

AFI (AUTOMATIC FUEL INJECTION)

SERVICE INFORMATION-----	.6- 1
SYSTEM DIAGRAM-----	---6- 4
SYSTEM LOCATION-----	.6- 5
TROUBLESHOOTING-----	--6- 7
SELF-DIAGNOSTIC PROCEDURES WITHOUT DIAGNOSTIC TOOL-----	.6- 8
EFI SELF-DIAGNOSIS CHECK ENGINE LAMP (CELP) FAILURE CODES-----	---6- 9
CELP FAILURE CODES CHART-----	---6-11
SELF-DIAGNOSTIC PROCEDURES USING DIAGNOSTIC TOOL (diagnostic tool)-----	.6-13
AFI SIGNAL DATA-----	.6-17
TPS/ISC RESET-----	.6-21
FUEL PUMP-----	.6-22
FUEL CUT-OFF RELAY-----	.6-24
TILT SWITCH-----	---6-25
AIR IDLE SPEED VALVE, ENGINE CONTROL UNIT (ECU)----	.6-26
FUEL INJECTOR-----	---6-29
ECT SENSOR (500 AFI)-----	.6-31
ECT SENSOR (300 AFI)-----	.6-32
O2/O2 HT SENSOR-----	.6-33
THROTTLE BODY/MAP/ISC/TPS-----	---6-34
DIAGNOSTIC TOOL CONNECTOR-----	---6-39



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- This section covers service of the fuel system.
- These services can be done with the engine installed in the frame.
- Be sure to relieve the fuel pressure before fuel pump or fuel hose removal.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum.
- Do not snap the throttle valve from fully open to fully close after the throttle cable has been removed; it may cause incorrect idle operation.
- Do not loosen or tighten the painted bolts and screws of the throttle body. Loosening or tighten them can cause throttle and idle valve synchronization failure.
- Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- Do not push the fuel pump base under the fuel tank when the fuel tank is stored.
- Always replace the packing when the fuel pump is removed.
- The electronic fuel injection system is equipped with the self-diagnostic system described on page 6-8 (without diagnostic tool) or page 6-13 (using diagnostic tool). If the Check Engine Lamp “CELP” illuminate while riding, follow the self-diagnostic procedures to remedy the problem.
- A faulty AFI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- When disassembling the fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Do not disconnect the battery negative or positive cable while engine is running, it may cause ECU damage.
- Connect the battery cables mistook may cause ECU damage.
- Do not disconnect or connect the ECU connector during the ignition switch “ON”; it may cause the ECU damage.

6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

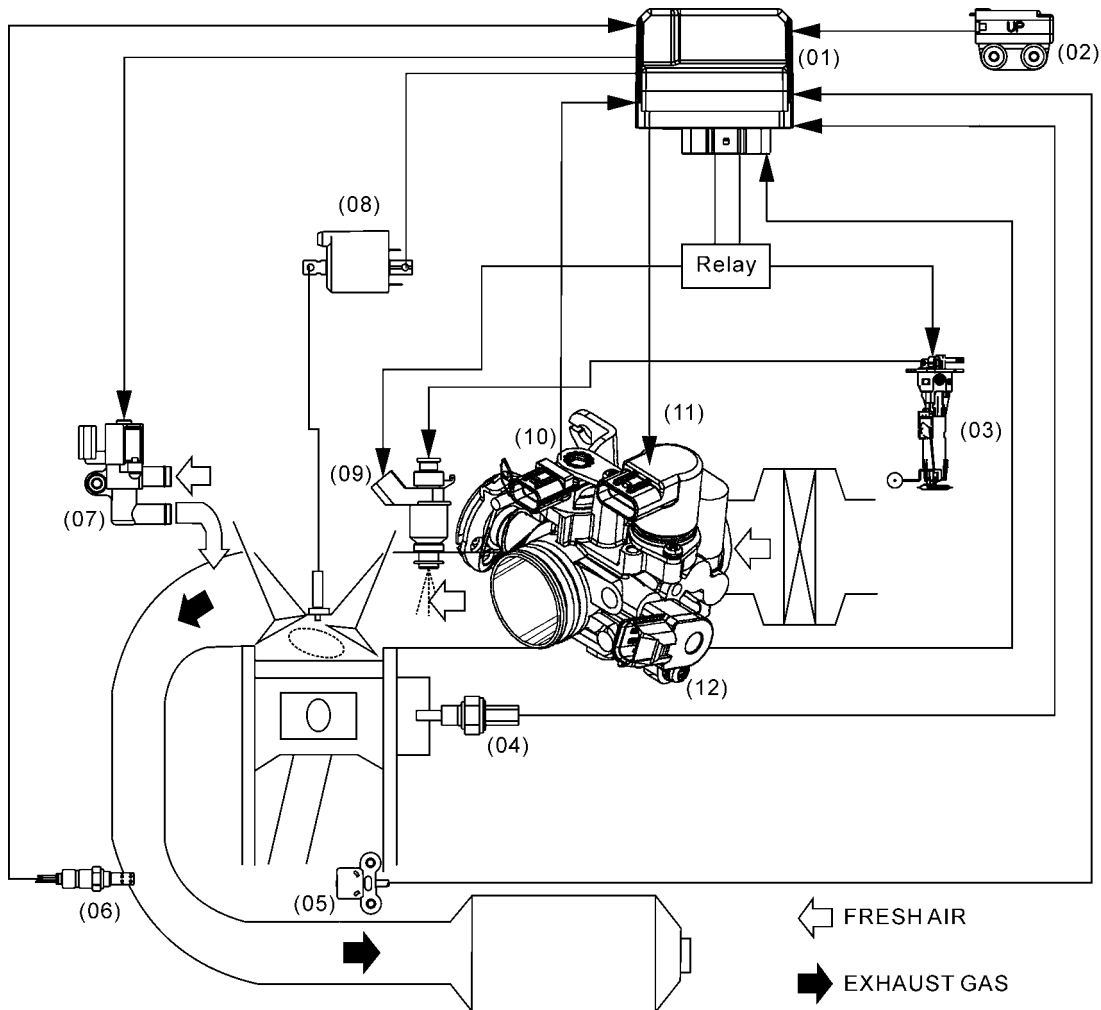
SPECIFICATIONS(XCITING 500 AFI)

ITEM		SPECIFICATIONS
Throttle body identification number		
Idle speed		1400±100 rpm
Throttle grip free play		2~6 mm (1/16~1/4 in)
Fuel injector resistance (at 20°C/68°F)		11.7±0.6Ω
Fuel pump resistance (at 20°C/68°F)	Float at full position	7±3 Ω
	Float at empty position	95±5 Ω
Fuel pump standard pressure (at 40 L/H)		294±6 kPa
Fuel pump flow (at 12 V/Standard pressure)		20 L/Hr (MIN)
Engine coolant temperature sensor resistance	At -20°C/28°F	18.8 KΩ
	At 40°C/88°F	1.136 KΩ
	At 100°C/148°F	0.1553 KΩ 25C:2.076+ - 10%
Intake pressure sensor (MAP) pressure (at 1~4.2 V)		13.332 kPa (0.13332 kgf/cm ² , 1.89 psi)~ 119.99 kPa (1.1999 kgf/cm ² , 17.04 psi)
Throttle position sensor (TPS) resistance (at 20°C/68°F)		0.3~4.5 V (at throttle valve open 0~100%)
Idle air bypass A/B valve (ISC) resistance (at 20°C/68°F)		80±5 Ω
Crank position sensor voltage (at any rpm)		Over 1 mV
O2 heater sensor resistance (at 20°C/68°F)		7.7±1.2 Ω
Tilt switch voltage	Standard	0.4~1.4 V
	Over 65° position	3.7~4.4 V
Air idle speed valve (AICV) resistance (at 20°C/68°F)		35.5~40.5 Ω

SPECIFICATIONS(XCITING 300 AFI)

ITEM		SPECIFICATIONS
Throttle body identification number		
Idle speed		1600±100 rpm
Throttle grip free play		2~6 mm (1/16~1/4 in)
Fuel injector resistance (at 20°C/68°F)		11.7±0.6Ω
Fuel pump resistance (at 20°C/68°F)	Float at full position	7±3 Ω
	Float at empty position	95±5 Ω
Fuel pump standard pressure (at 40 L/H)		294±6 kPa
Fuel pump flow (at 12 V/Standard pressure)		20 L/Hr (MIN)
Engine coolant temperature sensor resistance	At -20°C/28°F	18.8 KΩ
	At 40°C/88°F	1.136 KΩ
	At 100°C/148°F	0.1553 KΩ
Intake pressure sensor (MAP) pressure (at 1~4.2 V)		13.332 kPa (0.13332 kgf/ cm ² , 1.89 psi)~ 119.99 kPa (1.1999 kgf/ cm ² , 17.04 psi)
Throttle position sensor (TPS) resistance (at 20°C/68°F)		0.3~4.5 V (at throttle valve open 0~100%)
Idle air bypass A/B valve (ISC)		
Crank position sensor voltage (at 200 rpm)		Over 1 V
O2 heater sensor resistance (at 20°C/68°F)		7.7±1.2 Ω
Tilt switch voltage	Standard	0.4~1.4 V
	Over 65° position	3.7~4.4 V
Air idle speed valve (AISV) resistance (at 20°C/68°F)		25.95~29.55 Ω

