Particulate filter emulator

SK-09

Setting and installation manual
Abbreviated

Contents

1. Completeness

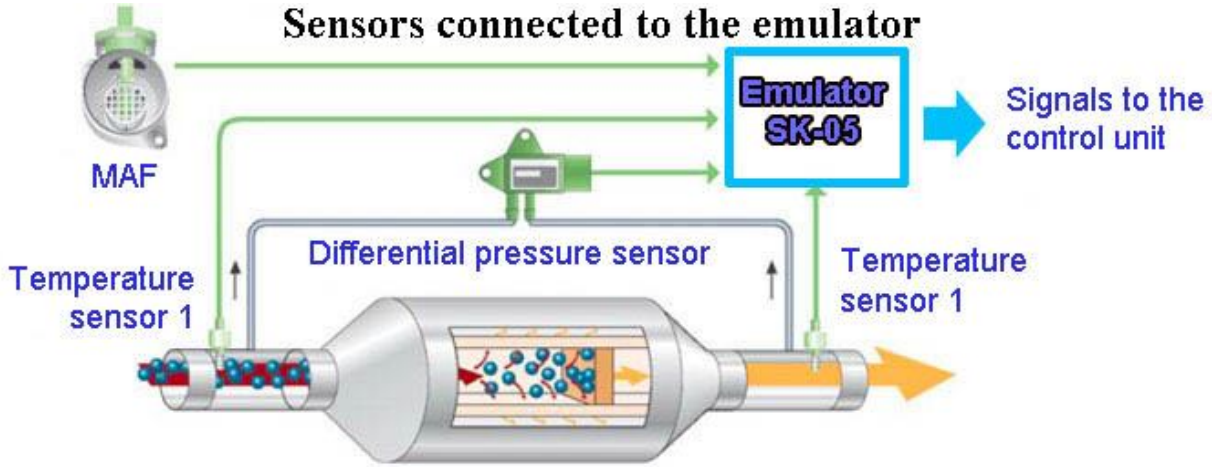
O. No.	Name	Quantity	Note
1	Electronics module	1	
2	User manual	1	
3	The software disc	1	Supplied upon agreement
4			

2. Operation principle and purpose

The emulator SK-09 is designed to recreate the signals from sensors, which are responsible for the diagnosis and maintenance of the particulate FAP/DPF filter. The recreation of signals is carried out by the models, recorded written in memory of the emulator.

The behavioral model of the particulate filter generates signals of the pressure differential and temperature sensors. Thus, the behavioral model of the particulate filter considers following factors:

- Air flow;
- Temperature of the exhaust gases;
- Heat capacity of the filter;
- Thermodynamics of original exhaust system;
- Effect of the chemical processes in the FAP / DPF filter on the sensor data;
- Emulates an increase of filter filling level;
- Regeneration start is tracked and the behavior of the filter during regeneration is emulated.

