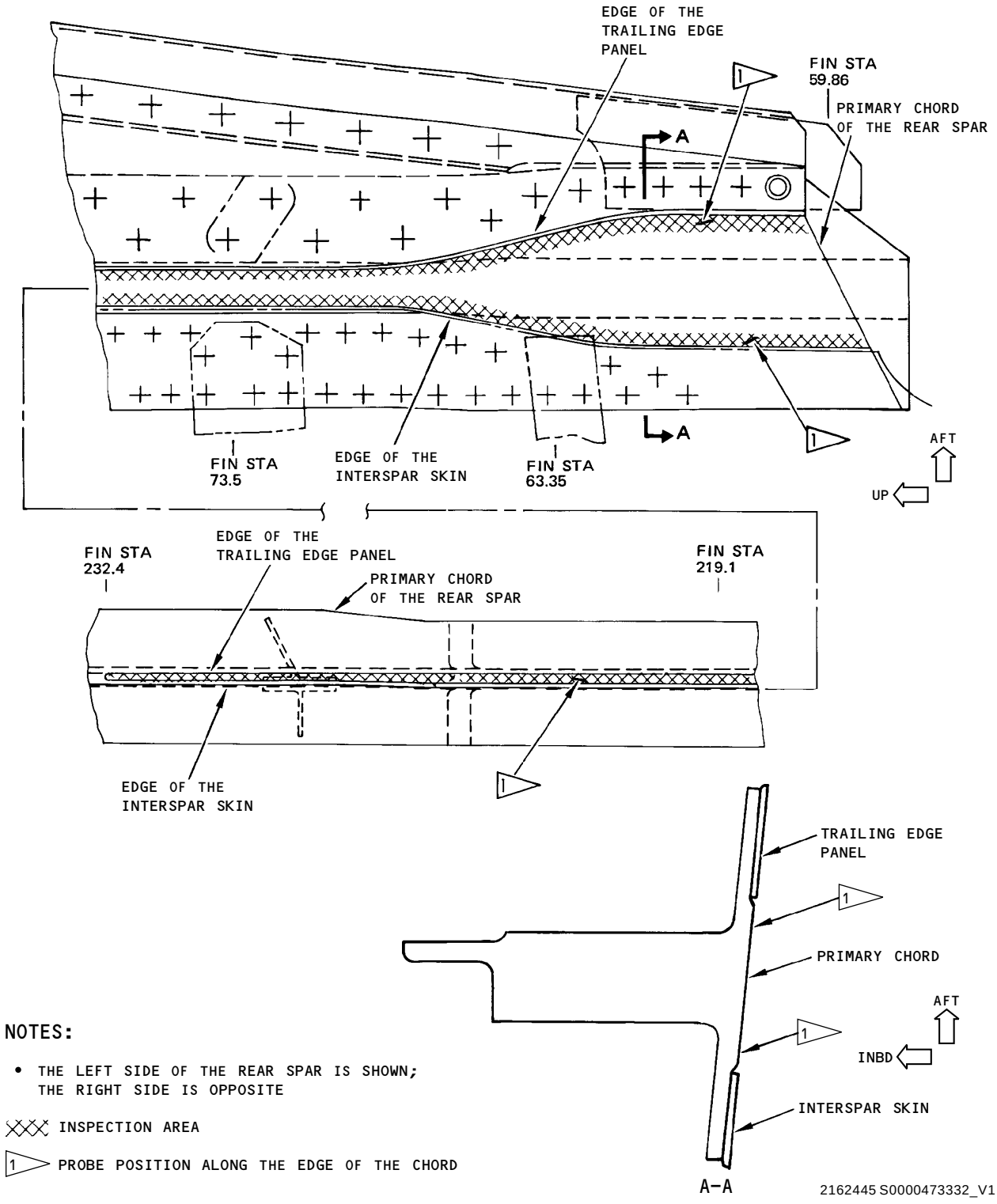
B. Make a scan along the forward and aft edges of the primary chord. Use a nonconductive straightedge as a guide during the scan inspection. See Figure 1 for the inspection areas.

(1) For instruments with a meter display, refer to Part 6, 51-00-00, Procedure 4, par. 6 for the inspection procedure. Refer to par. 6.D.(5) of Part 6, 51-00-00, Procedure 4, for the instructions to examine near the edges.

(2) For instruments with an impedance plane display, refer to Part 6, 51-00-00, Procedure 23, paragraph 6 for the inspection procedure. Refer to par. 6.E.(3)(e) of Part 6, 51-00-00, Procedure 23, for the instructions to examine near the edges.

6. Inspection Results

A. Refer to the applicable inspection procedure for data to help make an analysis of the inspection results.



Vertical Fin - Primary Chord of the Rear Spar
Figure 1

PART 6 - EDDY CURRENT

VERTICAL FIN - CLOSURE RIB CHORD (HFEC)

1. Purpose

A. Use this procedure to do a surface eddy current inspection to find cracks in the closure rib chord of the vertical fin. The inspection areas are between the front and rear spar. See Figure 1 for the inspection areas.

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

C. 737 Supplemental Structural Inspection Document (D6-37089) Reference:

(1) Item: E-7A

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, Probes and Reference Standard

(1) Refer to Part 6, 51-00-00, Procedure 4, for the instrument, probe and reference standard data if a meter display instrument is used or Part 6, 51-00-00, Procedure 23, if an impedance plane display instrument is used.

C. Nonconductive Straightedge

(1) Use a nonconductive straightedge as a guide during the scan inspection.

3. Prepare for the Inspection

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

B. Clean the inspection area:

(1) Remove sealant as necessary.

(2) Remove paint only if it is loose.

4. Instrument Calibration

A. Refer to Part 6, 51-00-00, Procedure 4, for the calibration instructions if a meter display instrument is used or Part 6, 51-00-00, Procedure 23, if an impedance plane display instrument is used.

