FI SYSTEM

CONTENTS

4

FI SYSTEM

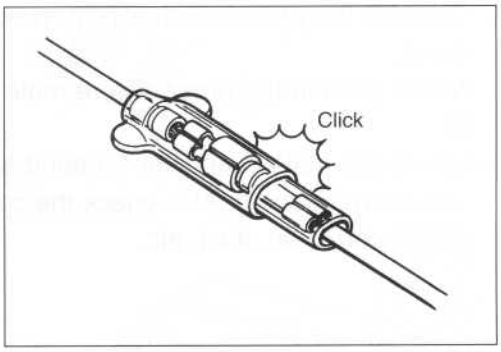
CONTENTS

PRECAUTIONS IN SERVICING

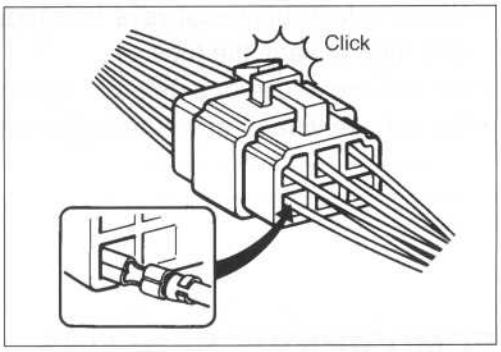
When handling the FI component parts or servicing the FI system, observe the following points for the safety of the system.

CONNECTOR/COUPLER

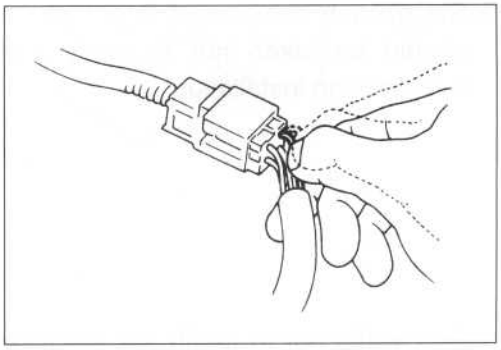
- When connecting a connector, be sure to push it in until a click is felt.
- With a lock type coupler, be sure to release the lock when disconnecting, and push it in fully till the lock works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the connector/coupler for looseness or bending.



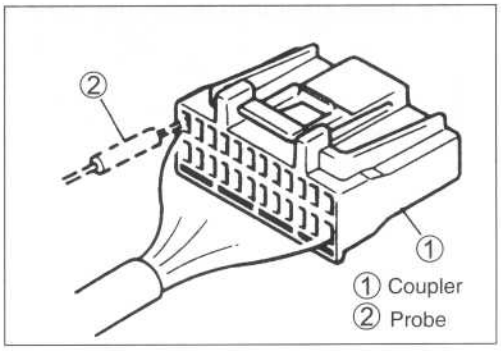
- Inspect each terminal for corrosion and contamination. The terminals must be clean and free of any foreign material which could impede proper terminal contact.



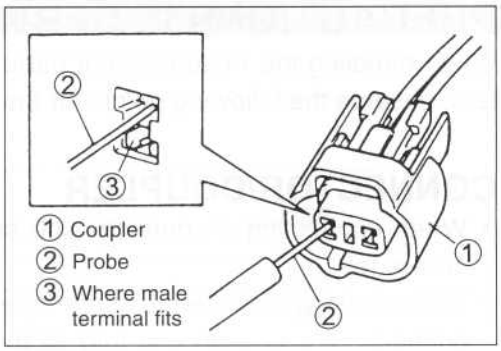
- Inspect each lead wire circuit for poor connection by shaking it by hand lightly. If any abnormal condition is found, repair or replace.



- When taking measurements at electrical connectors using a tester probe, be sure to insert the probe from the wire harness side (backside) of the connector/coupler

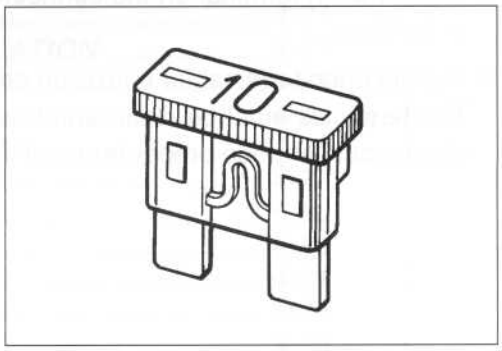


- When connecting meter probe from the terminal side of the coupler (connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open.
  Connect the probe as shown to avoid opening of female terminal.
  Never push in the probe where male terminal is supposed to fit.
- Check the male connector for bend and female connector for excessive opening. Also check the coupler for locking (looseness), corrosion, dust, etc.



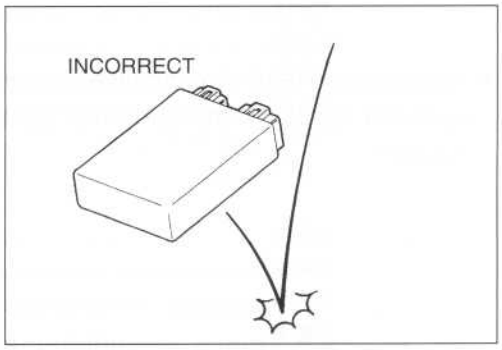
FUSE

- When a fuse blows, always investigate the cause, correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.

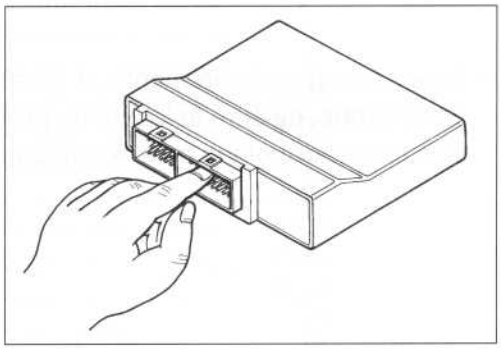


ECM/VARIOUS SENSORS

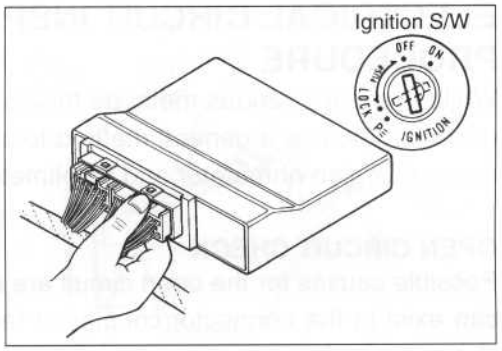
- Since each component is a high-precision part, great care should be taken not to apply any sharp impacts during removal and installation.



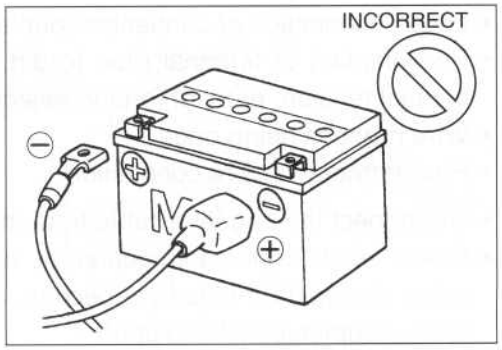
- Be careful not to touch the electrical terminals of the ECM. The static electricity from your body may damage this part.



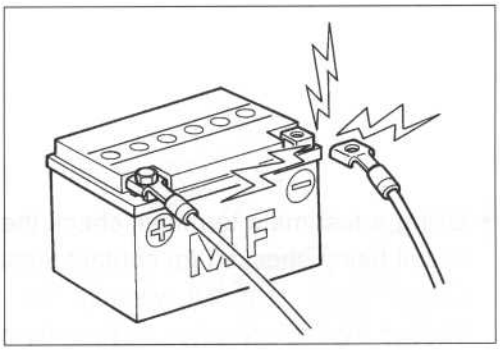
- When disconnecting and connecting the ECM couplers, make sure to turn OFF the ignition switch, or electronic parts may get damaged.



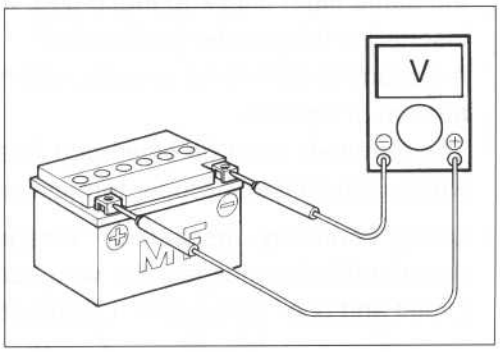
- Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the FI system instantly when reverse power is applied.