SYSTEM DIAGRAM



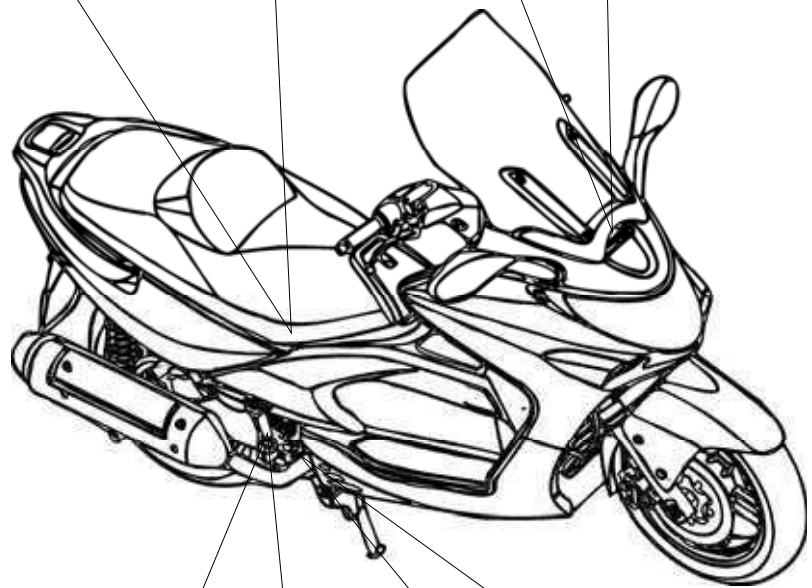
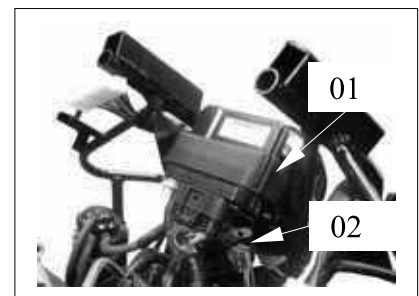
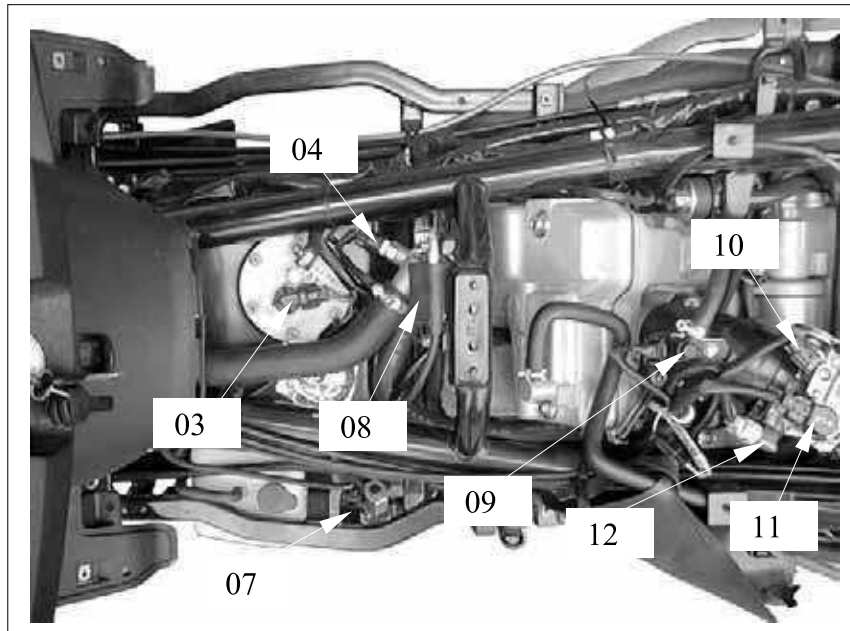
No.	FULL NAME	ABBREVIATIONS
(01)	Engine control unit	ECU
(02)	Tilt switch (Angle detect sensor)	ROLL
(03)	Fuel pump/Fuel level unit	FP
(04)	Engine coolant temperature sensor	ECT sensor
(05)	Crank position sensor (Pulser)	CPS
(06)	Oxygen/Oxygen heater sensor	O2/O2 HT sensor
(07)	Air idle speed valve (Secondary air valve)	(AISV)
(08)	Inductive ignition coil	IG
(09)	Fuel injector (Nozzle)	INJ
(10)	Intake pressure sensor	MAP sensor
(11)	Idle air bypass valve	ISC
(12)	Throttle position sensor	TPS

6. AFI (AUTOMATIC FUEL INJECTION)

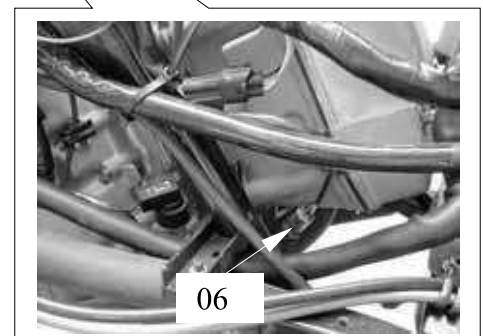
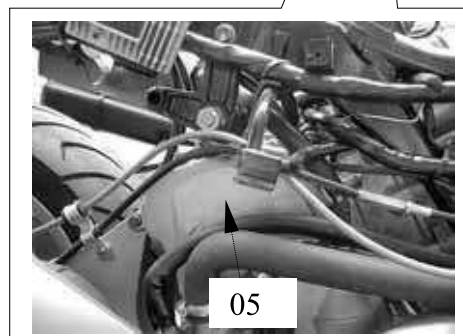


XCITING 500/500 AFI/250/300 AFI

SYSTEM LOCATION(XCITING 500 AFI)



- 01: ECU
- 02: ROLL
- 03: Fuel pump/Fuel level unit
- 04: ECT sensor
- 05: CPS
- 06: O2/O2 HT sensor
- 07: EXAI
- 08: IG
- 09: INJ
- 10: MAP sensor
- 11: ISC
- 12: TPS

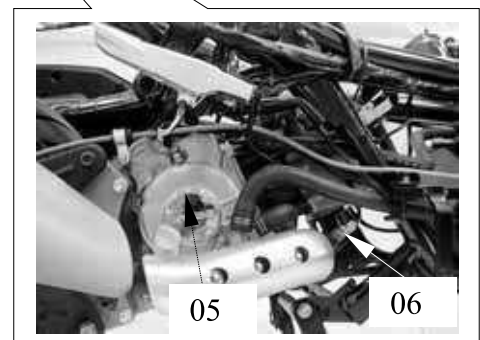
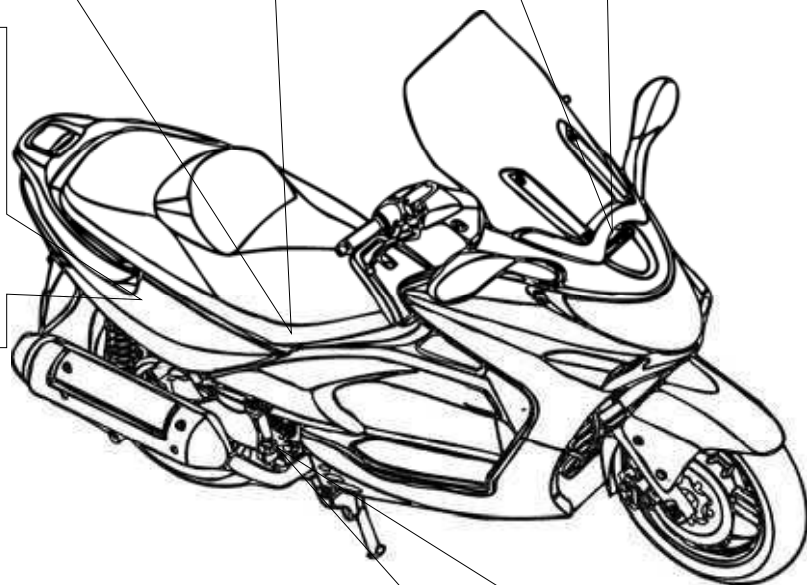
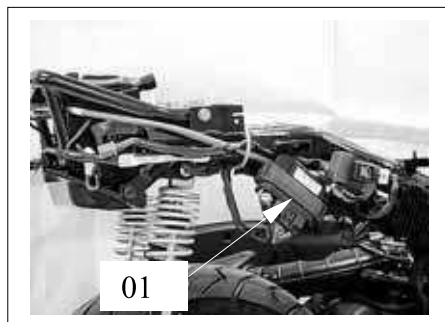
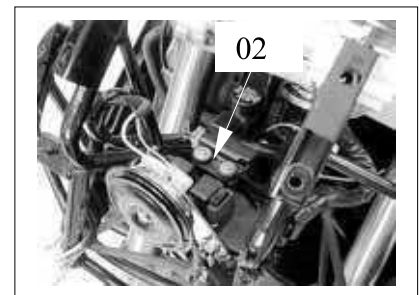
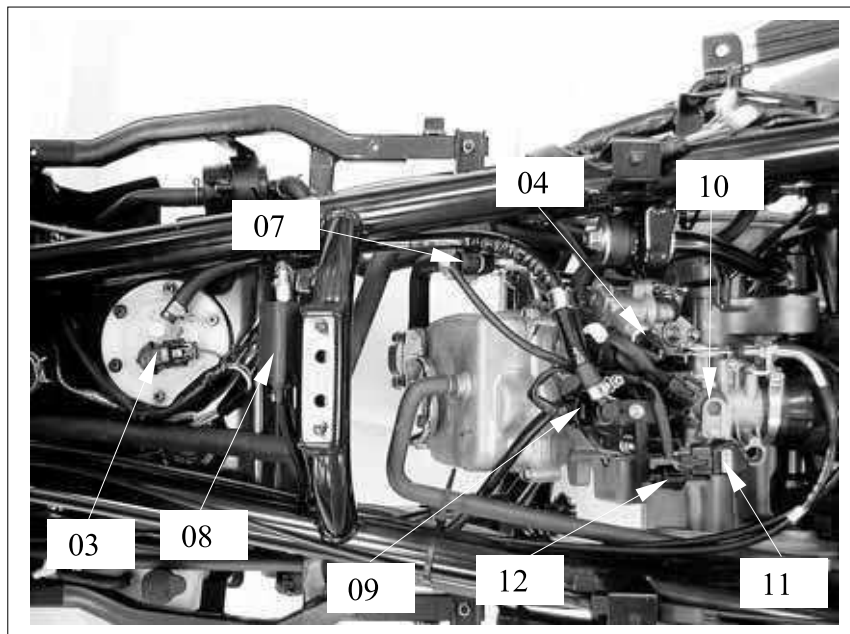


6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

SYSTEM LOCATION (XCITING 300 AFI)



- 01: ECU
- 02: ROLL
- 03: Fuel pump/Fuel level unit
- 04: ECT sensor
- 05: CPS
- 06: O2/O2 HT sensor
- 07: AISV
- 08: IG
- 09: INJ
- 10: MAP sensor
- 11: ISC
- 12: TPS

TROUBLESHOOTING

Engine would not start

- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Faulty fuel pump
- Clogged fuel filter
- Sticking fuel injector needle
- Faulty fuel pump operating system

Backfiring or misfiring during acceleration

- Ignition system malfunction

Engine stall, hard to start, rough idling

- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Idle speed misadjustment
- Fail to perform PTS/ISC reset

Poor performance (drive ability) and poor fuel economy

- Pinched or clogged fuel hose
- faulty injector

SELF-DIAGNOSTIC PROCEDURES WITHOUT DIAGNOSTIC TOOL

SELF-DIAGNOSTIC PROCEDURES

* Without diagnostics program can be performed condition.

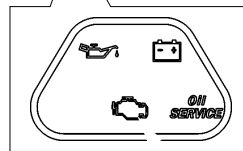
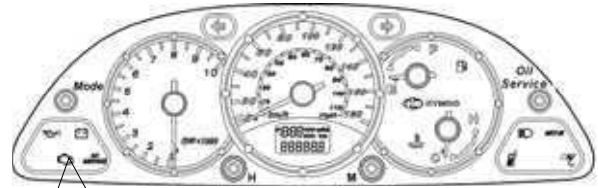
Place the scooter on its main stand.
Put the side stand up and the engine stop switch is at "RUN".

