4.1 ENGINE DTC (DIAGNOSTIC TROUBLE CODE) LIST

DTC	Definition	DTC	Definition
P0107	Much lower voltage of the air intake pressure sensor	P0340	Phase sensor signal failure
P0108	Much higher voltage of the air intake pressure sensor	P0342	Much lower voltage of the phase sensor
P0112	Indicated temperature is much lower of the air intake temperature sensor	P0343	Much higher voltage of the phase sensor
P0113	Temperature is much higher indicated by the air intake temperature sensor	P0443	Canister control valve drive grade control circuit failure
P0117	Temperature is much lower indicated by engine coolant temperature sensor	P0444	Much lower voltage of canister control valve drive grade control circuit
P0118	Temperature is much higher indicated by engine coolant temperature sensor	P0445	Much higher voltage of canister control valve drive grade control circuit
P0122	The circuit voltage of throttle position sensor is much lower	P0480	Air conditioner condenser cooling fan relay control circuit failure
P0123	The circuit voltage of throttle position sensor is much higher	P0500	Unreasonable failure of speed signal
P0130	Unreasonable failure of the upstream oxygen sensor signal	P0506	Rotating speed of idle speed is lower than target idle speed
P0132	Much higher voltage of upstream oxygen sensor	P0507	Rotating speed of idle speed is higher than target idle speed
P0134	Signal failure of upstream oxygen sensor	P0508	Idle speed regulator control circuit voltage is too low
P0135	Heating circuit failure of upstream oxygen sensor	P0509	Idle speed regulator control circuit voltage is too high
P0171	Closed loop air fuel ratio control self adapting exceeds it maximum limit	P0511	Idle speed regulator control circuit failure
P0172	Closed loop air fuel ratio control self adapting exceeds it minimum limit	P0560	System voltage signal unreasonable
P0201	The 1st cylinder injector circuit failure	P0562	System voltage is too low
P0202	The 2nd cylinder injector circuit failure	P0563	System voltage is too high
P0203	The 3rd cylinder injector circuit failure	P0601	ECU testing code failure
P0204	The 4th cylinder injector circuit failure	P0602	ECU diagnosis data ID code failure
P0230	Fuel pump control circuit failure	P0645	Air conditioner compressor relay control circuit failure
P0325	Knock sensor circuit failure	P0646	Much lower voltage of air conditioner compressor relay control circuit

P0335	Crank shaft position sensor signal failure	P0647	Much higher voltage of air conditioner compressor relay control circuit
P0336	Crank shaft position sensor signal unreasonable failure	P1651	Trouble light control circuit failure

4.2 DIAGNOSIS FLOW WHEN THERE IS DIFFERENT DTC

P0107 Much lower voltage of the air intake pressure sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Observe “air intake pressure” item in data flow, if it is about 101kpa (specific data is correlated to that time air pressure).	Yes	To step No. 5
		No	Next steps
3	Take off the joint of cable air intake pressure sensor, check the voltage between pin No. 3 and pin No. 1 by multimeter and look if it is around 5V.	Yes	To step No. 5
		No	Next step
4	Check if it is short circuit to ground between ECU pin No. 17, No. 33, No. 37 and sensor connector No.1, No.3 and No. 4.	Yes	Repair or replace cable
		No	Next step
5	Start the engine at idle speed. Step on the accelerator slowly approach to open completely and observe the value changes of diagnostic tester “air intake pressure”, the changes should be not big; step on the accelerator quickly to complete open, the displayed value should be reach up to 90kpa instantaneous.	Yes	Diagnosis help
		No	Replace the sensor

DTC: P0108 Much higher voltage of the air intake pressure sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Observe “air intake pressure” item in data flow, if it is about 101kpa(specific data is correlated to that time air pressure)	Yes	To step No. 5
		No	Next steps
3	Take off the joint of cable air intake pressure sensor, check the voltage between pin No. 3 and pin No. 1 by multimeter and look if it is around 5V.	Yes	To step No. 5
		No	Next step
4	Check if it is open circuit or short circuit to power supply between ECU pin No. 17, No. 33, No. 37 and sensor connector No.1, No.3 and No. 4.	Yes	Repair or replace cable
		No	Next step
5	Start the engine at idle speed. Step on the accelerator slowly approach to open completely and observe the	Yes	Diagnosis help
		No	Replace the

	value changes of diagnostic tester “air intake pressure”, the changes should be not big; step on the accelerator quickly to complete open, the displayed value should be reach up to 90kpa instantaneous.		sensor

DTC P0112 Circuit voltage is much lower of the throttle position sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Observe “air intake temperature” item in data flow, if it is same temperature with air intake pipe(specific data is correlated to the engine temperature at that time) Notice: if the value is - 40□ there is perhaps open circuit failure in the circuit.	Yes	To step No. 5
		No	Next step
3	Take off the joint of cable air intake temperature sensor, check the resistance values using multimeter between sensor connector No. 1 and No. 2 and check if it is corresponding to its temperature (please reference the related section of this service manual)	Yes	Next step
		No	Replace sensor
4	Take off the joint of cable air intake temperature sensor, check the voltage between pin No.1 and pin No.2 by multimeter and look if it is around 5V.	Yes	To step 5
		No	Next step
5	Check if it is open circuit or short circuit to power supply between ECU pin No. 17, No. 40 and sensor connector No.1, No.2	Yes	Repair or replace cable
		No	Next step
6	Start the engine at idle speed. Observe the value changes of diagnostic tester “air intake temperature”, the value should increase with the increase of the engine intake air.	Yes	Diagnosis help
		No	Replace the sensor

DTC: P0113 Temperature is much higher indicated by the air intake temperature sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Observe “air intake temperature” item in data flow, if it is same temperature with air intake pipe(specific data is correlated to the engine temperature at that time) Notice: if the value always is - 40□ there is perhaps open circuit failure in the circuit.	Yes	To step No. 5
		No	Next step
3	Take off the joint of cable air intake temperature sensor, check the resistance values using multimeter between sensor connector No. 1 and No. 2 and check if it is corresponding to its temperature (please reference the related section of this service manual).	Yes	Next step
		No	Replace sensor
4	Take off the joint of cable air intake temperature sensor, check the voltage between pin No.1 and pin No.2 by multimeter and look if it is around 5V.	Yes	To step 5
		No	Next step

5	Check if it is short circuit to ground between ECU pin No. 17, No. 40 and sensor connector No.1, No.2	Yes	Repair or replace cable
		No	Next step
6	Start the engine at idle speed. Observe the value changes of diagnostic tester “air intake temperature”, the value should increase with the increase of the engine intake air.	Yes	Diagnosis help
		No	Replace the sensor

DTC: P0117 Temperature is much lower indicated by engine coolant temperature sensor.

