



OSVĚDČENÍ o:

UDĚLENÍ HOMOLOGACE  
ROZŠÍŘENÍ HOMOLOGACE  
ODMÍTNUTÍ HOMOLOGACE  
ODEJMUTÍ HOMOLOGACE  
UKONČENÍ VÝROBY

COMMUNICATION concerning:

APPROVAL GRANTED  
APPROVAL EXTENDED  
APPROVAL REFUSED  
APPROVAL WITHDRAWN  
PRODUCTION DEFINITELY DISCONTINUED

typu komponenty CNG podle Předpisu č. 110.00  
of a type of CNG component pursuant to Regulation No. 110.00

Homologace č.:  
Approval No.: **110 R – 00 5441**

Rozšíření č.: –  
Extension No.: **N/A**

1. Uvažovaná komponenta CNG:  
CNG component considered:

~~Nádrž(e) nebo tlaková(é) láhev(e) / Container(s) or cylinder(s)~~  
~~Ukazatel tlaku / Pressure indicator~~  
~~Přetlakový ventil / Pressure relief valve~~  
~~Automatický(é) ventil(y) / Automatic valve(s)~~  
~~Přepadový ventil / Excess flow valve~~  
~~Plynotěsná skříň / Gas-tight housing~~  
~~Regulátor tlaku / Pressure regulator(s)~~  
~~Zpětný(é) ventil(y) / Check valve(s)~~  
~~Přetlakové zařízení / Pressure relief device~~  
~~Ruční ventil / Manual valve~~  
~~Ohebná vedení paliva / Flexible fuel lines~~  
~~Plnicí jednotka nebo plnicí hrdlo / Filling unit or receptacle~~  
~~Směšovač plyn/vzduch (vstřikovače) / Gas/air mixer (injectors)~~  
~~Nastavovač průtoku plynu / Gas flow adjuster~~  
~~Směšovač plyn/vzduch (karburátor) / Gas/air mixer (carburettor)~~  
**Elektronická řídicí jednotka / Electronic control unit**  
~~Tlakový(é) a teplotní snímač(e) / Pressure and temperature sensor(s)~~  
~~Filtr(y) CNG / CNG filter(s)~~

2. Obchodní název nebo značka:  
Trade name or mark:

**FOBOS**

Centrální jednotka typ: **FOBOS 2**  
Central unit of type:

Varianty: –  
Variants: **N/A**



3. Název a adresa výrobce:  
Manufacturer's name and address: **FOBOS AUTO LTD**  
**1. Bulgarska Aviatzia**  
**5800 Pleven**  
**Bulgaria**
4. Název a adresa zástupce výrobce  
(pokud jsou potřebné):  
If applicable, name and address  
of manufacturer's representative: **—**  
**N/A**
5. Předloženo k homologaci dne:  
Submitted for approval on: **21 October 2009**
6. Homologační zkušebna:  
Technical service responsible  
for conducting approval tests: **E8/C: TÜV SÜD Auto CZ s.r.o.**  
**Novodvorská 994/138**  
**142 21 Praha 4**  
**Czech Republic**
7. Datum protokolu, vydaného touto zkušebnou:  
Date of report issued by that service: **3 November 2009**
8. Číslo protokolu, vydaného touto zkušebnou:  
Number of report issued by that service: **120910 – 09 – TAC**


9. **HOMOLOGACE UDĚLENA** /ODMÍTNUTA / ROZŠÍŘENA / ODEJMUTA  
**APPROVAL IS GRANTED** /REFUSED / EXTENDED / WITHDRAWN

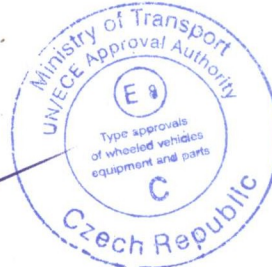
10. Důvod(y) pro rozšíření homologace:  
Reason(s) for extension: **—**  
**N/A**

11. Místo:  
Place: **Praha**

12. Datum:  
Date: **4 November 2009**

13. Podpis:  
Signature:

  
**Oleg Spružina**



14. Dokumentaci k této žádosti o homologaci nebo rozšíření homologace lze obdržet na vyžádání.  
The documents filed with the application or extension of approval authority can be obtained upon request.



