

EFFECTIVITY
MODEL: ALL 707 AND 720 SERVICE BULLETIN REFERENCE: 717, 1332

BOEING 
COMMERCIAL JET
NONDESTRUCTIVE TEST

PART 4 - ULTRASONIC

LANDING GEAR - MAIN GEAR

1. Purpose

- A. This procedure is recommended for locating stress cracks in main landing gear torsion links. Using a surface wave technique, cracks as small as 0.150 inch long and 0.010 inch deep have been detected.
- B. Service experience has indicated that there is a possibility of cracks occurring in the machined relief located on the forward, lower, left surface of the upper link, and on the forward, upper, right surface of the lower link. (See detail I.)

2. Equipment

- A. Any equipment which satisfies the requirements of this procedure may be used.
 - (1) Transducer
 - (a) 2.25-mc/s, for generating surface waves.
 - (2) Surface Wave Standard
 - (a) Fabricate standard as directed in detail II.
 - (3) Couplant. Light grease or oil is satisfactory.

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3. Preparation For Inspection

- A. Remove dirt and grease. Clean inspection area thoroughly to ensure good contact between transducer and link.
- B. Smooth out any sharp surface gouges which will interfere with sound beam.
- C. Coat inspection area with couplant.

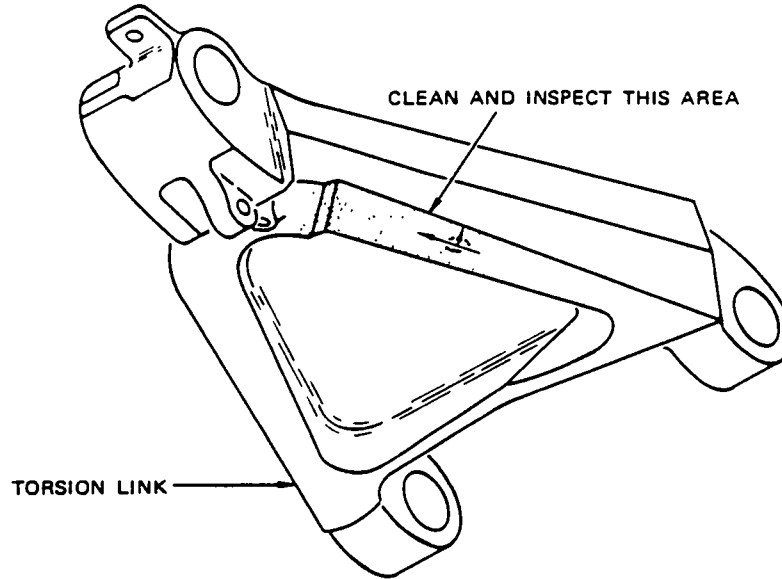
4. Instrument Calibration

- A. Set frequency of instrument at 2.25 mc/s.
- B. Set transducer on standard, with sound beam directed toward hole.
- C. Move transducer back and forth to obtain maximum response from hole. Hold transducer in this position.
- D. Calibrate sensitivity of instrument until vertical response indication on oscilloscope is approximately 50 percent of saturation.

