AFT PRESSURE BULKHEAD - BS 1582 (HFEC) INSPECTION

1. Purpose

A. To find surface cracks at the critical fastener locations of the aft-pressure-bulkhead-radial-web-lap splices and circumferential-tear-strap splices using high frequency eddy current. See Figure 1 for general locations.

(1) Service Bulletin 767-53A0026 examines the radial web lap splices and tear strap splices for airplane line numbers 1-175. MPD Appendix B DTR Check Form Item 53-80-I01C examines the radial web lap splices and item 53-80-I01E examines the tear strap splices and super tear strap splices.

B. To find surface cracks at the critical fastener locations of repaired areas. See Figure 4 for the inspection of a typical SRM repair. Refer to SRM 53-80-08.

C. To find surface cracks at the critical fastener locations of a special repair. See Figure 5 for the inspection from the aft side of the bulkhead. See Figure 6 for an optional inspection from the forward side of the bulkhead.

D. To examine the second layer, see Part 6, 53-80-02.

E. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-80-I01C

(2) ITEM 53-80-I01E

F. Service Bulletin reference: 767-53A0026

2. Equipment

A. Instrument - Any instrument with high frequency eddy current functions may be used if it satisfies the requirements of this procedure. The procedure was developed using a Hocking Locator UH instrument.

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

B. Probe - A shielded, right angle, pencil probe with the dimensions that follow is recommended: (See Part 6, 51-00-01, Fig. 1 or Part 6, 51-00-19, Fig. 1.)

A = 0.2 inch (5 mm)

B = 0.35 inch (8.9 mm)

C = 5.0 inch (127 mm)

This procedure was developed using a NDT Product Engineering probe, No. MP 902-50B.

C. Reference Standard - Refer to Part 6, 51-00-01 or Part 6, 51-00-19.

3. Preparation for Inspection

A. Make sure that the horizontal stabilizer is in the neutral position and is deactivated.

B. Get access to the aft side of the bulkhead through the jack-screw-access door.

C. Make sure that the inspection area is clean.

D. The aft galley must be removed to do the optional inspection shown in Figure 6.

4. Instrument Calibration

A. Refer to Part 6, 51-00-01 or Part 6, 51-00-19, par. 4.

5. Inspection Procedure

A. Inspection of the radial web lap splices (12 locations). See Figure 1.

(1) Find the lap splices. See Figure 1.

(2) Identify the second row of fasteners from the visible edge of the web. See Figure 2.

(3) Position the probe adjacent to the fastener head. Use the rivet head as a guide and scan 360 degrees around each of the fasteners in the second row. See Figure 2.

(4) Make an inspection around all fasteners in the second row from the Y ring to the dome inner ring at all 12 radial lap splice locations.

NOTE: No inspection is required where control cable doublers, hydraulic line doublers, electrical line doublers, APU outlet doublers, or tear straps cover the web-lap-splice-inspection areas. See Figure 1, flagnotes 1 thru 5.

B. Inspection of Circumferential-Tear-Strap Splices (65 locations).

(1) See Figure 1 for tear strap locations. There are 59 four row splices and 6 five row splices.

(2) Identify the inspection fasteners at each splice, two per tear strap. See Figure 3.

NOTE: Make sure that the 4 and 5 row splices are identified, by counting the rows from the tear strap edge, to find the correct fasteners.

(3) Position the probe on the tear strap splice, adjacent to the inspection fastener and scan 360 degrees around the two inspection fastener locations.

(4) Repeat this inspection at each of the 59 four row splices and the 6 five row splices. See Figure 1 and Figure 3.

NOTE: There are 7 tear strap splice locations which incorporate a doubler (Figure 1) there is no inspection required at these locations.

C. Inspection of Circumferential Super Tear Strap Splices

(1) See Figure 1 for super tear strap locations. There are 11 splices on the outer super tear strap and 12 splices on the inner super tear strap.

(2) Identify the four inspection fasteners at each super tear strap splice. See Figure 3.

(3) Put the probe on the super tear strap splice, adjacent to the inspection fastener, and do a 360 degree scan around each inspection fastener.

(4) Do Paragraph 5.C.(3) again at all the super tear strap splice locations. See Figure 1 and Figure 3.

D. Inspection of Repaired Areas

(1) See Figure 4 for the inspection of a typical SRM repair. Refer to SRM 53-80-08.

(2) See Figure 5 for the inspection of a special repair from the aft side.

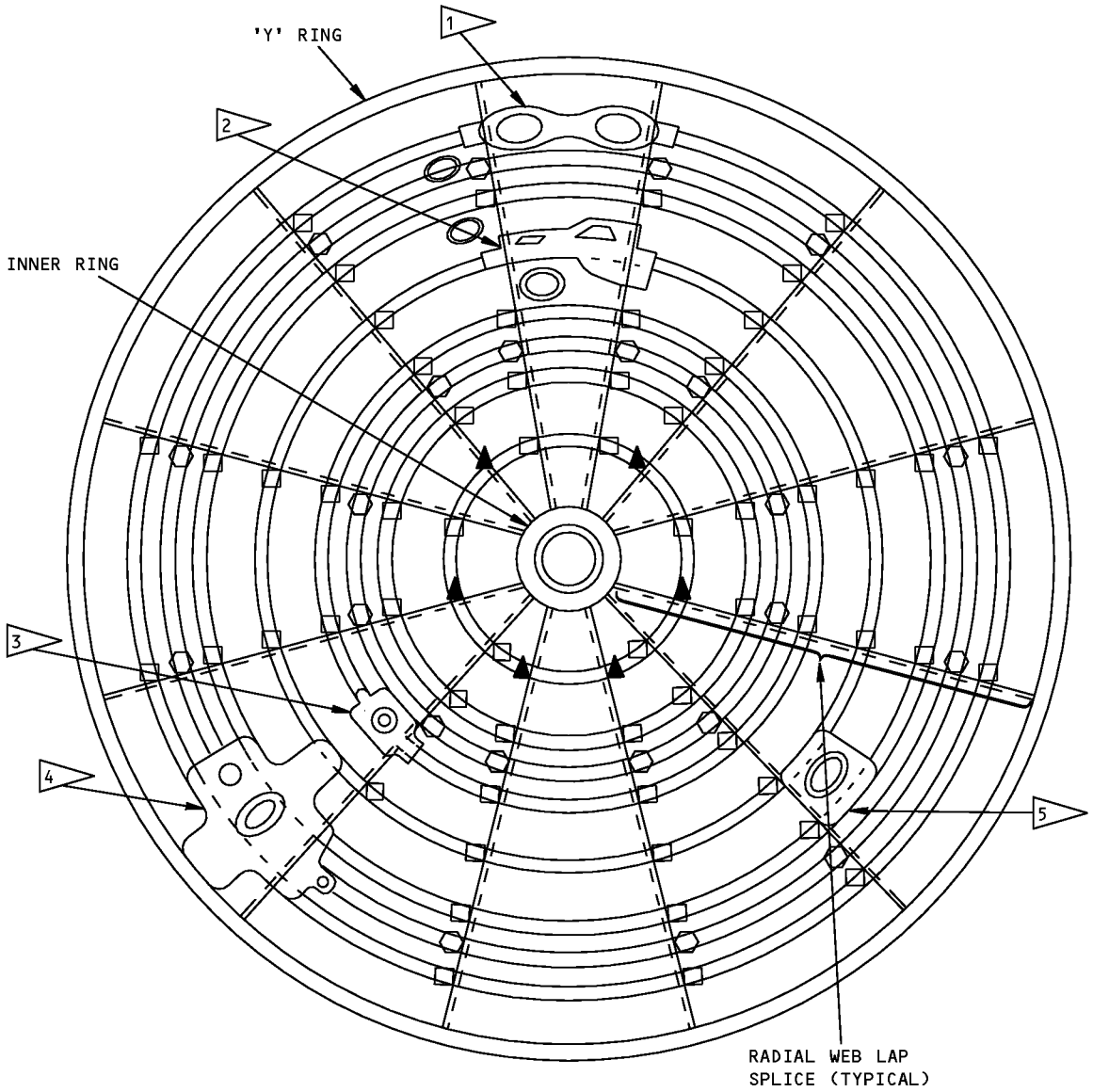
(3) See Figure 6 for an optional inspection of the special repair from the forward side.

(4) Do a 360 degree scan around each fastener shown in the applicable figure.

6. Inspection Results

A. A fast upscale signal occurring as the probe is moved over a short distance is a crack indication and should be further investigated.

B. Refer to Part 6, 51-00-01 or Part 6, 51-00-19, par. 6., for more information.



VIEW AS YOU LOOK FORWARD

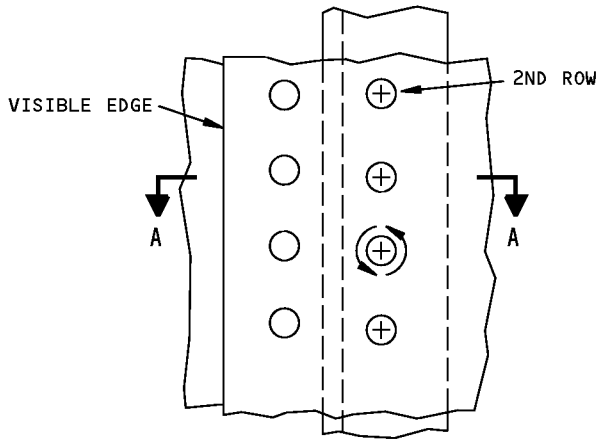
NOTES

1. ELECTRICAL OUTLETS
2. CONTROL CABLE OUTLETS
3. APU FUEL OUTLETS
4. APU OUTLETS
5. ELECTRICAL OUTLETS

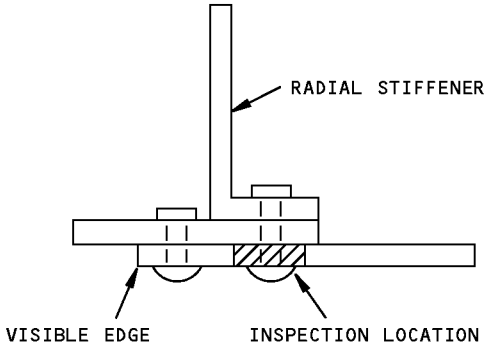
SYMBOLS

- □ TEAR STRAP SPLICE - 4 ROW SPLICE
- ▲ TEAR STRAP SPLICE - 5 ROW SPLICE
- ⬡ SUPER TEAR STRAP SPLICES

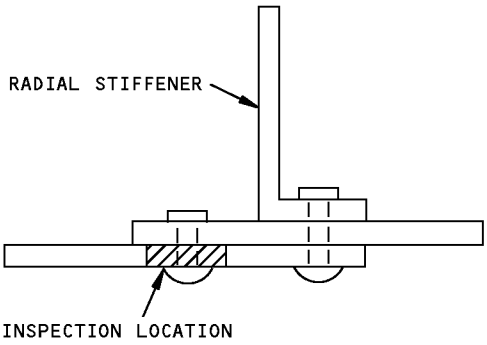
AFT Pressure Bulkhead Layout
Figure 1



RADIAL WEB LAP SPLICES



SECTION A–A



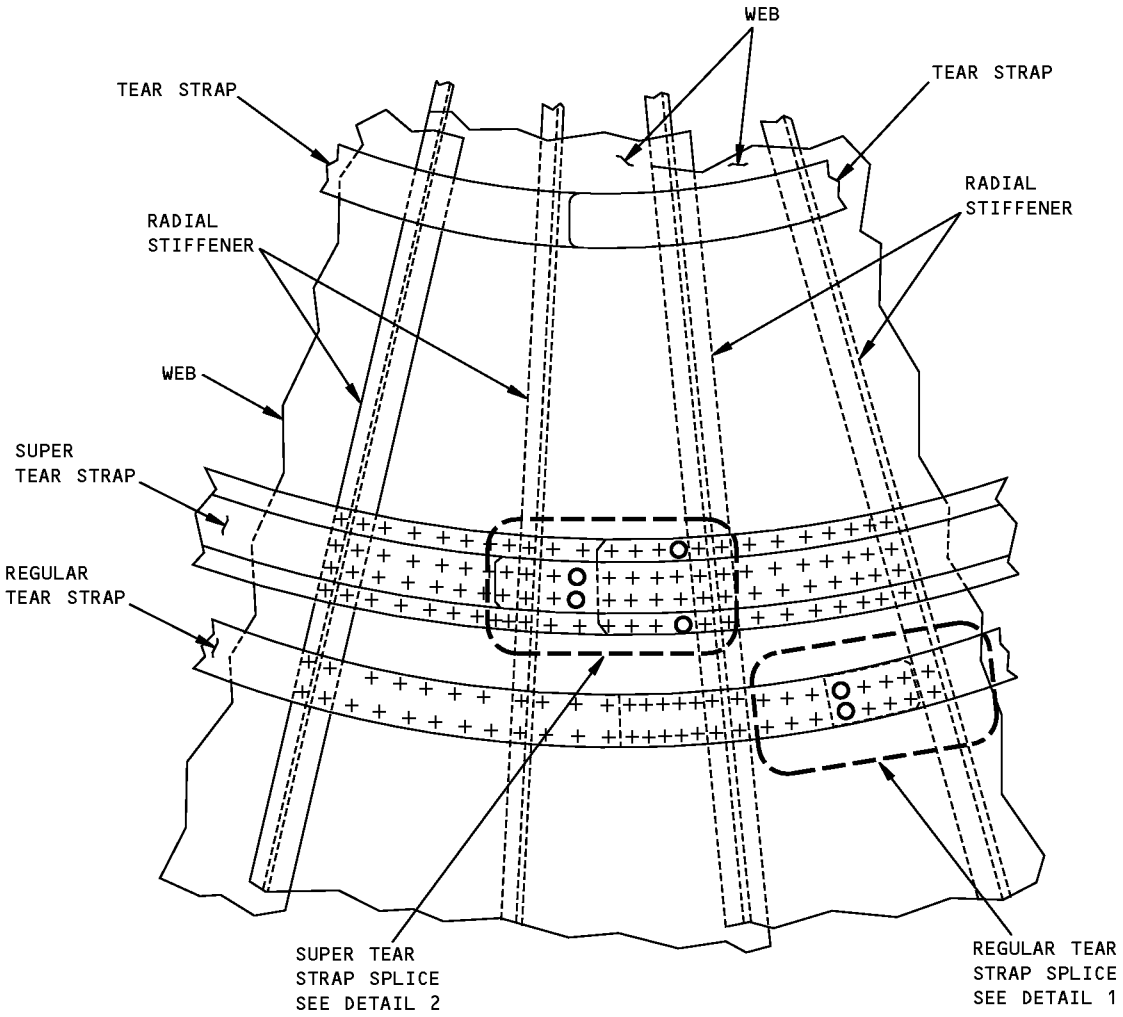
ALTERNATIVE CROSS SECTION

SYMBOLS

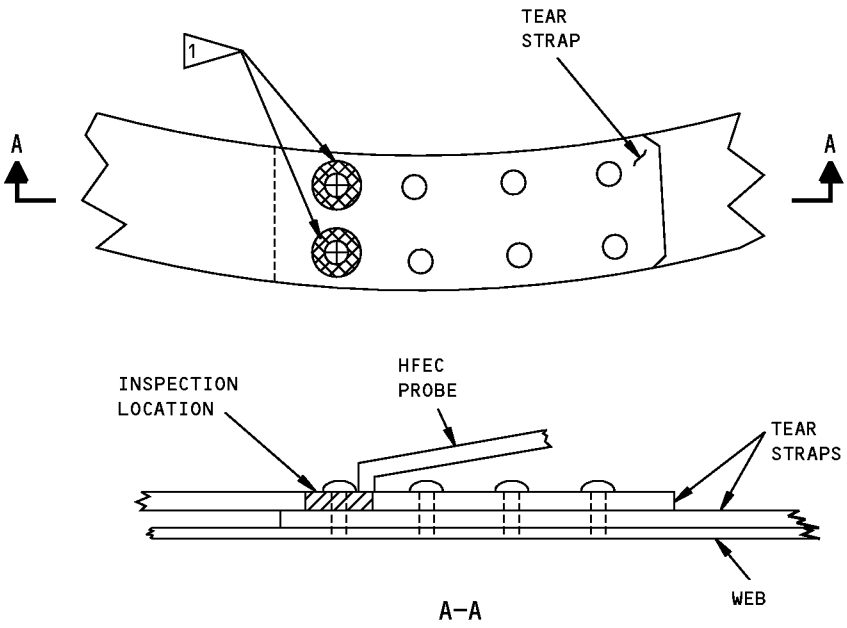
⊕ INSPECTION FASTENERS

360° SCAN AROUND FASTENER HEAD

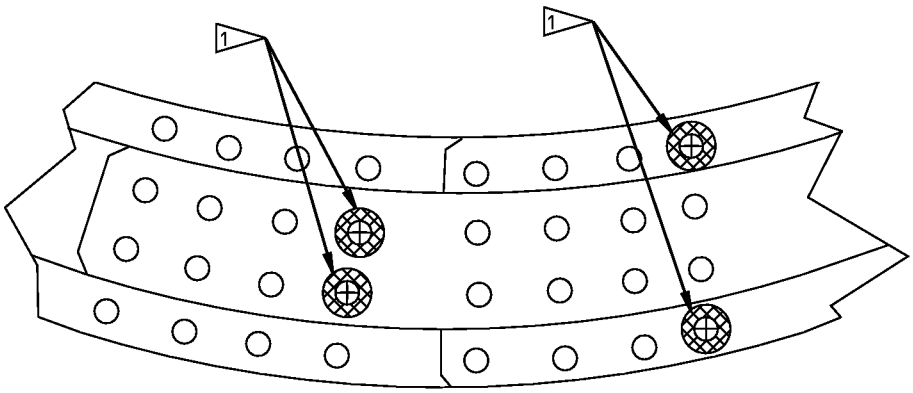
Radial Web Lap Splice Inspection
Figure 2



Regular and Super Tear Straps
Figure 3 (Sheet 1 of 2)



REGULAR TEAR STRAP SPLICE
DETAIL 1



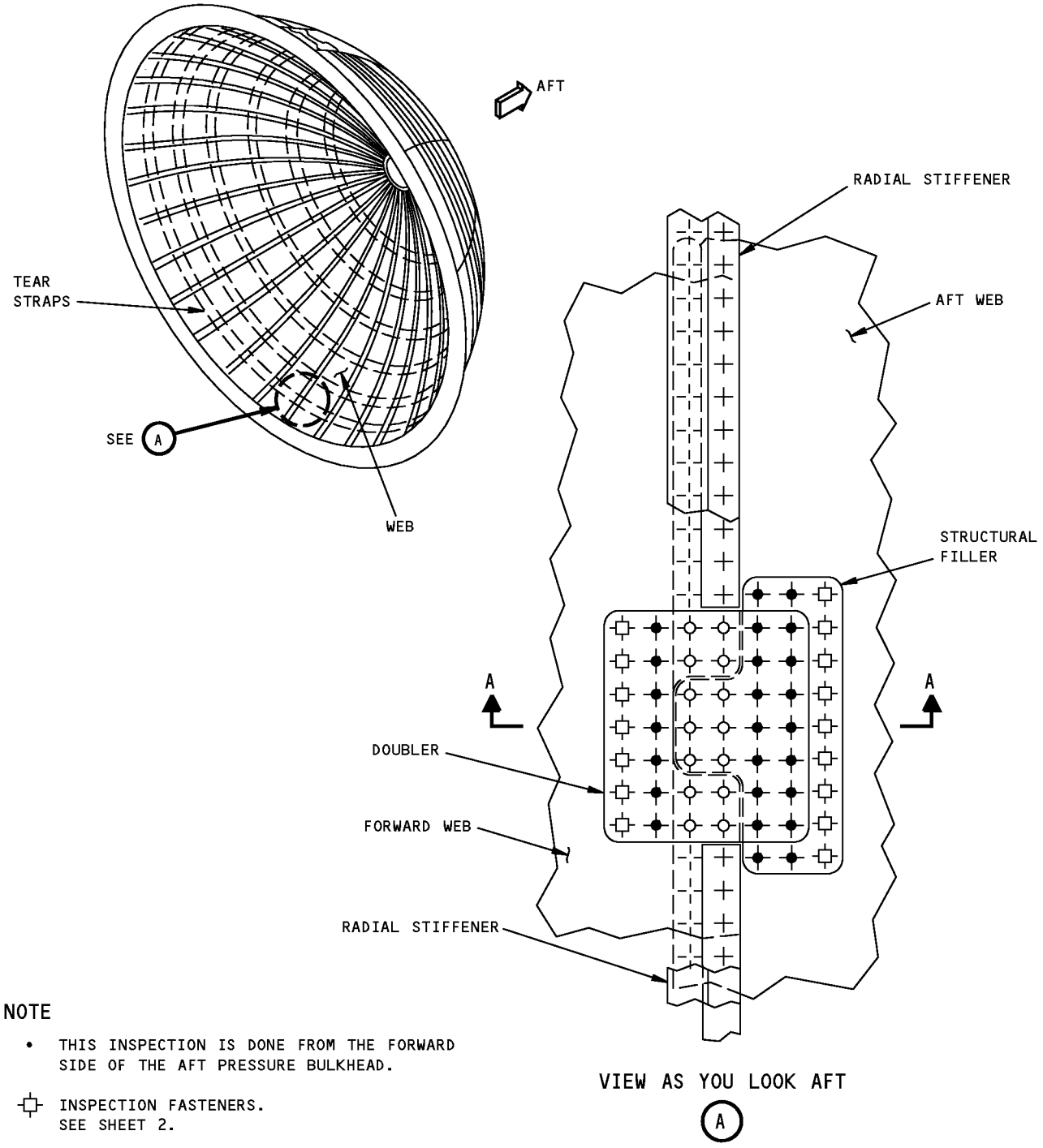
SUPER TEAR STRAP SPLICE
DETAIL 2

NOTES

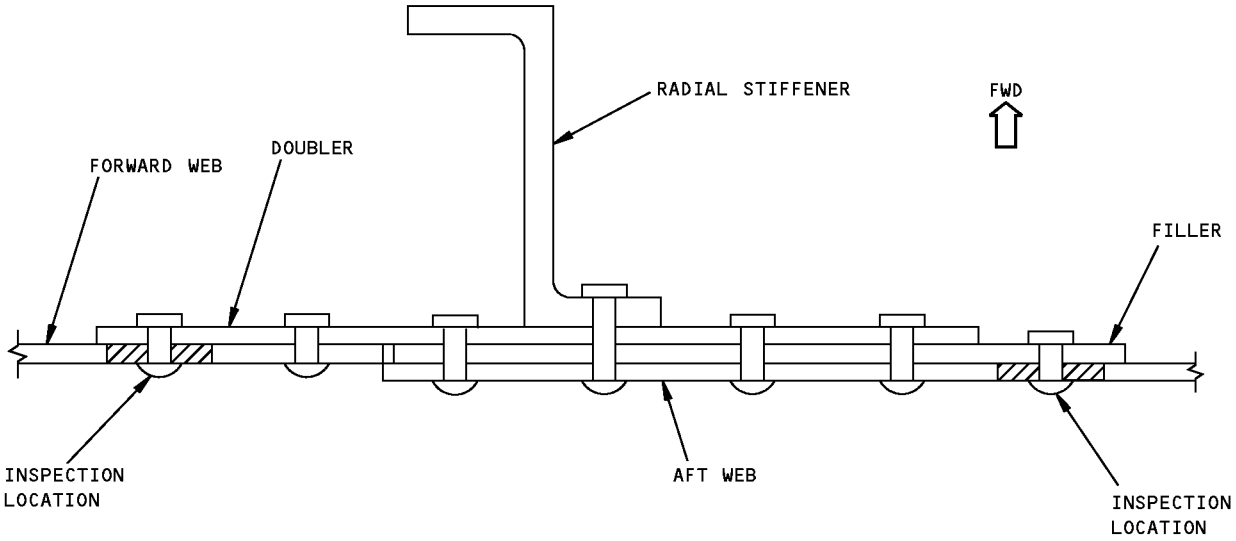
⊕ INSPECTION FASTENERS

1 DO A 360° SCAN AROUND THE FASTENER HEAD (TYPICAL)

Regular and Super Tear Straps
Figure 3 (Sheet 2 of 2)



