



GROUND SUPPORT TEST EQUIPMENT

UL101 Aviation Troubleshooter — Acoustic Ultrasound Inspection System (P/N B00033; Boeing Tool Tag SPL-1473)

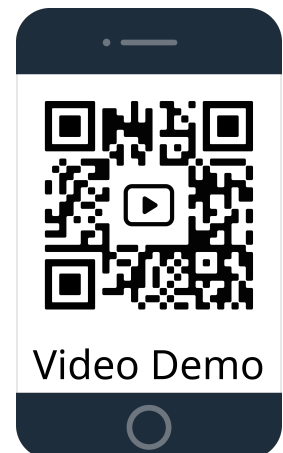
Ultrasonic Innovation for MRO & AOG Troubleshooting

The UL101 Aviation Troubleshooter provides aircraft technicians with a clear, intuitive method of troubleshooting a wide variety of faults across multiple aircraft systems. By demodulating ultrasonic frequency (40 kHz) into the audible range through a head set or available software, the UL101 can assist technicians in pinpointing the location of pneumatic, hydraulic, electrical, and mechanical faults more rapidly than other traditional methods. Most operators and MROs report 100% ROI within the UL101's first use. Compact, durable, and versatile, no aviation toolbox is complete without it.



FEATURES

- **Recommended in the AMM for all Boeing Commercial jet aircraft**
- Tuned to 40 kHz (+/- 1/5 kHz); **no frequency adjustment required.**
- **Gain Control all but eliminates ultrasonic "white noise" in most environments.**
- **Highest quality signal-to-noise ratio of any acoustic ultrasound sensor**
- Industrial Grade Materials (extruded aluminum housing)
- Concentrators and acoustic extension probes for airborne applications (*pressure testing; pitot static inspection; shraeder valves; corona discharge/arcing; vacuum leak checks; window seals/cabin/canopy*)
- Solid probes for contact applications (*hydraulic lines, switches, reservoirs; struts; actuators; regulators*)
- UT200 ultrasonic transmitter for tightness/non-pressurized testing (*cabin pressure; fuel tanks/cells; valves; pitot static system*)
- **No calibration required** (designated CNR by NAVSEA TMDE and U.S. Army TMDE)
- **Five-Year Limited Warranty** — optional annual manufacturer's inspection included
- NSN and GSA listings available (CTRL P/N 000033; NSN 6635 01 534 2512; GSA Contract #GS-06F-0001 N; CTRL Cage Code 62373)





SELECT APPLICATIONS

AC Packs, leak checks *

Bleed Air (engine and
airframe), leak checks *

Cabin Pressure, leak
checks *

Hydraulic Systems
(actuators, lines,
reservoirs, and switches)

Intermittent Wiring
Inspection (pinpoints
arcing and other electrical
faults) *

Oxygen Systems, leak
checks *

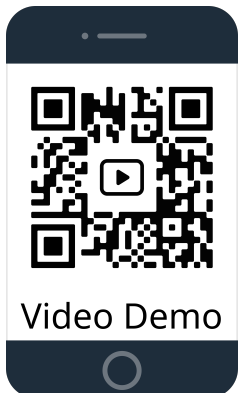
Parking Brake Pressure,
leak check *

Pitot Static Inspection
(non-pressurized) *

Regulator Bypass
Inspection (contact)

Vacuum Leak Checks
(window and door seals) *

**recommended in the
Boeing AMM for all BCA jet
aircraft*



Case Use Scenario — Southwest Airlines

Defective Hydraulic Actuators, Boeing 737 Leading Edge Flap Transmission

Southwest Airlines had an incident resulting in significant AOG down-time on a Boeing 737-700. A leading edge flap was slow to respond, indicating multiple failure in the hydraulic motor actuators on the flap's transmission. The aircraft was removed from service and placed on AOG. In the past, other troubleshooting methods for addressing this issue had been unable to identify the specific components which had caused the slow response time. As a result, the solution typically involved replacement of all the hydraulic actuators in the transmission — even the ones that were still good.

This time was different. Using the UL101 receiver with a solid probe and assisted over the phone by an experienced aircraft mechanic, an untrained aircraft technician quickly listened to the ultrasonic output of each hydraulic component and accurately identified which components had failed.



The UL101 demodulates ultrasound at 40 kHz (+/- 1.5 kHz) into the audible range, producing an audible signal that can be heard through noise-attenuating headphones or visually displayed with software. Failure modes in hydraulic actuators include external/internal leakage, blockages, and fluid by-pass. Each of these modes produce friction, impacts, and turbulence, and therefore, a strong ultrasonic signature. While external leakage is simple to detect with a visual inspection, internal modes of failure are often difficult to diagnose, resulting in long troubleshooting times and significant AOG delays.

	BEFORE	AFTER
Hourly Labor Rate	\$60.00	\$60.00
Technicians	4	4
Hours	96	36
Labor Cost	\$23,040.00	\$8,640.00
Component Cost (avg.)*	\$12,000.00	\$12,000.00
Total Components	8	3
Total Materials	\$96,000.00	\$36,000.00
Total Cost	\$119,040.00	\$44,640.00
Total Savings		\$74,400.00
ROI (single incident)		1,078%

The chart to the left shows a similar scenario that occurred prior to Southwest's acquisition of the UL101 ("Before"). After an extensive AOG down-time, the operator was unable to diagnose the specific components that had caused the slow response. The decision was made to replace all eight actuators in the LE flap transmission.

The "After" column demonstrates the operator's savings once the UL101 was applied to the same scenario several months later. In addition to a drastic reduction in troubleshooting time, the ability to diagnose the fault modes of specific components resulted in a significant cost savings.

"The UL101 Aviation Troubleshooter from CTRL Systems allows our team to quickly and accurately isolate defects in multiple aircraft systems, from leaking door seals to faulty flap transmission actuators and more. The UL101 and CTRL's accompanying support have helped us to minimize ground time and maximize aircraft utilization."

— Brandon Beard (Manager, Maintenance Operations Center, Southwest Airlines)