EarthScan is a machine that performs non-destrucEarthScan is a machine that performs non-destructive examination of 'Off The Road' tyres, with systems being available that will scan tyres from 25"up to 63" rim size. The large the rim size, dictates the scale of the machine, this is tailored for the customer. (image shows 63" machine)tive examination of 'Off The Road' tyres, with systems being available that will scan tyres from 25"up to 63" rim size. The large the rim size, dictates the scale of the machine, this is tailored for the customer. (image shows 63" machine)

engineered and developed by

Shand Systems Ltd

Tyres Equipment

EarthScan

The original EarthScan system was produced in 1996 and is very much an integral part of the re-treading process at OTR UK.

The technology has continuously developed and uses the 'rotating sound mirror' principle that is being used in TyreScan, the truck tyre inspection system.

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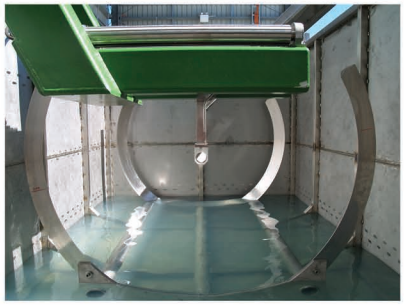
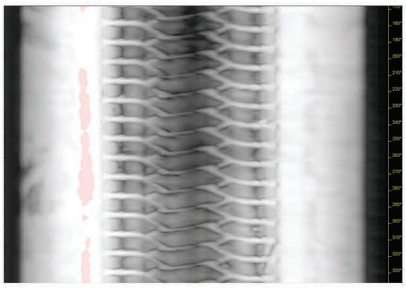
Description

EarthScan uses a pair of precision spinning sound mirrors and static conical reflectors to pass ultrasound through the structure of the tyre at high speed the tyre being rotated slowly. Where there is a change of density due to belt separations, impact damage build problems, porosity and incomplete curing, the sound passing through the structure is attenuated, and this is this is displayed live on the computer monitor, the shapes of the features say what the defects are.

The tyre is partially immersed in water so that the inside is flooded, the water couples the sound from the transmit probe through the tyre to the receive probe. The frequency of the ultrasound is 500KHz. As the pulses of sound are transmitted at a very high rate, and attenuated after passing through the tyre, specialised electronics is then required to amplify and process the data.



Mirror and Reflector system inside tank



Typical image from a 2700R49 tyre

The image can be printed or saved as a JPG or PCX file for archiving or transmission to the customer.

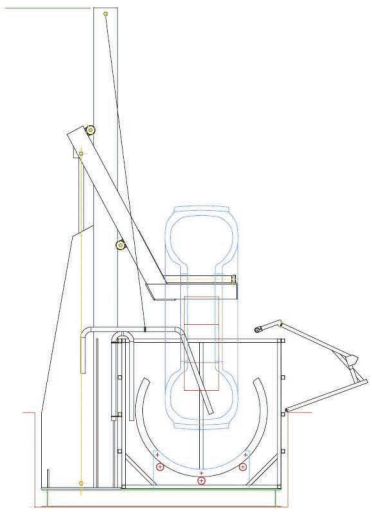
The tyre is loaded onto the hydraulic lift using a fork lift, and it is then lowered into the water and rotated during the scanning. The data acquisition time is approximately 6 minutes for a 4000R57. After the inspection, the tyre is lifted, the water sucked out of the inside of the tyre using an air driven diaphragm pump, and then further lifted so that it can be removed.

Specifications

The following are typical specifications for the machine inspecting up to 63 inch rims :

Maximum Tyre Weight	: 5.4 tons
Skid Weight	: 1.2 tons
Water in tyre	: 3.3 tons
Water in tank	: 25.3 tons
Machine weight (est)	: 11 tons
Load bearing footprint	: 4.94 m2

The machine is free standing, and built into a Pit.



Services

Hydraulic Pumps : 380 to 450v, 50Hz three phase at 45A per phase
Electrics: 220 to 240v 50Hz single phase at 3A (for electronics and computer)
Compressed Air at 8 Bar.

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