- Removing any battery terminal of a running engine is strictly prohibited.
  The moment such removal is made, damaging counter electromotive force will be applied to the ECM which may result in serious damage.



- Before measuring voltage at each terminal, check to make sure that battery voltage is 11 V or higher. Terminal voltage check at low battery voltage will lead to erroneous diagnosis.



- Never connect any tester (voltmeter, ohmmeter, or whatever) to the ECM when its coupler is disconnected. Otherwise, damage to the ECM may result.
- Never connect an ohmmeter to the ECM with its coupler connected. If attempted, damage to the ECM or sensors may result.
- Be sure to use a specified voltmeter/ohmmeter. Otherwise, accurate measurements may not be obtained and personal injury may result.

ELECTRICAL CIRCUIT INSPECTION PROCEDURE

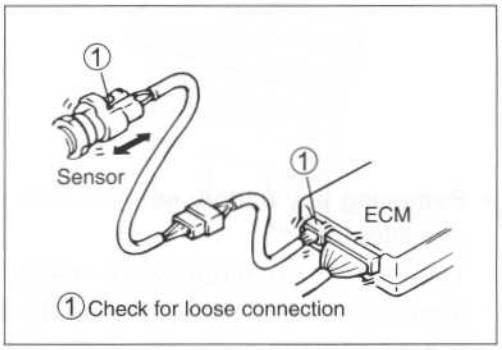
While there are various methods for electrical circuit inspection, described here is a general method to check for open and short circuit using an ohmmeter and a voltmeter.

OPEN CIRCUIT CHECK

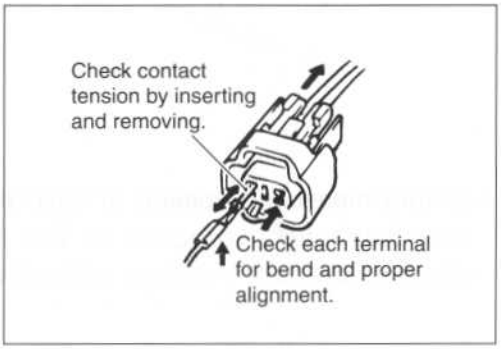
Possible causes for the open circuit are as follows. As the cause can exist in the connector/coupler or terminal, they need to be checked carefully.

- Loose connection of connector/coupler
- Poor contact of terminal (due to dirt, corrosion or rust, poor contact tension, entry of foreign object etc.)
- Wire harness being open
- Poor terminal-to-wire connection

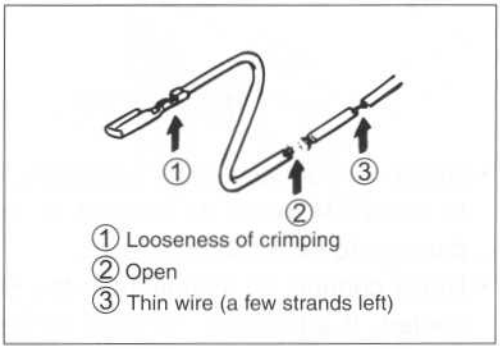
- Disconnect the negative cable from the battery.
- Check each connector/coupler at both ends of the circuit being checked for loose connection. Also check for condition of the coupler lock if equipped.



- Using a test male terminal, check the female terminals of the circuit being checked for contact tension.
  Check each terminal visually for poor contact (possibly caused by dirt, corrosion, rust, entry of foreign object, etc.). At the same time, check to make sure that each terminal is fully inserted in the coupler and locked.
  If contact tension is not enough, rectify the contact to increase tension or replace.
  The terminals must be clean and free of any foreign material which could impede proper terminal contact.

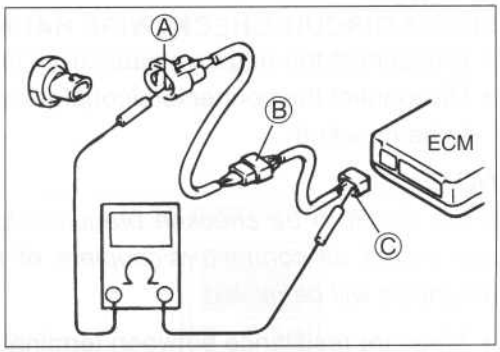


- Using continuity inspect or voltage check procedure as described below, inspect the wire harness terminals for open circuit and poor connection. Locate abnormality, if any.

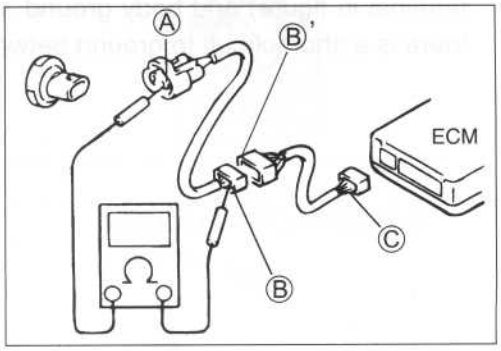


Continuity check

- Measure resistance across coupler Ⓑ (between Ⓐ and Ⓒ in the figure).
  If no continuity is indicated (infinity or over limit), the circuit is open between terminals Ⓐ and Ⓒ.



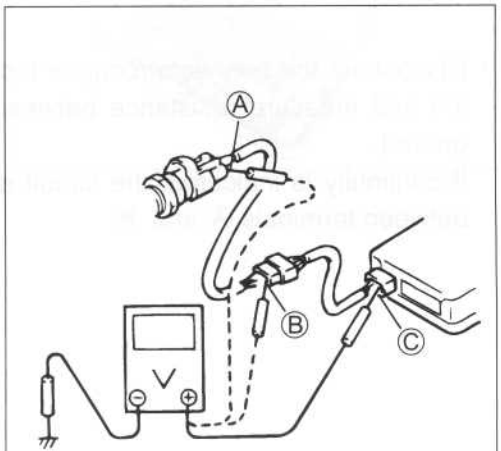
- Disconnect the coupler Ⓑ and measure resistance between couplers Ⓐ and Ⓑ.
  If no continuity is indicated, the circuit is open between couplers Ⓐ and Ⓑ. If continuity is indicated, there is an open circuit between couplers Ⓑ' and Ⓒ or an abnormality in coupler Ⓑ' or coupler Ⓒ.



VOLTAGE CHECK

If voltage is supplied to the circuit being checked, voltage check can be used as circuit check.

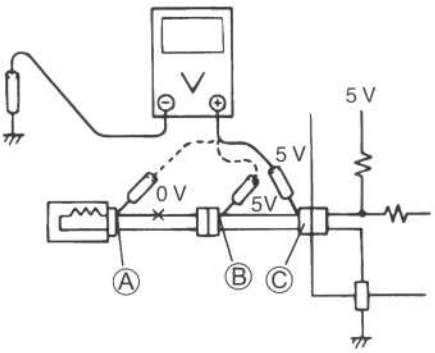
- With all connectors/couplers connected and voltage applied to the circuit being checked, measure voltage between each terminal and body ground.



If measurements were taken as shown in the figure at the right and results are as listed below, it means that the circuit is open between terminals Ⓐ and Ⓑ.

Voltage Between:

Ⓒ and body ground: Approx. 5 V
Ⓑ and body ground: Approx. 5 V
Ⓐ and body ground: 0 V



Also, if measured values are as listed below, a resistance (abnormality) exists which causes the voltage drop in the circuit between terminals Ⓐ and Ⓑ.

