

NONDESTRUCTIVE TESTING INSPECTION REPORT

Report Number	NDT-2026-07-001	Revision	A
Issue Date	09 July 2026	Status	Final
Project	Boeing 737-800 Main Landing Gear Trunnion — Pre-Overhaul Baseline		
Client	AeroTech MRO Services, LLC — MRO Station ATL-4		
Location	Hangar 12, Hartsfield-Jackson Atlanta International Airport (KATL)		

MLG Trunnion Assembly

Magnetic Particle & Ultrasonic Inspection

1 Revision History

Rev	Date	Description of Change	Author	Approved By
A	09 Jul 2026	Initial issue — pre-overhaul baseline MT & UT inspection of LH MLG trunnion, S/N SN-2847-MLG-LH	J. Martinez, ASNT Level III (MT/UT)	S. Chen, Quality Engineer

2 General Information

2.1 Component Data

Part Identification	
Part Name	Main Landing Gear Trunnion Assembly
Part Number	69-73782-1
Serial Number	SN-2847-MLG-LH
Material	300M High-Strength Steel (AMS 6419), Vacuum Arc Remelted
Heat Treatment	Quenched & tempered to 280–300 ksi UTS
Surface Condition	Cadmium-plated per AMS 2400; chemically stripped in designated inspection zones
Prior Repairs	None recorded — first overhaul cycle at 24 000 flight cycles
Inspection Scope	
Inspection Type	Pre-Overhaul Baseline — Magnetic Particle (MT) + Ultrasonic (UT)
Zones Inspected	Zone A: Trunnion barrel OD (full circumference, 317.5 mm length) Zone B: Lug bores (2×, 38.1 mm diameter) Zone C: Flange fillet radii (4×, R 6.35 mm)
Primary Standard	ASTM E1417/E1417M (MT), ASTM E2375 (UT)
Procedure Ref.	AeroTech NDT-PROC-014, Revision G
Acceptance Ref.	Boeing BAC 5424, Type I, Class A

2.2 Equipment & Calibration Status

Equipment	Model / S/N	Cal. Date	Cal. Due	Cal. Standard & Remarks
MT Bench Unit	Magnaflux A-2030 / FL-4721	05 Jul 2026	05 Jan 2027	ASTM E1444, Annex A3; 3 000 A AC output verified
UT Flaw Detector	Olympus EPOCH 650 / 21057A	02 Jul 2026	02 Jan 2027	ASTM E317; linearity within $\pm 2\%$
UT Transducer	Olympus A543S (5 MHz, 0.25", 45° SW)	Included in system calibration		ASTM E2375; wedge delay verified
Gauss/Helios Meter	Lake Shore 410 / LS-8829	01 Jul 2026	01 Jul 2027	NIST traceable; probe type: transverse
UV-A Lamp	Spectroline SB-100P / UV-312	04 Jul 2026	04 Jan 2027	ASTM E3022; $\lambda = 365 \pm 5$ nm

3 Inspection Technique Summary

3.1 Magnetic Particle Testing (MT)

Method	Wet fluorescent magnetic particle, continuous technique
Magnetisation Type	Circular — central conductor (3.0 kA AC, 50 Hz)
Particle Medium	Magnaflux MG-410, concentration 0.15% v/v (verified by settling tube)
UV-A Irradiance	1 200 $\mu\text{W}/\text{cm}^2$ at inspection surface (measured before & after)
Ambient White Light	< 20 lx at inspection surface
System Performance	Ketos test ring: 30 μm notch clearly resolved at 3.0 kA
Sensitivity	Capable of resolving 30 μm surface-breaking discontinuities
Acceptance Criteria	BAC 5424 Type I, Class A — no linear indications > 1.6 mm

