COUNTERSINK INSPECTION OF ALUMINUM PARTS (METER DISPLAY)

1. Purpose

A. To find the cracks that extend across the countersink surface after the fasteners have been removed. Refer to Figure 1 for an illustration of a usual crack.

B. Part 6, 53-30-02 or Part 6, 53-30-03 can be used as an alternative to this procedure.

2. Equipment

A. A countersink probe which can operate between 100 and 500 kHz is necessary for this procedure. All metered instrument and probe combinations that meet the calibration requirements of this procedure can be used. The following equipment was used to make this procedure:

(1) Instrument

(a) MIZ-10B, Zetec, Inc.

(b) Locator UH, Hocking Instruments

(2) Probe - Countersink Probe and Collar

(a) Use a probe that:

1) Operates at a frequency range of 100 to 500 kHz.

2) Has an external diameter that fits in the countersunk hole that is shown in Figure 2 or Figure 3 or the counterbore hole that is shown in Figure 4.

NOTE: A 100-degree countersunk probe can be used in the counterbore hole shown in Figure 4.

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

1) CSM-100-10 (0.156 inch diameter)
CSM-100-12 (0.187 inch diameter)
CSM-100-14 (0.218 inch diameter)
CSM-100-16 (0.250 inch diameter)
NDT Engineering Corp.

2) VM103C 5/32 (0.156 inch diameter)
VM103C 3/16 (0.187 inch diameter)
VM103C 7/32 (0.218 inch diameter)
VM103C 1/4 (0.250 inch diameter)
VM Products

(3) Reference Standard

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

(a) Use reference standard 194 or 194A to do 100-degree countersunk hole inspections. See Figure 2 or Figure 3 for data about the reference standards.

(b) Use reference standard NDT194B to do 120-degree counterbore hole inspections. See Figure 4 for data about the reference standard.

3. Preparation for Inspection

A. Remove the fasteners.

B. Make sure the inspection surface is clean.

NOTE: Be careful not to cause damage to or make the countersink larger when the fasteners are removed. Only deburr and make the surface clean.

4. Instrument Calibration

A. Start the instrument and do the initial adjustments as specified in the manufacturer's instructions.

B. Connect the probe to the instrument and set the frequency between 100 and 500 kHz.

NOTE: The reference standard and the eddy current probe must be the same size as the countersink hole that will be inspected.

C. Put the probe in the countersink hole of the reference standard with the coil installed opposite of the notch. Adjust the probe collar to keep the probe vertical to the reference standard surface. See Figure 1, Calibration Reference Standard.

D. Balance the instrument and adjust the meter signal to 10 percent of the full scale.

E. Put a 0.003 to 0.005-inch (0.007 to 0.013 cm) thick nonconductive shim between the probe coil and the countersink surface of the reference standard.

NOTE: An ordinary piece of writing paper is approximately 0.003 inch thick and can be used as the nonconductive shim during the lift-off adjustments.

F. Adjust the instrument lift-off or the phase control as specified in the manufacturer's instructions until no needle movement is monitored between the probe coil on the bare surface and when lifted off the surface with a 0.003 to 0.005-inch thick nonconductive shim.

G. Adjust the meter signal to 10 percent of the full scale as specified in Paragraph 4.D.

H. Turn the probe until the coil is above the notch and adjust the instrument sensitivity controls to get a 40 to 60 percent of the full scale signal.

I. Recheck lift-off. If an adjustment is made, do a check of the sensitivity as specified in Paragraph 4.H. and adjust if necessary.

NOTE: The use of an audible or a visual alarm is recommended and can increase the scan speed. Set the alarm to operate to signals that are 80 percent of the reference-standard-notch-signal amplitude.

J. Make a note of the instrument signal as the probe is turned over the notch to find the scan speed.

5. Inspection Procedure

A. Put the probe into the countersink and adjust the probe collar to hold the probe vertical to the surface.

B. Balance the instrument or adjust the meter signal to 10 percent of the full scale.

C. Scan the countersink. The probe must be turned more than 360 degrees to make sure the complete countersink is covered. Keep the probe vertical to the inspection surface during the inspection. See Figure 1, Inspection Procedure. Keep a probe scan speed that is almost the same as when the instrument was calibrated in Paragraph 4.

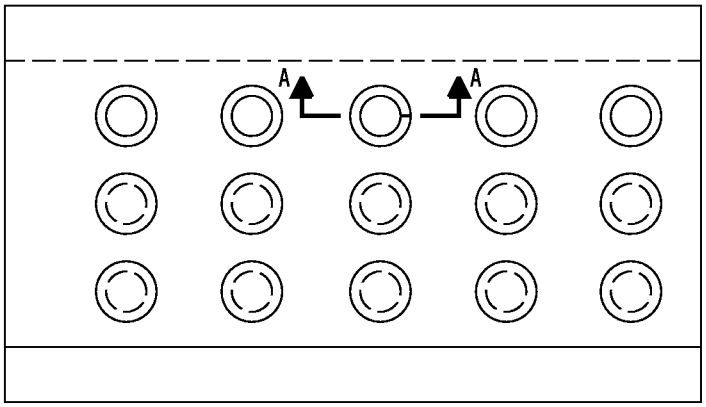
NOTE: The eddy current instrument will show cracks by a rapid meter deflection over a short-probe-scan distance. If the fastener hole is not circular, the eddy current instrument can show a slow meter change over a large-probe-scan distance. This is not a crack indication. Compare all crack indications with the reference-standard-notch signal.

D. At regular times through the inspection, do a check of the instrument calibration as specified in Paragraph 4.C. thru Paragraph 4.I. and adjust if necessary.

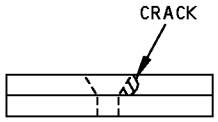
6. Inspection Results

A. All signals that are equal to or more than the reference-standard-notch signal and occur over a short scan distance are possible crack indications.

B. Part 6, 51-00-01 can be used to examine the area of the crack indication.

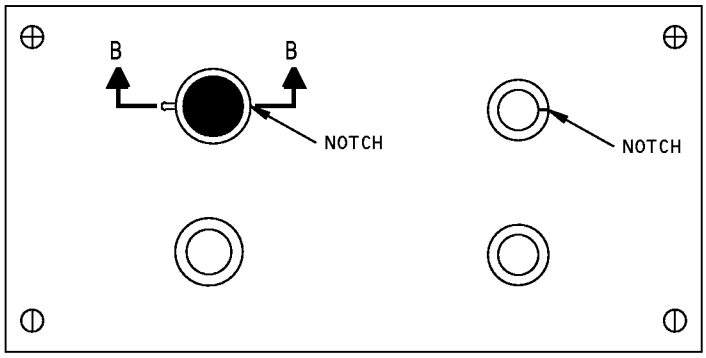


USUAL CRACK

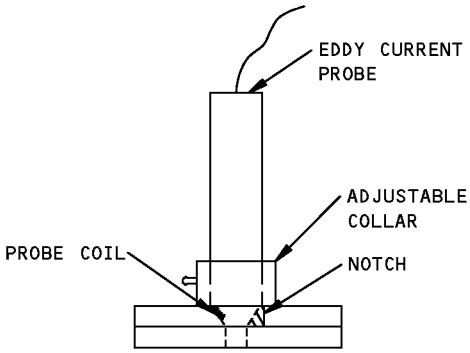


NOTE: A CRACK WHICH EXTENDS FROM THE FASTENER HOLE ACROSS THE COUNTERSINK.

A–A

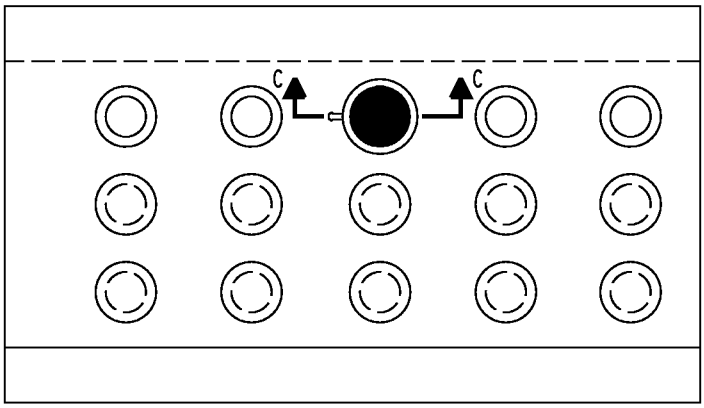


CALIBRATION - REFERENCE STANDARD

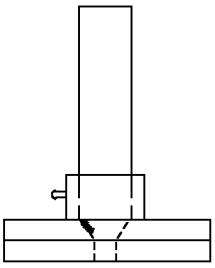


NOTE: PROBE COIL INSTALLED OPPOSITE OF THE NOTCH.

B–B



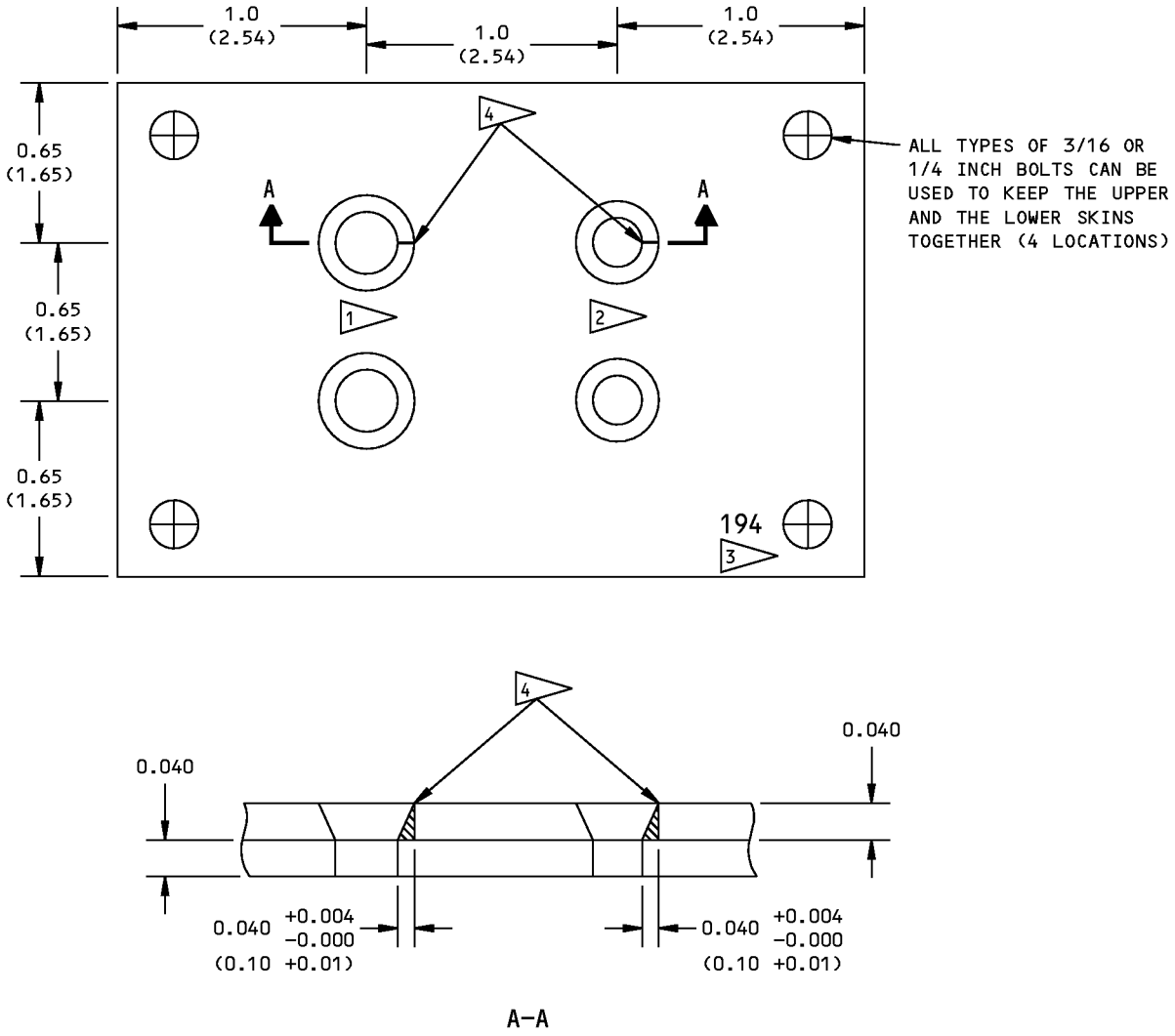
INSPECTION PROCEDURE



NOTE: TURN THE PROBE MORE THAN 360° TO MAKE SURE THE COMPLETE COUNTERSINK IS COVERED.

C–C

Countersink in Aluminum Parts
Figure 1



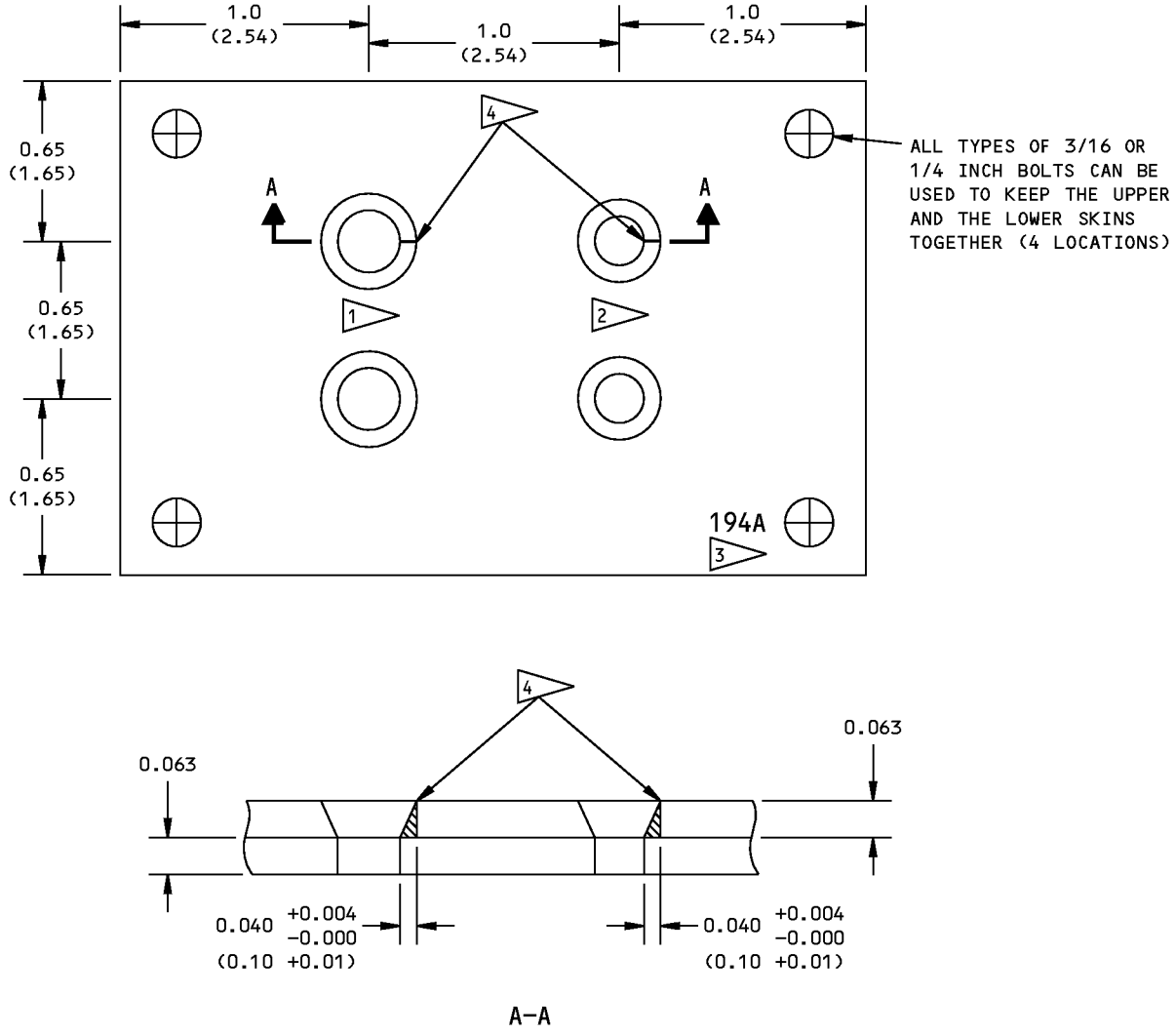
A–A

NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 3/16 INCH HOLE SIZE, DRILL A NO. 11 (0.191 INCH DIA) HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 5/32 INCH HOLE SIZE, DRILL A NO. 20 (0.161 INCH DIA) HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194
Figure 2



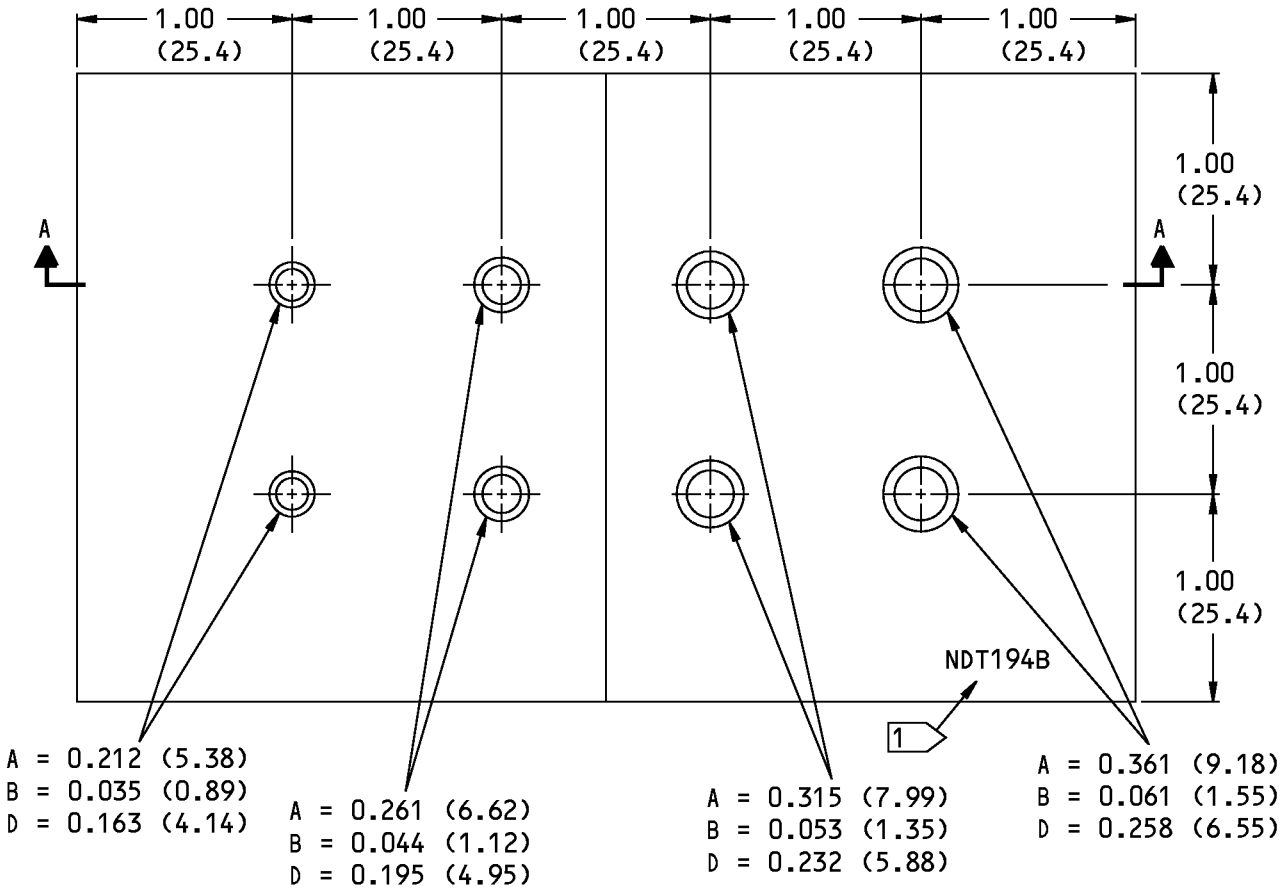
A–A

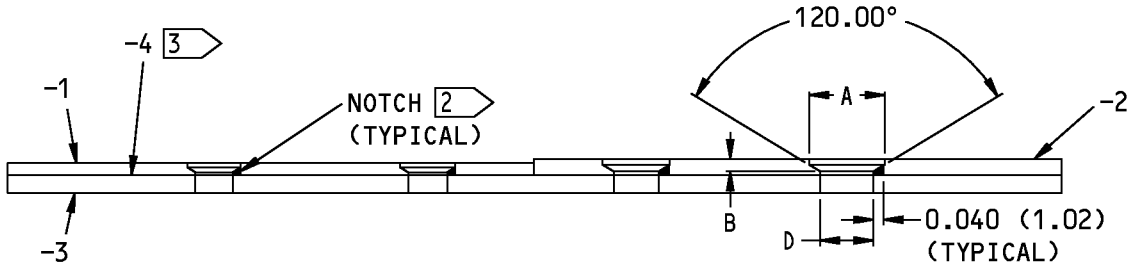
NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 1/4 INCH HOLE SIZE, DRILL A 0.250 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 7/32 INCH HOLE SIZE, DRILL A 0.218 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194A
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194A
Figure 3





A–A

Reference Standard NDT194B
Figure 4 (Sheet 1 of 2)

NOTES

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

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

- ANGULAR TOLERANCE: ±1.0 DEGREE
- SURFACE ROUGHNESS = 125 R_a OR BETTER.
- MATERIAL:

ID NO.	QUANTITY	DIMENSIONS	MATERIAL
-1	1	0.056 X 3.0 X 2.5 (1.42 X 76 X 64)	2024-T3 OR -T4 CLAD ALUMINUM
-2	1	0.081 X 3.0 X 2.5 (2.06 X 76 X 64)	2024-T3 OR -T2 CLAD ALUMINUM
-3	1	0.081 X 3.0 X 5.0 (2.06 X 76 X 127)	2024-T3 OR -T3 CLAD ALUMINUM
-4	1	0.010 X 3.0 X 5.0 (0.25 X 76 X 127)	ADHESIVE LAYER (USE A WATER RESISTANT ADHESIVE)

1> ETCH OR STEEL STAMP THE NUMBER "NDT194B" ON THE REFERENCE STANDARD.

2> EDM NOTCH: THE LENGTH OF THE NOTCH IS 0.040 (1.02) ±10% FROM THE FASTENER SHANK. THE DEPTH OF THE NOTCH IS THROUGH THE TOP LAYER. THE NOTCH WIDTH IS 0.005 ±0.002 (0.13 ±0.05). THE NOTCH MUST BE WITHIN ±0.005 (±0.10) OF THE CENTER OF THE HOLE.

3> APPLY AN EVEN LAYER OF ADHESIVE BETWEEN THE TOP AND BOTTOM LAYERS (-1 AND -3) (-2 AND -3).

Reference Standard NDT194B
Figure 4 (Sheet 2 of 2)

COUNTERSINK INSPECTION OF ALUMINUM PARTS (IMPEDANCE PLANE)

1. Purpose

A. To find the cracks that extend across the countersink surface with the fasteners removed. Use an impedance-plane-eddy-current instrument with a power-driven-rotating probe attachment. Refer to Figure 1 for an illustration of a usual crack.

B. Part 6, 53-30-01 or Part 6, 53-30-03 can be used as an alternative to this procedure.

2. Equipment

A. An impedance-plane-eddy-current instrument with a turning probe attachment is necessary for this procedure. All turning instrument and probe combinations that meet the necessary calibrations of this procedure can be used. The following equipment was used to make this procedure:

(1) Instrument

(a) Defectoscope D2.831, Foerster Instruments

(b) AV100 SE, Hocking Instruments

(2) Probe - Rotating Countersink Probes

(a) Use a probe that:

1) Operates at a frequency range of 100 to 500 kHz.

2) Has an external diameter that fits in the countersunk hole that is shown in Figure 2 or Figure 3 or the counterbore hole that is shown in Figure 4.

NOTE: A 100-degree countersunk probe can be used in the counterbore hole shown in Figure 4. But differences between the shape of the probe and the counterbore can cause the probe to wear very fast.

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

1) Probe Adapter P/N AH-DR (Required if using AV100 SE Instr.)

CSD-100-10 (0.156 inch diameter) for Defectoscope

CSD-100-12 (0.187 inch diameter) for Defectoscope

CSD-100-14 (0.218 inch diameter) for Defectoscope

CSD-100-16 (0.250 inch diameter) for Defectoscope

NDT Engineering Corp.

(3) Reference Standard

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

(a) Use reference standard 194 or 194A to examine 100-degree countersunk holes. See Figure 2 or Figure 3 for data about the reference standards.

(b) Use reference standard NDT194B to examine 120-degree counterbore holes. See Figure 4 for data about the reference standard.

3. Preparation for Inspection

A. Remove the fasteners.

B. Make sure the inspection surface is clean.

NOTE: Be careful not to cause damage to or make the countersink larger when the fasteners are removed. Only deburr and rub the surface clean.

4. Instrument Calibration

A. Turn instrument on and do the initial adjustments as specified in the manufacturer's instructions.

B. Find the countersink hole size that is to be inspected and connect the applicable probe to the instrument.

C. Set the frequency between 100 and 500 kHz.

NOTE: The reference standard and the eddy current probe must be the same size as the countersink hole that will be inspected.

D. Put the probe in the notched countersink hole of the reference standard and turn on the rotating scanner. See Figure 1, Calibration Reference Standard.

E. Set the instrument timebase line to the center of the screen and adjust the phase, the sensitivity and the filters to give a signal almost the same as that in Figure 5, Sensitivity and Filter Signal.

F. Adjust the sensitivity to set the notch signal at 80 percent of the full screen amplitude. See Figure 5, Sensitivity and Filter Signal.

NOTE: Keep a 3:1 or better signal-to-noise ratio during this inspection. Adjustment of the phase control and the filters possibly can decrease the noise signal.

G. Set the instrument gates so that the visual and/or audible alarms turn on when the notch signal reaches 80 percent of the reference-standard-notch response.

H. Turn the probe driver and monitor the effect of the crack orientation on screen display. Be able to identify the crack direction from the screen display.

5. Inspection Procedure

A. Turn on the rotating scanner and put the probe into the countersink hole. The scan speed must not be more than the calibration scan speed.

B. Put the probe at a small angle and make a scan inspection to keep the required signal-to-noise ratio. See Figure 5, Positioning of the Rotating Scanner.

C. Monitor the screen and make a scan inspection of the countersink hole. Make a note of all indications that are almost the same as the reference-standard-notch response.

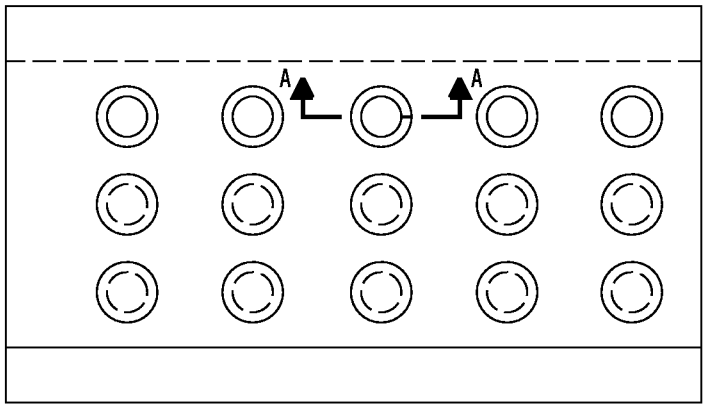
D. At regular times, do a check of the instrument calibration as specified in Paragraph 4.C. thru Paragraph 4.F. and adjust if necessary.

6. Inspection Results

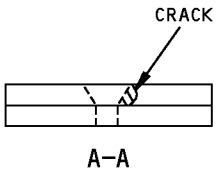
A. All signals that are equal to or more than the reference-standard-notch response are possible crack indications.

NOTE: Crack indications are usually narrow spikes that are almost the same as reference-standard-notch response. If a wide indication is shown or the noise level is more than the maximum allowed per Paragraph 4.F., rub the countersink with Scotch-Brite. This may improve signal-to-noise ratio.

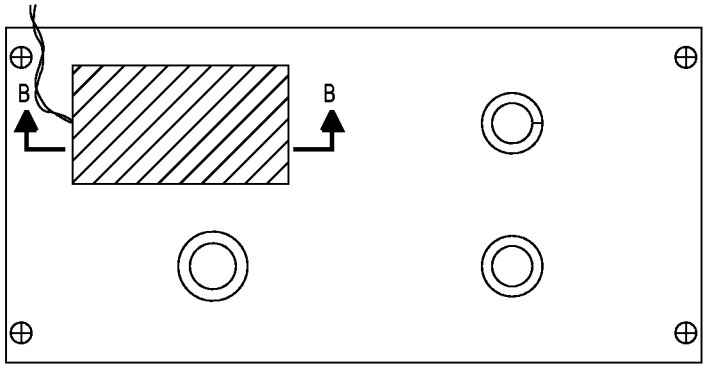
B. Part 6, 51-00-01 can be used to examine the area of the crack indication.



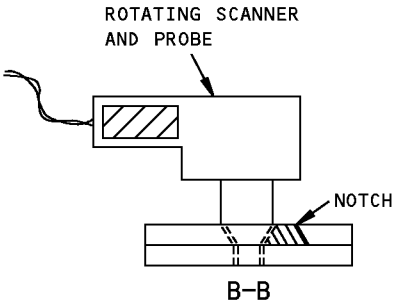
USUAL CRACK



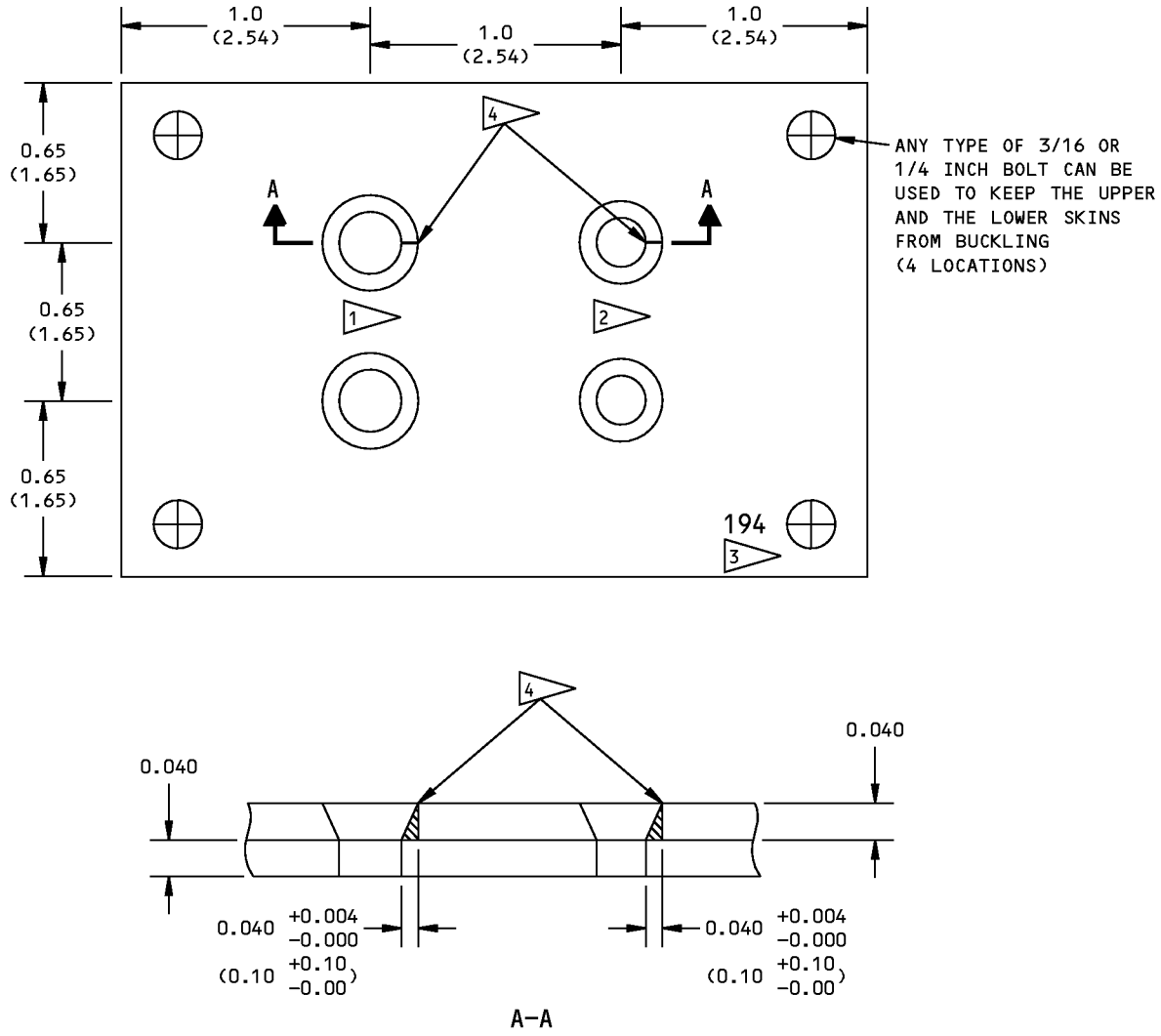
NOTE: THE CRACK EXTENDS FROM THE FASTENER HOLE ACROSS THE COUNTERSINK.



CALIBRATION - REFERENCE STANDARD



Countersink Inspection of Aluminum Parts
Figure 1

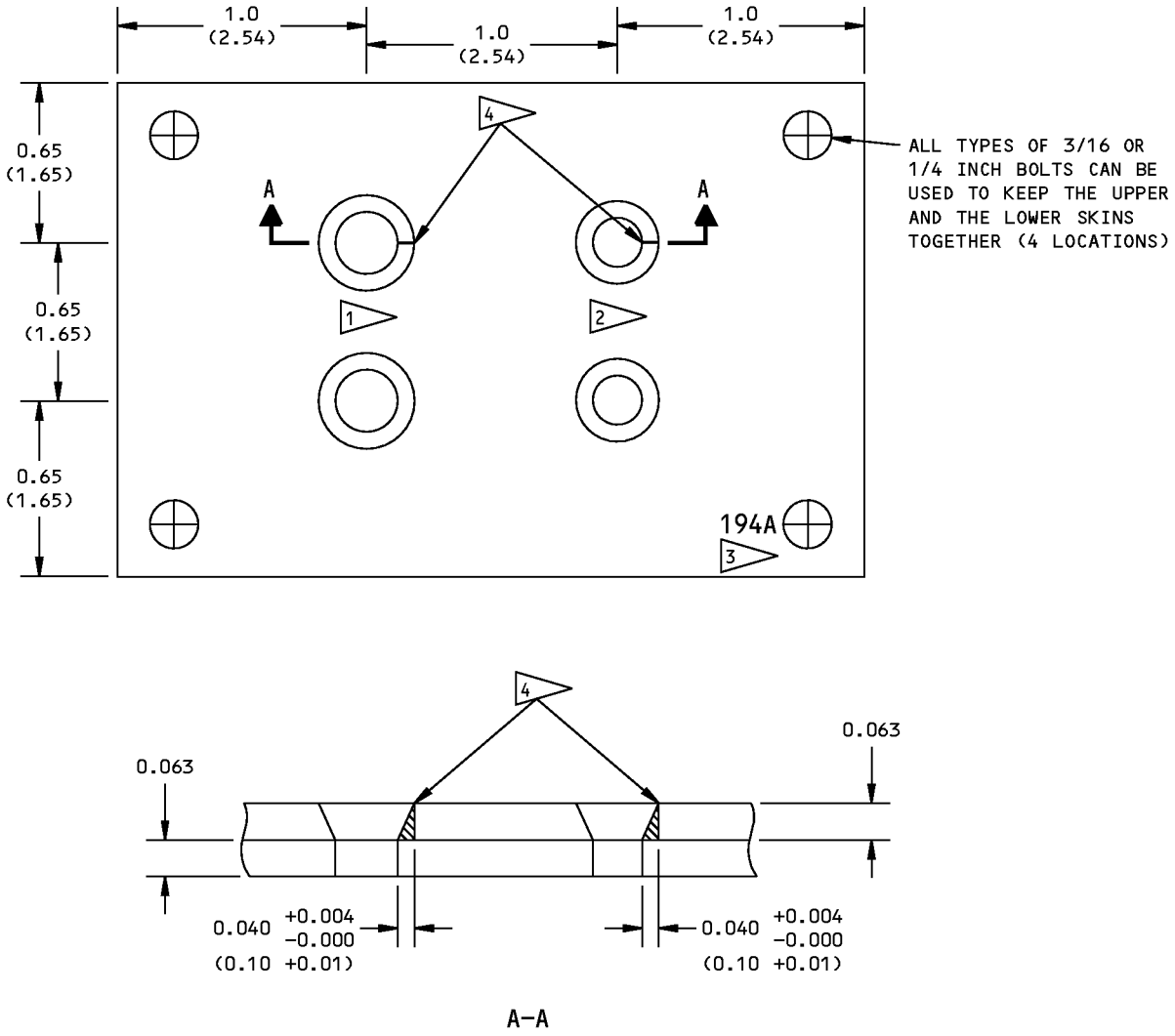


NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 3/16 INCH HOLE SIZE, DRILL A NO. 11 (0.191 INCH DIA) HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 5/32 INCH HOLE SIZE, DRILL A NO. 20 (0.161 INCH DIA) HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194
Figure 2

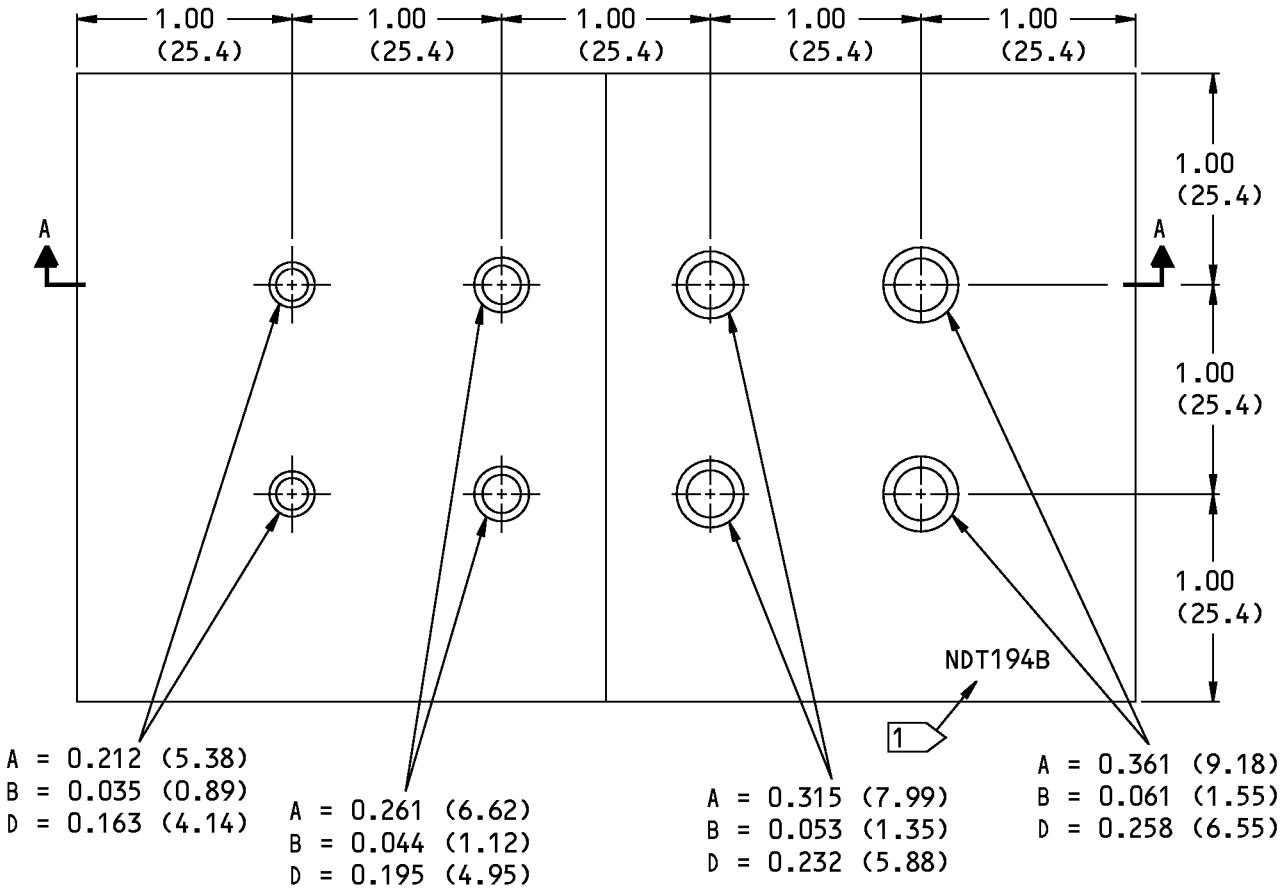


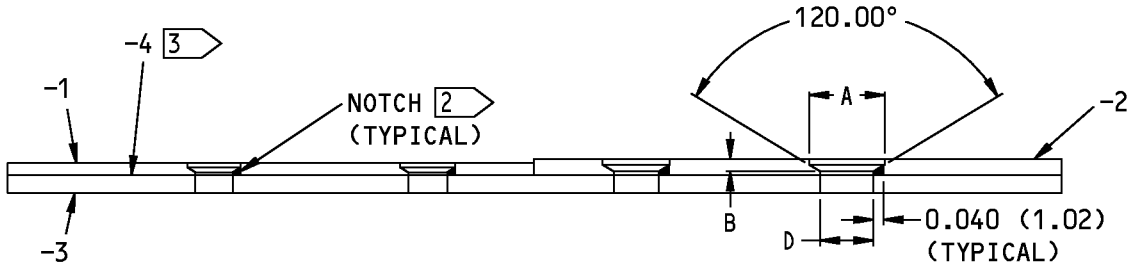
NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 1/4 INCH HOLE SIZE, DRILL A 0.250 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 7/32 INCH HOLE SIZE, DRILL A 0.218 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194A
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194A
Figure 3





A–A

Reference Standard NDT194B
Figure 4 (Sheet 1 of 2)

NOTES

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

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

- ANGULAR TOLERANCE: ±1.0 DEGREE
- SURFACE ROUGHNESS = 125 R_a OR BETTER.
- MATERIAL:

ID NO.	QUANTITY	DIMENSIONS	MATERIAL
-1	1	0.056 X 3.0 X 2.5 (1.42 X 76 X 64)	2024-T3 OR -T4 CLAD ALUMINUM
-2	1	0.081 X 3.0 X 2.5 (2.06 X 76 X 64)	2024-T3 OR -T2 CLAD ALUMINUM
-3	1	0.081 X 3.0 X 5.0 (2.06 X 76 X 127)	2024-T3 OR -T3 CLAD ALUMINUM
-4	1	0.010 X 3.0 X 5.0 (0.25 X 76 X 127)	ADHESIVE LAYER (USE A WATER RESISTANT ADHESIVE)

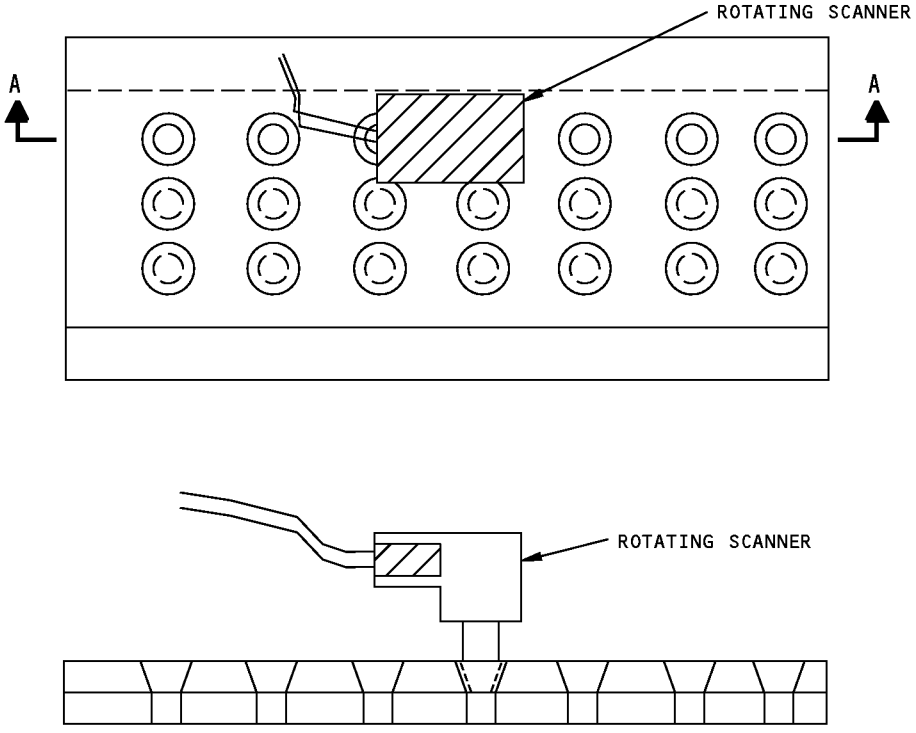
1> ETCH OR STEEL STAMP THE NUMBER "NDT194B" ON THE REFERENCE STANDARD.

