

# Trouble Shooting

Solving problems with LSI-NSI software

Update to version 2.1.0



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**TS LSI DIC'03**

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**Checks to be carried out from time to time if the vehicle shows signs of malfunctioning**

| <b>CHECK</b>   | <b>ACTION</b>  |
|--|--|
| Is reduction unit second stage pressure with the engine idling 0,95bar (LPG) or 2bar (CNG) $\pm 3\%$ ? | Adjust if higher or lower;   |
| Has DIAGNOSIS indicated the need for action?   | If 'yes', check the cause of the problem, rectify it (if possible) and reset the errors in the DIAGNOSIS page; |

## 1.1. Switching from petrol to gas

| PROBLEM  | CAUSE   | SOLUTION   |
|--|---|--|
| Gas does not flow                                      | LSI-NSI control box defective   | Replace LSI-NSI control box  |
|  | Injector disconnection wiring wrongly connected;  | Check connections;   |
|  | LSI-NSI control box has picked up an error in "Diagnosis";  | Check which defective component or malfunction has caused LSI-NSI control box to freeze;   |
|  | I have set too high a flow threshold for revolutions;   | Check the software setting;  |
|  | Injectors do not open;  | In "functioning diagnosis", check for any errors indicated. In the event of a defect, replace injector or control box;   |
|  | Control box does not read revolutions;  | Check wiring connections and software setting;   |
|  | Temperature sensor in water system does not function;   | Replace temperature sensor;  |
| For a few seconds after switching, carburation is poor | Electrovalves on tank and reduction unit do not open;   | In "functioning diagnosis", check for any errors indicated. In the event of a defect, replace the component;<br>Check correct mechanical functioning of opening of valves; |
|  | The maximum time set for changing is too short;   | Contact Landi SRL Technical Service;   |
| The engine switches to gas and cuts out                | In winter incorrect carburation can occur if the minimum water temperature is too low for the changeover set; | Raise the minimum water temperature for the changeover;  |
|  | Malfunction of one of the gas electrovalves;  | Check correct functioning of gas electrovalves, and if necessary replace the defective electrovalve;   |
|  | Check time of fuel overlap;   | Modify the overlap time;   |
|  | Engine carburation is too lean or rich;   | Repeat carburation procedure;  |
| The vehicle returns to petrol mode                     | One or more injectors is not functioning correctly;   | In "functioning diagnosis", check for any errors indicated. In the event of a defect, replace the component;   |
|  | Pressure too low;   | Filter blocked;  |
|  | Pressure too low;   | Adjust pressure;   |
|  | The gas injection times are too high and > T between two injections of petrol;                                | Seek assistance from Landi SRL technicians;  |

## 1.2. Drop at medium-high speeds

| PROBLEM                                    | CAUSE   | SOLUTION   |
|--|---|--|
| Lag between drop and start of acceleration | Carburation map incorrect;<br>The upper part of the main map has discontinuities; | Recalibrate engine;<br>Link up as well as possible the upper part of the central zone of the main map, or carry out a recalibration of carburation map F4; |
|  | Excessive distance between injector rail and gas injection points;                | Revise installation, moving the injector rail so as to reduce the length of the tubes and, if necessary, place the nozzles of the air valves closer;       |