3.2 Ultrasonic Testing (UT)

Technique	Pulse-echo, shear wave, contact method
Probe	5 MHz, 6 mm diameter element, 45° angle beam (acrylic wedge)
Couplant	Sonotech Ultragel II (sulfur-free, viscosity grade H)
Calibration Block	7075-T6 aluminium, #2 FBH (0.8 mm diam. at 19.0 mm depth)
Scanning Pattern	90° raster grid with $\geq 50\%$ transducer overlap
Gate A Settings	5.0–25.0 mm metal path; threshold 40% FSH
Gate B Settings	25.0–50.0 mm metal path; threshold 30% FSH
Sensitivity Level	Primary reference level + 6 dB scanning gain
Acceptance Criteria	BAC 5424 Type I, Class A — no reflector > 50% DAC

4 Indication Summary

ID	Method	Type	Size (mm)	Location	Orientation / Remarks
IND-001	MT	Linear	3.2 × 0.3	Zone A, 12 o'clock, 47 mm from flange face	Axial (0–5°). Sharp, well-defined. Morphology consistent with grinding burn.
IND-002	MT	Rounded	1.5 dia.	Zone A, 4 o'clock, 112 mm from flange face	— No linear tail. Likely subsurface inclusion exposed by acid strip.
IND-003	UT	Volumetric	4.1 × 2.8	Zone C, upper fillet radius, 9.0 mm depth	Radial. Signal 82% FSH at ref. + 6 dB. Probable forging inclusion cluster.
IND-004	UT	Planar	6.5 × 1.2	Zone B, LH lug bore ID, 3.2 mm depth	30° to bore axis. Exceeds DAC by 4 dB. Consistent with fatigue initiation from pitting.

4.1 Indication Details

- IND-001 — Linear MT Indication.** Orientation parallel to grinding lay (circumferential). Indication bleeds rapidly at 0.5 s dwell, indicating shallow depth (< 0.5 mm). Photographed at 10× magnification. Recommended for blend-out assessment per SRM 57-20-01.
- IND-002 — Rounded MT Indication.** Isolated, non-linear. Characteristic of non-metallic inclusion intersecting the surface after chemical stripping. Deemed non-relevant per BAC 5424 paragraph 7.2.3.
- IND-003 — Volumetric UT Indication.** Located at 9.0 mm below surface in the fillet radius transition zone. Signal morphology suggests a cluster of small reflectors rather than a single discrete flaw. Amplitude: 82% FSH (exceeds 50% DAC threshold).
- IND-004 — Planar UT Indication.** Oriented at approximately 30° to the bore centreline axis. Signal rises sharply and exceeds the DAC curve by 4 dB at the peak. Likely a fatigue crack initiating from bore-surface corrosion pitting.

5 Acceptance Criteria Matrix

Indication	Criterion (BAC 5424 Type I, Class A)	Measured	Limit	Disposition
IND-001	No linear MT indication > 1.6 mm in critical zones.	3.2 mm	≤ 1.6 mm	✗ REJECT
IND-002	Rounded indications ≤ 4.0 mm are acceptable.	1.5 mm	≤ 4.0 mm	✓ ACCEPT
IND-003	No UT reflector > 50% DAC at depths < 12.5 mm.	82% FSH	≤ 50% FSH	✗ REJECT
IND-004	Planar reflectors in lug bores: reject if > 20% above DAC.	DAC + 4 dB	≤ DAC + 0 dB	✗ REJECT



COMPONENT DOES NOT MEET ACCEPTANCE CRITERIA

Three of four recorded indications (IND-001, IND-003, IND-004) exceed allowable limits per BAC 5424 Type I, Class A. Engineering disposition is required. See Section 5 for recommendations.

6 Results and Disposition

Overall Result

REJECTED — does not satisfy BAC 5424 Type I, Class A

- Disposition
1. **IND-001 (MT Linear):** Blend-out permissible if post-blend wall thickness $\geq$ 90% of nominal, per SRM 57-20-01. Re-inspect with MT post-blend.

2. **IND-003 (UT Volumetric):** Excavate to 1.5 mm max depth per ECP-008. If indication persists beyond 1.5 mm, condemn component per CMM 57-20-02.

