

Installation guide

eFLEXFUEL™
TECHNOLOGY



Installation

youtube.com/c/eFlexFuel-E85-Upgrade



Support

support.eflexfuel.com

support@eflexfuel.com



WARNING: eFlexFuel® systems are to be installed only by qualified mechanics with proper training and experience.

NOTICE: Not legal for sale or use in pollution-controlled vehicles



WARNING:
Cancer and Reproductive Harm
– www.P65Warnings.ca.gov

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eflexfuel.com/us

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Specification to VERPCB5.0+

Thank you for your decision to become an eFlexFuel® driver. By choosing eFlexFuel® technology and ethanol fuel you can significantly reduce your emissions, save money and improve performance. In this guide we will briefly introduce the installation and the usage of eFlexFuel® and E85 ethanol fuel to ensure that you have the best possible driving experience, no matter which fuel you use.

eFlexFuel® has been installed in thousands of different vehicles and our customers have driven hundreds of millions of miles with ethanol fuels. Furthermore, E85 ethanol fuel contains additives that improve its lubrication and corrosion prevention features. Therefore, you can trust that you will be able to use E85 fuel in your vehicle safely.

eFlexFuel® operates completely automatically and does not require any attention from the user after the installation. However, to ensure the optimal functionality of the device, the vehicle should be adequately maintained and in normal working condition.

Your eFlexFuel® system is specific to your vehicle and engine family. Currently, three models of the eFlexFuel® system are available, allowing differing levels of programmable E85 optimization:

1. eFlexEco® is our standard system featuring StepOne Tech's proprietary E85 fueling parameters specific for your vehicle and a broad range of typical operating conditions.
2. eFlexPlus® allows limited access to optimize fueling parameters for varying operating conditions.
3. eFlexPro® is intended for experienced engine tuners, offering the broadest range of configurations to optimize E85 fueling for desired performance and conditions.

NOTICE: eFlexFuel® system was developed in Finland and has been in European use for several years. **Pending U.S. emissions certification; your eFlexFuel® system is sold only for competition and off-road use.**

eFlexFuel® vehicle maintenance

When driving with eFlexFuel® and E85 ethanol fuel you can still follow the regular maintenance schedule recommended by the manufacturer of your vehicle. We recommend ensuring that, in particular, the following components are in normal working condition:

- **Spark plugs:** The replacement interval recommended by the manufacturer is usually appropriate.
- **Fuel filter (if applicable):** Replacement preferably every 30 000 miles.
- **Engine oil and oil filter:** Always use the oil recommended by the vehicle manufacturer with SN classification. If the oil change interval is 10 000 miles or less, it is sufficient. If the oil change interval is 20 000 miles or 24 months, it is recommended that engine oils are changed at least once a year or after 12 000 miles.
- **Fuel pump:** If the vehicle has done over 125 000 miles with the same fuel pump, its performance might have deteriorated. Ethanol needs to be injected more than gasoline and, thus, the condition of the fuel pump is crucial. As the fuel pump is a component that wears out, it should be replaced when needed. Based on our experiences, we recommend pumps from reputable manufacturers.

NOTICE: Besides the mileage and the age of the vehicle, the circumstances in which it has been used and the way it has been driven has a great impact on the durability and maintenance needs. For instance, if the vehicle is driven for only short distances with a cold engine the maintenance intervals should be shorter no matter what fuel is used.

Filling up and expected consumption of eFlexFuel® vehicle

eFlexFuel® enables the usage of both regular gasoline and ethanol E85 or any mix of the two in the vehicle. We highly recommend using fuel with as high ethanol content as possible but, if not available, the vehicle will still work perfectly with regular gasoline as well. When E85 is used, the consumption of the vehicle, compared to regular gasoline, is increased by approx. 25 percent (%) depending on the vehicle. Please do note that the onboard computer of the vehicle will not recognize this change.

eFlexApp® and eFlexTuner®

eFlexApp® and eFlexTuner are free, additional features that are not required for using eFlexFuel®. These enable engine and fuel data monitoring in real time. The user can, for example, monitor the ethanol content of the fuel or the injector duty cycle. With eFlexPlus® and eFlexPro® devices, eFlexApp® and eFlexTuner® have added features like the ability to change drive modes or adjust engine startup. eFlexApp® can be downloaded for free from Google Play Store or from Apple App Store. eFlexTuner® is available on eFlexFuel.com/us.

