

# **SOFTWARE**

# **LANDIRENZO OMEGAS**



**LANDIRENZO®**

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The LANDIRENZO OMEGAS program allows distributors' technicians in the Landi Renzo network to work on the LANDIRENZO OMEGAS injection control box. In particular, it is possible to program gas control boxes with data from the auto file, to see and modify several parameters acted upon by the control box. The program can be used without special knowledge of the functioning of a Personal Computer except, of course, the basics of the Windows interface. The LANDIRENZO OMEGAS program requires one of the following operating systems:

Windows 98 SE, Windows ME, Windows 2000 and Windows XP.

It must also have Internet Explorer 5.5 or better. 6.0 is recommended.

When a new version of the software is installed, it is recommended that the old versions are uninstalled completely and the new cd-roms used.

The new cds contain a package "EncPak IE" with a file "Install.htm".

This file contains the correct links to further files on the cd-rom which allow updating of computers with the Internet Explorer files needed to proceed with the programming of the control boxes.

The minimum requirements for the Personal Computer are: 486 processor, 8Mb RAM, SVGA 640X480 graphics card with 256 colours, CD ROM reader (or Internet connection), at least 10Mb available on the hard disc (this figure depends on the number of auto cards in the file, since each auto card requires about 600Kb). For best functioning, a system with Pentium 133 processor or better, 16Mb RAM, and SVGA 800X600 graphics card is recommended.

To install the LANDIRENZO OMEGAS Program:

- run program setup.exe

- or installation starts automatically with autorun.

The installation program starts automatically; when asked by the program, press Next (you will be asked three times), Install and Finish.

The completely automatic installation process allows the state of progress to be viewed. The only data required is the file where the program is to be installed. If the destination file is not specified, it is <PROGRAMS\Landi Renzo\Landi Renzo OmeGas.

Once installation has been completed, to Start the program double-click on the LANDI RENZO OMEGAS icon on the desktop, or Start Programs\Landi Renzo\Landi Renzo OmeGas.

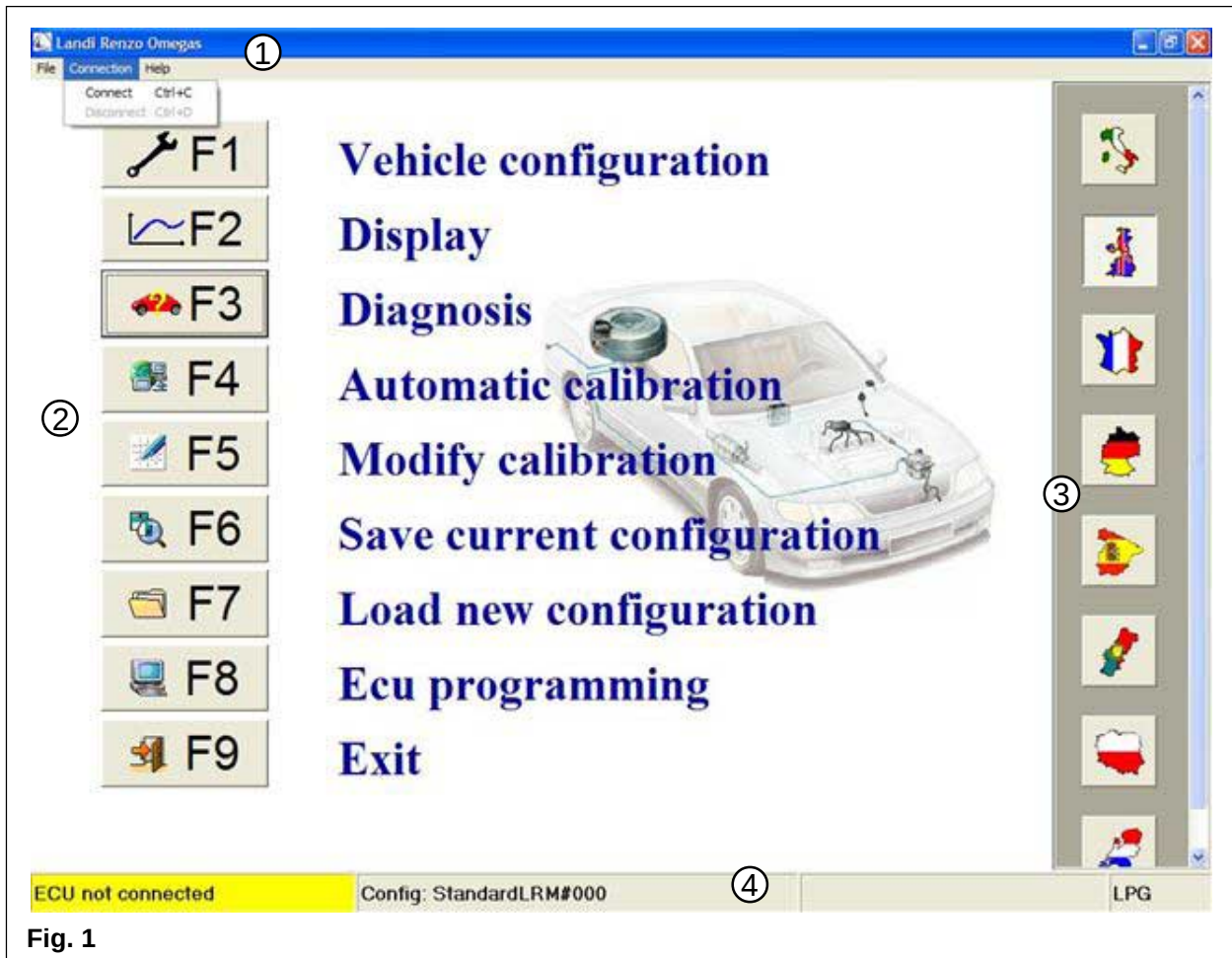
Before starting to use LANDIRENZO OMEGAS ensure that the PC has ACROBAT READER 4.0 software or better installed; this program is necessary for consulting the auto cards. A copy of this software is included on the Landi Renzo CD.

## CHAPTER 2

## MAIN SCREEN

### 2.1 MAIN SCREEN

Every time the program is started, the main screen (Fig. 1) appears.



The essential elements it contains are:

1. Main menu
2. Function buttons
3. Multi-language panel
4. Status bar

## 2.2 MAIN MENU

The main menu contains all the program's main commands and settings. Specifically, there are the following items:

**1 - FILE:** contains the commands:

OPEN CONFIGURATION...: allows files not in the LPG or METHANE file in the LRE 184 directory to be opened;

SAVE CONFIGURATION...: allows files not in the LPG or METHANE file in the LRE 184 directory to be saved;

PRINT CONFIGURATION: allows pages from F1 menu "Vehicle configuration" to be printed;

PRINT CORRECTION: allows the page from F5 menu "Change calibration" to be printed;

PRINT DIAGNOSIS: allows the page from F3 menu "Diagnosis" to be printed;

EXIT: allows LANDIRENZO OMEGAS Software to be closed;

**2 - CONNECTION:** includes the commands CONNECT and DISCONNECT, to respectively connect or disconnect the control box;

**3 - HELP:** contains INFORMATION ON..., a window with the program's identification data and copyright information.

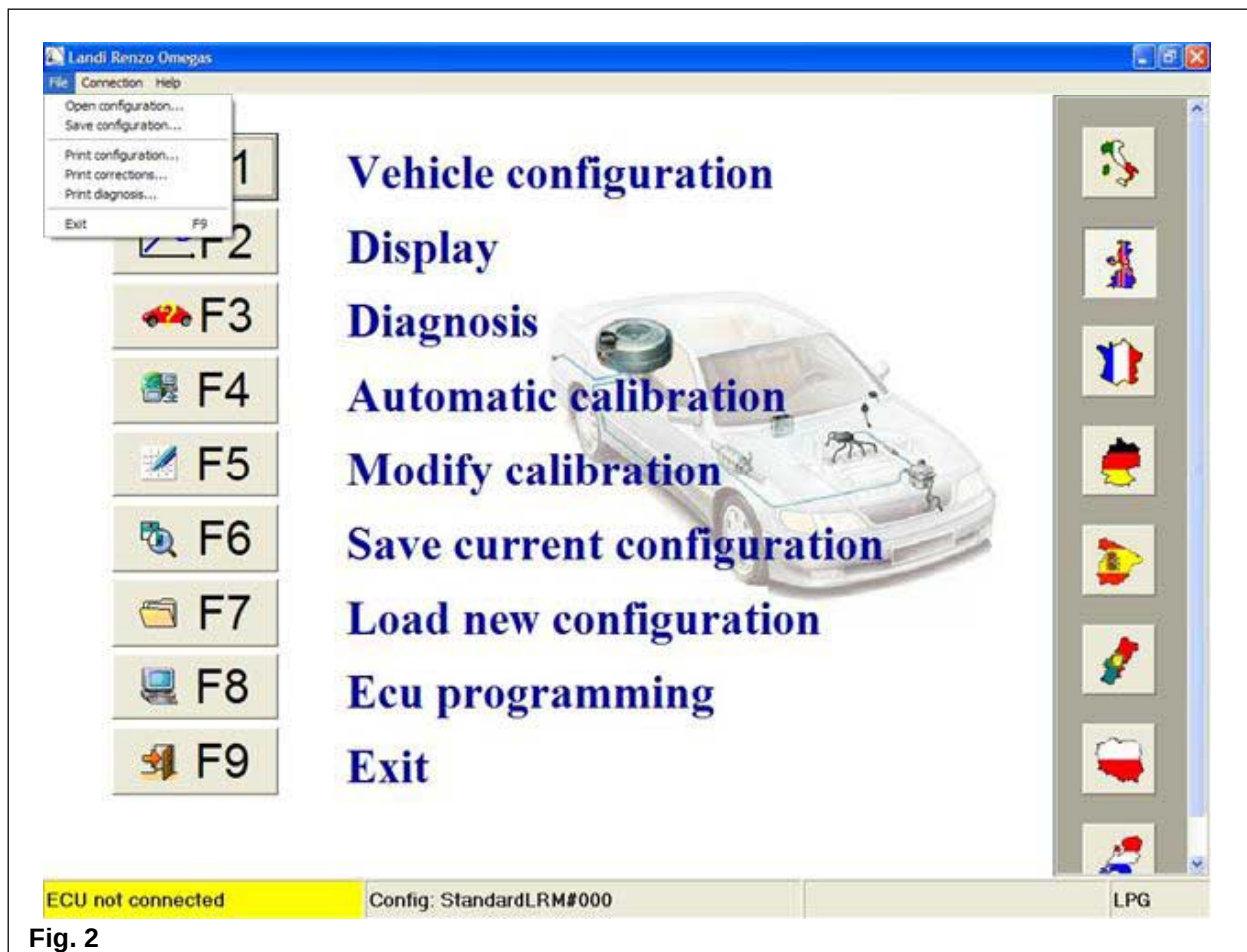


Fig. 2

## 2.3 FUNCTION BUTTONS

The buttons in the centre of the screen allow the program's functions to be carried out. They can be activated both with the mouse and with the function key indicated by the button. The functions are:

**F1 VEHICLE CONFIGURATION:** this activates a page which allows the correct setting of input signals from the vehicles and the parameters of the specifications of the gas equipment fitted to the vehicle;

**F2 VISUALISATION:** this activates a page which allows the visualisation of all the basic parameters for the correct functioning of the gas system;

**F3 DIAGNOSIS:** this activates a page which allows error messages to be visualised;

**F4 AUTOMATIC CALIBRATION:** accessing the menu activates an automatic vehicle calibration procedure;

**F5 CHANGE CALIBRATION:** this is a menu allowing optimisation of the calibration on the file created/already in the control box;

**F6 SAVE PRESENT CONFIGURATION:** a menu allowing the vehicle's present configuration to be saved;

**F7 LOAD NEW CONFIGURATION:** a menu allowing existing files to be loaded into an archive;

**F8 PROGRAMMING CONTROL BOX:** a menu allowing updating of control box software version;

**F9 EXIT:** finish program.

## 2.4 MULTI-LANGUAGE PANEL

The panel on the right of the screen allows selection of the language in which all the program's scripts and messages will be expressed. The functioning of this panel is very simple, just press the button for the language required and the whole program is INSTANTLY configured in the new language. The same operation can also be carried out by right-clicking the mouse at any point on the screen. A rapid menu appears containing the language corresponding to the button on the multi-language panel.

## 2.5 STATUS BAR

The bar in the lower part of the screen contains several pieces of information regarding the status of the program. It is divided into 3 areas which contain, from the left:

- 1 An indication of whether the control box is connected or not.
- 2 If the control box is connected, the name of the file it contains.
- 3 The control box software version.

The status bar cannot be directly altered.

The first time the LANDIRENZO OMEGAS program is used, certain parameters used for its correct functioning must be configured.

These are:

- Connection to be used for the internet (ONLY if an Internet connection is available).

The first connection is made directly within the LANDIRENZO OMEGAS program:

To select the Internet connection, proceed as follows:

- 1) Select INTERNET CONTROL PANEL SETUP in the Start Windows menu.
- 2) Select the page CONNECTION. Enable the item CONNECT TO INTERNET WHEN NECESSARY. Next to this a check sign will appear. In the box USE REMOTE CONTROL CONNECTION, select the connection normally used to connect to your Internet Provider. Confirm with OK. N.B.: if these settings are already enabled, no action is necessary.

These settings, like the dimension of the window, are permanently stored in the memory, even after the computer is switched off. Every time the program is started up, the previously-saved data is recalled. This is:

- Language
- Position and dimensions of the main window.

The serial port is automatically sought by the program in use where the serial cable used for programming the LANDIRENZO OMEGAS control box is connected.

