



## User manual

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## 1. Introduction

### About this manual

This manual applies to LiquidSi systems delivered as from 2013.

### What is liquefied petroleum gas?

LPG (Liquefied Petroleum Gas) is in most countries a combination of propane gas and butane gas. Liquefied petroleum gas is produced during the winning and refining of oil and natural gas. The use of liquefied petroleum gas helps to improve air quality. Liquefied petroleum gas is a cleaner fuel than for example petrol or diesel. In its natural state it is gaseous but it is stored, under pressure, as a liquid in the liquefied petroleum gas tank. It is an odourless gas, but to make it easier to identify an odour has been added to it. Liquefied petroleum gas is a safe fuel. Extremely high safety precautions are demanded by governments for its transport and storage. The liquefied petroleum gas system's components are individually approved by independent inspection bodies.

### The LiquidSi system

LiquidSi is an unique and innovative LPG system that injects LPG in liquid phase in the engine. This results in a higher performance and greater driveability than conventional LPG systems.

LiquidSi works well in extreme conditions, as its performance is not influenced by high or low temperatures, the autogas mix or humidity.

LiquidSi is maintenance free. LiquidSi can be installed on all modern multipoint petrol engines, including turbo charged engines, lean burn engines and Euro5 engines.

This results in an ultimate reliable system, giving you lots of driving pleasure and fuel costs savings for a long time.

## 2. Operating the LiquidSi system

### Fuel Switch

You can switch fuels, manually, by pressing:

**"Petrol pump symbol"** for switching to petrol.



**"Si"** for switching to LPG.



The engine will start on petrol and switch to LPG automatically after some time. The timing is determined by the engine temperature, usually approximately 30 seconds but this can take longer in cold conditions.

### Starting the engine

While starting, the LPG-system performs a check: all LEDs on the switch will light up, rotate counterclockwise, and will then go out. After the check has been performed, the LPG-system will start to switch to the chosen fuel type.



The top green LEDs are on. The engine is running on LPG. How many LEDs are on, depends on the fuel level in the tank.



The yellow LED in the lower left corner is on. The engine runs on petrol.

### Switching from petrol to LPG



The yellow LED in the lower left corner is on. The top left green LED flashes to indicate LPG is chosen. The engine still runs on petrol and the LPG-system is preparing to switch to LPG. Once the engine runs on LPG, the top green LEDs are on.

### Fuel level in LPG tank



The right, 4 top green, LEDs and the lower right red LED indicate the amount of LPG in the tank. If all 4 green LEDs are on, the tank is filled to its maximum capacity. The maximum capacity is approximately 80% of the gross content.

### Low LPG fuel level



The upper green LEDs are off, the switch beeps twice and the lower right red LED is on. The engine still runs on LPG, but it's time to refuel.

## Switching from LPG to petrol



Once the LPG tank is empty the system switches to petrol. *Please note:* the switch does not beep this time. The lower left yellow LED is on. The engine runs on petrol now.

After refilling, the system switches again to LPG automatically.

## Minimum petrol level





As the system starts on petrol, it's necessary to have **sufficient** (about ¼ tank) petrol in your petrol tank.

## Refuelling

When refuelling at a LPG station:

- Turn off the engine!
- Make sure the vehicle is in a horizontal position.
- It's recommended to always **fill** up the tank completely.
- Open filler flap.
- Remove filler cap from filler opening and screw on the required adapter.
- Bayonet filler: place fuel pistol in filler opening and turn it a quarter to the right or left. Pull the fuel pistol handle.
- Euro filler: tighten fuel pistol nut on filler opening. Press handle on fuel pistol.
- Italian filler: place fuel pistol in filler opening. Press handle on fuel pistol.
- Press LPG pump button. When the pump stops, the maximum tank level of 80% is reached. Stop refuelling by releasing the button.
- Now loosen the handle (some LPG vapour may be released) and remove the fuel pistol.

Put the filler cap in place to avoid dirt, water, sand and dust from entering the filler opening and therefore the entire system.

	ACME	Belgium, Germany, Ireland, Luxembourg, Northern UK Poland, Scotland, Switzerland and Wales.
	Bayonet	Netherlands, Norway and UK.
	Euro	Spain.
	Italian	Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Italy, Latvia, Lithuania, Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Sweden and Switzerland.

