

GE
Measurement & Control Solutions

WheelScan 5

Inspection Technologies

Rapid & Reliable Wheel Inspection

This automated system uses eddy current to detect flaws or damage in aircraft wheels of all sizes. WheelScan enables operators to perform inspections faster without compromising inspection integrity. Setup and operation is so easy that extensive training is not required.



Automatic System Increases Speed of Inspection

Aircraft wheels are subject to high level cyclic fatigue, particularly during landing. To ensure the safety of passengers and the aircraft, it is important that the wheels are maintained to the highest standard.

Eddy Current wheel inspection is widely accepted throughout the world as a rapid and reliable means of maintaining the integrity of aircraft wheels.

Rapid Testing

The unit covers the wheel with inspection speeds up to 2 ms⁻¹ (78 inches/second). All inspections are specified with a constant surface speed rather than fixed RPM, allowing the eddy current filters to give the best possible performance, irrespective of the amount of wheel taper. The operator can set up a wide range of helix settings to arrive at the quickest inspection for the required surface coverage. In addition, the stepper motor drives take the probe rapidly to the start of the inspection at up to 150 mms⁻¹ (6 inches/second) to minimize inspection cycle time.

Automatic Wheel Testing

- The wheel is first raised on a lift ram to a preset height, spun up to the required speed, and centered.
- The probe is then scanned over a test block with a reference notch, and the probe moves to the scan start.
- The wheel is scanned at the required scan helix and speed, and the signals from the probe are recorded.
- Test results are recorded using a thermal chart or paperless recording for quality assurance purposes.
- The probe returns to scan the test block again.
- If required, the probe can return to the defect for further analysis for process control purposes.

Teach & Learn

Setup is made easy using a “teach and learn” system. When a new wheel is encountered, WheelScan stores stop height, start height and other programmed parameters. The next time that wheel type is scanned, WheelScan recalls the stored parameters.

Reliable

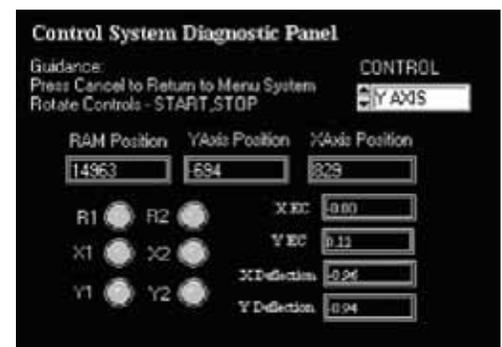
WheelScan uses standard motion control system components that promote long life. Its modular construction makes servicing and replacement of components easy. The ball-screw driven actuators have a standard life rating in excess of 10,000 km of travel, equivalent to approximately 10 million wheel inspection cycles.



Simple Human to Machine Interface with intuitive layout



HMI Diagnostic Panel



Control System Diagnostic Panel

Without Compromising the Integrity of Inspection

Accurate

With encoders on all axes, repeat positioning of scan parameters is guaranteed. The AutoTrak Plus, two-dimensional bi-directional contour following system, ensures that the probe travel path covers 100 % of the surface. The wheel may be tested flange up, flange down, fully assembled flange to flange, and can handle complex profiles (e.g., racing car wheels).

Minimizing User Errors

WheelScan 5 provides a variety of methods for entering and retrieving data. The aim of the unit is to allow the experienced user total flexibility when setting up precision inspections. The ability to “walk” the equipment through the tests and take settings from the on-board encoders ensures that measurements are absolutely precise for each type of wheel. Once the data has been set up, it can be stored digitally for easy recall in the future. The recall can even be automated so that the total test can be recalled with the single scan of a bar

code, and input errors such as the operator ID and Job References can also be input by bar code. This removes the need for manual data re-keying, the most frequent cause of data error in comparable systems. For added data protection, a key switch with user/supervisor mode locks out unauthorized changes.

WhIRS - Wheel Inspection Reporting System

WheelScan 5 has different levels of reporting to meet all your inspection requirements.

- Real Time Charts - the LCD displays real time charts for easy and convenient test checks.
- Instant Thermal Strip Chart - provides an in-unit report for each inspection.
- Offline Data Analysis - link a computer to WheelScan to print a full color report complete with all inspection parameters. This can be printed from a laptop situated next to the unit or from a PC located on another continent.

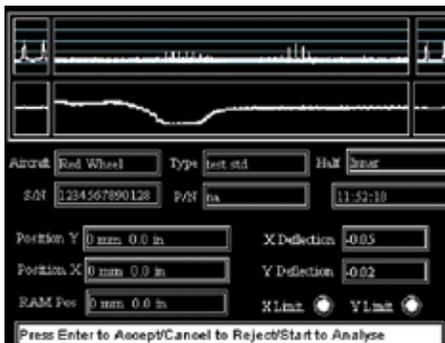


Versatile Inspection

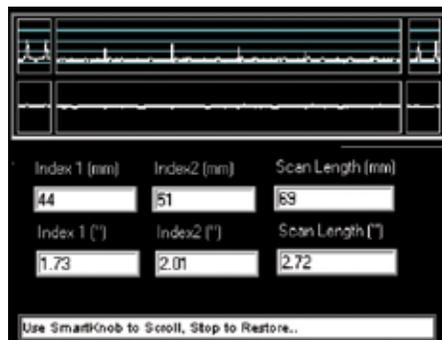
Aircraft Wheel Inspection requirements are constantly improved and expanded to include various wheel sizes and inspection styles. WheelScan 5 is designed to deal with these changes.