Inspection of a Typical SRM Repair
Figure 4 (Sheet 1 of 2)

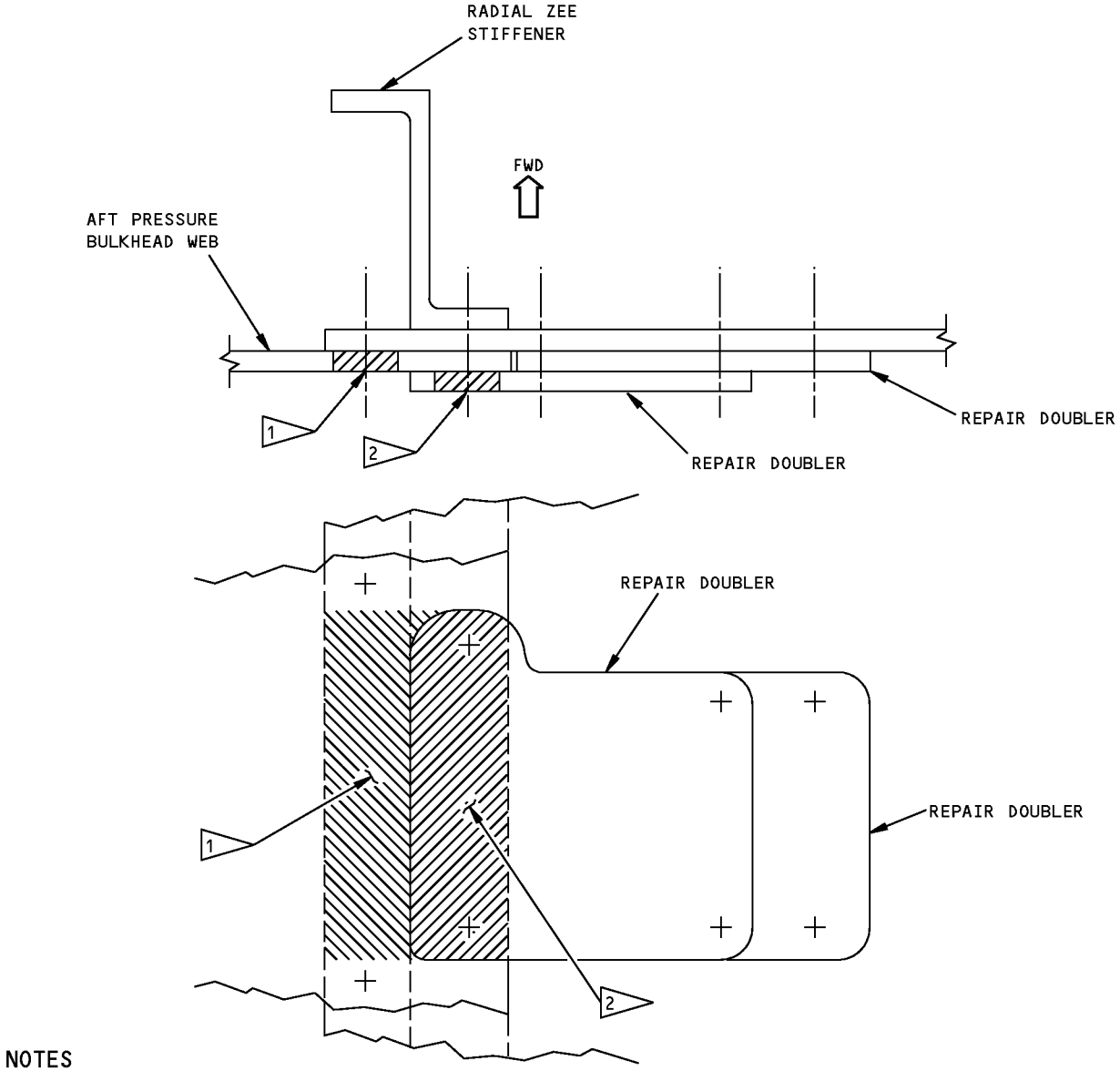


A–A

NOTES

- DO A 360 DEGREE SCAN AROUND EACH INSPECTION FASTENER SHOWN ON SHEET 1.

Inspection of a Typical SRM Repair
Figure 4 (Sheet 2 of 2)

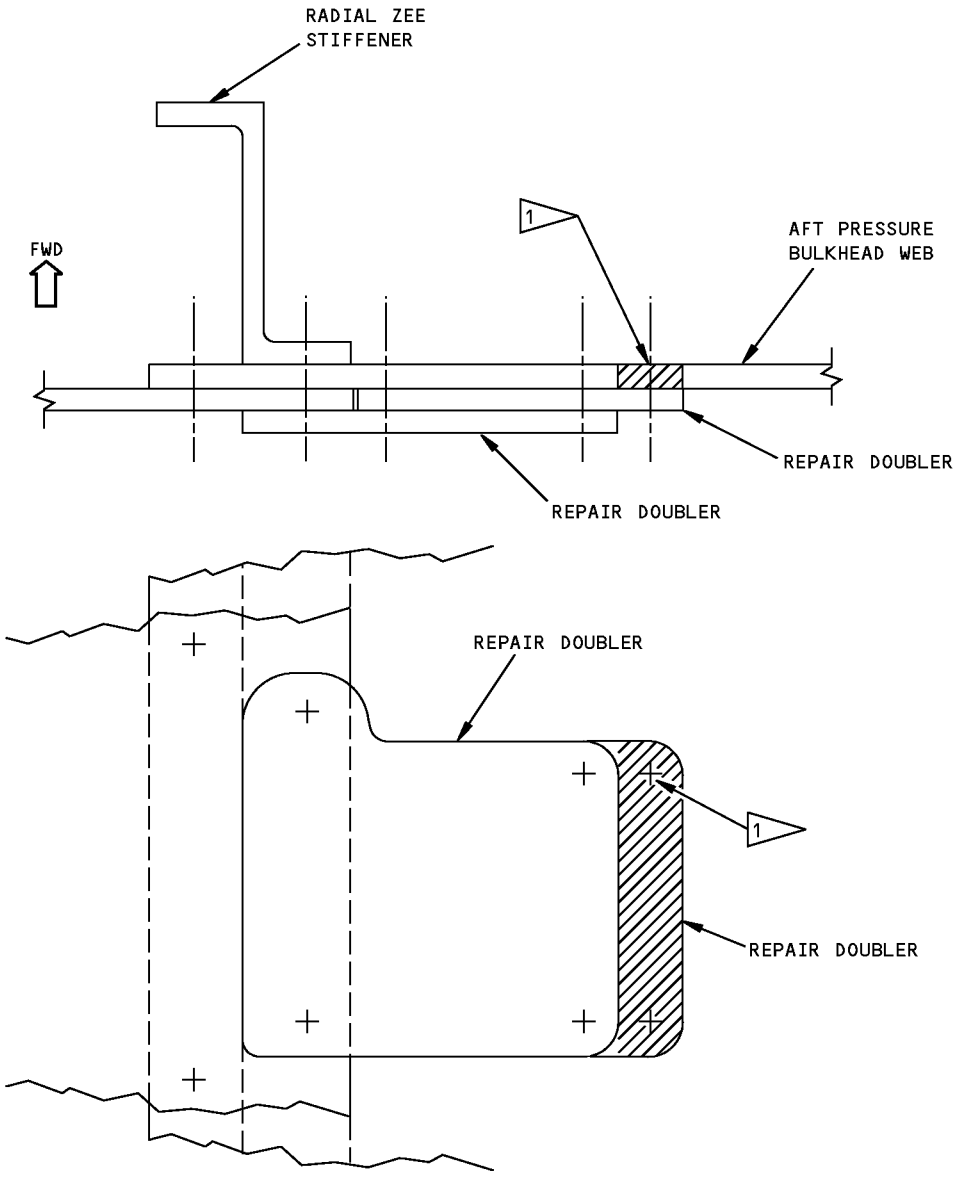


NOTES

- DO A 360 DEGREE SCAN AROUND EACH FASTENER IN THE SHADED AREA.

1 INSPECTION OF THE BULKHEAD WEB FOR CRACKS
2 INSPECTION OF THE REPAIR DOUBLER FOR CRACKS

Inspection of the Special Repair From the Aft Side of the Bulkhead
Figure 5



NOTES

1 DO A 360 DEGREE SCAN AROUND EACH FASTENER IN THE SHADED AREA TO EXAMINE THE BULKHEAD WEB FOR CRACKS.

Inspection of the Special Repair From the Forward Side of the Bulkhead
Figure 6

AFT PRESSURE BULKHEAD - BS 1582 (LFEC) INSPECTION

1. Purpose

A. To find cracks starting from critical fastener locations of the radial-web-lap splices and circumferential-tear-strap splices of the aft pressure bulkhead using low frequency eddy current. See Figure 1 for general locations.

(1) Service Bulletin 767-53A0026 examines the radial web lap splices and tear strap splices for airplane line numbers 1-175. MPD Appendix B DTR Check Form Item 53-80-I01B examines the radial web lap splices and item 53-80-I01D examines the tear strap splices and super tear strap splices for all airplanes.

B. To find cracks that start from the critical fastener locations of repaired areas. See Figure 6 for the inspection of the second layer. See Figure 7 for the inspection of the third layer. Refer to Service Bulletin 767-53A0026.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-80-I01B

(2) ITEM 53-80-I01D

D. Service Bulletin reference: 767-53A0026

2. Equipment

A. Instrument - Any eddy current instrument which will satisfy the requirements of this procedure, may be used. The instructions given in this procedure are for an impedance plane display instrument. A meter display instrument can also be used. This procedure was developed using a Zetec MIZ-10B and a Hocking Phasec 2200 instrument.

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

B. Probe - A right-angled-surface probe that operates between 4 and 8 kHz and is capable of scanning around protruding head fasteners. This probe must be able to satisfy the requirements of this procedure. Refer to Part 6, 51-00-01, Figure 1 or Part 6, 51-00-19, Figure 1 for identification of probe dimensions.

A = 0.4 inches

B = 0.50 inches

C = 2.0 inches

This procedure was developed using an NDT ENGINEERING probe, P/N P905-60/5KS.

C. Reference Standards - Make Reference Standards A607, A607A, and NDT682 as specified in Figure 2.

3. Preparation for Inspection

A. Make sure that the stabilizer is in the neutral position and is deactivated.

B. Get access to the aft side of the bulkhead through the jack-screw-access door.

C. Make sure that the inspection area is clean.

4. Instrument Calibration

A. Calibrate the equipment to examine the radial web lap splices, regular tear strap splices, and repaired areas.

NOTE: The inspection of the radial web lap splices and the regular tear straps examines the second layer from the inspection surface. The inspection of repaired areas can examine the second or third layer from the inspection surface.

(1) Connect the probe to the instrument and set the instrument frequency.

(a) Use 8 kHz if the inspection is for the second layer from the inspection surface.

(b) Use 4 kHz if the inspection is for the third layer from the inspection surface.

(2) Put the probe on the reference standard at the balance location (see Figure 3) and balance the instrument as specified by the manufacturer's instructions.

(a) Use reference standard A607 if the inspection is for the second layer from the inspection surface.

(b) Use reference standard A607A if the inspection is for the third layer from the inspection surface.

(3) Set the balance point at approximately 20 percent of full screen height and 80 percent of full screen width.

(4) Adjust the phase control until the signal moves horizontally from right to the left when the probe is lifted off the surface.

(5) Slowly move the probe above the notch and adjust the vertical gain to get a signal that is approximately 40 percent of full screen height above the balance point.

B. Calibrate the equipment to examine the super tear strap splices.

(1) Connect the probe to the instrument and set the frequency to 5 kHz.

(2) Put the probe on reference standard NDT682 at the balance location (see Figure 3) and balance the instrument as specified by the manufacturer's instructions.

(3) Set the balance point at approximately 20 percent of full screen height and 80 percent of full screen width.

(4) Adjust the phase control until the signal moves horizontally from right to the left when the probe is lifted off the surface.

(5) Slowly move the probe above the notch and adjust the vertical gain to get a signal that is approximately 40 percent of full screen height above the balance point.

(6) Do a check again of the lift-off and the sensitivity.

5. Inspection Procedure

A. Inspection of the Radial-Web-Lap Splices (12 locations): See Figure 1.

(1) Calibrate as specified in Paragraph 4. using reference standard 607.

(2) Identify the inspection locations. The inspection row of fasteners is the row closest to the visible edge of the web splice. See Figure 1 and Figure 4.

(3) Position the probe adjacent to the fastener head and scan 360 degrees (minus the edge effect area) around each inspection fastener using the head as a guide. See Figure 4.

NOTE: The area between a fastener and the edge of the web splice cannot be examined because of the edge effect. See Figure 4.

(4) Inspect all fasteners in the first row (closest to the visible edge) from the Y ring to the dome inner ring except where noted. See Figure 1.

NOTE: No inspection is required where control cable doublers, hydraulic line doublers, electrical line doublers, APU doublers, or tear straps cover the radial lap splice inspection areas. See Figure 1, flagnotes thru 5.

B. Inspection of Circumferential-Tear-Strap Splices (65 locations).

(1) Check calibration as specified in Paragraph 4., and refer to Figure 1 and Figure 5 for tear-strap-inspection locations. There are 65 splices and 2 inspection fasteners at each tear strap splice.

(2) Identify the inspection locations. See Figure 5.

NOTE: The inspection fasteners are the two fasteners closest to the strap edge. See Figure 5.

(3) Scan 360 degrees (minus the edge effect area) around each inspection fastener location, using the fastener head as a guide. See Figure 5.

NOTE: No inspection is necessary where APU doublers cover the splice inspection areas. See Figure 1, flagnotes 3 and 4.

NOTE: The area between a fastener and the edge of the circumferential-tear-strap splice cannot be examined because of the edge effect. See Figure 5.

C. Inspection of Circumferential Super Tear Strap Splices.

(1) Refer to Figure 1 and Figure 5 for the super tear strap locations. There are 4 inspection fasteners at each super tear strap splice.

(2) Calibrate the instrument as specified in Paragraph 4.B. with reference standard NDT682.

(3) Make a 360 degree scan around the four fastener heads nearest the lap edge at each tear strap splice. Refer to Figure 5, Detail 2.

NOTE: Make sure to keep the probe adjacent to the edge of the fastener as you make the scan.

NOTE: No inspection is necessary where APU doublers cover the splice inspection areas. See Figure 1, flagnotes 3 and 4.

NOTE: The area between a fastener and the edge of the circumferential-tear-strap splice cannot be examined because of the edge effect. See Figure 5.

D. Inspection of Repaired Areas

(1) See Figure 6 for a typical inspection of the second layer. See Figure 7 for a typical inspection of the third layer. Refer to Service Bulletin 767-53A0026.

(2) Do a 360-degree scan around each inspection fastener. Use the fastener head as a guide.

6. Inspection Results

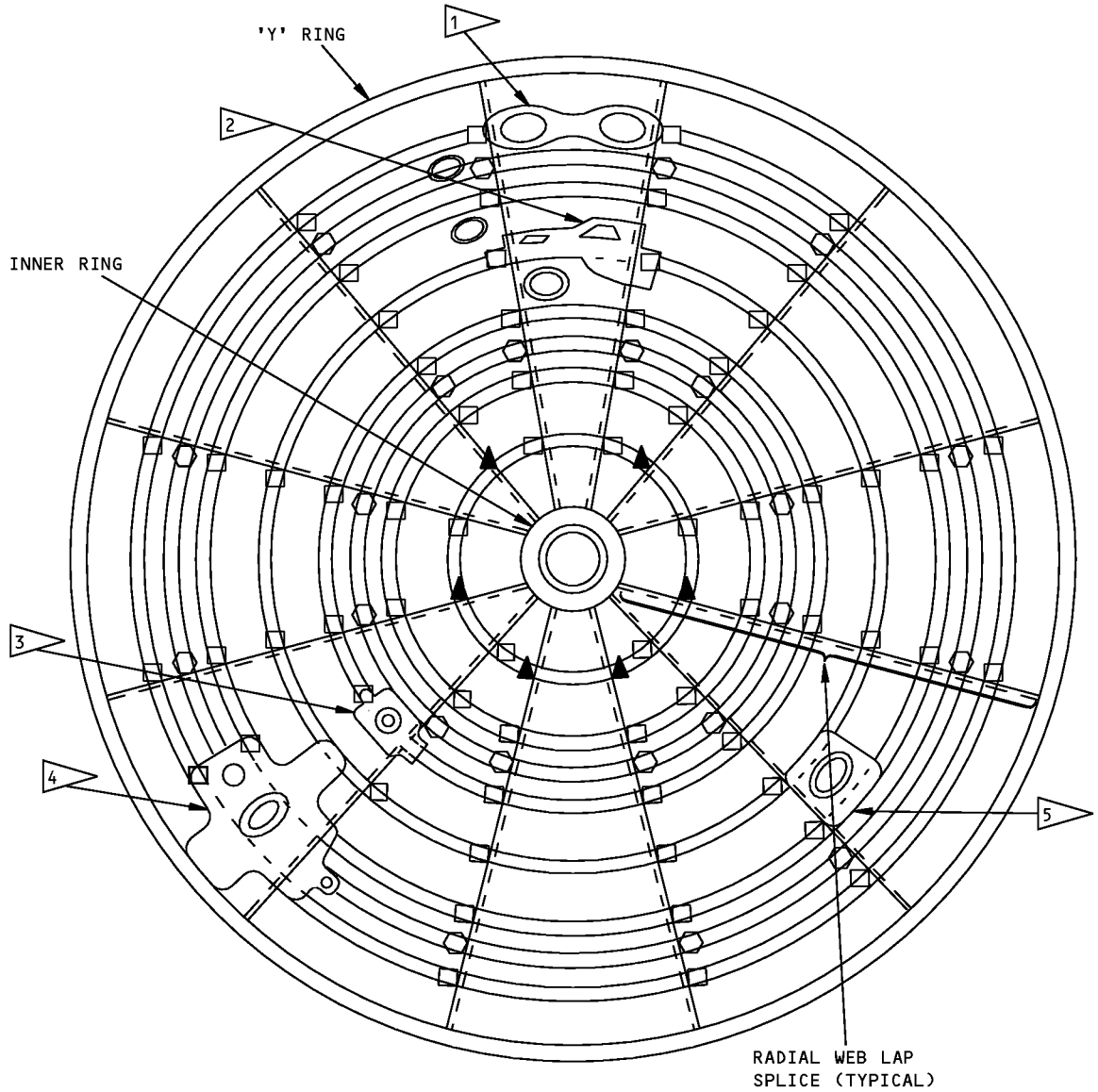
A. A fast signal movement that is 20 percent (or more) above the balance point that occurs as the probe moves a small distance is a sign of a crack and more analysis is necessary.

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

C. An overdriven rivet can put a small dent adjacent to the fastener head and cause a crack-type indication. Compare the crack signals to other locations with equivalent dents to see if the signals are almost the same.

D. A fastener near the edge of a tear strap or the web splice that is below the strap can give a crack-type indication. Visually compare the fastener alignment with other fasteners in the same row.

E. Sealant in the space between the tear strap and the web splice can cause a signal to occur that stays above the balance point for the full inspection scan area. At these locations, balance the instrument at the fastener location and do the inspection again.



