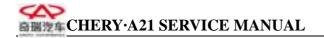


4.1 ENGINE DTC (DIAGNOSTIC TROUBLE CODE) LIST

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
	Observe "air intake pressure" item in data flow, if it is	Yes	To step No. 5
2	about 101kpa (specific data is correlated to that time air pressure).	No	Next steps
	Take off the joint of cable air intake pressure sensor,	Yes	To step No. 5
3	check the voltage between pin No. 3 and pin No. 1 by multimeter and look if it is around 5V.	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,	Yes	Repair or replace cable
	No.3 and No. 4.	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	Yes	Diagnosis help
5	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.	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
	Observe "air intake pressure" item in data flow, if it is	Yes	To step No. 5
2	about 101kpa(specific data is correlated to that time air pressure)	No	Next steps
	Take off the joint of cable air intake pressure sensor,	Yes	To step No. 5
3	check the voltage between pin No. 3 and pin No. 1 by multimeter and look if it is around 5V.	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	Yes	Repair or replace cable
	connector No.1, No.3 and No. 4.	No	Next step
5	Start the engine at idle speed. Step on the accelerator	Yes	Diagnosis help
	slowly approach to open completely and observe the	No	Replace the



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



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
	Observe "air intake temperature" item in data flow, if it is	Yes	To step No. 5
2	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.	No	Next step
	Take off the joint of cable air intake temperature sensor,	Yes	Next step
3	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)	No	Replace sensor
	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
4		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
	Start the engine at idle speed. Observe the value changes	Yes	Diagnosis help
6	of diagnostic tester "air intake temperature", the value should increase with the increase of the engine intake air.	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
	Observe "air intake temperature" item in data flow, if it is	Yes	To step No. 5
2	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.	No	Next step
	Take off the joint of cable air intake temperature sensor,	Yes	Next step
3	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).	No	Replace sensor
4	Take off the joint of cable air intake temperature sensor,	Yes	To step 5
	check the voltage between pin No.1 and pin No.2 by multimeter and look if it is around 5V.	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
	Start the engine at idle speed. Observe the value changes	Yes	Diagnosis help
6	of diagnostic tester "air intake temperature", the value should increase with the increase of the engine intake air.		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
	Observe "coolant temperature" item in data flow, if	Yes	To step 6
	it is same temperature with engine temperature		
2	(specific data is correlated to the engine temperature		
2	at that time).	No	Next
	Notice: if the value always is - 40 □ there is perhaps		
	open circuit failure in the circuit.		
	Take off the joint of coolant temperature sensor on	Yes	Next step
	the cable, check the resistance values using		
3	multimeter between sensor connector No. 1 and No.		
3	2 and check if it is corresponding to its temperature	No	Replace sensor
	(please reference the related section of this service		
	manual).		
	Take off the joint of coolant temperature sensor on	Yes	To step 6
4	the cable, check the voltage between pin No.1 and		
7	pin No.2 by multimeter and observe if it is around	No	Next step
	5V.		
	Check if it is open circuit or short circuit to power	Yes	Repair or replace
5	supply between ECU pin No.39, No. 35 and sensor	103	cable
	connector No.1, No.2.	No	Next step
	Start the engine at idle speed. Observe the value	Yes	Diagnosis help
6	changes of diagnostic tester "coolant temperature";		
O	the value should increase with the increase of the	No	Replace sensor
	engine coolant temperature.		

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
	Observe "coolant temperature" item in data flow, if	Yes	To step 6
2	it is same temperature with engine temperature (specific data is correlated to the engine temperature	No	Next