WheelScan's SLIC clamping system adjusts to all types of wheels and sizes. Even very small wheels are quickly and easily secured with this clamping system without special hardware.

As the effects of heat damage on wheels becomes more clearly understood, WheelScan provides conductivity measurement to assist users in evaluating these effects. A dynamic bolt-hole scanner also provides valuable information about any conditions that might exist in and around these potential stress raisers.



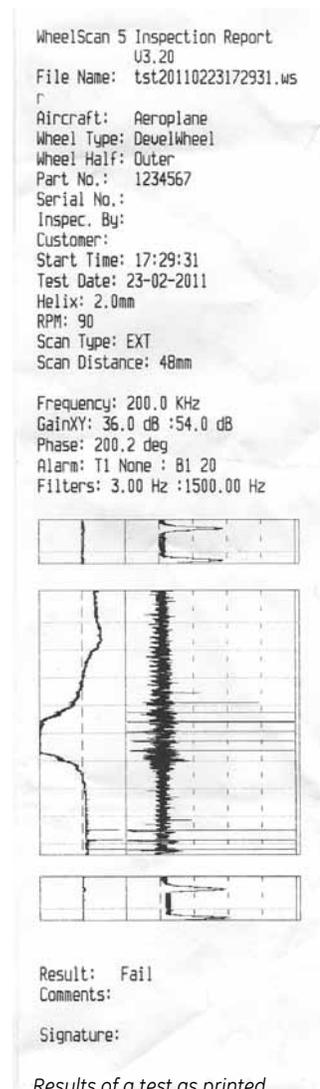
HMI display of a scan



HMI zoomed display of a scan



Offline data analysis







Easy to use

The roller table makes wheel positioning and incorporation into a conveyor system easy. The "Teach & Learn" system coupled with bar code scanning saves valuable inspection time while minimizing user error. Operation is easy with the intuitive interface, rotary control for parameter setting and push buttons for commonly used functions.

Easy Maintenance

WheelScan is designed with full diagnostic features, including motion control and test from the HMI to full remote evaluation from a computer.

With an all steel welded frame, WheelScan 5 is tough yet compact. The 100 kg (220.4 lbs) wheel lift capacity is in excess of the stripped weight of all commonly used wheels. The welded steel frame eliminates tightening and checking for loose bolts for minimum maintenance and maximum strength.

The unit's compact size and locking castors enable easy positioning and stabilization.

Specifications

Probe:	Absolute probe system. Probes are as standard 6 or 9.5 mm diameter with a choice of frequencies from 100 k, 200 k (standard), 500 k and 1.5 MHz. Other diameters and frequencies are available on request.	Data Recording	57 mm wide thermal chart or paperless recording and review system.
Component Size	Scan Height: 415 mm (16.3 inches) Diameter Range: 0-865 mm (35.5 inches) Max Weight: 100 kg (220.4 lbs) Lift Ram Stroke: 250 mm (9.8 inches)	Data Storage	Internal PC hard drive. Transferable to other hard drives via USB port.
Electro-luminescent display:	Color LCD (HMI) display.	Outputs	USB port and VGA
Probe Motion Speed	The probe X/Y motion will travel at up to 150 mms-1 (6"/second) for the motion to and from the wheel.	Maintenance	The unit has a modular construction for easy exchange of parts. Major wear parts are sealed units for maximum longevity. XY mechanism has expected life in excess of 10,000 kilometres (built in prompts for routine maintenance.)
Wheel handling	Roller table and 215 mm (8.5") stroke lift ram with position encoder locates SLIC adaptor on hub.	Weight	250 kg (550 lbs) or heavier, depending the accessories used.
SLIC	Secure Lift Inertial Centering (SLIC) adaptor is an automatic centering can that securely grips the wheel hub. Standard SLIC Part No. 50A210: 48 to 225 mm (1.9 to 8.85 inches) Large SLIC Part No. 50A213 50 to 230 mm (1.97 to 9 inches) <i>Note: Smaller wheels may be gripped on the rim.</i>	Frame	Welded steel tube
Inspection Speeds	Surface inspection speed is 2 ms-1 (78 inches/second) maximum (up to 120 rpm). Scan helix may be set in 0.1 mm (4 mil) steps from 0 to 25 mm (1 inch). Note: 120 rpm is limited to A/C wheels <300 mm diameter (11.8 inches)	Dimensions	914 x 870 x 800 mm (36 x 34 x 31½ inches)
Scan Direction	Bottom to top or top to bottom	Power	90 to 264 VAC, 47 - 63 Hz, 350 watts
AutoTrak Plus	Ensures the probe maintains a constant pressure normal to the wheel surface while scanning parallel to the surface at the required helix.	Important note. This product is covered by one or more patents.	



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