**Příloha 2B – Doplněk**  
**Annex 2B – Addendum**

- |      |  |          |
|------|--|----------|
| 1.   | Doplňující informace týkající se typové homologace typu komponenty CNG dle Předpisu č. 110<br>Additional information concerning the type approval of a type of CNG components pursuant to Regulation No. 110 |          |
| 1.1  | Nádrž(e) nebo tlaková(é) láhev(e):<br>Container(s) or cylinder(s):   | –<br>N/A |
| 1.2  | Ukazatel tlaku:<br>Pressure indicator:   | –<br>N/A |
| 1.3  | Přetlakový ventil (odpouštěcí ventil):<br>Pressure relief valve (discharge valve):   | –<br>N/A |
| 1.4  | Automatický(é) ventil(y):<br>Automatic valve(s):   | –<br>N/A |
| 1.5  | Přepadový ventil:<br>Excess flow valve:  | –<br>N/A |
| 1.6  | Plynotěsná skříň:<br>Gas-tight housing:  | –<br>N/A |
| 1.7  | Regulátor(y) tlaku:<br>Pressure regulator(s):  | –<br>N/A |
| 1.8  | Zpětná(é) klapka(y) nebo zpětný(é) ventil(y):<br>Check valve(s) or non-return valve(s):  | –<br>N/A |
| 1.9  | Přetlakové zařízení (iniciované teplotou):<br>Pressure relief device (temperature triggered):  | –<br>N/A |
| 1.10 | Ruční ventil:<br>Manual valve:   | –<br>N/A |
| 1.11 | Ohebná vedení paliva:<br>Flexible fuel lines:  | –<br>N/A |
| 1.12 | Plnicí jednotka nebo plnicí hrdlo:<br>Filling unit or receptacle:  | –<br>N/A |
| 1.13 | Směšovač plyn / vzduch (vstřikovače):<br>Gas / air mixer (injectors):  | –<br>N/A |
| 1.14 | Nastavovač průtoku plynu:<br>Gas flow adjustor:  | –<br>N/A |
| 1.15 | Směšovač plyn / vzduch (karburátor):<br>Gas / air mixer (carburettor):   | –<br>N/A |



### 1.16.1 Principy základního software: Basic software principles:

**ECU controls gas/engine operation. It further ensures the complying with requirements of Annex 4 to the ECE Regulation No. 110.**

<b>1.17</b>	Tlakový(é) a teplotní snímač(e): Pressure and temperature sensor(s):	– N/A
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<b>1.18</b>	Filtr(y) CNG:	–
	CNG filter(s):	N/A

1/ Určete toleranci.  
Specify the tolerance.







Auto CZ

Choose certainty.  
Add value.

Technical Report No.: 120910 – 09 – TAC  
ECE Regulation No.: 110.00  
Manufacturer: FOBOS AUTO LTD  
1. Bulgarska Aviatsia  
5800 Pleven  
Bulgaria  
Type: Electronic control unit type: Fobos 2

**TECHNICAL REPORT  
No. 120910 – 09 – TAC**

Test according to ECE Regulation No. 110.00

- I. Specific components of motor vehicles using compressed natural gas (CNG) in their propulsion system**
- II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) in their propulsion system**

ECE No. 110.00 – date of entry into force: 28 December 2000  
including all amendments up to and including:  
ECE No. 110.00, supplement 8 – date of entry into force: 22 July 2009

Objectives: Document for issue of approval certificate



**I. Technical data**

- 0.1. Make (trade name of manufacturer): FOBOS
- 0.2. Type: Fobos 2
- 0.3. Means of identification of type: By letters and digits
- 0.3.1. Location of that marking: On the label on the cover of ECU
- 0.4. Class of component: Not applicable
- 0.5. Name and address of manufacturer: FOBOS AUTO LTD  
1. Bulgarska Aviatsia  
5800 Pleven  
Bulgaria
- 0.8. Address of assembly plant: See item 0.5.
- 0.9. Location of the approval mark: On the cover of ECU

Technical Report No.: 120910 – 09 – TAC  
ECE Regulation No.: 110.00  
Manufacturer: FOBOS AUTO LTD  
1. Bulgarska Aviatsia  
5800 Pleven  
Bulgaria



Auto CZ

Type: Electronic control unit type: Fobos 2

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**II. Test report**

Technical data and tests results are indicated in the enclosure of this technical report.

