

# eFlexFuel

E85 conversion kit

Installation and user's manual

*stepone tech*

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## 1. Foreword

Thank you for choosing eFlexFuel E85 conversion kit, a product designed in Finland to endure vastly different climatic conditions encountered in the Northern Europe. With this conversion kit, you can easily upgrade your gasoline powered car to become a true flexfuel car. After the installation, you can use ethanol based E85 fuel blend, regular gasoline, or any mixture of the two. This conversion kit is compatible with almost any car equipped with fuel injection.

Please read this instruction manual in its entirety before attempting to install or to use the conversion kit. In addition to describing the installation and usage of the conversion kit, this manual will let you know the different aspects associated with using E85 fuel blend.

### The advantages of ethanol based fuel

E85 offers many advantages over regular gasoline. First of all, cost of driving will be notably cheaper. When taking into consideration the differences in the costs of the fuels and the slightly higher consumption of ethanol-based fuel, savings can exceed 20%.

At the same time, you save the environment! The CO2 emissions of bioethanol are significantly lower than those of the regular gasoline.

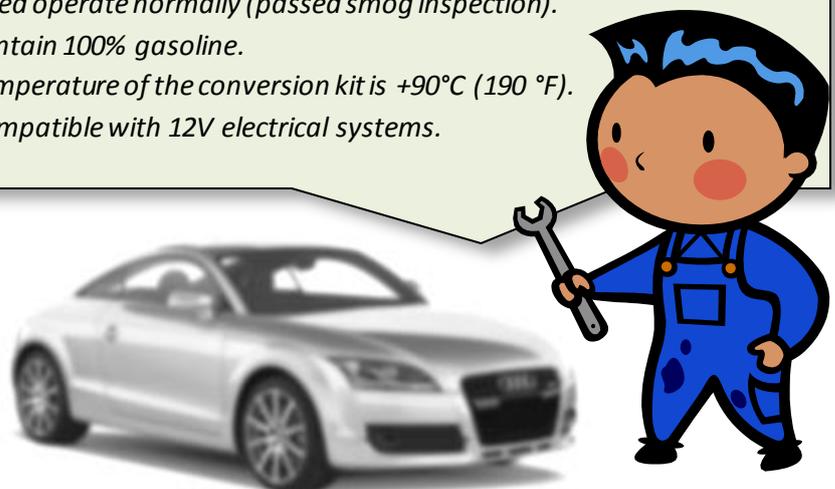
### How much have you saved?

The home page of eFlexFuel E85 conversion kit contains a calculator which you can use to estimate savings incurred by driving an E85-powered car. To use the calculator, you need to input the average fuel consumption, distance driven, and the prices of the fuels. Test the calculator at:

[eflexfuel.com](http://eflexfuel.com)

### **Please make note of the following items before installing the eFlexFuel E85 conversion kit!**

- ✓ *You have accepted the terms of use of eFlexFuel conversion kit (page 11).*
- ✓ *The conversion kit is only compatible with gasoline powered cars.*
- ✓ *The conversion kit is only compatible with high impedance fuel injectors.*
- ✓ *The conversion kit is not compatible with direct injection engines (FSI, TSI, GDI, etc.).*
- ✓ *Verify adequate flow rate of the fuel injectors (E85 requires c. 30% higher flow rate).*
- ✓ *Car needs to be in normal operating condition.*
- ✓ *The car's oxygen sensors need operate normally (passed smog inspection).*
- ✓ *The car's gas tank has to contain 100% gasoline.*
- ✓ *The maximum operating temperature of the conversion kit is +90°C (190 °F).*
- ✓ *The conversion kit is only compatible with 12V electrical systems.*



## 2. Introduction to eFlexFuel E85 conversion kit

eFlexFuel E85 conversion kit comprises two main parts, a control unit and a wiring harness.

S-Models are equipped with ethanol sensor and connection cable.

V-Models are designed for 8 to 12 cylinder engines. V-model includes two control units and eFlexLink cable to connect the two separate units.

### eFlexFuel control unit

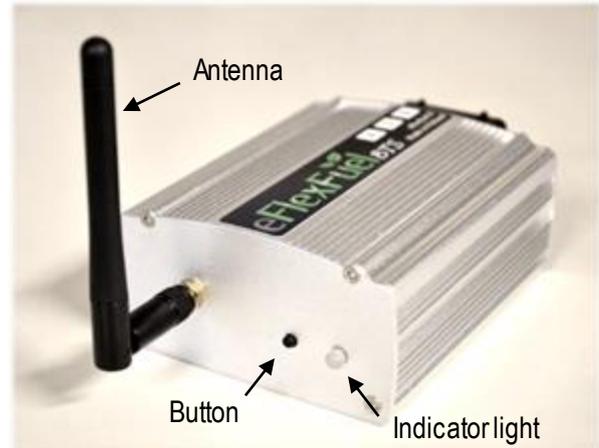
The control unit of eFlexFuel E85 conversion kit contains all the electrical components required to control the conversion kit. The numbers (4-6 or 8-12) on the top the unit indicate how many injectors can be controlled with the unit (the corresponding number is encircled).



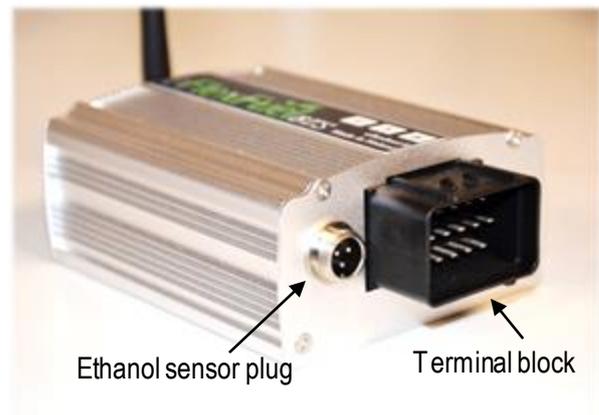
One end of the control unit has a button that is used to select the operation mode and an indicator light. The signals sent by the light are explained in more detail on page 24. In BT- and BTS-Model there is also an antenna for wireless connection.