VIEW AS YOU LOOK FORWARD

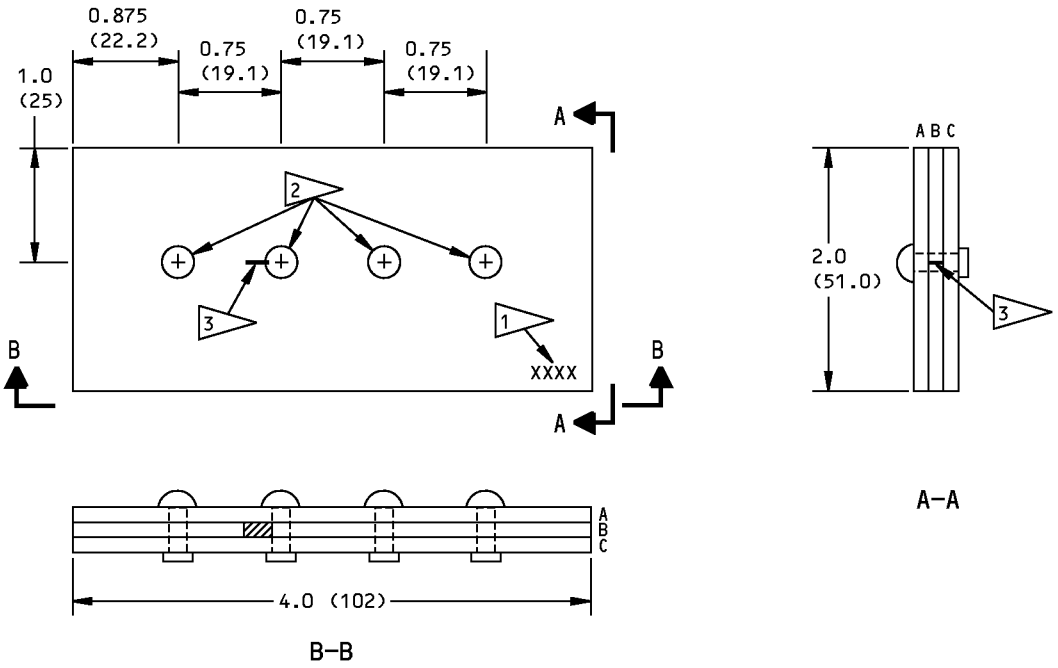
NOTES

1. ELECTRICAL OUTLETS
2. CONTROL CABLE OUTLETS
3. APU FUEL OUTLETS
4. APU OUTLETS
5. ELECTRICAL OUTLETS

SYMBOLS

- □ TEAR STRAP SPLICE - 4 ROW SPLICE
- ▲ TEAR STRAP SPLICE - 5 ROW SPLICE
- ⬡ SUPER TEAR STRAP SPLICES

AFT Pressure Bulkhead Layout
Figure 1



	A	B	C
A607	0.032	0.040	0.032
NDT682	0.050	0.050	0.036

REFERENCE STANDARDS A607 AND NDT682

NOTES

- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES)
- DIMENSION TOLERANCES:

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

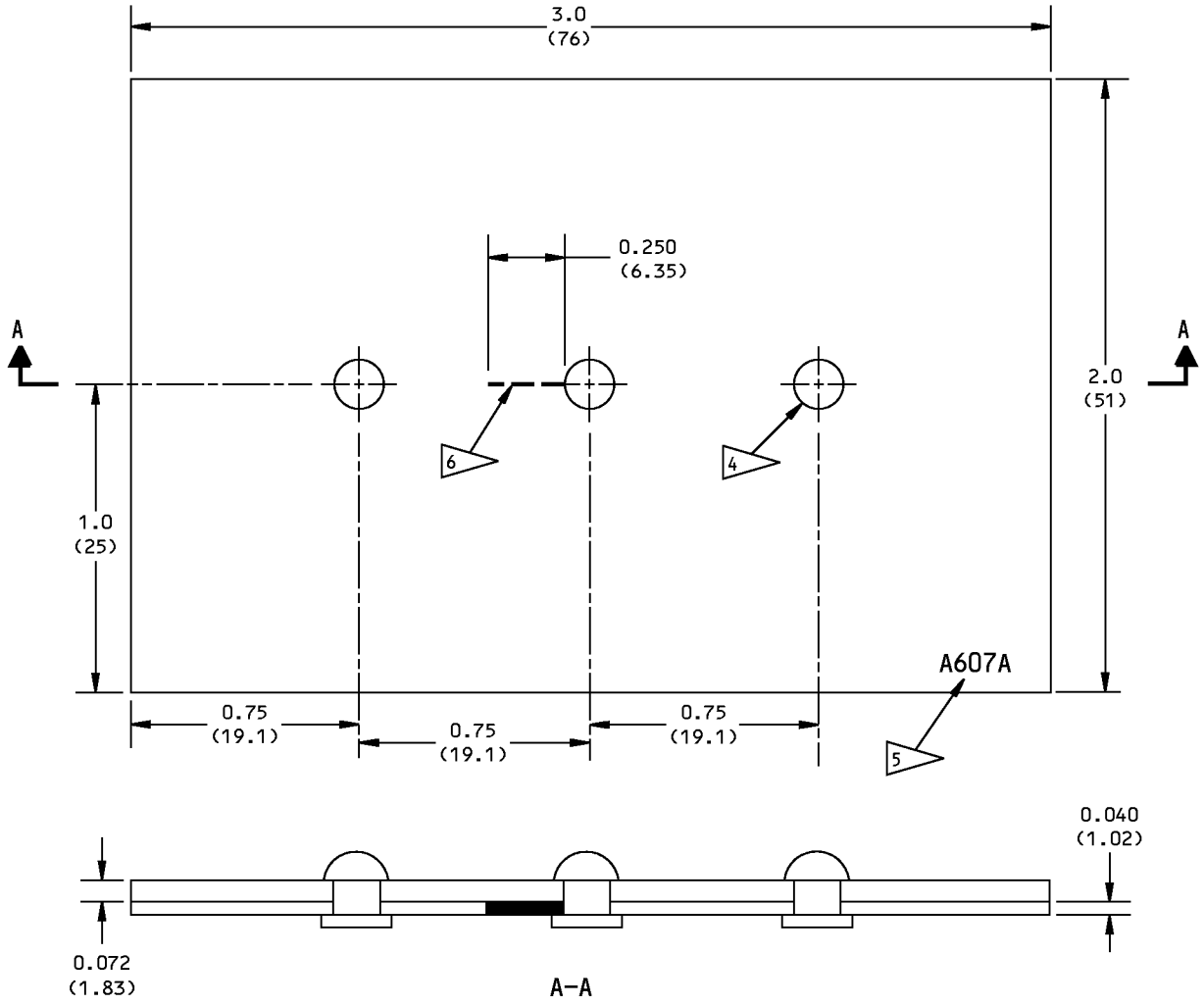
- MATERIAL: 2024-T3 ALUMINUM;
- DRIVE ALL THE BACR15BB6D RIVETS TO A MINIMUM BUTTON DIAMETER OF 0.245 (6.22)

1 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT681 OR NDT682, AS APPLICABLE.

2 BAC15RFT5D4 RIVETS, HOLE DIAMETER 0.156 (3.96). THESE RIVETS MUST HAVE A CONVERSION COATED (ALODINED) 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.

3 EDM NOTCH:
LENGTH: 0.15 (3.81) ±0.010 (0.25 FOR A607
0.20 (5.08) ±0.010 (0.25) FOR NDT682
DEPTH: THROUGH THICKNESS
WIDTH: 0.007 (0.18) ±0.002 (0.05)
MAKE SURE THE NOTCH IS WITHIN ±0.005 (0.10) OF THE CENTER LINE OF THE HOLE, AS SHOWN.

Reference Standards A607, A607A and NDT682
Figure 2 (Sheet 1 of 2)



NOTES

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

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

- MATERIAL: ALUMINUM ALLOY, 2024-T3
- SURFACE ROUGHNESS: 63 Ra OR BETTER

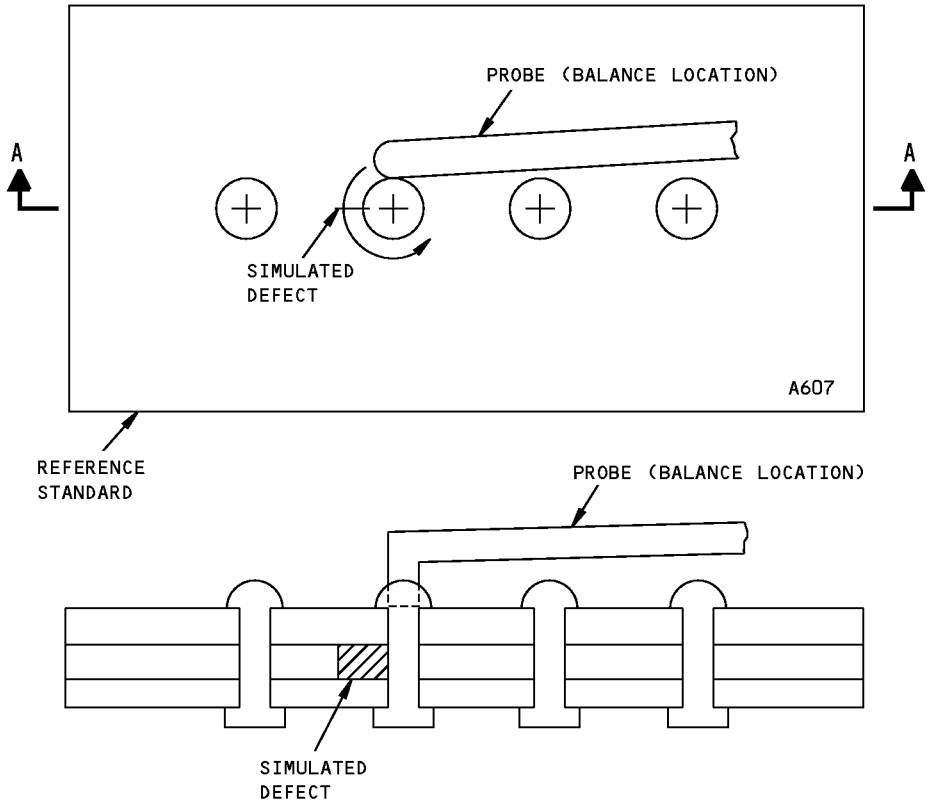
4 BACR15FT5D4 RIVETS. THESE RIVETS MUST HAVE A CONVERSION COATED (ALODINE) FINISH. TO MAKE SURE THE RIVETS ARE ALODINED, REFER TO PART 1, 51-06-01. INSTALL THE RIVETS AS SPECIFIED IN PART 1, 51-01-04.

5 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER A607 OR A607A (AS APPLICABLE) AT APPROXIMATELY THIS LOCATION. PUT A LETTER "A" IN FRONT OF THE REFERENCE STANDARD NUMBER TO SHOW THAT IT HAS ALODINED RIVETS.

6 JEWELERS SAW OR EDM NOTCH. THE MAXIMUM WIDTH IS 0.010 (0.25)

REFERENCE STANDARD A607A

Reference Standards A607, A607A and NDT682
Figure 2 (Sheet 2 of 2)

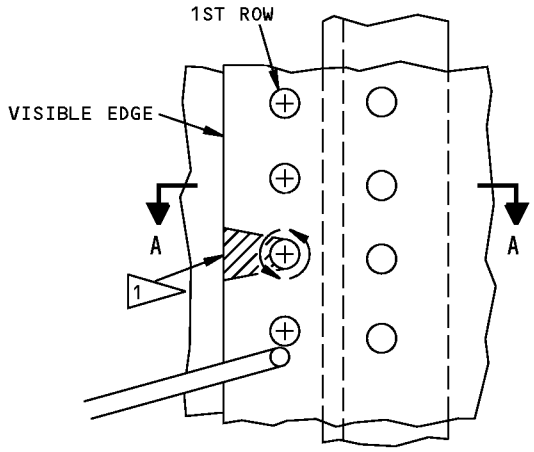


SECTION A–A

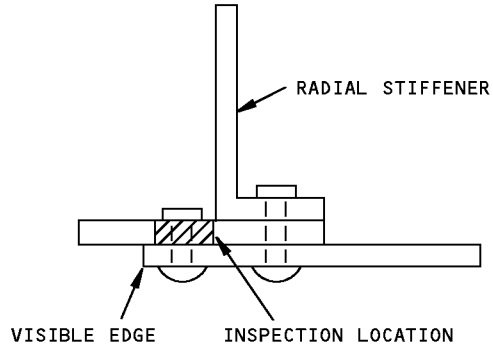
NOTES

- SCAN AROUND FASTENER AND SET SENSITIVITY TO PRODUCE A 50% NEEDLE DEFLECTION AT DEFECT
- REFERENCE STANDARD A607 IS SHOWN; REFERENCE STANDARD A607A IS ALMOST THE SAME.

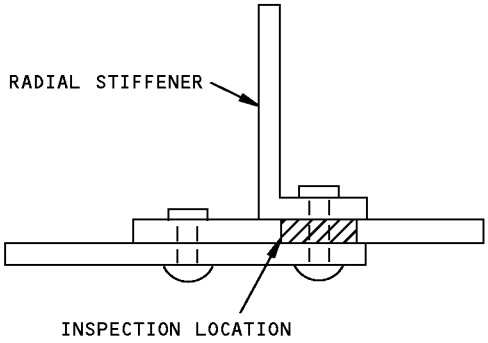
Probe Calibration Location
Figure 3



RADIAL WEB LAP SPLICES



SECTION A–A



ALTERNATIVE CROSS SECTION

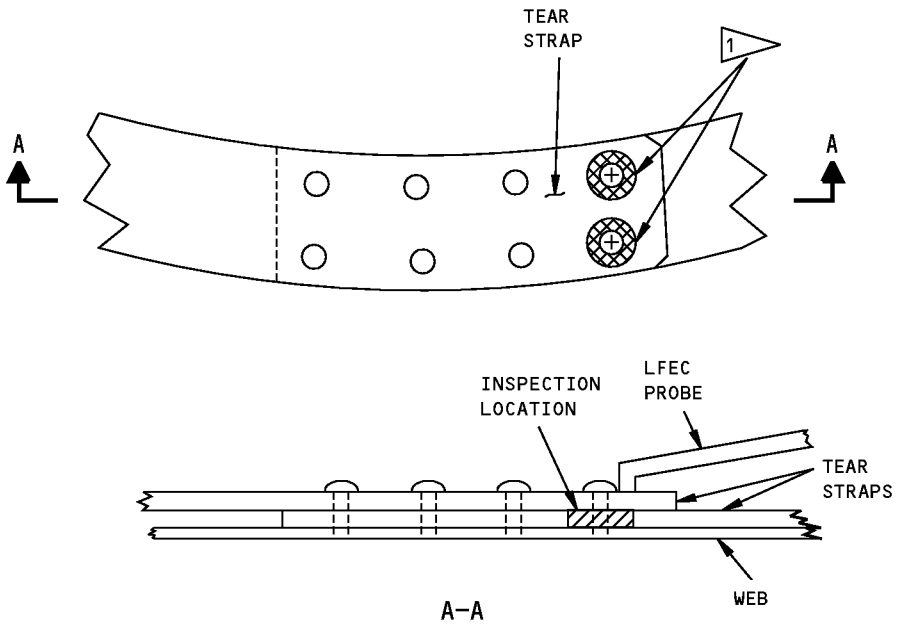
SYMBOLS

⊕ INSPECTION FASTENERS

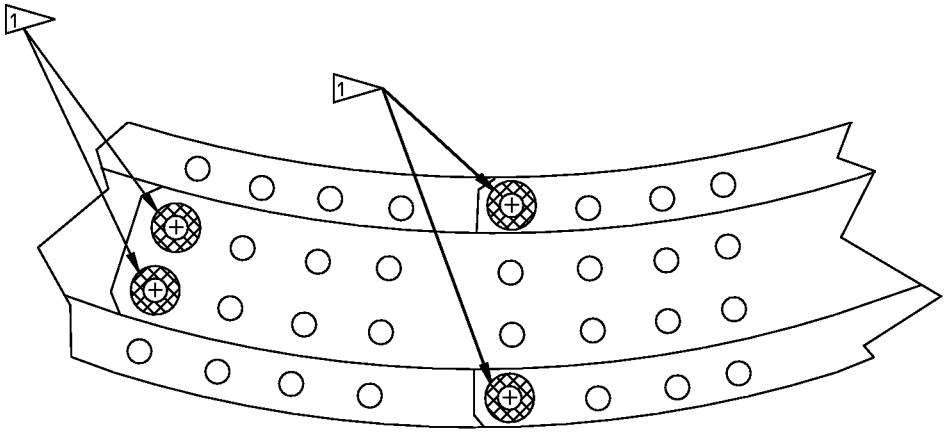
360° SCAN AROUND FASTENER HEAD
MINUS THE EDGE AFFECT AREA

1 EDGE AFFECT AREA (TYPICAL EXAMPLE)
– THIS AREA CAN NOT BE EXAMINED

Radial Web Lap Splice Inspection
Figure 4



REGULAR TEAR STRAP SPLICE
DETAIL 1



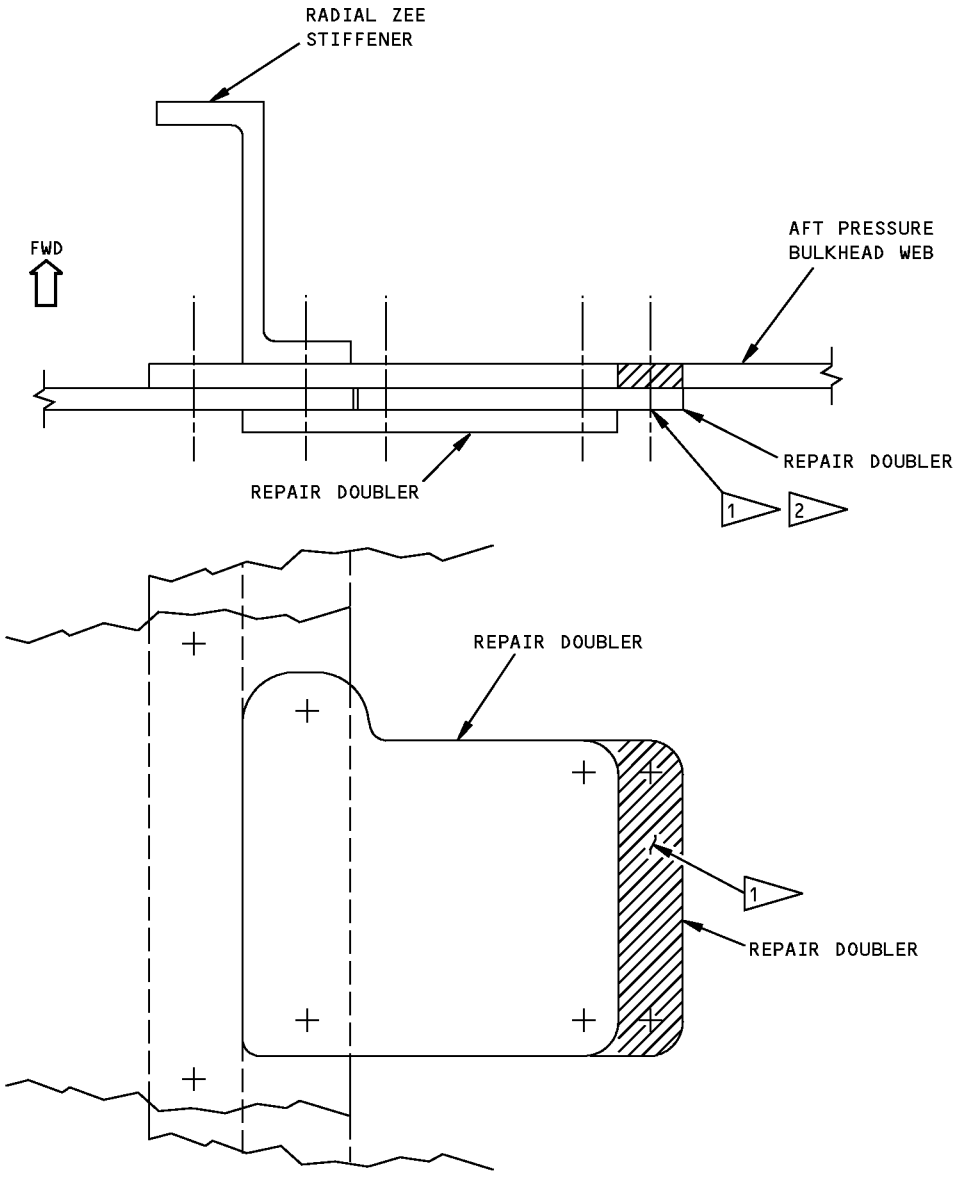
SUPER TEAR STRAP SPLICE
DETAIL 2

NOTES:

⊕ INSPECTION FASTENERS

1 DO A 360° SCAN AROUND THE FASTENER HEAD (TYPICAL)

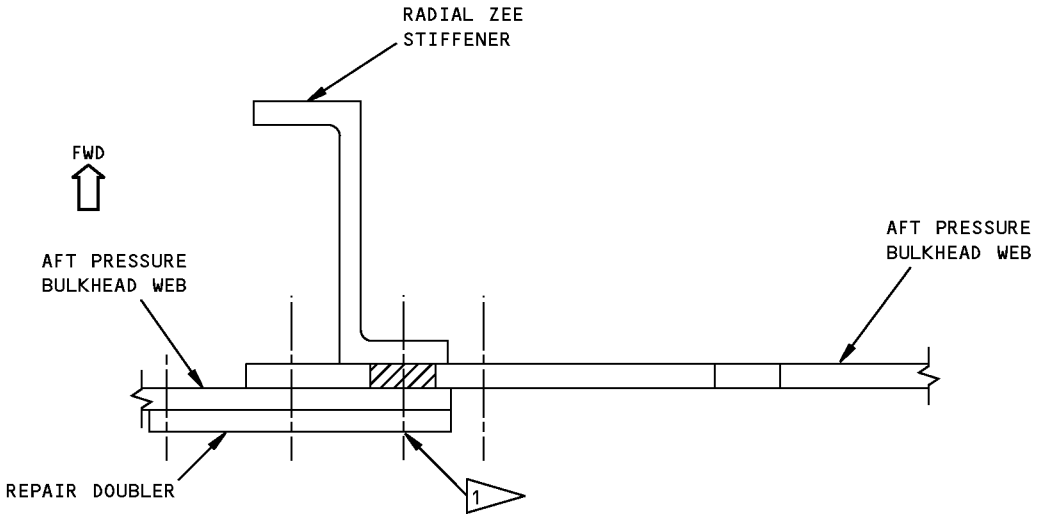
Tear Strap Inspection Location
Figure 5



NOTES

1. DO A 360 DEGREE SCAN AROUND EACH FASTENER IN THE SHADED AREA TO EXAMINE THE BULKHEAD WEB BEHIND THE REPAIR DOUBLER FOR CRACKS.
2. SEE PART 6, 53-80-01 FOR AN OPTIONAL HIGH FREQUENCY INSPECTION FROM THE FORWARD SIDE OF THE BULKHEAD.

Typical Inspection of the Second Layer of a Repair
Figure 6



NOTES

1 DO A 360 DEGREE SCAN AROUND EACH FASTENER IN THE SHADED AREA TO EXAMINE THE THIRD LAYER BEHIND THE REPAIR DOUBLER FOR CRACKS.

Typical Inspection of the Third Layer of a Repair
Figure 7

PART 6 - EDDY CURRENT

HORIZONTAL STABILIZER HINGE PINS

1. Purpose

A. Use this procedure to do a surface eddy current inspection for circumferential surface cracks that can occur in the hole (bore) of the inner and outer hinge pins of the horizontal stabilizer.

NOTE: To complete the MPD task, it is also necessary to do a visual inspection on the outer diameter of the inner and outer hinge pins. Refer to the MPD.

B. See Figure 1 for the hinge pin locations.

C. This procedure uses an eddy current instrument with an impedance plane display and a rotary scanner.

D. Two reference standards and probes are necessary because of the difference in the hole (bore) diameters of the inner and outer hinge pins.

E. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-80-I25

2. Equipment

A. General

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

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

B. Instrument

(1) Use an eddy current instrument that:

(a) Has an impedance plane display.

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

(c) Has a rotary scanner.

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

(a) Phasec 1.1 SD; manufactured by Hocking

(b) Elotest B1; manufactured by Rohmann GmbH

C. Probes

(1) Use a probe that:

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

(b) Has an external diameter that causes a light interference fit in the hole (bore) of the hinge pin. The inner hinge pin hole (bore) diameter is approximately 0.875 inch (22.2 mm) or 1.0 inch (25.4 mm) and the outer hinge pin hole (bore) diameter is approximately 1.44 inches (36.6 mm).

(c) Can examine a minimum of 5.0 inches (127 mm) into the hinge pin hole (bore).

(d) Has an unshielded differential-reflection coil.

(e) Operates with a minimum signal-to-noise ratio of 5:1 on the reference standard and a minimum signal-to-noise ratio of 3:1 on the part to be examined.

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

(a) Inner hinge pin 180T0011-1 and -2: NEC3035 - NDT Engineering Corp.

(b) Inner hinge pin 180T0011-3: NEC3113 - NDT Engineering Corp.

(c) Outer hinge pins: NEC3036 - NDT Engineering Corp.

D. Reference Standards

(1) Use reference standard NDT617 for the 180T0011-1 and -2 pins and NDT618A for the 180T0011-3 pins during calibration for the inspection of the inner hinge pin. See Figure 2 for data about the reference standard.

(2) Use reference standard NDT618 during calibration for the inspection of the outer hinge pin.

3. Preparation for Inspection

CAUTION: WHEN YOU CLEAN THE HINGE PINS, BE VERY CAREFUL NOT TO DAMAGE THE FINISH (TI-CAD) ON THE INNER SURFACE. A SMALL SCRATCH IN THE FINISH CAN CAUSE AN EDDY CURRENT SIGNAL THAT LOOKS THE SAME AS A CRACK SIGNAL

A. Remove the inner and outer hinge pins. Refer to Airplane Maintenance Manual (AMM) 55-17-51 to remove the pins.

NOTE: It is necessary to remove the outer pin to complete the MPD task. Refer to Paragraph 1.A. NOTE.

