USER'S MANUAL

Owner manual of the RongMao EFI system

Introduction

If the EFI motorcycle in use in the event of failure, it may be part of the traditional mechanical and electrical problems, there may be a problem with the EFI system. This manual focuses on the analysis and troubleshooting of the EFI system. In the troubleshooting we in addition to the use of conventional tools, multimeter, engine cylinder pressure gauge, oil pressure gauge, but also use a dedicated EFI system diagnostic apparatus for diagnostic analysis.Of course, EFI manual and EFI diagnostic apparatus can not solve all vehicle faults and can only be used as auxiliary tools

2.Precautions

1. to ensure that the battery positive and negative terminals are reliable and can not be interchanged,.When the engine is running, the battery can not be disassembled.

2. When the fuel gauge fuel alarm when the fuel as soon as possible. (Fuel pump can not work in the air or fuel other than the medium)

3. Can not arbitrarily disassemble vehicle parts, especially the fuel system (pipeline pressure of about 250kpa), if the need for disassembly operations by professional maintenance personnel to prevent fire.

4. can not be arbitrarily adjusted the vehicle parts, such as throttle valve door plate limit screw. The idle speed of the EFI car is automatically adjusted by the idle step motor (ECU)

5. Vehicles can only use the same type of parts specified by the manufacturer, in the disassembly and replacement of any electrical parts to close the ignition switch.

6. Cannot measure the signal by pierce the harness

7. Make sure the temperature of the ECU is below 80℃.

3.Fault analysis based on the malfunction code

Diagnostic cue

1. Clear the first time to read the malfunction code, and then re-read. If the trouble-free code exists then the problem may not be in the EFI system but in other places.

2. If necessary, you can replace an ECU to test, if the malfunction code disappears, then the ECU problem, if the fault still exists, then use the old ECU to continue the test.

3. If the malfunction code shows the voltage is low,it means maybe the wire is short to ground.if the malfunction code shows the voltage is high, it means maybe the wire is short to battery.if the malfunction code shows the components signal abnormal,it means the wire is open or short to other wires.

MalcodeL:P0107
Iformation:MAP Circuit Low Voltage or Open

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Check the data of "BARO". Make sure whether it is about 100kpa(depending on where you are)	Yes	Step 5
		No	next
3	Remove the connector, and use the multimeter to check whether voltage between pin 4 and 3 is about 5V.	Yes	Step 5
		No	next
4	Check whether the following pins is short to ground: j2-11,j2-10,j2-16 of the ECU and pin 5,3,4 of the connector.	Yes	Check the harness
		No	Next
5	Crank the engine to stay at idle. Check whether the MAP is about 30-50kpa. Then go to WOT,check whether the MAP goes to about 90kpa.	Yes	Diagnostic help
		No	Change the sensor

Malfcode: P0108

Information:MAP Circuit High Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Check the data of “BARO”. Make sure whether it is about 100kpa(depending on where you are)	Yes	Step 5
		No	next
3	Remove the connector, and use the multimeter to check whether voltage between pin 4 and 3 is about 5V.	Yes	Step 5
		No	next
4	Check whether the following pins is short to ground: j2-11,j2-10,j2-16 of the ECU and pin 5,3,4 of the connector.	Yes	Check the harness
		No	Next
5	Crank the engine to stay at idle. Check whether the MAP is about 30-50kpa. Then go to WOT,check whether the MAP goes to about 90kpa.	Yes	Diagnostic help
		No	Change the sensor

Malfcode: P0112

Information: IAT Circuit Low Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		NEXT STEP
2	check where the data of "intake air temperature" equals to the real intake air temperature	Yes	Step 5
		No	Next
3	Remove the connector, and use the multimeter to check whether the resistance between pin 1 and 3 is reasonable according to the temperature.	Yes	Step 5
		No	Next
4	Remove the connector and check whether the voltage between pin 4 and 3 is about 5V.	Yes	Next
		No	Check harness
5	Check whether the following pins are short battery:j2-8,j2-10of the ECU and pin 1,3 of the connector.	Yes	Check the harness
		No	Next
6	Crank the engine and stay idle. Check whether the “intake air temperature” goes up when the engine temperature goes up.	Yes	Help
		No	Change the sensor

Malfcode: P0112

Information: IAT Circuit High Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	check where the data of "intake air temperature" equals to the real intake air temperature	Yes	Step 5
		No	Next
3	Remove the connector, and use the multimeter to check whether the resistance between pin 1 and 3 is reasonable according to the temperature.	Yes	Step 5
		No	Next
4	Remove the connector and check whether the voltage between pin 4 and 3 is about 5V.	Yes	Next
		No	Check harness
5	Check whether the following pins are short battery:j2-8,j2-10of the ECU and pin 1,3 of the connector.	Yes	Check the harness
		No	Next
6	Crank the engine and stay idle. Check whether the "intake air temperature" goes up when the engine temperature goes up.	Yes	Help
		No	Change the sensor