#### PLEASE NOTE!

The master unit in V-models can be controlled with its button to select the operating mode. Sticker on the device indicates which unit is the master.



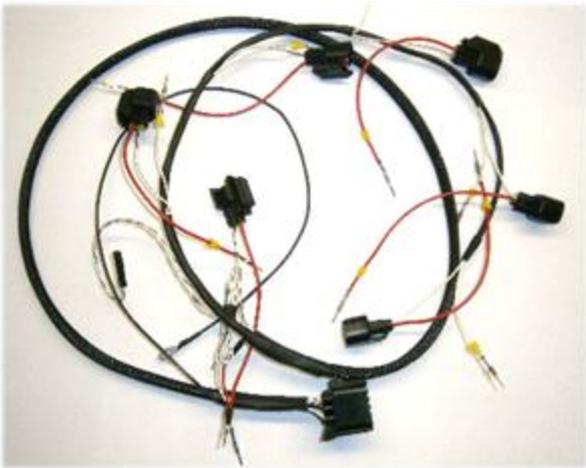
The other end of the controller has a male connector that is used to connect the wiring harness. There is also a 3-pole connector for ethanol sensor in S-models.



### eFlexFuel wiring harness

The wiring harness is used to connect the control unit to the car's fuel injectors. The wiring harness is specific for each car model. The number of fuel injector connectors and their type depends on the car where the harness is being installed. Wiring harnesses are also sold separately, for example, if the control used is transferred to another car.

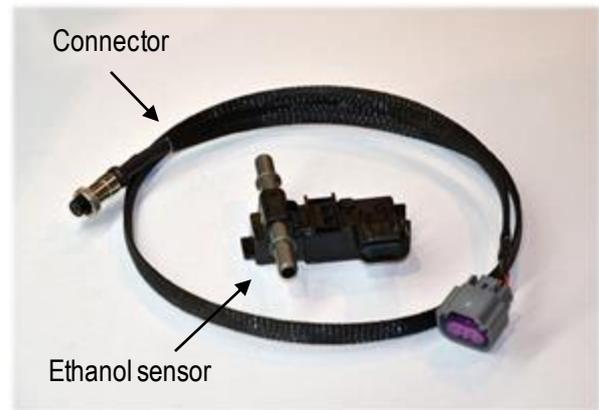
The wiring harness has a strip connector for the controller unit, ground wire with a round connector, thermal sensor, injector connectors and a diagnostic connector (the diagnostic connector can only be used to attach the harness to a separate diagnostic unit that is only available to authorized dealers).



### Ethanol sensor and connector cable

S-models use an ethanol sensor to recognize the fuel mixture. S-models are equipped with the same

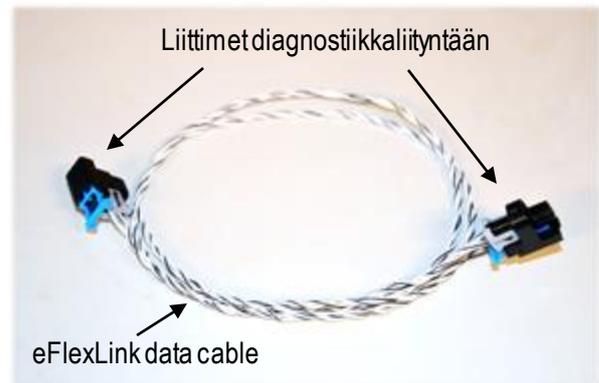
ethanol sensor used in factory-made flexfuel vehicles. S-models also include a connector cable to receive data from the ethanol sensor.



### eFlexLink data cable

The control unit and slave unit are connected together with eFlexLink data cable. Units are always operated with same settings by using eFlexLink.

V-model units can't be operated separately.



### 3. Installation of the conversion kit



The installation of the eFlexFuel E85 conversion kit is easy and does not require any structural modifications to the car's original electrical or fuel injection systems. It is connected in parallel with the car's injector wires with the included wiring harness. The installation requires only altering several connections and the attachment of the control unit and the wiring harness.

Please follow these instructions in detail and according to the numbered steps in order to ensure that the conversion kit operates as planned.

#### Time and tools required for the installation

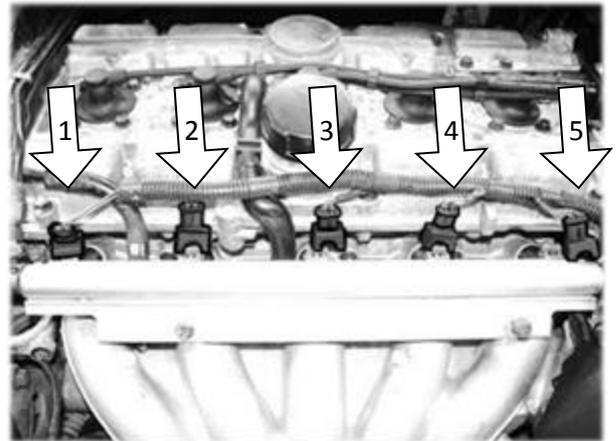
It is recommended to have basic tools and a multimeter when installing eFlexFuel.