5. Inspection Procedure

A. Calibrate the instrument as specified in Paragraph 4.

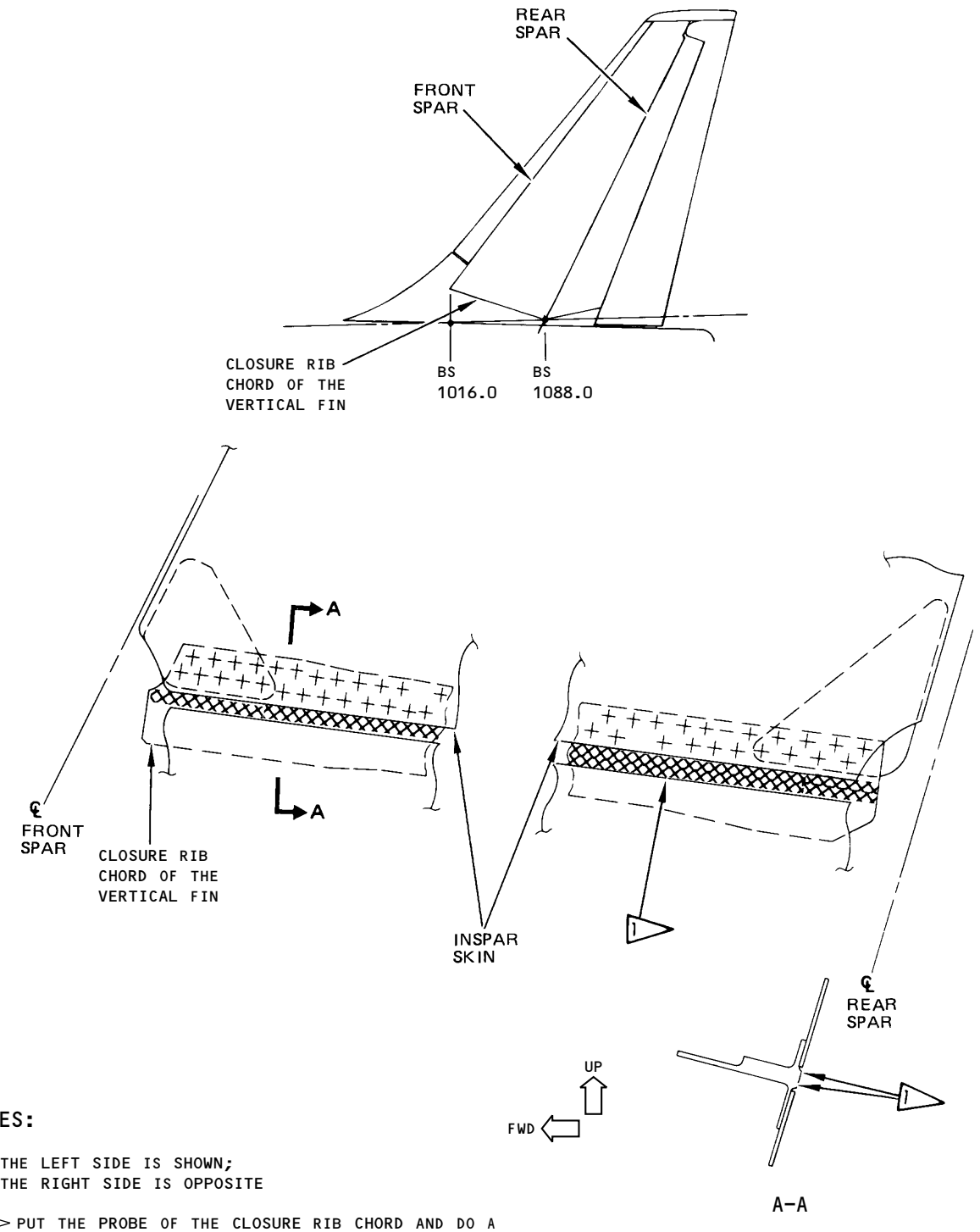
B. Make a scan along the upper and lower edges of the closure rib chord of the vertical fin and all areas between. Use a nonconductive straightedge as a guide during the scan inspection. See Figure 1 for the inspection areas.

(1) For instruments with a meter display, refer to Part 6, 51-00-00, Procedure 4, par. 6 for the inspection procedure. Refer to par. 6.D.(5) to examine near the edges.

(2) For instruments with an impedance plane display, refer to Part 6, 51-00-00, Procedure 23, par. 6 for the inspection procedure. Refer to par. 6.E.(3)(e) to examine near the edges.

6. Inspection Results

A. Refer to the applicable inspection procedure for data to help make an analysis of the inspection results.



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Closure Rib Chord of the Vertical Fin
Figure 1

PART 6 - EDDY CURRENT

VERTICAL STABILIZER REAR SPAR PRIMARY CHORD (HFEC)

1. Purpose

A. To detect cracks in the vertical stabilizer rear spar primary chord attachment to terminal fitting using high frequency eddy current.

B. 737 Supplemental Structural Inspection Document (D6-37089) Reference:

(1) Item: E-6

2. Equipment

A. Instrument - Refer to Part 6, 51-00-00, Procedure 4.

B. Probes - Right angle shielded probes per Part 6, 51-00-00, Procedure 4, with maximum B dimension of 0.3 inch (0.76 cm).

C. Reference Standard - Refer to Part 6, 51-00-00, Procedure 4.

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

3. Prepare for the Inspection

A. Remove fairings and access panels 9523L and 9524R to gain access to forward side of rear spar primary chord.

B. Clean inspection surfaces.

C. Remove any sealant or grease from edge of chord flange.

4. Instrument Calibration

A. Refer to Part 6, 51-00-00, Procedure 4.

5. Inspection Procedure

A. Inspect per Part 6, 51-00-00, Procedure 4.

B. Figure 1 defines the inspection areas, probe placement and scanning patterns.

6. Inspection Results

A. A rapid meter movement occurring as probe is moved over a short distance is a potential crack indication and further investigation is required.

