EFFECTIVITY
MODEL: 707/720 SSI DOCUMENT (D6-44860) REFERENCE: SSD 55-A00-07 55-A10-07 55-P20-07 55-P30-07 55-A40-07

PART 4 - ULTRASONIC

VERTICAL STABILIZER

1. Purpose

To detect cracks in the aft fin terminal fitting lug holes (Detail 1).

2. Equipment

Any ultrasonic equipment which satisfies the requirements of this procedure may be used. The following equipment was used during the development of this procedure and found acceptable.

NOTE: This procedure may require an instrument/transducer combination of better than average sensitivity to obtain satisfactory calibration.

(1) Instrument

(a) Sonic Mark IV, Sonic Instruments

(2) Transducer

(a) Shear wave, type SMZ, 5 MHZ, 0.375 inch (0.95 cm) X 0.375 inch (0.95 cm) element, 45°S, with top mounted connector: P/N: 57A3056TC, Automation Industries

(3) Reference Standard

(a) Fabricate reference standard as shown in Detail II.

(4) Couplant

(a) Light oil or grease.

3. Preparation for Inspection

NOTE: (1) This inspection can be performed with the vertical fin folded or removed.

(2) Inspection of the outboard side of the right side fitting must be accomplished before the fin is folded.

A. Remove the fin-to-body mid fairings, left and right sides.

Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 1)

B. Remove paint and smooth out inspection surfaces (Detail I) by polishing with fine grit abrasive cloth.

C. Clean inspection areas thoroughly to remove all grease, grit or other foreign material.

4. Instrument Calibration

A. Apply a thin film of couplant to the inspection surface of the reference standard. See Detail II and III.

B. Place the transducer on the reference standard so that the sound beam is pointed at the hole edge (Position I) and manipulate to obtain a maximum indication. Adjust sensitivity to obtain saturated response from hole, and adjust instrument controls to place indication at 80 percent of full screen width.

NOTE: Because of the beam spread, an indication due to sound reflection from the edge of the hole may appear on the screen (see Detail III).

C. Move the transducer forward to Position 2, so that the sound beam is pointed at the notch. Manipulate to obtain a maximum indication. Adjust instrument sensitivity to obtain an 80 percent of full screen width indication. Nose position of indication on screen.

NOTE: Extent of inspection coverage can be confirmed by moving transducer forward to Position 3. Note position and amplitude of indication.

D. Turn transducer around and place transducer on the reference standard adjacent to the radius break-away point. Aim sound beam at the notch (Position 4) and manipulate to obtain a maximum indication. Note position and amplitude of the indication.

5. Inspection Procedure

A. Coat the area to be inspected with a thin film of couplant.

B. Place the transducer in Position A on the inspection area and manipulate to obtain the maximum signal from the hole. Refer to Detail IV. Adjust instrument sensitivity to obtain the same height response from this hole as established during instrument calibration.

