TECHNICAL REPORT

No. 55 00059 06, vers. 0

issued by the

TÜV Rheinland Italia S.r.l.

Via Gavardina di Sopra Traversa II N° 42 I-25010 Ponte S. Marco (BS)

Test of a vehicle alarm system as a separate technical unit
according to

ECE-R97

(including Supplement 3 to the 01 series of amendments dated 14.10.02)

Approval status	
ECE	Number of approval
	-

Reason for the extension : **n.a.**

0. Technical description

0.1. Trade mark or trade name: GT
or: GETRONIC
or: GT AUTO ALARM

0.2. Type: GT 909

0.2.1. Models: fifteen

GT 909	kit consisting of vehicle alarm system control unit GT 906 with siren GT 945
GT 908	kit consisting of vehicle alarm system control unit GT 906 with siren GT 944
GT 907	kit consisting of vehicle alarm system control unit GT 906 with siren GT 843
GT 906	vehicle alarm system (using original vehicles horn)
GT 905	as GT 906, but without ultrasonic transducers
GT 904	as GT 909, but without radio control handset
GT 903	as GT 908, but without radio control handset
GT 902	as GT 907, but without radio control handset
GT 901	as GT 906, but without radio control handset
GT 900	as GT 905, but without radio control handset
GT 914	as GT 909, but without setting/unsetting using the original radio control handset
GT 913	as GT 908, but without setting/unsetting using the original radio control handset
GT 912	as GT 907, but without setting/unsetting using the original radio control handset
GT 911	as GT 906, but without setting/unsetting using the original radio control handset
GT 910	as GT 905, but without setting/unsetting using the original radio control handset

0.3.	Type identification:	GT 90?
0.4.	Position of the mark:	on the housing of the control unit GT 90?
0.5.	Kind of marking:	printed or affixed or stamped
0.6.	Manufacturer's name and address:	GETRONIC S.r.l. Via Calcinate, 12 I-21026 Gavirate (VA) Italy
0.7.	Production Plant's:	Via Calcinate, 12 I-21026 Gavirate (VA) Italy
0.8.	Manufacturer's authorised representative:	n.a.
0.9.	No. information document: dated:	55500059-06-00 09.03.06

1. Details of the test device:

1.0. Type of Immobiliser

The VAS is a modular vehicle alarm system, supply voltage 12 V. The units are supplied with wiring harness and all necessary accessories.

Components of the technical units:

1)	GT 906	modular vehicle alarm control unit
2)	GT 905	modular vehicle alarm control unit
3)	GT 889	remote control handset (optional)
4)	GT 971	status LED with receptacle
5)	-	ultrasonic Transducers (optional)
6)	GT 945	self powered siren via Radio (optional)
7)	GT 944	self powered siren (optional)
8)	GT 843	siren (optional)
9)	GT869CH	electronic key

Possible combinations:

1) + 3) + 4) + 5) + 6) + 9)
1) + 3) + 4) + 5) + 7) + 9)
1) + 3) + 4) + 5) + 8) + 9)
2) + 3) + 4) + 5) + 6) + 9)
2) + 3) + 4) + 5) + 7) + 9)
2) + 3) + 4) + 5) + 8) + 9)

The components marked "optional" may not be mounted in the above described combinations.

1.1. Type(s) of vehicle, on which the system has been tested:

The alarm system has been tested in the laboratory on installation conditions using simulators.

1.2. Vehicle Alarm System:

1.2.1. Operation	:	audible on	:	- external, optional self powered, siren and/or original vehicles warning device (horn)
		optical on	:	- all direction indicators
		radio alarm	:	- external siren GT 945 (only for versions with siren GT 945)
		panic alarm	:	- available for versions with GT 889 radio control handset
		others	:	- controlled command for window closure - emergency disarming using the electronic key - ultrasonic sensors exclusion - one electric immobilisation - central door looking command

1.2.2. Activation	:	- perimetric (door/boot/boonet contact) - perimetric via CAN (optional) - unintentional use of ignition switch - wires disconnection (only for systems with sirens GT 944 or GT 945) - ultrasonic protection (not for version GT 905 , GT 910 and GT 900)
1.2.3. Setting	:	- by the remote control handset (only for systems with radio control handset GT 889) - by command of the original central door locking system, transmitted through CAN line (only for systems with function setting/unsetting using the original vehicles key)
Unsetting	:	- by the remote control handset only for systems with radio control handset GT 889) - by command of the original central door locking system, transmitted through CAN line (only for systems with function setting/unsetting using the original vehicles key) - in emergency by inserting the electronic key in the receptacle
1.2.4.Status display	:	- LED in the vehicle compartment - Indication of short-term „dynamic“ processes by the direction indicators (only for versions with GT 889 radio control handset)

1.3. Immobilizer: **in the sense of the regulation not available**

1.3.1.Operation	:	n.a.
1.3.2.Setting	:	n.a.
1.3.3.Unsetting	:	n.a.