B. Refer to Part 6, 51-00-00, Procedure 4.

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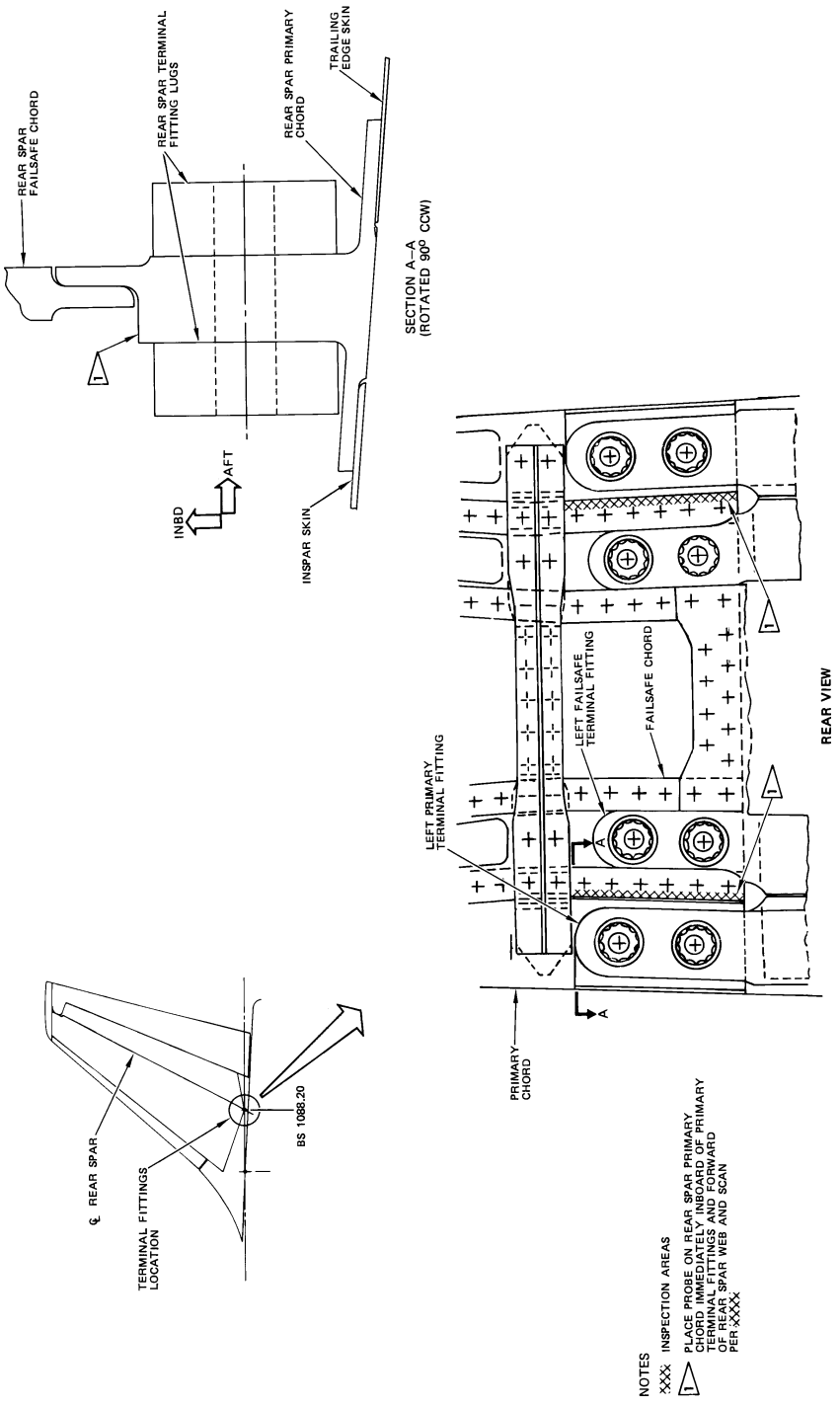


Vertical Stabilizer Rear Spar Primary Chord
Figure 1

PART 6 - EDDY CURRENT

RIVET EDGE DISTANCE FOR CHEM-MILL POCKETS

1. Purpose

A. To get the edge distances of fasteners adjacent to the edge of the chem-mill pockets of the right and left hand skins of the vertical stabilizer. The pockets are at FS 191.50, 200.70 and 219.10 (see Figure 3).

2. Equipment

A. Any eddy current instrument and probe combination that satisfies the performance requirements of this procedure is suitable for this inspection. The following equipment was used to develop this procedure.

(1) Instrument -- MIZ-10B; Zetec, Inc.

(2) Probe -- ULS-40; NDT Product Engineering, low frequency, non-shielded surface probe used at 8 kHz and capable of detecting 0.010 inch of metal thinning from an overall thickness of 0.042 inch of aluminum.

(3) Reference Standard -- Refer to Figure 1.

(4) Tape -- Transparent tape 1.00 inch wide.

3. Prepare for the Inspection

A. Clean inspection area and remove loose paint.

4. Instrument Calibration

A. Do initial instrument adjustments.

(1) Set instrument frequency, if applicable, between 8.0 and 10.0 kHz.

(2) Put tape on reference standard as shown (see Figure 2).

(3) Put probe on the thick section of the reference standard (see Position 1 in Figure 2).

(4) Balance instrument. Refer to manufacturer's instructions.

(5) Adjust lift-off to obtain less than 5 percent of full scale needle movement when probe is slid from a 0.005-0.010 inch (0.013-0.025 cm) non-conductive shim, placed on the tape, to the tape on the reference standard (see Position 1 in Figure 2).

NOTE: One or two sheets of ordinary writing paper, approximately 0.003 inch (0.007 cm) thick each, can be used as the non-conductive shim.

(6) Adjust meter needle position control to get a baseline response of 20 percent of full scale (see Figure 2).

B. Do sensitivity adjustment

(1) Put probe on thin section of the reference standard (see Position 2 in Figure 2).

(2) Adjust sensitivity (gain control) to get an 80 percent of full scale needle deflection (60 percent above baseline when probe is on thin section) (see Figure 2).

(3) Check balance and especially lift-off. If adjustments are made, check sensitivity.

(4) Slide probe from Position 1 toward Position 2. When needle deflection reaches 50 percent, stop and mark end of probe trace on tape (see Figure 2).

(5) Slide probe from Position 2 toward Position 1. When needle deflection reaches 50 percent, stop and mark end of probe trace on tape.

(6) Check with edge of reference standard that the 50 percent value of Paragraph 4.B.(4) and Paragraph 4.B.(5) are at Position 3 (centered on the edge between the thick and thin sections).

(7) If probe does not center on the edge between the thick and thin sections repeat Paragraph 4.A. and Paragraph 4.B.

5. Inspection Procedure

A. Put tape on inspection surfaces as shown (see Figure 3).

B. Calibrate instrument. Refer to Paragraph 4.

C. Put probe on the surface of taped skin, between fasteners, on the thick section away from chem-mill pocket edge (see Figure 3). Check for a baseline response of 20 percent. If baseline response is not 20 percent, balance instrument again.