Voltage Between:

Ⓒ and body ground: Approx. 5 V
Ⓑ and body ground: Approx. 5 V
Ⓐ and body ground: 3 V

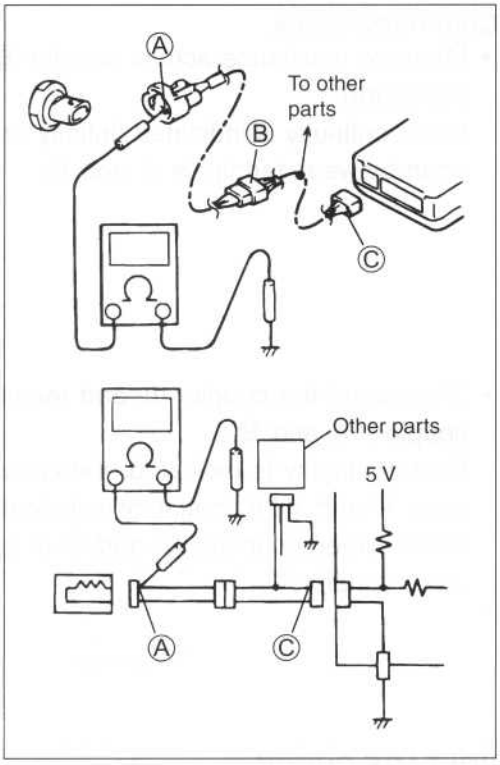
2 V voltage drop

SHORT CIRCUIT CHECK (WIRE HARNESS TO GROUND)

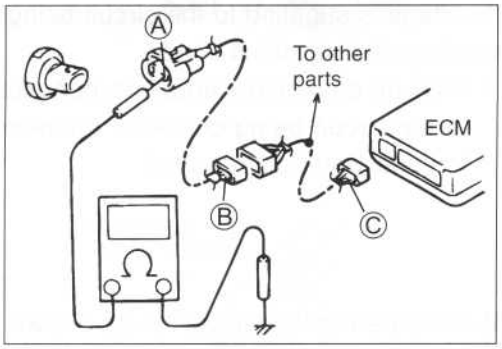
- Disconnect the negative cable from the battery.
- Disconnect the connectors/couplers at both ends of the circuit to be checked.

NOTE:
If the circuit to be checked branches to other parts as shown, disconnect all connectors/couplers of those parts. Otherwise, diagnosis will be misled.

- Measure resistance between terminal at one end of circuit (Ⓐ terminal in figure) and body ground. If continuity is indicated, there is a short circuit to ground between terminals Ⓐ and Ⓒ.



- Disconnect the connector/coupler included in circuit (coupler Ⓑ) and measure resistance between terminal Ⓐ and body ground.
  If continuity is indicated, the circuit is shorted to the ground between terminals Ⓐ and Ⓑ.



USING TESTERS

- Use the Suzuki multi-circuit tester (09900-25008).
- Use well-charged batteries in the tester.
- Be sure to set the tester to the correct testing range.

Using the tester

- Incorrectly connecting the ⊕ and ⊖ probes may cause the inside of the tester to burnout.
- If the voltage and current are not known, make measurements using the highest range.
- When measuring the resistance with the multi-circuit tester, ∞ will be shown as 10.00 MΩ and "1" flashes in the display.
- Check that no voltage is applied before making the measurement. If voltage is applied, the tester may be damaged.
- After using the tester, turn the power off.

TOOL 09900-25008: Multi-circuit tester
09900-25009: Needle pointed probe set

NOTE:

* *When connecting the multi-circuit tester, use a needle pointed probe set to the back side of the lead wire coupler and connect the probes of tester to them.*
* *Use a needle pointed probe set to prevent the rubber of the water proof coupler from damage.*

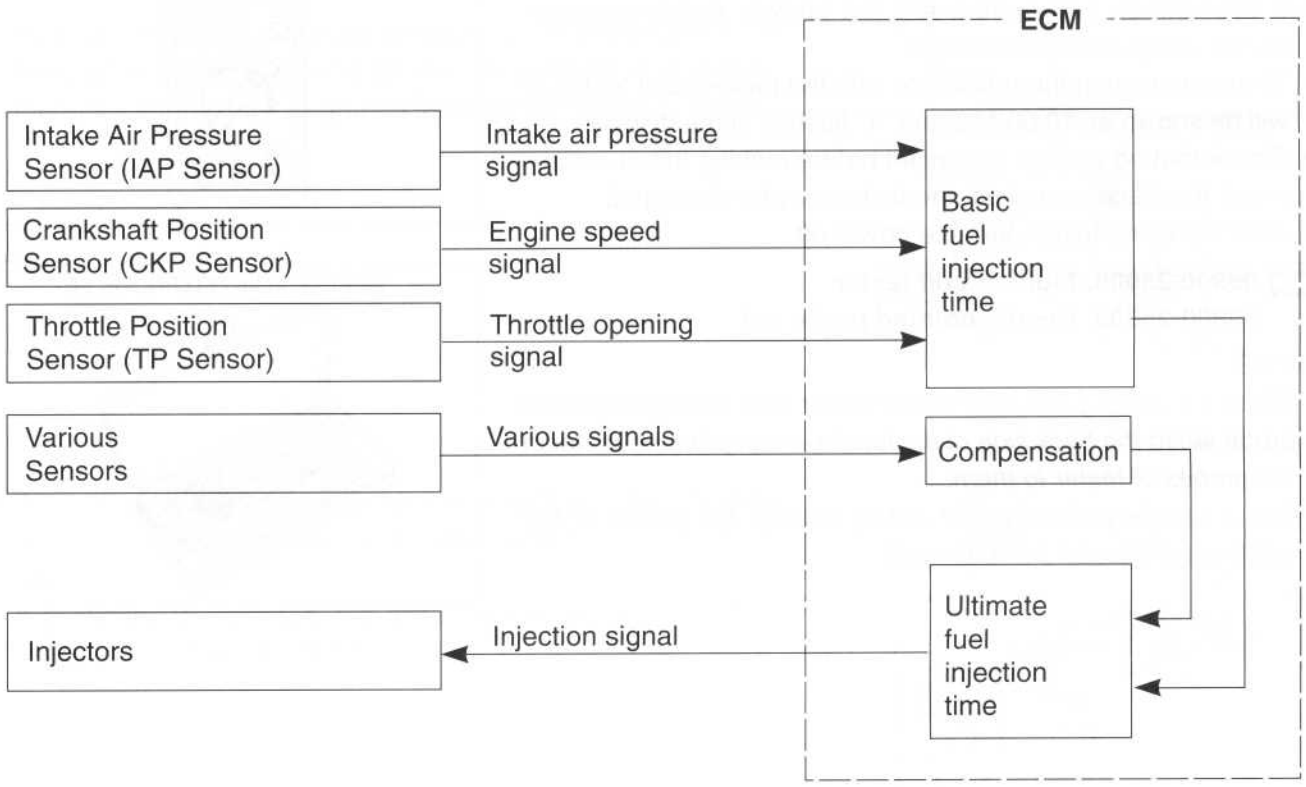
MULTI-CIRCUIT TESTER

NEEDLE POINTED PROBE SET

FI SYSTEM TECHNICAL FEATURES

INJECTION TIME (INJECTION VOLUME)

The factors to determine the injection time include the basic fuel injection time which is calculated on the basis of the intake air pressure, engine speed and throttle opening angle, and various compensations. These compensations are determined according to the signals from various sensors that detect the engine and driving conditions.



COMPENSATION OF INJECTION TIME (VOLUME)

The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

SIGNAL	DESCRIPTION
ATMOSPHERIC PRESSURE SENSOR SIGNAL	When atmospheric pressure is low, the sensor sends the signal to the ECM and reduce the injection time (volume).
ENGINE COOLANT TEMPERATURE SENSOR SIGNAL	When engine coolant temperature is low, injection time (volume) is increased.
INTAKE AIR TEMPERATURE SENSOR SIGNAL	When intake air temperature is low, injection time (volume) is increased.
HEATED OXYGEN SENSOR SIGNAL (FOR E-02, 19)	Air/fuel ratio is compensated to the theoretical ratio from density of oxygen in exhaust gasses. The compensation occurs in such a way that more fuel is supplied if detected air/fuel ratio is lean and less fuel is supplied if it is rich.
BATTERY VOLTAGE SIGNAL	ECM operates on the battery voltage and at the same time, it monitors the voltage signal for compensation of the fuel injection time (volume). A longer injection time is needed to adjust injection volume in the case of low voltage.
ENGINE RPM SIGNAL	At high speed, the injection time (volume) is increased.
STARTING SIGNAL	When starting engine, additional fuel is injected during cranking engine.
ACCELERATION SIGNAL/ DECELERATION SIGNAL	During acceleration, the fuel injection time (volume) is increased, in accordance with the throttle opening speed and engine rpm. During deceleration, the fuel injection time (volume) is decreased.