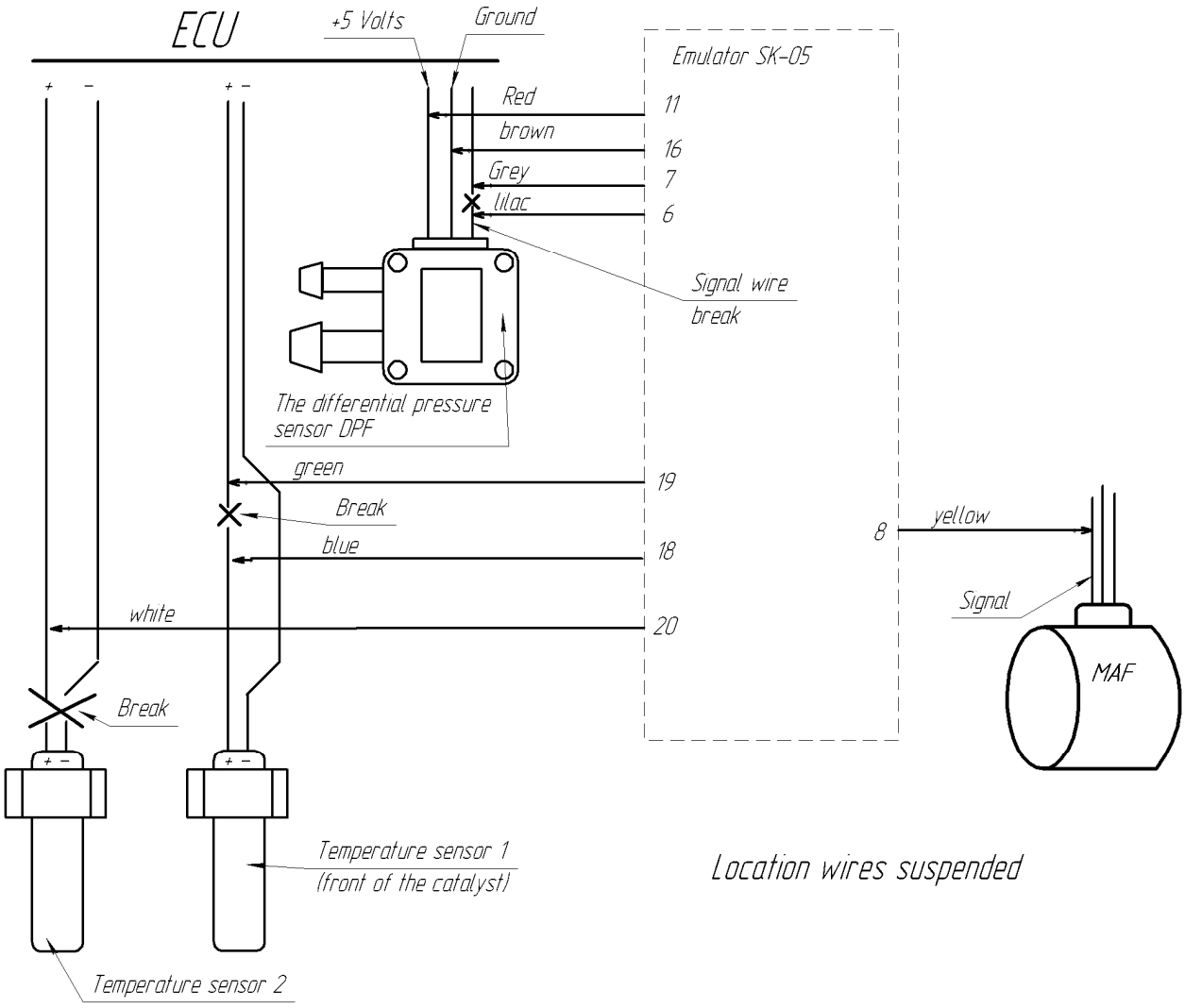


3. Installation of the emulator

The emulator must be installed in a place protected from exposure to elevated temperatures and moisture.

Schemes shown in Figures 3.1., 3.2, are used depending on the quantity of temperature sensors.

Figure 3.1. Scheme of connection of emulator SK-09 with 2 temperature sensors.