D. Put probe on the surface of the taped skin on the thin section (see Figure 3). Check that the meter reading is 80 percent of full scale. If meter reading is not 80 percent, adjust sensitivity, balance and lift-off to get an 80 percent meter deflection (60 percent above baseline) using the taped skin as a reference standard.

E. Put probe back on the thick section of taped skin. Check baseline and balance if required. Slide probe toward chem-mill pocket (thin section). When meter deflection reads 50 percent of full scale (30 percent above baseline), stop, lift probe off tape and mark end of probe trace on tape (see View A in Figure 3).

F. Put probe on the taped thin section. Meter should read 80 percent (± 3 percent) of full scale. If meter does not read 80 percent of full scale, put probe on thick section and balance again. If meter does not read 80 percent after balance, do Paragraph 5.D. again.

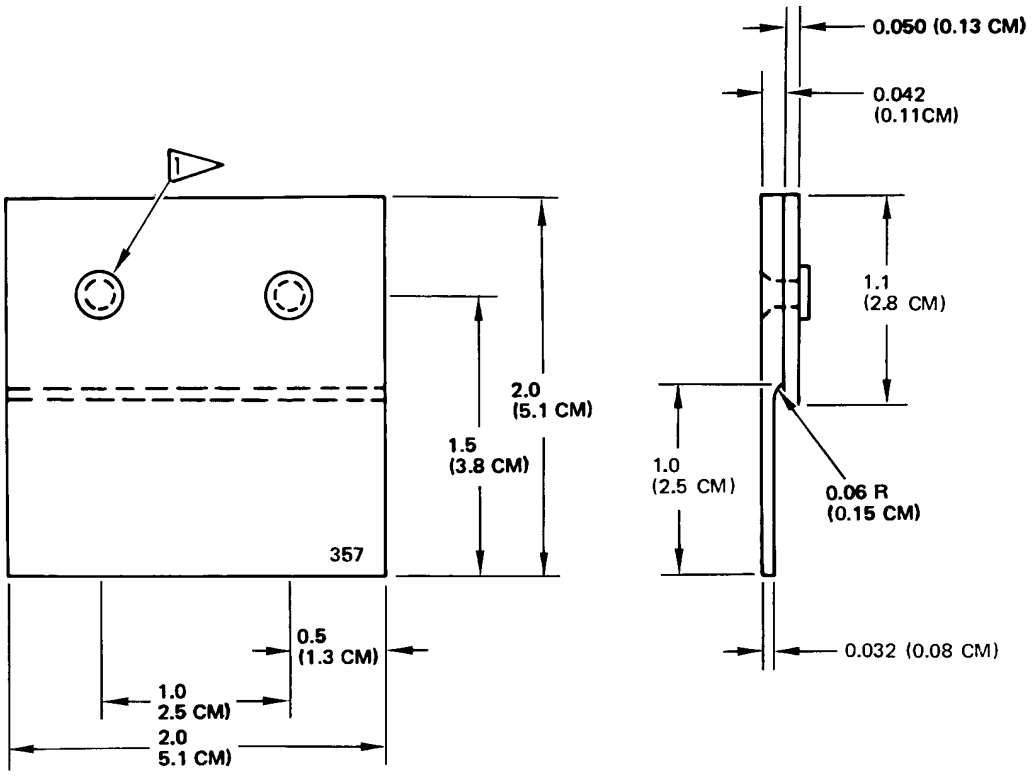
G. Slide probe from thin section toward thick section. When meter deflection reads 50 percent of full scale, stop, lift probe off tape and mark end of probe trace on tape (see View A in Figure 3).

H. Repeat Paragraph 5.C., Paragraph 5.E., Paragraph 5.F. and Paragraph 5.G. at least twice at each tape location.

I. Make a line on the skin, between each piece of tape, that connects the marks obtained from Paragraph 5.C., Paragraph 5.E., Paragraph 5.F. and Paragraph 5.G. to show the chem-mill pocket edge.

6. Inspection Results

A. If the line in Paragraph 5.I. touches a fastener head, the chem-mill edge is too close to the fastener.



NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ± 0.05 (0.13 CM)
  X.XX ± 0.02 (0.05 CM)
  X.XXX ± 0.005 (0.013 CM)
- MATERIAL: 2024—T3 OR —T4 AL
- STEEL STAMP WITH 357

1 BACR15CE5D5 RIVET (2 PLACES)

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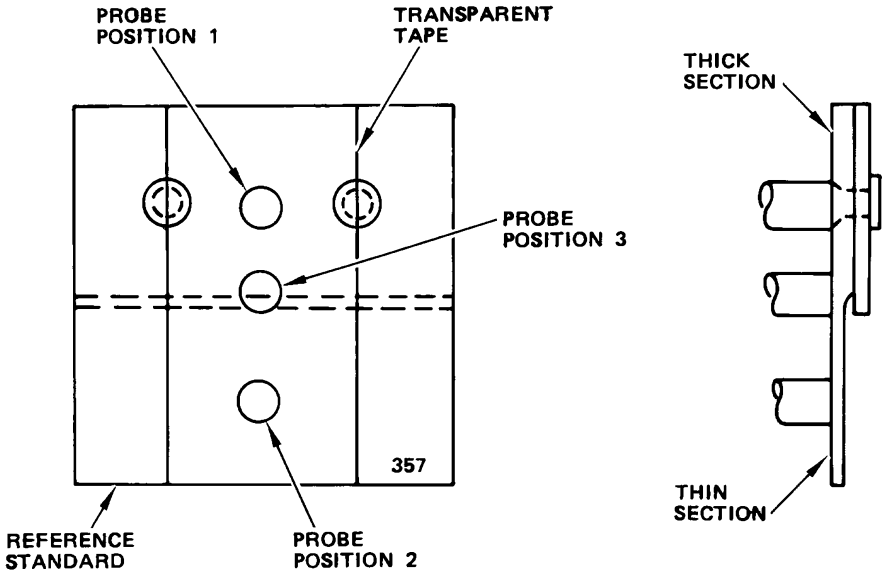
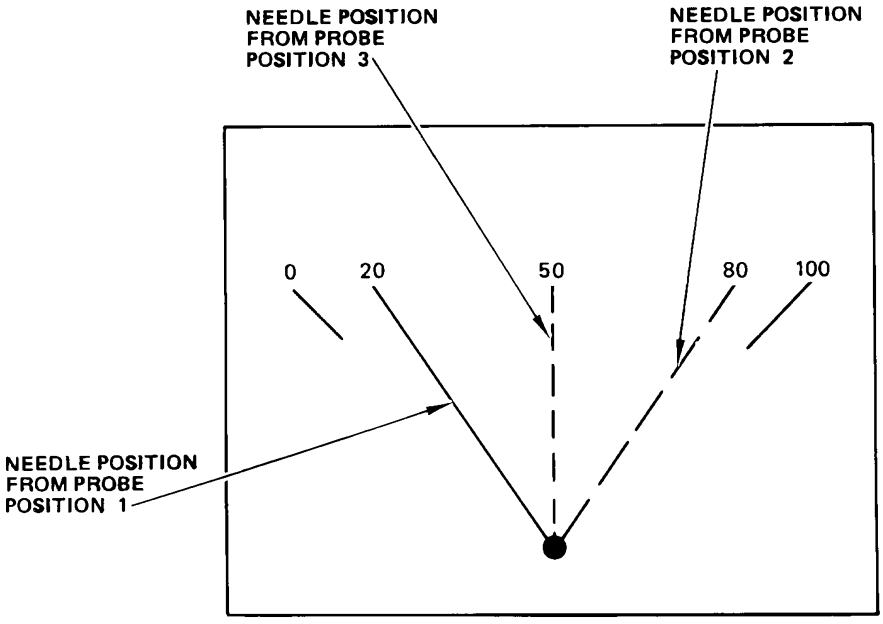
Reference Standard
Figure 1



