Fi Diagnostic Tool Operation Instructions Part No. 3620A-LEB2-E00

13

KEY FUNCTION

1 Model No.
2 Down Button
3 DTC indicator(Failure codes)
④ Enter or Exit
5 Power indicator
6 UP Button
7 Adjust(TPI and ABV reset function)
8 DATA Analyze
9 DTC Inspect
⑩ ECU Version

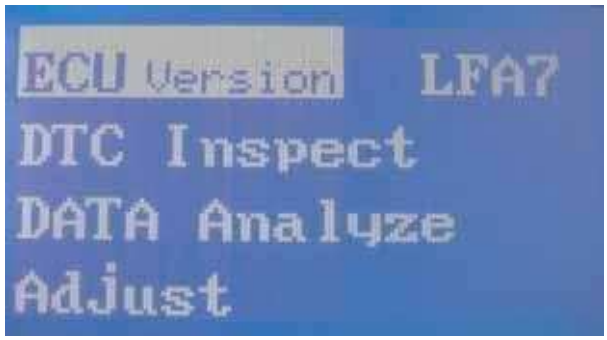
Fi diagnostic tool Outlook.....13-0
DTC Inspection Precedure 13-2
DTC Clear Procedure 13-5
Data Analysis.....13-6
Adjust.....13-8
Diagnostic Standard Specifications ·····13-9

DTC INSPECTION PROCEDURE

Connect Fi diagnostic tool with the connector of harness wire located beside the Battery.

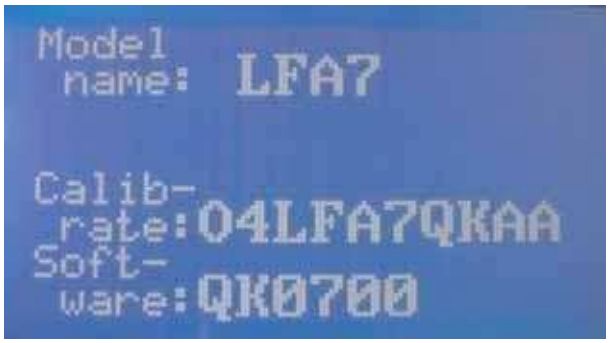
Diagnostic Tool Connector

Press the " Enter " button

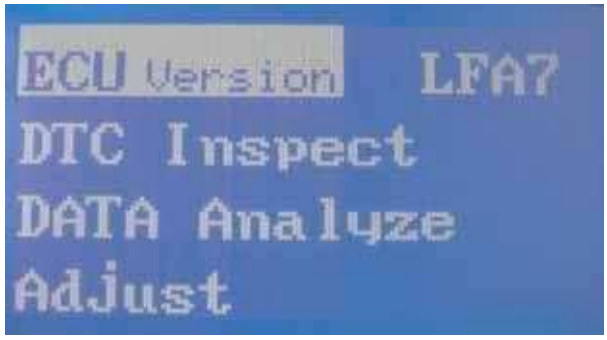


Check the software version

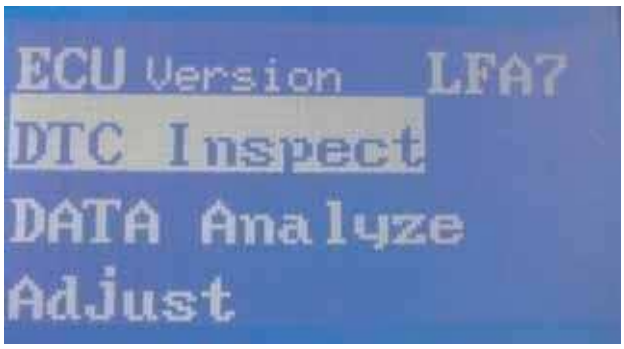
Press the " Enter " button and then turn to the first page.



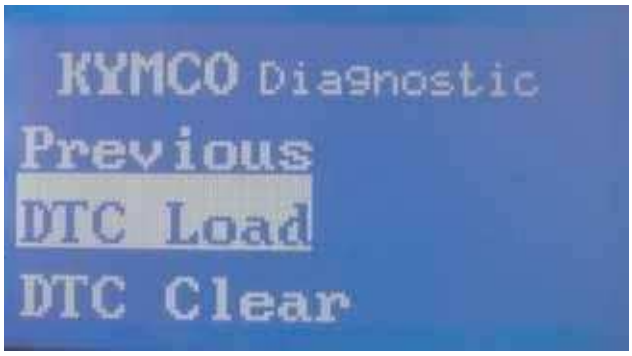
Press the " Down " button to enter the DTC Inspect.



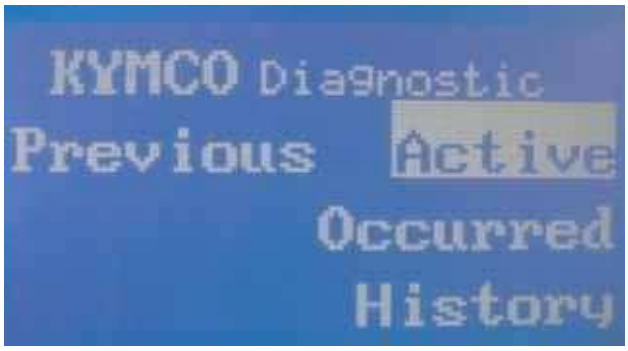
Press the " Enter " button to check the DTC number



Press the " Enter " button



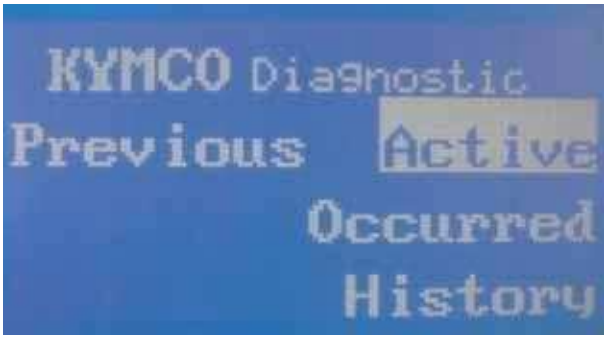
Press the " Enter " button



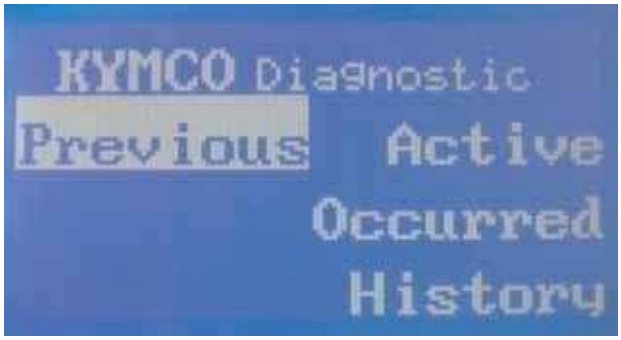
Display what's DTC number on this DTC-List. Refer to DTC summary list.

