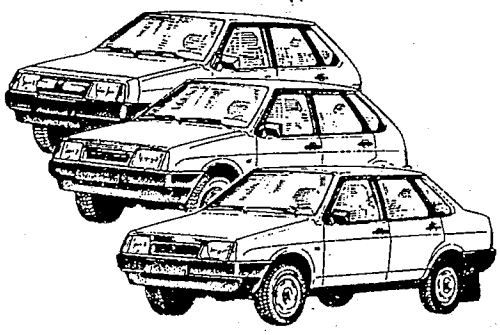
2108-3902031-11 - на английском языке



ATTACHMENT

to operating instructions for VAZ-2108, 2109 and 21099 vehicles covering VAZ-21083-20, 21093-20 and 21099-20 build specifications.

DEAR CUSTOMER:

The VAZ-2111-80 engine used in your vehicle features the multipoint fuel injection to allow improved fuel economy and reduced harmful exhaust emissions. While operating a vehicle with this engine, VAZ-2108 or 2109 instruction manual shall be used, with design features described in this Attachment taken into account.

КЭК НТЦ
ВТФ "АвтоЛАДА" Изд.N 9303
Автомобили ВАЗ 2108,ВАЗ-2109
Дополнение к руководству по эксплуатации на английском языке

Тип. ВАЗа

dioxide (CO2) and nitrogen (N2). The oxygen sensor 12 is electrically heated for fast achievement of the operating temperature. The ECM 15 uses the exhaust gas oxygen content information to adjust the air/fuel mixture for the optimum ratio by changing the injector pulse width.

This system will function properly if unleaded fuel is used only. Leaded fuel will quickly render the system ineffective, as lead restricts the micropores of the ceramic sustrate and deposits on the sensing part of the oxygen sensor 12, which results in wrong oxygen content information and subsequent incorrect injector pulse width adjustment by the ECM.

The converter can also fail if the engine misfires, as unburnt mixture will be entering the converter, causing an overtemperature which results in damage to the substrate. For this reason, make sure that the ignition system functions properly and is faultfree.

EVAPORATIVE EMISSION CONTROL SYSTEM

With the engine not running, the fuel vapours from the fuel tank 26 go to the separator 21 through tubes 25 and 24, T-piece 23 and tube 22, where some of them condensate. The condensate returns to the fuel tank. As the fuel vapours accumulate, they flow via the tube 20 to the roll over valve 17 and further via the tube 16 to the tank pressure control valve 27. The vent valve opens when certain vapour pressure builds up. The vapours then flow via the tube 35 into the canister 36, where they are absorbed by the activated carbon.

When the engine is running, the ECM 15 energizes for some time the canister purge solenoid valve. As the result, the fresh air is drawn through the carbon bed, mixes with the fuel vapours and is drawn into the throttle body 28. The consumption of fuel creates vacuum in the fuel tank 26, and the outside air flows through the canister 36 and the tube 35 into the tank pressure control valve 27 to open the check valve. The air then flows into the fuel tank 26 via the tube 16, the roll over valve 17, the tube 20, the separator 21, the tube 22, the T-piece 23 and the tubes 24 and 25.

The roll over valve 17 prevents the fuel leaking into the system from the fuel tank in the event of vehicle rolling over in an accident. When the fuel tank is deformed, the relief valve 18 vents the excessive pressure from the system to the atmosphere.

ENGINE

Bore and stroke, mm	82 x 71
Displacement, l	1.5
Compression ratio	9.8
Rated power per ISO 1585-82	
at 4800 RPM, at least, kW	51.5
Max torque per ISO 1585-82	
at 2800 RPM, at least, N.m	118
Min idle speed, RPM	750 + 50
Fuel	unleaded, 95 octan at least

FUEL SYSTEM

Fuel delivery to the engine features multipoint fuel injection. The electric fuel pump 15 (Fig. 1) pumps fuel from the fuel tank 14 through the fuel supply line 17 and the in-line fuel filter 13 to the fuel injector rail 20. The pressure regulator 18 keeps fuel available to the injectors 21 at a constant pressure, with excess fuel returned to the fuel tank 14 through the return line 16. The electronic control module (ECM) 11 commands the injectors 21 to inject the fuel into the intake manifold 19. The ECM 11 controls the injector pulse width based on engine operating conditions and load to maintain the optimum air/fuel ratio.

