OBD fault-code overview list									
Component	Fault Code	Fault Type	Monitoring strategy	Fault detection criteria	MI action criteria	Secondary parameters	Threshold	Preconditioning	Demonstration Test
Intake air pressure sensor	P0105	Plausibility	Intake pressure sensor voltage signal	no pressure sensor Circuit fault; after start>5s; pressure drop less than a threshold comparing with atmosphere pressure in idle condition	3 cycles	Throttle position，engine speed，intake manifold pressure	<100 hpa	NONE	idle
	P0106	Out of Range	Intake pressure sensor voltage signal	If the atmosphere pressure less than a threshold at key on that means not plausible	1 cycle	Engine speed，intake manifold pressure	<400hpa	NONE	Key on
	P0107	SC GND / OC	Intake pressure sensor voltage signal	If it is less than minimum setting voltage, that means it is SC GND or OC	1 cycle	Throttle position，engine speed，intake manifold pressure	0.1V	NONE	Key on
	P0108	SC VCC	Intake pressure sensor voltage signal	Check the sensor voltage; If it is bigger than maximum setting voltage, that means it is SC VCC	1 cycle	Throttle position，engine speed，intake manifold pressure	4.951V	NONE	Key on
Intake air temperature sensor	P0112	SC GND	Intake temperature sensor voltage signal	If it is less than minimum setting voltage, that means it is SC GND	1 cycle	Engine speed，Intake temperature	0.073V	NONE	Key on

	P0113	SC VCC / OC	Intake temperature sensor voltage signal	Check the sensor voltage; If it is bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，Intake temperature	4.88V	NONE	Key on
	P0114	Plausible	Air temperature sensor Intermitted	Signal not plausible	3 cycle	Engine running time，Air temperature	NA	NONE	Idle or driving cycle
	P0111	Stuck signal	Air temperature sensor stuck	Signal not plausible	3 cycle	Engine running time，Air temperature	NA	NONE	Idle or driving cycle
Water temperature sensor	P0119	Plausible	Coolant temperature sensor Intermitted	Signal not plausible	3 cycle	Engine speed，water temperature	NA	None	Idle or driving cycle
	P0116	Stuck signal	Coolant temperature sensor stuck	Signal not plausible	3 cycle	Engine speed，water temperature	NA	None	Idle or driving cycle
	P0117	SC GND	check circuit voltage	Error detected when the sensor voltage less than minimum setting voltage	1 cycle	Engine speed，water temperature	0.073V	None	Key on
	P0118	SC VCC / OC	check circuit voltage	Error detected when the sensor voltage bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，water temperature	4.88V	None	Key on

Throttle position sensor	P0120	SC GND	Check TPS voltage	Error detected when the sensor voltage less than minimum setting voltage, that means it is SC GND	1 cycle	Engine speed，engine state	0.1V	None	Key on
	P0123	SC VCC / OC	Check TPS voltage	Error detected when the sensor voltage bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，engine state	4.88V	None	Key on
Stepper motor	P0509	SC VCC	feedback voltage by hardware	SC VCC	1 cycle	NA	NA	None	Idle or driving cycle
	P0508	SC GND	feedback voltage by hardware	SC GND	1 cycle	NA	NA	None	Idle or driving cycle
	P0505	OC	feedback voltage by hardware	OPEN CIRCUIT	1 cycle	NA	NA	None	Idle or driving cycle
	P0511	Plausible	feedback voltage by hardware	Over current	1 cycle	NA	NA	None	Idle or driving cycle
MIL Lamp	P1651	OC	Performed by hardware	Open circuit	1 cycle	MIL state	NA	None	Key on
Oxygen sensor Bank 1 (upstream)	P0131	SC GND/ stuck signal	check oxygen feedback signal voltage	Error detected when short term lambda correction reaches to threshold for more than 3000 cycles.	3 cycle	signal voltage	25%	None	Idle or driving cycle
			check oxygen feedback signal voltage	Error detected when short term lambda correction reaches to threshold for more than 3000 cycles.	3 cycle	signal voltage	-25%	None	Idle or driving cycle