Press the " Enter " button and then turn to the previous page

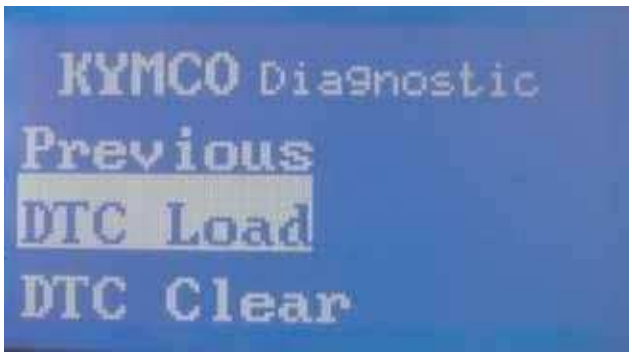
Press the " UP " button



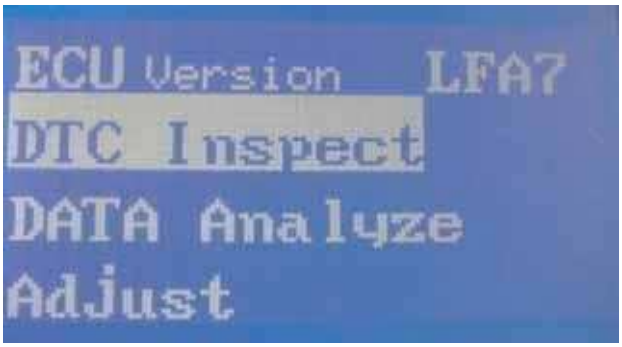
Press the " Enter " button and then turn to the previous page.



Press the " UP " button



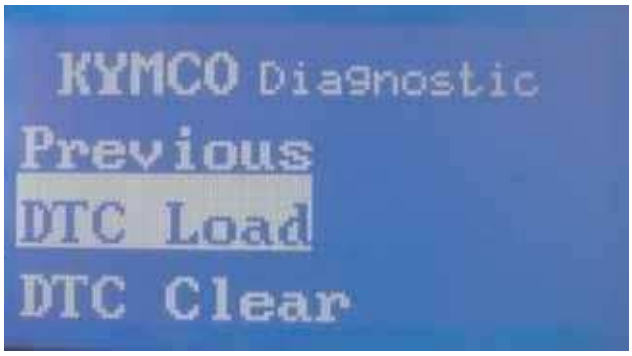
Press the " Enter " button and then turn to the first page.



DTC CLEAR PROCEDURE

Choose " Load DTC "

Press the " Down " button



Press the " Enter " button

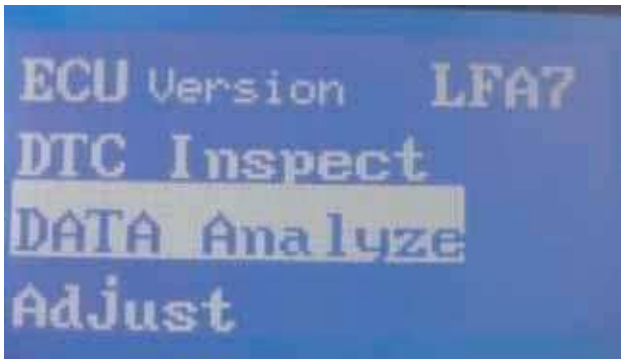
The DTC indicator is lighting at that time.

Clearing DTC completed until the DTC indicator is off.

DATA ANALYSIS

Choose " Data Analyze "

Press the " Enter " button to enter page 01.



The figure includes engine speed, idle speed setpoint and battery voltage.

Refer to standard specifications .

Press the " Down " button to enter page 02.

The figure includes TPS position, TPI idle adapted voltage and TPI WOT adapted (Throttle grip fully opened).

Refer to standard specifications .

Press the " Down " button to enter page 03.

The figure includes engine working temperature, atmosphere pressure and Manifold pressure.

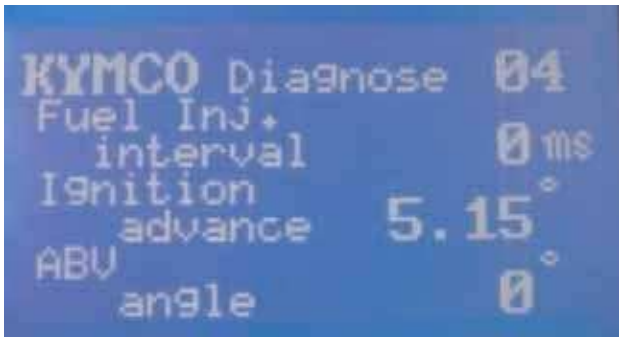
Refer to standard specifications on page 18-9.

Press the " Down " button to enter page 04.

The figure includes fuel injector interval, ignition advance angle and ABV angle.

Refer to standard specifications .

Press the " Down " button to enter page 05.



The figure includes O2 sensor voltage, O2 heater working condition and O2 correction.

Refer to standard specifications .

Press the " Down " button to enter page 06.

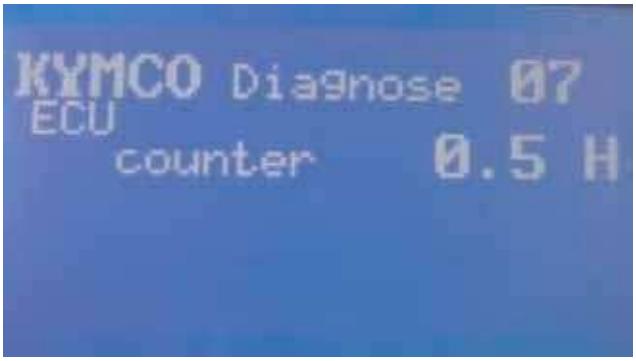
The figure includes rollover voltage .

Refer to standard specifications .

Press the " Down " button to enter page 07.

The figure includes ECU counter hours.

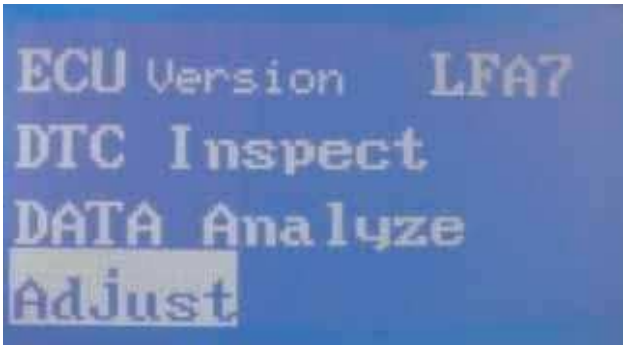
Press the " UP " button to the first page.