2. Test record

2.1. Vehicle alarm system:

2.1.1. The general requirement of section 5, Part I, ECE-R97 have been complied with.

The electromagnetic compatibility (EMC) of the device according to directive 72/245/EEC in the version 95/54/EC dated 31.10.1995 is ensured; this was demonstrated by a positive test; test results see enclosure 3. The further siren (GT 843) has already been tested positively with another vehicle alarm system.

The electromagnetic compatibility tests according to section 7.2.12., Part I, ECE-R97 have been carried out by TÜV Rheinland Italia S.r.l. according to the ISO test method as described in annex 9 of ECE-R97; test results see enclosure 2.

The radio transmission equipments (remote control and radio alarm) have been tested positively by an accredited test laboratory according to the appropriate standards (EN300-220:09/00 and EN301-489:08/00).

2.1.2. The particular specifications according to section 6, Part I, ECE-R97, have been complied with.

Audible alarm signal device	:	external siren: noise level according to point 6.1 and 6.2, Part I, ECE-R28: GT843: 106,4 dB(A) GT945: 105,2 dB(A)
Duration of the acoustic signal	:	25 - 30 s
Optional audible alarm signal device	:	original vehicles horn
Duration of the optical signal	:	25 - 30 s
Self-check, automatic breakdown indication is showed through	:	- direction indicators in case of arming with door and/or boot/bonnet open and/or vehicles battery low

2.1.3. Operation parameters and test conditions according to section 7, Part I, ECE-R97 are fulfilled by all components of the VAS.

Additional information:

point 7.2.2.: the climatic tests have been performed at -40°C and +85°C

point 7.2.3.: the grade of protection IP40 (in installation conditions) has been controlled for all components, except for the external sirens, for which the grade of protection IP54 has been controlled

point 7.2.8.: the vibration tests have been carried out according to type 1 for all components

2.1.4. Instructions:

The supplied instructions for installation, use and maintenance and the general warnings correspond to the requirements of the VAS.

2.2. Immobilizer: **N/A**

2.3. Date of tests : 16.12.2005 – 08.03.2006

2.4. Place of tests : TÜV Rheinland Italia S.r.l.,
I - Ponte S. Marco (BS)
Senton GmbH
D - Memmingen

2.5. Remarks : To monitor the state of the system, a Vector Can-Analyser supplied by Getronic S.r.l. has been used.

3. **Enclosures:**	**Drawing No:**	**Date:**
Enclosure 1 - Photo sheets of the test object (2 pages)	-	-
Enclosure 2 - Test results EMC-ISO/DIS 7637 and ISO/TR 10605) (5 pages)	-	-
Enclosure 3 - Test results EMC-Test set-up during EMC test and EMC test results (5 pages)	-	-
Information Document (73 pages)	55500059-06-00	09.03.2006

4. Summary:

The described type, GT 909, and the above mentioned information document, comply with the requirements of regulation ECE-R97 (including Supplement 3 to the 01 series of amendments); it is therefore suitable for an application on vehicles with Low-Speed CAN having a negatively earthed 12 volt battery powered electrical system.

There are no technical objections against granting an ECE approval.

The publication or duplication of this technical report with enclosures, or Part of this technical report with enclosures, without a written consent of the test laboratory is not permitted.

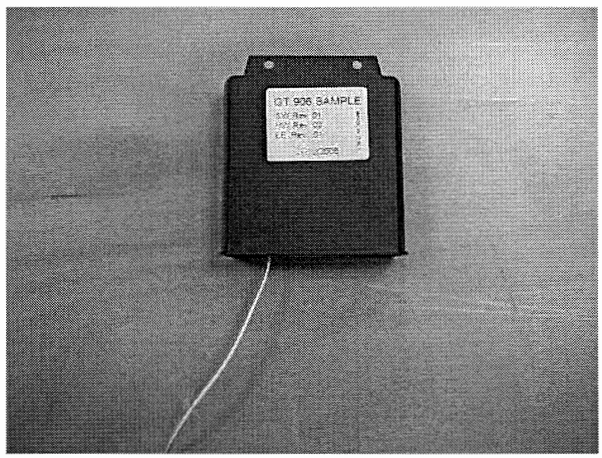
This technical report includes the pages 1 to 8.

