

# UTBT Ultrasonic Bolt Inspection System

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The Ultrasonic Bolt Inspection System is a mechanical fixture for manual immersion ultrasonic inspection of bolts for cracks in the thread, shank or head-to-shank fillet. Its primary application is the nondestructive inspection of aircraft wheel tie bolts. It is also used for testing of automotive parts and other cylindrical components for voids, inclusions and weld integrity.

## Main features:

- V-shaped tank for holding ultrasonic coupling fluid.
- Height-adjustable V-block for precise positioning of the bolt relative to the transducer.
- Exchangeable guides for holding bolts and other cylindrical parts.
- Durable aluminum and plastic construction, non-corroding.
- Selectable ultrasonic transducers for inspection of thread and shank areas.
- Detection of cracks of less than 0.16" (4mm) in length and 5% of shank diameter in depth.
- No cleaning of threads or demagnetizing of bolts required.
- Fast inspection, less than 6 seconds per bolt.

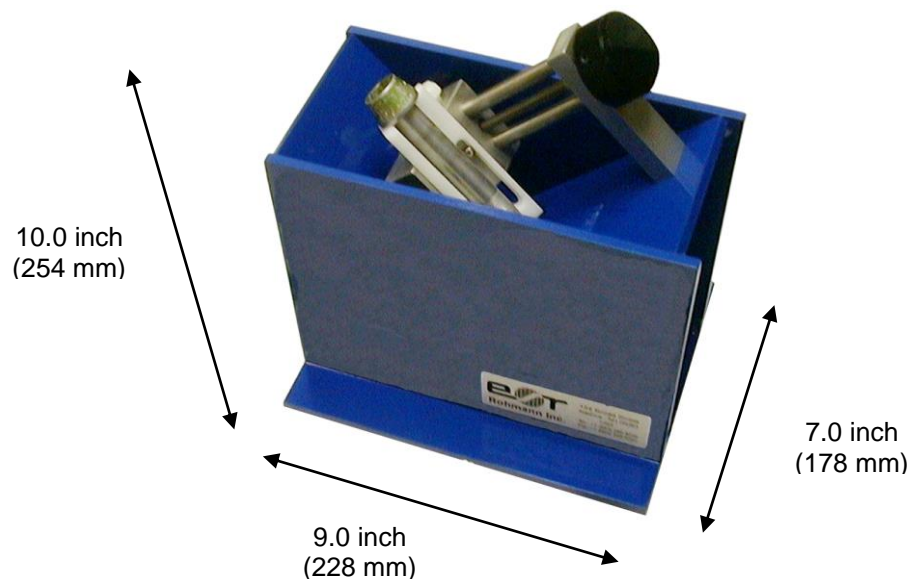
# UTBT Ultrasonic Bolt Inspection System



The UTBT System is approved by several manufacturers of aircraft tie bolts as a replacement of fluorescent magnetic particle inspection. It features equal or higher sensitivity, higher reliability and allows for drastic reductions in operating expenses and environmental waste management costs.

## Technical Information:

Tank dimensions:



Tank weight (unfilled): 7.2 lb (3.2 kg)

## UTBT Brief Description of Operation

- Prior to inspection, bolt ends must be polished flat, a one-time operation. No special cleaning, beyond removal of major dirt, is necessary. Threads must not be cleaned. No demagnetizing of ferrous bolts is required.
- Three bolt reference standards are required of each type of bolt to be inspected: One good bolt, one bolt with notches in the threads and one bolt with notches in the shank and head-to-shank fillet area. The reference standards are used for initial setup of the UTBT bolt inspection tank and the ultrasonic instrument.
- For thread inspection, the focussed transducer and good bolt are aligned using the V-block mechanism of the tank until the thread pattern appears on the instrument CRT. The setup of the instrument and tank are then fine-tuned for the detection of cracks in the thread area using the bolt with the notches in the threads.

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- Once the setup is complete (approximately 5 minutes), the V-block is locked and inspection can begin. The thread areas of all bolts are then tested.
- For inspection of the shank area, the setup is tuned using the flat transducer as above and all bolt shanks are subsequently inspected.
- Average inspection time per bolt is less than 6 seconds once the equipment is set up and calibrated.

## UTBT Suggested Equipment

Please find below a figure and a list of the equipment required. All items can be ordered separately. The UTBT tank is fully aligned mechanically prior to shipment with any purchased transducers. If supplied without transducers, we will align it using our in-house transducers, but you may have to fine-tune the mechanical alignment. You are welcome to specify the manufacturer of the transducers upon ordering, however pricing may change.

Our customers have used the bolt inspection system with a variety of ultrasonic instruments. A pulse echo instrument with a frequency range between 2 and 10 MHz, preferably with tuned frequencies of 5 and 10 MHz, is recommended.

We can supply you with bolt reference standards, but recommend that you make them yourself. Due to the large variety of bolts on the market we do not stock all, and suggest that you supply us with the bolts you wish to have machined. The tank will be aligned for all bolts that you supply.

The UTBT system is delivered with a complete operator's guide that describes in detail the features of the tank, the manufacture of reference standards, tank and instrument calibration and a suggested procedure for bolt inspection.



# UTBT

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### UTBT Ordering Information

Orderno.	Description	Orderno.	Description
1003343	UTBT-1 Tank with adjustable V-block, aluminum	1003345	SC-BNC-UHF-6 Signal cable, BNC to UHF connectors
1003357	UTBT-17-1 1/4-1.5SFO-1/4-10M transducer 1/4", 1.5" sph.focus, immersion type, 10 MHz, UHF connector; for threads	1003653	SC-LEMO1-UHF-6 Signal cable, LEMO1 to UHF connectors
1003347	UTBT-18-1 3/8-FL-1/4-5M transducer, 3/8" flat, immersion type, 5MHz, UHF connector; for shafts of long bolts	1003352	EDM machining, bolt thread, for custom bolts
1003690	UTBT-18-4 3/8-FL-1/4-10M transducer, 3/8" flat, immersion type, 10MHz, UHF connector; for shafts of 1-3" length	1003353	EDM machining, bolt shank, for custom bolts
1003349	UTBT-8-2 Guides Set of guides 2" (50 mm)	1003411	UTI-ST Ultrasonic Instrument: Sonatest Masterscan 330
1003350	UTBT-8-4 Guides Set of guides 4" (102 mm)	1003413	UTI-ST Ultrasonic Instrument: Sonatest Sitiescan 230
1003351	UTBT-8-6 Guides Set of guides 6" (152 mm)	1003746	Hex (Allen) key, english, 9/64 (one is supplied with the tank)

Please inquire about additional equipment, accessories and pricing. We also feature a full line of eddy current test equipment.

Information subject to change.

[UTBT-Datasheet-R3]