	P0132	SC VCC	check oxygen feedback signal voltage	Error detected when voltage above threshold	1 cycle	signal voltage	4.878V	None	Idle or driving cycle
	P0133	Slow Response	check oxygen feedback signal voltage	Frequency error	3 cycle	signal voltage	LAMSOND	2 cycle	Idle or driving cycle
	P0130	Plausibility	check oxygen feedback signal voltage	Battery voltage>11 V; O2 sensor reach the dew point and no O2 sensor heating fault. 1. lambda signal high during cutoff more than a certain time 2. lambda signal low during accerlaration more than a certain time after warm up， lambda signal voltage still between 2.5V to 4.8V for last 500TDC	1 cycle	Battery voltage		None	Idle or driving cycle
Oxygen sensor Bank 1 (downstream)	P0137	SC GND	check oxygen feedback signal voltage	Error detected when voltage below threshold	3 cycle	signal voltage	0.02V	None	Idle or driving cycle
	P0138	SC VCC	check oxygen feedback signal voltage	Error detected when voltage above threshold	1 cycle	signal voltage	3.6V	None	Idle or driving cycle
	P0140	OC	check oxygen feedback signal voltage	Error detected when voltage between thresholds	1 cycle	signal voltage	Above 1.5V and below 3.5V	None	Idle or driving cycle
	P2271	Signal Stuck Rich	check oxygen feedback signal voltage	Signal Stuck Lean after cutoff	3 cycle	signal voltage	RichToLean_TimeThrsh	2 cycle	Idle or driving cycle
Oxygen sensor heater	P0030	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Idle or driving cycle
	P0031	SC GND	check circuit	circuit low	1 cycle	NA	NA	None	Idle or driving

Bank 1 (upstream)			voltage	SC GND					cycle
	P0032	SC VCC	check circuit voltage	circuit high SC VCC	1 cycle	NA	NA	None	Idle or driving cycle
Oxygen sensor heater Bank 1 (downstream)	P0038	SC VCC	check circuit voltage	Recognition of the fault is enabled if ABI_HEA2 <> 0 AND (AUTOHEA2 <> 0 or altenative definition AUTOHEA1V), there are no load relay errors and the command is ON but the feedback is high.	1 cycle	NA	NA	None	Idle or driving cycle
	P0037	OC/ SC GND	check circuit voltage	Recognition of the fault is enabled if ABI_HEA2 <> 0 AND (AUTOHEA2 <> 0 or altenative definition AUTOHEA1V), there are no load relay errors and the command is OFF but the feedback is low.	1 cycle	NA	NA	None	Idle or driving cycle
Crankshaft position sensor	P0335	OC	Check flywheel signal	Open circuit	1 cycle	NA	NA	None	Key on
Ignition coil	P2300	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	key on and push start-switch
Fuel injector	P0201	OC/CC GND	check circuit voltage	circuit open NO feedback circuit Voltage	1 cycle	NA	NA	None	key on and push start-switch
	P0261	SC GND	check circuit voltage	circuit low SC GND	1 cycle	NA	NA	None	key on and push start-switch
	P0262	SC VCC	check circuit voltage	circuit high SC Vbat	1 cycle	NA	NA	None	key on and push start-switch
Headlight Relay	P1300	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Idle or driving cycle
		SC GND	check circuit voltage	circuit low when fan is not active	1 cycle	NA	NA	None	Idle or driving cycle

		SC VCC	check circuit voltage	circuit high when fan is active	1 cycle	NA	NA	None	Idle or driving cycle
Fuel pump relay	P0627	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Key on
	P0628	SC GND	check circuit voltage	SC GND	1 cycle	NA	NA	None	Key on
System Voltage	P0562	Low	check circuit voltage	circuit low	1 cycle	NA	Below 7V	None	Key on
	P0563	High	check circuit voltage	circuit high	1 cycle	NA	Above 16.3V	None	Key on
Misfire diagnosis	P0300	Performance	Crankshaft signal ,and misfire rate threshold	The misfire rate exceeds the threshold within 200 engine cycles	1 cycle, MIL flash	RPM , ETASP	CATA200	None	Idle or driving cycle
		Performance	Crankshaft signal and misfire rate threshold	The misfire rate is calculated through crank and cam signal in WLTC cycle when the catalyst is heated. Within the first 1000 engine cycles from engine start, the misfire rate exceeds the threshold	3 cycle	RPM , ETASP	MIS1000	WMTC	Test type I
Catalyst	P0420	Catalyst efficiency below threshold	Crankshaft signal; upstream lambda sensor and downstream lambda sensor signals; OSC threshold	After catalyst warm up, upstream lambda sensor and downstream lambda sensor is not aged, active OSC test and OSC value is below than threshold during engine running.	3 cycle	RPM , ETASP	OSC	WMTC	Test type I