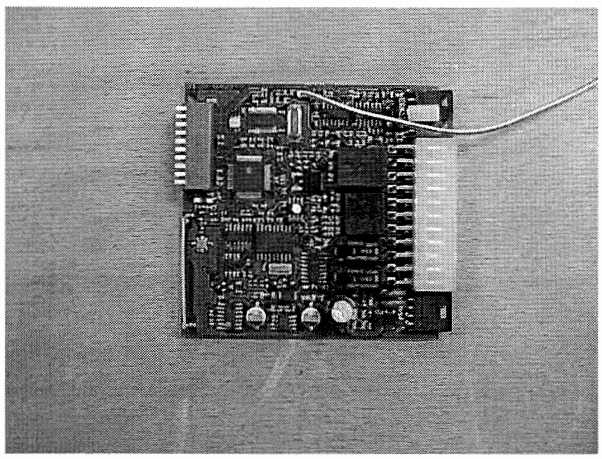
The Expert

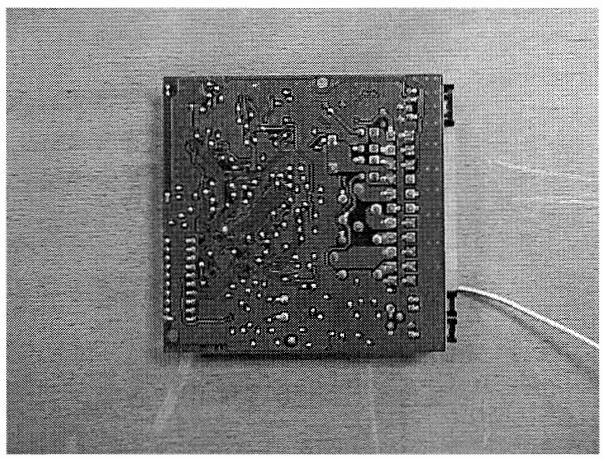
Dipl. Ing. (FH) A. Höpfl

Ponte S. Marco, 09.03.2006
ns/ah

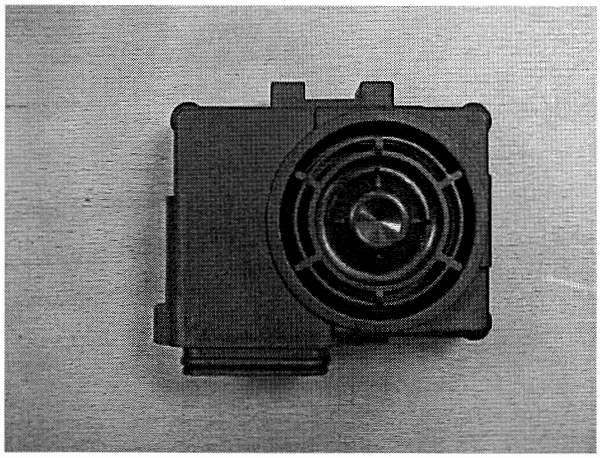
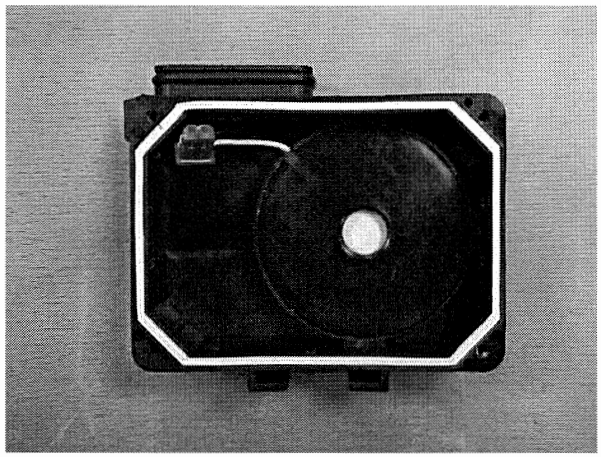
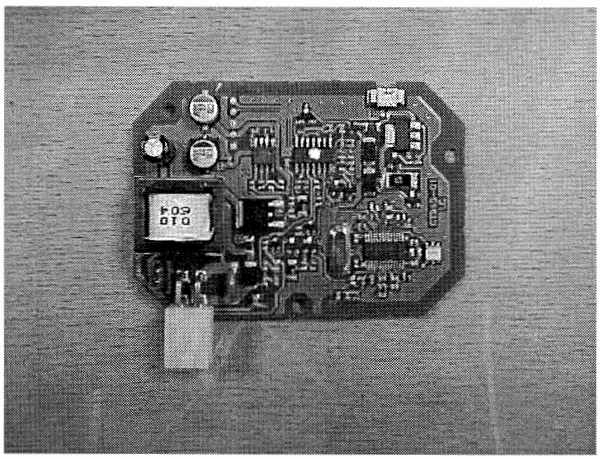
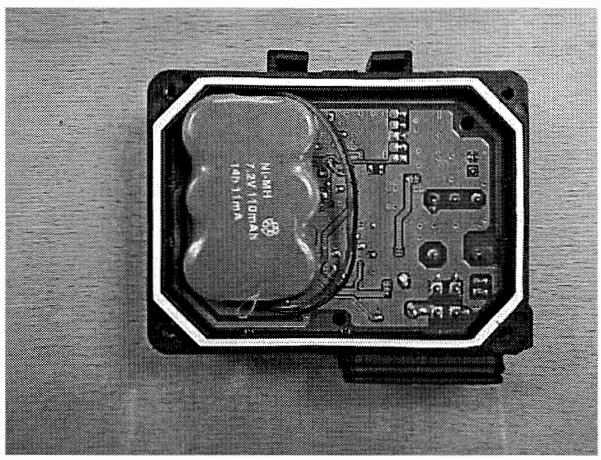
Photo Sheet of the test object