3. **IND-004 (UT Planar):** Bore-sleeve repair per CMM 57-20-02 Repair Scheme B, or replace trunnion assembly if bore damage exceeds sleeve limits.

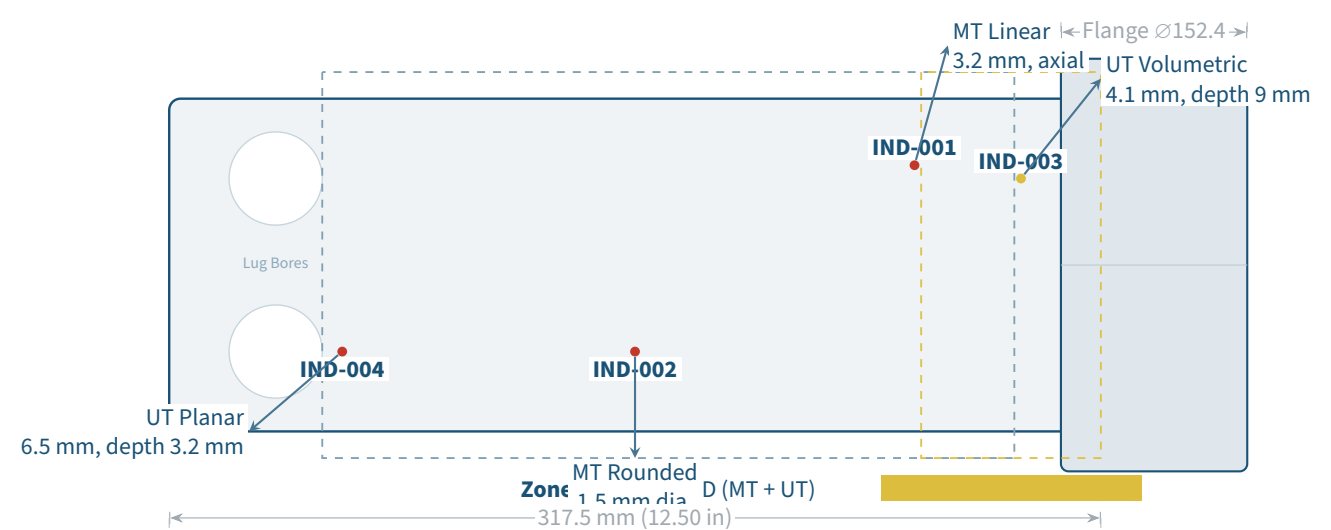
Concession Ref.

Pending — submit to Boeing LGE for MRB disposition

Next Inspection

After repair: repeat full baseline MT + UT per NDT-PROC-014 Rev. G

7 Annotated Diagram



Insert CAD-Annotated Inspection Image

Photograph or CAD screenshot with indication locations, reference dimensions, and zone markings superimposed

8 Symbols and Abbreviations

Abbreviation	
ASNT	American Society for Nondestructive Testing
BAC	Boeing Aircraft Company
CMM	Component Maintenance Manual
DAC	Distance-Amplitude Correction
ECP	Engineering Concession Procedure
FBH	Flat-Bottomed Hole
FSH	Full Screen Height
LGE	Landing Gear Engineering
MLG	Main Landing Gear
MRB	Material Review Board
MRO	Maintenance, Repair & Overhaul

9 Inspector Certification

Inspector Statement

I certify that the inspections documented in this report were performed in accordance with the referenced procedures and standards, and that the results recorded herein represent a true and accurate account of all findings observed during the inspection.

Inspector Name Javier Martinez
Certification ASNT NDT Level III, MT & UT (Certificate No. LM-28491)
Employer AeroTech MRO Services, LLC
Signature _____
Date

Technical Review

Reviewed By Sarah Chen, Quality Engineer
Signature _____
Date

Final Approval

Approved By Michael Okonkwo, Chief Inspector
Signature _____
Date