INNER CHORD AND STRAP INSPECTION AT THE FASTENER HOLES AT EACH END OF THE FRAME SPLICE JOINT THAT IS AT STA 1461, STR. 24L TO 26L

1. Purpose

A. Use this ultrasonic inspection procedure to examine the inner chord and the strap for cracks at the fastener holes that are at each end of the frame splice joint. The fastener holes are in the frame splice joint that is at station 1461, between stringers 24L and 26L. See Figure 1. The type of cracks this procedure can find are those that travel in a forward and aft direction as shown in Figure 1.

B. This inspection is done a 2 locations on the inner chord and 2 locations on the strap. See Figure 1.

C. MPD Appendix B DTR Check Form Reference:

(1) ITEM 53-60-I10B

2. Equipment

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

A. Instruments

(1) All ultrasonic instruments are permitted for use if they:

(a) Can operate at a frequency between 4 MHz and 6 MHz.

(b) Can find the simulated crack in the reference standard as specified in the calibration instructions of this procedure.

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

(a) USN 50; Krautkramer Branson

(b) Epoch 2002; Panametrics

(c) USL 38; Krautkramer Branson

B. Ultrasonic Transducer

(1) The transducer must put a shear wave, at an angle of 70 degrees, in aluminum and operate at 5 MHz. The maximum length of the transducer is 0.75 inch (19 mm). The maximum width of the transducer is 0.33 inch (8.4 mm).

(2) The shear wave transducer specified below was used to help prepare this procedure:

(a) Part Number 57A3066TC; 5 MHz, 70 degrees in aluminum. Made by Staveley Sensors.

C. Reference Standards - Make reference standard NDT620 as specified in Figure 2.

D. Ultrasonic Couplant - Use oil, grease or an equivalent couplant that will not damage the airplane structure.

3. Prepare for the Inspection

A. Remove the interior panels and insulation in the inspection area to get access to the inner chord and strap. See Figure 1.

4. Instrument Calibration

NOTE: Refer to the instrument instruction manual for the instrument operation instructions.

A. Set the instrument frequency between 4 and 6 MHz, if applicable.

B. Apply couplant to reference standard NDT620 at the transducer position shown in Figure 3.

C. Put the initial pulse signal at 0% of full-screen width.

D. Put the transducer on the reference standard so that it points directly at the fastener hole. Make sure the front edge of the transducer does not move across the reference line. See Figure 3.

E. Adjust the range and delay controls so that the signal from the fastener hole is at 80% of full-screen width. Make sure that the initial pulse stays at 0% of full-screen width.

F. Slowly turn the transducer until the signal from the reference standard notch shows at approximately 85% of full-screen width.

G. Adjust the instrument gain so that the signal from the notch is between 30 and 70% of full-screen height. See Figure 3.

H. Adjust the position of the transducer so that the highest signal from the reference standard notch is shown on the screen display.

I. Adjust the instrument gain so that the notch signal is at 100% of full-screen height.

J. Increase the gain by 6 dB.

NOTE: Do not remove the 6 dB gain during the inspection.

K. Move and turn the transducer along the reference line to get the signals from the fastener hole and the notch to show on the screen display. Identify the differences between these signals.

5. Inspection Procedure

A. Examine the inboard side of the inner chord for cracks as follows:

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

(2) Apply sufficient couplant to the inspection surfaces that the transducer will touch. These surfaces are immediately above and below the edge of the splice joint. See Figure 1.

(3) Put the transducer on the inner chord at one of the inspection locations shown in Figure 1.

(4) Slowly turn the transducer to get the highest signal from the fastener hole at the end of the splice joint.

(5) Move the transducer between the fasteners and the edge of the splice joint to examine the inner chord for cracks. Monitor the screen display for crack-type signals.

NOTE: The signal from the hole of the reference standard can occur at a different location (by a small quantity) on the screen display than the signal from the hole on the airplane. This can occur because of larger holes in the parts and/or differences in the distance between the edge of the splice joint and the hole.

(6) Do Paragraph 5.A.(3) thru Paragraph 5.A.(5) to examine the fastener hole at the other end of the splice joint.