#### **Please note!**

Prior to installing the eFlexFuel E85 conversion kit, the car's ignition switch needs to be set to off position. This is easily ensured by removing the keys entirely from the ignition switch.

#### 1) Locate the fuel injectors

Start the installation by locating the fuel injectors on the car's engine. They are usually located on top of the intake manifold close to the engine block and their number is typically equal to the number of the engine's cylinders. The picture below shows the location of fuel injectors on a 5-cylinder Volvo engine:



#### **Please note!**

You may need to remove plastic covers and other components on certain cars in order to expose the fuel injectors.

On some engines, the installation may require the removal of the intake manifold in order to expose the fuel injectors.

## 2) Disconnect the fuel injectors

Once you have located the fuel injectors, disconnect them. Most connector types have a locking mechanism that prevents them from being accidentally released. You need to unlock this mechanism before disconnecting the connectors.

### Please note!

Do not mix the order of the connectors!

## 3) Verify the right connector type

Make sure that the connectors of the injector wires you have disconnected match the connectors of the eFlexFuel conversion kit's wiring harness. If this is not the case, the wiring harness needs to be exchanged with a matching type. The available connector types are shown on the eFlexFuel conversion kit's web page.

## 4) Check the polarity of the injector connectors

eFlexFuel control unit gets its supply voltage (+12V) and injection signal through the injector wires. The injector connectors have two pins, whose polarity depends on the car's make. For this reason, the polarity of the connectors needs to be verified. To check the polarity, you'll need a multimeter. The picture below shows how the measurement is conducted.

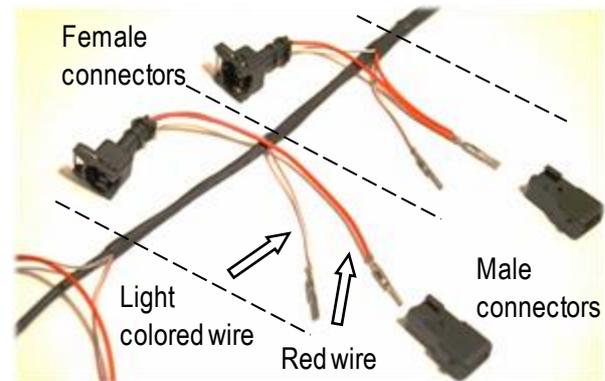
Easiest way to recognize +12V pole is to compare the color of wiring cables. They are usually of the same color. You can ensure the right wire by using multimeter's positive measurement lead. +12V cable

Injection signal goes through connectors to all poles. In these cables the coloring is usually different in every connector. They are not connected to each other.

## 5) Connect the male connectors of the wiring harness

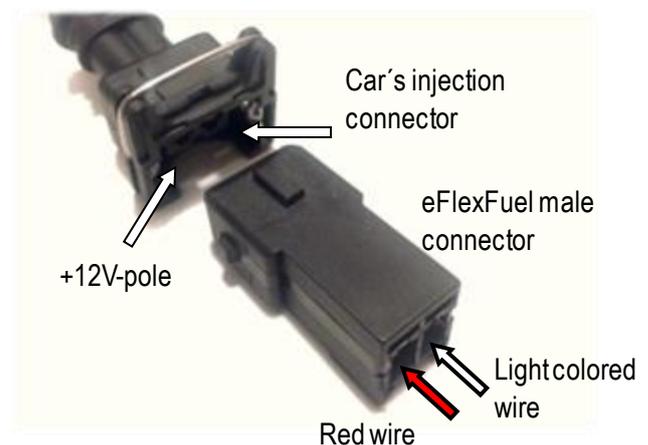
The male connectors of the eFlexFuel wiring harness are detached upon delivery and need to be

connected during the installation process. The reason for this is that the connectors are model specific. Each female connector of the wiring harness is accompanied by one male connector. The wiring harness has male-female connector pairs as shown in the following picture.



First, check in which way the male connectors fit the connectors of the car. This will let you know how to connect the rest of the wires.

Push the wiring harness' red wires to the male connectors in such a way that they are connected to the car's positive supply voltage (+12V). Then connect the light colored wires of the wiring harness to the remaining pins of the male connectors (injector signal). An example of the connection process is shown in the following picture.



Once the wire connectors are pushed in the plastic male connector housing, they will lock to the correct position. The wire connectors will lock only if positioned correctly. Be careful not to break the locking mechanisms! Some male connector types include rubber gaskets. Insert them to the connectors before pushing the wires in.

## 6) Connect the wiring harness to the injectors.

Once the male connectors are connected to the wiring harness, it is ready to be installed to the car. Do not mix the order of the connectors!

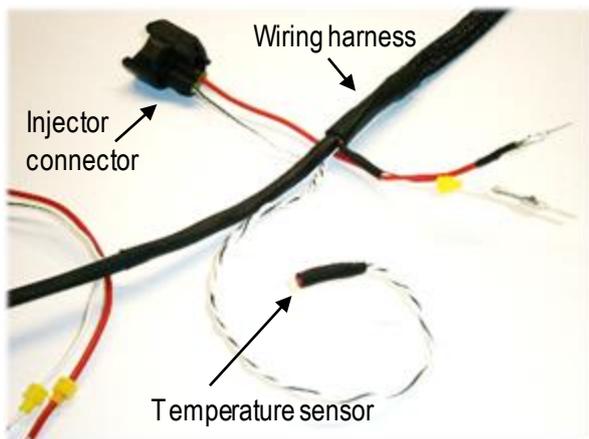
### PLEASE NOTE!

In V-models it is recommended that wiring harness is installed in different cylinder banks.