### 1.3. Functioning at idle speed

| PROBLEM   | CAUSE   | SOLUTION   |
|---|---|--|
| Revolutions at idle are too high or too low   | Air is entering the compensation circuit;   | Replace damaged tube;  |
|   | Idle speed of petrol engine incorrectly adjusted;   | Adjust petrol engine idle speed;   |
| With air conditioner switched on, from time to time idle speed becomes unstable for a few seconds | Levelling-out area of idle speed is too wide and in the map the points of functioning with air conditioning compressor working or not working have K coefficients which are too dissimilar; | Check (engine hot) K coefficients in two different functioning conditions (compressor on and off) and alter the relevant zones of the map;                   |
| Idle speed is unstable (engine "splutters") but Lambda probe is functioning                       | Length of injector rail/nozzle tubes incorrect;   | Replace injector rail/nozzle tubes;  |
|   | Injector rail/nozzle tubes twisted;   | Replace injector rail/nozzle tubes;  |
|   | One of the injector nozzles has a different diameter from the others;   | Replace incorrect nozzle;  |
|   | The VAE allows air to enter from the front of one of the collectors of the individual cylinders. Consequently, a greater quantity of air enters at idle speed;                              | Revise installation, following the instructions given in the vehicle card;   |
|   | Lambda probe has a slow or incorrect signal;  | Check correct functioning with petrol and, if defective, replace probe;;<br>With probe type 0-1V. Connect probe reference wire to negative battery terminal; |
| Carburation is so rich or lean that the engine will not run at idle speed                         | The pilot driver of one of the injectors is broken;   | Replace LSI-NSI control box;   |
|   | Connections of injector disconnection wiring incorrect;   | Revise installation;   |
|   | One injector may be defective;  | Check correct functioning of injectors in the "Look and Check" section;  |
|   | Nozzles of non-standard diameter fitted;  | Install correct nozzles;   |
| Engine runs irregularly at idle speed, unstable by several hundred revolutions                    | Idle speed is badly "levelled";   | "Level" idle speed, remembering to make a large distinction between the idle zones with air conditioning compressor on and off;                              |
| Analysis of exhaust gases indicates rich or lean carburation with engine idling                   | The emulator used allows petrol in the LSI-NSI control box to flow;   | Replace LSI-NSI control box;   |

## 1.4. Output from idle with a trace of gas

| PROBLEM  | CAUSE   | SOLUTION  |
|--|---|---|
| Engine misses a beat then cuts out                                 | The fall in revolutions causes the engine to operate at the medium-low end of the first column (500÷700 rpm), which often has excessive K coefficients; | Reduce the value of the K coefficient in that zone of the map and check that enrichment at idle speed is not excessive; |
|  | The Lambda probe sometimes fails to work and the system becomes enriches or weakens the petrol carburation more than necessary;                         | Check efficiency of Lambda probe and replace if necessary;  |
| Revolutions rise with difficulty and Lambda probe is fixed on rich | K coefficients in transit mode have excessively high values and carburation becomes excessively rich;   | Reduce value of the first cells in the first columns;   |
| Revolutions rise with difficulty and Lambda probe is fixed on lean | K coefficients in transit mode have excessively low values and carburation becomes excessively lean;  | increase value of the first cells in the first columns;   |



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### 1.5. Drive with load at low speeds

| PROBLEM   | CAUSE  | SOLUTION   |
|---|--|--|
| At low speeds the vehicle moves in jumps, jerkily | In this type of motion, the petrol control box performs special engine management strategies in advance of ignition, with a detrimental effect on the use of gas;; | Check programming of LSI-NSI control box and recalibrate F4 carburation map;   |
|   | The advance/retard mechanism modifies the original advance too much;   | Check that the programming of the advance mechanism is not too high, and if necessary adjust it so that it disengages at the engine speed at which the problem occurs; |



## 1.6. Output from idle with severe acceleration

| PROBLEM  | CAUSE   | SOLUTION   |
|--|---|--|
| Carburation is lean (absent for a moment) for a few tenths of a second after flooring the pedal, then the Lambda value stays in the red zone for a long time | The values taken on by the K coefficients during the transit phase are too low  | Gradually increase the K coefficients in the zone below idle (from 2 <sup>nd</sup> to 6 <sup>th</sup> column from the left);   |
| Carburation is lean during the whole flooring of the pedal and in subsequent acceleration  | The values taken on by the K coefficients during the transit phase are too low;   | Gradually increase the K coefficients in the zone below idle (from 2 <sup>nd</sup> to 6 <sup>th</sup> column from the left);   |
|  | Diameter of nozzles is incorrect<br>Installation required excessively long tubes (and therefore excessive volumes of gas and response times); | Install nozzles of the correct diameter;<br>Revise installation, moving the rail so as to reduce the length of the injector rail/nozzle tube and if necessary move the nozzles towards the air intake valve; |
| Carburation is rich during the whole flooring of the pedal and in subsequent acceleration  | The values taken on by the K coefficients during the transit phase are too high;  | Gradually reduce the K coefficients in the zone below idle (from 2 <sup>nd</sup> to 6 <sup>th</sup> column from the left);   |
| The engine cuts out or tends to cut out  | Carburation during acceleration is excessively lean;  | See solutions for similar cases of lean carburation;   |
|  | Carburation during acceleration is excessively rich   | See solutions for similar cases of rich carburation;   |