Limited Warranty

What is covered?

Subject to the terms, exclusions, and limitations herein, StepOne Tech America Inc¹ (“StepOne”) exclusively warrants the eFlexFuel® units purchased through authorized StepOne resellers to be free of defects in workmanship or materials when properly installed in the initial customer’s vehicle. This Limited Warranty is made as of the date of the first retail purchase and is extended only to the initial retail purchaser.

- For eFlexEco®, eFlexPlus® and eFlexPro® units and its accessories: your Limited Warranty term is two years from the date of the initial retail sale.
- In case of registration as a member of the eFlexClub, StepOne extends the warranty of the control unit to five years (60 months) from the date of the initial retail sale. Registration to the eFlexClub must take place within 90 days from the date of the initial retail sale.

What is not covered?

Your StepOne **Limited Warranty** does not cover damage or defects in the wiring harness and connectors if the initial retail purchaser transfers the harness or eFlexFuel® unit to another vehicle. Damage to your vehicle, vehicle systems, other products or components not manufactured by StepOne to our high-quality standards **are not covered**. StepOne makes no warranty with respect to vehicle emissions, emissions compliance, or components of your vehicle emissions system.

¹ StepOne Tech America Inc 330 East Liberty, 4th floor, Ann Arbor, Michigan 48104

Obtaining StepOne warranty & customer service

StepOne will coordinate and expedite all warranties, returns, and exchanges as quickly as possible. Many suspected issues can be resolved by a review of wiring and installation requirements directly with your authorized StepOne resellers. Failing a resolution with your authorized reseller, contact our technical support team (support@eflexfuel.com). For all issues, please have available:

1. Proof of product purchase with the date, purchaser name, reseller contact and VIN or license of vehicle that your eFlexFuel® unit is installed upon (**REQUIRED**).
2. Photos or video with a brief description of the indicated issue(s).
3. Customer contact information and shipping address.

In case of a justified claim, the StepOne can, at its discretion

1. Repair the product by using new or used parts that are reliable or equivalent to new by their functionality.
2. Replace the product with a new product, the functionality of which is, at least, equivalent to that of the product returned.
3. Refund the purchase price of the product, in which case the product remains with the Manufacturer.

Repaired or replaced products are granted a warranty of 90 days from the repair or replacement. Repaired or replaced products may be of a newer version than the existing products and the version may differ from the previous one.

The Manufacturer reserves the rights to have any changes, extensions, upgrades, and improvements made to the Customer's equipment.

Remedy limited to repair/replacement. Limited time for filing warranty claims. BINDING, SINGLE CLAIM ARBITRATION-Venue

At StepOne's option and upon inspection and determination of covered defect, *the exclusive remedy provided hereunder* shall be either a replacement with eFlexFuel® products of equal or greater value *or a purchase price reimbursement* to the initial retail customer. All labor, diagnostics, removal, installation, and shipping costs are the customer's responsibility. The Limited Warranty hereunder is not transferrable. No employee, reseller, or other agent of StepOne is authorized to amend this written Limited Warranty or make additional representations or warranties regarding any eFlexFuel® product. *Written notice of any claim for breach/damages related to this Limited Warranty must be provided to StepOne* within 30 days of the date your Limited Warranty expires. For separate, valuable consideration received; *all claims arising from or related to the purchase or use of eFlexFuel® products are exclusively subject to binding arbitration between a single initial retail purchaser and StepOne using an arbitrator supplied by and according to Consumer Arbitration Rules of the American Arbitration Association ("AAA")*². Any claim for arbitration must be made and received by StepOne and AAA within ninety (90) days of the date your Limited Warranty expires. The venue/place for arbitration shall be Pierce County, Washington unless otherwise mutually agreed upon for the convenience of the parties.