## 3.1 VEHICLE CONFIGURATION

### 3.1.1 Change to gas

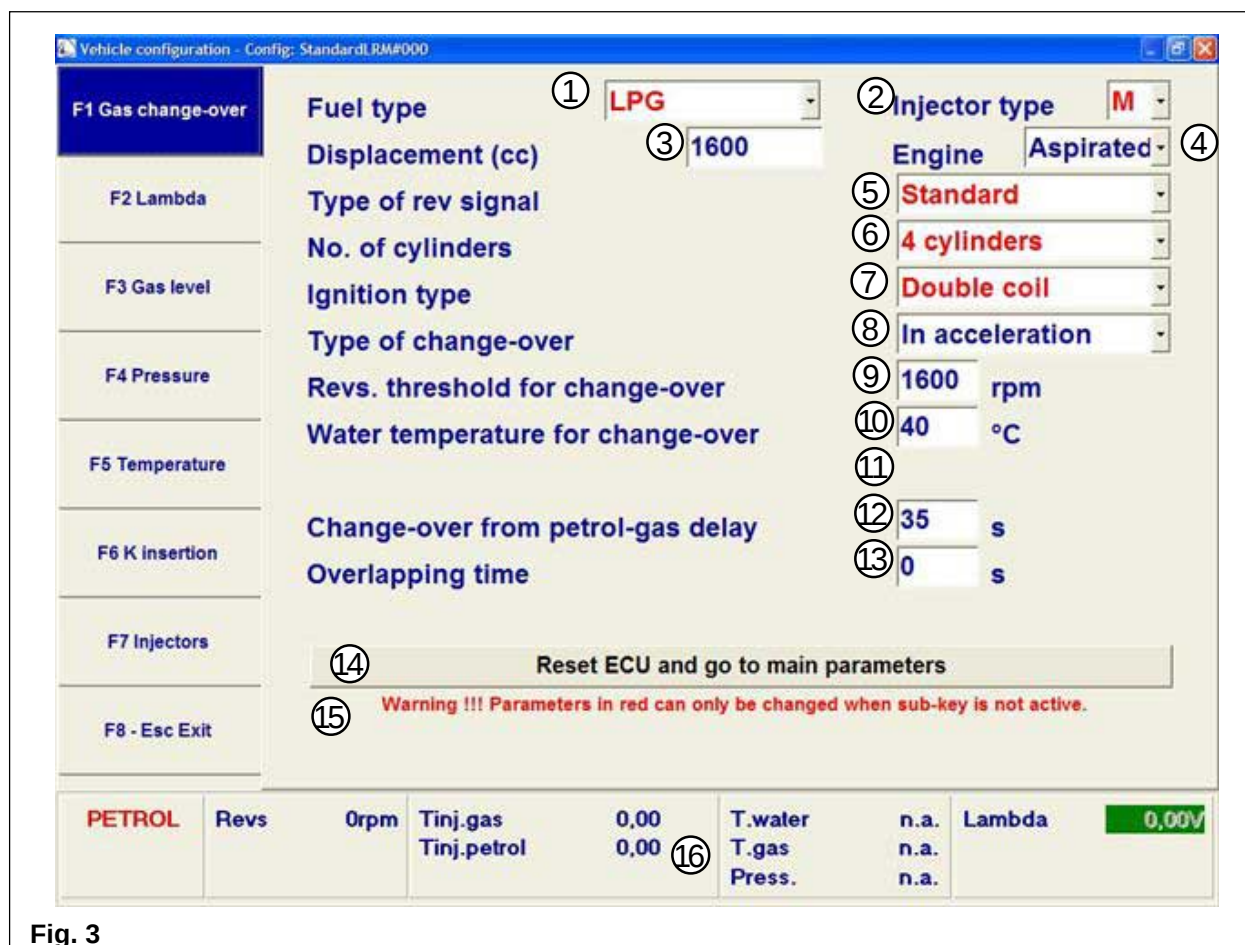


Fig. 3

#### 1 – TYPE OF FUEL:

Allows the type of fuel to be set:

- METHANE
- LPG

#### 2 – TYPE OF INJECTOR:

A window which identifies the type of injector fitted to the vehicle.

The wiring informs the control box of the type of injector fitted, therefore in the event that the injector mounted is XJ 544.09 for LPG or XJM 544.09 for Methane and the file loaded presents a drive incompatible with the injector, the software will not allow gas to pass.

It then provides the possibility for the drive to be updated to make it compatible with the injector fitted.

The incompatibility is signalled to the operator by a buzzer.

The injectors which can be installed are:

- M (XJ 544.09, XJ 533.09 for LPG or XJM 544.09, XJM 533.09 for Methane)
- K (18030023/L-R, 18030013/L-R)
- L (LANDIRENZO)

Memorised within the software is a series of possible configurations, with combinations specific to the type of fuel, the type of injector and engine.

If the configuration set by these three parameters does not exist in the settings, the software will not allow itself to be set, and will show a message as in Fig. 4.

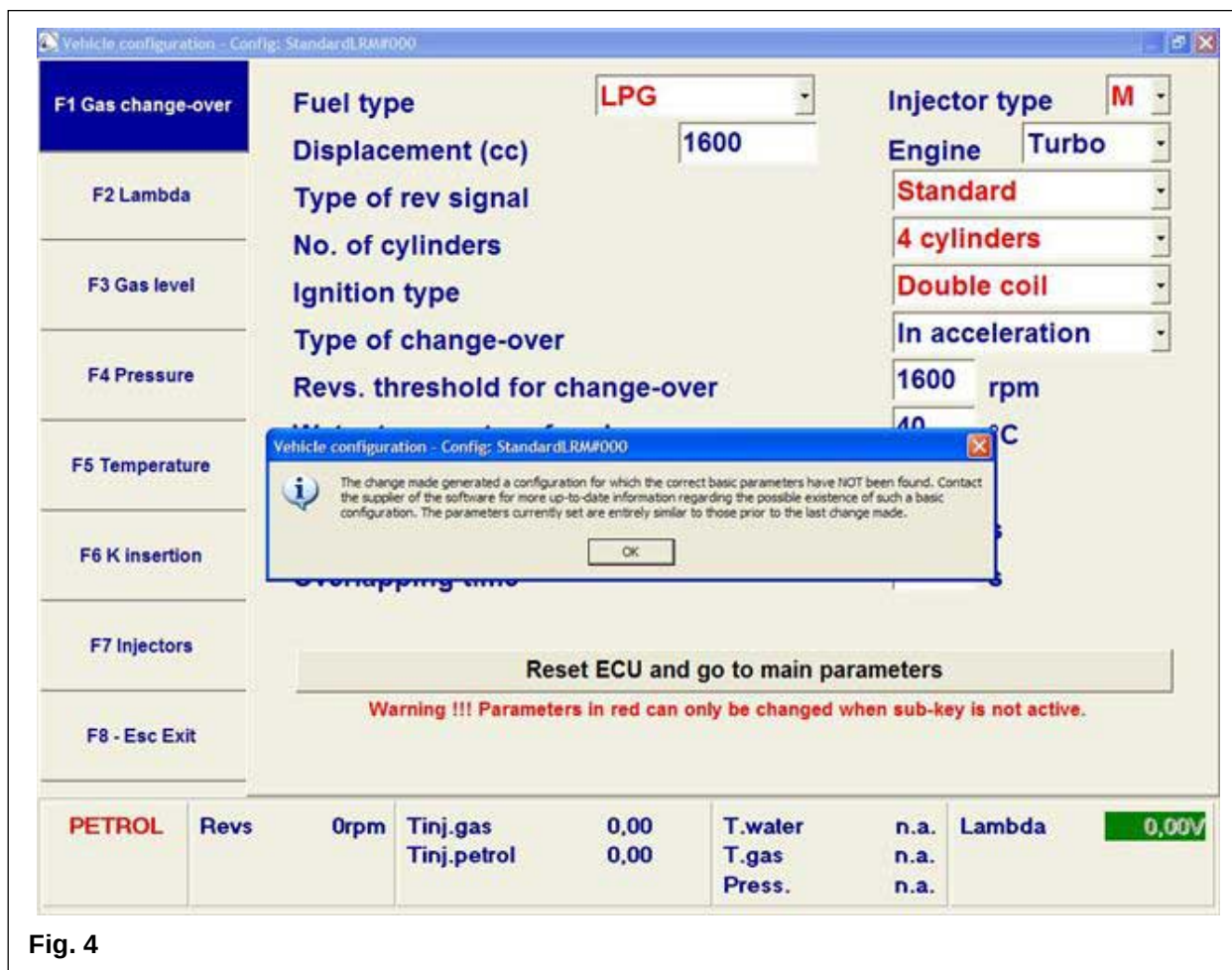


Fig. 4

### 3 - CAPACITY:

Allows the capacity of the vehicle to be set from as minimum of 900cc to a maximum of 8000cc.

### 4 - TYPE OF ENGINE

Indicates the type of engine in the vehicle in question, which can be set to normally-aspirated or turbo.

### 5 - TYPE OF R.P.M. SIGNAL

Allows the setting of either a weak signal or a standard signal. Selection of a WEAK signal must be carried out if the RPM input comes from the drive of the transistor of the starter coil: the STANDARD option is used if connection is to the coil negative. If connection is to the rev-counter, either signal can be used, although WEAK SIGNAL is preferable.

### 6 - NUMBER OF CYLINDERS

The number of cylinders in the engine of the converted vehicle must be set. The software accepts 3, 4, 5, 6 and 8 cylinders. In the window, the possibility of setting 5, 6 and 8 cylinders will only be visualised if connected to an 8-cylinder control box.

## 7 – TYPE OF IGNITION

The software allows the setting of the following parameters:

- A – Single coil
- B – Double coil
- C – Rev-counter

This information is used by the control box for correct calculation of the engine speed starting from the period read on the input of revolutions.

Select **SINGLE COIL** if the vehicle has one coil for each cylinder and the signal is taken from the negative or drive (transistor) of the coil; select **DOUBLE COIL** if the vehicle has one coil driving a pair of cylinders and the signal is taken from the negative or drive (transistor) of the coil.

In other cases use the **REV COUNTER** option.

## 8 – TYPE OF CHANGEOVER

Allows setting of the type of changeover to be used.

It can be set to:

- acceleration
- deceleration
- starting with gas

## 9 – REVOLUTIONS THRESHOLD FOR CHANGEOVER

This is the minimum threshold which must be exceeded to allow the changeover from petrol to gas; the default setting is 1600.

Values between 0 and 3000 engine revolutions can be set.

## 10 – WATER TEMPERATURE FOR CHANGEOVER

In addition to the revolutions threshold for changeover, this is the other parameter which must be checked for the changeover from petrol to gas.

Values between 30°C and 90°C can be set.

## 11 – GAS TEMPERATURE FOR CHANGEOVER

In addition to the revolutions threshold for changeover and the water temperature for changeover, if set in page F5, this is the other parameter which must be checked for the changeover from petrol to gas.

Values between 30°C and 90°C can be set.

## 12 – OVERLAP TIME

this is the time in which petrol and gas supplies overlap.

The default setting is 0 seconds, but this can be increased up to 2 seconds.

## 13 – SLOWING CHANGEOVER FROM PETROL TO GAS

This is the minimum threshold which must be exceeded, from starting, to allow the changeover from petrol to gas.

The default setting is 35 seconds, but retardation can be increased up to 225 seconds.

## 14 – ZEROING CONTROL BOX AND RETURN TO BASE PARAMETERS

If key 9 is pressed, the data previously set (from 1 to 8) are changed and revert to default values. The modification of parameters 1, 4, 5 and 6 must take place as shown in line 10 with key removed and commutator off.

In the event that modifications are made without the commutator being off, they will only be visualised, and at the next disconnection/connection with the control box they will be lost.

## 15 - WARNING! MODIFY THE PARAMETERS IN RED ONLY WITH LOCK REMOVED AND COMMUTATOR OFF

### 16 – STATUS BAR

The status bar shows, from left to right:

A – type of fuel being used;

B – number of engine revolutions;

C – time of petrol injection, time of gas injection;

D – engine water temperature, gas temperature and gas pressure;

E – voltage of Lambda sensor and rich (red) or lean (green) carburation of the vehicle while functioning (if the sensor is connected).

### 3.1.2 Lambda (optional)



#### 1 - TYPE OF LAMBDA SENSOR

Allows setting of type of lambda sensor fitted to the vehicle, to obtain a correct interpretation of the signal.

The following values can be set:

A - 0 - 1 Volt;

B - 0 - 5 Volt;

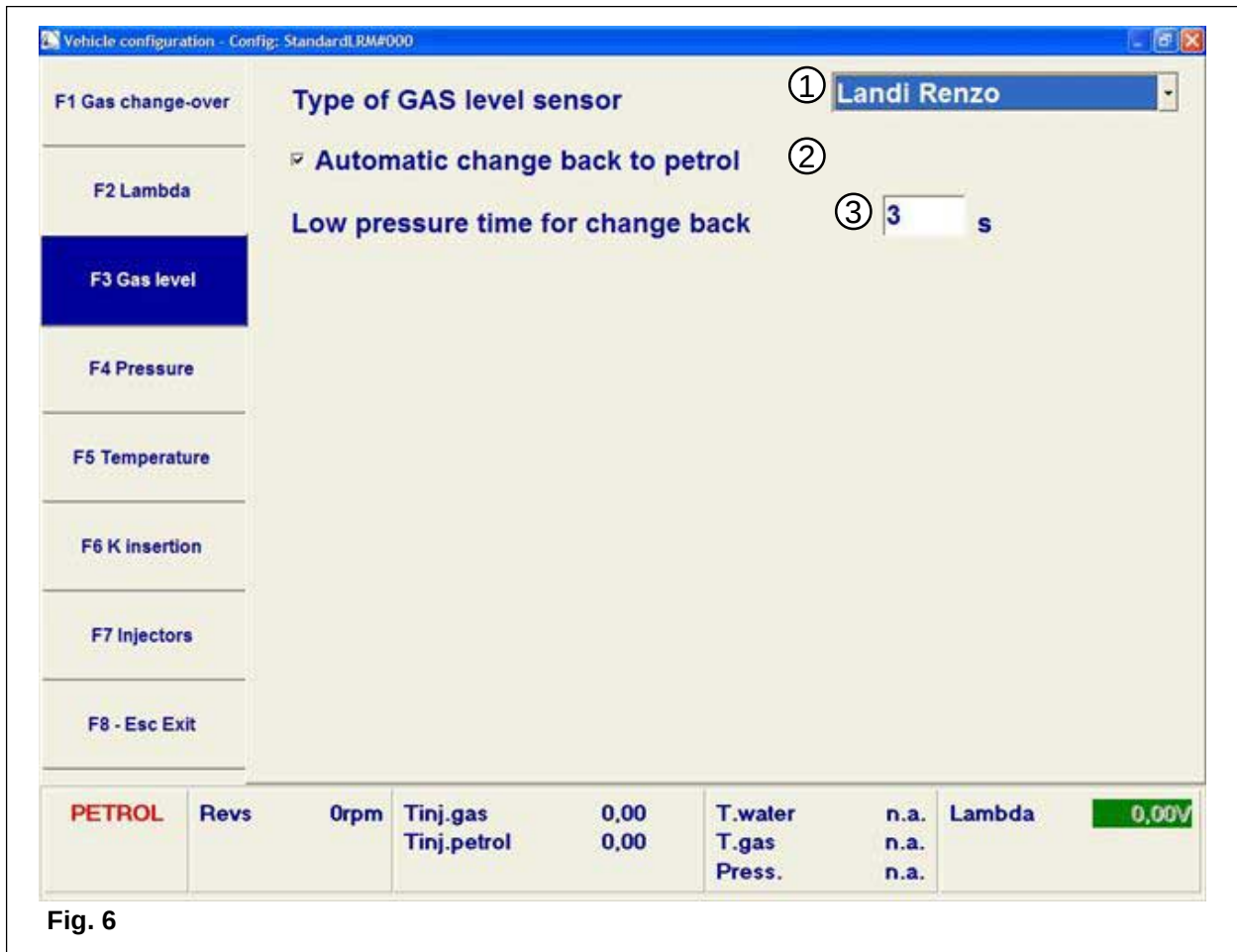
C - 5 - 0 Volt;

D - 0.8 - 1.6 Volt.