## 1.7. Return to idling speed

| PROBLEM   | CAUSE  | SOLUTION  |
|---|--|---|
| Engine cuts out returning from prolonged steady driving   | In the upper part of the map, the K coefficients have been increased to obtain a more prompt response following drop to high speeds;             | Link the route of cells better during return to idle, reducing the value of the K coefficient in the first cells of the columns to about 1200 to 1600 revolutions, or carry out recalibration of the carburation map; |
| Engine cuts out returning from high speeds  | The reduction unit becomes too cold during driving with high power, the gas increases in density and carburation becomes too rich at idle speed; | Check water system;   |
| Engine is unable to stabilise its speed of rotation and speed varies by several hundred revolutions | Idle speed is not well "levelled" at values with air conditioning on and off;  | Check value of K coefficient during correct functioning at idling speed, from time to time adding a different accessory load;   |
|   | There are marked discontinuities (10÷20 K points) in areas of the map which have been "levelled";  | Link the relevant areas of the map better;  |

## 1.8. Functioning at power

| PROBLEM  | CAUSE  | SOLUTION   |
|--|--|--|
| Vehicle loses power because carburation is lean  | K coefficient of cells in the power zone of the map is insufficient;   | Increase value of K coefficient and make repeated tests while accelerating under load;   |
|  | Diameter of injector nozzles has a total flow section which is insufficient to feed the motor in these conditions;     | Check indications of vehicle card regarding nozzle diameter;   |
|  | A high pressure variation is read and this remains below the nominal value for a long time;                            | The reduction unit is damaged;<br>The multivalve on the tank does not supply enough gas;   |
| Vehicle loses power because carburation is rich  | K coefficient of cells in the power zone of the map is too high;   | Reduce value of K coefficient and make repeated tests while accelerating under load;   |
| After a certain period of functioning at full power the vehicle switches to petrol; it is necessary to switch off the engine and restart it to make it switch to gas | The temperature of the reduction unit falls to too low a level and the LSI-NSI control box receives a diagnosis error; | The water system does not provide sufficient thermal power to maintain the temperature of the reduction unit during supply of high levels of LPG: check water system and installation; |
| During violent acceleration in low gears, when high revolutions are reached, the vehicle jerks violently   | The petrol override comes into play and the vehicle switches to petrol;  | Drive at lower revolutions;  |
|  | The Lambda sensor stops functioning and does not provide accurate values;  | Switch the engine to petrol and check that the sensor starts working again correctly, if not replace it;   |
| Fuel consumption is much different from the estimated average consumption for this type of vehicle   | Some zones of the map are excessively rich;  | Correct the zones of the map by reducing the K coefficient values of the cells affected;   |