	at that time).		
	Notice: if the value always is - 40 □ there is perhaps open circuit failure in the circuit.		
	Take off the joint of coolant temperature sensor on	Yes	Next step
3	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).	No	Replace sensor
	Take off the joint of coolant temperature sensor on	Yes	To step 6
4	the cable, check the voltage between pin No.1 and pin No.2 by multimeter and observe if it is around 5V.	No	Next step
5	Check if it is short circuit to ground between ECU	Yes	Repair or replace cable
	pin No.39, No. 35 and sensor connector No.1, No.2.	No	Next step
	Start the engine at idle speed. Observe the value	Yes	Diagnosis help
6	changes of diagnostic tester "coolant temperature"; the value should increase with the increase of the engine coolant temperature.	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
	Observe "throttle valve absolute opening" item in	Yes	Next step
2	data flow, check the value if it is between 4% and 10% (specific data is correlated to the vehicle type).	No	To step No. 5
	Step on the accelerator slowly to complete opening	Yes	Next step
3	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).	No	To step No. 5
	Repeat step 3 and observe "throttle valve absolute	Yes	Replace the sensor
4	opening" item in data flow, and check if there is jump during the changes.	No	Next step
_	Take off the joint of throttle valve positioning sensor on the cable, check if there is short circuit to ground	Yes	Repair or replace cable
5	between pin No.17, No.32, No.16 of ECU and pin No.1, No.2, No.3.	No	Next step
_	Check the voltage between pin No.1 and pin No.2 by	Yes	Replace sensor
6	multimeter and observe if it is around 5V.	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	Yes	Next step
	10% (specific data is correlated to the vehicle type).	No	To step No. 5
	Step on the accelerator slowly to complete opening and observe "throttle valve absolute opening" item	Yes	Next step
3	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).	No	To step No. 5
4	Repeat step 3 and observe "throttle valve absolute opening" item in data flow, and check if there is	Yes	Replace the sensor
	jump during the changes.	No	Next step
5	Take off the joint of throttle valve positioning sensor on the cable, check if there is open circuit or short	Yes	Repair or replace cable
3	circuit to power supply between pin No.17, No.32, No.16 of ECU and pin No.1, No.2, No.3 of sensor	No	Next step
6	Check the voltage between pin No.1 and pin No.2 by	Yes	Replace sensor
6	multimeter and observe if it is around 5V.	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
	Start the engine and leave it at idle speed until its coolant reaches to the normal value. Observe the	Yes	Diagnosis help
2	value changes of "oxygen sensor voltage" item on diagnostic meter, the displayed value should change rapidly from 100mV-900mV.	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	Yes	Repair or change cable
	sensor gray connecting line), B (opposite to oxygen sensor black connecting line).	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
	Start the engine and leave it at idle speed until its	Yes	Diagnosis help
	coolant reaches to the normal value. Observe the value		
2	changes of "oxygen sensor voltage" item on diagnostic	No	Next step
	meter, the displayed value should change rapidly from	INO	Next step
	100mV-900mV.		
	Check if there is short circuit to power supply between	Yes	Repair or change
3	pin No.36, No.18, of ECU and pin A (opposite to		cable
3	oxygen sensor gray connecting line), B (opposite to	No	Diagnosis help
	oxygen sensor black connecting line).	110	Diagnosis ncip
	A, check if the exhaust system is jammed		Check and repair
4	B, check if the injector is leaking	Yes	according to
+	C, check if the fuel pressure is over higher		diagnosis
	D, check if the valve clearance is over smaller etc.	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		Next step
1	ignition switch to "ON".		
	Start the engine and leave it at idle speed until its	Yes	Diagnosis help
	coolant temperature reaches to the normal value.		
2	Observe the value changes of "oxygen sensor voltage"	No	Next step
	item on diagnostic meter, the displayed value should		
	change rapidly from 100mV-900mV.		
	Check if there is open circuit between pin No.36,	Yes	Repair or change
3	No.18, of ECU and pin A (opposite to oxygen sensor	168	cable
3	gray connecting line), B (opposite to oxygen sensor	No	Diagnosis haln
	black connecting line) of sensor joint.	1NO	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
	Take off the oxygen sensor joint on the cable and	Yes	Next step
2	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,	No	To step No.4
	and observe if it is about 12V.		
3	Check the resistance value between oxygen sensor	Yes	Next step



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

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
	Start the engine and leave it at idle speed until its	Yes	Next step
	coolant temperature reaches to the normal value.		
2	Observe the value changes of "oxygen sensor voltage"	No	Diagnosis help
	item on diagnostic meter, and the displayed value keeps	110	Diagnosis ncip
	around the value of 100mV at some working conditions.		
	Connect the fuel pressure meter (connection position is	Yes	Repair or replace
	the front end of fuel distributing pipe assembly fuel	103	the cable
3	intake pipe); start the engine and check the fuel pressure		
	at idle speed conditions if it is around 260kpa; take off	No	Next step
	the vacuum pipe on fuel pressure regulator, check the		
	pressure and observe if it is around 300kpa.		
	Check if there is short circuit to ground between ECU	Yes	Repair or replace
4	pin No.36, No.18 and pin A (opposite to oxygen sensor	103	cable
	gray connecting line), pin B (opposite to oxygen sensor	No	Next step
	black connecting line) of sensor joint.	110	-
	A, check if there is a heavy leaking in air intake system	Yes	Repair according
	B, check if the injector is jammed	103	to diagnosis data
5	C, check if the clearance of spark plug is too big		
	D, check if the sub live wire resistance is too big	No	Diagnosis help
	E, check if the valve clearance is too big etc.		