Specimen submitted to test on: 21 October 2009

3.

Date of test: 21 October 2009

4.

**III. Manufacturer's information folder**

Documentation for type approval of  
21 October 2009, 6 pages total

**IV. Attachments**

Technical Reports No.:

260081 – 09 – TAC:

4 pages total

260082 – 09 – TAC:

3 pages total

The results presented above were measured/found in the laboratory accredited by ČIA under No. 1107 according to the ISO/IEC 17025 standard and relate only to items tested. The final confirmation exceeds the accreditation.

Measuring and test equipment and test site meet the requirements of the applicable legislation. This report must never be reproduced incomplete without a written permission of the testing laboratory.

**V. Final assessment**

The described / sample

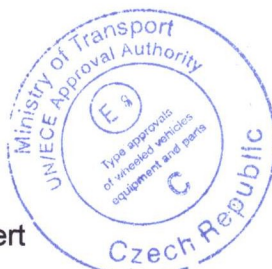
**complies**

with the requirements of ECE Regulation No. 110.00  
for issue of approval certificate

This technical report consists of pages No. 1 to 2 and 7 pages of attachments.

  
Vladimír Perný

Officially recognized expert



  
Vít Dvořák

Head of Group of experts

Prague, 3 November 2009





Technical Report No.: 260081 – 09 – TAC  
 ECE Regulation No.: 010.02  
 Manufacturer: FOBOS AUTO LTD.  
 Type: Fobos 2

## TECHNICAL REPORT No. 260081 – 09 – TAC

Test according to ECE Regulation No. 010.02  
**Uniform provisions concerning the approval of vehicles  
 with regard to electromagnetic compatibility.**

ECE No. 010.00 – date of entry into force: 1 April 1969  
 including all amendments up to and including  
 ECE No. 010.02, supplement 02 – date of entry into force: 12 August 2004

Objectives: partial document for issue of approval certificates according  
 to ECE Regulations 67.01 and 110.00

### I. Technical data

- 0.1. Make (trade name of manufacturer): FOBOS
- 0.2. Type: Fobos 2
- 0.2.1. Components of the system: CPU Fobos 2,  
 temperature & pressure sensors,  
 M.A.P. & level sensors,  
 gas/petrol switch model SW2.
- 0.3. Means of identification of type: manufacturer's label
- 0.3.1. Location of that marking: top side of the housing
- 0.4. Category of vehicle: n/a
- 0.5. Name and address of manufacturer: FOBOS AUTO LTD.  
 1 BULGARSKA AVIATSIA  
 5800 PLEVEN  
 BULGARIA
- 0.8. Address of assembly plant: see above
- 0.9. Location of the approval mark: next to the manufacturer's label





Technical Report No.: 260081 – 09 – TAC  
ECE Regulation No.: 010.02  
Manufacturer: FOBOS AUTO LTD.  
Type: Fobos 2



Auto CZ

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## II. Test report

### 1. Test conditions

1.1. Test sample: electronic control set for the gas propulsion system designed for vehicles with 12V negative ground mains.

### 1.2. Test procedures used:

tests executed according to one or more certified procedures:

(1.3.) Measurement of high frequency disturbing electromagnetic fields and voltages, test of high frequency resistance and

(1.4.) Tests of impulse resistance of electronic devices. Measurement of disturbing impulse overvoltage emitted into the vehicle electrical system.

### 1.3. Measuring and test equipment:

radiated interference measuring set:  
test receiver ROHDE & SCHWARZ  
ESCS 30 No. 100207,  
log. Periodical antenna SUNOL SCIENCES  
JB 3 No. A012006,  
artificial mains ROHDE & SCHWARZ  
ESH3-Z6 No. 847250/015.  
Immunity test instrument set  
ROHDE & SCHWARZ:  
generator SMY 01 s.n. 847984/043,  
hf. Milivoltmeter URV 5 s.n. 848565/022  
w. probe URV 5-Z2 s.n. 847922/02,  
wideband power amplifier BONN Elektronik  
BWLA 0210-25 s.n. 974436-01,  
injection probe FCC F-140 s.n. 192,  
directional coupler AR DC3001 s.n. 21970  
EMC test software ROHDE & SCHWARZ  
EMC 32 (radiation measurement & immunity test).