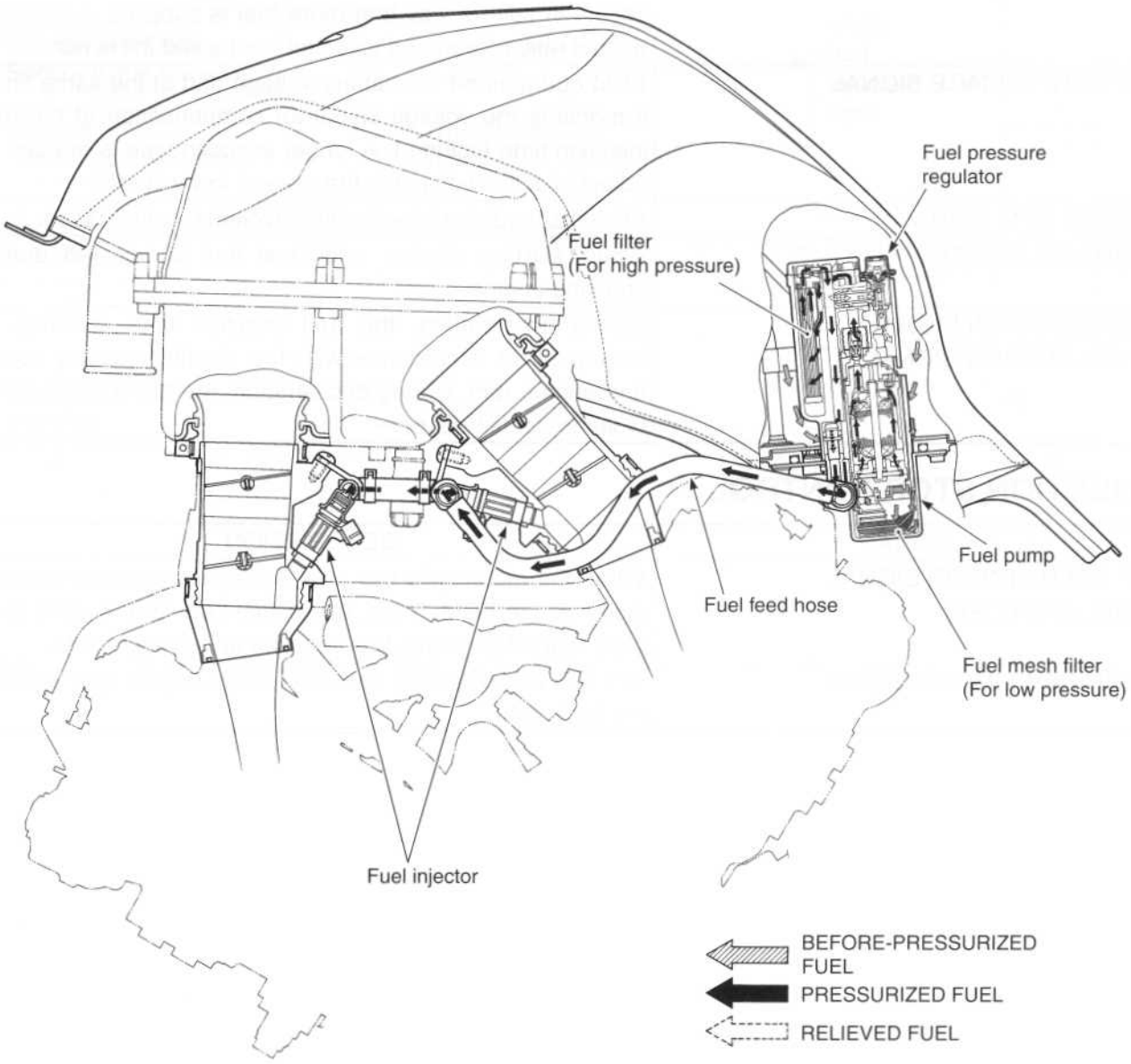
INJECTION STOP CONTROL

SIGNAL	DESCRIPTION
TIP OVER SENSOR SIGNAL (FUEL SHUT-OFF)	When the motorcycle tips over, the tip over sensor sends a signal to the ECM. Then, this signal cuts OFF current supplied to the fuel pump, fuel injectors and ignition coils.
OVER-REV. LIMITER SIGNAL	The fuel injectors stop operation when engine rpm reaches rev. limit rpm.

FUEL DELIVERY SYSTEM

The fuel delivery system consists of the fuel tank, fuel pump, fuel filters, fuel feed hose, fuel delivery pipe (including fuel injectors) and fuel pressure regulator. There is no fuel return hose. The fuel in the fuel tank is pumped up by the fuel pump and pressurized fuel flows into the injector installed in the fuel delivery pipe. Fuel pressure is regulated by the fuel pressure regulator. As the fuel pressure applied to the fuel injector (the fuel pressure in the fuel delivery pipe) is always kept at absolute fuel pressure of 300 kPa (3.0 kgf/cm^2, 43 psi), the fuel is injected into the throttle body in conic dispersion when the injector opens according to the injection signal from the ECM.

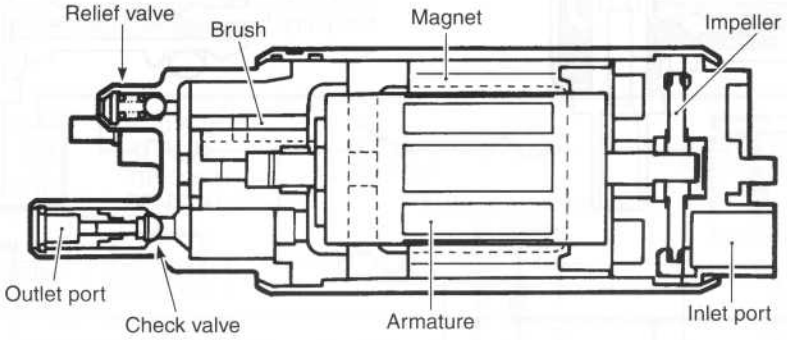
The fuel relieved by the fuel pressure regulator flows back to the fuel tank.



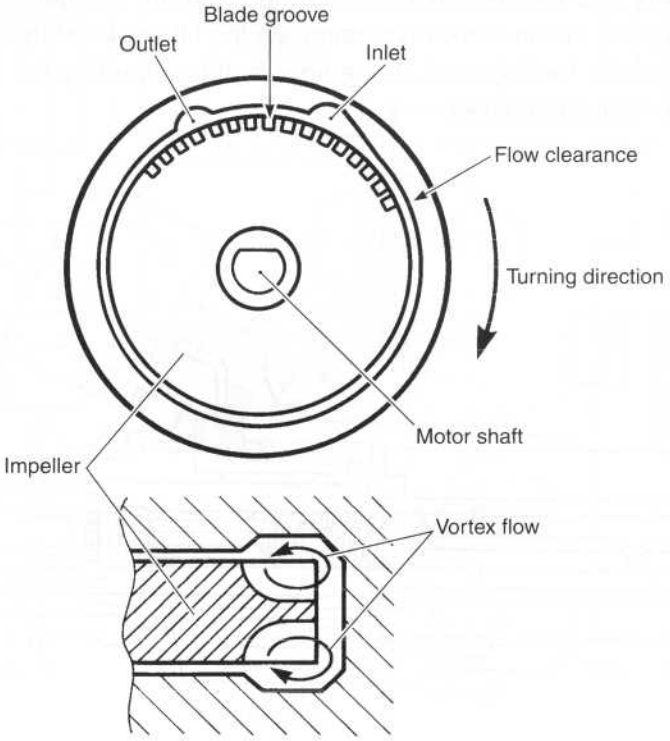
FUEL PUMP

The electric fuel pump is mounted at the bottom of the fuel tank, which consists of the armature, magnet, impeller, brush, check valve and relief valve. The ECM controls its ON/OFF operation as controlled under the FUEL PUMP CONTROL SYSTEM.

When electrical energy is supplied to the fuel pump, the motor in the pump runs and together with the impeller. This causes a pressure difference to occur on both sides of the impeller as there are many grooves around it. Then the fuel is drawn through the inlet port, and with its pressure increased, it is discharged through the outlet port. The fuel pump has a check valve to keep some pressure in the fuel feed hose even when the fuel pump is stopped. Also, the relief valve is equipped in the fuel pump, which releases pressurized fuel to the fuel tank when the outlet of the fuel pressure has increased up to 450 – 600 kPa (4.5 – 6.0 kgf/cm^2, 64 – 85 psi).