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
	Start the engine and leave it at idle speed until its	Yes	Next step
	coolant temperature reaches to the normal value.		
2	Observe the value changes of "oxygen sensor voltage"		
	item on diagnostic meter, and the displayed value	No	Diagnosis help
	keeps around the value of 900mV at some working		
	conditions.		
	Connect the fuel pressure meter (connection position is	Yes	Repair or replace
	the front end of fuel distributing pipe assembly fuel	103	the cable
3	intake pipe); start the engine and check the fuel		
	pressure at idle speed conditions if it is around 260kpa;	No	Check and repair
	take off the vacuum pipe on fuel pressure regulator,		fuel system
	check the pressure and observe if it is around 300kpa.		
	Check if there is short circuit to power supply between	Yes	Repair or replace
4	ECU pin No.36, No.18 and pin A (opposite to oxygen	103	cable
7	sensor gray connecting line), pin B (opposite to	No	Next step
	oxygen sensor black connecting line) of sensor joint.	110	Next step
	A, check if the injector is leaking	Yes	Repair according
5	B, check if the exhaust pipe is jammed	168	to diagnosis data
	C, check if the valve clearance is too small etc.	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
	Take off the 1 st cylinder injector joint from the cable,	Yes	To step No.4
2	check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	No	Next step
3	Check if there is open circuit or short circuit to ground between the 1 st injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
	between the 1 injector joint pin No.1 and main relay.	No	Next step
	Check the resistance value by multimeter between 1 st	Yes	Next step
4	cylinder injector pin No.1 and No.2, and observe if it is $11-13\Omega$ when it is 20° C.	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,		diagnosis data
	and observe if it is around 3.7V.	No	Diagnosis help
6	Check if there is open circuit or short circuit to ground between 1 st cylinder injector joint pin No.2 and the	Yes	Repair or replace cable
	ECU pin No.27.	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
	Take off the 2 nd cylinder injector joint from the cable,	Yes	To step No.4
2	check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	No	Next step
3	Check if there is open circuit or short circuit to ground between the 2 nd injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
	between the 2 injector joint pin No.1 and main relay.	No	Next step
	Check the resistance value by multimeter between 2 nd	Yes	Next
4	cylinder injector pin No.1 and No.2, and observe if it is $11-13\Omega$ when it is 20° C.	No	Change injector
	Check the voltage value by multimeter between 2 nd	Yes	Diagnosis help
5	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 2 nd cylinder injector joint pin No.2 and the	Yes	Repair or replace cable
	ECU pin No.6.	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
	Take off the 3 rd cylinder injector joint from the cable,	Yes	To step No.4
2	check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	No	Next step
3	Check if there is open circuit or short circuit to ground between the 3 rd injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
	Check the resistance value by multimeter between 3 rd	Yes	Next step
4	cylinder injector pin No.1 and No.2, and observe if it is $11-13\Omega$ when it is 20° C.	No	Change injector
5	Check the voltage value by multimeter between 3 rd	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 3 rd cylinder injector joint pin No.2 and the	Yes	Repair or replace cable
		ECU pin No.7.	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
	Take off the 4 th cylinder injector joint from the cable,	Yes	To step No.4
2	check the voltage value between this joint pin No.1 and the power cathode by multimeter and observe if it is 12V.	No	Next step
3	Check if there is open circuit or short circuit to ground between the 4 th injector joint pin No.1 and main relay.	Yes	Repair or replace the cable
		No	Next step
	Check the resistance value by multimeter between 4 th	Yes	Next step
4	cylinder injector pin No.1 and No.2, and observe if it is $11-13\Omega$ when it is 20° C.	No	Replace injector
	Check the voltage value by multimeter between 4 th	Yes	Diagnosis help
5	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 4 th cylinder injector joint pin No.2 and the	Yes	Repair or replace cable
	ECU pin No.47.	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
	Take off the fuel pump relay and put ignition switch to	Yes	To step No.4
2	"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.	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
	of the feray power suppry ends circuit.	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	Yes	Replace fuel pump relay
	supply cathode and observe if it is around 3.7V.	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		cable
relay pin No.85 and ECU pin No.69.	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
	Take off the knock sensor joint from the cable; check	Yes	Next step
2	the resistance value by multimeter between knock		
2	sensor connector No.1 and No.2 and observe if it is	No	Change sensor
	$1M\Omega$.		
	Check if there is open circuit or short circuit to ground	Yes	Repair or replace
3	or to power supply between circuit of knock sensor		the cable
	joint No.1, No.2 and ECU pin No.19, No. 20	No	To step No.2
	Replace the knock sensor according to the regulation;	Yes	Diagnosis help
4	try running the vehicle and make the engine speed		Check if it is a
+	exceed 2200rpm. Check if the DTC P0325 will appear	No	occasional fault
	again.		occasional faun