PROBE POSITIONS



METER NEEDLE RESPONSE

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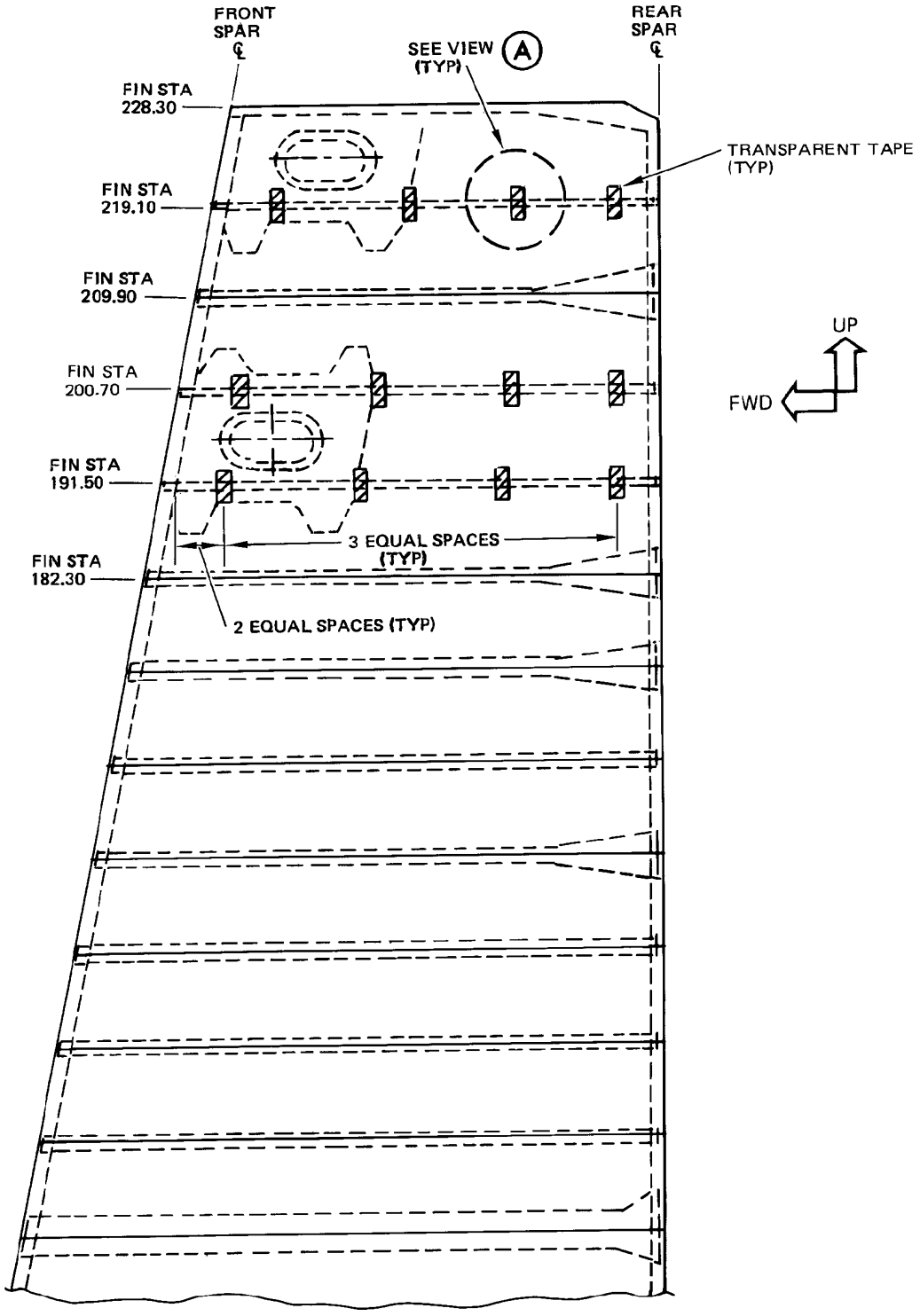
Instrument Calibration
Figure 2



