Service Manual for Chery QQ6

(UMC EFI for 473F Engine)

After Sales Service Department of Chery Automobile Sales Co., Ltd.

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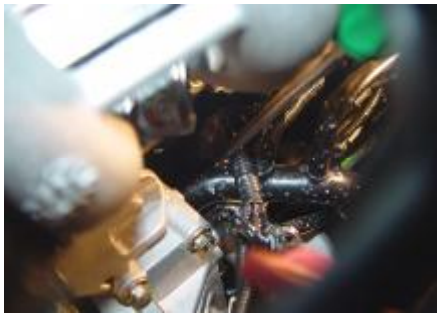
4. Remove fixing hoop of intake hose.

5. Remove the four fixing bolts of electronic throttle body.
Pull out the connector and take out the electronic throttle body.

6. Use a screwdriver to press down the fixed clip of the injection nozzle connector and then pull out the connector.

7. Use a screwdriver to press down the fixed clip of the knock sensor connector and then pull out the connector.



8. The water temperature sensor is behind the thermostat seat.

9. Pull out the connector of the ignition primary coil by hand.

10. Pull out the connector of the engine tachogenerator by hand.

Chapter Two Principle of Electronic Fuel Injection System

I. Overhaul of System Components

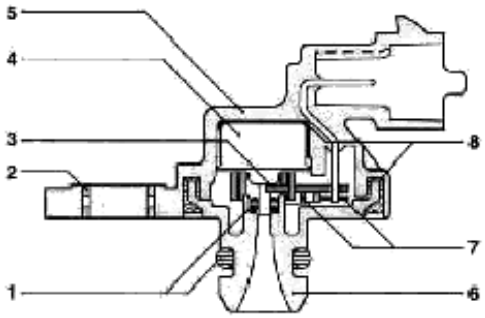
1. Intake Air Temperature Pressure Sensor

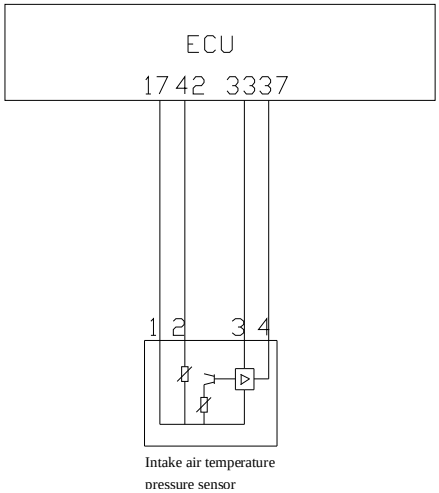
1.1 Function of the sensor:

Detect air intake pressure and temperature in air intake manifold, which will be provided to ECU as main load signal of engine; ECU will calculate injection pulse-width based on this signal.

1.2 Principle of the sensor:

Intake air temperature pressure sensor is a sensor that integrates an intake air pressure sensor and an intake air temperature sensor. Absolute pressure sensor element of intake manifold is composed of a silicon chip. A pressure diaphragm is etched on the silicon chip. On the pressure diaphragm, there are 4 piezo-resistances, which serve as strain sensors and constitute a Wheatstone bridge. In addition to this pressure diaphragm, a signal processing circuit is also integrated on the silicon chip. The silicon chip and a metal housing constitute a closed reference, where the absolute pressure of the gas inside approaches to zero. Thus, a micro-electronic mechanical system is formed. The active face of the silicon chip stands a pressure close to zero, while its back face stands the pending measuring intake manifold absolute pressure introduced by a connecting pipe. The thickness of the silicon chip is merely several μm, so the absolute pressure change in intake manifold will bring mechanical deformation to the silicon chip. The 4 piezo-resistances will accordingly deform and their resistances also change. The voltage signal in linear relation to the pressure is formed after process by the signal processing circuit on the silicon chip. The intake temperature sensor element is a negative temperature coefficient (NTC) resistance, which will change with the intake temperature. This sensor sends out a voltage indicating the intake temperature change to the controller.





Cross-section view for sensor of air absolute pressure and temperature in intake manifold

1 Gasket 2 Stainless Steel Sleeve 3 PCB Board 4 Sensing Element 5 Housing 6 Pressure Bracket 7 Soldering 8 Bonded With Bonding Agent

1.3 Parameters of technical features

This sensor is designed to be mounted on the plane of auto engine intake manifold. The pressure connecting pipe together with the temperature sensor protrudes inside the intake manifold and an O gasket is used to enable atmosphere-proof.

If it is mounted on an auto through an appropriate method (picks up pressure from the intake manifold and the pressure connecting pipe tilts down etc.), it can be ensured that no condensed water will be formed on the pressure-sensitive element.

Drilling and fixing on the intake manifold must be carried out according to the supply drawing so as to ensure a long seal and a good tolerance to fretting by agent.

The reliable contact of electric connection of a joint will mainly be affected by the joints of components and parts, and it is also in relation to the material quality and dimensional precision of the joint fitted with it on the harness.