2> EDM NOTCH: THE LENGTH OF THE NOTCH IS 0.040 (1.02) ±10% FROM THE FASTENER SHANK. THE DEPTH OF THE NOTCH IS THROUGH THE TOP LAYER. THE NOTCH WIDTH IS 0.005 ±0.002 (0.13 ±0.05). THE NOTCH MUST BE WITHIN ±0.005 (±0.10) OF THE CENTER OF THE HOLE.

3> APPLY AN EVEN LAYER OF ADHESIVE BETWEEN THE TOP AND BOTTOM LAYERS (-1 AND -3) (-2 AND -3).

Reference Standard NDT194B
Figure 4 (Sheet 2 of 2)

SENSITIVITY AND FILTER SIGNAL



A–A

POSITIONING OF THE ROTATING SCANNER

Instrument Calibrations
Figure 5

COUNTERSINK INSPECTION OF ALUMINUM PARTS (IMPEDANCE PLANE/COUNTERSINK PROBE)

1. Purpose

A. To find the cracks that extend across the countersink surface with the fasteners removed. Refer to Figure 1 for an illustration of a usual crack.

B. Part 6, 53-30-01 or Part 6, 53-30-02 can be used as an alternative to this procedure.

2. Equipment

A. This procedure uses an impedance-plane-display eddy current instrument with a countersink probe which can operate between 100 and 500 kHz. All impedance-plane-display instrument and countersink probe combinations that meet the necessary calibration conditions of this procedure can be used.

The following equipment was used to develop this procedure:

(1) Instrument

(a) AV100L, Hocking Instruments

(b) NDT 19, Staveley Instruments

(2) Probe

(a) Use a probe that:

1) Operates at a frequency range of 100 to 500 kHz.

2) Has an external diameter that fits in the countersunk hole that is shown in Figure 2 or Figure 3 or the counterbore hole that is shown in Figure 4.

NOTE: A 100-degree countersunk probe can be used in the counterbore hole shown in Figure 4.

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

1) CSM-100-10 (0.156 inch diameter)

CSM-100-12 (0.187 inch diameter)

CSM-100-14 (0.218 inch diameter)

CSM-100-16 (0.250 inch diameter)

NDT Engineering Corporation

2) VM103C 5/32 inch (0.156 inch diameter)

VM103C 3/16 inch (0.187 inch diameter)

VM103C 7/32 inch (0.218 inch diameter)

VM103C 1/4 inch (0.250 inch diameter)

VM Products

(3) Reference Standard

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

(a) Use reference standard 194 or 194A to examine 100-degree countersunk holes. See Figure 2 or Figure 3 for data about the reference standards.

(b) Use reference standard NDT194B to examine 120-degree counterbore holes. See Figure 4 for data about the reference standard.

3. Preparation for Inspection

A. Remove the fasteners.

B. Make sure inspection surface is clean.

NOTE: Be careful not to cause damage to or to make the countersink larger when the fasteners are removed. Only deburr and rub the surface clean.

4. Instrument Calibration

A. Get the correct probe and set the instrument frequency between 100 and 500 kHz.

NOTE: The reference standard and the eddy current probe must be the same size as the countersink hole that will be inspected.

B. Put the probe in the countersink hole of the reference standard with the coil installed opposite of the notch. Adjust the probe collar to keep the probe vertical to the reference standard surface. See Figure 1, Calibration-Reference Standard.

C. Balance the instrument and adjust the instrument controls until the "flying dot" is in the center of the screen.

D. Adjust the phase rotation control until the "flying dot" moves horizontally and to the left side of the screen when the probe coil is lifted off of the reference standard surface (Figure 5).

E. Turn the probe coil over the notch and adjust the instrument sensitivity to cause a crack indication signal with a 20-degree-minimum-angle separation from the horizontal lift-off and a two-division minimum horizontal or vertical separation from the instrument balance point. See Figure 5, General Impedance Plane Response.

NOTE: Adjustment of the instrument X/Y ratio or independent vertical gain controls can make the crack signal angle better. A signal from the calibration notch must not be greater than the horizontal or vertical limits of the screen.

F. Do a check of the lift-off again. If an adjustment is made, do a check of the sensitivity as specified in Paragraph 4.E. and adjust again if necessary.

G. Make a note of the instrument signal as the probe is turned over the notch to find the maximum or best scan speed.

NOTE: The use of an audible or visual alarm is recommended and can increase the scan speed. Set the alarm to operate to signals that are 80 percent of the reference standard notch signal.

5. Inspection Procedure

A. Put the probe into the countersink and adjust the probe collar to keep the probe vertical to the surface.

B. Balance the instrument and, if necessary, adjust the "flying dot" to the calibration reference position.

C. Scan the countersink. The probe must be turned more than 360 degrees to make sure the complete countersink is covered. Keep the probe vertical to the inspection surface during the inspection. See Figure 5, Inspection Procedure. Keep a scan speed that is almost the same as the calibration scan speed.

NOTE: The eddy current instrument will find cracks by a rapid deflection over a short probe scan distance that is almost the same as the reference standard signal. For some fastener holes that are out of round, the eddy current instrument can show a slow upward "flying dot" movement over a large-probe-scan distance. This is not a crack indication.

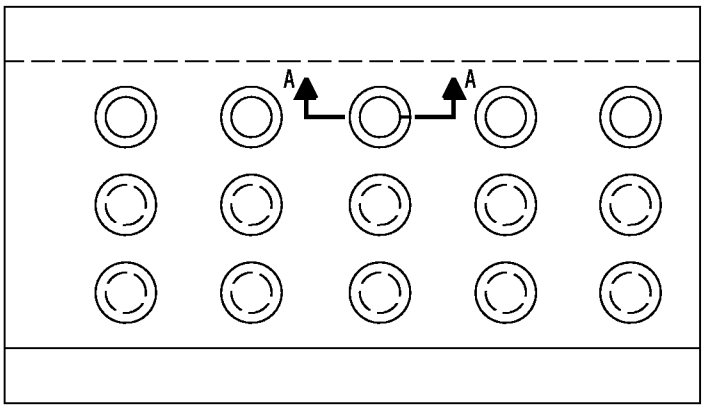
D. Compare all crack indications with the reference-standard-notch signal.

E. At regular times during the inspection, do a check of the instrument calibration as specified in Paragraph 4.B. thru Paragraph 4.G. and adjust if necessary.

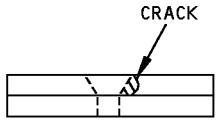
6. Inspection Results

A. A signal with a pattern which is almost the same as and is equal to or greater than the reference-standard-notch signal, which occurs over a short-probe-scan distance, is a possible crack indication and more inspection is necessary.

B. Part 6, 51-00-01 can be used to make sure the indication is a crack.

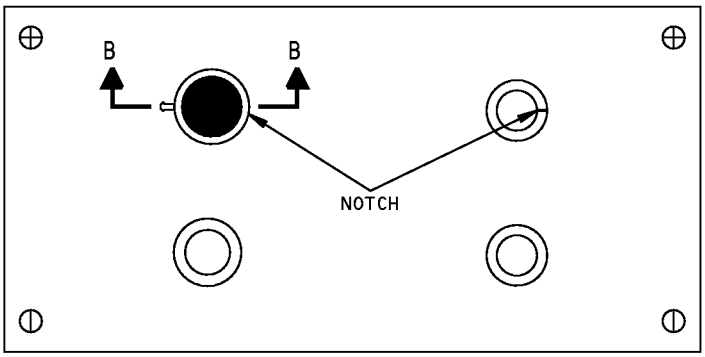


USUAL CRACK

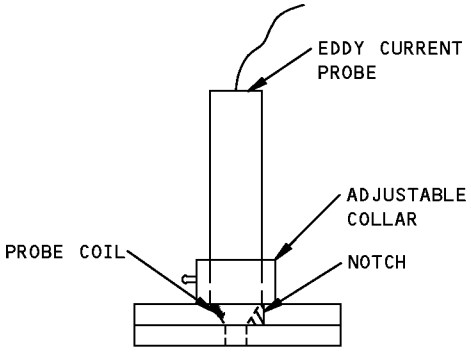


NOTE: A CRACK WHICH EXTENDS FROM THE FASTENER HOLE ACROSS THE COUNTERSINK.

A–A



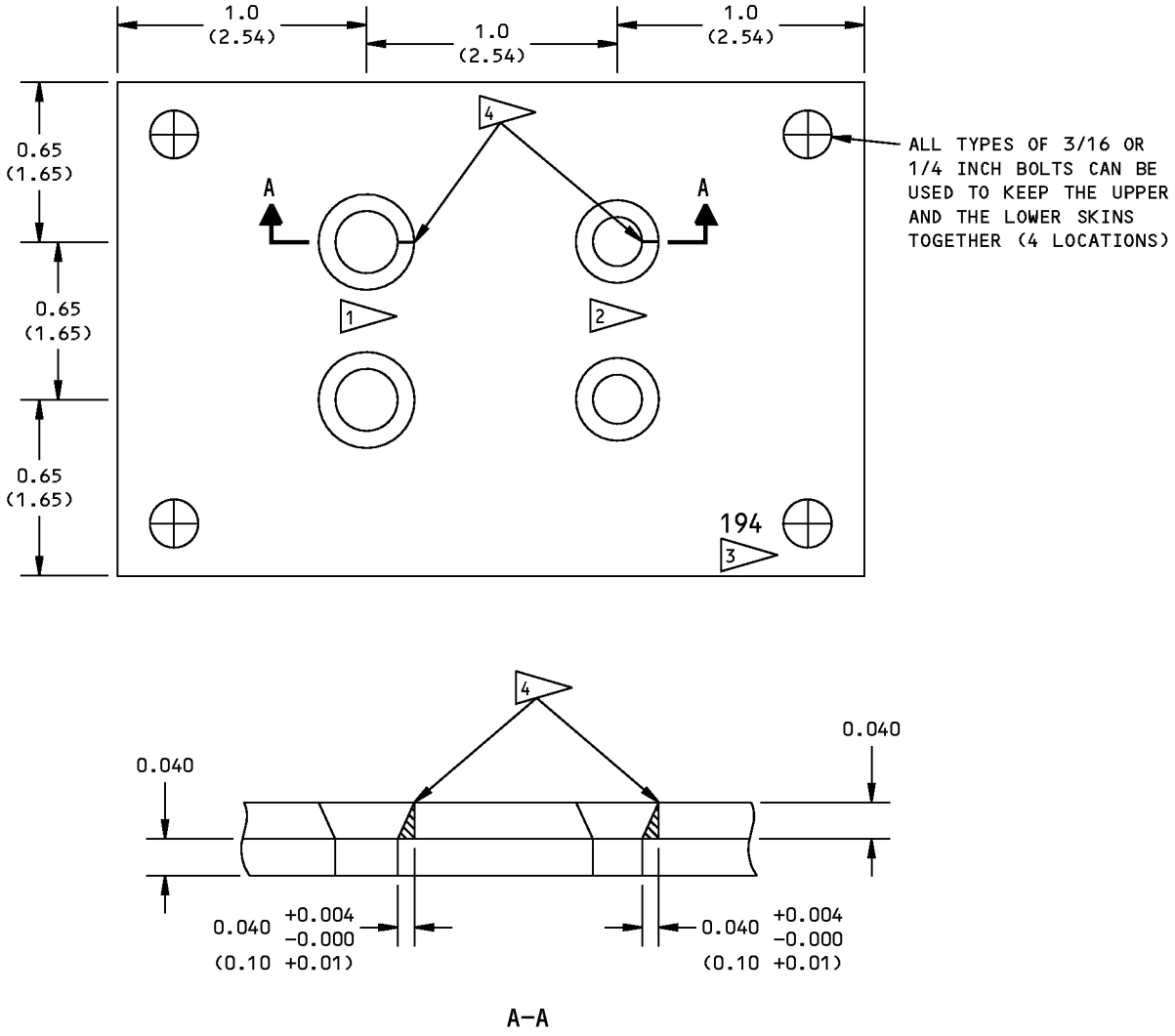
CALIBRATION - REFERENCE STANDARD



NOTE: PROBE COIL INSTALLED OPPOSITE OF THE NOTCH.

B–B

Countersink in Aluminum Parts
Figure 1

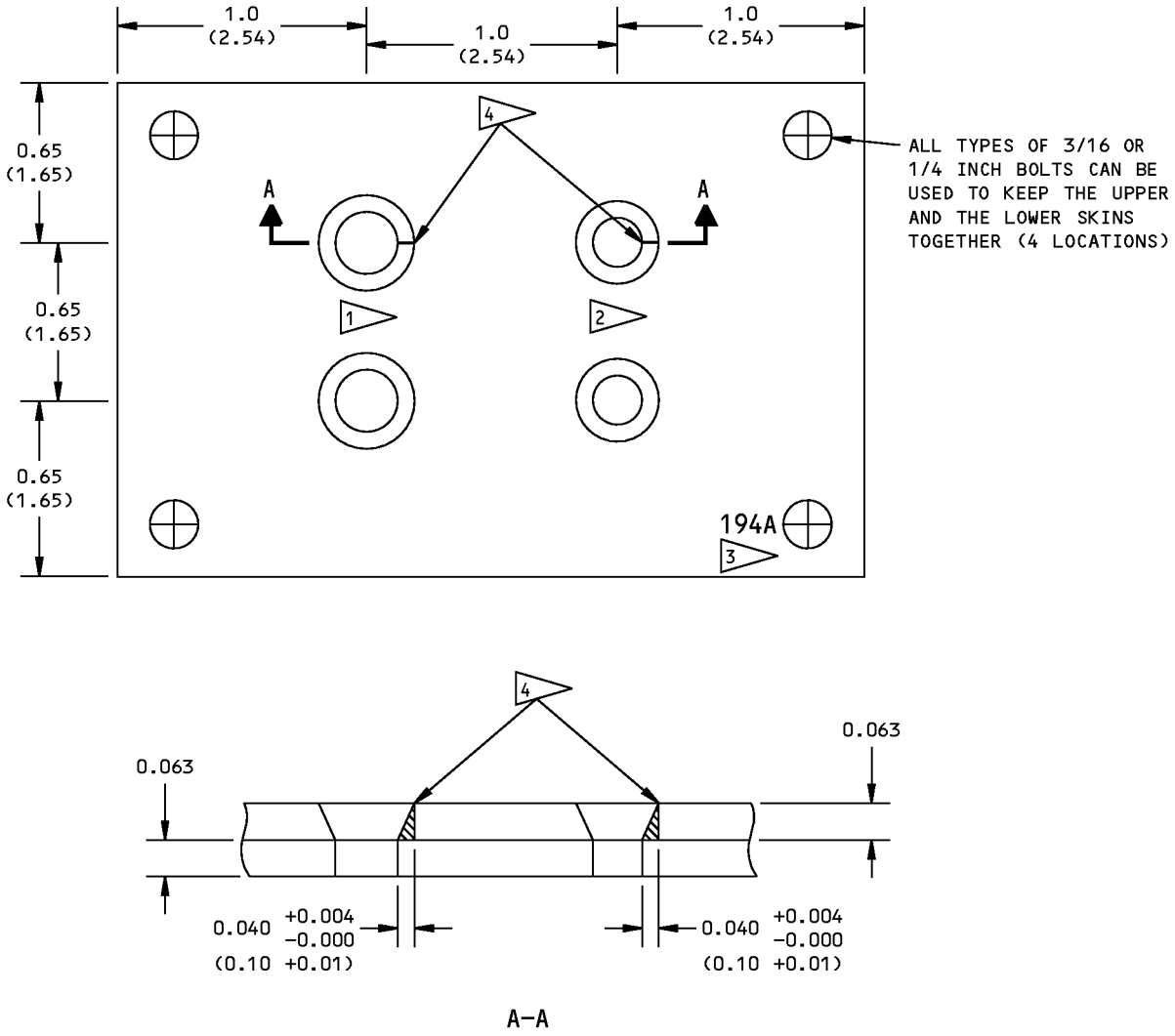


NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 3/16 INCH HOLE SIZE, DRILL A 0.191 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 5/32 INCH HOLE SIZE, DRILL A 0.161 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194
Figure 2

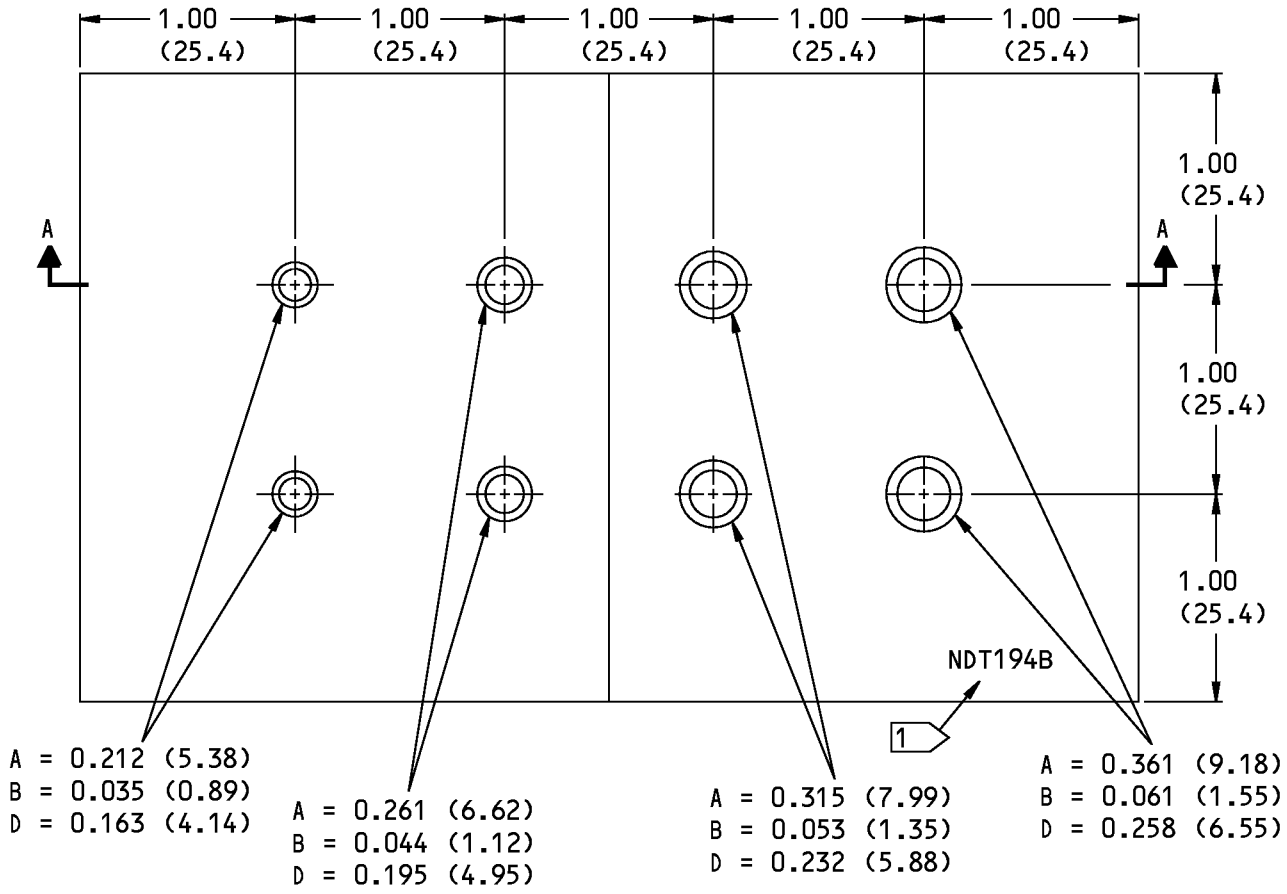


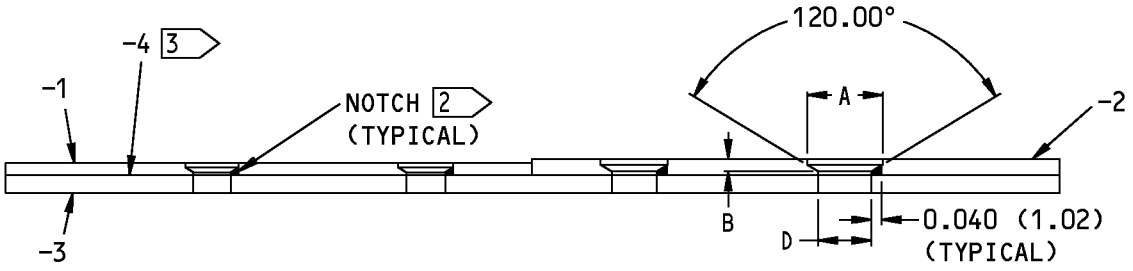
NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- TOLERANCE: X.X ±0.05
  X.XXX ±0.005 (0.013)
  (UNLESS NOTED)
- MATERIAL: 2024 T3 OR T4 CLAD ALUMINUM

1. FOR A 1/4 INCH HOLE SIZE, DRILL A 0.250 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
2. FOR A 7/32 INCH HOLE SIZE, DRILL A 0.218 INCH DIA HOLE AND COUNTERSINK 100° - TOP SHEET
3. ETCH OR STAMP PART NUMBER 194A
4. EDM NOTCH OR EQUIVALENT 0.007 (0.018) MAXIMUM WIDTH

Reference Standard 194A
Figure 3





A–A

Reference Standard NDT194B
Figure 4 (Sheet 1 of 2)

NOTES

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

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

- ANGULAR TOLERANCE: ±1.0 DEGREE
- SURFACE ROUGHNESS = 125 R_a OR BETTER.
- MATERIAL:

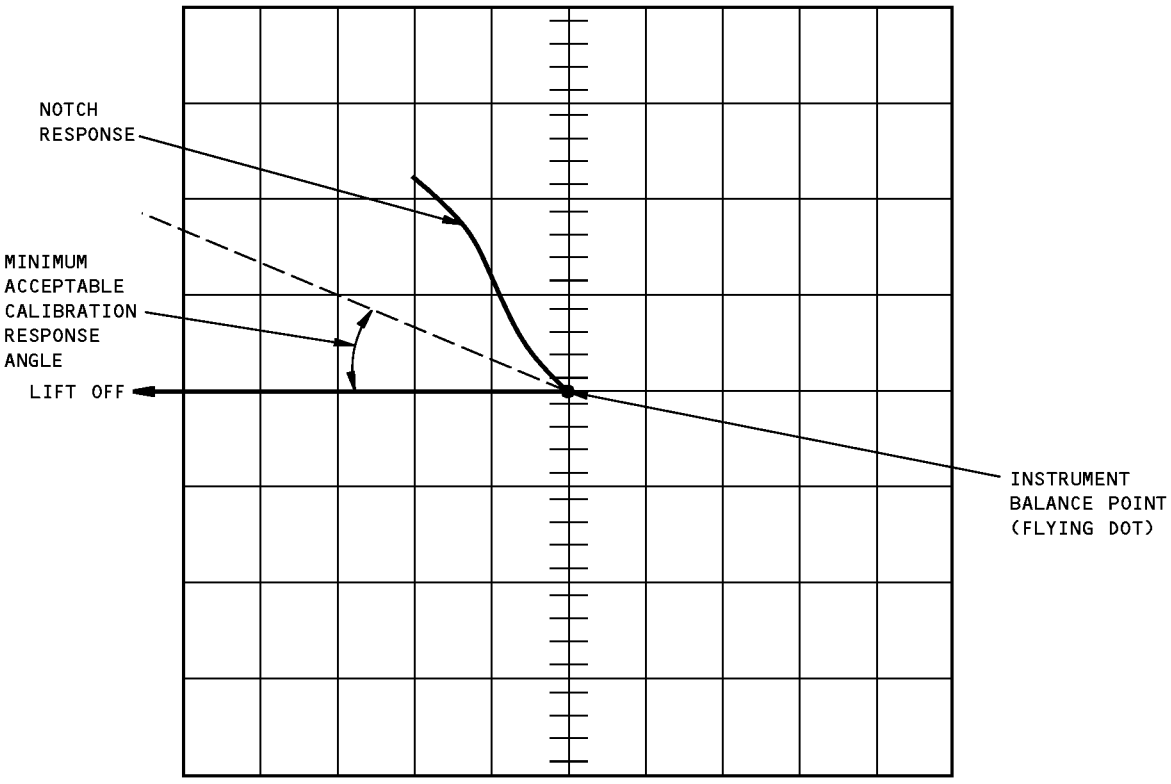
ID NO.	QUANTITY	DIMENSIONS	MATERIAL
-1	1	0.056 X 3.0 X 2.5 (1.42 X 76 X 64)	2024-T3 OR -T4 CLAD ALUMINUM
-2	1	0.081 X 3.0 X 2.5 (2.06 X 76 X 64)	2024-T3 OR -T2 CLAD ALUMINUM
-3	1	0.081 X 3.0 X 5.0 (2.06 X 76 X 127)	2024-T3 OR -T3 CLAD ALUMINUM
-4	1	0.010 X 3.0 X 5.0 (0.25 X 76 X 127)	ADHESIVE LAYER (USE A WATER RESISTANT ADHESIVE)

1> ETCH OR STEEL STAMP THE NUMBER "NDT194B" ON THE REFERENCE STANDARD.

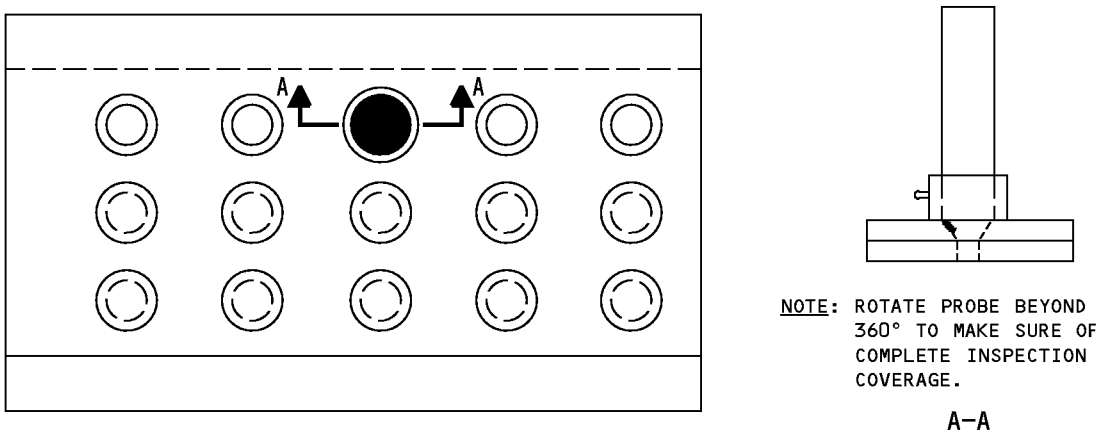
2> EDM NOTCH: THE LENGTH OF THE NOTCH IS 0.040 (1.02) ±10% FROM THE FASTENER SHANK. THE DEPTH OF THE NOTCH IS THROUGH THE TOP LAYER. THE NOTCH WIDTH IS 0.005 ±0.002 (0.13 ±0.05). THE NOTCH MUST BE WITHIN ±0.005 (±0.10) OF THE CENTER OF THE HOLE.

3> APPLY AN EVEN LAYER OF ADHESIVE BETWEEN THE TOP AND BOTTOM LAYERS (-1 AND -3) (-2 AND -3).

Reference Standard NDT194B
Figure 4 (Sheet 2 of 2)



GENERAL IMPEDENCE PLANE RESPONSE
FROM REFERENCE STANDARD



INSPECTION PROCEDURE

Instrument Calibrations
Figure 5

SUBSURFACE CRACK INSPECTION OF FAYING SURFACES

1. Purpose

A. Use this procedure to do an inspection for subsurface cracks that:

(1) Are adjacent to fastener holes

(2) Are near the external surface of the first layer of aluminum fuselage structures

(3) Start at the internal (faying) surface

B. This procedure can be used to find:

(1) Cracks that start at fastener holes and move out in a radial direction

(2) Cracks that start away from the fastener hole and are along side the hole (eyebrow cracks)

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. Instruments

(1) Use an impedance plane instrument that:

(a) Has an impedance plane display.

(b) Operates in a frequency range of 10 to 30 kHz.

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

(a) NDT 19; Staveley Instruments

(b) MIZ 22; Zetec Inc.

C. Probes

(1) Use a probe that can operate in a frequency range of 30 to 50 kHz.

(2) If you make an order for a probe, make sure to give the instrument or connector type.

(3) The probes identified below were used to prepare this procedure.

(a) LP903-50B/2-12K; NDT Engineering Corp.

(b) SPO-6464; Staveley Instruments

(c) LS905-50B; NDT Engineering Corp.

(d) SPC4TF-105; EC/NDT Company

D. Reference Standards

(1) Use reference standard ANDT4126. See Figure 1 for data about the reference standard.

3. Preparation for Inspection

A. Identify the location of the inspection areas.

B. Get access to the inspection areas.

C. Remove loose paint, dirt, and sealant from the surfaces of the inspection area.

D. Make the inspection surfaces smooth if they are rough.

4. Instrument Calibration

A. Set the frequency between 10 and 30 kHz.

B. If the inspection area is painted, put a nonconductive shim on top of the reference standard. The thickness of the nonconductive shim must be within ± 0.003 inch (0.08 mm) of the paint thickness.

C. Put the probe on reference standard ANDT4126 at position 1 on the side of the reference standard opposite the fastener heads (see Figure 2).

D. Balance the instrument.

E. Adjust the instrument phase to get a lift-off signal that moves horizontally to the left as shown in Figure 2.

F. Adjust the horizontal gain or vertical to horizontal gain ratio to get a lift-off signal of less than 20% of full screen width when the probe is lifted off the reference standard 0.003 inch (0.08 mm) (one sheet of paper is approximately 0.003 inch, 0.08 mm).

G. Move the balance point to the position shown in Figure 2.

H. Move the probe above the reference standard notch at probe position 2 as shown in Figure 2.

NOTE: This notch is used to calibrate the equipment to do an inspection for cracks along the side of the fastener hole.

I. Adjust the instrument gain to get a signal amplitude of 80 percent of full screen height as shown in Figure 2.

J. It will be necessary to use a different frequency between 10 and 30 kHz and do Paragraph 4.E. thru Paragraph 4.I. again if:

(1) The signal to noise ratio is less than 3:1 or,

(2) The notch signal is not vertical to the lift-off line.

K. Move the probe above the reference standard notch at probe position 3 as shown in Figure 2. This notch causes a radial crack signal to occur on the screen display. Monitor the signal as you move the probe above the notch. The radial crack signal must occur in the shaded area shown in Figure 2.

5. Inspection Procedure

A. Put the probe on the inspection surface adjacent to a fastener.

NOTE: After the instrument is calibrated from the tail side of a fastener, the inspection can be done from the head or the tail side of a fastener. Refer to the document that specified to use this procedure to identify the correct inspection surface.

B. Balance the instrument.

C. Do a scan of the inspection area as follows:

(1) Use a scan pattern that will permit you to find subsurface cracks that are 0.25 inch (6.4 mm) or more in length. Figure 3 shows a possible scan pattern.

(a) Use the end of the fastener as a probe guide and do the scan completely around the fastener.

(b) Make a second scan completely around the fastener with the probe moved a distance of 0.25 inch (6.4 mm) from the fastener.

(2) Keep the probe vertical to the part surface to decrease the balance point movement.

(3) Frequently do a check of the instrument/probe calibration during the inspection as follows.

(a) Put the probe on the reference standard to get a signal from the notch.

(b) Compare the signal you got from the notch during calibration with the signal you get now.

(c) If the signal has changed 10% or more, do the calibration and inspection again on all areas examined since the last calibration check.

(4) Monitor all areas for fast upscale signals that are almost the same as the signals you got from the reference standard notches.

6. Inspection Results

A. Indications of possible cracks are as follows.

(1) Signals more than 40 percent of the display.

(2) Fast upscale signals that occur when the probe is moved a small angular distance (signals such as those you got during calibration).

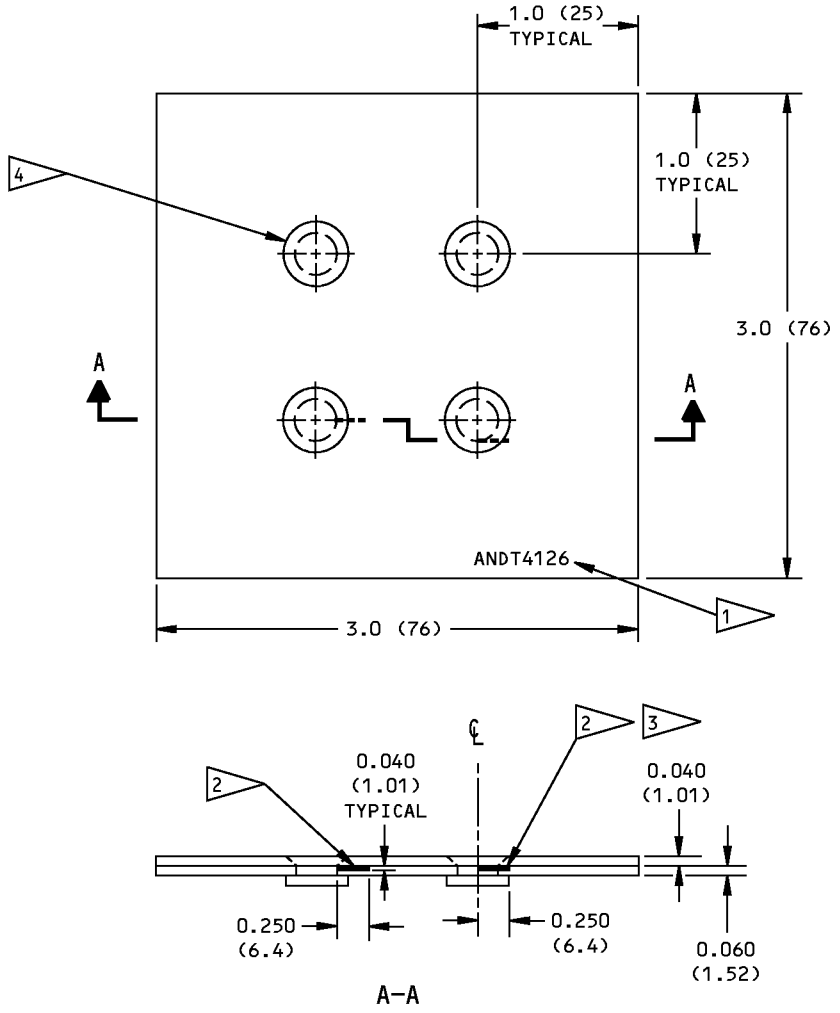
B. Some cracks follow a circumferential path around the fastener and do not always end at the fastener hole. These type of cracks cause a fast upscale signal that will keep the same signal amplitude as the probe is moved around the fastener head for the length of the crack.

C. To find the length, or the ends, of a crack, do a scan across the length of the crack until a signal does not occur.

D. You can do more examination to make sure a crack signal is the result of a crack as follows.

(1) For cracks that start at fastener holes, use a high frequency inspection procedure as specified in the "Fastener Hole Inspection" column of Table I (Figure 4).

(2) To examine the external side of the fuselage, use a low frequency eddy current procedure as specified in the "Repair Inspection" column of Table I (Figure 4).