B. Fully clean the hole (bore) of the inner and outer hinge pins.

4. Instrument Calibration

NOTE: The inner and outer hinge pins use different probes and reference standards because of the different hole (bore) diameters. However, the calibration and inspection procedure is the same for the two pins.

A. Set the frequency between 200 and 500 kHz.

B. Set the vertical gain equal to the horizontal gain.

C. Set the display to the X/Y mode.

D. Set the rotary scanner speed to a minimum of 1000 RPM.

E. Put a small piece of nonconductive tape on the probe coil. This will help prevent possible damage to the finish in the hinge pin hole (bore).

F. Start the rotary scanner.

G. Balance the instrument as recommended in the manufacturers instructions.

H. Adjust the balance point to the center of the display as shown in Figure 4, Detail II.

I. Put the probe on the surface of the reference standard as shown in Figure 4, Detail I and adjust the phase control so that the lift-off signal moves horizontally as shown in Figure 4, Detail II.

J. Set the display to the timebase mode or start the sweep function.

K. Put the probe into the reference standard and get a maximum signal from the EDM notch as shown in Figure 4, Detail III.

L. Adjust the vertical gain to get a signal that is approximately 50 percent of the display as shown in Figure 4, Detail IV.

M. Adjust the instrument filters. If the filters are set automatically, do the steps that follow to set the filters:

NOTE: Refer to the operation manual of the eddy current instrument for more data on the adjustment of the filters.

(1) High Pass Filters (HP)

(a) Set the filter to its lowest value.

(b) Increase the filter value to get the best signal-to-noise ratio. Do not let the notch signal decrease more than 50 percent of the signal height set in Paragraph 4.L.

(2) Low Pass Filters (LP)

(a) Set the filter to its highest value.

(b) Decrease the filter value to get a stable dot or until the signal from the notch in the reference standard starts to decrease. Do not decrease the filter value below the value of the high pass filter.

(3) Single Filter Control or Band Pass Filter (BP)

(a) Adjust the filter to get the best signal-to-noise ratio.

NOTE: If the speed of the rotary scanner is changed from the value set in Paragraph 4.D., you must adjust the filters again.

N. Adjust the gain to again get a notch signal that is approximately 50 percent of the display as shown in Figure 4, Detail IV.

O. Calculate the signal-to-noise ratio. If necessary, refer to Part 6, 51-00-17, Fig. 6, for data about signal-to-noise ratios.

P. If the signal-to-noise ratio is less than 5:1, more adjustment of the filters is necessary.

NOTE: It is possible that a different scanner speed can make the signal-to-noise ratio better. Or it can be necessary to try a different probe.

Q. The use of an audible or a visual alarm is recommended. Set the alarm to operate when a signal occurs that is 50 percent of the signal you got from the reference standard notch.

5. Inspection Procedure

NOTE: To find circumferential cracks in the hinge pins, it is very important to keep the probe aligned with the hole centerline during the scan.

NOTE: Because of the long length of these hinge pins, it is necessary to do the scan of the hinge pins from each end for a full examination.

A. Make a careful scan into the pin as far as possible as shown in Figure 5. Make sure to keep the probe aligned with the hinge pin centerline during the scan.

NOTE: Be careful not to damage the hinge pin with the rotary scanner when you get close to the end of the hinge pin.

B. Do Paragraph 5.A. from the opposite end of the pin.

C. Do a check of the instrument calibration as follows:

NOTE: Do not make adjustments to the instrument gain or filters.

(1) Put the probe in the hole of the reference standard to get a signal from the notch.

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

(3) If the signal from the notch in the reference standard has decreased 5 percent or more, do Paragraph 4.N. thru Paragraph 4.Q. again and examine the hinge pin again.

6. Inspection Results

A. Signals that are more than 40 percent of the display are signs of a defect and must be examined more fully.

B. Examine the hinge pin at a lower frequency as follows:

NOTE: During a surface eddy current inspection at a high frequency range, a scratch in the finish of the hole (bore) can look to be a crack signal. To see if an eddy current signal is caused by a scratch, the frequency is lowered to 50 kHz and the part is examined again. You will not get an eddy current signal from a scratch in the finish when you make an inspection at the lower frequency.

(1) Do the instrument calibration procedure of Paragraph 4. again, but change the frequency in Paragraph 4.A. to 50 kHz.

(2) Make a scan again of the area where the crack signal occurred.

(3) If you do not get a signal at the lower frequency, the signal was caused by a scratch in the finish.

NOTE: It can be necessary to repair the finish before the part can be accepted. Get engineering approval before you accept the part.

(4) If you get a signal that is 40 percent or more at the lower frequency, reject the part. If you want to be more sure that there is a crack in the hinge pin, examine the hinge pin with one of the NDT procedures identified in Paragraph 6.C.

C. It is recommended that you do one or more of the different NDT procedures specified below to make sure that there is a crack in the hinge pin.

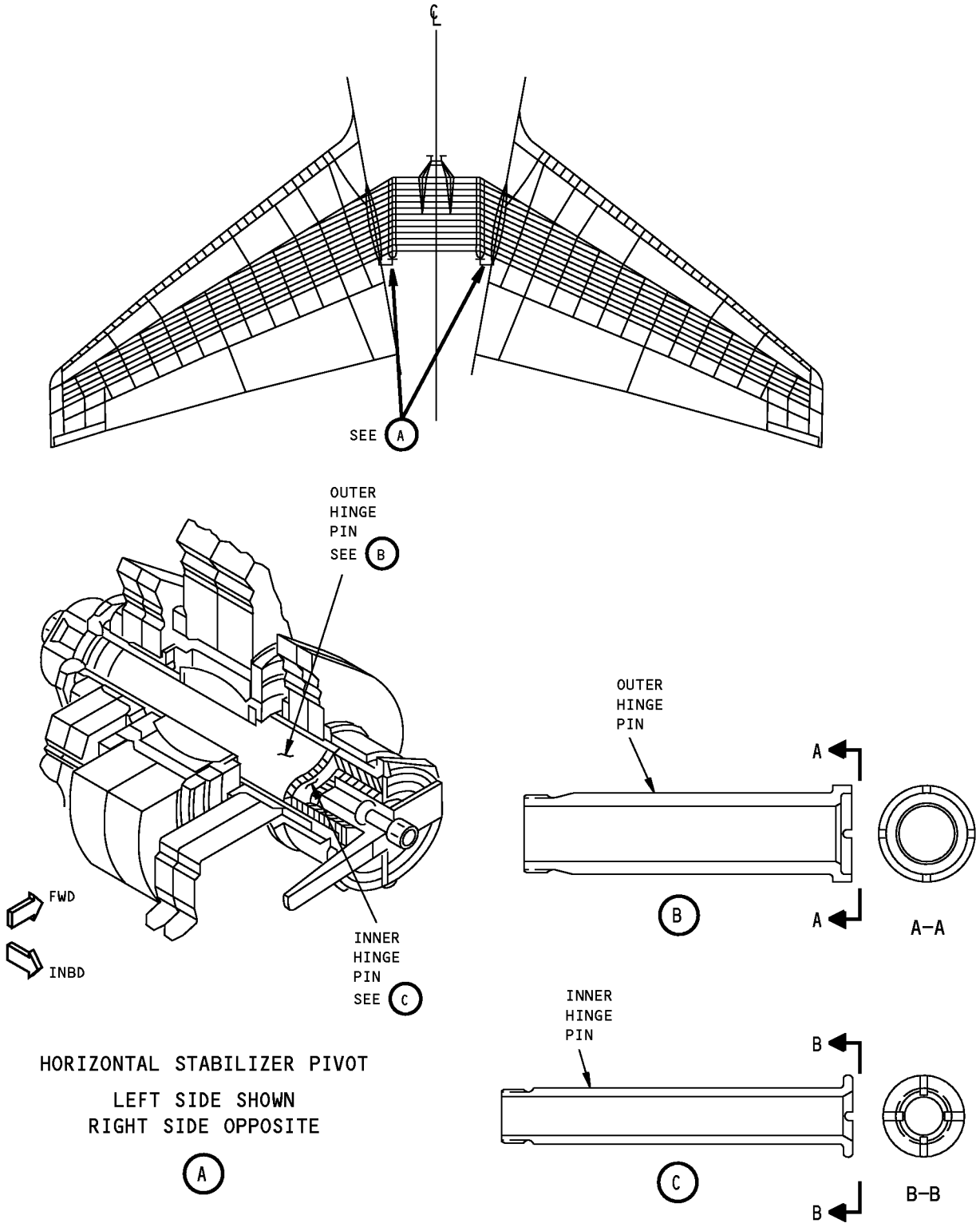
(1) Do a wet, visible, magnetic particle inspection and use a rigid borescope to visually examine the hole (bore). It is not necessary to remove the finish to do this procedure. Longitudinal magnetization and direct current is necessary to identify circumferential cracks in the hole (bore) of the hinge pins. Refer to SOPM 20-20-01.

(2) Do a wet fluorescent magnetic particle inspection and use a UV borescope to visually examine the hole (bore). It is not necessary to remove the finish to do this procedure. Longitudinal magnetization and direct current is necessary to find circumferential cracks in the hole (bore) of the hinge pins. Refer to SOPM 20-20-01.

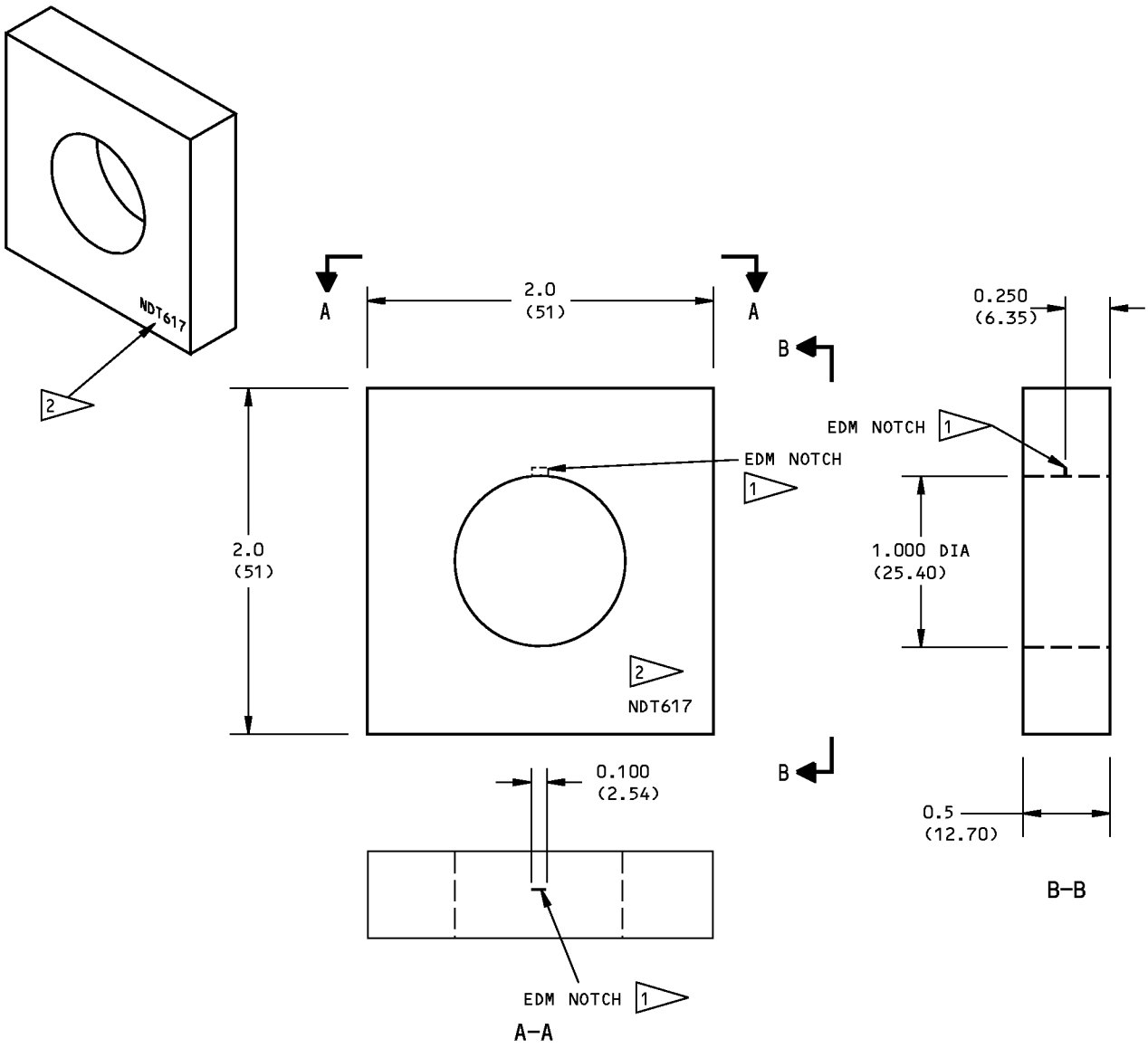
(3) Do a magnetic rubber inspection of the hinge pin hole (bore). This is a very sensitive surface inspection. It is not necessary to remove the finish to do this procedure. However, it is possible that magnetic rubber material will not be easily available. An electromagnetic yoke and alternating current is recommended for this procedure. Refer to SOPM 20-20-01.

(4) Do a dry powder, magnetic particle inspection and use a rigid borescope to visually examine the hole (bore). It is not necessary to remove the finish to do this procedure. Longitudinal magnetization and direct current are necessary to find circumferential cracks in the hole (bore) of the hinge pins. Refer to SOPM 20-20-01.

(5) Remove the Ti-Cad surface finish. Do the instrument calibration procedure of Paragraph 4. again but change the frequency in Paragraph 4.A. to 500 kHz. Examine the hinge pin again as specified in Paragraph 5.



Horizontal Stabilizer Hinge Pins
Figure 1



NOTES

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

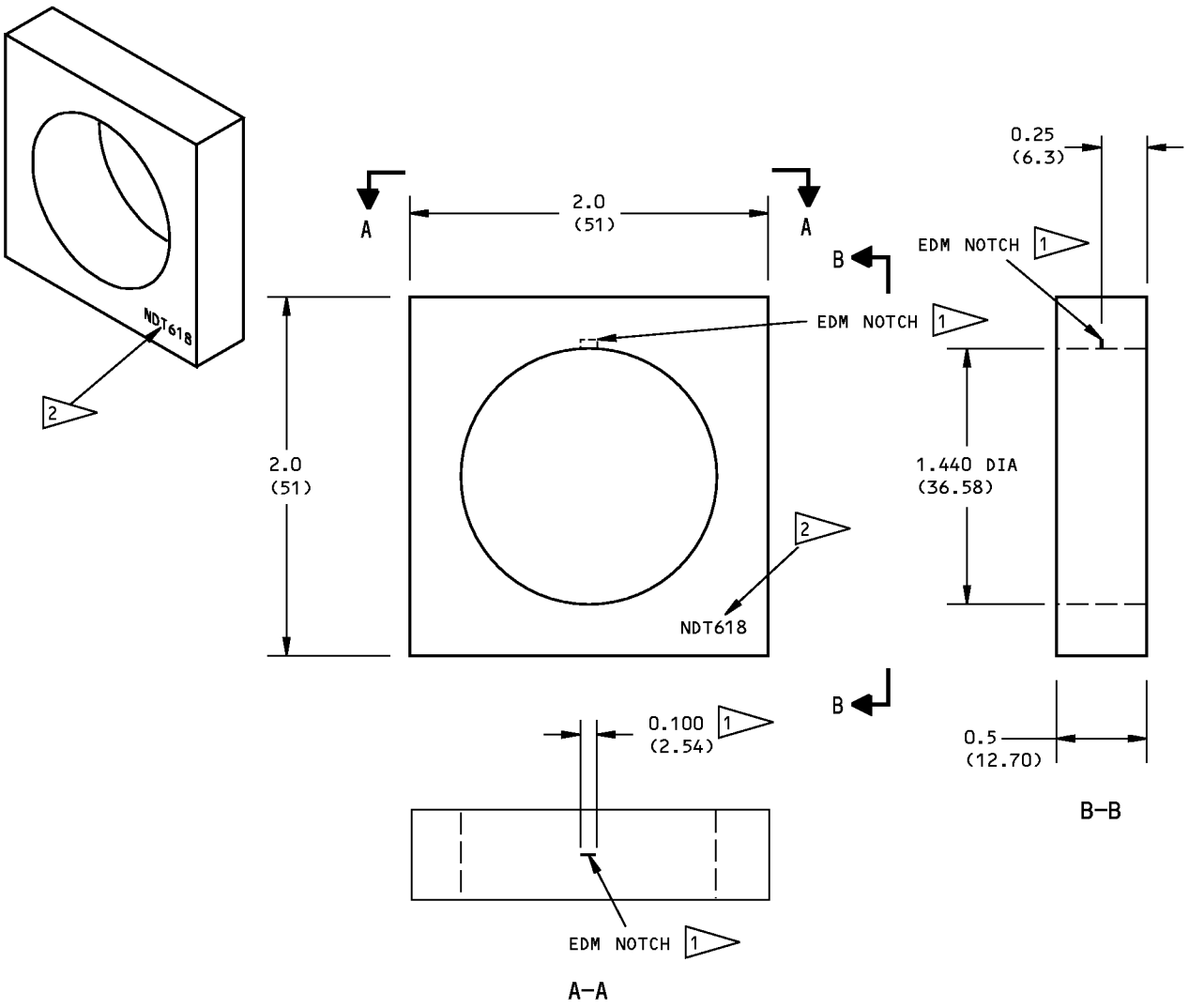
INCHES	MILLIMETERS
X.XXX = ± 0.005	X.XX = ± 0.10
X.XX = ± 0.025	X.X = ± 0.5
X.X = ± 0.050	X = ± 1

- MATERIAL: 4330M, 4340M
- SURFACE ROUGHNESS: HOLE SURFACE = 63 RA OR BETTER, ALL OTHER SURFACES = 125 RA OR BETTER

1 PUT THE EDM NOTCH AT THE CENTER OF THE HOLE. EDM NOTCH DIMENSIONS:
0.100 (2.54) LONG
0.040 (1.02) DEEP
0.005 (0.127) WIDE
TOLERANCE FOR ALL NOTCH DIMENSIONS:
± 0.003 (0.08)

2 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT617 AT APPROXIMATELY THIS LOCATION

Reference Standard NDT617
Figure 2



REFERENCE STANDARD NDT618

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

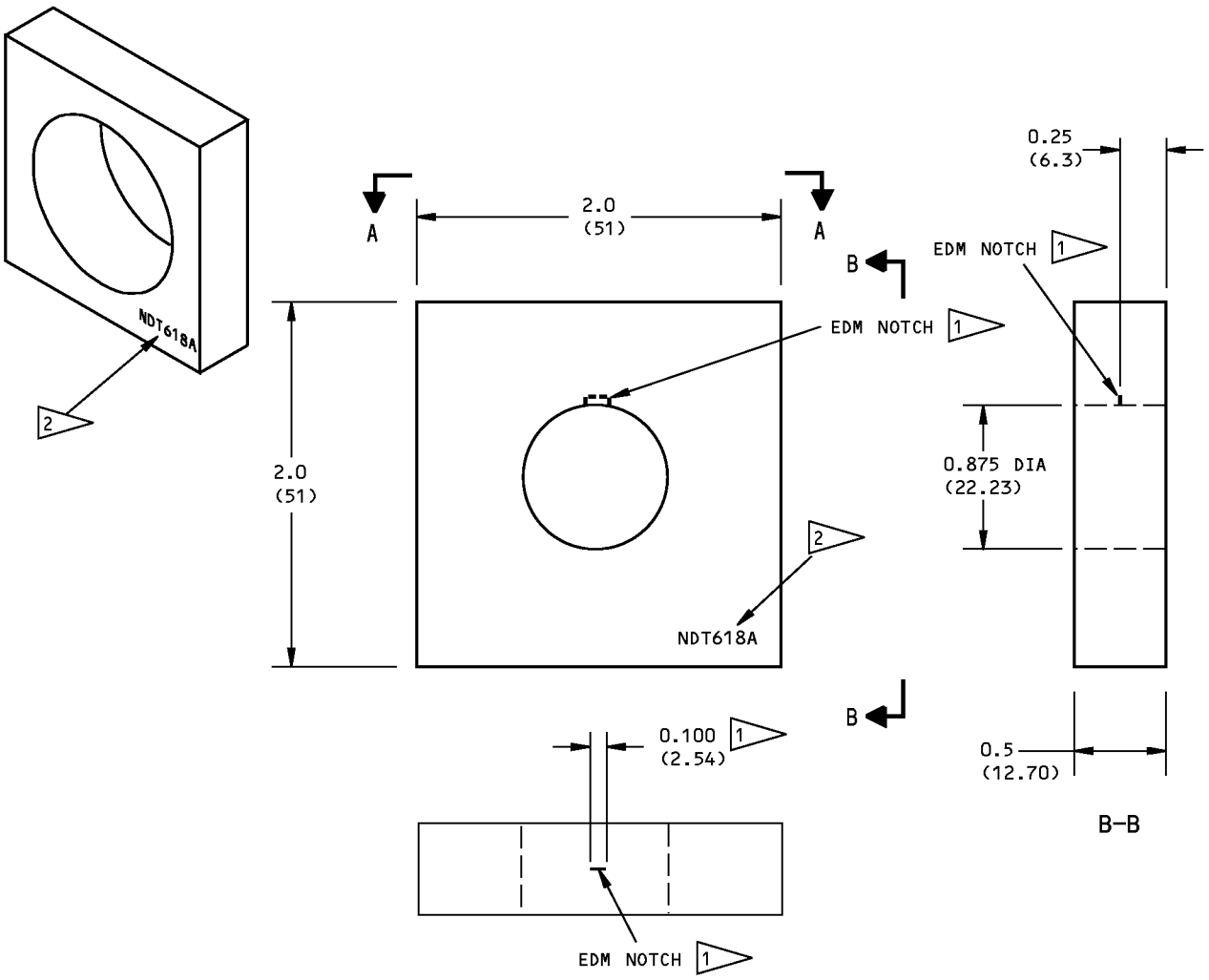
- MATERIAL: 4330M, 4340M
- SURFACE ROUGHNESS: HOLE SURFACE = 63 RA OR BETTER, ALL OTHER SURFACES = 125 RA OR BETTER

1 PUT THE EDM NOTCH AT THE CENTER OF THE HOLE. EDM NOTCH DIMENSIONS:
0.100 (2.54) LONG
0.040 (1.02) DEEP
0.005 (0.127) WIDE

TOLERANCE FOR ALL NOTCH DIMENSIONS:
± 0.003 (0.08)

2 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT618 AT APPROXIMATELY THIS LOCATION

Reference Standards
Figure 3 (Sheet 1 of 2)



REFERENCE STANDARD NDT618A

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

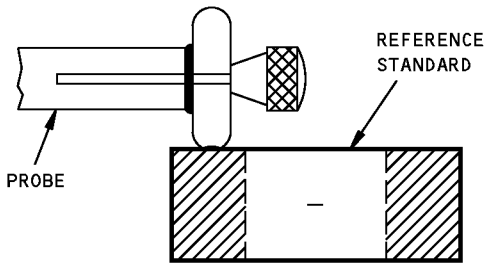
- MATERIAL: 4330M, 4340M
- SURFACE ROUGHNESS: HOLE SURFACE = 63 RA OR BETTER, ALL OTHER SURFACES = 125 RA OR BETTER