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Observe “coolant temperature” item in data flow, if it is same temperature with engine temperature (specific data is correlated to the engine temperature at that time). Notice: if the value always is - 40□ there is perhaps open circuit failure in the circuit.	Yes	To step 6
		No	Next
3	Take off the joint of coolant temperature sensor on the cable, check the resistance values using multimeter between sensor connector No. 1 and No. 2 and check if it is corresponding to its temperature (please reference the related section of this service manual).	Yes	Next step
		No	Replace sensor
4	Take off the joint of coolant temperature sensor on the cable, check the voltage between pin No.1 and pin No.2 by multimeter and observe if it is around 5V.	Yes	To step 6
		No	Next step
5	Check if it is open circuit or short circuit to power supply between ECU pin No.39, No. 35 and sensor connector No.1, No.2.	Yes	Repair or replace cable
		No	Next step
6	Start the engine at idle speed. Observe the value changes of diagnostic tester “coolant temperature”, the value should increase with the increase of the engine coolant temperature.	Yes	Diagnosis help
		No	Replace sensor

DTC: P0118 Temperature is much higher indicated by engine coolant temperature sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Observe “coolant temperature” item in data flow, if it is same temperature with engine temperature (specific data is correlated to the engine temperature	Yes	To step 6
		No	Next

	at that time). Notice: if the value always is - 40□ there is perhaps open circuit failure in the circuit.		
3	Take off the joint of coolant temperature sensor on the cable, check the resistance values using multimeter between the sensor connector No. 1 and the No. 2 and check if it is corresponding to its temperature (please reference the related section of this service manual).	Yes	Next step
		No	Replace sensor
4	Take off the joint of coolant temperature sensor on the cable, check the voltage between pin No.1 and pin No.2 by multimeter and observe if it is around 5V.	Yes	To step 6
		No	Next step
5	Check if it is short circuit to ground between ECU pin No.39, No. 35 and sensor connector No.1, No.2.	Yes	Repair or replace cable
		No	Next step
6	Start the engine at idle speed. Observe the value changes of diagnostic tester “coolant temperature”, the value should increase with the increase of the engine coolant temperature.	Yes	Diagnosis help
		No	Replace sensor

DTC: P0122 Indicated temperature is much lower of the air intake temperature sensor.

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Observe “throttle valve absolute opening” item in data flow, check the value if it is between 4% and 10% (specific data is correlated to the vehicle type).	Yes	Next step
		No	To step No. 5
3	Step on the accelerator slowly to complete opening and observe “throttle valve absolute opening” item in data flow, check if the value is increased to around 85-90% with the opening of the throttle valve (specific data is correlated to the vehicle type).	Yes	Next step
		No	To step No. 5
4	Repeat step 3 and observe “throttle valve absolute opening” item in data flow, and check if there is jump during the changes.	Yes	Replace the sensor
		No	Next step
5	Take off the joint of throttle valve positioning sensor on the cable, check if there is short circuit to ground between pin No.17, No.32, No.16 of ECU and pin No.1, No.2, No.3.	Yes	Repair or replace cable
		No	Next step
6	Check the voltage between pin No.1 and pin No.2 by multimeter and observe if it is around 5V.	Yes	Replace sensor
		No	Diagnosis help

DTC: P0123 Circuit voltage is much higher of the throttle position sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Observe “throttle valve absolute opening” item in data flow, check the value if it is between 4% and 10% (specific data is correlated to the vehicle type).	Yes	Next step
		No	To step No. 5
3	Step on the accelerator slowly to complete opening and observe “throttle valve absolute opening” item in data flow, check if the value is increased to around 85-90% with the opening of the throttle valve (specific data is correlated to the vehicle type).	Yes	Next step
		No	To step No. 5
4	Repeat step 3 and observe “throttle valve absolute opening” item in data flow, and check if there is jump during the changes.	Yes	Replace the sensor
		No	Next step
5	Take off the joint of throttle valve positioning sensor on the cable, check if there is open circuit or short circuit to power supply between pin No.17, No.32, No.16 of ECU and pin No.1, No.2, No.3 of sensor	Yes	Repair or replace cable
		No	Next step
6	Check the voltage between pin No.1 and pin No.2 by multimeter and observe if it is around 5V.	Yes	Replace sensor
		No	Diagnosis help

DTC: P0130 Unreasonable failure of the upstream oxygen sensor signal

(Notice: below diagnosis process is fit for those without P0135 at the same time; if there is P0135 failure, please deal with P0135 failure at first and then check as below.)

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Start the engine and leave it at idle speed until its coolant reaches to the normal value. Observe the value changes of “oxygen sensor voltage” item on diagnostic meter, the displayed value should change rapidly from 100mV-900mV.	Yes	Diagnosis help
		No	Next step
3	Check if there is short circuit to ground between pin No.36, No.18, of ECU and pin A (opposite to oxygen sensor gray connecting line), B (opposite to oxygen sensor black connecting line).	Yes	Repair or change cable
		No	Next step

DTC: P0132 Much higher voltage of upstream oxygen sensor

(Notice: below diagnosis process is fit for those without P0135 at the same time; if there is P0135 failure, please deal with P0135 failure at first and then check as below.)

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Start the engine and leave it at idle speed until its coolant reaches to the normal value. Observe the value changes of “oxygen sensor voltage” item on diagnostic meter, the displayed value should change rapidly from 100mV-900mV.	Yes	Diagnosis help
		No	Next step
3	Check if there is short circuit to power supply between pin No.36, No.18, of ECU and pin A (opposite to oxygen sensor gray connecting line), B (opposite to oxygen sensor black connecting line).	Yes	Repair or change cable
		No	Diagnosis help
4	A, check if the exhaust system is jammed B, check if the injector is leaking C, check if the fuel pressure is over higher D, check if the valve clearance is over smaller etc.	Yes	Check and repair according to diagnosis
		No	Diagnosis help

DTC: P0134 Signal failure of upstream oxygen sensor

(Notice: below diagnosis process is fit for those without P0135 at the same time; if there is P0135 failure, please deal with P0135 failure at first and then check as below.)