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

ANGULAR: = ±1.0 DEGREE

- MATERIAL: 2024-T3,T4.
- SURFACE ROUGHNESS = 125 RA OR BETTER

1 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER ANDT4126 AT APPROXIMATELY THIS LOCATION. PUT A LETTER "A" IN FRONT OF THE REFERENCE STANDARD NUMBER TO SHOW THAT IT HAS ALODINE RIVETS.

2 EDM NOTCH: PUT THE NOTCH ADJACENT TO THE HOLE EDGE WITHIN ±0.005 (±0.10).

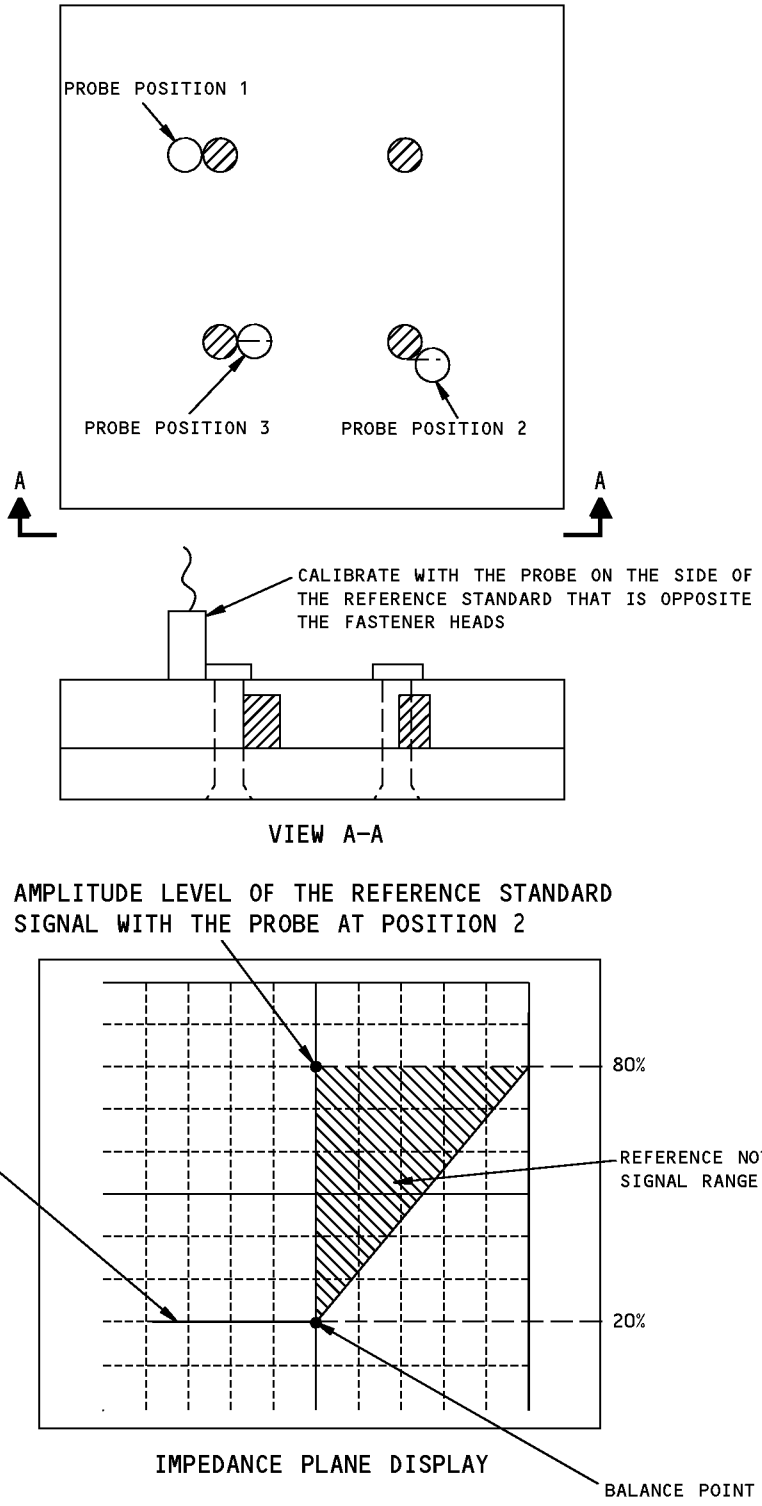
NOTCH DIMENSIONS AND TOLERANCES:

DEPTH: 0.040 (1.01)
WIDTH: 0.025 (0.75) MAXIMUM
LENGTH: 0.250 (6.4)

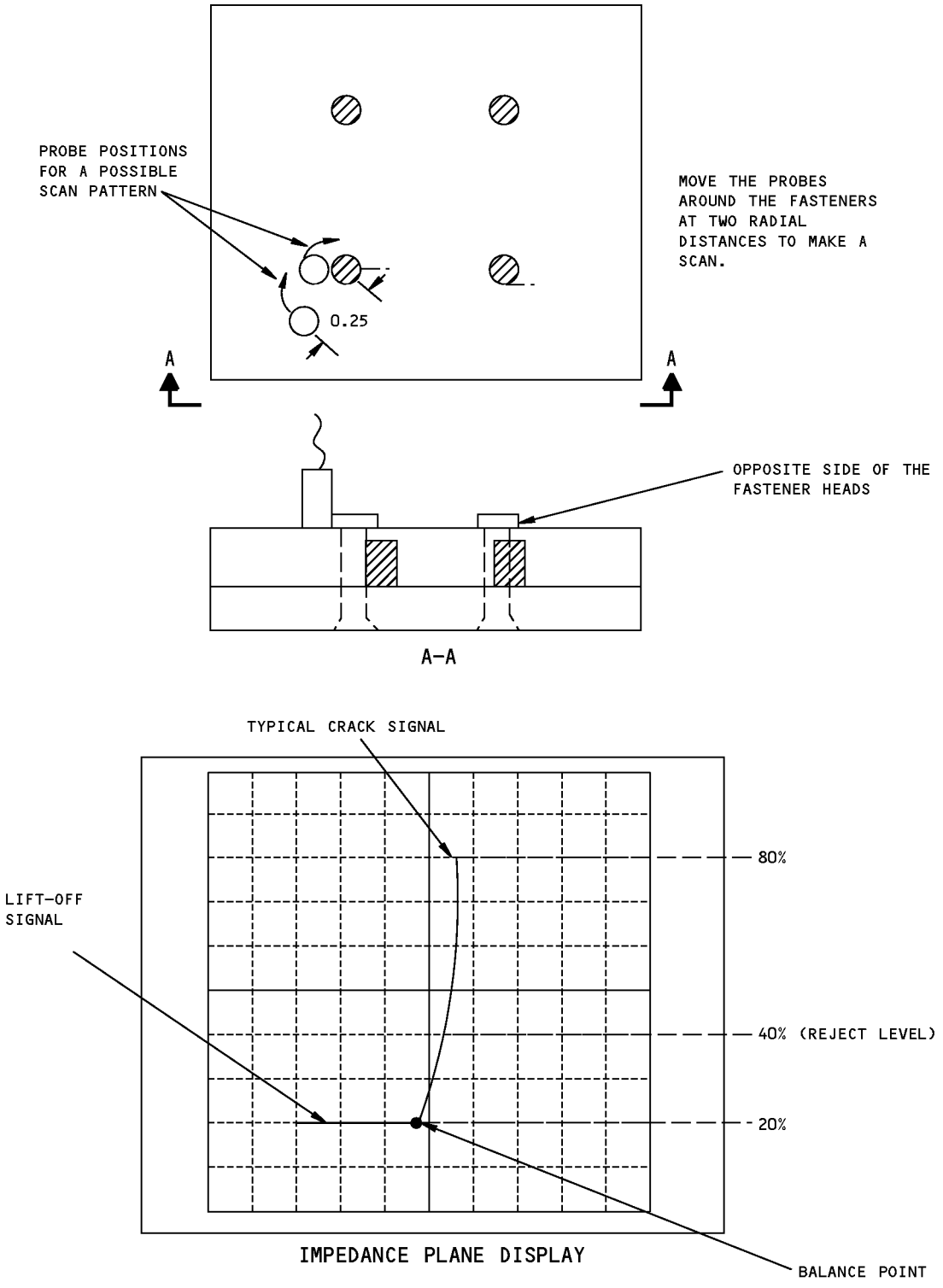
3 THIS NOTCH STARTS AT THE HOLE CENTERLINE AND IS TANGENT TO THE HOLE.

4 FASTENERS: BACR15CE6 OR EQUIVALENT (4 LOCATIONS). THESE RIVETS MUST HAVE CONVERSION COATED (ALODINE) FINISH. TO MAKE SURE THE FINISH IS ALODINE, REFER TO PART 1, 51-06-01. INSTALL THE RIVETS AS SPECIFIED IN PART 1, 51-01-04.

Reference Standard ANDT4126
Figure 1



Instrument Calibration
Figure 2



Inspection Scan Pattern and Defect Indications
Figure 3

AIRPLANE MODEL	FASTENER HOLE INSPECTION		REPAIR INSPECTION
	MANUAL PROBE	ROTATING PROBE	
707	PART 6 51-00-00 FIGURE 11	PART 6 51-00-00 FIGURE 16	PART 6 53-30-00 FIGURE 5
727	PART 6 51-00-00 FIGURE 11	PART 6 51-00-00 FIGURE 16	PART 6 53-30-00 FIGURE 5
737	PART 6 51-00-00 FIGURE 11	PART 6 51-00-00 FIGURE 16	PART 6 53-30-00 FIGURE 5
747	PART 6 51-00-00 FIGURE 11	PART 6 51-00-00 FIGURE 16	PART 6 53-30-00 FIGURE 5
757	PART 6 51-00-11	PART 6 51-00-16	PART 6 53-00-06
767	PART 6 51-00-11	PART 6 51-00-16	PART 6 53-00-06

TABLE I

Crack Inspection Procedures
Figure 4

CIRCUMFERENTIAL SPLICES - SECTIONS 43, 45 AND 46

1. Purpose

A. Use this procedure to find cracks in the splice plate at the circumferential butt splices.

(1) See Figure 1 for the inspection areas on the 767-2XX model airplanes.

(2) See Figure 2 for the inspection areas on the 767-3XX model airplanes.

NOTE: The inspection areas are different for the different model airplanes. Inspectors must make sure of the model type and use the correct Figure for the inspection.

B. Do this procedure from the external skin surface on the airplane.

C. This procedure uses a reflection (or driver pick-up), encircling type probe and an impedance plane display eddy current instrument.

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-30-I05

(2) ITEM 53-30-I21

(3) ITEM 53-30-I27

(4) ITEM 53-50-I03

(5) ITEM 53-60-I03

(6) ITEM 53-60-I26

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.

NOTE: Meter display instruments can be used if they can be calibrated on the reference standard as specified in Paragraph 4.

(b) Operates at a frequency range of 100 Hz to 1500 Hz.

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

(a) Phasec 1.1; Hocking/Krautkramer

(b) NDT 19e; Nortec-Staveley

C. Probes

(1) Use a reflection (driver pick-up), encircling type probe that can be calibrated as specified in Paragraph 4.

(2) The probe must operate in the frequency range of 100 Hz to 1500 Hz.

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

(a) NEC-4040; NDT Engineering Co.

(b) RR057-5; NDT Engineering Co.

D. Reference Standard

(1) Use reference standard NDT648. Make reference standard NDT648 as specified in Figure 3.

(a) Reference Standard NDT648 does not use titanium fasteners because tests did not show changes in the instrument signals when titanium fasteners were compared to aluminum fasteners.

(b) Only 0.25 inch (6.35 mm) diameter aluminum fasteners are used in reference standard NDT648; instrument signals did not change very much because of changes in fastener diameter during tests.

(c) It is not necessary to use Briles type (BACR15FV) fasteners in reference standard NDT648 because the probe design is sensitive only to radial crack indications, not the fastener type.

E. Special Tools

(1) A magnet can be used to identify magnetic (steel) fasteners

3. Preparation for Inspection

CAUTION: THIS INSPECTION IS DONE EXTERNALLY ON THE CROWN SKIN OF THE AIRPLANE. OBEY THE SAFETY RULES FOR WORK DONE AT HIGH LOCATIONS.

A. Remove loose paint, dirt and sealant from the inspection surfaces.

B. Remove paint, if necessary, so that you can see the fasteners.

4. Instrument Calibration

A. Calibration is necessary for each inspection code. An inspection code is used to identify fasteners that have equivalent (approximately) inspection conditions.

(1) Identify the inspection code for the fastener locations to be examined.

NOTE: The inspection areas are different for different model airplanes. Inspectors must make sure of the model type and use the correct figure for the inspection.

(a) See Figure 1 for the inspection areas on the 767-2XX model.

(b) See Figure 2 for the inspection areas on the 767-3XX model.

(2) Refer to Table 1 with the inspection code to identify:

(a) The instrument frequency to use.

NOTE: The instrument frequency to use is given as a reference only. Different instrument and probes can operate better at a frequency that is near the given frequency.

(b) The reference standard step to use.

(3) Set the instrument frequency to the frequency specified in Table 1.

(4) Set the instrument filters as follows:

(a) Set the high-pass filter to off or zero Hz.

(b) If the instrument has a low-pass filter, set it to its highest value.

(5) Put the probe on the reference standard at Position 1, as shown in Figure 4. Position 1 on the reference standard is equivalent to a good fastener hole location.

(a) Hold the probe so that the center of the probe is directly above the center of the fastener head.

(b) Balance (Null) the instrument.

NOTE: If the balance dot is not stable, decrease the Low Pass filter value to get a stable dot.

1) Move the probe to get a minimum signal.

2) Balance (Null) the instrument.

(c) Position the balance dot to 20% of full screen height and 60% of full screen width as shown in Figure 5.

(d) Tilt or lift the probe off of the reference standard at Position 1.

1) Adjust the rotation (or phase) control so that the balance dot moves horizontally to the left as shown in Figure 5 when the probe is tilted or lifted off the part.

(6) Put the probe on the reference standard at Position 2, as shown in Figure 4. Position 2 contains the EDM notch.

(a) Hold the probe so that the center of the probe is directly above the center of the fastener head.

1) Move the probe to get a minimum signal.

(b) Adjust the instrument gain to set the notch signal at 80% of full screen height.

(c) It is permitted to use a vertical and horizontal gain ratio of 2:1 or less.

(7) Do Paragraph 4.A.(5) and Paragraph 4.A.(6) again as necessary to get the necessary signal separation.

(8) Do the steps that follow to do a check of the signal to noise level:

(a) Put the probe on the reference standard at Position 1, as shown in Figure 4.

1) Move the probe to get a minimum signal.

(b) Lift the probe off of the reference standard.

(c) Do Paragraph 4.A.(8)(a) and Paragraph 4.A.(8)(b) a minimum of two more times while you monitor the instrument screen display.

1) The signal from the fastener hole at Position 1 must occur at the same full screen height location on the screen display (±10%).

5. Inspection Procedure

A. Identify the fastener locations that are necessary to examine.

(1) Look at the applicable inspection area Figures (Figure 1 or Figure 2).

(2) Examine the fastener locations that have the same inspection code and equivalent structure as a group.

(3) Examine each skin separately.

B. Calibrate the instrument as specified in Paragraph 4.

C. Balance (Null) the instrument on the airplane as follows:

(1) Make a selection of three or more fasteners from the group identified in Paragraph 5.A.(2). These fasteners will be used to identify a reference signal on the airplane for a satisfactory fastener location.

NOTE: Titanium fasteners must be compared only against other titanium fasteners in the area of inspection.

(2) Put the center of the probe on the center of one of the three identified fastener

NOTE: Operators must use a constant probe pressure during the inspection. Probe pressure changes can make the balance point move on the screen display and cause errors in signal analysis.

(3) Balance (Null) the instrument.

NOTE: Do not adjust the gain. Gain adjustments will make the instrument calibration unsatisfactory.

(a) Move the probe to get a minimum signal.

(b) Balance (Null) the instrument.

(4) Put the probe on the center of each of the three identified fasteners and monitor the screen display.

(a) Move the probe as necessary at each fastener location to get a minimum signal.

(5) Put the probe on the center of the fastener that gave the lowest signal. This fastener location will be called the baseline fastener.

(a) Move the probe to get a minimum signal.

(6) Balance (Null) the instrument.

(7) Do the steps that follow to make a check of the signal-to-noise level:

(a) Put the probe on the baseline fastener.

1) Move the probe to get a minimum signal.

(b) Lift the probe off of the baseline fastener.

(c) Do Paragraph 5.C.(7)(a) and Paragraph 5.C.(7)(b) a minimum of two more times while you monitor the instrument

(d) The signal from the fastener hole at Position 1 must occur at the same full screen height location on the screen display (within ± 10%).

(8) Refer back to the baseline fastener at regular intervals during the inspection to make sure the instrument signal is the same as before.

D. Do an inspection of each fastener from the group identified in Paragraph 5.A.(2) as follows:

(1) Put the center of the probe on the center of each fastener in the area to be examined.

(a) Move the probe at each fastener location to get a minimum signal.

NOTE: Balance point location changes can occur during the inspection because of conductivity and structural configuration changes. Balance point location changes of up to ±10% of full screen height are permitted during the inspection.

(2) Make a mark at the fastener locations that cause signals to occur that are 40% (or more) of full screen height. These are possible crack signals.

NOTE: A large crack can cause a signal to occur that is off the screen display.

NOTE: Use only markers that will not damage the structure.

(3) It is not necessary to examine the first fastener below a skin if the smaller edge margin does not allow the probe to be centered on the fastener.

(4) It is strongly recommended that the operator make a mark at each fastener that is examined or keep a log with the results of the inspection.

E. Do a check of the instrument calibration after the inspection of each skin as follows:

(1) Use the reference standard step identified by the inspection code for the inspection area.

(2) Put the center of the probe on the center of the fastener at Probe Position 1, as shown in Figure 4.

(a) Move the probe to get a minimum signal.

(3) Balance (Null) the instrument.

NOTE: Do not adjust the gain.

(4) Put the center of the probe on the center of the fastener at Probe Position 2, as shown in Figure 4.

(a) Move the probe to get a minimum signal.

(5) Compare this signal with the signal you got from the EDM notch during the calibration.

(6) If the signal from the EDM notch has changed 10% (or more) from the signal you got during calibration, do the calibration and the inspection again for all the fasteners examined since the last satisfactory calibration check.

6. Inspection Results

A. Signals that are more than 40% of full screen height are possible crack indications. Areas that cause crack type signals to occur must be examined some more.

B. Where the configuration is the same, compare the crack type signal from one side of the airplane with the signal you get from the same location on the opposite side of the airplane.

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

(1) A change in the edge margin.

(a) It is not necessary to examine the first fastener below a skin lap if the smaller edge margin does not allow the probe to be centered on the fastener.

(2) A decrease in the space between fasteners.

(3) A change in the fastener material.

(a) Do a visual inspection for titanium fasteners; remove paint if necessary.

1) The titanium fasteners are Hi Lok bolts and have a nut collar on the internal side of the airplane.

2) The titanium fasteners have a manufacturers mark on the fastener head.

3) Titanium fasteners have a tan color.

(b) Use a magnet to do a check for magnetic (steel) fasteners.

1) It is necessary to remove steel fasteners and examine the open hole as specified in one of the procedures identified in Paragraph 6.D.

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

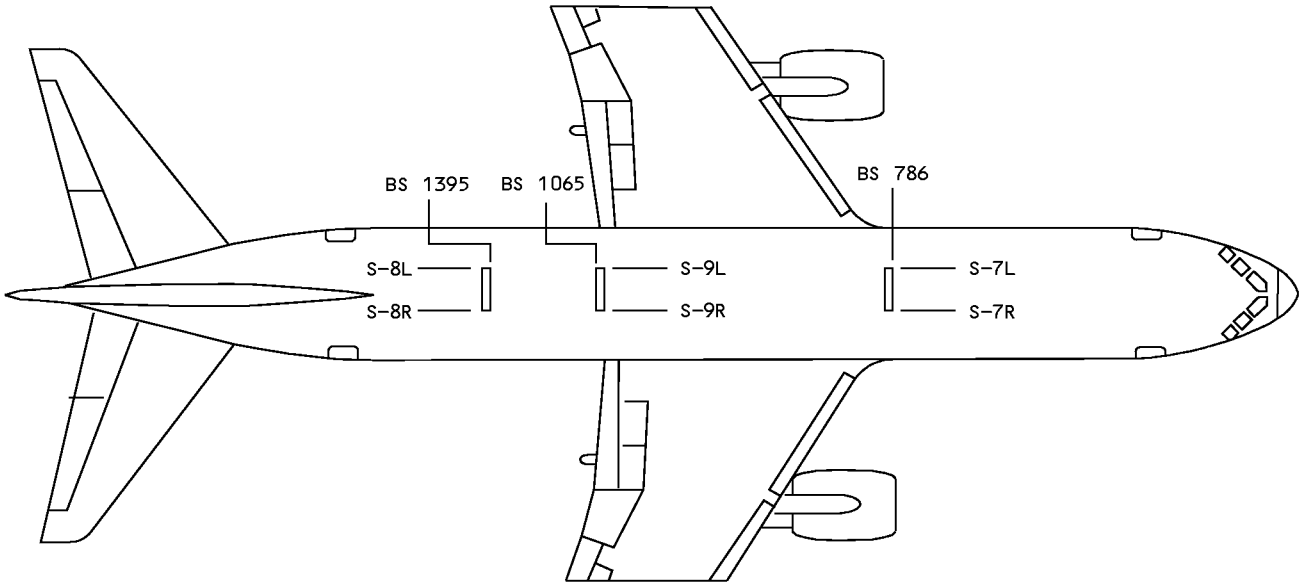
(1) Aluminum Part Fastener Hole Inspection, Part 6, 51-00-04, Part 6, 51-00-11 or Part 6, 51-00-16. It is necessary to remove the fastener to do this inspection.

Table 1 Calibration Frequency and Reference Standard Step

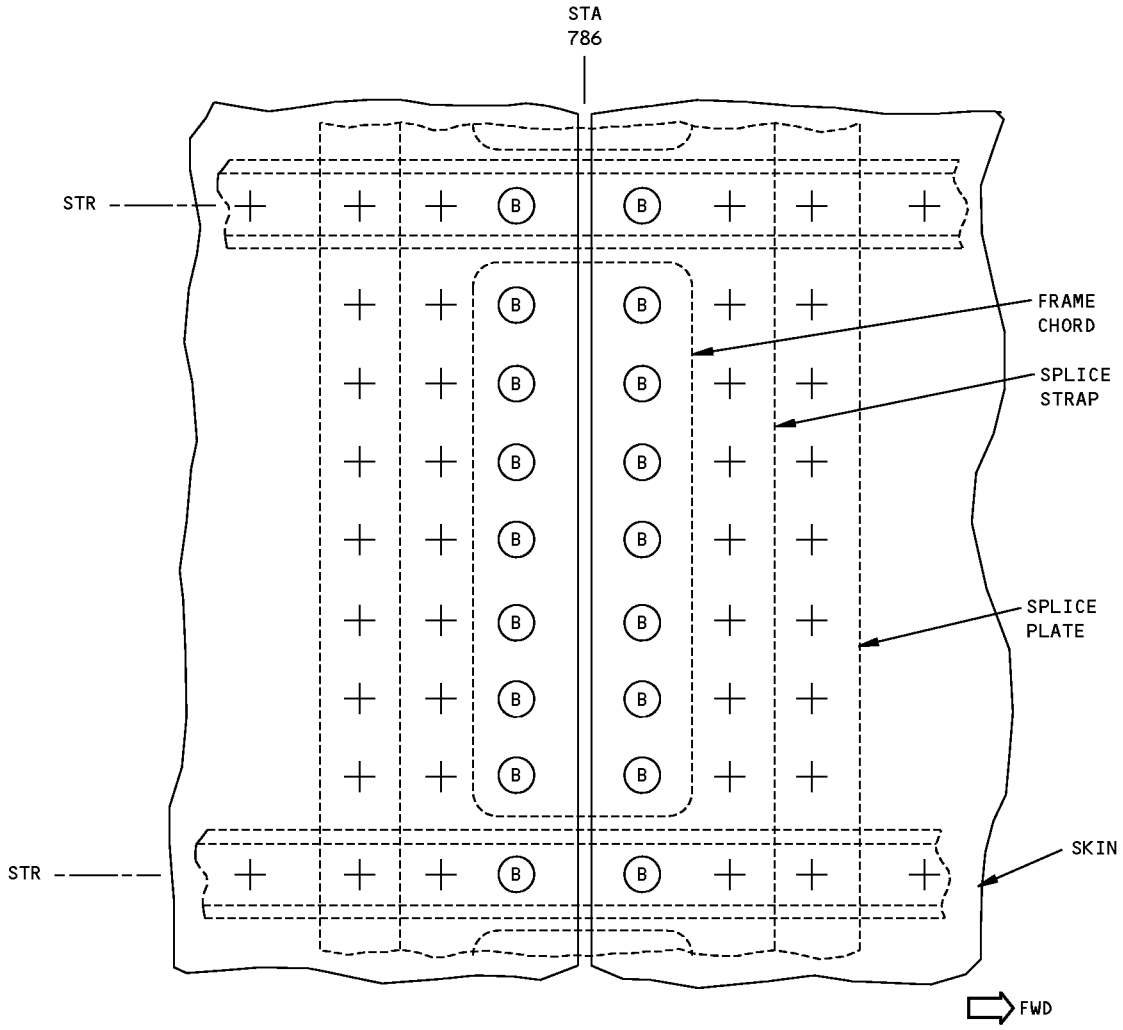
INSPECTION CODE	FREQUENCY	REFERENCE STANDARD STEP	INSPECTION AREA SKIN THICKNESS RANGE *[1]
A	1500 Hz	A - 0.11	0.09 - 0.105
B	500 Hz	B - 0.17	0.12 - 0.17
C	500 Hz	C - 0.17	0.12 - 0.24
D	200 Hz	D - 0.30	0.28 - 0.34

*[1] The thickness range is the sum of the thickness of the airplane skin and the shim material that are above the splice plate.

767-200



767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 1 of 12)



TYPICAL CONFIGURATION:
7R-5R, 4R TO SKIN LAP AT 2R, 1L-4L, 5L-7L

CIRCUMFERENTIAL SPLICE - BS 786

NOTES

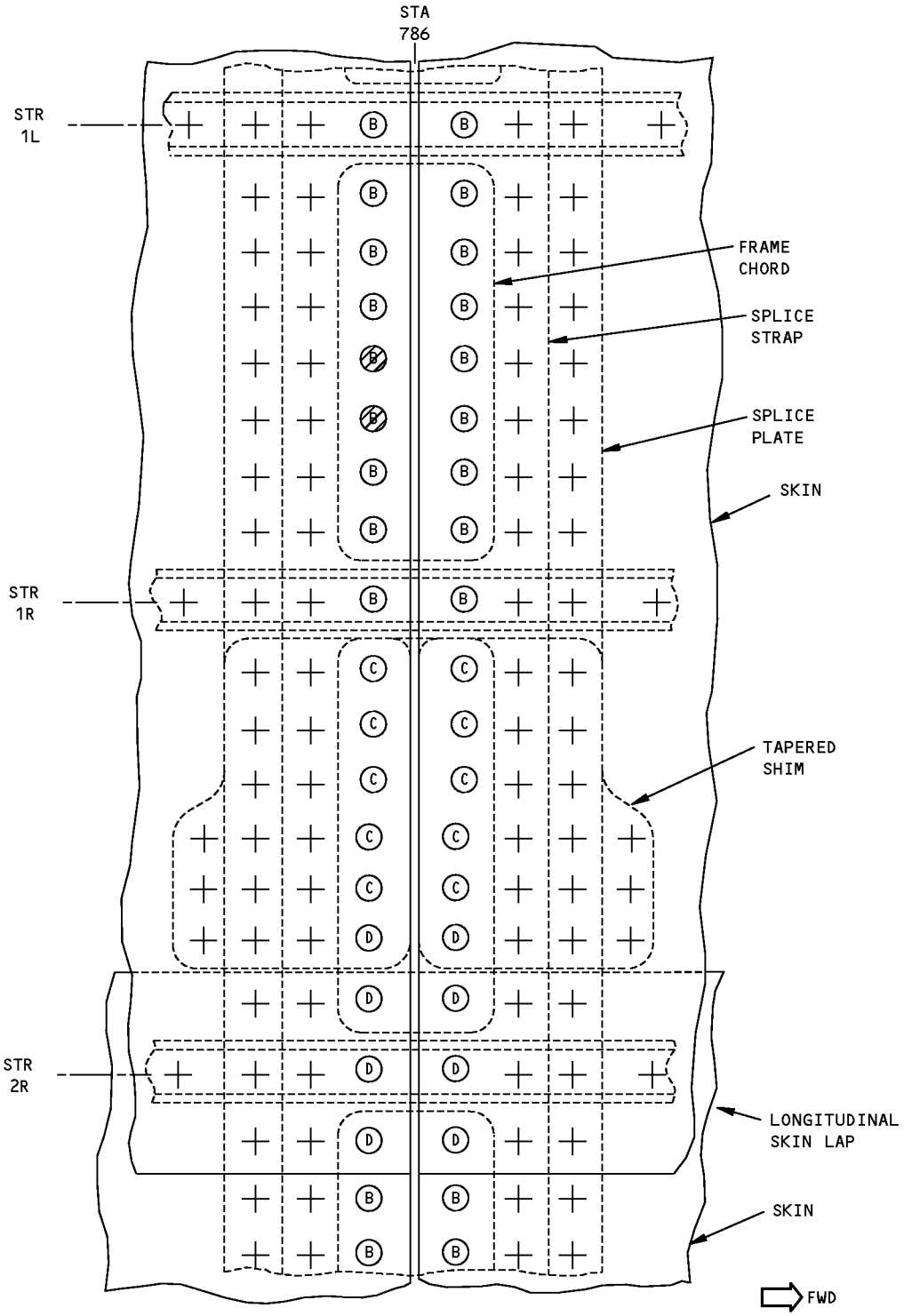
- THE RIGHT SIDE OF THE AIRPLANE IS SHOWN, THE LEFT SIDE IS OPPOSITE UNLESS SPECIFIED DIFFERENTLY.

◯ FASTENER LOCATIONS TO EXAMINE. THE LETTER (A,B,C OR D) GIVES THE FASTENER CODE. FASTENERS WITH THE SAME CODE HAVE ALMOST THE SAME INSPECTION CONDITIONS. REFER TO TABLE I WITH THE FASTENER CODE TO IDENTIFY THE INSTRUMENT FREQUENCY AND REFERENCE STANDARD STEP TO USE FOR CALIBRATION.

┼ FASTENER LOCATIONS THAT ARE NOT NECESSARY TO EXAMINE.

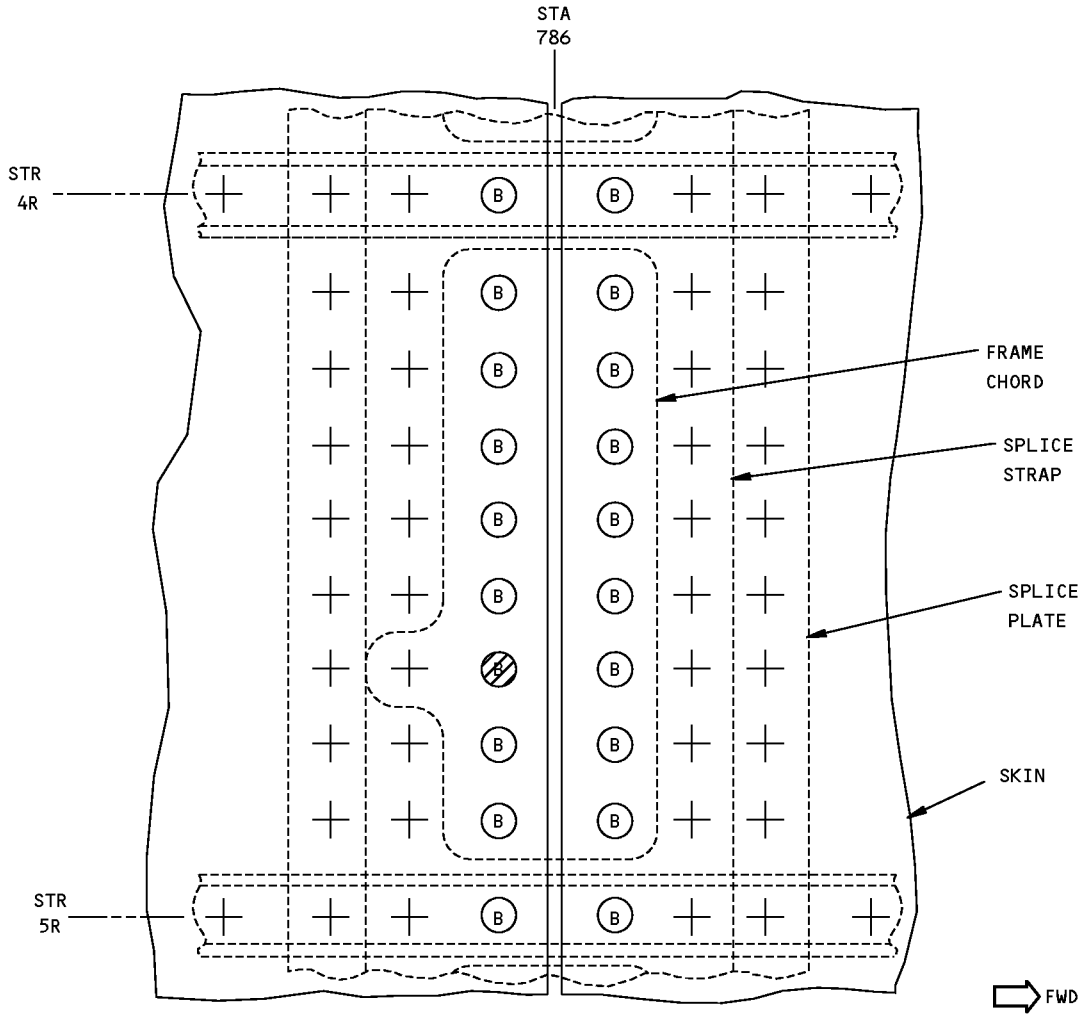
⊘ TITANIUM FASTENER LOCATIONS.

767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 2 of 12)



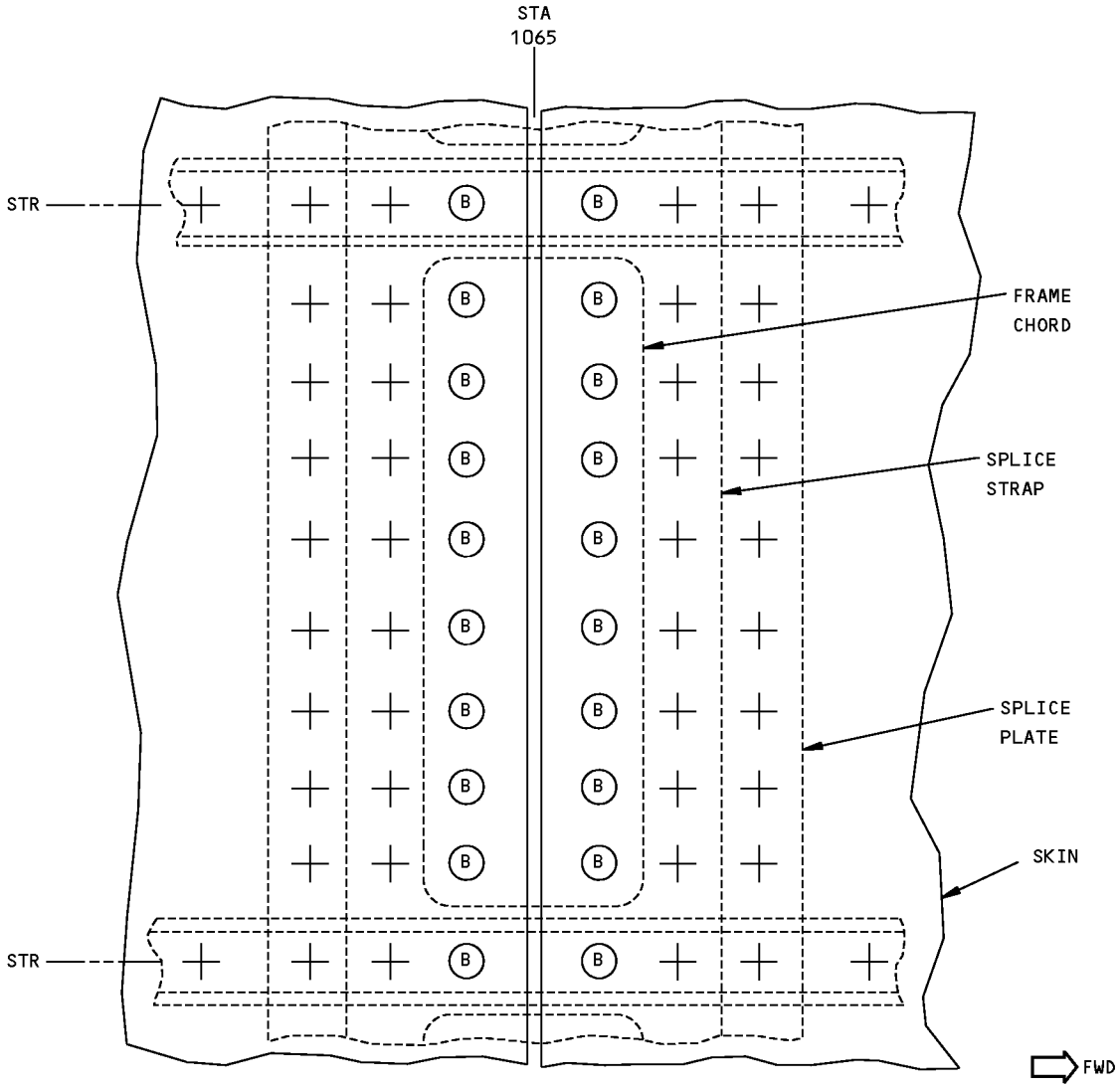
CIRCUMFERENTIAL SPLICE - BS 786

767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 3 of 12)



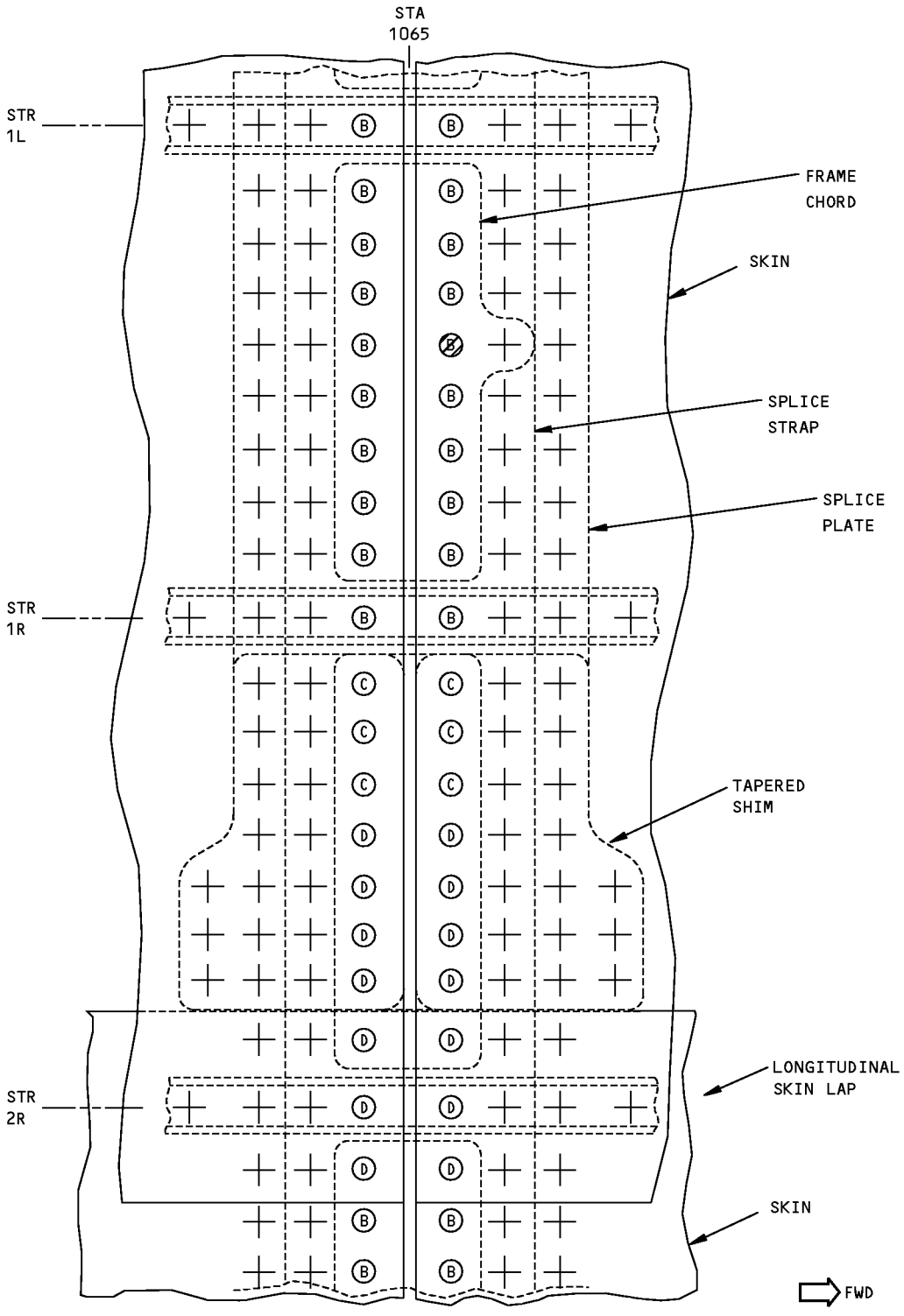
CIRCUMFERENTIAL SPLICE - BS 786

767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 4 of 12)