C. Manipulate the transducer to cover the entire area to be inspected.

D. Place transducer on lug in Position B. Repeat par 5.B and 5.C.

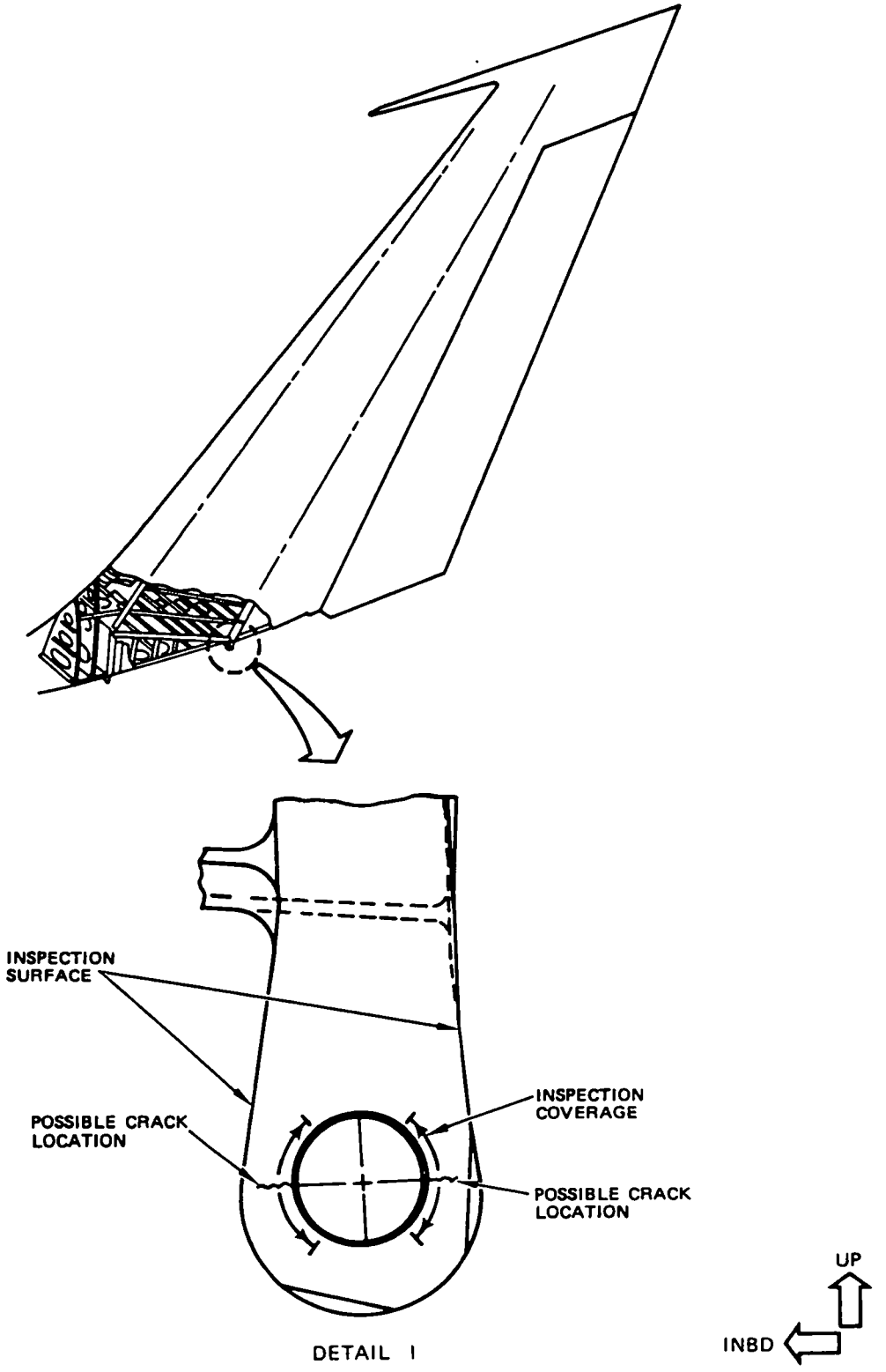
Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 2)

6. Inspection Results

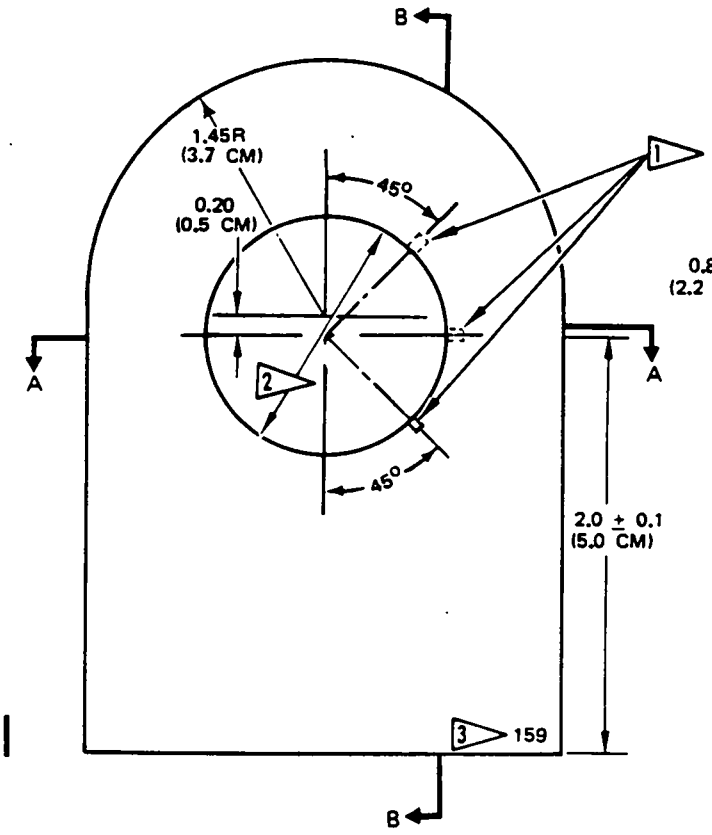
A. Ultrasonic indications equal to or greater than 50% of full signal amplitude which occur in the inspection area are potential cracks and should be investigated further.