ADJUST

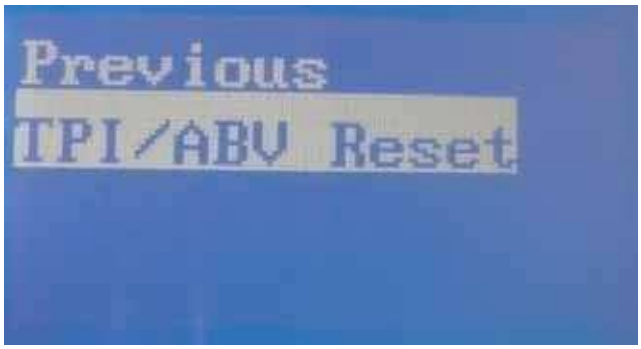
Need to make TPI/ABV reset to operate after changing new ECU and clean THROTTLE BODY and changing the engine department product, let ECU set up and set up initially

Choose "Adjust"

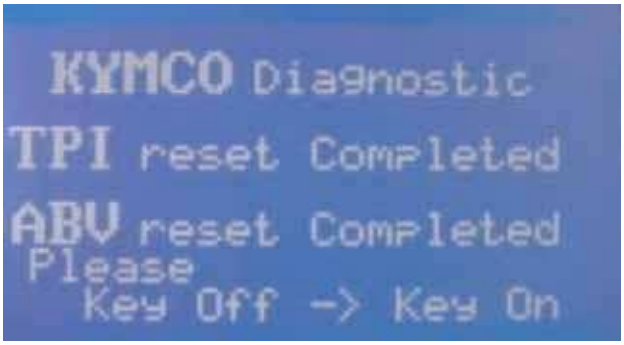


Press the "Enter" button to TPI/ABV Reset

Press the "Enter" button



Please key switch off then key switch on
Completed the TPI/ABV reset operate.



Diagnostic Standard Specifications

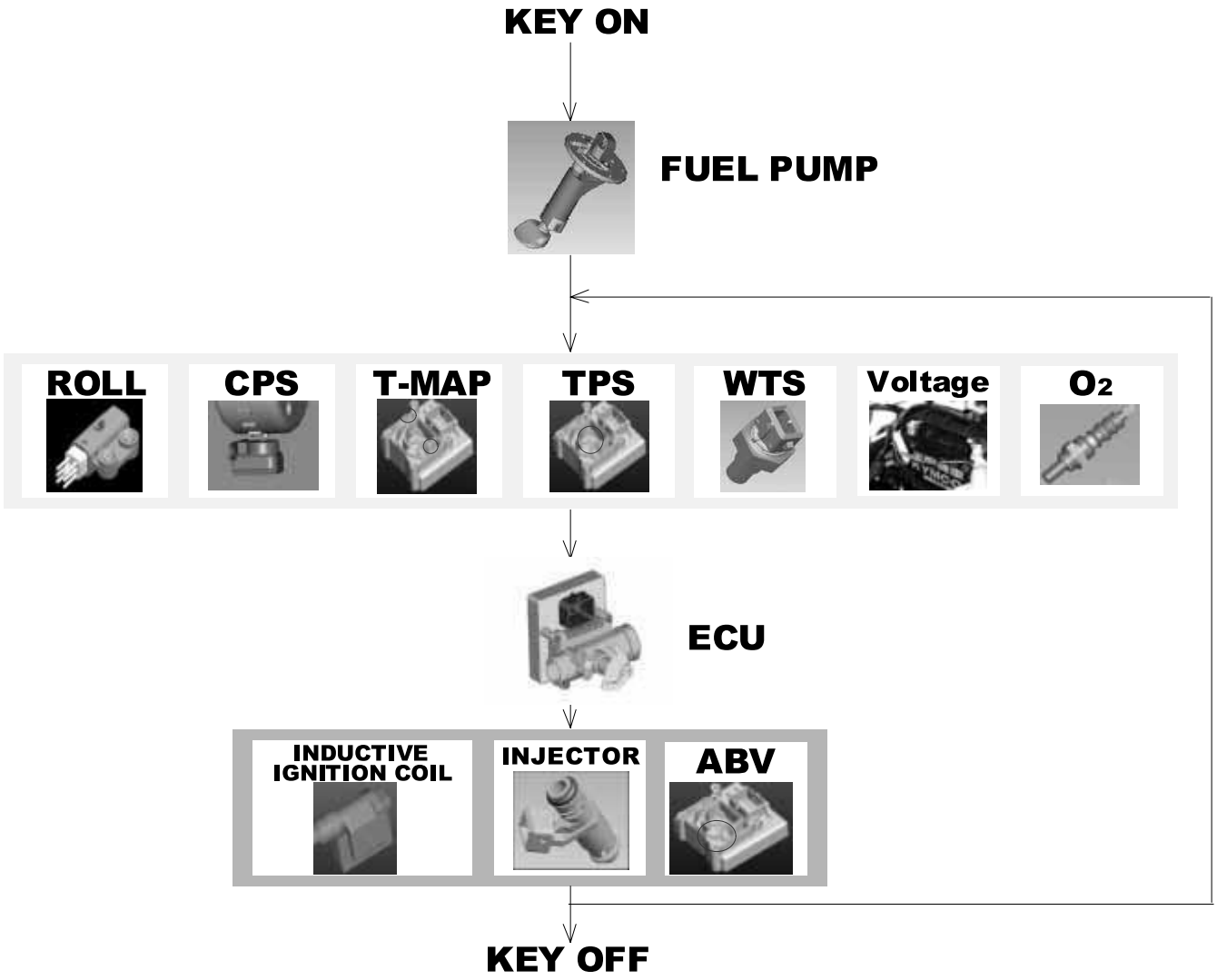
Reason of repair: □ maintenance □ breakdown