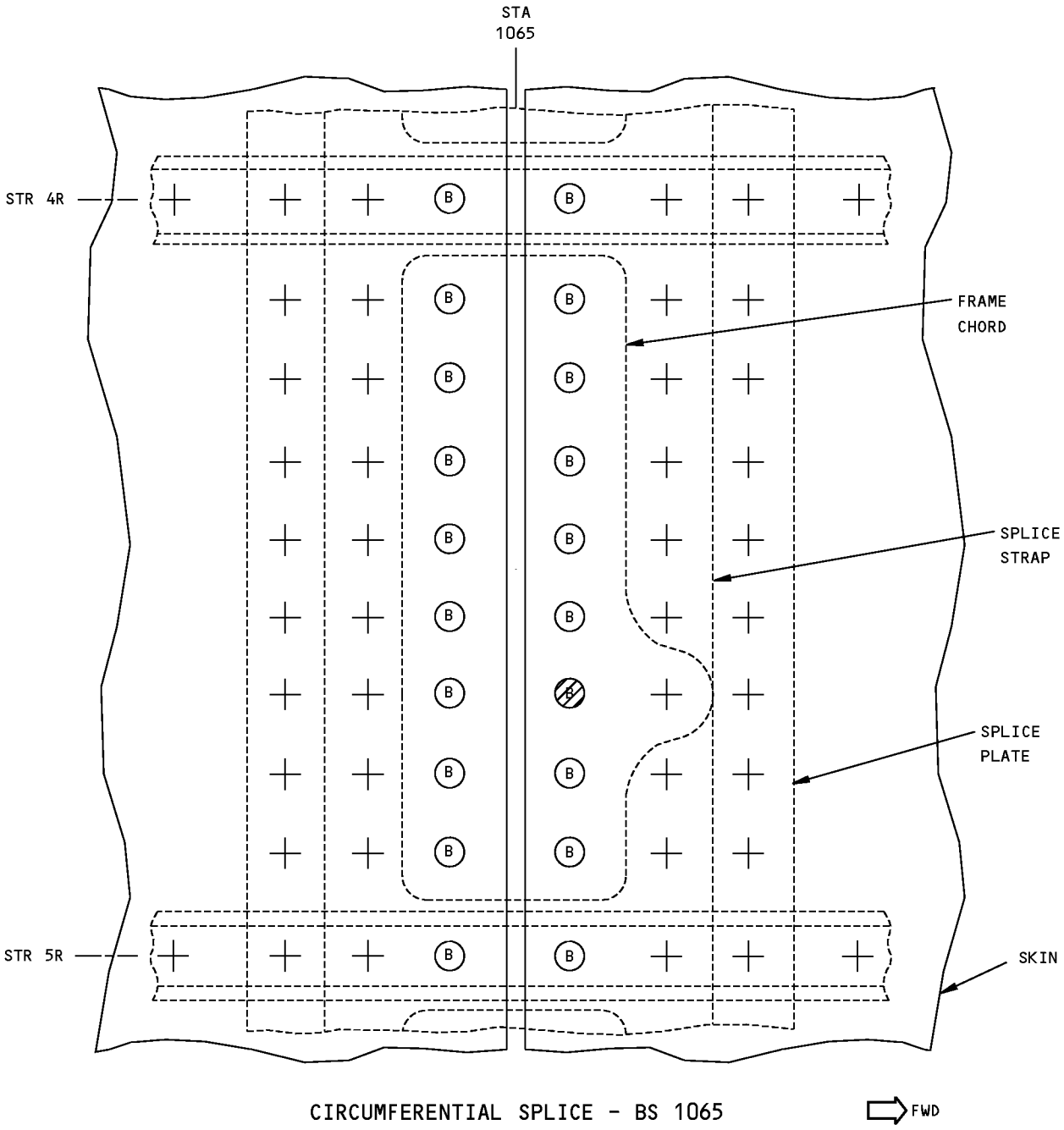


TYPICAL CONFIGURATION
STR 7R-5R, 4R - SKIN LAP AT 2R, 1L-4L, 5L-7L
CIRCUMFERENTIAL SPLICE - BS 1065

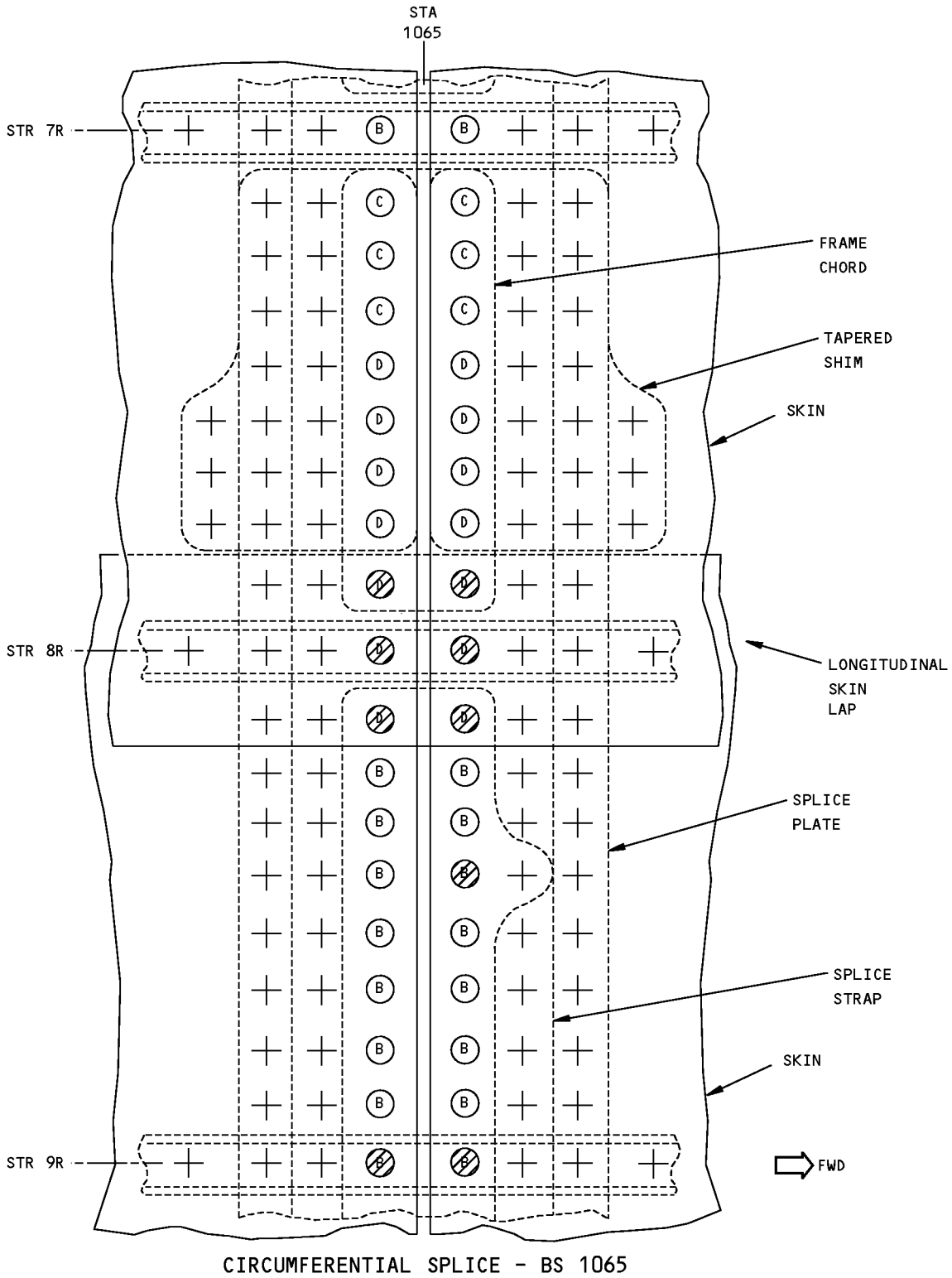
767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 5 of 12)



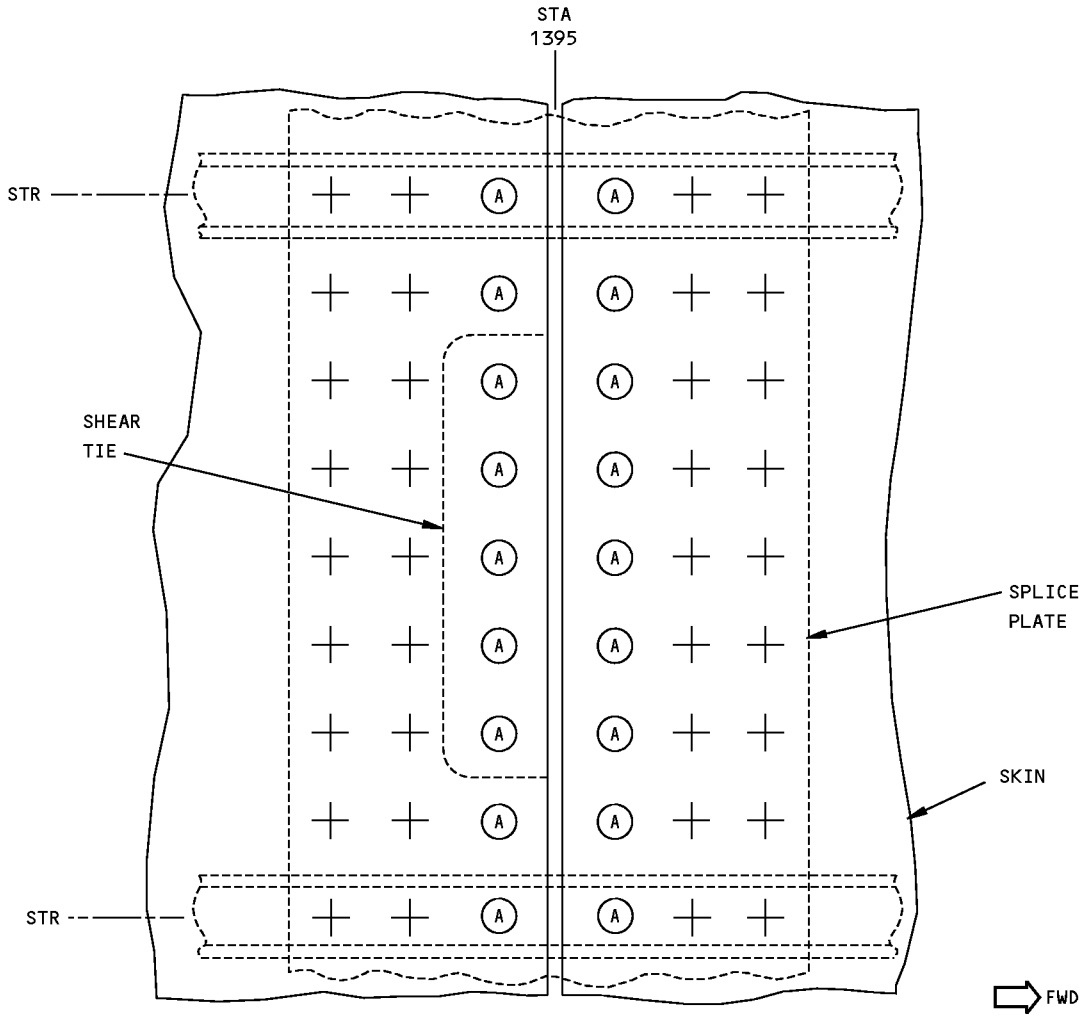
767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 6 of 12)



767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 7 of 12)

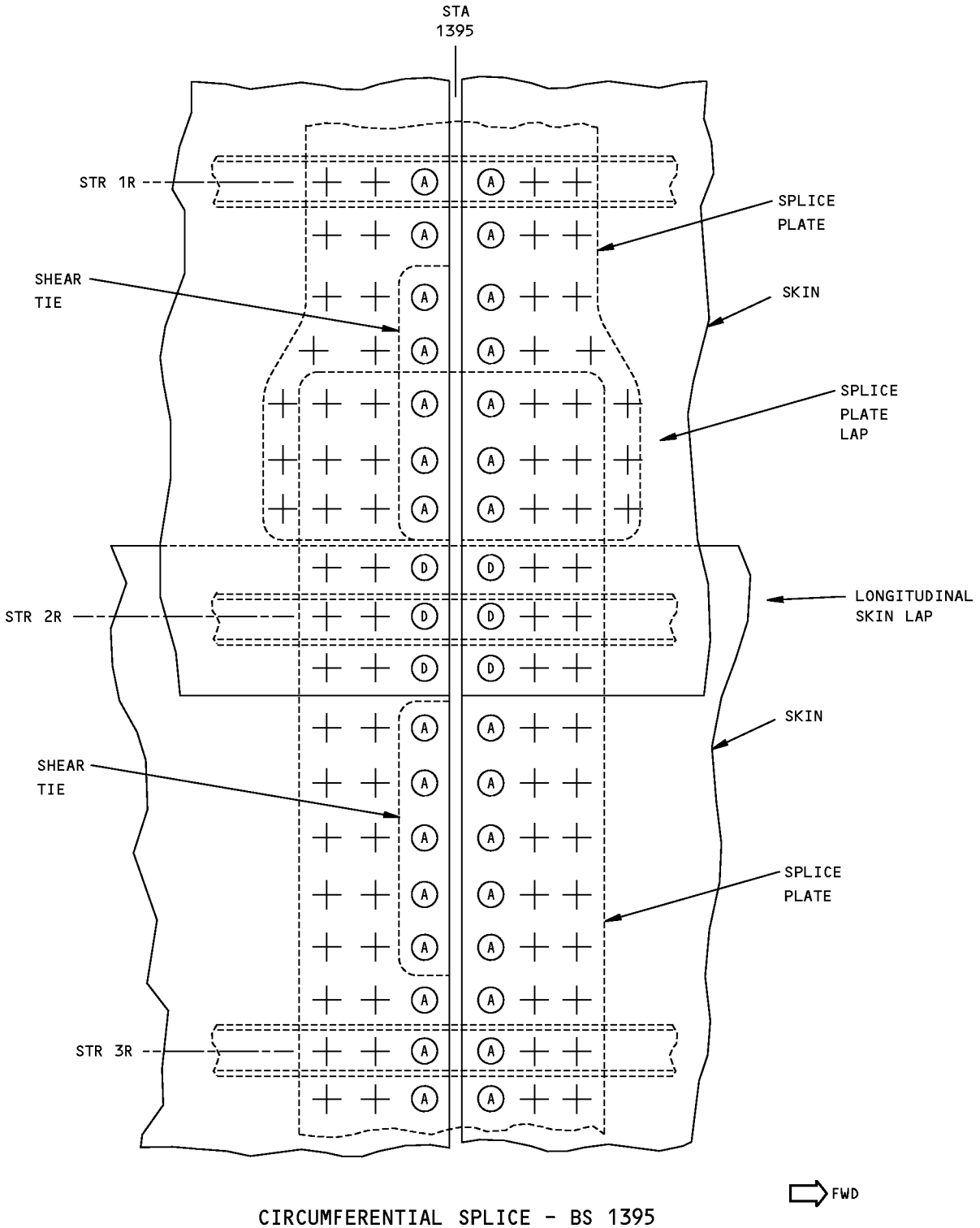


767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 8 of 12)

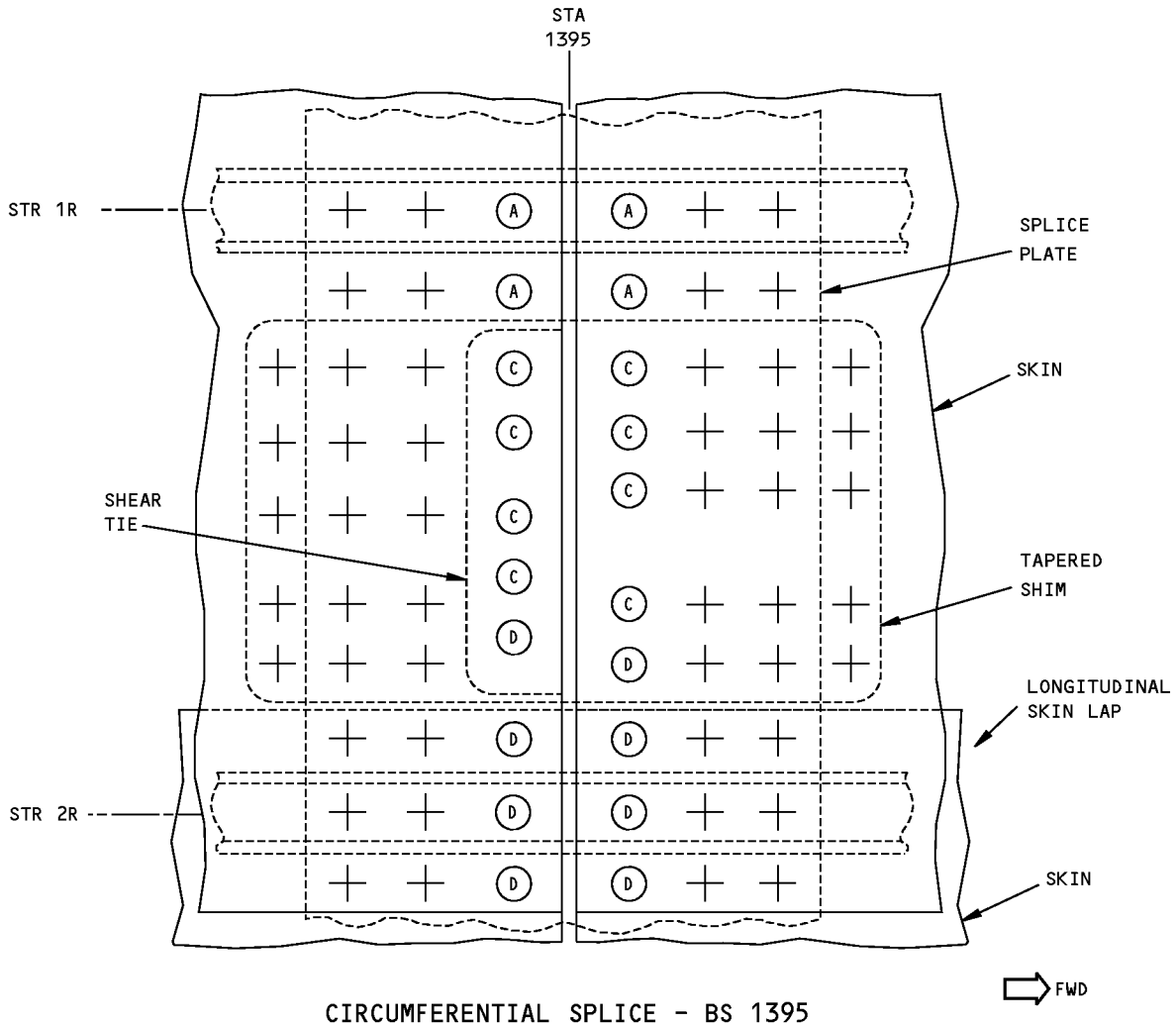


TYPICAL CONFIGURATION: 7R - SKIN LAP AT 2R, 1R-7L
CIRCUMFERENTIAL SPLICE - BS 1395

767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 9 of 12)

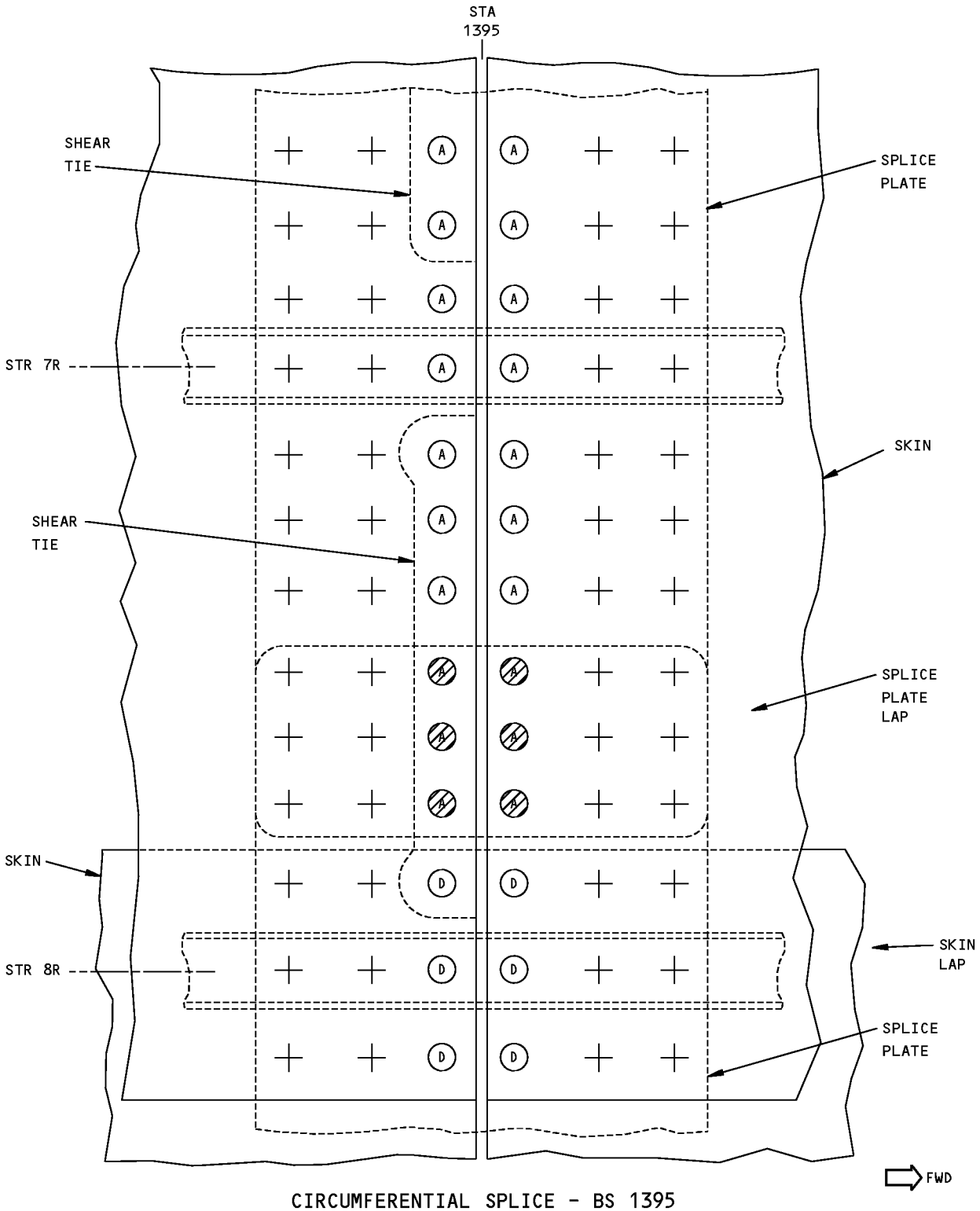


767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 10 of 12)



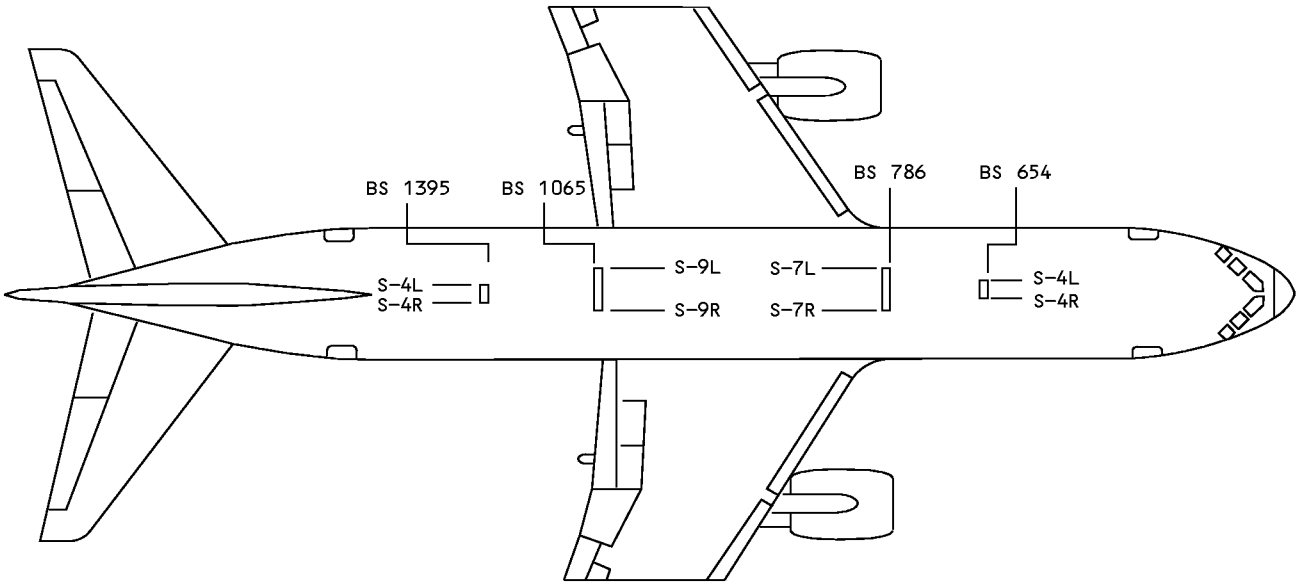
CIRCUMFERENTIAL SPLICE - BS 1395

767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 11 of 12)

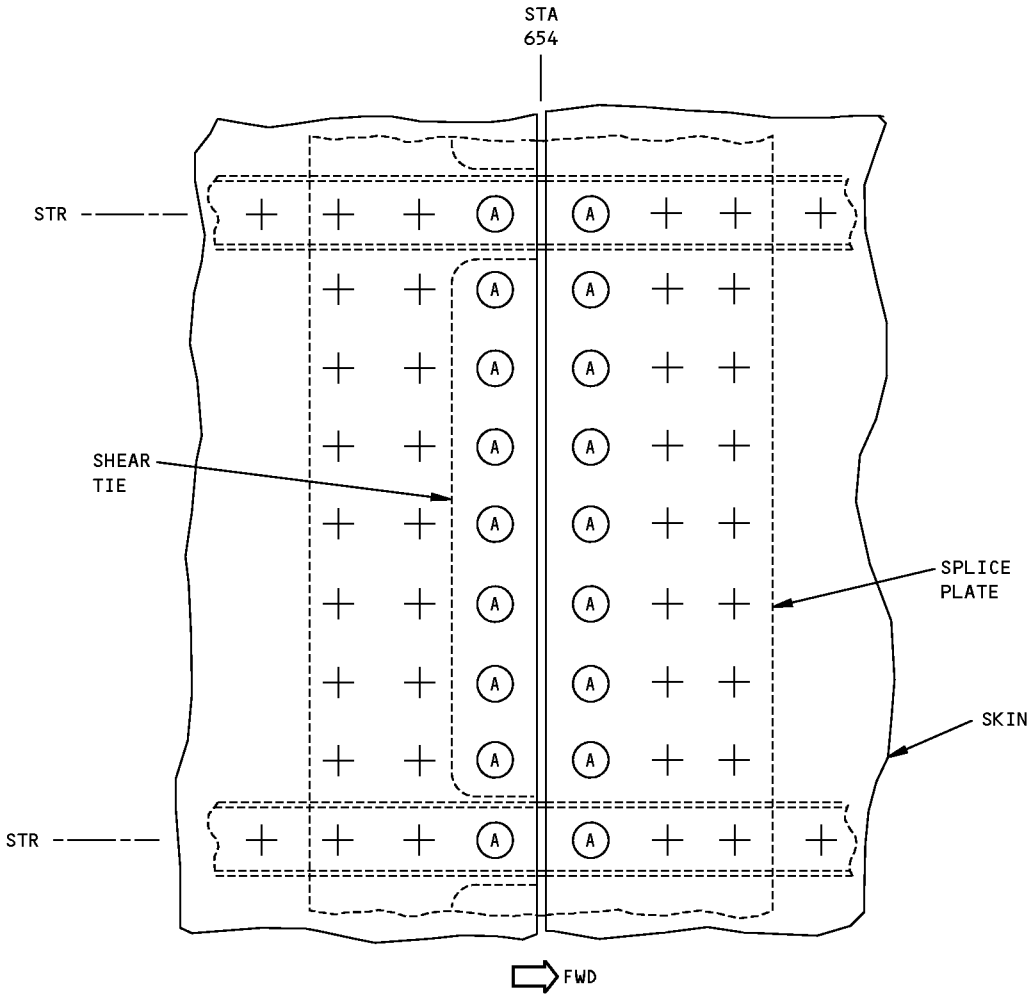


767-200 Circumferential Splice Inspection Locations
Figure 1 (Sheet 12 of 12)

767-300



767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 1 of 13)



TYPICAL CONFIGURATION:
STR 4R - SKIN LAP AT 2R, 1R-4L

CIRCUMFERENTIAL SPLICE - BS 654

NOTES

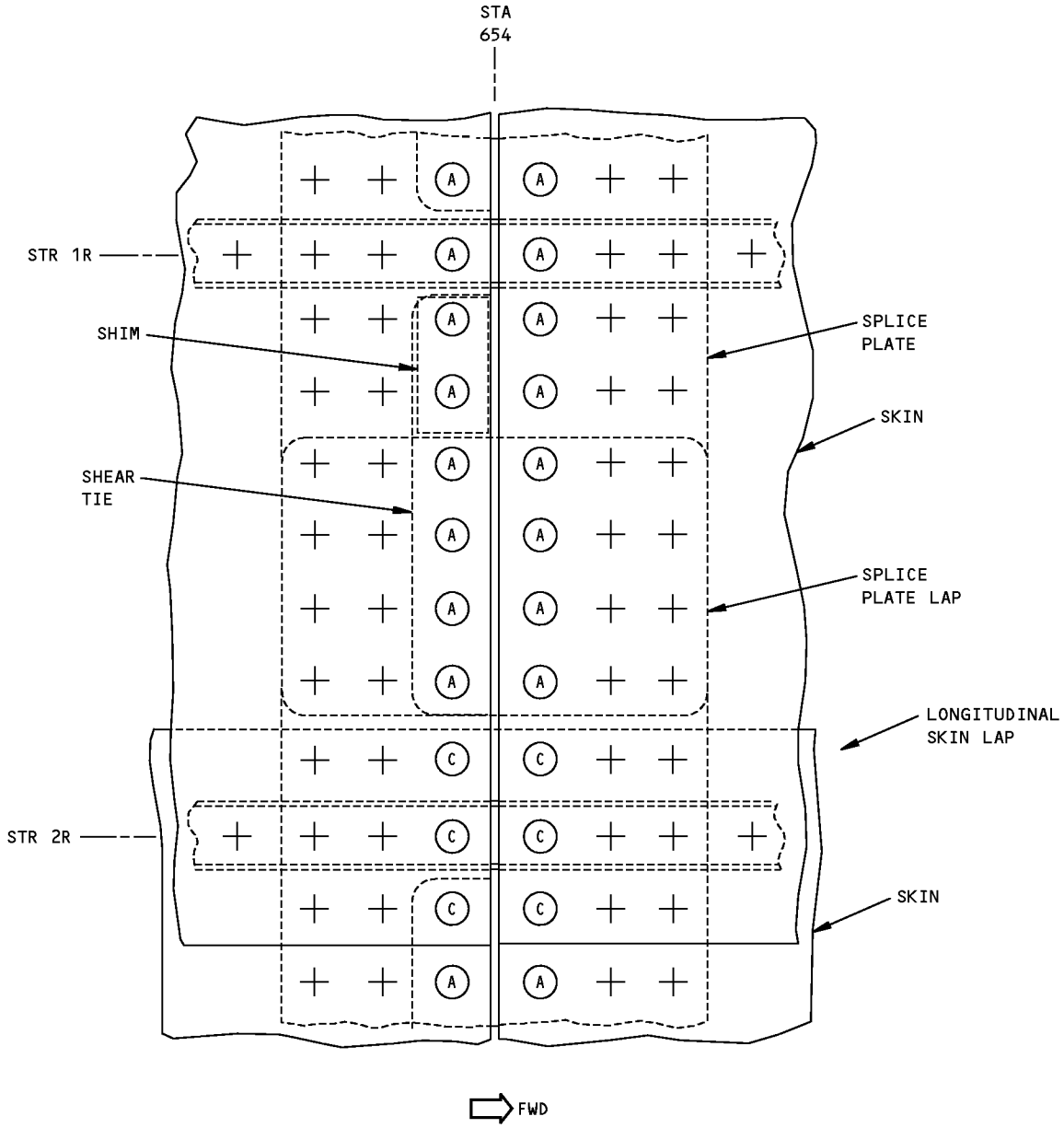
- THE RIGHT SIDE OF THE AIRPLANE IS SHOWN, THE LEFT SIDE IS OPPOSITE UNLESS SPECIFIED DIFFERENTLY.

◯ FASTENER LOCATIONS TO EXAMINE. THE LETTER (A,B,C OR D) GIVES THE FASTENER CODE. FASTENERS WITH THE SAME CODE HAVE ALMOST THE SAME INSPECTION CONDITIONS. REFER TO TABLE I WITH THE FASTENER CODE TO IDENTIFY THE INSTRUMENT FREQUENCY AND REFERENCE STANDARD STEP TO USE FOR CALIBRATION.

┼ FASTENER LOCATIONS THAT ARE NOT NECESSARY TO EXAMINE.

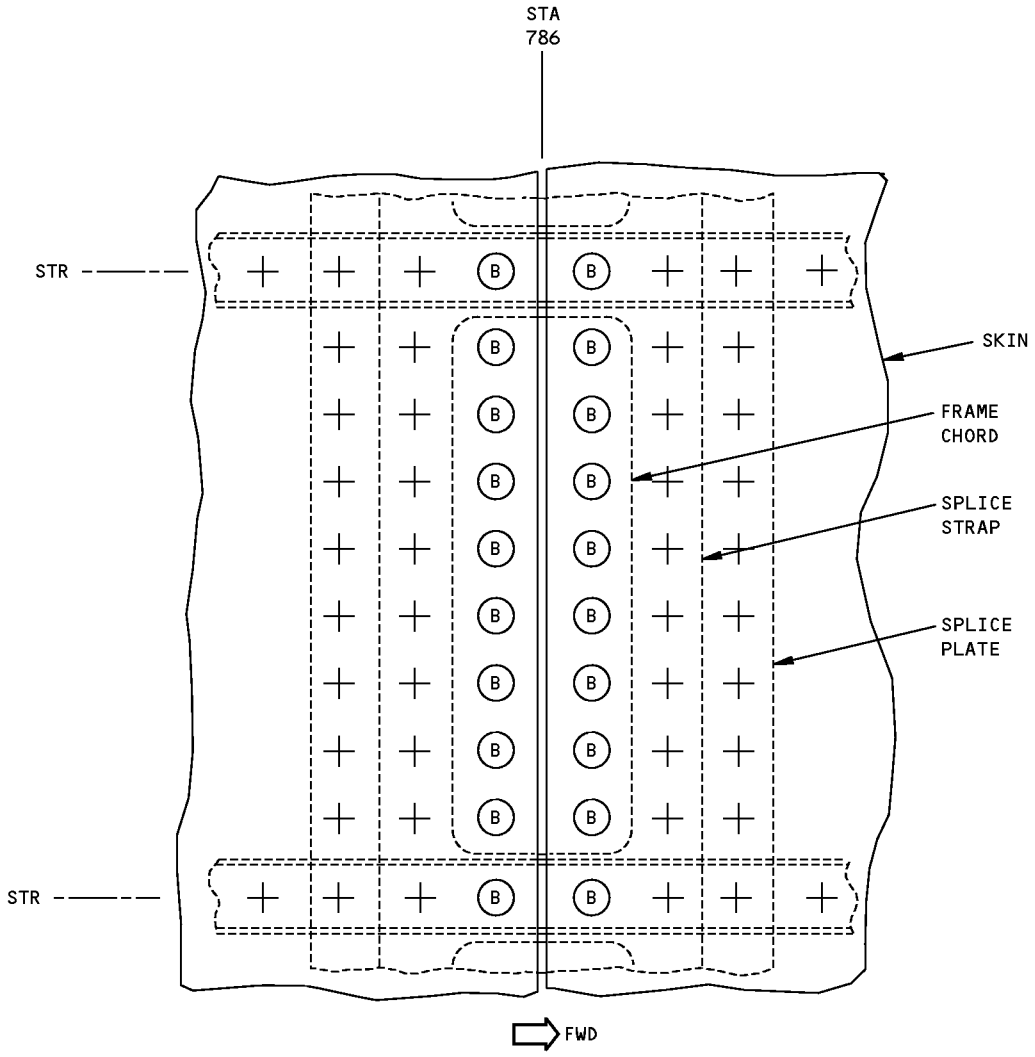
▨ TITANIUM FASTENER LOCATIONS.