The air is delivered into the intake manifold 19 from the air cleaner 1 through the hose 3, the throttle body 5 and the plegnum 9. The amount of air delevered is is monitored by the mass air flow sensor 2 and is adjusted by the throttle valve, controlled by the accelerator pedal. The ECM 11 constantly monitors the position of the throttle and the rate of its movement using the sensor 7, mounted on the end of the throttle shaft.

During engine cranking with the engine speed less than minimum, the ECM 11 increases the injector pulse width to give a richer air/fuel mixture. ***The accelerator pedal should not be depressed while attempting to start the engine.*** After the engine is running the injector 21 pulse width is calculated based on inputs from the mass air flow sensor 2 and the coolant temperature sensor 28.

After the engine is warm, the minimum idle speed is adjusted by the idle air control valve 6 as commanded by the ECM 11. Depending on the engine load (air conditioning, heater, rear window defroster etc. ON or OFF), the amount of air delivered through the idle air bypass channel around the throttle valve is adjusted by the movement of the valve actuated by the stepper motor. The throttle body 5 has the coolant cavity 8 for heating the idle channel. The coolant is delivered by the hose 4 from the coolant outlet 27.

The ECM 11 discontines the control of the idle air control valve when it receives a certain vehicle speed input from the vehicle speed sensor 22 mounted on the gearbox 25.

While driving with the warm engine the ECM adjusts the fuel injector pulse width based on the engine speed and uses the inputs of the mass air flow sensor 2 and oxygen sensor 23 mounted in the down pipe 24 of the exhaust system.

gine running, the system components should not be touched and the battery leads should not be removed. Any work with the ignition system components in the engine compartment should be performed with the ignition "OFF". The electronic control module shall be clean and dry at all times. Its removal and disassembly by the owner are prohibited.

ELECTRICAL EQUIPMENT

Fig. 3 shows a portion of the vehicle electrical wiring diagram.

EMISSION CONTROL SYSTEMS

CRANKCASE VENTILATION SYSTEM

The basic system is described in the "Crankcase Ventilation System" section of the manual. The difference is that at closed throttle idle with the minimum engine the crankcase vapours pass through hose 29 to the throttle body 28 and to the plengnum 11 via the idle channel around the throttle. Under load conditions, when the throttle is open, the crankcase vapours pass through the hose 30 into the plegnum 11.

EXHAUST EMISSIONS CONTROL SYSTEM

The system includes the three-way catalytic converter 14 and the oxygen sensor 12. The catalytic converter 14 has a honeycomb substrate coated with the catalytic material consisting of platinum, palladium and rhodium.

The most harmfull pollutants of the exhaust are the carbon monoxide (CO), the hydrocarbons (HC) and the oxides of nitrogen (NOx). On contact, the catalysts promote reactions that convert most of these pollutants into water vapour (H2O), carbon