OBD fault-code overview list									
Component	Fault Code	Fault Type	Monitoring strategy	Fault detection criteria	MI action criteria	Secondary parameters	Threshold	Preconditioning	Demonstration Test
Intake air pressure sensor	P0105	Plausibility	Intake pressure sensor voltage signal	no pressure sensor Circuit fault; after start>5s; pressure drop less than a threshold comparing with atmosphere pressure in idle condition	3 cycles	Throttle position，engine speed，intake manifold pressure	<100 hpa	NONE	idle
	P0106	Out of Range	Intake pressure sensor voltage signal	If the atmosphere pressure less than a threshold at key on that means not plausible	1 cycle	Engine speed，intake manifold pressure	<400hpa	NONE	Key on
	P0107	SC GND / OC	Intake pressure sensor voltage signal	If it is less than minimum setting voltage, that means it is SC GND or OC	1 cycle	Throttle position，engine speed，intake manifold pressure	0.1V	NONE	Key on
	P0108	SC VCC	Intake pressure sensor voltage signal	Check the sensor voltage; If it is bigger than maximum setting voltage, that means it is SC VCC	1 cycle	Throttle position，engine speed，intake manifold pressure	4.951V	NONE	Key on
Intake air temperature sensor	P0112	SC GND	Intake temperature sensor voltage signal	If it is less than minimum setting voltage, that means it is SC GND	1 cycle	Engine speed，Intake temperature	0.073V	NONE	Key on

	P0113	SC VCC / OC	Intake temperature sensor voltage signal	Check the sensor voltage; If it is bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，Intake temperature	4.88V	NONE	Key on
	P0114	Plausible	Air temperature sensor Intermitted	Signal not plausible	3 cycle	Engine running time，Air temperature	NA	NONE	Idle or driving cycle
	P0111	Stuck signal	Air temperature sensor stuck	Signal not plausible	3 cycle	Engine running time，Air temperature	NA	NONE	Idle or driving cycle
Water temperature sensor	P0119	Plausible	Coolant temperature sensor Intermitted	Signal not plausible	3 cycle	Engine speed，water temperature	NA	None	Idle or driving cycle
	P0116	Stuck signal	Coolant temperature sensor stuck	Signal not plausible	3 cycle	Engine speed，water temperature	NA	None	Idle or driving cycle
	P0117	SC GND	check circuit voltage	Error detected when the sensor voltage less than minimum setting voltage	1 cycle	Engine speed，water temperature	0.073V	None	Key on
	P0118	SC VCC / OC	check circuit voltage	Error detected when the sensor voltage bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，water temperature	4.88V	None	Key on

Throttle position sensor	P0120	SC GND	Check TPS voltage	Error detected when the sensor voltage less than minimum setting voltage, that means it is SC GND	1 cycle	Engine speed，engine state	0.1V	None	Key on
	P0123	SC VCC / OC	Check TPS voltage	Error detected when the sensor voltage bigger than maximum setting voltage, that means it is SC VCC or OC	1 cycle	Engine speed，engine state	4.88V	None	Key on
Stepper motor	P0509	SC VCC	feedback voltage by hardware	SC VCC	1 cycle	NA	NA	None	Idle or driving cycle
	P0508	SC GND	feedback voltage by hardware	SC GND	1 cycle	NA	NA	None	Idle or driving cycle
	P0505	OC	feedback voltage by hardware	OPEN CIRCUIT	1 cycle	NA	NA	None	Idle or driving cycle
	P0511	Plausible	feedback voltage by hardware	Over current	1 cycle	NA	NA	None	Idle or driving cycle
MIL Lamp	P1651	OC	Performed by hardware	Open circuit	1 cycle	MIL state	NA	None	Key on
Oxygen sensor Bank 1 (upstream)	P0131	SC GND/ stuck signal	check oxygen feedback signal voltage	Error detected when short term lambda correction reaches to threshold for more than 3000 cycles.	3 cycle	signal voltage	25%	None	Idle or driving cycle
			check oxygen feedback signal voltage	Error detected when short term lambda correction reaches to threshold for more than 3000 cycles.	3 cycle	signal voltage	-25%	None	Idle or driving cycle