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
	Take off the speed sensor joint from the cable; check	Yes	Next step
2	the resistance value by multimeter between speed sensor connector No.2and No.3 and observe if it is around 770-950MΩwhen it is 20°C	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 No	Repair or replace the cable Next step
	1	Yes	Diagnosis help
4	Check the flywheel signal disc if it is in good conditions.	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
	Take off the speed sensor joint from the cable; check	Yes	Next step
	the resistance value by multimeter between speed		
2	sensor connector No.2and No.3 and observe if it is	No	Replace sensor
	around 770-950MΩwhen it is 20°C	NO	Replace sellsol



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	Check if there is open circuit or short circuit to	Yes	Repair or replace the
3	ground or to power supply between circuit of speed	168	cable
3	sensor joint pin No.2, No.3 and ECU pin No.34, No.	No	Next step
4	Check the flywheel signal disc if it is in good	Yes	Diagnosis help
4	conditions.	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
	Take off the phase sensor joint from the cable; check the	Yes	To step No.4
2	voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	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	Yes	To step 6
4	joint pin No.2 and power supply cathode.	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	Yes	Repair or replace cable
	and ECU pin No.79.	No	Next step
6		Yes	Diagnosis help
	Check the camshaft signal disc if it is in good conditions.	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
	Take off the phase sensor joint from the cable; check the	Yes	To step No.4
2	voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	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
4		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	Yes	Repair or replace cable
	joint pin No.2 and ECU pin No.79.	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
	Take off the phase sensor joint from the cable; check	Yes	To step No.4
2	the voltage value by multimeter between phase sensor joint pin No.3 and No.1; and observe if it is around 12V.	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
3		No	Next step
4	Check the voltage if it is around 9.9V between phase	Yes	To step 6
4	sensor joint pin No.2 and power supply cathode.	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	Yes	Repair or replace cable
	joint pin No.2 and ECU pin No.79.	No	Next step
	Check the camebaft signal disc if it is in good	Yes	Diagnosis help
6	Check the camshaft signal disc if it is in good conditions.	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
	Take off the canister control valve joint from the cable;	Yes	To step No.4
2	check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	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
	Check the resistance value if it is around 22-30 Ω when	Yes	Next step
4	it is 20°C between canister control valve pin No.1 and pin No.2.	No	Replace the valve
5	Check the voltage if it is around 3.7V between canister	Yes	Diagnosis help
3	control valve joint pin No.1 and power supply cathode.	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
	Camster John Pin 140.2 and ECO pin 140. 40.	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
	Take off the canister control valve joint from the cable;	Yes	To step No.4
2	check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	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
	Check the resistance value if it is around $22-30\Omega$ when	Yes	Next step
4	it is 20°C between canister control valve pin No.1 and pin No.2.	No	Replace the valve
	Check the voltage by the multimeter if it is around	Yes	Diagnosis help
5	3.7V between canister control valve joint pin No.1 and power supply cathode.	No	Next step
6	Check if there is short circuit to ground between the	Yes	Repair or replace cable
	circuit of canister joint pin No.2 and ECU pin No. 46.	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
	Take off the canister control valve joint from the cable;	Yes	To step No.4
2	check the voltage value by multimeter between this joint pin No.1 and power supply cathode; and observe if it is around 12V.	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
	Check the resistance value if it is around 22-30 Ω when it	Yes	Next step
4	is 20°C between canister control valve pin No.1 and pin No.2.	No	Replace the valve
	Check the voltage by the multimeter if it is around 3.7V	Yes	Diagnosis help
5	between canister control valve joint pin No.1 and power supply cathode.	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
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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
	Take off the air conditioner condenser cooling fan relay; put the ignition switch to "ON" position, and check the	Yes	To step No.4
2	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.	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	Yes	Replace relay
4	control ends that is relay pin No.86 and power supply cathode.	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	Yes	Repair or replace cable
	end pin No.86 and ECU pin No. 50.	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
		Yes	Next step
3	Check if the speedometer finger works normally.	No	Check the speedometer line
		Yes	Next step
4	Check if the speed sensor works normally.	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		replace cable
sensor and ECU pin No. 59.	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
		Yes	Next step
2	Check if the throttle valve adjusting screw, accelerator cable and throttle valve working in good conditions.	No	Carry out the necessary repair and maintenance
		Yes	Next step
3	Check if the idle speed regulator works in good conditions.	No	Carry out the necessary repair and maintenance
	E, check if the pressure of the fuel supplying system is too	Yes	Next step
4	low F, check if the injector is jammed G, check if the exhaust system is not straightway	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
		Yes	Next step
2	Check if the throttle valve adjusting screw, accelerator cable and throttle valve working in good conditions.	No	Carry out the necessary repair and maintenance
		Yes	Next step
3	Check if the idle speed regulator works in good conditions.	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
	<i>6</i>	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
	Take off the idle regulator joint and Check the resistance	Yes	Next step
2	value between idle speed regulator pin A and pin D, pin B and pin C if it is around $53\pm5.3\Omega$ when it is 20° C.	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	Yes	Repair or replace cable
	No. 65, No.66, No.67. No.64.	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
	Take off the idle regulator joint and check the resistance	Yes	Next step
2	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°C.	No	Replace step motor
3	Check using multimeter separately if there is short circuit to power supply between the circuits of idle speed regulator	Yes	Repair or replace cable
3	joint pin A, B, C, D and ECU pin No. 65, No.66, No.67. No.64.	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
	Take off the idle regulator joint and check the resistance	Yes	Next step
2	value by multimeter separately between idle speed regulator pin A and pin D, pin B and pin C if it is around $53\pm5.3\Omega$ when it is 20° C.	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,	Yes	Repair or replace cable
	C, D and ECU pin No. 65, No.66, No.67. No.64.	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		Next step
1	ignition switch to "OFF".		rtext step