#### 2 – NUMBER OF LAMBDA SENSORS

If two Lambda sensors are fitted, allows setting and visualisation of both signals.

## 3.1.3 Gas level



### 1 – TYPE OF GAS LEVEL SENSOR

Allows setting of the type of gas level sensor installed.

The following gas level indicators can be set:

- A - A.E.B.;
- B - 0 - 90 ohm;
- C - Landi Renzo;
- D - Non standard;
- E - Non standard inverted.

The standard predefined setting is the Landi Renzo sensor.

By selecting the option "NON STANDARD" or "NON STANDARD INVERTED" it is possible to customise the settings for the type of gas level sensor used by setting the relevant thresholds.

## 2 – AUTOMATIC RETURN TO PETROL

If this control is activated, two conditions are possible governing the return to petrol:

- the lower pressure read for a certain period (point 3 fig. 5) can be set to a pre-determined value. In this case an automatic return to petrol takes place accompanied by an audible (fast intermittent buzzer) and visual signal (petrol and gas led lit up).
- from the series of calculations, the time on gas is greater than the maximum admissible ( $T_{max\_inj\_gas} = (120000/rpm) - Time\_closure\_inj\_gas [ms]$ ), once this time related to this action has passed, there is a momentary changeover to petrol. This is a temporary situation, and as such there is a visual signal of functioning on petrol on the commutator, but no audible signal. Also, normal functioning with gas is re-established as soon as the reset condition is effected: this condition corresponds to a time of petrol injection less than a pre-determined value (default value is 8 ms).

## 3.1.4 Pressure

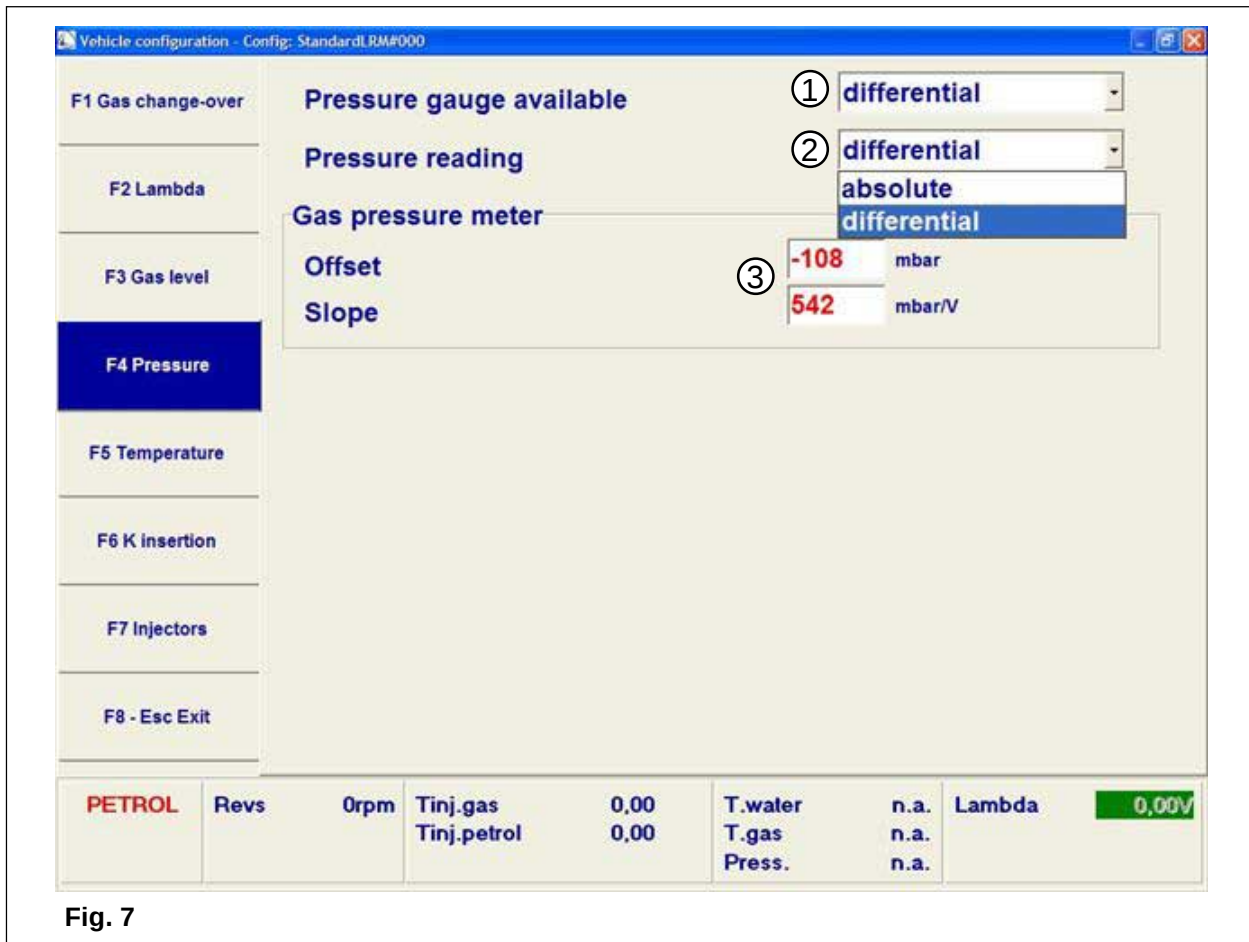


Fig. 7

### 1 – AVAILABLE PRESSURE METER

This indicates the type of meter installed on the vehicle; it is possible to set it as absolute for turbo vehicles and differential for normally-aspirated vehicles.

### 2 – PRESSURE READING

Indicates how the pressure is read and how it is visualised on the screen; it is possible to set it as absolute for turbo vehicles and differential for normally-aspirated vehicles.

### 3 – GAS PRESSURE METER

This is the characteristic of the pressure sensor used.

Default settings are:

Offset: -108

Gradient: 542

for the Landi Renzo Sensor used on normally-aspirated engines;

Offset: 125

Gradient: 750

for the Motorola Sensor used on turbo engines.

If it is decided to use an absolute meter and relative reading or vice versa, the software requires parameters to be set by an EXTERNAL MAP which is not available at present.

## 3.1.5 Temperature

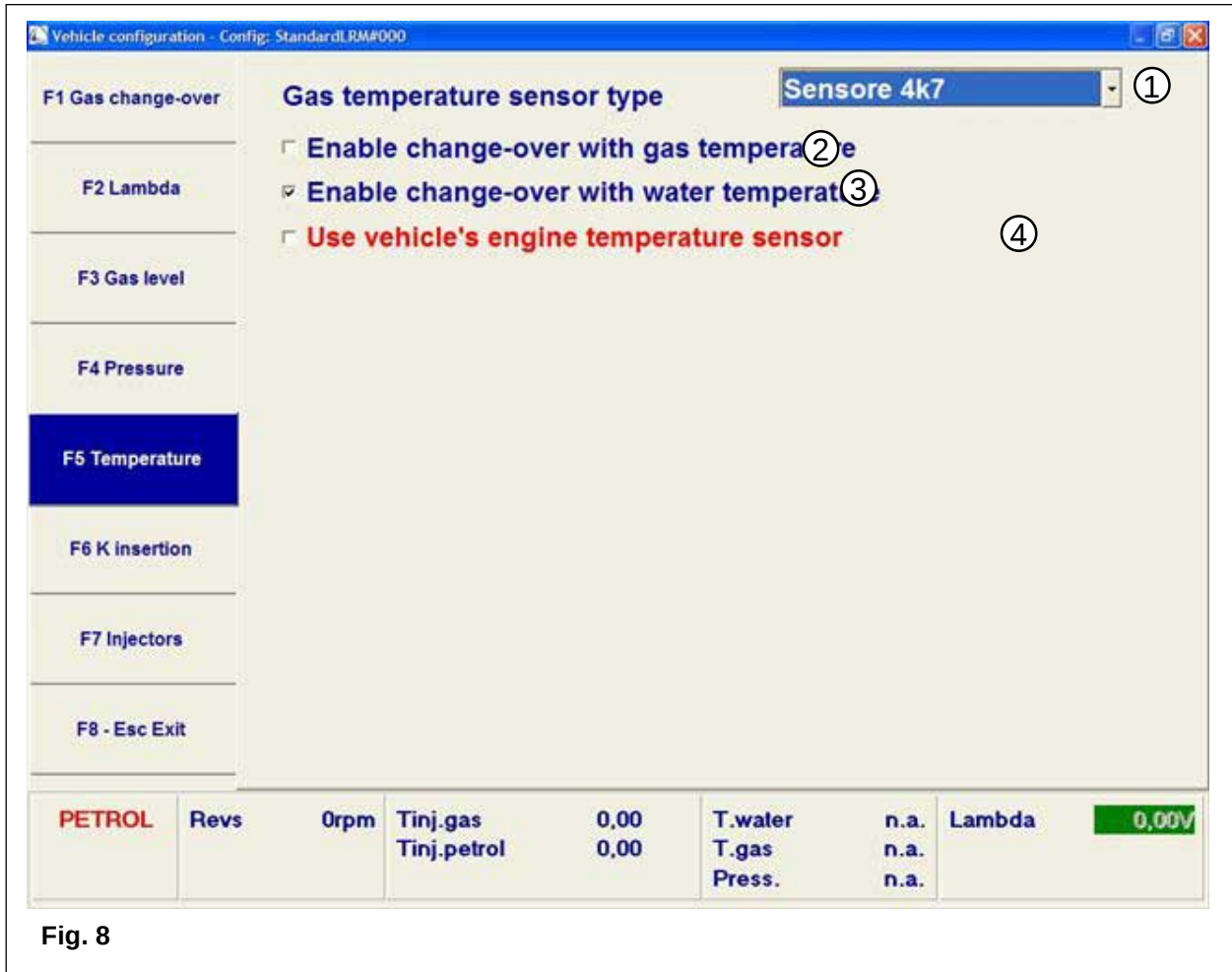


Fig. 8

### 1-TYPE OF GAS TEMPERATURE SENSOR

Identifies the type of gas sensor used.

Default settings are 4K7 sensor for normally-aspirated engines and 2K2 for turbo engines.

### 2-ENABLING CHANGEOVER WITH GAS TEMPERATURE

If this control is enabled, changeover is possible only if there is a condition where T gas is greater than the temperature set in page F1 changeover to gas (Fig. 1 point 11).

This enablement is not set as default.

### 3-ENABLING CHANGEOVER WITH WATER TEMPERATURE

If this control is enabled, changeover is possible only if there is a condition where T water is greater than the temperature set in page F1 changeover to gas (Fig. 1 point 10).

This enablement is set as default.

NB.: one of these two enablements must always be present

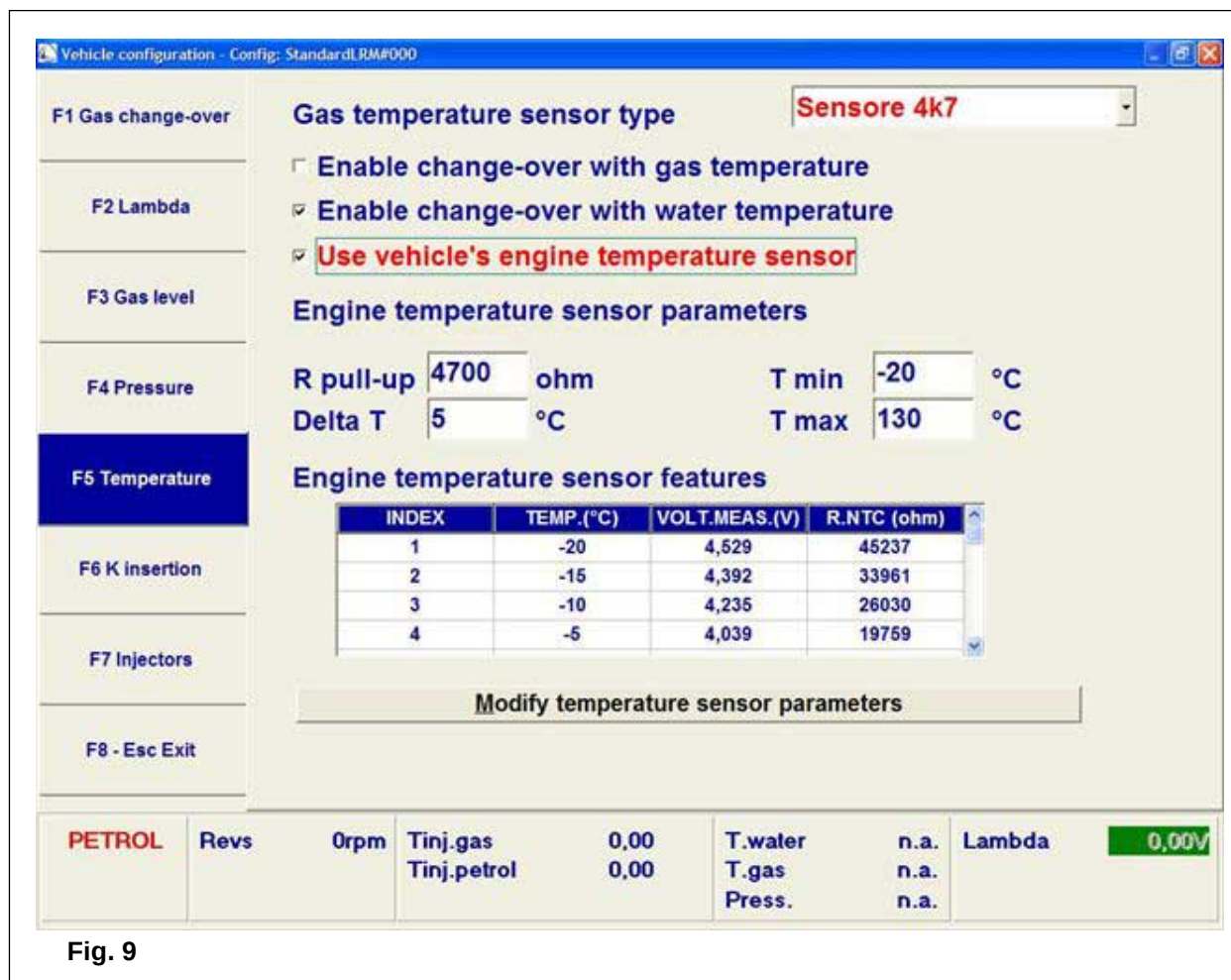


Fig. 9

## 4 - USE OF VEHICLE ENGINE TEMPERATURE SENSOR

If it is desired that the vehicle's original engine temperature sensor should be used, proceed to set parameters of the signal using a hand-held tester and building up step by step the Temperature/Voltage specifications of the sensor.

