

ECU FLASHING

Vhetrov E.D., student
Scientific supervisor –Romanova P.V., lecturer
English language department №1
Belarusian National Technical University
Minsk, Republic of Belarus

Contemporary vehicle engines and controlled by electronic control unit (ECU), which determine operations of key systems: injection, ignition, idling and others [1]. One of the most popular domestic ECUs is January 7.2, used in LADA automobiles and several other brands.

ECU flashing enables to change stock parameters of engine operating, optimizing it for certain conditions of exploitation, enhancing dynamic, efficiency and ecology [2]. During the flashing process you can adapt ECU to use alternative fuel, delete or modify work of sensor and moreover, remove manufacturer's restrictions.

ECU represents a complex device that collects and contains information about engine operating algorithms. Basically, all ECUs work similarly: they receive data from sensors and control, process it according to installed program, and send signals to actuator. The program of ECU is called firmware, it can be read, installed, uninstalled or edited, affecting vehicle's behavior. Work with firmware is a primary and most important step of modern cars tuning. Here in BNTU we were working with VS 5.1, Bosch 7.9.7, January 7.2 (Fig. 1).



Figure 1 – ECU January 7.2

To start interaction with ECU it is necessary to connect to it that can be implemented through different ways. We used ScanMaster CAN – an adapter which connects to laptop with USB and than to ECU from wide range with DB-15F port (Fig. 2). It also requires 12V power.



Figure 2 – ECU January 7.2, K-Line adapter ScanMaster CAN and clip for connecting to January 5.1 & 7.2

Then we launched Motor-Scan (Fig. 3) program, chose our ECU and checked successful connection. In such mode you can pick out several metrics and monitor the work process of ECU. This is an extremely important aspect of automobile diagnosis.

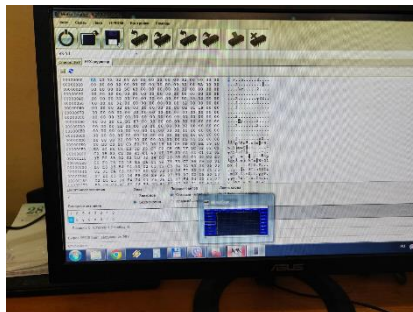


Figure 3 – Monitoring ECU working process with Motor-Scan

To work with firmware directly we used programs Motor-Loader and Chip TuningPRO. The first allowed us to open file with firmware, install and uninstall it from the ECU. But you needed to download new firmware in advance. To edit the very program inside the ECU we harnessed Chip TuningPRO (Fig. 4). It allows you to change distinct parameters of engine processing, for instance, idling revolutions, ignition and injection timing, thermostat threshold. The process of editing the firmware is difficult and requires specific knowledge and skills. After editing the firmware, it can be uploaded to the ECU through Motor-Loader.

The easier way to tune a car is to upload another firmware into the ECU instead of the old one. This way doesn't imply editing current program, but just flashing with a new one that can be picked from the internet.

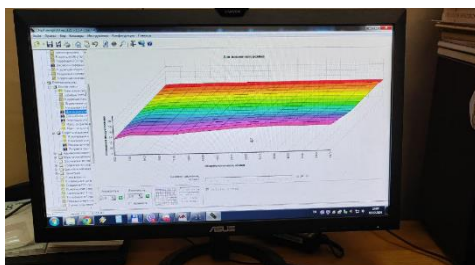


Figure 4 – Firmware editing in ChipTuningPRO

Thus we obtained skills of working with electronic control units VS 5.1, Bosch 7.9.7 and January 7.2, in particular reading, installing, erasing, editing and uploading firmware. Furthermore, we learned different ways of connecting to ECU and made contact with three modules. And also we examined the main parameters and characteristics relating to vehicle performance.

References

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