	Charle the accompulator valtage by multimator if it is around	Yes	Next step
2	Check the accumulator voltage by multimeter if it is around 12V.	No	Replace
	1 Z V.	110	accumulator
	Check if there is open circuit or short circuit to ground	Yes	Repair or
3	between the circuits of ECU pin No.44, No.45, No.63 and	ies	replace cable
	main relay pin No.87.	No	Next step
	Start the engine and shock if the entire concretor recharging	Yes	Next step
4	Start the engine and check if the entire generator recharging voltage is around 9-16V at the different engine speed.	No	Replace
			generator
	Check the engine cable harmons contact position if it is in	Yes	Diagnosis help
5	Check the engine cable harness contact position if it is in good conditions.	No	Repair or
		No	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
		Yes	Next step
2	Check the accumulator voltage by the multimeter and observe if it is around 12V.	No	Replace
	observe if it is around 12 v.	NO	accumulator
	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
3			replace cable
		No	Next step
	Start the engine and check if the entire generator recharging	Yes	Next step
4	voltage is around 9-16V at the different engine speed.	No	Replace
	voltage is around 9-10 v at the different engine speed.		generator
5	Check the engine cable harness contact position if it is in	Yes	Diagnosis help
	good conditions.	No	Repair or
			replace cable

DTC: P0563 System voltage is too high

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



ENGINE EFI SYSTEM



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
	Clean up the DTC and check the failure once again if it	Yes	Next step
2	is a steady failure.	No	System if
	is a steady failure.		correct
3	Replace ECU	Finish	