## 3.1.6 Insertion of K

This is the main carburation map; the three main variables are:

- RPM in x-axis
- Tinj petrol in y-axis
- Coefficient of K in the cells

The series of calculations for Tinj gas is:

$$\text{Tinj\_gas} = (\text{Tinj\_benz} - \text{Tmorto\_benz}) * \text{K1}(\text{Tinj\_benz, giri}) * \text{K2}(\text{Pressione}) * \text{K3}(\text{Temp\_acqua}) * \text{K4}(\text{Temp\_gas}) + \text{Tmorto\_gas}$$

where:

**Tinj\_benz:** time of petrol injection

**Tmorto\_benz:** petrol injection downtime

**K1(Tinj\_benz, giri):** map coefficient of K

**K2(Pressione):** pressure compensation

**K3(Temp\_acqua):** water temperature compensation

**K4(Temp\_gas):** gas temperature compensation

**Tmorto\_gas:** gas injector downtime



Fig. 10

The line K open loop can be used to manage the open loop when functioning with gas. When Tinj benz assumes a value higher than that shown in fig.10 point 1, the coefficient of K used to calculate the related Tinj gas is no longer that of the main map but as in point 2.

These values of Tinj e K can be modified when calibrating the vehicle. At present this function is not used, but the open loop can be managed with the main map.

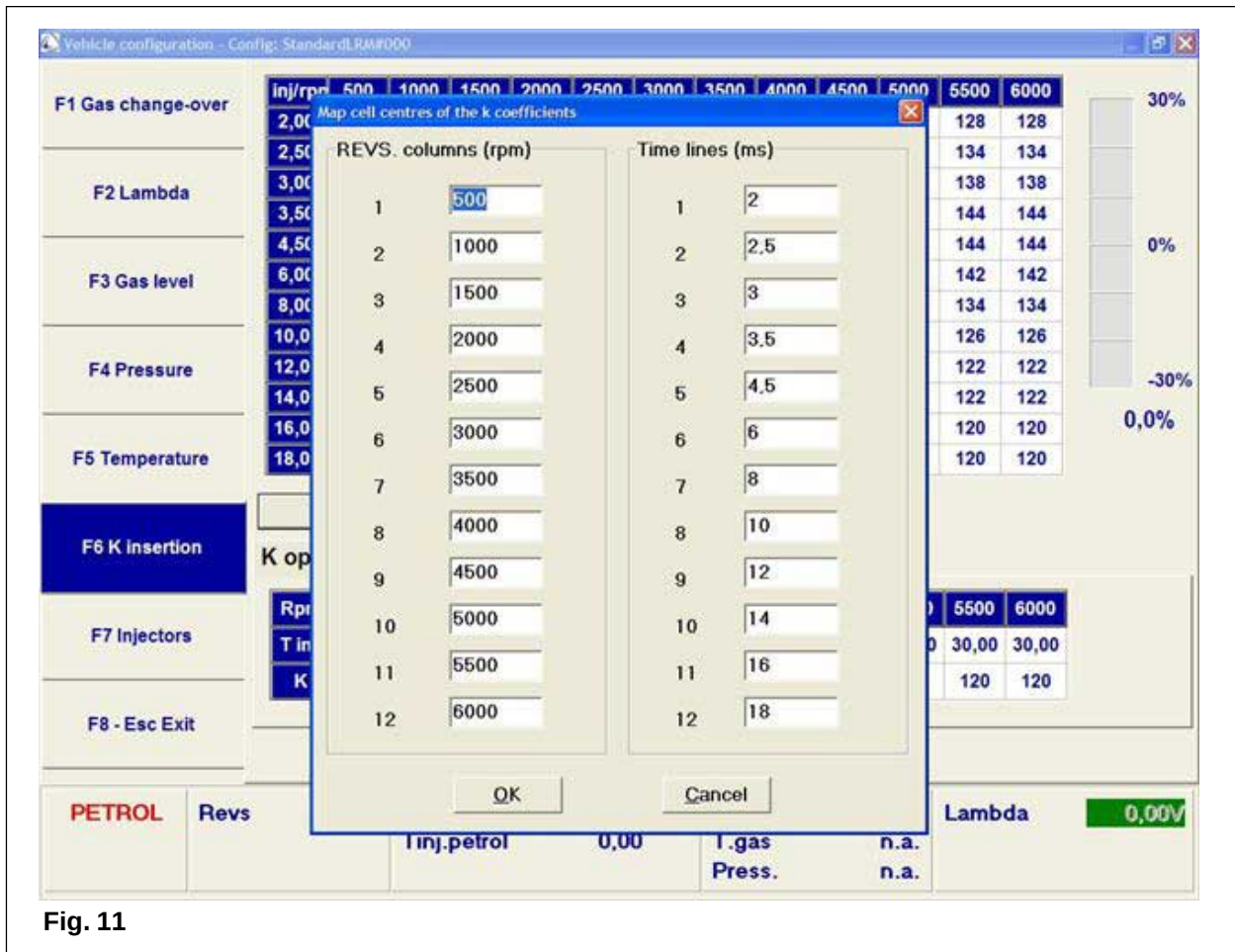


Fig. 11

With the modification "CELL CENTRES, MAP OF K COEFFICIENTS" it is possible to modify the cell centres of:

- RPM (from 0 to 8000)
- Tinj petrol (from 0 to 40 ms)

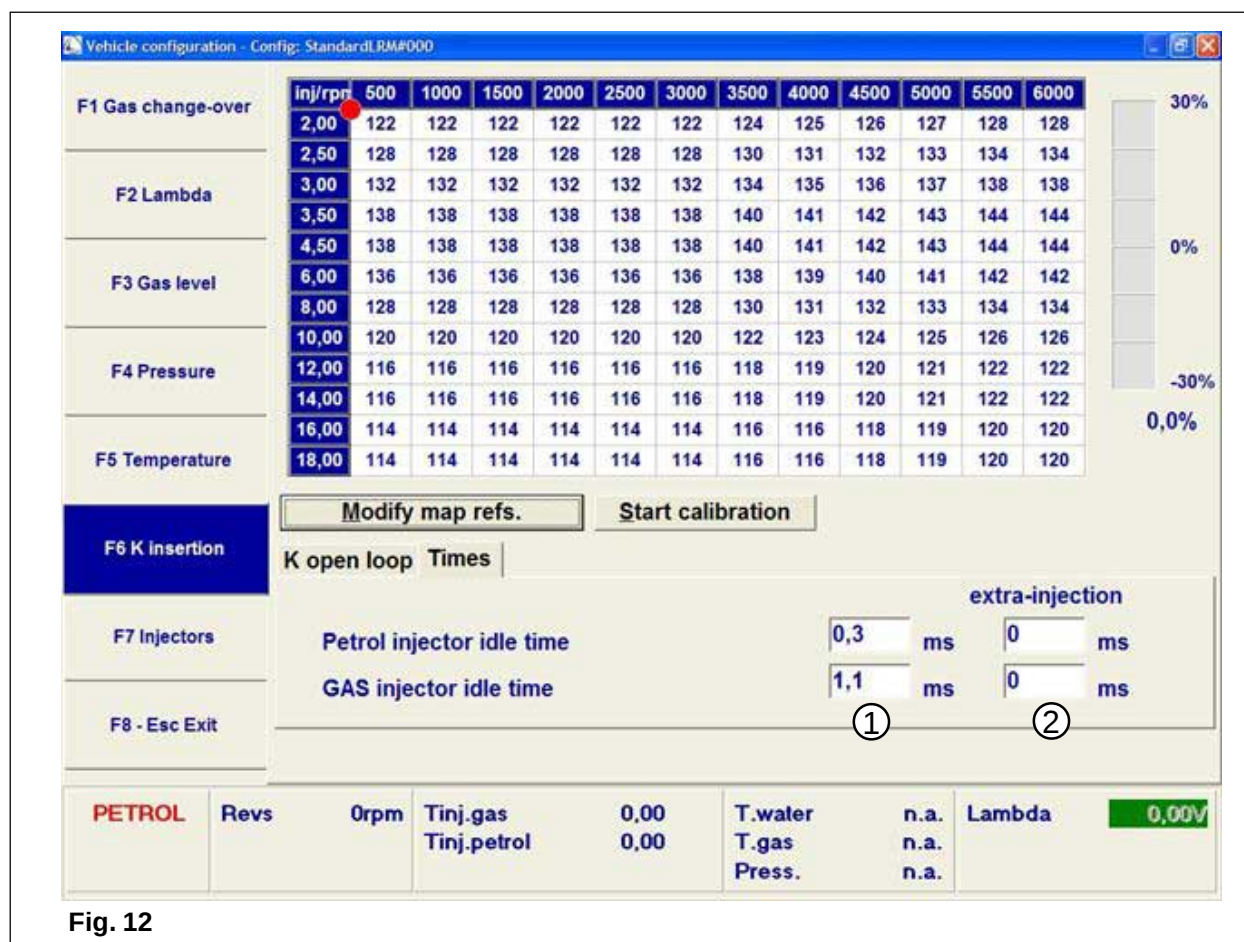


Fig. 12

The gas injector downtime and petrol downtime are two parameters characteristic of the respective injectors and serve to compensate for the transitions from open to closed of the injector itself.

They differ, as can be seen in Fig. 12, if they are relative to main injected (point 1) or extra injected (point 2).

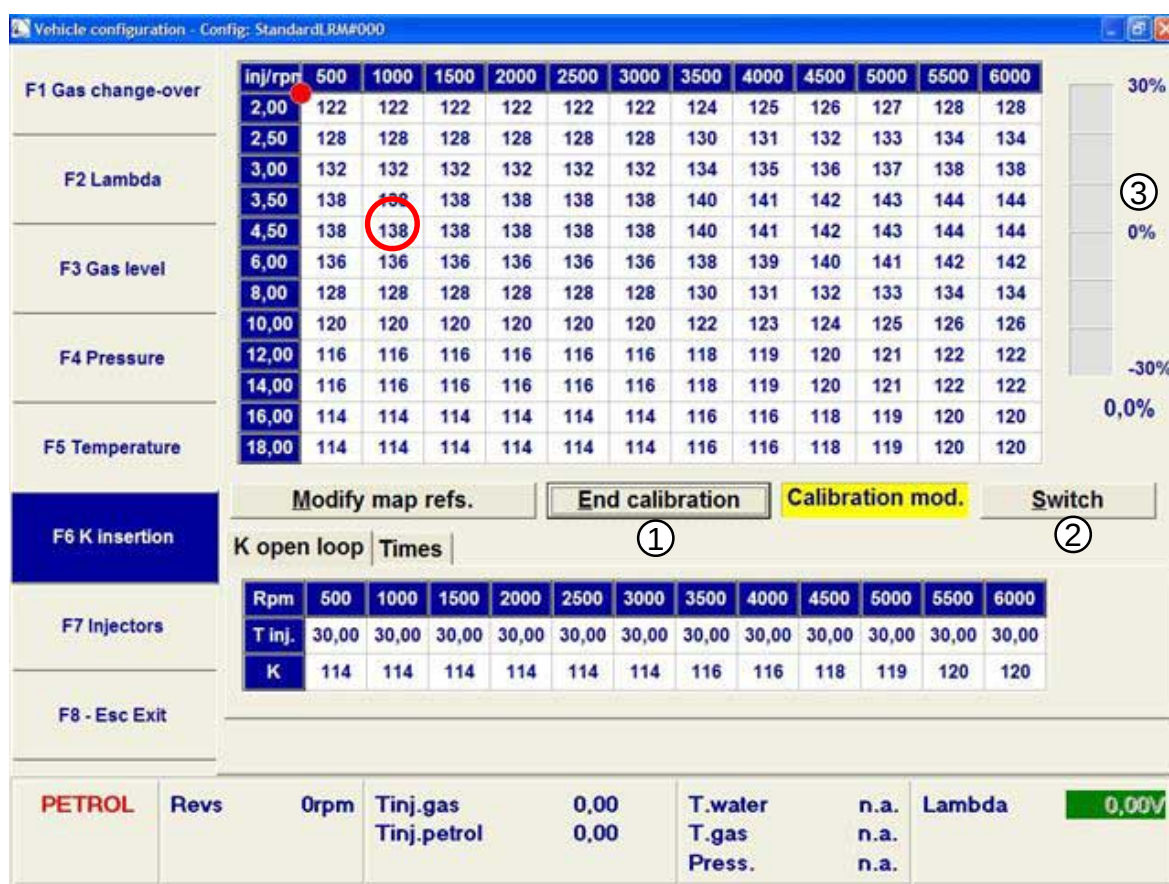


Fig. 13

## CALIBRATIONPROCEDURE

The objective here is to ensure that the petrol does not modify the Tinj in the changeover from petrol to gas, and to this end the stages to be followed to obtain the best carburation are these:

- click on start calibration 1 (management of the commutator takes place automatically by pressing key 2);
- set a precise point of vehicle functioning characterised by an exact cell in the map above (e.g. 1000 RPM, Tinj petrol 4.5 mS);
- allow the injection time to stabilise then click on key 2; the vehicle will change over to gas;
- by observing bar 3, evaluate how far in percentage terms the petrol injection time differs during functioning with gas compared with the petrol injection time when functioning with petrol;
- if the space bar assumes high percentage values it means that the petrol control box is increasing the injection time while functioning with gas, or the vehicle on gas is lean and it is therefore necessary to increase the K coefficient of the cell in question; if the space bar assumes low percentage values it means that the petrol control box is reducing the injection time while functioning with gas, or the vehicle on gas is rich and it is therefore necessary to reduce the K coefficient of the cell in question.

Variations of 2% are acceptable in the changeover from petrol to gas.