Other exclusions – Limitation of damages & reduced implied warranties if purchased through an unauthorized reseller – Your rights under state law

Excluded from this **Limited Warranty** are normal wear or loss of performance over time, damage caused by customer wiring or installation not according to eFlexFuel® instructions/warnings or third-party negligence, lack of maintenance, accident, improper

² Contact adr.org for additional information regarding AAA arbitrations.

application or service. Further, in consideration of the purchase price paid, neither StepOne nor any independent StepOne reseller are responsible for any time loss, rental costs, or for any incidental, consequential, punitive or other damages that you may have or incur in connection with any part or product purchased. **Your exclusive remedy hereunder for covered parts is replacement/reimbursement as described above.** The duration of any implied warranty shall be limited to the term of express warranty, provided above, except as to purchases from unauthorized StepOne resellers (see below). This **Limited Warranty** gives you specific rights. You may also have other rights that vary from state to state. For example, some states do not allow limitations of how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the limitations and exclusions herein may not apply to you. All other warranties are hereby disclaimed, except to the extent prohibited by applicable law.

Important: Protect your Limited Warranty by avoiding unauthorized Internet resellers

StepOne chooses to only distribute its eFlexFuel® products through independent Authorized Resellers and demonstrating full brand support, stocked inventory, technical expertise, and customer support consistent with the premium qualities of these products. *BE AWARE if you purchase eFlexFuel® products through an unauthorized reseller on Amazon, EBay, Walmart, Alibaba or other Internet site, the duration of any express warranty herein or implied warranty of merchantability, fitness for a particular purpose or other implied warranty is reduced to 3 months from the date of the initial retail purchase from the full Limited Warranty term offered to purchasers through authorized resellers.* StepOne reserves the rights to make future revisions to these products and Limited Warranty without prior notice or obligation to upgrade your eFlexFuel® unit. Please confirm that you are buying from an authorized reseller by consulting eflexfuel.com.

1. Pre-Installation Checklist

Important safety messages used with these instructions & eFlexFuel® System

Before installation, please take a moment to completely review the following safety information and installation instructions.

Important safety information is generally preceded by one of three signal words indicating the relative risk of injury. These signal words mean the following:



WARNING: [a hazardous situation which could result in serious injury or death if you do not follow instructions properly.](#)



CAUTION: [a hazardous situation which could result in minor or moderate injury if you do not follow instructions properly.](#)

NOTICE: careful attention is required to this instruction or operation, but generally does not relate to personal injury. Damage to eFlexFuel® components, vehicle, other property, or owner responsibilities for emissions compliance may result if you do not follow the instructions properly.

1.1 Before you begin

- [You have accepted the terms of use.](#)
- The conversion kit compatibility has been checked from the eFlexFuel database
- The vehicle needs to be in normal operating condition. E.g., no check engine -light and smog check OK.
- Do not fill up with E85 ethanol before installation.
- Make sure that the engine is cooled down.

1.2 Package contents

- Control unit.
- Wiring harness.
- Extension wiring harness for 5-8-cylinder cars (4 pcs).
- Male connectors (10 pcs).
- Ethanol sensor.
- Cable/zip ties
- Hose clamps 4 pcs.
- Quick connectors (size & type depending on your vehicle).
- Fuel line hose (size depending on your vehicle).
- Fuel line disconnect tool.

1.3 Tools required

- Multimeter.
- Basic tools, e.g., flat blade screw drivers.
- Eye protection & gloves.
- Cleaning rags.

- Cutting- and Needle nose pliers.

I have checked these things before moving on to the next phase:

- The vehicle is in normal working condition and appropriately maintained.
- Spark plugs and ignition coils are in good condition and working normally.
- The product package contains all the correct accessories (injector connectors and fuel line hose sizes match with the vehicle etc.).

2. eFlexFuel® Installation

2.1 Installation overview

I. Plan your installation

- a. Turn off the ignition from the vehicle and allow the engine to cool down. Open fuel cap.
- b. Plan the installation; ethanol sensor location and wiring harness routing.
- c. Remove all necessary parts to gain access to the fuel injectors. e.g. engine cover or intake manifold.

II. Wiring harness installation

- a. Verify the engine injector connector polarity with a multimeter and plug in the male connectors to the wiring harness.
- b. Connect wiring harness to the injectors.
- c. Place the temperature sensor close to the engine block.
- d. Connect the ground wire to a sufficient ground terminal (e.g. battery – terminal).