	P0132	SC VCC	check oxygen feedback signal voltage	Error detected when voltage above threshold	1 cycle	signal voltage	4.878V	None	Idle or driving cycle
	P0133	Slow Response	check oxygen feedback signal voltage	Frequency error	3 cycle	signal voltage	LAMSOND	2 cycle	Idle or driving cycle
	P0130	Plausibility	check oxygen feedback signal voltage	Battery voltage>11 V; O2 sensor reach the dew point and no O2 sensor heating fault. 3. lambda signal high during cutoff more than a certain time 4. lambda signal low during accerlaration more than a certain time after warm up， lambda signal voltage still between 2.5V to 4.8V for last 500TDC	1 cycle	Battery voltage		None	Idle or driving cycle
Oxygen sensor Bank 1 (downstream)	P0137	SC GND	check oxygen feedback signal voltage	Error detected when voltage below threshold	3 cycle	signal voltage	0.02V	None	Idle or driving cycle
	P0138	SC VCC	check oxygen feedback signal voltage	Error detected when voltage above threshold	1 cycle	signal voltage	3.6V	None	Idle or driving cycle
	P0140	OC	check oxygen feedback signal voltage	Error detected when voltage between thresholds	1 cycle	signal voltage	Above 1.5V and below 3.5V	None	Idle or driving cycle
	P2271	Signal Stuck Rich	check oxygen feedback signal voltage	Signal Stuck Lean after cutoff	3 cycle	signal voltage	RichToLean_TimeThrsh	2 cycle	Idle or driving cycle
Oxygen sensor heater	P0030	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Idle or driving cycle
	P0031	SC GND	check circuit	circuit low	1 cycle	NA	NA	None	Idle or driving

Bank 1 (upstream)			voltage	SC GND					cycle
	P0032	SC VCC	check circuit voltage	circuit high SC VCC	1 cycle	NA	NA	None	Idle or driving cycle
Oxygen sensor heater Bank 1 (downstream)	P0038	SC VCC	check circuit voltage	Recognition of the fault is enabled if ABI_HEA2 <> 0 AND (AUTOHEA2 <> 0 or altenative definition AUTOHEA1V), there are no load relay errors and the command is ON but the feedback is high.	1 cycle	NA	NA	None	Idle or driving cycle
	P0037	OC/ SC GND	check circuit voltage	Recognition of the fault is enabled if ABI_HEA2 <> 0 AND (AUTOHEA2 <> 0 or altenative definition AUTOHEA1V), there are no load relay errors and the command is OFF but the feedback is low.	1 cycle	NA	NA	None	Idle or driving cycle
Crankshaft position sensor	P0335	OC	Check flywheel signal	Open circuit	1 cycle	NA	NA	None	Key on
Ignition coil	P2300	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	key on and push start-switch
Fuel injector	P0201	OC/CC GND	check circuit voltage	circuit open NO feedback circuit Voltage	1 cycle	NA	NA	None	key on and push start-switch
	P0261	SC GND	check circuit voltage	circuit low SC GND	1 cycle	NA	NA	None	key on and push start-switch
	P0262	SC VCC	check circuit voltage	circuit high SC Vbat	1 cycle	NA	NA	None	key on and push start-switch
Headlight Relay	P1300	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Idle or driving cycle
		SC GND	check circuit voltage	circuit low when fan is not active	1 cycle	NA	NA	None	Idle or driving cycle

		SC VCC	check circuit voltage	circuit high when fan is active	1 cycle	NA	NA	None	Idle or driving cycle
Fuel pump relay	P0627	OC	check circuit voltage	circuit open	1 cycle	NA	NA	None	Key on
	P0628	SC GND	check circuit voltage	SC GND	1 cycle	NA	NA	None	Key on
System Voltage	P0562	Low	check circuit voltage	circuit low	1 cycle	NA	Below 7V	None	Key on
	P0563	High	check circuit voltage	circuit high	1 cycle	NA	Above 16.3V	None	Key on
Misfire diagnosis	P0300	Performance	Crankshaft signal ,and misfire rate threshold	The misfire rate exceeds the threshold within 200 engine cycles	1 cycle, MIL flash	RPM , ETASP	CATA200	None	Idle or driving cycle
		Performance	Crankshaft signal and misfire rate threshold	The misfire rate is calculated through crank and cam signal in WLTC cycle when the catalyst is heated. Within the first 1000 engine cycles from engine start, the misfire rate exceeds the threshold	3 cycle	RPM , ETASP	MIS1000	WMTC	Test type I
Catalyst	P0420	Catalyst efficiency below threshold	Crankshaft signal; upstream lambda sensor and downstream lambda sensor signals; OSC threshold	After catalyst warm up, upstream lambda sensor and downstream lambda sensor is not aged, active OSC test and OSC value is below than threshold during engine running.	3 cycle	RPM , ETASP	OSC	WMTC	Test type I