Item		Date	Reference	Memo
ECU Version	ECU No			LFA7
	Hardware Ver			
	Software Ver			
	Calibration Ver			
	Model Name			
DTC	Active			
	Occurred			
	History			
(Cool Engine) EngineStop	Air Temp.(℃)		environ.temp ± 2 ℃	
	Engine Temp.(Coiling)		environ.temp ± 2 ℃	
	Atom Pressure(Kpa)		101.3 ± 3 kPa	The ambient pressure drop about 12 kpa at the altitude every 1000m raised
	Throttle Position(%)		0° / 90° 以上	
	Throttle Position (V)		0.23V ± 0.05 / >3.27V	IDLE/Throttle fully
	TPIIdleMean (V)		0.23±0.05	IDLE/Throttle fully
	Battery Volt (V)		>12 V	
	Idle speed setpoint (rpm)		—	
	ISCAdapMean (°)		—	
	Cut Out switch volt (V)		0.4 ~ 1.44 V	3.7 ~ 4.7 V(Over 65°)
	Accumulated eng. run time (hr)		—	
(Hot Engine) BeforeRepair	EngineSpeed IDLE(rpm)		1850 ± 100 rpm	80~90℃
	MAPSample (kPa)		48 ~ 60 kpa	80~90℃
	Injection duration (ms)		1.6 ~ 2.7 ms	80~90℃
	Ign. Advance (°)		3 ~ 20 BTDC	80~90℃
	Ign.Dwell duration (ms)		1.9 ~ 2.6 ms	
	Air Temp.(℃)		environ.temp ±2 ℃	
	Engine Temp. (℃)		>80 ℃	
	O2 sensor voltage (V)		0 ~ 1 V	
	O2 sensor heater (Yes/no)		YES	
	O2 sensor correct		±20%	
	IDLE CO(%)		0.4 ~ 1.2 %	Engine warmup to 80~90 ℃
	ABVAngDurMech (°)		< 140 °	>140 ° The scooter with exchang engine oil and clean throttly body >180 ° The scooter must clean throttly body
(Hot Engine) AfterRepair	EngineSpeed IDLE(rpm)		1850 ± 100 rpm	80~90℃
	MAPSample (kPa)		48 ~ 60 kpa	80~90℃
	Injection duration (ms)		1.6 ~ 2.7 ms	80~90℃
	Ign. Advance (°)		3 ~ 20 BTDC	80~90℃
	Ign.Dwell duration (ms)		1.9 ~ 2.6 ms	Battery Volt (V)14V-1.9~2.1ms,12V-2.5~2.6ms
	Air Temp.(℃)		environ.temp ±2 ℃	
	Engine Temp. (℃)		>80 ℃	
	O2 sensor voltage (V)		0 ~ 1 V	
	O2 sensor heater (Yes/no)		YES	
	O2 sensor correct		±20%	
	IDLE CO(%)		0.4 ~ 1.2 %	Engine warmup to 80~90 ℃

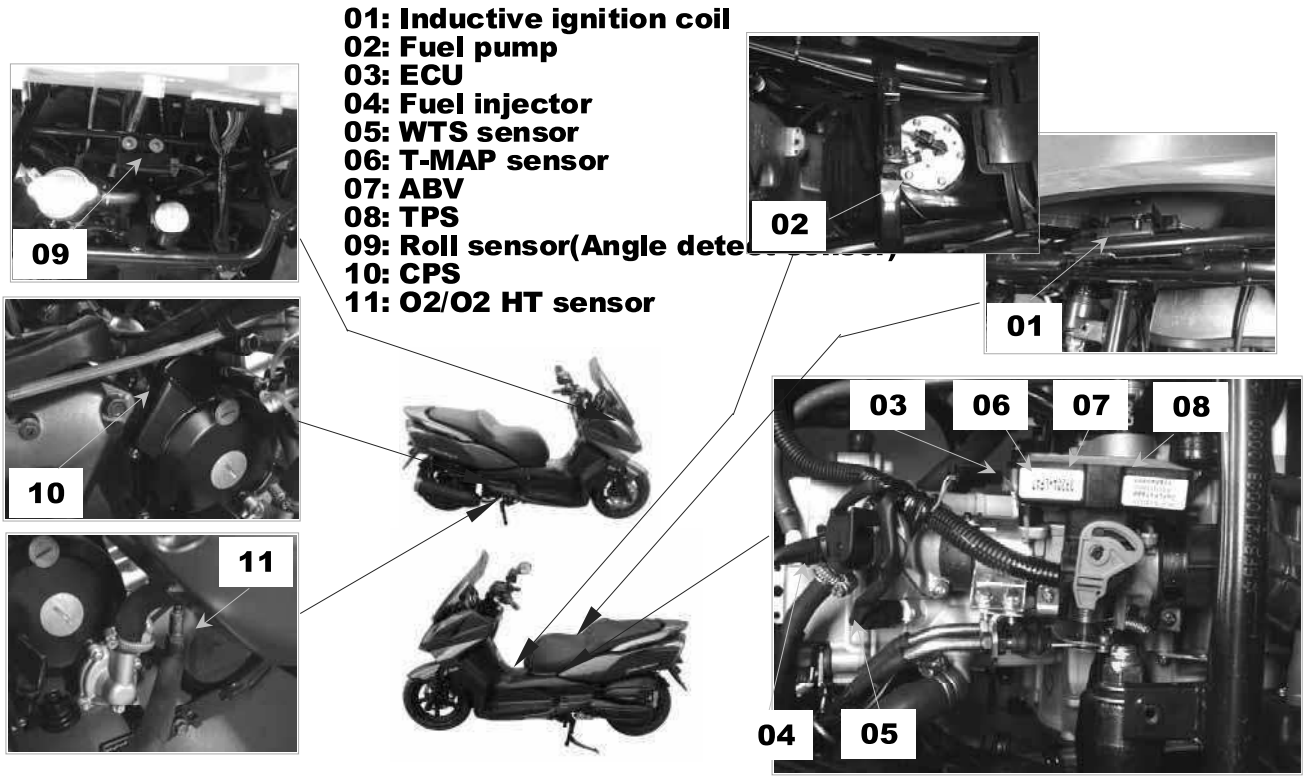
FUEL SYSTEM (Auto Control Fuel Injection System)

SYSTEM DIAGRAM 14-1
SYSTEM LOCATION 14-2
SERVICE INFORMATION 14-3
TROUBLESHOOTING 14-4
CHECK ENGINE LAMP (CELP) 14-5
HOW TO SHOW THE FAILURE CODE 14-6
CELP FAILURE CODES CHART 14-7
MAINTAINING BY CHECKING COMPONENT 14-11
MAINTAINING SPECIAL NOTICE 14-16
MAINTAINING RESET 14-17
DIAGNOSTIC RECORD SHEET 14-18

SYSTEM DIAGRAM



SYSTEM LOCATION



SERVICE INFORMATION

GENERAL INSTRUCTIONS

Gasoline is very dangerous. When working with gasoline, keep sparks and flames away from the working area.
Gasoline is extremely flammable and is explosive under certain conditions. Be sure to work in a well-ventilated area.