III. Ethanol sensor installation

- a. Disconnect the fuel line from the fuel rail.
- b. Plan and make a new fuel line assembly including the ethanol sensor. Use quick connectors.
- c. Connect the new fuel line assembly to the engine and the ethanol sensor connector to the wiring harness.

IV. Finalize the installation

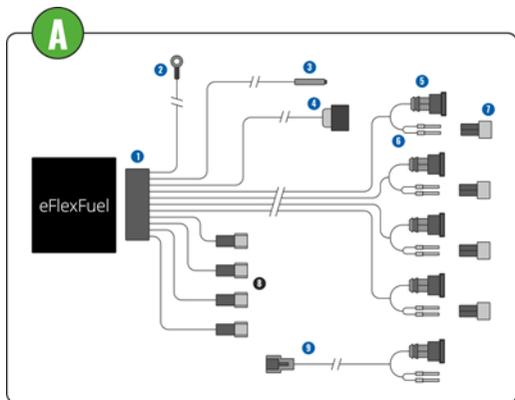
- a. Connect the eFlexFuel® control unit to the wiring harness and secure it in its place.
- b. Use zip ties to secure the wiring harness, avoiding high voltage, hot, or moving components/parts.
- c. Start the engine and check eFlexFuel® parameters with eFlexApp®. Do not fill up with E85 before ensuring that the eFlexFuel® system is working correctly.

Please follow the QR-code for installation videos:



2.2 Wiring harness

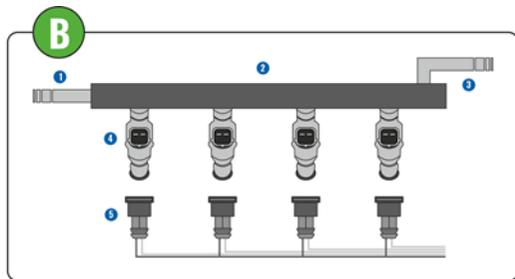
- Row connector (**Figure A, 1**)
- Ground wire (**Figure A, 2**)
- Temperature sensor (**Figure A, 3**)
- Ethanol sensor connector (**Figure A, 4**)
- Fuel injector connector (female) (**Figure A, 5**)
- Terminal couple for male connectors (**Figure A, 6**)
- Male connector (**Figure A, 7**)
- Extension connectors (5-8-cylinder cars) (**Figure A, 8**)
- Extension wiring harness (5-8-cylinder cars) (**Figure A, 9**)



2.2.1 Disconnect the fuel injector connectors

- Fuel rail (**Figure B, 2**)
- The fuel supply line (incoming pressure line) (**Figure B, 1**)
- The fuel return line (**Figure B, 3**)
- Fuel injector (**Figure B, 4**)
- Vehicle's existing injector connectors (**Figure B, 5**)

Disconnect existing connectors connected to the fuel injectors.



2.2.2 Check the compatibility of the fuel injector connectors

Before proceeding with the installation make sure that your vehicle's injector connectors are compatible with the contents of the product package. If the connectors do not fit, please contact the seller.

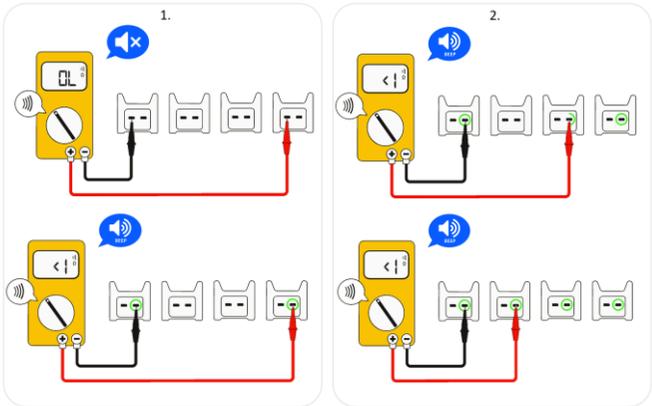
2.2.3 Check the polarity of the injector connectors



CAUTION: Verifying the injector connector polarities is crucial for successful installation of the eFlexFuel® device.