- Turn the ignition switch "ON" with no engine speed, the CELP will light for two second then off. It shows the lamp work normal.
- Turn the ignition switch "ON" with no engine speed, after "lamp test" illumination 2 seconds and the lamp shall turn off for 5 seconds. The "CELP" will start blinking if the ECU has self-diagnosis memory data.

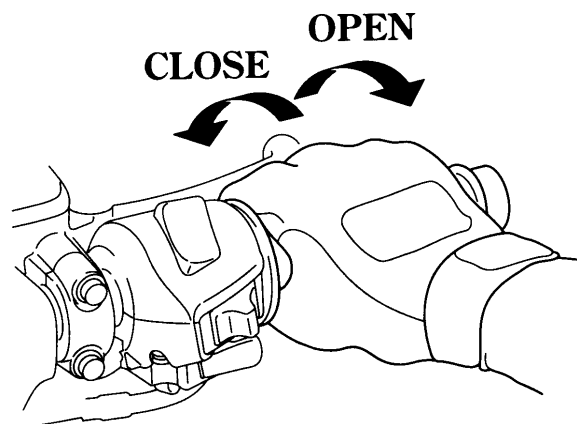
Note no matter when the "CELP" illuminate while riding, and determine the cause of the problem (page 6-11 through 6-12).

SELF-DIAGNOSIS RESET (CLEAR FAILURE CODES) PROCEDURE

1. Put the side stand up and engine stop switch is at "RUN".
2. Turn the ignition switch "OFF" and close the throttle fully.
3. Disconnect the diagnostic tool (page 6-13).
4. Turn the ignition switch "ON" and wait 10 seconds.
5. Open and hold the throttle fully, after 10 seconds close the throttle fully.



Check Engine Lamp (CELP)



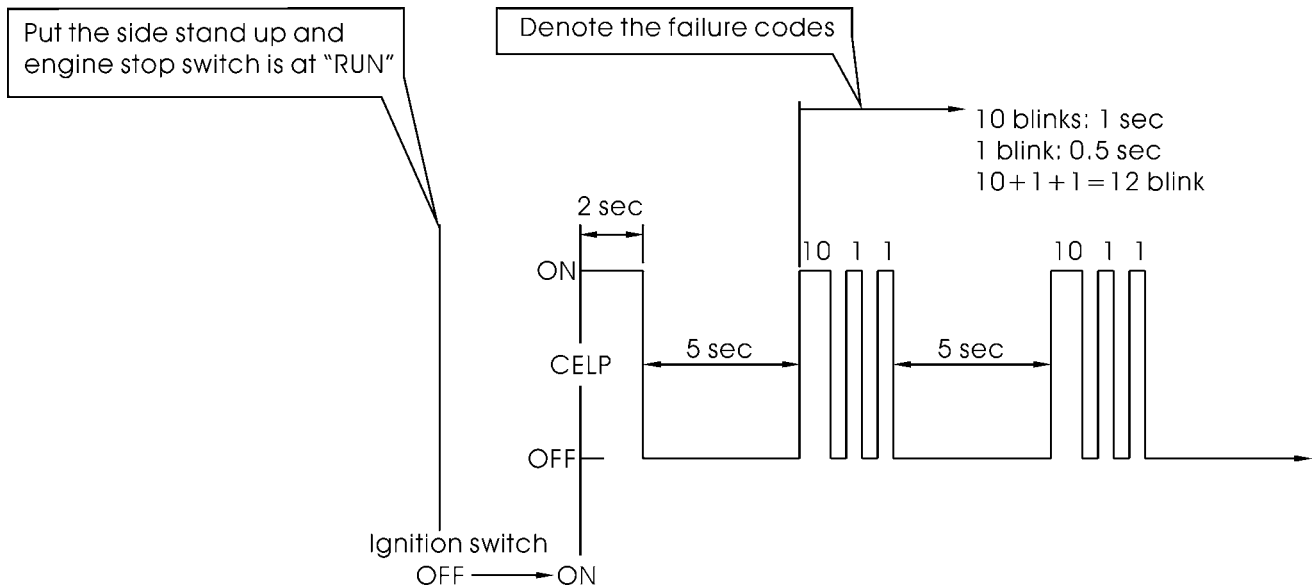
6. The CELP will blink 2 times after 5 seconds. Self-diagnosis memory data is erased if the CELP turns off.

* The self-diagnosis can not reset when there still is trouble in the system.

EFI SELF-DIAGNOSIS CHECK ENGINE LAMP (CELP) FAILURE CODES

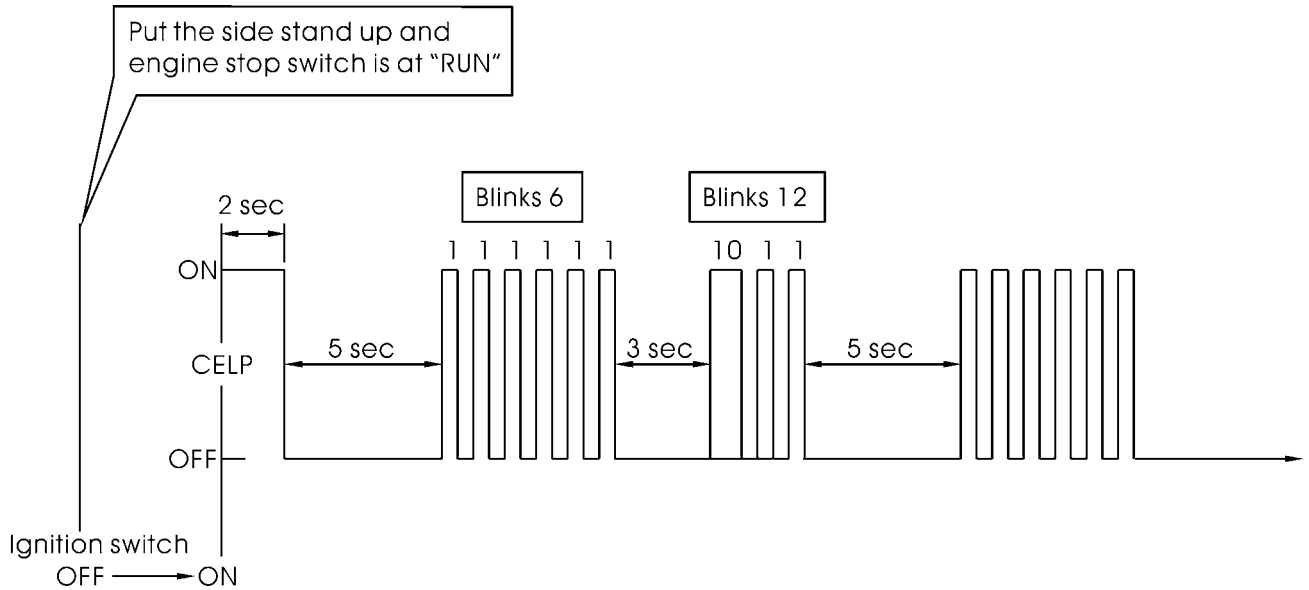
- The “CELP” denotes the failure codes. When the indicator lights for 1 second it is equivalent 10 blinks. For example, a 1 second illumination and two blink (0.5 second x 2) of the indicator equals 12 blinks. Follow code 12.

Example 1 (procedures):



- When more than one failure occurs, the "CELP" shows the blinks in the occurred order. For example, if the indicator blinks 6 times, then 1-second illumination and two blinks, two failures have occurred. Follow code 6 and 12.

Example 2 (failure codes 6 and 12):



CELP FAILURE CODES CHART

Blinks	Failure Codes (diagnostic tool)	Contents	Causes	Symptoms
06	P0120	Faulty TPS	<ul style="list-style-type: none"> • TPS range fault • TPS voltage range (0.3~4.5 V) fault • Loose or poor contacts on TP Sensor • Open or short circuit in TPS wire • Faulty TPS 	<ul style="list-style-type: none"> • Engine operates normally
09	P0105	Faulty MAP	<ul style="list-style-type: none"> • MAP voltage range (1~4.2 V) fault • Loose or poor contacts on MAP • Open or short circuit in MAP wire • Faulty MAP 	<ul style="list-style-type: none"> • Engine operates normally
11	P0195	Faulty ECT (oil temperature)	<ul style="list-style-type: none"> • No this equipment 	
12	P0115	Faulty ECT (water temperature)	<ul style="list-style-type: none"> • ECT Ω range (-20°C: 18.8 Ω/40°C: 1.136 Ω/100°C: 0.1553 Ω) fault • Loose or poor contacts on ECT • Open or short circuit in ECT wire • Faulty ECT 	<ul style="list-style-type: none"> • Engine operates normally
13	P0110	Faulty IAT	<ul style="list-style-type: none"> • No this equipment 	
15	P1630	Faulty Tilt switch (Roll)	<ul style="list-style-type: none"> • Tilt switch voltage range (incline angle < 65°: 0.4~1.4 V/incline angle . 65°: 3.7~4.4 V) fault • Loose or poor contacts on tilt switch • Open or short circuit in tilt switch wire • Faulty tilt switch 	<ul style="list-style-type: none"> • Engine operates normally
17	P0130	Faulty O2 sensor	<ul style="list-style-type: none"> • O2 sensor voltage range (A/F below 14.7: > 0.7V/ A/F over 14.7: < 0.18 V) fault • Loose or poor contacts on O2 sensor • Open or short circuit in O2 sensor wire • Faulty O2 sensor 	<ul style="list-style-type: none"> • Engine operates normally
33	P0201	Faulty injector (Nozzle)	<ul style="list-style-type: none"> • Fuel injector Ω range (11.7Ω \pm 15%) fault • Loose or poor contacts on injector • Open or short circuit in injector wire • Faulty fuel injector 	<ul style="list-style-type: none"> • Engine does not start • Engine does not operate

(Cont'd)

6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

Blinks	Failure Codes (diagnostic tool)	Contents	Causes	Symptoms
37	P0351	Faulty inductive ignition coil	<ul style="list-style-type: none"> ● Inductive ignition coil Ω range ($4.2 \Omega \pm 15\%$) fault ● Loose or poor contacts on inductive ignition coil ● Open or short circuit in inductive ignition coil wire ● Faulty inductive ignition coil 	<ul style="list-style-type: none"> ● Engine does not start ● Engine does not operate
41	P0230	Faulty fuel pump	<ul style="list-style-type: none"> ● Fuel pump Ω range ($11.7 \Omega \pm 15\%$) fault ● Loose or poor contacts on fuel pump ● Open or short circuit in fuel pump wire ● Faulty fuel pump 	<ul style="list-style-type: none"> ● Engine does not start ● Engine does not operate
45	P0135	Faulty O2 sensor heater	<ul style="list-style-type: none"> ● O2 sensor heater Ω range ($7.7 \Omega \pm 2 \Omega$) fault ● Loose or poor contacts on O2 sensor heater ● Open or short circuit in O2 sensor heater wire ● Faulty O2 sensor heater 	<ul style="list-style-type: none"> ● Engine starts normally ● Engine does not operate
49	P1505	Faulty ISC	<ul style="list-style-type: none"> ● Loose or poor contacts on ISC ● Open or short circuit in ISC wire ● Faulty ISC 	<ul style="list-style-type: none"> ● Engine operates normally
54	P1410	Faulty AICV (AISV)	<ul style="list-style-type: none"> ● AISV Ω range fault ● Loose or poor contacts on AISV ● Open or short circuit in AISV wire ● Faulty AISV 	<ul style="list-style-type: none"> ● Engine operates normally
66	P0335	Faulty CPS	<ul style="list-style-type: none"> ● Loose or poor contacts on CPS ● Open or short circuit in CPS wire ● Faulty CPS 	<ul style="list-style-type: none"> ● Engine does not start ● Engine does not operate

KYMCO Fi DIAGNOSTIC TOOL (Part No,3620A-LEB2-E00)

DIAGNOSTIC PROCEDURE

Connect the KYMCO Fi Diagnostic tool with this connector as picture. Upward the side stand and keep the engine stop switch is at “RUN” position. This power is from the battery.



