ULTRASONIC INSPECTION

TECHNIQUE SHEET

01 PART IDENTIFICATION

PART NUMBER LG-787-CYL-001	PART NAME Main Landing Gear Actuator Cylinder
MATERIAL Aluminum	MATERIAL SPEC AMS 4045 / QQ-A-250/12
GEOMETRY Tube	DRAWING NO DWG-787-LG-2024-001

02 INSPECTOR & CERTIFICATION

INSPECTOR Dr. Michael Chen	LEVEL Level III
CERT. NUMBER ASNT-TC-1A Level III	ORGANIZATION ASNT

ACCEPTANCE CLASS

AA

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1. PART INFORMATION

Parameter	Value
Part Number	LG-787-CYL-001
Part Name	Main Landing Gear Actuator Cylinder
Material	Aluminum
Material Specification	AMS 4045 / QQ-A-250/12
Part Type / Geometry	Tube
Drawing Number	DWG-787-LG-2024-001
Heat Treatment	T6 Solution Heat Treated and Aged

Dimensions

Dimension	Value
Thickness	45.0 mm
Length	320.0 mm
Outer Diameter (OD)	152.4 mm
Inner Diameter (ID)	101.6 mm
Wall Thickness	25.40 mm
Hollow Part	Yes

Material Properties

Acoustic Velocity	6320 m/s
Material Density	2810 kg/m³

2. EQUIPMENT

Equipment	Value
Manufacturer	Olympus NDT
Model	OmniScan X3 64
Serial Number	OSX3-2024-0847
Software Version	5.2.1

Transducer

Transducer Parameter	Value
Probe Model	V309-SU
Frequency	2.25 MHz
Type	Immersion
Element Diameter	0.500 inches
Couplant	Deionized Water

Performance Parameters

Vertical Linearity	98.5%
Horizontal Linearity	97.2%
Entry Surface Resolution	0.080 inches
Back Surface Resolution	0.040 inches

Phased Array Configuration

Phased Array	Value
Number of Elements	64

Phased Array	Value
Element Pitch	0.60 mm
Wedge Model	SA32-N55S
Wedge Type	Normal Incidence
Delay Line	Water Path

3. CALIBRATION

Calibration Parameter	Value
Standard/Block Type	Cylinder (Notched)
Reference Material	Aluminum 7075-T6
Block Dimensions	75 x 75 x 50 mm
Block Serial Number	CAL-AL-7075-001
Last Calibration Date	Nov 15, 2024
Metal Travel Distance	50.8 mm

Flat Bottom Holes (FBH)

P/N	” T y p e	Ø FBH (inch)	Ø FBH (mm)	B (mm)	H (mm)
7075-3-0050	Delta3	#3 (3/64")	1.19 mm	12.7 mm	25.4 mm
7075-5-0100	Delta5	#5 (5/64")	1.98 mm	25.4 mm	38.1 mm
7075-8-0150	Delta8	#8 (1/8")	3.18 mm	38.1 mm	50.8 mm