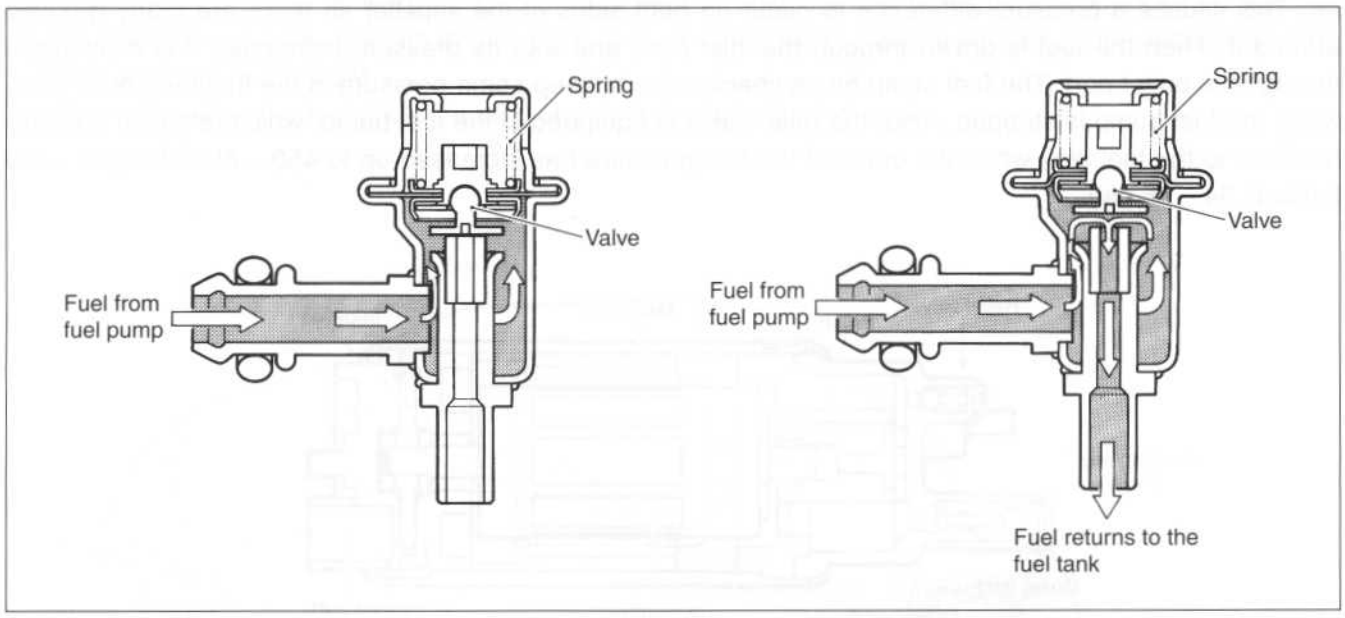
When the impeller is driven by the motor, pressure differential occurs between the front part and the rear part of the blade groove as viewed in angular direction due to fluid friction. This process continuously takes place causing fuel pressure to be built up. The pressurized fuel is then let out from the pump chamber and discharged through the motor section and the check valve.



FUEL PRESSURE REGULATOR

The fuel pressure regulator consists of the spring and valve. It keeps absolute fuel pressure of 300 kPa (3.0 kgf/cm², 43 psi) to be applied to the injector at all times.

When the fuel pressure rises more than 300 kPa (3.0 kgf/cm², 43 psi), the fuel pushes the valve in the regulator open and excess fuel returns to the fuel tank.

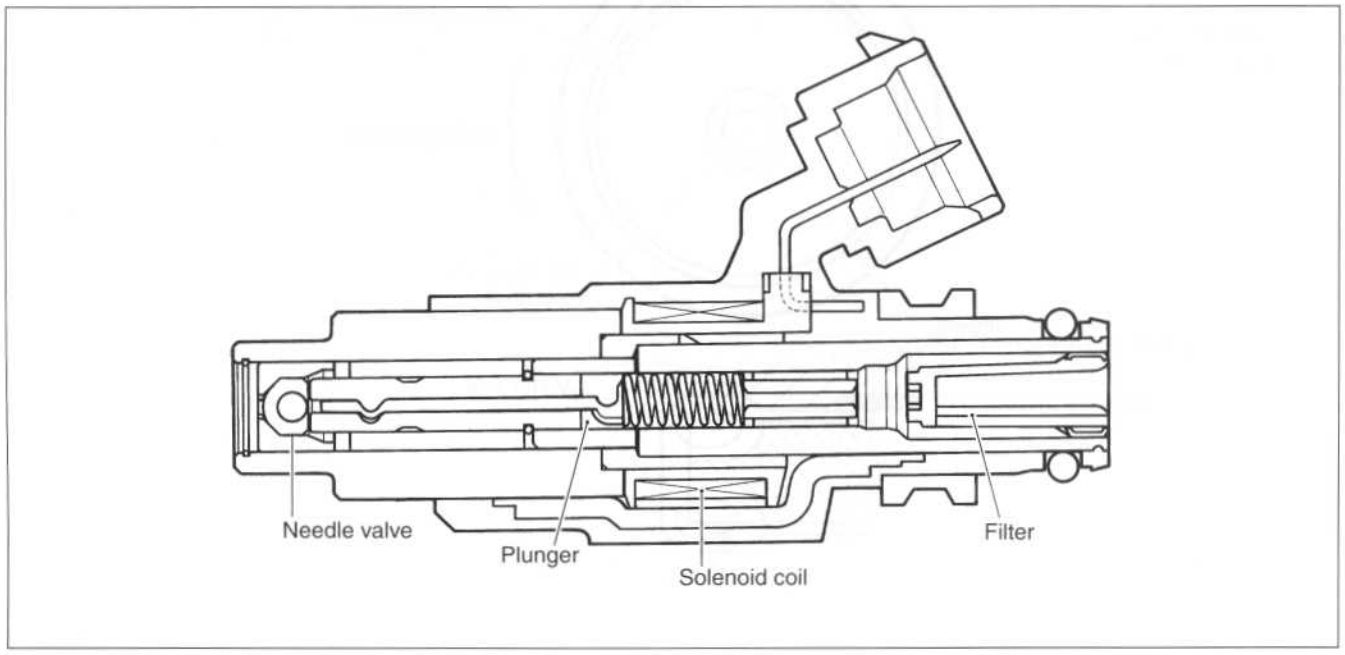


FUEL INJECTOR

The fuel injector consists of the solenoid coil, plunger, needle valve and filter.

It is an electromagnetic type injection nozzle which injects fuel in the throttle body according to the signal from the ECM.

When the solenoid coil of the injector is energized by the ECM, it becomes an electromagnet and attracts the plunger. At the same time, the needle valve incorporated with the plunger opens and the injector which is under the fuel pressure injects fuel in conic dispersion. As the lift stroke of the needle valve of the injector is set constant, the volume of the fuel injected at one time is determined by the length of time during which the solenoid coil is energized (injection time).