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 2 of 13)



CIRCUMFERENTIAL SPLICE - BS 654

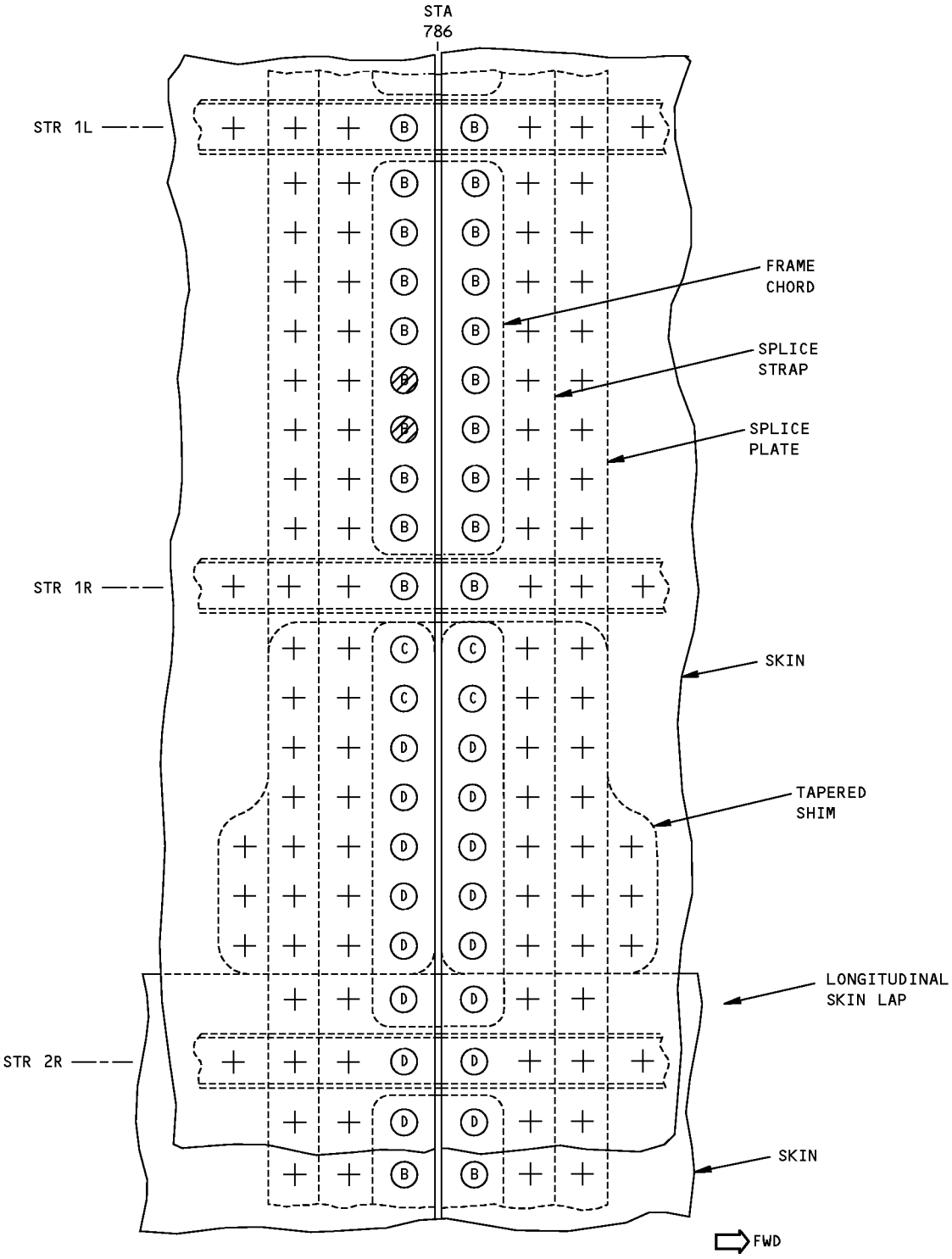
767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 3 of 13)



TYPICAL CONFIGURATION:
7R-5R, 4R - SKIN LAP AT 2R, 1L-4L, 5L-7L

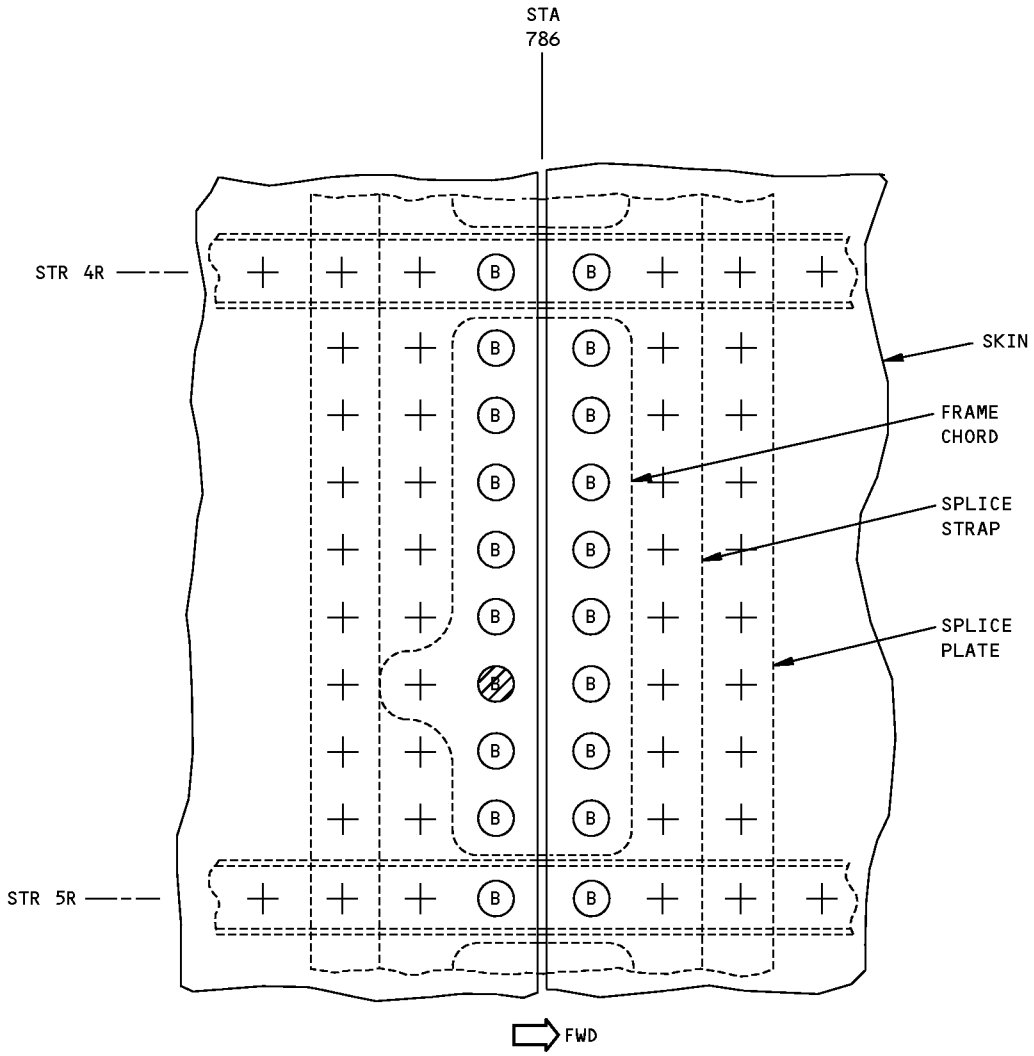
CIRCUMFERENTIAL SPLICE - BS 786

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 4 of 13)



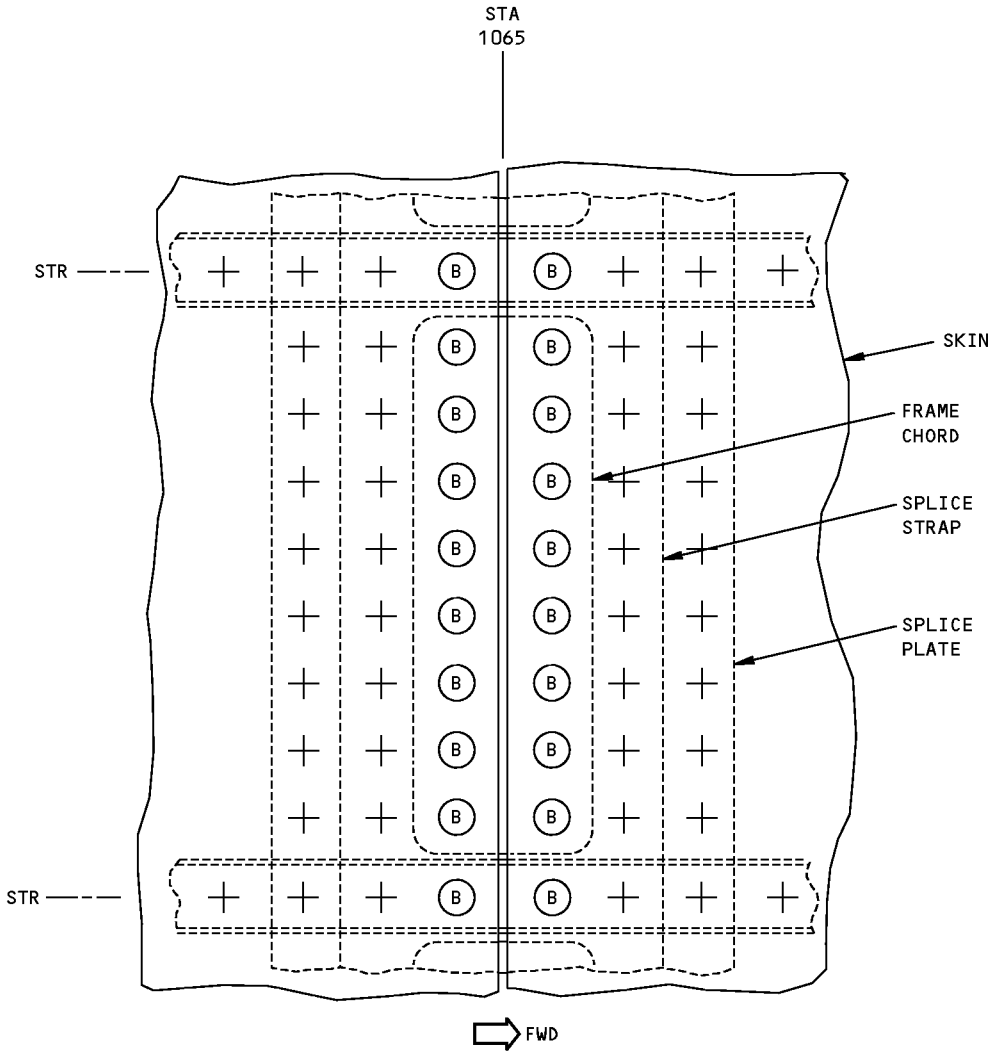
CIRCUMFERENTIAL SPLICE - BS 786

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 5 of 13)



CIRCUMFERENTIAL SPLICE - BS 786

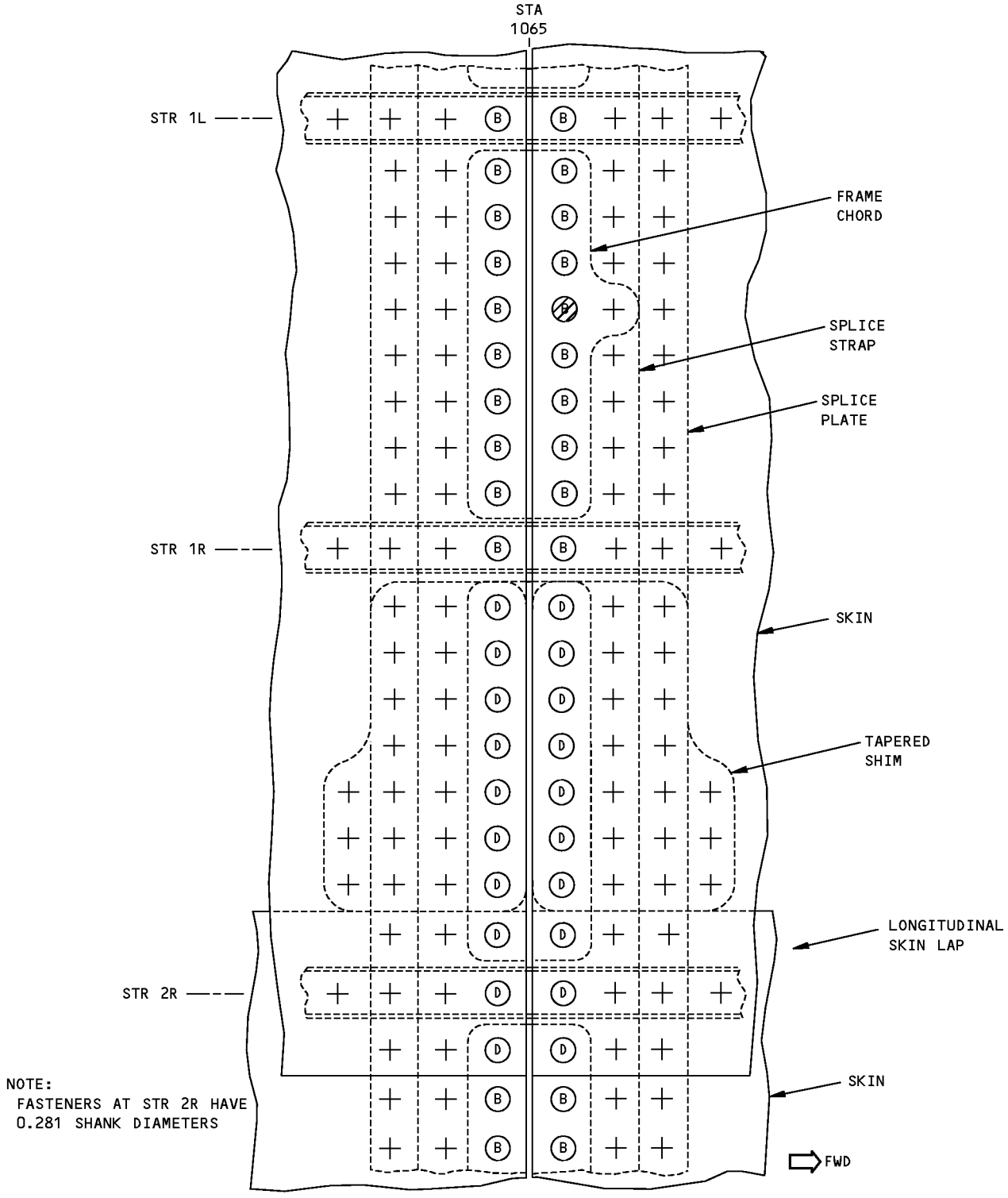
767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 6 of 13)



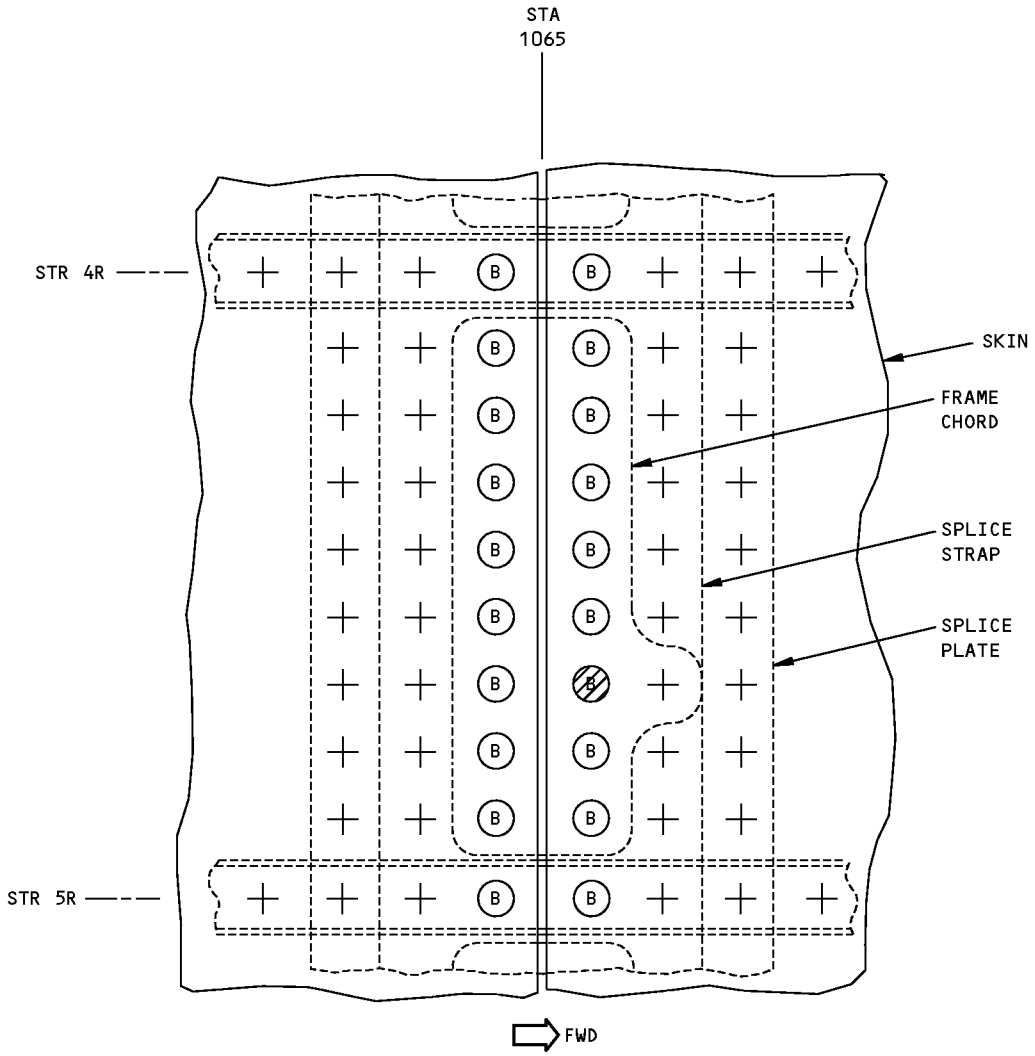
TYPICAL CONFIGURATION: STR 7R-5R,
4R - SKIN LAP AT 2R, 1L-4L, 5L-7L

CIRCUMFERENTIAL SPLICE - BS 1065

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 7 of 13)

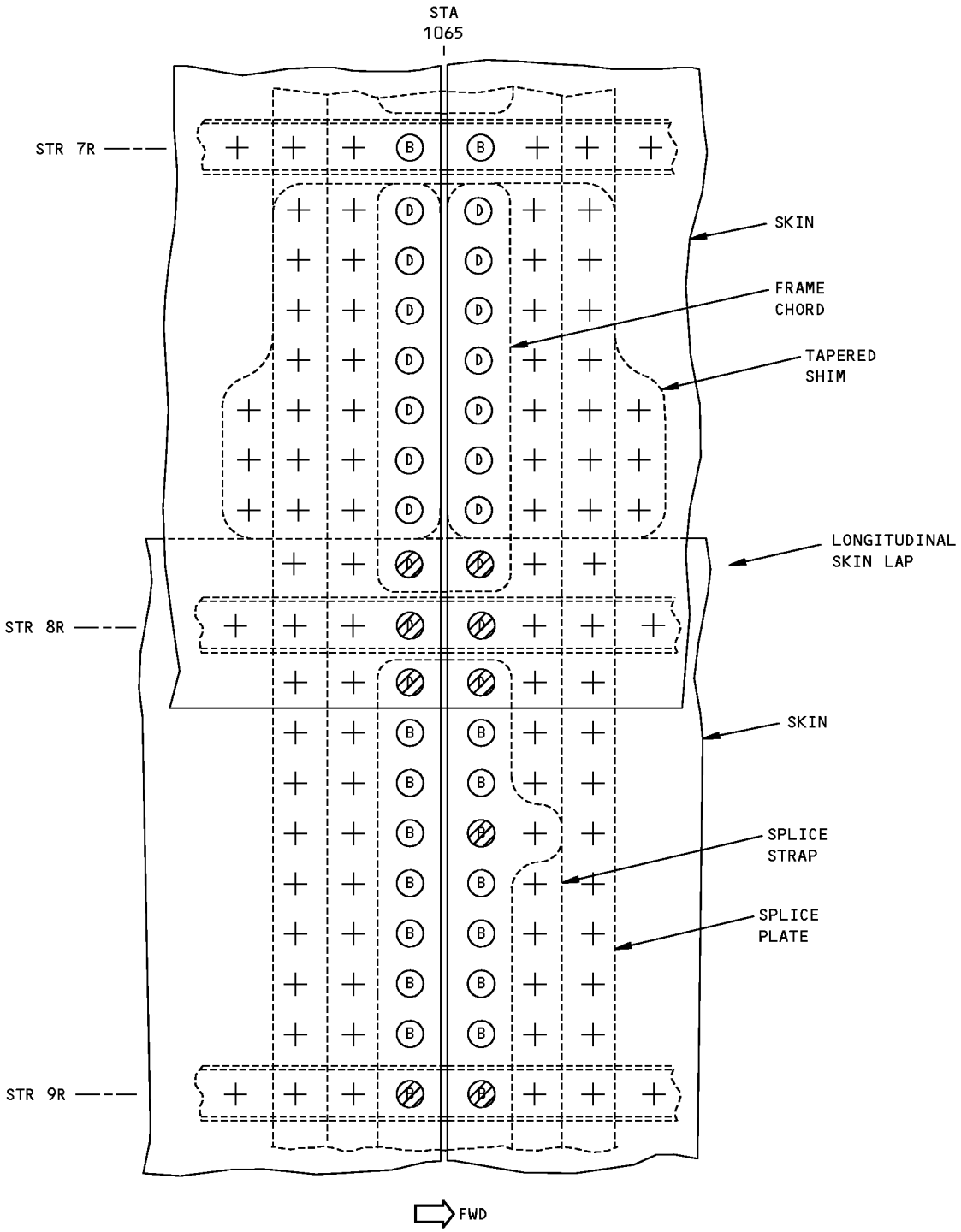


767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 8 of 13)



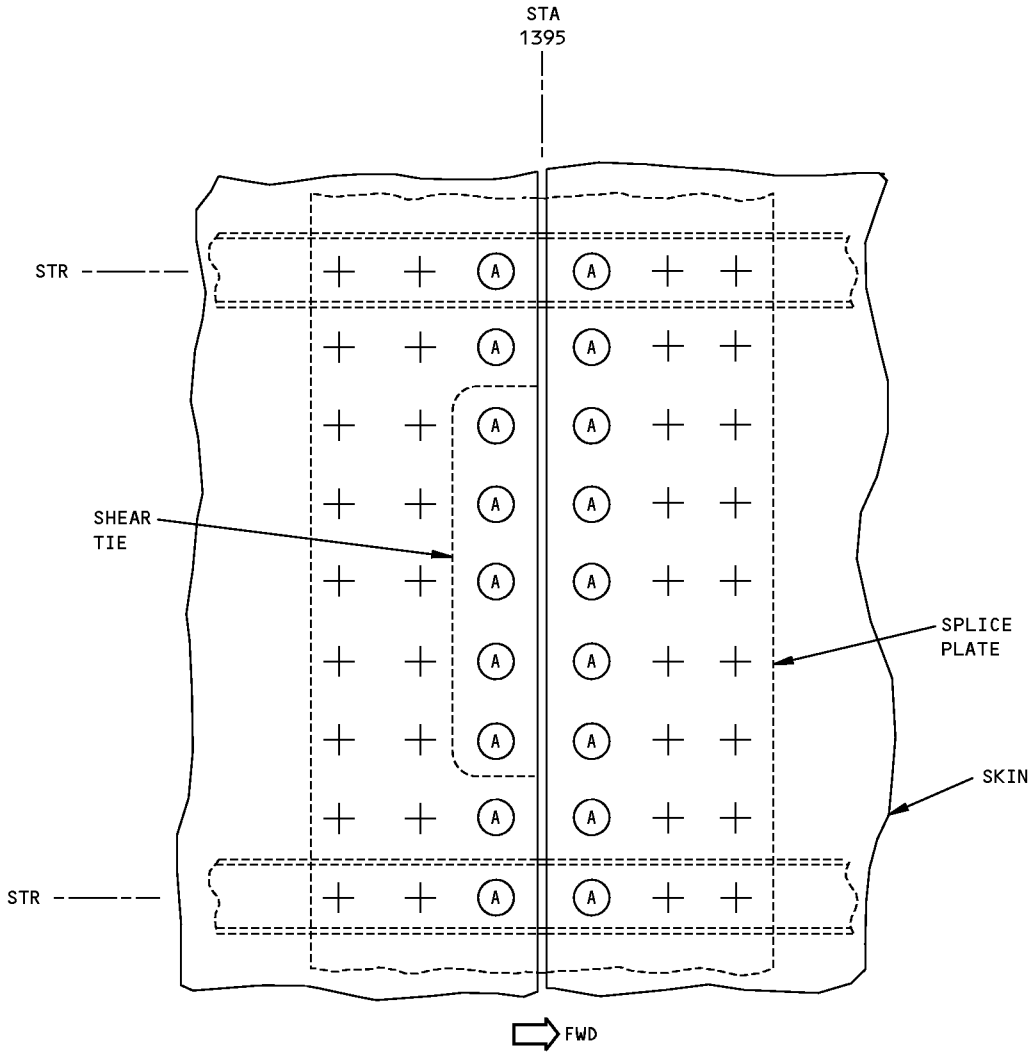
CIRCUMFERENTIAL SPLICE - BS 1065

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 9 of 13)



CIRCUMFERENTIAL SPLICE - BS 1065

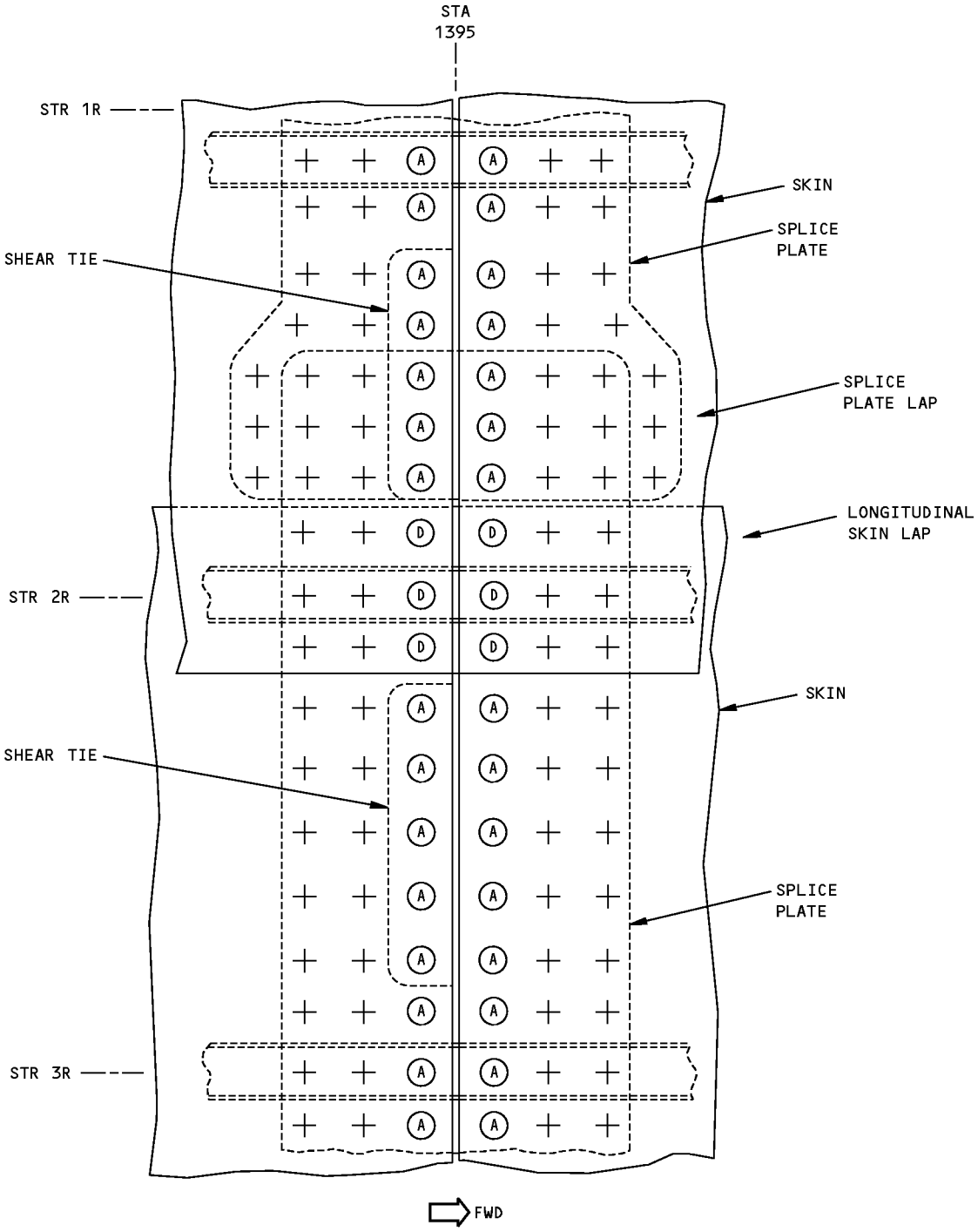
767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 10 of 13)



TYPICAL CONFIGURATION:
STR 4R - SKIN LAP AT 2R, 1R-4L

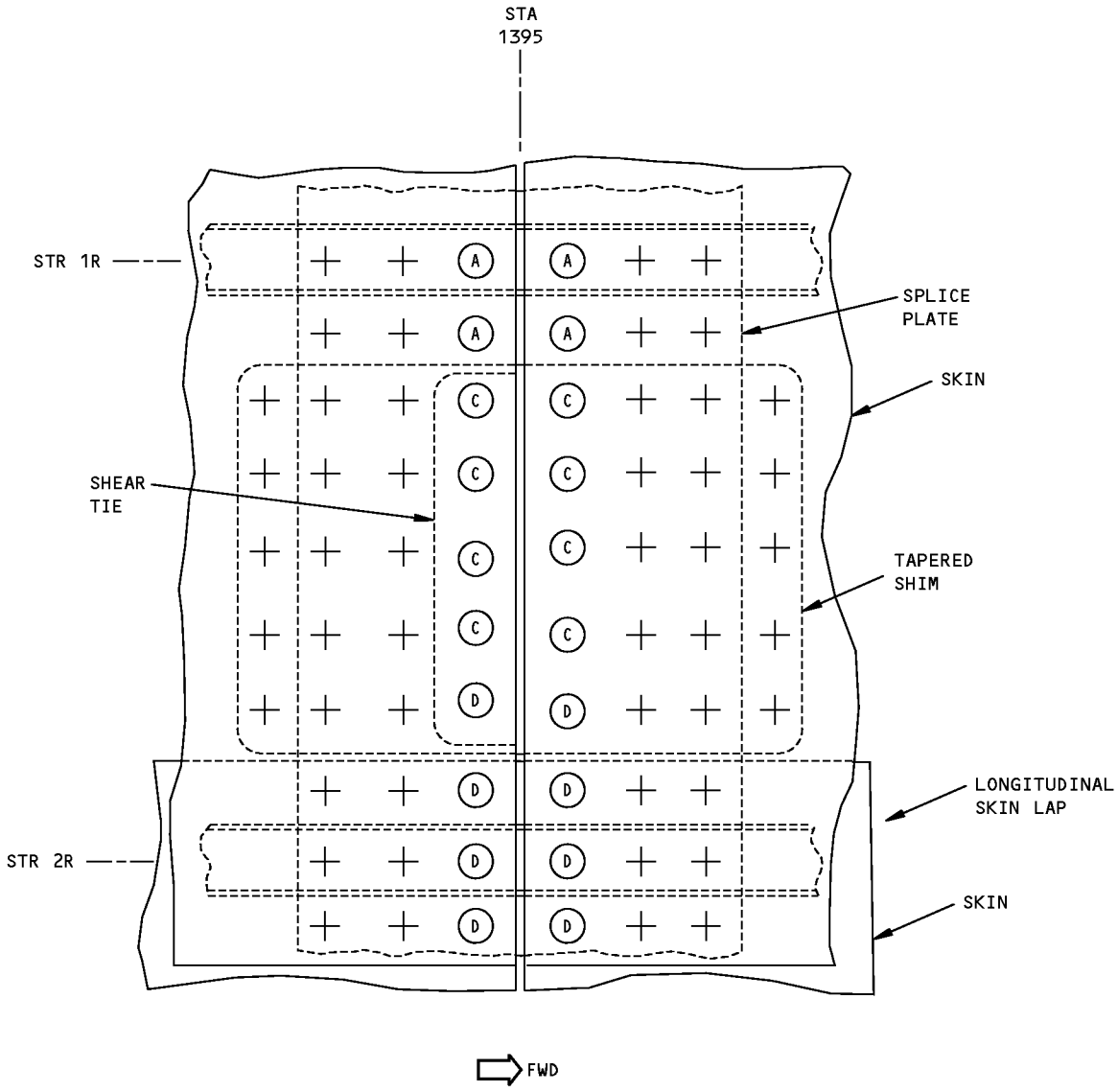
CIRCUMFERENTIAL SPLICE - BS 1395

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 11 of 13)



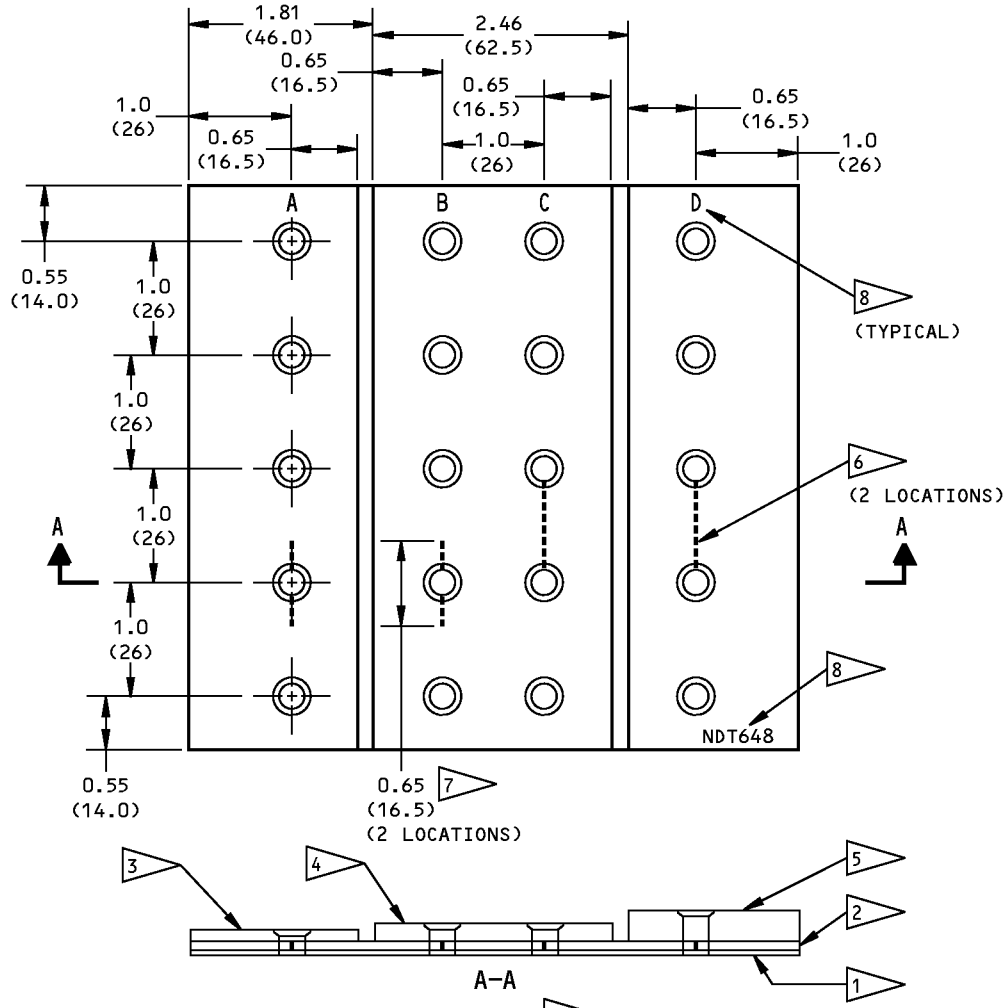
CIRCUMFERENTIAL SPLICE - BS 1395

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 12 of 13)



CIRCUMFERENTIAL SPLICE - BS 1395

767-300 Circumferential Splice Inspection Locations
Figure 2 (Sheet 13 of 13)



NOTES

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

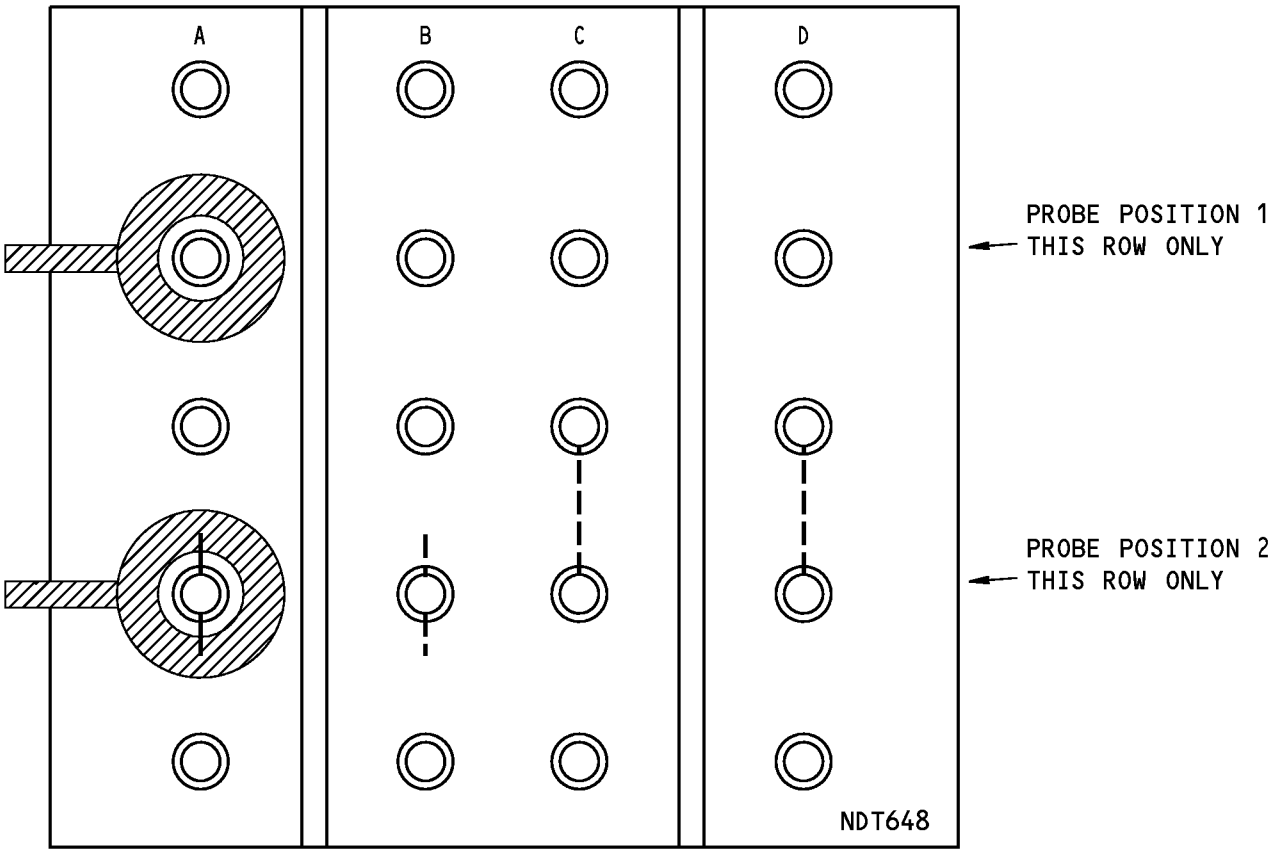
INCHES	MILLIMETERS
X.XXX = ± 0.005	X.XX = ± 0.10
X.XX = ± 0.025	X.X = ± 0.5
X.X = ± 0.050	X = ± 1
ANGULAR: ±1.0 DEGREE	

- MATERIAL: ALUMINUM, 2024-T3 OR T4
- SURFACE ROUGHNESS: 63 Ra OR BETTER
- EDM NOTCH LOCATION TOLERANCE: THE NOTCH MUST BE WITHIN ±0.005 (±0.10) OF THE CENTERLINE OF THE HOLE.
- EDM NOTCH DIMENSIONS AND TOLERANCES:
  WIDTH: 0.025 (0.64) MAXIMUM
  LENGTH: AS SPECIFIED BY 6 AND 7
  DEPTH: 0.090 (2.30) THROUGH 2 SHEET THICKNESS

1. 0.040 (1.00) THICK
2. 0.090 (2.30) THICK: THIS SHEET CONTAINS ALL OF THE EDM NOTCHES
3. 0.110 (2.80) THICK
4. 0.170 (4.30) THICK
5. 0.300 (7.60) THICK
6. EDM NOTCH. FASTENER TO FASTENER. TWO LOCATIONS ONLY.
7. EDM NOTCH - 0.20 (5) LONG ON EACH SIDE OF THE HOLE. 0.65 (16.5) TOTAL LENGTH INCLUDES THE FASTENER HOLE DIAMETER - TWO LOCATIONS
8. ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT648 AND OTHER DATA AS SHOWN.