1 PUT THE EDM NOTCH AT THE CENTER OF THE HOLE. EDM NOTCH DIMENSIONS:
0.100 (2.54) LONG
0.040 (1.02) DEEP
0.005 (0.127) WIDE

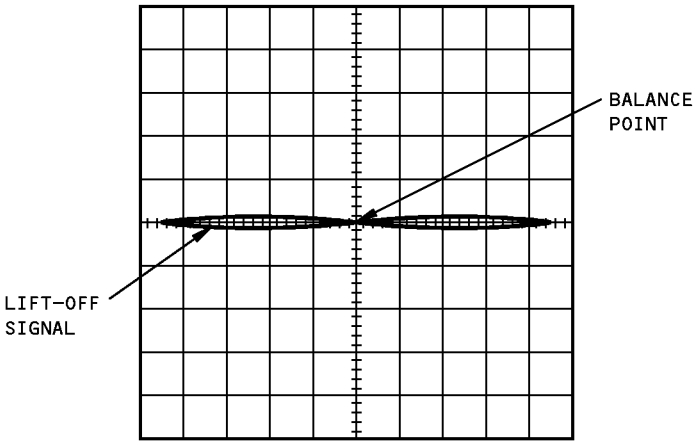
TOLERANCE FOR ALL NOTCH DIMENSIONS:
± 0.003 (0.08)

2 ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT618A AT APPROXIMATELY THIS LOCATION

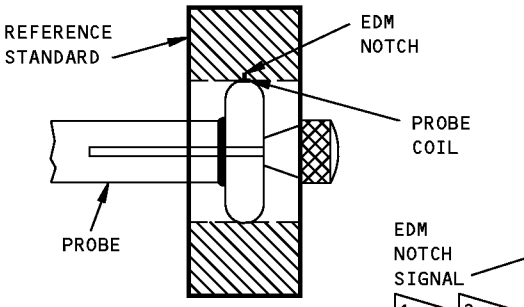
Reference Standards
Figure 3 (Sheet 2 of 2)



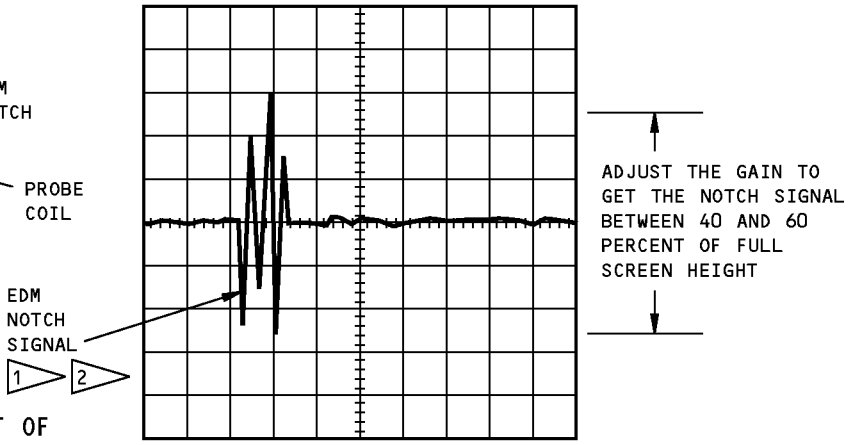
PROBE POSITION FOR ADJUSTMENT OF
INSTRUMENT LIFT-OFF AND BALANCE POINT
DETAIL I



SCREEN DISPLAY OF BALANCE POINT POSITION
AND LIFT-OFF SIGNAL DIRECTION
DETAIL II



PROBE POSITION FOR ADJUSTMENT OF
INSTRUMENT SENSITIVITY
DETAIL III

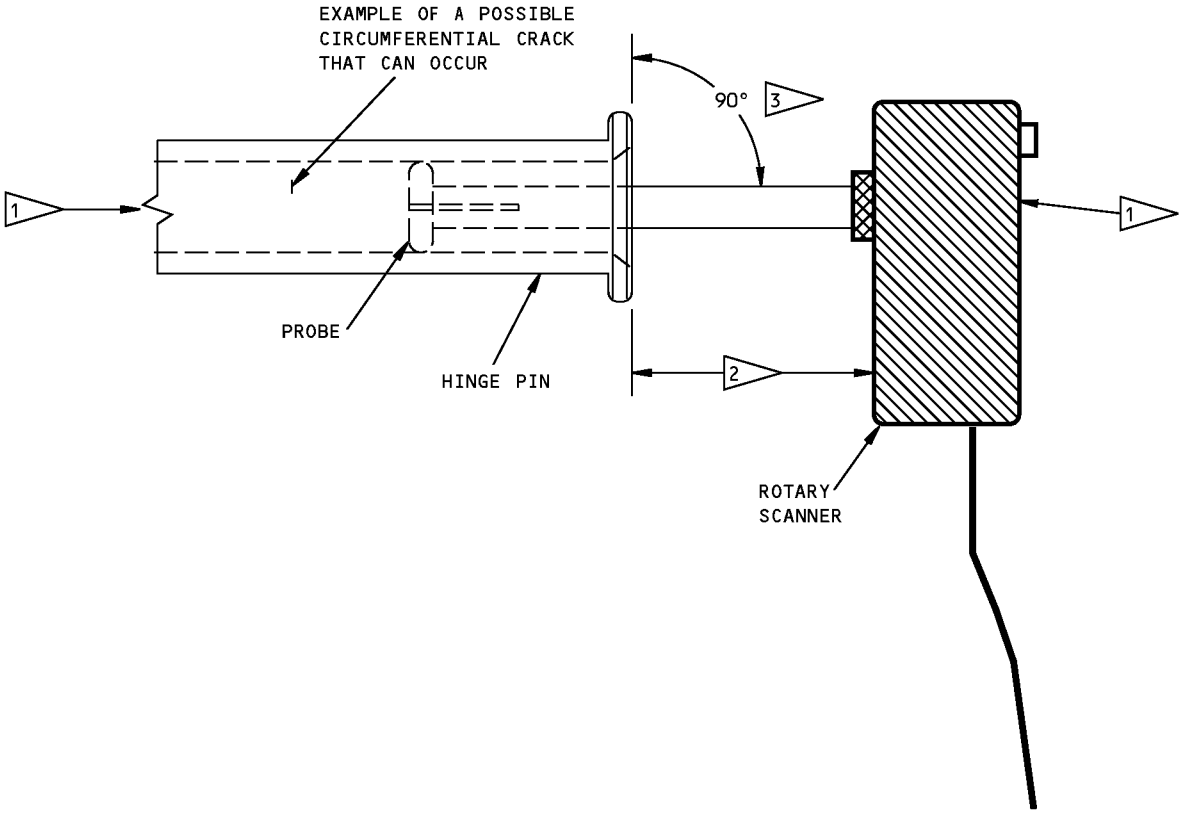


SCREEN DISPLAY OF THE EDM NOTCH SIGNAL
DETAIL IV

NOTES

1. THE HORIZONTAL POSITION OF THE NOTCH SIGNAL IS RELATED TO THE POSITION OF THE NOTCH IN THE REFERENCE STANDARD.
2. BECAUSE OF DIFFERENT FILTER ADJUSTMENTS AND DIFFERENT TYPES OF PROBES, THE SIGNAL CAN LOOK DIFFERENT FROM THE SIGNAL SHOWN HERE.

Calibration Probe Positions and Instrument Displays
Figure 4



NOTES

1. TO EXAMINE THE FULL LENGTH OF THE HOLE (BORE) YOU MUST DO THE INSPECTION FROM EACH END OF THE HINGE PIN.
2. MAKE A CAREFUL SCAN INTO THE HOLE (BORE) UNTIL THE SCANNER IS CLOSE TO OR TOUCHES THE END OF THE HINGE PIN.
3. BE CAREFUL TO KEEP THE PROBE ALIGNED WITH THE CENTERLINE OF THE HINGE PIN DURING THE INSPECTION.

Hinge Pin Inspection
Figure 5

PART 6 - EDDY CURRENT

FUSELAGE - SECTION 48 - BS 1809 OUTER CHORD

1. Purpose

A. Use this eddy current inspection to find cracks in the outer chord of the BS 1809 bulkhead.

B. The inspection locations are immediately below stringer S-12, on each side of the airplane.

C. This eddy current procedure uses an impedance plane display instrument.

D. It is also necessary to do a high frequency eddy current inspection along the edge of the outer chord at BS 1809.

E. Figure 1, Figure 2 and Figure 7 show the inspection locations.

F. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-80-I15, I16, I17

G. Service Bulletin reference: 767-53-0078

2. Equipment

A. General

(1) Use inspection equipment that can be calibrated on reference standard NDT660 as specified in Paragraph 4.

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

B. Instrument

(1) Use an impedance plane display instrument that operates in a frequency range of 400 Hz to 300 kHz.

(2) A Zetec MIZ-21A eddy current instrument was used to help prepare this procedure.

C. Probes

(1) Four probes are necessary to do this procedure:

(a) A reflection type spot probe with a maximum diameter of 0.6 inch (15.2 mm) that operates at 400 and 500 Hz.

(b) A reflection type ring probe with an inner diameter of 0.45 inch (11.4 mm) and an outer diameter of 0.9 inch (22.8 mm) that operates at 500 and 800 Hz.

(c) A reflection type ring probe with an inner diameter of 0.6 inch (15.2 mm) and an outer diameter of 1.0 inch (25.4 mm) that operates at 400 Hz.

(d) A pencil probe with a 0.125 inch (3.1 mm) diameter, a 7.0 inch (177.8 mm) long flexible shaft, and a 0.02 inch (0.50 mm) coil drop, that operates between 200 and 500 kHz.

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

(a) Spot probe, NEC-4087-7.

(b) Ring probe, RR019-5/TF.

(c) Ring probe, NEC4028-3.

(d) Pencil probe, MTF9002-70 FX.

NOTE: Make sure you tell the probe manufacturer the eddy current instrument you will use with the probes. All the above probes have a Trix Fisher connector. Probe cables that connect to your instrument will have to be ordered independently.

NOTE: The instruments that follow were used with the probes and reference standard in this procedure and operated satisfactorily.

- Elotest B1
- Hocking Phasec 1.1
- Hocking Phasec 2200
- Staveley 19e
- Zetec MIZ 22
- Nortec 2000

D. Reference Standard

(1) Make or buy reference standard NDT660 as shown in Figure 3.

3. Preparation for Inspection

A. Find inspection areas 1, 2 and 3. See Figure 1, Figure 2 and Figure 7.

WARNING: MAKE SURE THE HORIZONTAL STABILIZER IS IN THE CENTER POSITION AND THE SYSTEM IS ISOLATED TO PREVENT POSSIBLE INJURY TO PERSONNEL.

B. Get access to the top of the horizontal stabilizer torque box through the lower access door 312AR.

C. Remove the upper blade seal access doors, 335AT (left side) and 345AT (right side), from the horizontal stabilizer.

D. Remove dirt, grease and sealant from the areas that the probes will touch. See Figure 1, Figure 2 and Figure 7.

4. Instrument Calibration

NOTE: Six instrument calibrations are necessary to examine inspection areas 1, 2 and 3. To examine inspection areas 1 and 2, it will be necessary to calibrate the instrument with a low frequency ring and spot probe and a high frequency pencil probe. To examine inspection area 3, it will be necessary to calibrate the instrument with a low frequency ring and spot probe.

NOTE: Airplane Line Numbers 1 thru 681 will not have the thickness change in the upper splice fitting that is shown in Figure 7, flagnote 5. If your airplane is in this group, do not calibrate the instrument as specified in Paragraph 4.D. or do the inspection as specified in Paragraph 5.D. Calibrate your instrument and examine all three fastener holes in this row as specified in Paragraph 4.C. and Paragraph 5.C. See Figure 7, flagnote 1 for the inspection fastener holes.

A. Inspection area 1 - Calibrate the equipment for the low frequency ring probe inspection as follows (see Figure 1 for the inspection hole locations):

(1) Set the instrument frequency to 800 Hz.

(2) Connect the ring probe to the instrument.

NOTE: Use the ring probe with an inner diameter of 0.45-inch (11.4 mm).

(3) Put the ring probe at probe position 1 as shown by Figure 4, flagnote 1. Center the probe above the fastener head.

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

(5) Move the probe above the fastener as necessary until the height of the signal is at its minimum.

(6) Set the balance point at approximately 20% of full screen height and 60% of full screen width as shown in Figure 6.

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

(8) Put the ring probe at probe position 2 as shown by Figure 4, flagnote 2. Make sure the fastener is in the center of the probe.

(9) Move the probe above the fastener as necessary until the height of the signal is at its minimum.

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

(11) Adjust the instrument gain to get a notch signal that is approximately 40% of full screen height above the balance point as shown in Figure 6.

(12) Do Paragraph 4.A.(3), Paragraph 4.A.(4), Paragraph 4.A.(5), Paragraph 4.A.(8) and Paragraph 4.A.(9) again to make sure that there is 40% separation between the signals from the fastener hole with a notch and the fastener hole without a notch.

(13) Do Paragraph 4.A.(4) thru Paragraph 4.A.(12) again if the signal from the fastener hole with a notch is not approximately 40% of full screen height above the signal from the fastener hole with a notch.

B. Inspection area 2 - Calibrate the equipment for the low frequency ring probe inspection as follows (see Figure 1, flagnote 1 for the inspection hole locations):

(1) Set the instrument frequency to 500 Hz.

(2) Do Paragraph 4.A.(2) thru Paragraph 4.A.(13) again but replace Figure 4, probe position 1 with probe position 3 and probe position 2 with 4 and replace flagnote 1 with flagnote 3 and flagnote 2 with 4.

NOTE: Make sure that the probe is above the countersunk head of the fastener on the reference standard.

C. Inspection area 2 - Calibrate the equipment for the low frequency spot probe inspection as follows (see Figure 7, flagnote 3 for the inspection hole locations):

(1) Set the instrument frequency to 500 Hz.

(2) Connect the spot probe to the instrument.

NOTE: Use the 0.6 inch (15.2 mm) diameter spot probe.

(3) Put the probe adjacent to the fastener collar at probe position 5 as shown by Figure 4, flagnote 5.

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

(5) Set the balance point at approximately 20% of full screen height and 60% of full screen width as shown in Figure 6.

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

(7) Put the spot probe at probe position 6 as shown by Figure 4, flagnote 6.

(8) Monitor the signal that occurs on the instrument screen display when you move the probe from probe position 5 to probe position 6.

(9) With the probe at probe position 6, adjust the instrument gain to get a notch signal that is approximately 40% of full screen height above the balance point as shown in Figure 6.

(10) Do Paragraph 4.C.(3), Paragraph 4.C.(4) and Paragraph 4.C.(7) again to make sure that there is 40% separation between the signals from the fastener hole with a notch and the fastener hole without a notch.

(11) Do Paragraph 4.C.(3) thru Paragraph 4.C.(10) again if the signal from the fastener hole with a notch is not approximately 40% of full screen height above the signal from the fastener hole without a notch.

D. Inspection area 2 - Calibrate the equipment for the low frequency spot probe inspection as follows (see Figure 7, flagnote 4 for the inspection hole location):

NOTE: This step is only necessary for airplane line numbers 682 and on. See the Note in Paragraph 4.

(1) Set the instrument frequency to 1.5 kHz.

(2) Do Paragraph 4.C.(2) thru Paragraph 4.C.(11) but replace Figure 4 probe position 5 with 7 and 6 with 8 and replace flagnotes 5 with 7 and 6 with 8.

E. Inspection area 2 - Calibrate the equipment for the high frequency pencil probe inspection as follows:

(1) Calibrate the instrument and the pencil probe specified in Paragraph 2.C.(2)(d) with reference standard NDT660 as specified in Part 6, 51-00-19. See Figure 4, flagnote 9 for the location of the edge surface notch on reference standard NDT660.

(2) Move the probe over the notch and adjust the instrument gain to get a notch signal that is approximately 25% above the balance point.

F. Inspection area 3 - Calibrate the equipment for the ring probe inspection as follows (see Figure 2, flagnotes 1 and 2 for the inspection hole locations):

NOTE: SeeParagraph 5.F.(3)(a) before you calibrate the instrument.

(1) Set the instrument frequency to 400 Hz.

(2) Connect the ring probe to the instrument.

NOTE: Use the ring probe with an inner diameter of 0.6 inch (15.2 mm).

(3) Put the ring probe at probe position 1 around the fastener head as shown by Figure 5, flagnote 1.

(4) Do Paragraph 4.A.(4) thru Paragraph 4.A.(13) but use Figure 5, probe positions 1 and 2. See Figure 5, flagnotes 1 and 2.

G. Inspection area 3 - Calibrate the equipment for the spot probe inspection as follows (see Figure 2, flagnote 3 for the probe position).

(1) Do Paragraph 4.C.(1) thru Paragraph 4.C.(11) but use flagnote 3 probe position for the unnotched probe position and flagnote 4 for the notched probe position. See Figure 5.

5. Inspection Procedure

A. Use a ring probe to examine the outer chord flange at the BS 1809 bulkhead for cracks at the fastener holes identified in inspection area 1 of Figure 1. The outer chord is examined from outside the airplane as follows:

(1) Get access to the left side of the fuselage, above the horizontal stabilizer and identify inspection area 1. See Figure 1.

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

(3) Put the ring probe above one of the forward fasteners in inspection area 1 (Figure 1). Make sure the fastener is in the center of the ring probe.

(4) Move the probe above the fastener as necessary until the height of the signal is at its minimum.

(5) Balance the instrument to put the signal from the fastener hole at approximately 20% of full screen height.

NOTE: Do not change the instrument sensitivity when you put the fastener signal at 20% of full screen height.

NOTE: This will be the baseline signal for the forward fastener holes. The baseline signal for the aft fastener holes will be different from the baseline signal for the forward fastener holes.

NOTE: If an external doubler does not allow the inspection to be done from outside the airplane, remove the fasteners and do an open hole inspection. Refer to Part 6, 51-00-04, Part 6, 51-00-11, or Part 6, 51-00-16 for the open hole inspection. Make sure to examine the full length of the hole.

(6) Put the ring probe above the second forward fastener in the same inspection fastener column in inspection area 1 (see Figure 1). Make sure you move the probe until the height of the signal from the fastener hole is at its minimum.

NOTE: It is possible that the fastener hole you used to get the baseline signal was cracked. If this occurred, all fastener holes that are not cracked will have a screen signal below the balance point. Put the probe on a different inspection fastener hole if you think you set-up on a cracked fastener hole.

(7) Do Paragraph 5.A.(1) thru Paragraph 5.A.(6) for the two aft fasteners.

(8) Make a record of the fastener locations that cause signals that are more than 35% of full screen height above the balance point.

(9) Do Paragraph 5.A.(1) thru Paragraph 5.A.(8) again on the right side of the airplane.

B. Use a ring probe to examine the outer chord flange for cracks at the BS 1809 bulkhead. The outer chord flange is examined from outside the airplane at the three fastener holes identified by flagnote 1 in Inspection Area 2 of Figure 1 as follows:

(1) Get access to the left side of the fuselage, above the horizontal stabilizer and identify inspection area 2. See Figure 1.

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

(3) Put the probe on the center fastener identified by flagnote 1 in inspection area 2.

(4) Move the probe above the fastener as necessary until the height of the signal is at its minimum.

(5) Balance the instrument to put the signal from the fastener hole at approximately 20% of full screen height.

NOTE: Do not change the instrument sensitivity when you put the fastener signal at 20% of full screen height.

NOTE: This will be the baseline signal for the aft fastener holes in inspection area 2.

(6) Put the ring probe on a different flagnote 1 fastener in inspection area 2. Make sure you move the probe until the height of the signal from the fastener hole is at its minimum.

NOTE: It is possible that the center fastener hole was cracked. If this occurred, all fastener holes that are not cracked will have a screen signal below the balance point. Put the probe on a different inspection fastener hole if you think you set-up on a cracked fastener hole.

(7) Do Paragraph 5.B.(6) again for the remaining fastener hole identified by flagnote 1 in inspection area 2.

(8) Make a record of the fastener locations that cause signals that are more than 35% of full screen height above the balance point.

(9) Do Paragraph 5.A.(3) thru Paragraph 5.A.(8) again on the right side of the airplane.

C. Use a spot probe to examine the outer chord flange at the BS 1809 bulkhead for cracks at the upper two fastener holes identified in Figure 1 by flagnote 2. These fastener locations are examined from inside the airplane as follows:

NOTE: Examine all three forward fasteners if your airplane does not have an upper splice fitting with a thickness step. See Figure 7, flagnotes 1 and 5.

NOTE: Use the steps in Paragraph 5.C. to examine the fastener locations shown in Figure 1, flagnote 1 if an external repair does not allow the inspection to be done from outside the airplane. Use Paragraph 5.D. if the external repair prevents the inspection of the lower fastener that is shown in Figure 1, flagnote 1, on airplane line numbers 682 and on.

(1) Get access to the top right side of the horizontal stabilizer torque box and identify inspection area 2. See Figure 7.

(2) Calibrate the instrument as specified in Paragraph 4.C.

(3) Put the probe adjacent to the upper fastener collar and balance the instrument. See Figure 7, flagnotes 1 and 3.

NOTE: This will be the baseline signal.

(4) Move the probe adjacent to the center inspection fastener. See Figure 7, flagnotes 1 and 3.

NOTE: It is possible that the fastener hole you used to get the baseline signal was cracked. If this occurred, all fastener holes that are not cracked will have a screen signal below the balance point. Put the probe on a different inspection fastener hole if you think you set-up on a cracked fastener hole.

(5) Make a record of the fastener locations that cause signals that are more than 35% of full screen height above the balance point.

(6) Do Paragraph 5.C.(3) thru Paragraph 5.C.(5) again on the left side of the airplane.

D. Use a spot probe to examine the outer chord flange at the BS 1809 bulkhead for cracks at the lower fastener hole identified in Figure 1 by flagnote 2. This fastener location is examined from inside the airplane as follows:

NOTE: This step is only necessary for airplane line numbers 682 and on. See the Note in Paragraph 4.

NOTE: Use the steps in Paragraph 5.D. to examine the lower fastener shown in Figure 1, flagnote 1, if an external repair does not allow the inspection to be done from outside the airplane.

(1) Get access to the top right side of the horizontal stabilizer torque box and identify inspection area 2. See Figure 1 or Figure 7.

(2) Calibrate the instrument as specified in Paragraph 4.D.

(3) Put the probe adjacent to the lowest fastener collar. See Figure 7, flagnotes 1 and 4. Do not balance the probe on the airplane.

(4) Do Paragraph 5.D.(3) again at the other inspection fastener on the left side of the airplane.

(5) Compare the fastener hole signals you got from each side of the airplane. If one of the fastener hole signals is 35% (or more) above the balance point, do the steps that follow:

(a) Put the probe adjacent to the fastener that had the lowest signal.

(b) Balance the instrument as specified by the manufacturer's instructions to get the baseline signal at that fastener location.

(c) Put the probe adjacent to the inspection fastener on the opposite side of the airplane and compare the signals between the two inspection fasteners.

(d) Make a record of the fastener location that causes the signal to be more than 35% of full screen height above the balance point.