Diagnostic Tool Connector

Main drawing introduce

Model No.



Press ENTER button

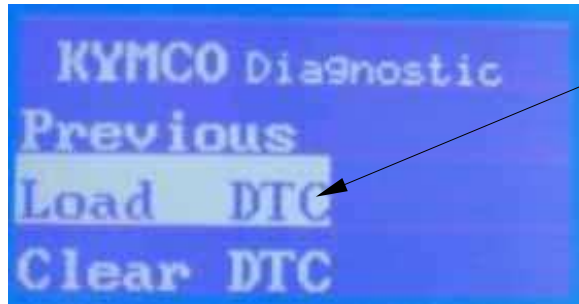


Check the ECU version

Loading DTC



Press ENTER



Loading DTC



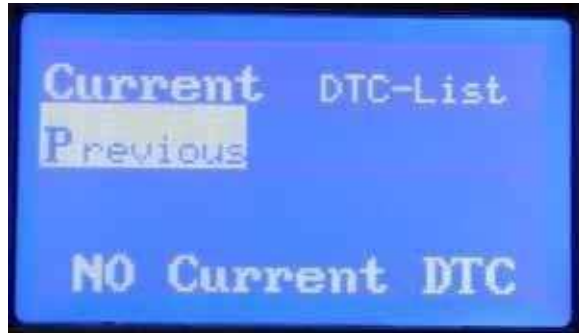
Press ENTER button



Current DTC



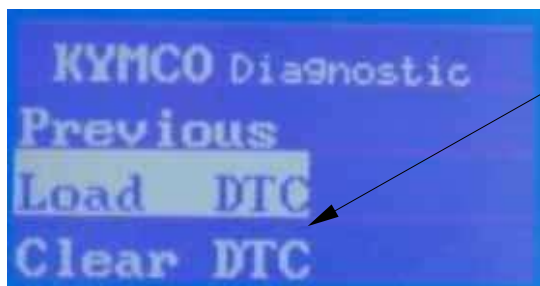
Press ENTER button



NO Current DTC



Press ENTER button



Loading DTC



Press ENTER button



Freeze DTC

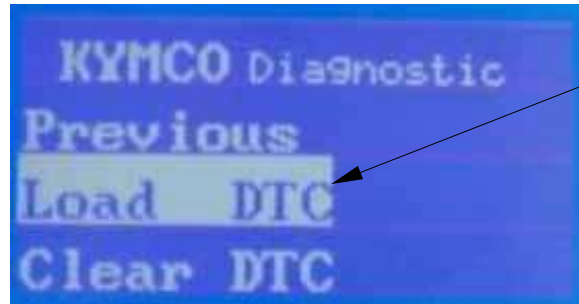
6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI



Press ENTER button



Loading DTC



Press ENTER button

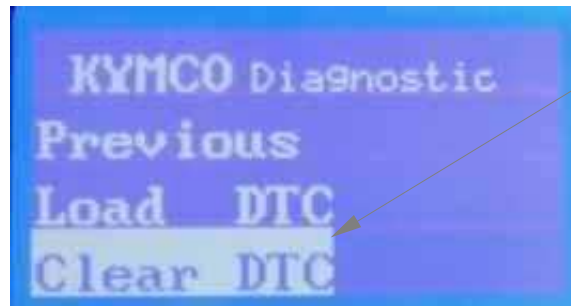


All DTC

Clear DTC



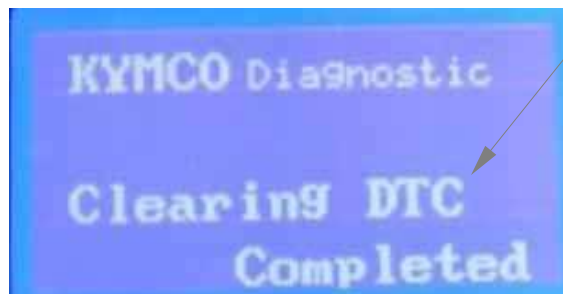
Press ENTER button



Clear DTC



Press ENTER button



Completed

Data Analyze(Please see XCITING 300i diagnostic report standard) to checking it. Page 20)

Page 01



Press ENTER button



Page 02



Page 03



Page 05



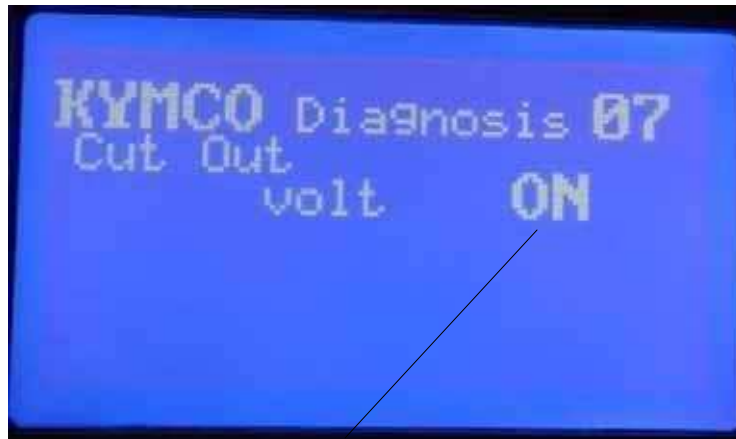
Page 04



Page 06



Data Analyze(Please see XCITING 300i diagnostic report standard) to checking it. page 20)



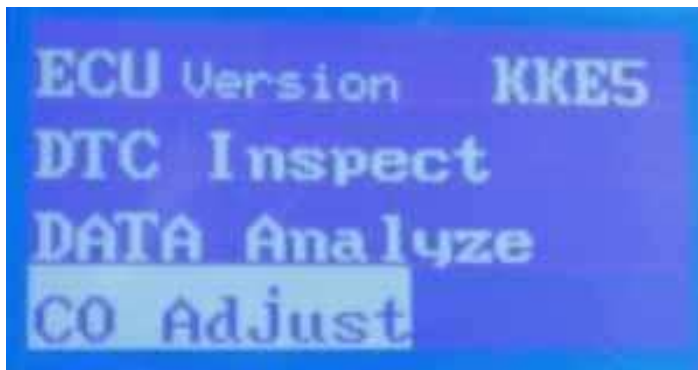
Page 07

Roll sensor is normal

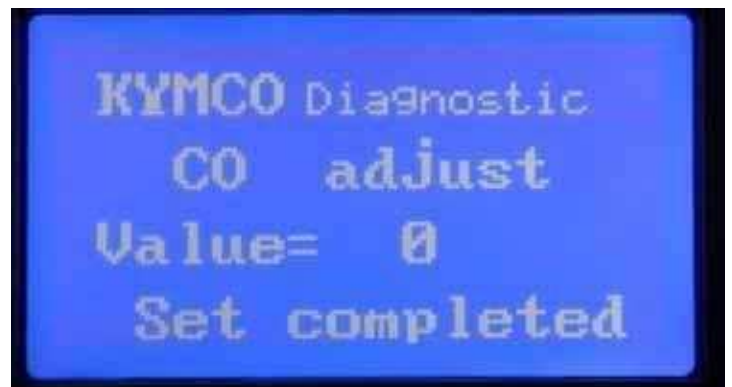
CO ADJUST (Please connect E/M measure machine checking it and see XCITING 300i diagnostic report co item standard-page 20)



Press ENTER button



Press ENTER button

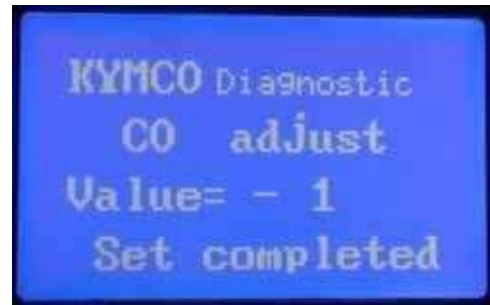


UP
button:+1

DOWN
button:-1



UP button:1



DOWN button:-1

Xciting 300i/Ri Diagnostic Report

光陽機車 **KYMCO** Diagnostic Report

LFG2

SF :
Date of
production

Customer :
Date of
repair :

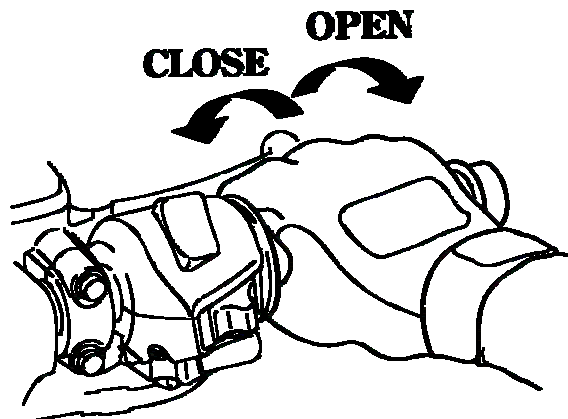
Eng.Num :
Mileage :