DTC: P0602 ECU diagnosis data ID code failure

No.	Operating steps	Result	Follow up
140.	Operating steps	Result	steps
1	Connect the diagnostic tester and commutator, put the ignition switch to "ON".		Next step
	Clean up the DTC and check the failure once again if it is	Yes	Next step
2	a steady failure.	No	System if
	and the same of th	NO	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	Yes	To step No.4
2	power supply ends that relay pin No.30, No.85 and power cathode and observe if it is around 12V.	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
	of the relay power supprying chas cheart.	No	To step No.2
4	Check the voltage value by the multimeter between air conditioner compressor relay control ends that is relay	Yes	Replace relay
	pin No.86 and power cathode and observe if it is around 3.7V.	No	Next step
5	Check if there is open circuit between the circuit of air conditioner compressor relay control ends that is relay	Yes	Repair or replace cable
	pin No.86 and ECU pin No.70.	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
	Take off air conditioner compressor relay; put ignition	Yes	To step No.4
2	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.	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
	the relay power supprying ends circuit.	No	To step No.2
	Check the voltage value by the multimeter between air	Yes	Replace relay
4	conditioner compressor relay control ends that is relay pin No.86 and power cathode and observe if it is around 3.7V.	No	Next step
5	Check if there is short circuit to ground between the circuit of air conditioner compressor relay control ends	Yes	Repair or replace cable
	that is relay pin No.86 and ECU pin No.70.	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
	Take off air conditioner compressor relay; put ignition	Yes	To step No.4
2	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.	No	Next step
3	Check if there is open circuit or short circuit to ground of	Yes	Repair or replace cable
	the relay power supplying ends circuit.	No	To step No.2
	Check the voltage value by the multimeter between air	Yes	Replace relay
4	conditioner compressor relay control ends that is relay pin No.86 and power cathode and observe if it is around 3.7V.	No	Next step
5	Check if there is short circuit to power supply between	Yes	Repair or replace cable
	the circuit of air conditioner compressor relay control ends that is relay pin No.86 and ECU pin No.70.	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
	Carry out action test to engine trouble light by using	Yes	Next step
2	diagnostic meter "actuator action test" item; and observe the indicator if it is always at the status of extinguishing or lighting on.	No	System is correct
3	Check if there is open circuit or short circuit to ground of	Yes	Repair or replace cable
	the engine trouble light power supplying circuit.	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
4		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
	Check the voltage value between the two wiring terminals	Yes	Next step
1	of the accumulator by multimeter; check if it is around	No	Replace
	8-12V when the engine is starting.	110	accumulator
	Put the ignition switch at start position, checking the anode	Yes	Next step
2	terminal of starting motor by multimeter and observe the	No	Repair or
	voltage if it is above 8V.	110	replace cable
	Disassemble the starting motor and check its working		Repair or
3	conditions. Check if there is open circuit or jammed by	Yes	replace starting
	poor lubricating.		motor
	poor tubricating.	No	Next step
	If the failure is happened in winter time, check if it is		Change to
4	because of the wrong engine lubricant and gearbox oil	Yes	correct
	causes the big resistance of the starting motor.		lubricant
	causes the big resistance of the starting motor.	No	Next step
			Repair the
	Check the mechanical resistance inside of the engine if it is	Yes	engine inside
5	too big causes the starting motor can not rotate or rotate		resistance
	slowly.	No	Repeat the
		110	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
	Connect the fuel pressure meter (connecting point is	Yes	Next step
1	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.	No	Repair the fuel supplying system
	Connect EFI diagnostic meter; observe "engine speed"	Yes	Next step
2	data item and start the engine and check if there is rotation speed signal is output.	No	Repair the sensor cable
	Pull off one of the cylinder separating line and take off	Yes	Next step
3	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.	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,	Yes	Diagnosis help
	45, 63 is correct; check if the pin armature of No. 3, 51, 53, 61, 80 are working correctly.	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.

No.	Operating steps	Result	Follow up steps
	Connect the fuel pressure meter (connecting point is the	Yes	Next step
1	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.	No	Repair the fuel supplying system
	Pull off one of the cylinder separating line and connect	Yes	Next step
2	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.	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	Yes	Repair circuit or replace sensor
	the joint of coolant temperature sensor; observe if we can start the engine)	No	Next step
4	Check if there if loosen or leaking of the fuel pressure	Yes	Repair or replace
	regulator vacuum pipe	No	Next step
	Check fuel conditions and check if the failure is	Yes	Change fuel
5	appeared after the fuel refilling	No	Diagnosis help
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
6	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.		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.