Malfcode:P0117

Information: Coolant/Oil Temperature Sensor Circuit Low Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	check where the data of "engine temperature" equals to the real temperature	Yes	Step 5
		No	next
3	Remove the connector, and use the multimeter to check whether the resistance between pin 1 and 2 of the sensor is reasonable according to the temperature.	Yes	Step 5
		No	next
4	check whether the following pins are short to ground or open: j2-10,j2-14of the ECU and pin C and D of the sensor.	Yes	Harness issue
		No	Next
5	crank the engine and stay idle. Check whether the "engine temperature" goes high when engine get warm.	Yes	Help
		No	Change the sensor

Malfcode:P0118

Information: Coolant/Oil Temperature Sensor Circuit High Voltage or Open

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	check where the data of "engine temperature" equals to the real temperature	Yes	Step 5
		No	next
3	Remove the connector, and use the multimeter to check whether the resistance between pin 1 and 2 of the sensor is reasonable according to the temperature.	Yes	Step 5
		No	next
4	check whether the following pins are short to ground or open: j2-10,j2-14of the ECU and pin 1 and 2 of the sensor.	Yes	Harness issue
		No	Next
5	crank the engine and stay idle. Check whether the "engine temperature" goes high when engine get warm.	Yes	Help
		No	Change the sensor

Malfcode:P0122

Information: TPS Circuit Low Voltage or Open

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	check where the data of "Throttle opening" is between 0%-1%.	Yes	Step 5
		No	Next
3	Open the throttle to 100% slowly, check whether the data of"throttle opening" goes to between 90%-100%.	Yes	Step 5
		No	Next
4	Repeat Step 3,check whether the data jumps when open the throttle slowly.	Yes	Change the sensor
		No	Next
5	Remove the connector and check whether the following pins are short to ground or open: j2-12,j2-16of the ECU and pin 2 and 4 of the sensor.	Yes	Harness issue
		No	Next
6	Use multimeter to check whether the voltage between pin 4 and 3 is about 5V.	Yes	Help
		No	Step 5

Malfcode:P0123

Information: TPS Circuit High Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	check where the data of "Throttle opening" is between 0%-1%.	Yes	Step 5
		No	Next
3	Open the throttle to 100% slowly, check whether the data of"throttle opening" goes to between 90%-100%.	Yes	Step 5
		No	Next
4	Repeat Step 3,check whether the data jumps when open the throttle slowly.	Yes	Change the sensor
		No	Next
5	Remove the connector and check whether the following pins are short to ground or open: j2-12,j2-16of the ECU and pin 2 and 4 of the sensor.	Yes	Harness issue
		No	Next
6	Use multimeter to check whether the voltage between pin 4 and 3 is about 5V.	Yes	Help
		No	Step 5

Malfcode:P0131/P0132

Information: 02S1 Circuit Low/High Voltage

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Use multimeter to check whether the connection between pin B of the oxygen sensor and pin j1-17 of the ECU is open, and whether the pin B of sensor is short to pin A.	Yes	Harness issue
		No	Next
3	Crank the engine and stay idle. When the engines gets warm, use multimeter to check whether the voltage between pin A and B keeps jumping between 100-900mV	Yes	Help
		No	Next
4	A. emission pipe: block/leakage or not. B. injector: leakage or not C. fuel pressure too big or not D. valve clearance is to small or not	Yes	Engine maintenance
		No	Change sensor

Malfcode:P0201

Information: Injector 1 Circuit Malfunction

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Remove the connector of injector 1, use multimeter to check whether the voltage of pin A is about 12V.	Yes	Step 4
		No	Next
3	Check whether the connection between pin A and the main power relay is short ground or open,	Yes	Harness issue
		No	Next
4	Use multimeter to measure whether the resistance between pin A and B of the injector is about 10-14Ω@20℃	Yes	Change the injector
		No	Next
5	Use the multimeter to check whether the voltage of pin B is about 12V.	Yes	Help
		No	Next
6	Check whether the connection between pin B of the injector and j2-05 of the ECU is open or short to battery/ground.	Yes	Harness issue
		No	Help

Malfcode:P0230/P0232

Information: FPR Coil Circuit Low/High Voltage or Open

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Wait about 30s. Remove the fuel pump relay, ignition on. Check whether voltage of the relay feeder ear is about 12v	Yes	Change the pump
		No	Next
3	Check whether the feeder ear is short to ground or open,	Yes	Harness issue
		No	Next