3.1 CALIBRATION BLOCK DIAGRAM

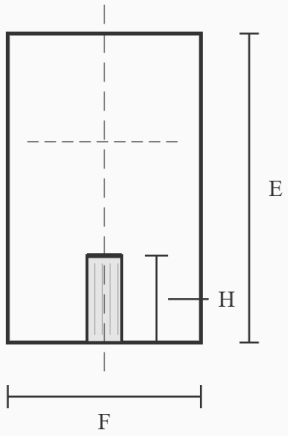
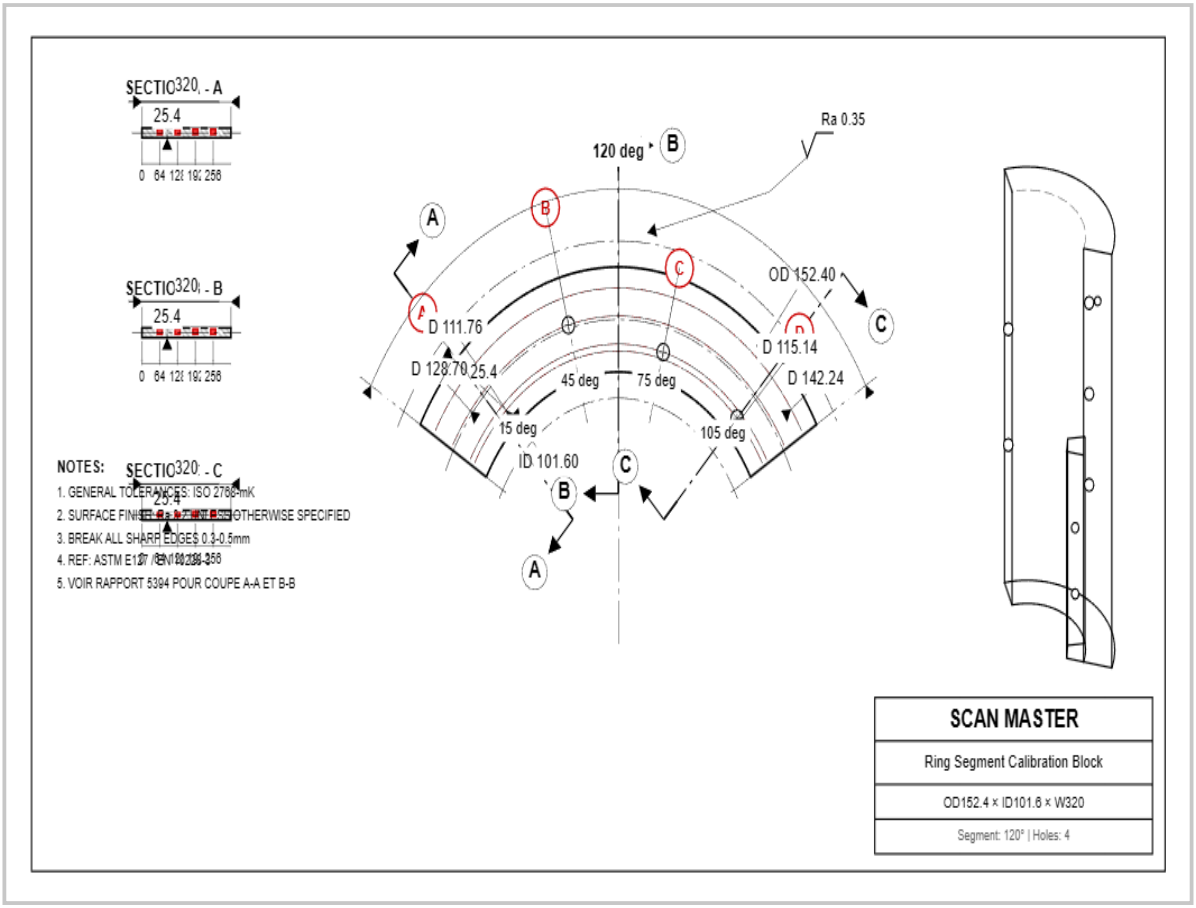


FIG. 1 Standard Set Block Dimensions

3.2 ANGLE BEAM CALIBRATION BLOCK

Shear Wave / Circumferential Inspection Reference Block



4. SCAN PARAMETERS

Parameter	Value
Scan Method	Immersion
Technique	-
Scan Type	Automated C-Scan
Scan Pattern	Raster
Coupling Method	immersion

Speed & Coverage

Scan Speed	150 mm/s
Scan Index	50 %
Coverage	100%
Water Path	25.4 mm

Instrument Settings

Pulse Repetition Rate (PRF)	2000 Hz
Gain Settings	TCG Applied - 45 dB base
Alarm Gate Settings	Gate A: 2-48mm, 80% threshold

5. ACCEPTANCE CRITERIA

ACCEPTANCE CLASS

AA

Very Stringent - Primary Structure

Criterion	Limit
Single Discontinuity	3/64" (1.2mm) FBH response
Multiple Discontinuities	3/64" FBH (centers <1" apart)
Linear Discontinuity	1/2" max length - 2/64" response
Back Reflection Loss	50%
Noise Level	Alarm level