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Start the engine and leave it at idle speed until its coolant temperature reaches to the normal value. Observe the value changes of “oxygen sensor voltage” item on diagnostic meter, the displayed value should change rapidly from 100mV-900mV.	Yes	Diagnosis help
		No	Next step
3	Check if there is open circuit between pin No.36, No.18, of ECU and pin A (opposite to oxygen sensor gray connecting line), B (opposite to oxygen sensor black connecting line) of sensor joint.	Yes	Repair or change cable
		No	Diagnosis help

DTC: P0135 Heating circuit failure of upstream oxygen sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Take off the oxygen sensor joint on the cable and check the voltage between the pins of C (opposite to oxygen sensor white connecting line) and D (opposite to oxygen sensor white connecting line) by multimeter, and observe if it is about 12V.	Yes	Next step
		No	To step No.4
3	Check the resistance value between oxygen sensor	Yes	Next step

	connectors C (white) and D (white) using multimeter, and observe if it is 2-5Ω when it is 20□.	No	Change sensor
4	Check the fuse inside of oxygen sensor heating circuit and observe if it is blow.	Yes	Change fuse
			Next step
5	Check if there is open circuit or short circuit to power supply between ECU pin No.1, main relay sensor No.87 and pin C (opposite to oxygen sensor white connecting line), D (opposite to oxygen sensor white connecting line) of sensor joint.	Yes	Repair or change cable
		No	Diagnosis help

DTC: P0171 Closed loop air fuel ratio control self adapting exceeds it maximum limit

(Notice: below diagnosis flow is fit for when air intake pressure sensor failure, canister control valve failure and oxygen sensor failure are not appeared at the same time; if there are failures existing at the same time please deal with other failures at first and then do as below.)

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Start the engine and leave it at idle speed until its coolant temperature reaches to the normal value. Observe the value changes of “oxygen sensor voltage” item on diagnostic meter, and the displayed value keeps around the value of 100mV at some working conditions.	Yes	Next step
		No	Diagnosis help
3	Connect the fuel pressure meter (connection position is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check the fuel pressure at idle speed conditions if it is around 260kpa; take off the vacuum pipe on fuel pressure regulator, check the pressure and observe if it is around 300kpa.	Yes	Repair or replace the cable
		No	Next step
4	Check if there is short circuit to ground between ECU pin No.36, No.18 and pin A (opposite to oxygen sensor gray connecting line), pin B (opposite to oxygen sensor black connecting line) of sensor joint.	Yes	Repair or replace cable
		No	Next step
5	A, check if there is a heavy leaking in air intake system B, check if the injector is jammed C, check if the clearance of spark plug is too big D, check if the sub live wire resistance is too big E, check if the valve clearance is too big etc.	Yes	Repair according to diagnosis data
		No	Diagnosis help

DTC: P0172 Closed loop air fuel ratio control self adapting exceeds it minimum limit

(Notice: below diagnosis flow is fit for when air intake pressure sensor failure, canister control valve failure and oxygen sensor failure are not appeared at the same time; if there are failures existing at the same time please deal with other failures at first and then do as below.)

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to "ON"		Next step
2	Start the engine and leave it at idle speed until its coolant temperature reaches to the normal value. Observe the value changes of "oxygen sensor voltage" item on diagnostic meter, and the displayed value keeps around the value of 900mV at some working conditions.	Yes	Next step
		No	Diagnosis help
3	Connect the fuel pressure meter (connection position is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check the fuel pressure at idle speed conditions if it is around 260kpa; take off the vacuum pipe on fuel pressure regulator, check the pressure and observe if it is around 300kpa.	Yes	Repair or replace the cable
		No	Check and repair fuel system
4	Check if there is short circuit to power supply between ECU pin No.36, No.18 and pin A (opposite to oxygen sensor gray connecting line), pin B (opposite to oxygen sensor black connecting line) of sensor joint.	Yes	Repair or replace cable
		No	Next step
5	A, check if the injector is leaking B, check if the exhaust pipe is jammed C, check if the valve clearance is too small etc.	Yes	Repair according to diagnosis data
		No	Diagnosis help

DTC: P0201 The 1st cylinder injector circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to "ON"		Next step
2	Take off the 1st cylinder injector joint from the cable, check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between the 1st injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
4	Check the resistance value by multimeter between 1st cylinder injector pin No.1 and No.2, and observe if it is 11-13Ω when it is 20℃.	Yes	Next step
		No	Change injector
5	Check the voltage value by multimeter between 1st	Yes	Repair according to

	cylinder injector pin No.2 and power supply cathode, and observe if it is around 3.7V.		diagnosis data
		No	Diagnosis help
6	Check if there is open circuit or short circuit to ground between 1st cylinder injector joint pin No.2 and the ECU pin No.27.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0202 The 2nd cylinder injector circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the 2nd cylinder injector joint from the cable, check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between the 2nd injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
4	Check the resistance value by multimeter between 2nd cylinder injector pin No.1 and No.2, and observe if it is 11-13Ω when it is 20℃.	Yes	Next
		No	Change injector
5	Check the voltage value by multimeter between 2nd cylinder injector pin No.2 and power supply cathode, and observe if it is around 3.7V.	Yes	Diagnosis help
		No	Next step
6	Check if there is open circuit or short circuit to ground between 2nd cylinder injector joint pin No.2 and the ECU pin No.6.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0203 The 3rd cylinder injector circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the 3rd cylinder injector joint from the cable, check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between the 3rd injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
4	Check the resistance value by multimeter between 3rd cylinder injector pin No.1 and No.2, and observe if it is 11-13Ω when it is 20℃.	Yes	Next step
		No	Change injector
5	Check the voltage value by multimeter between 3rd	Yes	Diagnosis help

