VINTEST

Computer aided non-destructive method and instrument for bodywork test and vehicle identification number (chassis number, VIN) verification

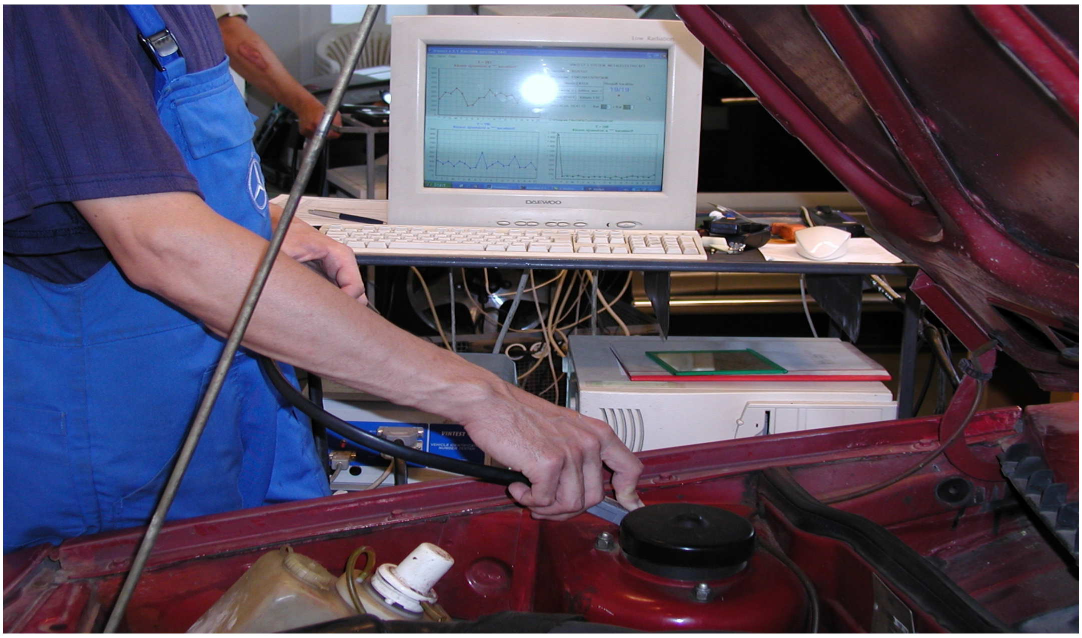

Figure Nr. 1. Measuring with the VINTEST-S instrument

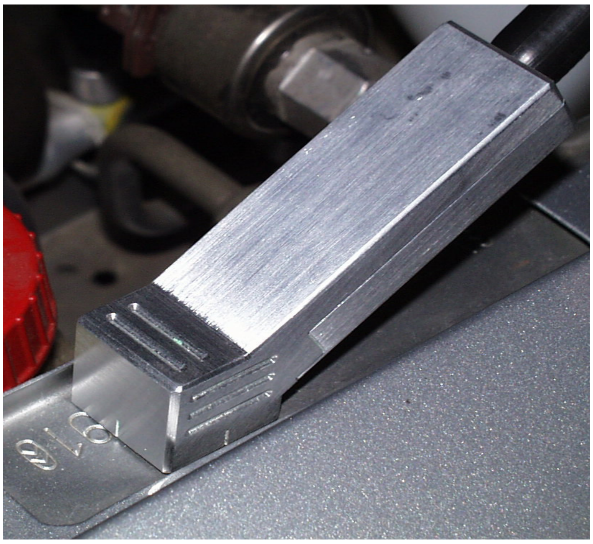

Figure Nr.2. VINEST probe during measurement and its bottom-view. The four inducers are well distinguishable that ensures two perpendicular inducing directions. The central probe is suitable for detecting both the magnetic Barkhausen-noise (X, Y diagram) and the electric signal proportional to the coating's thickness. Measured value is displayed in micrometer scale as defined by the computer after calibration.*

Magnetic principle based measurements can be performed with the equipment on steel sheet bodywork that is most widely used in the car manufacturing industry. As a result of measurements, metal sheets' stress status and microstructure as well as coating (paint) thickness can be examined.

Any manipulation, welding, plastic shaping of characters in the vehicle identification number (VIN) leads to residual changes of texture and stress status. Applying VINTEST device on and near the VIN definitely reveals manipulations or, on the contrary, proves the metal sheet be original.

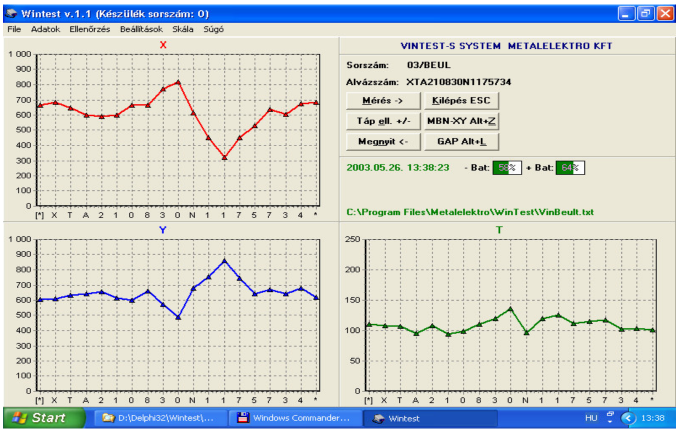

Figure 3. Operator screen of VINTEST software with typical measurement results. The ″N701″ characters have been modified by the means of welding (and/or peening).

The equipment can be even used in case when not only one or two characters have been changed but a smaller or larger piece of the VIN containing sheet have been changed. In this case the replaced sheet or the place of manipulation becomes detectable.

VINTEST is manufactured in PC installed version and also in mobile version with a microcomputer. Power supply is ensured from the mains, the built-in or vehicle battery.