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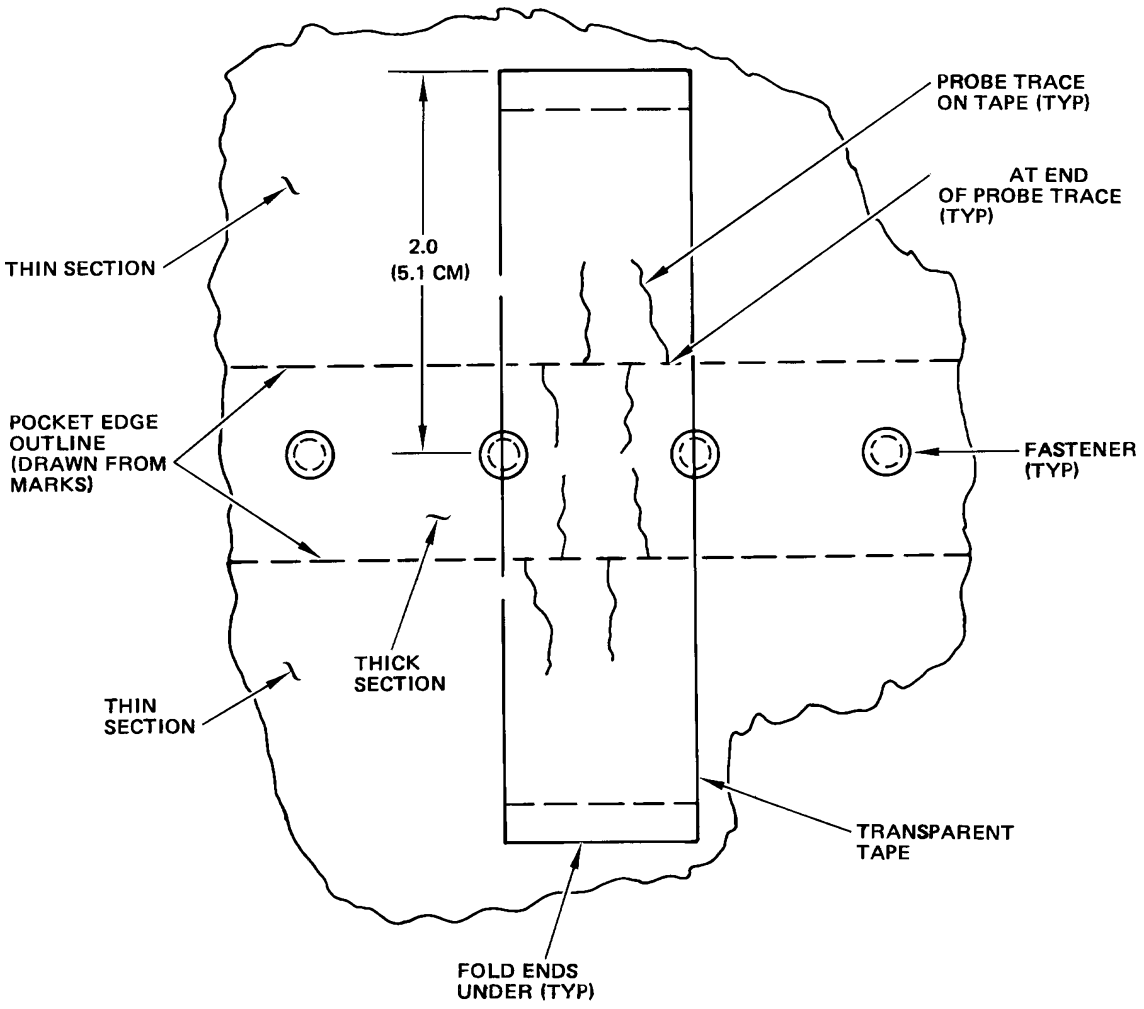
Vertical Stabilizer Skin Panel
Figure 3 (Sheet 1 of 3)



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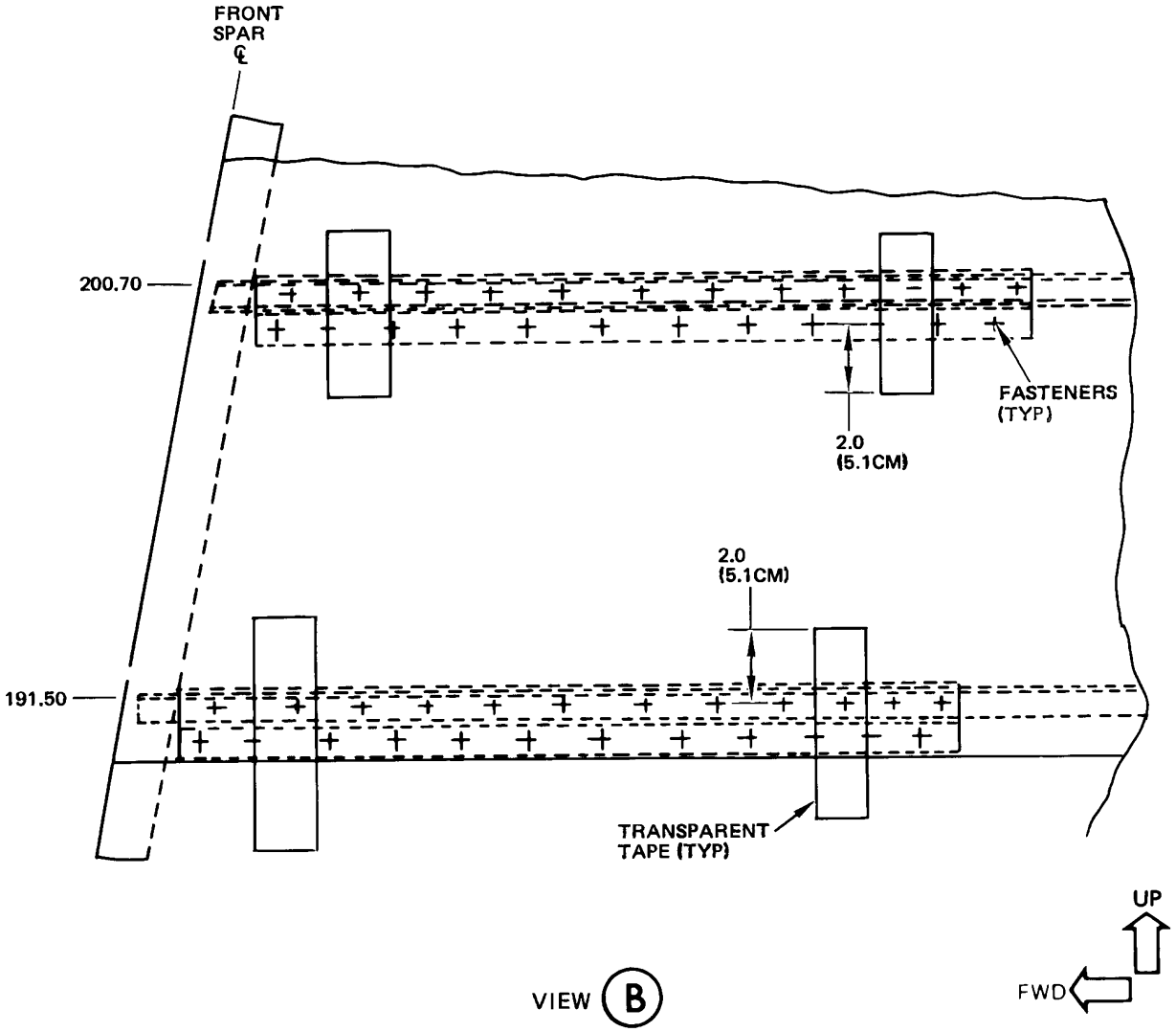
Vertical Stabilizer Skin Panel
Figure 3 (Sheet 2 of 3)