1. Connect the male connectors of the eFlexFuel wiring harness to the car's injector wires you disconnected earlier.
2. Connect the female connectors of the eFlexFuel wiring harness to the injectors on the car

## 7) Install the temperature sensor

eFlexFuel wiring harness has a temperature sensor around the injector connectors. This allows you to install it easily to a location where it can measure the engine temperature. A good spot for the sensor is next to the injectors close to the engine's cylinder head or on top of the valve cover. The temperature sensor must not be located close to the car's exhaust system!



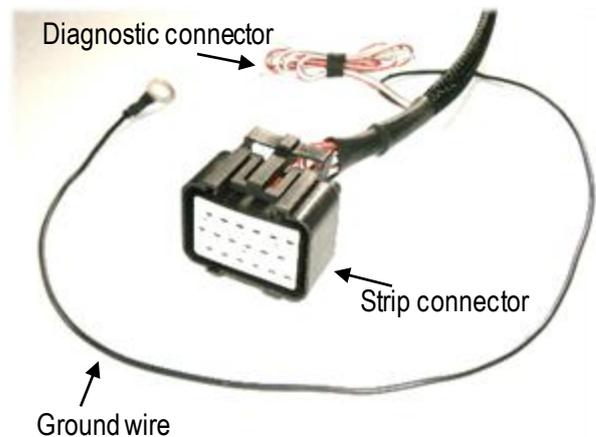
## 8) Installing the control unit

Find a proper location for the eFlexFuel control unit in the car's engine bay. The control unit needs to be close enough to the injectors so that the wiring harness reaches the control unit and on such location that the control unit's button is easily

accessible, the signal light visible, and that the unit is not exposed to excessive heat or moisture. Also, make sure that the control unit is not touching moving parts. Secure the control unit firmly with e.g. strong double-sided tape or cable ties.

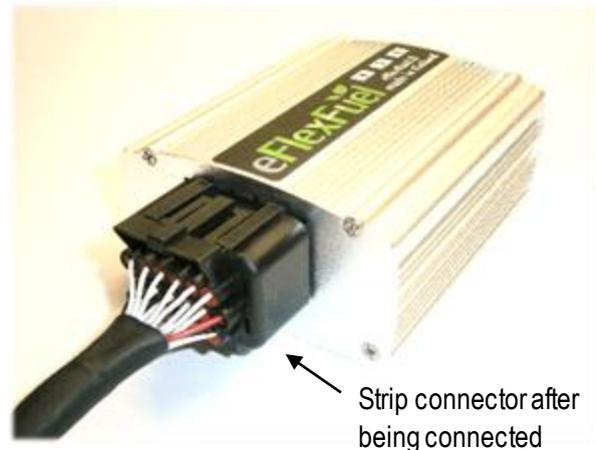
## 9) Connect the ground wire

Connect the wiring harness' ground wire either directly to the negative terminal of the car's battery or to the metallic chassis of the car with the ground wire's round connector. The ground wire is located next to the strip connector. Make sure that the ground connection is good.



## 10) Secure the wiring harness

Connect the wiring harness' strip connector to the eFlexFuel control unit. Make sure that the connector is securely attached and locks into the housing on the eFlexFuel control unit.



Arrange the wiring harness to the car's engine bay in such a way that none of the wires is under tension or touches moving parts. The wiring harness

endures temperatures up to +120°C (250 °F), but avoid installing the harness close to the engine's hottest parts.

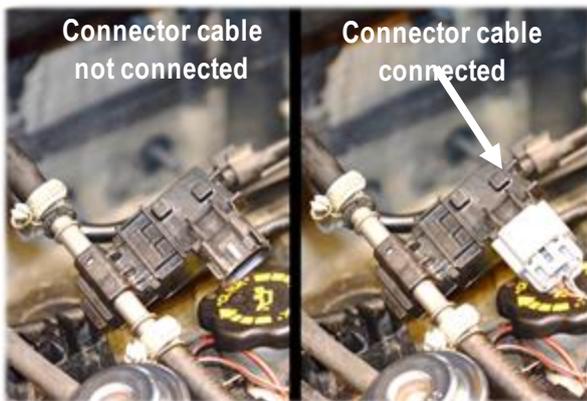
Secure the wiring harness with cable ties.

### 11) Installation of the ethanol sensor (S-models)

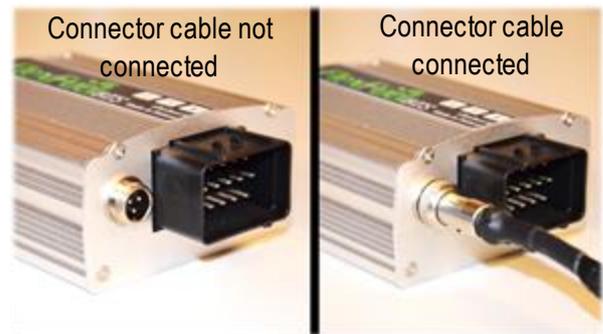
eFlexFuel S-models are equipped with ethanol sensor which is meant to be installed in the fuel line. The low pressure fuel return line is the preferred installation place. In returnless fuel systems the sensor can also be installed in the fuel feed line. Ethanol sensor should be installed near fuel rail. Fuel flow direction doesn't affect the result from sensor.

The sensor has two 10 mm quick connections. Use 8-10 mm ethanol compatible fuel hose with suitable hose clamps if the car fuel line connectors are not compatible with the sensor.

When ethanol sensor is installed to the fuel line you can connect the harness to the sensor as shown in the picture below.



Next attach another head of the sensor harness to the eFlexFuel device. Then fasten the locking ring properly as shown in the picture below.