1.4 Failure effects and judgment method

- Failure effects: spark extinction and poor idling etc.
- General Failure Reason:

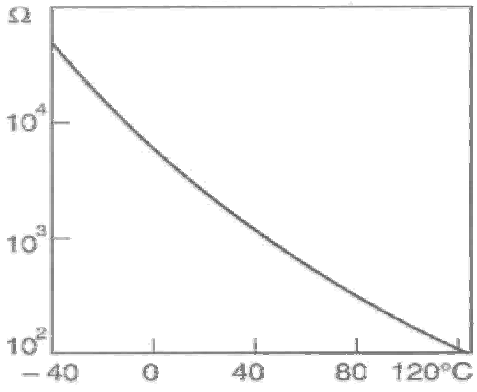
  1. Abnormal high voltage or inverse strong current occur during working;
  2. The vacuum element is damaged during maintenance.
- Maintenance precautions: during maintenance, impinge using high pressure gas toward the vacuum element is prohibited; when replacing the sensor after a failure is found, remember to check if output voltage and current of the generator is normal.
- Simple measurement method:

1.4.1 Temperature sensor:

With the joint removed, turn the digital multimeter to Ohm shift, and then connect the two meter pens respectively to 1# and 2# pins of the sensor; At 20℃, the rated resistance should be 2.5 kΩ±5%, and the other corresponding resistances can be measured out from the characteristic curve in above chart. Analogue method can also be used when measuring, i.e., use an electric drier to blow the sensor (be careful not to be too close to the sensor), and then observe the change of the sensor resistance. At this point, the sensor resistance should fall.

1.4.2 Pressure sensor:

With the joint connected, turn the digital multimeter to DC Voltage shift, and then connect the black pen to ground while the red pen respectively to 3# and 4# pins. Under idle speed state, 3# pin should have a 5V reference voltage while the voltage on 4# pin should be around 1.3V (the actual value depends on the model); Under no load state, when opening the throttle slowly, the voltage on 4# pin may change little; when opening the throttle rapidly, the voltage on 4# pin may reach around 4V instantly (the actual value depends on the model) and then fall to around 1.5V (the actual value depends on the model).



2. Tachogenerator of Engine

2.1 Function of the sensor:

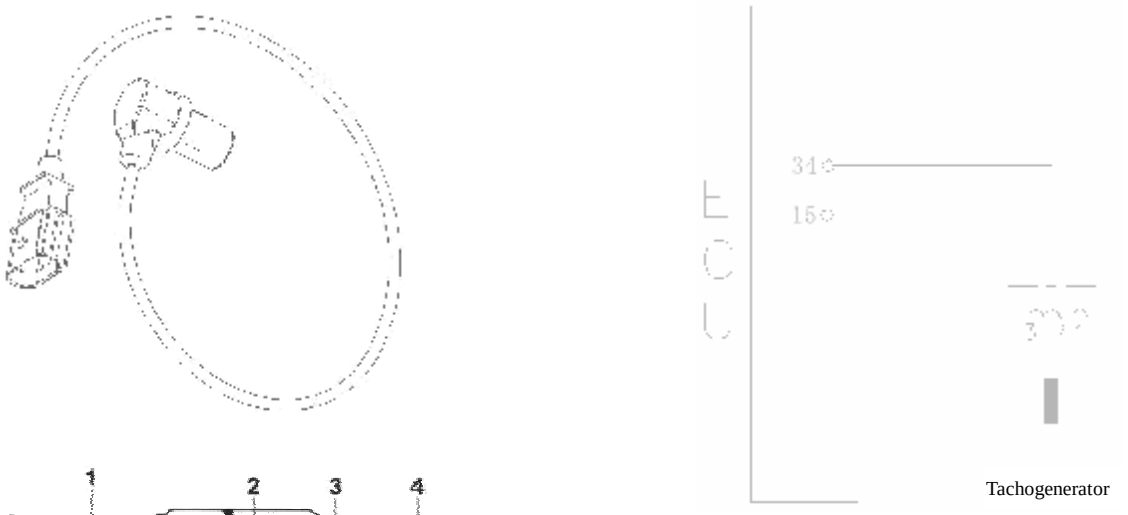
As one of the uppermost sensors of engine, the tachogenerator of engine provides ECU with rev signal, acceleration signal and crank angle signal etc. of engine. ECU will calculate injection pulse-width, injection time and ignition timing through these signals and provide the instruments with rev signal of engine.

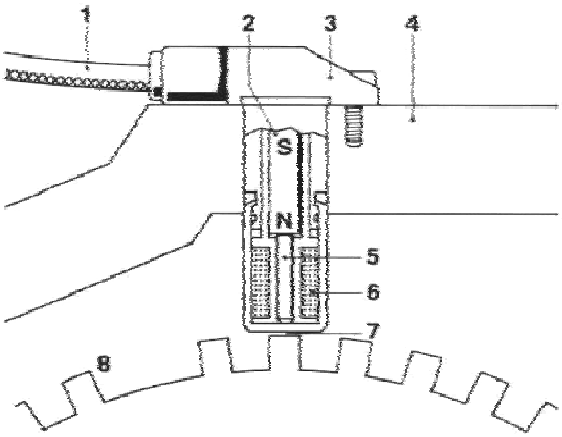
2.2 Principle of the sensor:

The inductive tachogenerator work together with pulse disc, it is used in ignition system without distributor providing engine speed and crank shaft top dead center information.

Inductive tachogenerator is made up of a permanent magnet and coil outside of magnet.

Pulse disc is a tooth disc with 60 teeth originally but there are two teeth opening. Pulse disc is assembled on crank shaft and rotate with crankshaft. When the tooth tip passes through closely the end of the inductive engine tachogenerator, the pulse disc made of the ferromagnetic material will cut the line of magnetic force of the permanent magnet in the inductive engine tachogenerator to generate inductive voltage in the coil as engine speed signal output.





1. Shielded wire
2. Permanent magnet
3. Housing of sensor
4. Installation bracket
5. Soft magnet core
6. Coil
7. Air gap
8. 60-2 gear ring