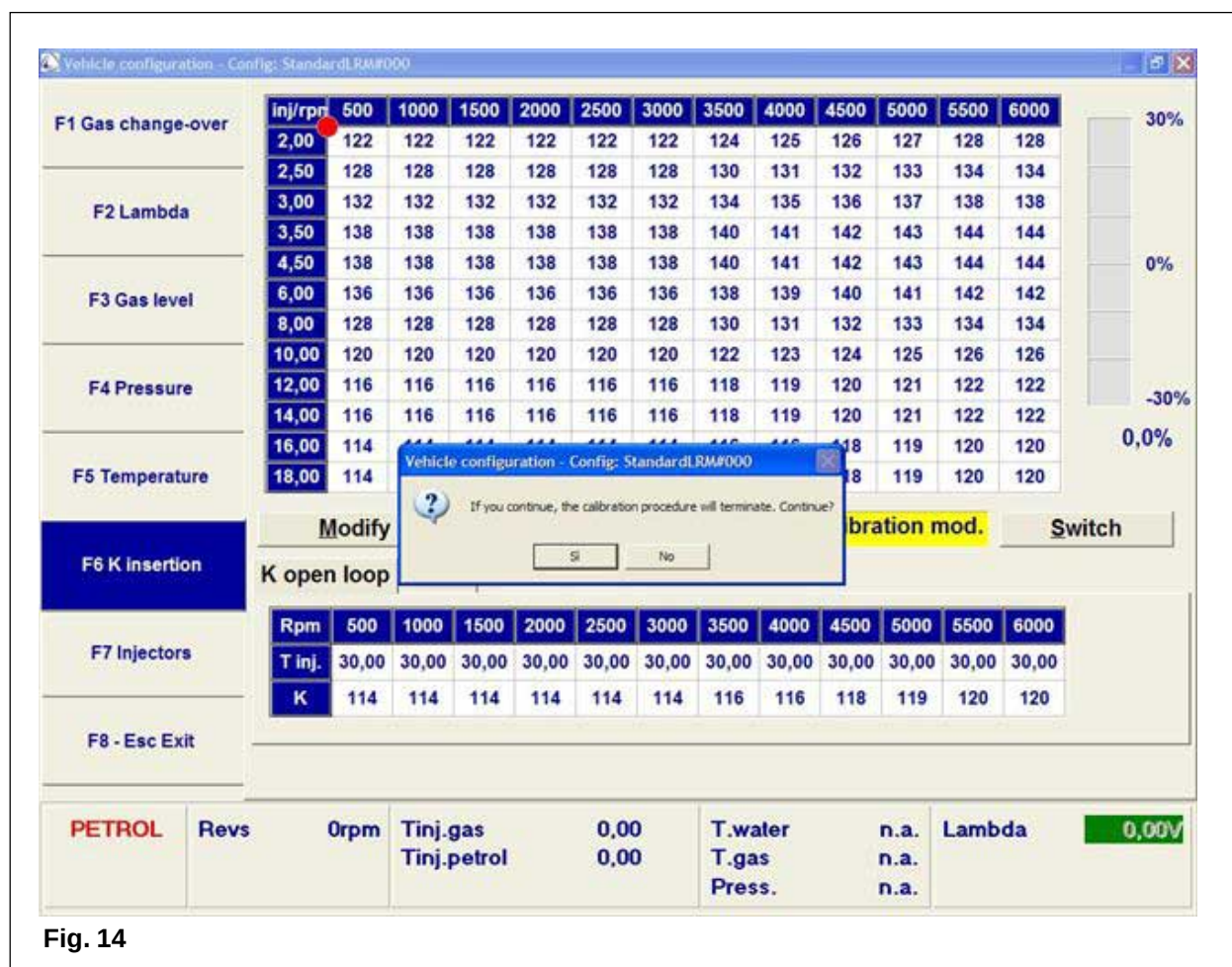


Fig. 14

NB.: while functioning with petrol or gas, the percentage bar (point 3) loses all significance.

If it is attempted to exit from the calibration without this being completed, the system advises of the need to close the procedure before it is possible to continue.

## 3.1.7 Injectors

| Function            | Parameter                                | Value | Unit | Label |
|---------------------|------------------------------------------|-------|------|-------|
| F1 Gas change-over  | Max. current time (12 V)                 | 3     | ms   | ①     |
| F2 Lambda           | Holding current                          | 1     | A    | ②     |
| F3 Gas level        | Injector impedance                       | 5     | Ohm  | ③     |
| F4 Pressure         | Gas injector minimum opening time        | 2,5   | ms   | ④     |
| F5 Temperature      | Gas extra-injection minimum opening time | 0,8   | ms   | ⑤     |
| F6 K insertion      |                                          |       |      |       |
| <b>F7 Injectors</b> |                                          |       |      |       |
| F8 - Esc Exit       |                                          |       |      |       |

|               |      |      |             |      |         |      |        |       |
|---------------|------|------|-------------|------|---------|------|--------|-------|
| <b>PETROL</b> | Revs | 0rpm | Tinj.gas    | 0,00 | T.water | n.a. | Lambda | 0,00V |
|               |      |      | Tinj.petrol | 0,00 | T.gas   | n.a. |        |       |
|               |      |      |             |      | Press.  | n.a. |        |       |

Fig. 15

This page shows some of the characteristics of the injector and its drive.

### 1 – 12V CURRENT MAXIMUM TIME (Tmax)

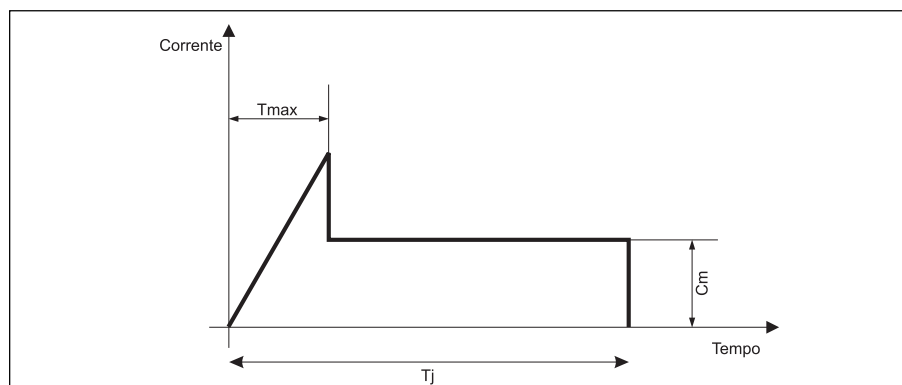
This is the time 12V are supplied to the injector.

### 2 – MAINTENANCE CURRENT (Cm)

This is the current supplied to the injector during the maintenance stage.

### 3 – INJECTOR IMPEDANCE

This is the resistance of the injector.



### 4 – GAS INJECTOR MINIMUM OPENING TIME

If the calculation of Tinj gas provides a value which is less than this minimum time, the system activates the value set as the minimum time..

### 5 – EXTRAJECTED GAS MINIMUM OPENING TIME

As point 4 relating to extrainjection.

## 3.2 VISUALISATION

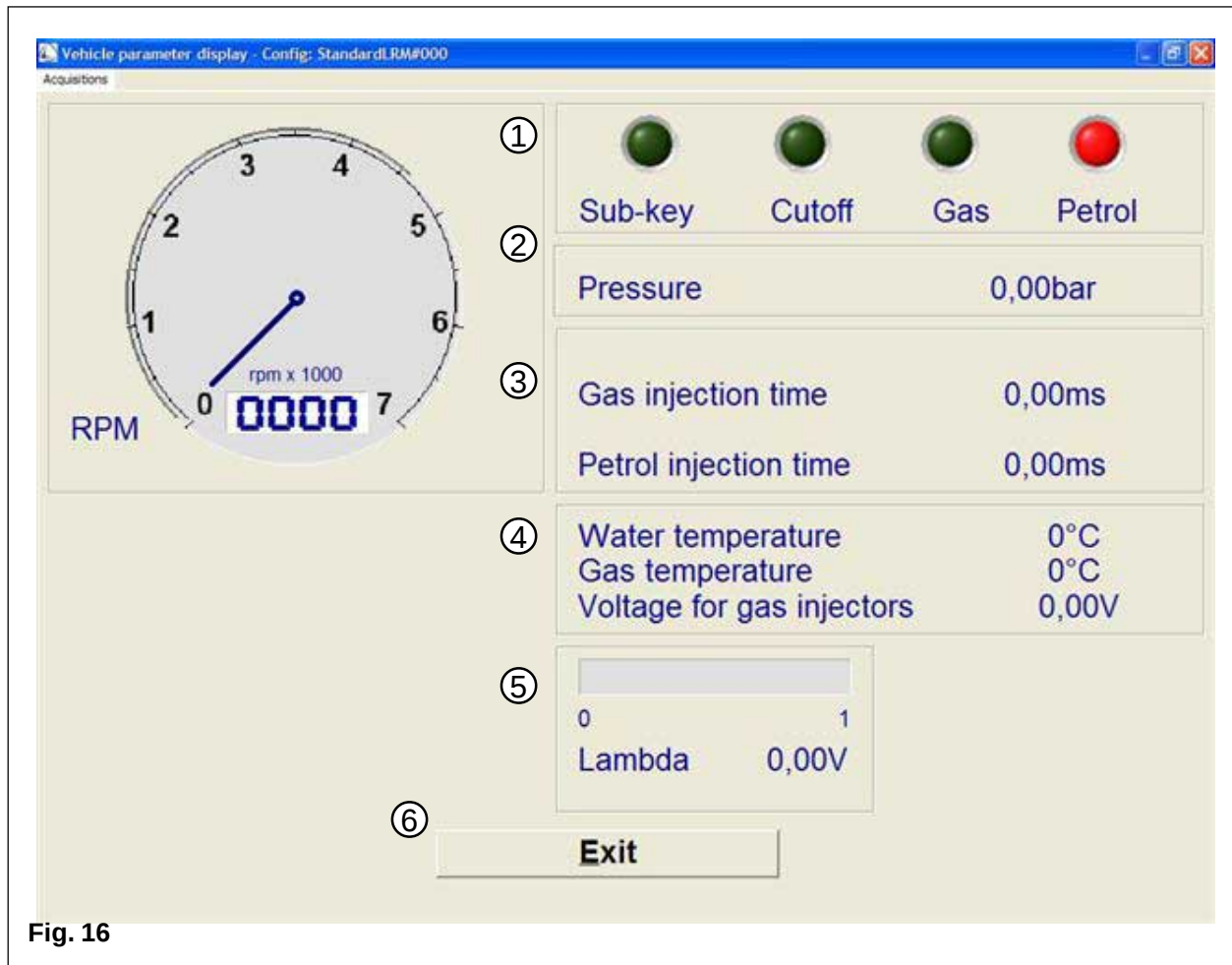


Fig. 16

This command allows all the important signals with which the gas control box works to be visualised on a screen.

There follows a brief description of the information visualised:

### 1 – STATUS VISUALISER:

This shows, from left to right:

- A - Lock;
- B - Cutoff;
- C - Gas;
- D - Petrol.

The active status is highlighted by a red led, the inactive status by a green led.

### 2 - PRESSURE

This shows the gas pressure in bar.

### 3 – INJECTION TIME

A - Gas

Injection time on gas actuated by gas injectors.

B - Petrol

Petrol injection time read from the LANDIRENZO OMEGAS control box via the injector disconnection wiring.

## **4 - WATER TEMPERATURE, GAS TEMPERATURE, GAS INJECTOR VOLTAGE**

A – Water temperature

Provides indications of the water temperature read from the sensor fitted to the “T” inserted into the engine cooling water circuit at the reduction unit inlet.

B – Gas temperature

Provides indications of the gas temperature read from the sensor fitted to the injector rail.

C – Gas injector voltage

Indicates the power feed voltage of the gas injectors.

## **5 – LAMBDA SENSOR**

This is the value in Volts supplied by the Lambda sensor (if connected).

## **6 - EXIT**

## 3.3 DIAGNOSIS

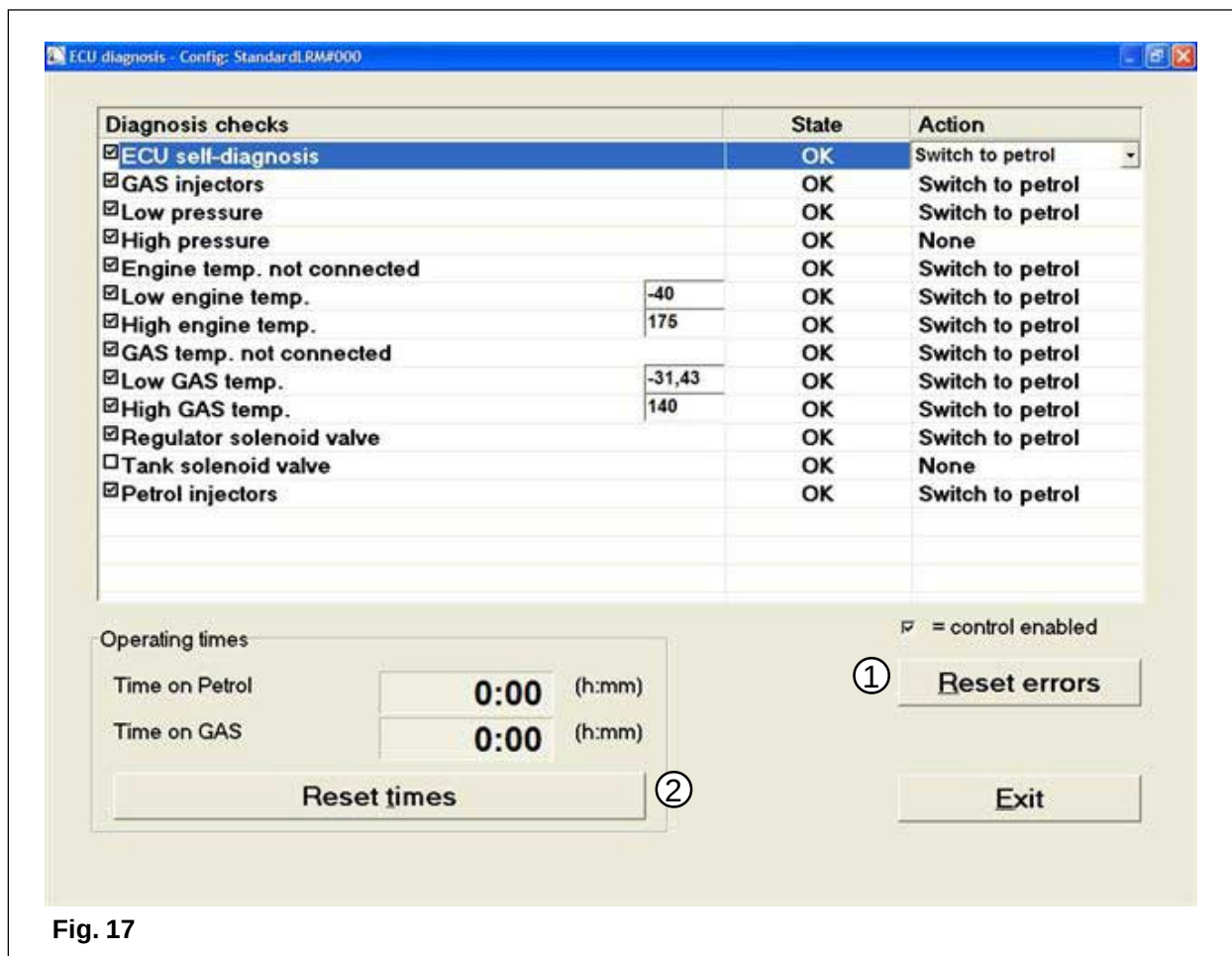


Fig. 17

The functioning diagnosis page allows the viewing of any possible malfunctions of components and system which may occur while functioning with gas. If an error is seen, after resolving the problem which caused the error, zero the system by pressing key 1. The malfunctions which may be indicated are:

### GAS INJECTOR DIAGNOSIS

While functioning with gas an error is signalled on the corresponding injector if for a certain consecutive number of injections (10) situations of open-load or short circuit occur in the coil of that injector.