Reason of repair: maintenance breakdown

Item		Date	Reference	Memo
ECU Version	ECU No			
	Hardware Ver			
	Software Ver			
	Calibration Ver			
	Model Name			
DTC	Current			
	Freeze			
	All DTC			
(Cool Engine) EngineStop	DTC Number			
	Engine Temp.<Coiling>(°C)		environ.temp ± 1.6 °C	
	Atom. Pressure(Kpa)		101.3 ± 2 kPa	
	Throttle Position(%)		1.00%以下	Throttle fully(94% OVER)
	Throttle Position Voltage (V)		0.5±0.10 V	Throttle fully(3.5--3.9 V)
	Battery Voltage(V)		>12 V	
	O2 Sensor Voltage(V)		5±0.1 V	
	Roll Sensor State		UP Ward	
	Spark plug Type		DPR6EA-9	
	IDLE CO(%)		0	
(Hot Engine) BeforeRepair	Engine speed (rpm)		1600 ± 100 rpm	Water Temp 80 Over(°C)
	Intake Pressure(Kpa)		31~40 kpa	
	Fuel Inject Interval(ms)		1.6 ~ 2.8 ms	Water Temp 80 Over(°C)
	Engine Temp.<Coiling>(°C)		°C	
	Ignition Timing (°)		12 ~ 14 BTDC	
	Battery Voltage(V)		>12 V	
	O2 Sensor Voltage(V)		0.05--0.9 V	
	ISC Step (step)		98 ± 10	Water Temp 80 Over(°C)
	Ex. 2nd Air Solenoid Valve State		Open	
	IDLE CO(%)		0.6~2.6%	
(Hot Engine) AfterRepair	Engine speed (rpm)		1600 ± 100 rpm	Water Temp 80 Over(°C)
	Intake Pressure(Kpa)		31~40 kpa	
	Fuel Inject Interval(ms)		1.6 ~ 2.8 ms	Water Temp 80 Over(°C)
	Engine Temp.<Coiling>(°C)		°C	
	Ignition Timing (°)		12 ~ 14 BTDC	
	Battery Voltage(V)		>12 V	
	O2 Sensor Voltage(V)		0.05--0.9 V	
	ISC Step (step)		98 ± 10	Water Temp 80 Over(°C)
	Ex. 2nd Air Solenoid Valve State		Open	
	IDLE CO(%)		0.2~3.5%	
CO Set		-10~10		
Repair description			Repair Process	

TPS/ISC RESET

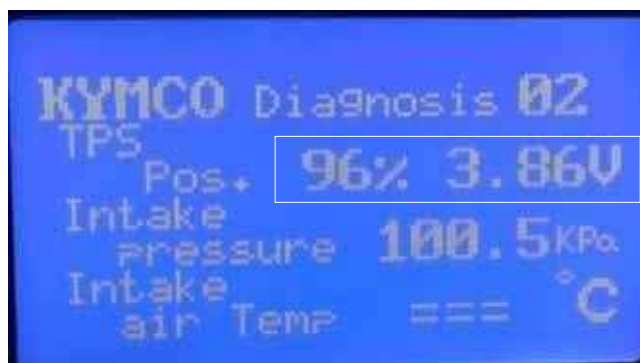
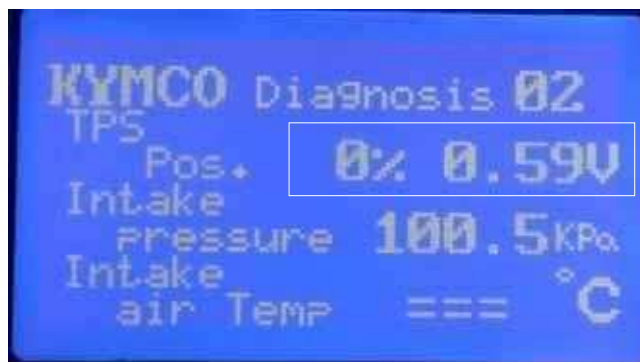
- The ECU may record incorrect TPS close fully or open fully position when the ECU or the throttle body has been reinstalled. It can cause engine stall, hard to start or rough idling.
- ISC has a motor inside. It controls ISC valve to obtain regulated idling. The ECU may record incorrect ISC position during the engine speed is 0 rpm when the ECU or the throttle body has been reinstalled. It can cause engine stall, hard to start or rough idling.



The throttle position sensor (TPS) and idle air bypass valve (ISC) have to reset when the throttle body MAP, TPS, ISC or ECU has been reinstalled.

TPS/ISC RESET PROCEDURE

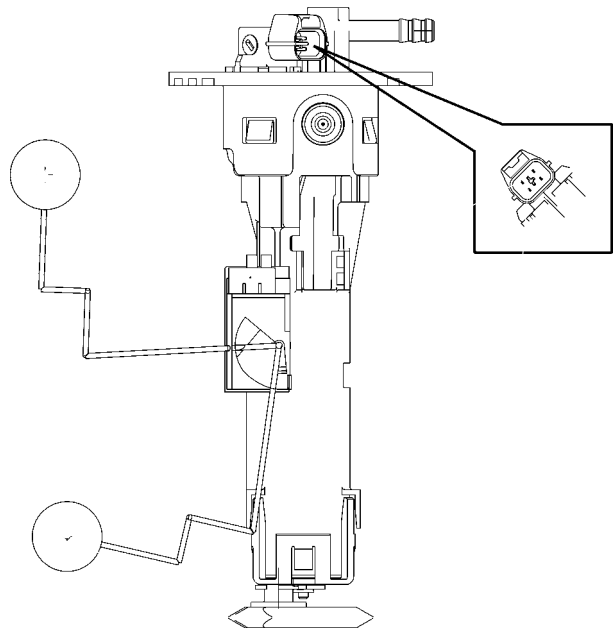
1. Put the side stand up and engine stop switch is at "RUN".
2. Turn the ignition switch to "OFF".
3. Open and hold the throttle fully.
4. Turn the ignition switch to "ON", after 8 seconds close the throttle fully.
5. Turn the ignition switch to "OFF".
6. When turn the ignition switch to "ON" again, the TPS and ISC have been reset.
7. Enter EFI signal data page 02 then close the throttle fully
 Check "Throttle position (TP)" is 1.0% below and "Throttle position sensor output voltage (TPAD)" is 0.5 ± 0.10 V.
 If not repeat the steps from 1 to 6.
8. Open the throttle fully and check "Throttle position (TP)" is 94% over and "Throttle position sensor output voltage (TPAD)" is 3.5 to 3.9 V.
 If not repeat the steps from 1 to 6.



6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI



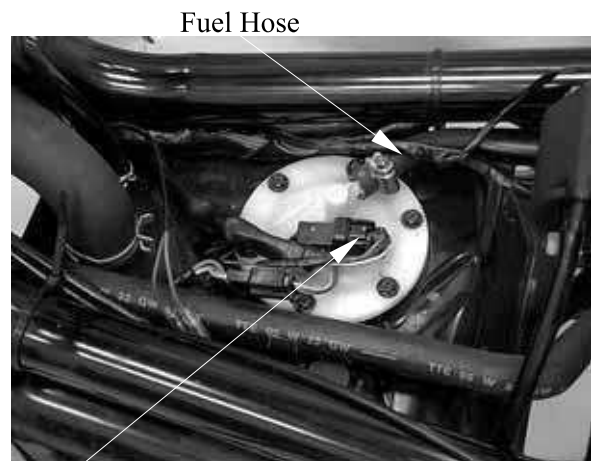
6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

REMOVAL

Disconnect the fuel pump connector and fuel hose from fuel pump.



Remove the six screws, then remove the fuel pump and O-ring.



INSTALLATION

Place a new O-ring onto fuel tank.

Install the fuel pump being careful not to damage the fuel pump wire and make sure fuel connector rearward.

Install and tighten the screws using crisscross pattern to the specified torque.

Torque: 0.35 kgf-m (3.5 N-m, 2.5 lbf-ft)



FUEL CUT-OFF RELAY

INSPECTION

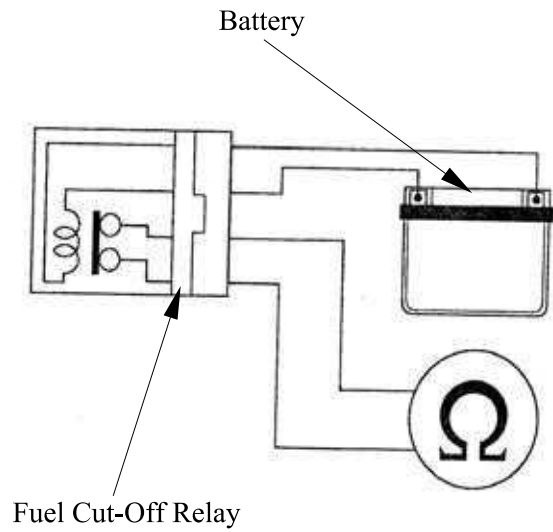
Remove the fuel cut-off relay.
Connect the ohmmeter to the fuel cut-off relay connector terminals.

Connection: Black – Red/Black

Connect the 12 V battery to the following fuel cut-off relay connector terminals

Connection: Blue/Black – Black

There should be continuity only when the 12 V battery is connected.
If there is no continuity when the 12 V battery is connected, replace the fuel cut-off relay.



REMOVAL (500 AFI)

Disconnect the fuel cut-off relay connector, then remove it from frame.



REMOVAL (300 AFI)

Disconnect the fuel cut-off relay connector, then remove it from frame.



TILT SWITCH

INSPECTION

Support the scooter level surface.

Put the side stand up and engine stop switch is at "RUN".

Turn the ignition switch to "OFF"

Remove the screws, washers and tilt switch.

* Do not disconnect the tilt switch connector during inspection.

Place the tilt switch vertical as shown, and turn the ignition switch to "ON".

Measure the voltage between the following terminals of the tilt switch connector with the connector connected.

Terminal	Normal
Violet/Red (+) – Green/Pink (-)	5 V (ECU voltage)
Black/Blue (+) – Green/Pink (-)	0.4 ~ 1.4 V

Incline the tilt switch 65 ± 10 degrees to the left or right with the ignition switch turned to "ON".

Measure the voltage between the following terminals of the tilt switch connector with the connector connected.

Terminal	$65 \pm 10^\circ$
Violet/Red (+) – Green/Pink (-)	5 V (ECU voltage)
Black/Blue (+) – Green/Pink (-)	3.7 ~ 4.4 V

If you repeat this test, first turn the ignition switch to "OFF", then turn the ignition switch to "ON".