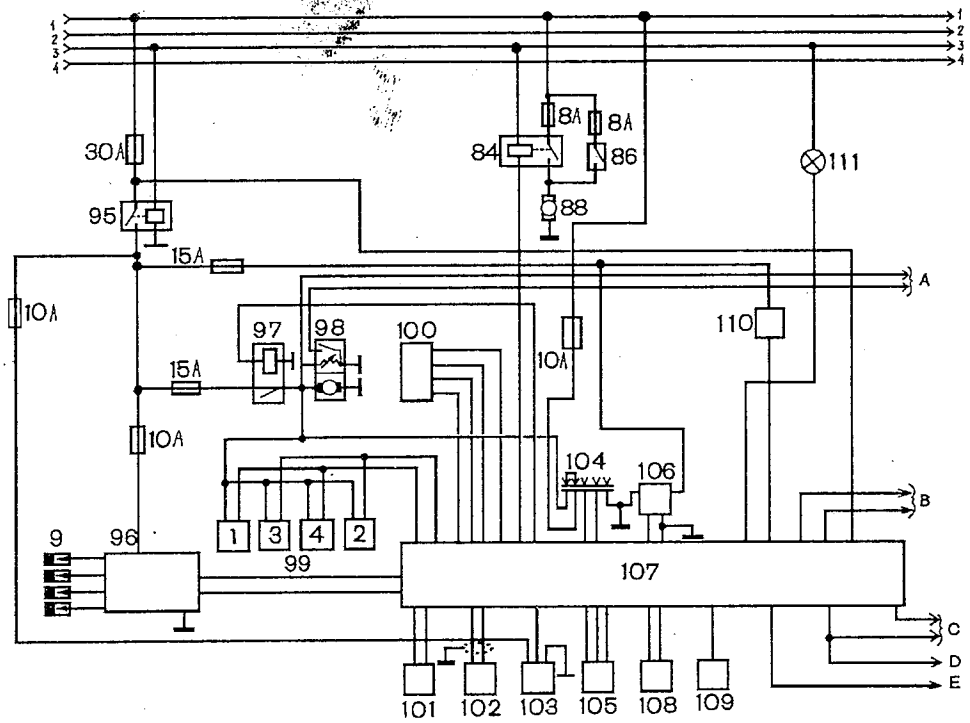


Fig. 3 - Electrical System Wiring Diagram (portion): 95 - main relay; 96 - ignitionmodule; 97 - fuel pump relay; 98 - electric fuel pump and fuel level sender assembly; 99 - injectors; 100 - idle air control valve with stepper motor; 101 -vehicle speed sensor; 102 - crankshaft sensor; 103 - mass air flow sensor; 104 -diagnostic connector; 105 - throttle position sensor; 106 - oxygen sensor; 107 -electronic control module; 108 - coolant temperature sensor; 109 - knock sensor;110 - canister purge valve; 111 - "Check Engine" warning light; "A" - to fuel level and reserve indicator; "B" - to air conditioning unit; "C"* - to route computer; "D"* - to electronic speedometer; "E"* - to tachometer.
* Optional