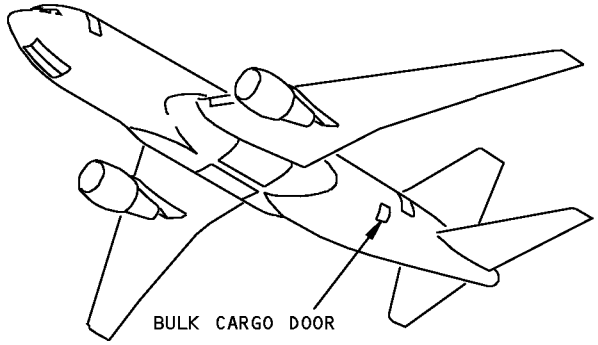
B. Examine the outboard side of the strap for cracks as follows:

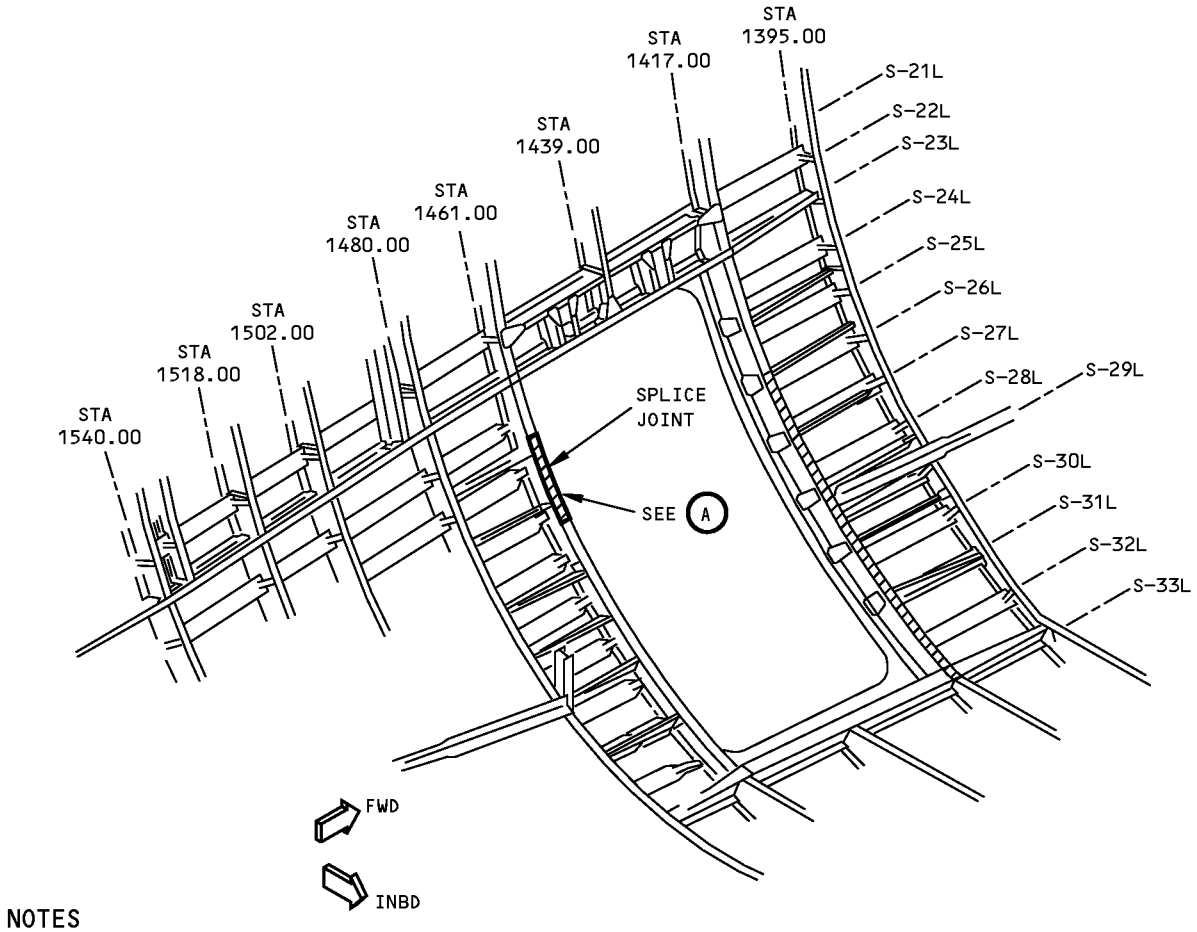
(1) Do Paragraph 5.A.(1) thru Paragraph 5.A.(6) again but for the strap inspection areas identified in Figure 1.