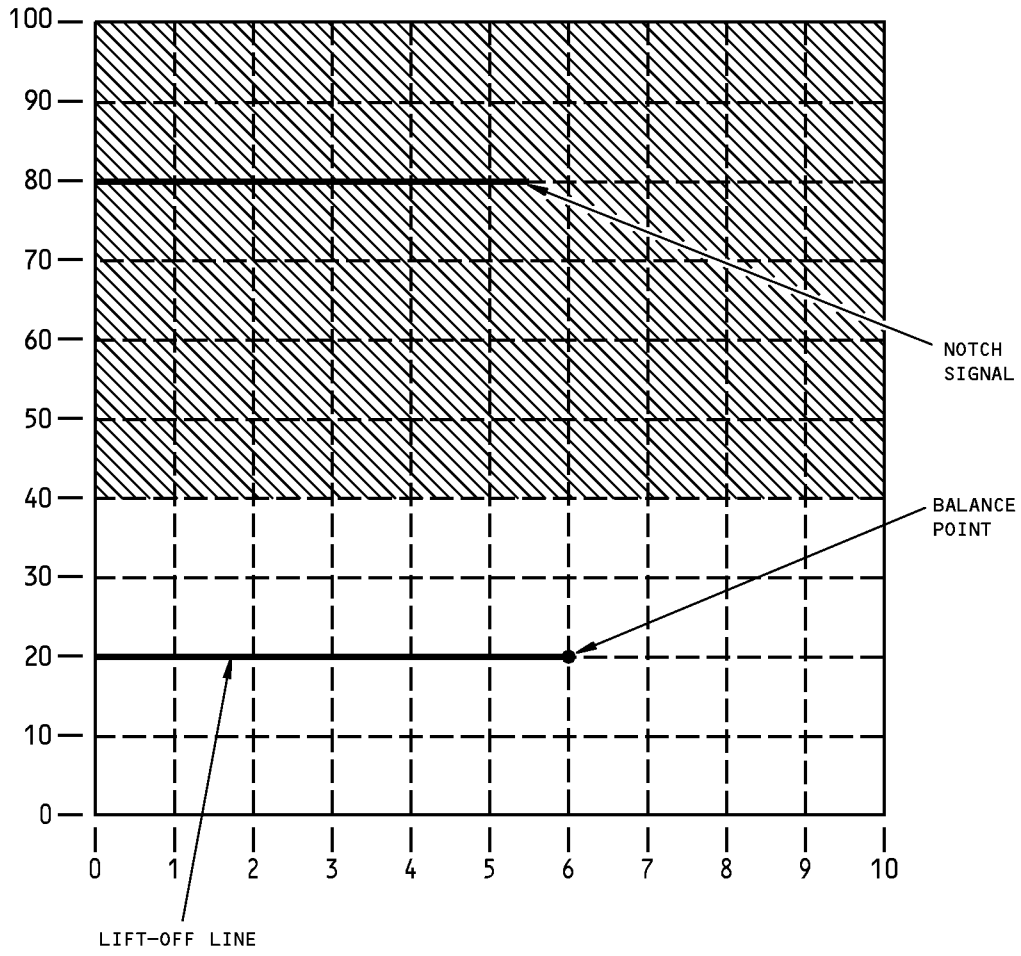
FASTENERS: BACR15CE8D OR BACR15FV8D RIVETS (20 LOCATIONS). INSTALL AS SPECIFIED IN PART 1, 51-01-04.

Reference Standard NDT648
Figure 3



PROBE POSITIONS

Calibration
Figure 4



IMPEDANCE PLANE DISPLAY

NOTES

- BECAUSE OF THE HIGH GAIN THAT IS NECESSARY TO DO THIS INSPECTION, THE LIFT-OFF LINE CAN HAVE SOME VERTICAL COMPONENT.

SIGNALS MORE THAN 40 PERCENT OF FULL SCREEN HEIGHT ARE CRACK SIGNALS.

Impedance Plane Display
Figure 5

INNER CHORD OF THE EDGE FRAMES AT THE FORWARD MAIN CARGO DOOR CUTOUT

1. Purpose

A. Use this procedure to examine the inner chord of the edge frames at the forward main cargo door cutout for surface cracks around the fasteners. The inner chord inspection areas are at BS 539.5 and BS 615.5, from stringers 17 to 21 and from stringers 28 to 36.

B. Cracks can start at the fastener holes of the inner chord and the strap of the edge frames. The location of the fastener holes examined in this procedure are identified 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 53-30-I14A

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 between 50 and 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 the probe does not hit the collar during the scan around each collar.

(2) Refer to Part 6, 51-00-01, par. 2.B. or Part 6, 51-00-19, par. 2.C., for data about probe selection.

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

(a) MP 905-50; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 188A as identified in Part 6, 51-00-01, Fig. 6, or Part 6, 51-00-19, Fig. 6.

3. Preparation for Inspection

A. Open the forward cargo door to get access to the inspection areas.

B. Remove the wall liner and insulation blankets.

C. Remove unwanted material from around the fasteners to get access to the inspection surfaces. See Figure 1 for the fastener locations.

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.

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.

5. Inspection Procedure

A. Examine the inner chord and straps for cracks around the fasteners in the inspection areas identified in Figure 1.

NOTE: If access to the inner chord or straps is blocked by a clip or bracket, do the scan at the edge of the inner chord or strap (Figure 1, Sheet 2) if possible.

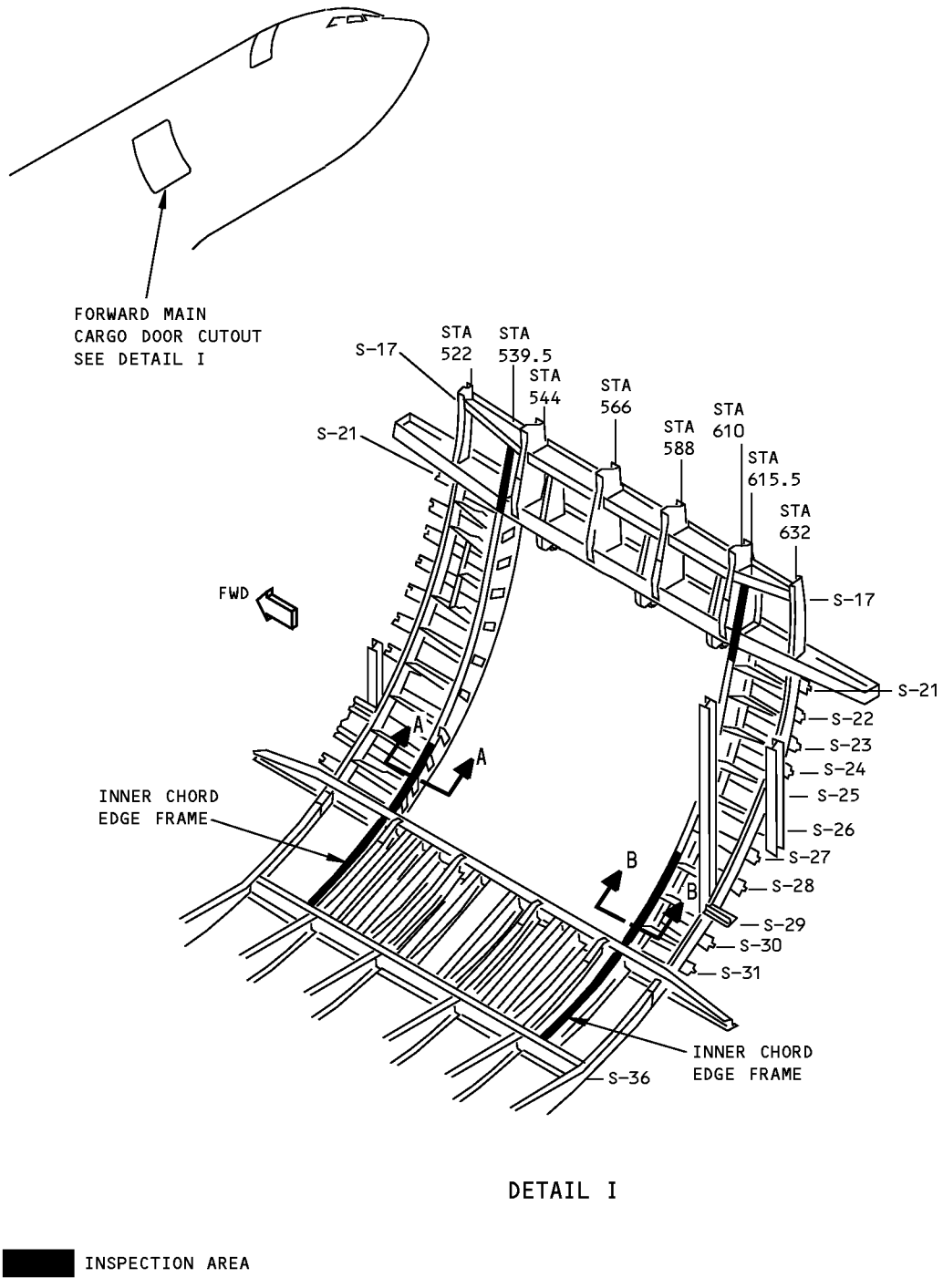
(1) For instruments with a meter display, refer to Part 6, 51-00-01, par. 5 for the inspection procedure.

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

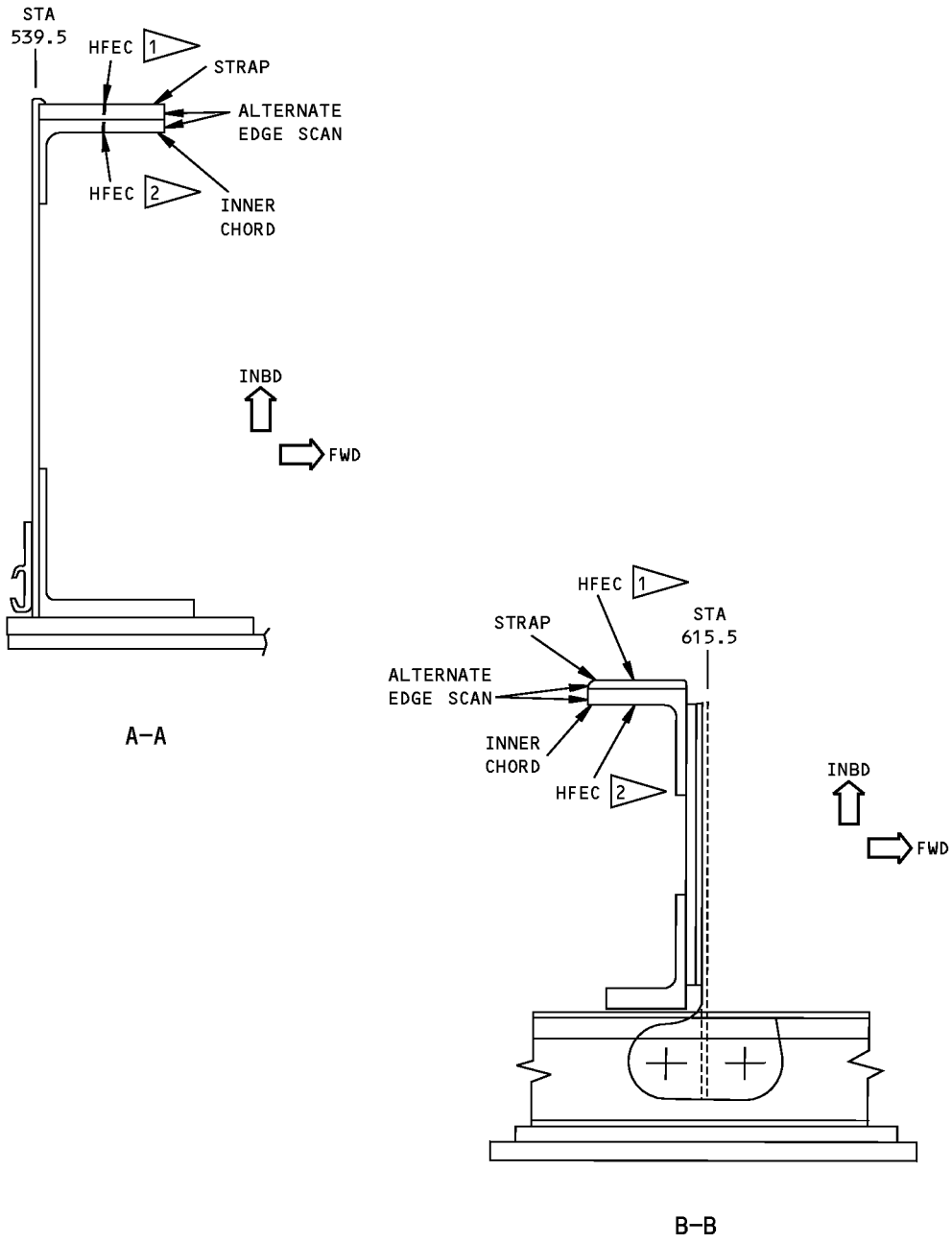
6. Inspection Results

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.



Inspection Locations
Figure 1 (Sheet 1 of 2)



1 MAKE A SCAN AROUND ALL THE FASTENERS IN THE STRAP FROM S-17 TO S-21 AND S-28 TO S-36

2 MAKE A SCAN AROUND ALL THE FASTENERS IN THE INNER CHORD FROM S-17 TO S-21 AND S-28 TO S-36

Inspection Locations
Figure 1 (Sheet 2 of 2)

EDGE FRAMES OF THE CUTOUT FOR THE FORWARD LARGE CARGO DOOR (HFEC)

1. Purpose

A. Use this procedure to find cracks in the fail safe strap at the forward and aft edge frames of the cutout for the forward large cargo door. The areas to examine are identified in Figure 1.

B. This procedure was prepared for the MPD Appendix B DTR Check Form Items that follow:

(1) 53-30-I19A, direction 2: At STA 478 between stringers 23R and 28R, and STA 618 between stringers 27R and 28R, and stringers 29R and 30R.

(2) 53-30-I19B, direction 3: At STA 478 between stringers 26R and 27R, and 29R and 30R.

(3) 53-30-I19C, direction 2: At STA 618, between stringers 28R and 29R.

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

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 that follow were used to help prepare this procedure.

(a) Locator UH; Hocking, Inc.

(b) NDT-19e; Staveley

C. Probes

(1) A shielded, right angle probe with a 0.02 inch (0.5 mm) drop is recommended. Other probes can be used if all of the inspection areas can be satisfactorily examined.

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

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

(a) MP-902-50; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 188A or an equivalent as given in Part 6, 51-00-01, par. 2.C.

3. Preparation for Inspection

A. Get access to the inspection area through the large cargo door.

B. Clean the inspection area.

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, "Instrument Calibration". Use reference standard 188A or an equivalent for the 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, "Instrument Calibration". Use reference standard 188A or an equivalent for the calibration.

5. Inspection Procedure

A. Make a scan around each fastener location identified in Figure 1.

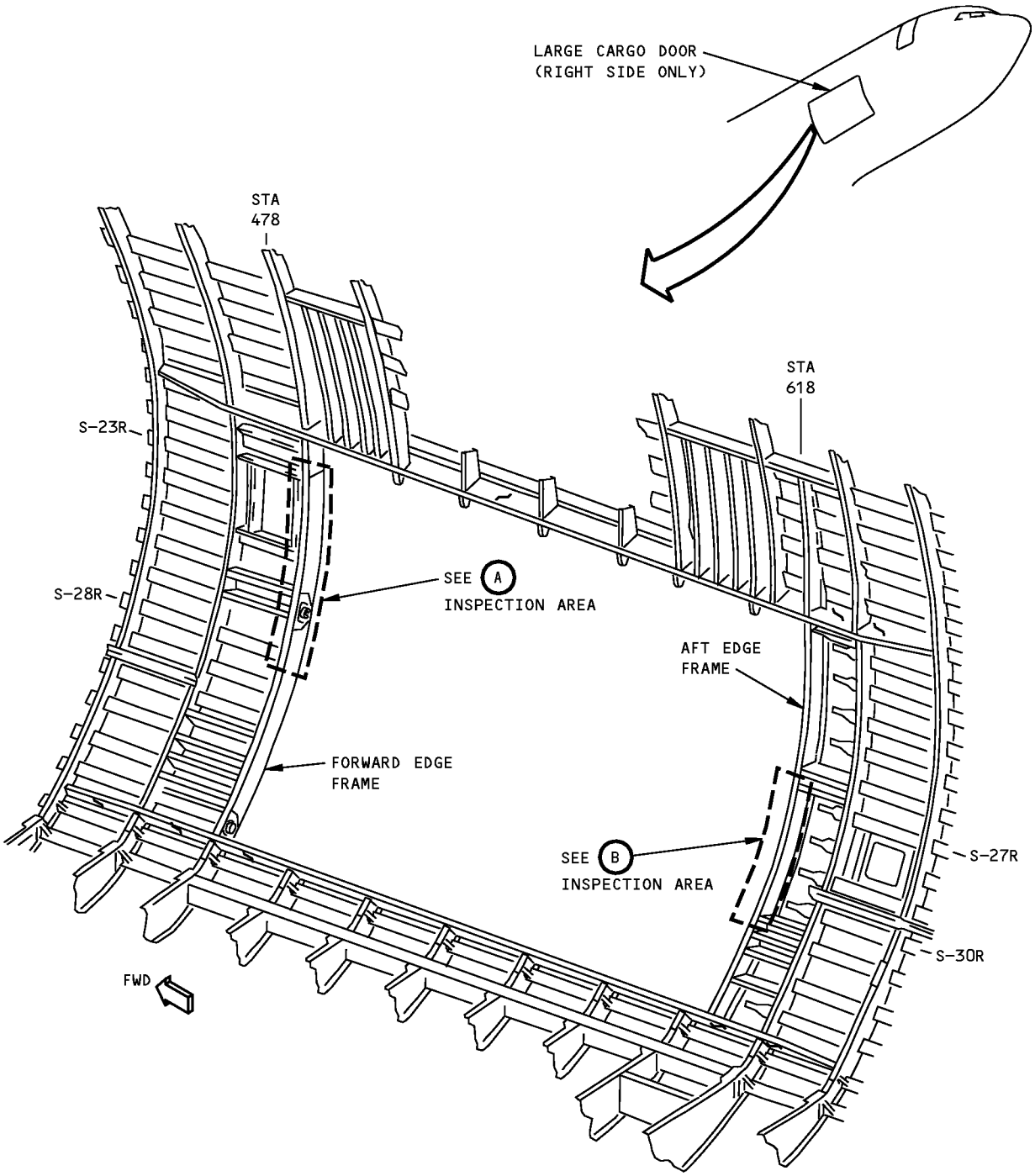
(1) For instruments with a meter display, refer to Part 6, 51-00-01, par. 5, for the inspection procedure.

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

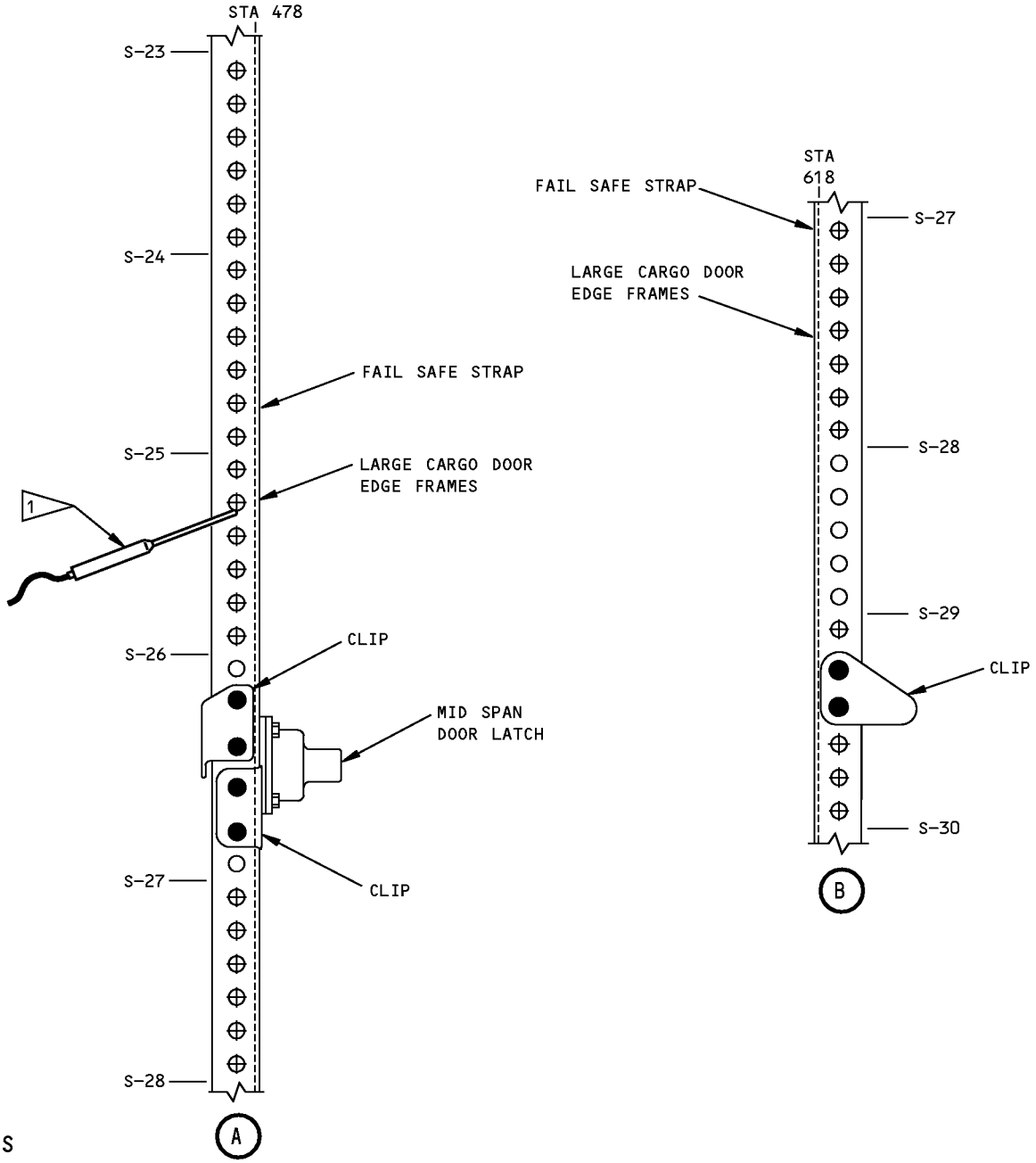
6. Inspection Results

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



Inspection Area
Figure 1 (Sheet 1 of 2)



NOTES

● EXAMINE THESE FASTENER LOCATIONS FROM THE FAR SIDE. REFER TO MPD APPENDIX B DTR CHECK FORM ITEM 53-30-I19B.

⊕ EXAMINE THESE FASTENER LOCATIONS FROM THE NEAR SIDE. REFER TO MPD APPENDIX B DTR CHECK FORM ITEM 53-30-I19A.

○ EXAMINE THESE FASTENER LOCATIONS FROM THE NEAR SIDE. REFER TO MPD APPENDIX B DTR CHECK FORM ITEM 53-30-I19C.

1 USE A SURFACE CURRENT PROBE TO EXAMINE THE FAIL SAFE STRAP OF THE EDGE FRAMES AT STATION 478 AND STATION 618. USE THE FASTENER AS A GUIDE AND MAKE A 360° SCAN AROUND EACH FASTENER

Inspection Area
Figure 1 (Sheet 2 of 2)

EDGE FRAMES OF THE CUTOUT FOR THE FORWARD LARGE CARGO DOOR (OPEN HOLE)

1. Purpose

A. Use this surface eddy current procedure to find cracks in the inner chord and fail safe strap of the edge frames at STA 478, between stringers S-26R and S-27R and at STA 618, between stringers S-29R and S-30R.

B. It is necessary to remove fasteners to do this inspection. The location of the fastener holes to examine are shown in Figure 1.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-30-I19B

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 (with or without a rotary scanner) or a meter display.

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

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

(a) Phasec 1.1 SD; Hocking, Inc.

(b) Phasec 2200; Hocking, Inc.

C. Probes

(1) Use a probe that can be expanded to examine holes of 0.188 inch (4.78 mm) diameter and 0.25 inch (6.4 mm) diameter. Or use two probes, one for each hole diameter.

(a) For instruments with a meter display and a manual hole probe, refer to Part 6, 51-00-04, par. 2.B. for data about probe selection.

(b) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 2.B. for data about probe selection.

(c) For instruments with an impedance plane display and rotary scanner, refer to Part 6, 51-00-16, par. 2.B. for data about probe selection.

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

(a) BYU-12; NDT Engineering Corp

(b) BYU-16; NDT Engineering Corp

D. Reference Standard

(1) Use the reference standards that follow or approved equivalent reference standards. Refer to Part 6, 51-00-04, Fig. 2, Part 6, 51-00-11, Fig. 3, or Part 6, 51-00-16, Fig. 3 for reference standard data.

(a) 0.188 inch (4.78 mm) diameter fastener hole - Use 186A or NDT1016.

(b) 0.25 inch (6.4 mm) diameter fastener hole - Use 186B or NDT1017.

3. Preparation for Inspection

A. Refer to Figure 1 for the inspection areas and remove the fasteners from the holes to be examined.

B. Clean loose dirt and sealant from inside the fastener holes.

C. Visually examine the inner surface of the holes for surface conditions that can cause rejectable noise signals during the inspection. Borescopes, endoscopes or other optical aids can be used to help with the visual inspection. These are the conditions to look for:

(1) Burrs

(2) Galling

(3) Corrosion

(4) Out-of-round holes

D. If one or more of the conditions given in Paragraph 3.C. are seen, do a 0.016 inch (0.41 mm) cleanup ream. A 125 RHR or better surface finish is necessary after a cleanup ream. Get Engineering approval before you do a cleanup ream.

4. Instrument Calibration

A. For instruments with a meter display and a handheld probe, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-04, par. 4.

B. For instruments with an impedance plane display and a handheld probe, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-11, par. 4.

C. For instruments with an impedance plane display and a rotary scanner, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-16, par. 4.

5. Inspection Procedure

A. Use the applicable procedure given below to examine each fastener hole identified in Figure 1 for cracks.

NOTE: Only the fail safe strap and the inner chord must be examined.

(1) For instruments with a meter display, refer to Part 6, 51-00-04, par. 5.

(2) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 5.

(3) For instruments with an impedance plane display and a rotary scanner, refer to Part 6, 51-00-16, par. 5.

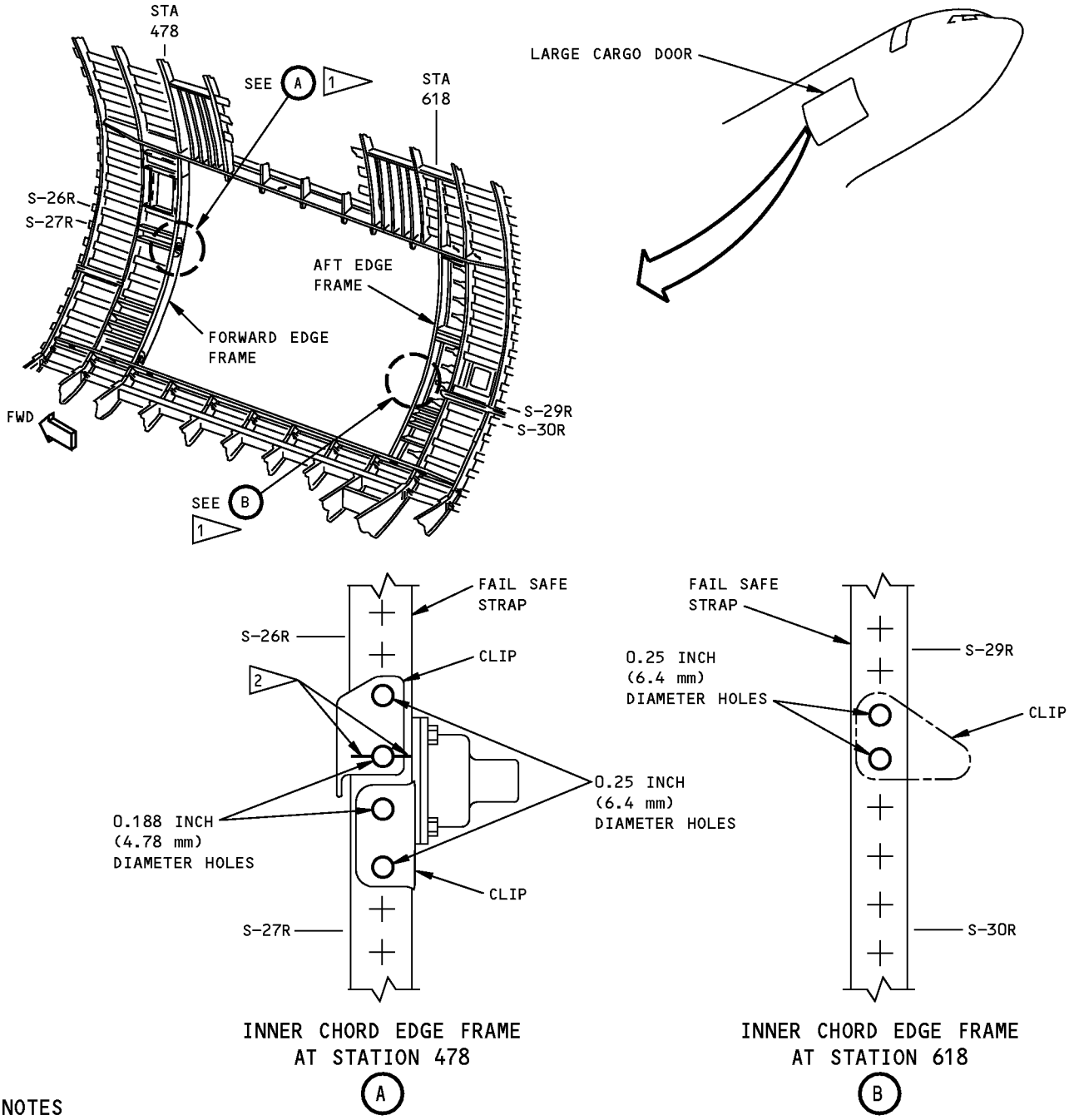
6. Inspection Results

A. Use the applicable procedure given below to make an analysis of all signals that occur during the inspection of the fastener holes.

(1) For instruments with a meter display, refer to Part 6, 51-00-04, par. 6.

(2) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 6.

(3) For instruments with an impedance plane display and a rotary scanner, refer to Part 6, 51-00-16, par. 6.



NOTES

- ○ FASTENER HOLES TO EXAMINE; REMOVE THE FASTENERS AND DO AN OPEN HOLE EDDY CURRENT INSPECTION OF THE FAIL SAFE STRAP AND THE INNER CHORD (THE INNER CHORD IS BEHIND THE FAIL SAFE STRAP SHOWN).
- 1 AREA OF INSPECTION; FORWARD AND AFT EDGE FRAMES
- 2 TYPICAL CRACK EXAMPLE: CRACKS CAN OCCUR IN THE FAIL SAFE STRAP AND INNER CHORD AND GROW IN THE FORWARD AND AFT DIRECTION

Inspection Area
Figure 1

UPPER AND LOWER SILLS OF THE FORWARD LARGE CARGO DOOR CUTOUT (HFEC)

1. Purpose

A. This procedure examines areas related to three DTR Check Form Items from the Maintenance Planning Data (MPD) that identify inspections at the forward large cargo door surround structure. Use this procedure to do a check for cracks at these locations:

(1) In the strap of the upper sill from BS 456 to BS 478 and BS 482 to BS 493. In the strap of the lower sill from BS 610 to BS 632. Refer to MPD DTR Check Form Item 53-30-I19D, direction 2.

(2) In the strap of the upper sill from BS 478 to BS 482. Refer to MPD DTR Check Form Item 53-30-I19E, direction 1.

(3) In the strap of the upper sill from BS 482 to BS 493. Refer to MPD DTR Check Form Item 53-30-I19G, direction 1.

B. The areas to examine are identified in Figure 1.

C. Use an impedance plane display instrument to do this inspection.

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 kHz to 500 kHz.

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

(a) NDT-19e; Staveley

(b) Phasec 2200; Hocking

(c) Locator 2; Hocking

C. Probes -- Refer to Part 6, 51-00-19, par. 2.C for data about probe selection.

(1) A flexible, right-angle surface probe with a probe drop (dimension ''A'') of 0.2 inches (5 mm) can be used to examine all of the inspection areas identified in this procedure. Other probe designs can be used if a satisfactory inspection can be done with them. A straight, surface probe can also be used to examine many of the areas.

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

1) MP902-50FX; NDT Engineering Corp

2) MP905-50FX; NDT Engineering Corp

3) MP30; NDT Engineering Corp

D. Reference Standards

(1) To examine the inspection areas identified in MPD DTR Check Form Items 53-30-I19D, direction 2, and 53-30-I19G, direction 1, use:

(a) Reference standard 188A and the aluminum rivet as given in Part 6, 51-00-19, par. 2.D.

(2) To examine the inspection areas identified in MPD DTR Check Form Item 53-30-I19E, direction 1, use:

(a) Reference standard 189 or an equivalent as given in Part 6, 51-00-19, par. 2.D.

NOTE: Other reference standards can be used if they are equivalent to the reference standards identified in Paragraph 2.D.

3. Preparation for Inspection

A. Identify the inspection areas shown in Figure 1.

B. Remove all structure necessary to get access to the inspection area.

C. Remove dirt, loose paint, and grease from the inspection surface.

4. Instrument Calibration

A. Get the necessary reference standard for the DTR Check Form Item to be examined. Refer to Paragraph 2.D.(1) and Paragraph 2.D.(2) for the necessary reference standard.

B. Calibrate the equipment as specified in the calibration instructions given in Part 6, 51-00-19, par. 4.

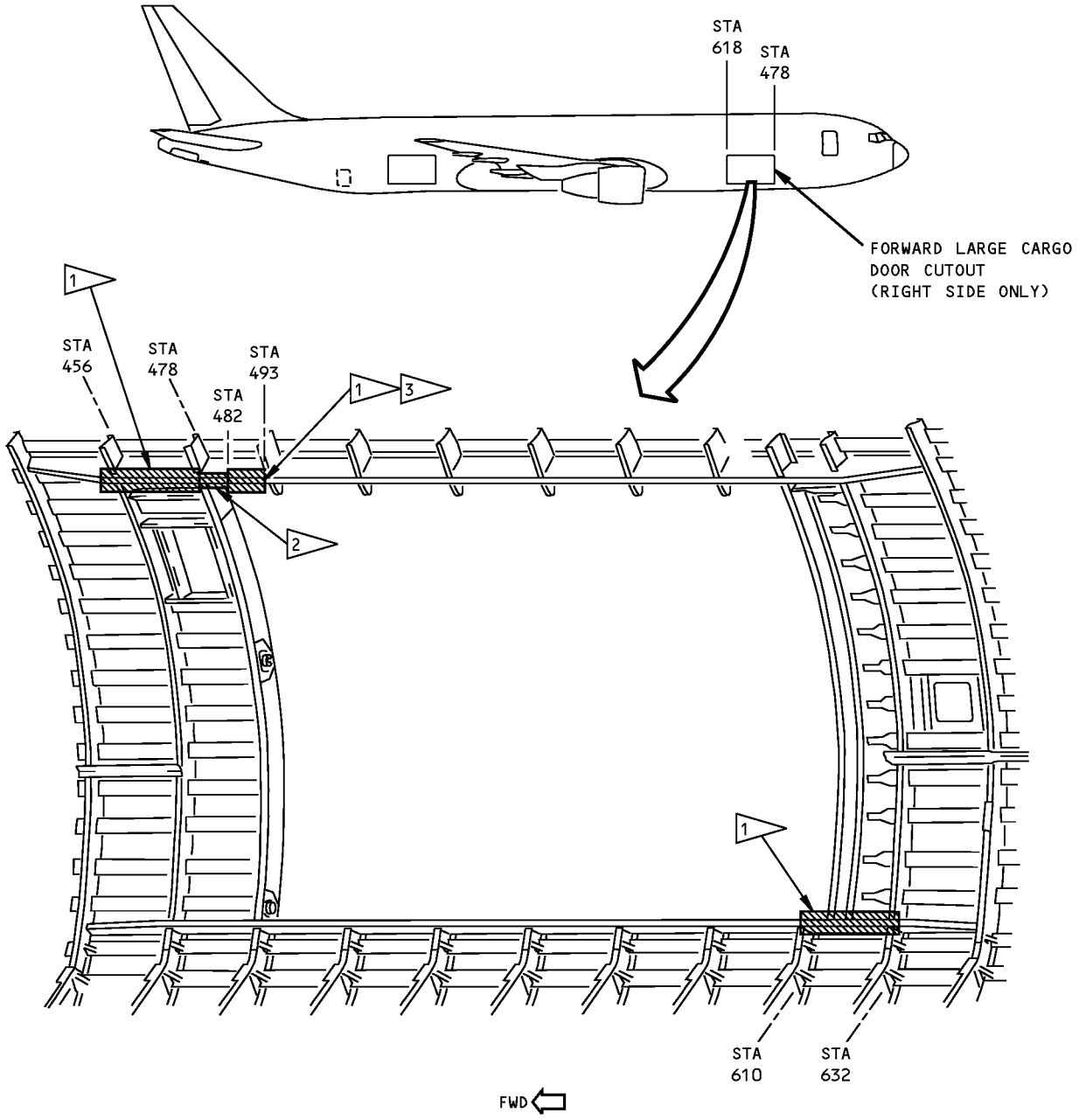
5. Inspection Procedure

A. Examine all inspection areas identified in Figure 2 thru Figure 5.

(1) Refer to Part 6, 51-00-19, par. 5 for the inspection procedure.

6. Inspection Results

A. Refer to Part 6, 51-00-19, par. 6 to make an analysis of crack indications that occur during the inspection.



CUTOUT FOR THE FORWARD LARGE CARGO DOOR

NOTES:

INSPECTION AREAS

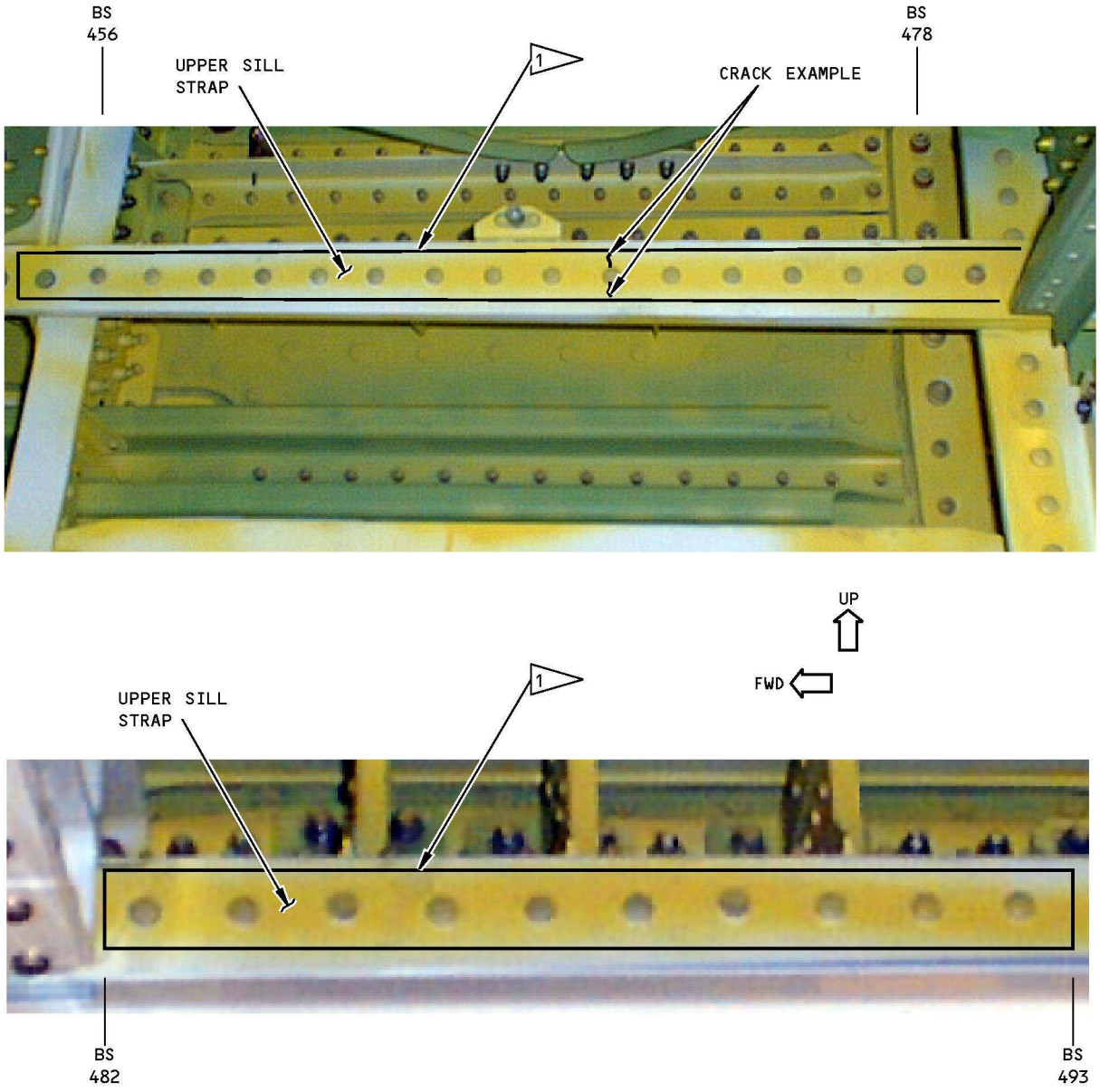
1 REFER TO PAR. 1.A.(1) AND FIGURES 2 AND 3 FOR THE INSPECTION DETAILS.