Fasten the harness to the engine room with zip ties so it won't move. Try to avoid attaching the harness near hot surfaces in the engine room.

### 12) eFlexLink data cable (V-Models)



Finish installation of eFlexFuel V-models by attaching control units to each other with the eFlexLink data cable. Data cable is being installed to the diagnostic connectors as shown in the picture below.

### 13) Finalizing the installation

Reinstall the components you have removed from the engine. Turn on the car's ignition switch. The indicator light on the control unit should now turn on. On some car models the indicator light won't turn on unless the engine is running.

If the control unit's indicator light does not turn on, check its ground wire. Bad ground connection can cause erratic behavior or total inactivity of the control unit.

Now the installation of the eFlexFuel E85 conversion kit is complete and you can start using it. The instructions for this can be found on page 10 of this manual.

## 4. The first start and adaptation of the control parameters



After the eFlexFuel conversion kit has been installed, it is ready for the first starting of the car's engine.

### The first start of the car's engine

During the first start, the control unit uses its default values (the indicator light is red). At this point, the car should have only regular gasoline in its fuel system. Crank and start the engine! The car can be driven normally when the control unit uses the default values. In S-models the same indicator light is green at default values.

#### PLEASE NOTE!

Adaptation is done differently in S-models. Read the last chapter of this page.

### Adapting the control parameters

Next the control unit's operating parameters need to be adapted to the car it has been installed in.

1. Let the engine run until it has reached its normal operating temperature. A sure sign that the engine is warm enough is that its cooling fan has turned on and off once. The engine can be warmed up also by driving the car.

2. Let the engine idle, turn off the air conditioning, seat warmers, rear window defroster, and all other current consuming accessories. Press the button on the control unit briefly (0.5 seconds). The indicator light will flash white and the control unit will start the adaptation. The indicator light will flash red when the adaptation is running. This will take a few seconds.

#### PLEASE NOTE!

Do not press the gas pedal or turn off the engine during the adaptation phase. Let the engine idle.

3. Once the adaptation phase is complete, the indicator light stops flashing and stays green.

### After the adaptation

Now the control units parameters have been adapted to the car and the car can be driven normally. The control unit has been adapted to running on regular gasoline, but in the future, you can use also E85 fuel. Once refueling the car, please follow the instructions in chapter 5 (on page 10).

### Adapting the control parameters in S-models

Users don't have to do control parameter adapting in S-models. Just press the control units main button until it flashes white. Indicator light turns from green to blue. When the light is blue the control unit is ready to use. Fuel mixture recognition is done automatically at this point. Users can now refuel any mixture of gasoline and E85!

## 5. Refueling with E85 fuel blend and fuel mixture recognition



eFlexFuel has been designed in such a way that you can refuel your car with E85 fuel blend, regular gasoline, or any mixture of the two. The control unit recognizes the ethanol content of the current fuel mixture and adjusts the car's fuel injection accordingly.

### PLEASE NOTE!

Do not refuel your car with E85 until you have adapted the eFlexFuel control unit's control parameters (see page 10)

### Fuel mixture recognition must be carried out

- If you refuel E85 for the first time or fuel mixture changes.

### Fuel mixture recognition does not need to be carried out

- If you refuel same fuel mixture. Fuel mixture doesn't change.
- If you use eFlexFuel S-model. Ethanol sensor recognizes fuel mixture automatically.

### Fuel mixture recognition

1. Refuel your car with E85, regular gasoline or their mixture.
2. Start the engine and let it idle. Before the fuel recognition, the engine needs to be at its normal operating temperature and the eFlexFuel control unit's indicator light must not flash. A sure sign that the engine is warm enough is that its cooling fan has turned on and off once.
3. Let the engine idle, turn off the air conditioning, seat warmers, rear window defroster, and all other current consuming accessories. Press the button on the control unit briefly (0.5 seconds). The indicator light will flash white and the control unit will start the fuel blend recognition. During the recognition, the indicator light will flash. The recognition will take about 30 seconds.

### PLEASE NOTE!

Tunnistuksen ollessa käynnissä älä paina kaasua tai sammuta moottoria. Anna moottorin käydä tyhjäkäynnillä.

4. Once the fuel mixture recognition phase is complete, the indicator light will stop flashing and will stay blue. Now, the control unit has recognized the car's fuel blend and you can drive the car.

### PLEASE NOTE!

In some car models the complete mixing of fuel could take few minutes. In Basic na BT-models it is recommended to do fuel mixture recognition again after 5 or 10 minutes. You can drive normally after this.

## 6. Ethanol fuel and operating in cold climates



When E85 fuel blend is used in cold climates, the engine's cold starting gets more difficult. The reason for this is that ignition of ethanol based fuels gets harder at temperatures below +10°C (50 °F). In very cold temperature conditions, the cold starting of the engine may require multiple attempts.

### eFlexFuel adjusts itself to the temperature conditions

eFlexFuel E85 conversion kit includes an external temperature sensor that regulates the control unit's automatic cold start assistant according to the engine's temperature. The cold start assistant operates after the engine start when the engine temperature is under +50°C (122°F) and the car's fuel mixture contains E85 fuel blend. During the cold start assistant's operation, the control unit's

indicator light is flashing. During the 60s that the cold start assistant is operating, the button on the control unit is disabled. Fuel mixture recognition cannot be carried out until the cold start assistant has stopped operating.

Cold start assistant is on only when eFlexFuel has recognized ethanol or engine temperature requires it.

### Improving cold starting of the car

There are different ways to improve the cold starting capability of the car. When the outside temperature is below +10°C (50 °F). The cold start capability of the engine can be improved by adding 5-10% of regular gasoline to the car's fuel mixture. During freezing temperature conditions, we recommend using engine block heater.