6. Inspection Results

A. Signals that are 50% of full-screen height (or higher) and are also between 80 and 90% of full-screen width are crack indications (see the Paragraph 5.A.(5) note). Make sure the fastener hole is not the cause of the crack-type signal.

B. To make sure that a crack-type signal is from a crack, remove the fastener and do an open hole eddy current inspection as specified in Part 6, 51-00-04, Part 6, 51-00-11 or Part 6, 51-00-16.

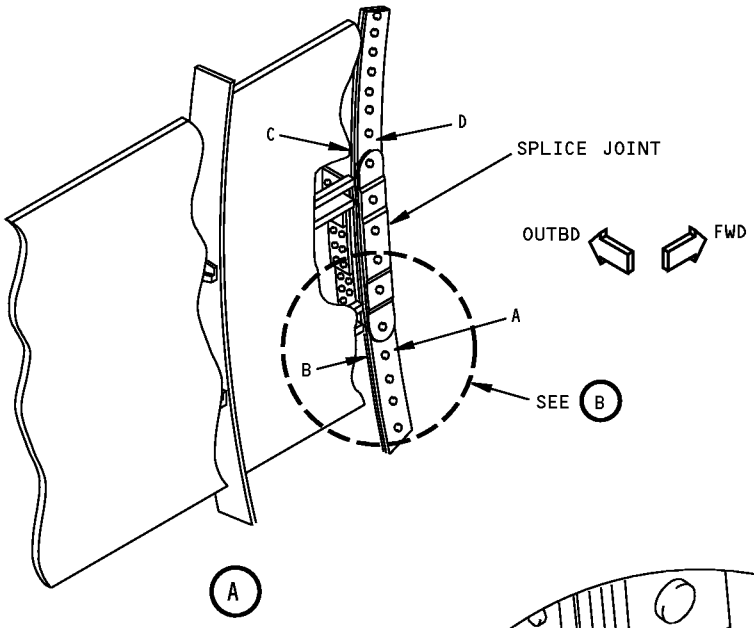


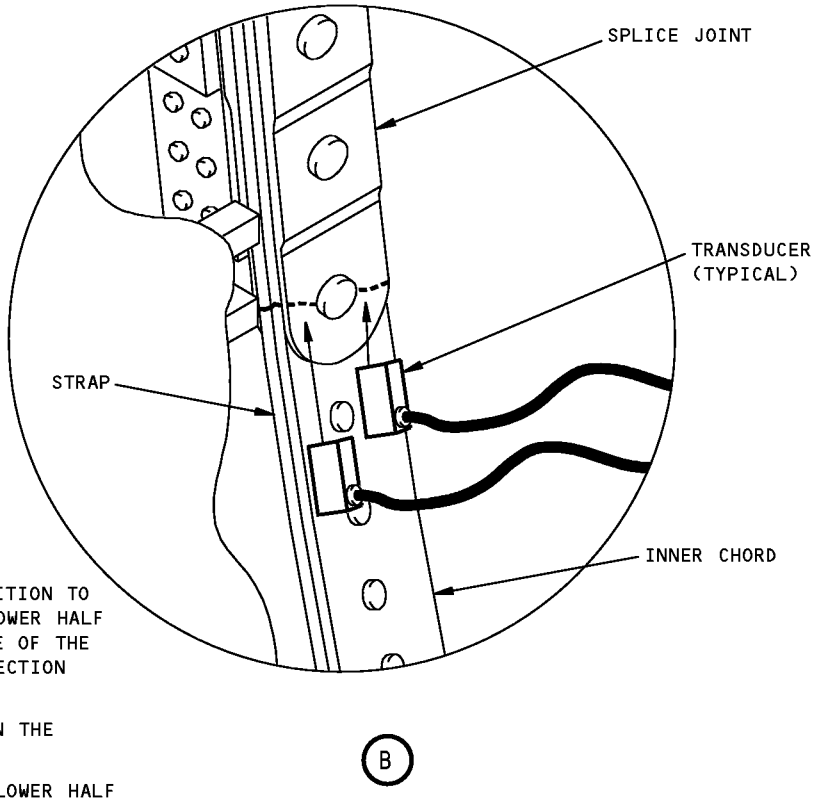


NOTES

= INSPECTION AREA

Inspection Area
Figure 1 (Sheet 1 of 2)