2 REFER TO PAR. 1.A.(2) AND FIGURE 4 FOR THE INSPECTION DETAILS.

3 REFER TO PAR. 1.A.(3) AND FIGURE 5 FOR THE INSPECTION DETAILS.

U80093 S0000224121_V2

Inspection Locations
Figure 1

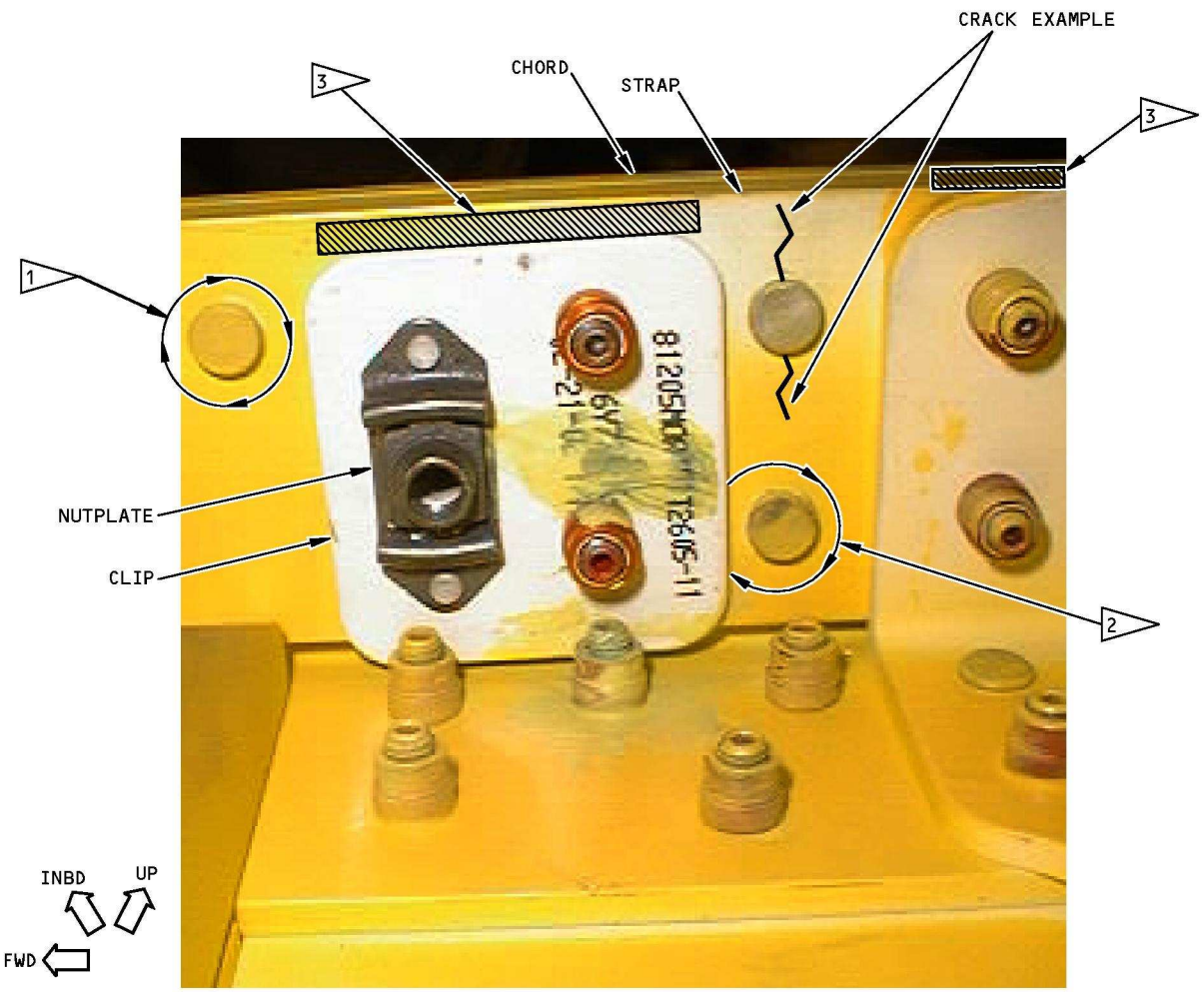


NOTES:

- VIEW OF THE UPPER SILL AS YOU LOOK OUTBOARD

1 INSPECTION AREA.
MAKE A SCAN OF THE STRAP AT EACH FASTENER LOCATION FROM BS 456 TO BS 478 AND BS 482 TO BS 493.
REFER TO FIG. 1

Inspection Details for the Upper Sill
Figure 2

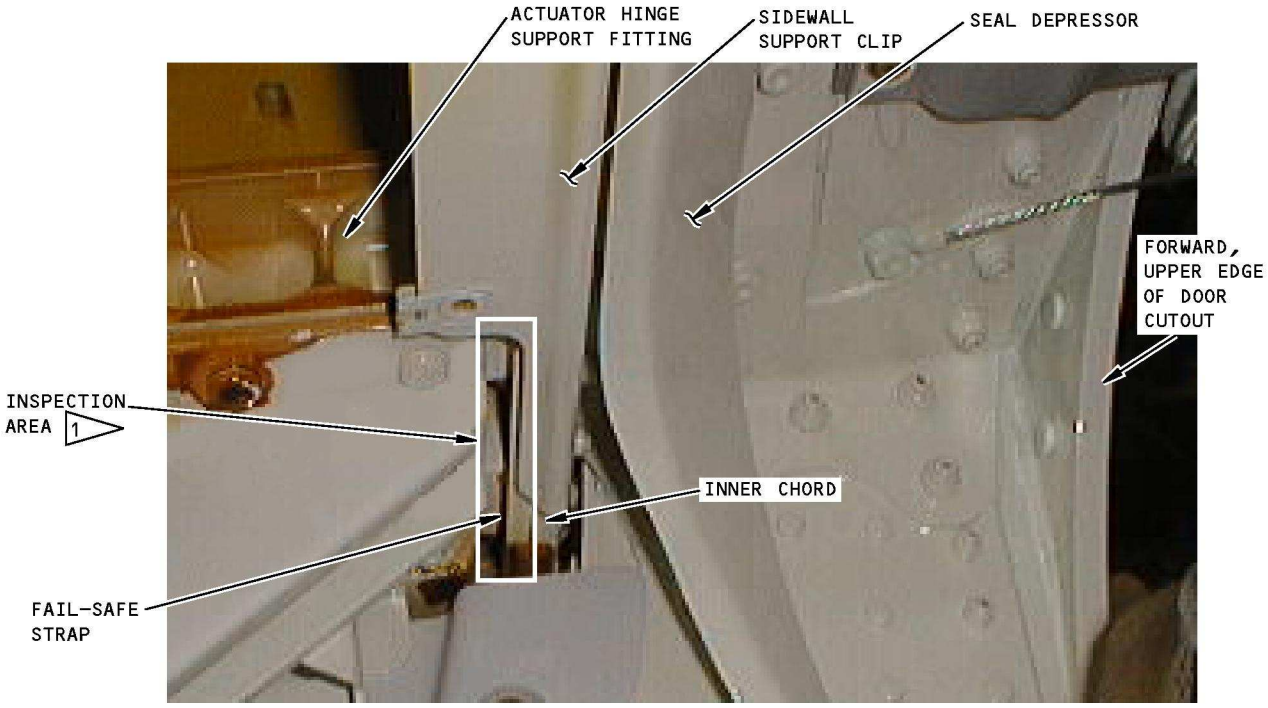


NOTES:

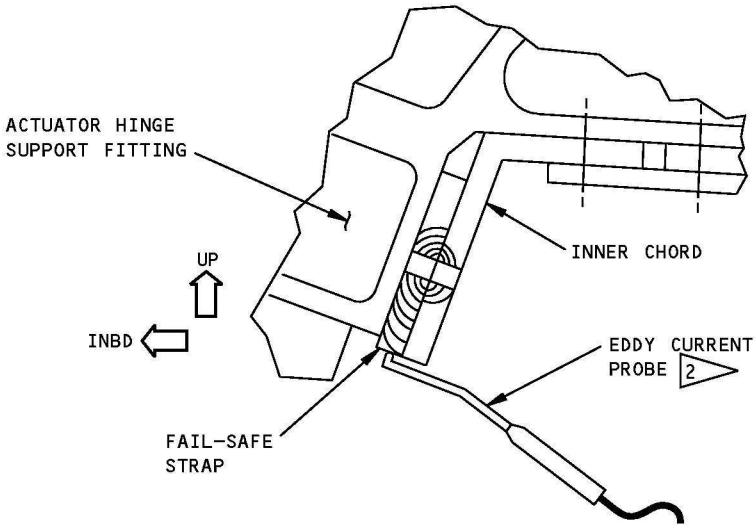
- VIEW OF THE LOWER SILL AS YOU LOOK UP

1. MAKE A SCAN OF THE STRAP AT EACH FASTENER LOCATION FROM BS 610 TO BS 632. REFER TO FIG. 1.
2. IF ACCESS IS LIMITED, MAKE A SCAN AROUND AS MUCH OF THE FASTENER THAT YOU CAN ACCESS. IF AVAILABLE, USE A SMALLER DIAMETER PROBE TO EXAMINE THE LIMITED AREAS. SEE FLAGNOTE 3.
3. AT LOCATIONS WHERE THE STRAP IS HIDDEN BY OTHER STRUCTURE, MAKE A SCAN ALONG THE EDGE OF THE STRUCTURE, OR IF NECESSARY, ALONG THE EDGE OF THE STRAP.

Inspection Details for the Lower Sill
Figure 3



UPPER SILL INSPECTION AREA AT BS 478 TO BS 482
FORWARD LARGE CARGO DOOR CUTOUT



SECTION VIEW THROUGH STA 480
(THE SIDE WALL SUPPORT CLIP AND SEAL DEPRESSOR ARE NOT SHOWN)

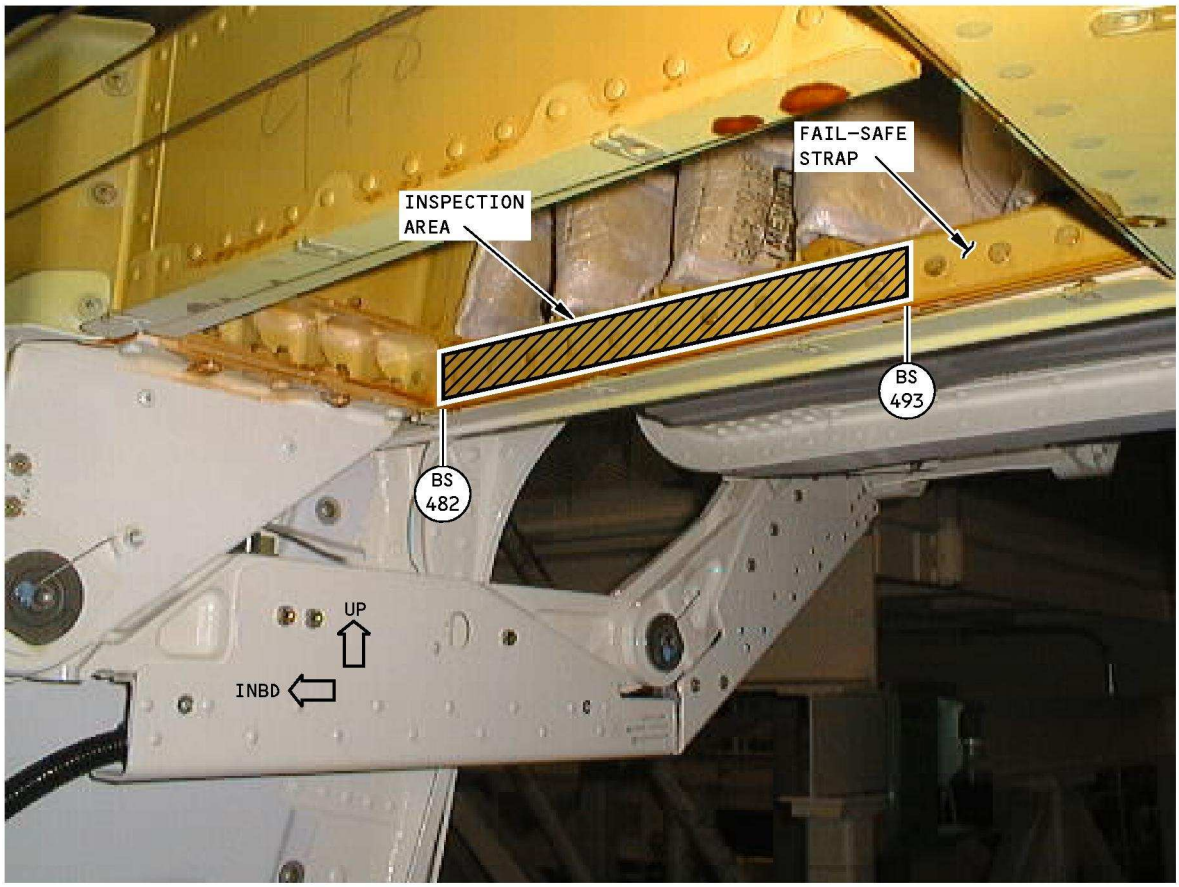
NOTES:

INSPECTION AREA

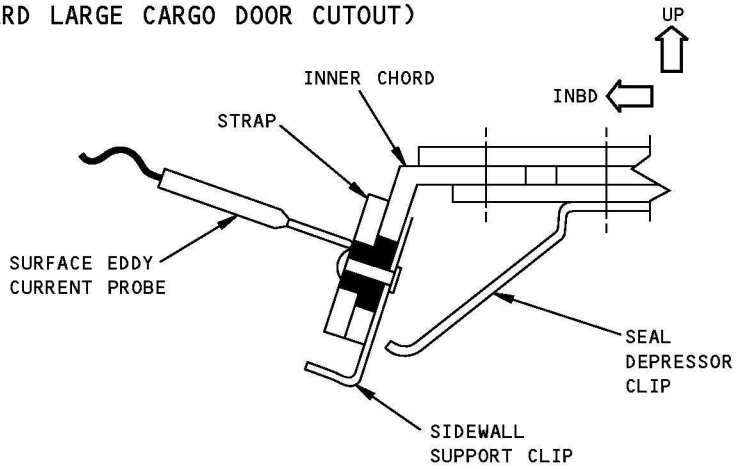
1 MAKE A SCAN ALONG THE EDGE OF THE FAIL-SAFE STRAP FROM BS 478 TO BS 482.

2 THE PROBE IS TURNED 90 DEGREES FROM THE USUAL POSITION NECESSARY TO MAKE A SCAN OF THIS PART.

Inspection Details
Figure 4



UPPER SILL STRAP AND INNER CHORD INSPECTION FROM BS 482 TO BS 493
(VIEW FROM INSIDE THE FUSELAGE AT THE FORWARD, UPPER CORNER
OF THE FORWARD LARGE CARGO DOOR CUTOUT)



TYPICAL INSPECTION VIEW
THROUGH THIS INSPECTION AREA

NOTES:

INSPECTION AREA

- REFER TO MPD ITEM 53-30-I19G
- MAKE A SCAN AROUND EACH FASTENER IN THE INSPECION AREA (BS 482 TO BS 493)

Inspection Details
Figure 5

UPPER SILL OF THE CUTOUT FOR THE FORWARD LARGE CARGO DOOR (OPEN HOLE)

1. Purpose

A. Use this procedure to examine the inner chord and the fail safe strap for cracks at BS 480 and from BS 482 to 493.

B. It is necessary to remove fasteners to do this inspection. The fastener holes to examine are identified in Figure 1.

C. This procedure was prepared for the MPD Appendix B DTR Check Form Items that follow:

(1) 53-30-I19F "Forward Large Cargo Door Cutout - Upper Sill at BS 480"

(2) 53-30-I19G "Forward Large Cargo Door Cutout - Upper Sill at BS 482 to 493''

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 with a rotary scanner or manual hole probe, or a meter display instrument with a manual hole probe.

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

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

(a) Phasec 1.1 SD; Hocking, Inc.

(b) Phasec 2200; Hocking, Inc.

C. Probes

(1) Use a probe that can be expanded to examine 0.250 inch (6.35 mm) diameter holes.

(a) For instruments with a meter display and a manual hole probe, refer to Part 6, 51-00-04, par. 2.B., for data about probe selection.

(b) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 2.B., for data about probe selection.

(c) For instruments with an impedance plane display and rotary scanner, refer to Part 6, 51-00-16, par. 2.B., for data about probe selection.

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

(a) BYU-16; NDT Engineering Corp

D. Reference Standard

(1) Use one of the reference standards that follows, or an approved equivalent reference standard. Refer to Part 6, 51-00-04, Fig. 2, Part 6, 51-00-11, Fig. 3, or Part 6, 51-00-16, Fig. 3 for reference standard data.

(a) 186B, NDT1017 or equivalent with a 0.25 inch (6.4 mm) diameter fastener hole.

3. Preparation for Inspection

A. Refer to Figure 1 for the inspection areas and remove the fasteners from the holes to be examined.

B. Clean the fastener holes if necessary.

C. Visually examine the inner surface of the holes for surface conditions that can cause rejectable noise signals during the inspection. Borescopes, endoscopes or other optical aids can be used to help with the visual inspection. These are the conditions to look for:

(1) Burrs

(2) Galling

(3) Corrosion

(4) Out-of-round holes

D. If one or more of the conditions given in Paragraph 3.C. are seen, do a 0.016 inch (0.41 mm) cleanup ream. A 125 RHR or better surface finish is necessary after a cleanup ream. Get Engineering approval before you do a cleanup ream.

4. Instrument Calibration

A. For instruments with a meter display and a handheld probe, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-04, par. 4.

B. For instruments with an impedance plane display and a handheld probe, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-11, par. 4.

C. For instruments with an impedance plane display and a rotary scanner, calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-16, par. 4.

5. Inspection Procedure

A. Use the applicable procedure that follows to examine each fastener hole identified in Figure 1 for cracks.

NOTE: Only the fail safe strap and the inner chord must be examined.

(1) For instruments with a meter display, refer to Part 6, 51-00-04, par. 5.

(2) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 5.

(3) For instruments with an impedance plane display and a rotary scanner, refer to Part 6, 51-00-16, par. 5.

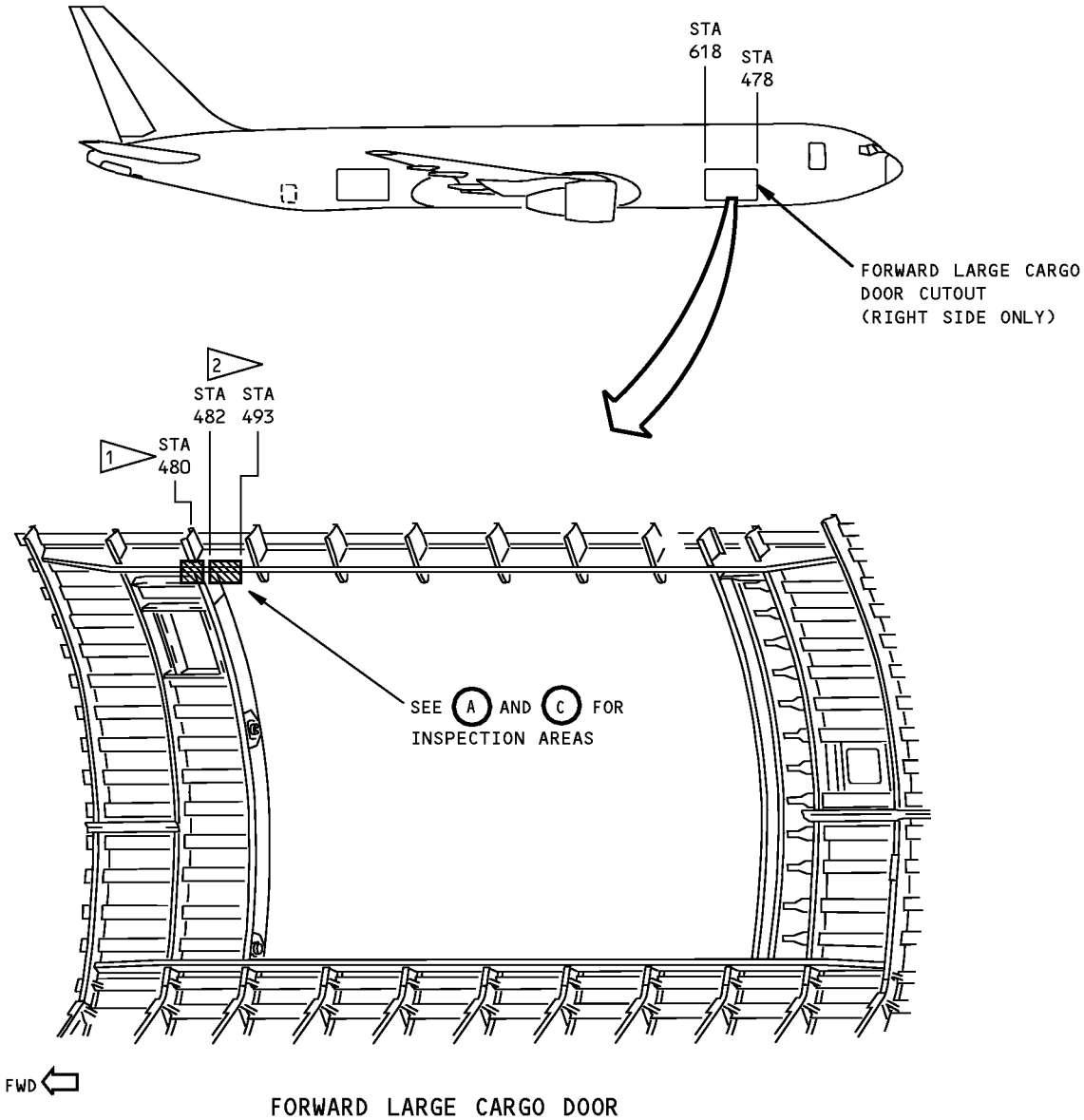
6. Inspection Results

A. Use the applicable procedure that follows to make an analysis of all signals that occur during the inspection of the fastener holes.

(1) For instruments with a meter display, refer to Part 6, 51-00-04, par. 6.

(2) For instruments with an impedance plane display and a manual hole probe, refer to Part 6, 51-00-11, par. 6.

(3) For instruments with an impedance plane display and a rotary scanner, refer to Part 6, 51-00-16, par. 6.



FORWARD LARGE CARGO DOOR

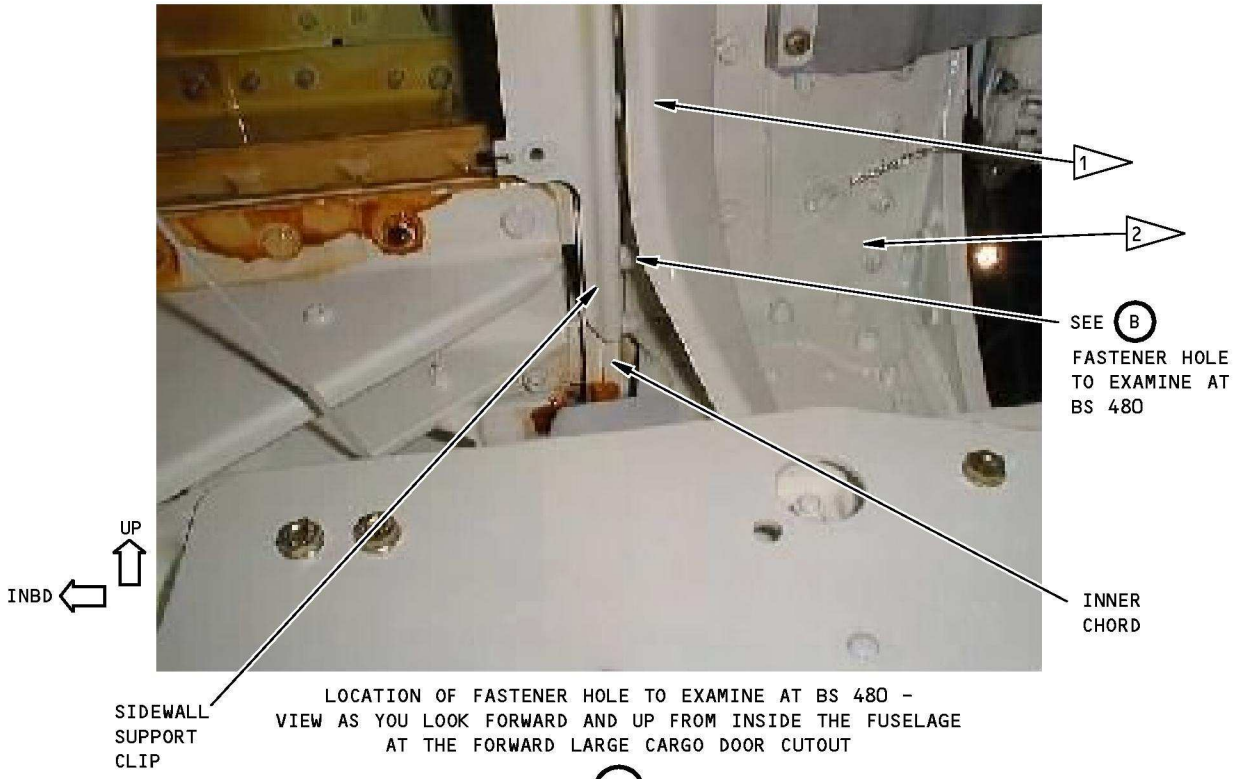
NOTES:

INSPECTION AREAS

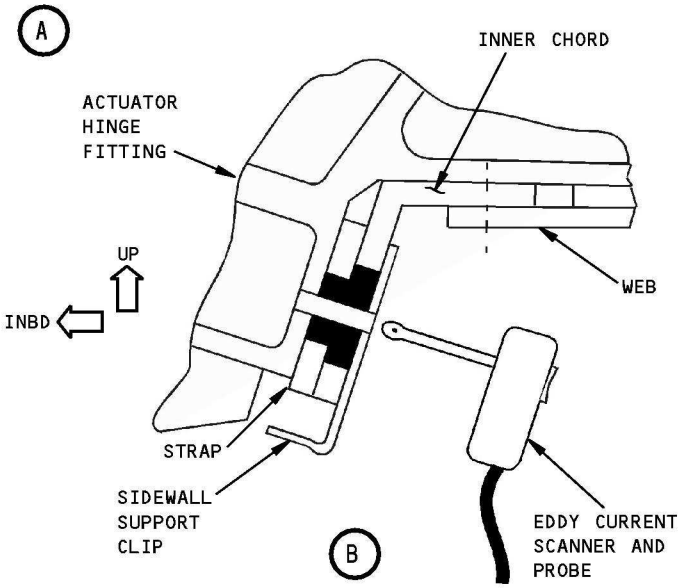
1 REFER TO THE 767 MPD APPENDIX B, DTR CHECK FORM ITEM 53-30-I19F, INSPECTION OPTION 2. SEE A FOR THE INSPECTION DETAILS.

2 REFER TO THE 767 MPD APPENDIX B, DTR CHECK FORM ITEM 53-30-I19G, INSPECTION OPTION 2. SEE C FOR THE INSPECTION DETAILS.

Inspection Areas
Figure 1 (Sheet 1 of 3)



LOCATION OF FASTENER HOLE TO EXAMINE AT BS 480 - VIEW AS YOU LOOK FORWARD AND UP FROM INSIDE THE FUSELAGE AT THE FORWARD LARGE CARGO DOOR CUTOUT



NOTES

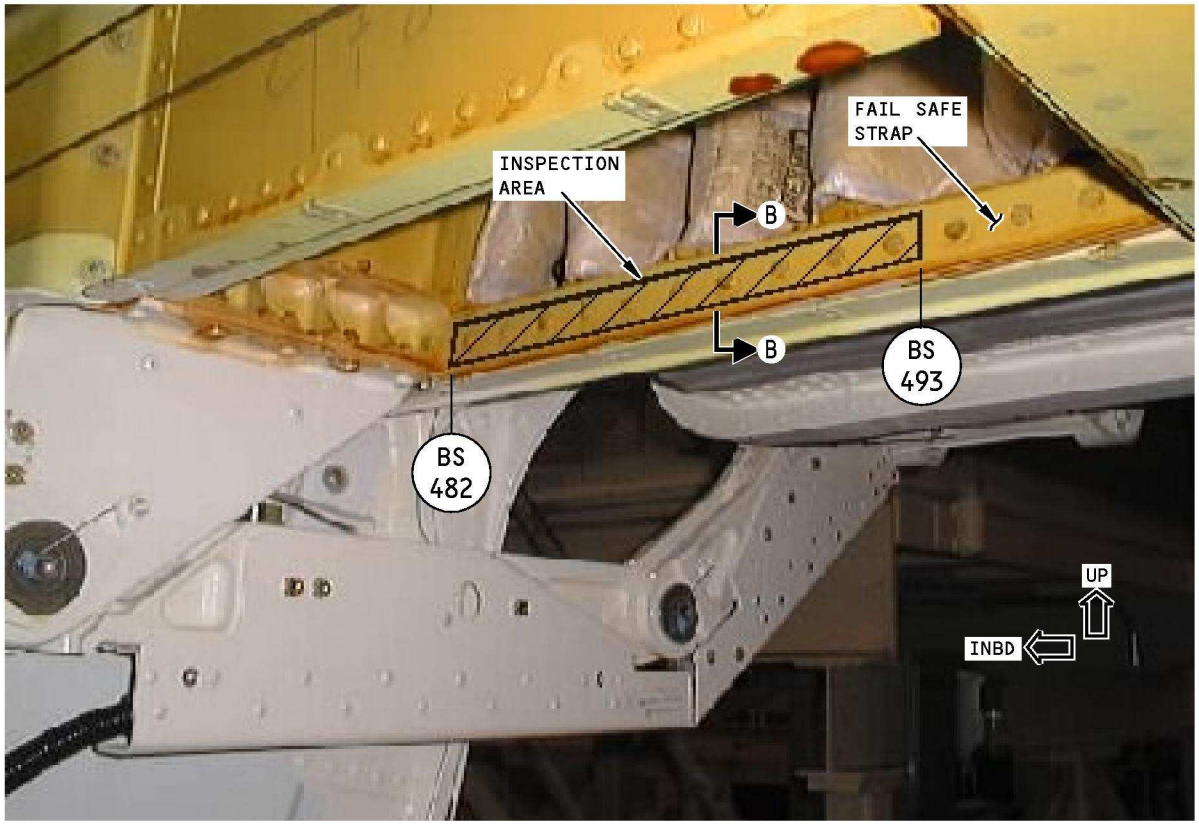
- REMOVE THE FASTENER FROM BS 480 AND DO AN OPEN HOLE EDDY CURRENT INSPECTION

1 THE SEAL DEPRESSOR CLIP MUST BE REMOVED FOR THIS INSPECTION

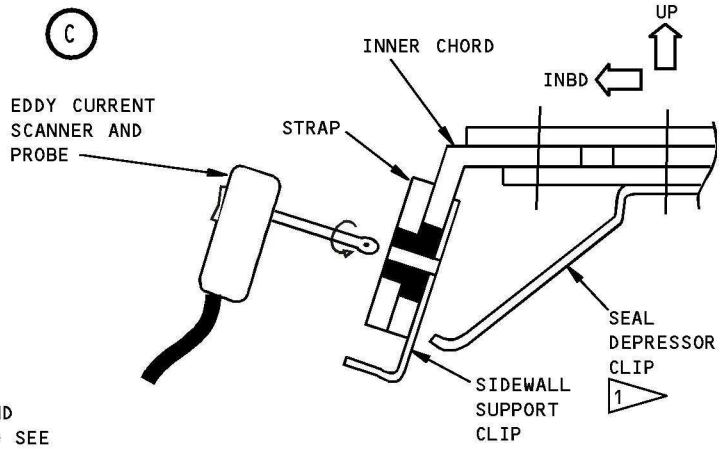
2 FORWARD UPPER CORNER OF THE FORWARD LARGE CARGO DOOR CUTOUT

INSPECTION DETAILS AT BS 480

Inspection Areas
Figure 1 (Sheet 2 of 3)



UPPER SILL FAIL SAFE STRAP AND INNER CHORD INSPECTION AT BS 482 TO 493
(VIEW FROM INSIDE THE FUSELAGE AT THE FORWARD UPPER CORNER OF
THE FORWARD LARGE CARGO DOOR CUTOUT)



TYPICAL SECTION VIEW
THROUGH THIS INSPECTION AREA
B–B

NOTES

INSPECTION AREA

- REMOVE THE FASTENER FROM BS 482 TO 493 AND DO AN OPEN HOLE EDDY CURRENT INSPECTION - SEE FLAGNOTE 1.

1 IT IS NECESSARY TO REMOVE THE SEAL DEPRESSOR CLIP TO GET ACCESS FOR FASTENER REMOVAL

INSPECTION DETAILS AT BS 482 TO BS 493

Inspection Areas
Figure 1 (Sheet 3 of 3)

PART 6 - EDDY CURRENT

UPPER SILL OF THE CUTOUT FOR THE FORWARD LARGE CARGO DOOR (LFEC)

1. Purpose

A. Use this procedure to examine the inner chord of the upper sill for cracks at the forward large cargo door cutout. The inner chord is examined with low frequency eddy current that goes through the sidewall support clip.

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

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-30-I19F

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, 51-06-00 for more data about eddy current inspection.

B. Instrument - Use an eddy current instrument with a meter display or an impedance plane display. Use an instrument that:

(1) Can operate at a frequency of 5 kHz.

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

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

(b) Phasec 2200; Hocking

C. Probes - It is necessary to use a right-angle spot probe that is approximately 0.19 inch (4.8 mm) in diameter, has a 0.5 inch (13 mm) drop, and can operate at 5 kHz. The probe that follows was used to help prepare this procedure.

(1) SPC-4TF-105-1R, 1-20 kHz; EC NDT.

D. Reference Standard - Make reference standard NDT671 as specified in Figure 2.

3. Preparation for Inspection

A. Identify the inspection area shown in Figure 1.

B. Remove the seal depressor clip if necessary to gain access to the inspection area.

C. Clean the inspection surface if necessary.

4. Instrument Calibration

A. Set the instrument frequency to 5 kHz.

B. Put the probe on reference standard NDT671 at position 1 as shown in Figure 3.

C. Balance the instrument.

D. Set the instrument balance point as follows:

(1) Impedance plane display instrument -- Set the balance point at approximately 20 percent of full screen height (FSH) and approximately 60 percent of full screen width (FSW) as shown in Figure 3, Detail 1.

(2) Meter display instrument -- Set the meter needle to 20 percent of full scale as shown in Figure 3, Detail 2.

E. Adjust the instrument lift-off as follows:

(1) Impedance plane instrument -- Adjust the phase control so that the signal moves horizontally from right to left when the probe is lifted off the reference standard. See Figure 3, Detail 1.

(2) Meter display instrument -- Adjust the phase control so that the meter needle moves no more than 5 percent of full scale for probe-to-part distances of approximately 0.006 inch (0.15 mm). This is equivalent to the thickness of two sheets of paper.

F. Put the probe on the reference standard at probe position 2 as shown in Figure 3 and make a scan to probe position 3. For a meter display instrument, the needle must move to an upscale location. For an impedance plane display instrument, the signal must be above the balance point. If necessary, do Paragraph 4.B. thru Paragraph 4.F. again.

G. Adjust the instrument sensitivity as follows:

(1) Make a scan from probe position 2 to probe position 3 to get a signal from the EDM notch.

(a) Impedance plane instruments - Adjust the instrument gain so the maximum signal from the reference notch is 60 percent of FSH as shown in Figure 3, Detail 1.

NOTE: It can be necessary to adjust the horizontal-to-vertical gain ratio to get the notch signal as shown in Figure 3, Detail 1.

(b) Meter display instruments -- Adjust the gain so that the meter needle is at 60 percent of full scale as shown in Figure 3, Detail 2.

5. Inspection Procedure

A. Put the probe on the inspection surface at the approximate location that is shown in Figure 1, Detail 1.

B. Balance the instrument.

C. Make a scan of the inspection area (360 degrees around the fastener). See Figure 1, Detail 1 for the inspection area.

D. Make a mark at all the locations where signals occur that are 40 percent (or more) of FSH.

E. Do a calibration check as follows if the equipment is changed or when the inspection is completed:

NOTE: Do not adjust the instrument gain.

(1) Put the probe on the reference standard at probe position 1 and balance the instrument.

(2) Put the probe on the reference standard at probe position 2 and make a scan to probe position 3. Compare the signal you got from the notch during calibration with the signal you get now.

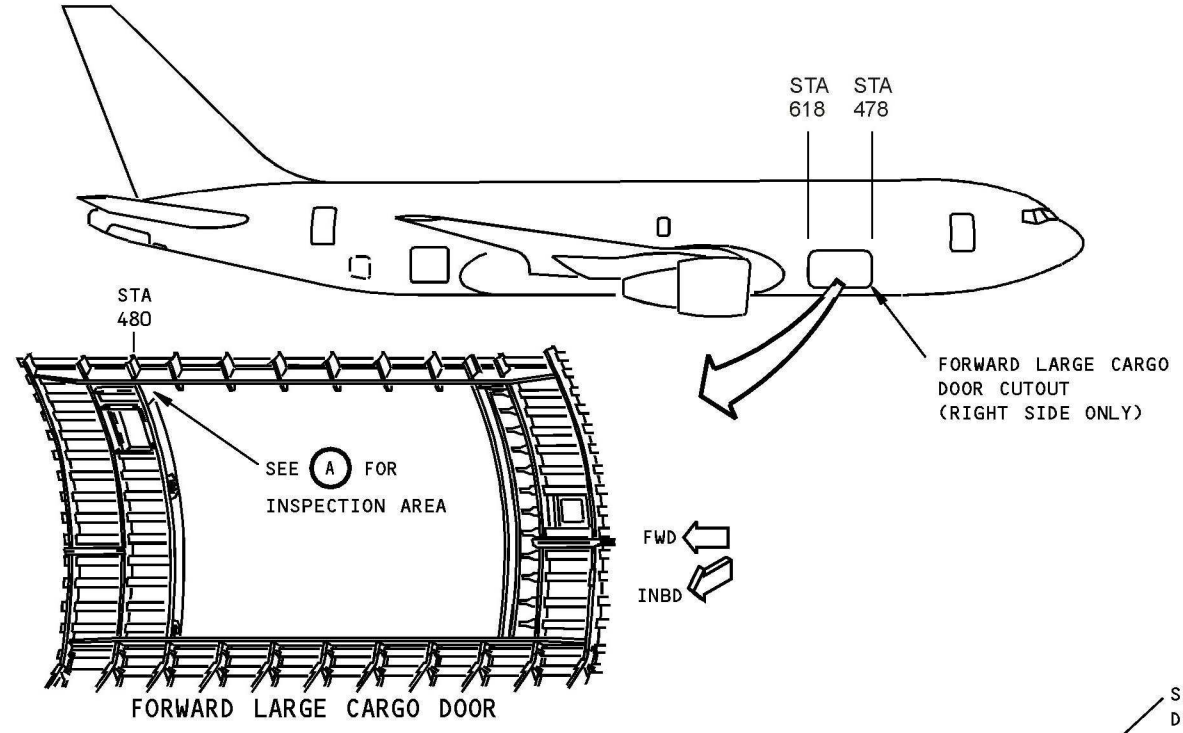
(3) If the signal you now get from the notch has decreased in FSH by 10 percent or more, do the calibration and inspection again.