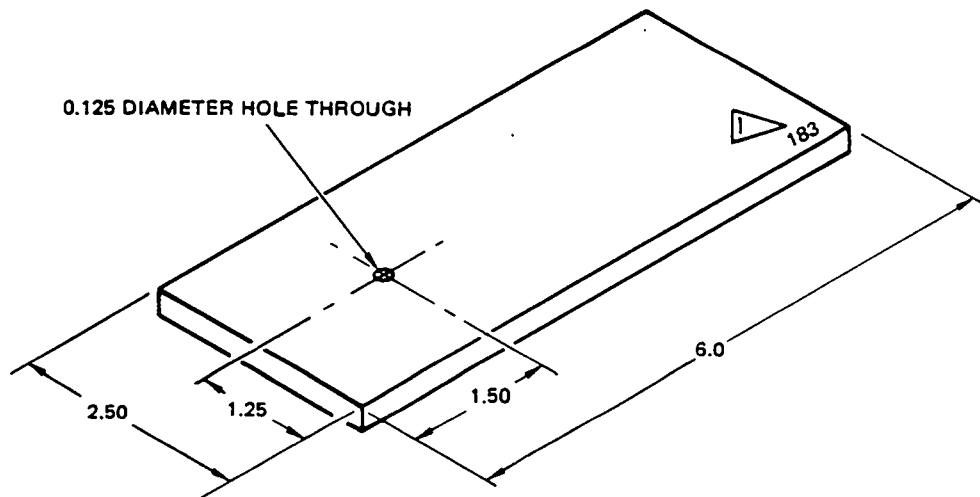
5. Inspection Procedure

- A. Place transducer on inspection area of torsion link, with sound beam directed toward critical area. (See detail I.)
- B. Scan entire area.
- C. Determine location of defect in part by placing finger in front of transducer to interrupt sound beam. Crack indication on oscilloscope will disappear. Gradually move finger away from transducer. When crack indication first reappears, crack is beneath finger. Mark the area.
- D. Verify crack indication by wiping oil film away from in front of transducer. Oil buildup can cause a false indication. Confirm crack indication by visual or other means.

NONDESTRUCTIVE TEST



AREA OF TORSION LINK REQUIRING INSPECTION
DETAIL I



NOTES

- FABRICATE FROM 0.25 INCH THICK MILD STEEL PLATE
- ALL DIMENSIONS IN INCHES

 ETCH OR STEEL STAMP WITH 183

SURFACE WAVE STANDARD
DETAIL II

Main Landing Gear Torsion Links
Figure 2 (Sheet 3)

EFFECTIVITY
MODEL: 707

PART 4 - ULTRASONIC

LANDING GEAR - MAIN GEAR

1. Purpose

- A. To detect cracks that occur in the top portion of the piston rod that is located just inside of the main landing gear outer cylinder. See detail I.

2. Equipment

- A. Any ultrasonic equipment that satisfies the sensitivity requirements of this procedure may be used.

A Branson Model 301 Ultrasonic Instrument was used in the development of this procedure.

- B. Transducer

- (1) Any 0.375-inch diameter 5MHz transducer within a case or holder 0.50 inches in diameter or width that satisfies the sensitivity and dimensional requirements of this procedure may be used. See detail II.

- (2) A 5MHz 0.375-inch diameter transducer SPO-692, manufactured by Nortec Corporation, 3001 George Washington Way, Richland, Washington 99352, was used in the development of this inspection procedure.

- C. Reference Standard

- (1) Aluminum reference block with 5/64-inch diameter flat bottomed hole at 2.5 inches metal travel.

- D. Couplant

- (1) Light oil or grease.

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3. Preparation for Inspection

- A. This inspection can be performed with the part in place on the airplane. No removals are required.
- B. Remove any loose paint and smooth out any surface nicks or rough areas by polishing lightly with fine grit abrasive cloth.
- C. Clean to remove old grease, dirt, grit, or other foreign material.