	cylinder injector pin No.2 and power supply cathode, and observe if it is around 3.7V.	No	Next step
6	Check if there is open circuit or short circuit to ground between 3rd cylinder injector joint pin No.2 and the ECU pin No.7.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0204 The 4th cylinder injector circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to "ON"		Next step
2	Take off the 4th cylinder injector joint from the cable, check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between the 4th injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
4	Check the resistance value by multimeter between 4th cylinder injector pin No.1 and No.2, and observe if it is 11-13Ω when it is 20℃.	Yes	Next step
		No	Replace injector
5	Check the voltage value by multimeter between 4th cylinder injector pin No.2 and power supply cathode, and observe if it is around 3.7V.	Yes	Diagnosis help
		No	Next step
6	Check if there is open circuit or short circuit to ground between 4th cylinder injector joint pin No.2 and the ECU pin No.47.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0230 Fuel pump control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to "OFF"		Next step
2	Take off the fuel pump relay and put ignition switch to "ON", check the voltage separately between fuel pump relay power supply ends - that is relay pin No. 30 and No.86 and power supply cathode, and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the relay power supply ends circuit.	Yes	Repair or replace the cable
		No	To step No.2
4	Check the voltage by multimeter between fuel pump relay control ends that is relay pin No. 85 and power supply cathode and observe if it is around 3.7V.	Yes	Replace fuel pump relay
		No	Next step
5	Check if there is open circuit or short circuit to ground	Yes	Repair or replace

	or to power supply between relay control ends that is relay pin No.85 and ECU pin No.69.		cable
		No	Diagnosis help

DTC: P0325 Knock sensor circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”		Next step
2	Take off the knock sensor joint from the cable; check the resistance value by multimeter between knock sensor connector No.1and No.2 and observe if it is 1MΩ.	Yes	Next step
		No	Change sensor
3	Check if there is open circuit or short circuit to ground or to power supply between circuit of knock sensor joint No.1, No.2 and ECU pin No.19, No. 20	Yes	Repair or replace the cable
		No	To step No.2
4	Replace the knock sensor according to the regulation; try running the vehicle and make the engine speed exceed 2200rpm. Check if the DTC P0325 will appear again.	Yes	Diagnosis help
		No	Check if it is a occasional fault

DTC: P0335 Crank shaft position sensor signal failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”		Next step
2	Take off the speed sensor joint from the cable; check the resistance value by multimeter between speed sensor connector No.2and No.3 and observe if it is around 770-950MΩwhen it is 20℃	Yes	Next step
		No	Replace sensor
3	Check if there is open circuit or short circuit to ground or to power supply between circuit of speed sensor joint No.2, No.3 and ECU pin No.34, No. 15	Yes	Repair or replace the cable
		No	Next step
4	Check the flywheel signal disc if it is in good conditions.	Yes	Diagnosis help
		No	Replace signal disc

DTC: P0336 Crank shaft position sensor signal unreasonable failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”		Next step
2	Take off the speed sensor joint from the cable; check the resistance value by multimeter between speed sensor connector No.2and No.3 and observe if it is around 770-950MΩwhen it is 20℃	Yes	Next step
		No	Replace sensor

3	Check if there is open circuit or short circuit to ground or to power supply between circuit of speed sensor joint pin No.2, No.3 and ECU pin No.34, No. 15	Yes	Repair or replace the cable
		No	Next step
4	Check the flywheel signal disc if it is in good conditions.	Yes	Diagnosis help
		No	Replace signal disc

DTC: P0340 Phase sensor signal failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the phase sensor joint from the cable; check the voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between circuit of phase sensor joint pin No.3 and main relay pin No.87; check if there is bad contact of phase sensor connector No.1.	Yes	Repair or replace the cable
		No	Next step
4	Check the voltage if it is around 9.9V between phase sensor joint pin No.2 and power supply cathode.	Yes	To step 6
		No	Next step
5	Check if there is open circuit or short circuit to power supply or to ground between phase sensor joint pin No.2 and ECU pin No.79.	Yes	Repair or replace cable
		No	Next step
6	Check the camshaft signal disc if it is in good conditions.	Yes	Diagnosis help
		No	Replace signal disc

DTC: P0342 Much lower voltage of the phase sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the phase sensor joint from the cable; check the voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between circuit of phase sensor joint pin No.3 and main relay pin No.87; check if there is bad contact of phase sensor connector No.1.	Yes	Repair or replace the cable
		No	Next step
4	Check the voltage if it is around 9.9V between phase sensor joint pin No.2 and power supply cathode.	Yes	To step 6
		No	Next step
5	Check if there is open circuit or short circuit to power supply or to ground between the circuit of phase sensor joint pin No.2 and ECU pin No.79.	Yes	Repair or replace cable
		No	Next step
6	Check the camshaft signal disc if it is in good conditions.	Yes	Diagnosis help
		No	Replace signal disc

DTC: P0343 Much higher voltage of the phase sensor

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the phase sensor joint from the cable; check the voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground between circuit of phase sensor joint pin No.3 and main relay pin No.87; check if there is bad contact of phase sensor connector No.1.	Yes	Repair or replace the cable
		No	Next step
4	Check the voltage if it is around 9.9V between phase sensor joint pin No.2 and power supply cathode.	Yes	To step 6
		No	Next step
5	Check if there is open circuit or short circuit to power supply or to ground between the circuit of phase sensor joint pin No.2 and ECU pin No.79.	Yes	Repair or replace cable
		No	Next step
6	Check the camshaft signal disc if it is in good conditions.	Yes	Diagnosis help
		No	Replace signal disc

DTC: P0443 Canister control valve drive grade control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the canister control valve joint from the cable; check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the canister control valve power supply ends circuit.	Yes	Repair or replace the cable
		No	To step No.2
4	Check the resistance value if it is around 22-30Ωwhen it is 20℃ between canister control valve pin No.1 and pin No.2.	Yes	Next step
		No	Replace the valve
5	Check the voltage if it is around 3.7V between canister control valve joint pin No.1 and power supply cathode.	Yes	Diagnosis help
		No	Next step
6	Check if there is open circuit between the circuit of canister joint pin No.2 and ECU pin No. 46.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0444 Much lower voltage of canister control valve drive grade control circuit

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the canister control valve joint from the cable; check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the canister control valve power supply ends circuit.	Yes	Repair or replace the cable
		No	To step No.2
4	Check the resistance value if it is around 22-30Ω when it is 20℃ between canister control valve pin No.1 and pin No.2.	Yes	Next step
		No	Replace the valve
5	Check the voltage by the multimeter if it is around 3.7V between canister control valve joint pin No.1 and power supply cathode.	Yes	Diagnosis help
		No	Next step
6	Check if there is short circuit to ground between the circuit of canister joint pin No.2 and ECU pin No. 46.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0445 Much higher voltage of canister control valve drives grade control circuit