## 1.9. Miscellaneous problems

| PROBLEM   | CAUSE   | SOLUTION  |
|---|---|---|
| The commutator does not switch on   | The commutator is faulty;   | Replace commutator;   |
|   | The commutator wiring is damaged;   | Replace or repair wiring;   |
|   | The 12 V fuses have blown;  | Replace fuse;   |
|   | The connector of the LSI-NSI control box is oxidised;                                       | Clean connector with suitable product or replace it;  |
|   | The control box is not programmed;  | Program control box;  |
| Long start-up time  | Gas mixing with petrol;   | Replace LSI-NSI control box;  |
| The vehicle runs with difficulty, cuts out occasionally and driveability is poor in all conditions                  | LSI-NSI control box has been programmed with wrong file;                                    | Check file loaded and in the event of an error reprogram the LSI-NSI control box;   |
|   | One or more injectors on the rail does not function correctly;                              | Check functioning and replace if necessary;   |
| Functioning is erratic, especially at idle, and it is often possible to smell gas                                   | There is loss of gas in some part of the system, and carburation is therefore compromised;  | Check tightness of installation and working pressure of reduction unit;   |
|   | The reduction unit valve seats have deteriorated, changing performance characteristics;     | Replace or service reduction unit;  |
| Carburation is rich at all speeds   | Valve seats of 1 <sup>st</sup> and/or 2 <sup>nd</sup> stage levers are worn;                | Replace or service;   |
| When driving with LPG there is still clear and continuous consumption of petrol                                     | The injector emulator is defective and vehicle consumes gas and petrol at the same time;    | Replace LSI-NSI control box;  |
| After a few hundred kilometres running of LPG, there is a deterioration in emissions when running on petrol         | The carburation map is not functioning effectively;   | Recalibrate map;  |
| Loss of water from water system   | Hose clips incorrectly fitted;  | Revise installation;  |
| When pressing "Load new F7 configuration" or "F8 control box programming", reprogramming of the control box freezes | Control box does not communicate correctly;   | Remove main feed fuse, replace it and within 4 seconds press "Program" on panel;  |
|   | Control box is at present programmed with an obsolete and incompatible version of firmware; | Check that control box is powered, that interface cable is connected to computer and control box;<br>Program control box with an updated version; |
| Control box has memorised errors in functioning diagnosis under "Control Box Self-Diagnosis"                        | Control box faulty;   | Replace control box;  |
|   | Power feed absent or intermittently absent at Red/Black wire (+battery);                    | Check battery connection, continuity of Red/Black wire, condition of fuse on same wire;   |

## 1.10 LSI-NSI Calibration Tool Error Code

### 1.10.1 Programming

| ERROR         | CAUSE  |
|---------------|--|
| P01           | Impossible to connect to control box via COM or USB ports, impossible to find a connected control box. The control box does not communicate or communication route is interrupted; |
| P02           | Control box connected is incompatible with hardware or firmware;   |
| P03           | Error in opening programming file;   |
| P04           | Error in decryption of programming file (reprogramming procedure requires presence on PC of a version of Internet Explorer better than 5.5, with at least 128 bits cryptography);  |
| P05.          | Wrong programming tension;   |
| P06           | Error in cancellation of flash;  |
| P07           | Error in start-up phase (BAD_PREPARATION);   |
| P08           | Error in start-up phase (BAD_ERASE);   |
| P09           | Error in start programming phase;  |
| P10           | No dimension of data input;;   |
| P11           | Wrong encrypting mode;   |
| P12           | Generic programming error;   |
| from P1000 on | Error in record programming (ERR.CODE-1000). Writing of firmware has not ended correctly, it is necessary to repeat programming procedure;   |

### 1.10.2 Hardware Key

| ERROR | CAUSE  |
|-------|--|
| H01   | Error in reading/writing of hardware key;        |
| H02   | No hardware key present compatible with program; |
| H03   | Key with expired access number or date;          |
| H04   | Data not compatible with key internal data;      |

### 1.10.3 Connection

| ERROR | CAUSE  |
|-------|--|
| C01   | Impossible to connect to control box via COM or USB ports, impossible to find a connected control box. The control box does not communicate or communication route is interrupted; |
| C02   | Error in loading control box identification data;  |
| C03   | Control box firmware not compatible with calibration tool;   |
| C04   | Calibration tool not compatible with control box firmware;   |

Assistance for LSI-NSI is provided by Landi SRL technical service and technical manager of your authorised retailer of Landi SRL components.



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