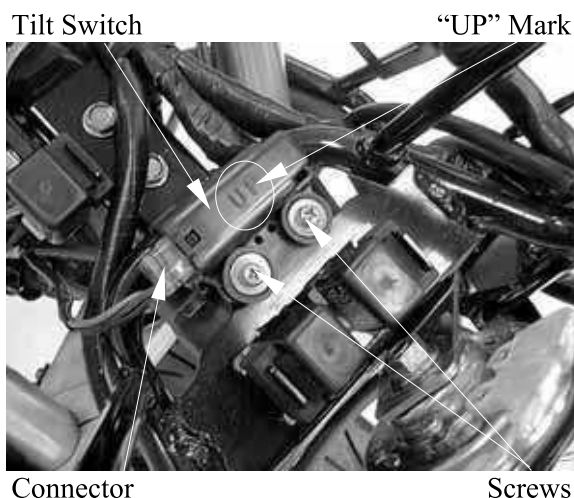
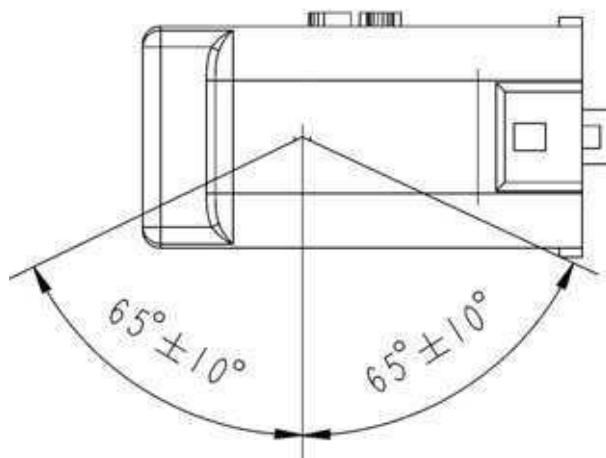
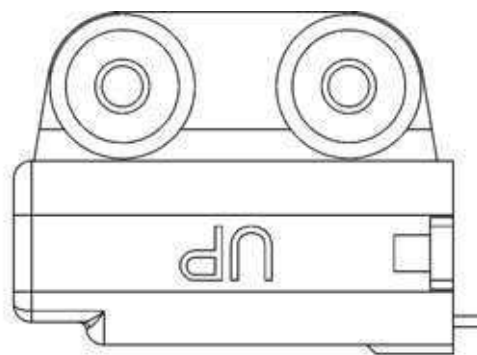
REMOVAL/INSTALLATION

Disconnect the connector and remove two screws, then remove tilt switch.

Installation is in the reverse order of removal.

* Install the tilt switch with its "UP" mark facing up.

Tighten the mounting screws securely.

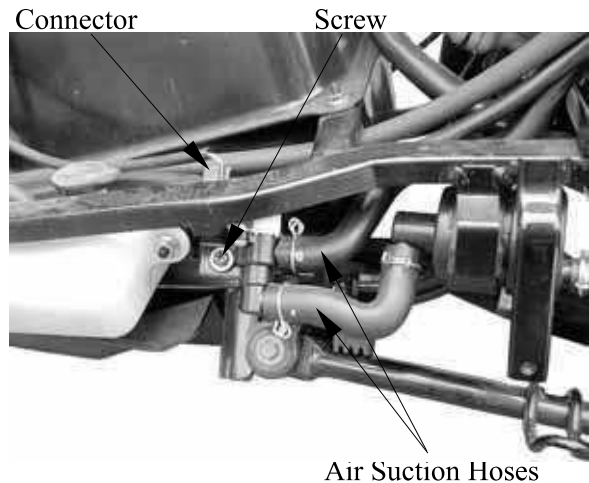


AIR IDLE SPEED VALVE (500 AFI) REMOVAL/INSTALLATION

Disconnect the air idle speed valve connector.

Remove the bolt and disconnect the air idle speed valve air suction hoses.

Installation is in the reverse order of removal.



INSPECTION

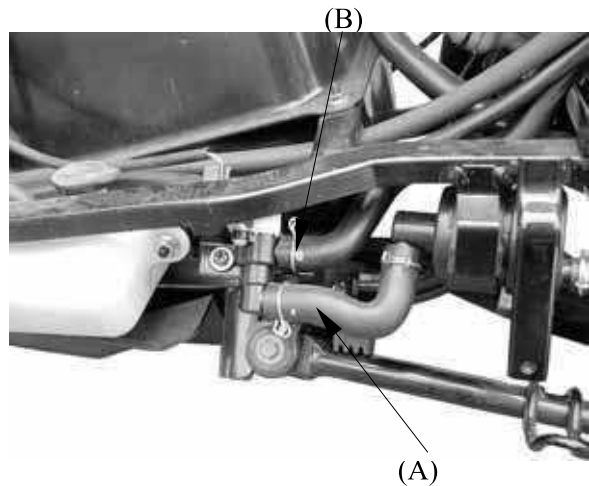
Remove the air idle speed valve.

Check the resistance between the terminals of the air idle speed valve.

Standard: 25.95~29.55 Ω (at 25°C)

If the resistance is out of specification, replace the air idle speed valve.

Check that the air should not flow (A) to (B), only when the 12-V battery is connected to the air idle speed valve terminals.



ENGINE CONTROL UNIT (ECU) (500 AFI) REMOVAL/INSTALLATION

- * Do not disconnect or connect the ECU connector during the ignition switch "ON"; it may cause the ECU damage.
- * The throttle position sensor (TPS) and idle air bypass valve (ISC) have to reset when the throttle body MAP, TPS, ISC or ECU has been reinstalled (see page 6-28).

Disconnect the ECU connector, then remove the ECU from the frame.

Installation is in the reverse order of the removal.

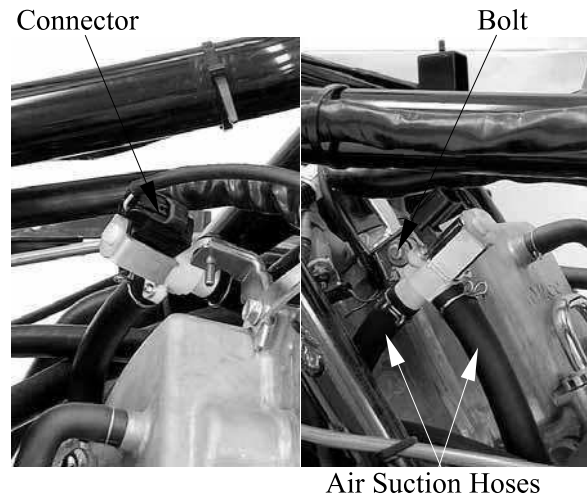


AIR IDLE SPEED VALVE (300 AFI) REMOVAL/INSTALLATION

Disconnect the air idle speed valve connector.

Remove the bolt and disconnect the air idle speed valve air suction hoses.

Installation is in the reverse order of removal.



INSPECTION

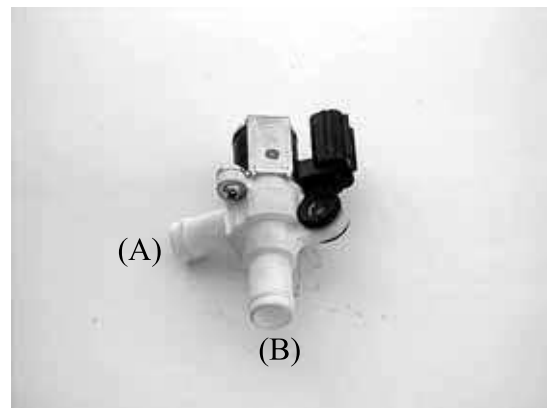
Remove the air idle speed valve.

Check the resistance between the terminals of the air idle speed valve.

Standard: 25.95~29.55 (at 25°C)

If the resistance is out of specification, replace the air idle speed valve.

Check that the air should not flow (A) to (B), only when the 12-V battery is connected to the air idle speed valve terminals.



ENGINE CONTROL UNIT (ECU) (250 AFI) REMOVAL/INSTALLATION

- * Do not disconnect or connect the ECU connector during the ignition switch "ON"; it may cause the ECU damage.
- * The throttle position sensor (TPS) and idle air bypass valve (ISC) have to reset when the throttle body MAP, TPS, ISC or ECU has been reinstalled (see page 6-28).

Disconnect the ECU connector, then remove the ECU from the frame.

Installation is in the reverse order of the removal.



6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

INSPECTION

Disconnect and remove the ECU from the frame.

Check for continuity between pins 35 and 36 of the ECU side connector.

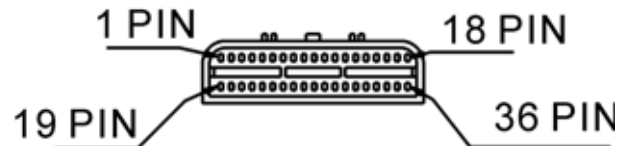
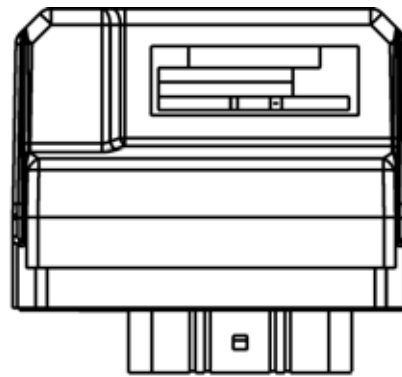
There should be continuity at all times.

Check for continuity between each pins 8, 9 and 24 of the ECU side connector.

There should be continuity at all times.

Check for continuity between pins 24 and 36 of the ECU side connector.

There should be no continuity at all times.



ECU PIN FUNCTION

PIN NO.	NAME	FUNCTION	PIN NO.	NAME	FUNCTION
1	IGP	Ignition power	19	BATT	Battery
2	ROLL	Roll sensor (Tilt switch)	20	—	—
3	CRK-P	Crank pulse sensor	21	MIL	Multi indicator lamp (ECLP)
4	—	—	22	TW	Water temperature sensor (ECT)
5	TH	Throttle position sensor	23	—	—
6	PM	Manifold pressure sensor (Intake pressure sensor)	24	SG	Sensor ground
7	HEGO	HEGO sensor (O ₂ sensor)	25	—	—
8	LG	Logic ground	26	—	—
9	CRK-M	Crank pulse sensor ground	27	—	—
10	K-LINE	Diagnostic tool	28	—	—
11	FLPR	Fuel pump relay	29	—	—
12	SOL	Solenoid (air idle speed valve) output	30	—	—
13	VCC	Sensor power output (+5V)	31	ISCAN	Idle speed control (ISC) / A (-)
14	ISCBP	Idle speed control (ISC) B (+)	32	ISCBN	Idle speed control (ISC) / B (-)
15	ISCAP	Idle speed control (ISC) A (+)	33	NE	Meter
16	INJ	Injection	34	—	—
17	HEGO HT	HEGO HT sensor (O ₂ HT sensor)	35	PG1	Power ground
18	IG	Ignition coil	36	PG2	Power ground

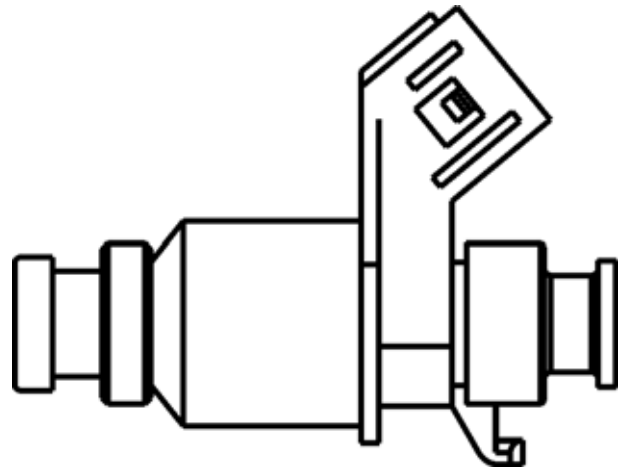
FUEL INJECTOR

INSPECTION

Disconnect the fuel injector connector.