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”		Next step
2	Take off the canister control valve joint from the cable; check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the canister control valve power supply ends circuit.	Yes	Repair or replace the cable
		No	To step No.2
4	Check the resistance value if it is around 22-30Ωwhen it is 20℃ between canister control valve pin No.1 and pin No.2.	Yes	Next step
		No	Replace the valve
5	Check the voltage by the multimeter if it is around 3.7V between canister control valve joint pin No.1 and power supply cathode.	Yes	Diagnosis help
		No	Next step
6	Check if there is short circuit to power supply between the circuit of canister joint pin No.2 and ECU pin No. 46.	Yes	Repair or replace cable

		No	Diagnosis help

DTC: P0480 Air conditioner condenser cooling fan relay control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”		Next step
2	Take off the air conditioner condenser cooling fan relay; put the ignition switch to “ON” position, and check the voltage value by multimeter between this relay power supply end that is relay pin No.30, No.85 and power supply cathode if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the air conditioner cooling fan relay power supply end circuit.	Yes	Repair or replace the cable
		No	To step No.2
4	Check the voltage by the multimeter if it is around 3.7V between air conditioner condenser cooling fan relay control ends that is relay pin No.86 and power supply cathode.	Yes	Replace relay
		No	Next step
5	Check if there is open circuit or short circuit to power supply or to ground between the circuit of relay control end pin No.86 and ECU pin No. 50.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0500 Unreasonable failure of speed signal

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	If it is a vehicle with ABS, please check if there is ABS DTC.	Yes	Check and repair ABS system
		No	Next step
3	Check if the speedometer finger works normally.	Yes	Next step
		No	Check the speedometer line
4	Check if the speed sensor works normally.	Yes	Next step
		No	Replace speed sensor
5	Check if there is open circuit or short circuit to power	Yes	Repair or

	supply or to ground between the circuit of speed sensor and ECU pin No. 59.		replace cable
		No	Diagnosis help

DTC: P0506 Rotating speed of idle speed is lower than target idle speed

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Check if the throttle valve adjusting screw, accelerator cable and throttle valve working in good conditions.	Yes	Next step
		No	Carry out the necessary repair and maintenance
3	Check if the idle speed regulator works in good conditions.	Yes	Next step
		No	Carry out the necessary repair and maintenance
4	E, check if the pressure of the fuel supplying system is too low F, check if the injector is jammed G, check if the exhaust system is not straightway	Yes	Next step
		No	Replace speed sensor

DTC: P0507 Rotating speed of idle speed is higher than target idle speed

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”		Next step
2	Check if the throttle valve adjusting screw, accelerator cable and throttle valve working in good conditions.	Yes	Next step
		No	Carry out the necessary repair and maintenance
3	Check if the idle speed regulator works in good conditions.	Yes	Next step
		No	Carry out the necessary repair and maintenance
4	A, check if the system is leaking; B, check if the injector is leaking; C, check if the pressure of fuel supplying system is too high	Yes	Carry out the necessary repair and maintenance
		No	Diagnosis help

DTC: P0508 Idle speed regulator control circuit voltage is too low

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Take off the idle regulator joint and Check the resistance value between idle speed regulator pin A and pin D, pin B and pin C if it is around 53±5.3Ω when it is 20℃.	Yes	Next step
		No	Replace step motor
3	Check if there is short circuit to ground between the circuits of idle speed regulator joint pin A, B, C, D and ECU pin No. 65, No.66, No.67. No.64.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0509 Idle speed regulator control circuit voltage is too high

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Take off the idle regulator joint and check the resistance value by multimeter separately between idle speed regulator pin A and pin D, pin B and pin C if it is around 53±5.3Ω when it is 20℃.	Yes	Next step
		No	Replace step motor
3	Check using multimeter separately if there is short circuit to power supply between the circuits of idle speed regulator joint pin A, B, C, D and ECU pin No. 65, No.66, No.67. No.64.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0511 Idle speed regulator control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Take off the idle regulator joint and check the resistance value by multimeter separately between idle speed regulator pin A and pin D, pin B and pin C if it is around 53±5.3Ω when it is 20℃.	Yes	Next step
		No	Replace step motor
3	Check using multimeter separately if there is open circuit between the circuits of idle speed regulator joint pin A, B, C, D and ECU pin No. 65, No.66, No.67. No.64.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0560 System voltage signal unreasonable

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step

2	Check the accumulator voltage by multimeter if it is around 12V.	Yes	Next step
		No	Replace accumulator
3	Check if there is open circuit or short circuit to ground between the circuits of ECU pin No.44, No.45, No.63 and main relay pin No.87.	Yes	Repair or replace cable
		No	Next step
4	Start the engine and check if the entire generator recharging voltage is around 9-16V at the different engine speed.	Yes	Next step
		No	Replace generator
5	Check the engine cable harness contact position if it is in good conditions.	Yes	Diagnosis help
		No	Repair or replace cable

DTC: P0562 System voltage is too low

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Check the accumulator voltage by the multimeter and observe if it is around 12V.	Yes	Next step
		No	Replace accumulator
3	Check if the resistance is over big between the circuits of ECU pin No.44, No.45, No.63 and main relay pin No.87.	Yes	Repair or replace cable
		No	Next step
4	Start the engine and check if the entire generator recharging voltage is around 9-16V at the different engine speed.	Yes	Next step
		No	Replace generator
5	Check the engine cable harness contact position if it is in good conditions.	Yes	Diagnosis help
		No	Repair or replace cable

DTC: P0563 System voltage is too high

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Check the accumulator voltage by the multimeter and observe if it is around 12V.	Yes	Next step
		No	Replace accumulator
3	Start the engine and check if the entire generator recharging voltage is around 9-16V at the different engine speed.	Yes	Next step
		No	Replace generator
4	Check the engine cable harness contact position if it is in good conditions.	Yes	Diagnosis help
		No	Repair or replace

			cable

DTC: P0601 ECU testing code failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Clean up the DTC and check the failure once again if it is a steady failure.	Yes	Next step
		No	System if correct
3	Replace ECU	Finish	