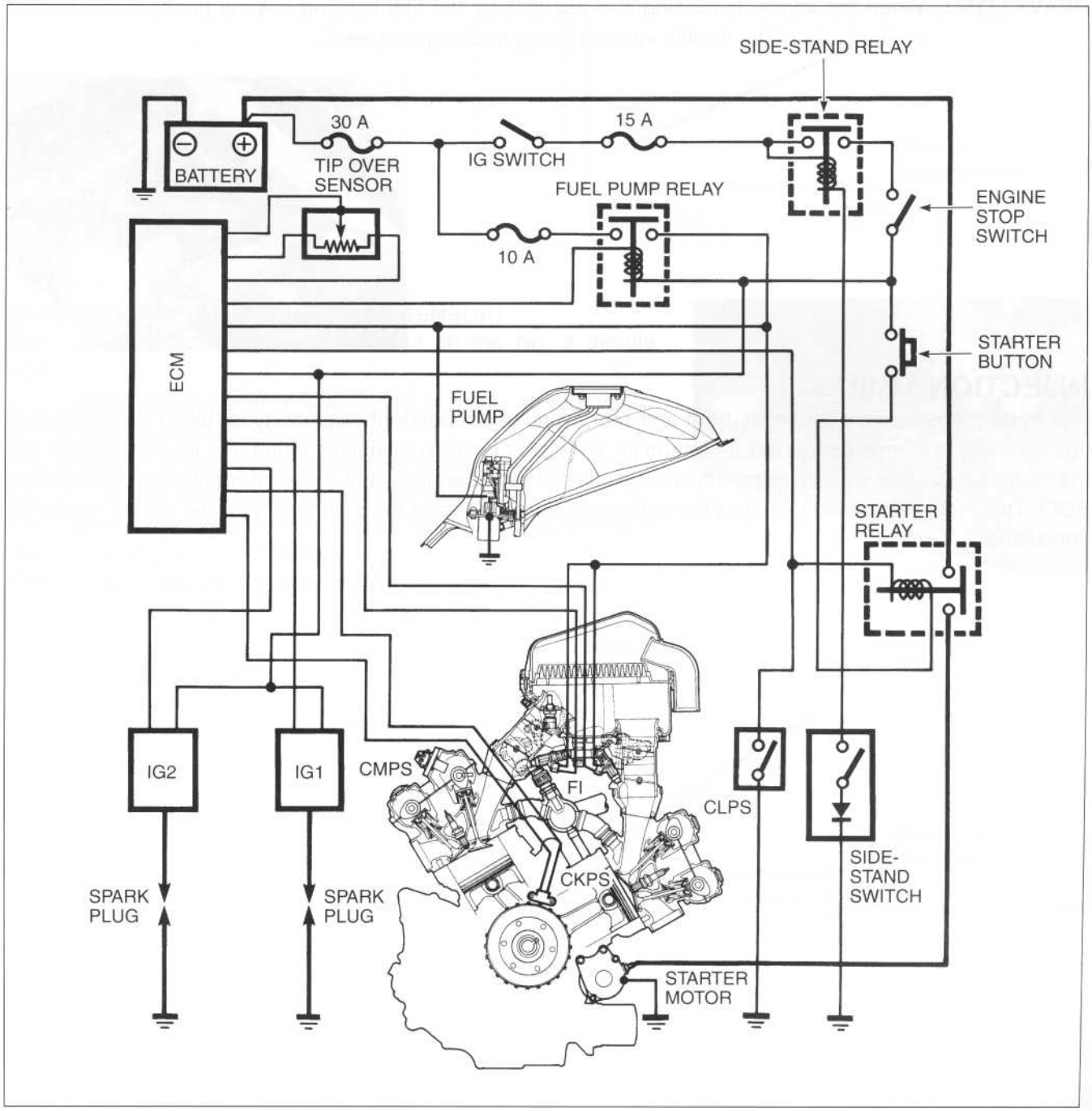
FUEL PUMP CONTROL SYSTEM

When the ignition switch is turned on, current from the battery flows to the fuel pump motor through the side-stand relay and the fuel pump relay causing the motor to turn.

Since the ECM has a timer function, the fuel pump motor stops turning in three seconds after the switch has been turned on.

Thereafter, when the crankshaft is turned by the starter motor or the engine has been started, the engine revolving signal is input to the ECM. Then, current flows to the fuel pump motor from the battery through the side-stand relay and the fuel pump relay so that the pump continues to function.

A tip over sensor is provided in the fuel pump control circuit. By this provision, anytime the motorcycle tips over, the tip over sensor sends a signal to the ECM to turn off power to the fuel pump relay, causing the fuel pump motor to stop. At the same time, current to the fuel injectors as well as the ignition coil is interrupted, which then stops the engine.



ECM (FI CONTROL UNIT)

The ECM is located under the seat.

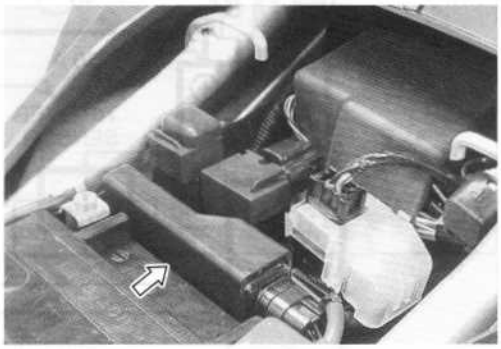
The ECM consists of CPU (Central Processing Unit), memory (ROM) and I/O (Input/Output) sections. The signal from each sensor is sent to the input section and then sent to CPU. On the basis of signal information received, CPU calculates the volume of fuel necessary for injection using maps programmed for varying engine conditions. Then, the operation signal of the fuel injection is sent from the output section to the fuel injector.

The eight kinds of independent program maps are programmed in the ROM.

These eight kinds of maps are designed to compensate for differences of the intake/exhaust systems and cooling performance.

LIGHT LOAD: When the engine is running in a light load, the fuel injected volume (time) is determined the on basis of the intake air pressure and engine speed.

HEAVY LOAD: When the engine is running in a heavy load, the fuel injected volume (time) is determined on the basis of the throttle valve opening and engine speed.

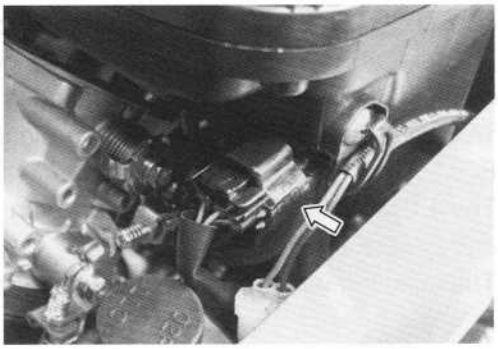


INJECTION TIMING

The system employs a sequential, front and rear cylinder independent injection type, using the crankshaft position sensor (signal generator) to determine the piston position (injection timing and ignition timing) and the camshaft position sensor to identify the cylinder during operation, and these information are sent to the ECM. This makes it possible to inject the optimum volume of fuel in the best timing for the engine operating conditions.

SENSORS

INTAKE AIR PRESSURE SENSOR (IAP SENSOR)

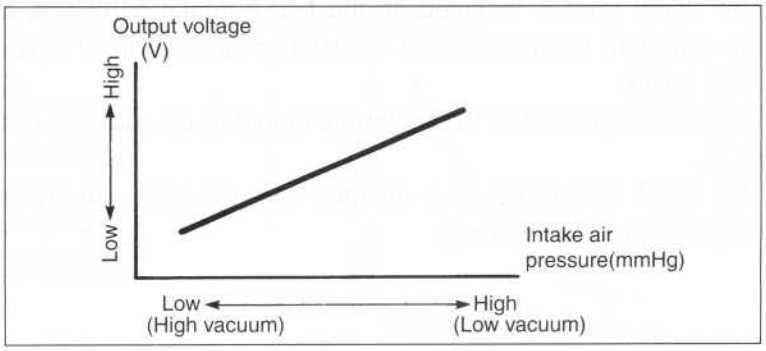


The intake air pressure sensor is located at the rear side of the air cleaner box and its vacuum hose is connected to the throttle body.

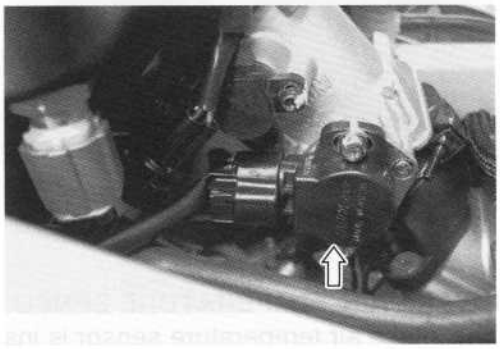
The sensor detects the intake air pressure, which is then converted into voltage signal and sent to the ECM.

The basic fuel injection time (volume) is determined according to the voltage signal (output voltage).

The voltage signal increases when the intake air pressure is high.



THROTTLE POSITION SENSOR (TP SENSOR)



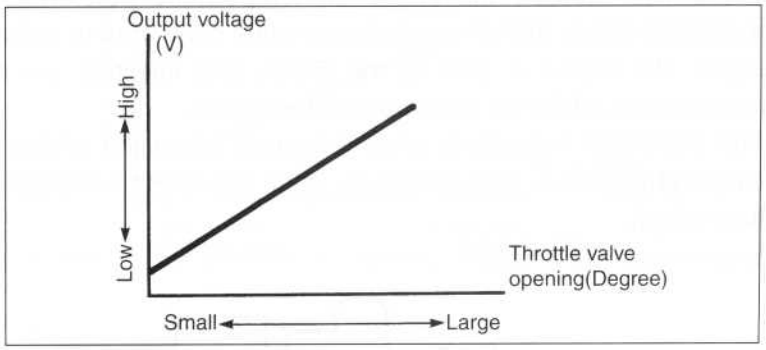
The throttle position sensor is installed on the No. 2 throttle body.