No.	Operating steps	Result	Follow up steps
	Connect the fuel pressure meter (connecting point is the	Yes	Next step
	front end of fuel distributing pipe assembly fuel intake		
1	pipe); start the engine and check fuel pressure at idle		Repair the fuel
1	speed if it is around 260kpa; take off the vacuum pipe	No	supplying system
	from fuel pressure regulator check the fuel pressure if it		supplying system
	is around 300kpa.		
	Pull off one of the cylinder separating line and connect	Yes	Next step
2	spark plug to it; keep the spark electrode around 5mm		Check and repair
	away from engine body; start the engine and check if	No	ignition system
	there is blue and white high pressure fire.		Igintion system
	Take off the coolant temperature sensor joint and start the	Yes	Repair circuit or
3	engine; observe if the engine can be started successfully.	103	replace sensor
	(or serial connecting a 2500Ω resistance at the joint of		
	coolant temperature sensor; observe if we can start the	No	Next step
	engine)		
			Clean throttle
4	Step on the accelerator slightly and observe if it is easy to	Yes	valve and idle
'	be started		speed air port
		No	Next step
	Disassemble the injector, check the injector using the	Yes	Replace the part
5	injector special cleaning analysis meter and observe if it	No	Next step
	is leaking or jammed.		
6	Check fuel conditions and check if the failure is appeared	Yes	Change fuel
	after the fuel refilling	No	Next step
7	Check pressure conditions of every cylinder and observe	Yes	Trouble shoot
	if there is insufficient pressure	No	Next step
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
8	check the power supply of pin No.12, 13, 44, 45 and		Check correspond
	No.63 if it is in right conditions; check pin armature of	No	circuit
	No.3, 51, 53, 61 and No.80 if it is in right conditions.		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.

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air	Yes	Repair the air intake system
	intake port if it is leaking.	No	Next step
	Connect the fuel pressure meter (connecting point is	Yes	Next step
2	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.	No	Repair the fuel supplying system
	Pull off one of the cylinder separating line and connect	Yes	Next step
3	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.	No	Check and repair ignition system
	Check spark plugs in every cylinder and observe its	Yes	Next step
4	type and clearance if it is accord with the regulation.	No	Adjust or replace
5	Take off the coolant temperature sensor joint and start the engine; observe if the engine can be started	Yes	Repair circuit or replace sensor
	successfully.	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
	Disassemble the injector, check the injector using the	Yes	Replace the part
7	injector special cleaning analysis meter and observe if it is leaking or jammed.	No	Next step
8	Check fuel conditions and check if the failure is	Yes	Change fuel
U	appeared after the fuel refilling	No	Next step
9	Check pressure conditions of every cylinder and	Yes	Trouble shoot
	observe if there is insufficient pressure	No	Next step
	Check the engine ignition order and ignition timing if	Yes	Next step
10	it is accord with the regulation.	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.

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake	Yes	Repair the air intake system
	port if it is leaking.	No	Next step
2	Check idle speed regulator if it is partial blocked	Yes	Clean or replace
		No	Next step
	Check spark plugs in every cylinder and observe its type	Yes	Next step
3	and clearance if it is accord with the regulation.	No	Adjust or replace
	Check the throttle valve and idle speed by pass if there is	Yes	Cleaning
4	carbon deposition.	No	Next step
_	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is leaking or jammed.	Yes	Replace part
5		No	Next step
6	Check fuel conditions and check if the failure is appeared	Yes	Change fuel
U	after the fuel refilling	No	Next step
7	Check pressure conditions of every cylinder and observe if	Yes	Trouble shoot
,	there is big pressure difference between the cylinders.	No	Next step
	Check the engine ignition order and ignition timing if it is	Yes	Next step
8	accord with the regulation.	No	Repair the
	decord with the regulation.	110	ignition timing
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
9	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.	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.

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

No.	Operating steps	Result	Follow up steps
1	Check the air cleaner if it is jammed; check the air intake	Yes	Repair the air intake system
	port if it is leaking.	No	Next step
	Check spark plugs in every cylinder and observe its type	Yes	Next step
2	and clearance if it is accord with the regulation.	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	Yes	Cleaning the related parts
	deposition	No	Next step
4	Pull off coolant temperature sensor joint and start the	Yes	Repair the line or replace sensor
		No	Next step
_	Disassemble the injector, check the injector using the	Yes	Replace part
5	injector special cleaning analysis meter and observe if it is leaking or jammed or overflowing.	No	Next step
6	Check fuel conditions and check if the failure is appeared	Yes	Change fuel
	just after the fuel refilling	No	Next step
7	Check pressure conditions of every cylinder and observe if	Yes	Trouble shoot
,	there is big pressure difference between the cylinders.	No	Next step
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
8	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.	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.