DTC: P0602 ECU diagnosis data ID code failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Clean up the DTC and check the failure once again if it is a steady failure.	Yes	Next step
		No	System if correct
3	Replace ECU	Finish	

DTC: P0645 Air conditioner compressor relay control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Take off air conditioner compressor relay; put ignition switch to “ON”, check the voltage value between relay power supply ends that relay pin No.30, No.85 and power cathode and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the relay power supplying ends circuit.	Yes	Repair or replace cable
		No	To step No.2
4	Check the voltage value by the multimeter between air conditioner compressor relay control ends that is relay pin No.86 and power cathode and observe if it is around 3.7V.	Yes	Replace relay
		No	Next step
5	Check if there is open circuit between the circuit of air conditioner compressor relay control ends that is relay pin No.86 and ECU pin No.70.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0646 Much lower voltage of air conditioner compressor relay control circuit

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Take off air conditioner compressor relay; put ignition switch to “ON”, check the voltage value between relay power supply ends that relay pin No.30, No.85 and power cathode and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the relay power supplying ends circuit.	Yes	Repair or replace cable
		No	To step No.2
4	Check the voltage value by the multimeter between air conditioner compressor relay control ends that is relay pin No.86 and power cathode and observe if it is around 3.7V.	Yes	Replace relay
		No	Next step
5	Check if there is short circuit to ground between the circuit of air conditioner compressor relay control ends that is relay pin No.86 and ECU pin No.70.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P0647 Much higher voltage of air conditioner compressor relay control circuit

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “OFF”.		Next step
2	Take off air conditioner compressor relay; put ignition switch to “ON”, check the voltage value between relay power supply ends that relay pin No.30, No.85 and power cathode and observe if it is around 12V.	Yes	To step No.4
		No	Next step
3	Check if there is open circuit or short circuit to ground of the relay power supplying ends circuit.	Yes	Repair or replace cable
		No	To step No.2
4	Check the voltage value by the multimeter between air conditioner compressor relay control ends that is relay pin No.86 and power cathode and observe if it is around 3.7V.	Yes	Replace relay
		No	Next step
5	Check if there is short circuit to power supply between the circuit of air conditioner compressor relay control ends that is relay pin No.86 and ECU pin No.70.	Yes	Repair or replace cable
		No	Diagnosis help

DTC: P1651 Trouble light control circuit failure

No.	Operating steps	Result	Follow up steps
1	Connect the diagnostic tester and commutator, put the ignition switch to “ON”.		Next step
2	Carry out action test to engine trouble light by using diagnostic meter “actuator action test” item; and observe the indicator if it is always at the status of extinguishing or lighting on.	Yes	Next step
		No	System is correct
3	Check if there is open circuit or short circuit to ground of the engine trouble light power supplying circuit.	Yes	Repair or replace cable
		No	Next step
4	Check if there is open circuit or short circuit to power supply or short circuit to ground between the circuit of engine trouble light control ends and ECU pin No. 28.	Yes	Repair or replace cable
		No	Diagnosis help

5. TYPICAL FAILURE AND ITS DIAGNOSIS FLOW

5.1 EXPLANATION

Carry out the primary inspection before start the diagnosing according to the engine failure phenomenon.

1) Make sure the engine trouble light is working properly;
2) Make sure that there is no failure information record checked by diagnostic meter;
3) Make sure that the failure phenomenon exists according to the customers’ complaints , and confirm the conditions causing the failure.

Then carry out the exterior inspection:

(1) Check if there is any fuel pipe is leaking;

(2) Check if the vacuum pipe is broken, kinked up or linked correctly;

(3) Check if the air intake pipe is jammed, leaking, staved or damaged;

(4) Check the high voltage line of ignition system if it is broken or aging and if the ignition order is correct;

(5) Check the cable grounding place if it is clean and fastness;

（6） Check the sensor and actuator joint if it is loosening or bad contact.

Important notice: if the above phenomenon is appeared, you should repair the above the failure at first otherwise it will influence the later service.

Diagnosis help:1 Confirm there is no engine failure record;

2 Confirm that the failure exists before the customer complaints;

3 Inspect the engine according to the above steps and find nothing wrong;

4 During the service please do not ignore the influence from vehicle maintenance, cylinder pressure, mechanical ignition timing and fuel conditions;

5 Replace ECU and carry out test. If the failure is deleted, the failure is in ECU; if the failure can not be deleted, replace back to the original ECU and repeat the flow and check and repair it again.

5.2 TYPICAL FAILURE DIAGNOSIS FLOW

1. The engine does not rotate or rotate slowly when it is started

The normal failure component: 1) accumulator; 2) starting motor; 3) cable or ignition switch; 4) mechanical part of the engine.

The general diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the voltage value between the two wiring terminals of the accumulator by multimeter; check if it is around 8-12V when the engine is starting.	Yes	Next step
		No	Replace accumulator
2	Put the ignition switch at start position, checking the anode terminal of starting motor by multimeter and observe the voltage if it is above 8V.	Yes	Next step
		No	Repair or replace cable
3	Disassemble the starting motor and check its working conditions. Check if there is open circuit or jammed by poor lubricating.	Yes	Repair or replace starting motor
		No	Next step
4	If the failure is happened in winter time, check if it is because of the wrong engine lubricant and gearbox oil causes the big resistance of the starting motor.	Yes	Change to correct lubricant
		No	Next step
5	Check the mechanical resistance inside of the engine if it is too big causes the starting motor can not rotate or rotate slowly.	Yes	Repair the engine inside resistance
		No	Repeat the above steps

2. The engine can draw rotating but can not start successfully when it is started.

General failure component: 1) no fuel in fuel tank; 2) fuel pump; 3) speed sensor; 4) ignition coil; 5) engine mechanical part.

Diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); starting the engine by starter and check fuel pressure if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
2	Connect EFI diagnostic meter; observe “engine speed” data item and start the engine and check if there is rotation speed signal is output.	Yes	Next step
		No	Repair the sensor cable
3	Pull off one of the cylinder separating line and take off this cylinder injector joint and connect spark plug to it; keep the spark electrode around 5mm away from engine body; start the engine by starter and check if there is blue and white high pressure fire.	Yes	Next step
		No	Repair the ignition system
4	Check the pressure of each engine cylinder; check if there is engine cylinder insufficient pressure.	Yes	Eliminate engine mechanical failure
		No	Next step
5	Check if the power supply to ECU pin No.12, 13, 44, 45, 63 is correct; check if the pin armature of No. 3, 51, 53, 61, 80 are working correctly.	Yes	Diagnosis help
		No	Check the corresponding line

3. It is hard to start the heating car.

General failure component: 1) water inside of fuel; 2) fuel pump; 3) coolant temperature sensor; 4) fuel pressure regulator vacuum pipe; 5) ignition coil.