- Disconnect the cables of the battery when the engine is running, which could lead to ECU damage.
- Connect the harness positive (+) cable to the battery negative (-) terminal or connect the harness negative (-) to the battery positive (+) terminal, which could lead to ECU damage.
- Always keep fuel over 750 cc in fuel tank.

SPECIFICATIONS

Item			Standard
Charging voltage of battery			13.5~14.5V
Voltage from the ECU to sensor			5±0.1V
Fuel injector resistance (20°C/68°F)			10.6~15.9Ω
Water temperature sensor resistance			2.075±10 KΩ (20~30°C)
Throttle position sensor voltage			Idle (0°)=0.23±0.05V Throttle fully (90° /3.27V over)
Fuel pump resistance (20°C/68°F)			F: about 1100Ω E: about 100Ω
O2 sensor	O2 sensor heater resistance		6.7~9.5Ω
	Voltage	Air/Fuel<14.7 (Rich)	>0.7V
		Air/Fuel>14.7 (Lean)	<0.18V

Item	Standard
Crank position sensor (Pulser) resistance (20°C/68°F)	95~144Ω
Inductive ignition coil resistance (20°C/68°F)	0.55~0.75Ω
Roll sensor voltage (diagnostics)	Normal: 0.3~1.4V Over 65° fall down: 3.5~4.7V
Idle speed	1850±100 rpm

TROUBLESHOOTING

Engine won't start

- Battery voltage too low
- Fuel level too low
- Pinched or clogged fuel hose
- Faulty fuel pump operating system
- Clogged fuel filter (fuel pump)
- Clogged fuel injector
- Faulty spark plug or wrong type
- Cut by ECU due to angle detect sensor or incorrect function

Backfiring or misfiring during acceleration

- Ignition system malfunction

Poor performance (drive ability) and poor fuel economy

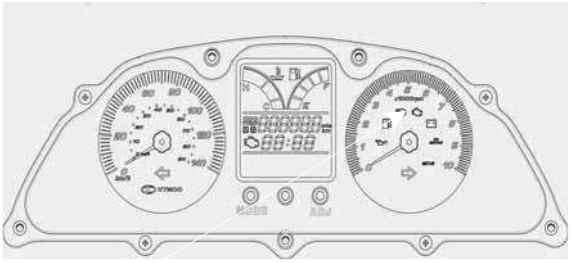
- Pinched or clogged fuel hose
- Faulty fuel injector

Engine stall, hard to start, rough idling

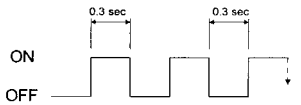
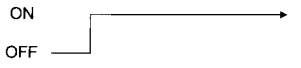
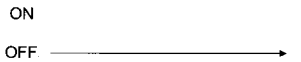
- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Idle speed misadjusted

CHECK ENGINE LAMP (CELP)

- When turning on the switch, the lamp will be lighted for 2 seconds then off. Let user to know the lamp is available and connect to ECU.
- But after then or during riding, if the CELP start to blink or keep lighting, it means something wrong with this vehicle, you better do the further check to find out the failure code to know which part get trouble

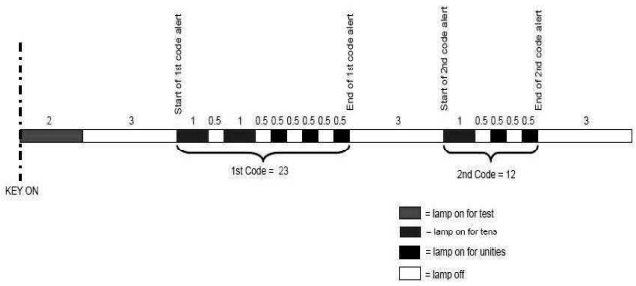


- There are 3 kinds of priority grade let user to know what kind of trouble was happened.
- Priority grade 1: CELP blinks continuously. This is the most emergent situation like engine over heat. User better slow down the riding and go to dealer for checking.
- Priority grade 2: CELP lights all the time. It means components get trouble or circuit something wrong. Do the further check to find out the failure code to know which part get trouble.
- Priority grade 3: CELP just blinks once suddenly and then disappear. It sometimes just warning like the RPM was too high in a short term.

PRIORITY	LAMP ACTION
1	
2	
3	

How To Show Failure Code

- You can read the failure code by as below :
- Turn switch on. The CELP will be lighted for 2 seconds then off. The CELP start to blink to show the failure codes
- (The number of blinks from 1 to 25).
- If vehicle got more than one failure code, the CELP will be shown from lower number failure code and then show the other higher number one after four seconds. All the failure codes would be shown repeatedly.



How To Reset Failure Code

- After repairing the trouble, you should clear the failure code or it will still exist in the ECU memory. When you maintain this vehicle next time, it will show again and you get confuse.
- Turn switch on. The CELP will be lighted for two seconds then off.
- The CELP begins to blink to show the failure codes.
- The self-diagnosis memory data will be erased when all the failure codes has showed for **4** cycles.

CELP Failure Code Chart(1)

Blink	Failure Codes	Fault description	Priority	Fault management
1	P0217	Engine temperature overheat	1	1.Slow down the vehicle and go to workshop for checking immediately. 2.Confirm if the engine temperature sensor or electric circuit is abnormality.
2	P0335	Crankshaft position sensor or circuit malfunction	2	1.Check if the connector of crankshaft position sensor is loosen. 2.Check if the Rotor is align with Crankshaft position sensor during the crankshaft running.
3	P1120	Throttle position sensor setting value problem	2	1.Make sure if the connector of Throttle position sensor is connected correctly. 2.Check if the Throttle position sensor is adjusted.
4	P1121	Throttle position sensor output range problem	2	1.Make sure if the connector of Throttle position sensor is connected correctly. 2.Check if the Throttle position sensor is adjusted.

CELP Failure Code Chart(2)

Blink	Failure Codes	Fault description	Priority	Fault management
5	P1122	Throttle position sensor movement speed problem	2	1.Make sure if the connector of Throttle position sensor is connected correctly. 2.Check if theThrottle position sensor is adjusted.
6	P0560	Battery voltage malfunction	1	1. Check if the battery voltage is lower or higher. 2.Check if the charge system is malfunction.
7	P0110	Inlet air temperature sensor or electric circuit malfunction	2	1. Check if the connector of Inlet air temperature sensor loosen. 2.Check if the resistance of sensor is normal .
8	P0410	Idle air valve or electric circuit malfunction	2	1. Check if the connector of Idle air valve loosen. 2.Check if the resistance of valve is normal.
9	P0505	Idle speed volume control range	2	1.Check if the opening angle is over 180 □ for Idle air valve. 2.Check if the opening angle is malfunction.
10	P0251	Injector or electric circuit	2	1.Check if the connector of Injector is loosen. 2.Check if the ECU send signal to Injector. 3.Check if the power source and resistance of Injector are malfunction.