Malfcode:P0351

Information: Cylinder 1 lgnition Coil Malfunction

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Remove the connector and check whether the voltage of pin + is about 12V.	Yes	Step 4
		No	Next
3	Check whether the connection of the pin + and main power relay is open short to ground.	Yes	Harness issue
		No	Next
4	Use multimeter to check whether the resistance of the two coil pins is 0.5-0.65Ω@20℃	Yes	Change coil
		No	Next
5	Use the multimeter to check whether the voltage of pin B is about 12V.	Yes	Help
		No	Next
6	Check whether the connection of pin 2 to the coil and j2-01 of ESU is open or short to battery/ground.	Yes	Harness issue
		No	Help

Malfcode:P0505

Information: Idle Speed Control Error

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Remove the connector. Use multimere to check whether the resistance pin A and pin D,pin B and pin C is about 53±5.3Ω	Yes	Next
		No	Change stepper motor
3	Check whether the 4 wires are short to battery/ground or open,	Yes	Harness issue
		No	Help

4.Maintenace depending on the performance

Before issue analysis, please check:

1)The MIL works well.

2)Clear the history malfcode,

3)When the malfcode comes again, note the conditions.

Check the appearance

1)Whether there is leakage of the fuel pipe or not.

2)Whether there is bloc/leakage or damage of the intake pipe.

3)Aging the ground connection is strong enough.

4)Whether the ground connection is strong enough.

5)All the connectors connected well.

Note:if any item above exists, please do the fix it at first before issue analysis.

Diagnostic Help:

1)Make sure there is no any issue record of the engine,

2)Make sure the issue could repeat.

3)Have checked follow the instructions above and no cause found.

4)Do not ignore the maintenance situation, cylinder pressure, mechanical timing and fuel quality.

5)Change the ECU and repeat the test, if the issue is gone, then the root cause is the ESU. Or change the old one back to check the root cause.

● Engine cannot start

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the voltage of the battery of the battery is around 8-12V.	Yes	Next
		No	Change the battery
2	Crank the engine, and check whether the voltage is above 8V.	Yes	Next
		No	Change the battery
3	Check whether the start motor working well or not.	Yes	Next
		No	Change the start motor
4	If the issue only occurs in winter, check the oil and gear box oil.	Yes	Change the oil
		No	Next
5	Check whether the engine rotation resistance is too big or not.	Yes	Check the engine
		No	Help

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the fuel pump pressure is about 250kpa at idle.	Yes	Next
		No	Check the pump
2	Check whether the "RMP" data on the diagnostic tool shows the real engine RPM	Yes	Next
		No	Check the crank sensor
3	Pull out the spark plug, check whether the spark over is normal.	Yes	Next
		No	Check the ignition system
4	Check whether the cylinder pressure is normal.	Yes	Engine is good
		No	Check the engine

● Start Difficult

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the fuel pump pressure is about 250kpa at idle.	Yes	Next
		No	Check the pump.
2	Pull out the spark plug, check whether the spark over is normal.	Yes	Next
		No	Check the ignition system
3	Remover the connector of the engine temperature sensor, and check whether the engine star well.	Yes	Check the engine temperature sensor
		No	Next
4	With a little bigger throttle, check whether the engine starts well.	Yes	Clean the throttle body and bypass channel.
		No	Next
5	Pull out the injector, and crank the engine. Check whether injection is normal.	Yes	Next
		No	Clean or change the injector
6	Pull out the spark plug, check whether it is wet or not	Yes	Dry the plug and combustion chamber.
		No	Next
7	Check whether the cylinder pressure is normal or not	Yes	Engine is good
		No	Check the engine

● Unstable idle

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the air filter is blocked and whether the intake pipe leaks.	Yes	Intake system maintenance
		No	Next
2	Whether there is carbon deposit at the throttle body and bypass channel.	Yes	Clean the TB
		No	Next
3	Check whether the IACV work well	Yes	Next
		No	Check the IACV
4	Check whether the fuel pressure is about 250kpa.	Yes	Next
		No	Check the pump
5	Check whether the injector is blocked.	Yes	Clean or change the injector
		No	Next
6	Make sue using the right type spark plug.	Yes	Next
		No	Change the spark plug
7	Check whether the cylinder pressure is normal	Yes	Next
		No	Check the engine
8	Remove the engine temperature sensor, and check whether the works well	Yes	Check the senor
		No	Next
9	Remove the TPS, check whether the engine works well	Yes	Change the sensor
		No	Help