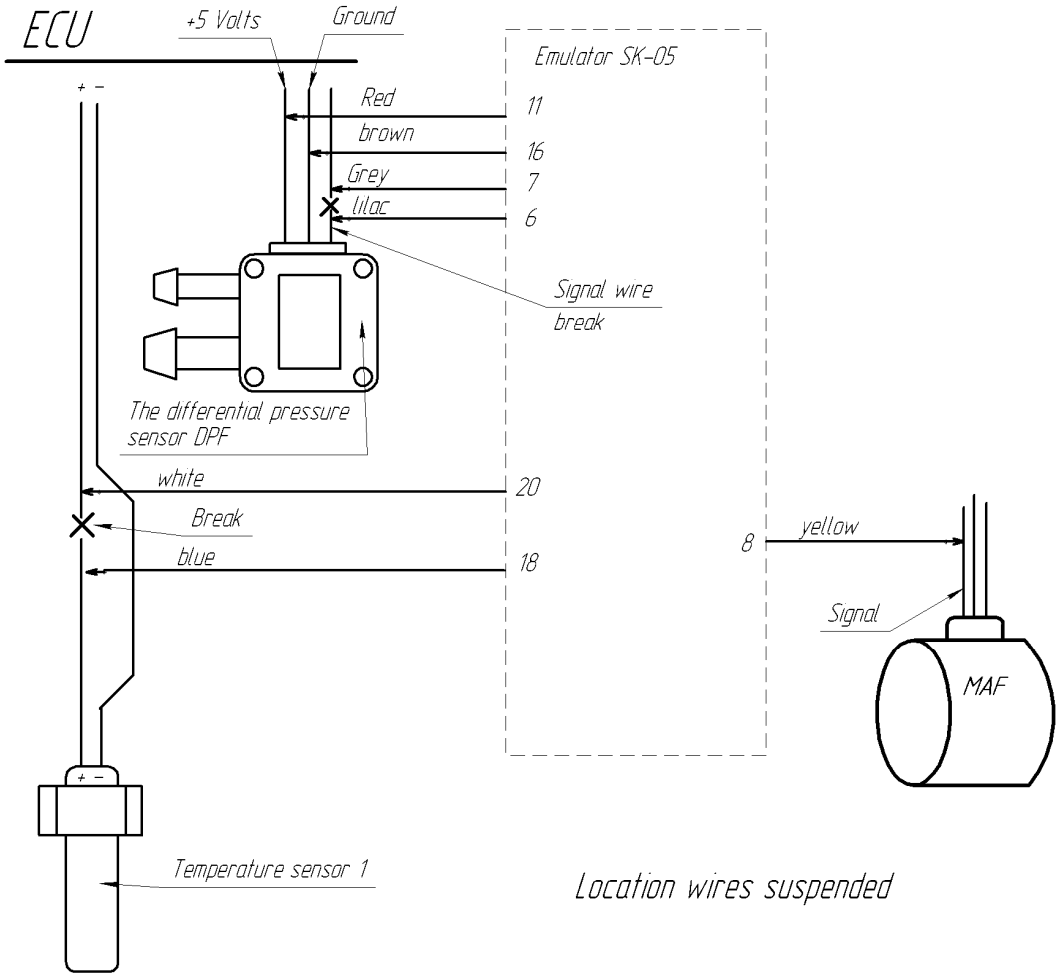


Before connecting the temperature sensors, it is necessary to start up the ignition and to measure the voltage with multimeter and to determine the polarity on their wires.

At removing particulate filter, make sure that the 1st temperature sensor was located in the exhaust gas flow, and not away from it!

To determine signal wire of pressure differential sensor, it is necessary to start up the ignition and to measure the voltage on sensor wires referred to case. Typically, the wires have the voltage of 0 and 5 volts. Usually the signal wire has the voltage around 0,4 ... 1,0 volts with turned off engine, in some cases — 2.5V.

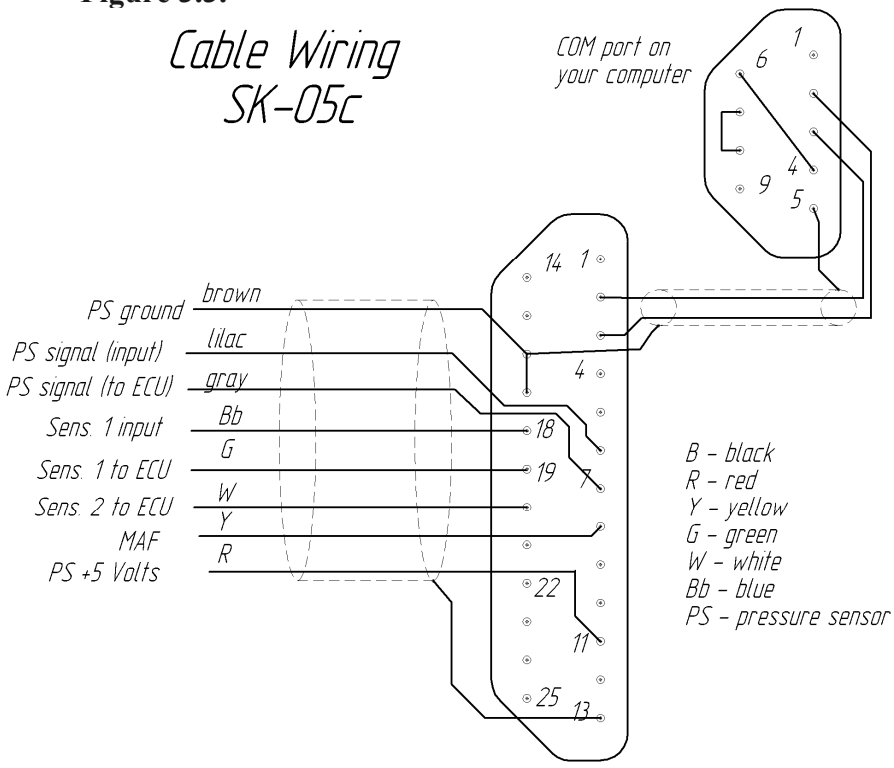
Figure 3.2. Scheme of connection of emulator SK-09 with temperature sensor



To determine the signal wire MAF, it is necessary to start up the motor and to determine the signal wire by measuring the voltage relative to the weight of the car. The voltage of this wire should be approximately 1 ... 1,7V. This voltage should increase to 3 ... 4 volts upon pressing on the gas pedal. MAF with frequency output can be used in some models of engines; the voltage of signal wire of such sensor does not significantly change and is approximately 2 ... 3V.