### LOW PRESSURE DIAGNOSIS

While functioning with gas an error is signalled if the pressure read stays for a certain time (low pressure time for return, which can be set from Tools in the Gas Level page) at a level:

- less than 0.4 bar for normally-aspirated engines and 1 bar for turbo engines running on LPG
  - less than 1.54 bar for normally-aspirated engines and 2.6 bar for turbo engines running on Methane
- when at the same time the gas level is not on reserve.

### HIGH PRESSURE DIAGNOSIS

While functioning with gas an error is signalled if the pressure read stays for a certain time (5 seconds) at a level:

- higher than 1.4 bar for normally-aspirated engines and 2.85 bar for turbo engines running on LPG
- higher than 2.5 bar for normally-aspirated engines and 4.1 bar for turbo engines running on Methane .

## **SAFETY RELAY DIAGNOSIS**

An error is signalled if in the absence of lock (and thus with the relay disabled) there is downstream from the relay a voltage greater than 6V for more than 150 seconds. This situation corresponds to a case of relay “unstuck”.

A diagnostic error is also signalled if while running, downstream from the relay a voltage of less than 6V for 5 seconds is read.

## **ELECTROVALVE DIAGNOSIS**

It is possible that short or open circuits in the gas electrovalve coils are diagnosed when functioning with gas. Bearing in mind that the wiring of the two electrovalves is connected in parallel to the same contact, it is possible to enable the check only at the drive outlet (reduction unit electrovalve check). The error is signalled when for 5 seconds the absorption of current measured does not fall within the working range.

## **PETROL INJECTOR DIAGNOSIS (OR RATHER, INJECTOR DIVIDER PHASE)**

While functioning with gas an error is signalled if for a certain time (8 seconds) petrol is not detected injected in any channel of the injector divider. Obviously, the vehicle must not be in cut-off and this check (to avoid unusual conditions of partialisation of petrol injected) is only carried out if RPM are between 650 and 1000 (idling zone, where it is assumed that the petrol control box is not activating the injectors with a particularly unusual strategy).

## **GAS TEMPERATURE DIAGNOSIS**

Can only be activated if “enable changeover with gas temperature” has been set from Tools in the Temperature page.

When functioning with gas it may indicate:

- sensor disconnected: in the event of a similar reading for 10 seconds of a reference corresponding to the absence of the temperature sensor
- temperature too low: for 10 seconds a temperature is read which is lower than a value which can be set from the diagnosis page.
- temperature too high: for 10 seconds a temperature is read which is higher than a value which can be set from the diagnosis page.

## **WATER TEMPERATURE DIAGNOSIS**

Can only be activated if “enable changeover with water temperature” has been set from Tools in the Temperature page.

When functioning with gas it may indicate:

- sensor disconnected: in the event of a similar reading for 10 seconds of a reference corresponding to the absence of the temperature sensor
- temperature too low: for 10 seconds a temperature is read which is lower than a value which can be set from the diagnosis page.
- temperature too high: for 10 seconds a temperature is read which is higher than a value which can be set from the diagnosis page.

Also visualised in this page is a counter logging the hours of functioning respectively with petrol and with gas. This can be zeroed by pressing key 2

## 3.4 AUTOMATIC CALIBRATION

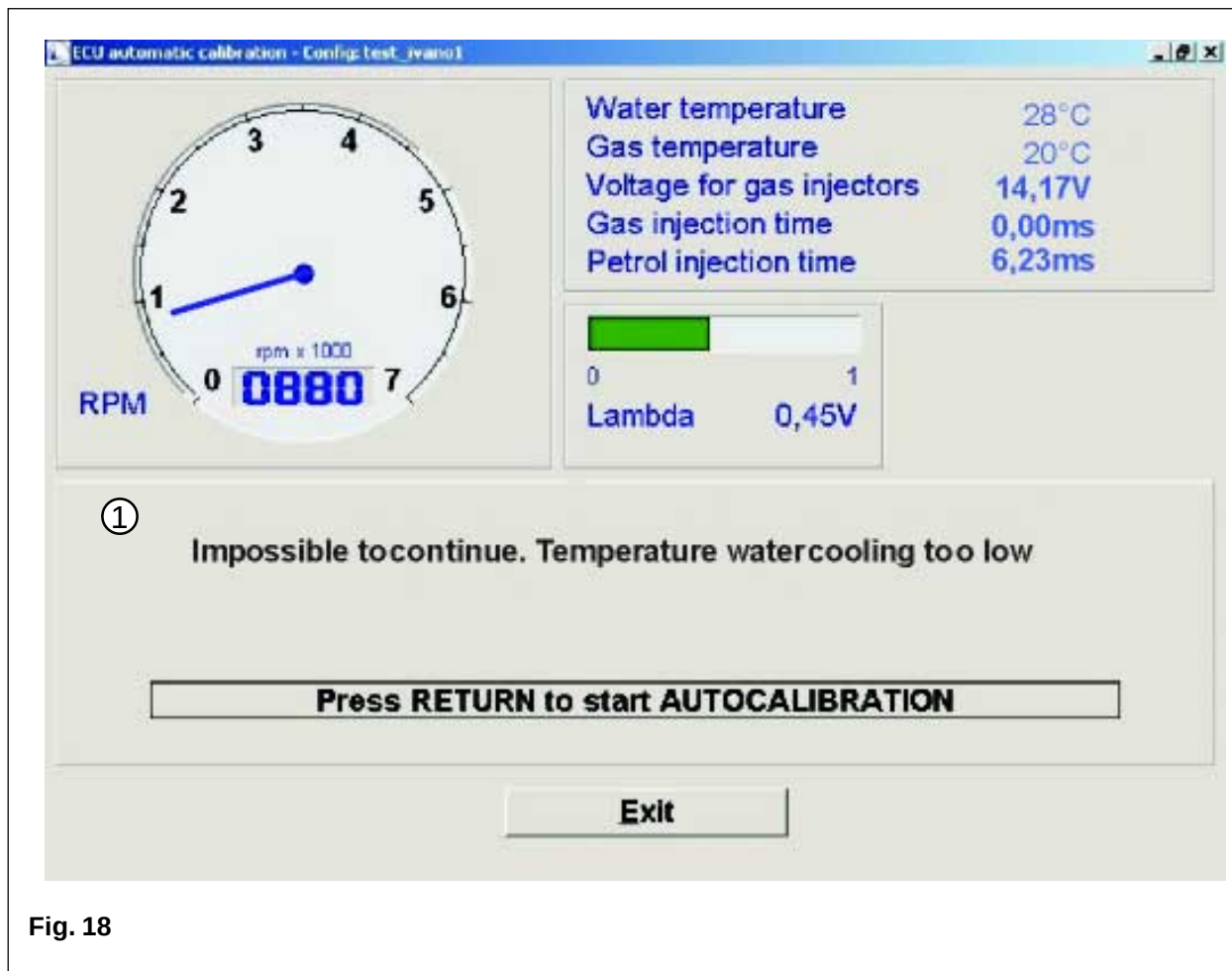


Fig. 18

This procedure allows calibration of the mapping of the vehicle in question to be carried out quickly, thus obtaining good driving characteristics. In order to proceed with the mapping of the vehicle a water temperature threshold set at 50°C must be exceeded. If the procedure is attempted without this condition being met, message 1 will appear as shown in the figure.

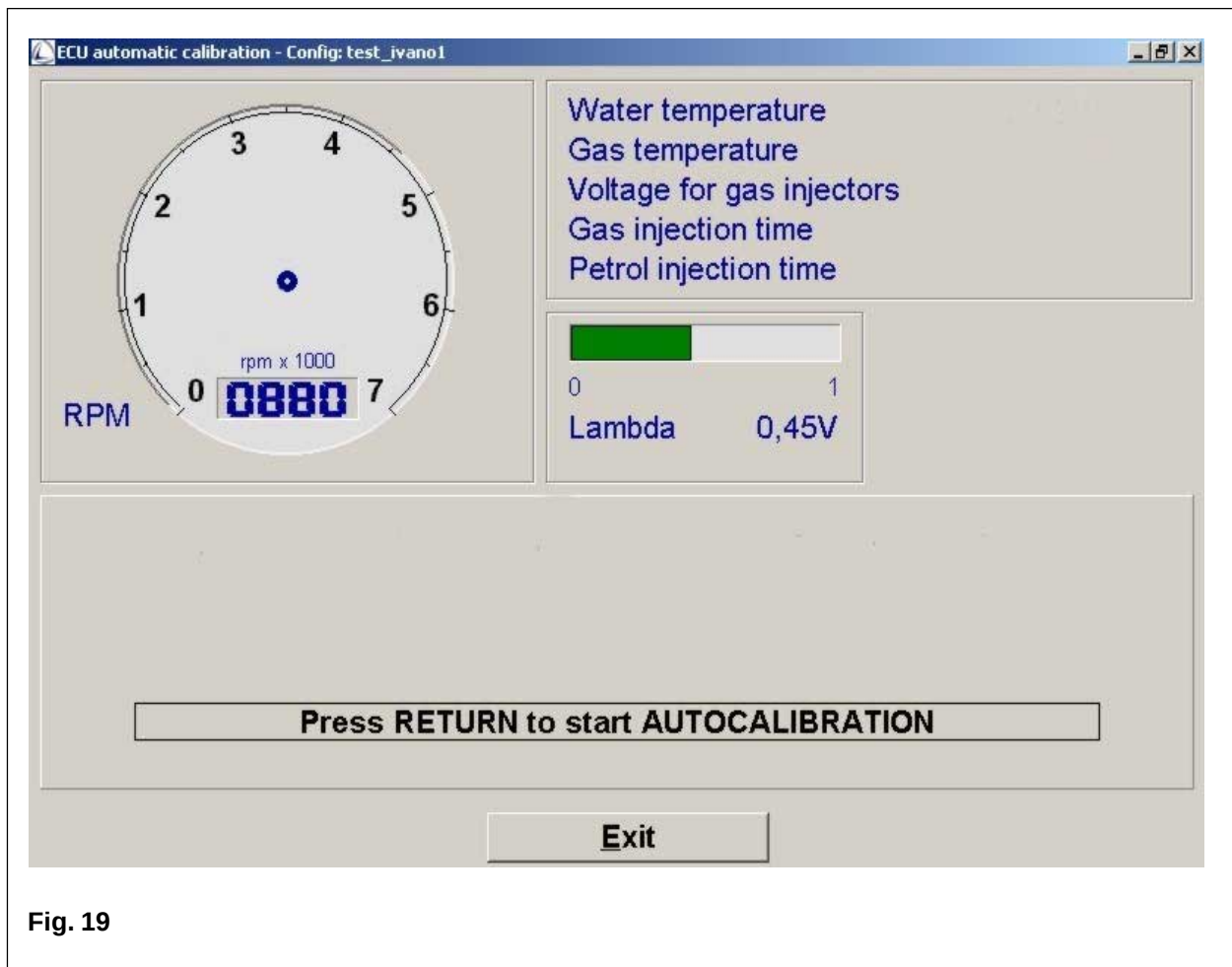
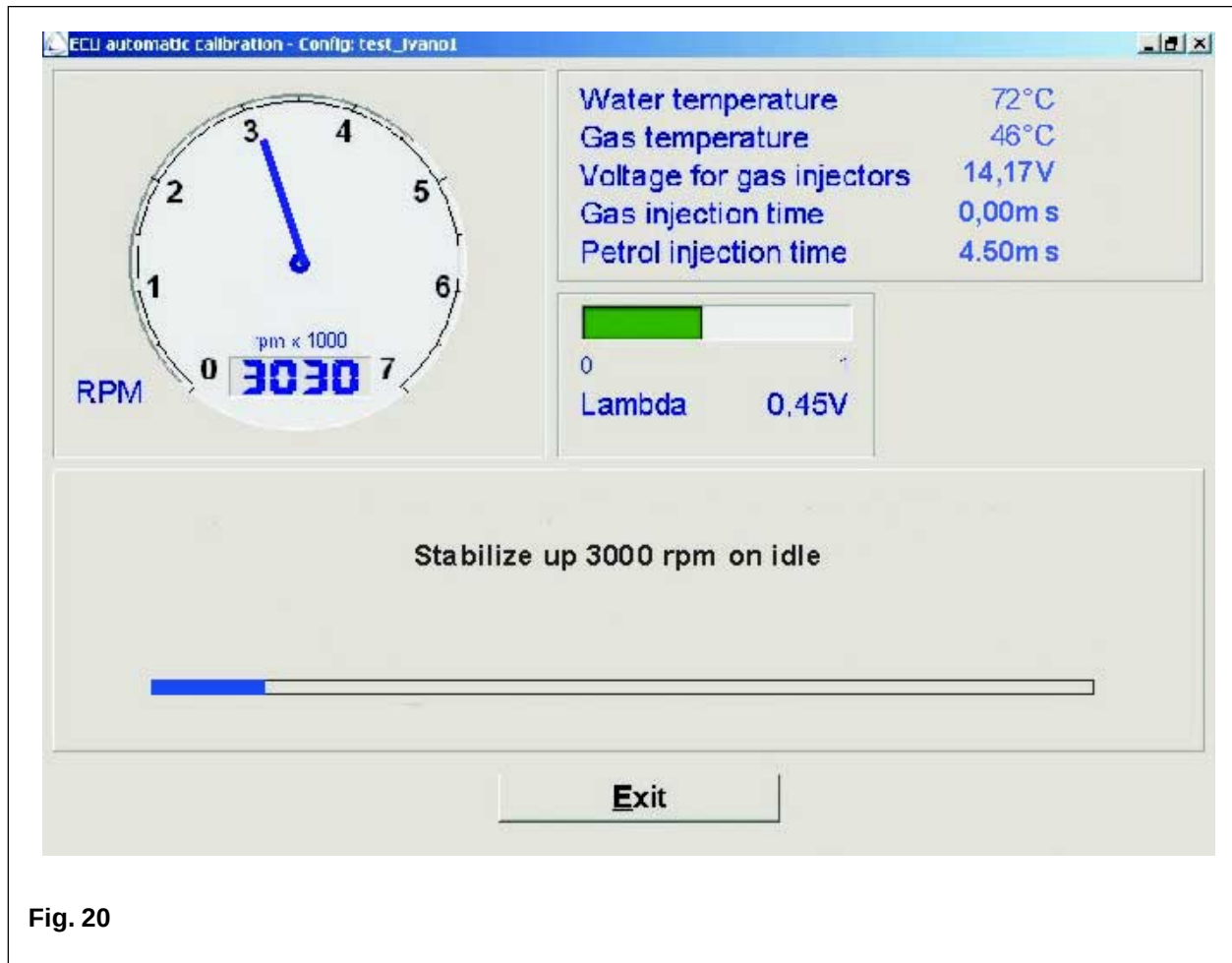