E. Use a high frequency probe to examine the edge of the outer chord flange at the BS 1809 bulkhead in inspection area 2 from inside the airplane as follows (see Figure 7):

(1) Get access to the top right side of the horizontal stabilizer torque box and identify inspection area 2.

(2) Calibrate the instrument as specified in Paragraph 4.E.

(3) Put the probe on the edge of the outer chord flange. Make sure that the probe coil touches the edge of the outer chord flange. See Figure 7, flagnote 2.

(4) Move the probe to examine the edge of the outer chord flange. See Figure 7, flagnote 2.

(5) Make a record of the locations that cause signals that are more than 25% of full screen height above the balance point.

(6) Do Paragraph 5.E.(1) thru Paragraph 5.E.(5) for the edge of the outer chord flange in inspection area 2 on the left side of the airplane.

F. Use a ring probe to examine the outer chord flange for cracks, from inside the airplane, at the BS 1809 bulkhead, inspection area 3, as follows:

(1) Get access to the top of the horizontal stabilizer torque box. See Figure 2.

(2) Find the three inspection fasteners on the left side of the airplane at inspection area 3. See Figure 2, flagnotes 1 and 2.

(3) Calibrate the instrument and ring probe as specified in Paragraph 4.F.

(a) The fastener collars can be on the forward or aft side of the BS 1809 bulkhead. Make sure you calibrate your equipment so the fastener configuration is the same during calibration as it will be during the inspection. That is, if the inspection is done with the probe around the fastener collar, the calibration must be done with the probe around the fastener collar.

(4) Center the ring probe around the most inboard and upper fastener collar, or head, that is in inspection area 3. See Figure 2, flagnote 1.

NOTE: Make sure there is no sealant on the surface where the probe touches the inspection surface.

(5) Balance the instrument to put the fastener hole signal at approximately 20% of full screen height.

NOTE: Do not change the instrument sensitivity when you put the fastener signal at 20% of full screen height.

(6) Put the ring probe around each fastener collar in inspection area 3. See Figure 2, flagnotes 1 and 2.

NOTE: It is possible that the fastener hole you used to get the baseline signal was cracked. If this occurred, all fastener holes that are not cracked will have a screen signal below the balance point. Put the probe on a different inspection fastener hole if you think you set-up on a cracked fastener hole.

(a) Make a record of the fastener locations that cause signals that are more than 35% of full screen height above the balance point.

(7) Do Paragraph 5.F.(4) thru Paragraph 5.F.(6) again for the fastener locations on the right side of the airplane in inspection area 3.

G. Use a spot probe to examine the outer chord flange for cracks, from inside the airplane, at the BS 1809 bulkhead, inspection area 3, as follows (see Figure 2, flagnote 4):

NOTE: Do this spot probe inspection between the lowest two fasteners in inspection area 3 if a crack indication did not occur when you did Paragraph 5.F. on the upper two fastener locations. See Figure 2, flagnotes 1 and 2 for the fastener locations.

NOTE: If a crack indication occurred when you did Paragraph 5.F. on the upper two fastener locations, remove the fastener and do an eddy current, open fastener hole inspection as specified in Part 6, 51-00-16. See Figure 2, flagnote 5 for the fastener hole location.

(1) Get access to the top of the horizontal stabilizer torque box. See Figure 2.

(2) Identify the inspection area between the two lowest fastener collars in inspection area 3 on the left side the airplane. See Figure 2, flagnote 4.

(3) Calibrate the instrument and spot probe as specified in Paragraph 4.G.

(4) Put the spot probe between the upper two inspection fasteners and balance the instrument. See Figure 2, flagnote 3.

(5) Move the spot probe to the lowest two inspection fastener holes in inspection area 3. See Figure 2, flagnote 4.

(a) Examine this inspection area for a possible crack between the lowest two fasteners in inspection area 3.

(6) Make a record of the locations that cause signals to occur that are more than 35% of full screen height above the balance point.

(7) Do Paragraph 5.G.(4) thru Paragraph 5.G.(6) again on the right side of the airplane.

6. Inspection Results

A. Reject signals for the low frequency inspections are specified below:

(1) Ring and spot probe signals that are 35% above the balance point. See Figure 6.

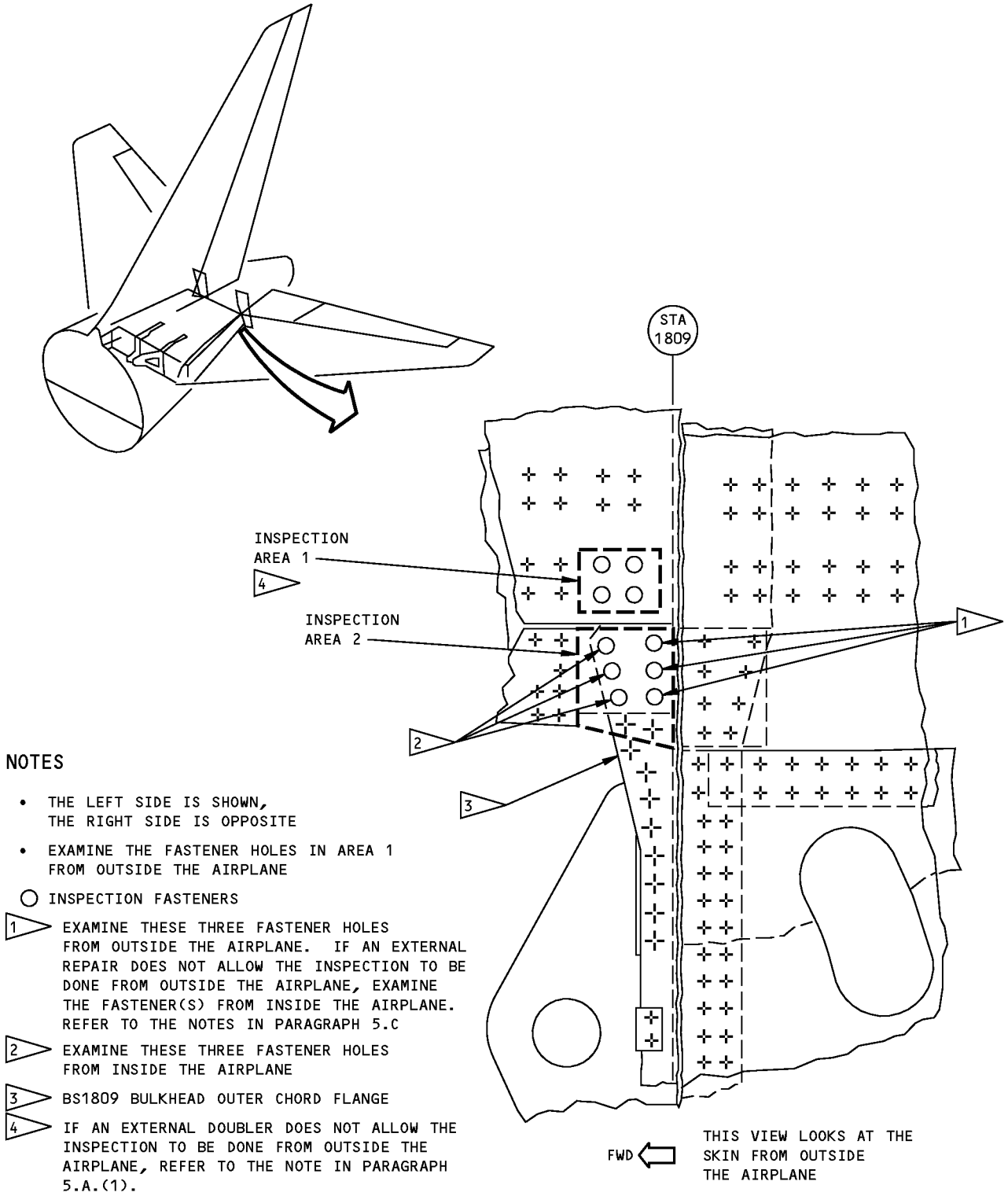
(2) Compare the signal that you got during the inspection to the signal you got during calibration from the notch in the reference standard.

NOTE: It is possible that the first fastener hole you used to get the baseline signal was cracked. If this occurred all fastener holes that are not cracked will have a screen signal that is below the balance point. Put the probe on a different inspection fastener hole if you think you set-up on a cracked fastener hole.

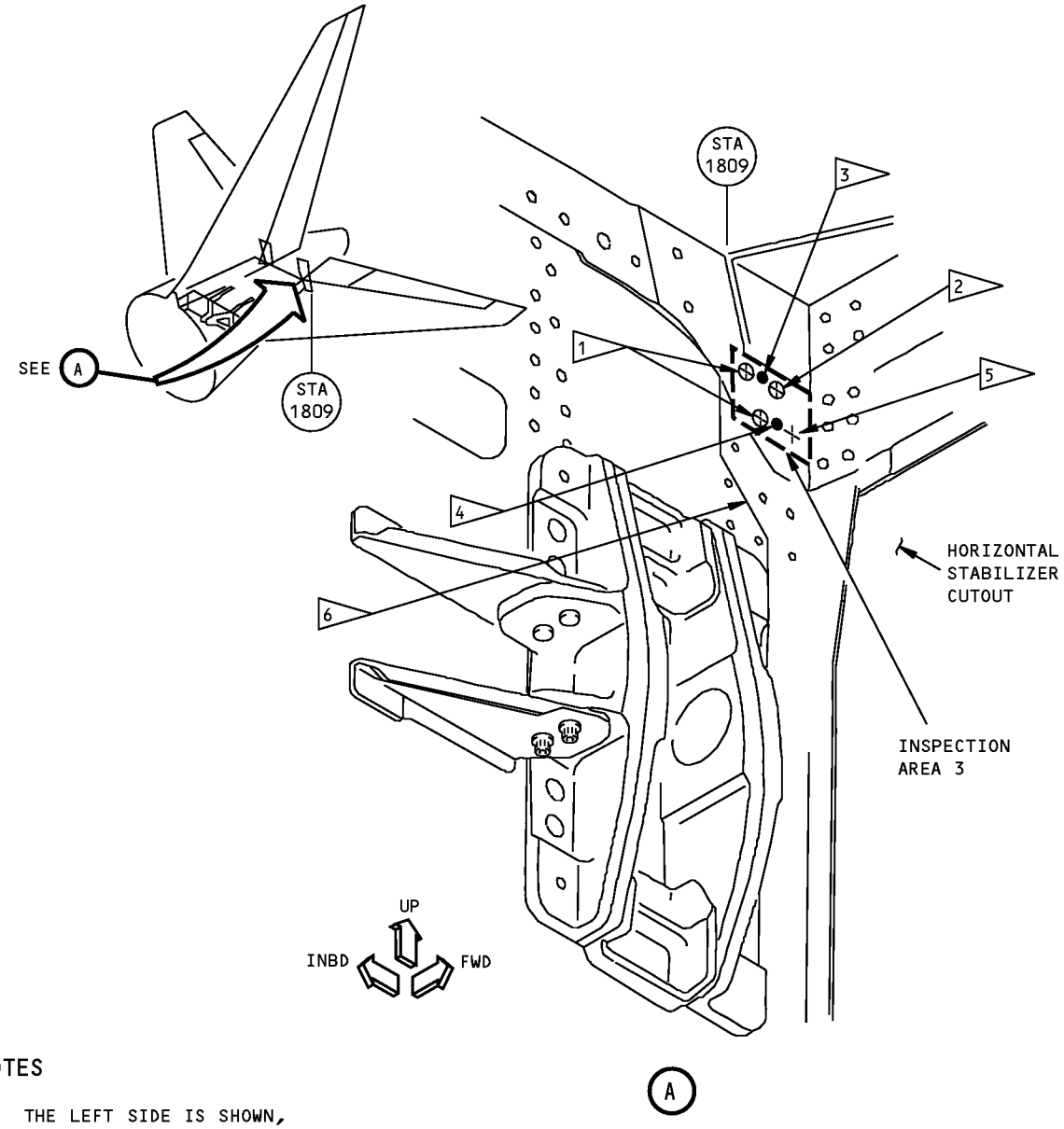
B. To make sure the signal you got is from a crack, remove the fastener and do a high frequency, eddy current, open fastener hole inspection as specified in Part 6, 51-00-16

NOTE: It is possible to get a false crack indication from the edge of a shim when you examine inspection area 2 with a ring probe from outside the airplane when you do Paragraph 5.B.. There is a shim between the skin and the upper splice fitting at this location. The location of the shim can be different for each airplane.

C. High frequency, pencil probe inspection signals that are 25% (or more) of full screen height above the balance point are possible cracks.



Inspection Areas 1 and 2
Figure 1



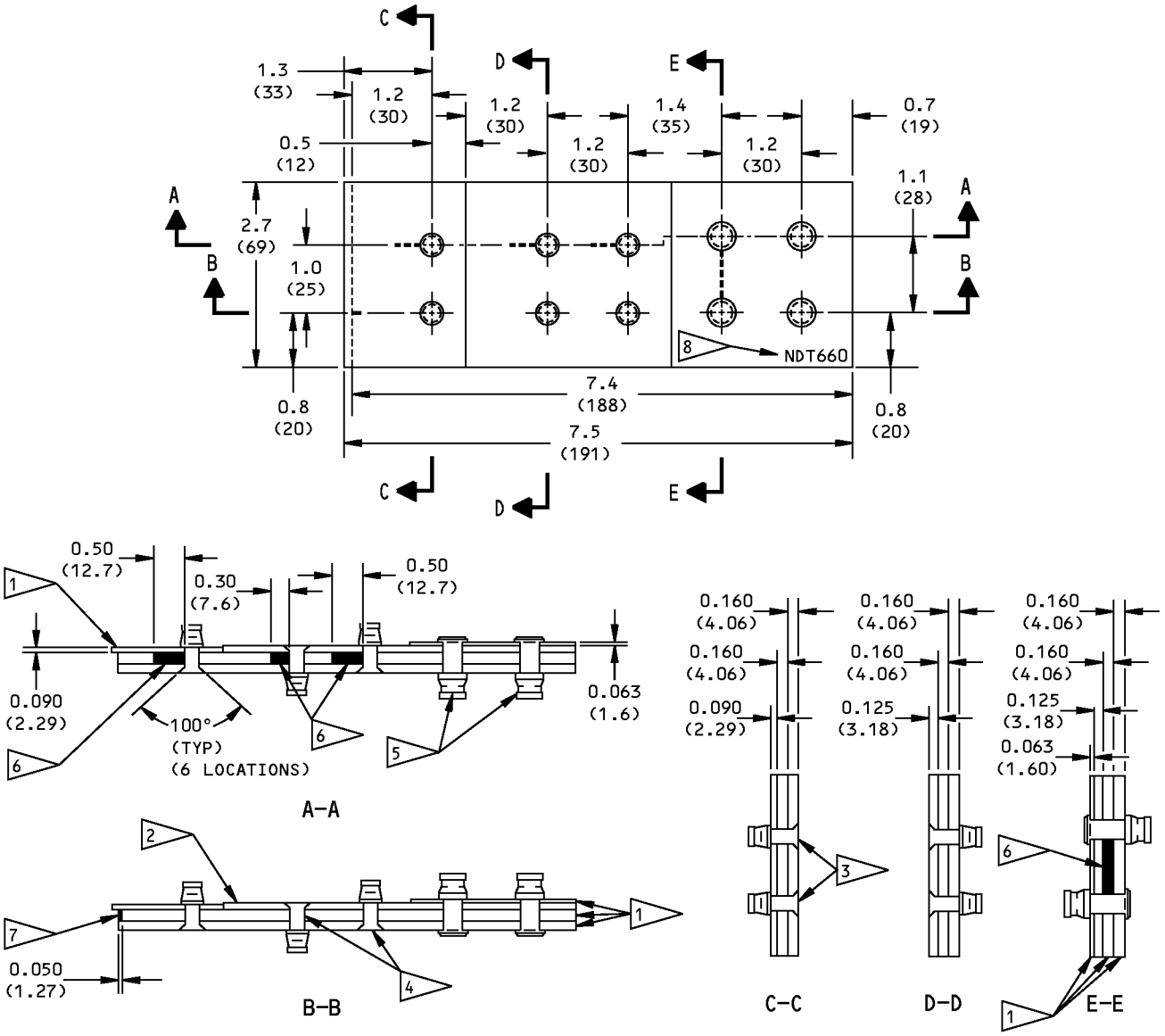
NOTES

- THE LEFT SIDE IS SHOWN, THE RIGHT SIDE IS OPPOSITE.

EXAMINE THESE THREE FASTENER HOLES WITH A RING PROBE.

1. EXAMINE THESE TWO FASTENER HOLES FIRST.
2. THIS FASTENER HOLE CAN HAVE A 20% HIGHER BASELINE SIGNAL.
3. PUT THE SPOT PROBE BETWEEN THESE TWO FASTENER HOLES TO BALANCE THE INSTRUMENT ON THE AIRPLANE.
4. PUT THE SPOT PROBE BETWEEN THESE TWO FASTENER HOLES FOR THE INSPECTION.
5. REMOVE THIS FASTENER IF A CRACK INDICATION OCCURRED DURING THE INSPECTION OF THE UPPER TWO FASTENER LOCATIONS IDENTIFIED BY FLAG NOTES 1 AND 2 AND DO AN EDDY CURRENT, OPEN FASTENER HOLE INSPECTION OF THIS HOLE.
6. BS1809 BULHEAD OUTER CHORD FLANGE

Inspection Area 3
Figure 2



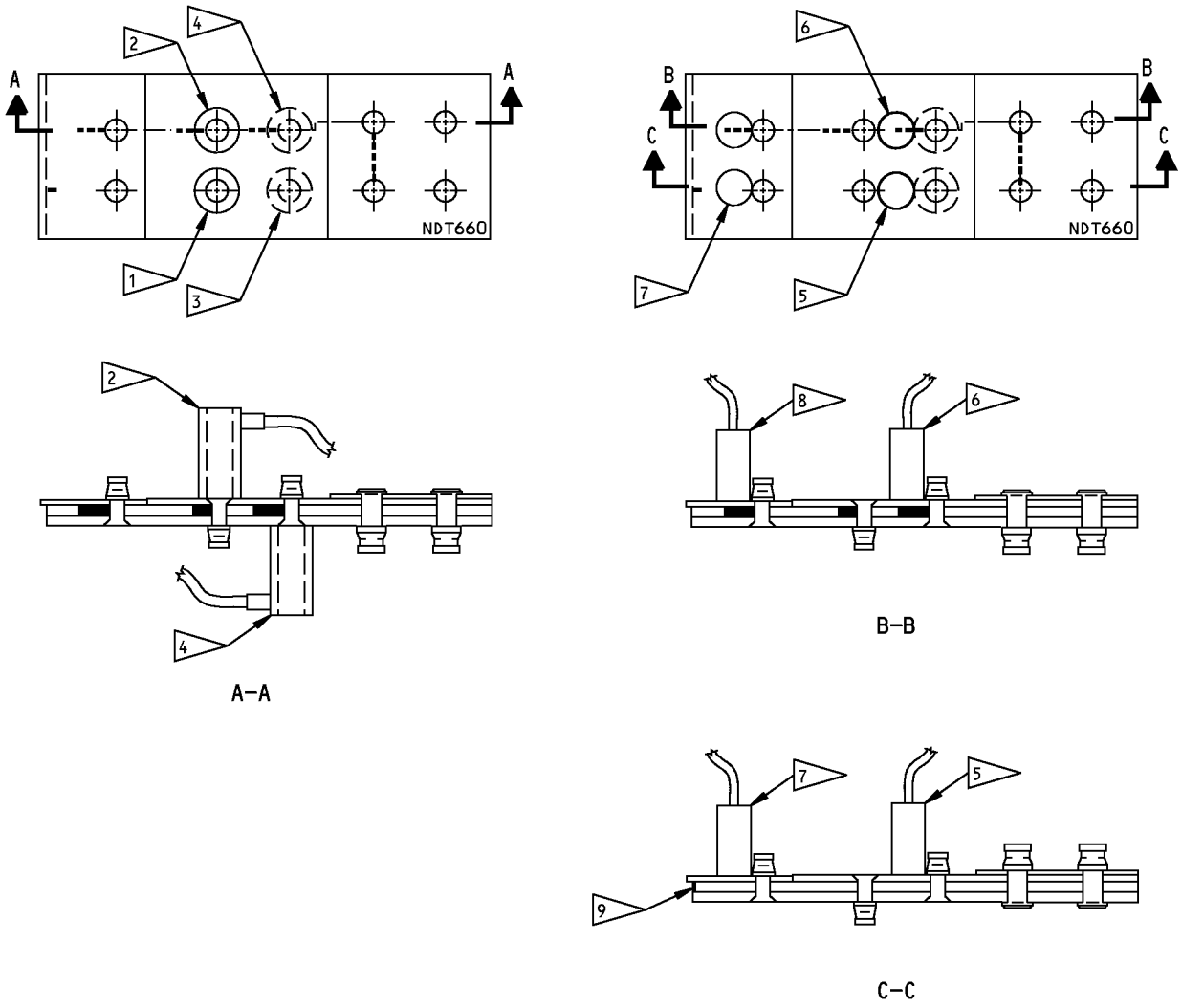
NOTES

- 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 = ± 0.05	X = ± 1

1. MATERIAL - ALUMINUM 7075-T6 BARE
2. MATERIAL - ALUMINUM 7075-T6 CLAD
3. FASTENERS - BACB30NW8K7; COLLARS - BACC30M8
4. FASTENERS - BACB30NW8K7; COLLARS - BACC30M8
5. FASTENERS - BACB30NX10K8; COLLARS - BACC30X10
6. EDM NOTCH - THE EDM NOTCH MAXIMUM WIDTH IS 0.025 INCH (0.64 MM)
7. EDM NOTCH - THE EDM NOTCH MAXIMUM WIDTH IS 0.005 INCH (0.12 MM)
8. ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT660 AT APPROXIMATELY THIS LOCATION.