Use the multimeter's continuity function ("beep"-function) to find out which wires of the engine's original injector connectors are connected to each other. To find out this, take following steps:

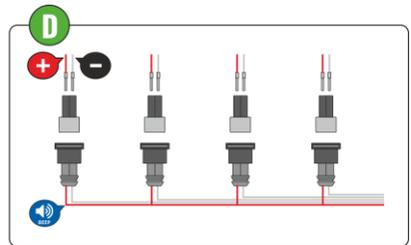
1. Take two injector terminals and find which of the connectors are connected to each other. These are the positive side of the terminal (+12V)
2. Keep the multimeter's other probe in the positive side of the terminal and check other injector connector polarity.
3. Write down the wire colors from each injector, which is the positive side (+12V). This information is required later during the installation.



Colors	Injector 1	Injector 2	Injector 3	Injector 4	Injector 5	Injector 6	Injector 7	Injector 8
+12V color								

2.2.4 If you are unsure of the polarity or are unable to get a solid reading, contact our technical support for assistance. Connect the male connectors to wiring harness

Check which way the male connector plugs in to the car's connector. Push both wires of the wiring harness to the male connector and make sure that the **red wire (+)** inserts to the same side as the positive side was marked in the previous chapter.



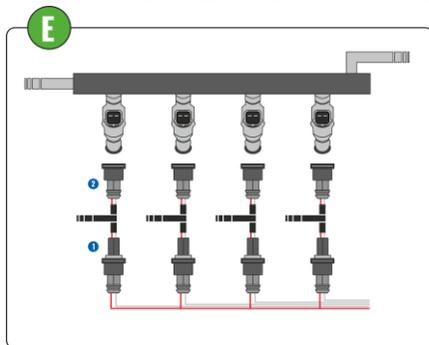
2.2.5 Install the wiring harness to the fuel injectors

Once the male connectors are connected to the eFlexFuel® wiring harness, it is ready to be installed.



CAUTION: Do not change the order of the vehicle's original injector connectors! eFlexFuel® injector wires can be in any order. The connector pair with the **red shrink tube +12V** (see image below) must be connected so that eFlexFuel® gets its operating voltage.

- Connect the male connectors of the eFlexFuel® wiring harness to the vehicle's injector wires that you disconnected earlier. (**Figure E, 1**)
- Connect the female connectors of the eFlexFuel® wiring harness to the injectors. (**Figure E, 2**)



2.2.6 Temperature sensor location



CAUTION: The temperature sensor must not be installed near the engine exhaust manifold.

An optimal location for the temperature sensor is near the cylinder head next to the fuel injectors.

2.2.7 Connect the ground wire

Ground the eFlexFuel® wiring harness either directly to the negative terminal of the car's battery or to the vehicle chassis.

NOTICE: Make sure that the ground wire is connected properly.

I have checked the following before moving on to the next phase:

- Male connectors have been verified with a multimeter by using its conductivity measurement setting.
- The eFlexFuel® system is grounded appropriately.

2.3 Ethanol sensor



WARNING: Fire/explosion risk from gasoline & vapors. The fuel line is disconnected in this step. Improper installation or routing may result in spilled fuel. Assure that the engine is cold, and that no electrical or other ignition sources are within or adjacent to the working area. Use rags to remove any spilt fuel and dispose in an appropriate sealed container.

2.3.1 Key points

- 1) Block or secure the vehicle and confirm that there are no combustion sources near or around the vehicle and work area.
- 2) Open the fuel filling cap to release pressure from the fuel tank.
- 3) **NOTICE:** The ethanol sensor should be installed in a location free from moving parts and high temperatures. Engine movement may cause the fuel hose to rub against components and, thus, cause damage to the hose itself if installed incorrectly. Installing the fuel hose too close to a hot source may cause the hose to melt, which can lead to slippages or leakages. Clean the fuel line connection before disconnecting them.
- 4) Clean the connectors before disconnecting.
- 5) The fuel hose should be installed as straight as possible. Avoid tight bends. The minimum radius for a bend is 3.1" (80 mm). Tight bending of a fuel hose may cause breaching and/or leaking.
- 6) **NOTICE:** Use quick connectors when installing the ethanol sensor.
- 7) If an additional fuel hose is required during the installation, use the fuel hose included in the eFlexFuel® accessories kit.
- 8) Do not use solvents when installing the fuel hose.
- 9) Lubricate the quick connector seals with clean engine oil before installation.