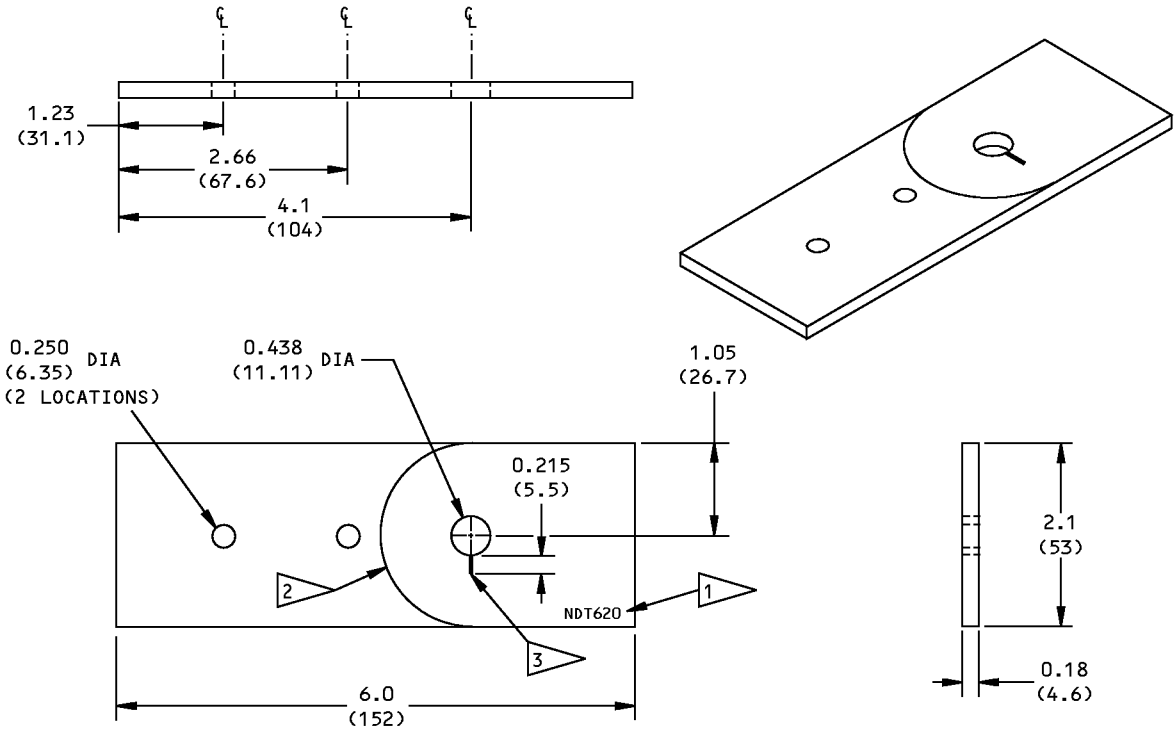




NOTES

- THE TRANSDUCERS ARE SHOWN IN POSITION TO EXAMINE THE INNER CHORD ON THE LOWER HALF OF THE SPLICE JOINT. THIS IS ONE OF THE FOUR AREAS EXAMINED BY THIS INSPECTION PROCEDURE.
- A= INNER CHORD INSPECTION AREA ON THE LOWER HALF OF THE SPLICE JOINT.
- B= STRAP INSPECTION AREA ON THE LOWER HALF OF THE SPLICE JOINT.
- C= STRAP INSPECTION AREA ON THE UPPER HALF OF THE SPLICE JOINT.
- D= INNER CHORD INSPECTION AREA ON THE UPPER HALF OF THE SPLICE JOINT.

Inspection Area
Figure 1 (Sheet 2 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