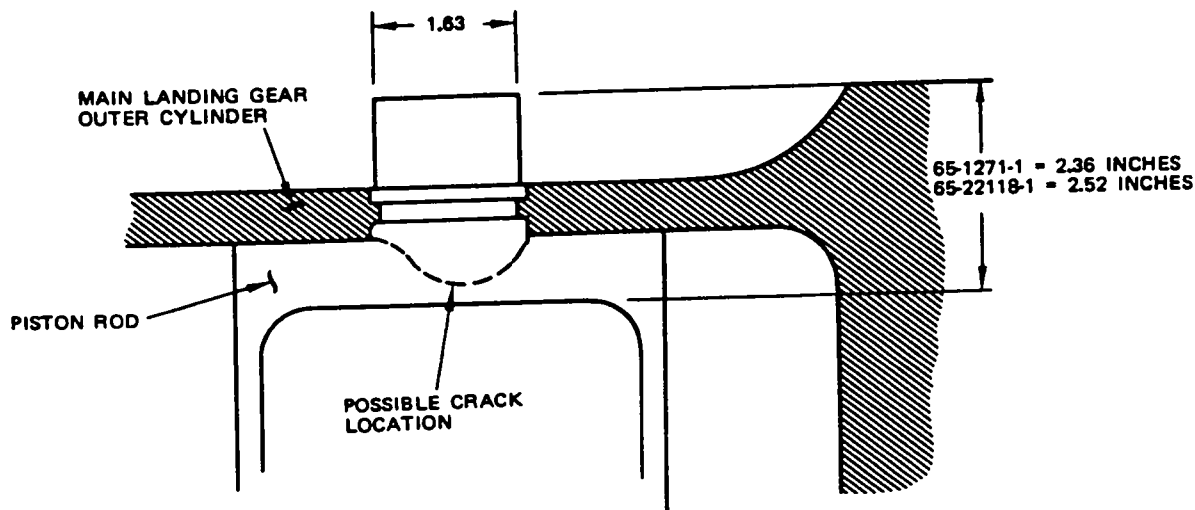
4. Instrument Calibration

- A. Apply couplant to the top of the reference standard.
- B. Place transducer on the reference standard and position to obtain an 80% response from the 5/64-inch diameter flat bottom hole at 2.5 inches metal travel.
- C. Carefully adjust instrument so that the response is proportionately calibrated on the cathode ray tube display and note its exact location.

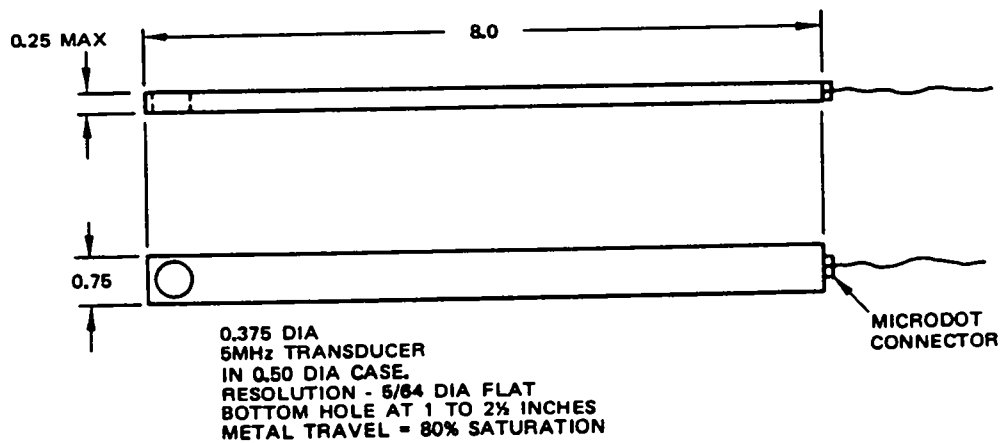
5. Inspection Procedure

- A. Identify and determine dimension of part at area of inspection.
- B. Apply an ample amount of couplant to end of piston rod.
- C. Place transducer on the part and carefully scan the end. Look for a back reflection response at the depth determined in Step A above. Loss of back reflection or change in response depth is indication of a cracked part. See detail III.
- D. Questionable areas may be evaluated at different gain settings, if desired.