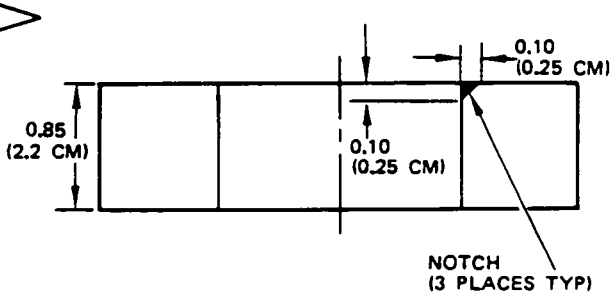
B. Compare potential crack response with response from reference standard notch.

Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 3)

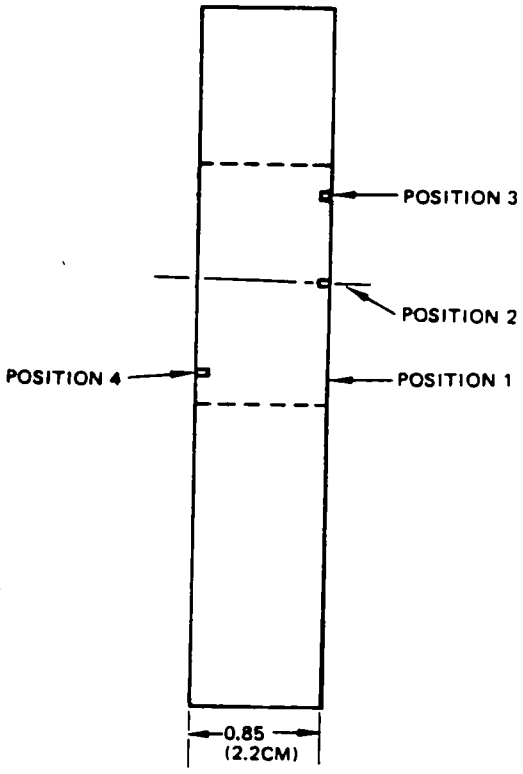


Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 4)





SECTION A–A



SECTION B–B

NOTES

- ALL DIMENSIONS ARE IN INCHES (CENTIMETERS IN PARENTHESES)
- MATERIAL. 4330M STEEL OR EQUIVALENT
- TOLERANCES: X.X ± 0.01 (0.03 CM), X.XX ± 0.005 (0.013 CM)
- P/N 6411–99 AVAILABLE FROM IDEAL SPECIALTY CO.

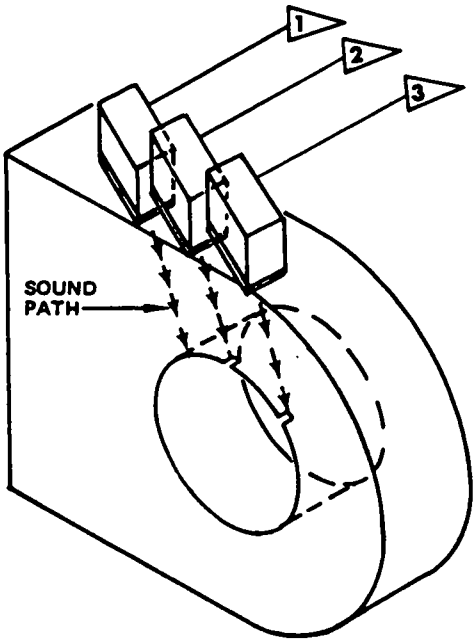
1 JEWELER'S SAWCUT 0.030 MAX WIDTH, 0.10 (0.25 CM) DEEP AT 45°, TYPICAL 3 PLACES