Measure the resistance between 2 pins of the fuel injector connector.

Standard: 9.945~13.5 Ω (at 20°C/68°F)



REMOVAL

Disconnect the fuel injector connector and from fuel injector.

Remove the bolt, then pull fuel pipe and fuel injector as assembly out from intake manifold.



Connector

Bolt

Remove the fuel injector from the fuel pipe.



Fuel Pipe

Fuel Injector

6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

INSTALLATION

Apply oil to new O-ring.

Install the fuel injector into the fuel pipe, being careful not to damage the O-ring and cushion ring.

Cushion Ring



O-ring

Make sure the tab on the fuel injector into the groove on the fuel pipe.

Groove



Tab

Install the fuel pipe assembly onto intake manifold by aligning the dowel pin, being careful not to damage the seal ring.

Install and tighten the fuel pipe mounting bolt.



O-ring

Dowel Pin

ECT SENSOR (500 AFI) REMOVAL /INSTALLATION

* Replace the ECT sensor while the engine is cold.

Drain the coolant from the cooling system (refer to chapter 7)

Disconnect the ECT sensor connector from the sensor.

Remove the ECT sensor and O-ring



Connector

Install the new O-ring and ECT sensor.

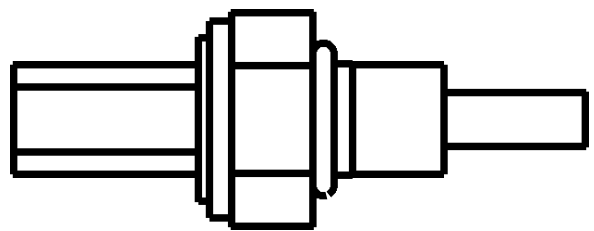
* Always replace an O-ring with a new

Tighten the ECT sensor to specified torque.

Torque: 1.2 kgf-m (12 N-m, 8.6 lbf-ft)

Connect the ECT sensor connector.

Fill the cooling system with the recommended coolant (refer to chapter 7)



INSPECTION

Measure the resistance at the ECT sensor terminals

STANDARD

°C	-20	40	100
KΩ	18.8	1.136	0.1553



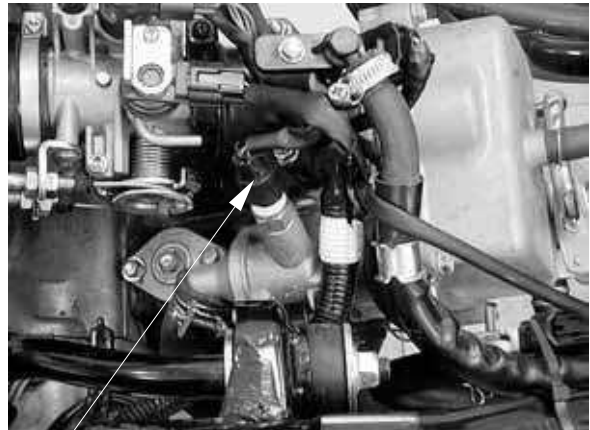
ECT SENSOR(300 AFI) REMOVAL /INSTALLATION

* Replace the ECT sensor while the engine is cold.

Drain the coolant from the cooling system (refer to chapter 7)

Disconnect the ECT sensor connector from the sensor.

Remove the ECT sensor and O-ring



Connector

Install the new O-ring and ECT sensor.

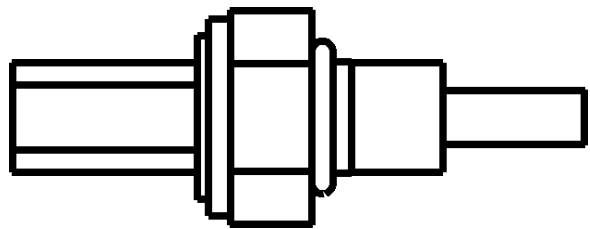
*

Tighten the ECT sensor to specified torque.

Torque: 1.2 kgf-m (12 N-m, 8.6 lbf-ft)

Connect the ECT sensor connector.

Fill the cooling system with the recommended coolant (refer to chapter 7)



INSPECTION

Measure the resistance at the ECT sensor terminals

STANDARD

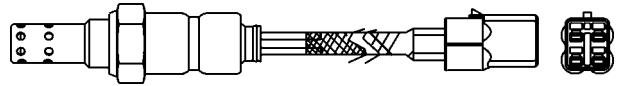
°C	-20	40	100
KΩ	18.8	1.136	0.1553



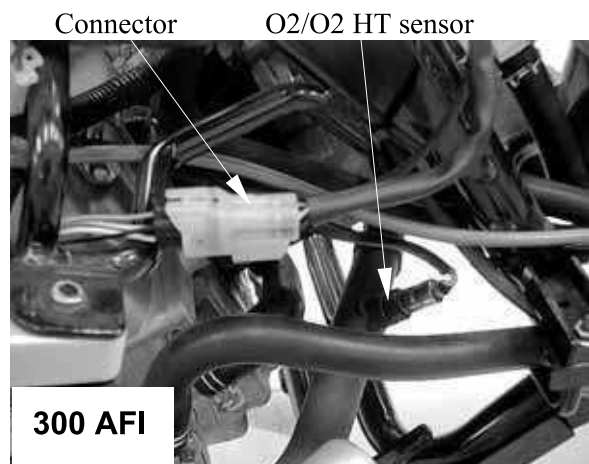
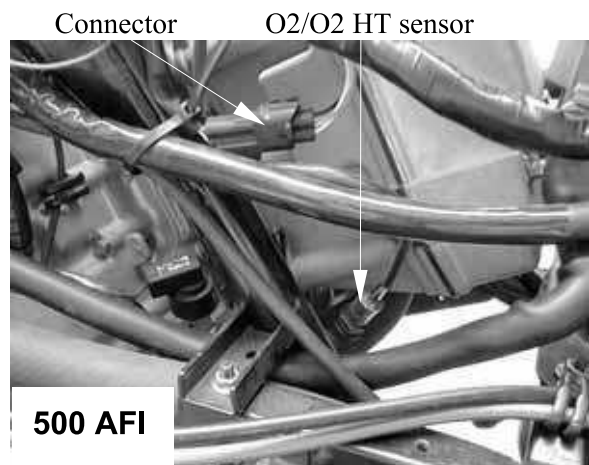
6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

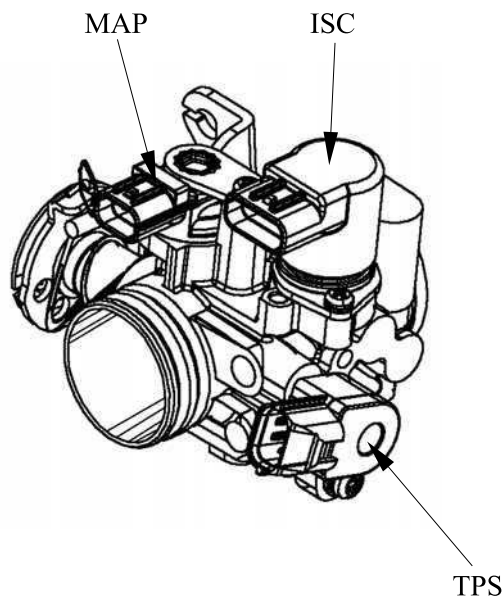


*
Apply anti-seize compound on circumference of thread area before O₂/O₂ HT sensor installation.



THROTTLE BODY/MAP/ISC/TPS

- Turn ignition switch off and set up center stand when do the replacement.
- Check and confirm the voltage above 12V by a voltmeter after replacement.
- Check and confirm the other connectors are assembled correctly after replacement.
- Do not damage the throttle body, this may cause incorrect throttle and idle valve synchronization.
- The throttle body is factory pre-set, do not disassemble it in a way other than shown in this manual.
- Do not loosen or tighten the painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.



MAP INSPECTION

Support the scooter level surface.
Put the side stand up and engine stop switch is at "RUN".

Turn the ignition switch to "ON"

Measure the ECU voltage between the following terminals of the MAP connector.

Terminal	Normal
Violet/Red (+) – Green/Pink (-)	5 V

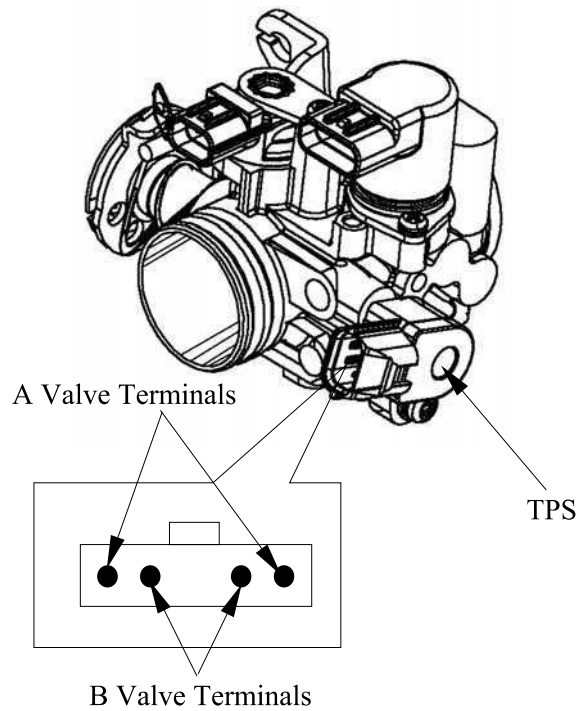
TPS INSPECTION

Support the scooter level surface.
Put the side stand up and engine stop switch is at "RUN".