● High idle

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the throttle cable is stuck	Yes	Adjust the cable
		No	Next
2	Check whether the idle pintle has been adjusted	Yes	Clean the TB
		No	Next
3	Check whether there is any leakage of the intake pipe.	Yes	Maintenance
		No	Next
4	Check whether the IACV works well	Yes	Next
		No	Change IACV
5	Remove the engine temperature sensor and check whether the engine works well.	Yes	Help
		No	Change the sensor

● Acceleration gets worse

ITEM	OPERATION	RESULT	NEXTSTEP
1	Check whether the air filter is blocked and whether the intake pipe leaks.	Yes	Intake system maintenance
		No	Next
2	Check whether the fuel pressure is about 250kpa.	Yes	Next
		No	Check the pump
3	Pull out the spark plug, check whether it is wet or not	Yes	Dry the plug and combustion chamber
		No	Next
4	Check whether the TMAP, TPS and the connections works well.	Yes	Next
		No	Change the sensor or harness maintenance
5	Check whether the injector is blocked.	Yes	Clean or change the injector
		No	Next
6	Check the type and the clearance of the spark plug.	Yes	Next
		No	Change the spark plug
7	Check whether the cylinder pressure is normal	Yes	Next
		No	Check the engine
8	Check whether the exhaust pipe is blocked or nor	Yes	Help
		No	Maintenance

● Backfire

ITEM	OPERATION	RESULT	NEXTSTEP
1	Pull out the spark plug, check whether the spark over is normal.	Yes	Next
		No	Check the ignition system
2	Check whether the timing is right.	Yes	Next
		No	Adjust the timing
3	Check whether there is leakage of the valve.	Yes	Adjust the valve
		No	Next
4	Check whether the injector is blocked.	Yes	Clean or change the injector
		No	Next
5	Check whether the oxygen sensor works well	Yes	Help
		No	Change the sensor

● Miss fire

ITEM	OPERATION	RESULT	NEXTSTEP
1	Connect the diagnostic too, and ignition on		next
2	Remove the connector. Use multimere to check whether the resistance pin A and pin D,pin B and pin C is about 53±5.3Ω	Yes	Next
		No	Change stepper motor
3	Check whether the 4 wires are short to battery/ground or open,	Yes	Harness issue
		No	Help

System or component	DTC number	DTC Description
ManifoldAbsolute Pressure Sensor (MAP)	P0107 P0108	MAP Circuit Low voltage or open Map Circuit High Voltage
Intake AirTemperature Sensor(IAT)	P0112 P0113	IAT Circuit Low Voltage IAT Circuit High Voltage or Open
Coolant/Oil Sensor	P0117 P0118	Coolant/Oil Temperature sensor Circuit Low Voltage Coolant/Oil Temperature sensor Circuit High Voltage or Open
Throttle Position Sensor(TPS)	P0122 P0123	TPS Circuit Low Voltage or Open TPS Circuit High Voltage
Oxygen Sensor	P0131 P0132	O2S 1 Circuit Low Voltage O2S 1 Circuit High Voltage
Oxygen Sensor Heater	P0032 P0031	O2S Heater Circuit High Voltage O2S Heater Circuit Low Voltage
Fuel Injector	P0201 P0202	Injector 1 Circuit malfunction Injector 2 Circuit malfunction
Fuel Pump Relay (FPR)	P0230 P0232	FPR Coil Circuit Low Voltage or Open FPR Coil Circuit High Voltage
Crankshaft Position Sensor(CKP)	P0336 P0337	CKP Sensor Noisy Signal CKP Sensor No Signal

System or component	DTC number	DTC Description
Ignition Coil	P0351 P0352	Cylinder 1 Ignition Coil Malfunction Cylinder 2 Ignition Coil Malfunction
Idle Control System	P0505	Idle Speed Control Error
System Voltage	P0562 P0563	System Voltage Low System Voltage High
MIL	P0650	MI Circuit Malfunction
Tachometer	P1693 P1694	Tachometer Circuit Low Voltage Tachometer Circuit High Voltage
Oxygen Sensor 2	P0137 P0138	O2S 2 Circuit High Voltage O2S 2 Circuit Low Voltage
Oxygen Sensor Heater 2	P0038 P0037	O2S Heater 2 Circuit High Voltage O2S Heater 2 Circuit Low Voltage
Vehicle Speed Sensor	P0500	VSS No Signal
Park Neutral Switch Diag	P0850	Park Neutral Switch Error
CCP	P0445 P0444	CCP short to high CCP short to low/open
BLM MaxAdapt	P0171	BLM Max Adapt(Kohler Special)
BLM MinAdapt	P0172	BLM Min Adapt(Kohler Special)
PE system Lean	P0174	PE syst Lean(Kohler Special)