GUARANTEE AND SERVICE

MAINTENANCE BOOK

LPG TECH
GAS INNOVATIONS

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GAS INNOVATIONS

IMPORTANT!

This manual contains information on operation and maintenance of the LPGTECH autogas system. We would like to emphasise that information provided in this manual is valid as of the day of its publication.

CONTENTS

GUARANTEE CARD

Dear User,

Thank you for purchasing an LPGTECH autogas system.

We would like to assure you that we made all efforts to ensure you are satisfied with our product. To ensure correct operation and configuration of the product, please read this operating manual and keep it in a safe place so you can refer to it in the future.

GUARANTEE CARD NO.

DATE OF CONVERSION

APPROVAL NUMBER

DETAILS OF THE VEHICLE

Make/Model	
Date of manufacture	
Engine capacity	
Engine power	
Milleage (km/mi)	
VIN	

DETAILS OF THE AUTOGAS INSTALLATION

Injection controller type/No.	
Injection rail type/No.	
Reducer type/No.	
Gas tank type/No.	
Additional components of installation	

Stamp and signature of the workshop

Location/Date

Signature of the owner

GUARANTEE TERMS AND CONDITIONS

1. The guarantee shall be granted to the Customer - the system purchaser and user, by an entity installing the car LPG system.
   - TECH controllers, disclosed within the period of 24 months from the date of installation,
   - TECH electronics, disclosed within the period of 24 months from the date of installation,
   - TECH-DRAGON injectors, disclosed within the period of 24 months from the date of installation,
2. The guarantee shall cover defects of the product and its installation.
3. The guarantee period shall cover 24 months from the installation date, without a mileage limit.
4. During the guarantee period, the entity installing the car LPG system shall guarantee a free of charge repair of any defects/failures in the system installed by it, provided the terms and conditions specified herein are met.
5. The guarantee services shall be provided at the facilities of the entity installing the car LPG system.
6. The Purchaser/User of the system shall be entitled to replacement of a defective component covered by the manufacturer's guarantee when:
   - defect/failure of the same kind appears after two successive repairs;
   - repair is not performed within 14 days of a date the vehicle/component is received for repair.

   When it is necessary to send the defective element/component to the manufacturer, the above deadline shall be extended for maximum 30 working days, where the entity performing installation notifies the Customer about that immediately.
7. The guarantee period for defective elements/components shall be extended for the time of repair, starting with the date on which the vehicle or the defective element/component is received by the entity installing the system.
8. The guarantee shall not cover the system parts and components which were:
   - damaged mechanically;
   - damaged due to faulty connections (e.g., electrical), installation contrary to guidelines of the component or the system manufacturer;
   - damaged due to poor quality of gas;
   - installed by a garage not authorised to install autogas systems;
   - damaged by incorrect engine adjustments or incorrect engine work on petrol;
   - damaged by incorrect work of the vehicle systems, e.g., engine, electrical system, cooling system, Lambda sensor, etc.;
   - damaged by incorrect system maintenance or operation;
   - parts requiring periodic replacement - gas filters requiring periodic adjustment.
9. The guarantee shall not cover consequences of normal wear and tear of the system components.
10. The guarantee shall not cover products that were modified, repaired, replaced or interfered with in any other way, excluding interventions made by the Guarantor.
11. The Guarantor shall not be held responsible for damages caused by contaminated gas fuel and poor operational condition of the engine or its instrumentation, including:
    - faulty valve train, or an ignition system;
    - exhaust system;
    - contaminated air filter cartridge;
    - poor condition of sensors;
    - spark plugs and ignition leads;
    - membranes, rubber elements.

    Repairs of defects/damages caused by contaminated gas fuel and poor operational condition of the engine or its instrumentation shall be charged to the User.
12. The Guarantor shall not be held responsible for damages to any vehicle components, including an engine, a fuel pump, injectors, petrol, gas filters, and high voltage coils.
13. All damage resulting from causes outside the Guarantor's control can be removed solely at the User's cost.