Turn the ignition switch to "ON"

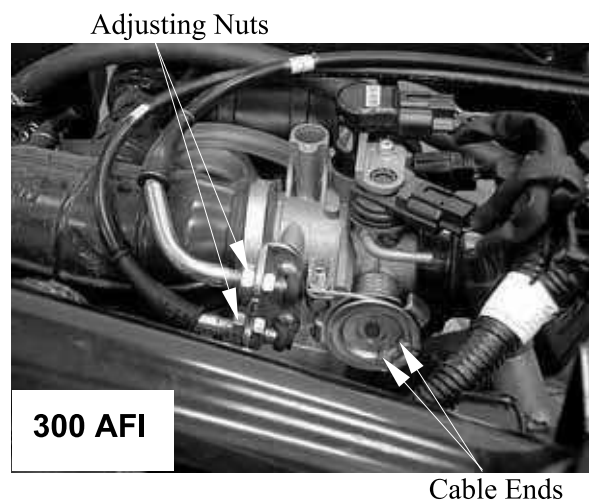
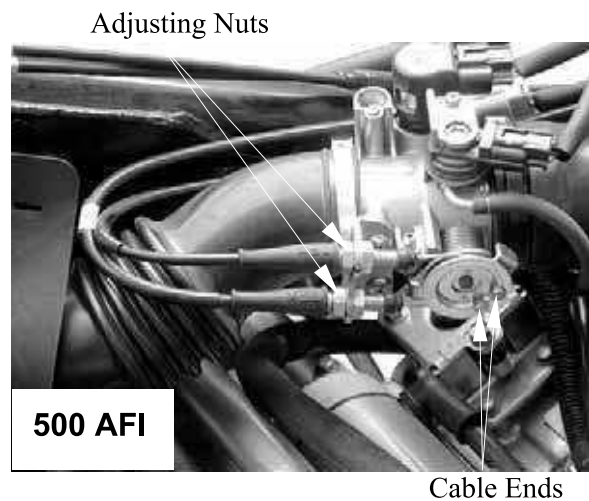
Measure the ECU voltage between the following terminals of the PTS connector with.

Terminal	Normal
Violet/Red (+) – Green/Pink (-)	5 V



REMOVAL

Loosen the throttle cables free play with the adjusting nuts.
Disconnect the throttle cable ends from throttle drum.



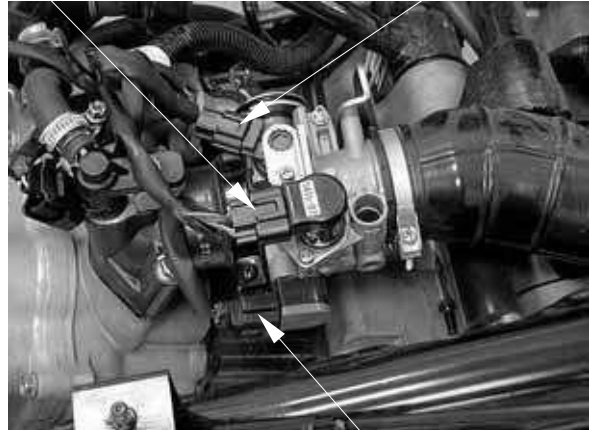
6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

Disconnect the TPS, ISC and MAP sensor connectors.

ISC Sensor Connector/MAP Sensor Connector



TPS Sensor Connector

Loosen the air cleaner chamber connecting hose band screw.
Loosen the intake manifold band screw.
Remove the throttle body, MAP sensor, TPS sensor and ISC sensor as assembly.

Connecting Hose Band Screw



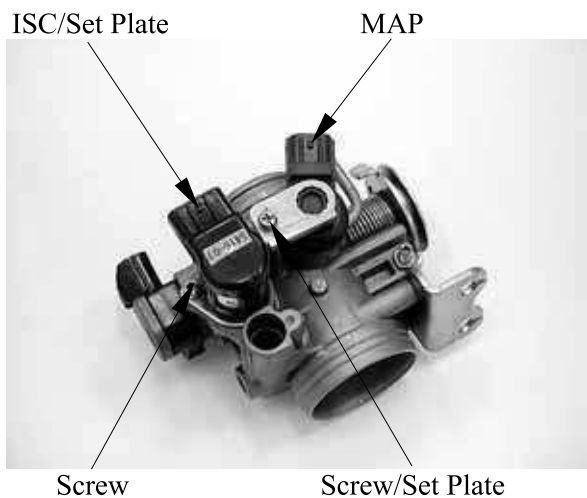
Intake Manifold Band Screw

DISASSEMBLY

* The throttle position sensor (TPS) and idle air bypass valve (ISC) have to reset when the throttle body MAP, TPS, ISC or ECU has been reinstalled (see page 6-28).

Remove the screw, then remove the ISC and set plate.

Remove the screw and set plate, remove the MAP

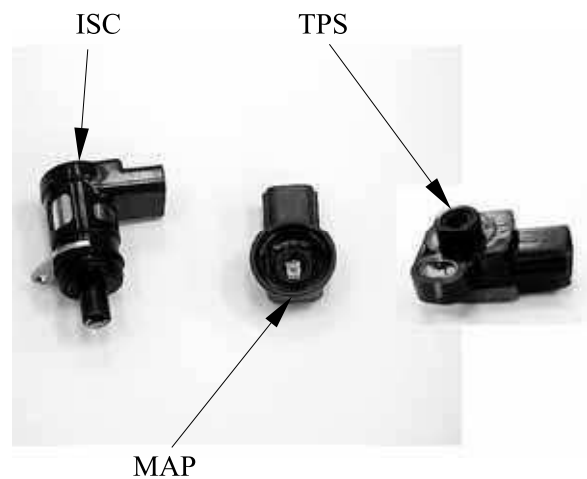
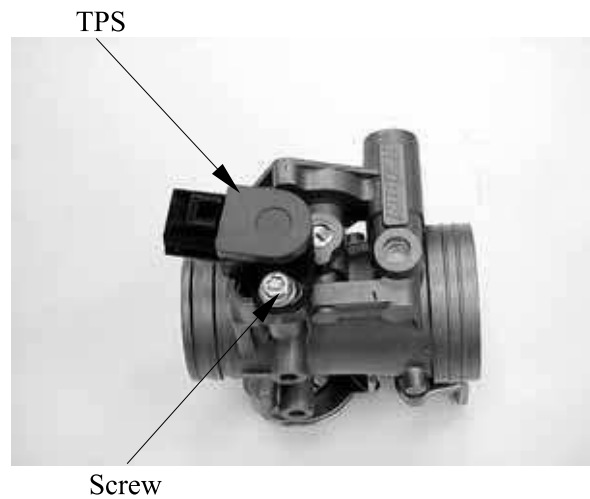


6. AFI (AUTOMATIC FUEL INJECTION)



XCITING 500/500 AFI/250/300 AFI

Remove the screw, then remove the TPS.



ASSEMBLY

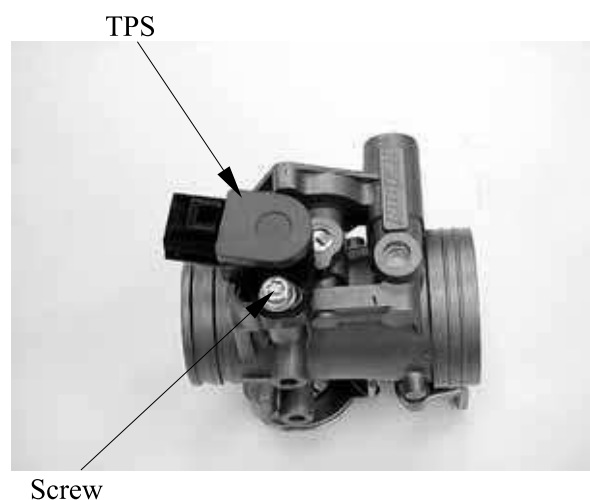
*

The throttle position sensor (TPS) and idle air bypass valve (ISC) have to reset when the throttle body MAP, TPS, ISC or ECU has been reinstalled (see page 6-28).

Apply oil to new O-ring.

Install the TPS onto the throttle body, being careful not to damage the O-ring.

Install and tighten the screw securely.



6. AFI (AUTOMATIC FUEL INJECTION)

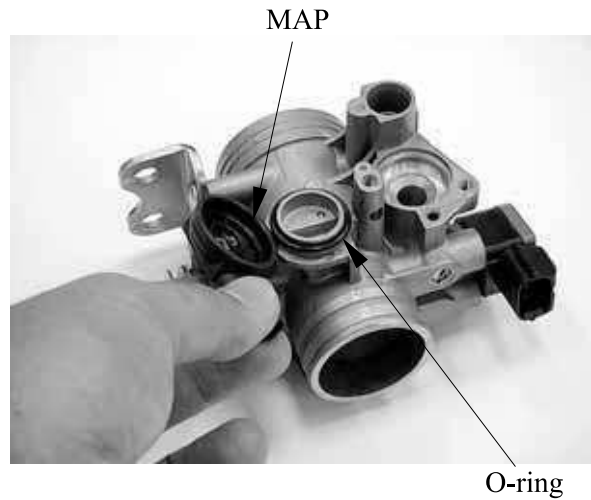


XCITING 500/500 AFI/250/300 AFI

* Always replace an O-ring with a new

Apply oil to new O-ring.

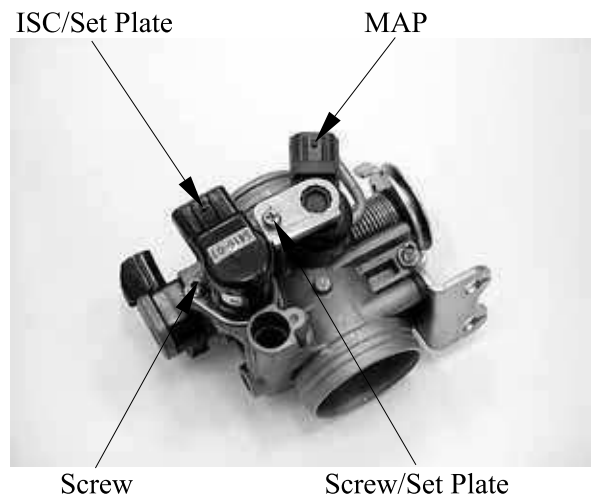
Install the MAP onto the throttle body, being careful not to damage the O-ring.



Install the set plate and tighten the screw securely.

Apply oil to new O-ring.

Install the ISC and set plate onto the throttle body, being careful not to damage the O-ring.



DIAGNOSTIC TOOL CONNECTOR

INSPECTION

Put the side stand up and engine stop switch is at “RUN”.

Turn the ignition switch to “ON”

Measure the voltage between the following terminals of the diagnostic tool connector with.

Terminal	Normal
Black (+) – Green (-)	Battery voltage
White/Yellow (+) – Green (-)	Battery voltage – 1 V



Diagnostic Tool Connector