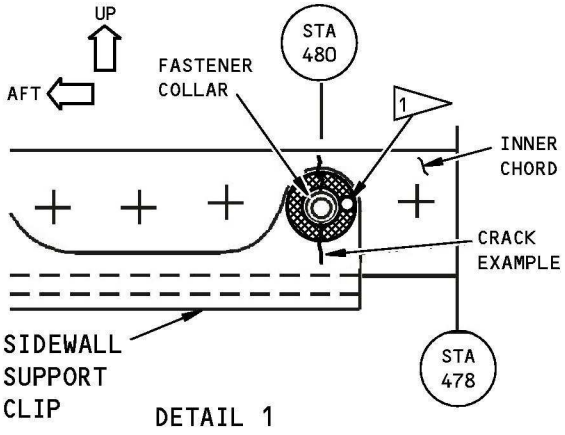
6. Inspection Results

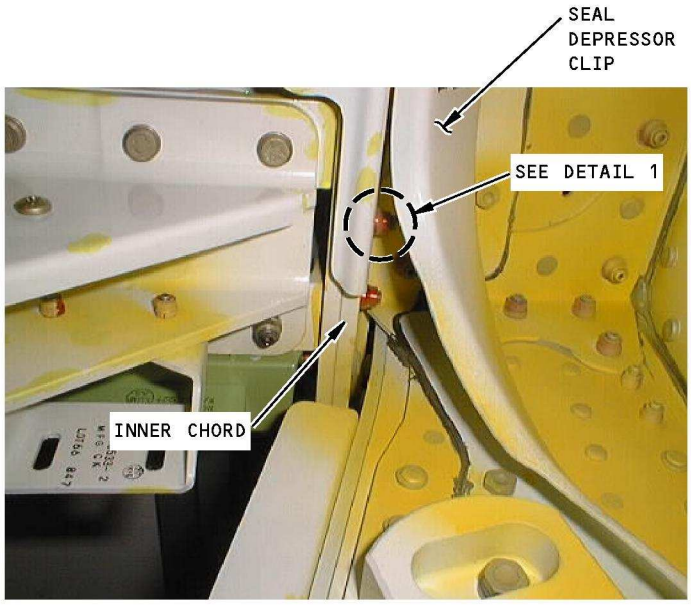
A. A signal that is more than 40% of FSH (more than 40% of the display for meter display instruments) is a sign of a crack and the location must be rejected and more analysis is necessary.

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

C. 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.







VIEW OF THE INNER CHORD AS YOU LOOK UP FROM INSIDE THE FUSELAGE. THIS INSPECTION AREA IS AT THE FORWARD UPPER CORNER OF THE FORWARD LARGE CARGO DOOR CUTOUT

A

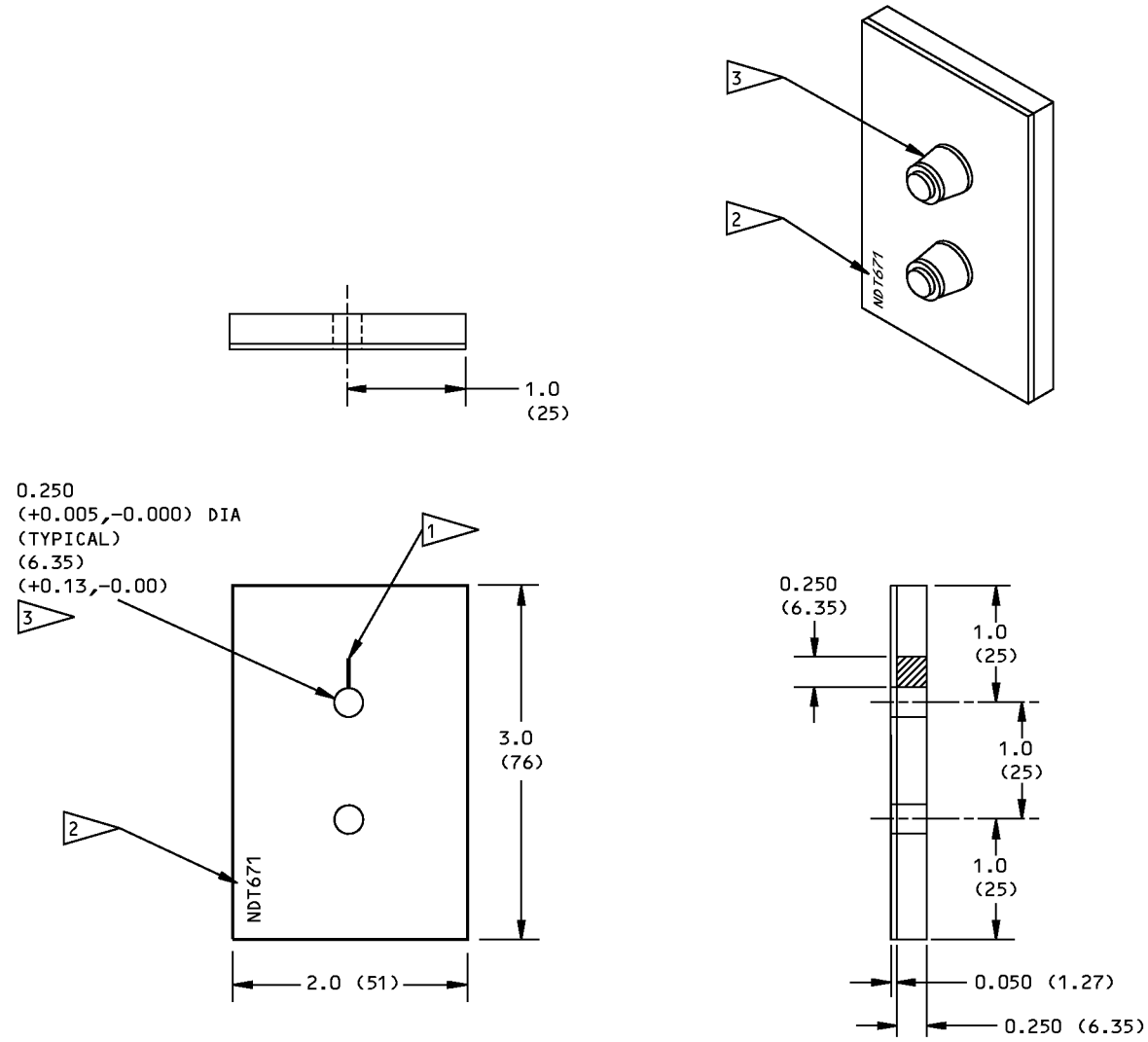
NOTES

- REFER TO SIPD ITEM 53-30-I19F, DIRECTION 1

SCAN PATH - SEE DETAIL 1

1 BALANCE THE INSTRUMENT WITH THE PROBE AT APPROXIMATELY THIS LOCATION AND MAKE A 360° SCAN AROUND THE COLLAR.

Inspection Location
Figure 1



NOTES

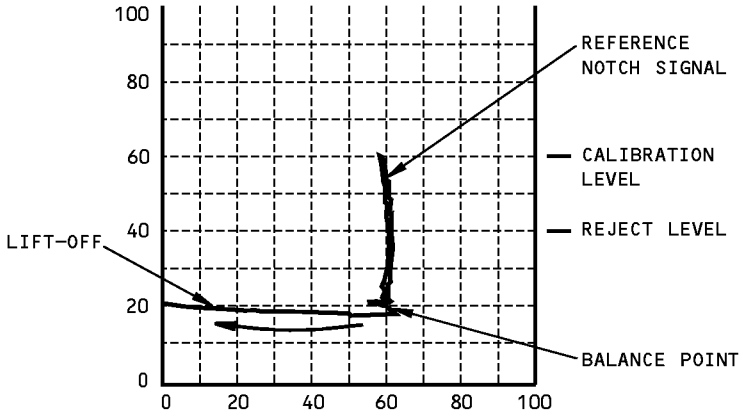
- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- TOLERANCE (UNLESS SPECIFIED DIFFERENTLY):

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: 7075-T6 (2024-T3,-T4 OR 7075-T735 IS OPTIONAL)
- SURFACE ROUGHNESS: 125 Ra OR BETTER

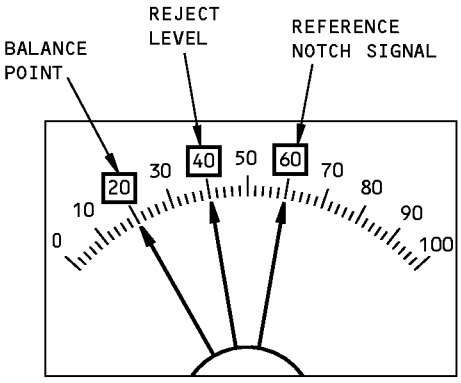
1. EDM NOTCH OR SAWCUT: 0.25 (7.4) LONG THROUGH THE THICKNESS, 0.010 (0.25) WIDE, SECOND LAYER ONLY
2. ETCH OR STAMP THE REFERENCE STANDARD NUMBER NDT671 AT APPROXIMATELY THIS LOCATION
3. INSTALL BACB30MY8K FASTENERS AND BACC30M8 COLLARS. PUT THE COLLARS ON THE TOP SURFACE (THE SAME SIDE AS THE REFERENCE STANDARD IDENTIFICATION). USE A FASTENER LENGTH AS NECESSARY TO GET A TIGHT FIT.

Reference Standard NDT671
Figure 2



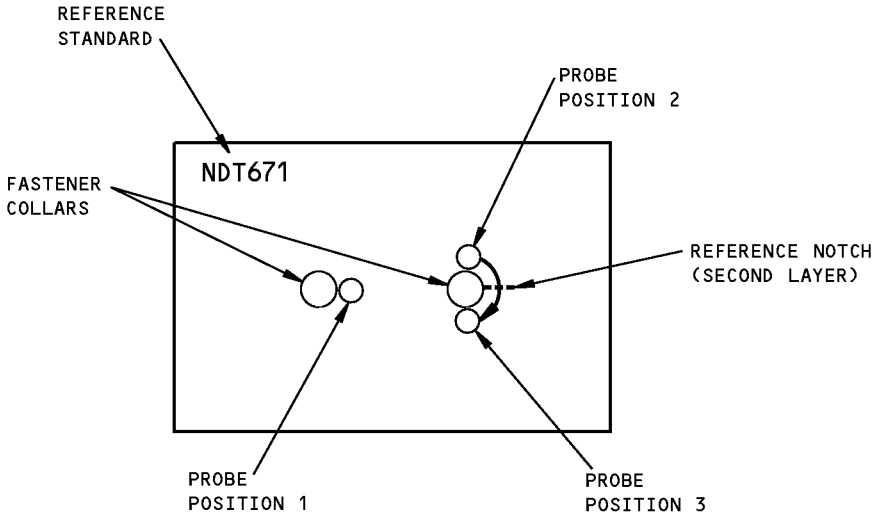
IMPEDANCE PLANE DISPLAY

DETAIL 1



METER DISPLAY

DETAIL 2



NOTES

- CALIBRATE THE INSTRUMENT AS FOLLOWS:

1. BALANCE THE INSTRUMENT WITH THE PROBE AT POSITION 1 AND ADJUST THE LIFT-OFF SIGNAL TO MOVE FROM RIGHT TO LEFT (DOWN-SCALE ON A METER DISPLAY INSTRUMENT)
2. SET THE BALANCE POINT TO 60% OF FULL SCREEN WIDTH AND 20% OF FULL SCREEN HEIGHT (20% OF THE DISPLAY ON A METER DISPLAY INSTRUMENT)
3. PUT THE PROBE AT POSITION 2 AND MAKE A SCAN TO PROBE POSITION 3
4. SET THE INSTRUMENT SENSITIVITY AS FOLLOWS:
   (a) IMPEDANCE PLANE INSTRUMENT: ADJUST THE HORIZONTAL AND VERTICAL GAIN TO GET A SIGNAL THAT IS APPROXIMATELY THE SAME AS THE SIGNAL THAT IS SHOWN IN DETAIL 1.
   (b) METER DISPLAY INSTRUMENT: ADJUST THE GAIN TO SET THE METER AT 60% OF THE DISPLAY AS SHOWN IN DETAIL 2.

Calibration Details
Figure 3

LOWER LATCH BACKUP STRUCTURE OF THE CUTOUT FOR THE FORWARD LARGE CARGO DOOR

1. Purpose

A. Use this procedure to do an inspection for surface cracks in the latch support fitting and truss fitting of the latch backup structure that is at the cutout for the forward, large cargo door.

B. Cracks can start in the fastener holes of the latch support fitting or the truss fitting and can be found when they grow out from the head or collar end of the fastener. The inspection areas 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 53-30-I20A

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 that follow were used to help prepare this procedure.

(a) Locator UH; Hocking, Inc.

(b) NDT-19e; Staveley

(c) Phasec 1.1SD; Hocking, Inc.

C. Probes

(1) A shielded, right-angle probe is recommended for easier access. Other probe designs can be used if a satisfactory inspection can be done.

(2) Refer to Part 6, 51-00-01, par. 2.B. or Part 6, 51-00-19, par. 2.C. for data about probe selection.

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

(a) MP-905-50; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 188A as given in Part 6, 51-00-01, par. 2.C. for meter display instruments, or Part 6, 51-00-19, par. 2.D. for impedance plane display instruments.

3. Preparation for Inspection

A. Remove the floor panels between BS 478 and BS 618 from approximately RBL 29.46 and RBL 44.40.

B. Remove all other equipment as necessary to get access to the inspection areas.

C. Remove loose paint, dirt, grease, or sealant from the inspection area.

D. Clean the inspection surface with a dry cloth.

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, "Instrument Calibration". Use reference standard 188A and the aluminum rivet in the reference standard.

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, "Instrument Calibration". Use reference standard 188A and the aluminum rivet in the reference standard.

5. Inspection Procedure

A. Make a scan around the fastener head and collar in each group of six fasteners that are in the inspection area shown in Figure 1 to examine the latch support fittings and truss fittings for cracks.

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

(2) For instruments with an impedance plane display, refer to 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 that occur during the inspection.

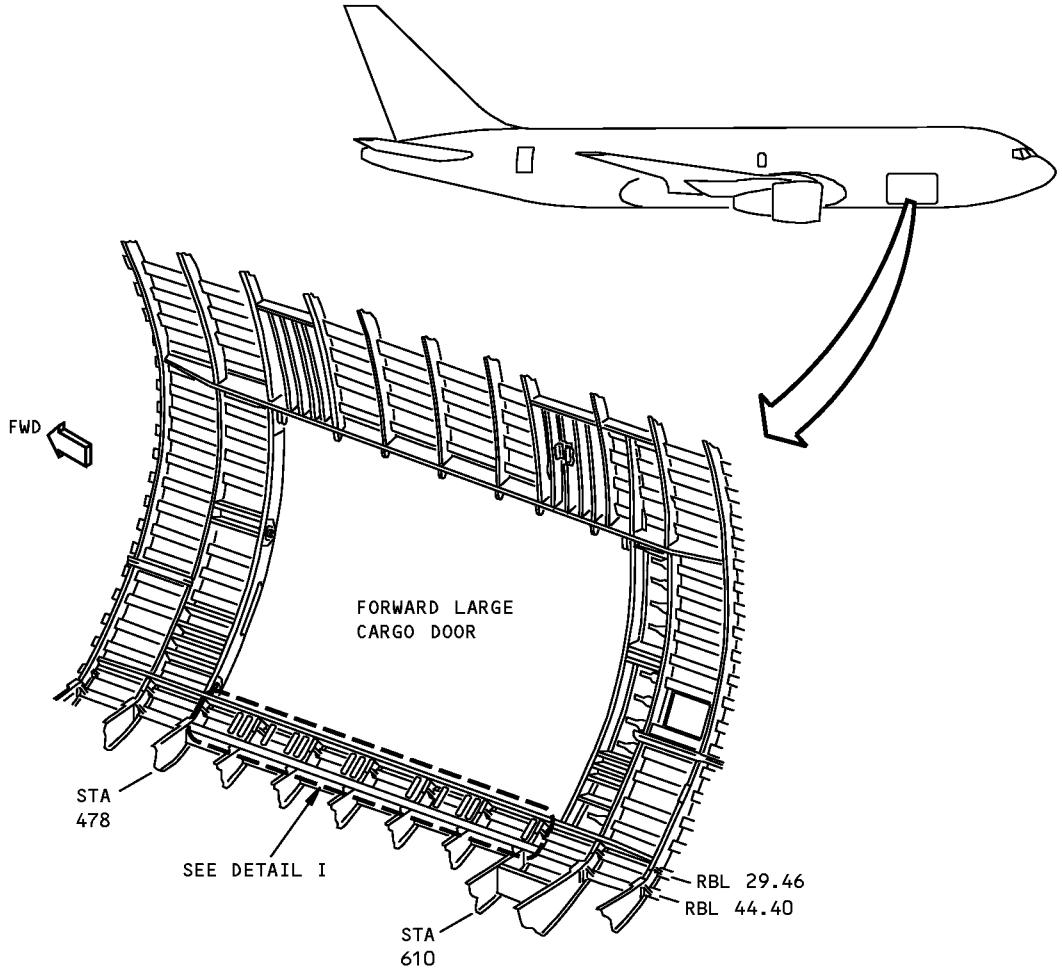
B. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6, to make an analysis of indications that occur during the inspection.

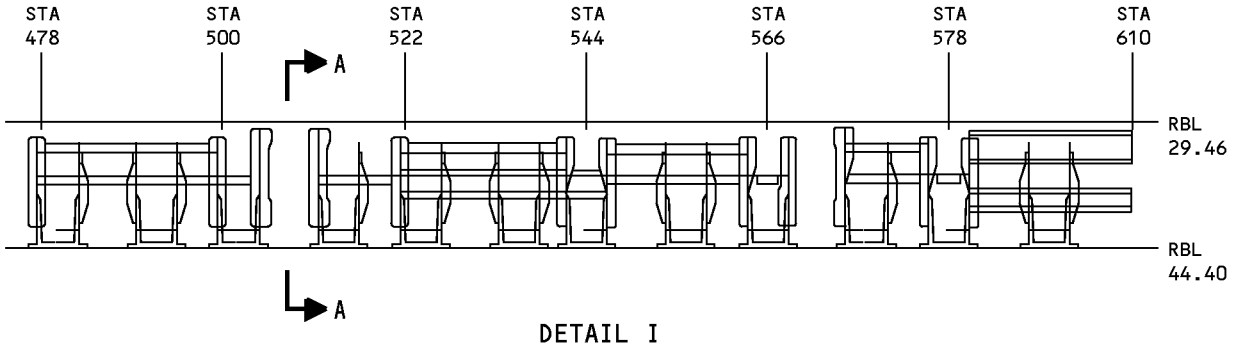
C. Compare the signals that occur on the airplane to the signal from the notch in the reference standard.

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

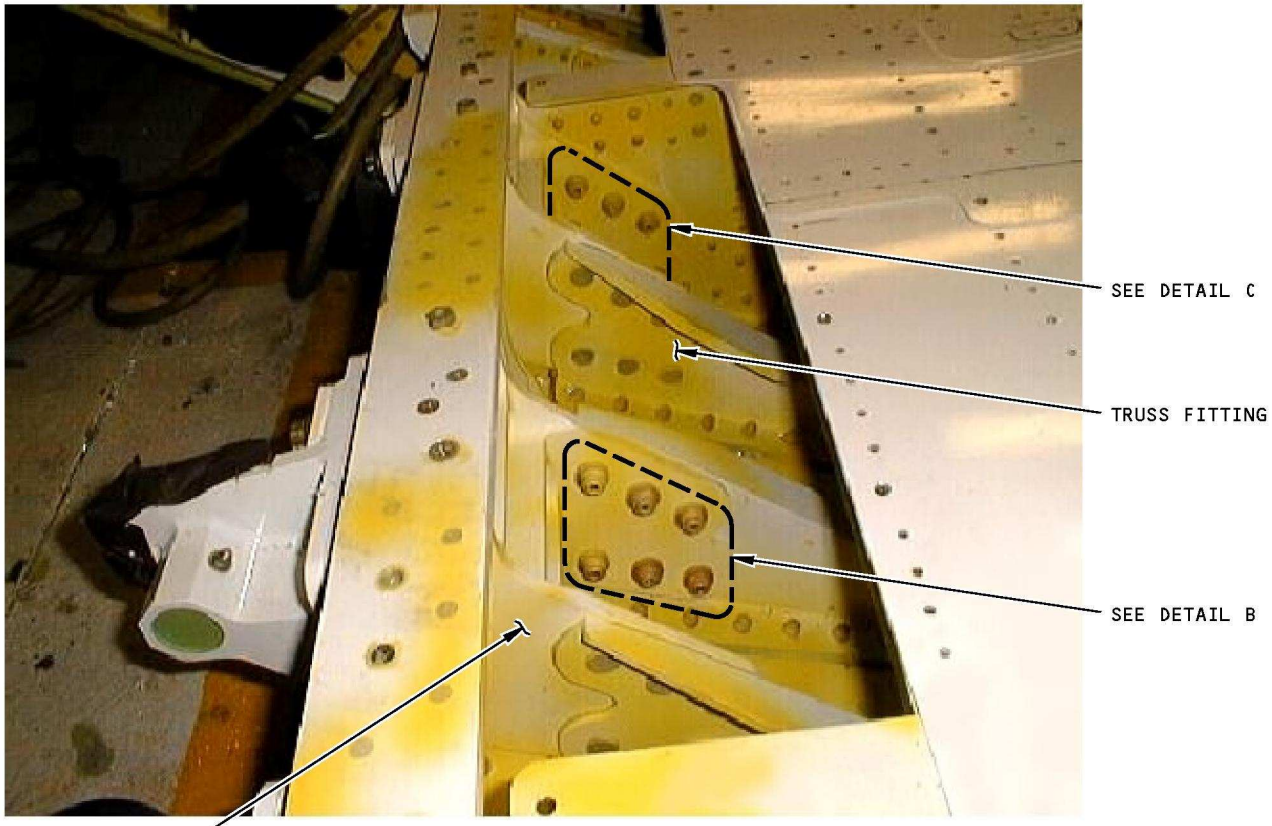
(1) Remove the surface finish and do a visual inspection with 10 power (or higher) magnification and sufficient light.

(2) Remove the fastener 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.

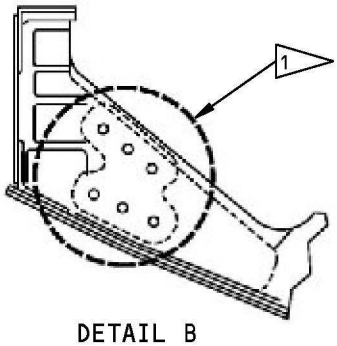




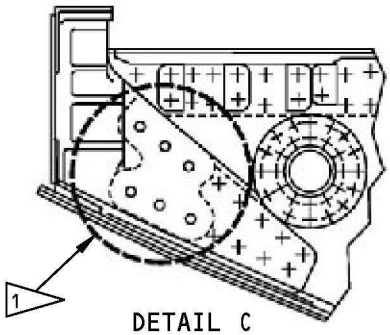
Inspection Area
Figure 1 (Sheet 1 of 2)



LOWER LATCH BACKUP STRUCTURE
A-A



DETAIL B



DETAIL C

1 MAKE A SCAN AROUND EACH OF THESE (6) FASTENERS, NEAR AND FAR SIDE, AT ALL LATCH SUPPORT FITTINGS AND TRUSS FITTINGS BETWEEN STATION 478 AND 610

Inspection Area
Figure 1 (Sheet 2 of 2)

PART 6 - EDDY CURRENT

FORWARD AND AFT EDGE FRAMES OF THE MID ENTRY DOOR CUTOUT

1. Purpose

A. Use this procedure to examine the forward and aft edge frames at the cutout of the mid entry door for cracks. The inspection locations are shown in Figure 1.

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

C. MPD DTR Check Form Reference:

(1) ITEM 53-30-I22C

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 - Use an eddy current instrument with a meter display or an impedance plane display. Use an instrument that:

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

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

(a) Locator UH; Hocking, Inc.

(b) NDT-19e; Staveley

(c) Phasec 1.1 SD; Hocking, Inc.

C. Probes

(1) A shielded pencil probe is necessary for this inspection. A straight probe or a right angle probe can be used.

(2) Refer to Part 6, 51-00-01, par. 2.B or Part 6, 51-00-19, par. 2.C for data about probe selection.

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

(a) MP-30; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 126 as given in Part 6, 51-00-01 or Part 6, 51-00-19.

E. Probe Guide

(1) A nonconductive straight edge is necessary for some of this inspection.

3. Preparation for Inspection

A. Identify the inspection areas shown in Figure 1.

B. Remove all necessary structure to get access to the inspection area.

C. Remove loose dirt, paint and grease from the inspection surface.

4. Instrument Calibration

A. Meter Display Instruments -- Calibrate the equipment as specified in the calibration instructions of Part 6, 51-00-01, par. 4, ''Instrument 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, ''Instrument Calibration''.

5. Inspection Procedure

A. Make a scan along the edge of the reinforcing strap, the inner chord frame, and the failsafe chord at the inspection locations shown in Figure 1, flagnotes 1 and 2. Use a nonconductive straight edge as a probe guide to keep the probe centered on the end of the part as shown in Figure 2, flagnote 1.

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

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

B. Examine the cutouts of the mid entry doors on the left and right sides of the airplane.

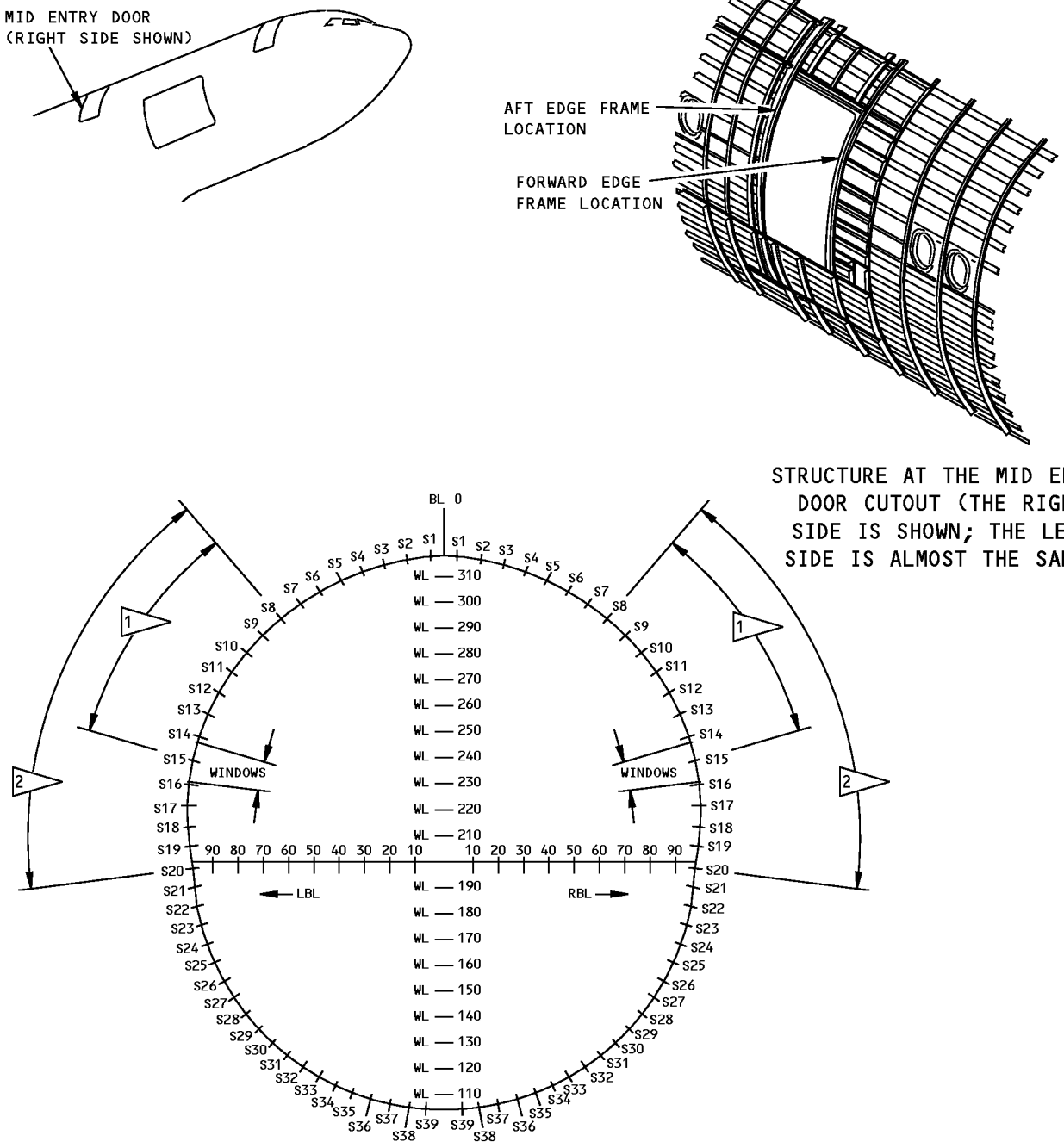
6. Inspection Results

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

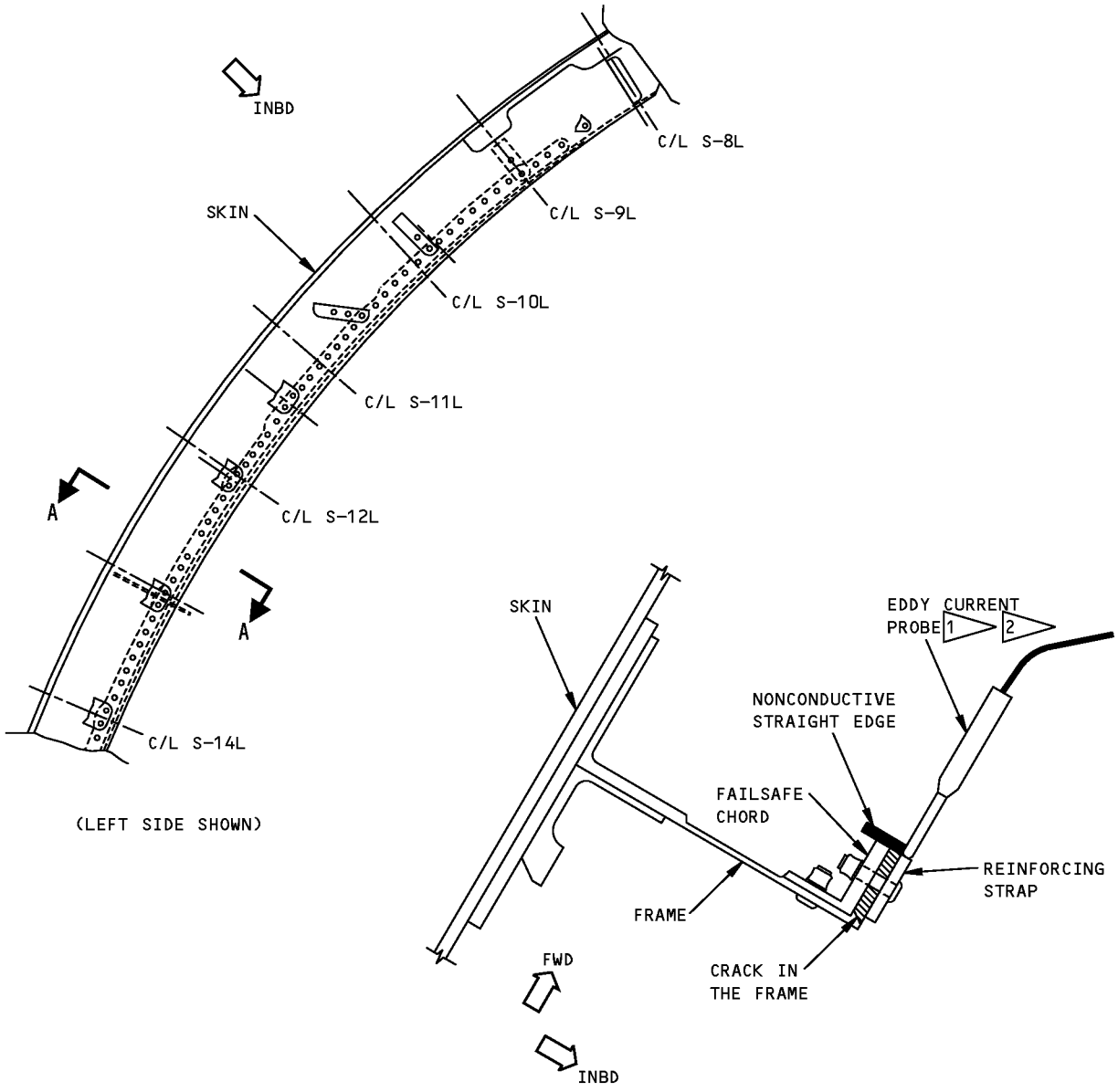
B. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6 to make an analysis of indications that occur during the inspection.

C. Compare the signals that occur during the inspection on the airplane to the signal from the notch in the reference standard.

D. To make sure a signal is the result of a crack, remove the surface finish and do a visual inspection with 10 power (or higher) magnification and sufficient light.



Inspection Areas
Figure 1



1 A STRAIGHT OR RIGHT ANGLE EDDY CURRENT PROBE CAN BE USED

2 MAKE A SCAN ALONG THE FORWARD EDGE OF THE REINFORCING STRAP, THE INNER CHORD FRAME, AND THE FAILSAFE CHORD FROM STRINGERS 8 TO 15 ON THE FORWARD EDGE FRAME, AND FROM STRINGERS 8 TO 20 ON THE AFT EDGE FRAME. USE A NONCONDUCTIVE STRAIGHT EDGE AS A PROBE GUIDE.

Inspection Details
Figure 2

UPPER SILL OF THE MID ENTRY DOOR CUTOUT

1. Purpose

A. Use this procedure to examine the upper main sill of the mid entry door cutout for cracks. The inspection location is shown in Figure 1.

B. Cracks can start at the fastener holes of the inner chord and are found when a surface eddy current inspection is done around the fasteners. At locations where the strap prevents an inspection around the fastener, it is necessary to do a surface eddy current inspection along the edge of the inner chord. See Figure 1, Section A-A, for the inspection details.

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

D. MPD DTR Check Form Reference:

(1) ITEM 53-30-I22D

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 - Use an eddy current instrument with a meter display or an impedance plane display. Use an instrument that:

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

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

(a) Locator UH; Hocking, Inc.

(b) NDT-19e; Staveley

(c) Phasec 2200; Hocking, Inc.

C. Probes

(1) A shielded pencil probe is necessary for this inspection. A straight probe or a right angle probe can be used.

(2) Refer to Part 6, 51-00-01, par. 2.B. or Part 6, 51-00-19, par. 2.C., for data about probe selection.

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

(a) MP-30; NDT Engineering Corp

D. Reference Standards

(1) Use reference standard 126 as given in Part 6, 51-00-01 or Part 6, 51-00-19.

3. Preparation for Inspection

A. Identify the inspection areas shown in Figure 1.

B. Remove all structure necessary to get access to the inspection area.

C. Remove loose dirt, paint, sealant and grease from the inspection surface.

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, ''Instrument 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, ''Instrument Calibration''.

5. Inspection Procedure

A. Examine the inner chord for cracks as follows:

(1) From BS 654 + 24 to approximately BS 654 + 64, do an edge scan of the inner chord as shown in Figure 1, flagnote 4. If necessary, use a nonconductive straight edge as a probe guide to keep the probe centered on the edge of the part.

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

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

(2) From BS 654 + 91.4 to BS 654 + 110, make a scan around each fastener of the inner chord as shown in Figure 1, flagnote 3.

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

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

B. Examine the failsafe chord for cracks as follows:

(1) Make a scan along the top edge of the reinforcing strap from BS 654 + 24 to BS 654 + 64 and from BS 654 + 91.4 to 654 + 110 as shown in Figure 1, flagnote 5. Use the inner chord or a nonconductive straight edge as a probe guide to keep the probe centered on the edge of the part.

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

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

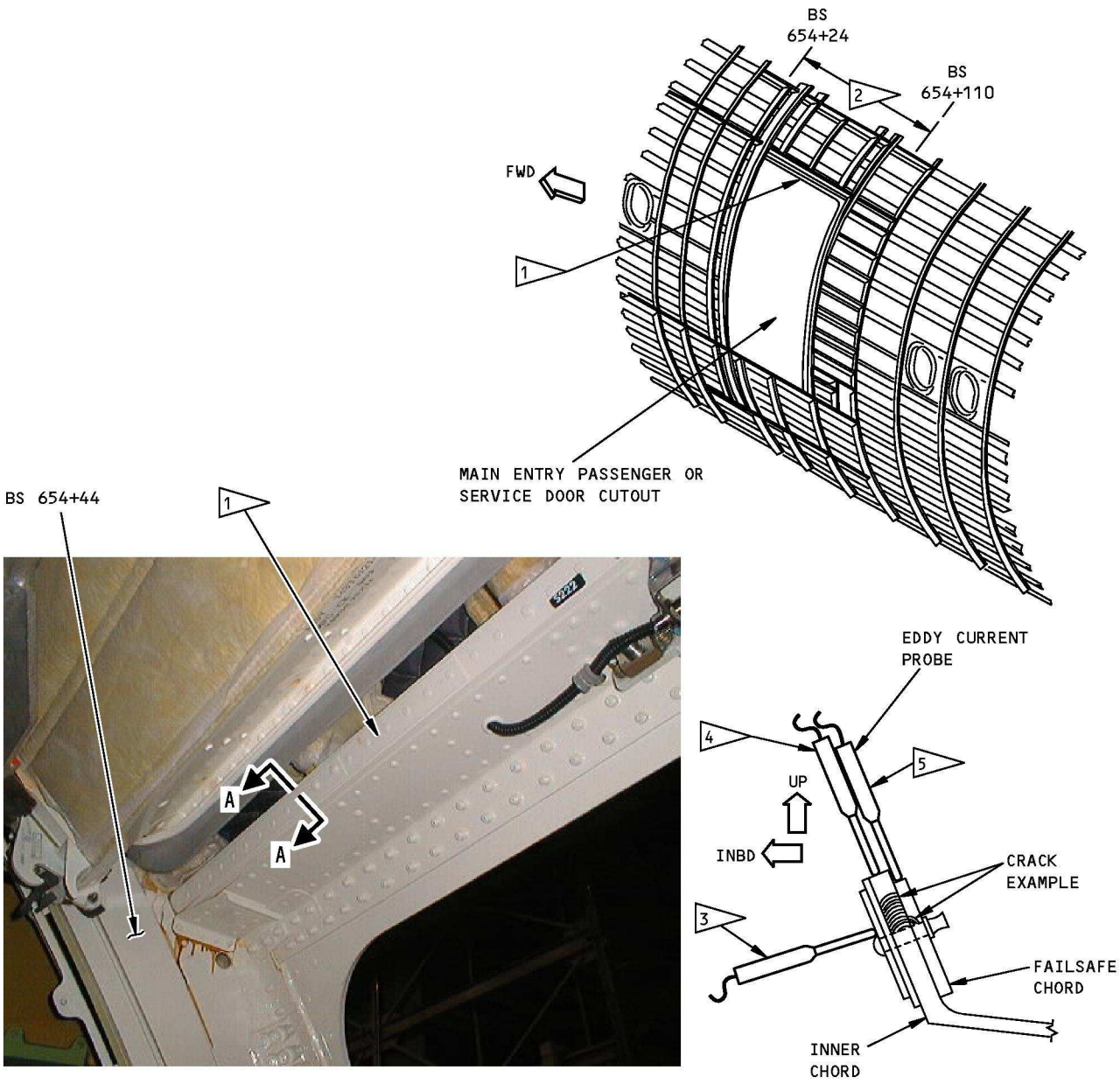
6. Inspection Results

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

C. Compare the signals that occur on the airplane to the signals that occur from the notch in the reference standard.

D. To make sure a signal is the result of a defect, remove the surface finish and do a visual inspection with 10 power (or higher) magnification and sufficient light.



NOTES:

1. UPPER MAIN SILL OF THE MID ENTRY DOOR (PASENGER/SERVICE DOOR)
2. INSPECTION AREA - BS 654+24 TO BS 654+110
3. EXAMINE THE INNER CHORD AND STRAPS FROM BS 654+91.4 TO BS 654+110. MAKE A SCAN AROUND EACH FASTENER IN THE INSPECTION AREA.
4. EXAMINE THE EDGE OF THE INNER CHORD FROM BS 654+24 TO BS 654+64.
5. EXAMINE THE EDGE OF THE FAILSAFE CHORD FROM BS 654+24 TO BS 654+64 AND FROM BS 654+91.4 TO BS 654+110.

Inspection Locations
Figure 1