Special Requirements

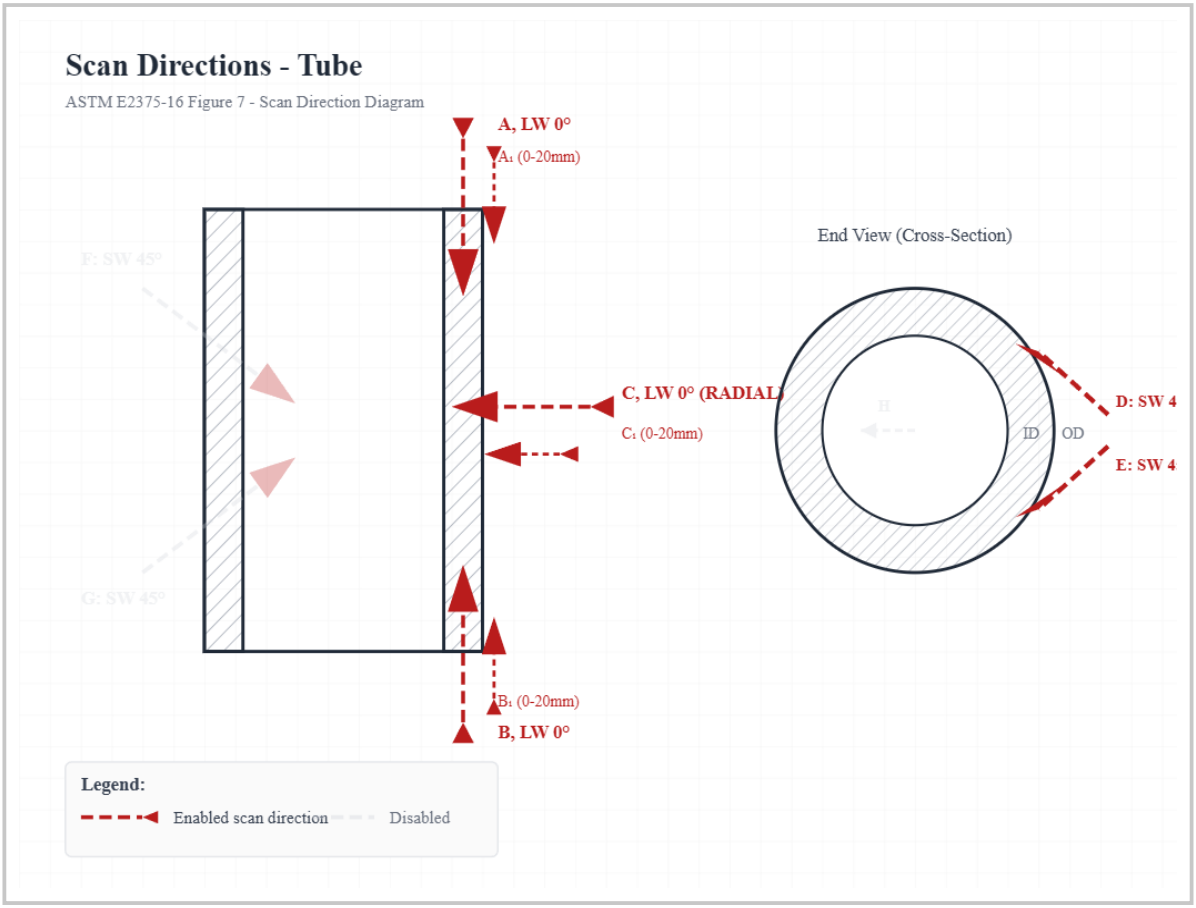
Zone 1 (0-6mm from surface): No indications > #2 FBH equivalent. 100% coverage mandatory.

6. SCAN DETAILS & DIRECTIONS

Dir.	Wave Mode	Angle	Freq.	Technique	Active El.	Probe	Remarks
A	LW 0° (Primary Surface)	0°	-	-	-	-	-
A •	LW 0° (Dual Element - Near Surface 0-20mm)	0°	-	-	-	-	-
B	LW 0° (Adjacent Side)	0°	-	-	-	-	-
B •	LW 0° (Dual Element - Near Surface 0-20mm)	0°	-	-	-	-	-
C	LW 0° (Third Face / Radial from OD)	0°	-	-	-	-	-
C •	LW 0° (Dual Element - Near Surface 0-20mm)	0°	-	-	-	-	-
D	SW Circumferential CW	45°	-	-	-	-	-
E	SW Circumferential CCW	45°	-	-	-	-	-

6.1 ASTM E2375 SCAN DIRECTIONS DIAGRAM

Standard Practice for Ultrasonic Testing of Wrought Products - Tube



Reference: ASTM E2375-16 "Standard Practice for Ultrasonic Testing of Wrought Products"

8. SCAN PLAN & REFERENCE DOCUMENTS

The following reference documents are associated with this technique sheet:

#	Document Title	Description	Category	File Reference
1	**UT Scan Planning Guide**	Complete guide for scan planning and execution	Planning	scan-plan-guide.docx
2	**TCG for Shear Wave Calibration**	Time Corrected Gain calibration procedures for shear wave testing	Calibration	tcg-shear-wave-calibration.docx

NOTE

The documents listed above provide detailed procedures, calibration guides, and reference materials.

Refer to these documents for complete inspection methodology and compliance requirements.

8. DOCUMENTATION

Inspector

Inspector Name	Dr. Michael Chen
Certification Number	ASNT-TC-1A Level III
Level	Level III
Certifying Organization	ASNT

Customer & Document

Customer Name	Boeing Commercial Airplanes
Purchase Order	PO-BCA-2024-15847
Part Serial Number	SN-LG787-2024-0342
Inspection Date	Dec 17, 2024
Procedure Number	NDT-UT-787-001 Rev. C
Drawing Reference	DWG-787-LG-2024-001 Rev. B
Revision	C

Additional Notes

Critical flight safety component. Requires Level III review and customer witness point.

9. APPROVAL SIGNATURES

Role	Name / Signature	Date	Comments
Prepared By	Dr. Michael Chen	Dec 17, 2024	
Reviewed By (Level III)	_____	_____	
Approved By	_____	_____	
Customer Representative	_____	_____	

NOTICE: This technique sheet requires Level III approval before use.

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