There are no other controls on the VINTEST equipment beside the On/Off switch, because it is controlled by the measuring software running on the computer. Each character of the VIN shall be measured including the end character after specifying the measurement serial number and the vehicle identification number. The software indicates the start and end of measurement and a possible faulty measurement with a beeping noise. A so called master-curve collection gathered from vehicles in original condition helps evaluating the results. The result of the measurement is archived automatically to the background storage of the computer.

Technical data

- Appropriate materials:	Ferromagnetic materials
- Sheet thickness:	0.5 - 3mm
- Coating thickness max.:	1.5mm
- Measuring accuracy of coating:	1 %, min. 2 μm
- Power supply:	220V 50Hz / 12V DC, 20VA
- Battery, external:	2×12V / 1.2Ah
- Operating temperature:	0 -35 °C
- Dimensions:	130 x 250 x 400mm
- Weight:	4 kg
- Time needed for examination:	5 minutes

*** Barkhausen-noise**

In 1917 Barkhausen discovered that high frequency noises are being generated in transformer secondary coils and also proved that this noise is determined by the material characteristics of the transformer.

In 1921 Gerlach and Lertes published results of their examinations. They made the statement that noise is determined by the mechanical stress.

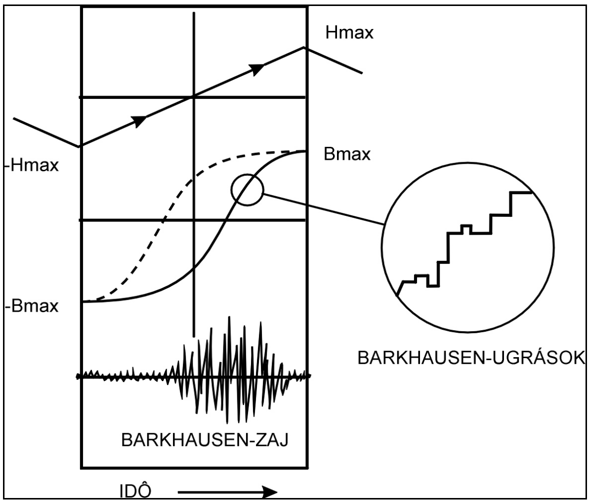

Figure 1. The hysteresis Barkhausen jumps

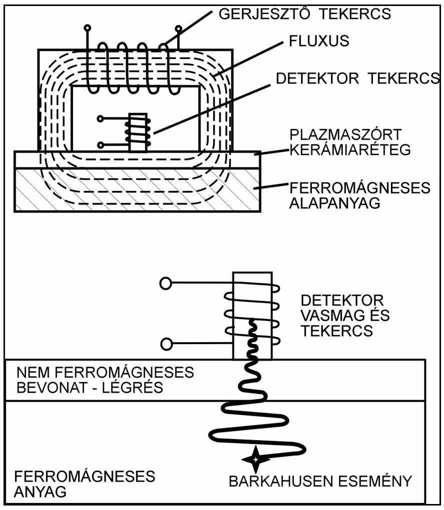

Figure 2. Excitation and the MNB detection

The Barkhausen-noise is generated in the detector coil placed on the surface during hysteresis loop forming because during change in the magnetic field magnetizing does not occur actually in a continuous way but with many small discrete jumps. Amplitude, density, its dependence on the strength of the magnetizing field (spectrum of the Barkhausen-noise) is determined by the microstructure of the ferromagnetic material and the mechanical stress in a given material volume. If the microstructure of the material to be measured is known, that is manufactured from identical composition material with a set technology; changes of the Barkhausen-noise indicate the distribution of mechanical stress. MNB (magnetic Barkhausen-noise) increases in the direction of tensional stress and decreases in the direction of compressive stress.

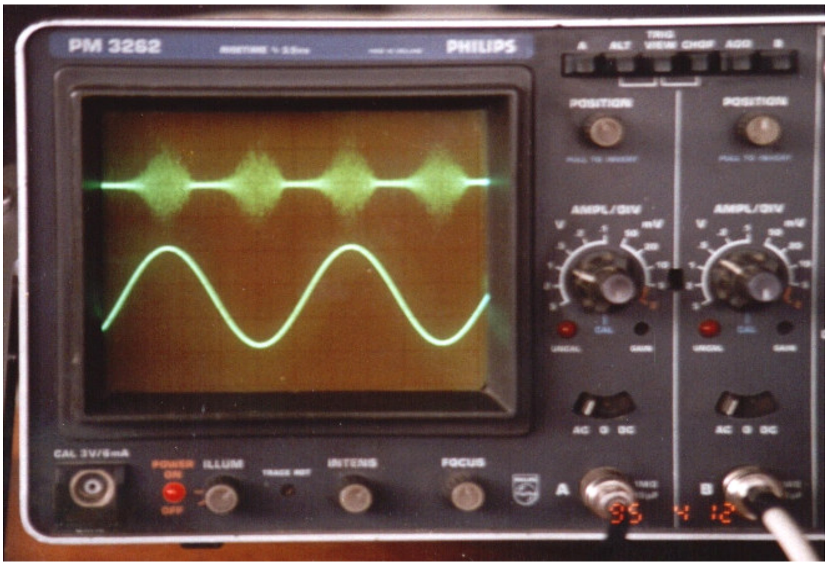

Figure 3. Sinusoidal excitation and MNB packets received every half-wave displayed on oscilloscope

METAL
ELEKTRO
MEASURING TECHNIQUE LTD

H-1119 Budapest, Borszék köz 13.

Hungary
Tel: +36 1 / 371-2290, Fax: 36 1 / 371-2292
e-mail: merestechnika@metalelektro.hu
http://www.metalelektro.hu/merestechnika/