CELP Failure Code Chart(3)

Blink	Failure Codes	Fault description	Priority	Fault management
11	P0350	Ignition coil or electric circuit malfunction	2	1. Check if the connector of ignition coil is loosen. 2. Check if the ECU send signal to Ignition coil. 3. Check if the power source and resistance is malfunction.
12	P0230	Fuel pump relay or electric circuit malfunction	2	1. Check if the connector of relay is loosen. 2. Check if the ECU send signal to relay. 3. Check the fuel pump relay resistance
13	P0219	Engine speed is over than top speed	2	Check if the belt of CVT is broken.
14	P1560	Sensor don't receive power source from ECU	2	1. Check if ECU output DC5V to sensor. 2. Check if the power source of all sensor is DC5V. 3. Replace a new ECU if the CELP still blinks even the output power source of ECU is normal.
15	P0700	Engine starting speed exceed CVT speed limited	2	1. Check if the throttle wire locked. 2. Check if the position of throttle screw is correct. 3. Check if the belt of CVT is broken.
16	P0115	Engine temperature sensor or electric circuit malfunction	2	1. Check if the connector of sensor is loosen. 2. Check if ECU pin is broken. 3.Check if the resistance of sensor is malfunction.
17	P1561	Temperature gauge electric circuit malfunction	2	Don't use it at present.

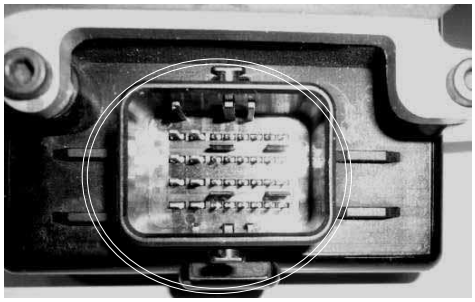
CELP Failure Code Chart(4)

Blink	Failure Codes	Fault description	Priority	Fault management
18	P0650	CELP electric circuit malfunction	3	1. Check if the lamp of CELP is broken. 2. Check if wires of CELP is broken.
21	P0105	Atmospheric Pressure Sensor or electric Circuit Malfunction	2	1. Check if the connector of sensor is loosen. 2. Check if ECU pin is broken. 3. Check if voltage of sensor is fit in specification.
22	P1110	Roll sensor or electric circuit malfunction	2	1. Check if the sensor installation direction is correct. 2. Check if voltage of sensor is fit in specification. 3. Check if ECU pin is broken.
23	P0136	O2 sensor malfunction	1	1. Check if the connector of sensor is loosen. 2. Check if ECU pin is broken.
24	P0141	O2 sensor heater malfunction	1	1. Check if the connector of sensor is loosen. 2. Check if ECU pin is broken. 3. Check if the resistance of sensor is malfunction.
25	P0171	O2 sensor electric circuit malfunction	1	1. Check if the connector of sensor is loosen. 2. Check if O2 sensor is blocked. 3. Don't follow a routine maintenance.

Maintaining By Checking Component

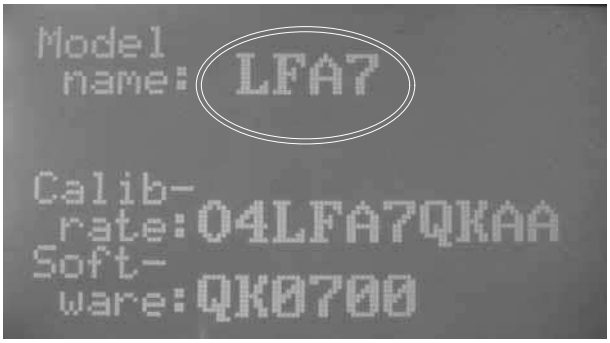
ECU(Engine Control Unit)

Outlook checking



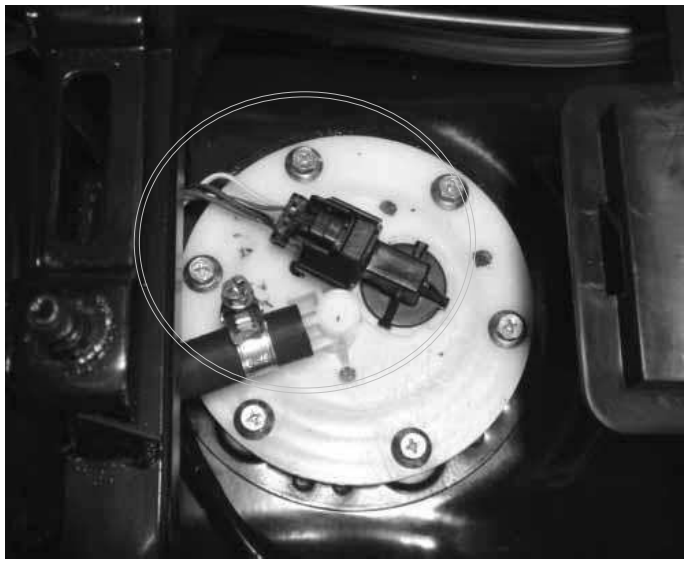
Voltage inspection
Connect the meter (+) probe to the F4(R/W)wire and the
meter (-) probe to the H4(G/B) wire to measure the voltage.

MAP content (edition issue no.)



FUEL PUMP

Connect the meter (+) probe to the red/black wire and the meter (-) probe to the green wire to measure the voltage from the ECU input to fuel pump unit.

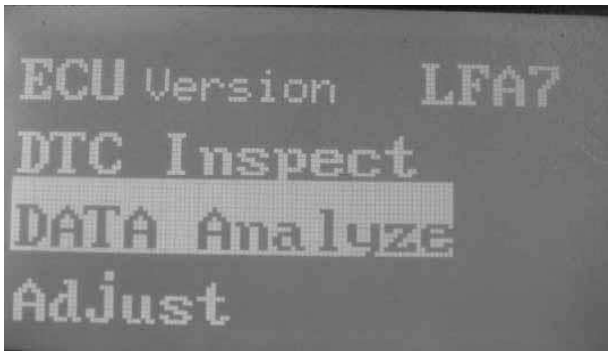


Standard : 8~16 V (Battery volt)

Measure the resistance of the fuel pump to see if it is short circuit or not.