### 1.4. Testing conditions:

w/o precipitation, 4°C, 976hPa, 77% hum.

### 1.5. Test track or site:

opened area of the TÜV SÜD Auto CZ,  
Novodvorská 994/138, Prague 4,  
Czech Republic

Technical Report No.: 260081 – 09 – TAC  
ECE Regulation No.: 010.02  
Manufacturer: FOBOS AUTO LTD.  
Type: Fobos 2



Auto CZ

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2. Test results

- 2.1. Regulation clause 6.6.: radiated emissions  $\leq 31 \text{ dB}\mu\text{V/m}$  in frequency range 20 to 1000MHz and both antenna polarizations
- 2.2. Regulation clause 6.7.: Functional status during immunity test A (no malfunctions).

3. Specimen submitted to test on: 21 October 2009

4. Date of test: 21 October 2009

III. Manufacturer's information folder

No information folder

IV. Attachments

Diagrams of applied immunity testing levels & position of the BCI probe 1 page

The results presented above have been measured/found in the No. 1107 laboratory accredited by ČIA according to the ISO/IEC 17025 standard and relate only to the items tested. The final assessment exceeds the accreditation scope.

Measuring and test equipment and test site meet the requirements of the applicable legislation. This report must never be reproduced incomplete without a written permission of the testing laboratory.

V. Final assessment

The described sample

**complies**

with the requirements of ECE Regulation No. 010.02

for issue the approval certificate according to ECE Regulations Nos. 67.01 and 110.00

This technical report consists of pages No. 1 to 3 and has no attachment.

  
Zdeněk Hrdlička

Test executive

  
Vilém Kunzl

Officially recognized expert

Prague, 22 October 2009



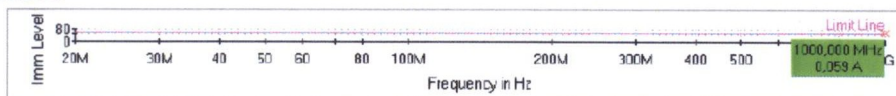


## Diagrams of applied immunity testing levels & position of the BCI probe

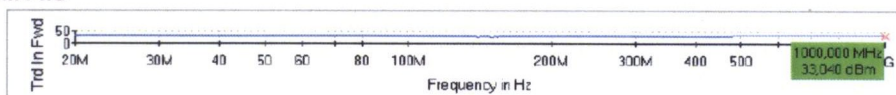
260081-09

### EMC32 Report

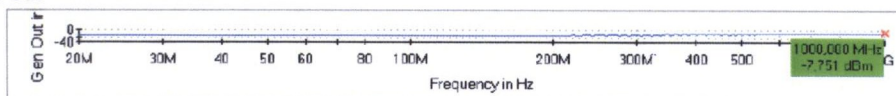
#### Imm Level



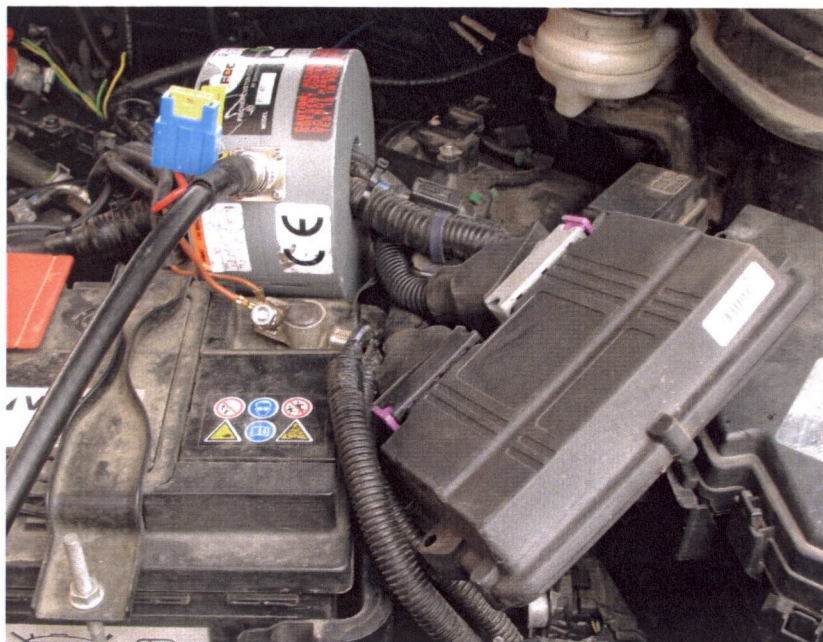
#### Trd In Fwd



#### Gen Out



EMC32







Technical Report No.: 260082 – 09 – TAC  
 ECE Regulation No.: 110.00  
 Manufacturer: FOBOS AUTO LTD.  
 Type: Fobos 2