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	Yes	Cleaning the related parts
	carbon deposition.	No	Next step
	Observe if the engine output power increased when	Yes	To step No.4
2	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.	No	Next step
	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
3		No	Repair air conditioning system
	Check air conditioning system pressure; check the	Yes	Next step
4	compressor solenoid clutch and air conditioner compressor pump fuel conditions and check if it is working correctly.	No	Repair the air conditioning sys.
	Disassemble the injector, check the injector using the	Yes	Replace fault part
5	injector special cleaning analysis meter and observe if it is leaking or jammed or overflowing.	No	Next step
	Connect EFI system adaptor, turn on the ignition	Yes	Diagnosis help
6	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.	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.

No.	Operating steps	Result	Follow up steps
1	Charle applementar pobla if it is blooked or ever tightening	Yes	Adjust
1	Check accelerator cable if it is blocked or over tightening	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	Yes	Clean related part
	deposition	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
	Check the engine ignition timing if it is accord with the	Yes	Next step
5	regulations.	No	Repair the ignition timing
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
6	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.	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.

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
	Connect the fuel pressure meter (connecting point is the	Yes	Next step
2	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.	No	Repair the fuel supplying system
	Check spark plugs in every cylinder and observe its type	Yes	Next step
3	and clearance if it is accord with the regulation.	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	Yes	Clean related part
	carbon deposition.	No	Next step
	Inspect air intake pressure sensor, throttle position sensor and its line if it is working correctly.	Yes	Next step
5		No	Repair line or
		140	replace sensor
6	Disassemble the injector, check the injector using the injector special cleaning analysis meter and observe if it is	Yes	Replace fault part
	leaking or jammed.	No	Next step
7	Check fuel conditions and check if the failure is appeared	Yes	Replace fuel
,	after the fuel refilling	No	Next step
	Check the engine ignition order and ignition timing if it is	Yes	Next step
8	accord with the regulation.	No	Repair ignition timing
		Yes	Next step
9	Check the exhaust pipe if the air exhausting is smooth	No	Repair or replace exhaust pipe
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
10	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.	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.

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
	Connect the fuel pressure meter (connecting point is the front end of fuel distributing pipe assembly fuel intake	Yes	Next step
2	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.	No	Repair the fuel supplying system
	Check spark plugs in every cylinder and observe its type	Yes	Next step
3	and clearance if it is accord with the regulation.	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	Yes	Clean related part
	carbon deposition.	No	Next step
	Inspect oil intoles procesure concer throttle position concer	Yes	Next step
5	Inspect air intake pressure sensor, throttle position sensor and its line if it is working correctly.	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	Yes	Replace fault part
	leaking or jammed.	No	Next step
7	Check fuel conditions and check if the failure is appeared	Yes	Replace fuel
	after the fuel refilling	No	Next step
	Check the engine ignition order and ignition timing if it is	Yes	Next step
8	accord with the regulation.	No	Repair ignition timing
		Yes	Next step
9	Check the exhaust pipe if the air exhausting is smooth	No	Repair or replace exhaust pipe
	Connect EFI system adaptor, turn on the ignition switch;	Yes	Diagnosis help
10	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.	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.

No.	Operating steps	Result	Follow up steps
	Check if there are failures like clutch skidding, low tyre	Yes	Repair
1	pressure, brake dragging, wrong tyre size, and wrong four wheel positioning etc		Next step
2	Check the air cleaner if it is jammed.	Yes	Repair the air intake system
		No	Next step
	Connect the fuel pressure meter (connecting point is the	Yes	Next step
3	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.	No	Repair the fuel supplying system
	Pull off one of the cylinder separating line and connect	Yes	Next step
4	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.	No	Repair ignition system
		Yes	Next step
5	Check spark plugs in every cylinder and observe its type and clearance if it is accord with the regulation.	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	Yes	Clean related part
	carbon deposition.	No	Next step
	Inspect air intake pressure sensor, throttle position sensor	Yes	Next step
7	and its line if it is working correctly.	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	Yes	Replace fault part
	leaking or jammed.	No	Next step
9	Check fuel conditions and check if the failure is appeared	Yes	Replace fuel
	after the fuel refilling	No	Next step
		Yes	Next step
10	Check the engine ignition order and ignition timing if it is accord with the regulation.	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