Enclosure 1

Enclosure 2

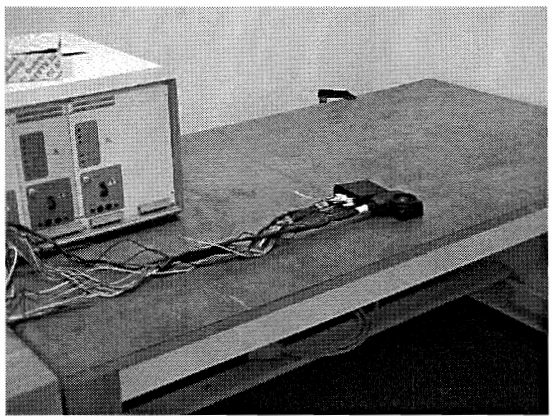
Test Results of Electromagnetic Compatibility tests (ISO7637 and ISO/TR 10605) according to Annex I, ECE-R97, method ISO

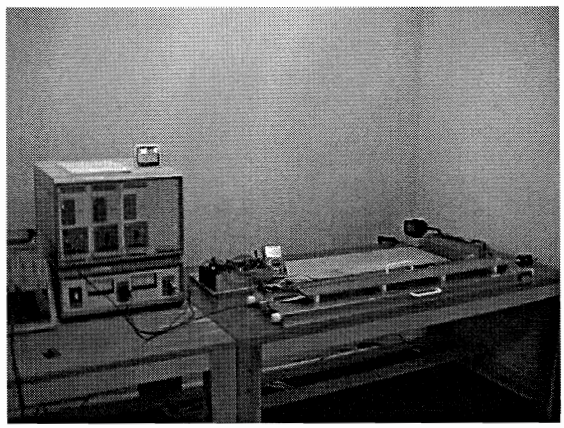
The following tests has been carried out only on the parts, relevant for the VAS. The other inputs/outputs of the system (for example comfort facility) have not been examined.

1. Immunity tests against disturbances conducted on supply lines and coupled on signal lines:

The immunity tests against disturbances conducted on supply lines and coupled on signal lines have been carried out according to the indications taken from Annex 9 of ECE-Regulation 97.

1.1. Test set up:





1.2. Used test equipment:

Oscilloscope:

Manufacturer:	TEKTRONIX
Type:	TDS380
Serial no.:	B015667
Identification no.:	55500087

Pulse Generator:

Manufacturer:	SCHAFFNER
Type:	NSG5000
Serial no.:	20142.101AR
Identification no.:	55500090/0

Coupling Clamp:

Manufacturer:	SCHAFFNER
Type:	CDN500
Serial no.:	425 0147
Identification no.:	55500090/3

Power supply:

Manufacturer:	SCHAFFNER
Type:	NSG 530
Serial no.:	206
Identification no.:	55500090/1

Humidity and Temperature indicator:

Manufacturer:	TESTO
Type:	Hygrometer testo 608-H1
Serial no.:	037.99
Identification no.:	55500104/1

1.3. Immunity tests against disturbances conducted on supply lines and coupled on signal lines:

The immunity tests against disturbances conducted on supply lines have been carried out according to ISO 7637-1:1990, test pulse 1-5.

The immunity tests against disturbances coupled on signal lines have been carried out according to ISO 7637-3:1995, test pulse 3a, 3b.

During the test the test object has been connected to 13,5 V DC (except for pulse 4 tests); the pulse characteristics and the state of the system has been adjusted in accordance to the ECE-Regulation, Annex 9, point 1.