Add regular gasoline before you add E85 fuel blend in order to improve mixing of the fuels.

#### PLEASE NOTE!

If fuel mixture changes use the eFlexFuel conversion kit's fuel mixture recognition function when using Basic, V or BT-model. (see page 11).

## 7. Resetting the control unit



It is possible to reset the eFlexFuel conversion kit's control parameters to their factory default values. This feature is useful if you would like to transfer the conversion kit to another car.

Resetting eFlexFuel control parameters is not possible in S-models.

### PLEASE NOTE!

Normal operation of the car's engine cannot be guaranteed if you reset the eFlexFuel conversion kit's control parameters while the car's fuel tank contains E85 fuel blend. The reason for this is that the control unit doesn't have information regarding the fuel mixture anymore. This can cause irregular operation of the engine and can cause engine damage in the long run.

If the control parameters are reset accidentally, they can be restored by following the instructions on page 14.

### Resetting the control parameters

1. The control unit of the eFlexFuel conversion kit needs to be powered on prior to resetting (the indicator light needs to be on). On some cars, the control unit is powered on already when the ignition lock is turned to on position, but on some cars, the engine needs to be running. The fuel tank of the car must contain only regular gasoline at this point. Also, the indicator light of the control unit must not flash. Therefore, if the indicator light is flashing, you need to wait for it to stop.
2. Keep the button on the control unit pressed for 10 seconds. When the button has been pressed for long enough, the indicator will flash white three times. After the third flash, you can release the button.
3. Once the indicator light turns red, the control parameter reset is complete.

After you have reset the eFlexFuel E85 conversion kit, you can follow the instructions on page 10 to adapt the control parameters.

### If you reset the control parameter by accident

It is still possible to restore the old control parameters, if you have reset them by accident. Restoring the old control parameters is described on page 13.

## 8. Restoring old control parameters and activating safe mode



Restoring the old control parameters or activating the safe mode is useful:

1. If you have reset the eFlexFuel E85 conversion kit's control parameters (indicator light flashes red), but you would like to continue to use the conversion kit on the same car (see restoring of the control parameters).
2. If you are unsure of the control parameters, if you are unsure that the control unit has recognized the fuel mixture correctly, or if the engine is running irregularly (see activation of the safe mode).

This functions cannot be done with S-models.

### Restoring old control parameters

1. Before restoring old control parameters, the control unit of the eFlexFuel conversion kit needs to be powered on (the indicator light needs to be on). On some cars, the control unit is powered on already when the ignition lock is turned to on position, but on some cars, the engine needs to be running. Also, the indicator light of the control unit must not flash. Therefore, if the indicator light is flashing, you need to wait for it to stop.
2. Keep the button on the control unit pressed for 6 seconds. When the button has been pressed for long enough, the indicator will flash white twice. After the second flash, you can release the button.

3. Once the indicator light turns blue, the control parameter restore is complete.

4. Recognize the fuel mixture. This process is described on page 10 of this manual. Once you have completed the fuel mixture recognition, you can drive the car normally.

### Activating the safe mode

1. Before activating the safe mode, the control unit of the eFlexFuel conversion kit needs to be powered on (the indicator light needs to be on). On some cars, the control unit is powered on already when the ignition lock is turned to on position, but on some cars, the engine needs to be running. Also, the indicator light of the control unit must not flash. Therefore, if the indicator light is flashing, you need to wait for it to stop.

2. Keep the button on the control unit pressed for 6 seconds. When the button has been pressed for long enough, the indicator will flash white twice. After the second flash, you can release the button

3. The safe mode is active once the indicator light remains blue.

4. Now the control unit is in safe mode and is adjusted to 50% ethanol fuel mixture. While in safe mode, continue driving normally until the fuel tank is almost empty, but avoid straining the engine unnecessarily! If the engine doesn't run properly in safe mode, refuel the fuel tank as much as possible with regular gasoline.

5. For the next two tankfuls, refuel only regular gasoline. This flushes the car's fuel system of the remaining ethanol fuel.

6. Once you are sure that the fuel tank contains only gasoline, you can reset the control unit to factory control parameters (page 13 of this manual) and redo the control parameter adaptation (page 10 of this manual) and finally recognize the fuel mixture (page 11 of this manual).

## 9. Restoring old control parameters and activating safe mode in S-models



Ethanol sensor equipped eFlexFuel S-models have two operating modes: factory settings and auto-mode. By pressing main button it is possible to switch mode. You can do that by pressing main button until it flashes white. Indicator light changes if the operating mode is being switched to another.

### Factory settings

Indicator light is green when factory setting is on. Vehicle is now on the same state that it would be without eFlexFuel device. Fuel mixture must be only gasoline at this point.

### Auto-mode

Indicator light is blue if auto-mode is on. eFlexFuel is using ethanol sensor in auto-mode. You can

refuel any mixture of gasoline and E85. eFlexFuel recognize fuel mixture automatically by using ethanol sensor.

### Safe Mode

Safe mode goes on automatically when device is not working properly. Indicator light is red when device is in safe mode. If safe mode is on eFlexFuel is adjusted to 50% ethanol fuel mixture. It is possible to drive in safe mode but high engine load should be avoided.

Possible faults:

#### **eFlexFuel is not connected to ethanol sensor**

- Unplug and reconnect ethanol sensor to the connection cable. If this doesn't help unplug and reconnect the connector cable of eFlexFuel device. Connection to eFlexFuel is on when indicator light is blue.

#### **Ethanol sensor recognizes dirty gasoline (e.g. water in fuel mixture)**

- Refuel gasoline. Fault is reseted if indicator light turns blue.