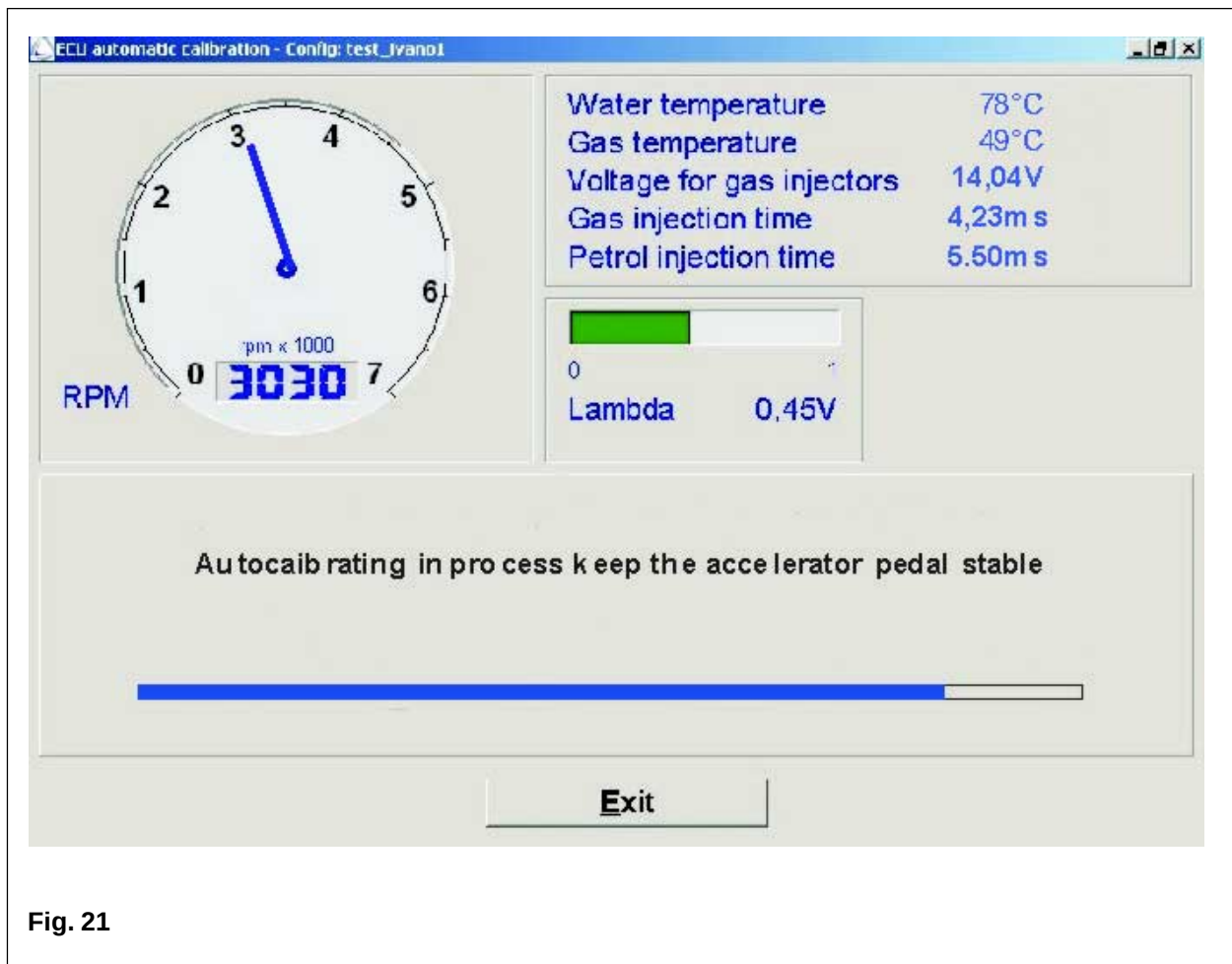
Fig. 19

If the temperature is higher than 50°C, press Start to proceed with the automatic calibration.

The program requires engine RPM to be stabilised at 3000.



The software automatically manages the changeover from petrol to gas to systemise the two injectors and obtain a correct carburation map. During these continual changeovers from petrol to gas it is important to maintain steady pressure on the accelerator pedal to avoid the system becoming unstable and prolonging the time needed to map the vehicle.



Once the correct mapping has been obtained, the software itself carries out a series of validation tests.

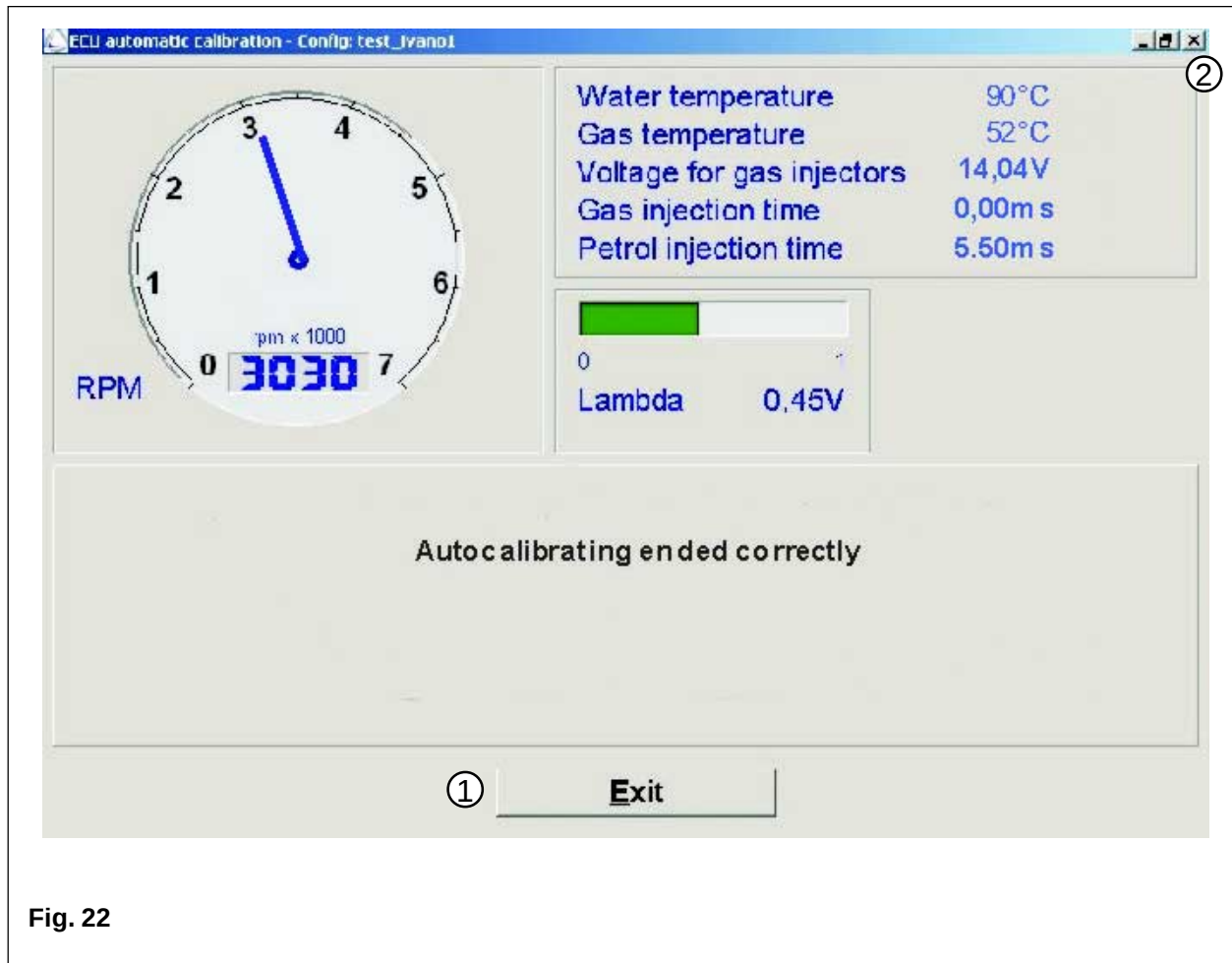


Fig. 22

If these tests are positive, the message “**Autocalibration correctly completed**” appears.

**N.B.:** Exit the program by using the “**EXIT**” key (1); in this way the calibration setup will be correctly downloaded to the control box.  
Exit the screen with the guide keys and **NEVER** with key 2, except in extreme circumstances such as the program freezing.

## 3.5 CHANGE CALIBRATION

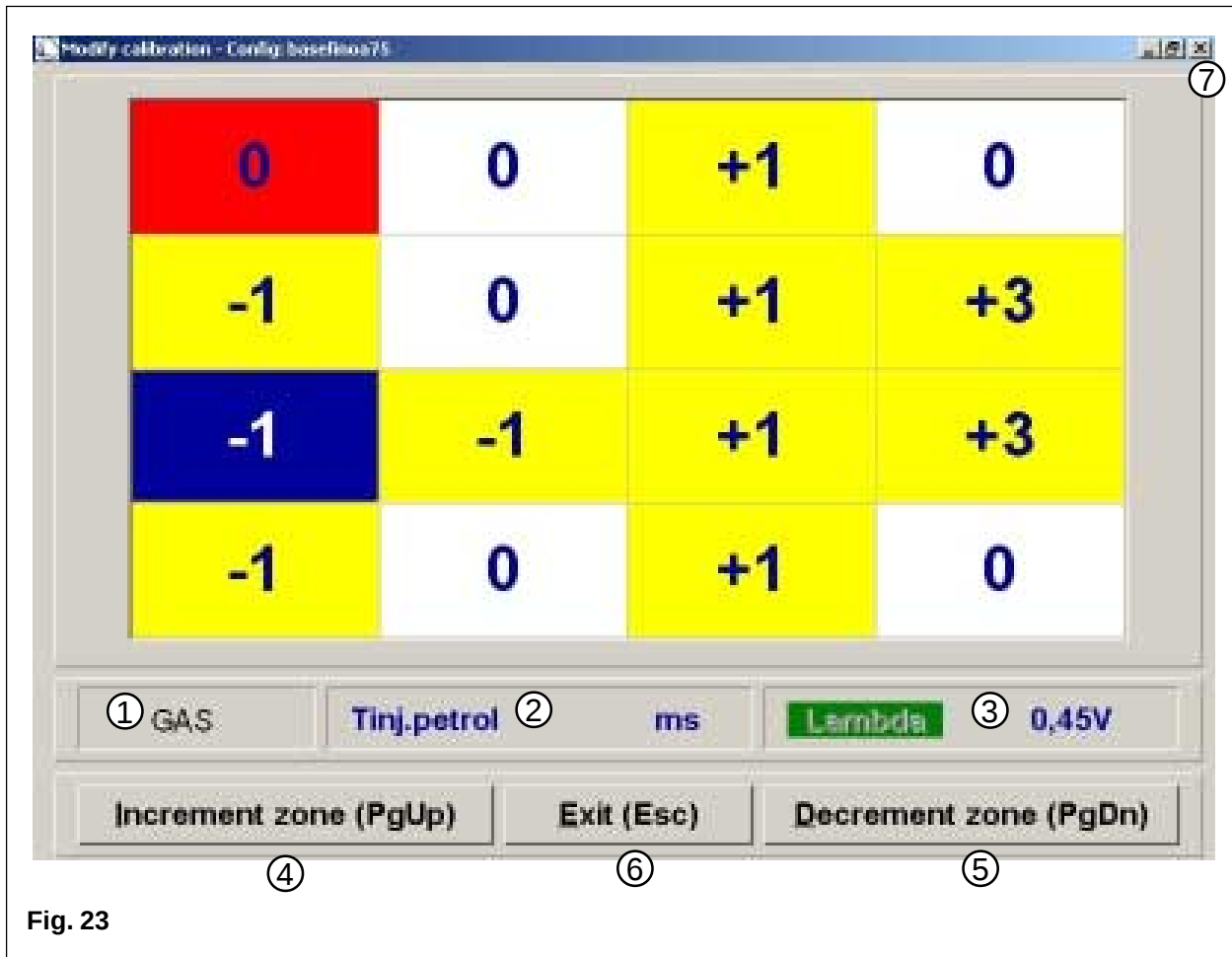


Fig. 23

An additional function which allows refinement of the map created/downloaded to the control box.

When functioning with gas, the box corresponding to the present operating zone will be lit up in red.

It is possible to effect a precise correction to each of the sixteen cells corresponding to the sixteen possible zones of vehicle functioning.

To increase or reduce the percentage correction, use the keys to increase the zone (PgUp) (4) or decrease the zone (PgDn) (5).

To carry out a complete diagnosis of the vehicle, it may be useful to use:

- scantool code no. 616287001
- the Lambda sensor connection.

Also shown in the page are:

- 1 – Fuel in use
- 2 – Petrol injection time
- 3 – Lambda sensor voltage
- 6 - Exit.

**ATTENTION:** Exit the program by using the "EXIT" key (6); in this way the calibration setup will be correctly downloaded to the control box.

Exit the screen with the guide keys and **NEVER** with key 7, except in extreme circumstances such as the program freezing.