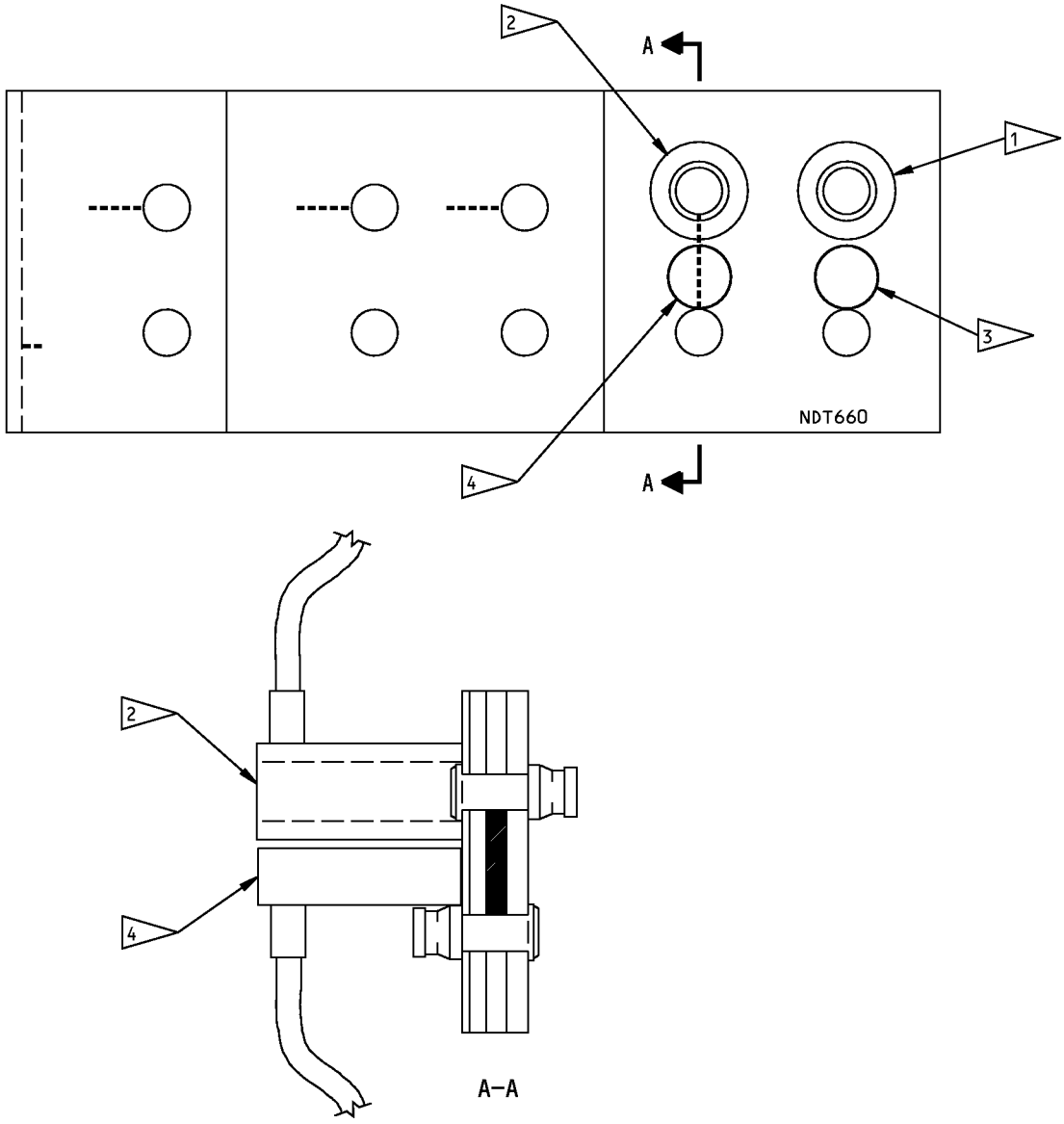
Reference Standard NDT660
Figure 3



NOTES

1. RING PROBE POSITION 1 FOR BS1809 OUTER CHORD AREA 1 SKIN FLANGE
2. RING PROBE POSITION 2 FOR BS1809 OUTER CHORD AREA 1 SKIN FLANGE
3. RING PROBE POSITION 3 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
4. RING PROBE POSITION 4 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
5. SPOT PROBE POSITION 5 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
6. SPOT PROBE POSITION 6 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
7. SPOT PROBE POSITION 7 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
8. SPOT PROBE POSITION 8 FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE
9. SURFACE NOTCH FOR BS1809 OUTER CHORD AREA 2 SKIN FLANGE EDGE

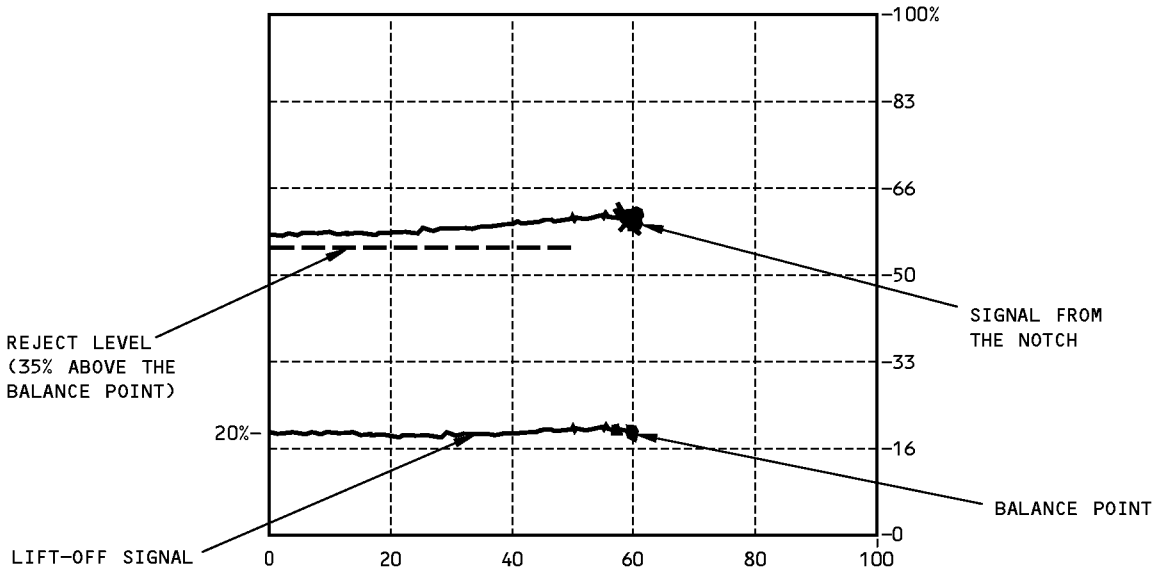
Instrument Calibration for Inspection Areas 1 and 2
Figure 4



NOTES

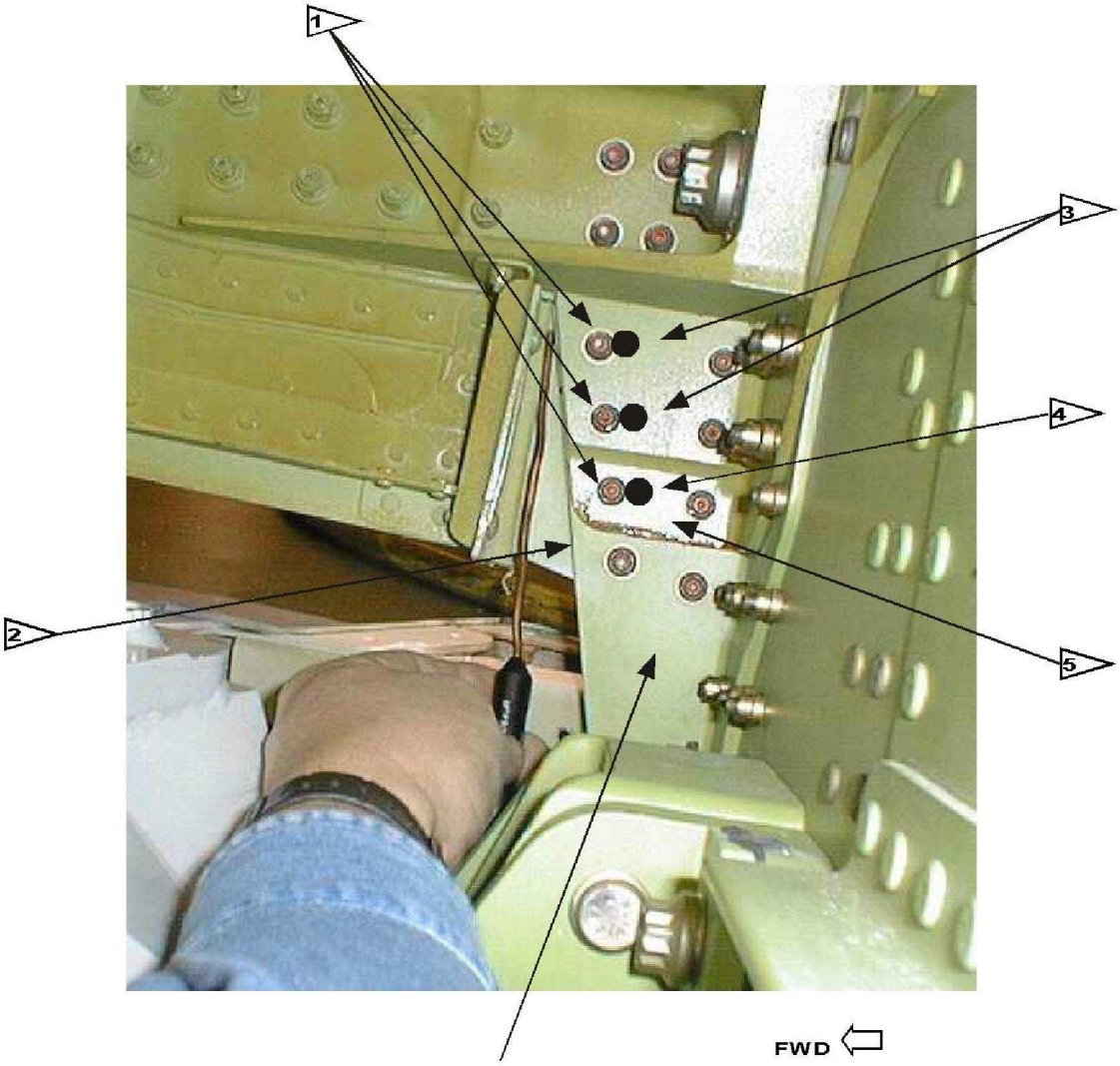
1. RING PROBE POSITION 1 FOR BS1809 OUTER CHORD BULKHEAD FLANGE
2. RING PROBE POSITION 2 FOR BS1809 OUTER CHORD BULKHEAD FLANGE
3. SPOT PROBE POSITION 1 FOR BS1809 OUTER CHORD SKIN FLANGE
4. SPOT PROBE POSITION 2 FOR BS1809 OUTER CHORD SKIN FLANGE

Instrument Calibration for Inspection Area 3
Figure 5



SCREEN DISPLAY

Calibration Screen Displays
Figure 6



NOTES:

- THE RIGHT SIDE IS SHOWN, LEFT SIDE IS OPPOSITE
- THIS VIEW LOOKS AT THE OUTER CHORD FROM INSIDE THE AIRPLANE

1. INSPECTION FASTENER HOLES
2. MOVE THE PROBE ALONG THE EDGE OF THE OUTER CHORD FLANGE
3. PUT THE SPOT PROBE ADJACENT TO THE FASTENER COLLAR
4. PUT THE SPOT PROBE ADJACENT TO THE FASTENER COLLAR
5. UPPER SPLICE FITTING WITH THICKNESS STEP SHOWN

Inspection Area 2 Fastener Holes
Figure 7

AFT PRESSURE BULKHEAD - WEB TO Y-RING ATTACHMENT

1. Purpose

A. Use this procedure to do an inspection for surface cracks in the web of the aft pressure dome (body station 1582) at the web to Y-ring circumferential attachment.

B. Cracks can start in the fastener holes of the inner row (the fastener row nearest the center of the pressure dome) and grow in a circumferential direction. The location of the fastener holes to examine are given in Figure 1.

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

D. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-80-I01A

2. Equipment

A. General

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

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

B. Instrument

(1) Use an eddy current instrument that:

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

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

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

(a) Locator UH; Hocking, Inc.

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

(c) Phase 1.1 SD; Hocking, Inc.

C. Probes

(1) A shielded right-angle probe with a drop of 0.5 inch (12.7 mm) is recommended. Other probe designs can be used if a satisfactory inspection can be done.

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

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

(a) 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.

3. Preparation for Inspection

A. Gain access to the pressure dome through the bulk cargo door.

B. To get access to the inspection area, remove the waste water tank, air circulating fans and ductwork, and insulation blankets.

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

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 each fastener in the inspection area as shown in Figure 1. The inspection area is the fastener row shown in Figure 1 and includes all fasteners in that row around the full circumference of the bulkhead.

NOTE: If a crack occurs, the direction of crack growth will be in the circumferential direction from fastener hole to fastener hole.

(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.

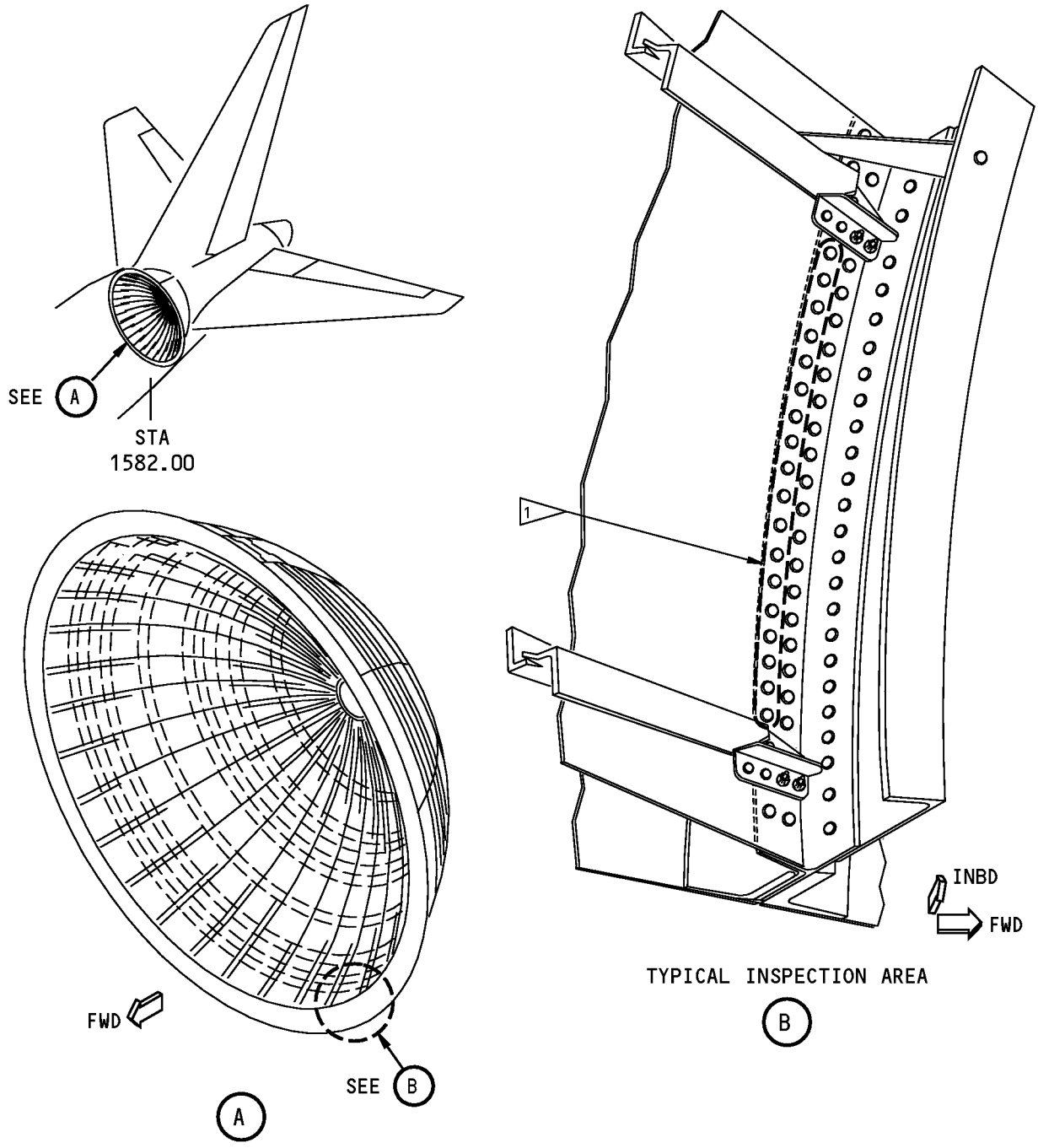
B. For instruments with an impedance plane display, refer to Part 6, 51-00-19, par. 6, to make an analysis of indications that occur during the inspection.

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

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

(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.



1 INSPECTION AREA -- MAKE A SCAN AROUND EACH FASTENER THAT IS BETWEEN THE RADIAL STIFFENERS AND IN THE INSPECTION AREA SHOWN. DO THIS INSPECTION AROUND THE FULL CIRCUMFERENCE OF THE BULKHEAD.

Inspection Location
Figure 1

AFT PRESSURE BULKHEAD - BS 1582 (MFEC) INSPECTION

1. Purpose

A. This procedure uses mid-frequency eddy current to find cracks at the far side of the first layer of the aft pressure bulkhead. Figure 1 shows the fastener locations that are examined at the radial web lap splices and circumferential tear strap splices.

NOTE: This procedure will also find surface cracks at the locations given above.

(1) Service bulletin reference: 767-53A0147.

B. To examine the second layer of the aft pressure bulkhead, see Part 6, 53-80-02.

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 between 34 and 45 kHz.

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

(a) Nortec 1000/2000; Nortec/Olympus NDT

(b) NDT 19e; Nortec/Olympus NDT

C. Probes

(1) Use a spot probe with these properties:

NOTE: A reflection type probe is recommended.

(a) Use a probe with an end diameter that is no larger than 0.190 inch (4.83 mm) and a probe drop (dimension ''A'') that is no more than 0.50 inch (12.7 mm). Refer to Part 6, 51-00-19, Figure 1.

(b) Operates at a frequency between 34 and 45 kHz.

(c) Is at a right angle.

NOTE: A straight probe can be used where a satisfactory scan around the fasteners can be done.

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

(a) NEC-1084; NDT Engineering Corp (Olympus NDT)

(b) NEC-1095; NDT Engineering Corp (Olympus NDT)

(c) SPC-4TF-105-1R; EC/NDT Company

(d) SPC-4TF-105-2R; EC/NDT Company

(e) SPC-4TF-105-3; EC/NDT Company

D. Reference Standard - Use reference standard ANDT1079 as given in Part 6, 53-00-07, par. 2.D.(2)(a).

3. Preparation for Inspection

A. Refer to Part 6, 53-00-07, par. 3 for preparation instructions.

4. Instrument Calibration

A. Calibrate the equipment as specified in the calibration instructions of Part 6, 53-00-07, par. 4.B thru 4.I. Use reference standard ANDT1079 as given in Part 6, 53-00-07, par. 2.D.(2)(a) and an instrument frequency of 34 kHz to 45 kHz.

5. Inspection Procedure

A. Examine the radial web lap splices (12 locations; see Figure 1) for cracks as follows:

(1) Find the radial web lap splices. See Figure 1.

(2) Identify the second row of fasteners from the visible edge of the web. See Figure 2.

(3) Examine all fastener locations in the second row, from the Y ring to the dome inner ring at all 12 radial web lap splice locations, as specified in Part 6, 53-00-07, par. 5.

NOTE: It is not necessary to examine inspection areas of the radial web lap splices where control cable doublers, hydraulic line doublers, electrical line doublers, APU outlet doublers, or tear straps prevent access. See Figure 1, flagnotes 1 thru 5.

B. Examine the regular circumferential tear strap splices (72 locations; see Figure 1) for cracks as follows:

(1) See Figure 1 for the regular tear strap splice locations. There are 65 four row splices (four fasteners from the visible edge), and 7 five row splices (five fasteners from the visible edge).

NOTE: Make sure that the 4 and 5 row splices are identified. Count the rows (fasteners) from the tear strap edge, to find the correct fasteners to examine.

(2) Identify the two fastener locations at each regular tear strap splice where an inspection is necessary. See Figure 3 thru Figure 5.

NOTE: Figure 3 shows a four row splice. At the five row splice locations, count five fasteners from the visible edge and examine those fastener locations.

(3) Make a scan around the fasteners as specified in Part 6, 53-00-07, par. 5.

C. Examine the super circumferential tear strap splices for cracks as follows:

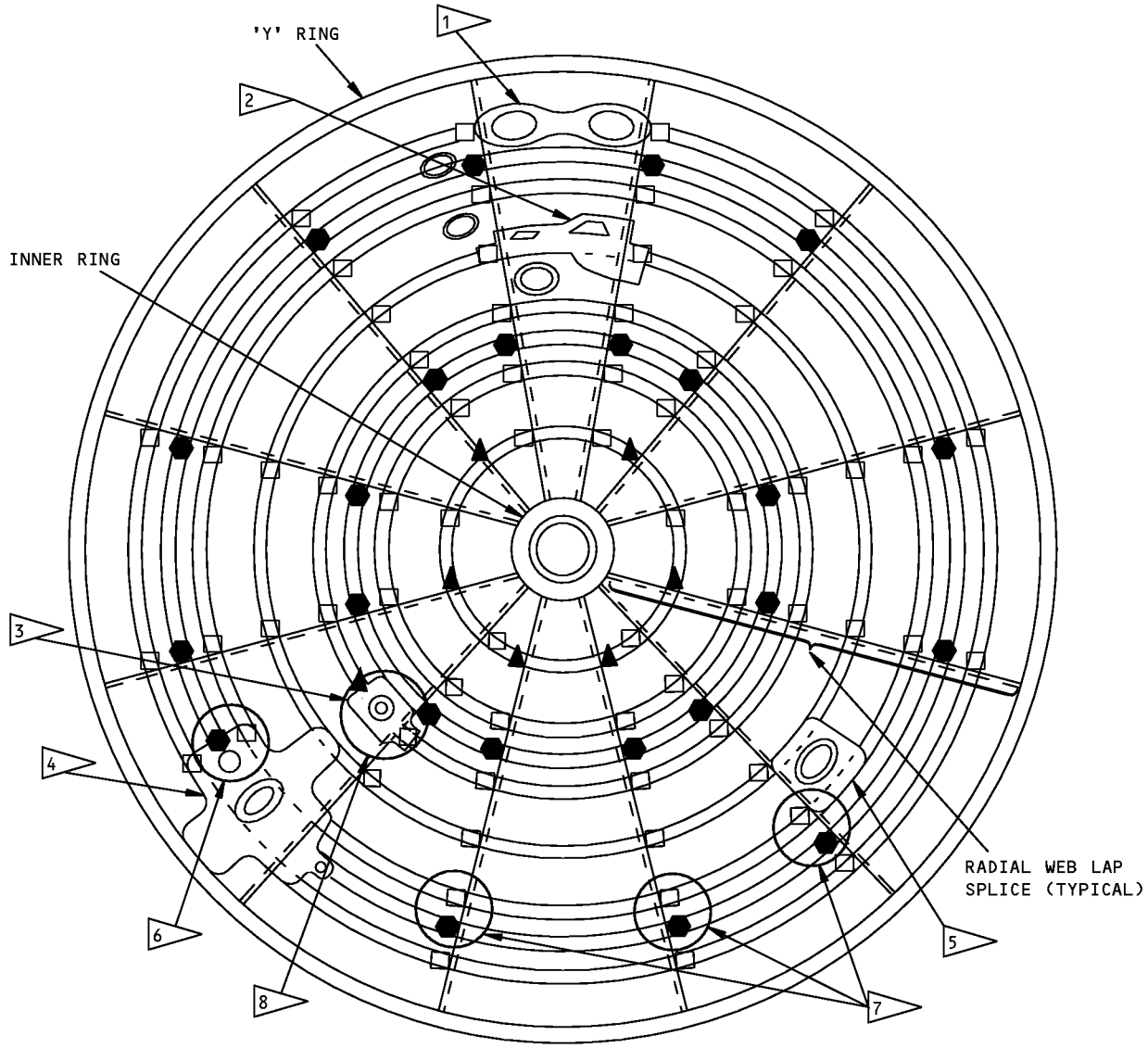
(1) See Figure 1 for the super tear strap splice locations. There are 12 splices on the outer super tear strap and 12 splices on the inner super tear strap.