VIEW (B)

ALTERNATE RIVET PATTERN
(RIGHT SIDE ONLY)

NOTES

- LEFT SIDE SHOWN, RIGHT SIDE SIMILAR
- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)

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Vertical Stabilizer Skin Panel
Figure 3 (Sheet 3 of 3)

PART 6 - EDDY CURRENT

VERTICAL FIN - PRIMARY CHORD OF THE REAR SPAR - STA 73.4 OR STA 80.0 TO THE FIN TIP

1. Purpose

A. Use this procedure to examine the primary chord at the rear spar of the vertical fin for cracks from fin STA 80 (on 737-700C/-700IGW models) or fin STA 73.4 (on 737-600/-700/-800/-900/-900ER models) to the fin tip. See Figure 1 for the inspection areas.

B. This procedure uses an impedance plane display instrument.

C. The primary chord is made from aluminum.

D. 737 Damage Tolerance Rating (D626A001-DTR):

(1) Item: 55-30-03-2; Vertical Fin Rear Spar (Fin STA 73.4 – Fin Tip)

(2) Item: 55-30-03-2a; Vertical Fin Rear Spar (Fin STA 80.0 – Fin Tip)

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on the reference standard as specified in Part 6, 51-00-00, Procedure 23, paragraph 5.

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

B. Instrument

(1) Use an instrument that:

(a) Operates between 50 and 500 kHz.

(b) Has an impedance plane display.

(2) Refer to Part 6, 51-00-00, Procedure 23, paragraph 3.B, for the instrument data.

C. Probe

(1) Use a probe that:

(a) Operates between 50 and 500 kHz.

(b) Has a diameter of 0.125 inch (3.18 mm).

(c) Is shielded.

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

(a) TPEN925-5; Techna NDT

D. Reference Standard

(1) Use reference standard 126 as specified in Part 6, 51-00-00, Procedure 23, paragraph 3.D.

3. Prepare for the Inspection

A. Identify and get access to the inspection area. See Figure 1.

B. Clean the inspection surfaces.

(1) Remove dirt or grease from the inspection surfaces.

(2) Remove paint only if it is loose.

(3) Remove sealant from the areas that the probe will touch.

C. Refer to Part 6, 51-00-00, Procedure 23, paragraph 4, for more instructions on how to prepare for the inspection.

4. Instrument Calibration

A. Calibrate the instrument as specified in Part 6, 51-00-00, Procedure 23, paragraph 5.

(1) Use reference standard 126, or an equivalent, as specified in Part 6, 51-00-00, Procedure 23, paragraph 5.

5. Inspection Procedure

A. Get access to the inspection areas shown in Figure 1.

B. Examine the primary chord of the vertical fin for cracks as specified in Part 6, 51-00-00, Procedure 23, paragraph 6, and the steps that follow:

(1) For 737-700C/-700IGW models, examine the primary chord from fin STA 80 to the fin tip.

(2) For 737-600/-700/-800/-900/-900ER models, examine the primary chord from fin STA 73.4 to the fin tip.

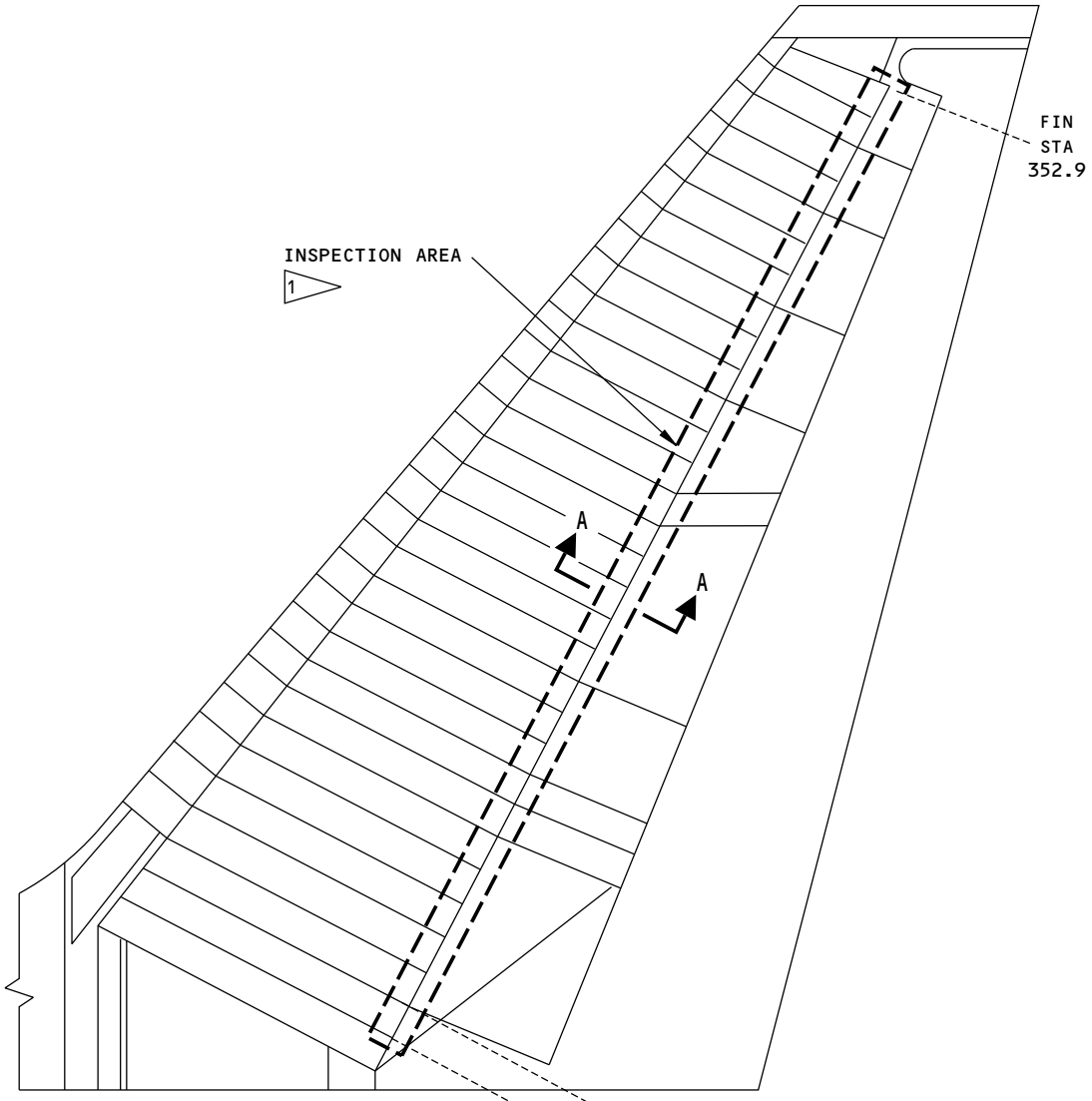
(3) Make a scan at the forward and aft edges of the primary chord as shown by flagnote 1 in Figure 1.