The throttle position sensor is a kind of variable resistor which detects the throttle opening angle.

The supplied voltage in the sensor is changed to the throttle position voltage which is then sent to the ECM.

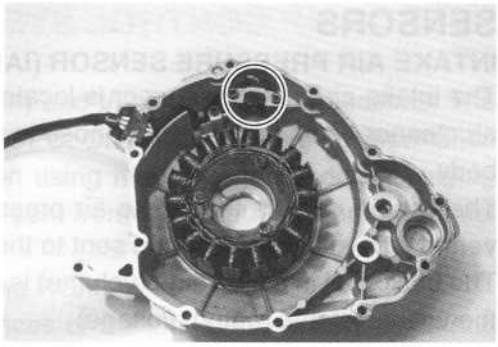
The basic fuel injection time (volume) is determined according to the voltage signal (output voltage).

The voltage signal increases as the throttle is opened wider.



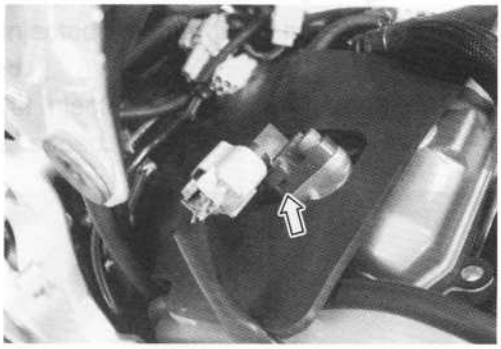
CRANKSHAFT POSITION SENSOR (CKP SENSOR)

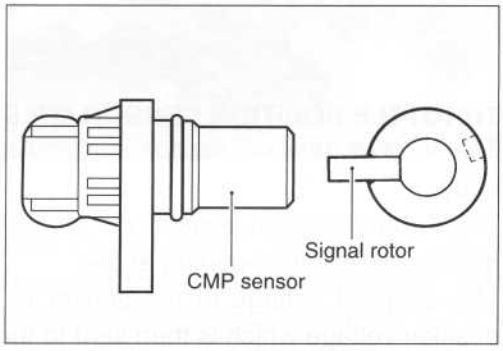
The signal rotor is mounted on the generator rotor, and the crankshaft position sensor is installed in the generator cover.
The sensor generates the pick-up signal to be supplied to the ECM.
The ECM calculates and decides both the fuel injection timing and ignition timing.
The injection volume increases when the engine rpm is high.



CAMSHAFT POSITION SENSOR (CMP SENSOR)

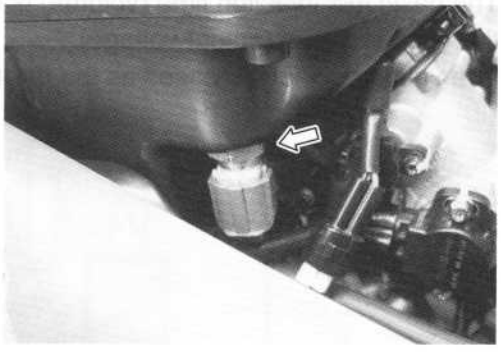
The signal rotor is installed on the No. 2 intake camshaft, and the camshaft position sensor is installed on the No. 2 cylinder head cover.
The sensor generates the rectangle signal to be supplied to the ECM.
The ECM calculates and decides the cylinder identity and sequential injection timing.

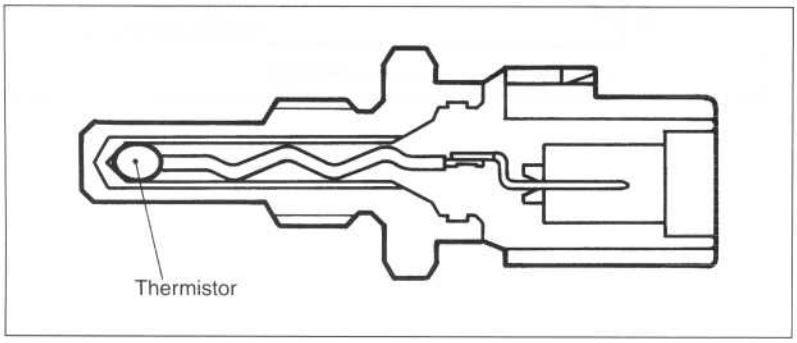


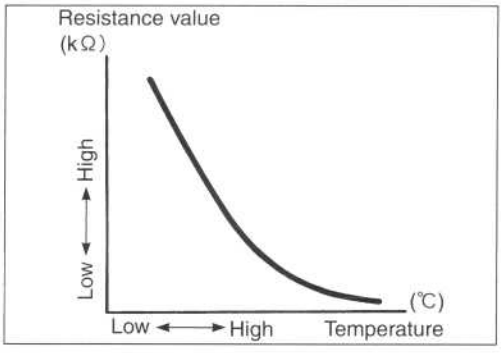


INTAKE AIR TEMPERATURE SENSOR (IAT SENSOR)

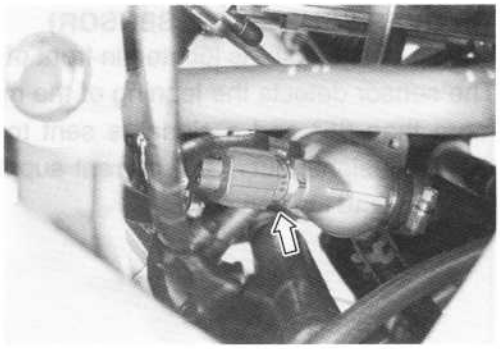
The intake air temperature sensor is installed at the rear side of the air cleaner box.
The sensor detects the intake air temperature in thermistor resistance value. With this resistance value converted to voltage signal, the signal is sent to the ECM. The injection volume increases as intake air temperature decreases.
The thermistor resistance value increases when the intake air temperature is low, and decreases when the intake air temperature is high.





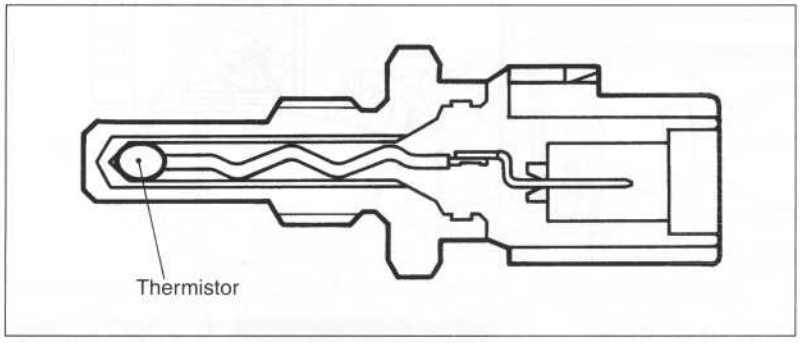


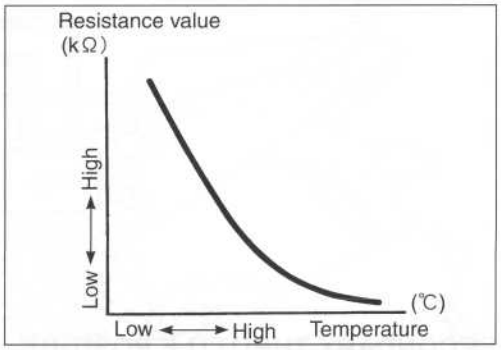
ENGINE COOLANT TEMPERATURE SENSOR (ECT SENSOR)



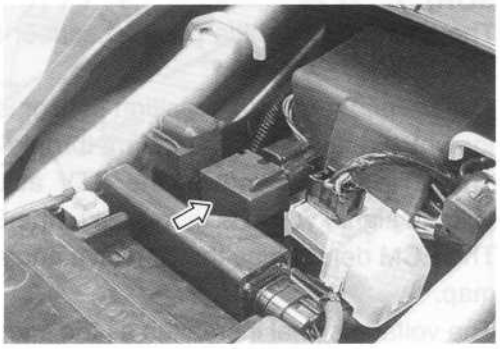
The engine coolant temperature sensor is installed at the thermostat case.
The sensor detects the engine coolant temperature in thermistor resistance value, which is then converted to voltage signal and sent to the ECM. The injection volume increases as coolant temperature decreases.