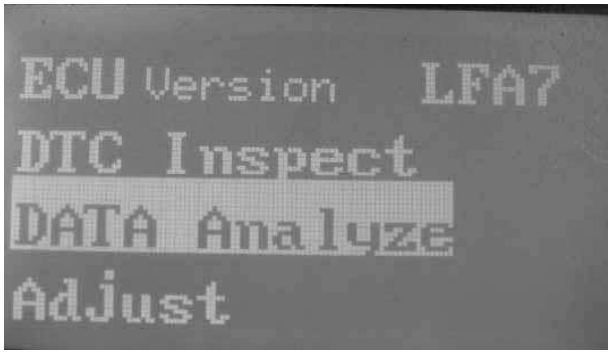
T-MAP(Manifold Air Temperature Pressure) Sensor

Connect the PDA or KYMCO Fi diagnostic tool.
Into the Data Analyze item .
Check if the manifold pressure data is malfunction.
(Key switch ON but engine is not start)
If data was incorrect.
It is possible T-map sensor is not normal.

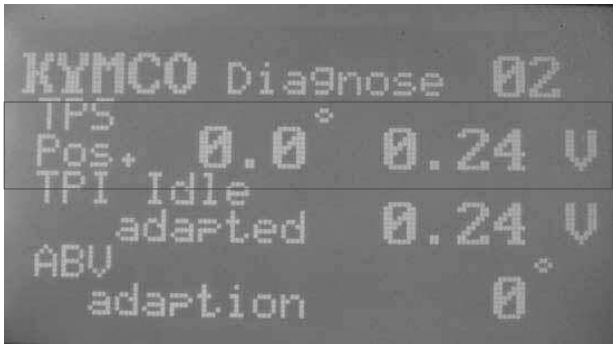


Standard : 101.3 ±3 kpa(see level)
The ambient pressure drop about 12Kpa at the altitude every raised.

TPS(Throttle Position Sensor)
Connect the PDA or KYMCO Fi diagnostic tool.
Into the Data Analyze item .
Check if the TPS position data is malfunction.
(Key switch ON but engine is not start)
If data was incorrect.(Idle and throttle fully)
It is possible TPS is not normal.

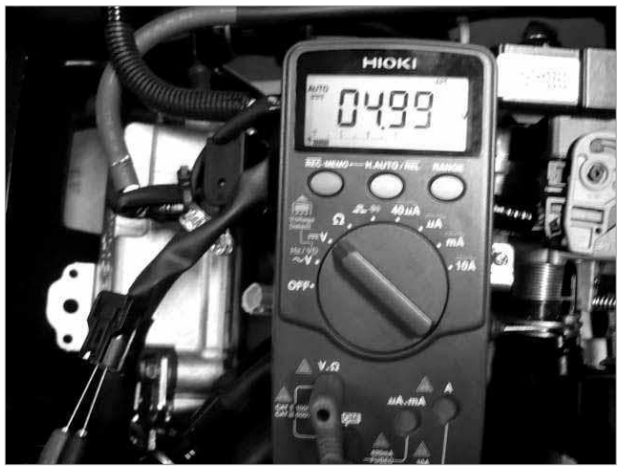


Standard :Idle ~0 ° voltage~0.23V ±0.05
Throttle fully~90°over
voltage~3.27V over



WTS (Water Temperature Sensor)

Connect the meter (+) probe to the V/G wire and the meter (-) probe to the G/L wire to measure the voltage



Standard : 5±0.25 V

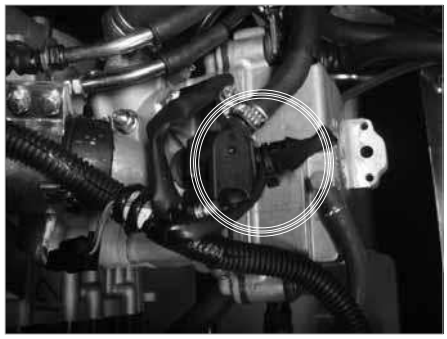
Measure the resistance of the WTS

Standard (20°C/68°F): 2.075±10%kΩ

INJECTOR

Measure the resistance of the Injector

Standard (20°C/68°F): 10.6~15.9Ω



O2 SENSOR

Measure the resistance of the O2 sensor heater. (2 white wire pin)

Standard (20°C/68°F): 6.7 ~9.5Ω

Connect the PDA or KYMCO Fi diagnostic tool.

Into the Data Analyze item .

Check Page 05

(Key switch ON then start engine until O2 heater activation is ON)

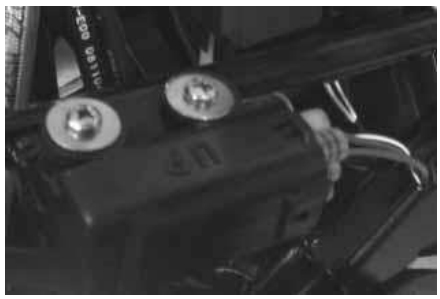
If data was incorrect.

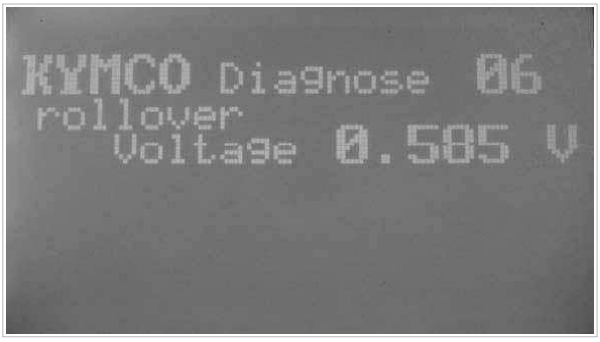
It is possible O2 sensor is not normal

ROLL SENSOR

The engine should be stall when the vehicle incline over 65° for safety. When you place the vehicle back to normal situation, you have to key-off and key-on the switch, then it can be restarted.

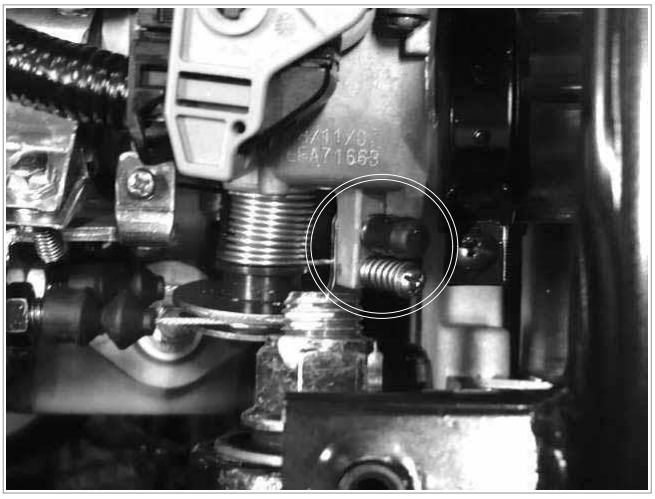
Standard: Normal: 0.4~1.4V
OVER 65°: 3.7~4.4 V





Maintaining Special Notice

Never adjust those two TP screws, those were adjusted to be the best condition by KYMCO, if change this condition it may cause instable riding.