If the problem persists problem may be with ethanol sensor. Then it must be replaced.

## 10. eFlexFuel Commander 2.1

### 1. Description

eFlexFuel Commander 2.1 is an app designed for Android devices. Users can control eFlexFuel device and monitor info from eFlexFuel device with Commander app. App works with Bluetooth connection.

#### What you need

- eFlexFuel BT device
- Android mobile or tablet device (Android version 3.0 or newer)



#### Functions

- Communication between eFlexFuel and Android device
- Wireless fuel mixture recognition
- Monitor duty cycle in real time
- Monitor temperature sensor in real time
- Monitor ethanol content in real time (only in S-models)
- Monitor enrichment in real time
- Shows eFlexFuel version
- Fuel saving calculator
- eFlexFuel commander is available in english and in finnish

### 2. Installing app

1. Download app from Google Play Store.



2. When app is installed you can move app icon to  home screen.

### 3. Starting app

1. Start the app by clicking the app icon: 
2. App asks you to turn on Bluetooth. If you click "No" app turns off. (Picture 1).



Picture 1

### 4. Connecting to eFlexFuel BT device

1. Make sure that eFlexFuel device is on (green light).
2. Press magnify button. This shows all found Bluetooth devices.
3. Choose "eFlexFuel BT" from the list (if you do this for the first time device may appear in the list as "null").
4. If the application asks for a PIN code, enter provided PIN code.
5. eFlexFuel is now paired and connected with your Android device. (Some old Android devices can't connect automatically. In this case, you need to select the device again under a magnifying glass from the popup list).
6. App is ready for usage when screen shows "connected eFlexFuel BT" and button in center of screen turns green. (Picture 2).

**Please note!** eFlexFuel S-model button turns blue and app informs "eFlexFuel ethanol sensor detected". In S-models users don't have to recognize fuel mixture manually. (Picture 3).



Picture 2



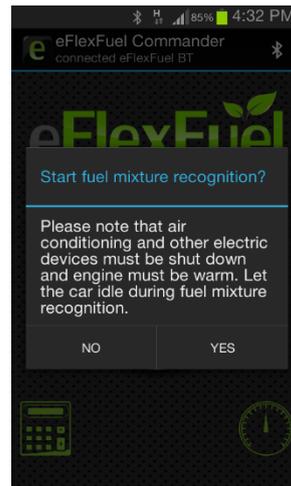
Picture 3

## 5. Fuel mixture recognition

1. You are connected to eFlexFuel BT (section 4).
2. Press green button. Continue to recognition by pressing "Yes". (Picture 5).
3. While fuel mixture recognition is on, button turns red. App informs it by showing "Detecting fuel mixture...".(Picture 4). Operation takes 30 seconds. Allow vehicles engine to idle.

**Please note!** Fuel mixture recognition can't be made during cold start assistant. (Picture 6).

4. Fuel mixture recognition is ready when app informs "Fuel mixture recognition ready! You can drive now. Have a safe trip!" (Picture 7).



Picture 5



Picture 4



Picture 6



Picture 7

## 6. Gauge display

Users can enter gauge display mode by pressing gauge button in home screen.

Users can monitor duty cycle, temperature sensor, enrichment and ethanol content in real time. Gauge display also shows eFlexFuel current version.

**Please note!** Ethanol content display is only usable in S-models. Display shows 0 in other eFlexFuel models. If display shows 999, eFlexFuel S-model is in safe mode.

Go back to home screen by pressing back button.



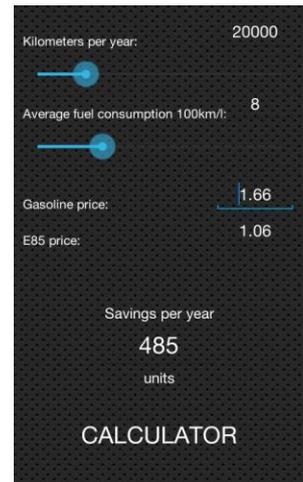
Picture 8

## 7. Fuel saving calculator

Users can enter calculator by pressing calculator icon in home screen.

With calculator users can check how much they save choosing E85 for fuel instead of gasoline (Picture 9).

Go back to home screen by pressing back button.



Picture 9

## 8. Turning off app

Turn off app by pressing back button in home screen. This turns off connection between eFlexFuel device and stops running eFlexFuel Commander app. Choose "YES" if you want to close Bluetooth connection.

Users can also put app running in the background by pressing home button in home screen.

## 9. Updating app

Install the newest update from Google Play Store. If you have enabled automatic updates to app eFlexFuel Commander will update automatically.

## 10. Fault and attention

- Bluetooth connection is lost during fuel mixture recognition

eFlexFuel device continues fuel mixture recognition even when connection to mobile device is lost. App informs user when the vehicle is ready to drive. Vehicle is drivable also if you wait more than 30 seconds after starting fuel mixture recognition.

- App asks PIN-code repeatedly when connecting to eFlexFuel device

Some Android devices use old Bluetooth circuits that won't keep devices paired properly. Problem can be solved by updating firmware or operating system. If that doesn't help, PIN-code must be input every time when connecting to eFlexFuel device.

## 11. Terms of use

These terms of use are applicable to all eFlexFuel E85 conversion kits, their wiring harnesses, and their accessories manufactured by StepOne Tech Oy (the manufacturer). Please read these terms of use carefully before using or attempting to install the eFlexFuel conversion kit or the related components. This ensures that both parties (the buyer and the seller) are aware of how to proceed in different operational situations of the eFlexFuel conversion kit.