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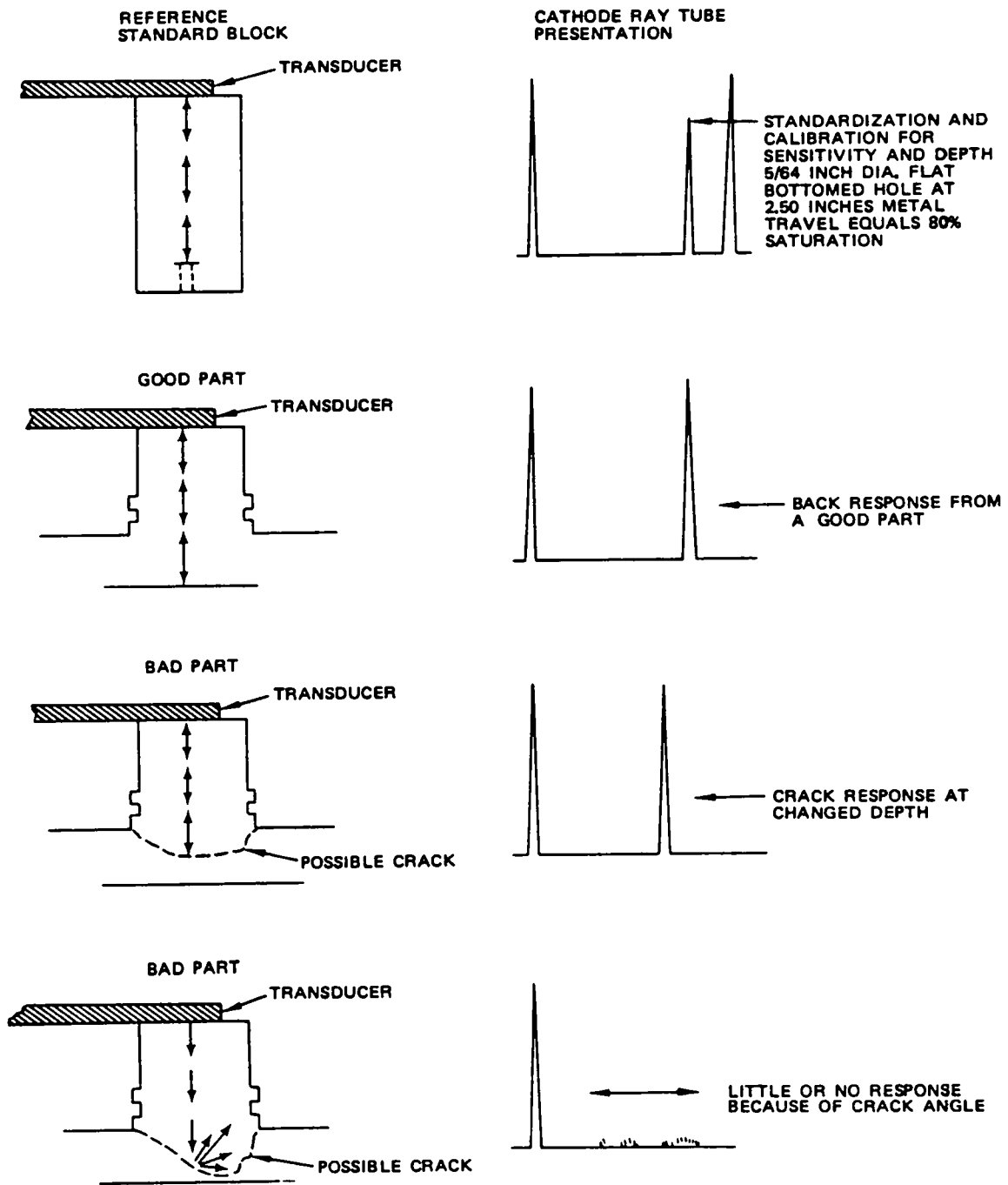


**POSSIBLE CRACK LOCATION
(CHECK DRAWING FOR VARIOUS DIMENSIONS)
DETAIL I**



**DESIGN REQUIREMENTS FOR TRANSDUCER
DETAIL II**

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TYPICAL STANDARDIZATION RESPONSE AND
 POSSIBLE VARIATIONS OF RESPONSE FROM A PART.
 DETAIL III

Nov 1/78

Main Landing Gear Piston Rod
 Figure 3 (Sheet 4)

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