1.4. Place of test: TÜV Rheinland Italia S.r.l.
Ponte S. Marco (BS)

1.5. Date of test: 27.02.2006 – 28.02.2006

1.6. Ambient conditions during the test: T = 21 ± 2°C
RH = 35 ± 10%

1.7. Measuring records:

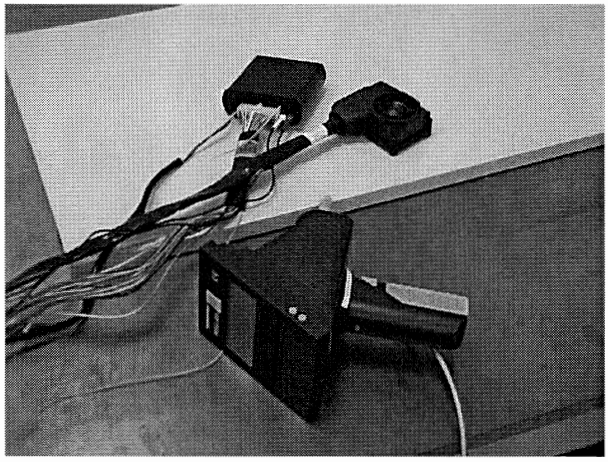
Power supply	State	Tested Pulse	Test Level	Voltage Level	No. pulses/ test time	Require-ments / Limit	Test results
+13,5VDC	unset state	1	III	-75V	5000	[A]	passed
+13,5VDC	set state	1	III	-75V	5000	[C]	passed
+13,5VDC	unset state	2	III	+75V	5000	[A]	passed
+13,5VDC	set state	2	III	+75V	5000	[A]	passed
+13,5VDC	unset state	3a	III	-100V	1 h	[A]	passed
+13,5VDC	set state	3a	III	-100V	1 h	[C]	passed
+13,5VDC	set state	3a *	III	-100V	10 min	[C]	passed
+13,5VDC	unset state	3b	III	+75V	1 h	[A]	passed
+13,5VDC	set state	3b	III	+75V	1 h	[A]	passed
+13,5VDC	set state	3b*	III	+75V	10 min	[A]	passed
Var.VDC	unset state	4	III	-6V	1	[A]	passed
Var.VDC	set state	4	III	-6V	1	[B]	passed
Var.VDC	set state	4	I	-4V	1	[A]	passed
+13,5VDC	unset state	5	III	+66,5V	3	[A]	passed
+13,5VDC	set state	5	III	+66,5V	3	[A]	passed

[A] All functions perform as designed during and after exposure to disturbance
[B] All functions perform as designed during exposure to disturbance. All functions return automatically to within normal limits after exposure is removed. Memory functions comply with [A]
[C] All functions return automatically to within normal limits after exposure is removed.
* Immunity against disturbance coupled on signal lines

2. Immunity to electrostatic discharge (ESD):

The immunity tests to electrostatic discharge have been carried out according to the indications taken from Annex 9 of ECE-Regulation 97.

2.1. Test set up:



2.2. Used test equipment:

ESD Simulator:

Manufacturer:	SCHAFFNER
Type:	NSG435
Serial no.:	001883
Identification no.:	55500083

Power supply: Car Battery

Humidity and Temperature indicator:

Manufacturer:	TESTO
Type:	Hygrometer testo 608-H1
Serial no.:	037.99
Identification no.:	55500104/1

2.3. Immunity to electrostatic discharge:

The tests have been carried out according to IEC/TR 10605-1993.

During the tests the test object has been connected to 13,5 VDC. The VAS with immobilizer has been triggered for each discharge location and test voltage with three positive and negative impulses. For the discharge locations point 5.8 of IEC/TR 10605-1993 has been applied.

Enclosure 2

2.4. Place of test: TÜV Rheinland Italia S.r.l.
Ponte S. Marco (BS)

2.5. Date of test: 28.02.2006

2.6. Ambient conditions during the test: T = 23 ± 2°C
RH = 30 ± 10%

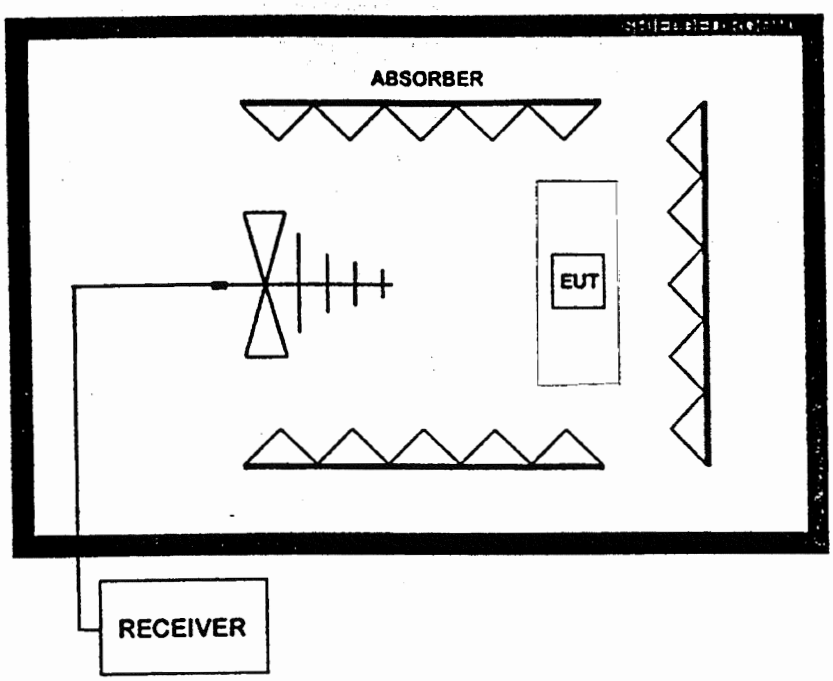
2.7. Measuring records:

Power supply	Test Temperature	Discharge type	Test Voltage	Require-ments / Limit	Test results
+13,5VDC	ambient	contact	± 4 kV	[1]	passed
			± 6 kV	[1]	passed
			± 7 kV	[1]	passed
			± 8 kV	[1]	passed
+13,5VDC	ambient	Air-discharge	± 4 kV	[1]	passed
			± 8 kV	[1]	passed
			± 14 kV	[1]	passed
			± 15 kV	[1]	passed

[1] full function during test / no change of state / no uncontrolled behavior

Photo Sheet of the test object

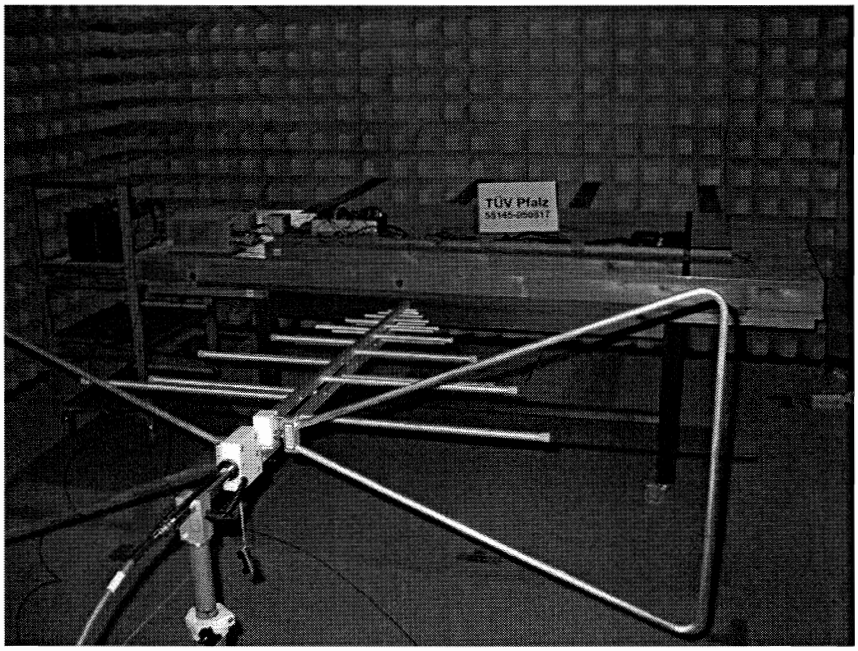
Test-Set-up radiated emissions test according to directive 95/54/EC



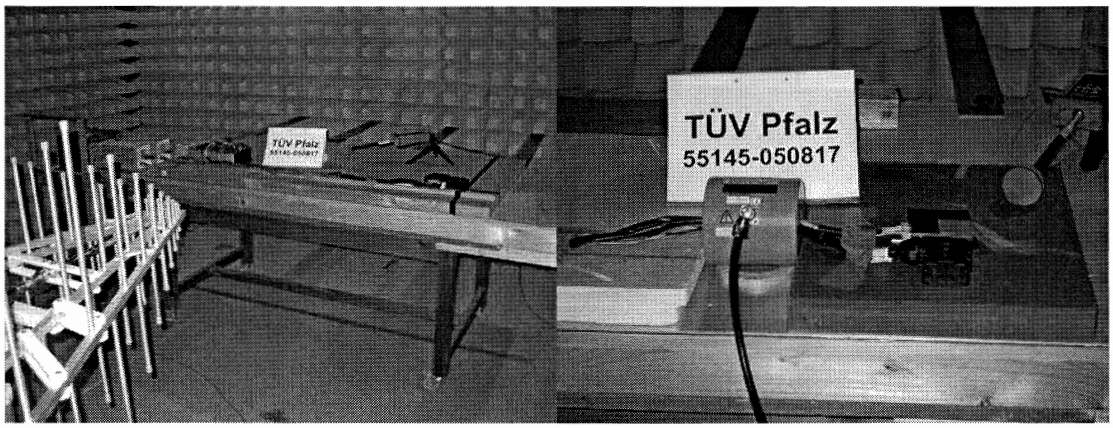
Netz/Mains:	**DC 12V**
Antenne/Antenna:	**see test results**
Abstand/Distance from Antenna to table	**100 cm (from reference point)**