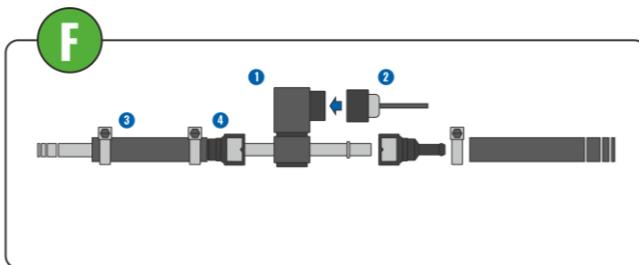
2.3.2 Installation of ethanol sensor

- Ethanol sensor (**Figure F, 1**)
- Ethanol sensor connector (**Figure A, 4 / Figure F, 2**)
- Fuel hose and hose clamps (**Figure F, 3**)
- Fuel line quick connector (**Figure F, 4**)

Use quick connectors when installing the ethanol sensor!

The ethanol sensor can be installed to either the incoming fuel pressure line or the return line. The fuel flow direction does not affect the reading of the sensor. The ethanol sensor should be installed near the fuel rail. We recommend installing the sensor in the incoming pressure line.

After installing the quick connectors, make sure that they are properly locked by pulling the connector back and forth.



I have checked the following before moving on to the next phase

- The ethanol sensor is properly fastened with the quick connectors included in the accessories kit.
- There are no tight bends in the fuel line.
- No solvents were used during the installation.

2.4 Finalizing the installation

Make sure that the harness has a little bit of play to compensate for engine movement and that it does not touch any moving or hot components. The wiring harness can safely withstand 212 °F (100 °C) temperatures, but avoid routing it close to hot components e.g., exhaust manifold etc.

2.4.1 Installing the control unit

Find an optimal location for the control unit in the engine bay. Make sure that the control unit is not exposed to excessive heat or moisture. Additionally, make sure that the control unit is not touching moving parts and is not located close to high voltage wires/components.

2.4.2 Secure the wiring harness

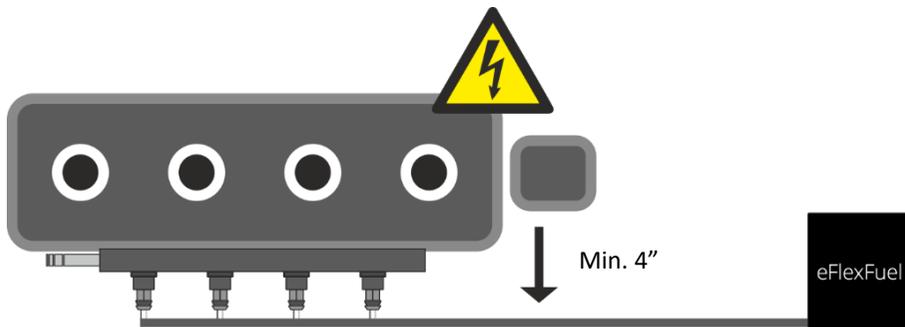


CAUTION: This is a multipin connector. Damaging the pins will affect the intended operation of your eFlexFuel® system.

Make sure that the terminals of the control unit's main connector are straight before connecting the wiring harness. Connect the wiring harness to the control unit. **Do not use excessive force!** Make sure that the connector is securely attached.

Connect the wiring harness to the ethanol sensor. The connector should click once correctly inserted.

- Ensure that the wiring harness is not located next to high voltage wires/components, i.e. ignition coils etc.



**Do not install the eFlexFuel™ wiring harness near high voltage components!
(spark plugs, ignition coils, distributor etc.)**

2.5 Driving with the eFlexFuel® system

The eFlexFuel® system is sold as a competition and off road E85 conversion unit. Your eFlexFuel® system may not be compatible with (and is not recommended for combination with) other aftermarket fuel management systems. The vehicle owner remains responsible for any use outside competition and/or off road, including Federal and State emissions and highway equipment laws. We recommend that you initially confirm that your eFlexFuel® installation has retained baseline operation using regular gasoline.