General diagnostic flow

No.	Operating steps	Result	Follow up steps
1	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); starting the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
2	Pull off one of the cylinder separating line and connect spark plug to it; keep the spark electrode around 5mm away from engine body; start the engine and check if there is blue and white high pressure fire.	Yes	Next step
		No	Repair the ignition system
3	Take off the coolant temperature sensor joint and start the engine; observe if the engine can be started successfully. (or serial connecting a 300Ωresistance at the joint of coolant temperature sensor; observe if we can start the engine)	Yes	Repair circuit or replace sensor
		No	Next step
4	Check if there if loosen or leaking of the fuel pressure regulator vacuum pipe..	Yes	Repair or replace
		No	Next step
5	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Change fuel
		No	Diagnosis help
6	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
			Check correspond circuit

4. It's hard to start the cold car.

General failure component: 1), water in the fuel; 2), fuel pump; 3), coolant temperature sensor; 4), injector; 5), ignition coil; 6), throttle valve and idle speed by pass port; 7), engine mechanical part.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
2	Pull off one of the cylinder separating line and connect spark plug to it; keep the spark electrode around 5mm away from engine body; start the engine and check if there is blue and white high pressure fire.	Yes	Next step
		No	Check and repair ignition system
3	Take off the coolant temperature sensor joint and start the engine; observe if the engine can be started successfully. (or serial connecting a 2500Ωresistance at the joint of coolant temperature sensor; observe if we can start the engine)	Yes	Repair circuit or replace sensor
		No	Next step
4	Step on the accelerator slightly and observe if it is easy to be started	Yes	Clean throttle valve and idle speed air port
		No	Next step
5	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace the part
		No	Next step
6	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Change fuel
		No	Next step
7	Check pressure conditions of every cylinder and observe if there is insufficient pressure	Yes	Trouble shoot
		No	Next step
8	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Check correspond circuit

5. Normal engine speed but hard to start at any time.

General failure component: 1), water in fuel; 2), fuel pump; 3), coolant temperature sensor; 4), injector; 5), ignition coil; 6), throttle valve and idle speed by pass port; 7), air intake port; 8), ignition timing; 9), spark plug; 10), engine mechanical part.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake port if it is leaking.	Yes	Repair the air intake system
		No	Next step
2	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
3	Pull off one of the cylinder separating line and connect spark plug to it; keep the spark electrode around 5mm away from engine body; start the engine and check if there is blue and white high pressure fire.	Yes	Next step
		No	Check and repair ignition system
4	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
5	Take off the coolant temperature sensor joint and start the engine; observe if the engine can be started successfully.	Yes	Repair circuit or replace sensor
		No	Next step
6	Step on the accelerator slightly and observe if it is easy to be started easily.	Yes	Clean throttle valve and idle speed air port
		No	Next step
7	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace the part
		No	Next step
8	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Change fuel
		No	Next step
9	Check pressure conditions of every cylinder and observe if there is insufficient pressure	Yes	Trouble shoot
		No	Next step
10	Check the engine ignition order and ignition timing if it is accord with the regulation.	Yes	Next step
		No	Repair the ignition timing

6. Regular starts but the idle speed is not steady at any time.

General failure component: 1), water in fuel; 2), injector; 3), spark plug; 4), throttle valve and idle speed by pass port; 5), air intake port; 6), idle speed regulator; 7), ignition timing; 8), spark plug; 9), engine mechanical.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake port if it is leaking.	Yes	Repair the air intake system
		No	Next step
2	Check idle speed regulator if it is partial blocked	Yes	Clean or replace
		No	Next step
3	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
4	Check the throttle valve and idle speed by pass if there is carbon deposition.	Yes	Cleaning
		No	Next step
5	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace part
		No	Next step
6	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Change fuel
		No	Next step
7	Check pressure conditions of every cylinder and observe if there is big pressure difference between the cylinders.	Yes	Trouble shoot
		No	Next step
8	Check the engine ignition order and ignition timing if it is accord with the regulation.	Yes	Next step
		No	Repair the ignition timing
9	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair the corresponding line

7. Regular starts but the idle speed is not steady during engine heating.

General failure component: 1), water in fuel; 2), coolant temperature sensor; 3), spark plug; 4), throttle valve and idle speed by pass port; 5), air intake port; 6), idle speed regulator; 7), engine mechanical.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake port if it is leaking.	Yes	Repair the air intake system
		No	Next step
2	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
3	Disassemble the idle speed regulator and check the throttle valve and idle speed by pass port if there is carbon deposition	Yes	Cleaning the related parts
		No	Next step
4	Pull off coolant temperature sensor joint and start the engine; observe the engine if it is idle speed unsteady during warming up the engine.	Yes	Repair the line or replace sensor
		No	Next step
5	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed or overflowing.	Yes	Replace part
		No	Next step
6	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Change fuel
		No	Next step
7	Check pressure conditions of every cylinder and observe if there is big pressure difference between the cylinders.	Yes	Trouble shoot
		No	Next step
8	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair the corresponding line

8. Regular starts but idle speed is not steady after the engine heating.

General failure component: 1), water in fuel; 2), coolant temperature sensor; 3), spark plug; 4),throttle valve and idle by pass port; 5), air intake port; 6), idle speed regulator; 7), engine mechanical part.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake port if it is leaking.	Yes	Repair the air intake system
		No	Next step
2	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
3	Disassemble the idle speed regulator and check the throttle valve and idle speed by pass port if there is carbon deposition	Yes	Cleaning the related parts
		No	Next step
4	Pull off coolant temperature sensor joint and start the engine; observe the engine if it is idle speed unsteady during warming up the engine.	Yes	Repair the line or replace sensor
		No	Next step
5	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed or overflowing.	Yes	Replace part
		No	Next step
6	Check fuel conditions and check if the failure is appeared just after the fuel refilling	Yes	Change fuel
		No	Next step
7	Check pressure conditions of every cylinder and observe if there is big pressure difference between the cylinders.	Yes	Trouble shoot
		No	Next step
8	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair the corresponding line