2 1.63 (4.1 CM) DIAMETER HOLE

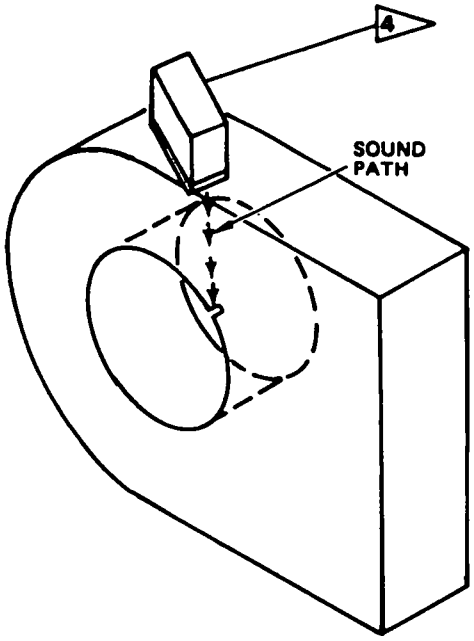
3 ETCH OR STEEL STAMP WITH 159

REFERENCE STANDARD
DETAIL II

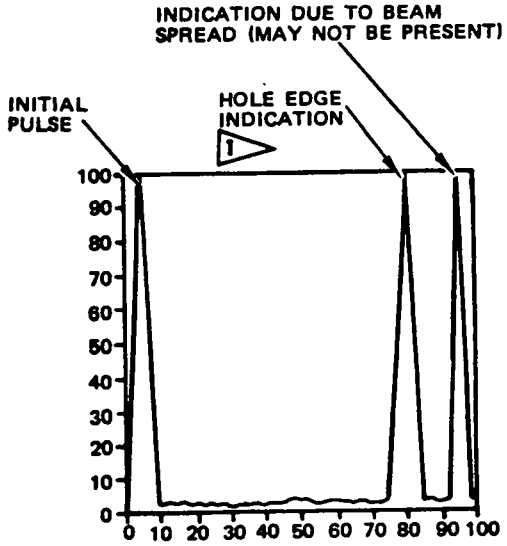
Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 5)