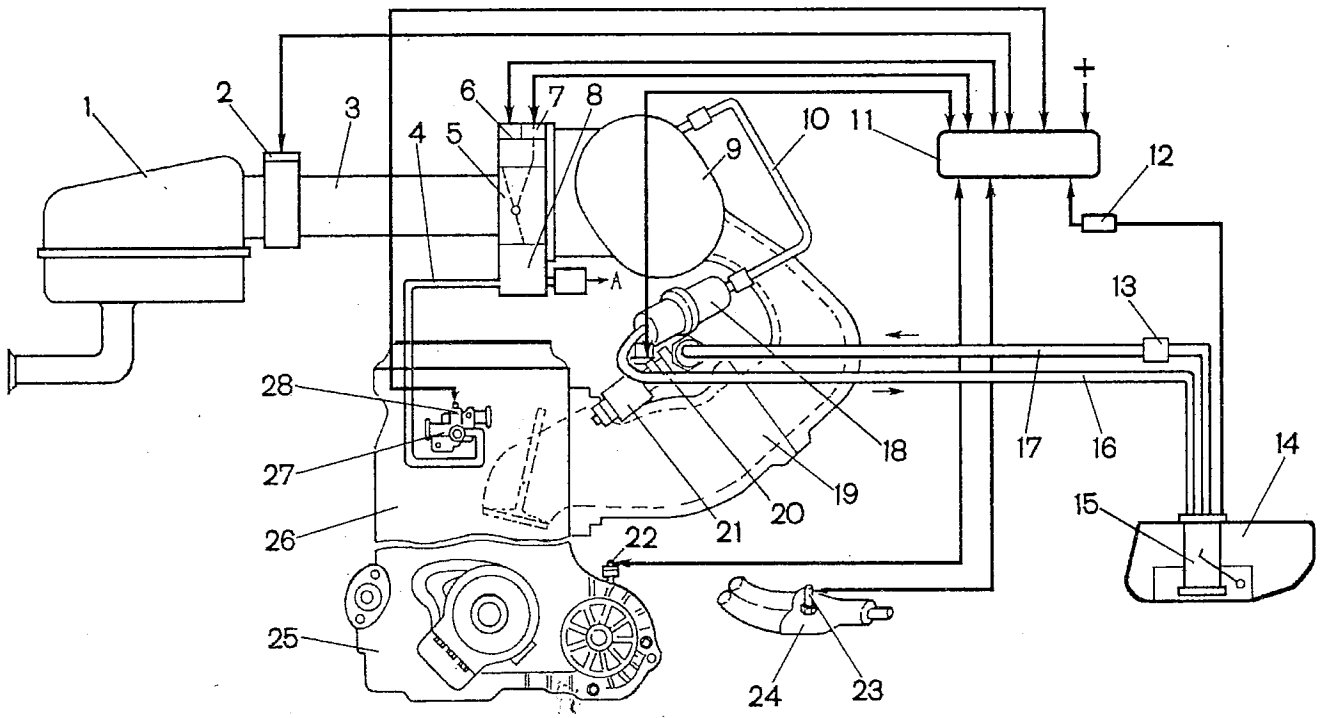


Fig. 1 - Fuel System: 1 - fuel filter; 2 - mass air flow sensor; 3 - intake manifold hose; 4 - coolant inlet hose; 5 - throttle body; 6 - idle air control valve with stepper motor; 7 - throttle position sensor; 8 - idle system coolant cavity; 9-plegnum; 10-pressure regulator hose;11-electronic control module;12-fuel pump relay; 13 - fuel filter; 14 - fuel tank; 15 - fuel pump and fuel level sender assembly;16 -fuel return line; 17 - fuel supply line; 18-pressure regulator;19-intake manifold; 20 - fuel rail; 21 - injector; 22 - vehicle speed sensor; 23 -oxygen sensor; 24 - down pipe; 25 - gearbox; 26 - cylinder head; 27 - coolant system outlet; 28 - coolant temperature sensor; "A" - to water pump suuply line.

During acceleration the ECM 11 reacts to rapid changes in throttle position and provides extra fuel, while at closed throttle engine deceleration it reduces the fuel and has the ability to cut off the fuel delivery completely for a certain period. In addition, the ECM cuts the fuel off when the engine reaches the maximum permissible RPM, as an overspeed protection, and when the vehicle reaches the top speed.

When a fault occurs in the fuel system, the "Check Engine" light will come on in the instrument panel. If the light comes "ON", it does not mean the engine should be stopped immediately, as the ECM has backup systems that will allow the engine to operate in a near normal manner. However, the cause of the light coming "ON" should be established at a service outlet.

IGNITION SYSTEM

The electronic ignition system consists of the ignition module 2 (Fig. 2), crankshaft sensor 10, spark plugs 6, high voltage wires 3 and electronic control module 15. The ignition module assembly incorporates two ignition coils. Each coil provides the spark simultaneously for two cylinders with opposite events, like for cylinder 1 coming up on the compression stroke and for cylinder 4 coming up on the exhaust stroke. Cylinder 4 requires very little of available energy to fire the spark plug, and most of the energy will be used to fire cylinder 1 spark plug.

The crankshaft sensor 10 reacts to the rotation of the reluctor wheel 9 and sends signals to the ECM through the ignition module The ECM 15 uses this information to determine crankshaft position and engine speed and to control the ignition timing and the injector pulse width.

During engine malfunction (knocking) the knock sensor 5 generates signals proportional to the knock amplitude. The ECM 15 uses these signals to adjust the advance angle for reduction of knocking.