C. Do a check of the instrument/probe as specified in Part 6, 51-00-00, Procedure 23, paragraph 6.E.(5).

D. Do Paragraph 5.B. thru Paragraph 5.C. again to examine the primary chord for cracks on the other side of the vertical fin.

6. Inspection Results

A. Refer to Part 6, 51-00-00, Procedure 23, paragraph 7, for instructions to help make an analysis of the indications that occur during the inspection.



NOTES:

- THE LEFT SIDE OF THE VERTICAL FIN IS SHOWN; THE RIGHT SIDE IS OPPOSITE.

1 EXAMINE THE FORWARD AND AFT EDGES OF THE PRIMARY CHORD. FOR MODELS 737-700C/-700IGW, THE AREA TO EXAMINE IS FROM FIN STA 80.0 TO THE FIN TIP.
FOR MODELS 737-600/-700/-800/-900/-900ER, THE AREA TO EXAMINE IS FROM FIN STA 73.4 TO THE FIN TIP.

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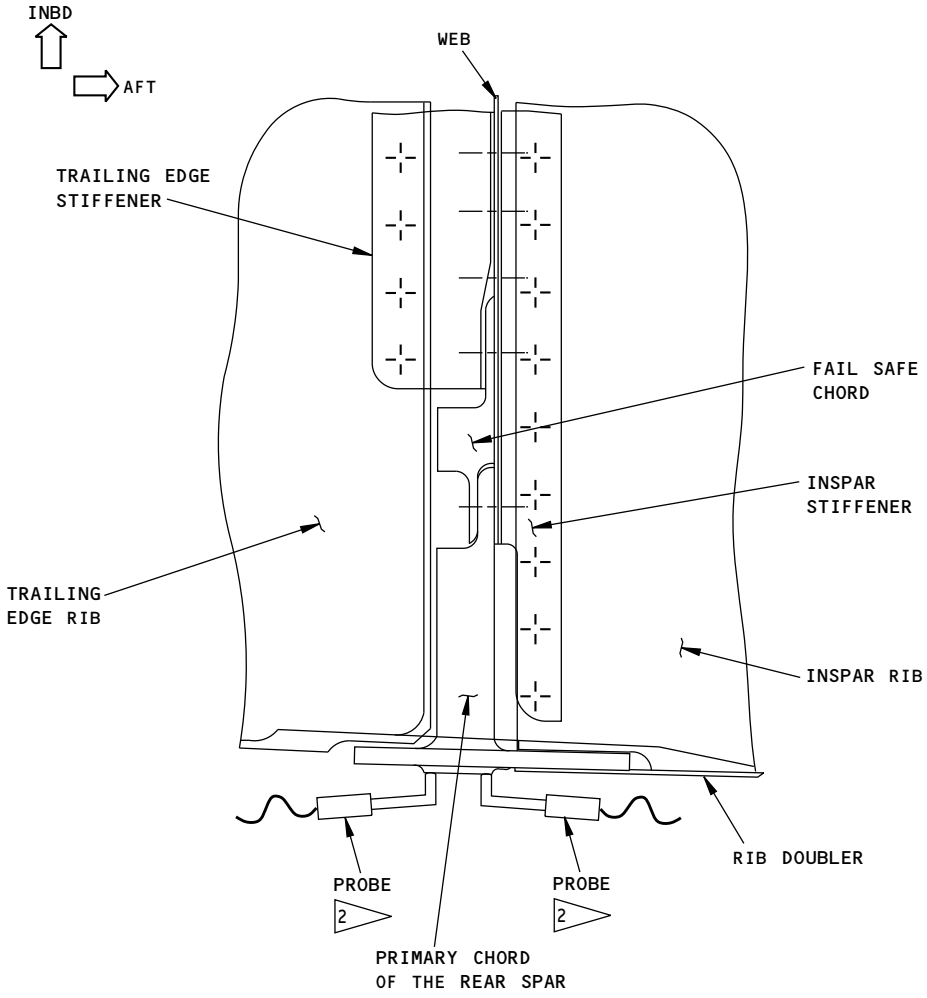
Inspection Areas
Figure 1 (Sheet 1 of 2)



A-A

NOTES:

2 EXAMINE THE FORWARD AND AFT EDGES OF THE PRIMARY CHORD. KEEP THE PROBE COIL A CONSTANT DISTANCE FROM THE EDGE OF THE PART DURING THE SCAN.

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Inspection Areas
Figure 1 (Sheet 2 of 2)