GUARANTEE TERMS AND CONDITIONS

14. When any adjustment or inspection is performed on the Purchaser/User's request, and when following such adjustment and inspection the entity installing the system finds the system operates correctly and the defects/failures specified by the Purchaser/User result from incorrect functioning of the vehicle parameters, costs of adjustments and inspection shall be covered by the Purchaser/User.
15. Guarantee repairs and inspections shall be performed by the garage installing the system solely on presentation of the guarantee card.
16. The complaint notification should include the following details: Customer specification, its address and contact phone number, proof of product purchase, description of the product under complaint, detailed description of the failure or defect under the complaint.
17. The following documents should be attached to the complaint notification: the completed Guarantee Card, and a copy of an invoice or other proof of purchase for the product under complaint.
18. For performance of the guarantee claims, the Purchaser should deliver the product under complaint to the Guarantor's facilities at its own cost. The Customer shall cover costs of travel to the Guarantor.
19. When repair is not possible, the faulty component shall be replaced.
20. The Guarantor shall decide about the repair method.
21. Costs of repairing the system defects, and of its adjustments and repairs caused by reasons listed in Articles 12–18 shall be covered by the Customer.
22. When the system is disassembled on the Customer request, it shall cover the costs of disassembling.
23. Changes in the gas system configuration are possible on the Customer's written consent.
24. The Guarantor shall not reimburse a difference between gas and petrol prices when driving on petrol is necessary (e.g., the system repair, inspection, or maintenance).
25. Other issues not covered by this Guarantee shall be governed by relevant provisions of the Civil Code.
26. This Guarantee shall not exclude, limit or suspend any rights of the Customer being a consumer, resulting from nonconformity of goods with the agreement, or rights resulting from mandatory legal requirements.

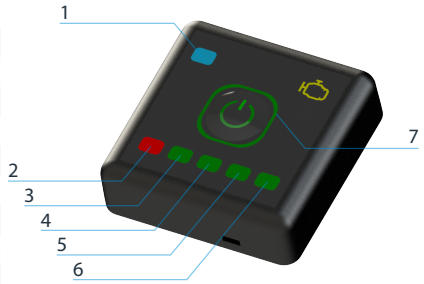
GENERAL PRINCIPLES OF OPERATION FOR THE GAS INJECTION SYSTEM WITH THE TECH CONTROLLER

Control panel - gas/petrol switch
The control panel displays a current autogas system operation mode and a gas level in the tank.

Control panel indicators
1) operation mode indicator - blue field (1):
   off - petrol operation mode
   flashing - waiting for the fulfillment of switching over conditions
   lit - gas operation mode
2) gas reserve indicator - red field (2):
   lit - gas reserve in the tank
3) ca. 25% of gas in the tank - green field lit (3)
4) ca. 50% of gas in the tank - green field lit (4)
5) ca. 75% of gas in the tank - green field lit (5)
6) ca. 100% of gas in the tank - green field lit (6)

On/Off Switch (7) - a switch for changing the autogas system operation mode.

When all control panel indicators are off, the system works in the petrol mode.



The microprocessor controller TECH is responsible for correct operation of the autogas system in the vehicle, as it collects all data on the engine work and gas pressure and temperature, and controls other parameters of the system.

When the specified temperature of the cooling liquid is exceeded, the process of switching the engine from petrol to gas is initiated.