(2) Identify the four fastener locations at each super tear strap splice where an inspection is necessary. See Figure 3 thru Figure 5.

(3) Make a scan around the identified fasteners at all super tear strap splice locations as specified in Part 6, 53-00-07, par. 5.

6. Inspection Results

A. Refer to Part 6, 53-00-07, par. 6.B thru 6.C.(4)(b) to make an analysis of signals that occur during the inspections.



VIEW AS YOU LOOK FORWARD

NOTES:

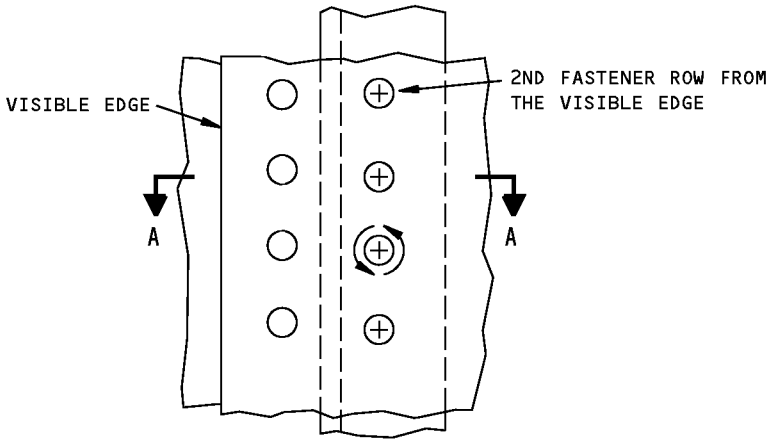
- NO INSPECTION IS NECESSARY WHERE THE OUTLETS, IDENTIFIED BY FLAG NOTES 1 THRU 5, PREVENT ACCESS TO THE INSPECTION AREAS.

1. ELECTRICAL OUTLETS
2. CONTROL CABLE OUTLETS
3. APU FUEL OUTLETS
4. APU OUTLETS
5. ELECTRICAL OUTLETS
6. REFER TO FIGURE 4 FOR THE INSPECTION DETAILS
7. REFER TO FIGURE 5 FOR THE INSPECTION DETAILS
8. REFER TO FIGURE 6 FOR THE INSPECTION DETAILS

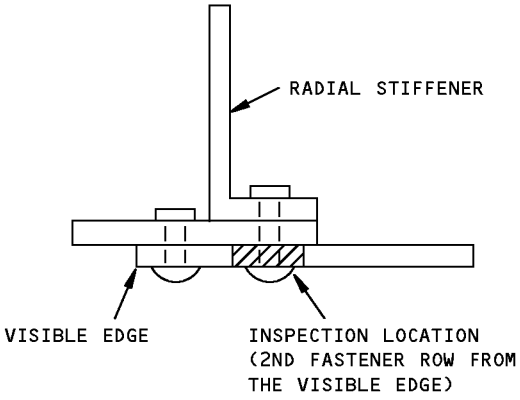
SYMBOLS

- □ REGULAR TEAR STRAP SPLICE - 4 ROW SPLICE
- ▲ REGULAR TEAR STRAP SPLICE - 5 ROW SPLICE
- ⬢ SUPER TEAR STRAP SPLICES

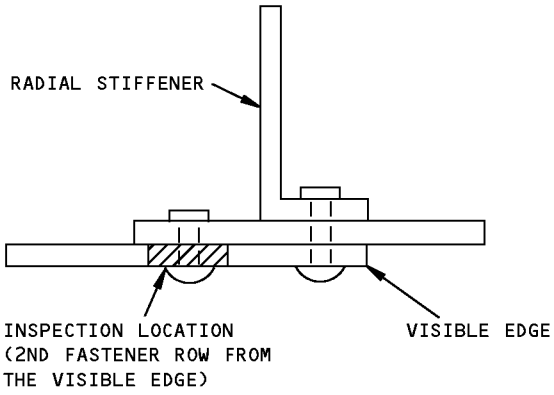
Aft Pressure Bulkhead - BS 1582 (MFEC) Inspection
Figure 1



RADIAL WEB LAP SPLICES



A-A



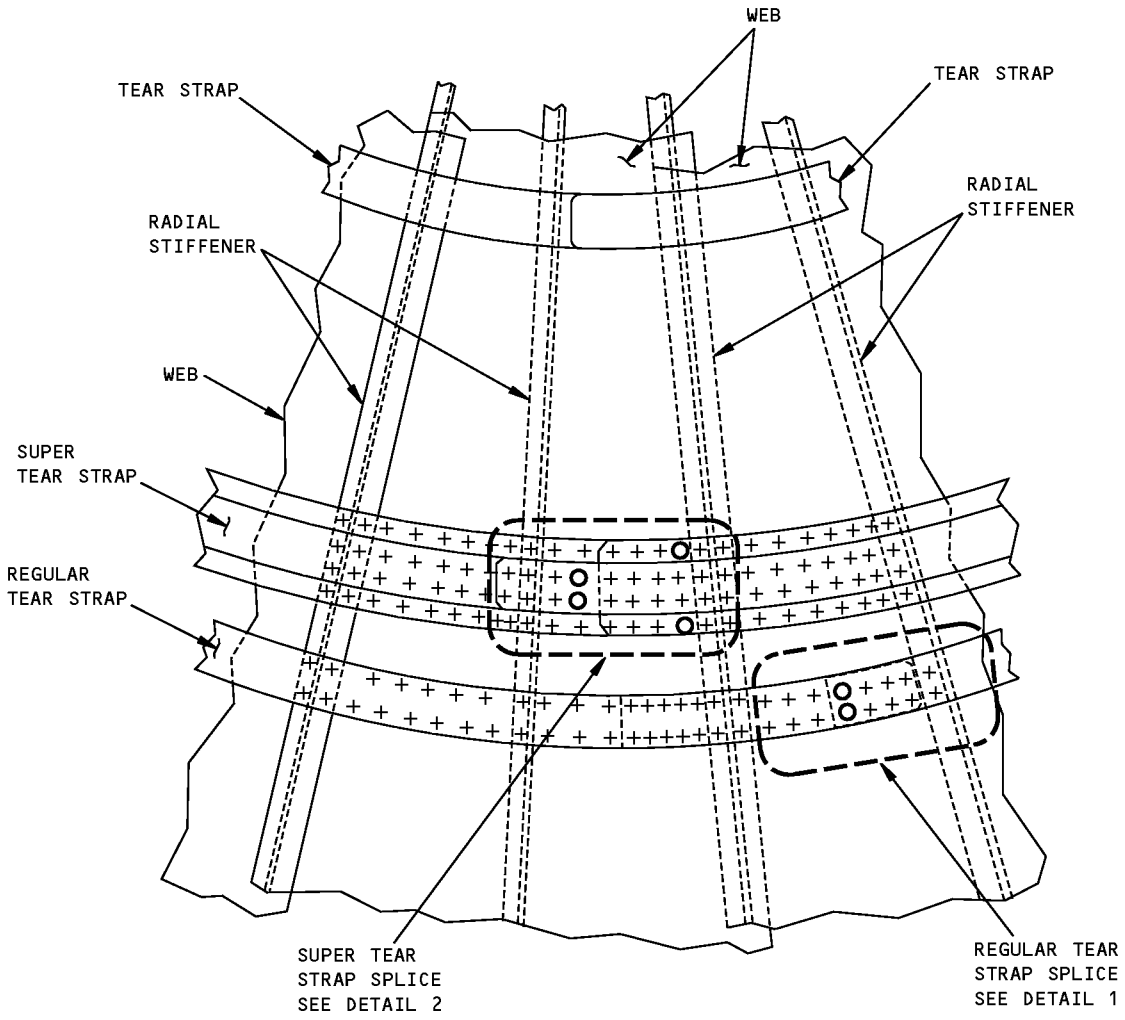
ALTERNATIVE CROSS SECTION

SYMBOLS

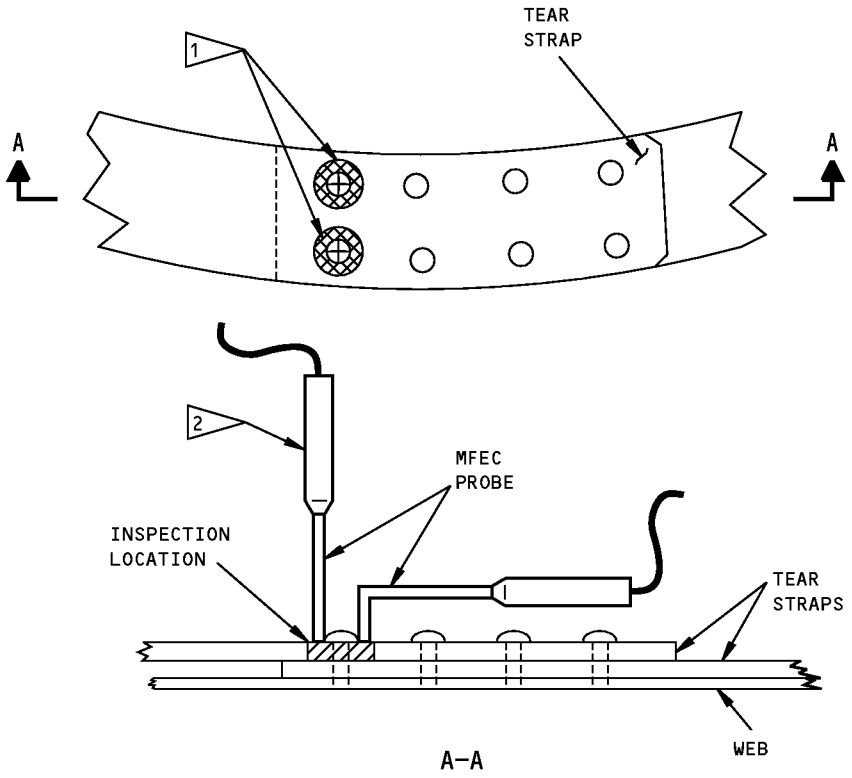
⊕ INSPECTION FASTENERS (ALL FASTENERS IN THE RADIAL STIFFENER)

360 DEGREE SCAN AROUND THE FASTENER HEAD

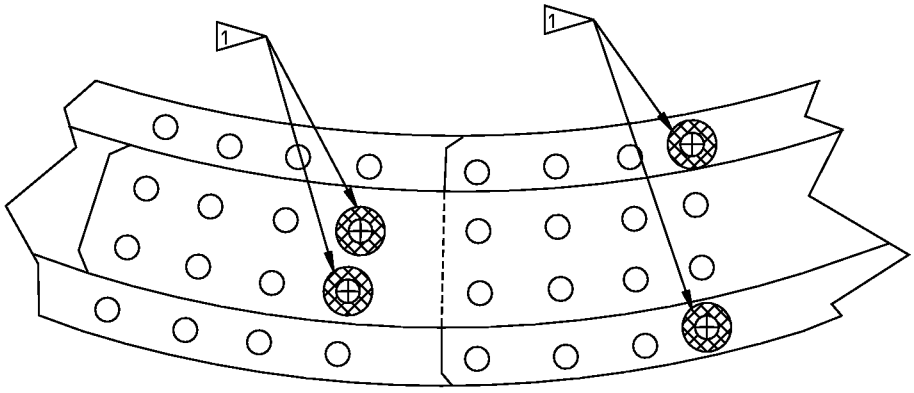
Radial Web Lap Splice Inspection
Figure 2



Regular and Super Tear Straps
Figure 3 (Sheet 1 of 2)



REGULAR TEAR STRAP SPLICE
DETAIL 1



SUPER TEAR STRAP SPLICE
DETAIL 2

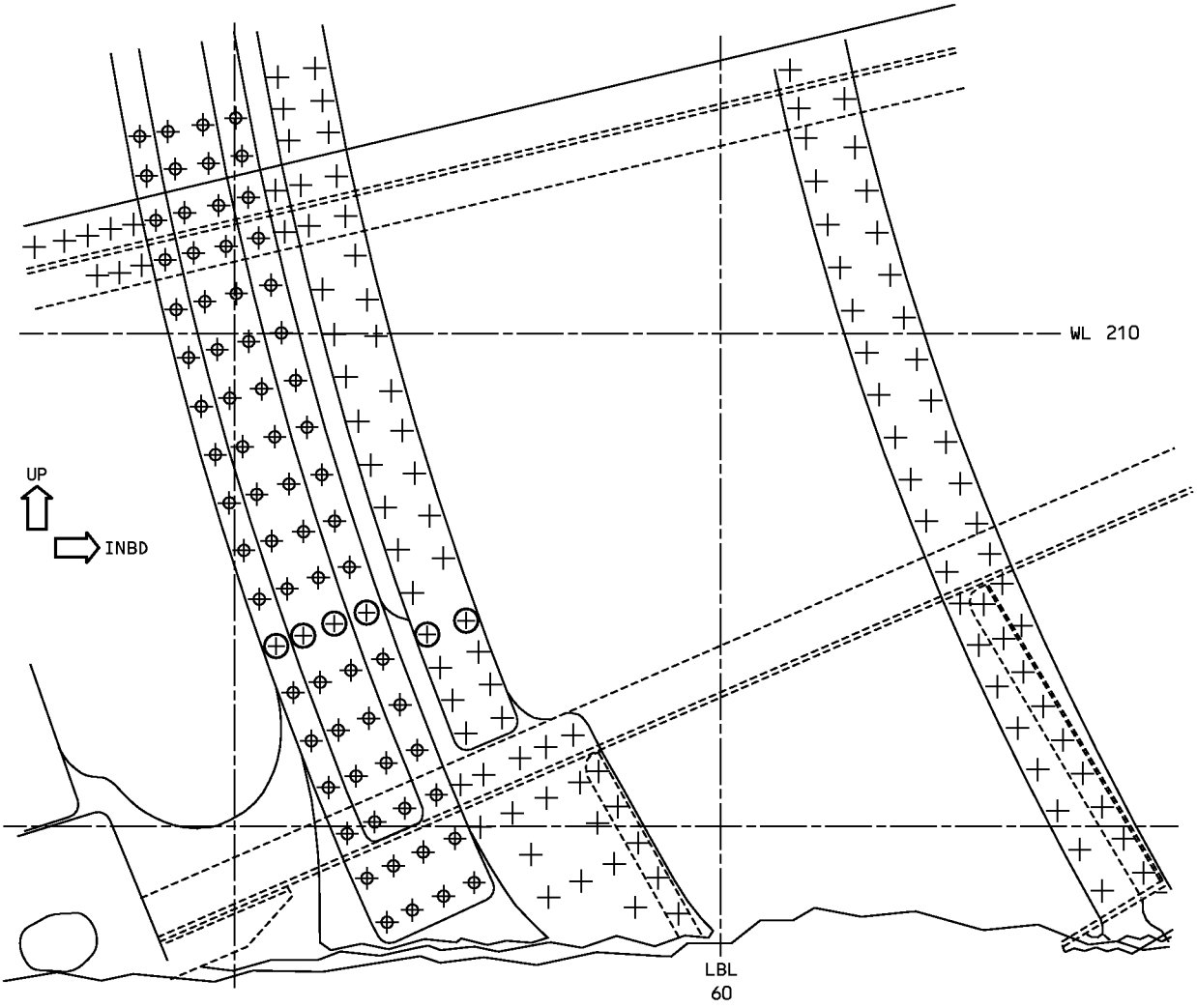
NOTES:

⊕ INSPECTION FASTENERS

1 DO A 360 DEGREE SCAN AROUND THE FASTENER HEAD (TYPICAL)

2 A STRAIGHT PROBE CAN BE USED IF THERE IS NO INTERFERENCE WITH STRUCTURE DURING A SCAN

Regular and Super Tear Straps
Figure 3 (Sheet 2 of 2)



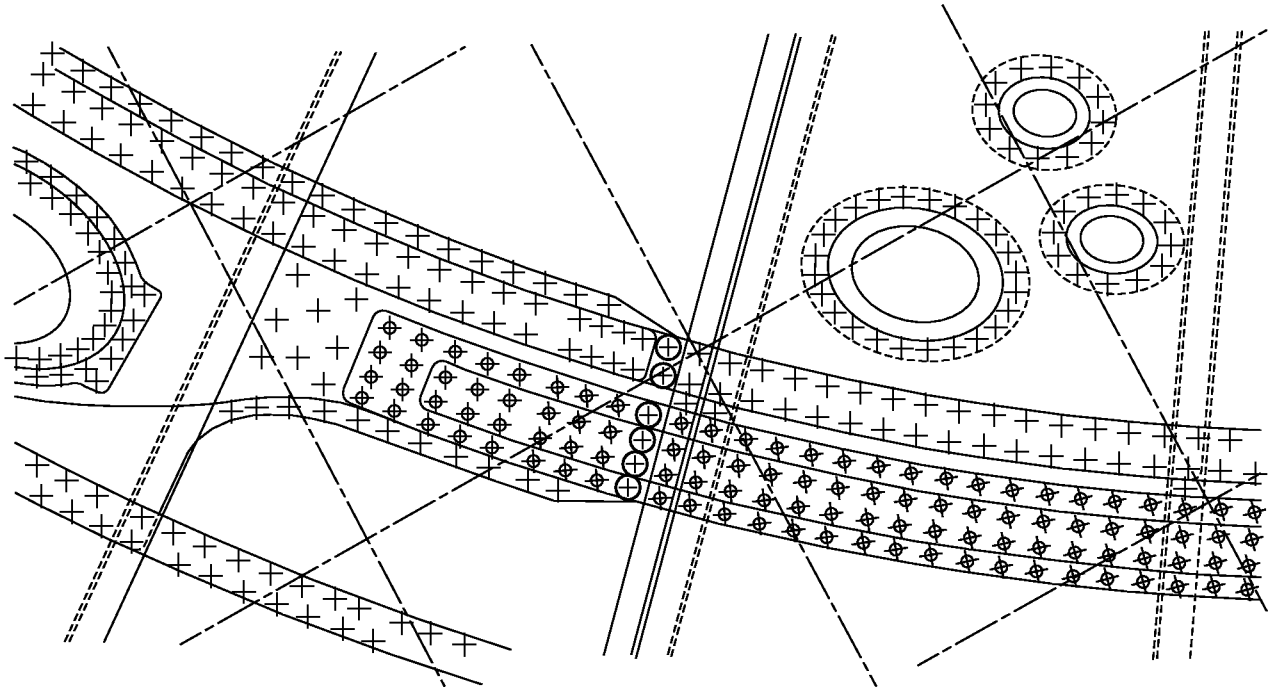
INSPECTION DETAILS

NOTES:

⊕ INSPECTION FASTENERS

- DO A 360 DEGREE SCAN AROUND THE FASTENER HEAD (TYPICAL)
- A STRAIGHT PROBE CAN BE USED IF THERE IS NO INTERFERENCE WITH STRUCTURE DURING A SCAN

APU Outlet Doubler
Figure 4



AREA NEAR RBL 50 IS SHOWN;
OTHER AREAS ARE ALMOST THE SAME

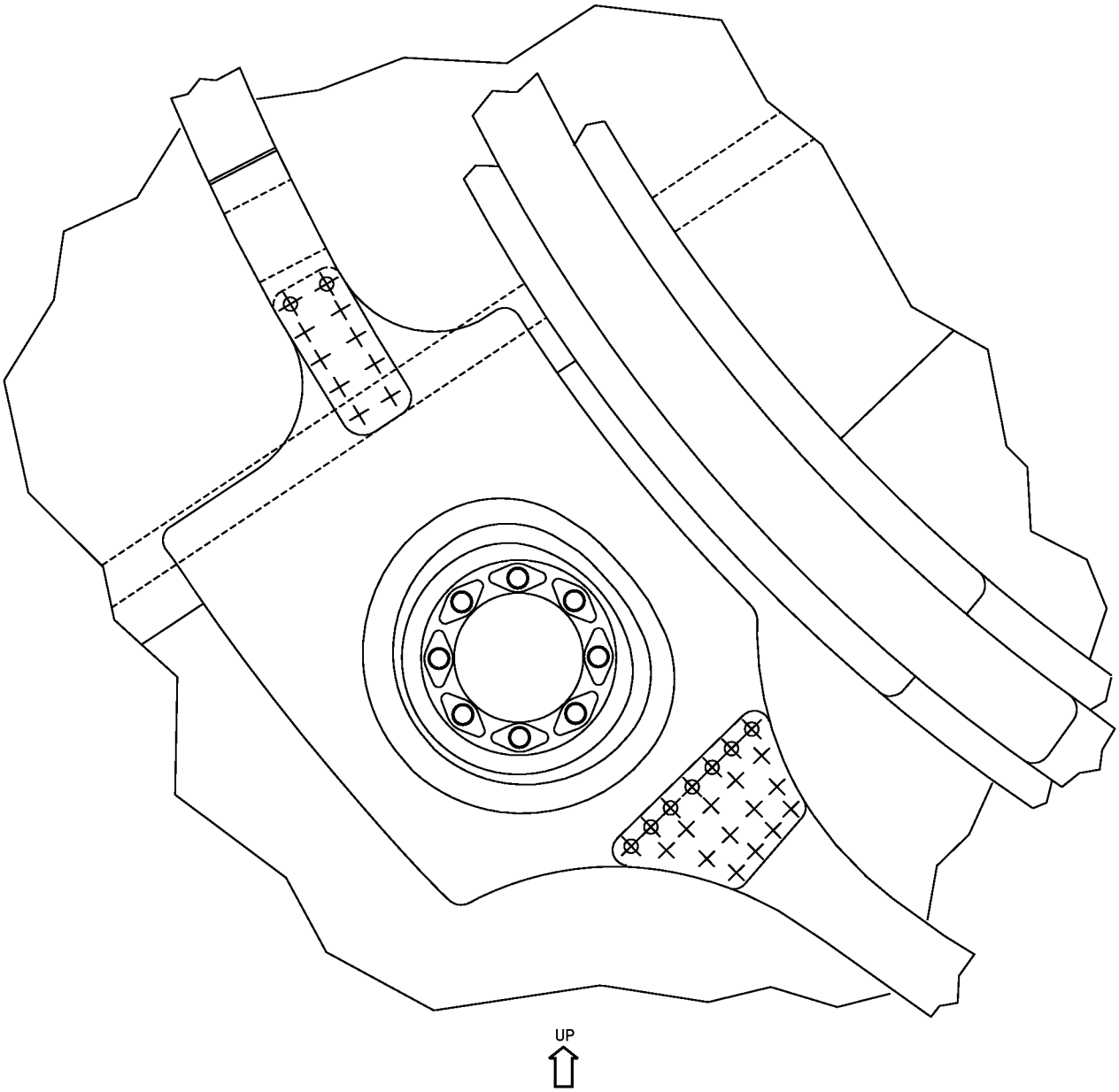
INSPECTION DETAILS

NOTES:

⊕ INSPECTION FASTENERS

- DO A 360 DEGREE SCAN AROUND THE FASTENER HEAD (TYPICAL)
- A STRAIGHT PROBE CAN BE USED IF THERE IS NO INTERFERENCE WITH STRUCTURE DURING A SCAN

Areas Near Doublers
Figure 5



INSPECTION DETAILS

NOTES:

REFERENCE FASTENERS

INSPECTION FASTENERS

APU Fuel Outlets Doubler
Figure 6