### 3. General user information and hints for optimum use

#### Originally installed petrol gauge and petrol consumption indicator

In some vehicles, the petrol gauge on the dashboard may move to a lower level while driving on LPG. This is not due to petrol consumption, but it's caused by your vehicle's electronically regulated petrol gauge believing that you are driving on petrol. When you restart the vehicle, the petrol gauge will reset and then indicate the correct level again. If your vehicle is equipped with an onboard computer with a fuel consumption indicator, it communicates the fuel consumption as though the vehicle is running on petrol. It does not take into account the extra fuel consumption due to driving on LPG.

#### Fuel consumption

As LPG gas has a lower energy value than petrol, the fuel consumption when using LPG will be approximately 20% higher than when you are driving on petrol. Ultimately, the extra consumption depends on LPG-mix you have refuelled with.

#### Maintenance

LiquidSi does not require any maintenance. However, your dealer may advise to have the system checked on a regular basis.

#### Warranty

LiquidSi comes with a warranty of 2 years or 100.000 km, whichever comes first. The warranty starts at the moment the system has been installed. Please check if the warranty certificate is provided with the system.

#### Troubleshooting

In case problems should occur, the following guidelines should be of assistance how to proceed.

##### The car won't run on LPG

Follow the next checklist:

- Is there enough LPG in the tank?
- Is there enough petrol in the tank for starting on petrol?
- Is one of the fuses in the LiquidSi system defective?

15A rating for the fuse nearest to the battery;

5A for the second fuse.

Removing both fuses will disable the LPG system and the engine should run on petrol. Never use a heavier fuse than indicated on the fuse wire. It can cause damage to the system.

##### Extreme temperatures

LiquidSi can handle extreme climatic conditions. However, in very hot conditions or after prolonged driving with low fuel consumption (e.g. traffic jams) you may experience a slower rate of filling when refuelling your vehicle. In such case, continue your journey on petrol for a short while and retry at the next refuelling station.

The filling pressure can be lower at certain refuelling stations. In these cases, try to refuel when the temperature is relatively low; e.g. early in the morning.

##### Gas leakage

If you can smell LPG, switch to petrol immediately and contact an approved LiquidSi dealer immediately.

If you cannot solve the problem yourself, please contact your LiquidSi dealer.

Do not carry out any repairs yourself. Failure to comply with this instruction revokes your warranty.

## 4. Exceptional circumstances

### Repair of damage

In the case of damage to your vehicle alert the mechanic of the presence of LiquidSi system. If the vehicle needs to be placed in a drying oven after re-spraying, the liquefied petroleum gas tank must first be removed by an approved LiquidSi dealer.

### Disassembly of parts of the system or removal of the system

Do not attempt under any circumstances to disconnect or disassemble liquefied petroleum gas system components yourself. The system is pressurised and there is a risk that liquid gas will escape. You run the risk of serious burns if you touch liquid gas. Only have an approved LiquidSi dealer remove or repair the system.

### Fire

In the case of a fire, leave the vehicle and take distance. The liquefied petroleum gas tank is equipped with a safety valve that allows the liquefied petroleum gas to escape from the tank in case of abnormal pressures inside this tank due to excessive heat. Thanks to this facility it is impossible for the liquefied petroleum gas tank to explode. Inform the emergency services that you have a liquefied petroleum gas system in the vehicle.

### Extreme environmental conditions

Under extreme environmental conditions (e.g. extreme cold / heat, high altitude) the LiquidSi system behaves like the original petrol system on the vehicle. Therefore, please follow the instructions of the car manufacturer. At low outside temperatures it may take longer before the system switches over to LPG. At high outside temperatures, you have to ensure that the gas tank is not placed in direct sunlight. Welding and grinding in the proximity of parts of the gas system should only be performed after demounting the concerning parts.

### Empty petrol tank

As the LiquidSi system starts on petrol, starting when the petrol tank is empty can be done as follows.

1. Push and hold the "Si" button on the switch.
2. Turn the ignition key to the "ON" position.
3. Now wait for the five green LEDs to flash simultaneously and for a repeating beep tone from the buzzer.
4. Release the "Si" button and wait a few seconds for the gas pump to circulate fresh fuel over the injectors.
5. Start the engine.