### Guarantee and refund

The manufacturer offers a one-year manufacturer's guarantee (12 months). The guarantee applies only to the conversion kit, the included wiring harness, and their functionality. Always read the instructions on this instruction manual in its entirety before attempting to install or use the conversion kit. This ensures that the product operates to its full potential.

The guarantee does not cover damages caused by improper installation by the buyer or by the buyer's agent, or if the product has been damaged by wear that is not caused by normal use or by a manufacturing defect.

The guarantee covers faulty installation by the manufacturer or by an authorized dealer. Any modification done to the conversion kit without the consent of the manufacturer voids the guarantee.

If the product has a fault that can be regarded as a result of a faster than normal wear or a result of a manufacturing defect, the manufacturer will provide the buyer with a new product or repair the faulty product within the time that is seen appropriate by the Finnish consumer protection act. The manufacturer has the right to redeem the faulty product if it is replaced by a new one.

The manufacturer reserves the rights to any modifications, expansions, attachments, or improvements made by customer.

The manufacturer has to accept returns of unused products within 32 days as stipulated by the Chapter 6 of the Finnish consumer protection act.

### Product liability

The use of eFlexFuel conversion kit happens at the user's own risk. Please take into account that a guarantee offered by a car manufacturer may be void once a conversion kit has been connected to the car's systems.

The manufacturer commits only to make up for damage caused to the conversion kit, the accompanied wiring harness, or accessories as covered by the guarantee.

The manufacturer does not make up for damage caused to the car by the use of ethanol containing fuel. Neither does the manufacturer make up for damage caused by the installation to the product, the installation's target or the person carrying out the installation, if the installation is carried out by the customer or by customer's agent.

The manufacturer recommends replacing the fuel hoses and gaskets with ones that meet the SAE30R9 requirements and are therefore better capable of enduring ethanol exposure.

### Modified vehicle inspection

At the time of the writing, after a conversion kit has been installed and in order to meet the street legality requirements of Finland, the car needs to pass an emission measurement carried out by an authorized inspector or an inspection organization, and to pass a modified vehicle inspection. Such emission measurements are carried out by VTT Expert Services, Test World, and TÜV Nord Finland. The manufacturer is not responsible for the road legality.







## 12. Control unit's mode of operation

### Basic-, BT-, V- and Euro3 -models

Color	Mode of operation	Flashing?	Function
Red	<ul style="list-style-type: none"> <li>The control unit is using factory default control parameters</li> <li>You can drive normally</li> <li>Fuel tank should contain only regular gasoline</li> <li>You can adapt the control parameters to match the car</li> </ul>	No	<ul style="list-style-type: none"> <li>Normal operation</li> </ul>
		Yes	<ul style="list-style-type: none"> <li>Adapting control parameters</li> </ul>
Green	<ul style="list-style-type: none"> <li>The control parameters are matched to the car</li> <li>You can drive normally</li> <li>If driving, the fuel tank should contain only regular gasoline</li> <li>You can refuel with regular gasoline, E85 fuel blend, or their mixture</li> </ul>	No	<ul style="list-style-type: none"> <li>Normal operation</li> </ul>
		Yes	<ul style="list-style-type: none"> <li>Recognizing fuel mixture (30 seconds)</li> </ul>
Blue	<ul style="list-style-type: none"> <li>The control unit has recognized the fuel mixture</li> <li>You can drive normally</li> <li>You can refuel with regular gasoline, E85 fuel blend, or their mixture</li> <li>Possibly in safe mode (self-activated)</li> </ul>	No	<ul style="list-style-type: none"> <li>Normal operation</li> </ul>
		Yes	<ul style="list-style-type: none"> <li>Cold start assistant activated (60 seconds)</li> <li>Recognizing fuel mixture (30 seconds)</li> </ul>
White	<ul style="list-style-type: none"> <li>Flashes white when the button is pressed</li> </ul>	1-3 flashes	<ul style="list-style-type: none"> <li>When pressing button</li> </ul>
<b>Only V-models</b>			
White	<ul style="list-style-type: none"> <li>eFlexLink data cable connection problem</li> <li>avoid using high rpm</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Safe mode active</li> </ul>

### S-, BTS- ja VS-models (includes ethanol sensor)

Color	Mode of operation	Flashing?	Function
Green	<ul style="list-style-type: none"> <li>The control unit is using factory default control parameters</li> <li>You can drive normally</li> <li>Fuel tank should contain only regular gasoline</li> </ul>	-	<ul style="list-style-type: none"> <li>Normal operation</li> </ul>
Blue	<ul style="list-style-type: none"> <li>Auto-mode</li> <li>You can drive normally</li> <li>You can refuel with regular gasoline, E85 fuel blend, or their mixture</li> </ul>	No	<ul style="list-style-type: none"> <li>Normal operation</li> </ul>
		Yes	<ul style="list-style-type: none"> <li>Cold start assistant</li> </ul>
Red	<ul style="list-style-type: none"> <li>Safe mode (page <b>Error! Bookmark not defined.</b>)</li> <li>avoid using high rpm</li> </ul>	-	<ul style="list-style-type: none"> <li>Safe mode active</li> </ul>
White	<ul style="list-style-type: none"> <li>ohjainyksikkö vaihtaa toimintatilaa</li> </ul>	1 flash	<ul style="list-style-type: none"> <li>When pressing button</li> </ul>
<b>Only VS-models</b>			
White	<ul style="list-style-type: none"> <li>eFlexLink-datakaapelin yhteysongelma</li> <li>vältä moottorin turhaa kuormittamista!</li> </ul>	Yes	<ul style="list-style-type: none"> <li>suojatila aktiivinen</li> </ul>

**PIN:**

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