During cranking, when the engine speed is below 400 RPM, the ignition timing is controlled by the ignition module 2. At engine speed above 400 RPM this function is taken over by the ECM 15, which takes into account all operating conditions.

The electronic ignition system is a high energy system. For this reason, while the en-

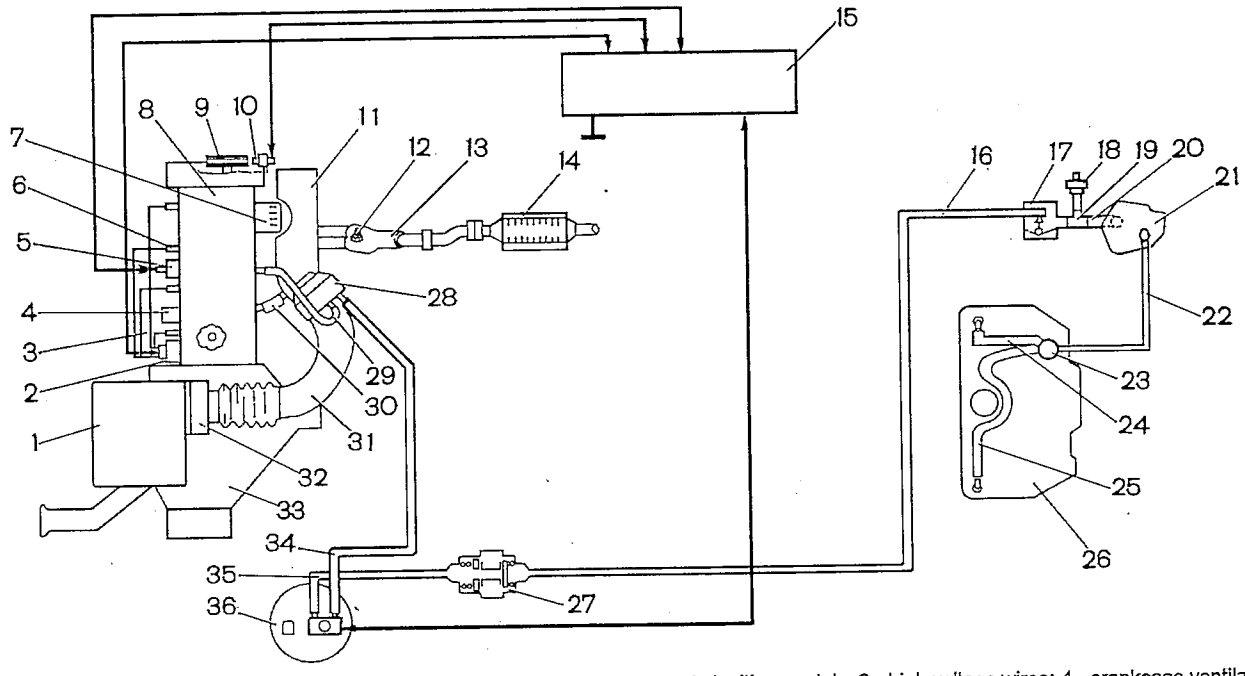


Fig. 2 - Ignition System and Emission Control Systems: 1 - air cleaner; 2 -ignition module; 3 - high voltage wires; 4 - crankcase ventilation system vent hose, 5 -knock sensor; 6 - spark plugs; 7 - oil filter; 8 - engine; 9 - reluctor wheel; 10 - crankshaft sensor; 11 - plegnum; 12 - oxygen sensor; 13 - down pipe; 14 - catalytic converter; 15 - electronic control module; 16, 20, 22, 24, 25, 34, 35 - vapour tubes; 17 - roll over valve; 18 - pressure relief valve; 19 - T-piece; 21 - separator; 23 - T-piece; 26 - fuel tank; 27 - tank pressure control valve; 28 - throttle body; 29 - crankcase ventilation primary circuit hose; 30 - crankcase ventilation secondary circuit hose; 31 - intake manifold hose; 32 - mass air flow sensor; 33 - gearbox; 36 - canister with canister purge solenoid valve.