GENERAL PRINCIPLES OF OPERATION FOR THE GAS INJECTION SYSTEM WITH THE TECH CONTROLLER

1. When solenoid valves are opened, the liquid gas at the pressure of ca. 5–10 bar (depending on temperatures) flows from a tank through a high pressure line to a pressure regulator. In the CNG system the volatile gas at the pressure up to 200 bar (depending on the tank filling level) flows through a high pressure line to a pressure regulator.
2. In the pressure regulator, the gas is heated and its pressure is reduced to ca. 1 bar (LPG) or ca. 2 bar (CNG).
3. Following temperature and pressure control, gas is fed into gas injectors injecting it into a vacuum manifold, near a petrol feeding site.
4. **A microprocessor TECH gas controller controls the gas injection time on a basis of the petrol injection time, with necessary adjustments resulting from differences between fuels.**
5. Algorithms in the TECH controller optimally use information from modern petrol control computers, ensuring very precise gas dosing, continuous control over combustion conditions and exhaust gases emission, and optimal operating conditions for a catalyst converter.
6. The vehicle supply system and the gas level in the tank are displayed on the control panel installed in the driver's compartment. The controller operation mode is changed with the On/Off switch (7) on the control panel.

No gas in the tank

When there is no gas in the tank, the supply mode is automatically switched over to petrol, and this is confirmed with two long audio signals and short flashing of the operation mode indicator (1).

Fuelling

The gas tank is filled solely through a fuelling valve, and only at LPG/CNG stations. When the maximum filling level is reached, the fuelling valve should automatically cut the gas supply off.

NOTE!

For LPG, the maximum tank filling level is 80% of its capacity. In the CNG system, the maximum gas pressure in the tank of 200 bar should not be exceeded. This activity should be performed in accordance with relevant national laws.

EXPLOITATION AUTOGAS/PETROL OPERATION

Switching over to the PETROL mode

- With the ignition on, press the On/Off switch (7)
- All control panel fields switch off - the vehicle is operating in the petrol mode

Switching over to the GAS mode

- With the ignition on, press the On/Off switch (7)
- All control panel fields switch on - the vehicle is operating in the gas mode

Automatic calibration of the gas level sensor

When the gas level is incorrectly indicated, the sensor parameters can be automatically calibrated. This function automatically sets voltage thresholds for individual sensor fields. To calibrate gas level indications, fill the empty tank (after the tank is emptied and following automatic switch over to petrol) by following the steps below.

- Drive to a gas fuelling station.
- With the engine running, press and hold the On/Off switch (7).
- Switch the ignition off while holding the On/Off switch.
- When an audio signal is heard, release the switch - the control panel indicators will switch on in a sequence, from the lowest (3) to the highest (6) gas level.
- Fill the gas tank up to the full, and switch the engine on.

Automatically set voltage thresholds can be adjusted at the Authorised Autogas System Installation Garage, when necessary.

Emergency engine start-up on gas

It is possible to start the engine solely on gas, however it must be remembered that this is an emergency situation and requires a reasonable approach.

- Switch the ignition off with a key - "0" position on the ignition.
- Press and hold the On/Off switch (7) on the control panel.
- Holding the On/Off switch (7), start the car and release the switch.

NOTE!

Following the vehicle emergency start-up on gas, wait until the engine temperature reaches the right value for the correct pressure regulator operation, i.e., until the engine temperature indicator displays ca. 40°C. Otherwise, the pressure regulator can freeze, resulting in the car being immobilised again, or even in damage to the pressure regulator or other system components. The pressure regulator will not freeze in the CNG system. However, it is recommended to wait until the fluid is warmed up, for the system to operate steadily.

EXPLOITATION OBD FUNCTION SWITCHING ON AND OFF FROM THE CHANGEOVER SWITCH

Switching the OBD module on/off on the control panel

In vehicles equipped with the autogas systems with TECH OBD controllers or controllers with an external SCANNER TECH-OBD module, it may be necessary to switch the OBD module off, e.g., for vehicle diagnostic tests not related to the autogas system Then the OBD module must be switched off with a switch on the control panel.

- With the ignition on, press and hold the On/Off switch (7).
- After a single audio signal is emitted, the OBD module is switched off.

To switch the OBD module on again, with the ignition on, press and hold the On/Off switch (7) for 6 seconds.