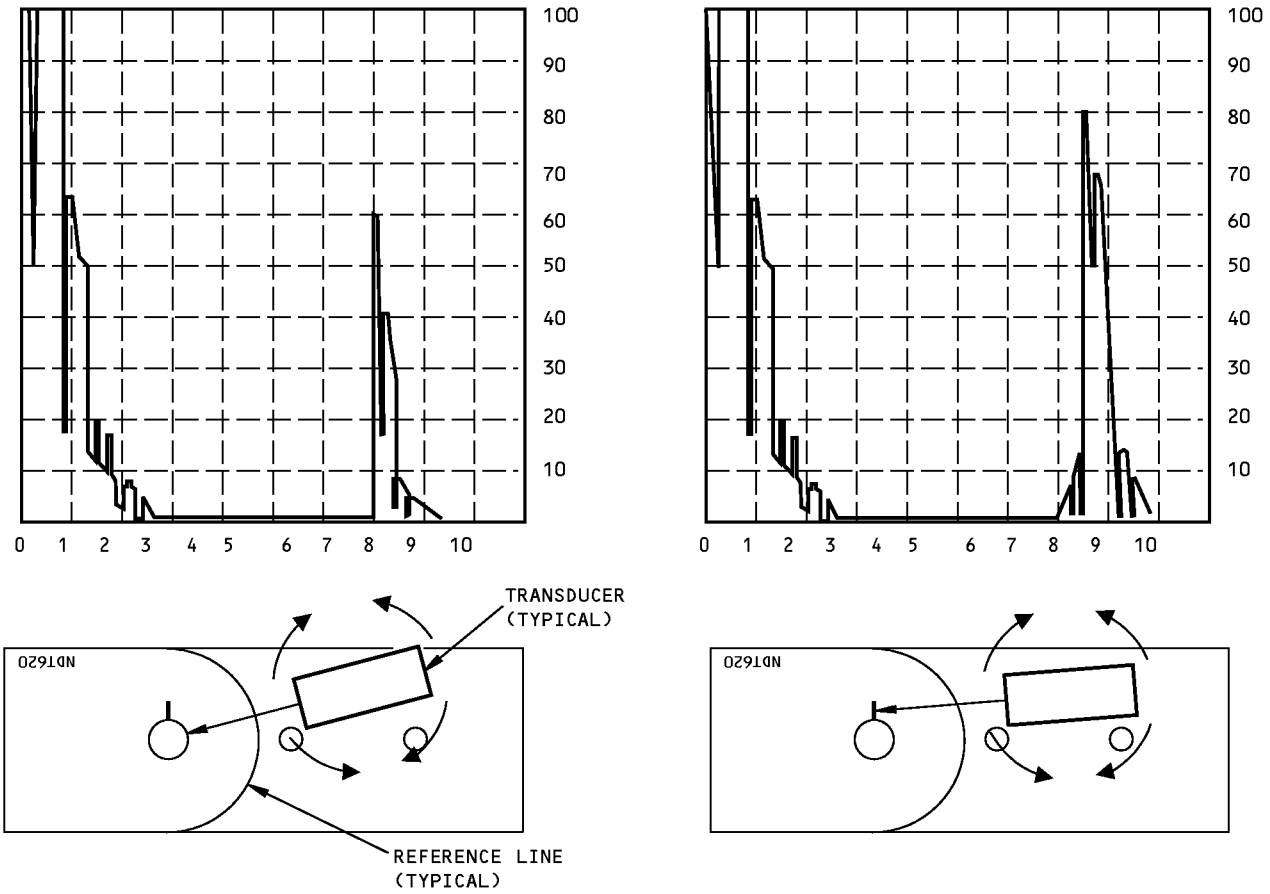
ANGULAR: = ± 1.0

- MATERIAL: ALUMINUM 2024-T3, 2024-T4 OR 7075-T6
- SURFACE ROUGHNESS: 125 RA OR BETTER

1. ETCH OR STEEL STAMP THE REFERENCE STANDARD NUMBER NDT620 AT APPROXIMATELY THIS LOCATION.
2. ETCH OR SCRIBE A LINE IN THE REFERENCE STANDARD THAT HAS A 1.05 (26.7) RADIUS FROM THE 0.438 (11.1) DIAMETER HOLE.
3. NOTCH LOCATION AND TOLERANCES:
   THE NOTCH MUST BE WITHIN ±0.005 (0.10) OF THE CENTERLINE OF THE HOLE AS SHOWN.

   NOTCH DIMENSIONS AND TOLERANCES:
   WIDTH: 0.030 (0.80) MAXIMUM
   LENGTH: 0.215 (5.5) ±10%
   DEPTH: FULL PART THICKNESS

Reference Standard NDT620
Figure 2



NOTES

- MAKE SURE THAT THE TRANSDUCER IS BEHIND THE REFERENCE LINE.
- TURN THE TRANSDUCER TO GET THE MAXIMUM SIGNAL.

Instrument Calibration
Figure 3