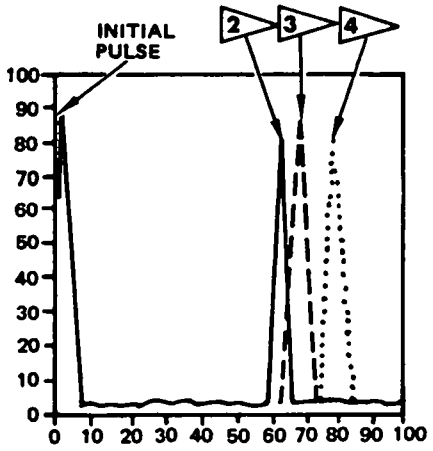
TRANSDUCER PLACEMENT, POS. 1–3



TRANSDUCER PLACEMENT, POS. 4



RESPONSE PATTERN FROM REFERENCE STANDARD; TRANSDUCER AT POS. 1



RESPONSE PATTERN FROM REFERENCE STANDARD; TRANSDUCER AT POS. 2 THRU 4

1 TRANSDUCER AT POSITION 1 FOR CALIBRATION – UNNOTCHED

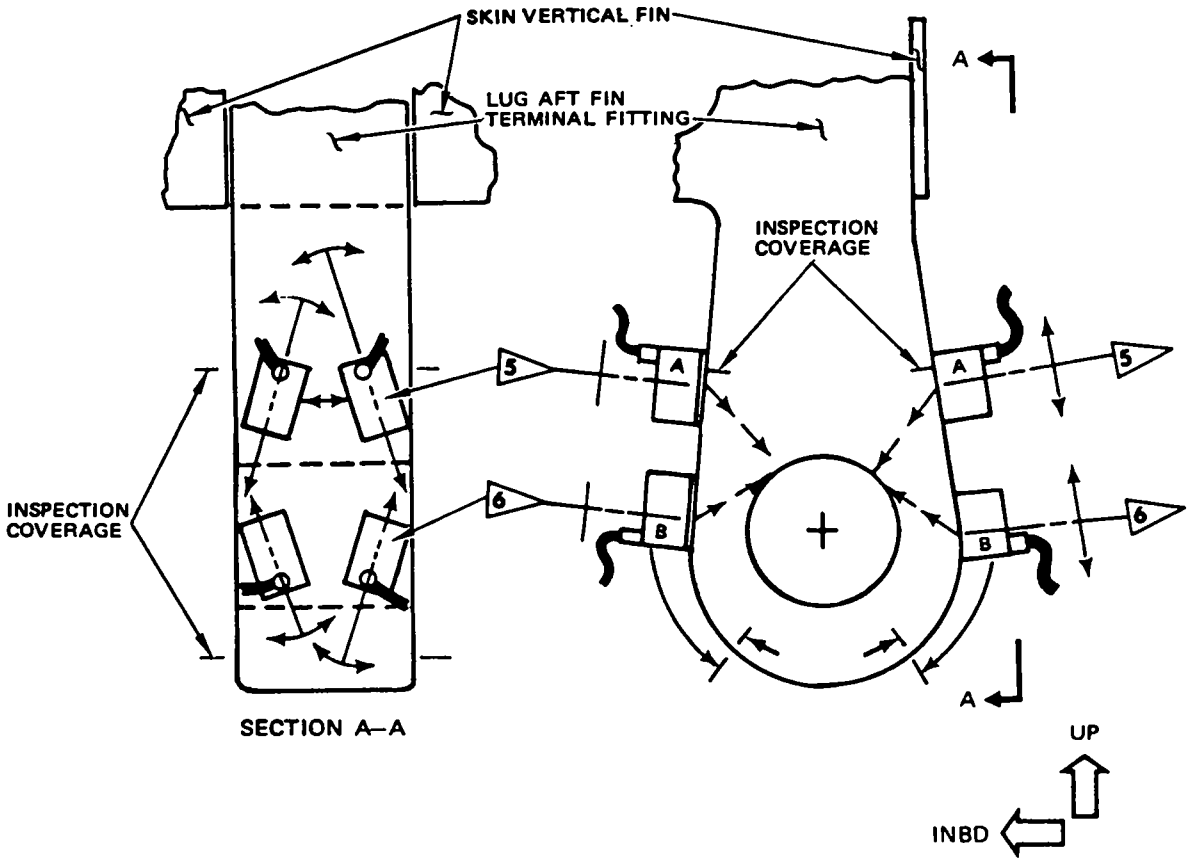
2 TRANSDUCER AT POSITION 2 NOTCH

3 TRANSDUCER AT POSITION 3 NOTCH

4 TRANSDUCER AT POSITION 4 NOTCH

TRANSDUCER POSITIONS FOR CALIBRATION
DETAIL III

Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 6)



NOTES

5 PLACE TRANSDUCER ON LUG IN POSITION SHOWN AND MANIPULATE TO OBTAIN MAXIMUM SIGNAL FROM HOLE. ADJUST INSTRUMENT SENSITIVITY TO OBTAIN THE SAME RESPONSE FROM THE HOLE AS ESTABLISHED DURING INSTRUMENT CALIBRATION.

MANIPULATE TRANSDUCER TO COVER THE ENTIRE AREA TO BE INSPECTED

6 TURN TRANSDUCER AROUND AND PLACE ADJACENT TO THE RADIUS BREAK AWAY POINT IN POSITION SHOWN.

MANIPULATE TRANSDUCER TO INSPECT THE ENTIRE INSPECTION AREA OF THE LUG.

TRANSDUCER POSITIONS FOR INSPECTION
DETAIL IV

Aft Fin Terminal Fitting Lug Hole
Figure 1 (Sheet 7)