Photo Sheet of test set-up

Test Set-up of radiated emission test



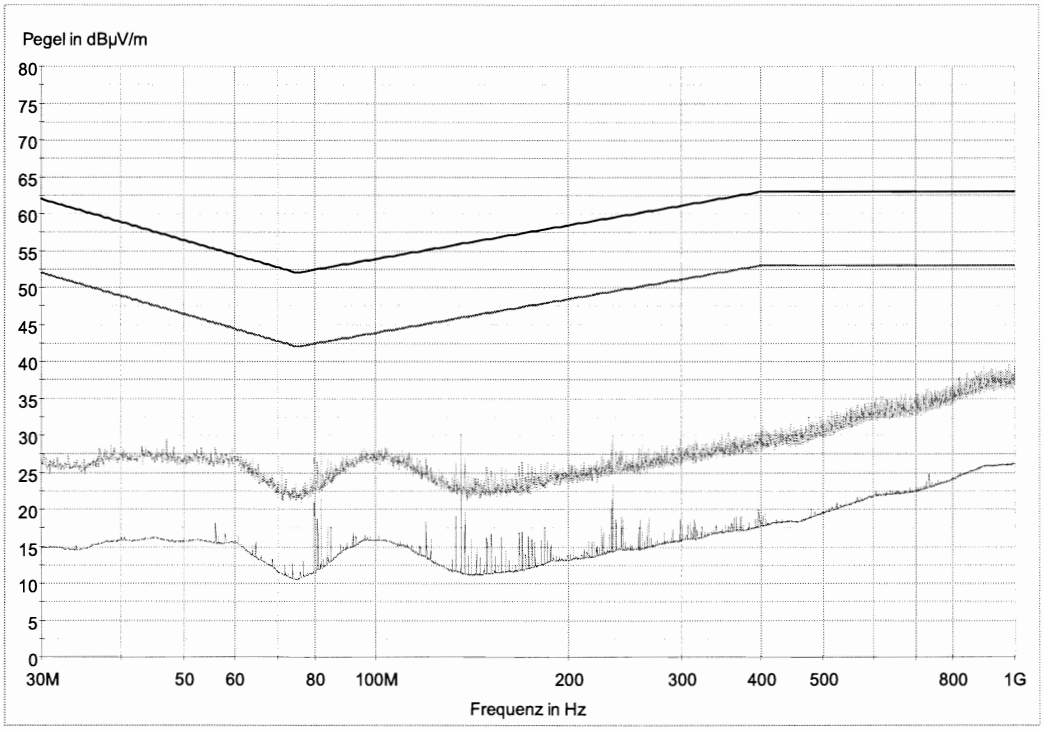
Test Set-up of immunity test



Test results – Immunity test

Model:	GT 909 with siren GT 945	
Applicant:	GETRONIC S.r.l.	
Mode of operation:	System activated/de-activated	
Regulations:	95/54/EC	
Test method:	Free Field Substitution method according to point 8, Annex IX for the frequency field from 200 MHz up to 1 GHz and bulk current injection according to point 10, Annex IX for the frequency field from 20 MHz up to 200 MHz.	
Interfering signal:	Modulation:	AM
	Modulation depth:	80 %
	Modulation frequency:	1kHz
	Polarisation:	horizontal and vertical (only for free field substitution method)
	Dwell time:	2.0 seconds
Performance criteria:	No false signal; no uncontrolled behaviour, no change of state	
Test result:	Up to a field strength of 30 V/m – 60 mA no deviation of the normal operation of the electrical/electronic sub-assembly was observed. Particularly no degradations of performance and no degradations which could influence driver's direct control of the vehicle, as described in the directive, were noticed.	
Classification:	Test passed	
Date of test:	16.12.2005	
Tested by:	N. Scartapacchio	