9. Regular starts but idle speed is not steady or dying out when there is partial loading.

General failure component: 1) air conditioner system; 2) idle speed regulator; 3) injector.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Disassemble the idle speed regulator and check the throttle valve and idle speed by pass port if there is carbon deposition.	Yes	Cleaning the related parts
		No	Next step
2	Observe if the engine output power increased when the air conditioner is switched on, that is using EFI system diagnosis meter observing ignition angle of advance, fuel injection pulse width and changes of air intake flow.	Yes	To step No.4
		No	Next step
3	Connect EFI system adaptor; break connecting line of ECU pin No.75; check the cable end if it is up level signal when the air conditioner is switched on.	Yes	Next step
		No	Repair air conditioning system
4	Check air conditioning system pressure; check the compressor solenoid clutch and air conditioner compressor pump fuel conditions and check if it is working correctly.	Yes	Next step
		No	Repair the air conditioning sys.
5	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed or overflowing.	Yes	Replace fault part
		No	Next step
6	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair the corresponding line

10. Regular starts with high idle speed.

General failure component: 1) throttle valve and idle speed by pass port; 2) vacuum pipe; 3) idle speed regulator; 4) coolant temperature sensor; 5) ignition timing.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check accelerator cable if it is blocked or over tightening	Yes	Adjust
		No	Next step
2	Check the air intake system and its connecting vacuum pipe if it is leaking.	Yes	Repair the air in taking system
		No	Next step
3	Disassemble the idle speed regulator and check the throttle valve and idle speed by pass port if there is carbon deposition	Yes	Clean related part
		No	Next step
4	Take off the coolant temperature sensor joint; start the engine and observe if it has high idle speed.	Yes	Repair line or replace sensor
		No	Next step
5	Check the engine ignition timing if it is accord with the regulations.	Yes	Next step
		No	Repair the ignition timing
6	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair the corresponding line

11. Low engine speed or dying out exists when it is accelerated.

General failure component: 1) water in fuel; 2) air intake pressure sensor and throttle position sensor; 3) spark plug; 4) throttle valve and idle speed by pass port; 5) air intake port; 6) idle speed regulator; 7) injector; 8) ignition timing; 9) exhaust pipe.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed.	Yes	Repair the air intake system
		No	Next step
2	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
3	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
4	Disassemble idle speed regulator and check throttle valve, idle speed regulator and idle speed by pass port if there is carbon deposition.	Yes	Clean related part
		No	Next step
5	Inspect air intake pressure sensor, throttle position sensor and its line if it is working correctly.	Yes	Next step
		No	Repair line or replace sensor
6	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace fault part
		No	Next step
7	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Replace fuel
		No	Next step
8	Check the engine ignition order and ignition timing if it is accord with the regulation.	Yes	Next step
		No	Repair ignition timing
9	Check the exhaust pipe if the air exhausting is smooth	Yes	Next step
		No	Repair or replace exhaust pipe
10	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair corresponding line

12. React slowly when it is accelerated.

General failure component: 1) water in fuel; 2) air intake pressure sensor and throttle position sensor; 3) spark plug; 4) throttle valve and idle speed by pass port; 5) air intake port; 6) idle speed regulator; 7) injector; 8) ignition timing; 9) exhaust pipe.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed.	Yes	Repair the air intake system
		No	Next step
2	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
3	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
4	Disassemble idle speed regulator and check throttle valve, idle speed regulator and idle speed by pass port if there is carbon deposition.	Yes	Clean related part
		No	Next step
5	Inspect air intake pressure sensor, throttle position sensor and its line if it is working correctly.	Yes	Next step
		No	Repair line or replace sensor
6	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace fault part
		No	Next step
7	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Replace fuel
		No	Next step
8	Check the engine ignition order and ignition timing if it is accord with the regulation.	Yes	Next step
		No	Repair ignition timing
9	Check the exhaust pipe if the air exhausting is smooth	Yes	Next step
		No	Repair or replace exhaust pipe
10	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair corresponding line

13. The performance is poor when it is accelerated.

General failure component:1) water in fuel; 2) air intake pressure sensor and throttle position sensor; 3) spark plug; 4) ignition coil; 5) throttle valve and idle speed by pass port; 6) air intake port;7) idle speed regulator; 8) injector; 9) ignition timing; 10) exhaust pipe.

General diagnosis flow:

No.	Operating steps	Result	Follow up steps
1	Check if there are failures like clutch skidding, low tyre pressure, brake dragging, wrong tyre size, and wrong four wheel positioning etc..	Yes	Repair
			Next step
2	Check the air cleaner if it is jammed.	Yes	Repair the air intake system
		No	Next step
3	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake pipe); start the engine and check fuel pressure at idle speed if it is around 260kpa; take off the vacuum pipe from fuel pressure regulator check the fuel pressure if it is around 300kpa.	Yes	Next step
		No	Repair the fuel supplying system
4	Pull off one of the cylinder separating line and connect spark plug to it; keep the spark electrode around 5mm away from engine body; start the engine and check the high pressure fire strength if it is regular.	Yes	Next step
		No	Repair ignition system
5	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	Yes	Next step
		No	Adjust or replace
6	Disassemble idle speed regulator and check throttle valve, idle speed regulator and idle speed by pass port if there is carbon deposition.	Yes	Clean related part
		No	Next step
7	Inspect air intake pressure sensor, throttle position sensor and its line if it is working correctly.	Yes	Next step
		No	Repair line or replace sensor
8	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace fault part
		No	Next step
9	Check fuel conditions and check if the failure is appeared after the fuel refilling	Yes	Replace fuel
		No	Next step
10	Check the engine ignition order and ignition timing if it is accord with the regulation.	Yes	Next step
		No	Repair ignition timing

11	Check the exhaust pipe if the air exhausting is smooth	Yes	Next step
		No	Repair or replace exhaust pipe
12	Connect EFI system adaptor, turn on the ignition switch; check the power supply of pin No.12, 13, 44, 45 and No.63 if it is in right conditions; check pin armature of No.3, 51, 53, 61 and No.80 if it is in right conditions.	Yes	Diagnosis help
		No	Repair corresponding line