## 3.6 SAVE PRESENT CONFIGURATION

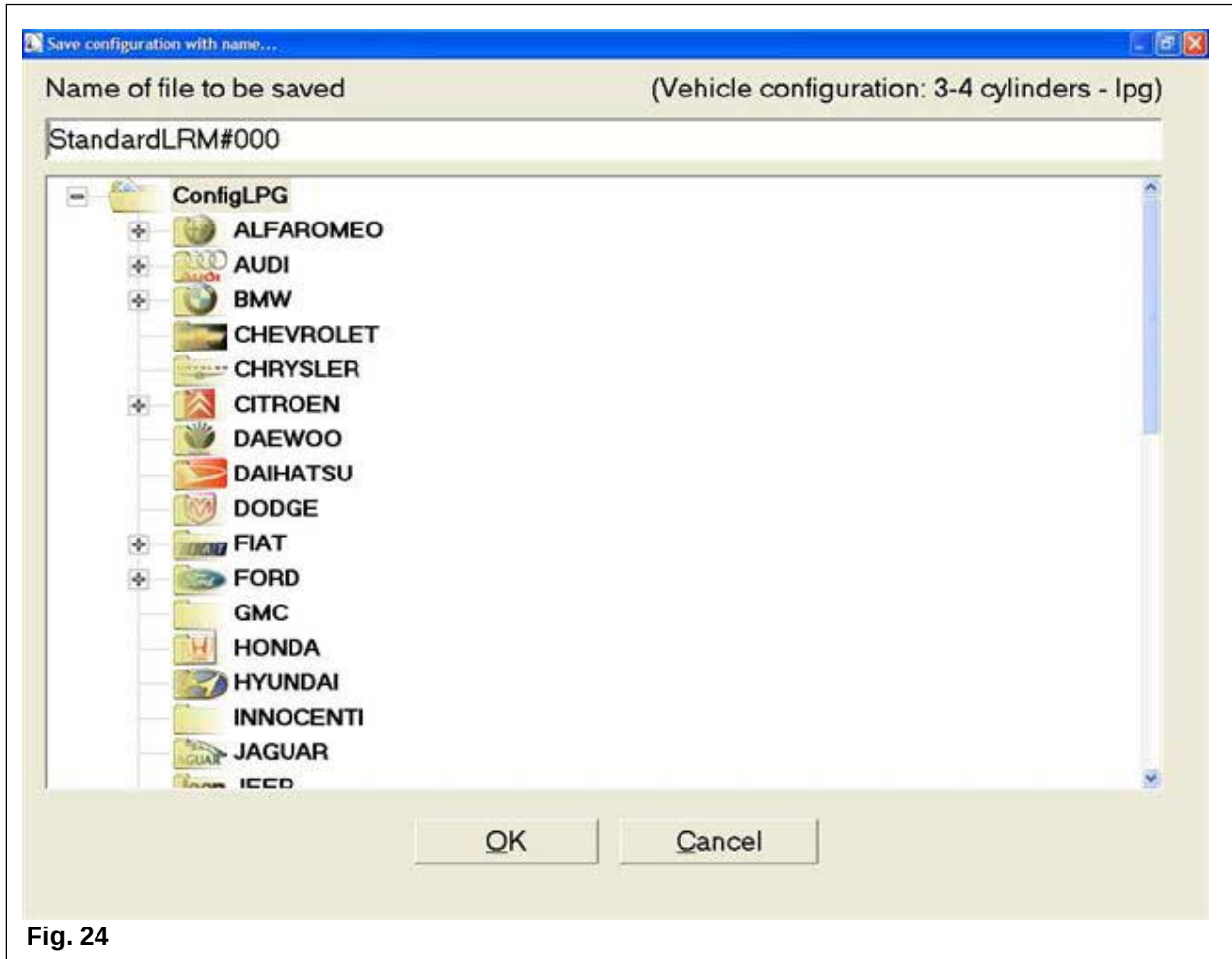


Fig. 24

By accessing SAVE PRESENT CONFIGURATION it is possible to save the 3,4 cylinder or 5, 6 or 8 cylinder file in the relevant archive, depending on the type of fuel used.

Recognising the type of control box connected, the program automatically saves the file relating to 3, 4 cylinders or 5, 6 or 8 cylinders.

Selecting the type of fuel in the "CHANGE TO GAS" page (paragraph 3.1.1) will determine whether the METHANE file is saved in the METHANE archive or the LPG file is saved in the LPG archive.

Each METHANRE or LPG archive is structured with an archive in the left part of the screen and organised as a hierarchical tree diagram on three levels.

This means that to arrive at a particular vehicle model it is necessary to move around the tree, each time selecting the correct branch from those available.

The **first** level corresponds to the type of fuel in use and is managed automatically by the software once the type of fuel is set in the page F1 CHANGE TO GAS in F1 VEHICLE CONFIGURATION.

The **second** level corresponds to the names of the vehicle manufacturers, arranged in alphabetical order, so the branch corresponding to the manufacturer in question must be "expanded" (keys RIGHT ARROW or RETURN).

The **third** and last level corresponds to the vehicle model. In this case it is not possible to expand the branch further, but it is necessary to select the model using the UP/DOWN ARROW or mouse.

If a wrong branch is accidentally expanded, it is possible to re-compress it by pressing the keys RETURN or LEFT ARROW, clicking on the "-" sign or double-clicking on the branch itself.

## 3.7 LOAD NEW CONFIGURATION

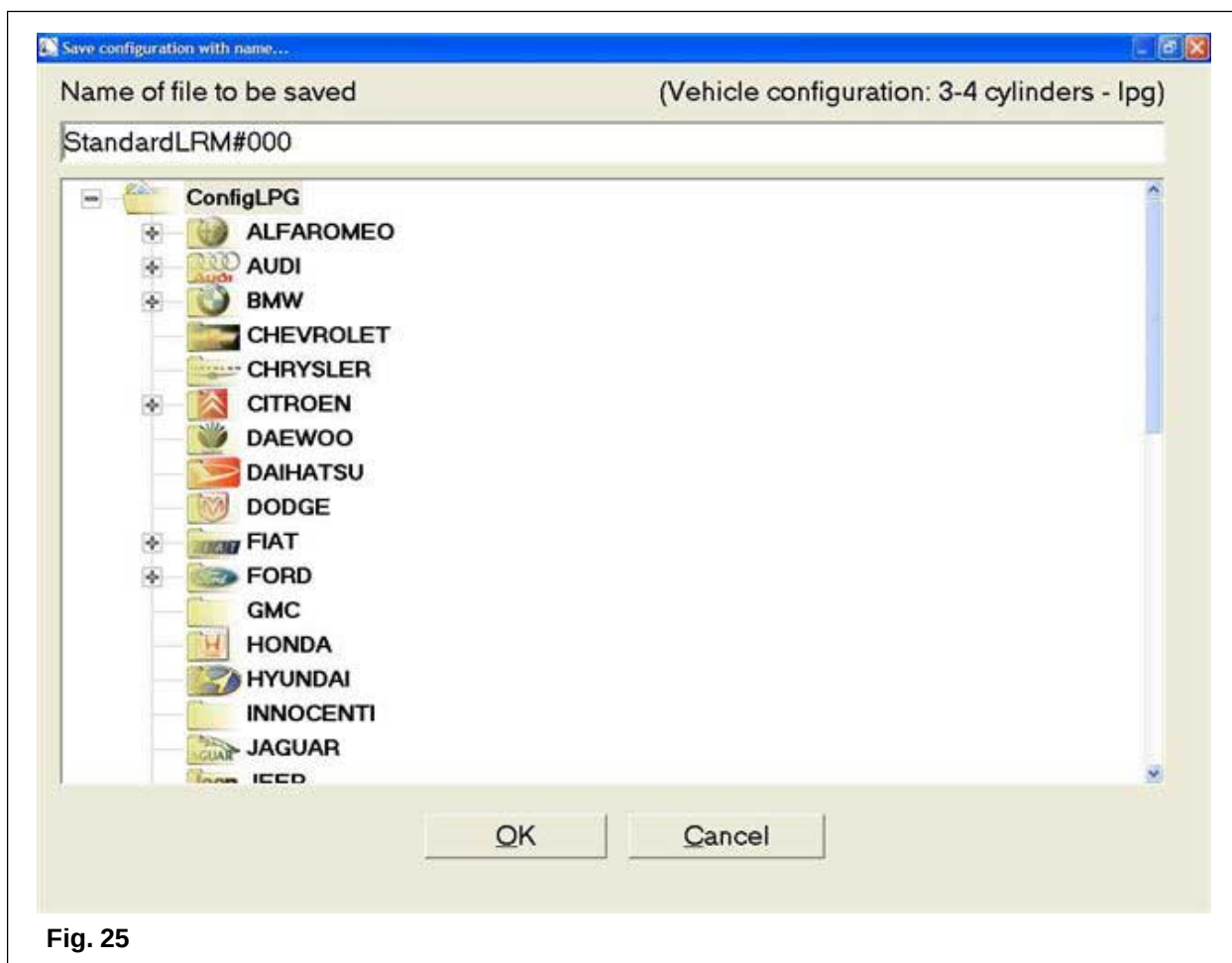


Fig. 25

By accessing "LOAD PRESENT CONFIGURATION", it is possible to load 3,4 or 5,6 or 8 cylinder files into the gas control box, depending on the type of fuel used. Recognising the type of control box connected, the program automatically saves the file relating to 3, 4 cylinders or 5, 6 or 8 cylinders.

Selecting the type of fuel in the "CHANGE TO GAS" page (paragraph 3.1.1) will determine whether the METHANE file is saved in the METHANE archive or the LPG file is saved in the LPG archive.

Each METHANE or LPG archive is structured with an archive in the left part of the screen and organised as a hierarchical tree diagram on three levels.

This means that to arrive at a particular vehicle model it is necessary to move around the tree, each time selecting the correct branch from those available.

The **first** level corresponds to the type of fuel in use and is managed automatically by the software once the type of fuel is set in the page F1 CHANGE TO GAS in F1 VEHICLE CONFIGURATION.

The **second** level corresponds to the names of the vehicle manufacturers, arranged in alphabetical order, so the branch corresponding to the manufacturer in question must be "expanded" (keys RIGHT ARROW or RETURN).

The **third** and last level corresponds to the vehicle model. In this case it is not possible to expand the branch further, but it is necessary to select the model using the UP/DOWN ARROW or mouse.

If a wrong branch is accidentally expanded, it is possible to re-compress it by pressing the keys RETURN or LEFT ARROW, clicking on the "-" sign or double-clicking on the branch itself

## 3.8 PROGRAMMING CONTROL BOX

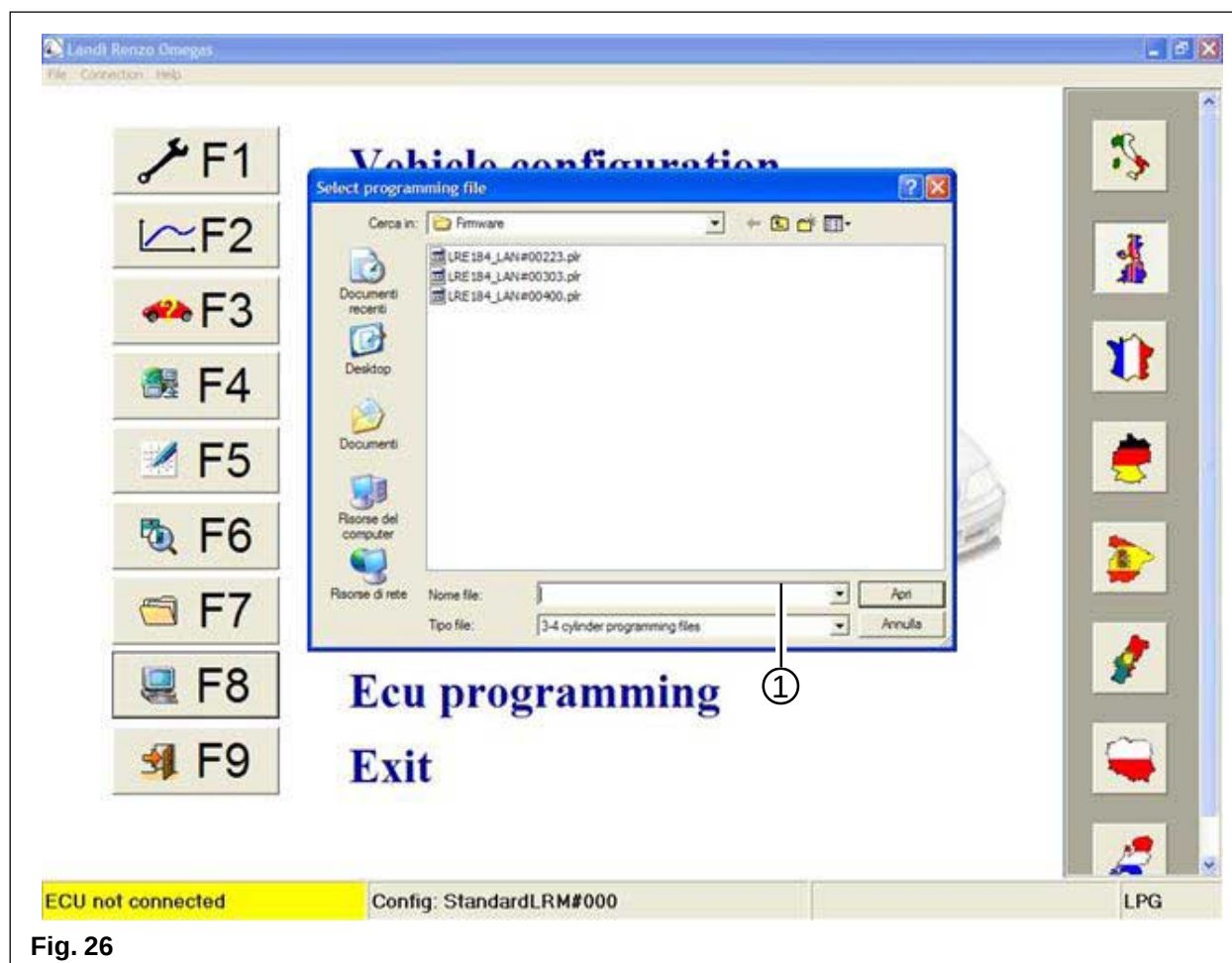


Fig. 26

By accessing the PROGRAMMING CONTROL BOX menu it is possible to update the control box software version.

Press F8 to access the screen shown above. It is now possible to select the firmware version to be downloaded into the control box from those shown and if the version is for a 3-4 cylinder or 5-6-8 cylinder control box (1).

During the updating phase, the software picks up the data present in the control box and, after updating it, reloads it.

## 3.9 FINISH PROGRAM

To finish the program simply press ESC key when it is in the main screen. If the control box is connected, it automatically disconnects.

## CHAPTER 4 BASIC SETTINGS

### 4.1 FIRST PROGRAMMING

Once connected to the LANDIRENZO OMEGAS control box, the first programming must proceed by providing a series of data used for the recognition of certain characteristic parameters of the vehicle to be calibrated.

These parameters are:

- type of fuel (set with lock disengaged)
- capacity
- type of RPM signal (set with lock disengaged)
- number of cylinders (set with lock disengaged)
- type of ignition (set with lock disengaged)
- RPM threshold for changeover
- water temperature for changeover.

By opening the program, all these values are set to default, but they must be customised to suit the vehicle to be calibrated.

Next proceed to AUTOMATIC CALIBRATION (para. 3.4).

In the event that connection with the control box is difficult, it is possible that the control box has no software version in it.

This software must be downloaded following the procedure described in paragraph 3.8 PROGRAMMING CONTROL BOX.



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