- 1) Start the engine.
- 2) The engine should be running normally. However, the initial start-up after the installation might be a little longer if the ethanol sensor was installed in the incoming fuel pressure line.
- 3) Observe the installed fuel line connectors and fuel hose when the engine is running.



WARNING: Even a small leak could cause a fire hazard.

- 4) If the vehicle idles badly or will not start, check the polarity of the wiring harness connectors and that the connectors are connected properly.
- 5) eFlexFuel® system can be monitored with the eFlexApp® mobile application.

The installation is complete, and you can now refuel the vehicle with ethanol E85, gasoline or any mixture of these.

I have checked the following after the initial start

- I have verified that the data displayed on eFlexApp® is correct.
- The ethanol content is, at least, 5 percent (%) or higher depending on the fuel in the tank.
- The temperature reading is accurate.
- The injector activity indicators display the correct amount of cylinders.
- The duty cycle is roughly 1 to 4 percent (%) on idle.
- There is no lack of power or torque while driving.
- The engine is running identically as pre-installation.

3. FAQ

Cold weather use

eFlexFuel® has been designed, tested, and manufactured in one of the coldest countries on earth, Finland. Thus, a great deal of emphasis has been put into ensuring that the device and the vehicle will also work in cold conditions. Vehicles equipped with eFlexFuel® will start even in the coldest temperatures. However, in extreme conditions a couple of starts might be required with pure E85 fuel.

E85 does not evaporate as easily as gasoline. Therefore, in cold temperatures (less than 40°F) we recommend taking the following steps:

- Use an engine block heater, whenever possible.
- Fill up with some gasoline (10% or more) to lower the ethanol content.
- Make sure that the engine is well maintained and, in particular, the ignition components and spark plugs are in normal working condition.
- *Avoid* long cranking. We recommend short start-ups (2-3 seconds) and adequate pauses in between attempts (5-8 seconds). This helps ethanol to evaporate in the cylinders before attempting to start the engine again.
- eFlexPlus and eFlexPro come with an adjustable cold start feature that is accessible from the eFlexApp. This will allow you to configure the cold start specifically for your vehicle, if needed.

NOTICE: Consult your eFlexFuel® reseller/installer or our technical support for further recommended adjustments/steps if E85 fueling issues persist.

The fuel consumption reading does not match actual consumption

In most vehicles the fuel consumption readout is calculated based on the injection pulse width. The real fuel consumption may differ from the original fuel consumption using ethanol E85.

eFlexApp® fault codes

Fault codes may appear if there are pre-existing electrical problems that influence the operation of the eFlexFuel® control unit.

Ethanol sensor not connected

- Check that the ethanol sensor connectors are properly attached at both ends, and the wire is not damaged.
- Check that the pins on the connectors are not oxidized and/or damaged.
- Check that the wiring harness routing is not close to high voltage components.

Low ethanol content

- The ethanol sensor has detected a low ethanol content. The warning limit is 2 percent (%). Under normal circumstances, gasoline contains at least 5 percent (%) ethanol.
- If the ethanol content reading is 0 percent (%), make sure that the ethanol sensor is connected to the fuel line and not to e.g., a breather hose.
- A low ethanol content reading can indicate a low fuel pressure. There is air in the fuel line, and varying ethanol content readings are displayed. The fuel pump may be worn out, or the fuel filter can be clogged.

Fuel is contaminated

- The ethanol sensor has detected contaminated fuel. If the sensor cannot detect the right ethanol content, the value is set to 40 percent (%) as a safety precaution. *NOTICE:* avoid driving with this condition or refuel the vehicle with a 50/50 percent (%) mixture of ethanol and gasoline.

Temperature sensor signal is too low / high

- The temperature sensor has detected temperature that is out of the measurement range.
- Check that the wiring harness is not routed close to high voltage components.
- Check that the temperature sensor is properly installed.

Duty cycle warning

- The injector duty cycle has reached 100 percent (%). Monitor the duty cycle level with the eFlexApp® mobile application's log feature while driving.
- Possible reasons could be clogged fuel nozzles, a clogged fuel filter, defected fuel pump, or inadequate fuel system for E85.

Troubleshooting

To access our technical support portal, visit the following website <https://eflexfuel.com/us/support>

EFLEXECO™

EFLEXPLUS™

EFLEXPRO™