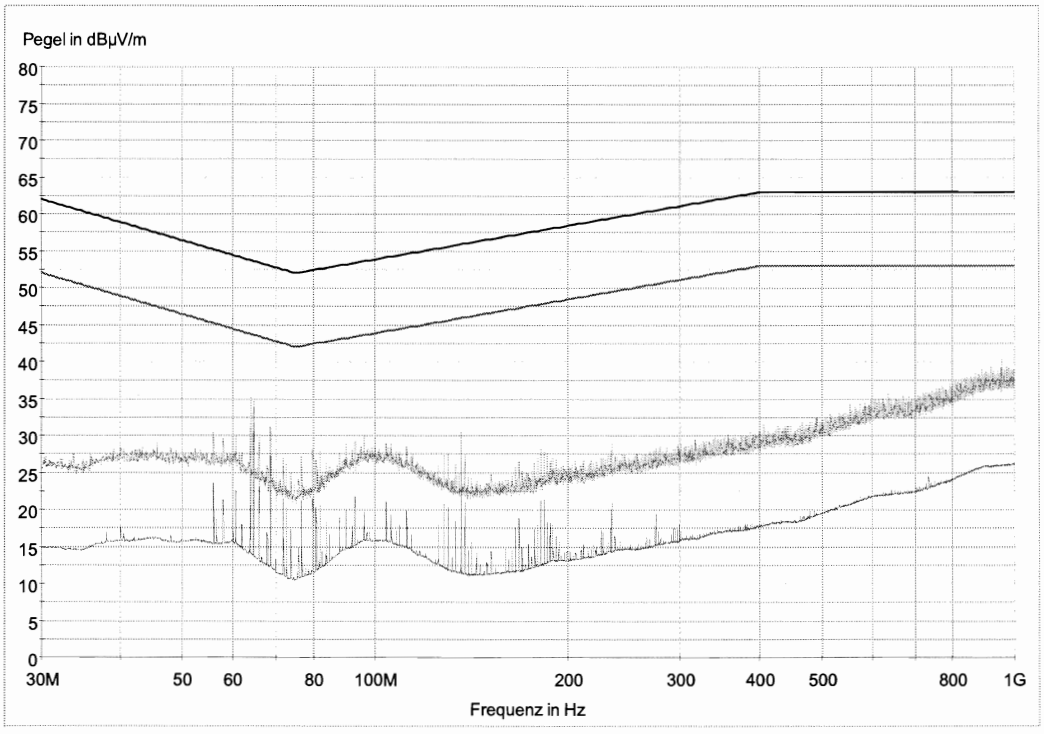
Test results – Radiated Interference Test



MaxPeak-ClearWrite
Directive 72-245-EEC (2004-104-EC) BB

Average-ClearWrite
Directive 72-245-EEC (2004-104-EC) NB

Test results – Radiated Interference Test



MaxPeak-ClearWrite
Directive 72-245-EEC (2004-104-EC) BB

Average-ClearWrite
Directive 72-245-EEC (2004-104-EC) NB

Information document No. 5500059-06-00
relating to a separate technical unit of vehicle alarm system

0. General

0.1. Make (trade name of manufacturer):		GT
	or:	GETRONIC
	or:	GT AUTO ALARM
0.2. Type and general commercial description:		GT 909 Vehicle Alarm System

0.2.1. Models: fifteen

GT 909	kit consisting of vehicle alarm system control unit GT 906 with siren GT 945
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GT 907	kit consisting of vehicle alarm system control unit GT 906 with siren GT 843
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GT 903	as GT 908, but without radio control handset
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GT 901	as GT 906, but without radio control handset
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GT 914	as GT 909, but without setting/unsetting using the original radio control handset
GT 913	as GT 908, but without setting/unsetting using the original radio control handset
GT 912	as GT 907, but without setting/unsetting using the original radio control handset
GT 911	as GT 906, but without setting/unsetting using the original radio control handset
GT 910	as GT 905, but without setting/unsetting using the original radio control handset

0.5. Name and address of manufacturer:	GETRONIC S.r.l. Via Calcinate 12 I-21026 Gavirate (VA)
0.7. In the case of components and separate technical units, location and method of affixing of the ECE approval mark:	on the housing of the control unit, printed or affixed or stamped

Varese, 09.03.2006

0.8. Address of assembly plant: see 0.5.

1. Description of device

1.1. A detailed technical description of the device: see enclosure

1.2. Range of protection offered by the device:
- perimetric (door/boot/boonet contact)
- perimetric via CAN (optional)
- unintentional use of ignition switch
- wires disconnection (only for system with sirens GT 944 or GT 945)
- ultrasonic protection (not for version GT 905 , GT 910 and GT 900)

1.3. Method of setting/unsetting the device:

Setting :
- by the remote control handset (only for systems with radio control handset GT 889)
- by command of the original central door locking system, transmitted through CAN line (only for systems with function setting/unsetting using the original vehicles key)

Unsetting :
- by the remote control handset only for systems with radio control handset GT 889)
- by command of the original central door locking system, transmitted through CAN line (only for systems with function setting/unsetting using the original vehicles key)
- in emergency by inserting the electronic key in the receptacle

1.4. Number of effective interchangeable codes: According to the requirements of the directive.

1.5. List of main components comprising the device and, if applicable, their reference marks:
- Control unit GT 909
- Remote Control handset GT 889 (optional)
- Check LED with receptacle
- US-Transducers (optional)
- External Siren (GT 944, GT 945, GT 843) - optionally

Varese, 09.03.2006

2.	Drawings	
2.1	Drawings of main components of the device	see enclosure
3.	Instructions	
3.1.	List of vehicle to which the device is intended	see enclosure
3.2.	Description of the method of installation illustrated by photographs and/or drawings:	see enclosure
3.3.	Instruction for use:	see enclosure
3.4.	Instruction for maintenance, if any:	see enclosure

ENCLOSURE
Documentation Dossier GT 909 (73 pages)

Varese, 09.03.2006