## TECHNICAL REPORT No. 260082 – 09 – TAC

Test according to ECE Regulation No. 110.00

**Uniform provisions concerning the approval of:**

**I. Specific components of motor vehicles using compressed natural gas (CNG)  
in their propulsion system,**

**II. Vehicles with regard to the installation of specific components of an approved type for  
use of compressed natural gas (CNG) in their propulsion system.**

ECE No. 110.00 – date of entry into force: 28 December 2000

including all amendments up to and including

ECE No. 110.00, Supplement 6 – date of entry into force: 18 June 2007

Objectives: document for issue of approval certificate

### I. Technical data

- 0.1. Make (trade name of manufacturer): FOBOS
- 0.2. Type: Fobos 2
- 0.2.1. Components of the system: CPU Fobos 2,  
temperature & pressure sensors,  
M.A.P. & level sensors,  
gas/petrol switch model SW2.
- 0.3. Means of identification of type: manufacturer's label
- 0.3.1. Location of that marking: top side of the housing
- 0.4. Category of vehicle: n/a
- 0.5. Name and address of manufacturer: FOBOS AUTO LTD.  
1 BULGARSKA AVIATSIA  
5800 PLEVEN  
BULGARIA
- 0.8. Address of assembly plant: see above
- 0.9. Location of the approval mark: next to the manufacturer's label



Technical Report No.: 260082 – 09 – TAC  
ECE Regulation No.: 110.00  
Manufacturer: FOBOS AUTO LTD.  
Type: Fobos 2



Auto CZ

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**II. Test report**

**1. Test conditions**

1.1. Test sample: electronic control set for the CNG propulsion system designed for vehicles with 12V negative ground mains.

1.2. Test procedures used

tests executed according to one or more certified procedures:  
Measurement of high frequency disturbing electromagnetic fields and voltages, test of high frequency resistance and  
Tests of impulse resistance of electronic devices. Measurement of disturbing impulse overvoltage emitted into the vehicle electrical system.

1.3. Measuring and test equipment: scopemeter FLUKE199C,  
s.n. DM 8140090.

1.4. Ambient conditions: w/o precipitation, 4°C, 976hPa, 77% hum.

1.5. Test site: opened area of the TÜV SÜD Auto CZ,  
Novodvorská 994/138, Prague 4,  
Czech Republic

**2. Test results**

2.1. Regulation Annex 4H, clause 2.2.: switching off delay of the service cut-off valves after stalling of the engine <5s  
2.2. Regulation clause 6.1.1.: for EMC test of the electronic control unit see our Test Report No. 260081 – 09 – TAC

3. Specimen submitted to test on: 21 October 2009

4. Date of test: 21 October 2009





Technical Report No.: 260082 – 09 – TAC  
ECE Regulation No.: 110.00  
Manufacturer: FOBOS AUTO LTD.  
Type: Fobos 2



Auto CZ

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III. **Manufacturer's information folder**

Application for approval for the electronic control unit Fobos 2 pursuant to ECE Regulation No. 110.

6 pages total of 21 October 2009

IV. **Attachments**

No attachments

The results presented above have been measured/found in the No. 1107 laboratory accredited by ČIA according to the ISO/IEC 17025 standard and relate only to the items tested. The final assessment exceeds the accreditation scope.

Measuring and test equipment and test site meet the requirements of the applicable legislation. This report must never be reproduced incomplete without a written permission of the testing laboratory.

V. **Final assessment**

The described sample

**complies**

with the requirements of ECE Regulation No. 110.00 for issue of approval certificate.

This technical report consists of pages No. 1 to 3 and has no attachments.

Zdeněk Hrdlička

Test executive

Vilém Kunzl

Officially recognized expert

Prague, 22 October 2009