TP screws

Connect the PDA or KYMCO Fi diagnostic tool.

Into the Data Analyze item .

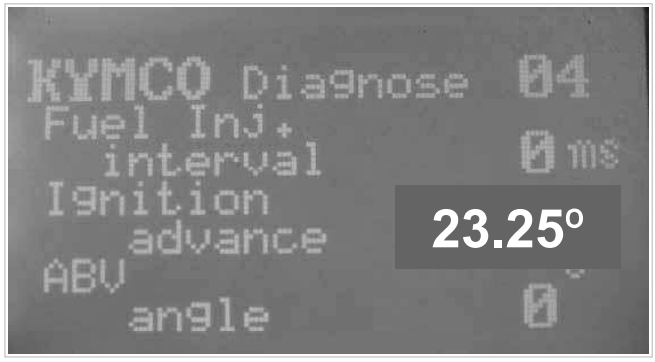
Check if the ignition advance data is malfunction.

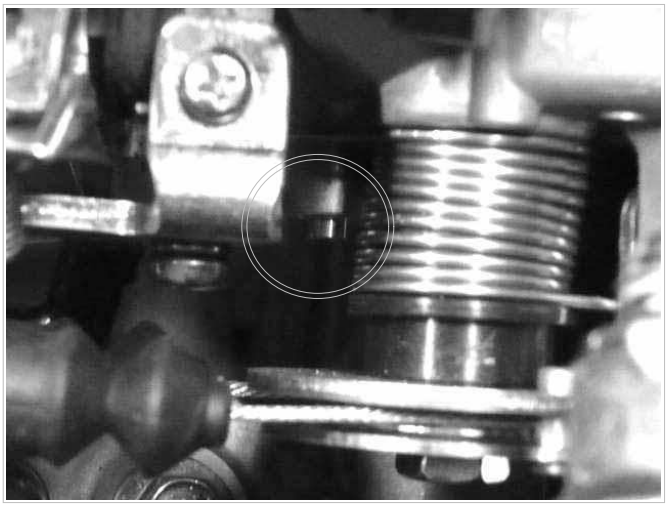
(Key switch is ON then start engine until 80 ° C)

If data was over **20 °**

you can adjustment the air bypass adjustment screw 1~1.5 circle.(counterclockwise)

Don't adjust the air bypass adjustment screw over 1.5 circle.





Maintenance reset

TPI and ABV Initialization Method

After replacing throttle body or engine overhauled, It will change the efficiency of air intake so must be do the TPI/ABV initialization process.

- When the vehicle is started, turn off the ignition and Key On again (do not start the engine).

Use test rod or wire clip short Reset (pink) wire to short with negative of battery or the earthing of frame to complete TPI ABV resetting.

Precautious:

1. After short, remove test rod or wire clip. Never let it connected all the time.

2. Do not break the PVC sleeve of Reset wire.

KYMCO Diagnostic Report DOWNTOWN 125 i

SF
Date of production

Customer：
Date of repair：

Eng.Num：

Mileage：

Reason of repair: ☐ maintenance ☐ breakdown

	Item	Date	Reference	Memo
ECU Version	ECU No			LFA7
	Hardware Ver			
	Software Ver			
	Calibration Ver			
	Model Name			
DTC	Active			
	Occurred			
	History			
(Cool Engine) EngineStop	Air Temp.(°C)		environ.temp ± 2 °C	
	Engine Temp.(Coiling)		environ.temp ± 2 °C	
	Atom. Pressure(Kpa)		101.3 ± 3 kPa	The ambient pressure drop about 12 kpa at the altitude every 1000m raised
	Throttle Position(%)		0° / 90° 以上	
	Throttle Position (V)		0.23V ± 0.05 / >3.27V	IDLE/Throttle fully
	TPIIdleMean (V)		0.23±0.05	IDLE/Throttle fully
	Battery Volt (V)		>12 V	
	Idle speed setpoint (rpm)		---	
	ISCAdapMean (°)		---	
	Cut Out switch volt (V)		0.4 ~ 1.44 V	3.7 ~ 4.7 V(Over 65°)
	Accumulated eng. run time (hr)		---	
(Hot Engine) BeforeRepair	EngineSpeed IDLE(rpm)		1850 ± 100 rpm	80~90°C
	MAPSample (kPa)		48 ~ 60 kpa	80~90°C
	Injection duration (ms)		1.6 ~ 2.7 ms	80~90°C
	Ign. Advance (°)		3 ~ 20 BTDC	80~90°C
	Ign.Dwell duration (ms)		1.9 ~ 2.6 ms	
	Air Temp.(°C)		environ.temp ±2 °C	
	Engine Temp. (°C)		>80 °C	
	O2 sensor voltage (V)		0 ~ 1 V	
	O2 sensor heater (Yes/no)		YES	
	O2 sensor correct		±20%	
	IDLE CO(%)		0.4 ~ 1.2 %	Engine warm up to 80~90 °C
	ABVAngDurMech (°)		140 °	>140 ° The scooter with exchang engine oil and clean throttly body >180 ° The scooter must clean throttly body
(Hot Engine) AfterRepair	EngineSpeed IDLE(rpm)		1850 ± 100 rpm	80~90°C
	MAPSample (kPa)		48 ~ 60 kpa	80~90°C
	Injection duration (ms)		1.6 ~ 2.7 ms	80~90°C
	Ign. Advance (°)		3 ~ 20 BTDC	80~90°C
	Ign.Dwell duration (ms)		1.9 ~ 2.6 ms	Battery Volt (V)14V-1.9~2.1ms,12V-2.5~2.6ms
	Air Temp.(°C)		environ.temp ±2 °C	
	Engine Temp. (°C)		>80 °C	
	O2 sensor voltage (V)		0 ~ 1 V	
	O2 sensor heater (Yes/no)		YES	
	O2 sensor correct		±20%	
	IDLE CO(%)		0.4 ~ 1.2 %	Engine warm up to 80~90 °C
	ABVAngDurMech (°)		140 °	>140 ° The scooter with exchang engine oil and clean throttly body >180 ° The scooter must clean throttly body

Repair description	Repair Process

Report ID=

Report Version : DEC/11/2008