When the control panel emits two long audio signals, the OBD module is switched on.

Error detection signal

When any error is detected in the system, the control panel emits one long signal and the mode switch to petrol. When the error is repeated, go the Authorised Autogas System Installation Garage.

Audio signals

The control panel emits the following audio signals:

- Two long audio signals - switch over from gas to petrol when the gas tank is empty.
- One long audio signal - the autogas system error.
- One long audio signal – when the OBD is switched off.
- Two long audio signals - when the OBD is switched on.

SAFETY REGULATIONS

Safe driving

- All maintenance and repair works on the gas system can be performed solely by employees at an Authorised Autogas System Installation Garage.
- For safe gas system operation, it is necessary to regularly verify the operating condition of the pressure regulator, gas solenoid valve, and line connections as a part of periodic mandatory technical inspections.
- When any leaks are found in the gas system, immediately close an output valve on the tank multivalve and eliminate the leak at the Authorised Autogas System Installation Garage.
- The gas tank and the multivalve must be secured against objects that can damage them. When such risk occurs, install covers protecting the tank and the multivalve.
- A garage for vehicles with a gas system should be provided with sufficient ventilation, because LPG is heavier than air and accumulates at the bottom of a room. CNG is lighter than air so it migrates upward; however the room should be appropriately ventilated.
- A car with an LPG system should not be kept in underground rooms if they are not provided with sufficient ventilation. As CNG migrates upward, the gas will not accumulate at the lowest point.
- When using an autogas system, the general principles for car operation should be observed.
- Dates for periodic maintenance inspections and mandatory inspections at a Motor Vehicle Inspection Station must be observed.

NOTE!

A petrol tank should always be filled to at least 1/4 of its capacity (the fuel level low light should not be on), as this may cause damage to the petrol pump. The maximum filling of the LPG tank should not exceed 80% of its nominal capacity. Maximum filling of the CNG cylinder should not exceed the pressure of 200 bar.

PERIODIC MAINTENANCE INSPECTIONS

The autogas system is subject to mandatory annual inspection at a Motor Vehicle Inspection Station.

The periodic inspections at an Authorised Autogas System Installation Garage increase the system reliability and reduce costs of its maintenance. They include the activities listed below:

- Checking the autogas system for leaks.
- Removing oil contaminations from the filter (for filters with a replaceable filter cartridge).
- Gas filters replacement.
- Verification of parameters and settings of the gas injection controller. Verification of petrol adjustments.
- Repair or replacement of damaged components of the autogas system.

NOTE!
The first inspection should be performed after 1000 km (+/- 200 km) from installation.

PERIODIC MAINTENANCE INSPECTIONS

Date

Odometer value

Next inspection

Checking the system for leaks

Verification of parameters and settings of the gas injection controller
Verification of petrol adjustments

FREE INSPECTION

Notes

Station seal and signature of a person performing the inspection

Date

Odometer value

Next inspection

Checking the system for leaks

Replacement of the liquid phase filter

Verification of parameters and settings of the gas injection controller
Verification of petrol adjustments

Replacement of the volatile phase filter

Notes

Station seal and signature of a person performing the inspection

PERIODIC MAINTENANCE INSPECTIONS

Date

Odometer value

Next inspection

Checking the system for leaks

Replacement of the liquid phase filter

Verification of parameters and settings of the gas injection controller
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Date

Odometer value

Next inspection

Checking the system for leaks ☐ Replacement of the liquid phase filter ☐

Verification of parameters and settings of the gas injection controller Verification of petrol adjustments ☐ Replacement of the volatile phase filter ☐

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Date

Odometer value

Next inspection

Checking the system for leaks ☐ Replacement of the liquid phase filter ☐

Verification of parameters and settings of the gas injection controller Verification of petrol adjustments ☐ Replacement of the volatile phase filter ☐

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- Holding the On/Off switch (7), start the car and release the switch.

cut by the line

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