If you have such MAF, you must choose “Digital” type of mass airflow sensor (ДМРВ) (normally, the emulator is supplied already set for a specific automobile) in the settings of the emulator.

Figure 3.3.



3.1. Adaptation emulator for your car

The adaptation is performed only if the settings for your car are not written into the emulator.

You need clearly follow this course of action for proper adaptation:

1. Turn on the ignition (without starting the engine) and touch the magnet to the yellow emulator sticker Магнитный датчик. Exhaust system must be cold in this case. The indicator "Work" blinks after clicking on the button;
2. Wait for 15 seconds, please;
3. If you 2 indicators blinked together infinitely, then the adaptation had completed. You can go directly to step # 8;
4. Start the engine and let it warm up, if necessary;
5. Take the active trip, unwinding motor to the maximum;
6. Pay attention to the work of emulator indicators (if there are any errors of adaptation) and switch off the engine;
7. Read ECU fault codes and erase them if they come, make the ECU adaptation;
8. Turn off the ignition for 1 minute, which the emulator would be disconnected;
9. Switch on the ignition. If indicator "Work" would light up (with a slight blinking), the adaptation was successful. If you 2 indicators would blink together, the adaptation was in error. The cause can be found according the number of indicators flickering.

The reason of failed adaptation can be understood according to the number of indicators flickering (during the 8 seconds period):

1. No signal from the pressure sensor. The voltage of 0.5 volts is recorded at zero pressure by default. If pressure sensor failed, it is possible to do without it. You need to install the program after teaching in the SK-09 Program (Demo) for this. You need submit the required value from the pressure sensor or on the period of teaching to the lilac (pink) wire used for it a variable resistor. **This error is displayed until you restart the emulator only;**
2. Temperature sensor short circuit to the ground;
3. Incorrect signal from air consumption indicator.

Most commonly, the adaptation errors occur due to improper connection.

Emulator adaptation errors can also occur if the emulator power supply is connected improperly. Measure the voltage on the red wire of emulator should be at 4.8 ... 5.1 volts. If the voltage is less, probably, the wires +5V and signal of the pressure sensor twisted.

Teaching errors are cleared when re-adaptation start and they can be removed using a computer and the SK-09 Program.

Important!

- The adaptation does not start if settings are written into the emulator.
- During the first trip with enabled adaptation, the ECU error codes may appear. Don't worry it is normal! Just delete them after it.
- 2 blinked indicators on the emulator after the engine re-starting indicate that the emulator cannon adapt.

3.2. CAR Adaptation

We recommend make an adaptation of pressure sensors, clean the particulate filter counter using diagnostic equipment, after the emulator installation and adaptation. The emulator will not work in some cars without the ECU adaptation.

The essence of the adaptation of the car is if the control unit will understand (accept) the installation procedure of a new DPF (diesel particulate filter) and pressure sensor.

4. Check of the emulator

1. Start up the ignition and connect the scanner (cold engine).

2. Check pressure difference in the particulate filter in situ. Readings should be at the level of about 0.

3. Check temperature in the exhaust system (before the catalyst and in the particulate filter). It should not differ by more than +/- 40 degrees from the real temperature for sensors with a voltage up to 1V and not by more than + 100 degrees for sensors with a voltage of 5V.

4. Start up the engine up and heat it. At idle speed the temperature should be between 180 to 300 degrees. Pressure difference is about 0.

5. At 3000 rpm the pressure difference should be 4 - 9 kPa (40 … 90 hPa).

6. At the speed of 100 km/h the temperature should be 550 – 650 degrees.

5. Guarantee obligations

The manufacturer guarantees the operation capacity of the product provided that rules of operation, stipulated in the operation manual, are observed.

The guaranteed service life of the emulator is 12 months from the date of sale.

During guaranteed service life, in case of system failure, the owner is entitled to free repair.

During guaranteed service life the repair is made at the expense of the owner, if he operates the optimizer not in accordance with this operation manual or does not comply with the manufacturer's recommendations.

The guarantee of the system is cancelled in the following cases:

- Opening of the device;
- Mechanical damages;
- Operation not in accordance with this user manual.

Emulator SK-09, serial number _____ complies with specifications and accepted fir for service.

Date of manufacture _____ 2019

Seller _____ Place for seal

Automobile model (on which the equipment is installed): _____

Was installed by: _____/_____/

Date of installation: _____