The thermistor resistance value increases when the engine coolant temperature is low, and decreases when the engine coolant temperature is high.



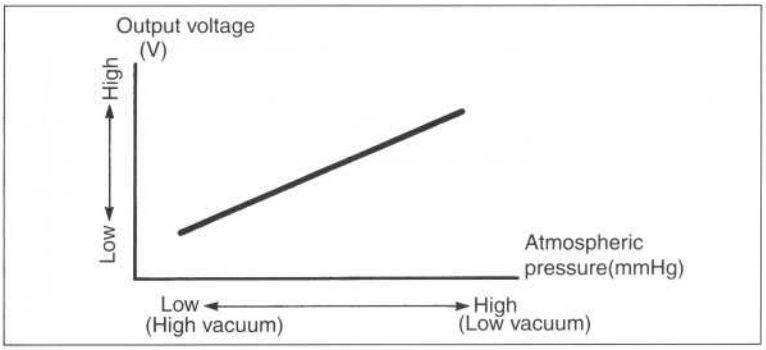


ATMOSPHERIC PRESSURE SENSOR (AP SENSOR)



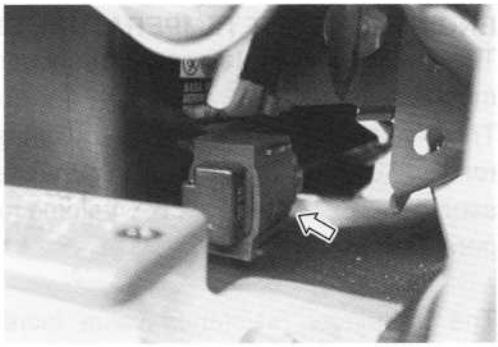
The atmospheric pressure sensor is located under the seat.
The sensor detects the atmospheric pressure. The detected pressure is converted into voltage signal and sent to the ECM.
The injection time (volume) is controlled according to the voltage signal (output voltage).

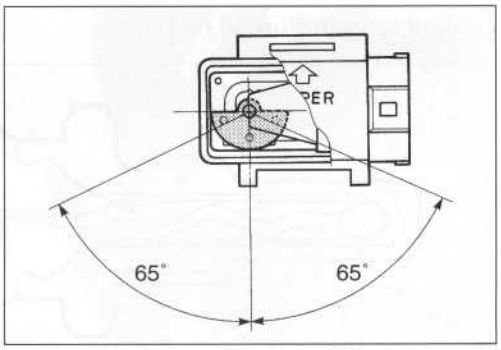
The voltage signal increases as the atmospheric pressure rises.



TIP OVER SENSOR (TO SENSOR)

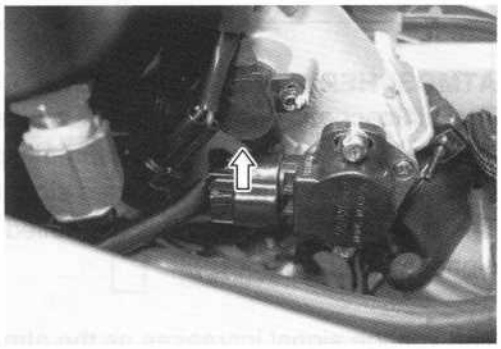
The tip over sensor is located in front of the battery holder.
The sensor detects the leaning of the motorcycle. When it leans more than 65° and a signal is sent to the ECM. At the same time, this signal cuts OFF current supply to the fuel pump, fuel injectors and ignition coils.

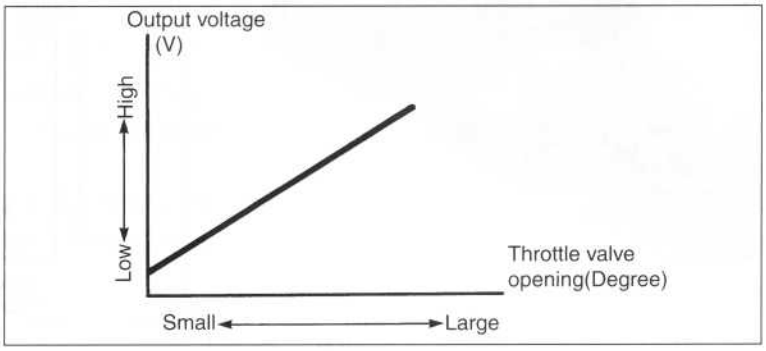




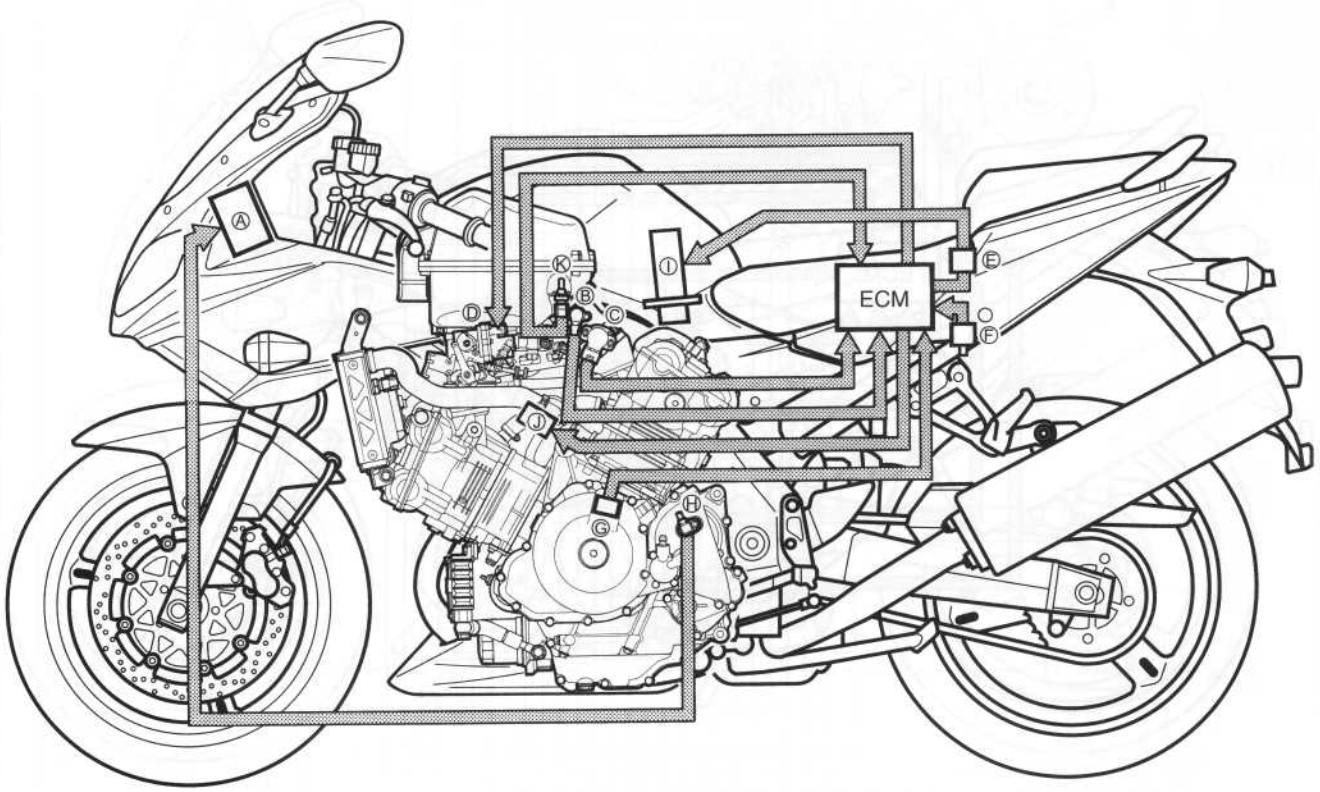
SECONDARY THROTTLE POSITION SENSOR (STP SENSOR)

The secondary throttle position sensor is installed on the No. 2 throttle body.
The secondary throttle position sensor is a kind of variable resistor which detects the secondary throttle opening angle.
The STP sensor detects the STV actuator movement by the voltage signal which is then sent to the ECM.
The ECM determines the ST valve angle based on the operation map.
The voltage signal increases as the secondary throttle is opened wider.

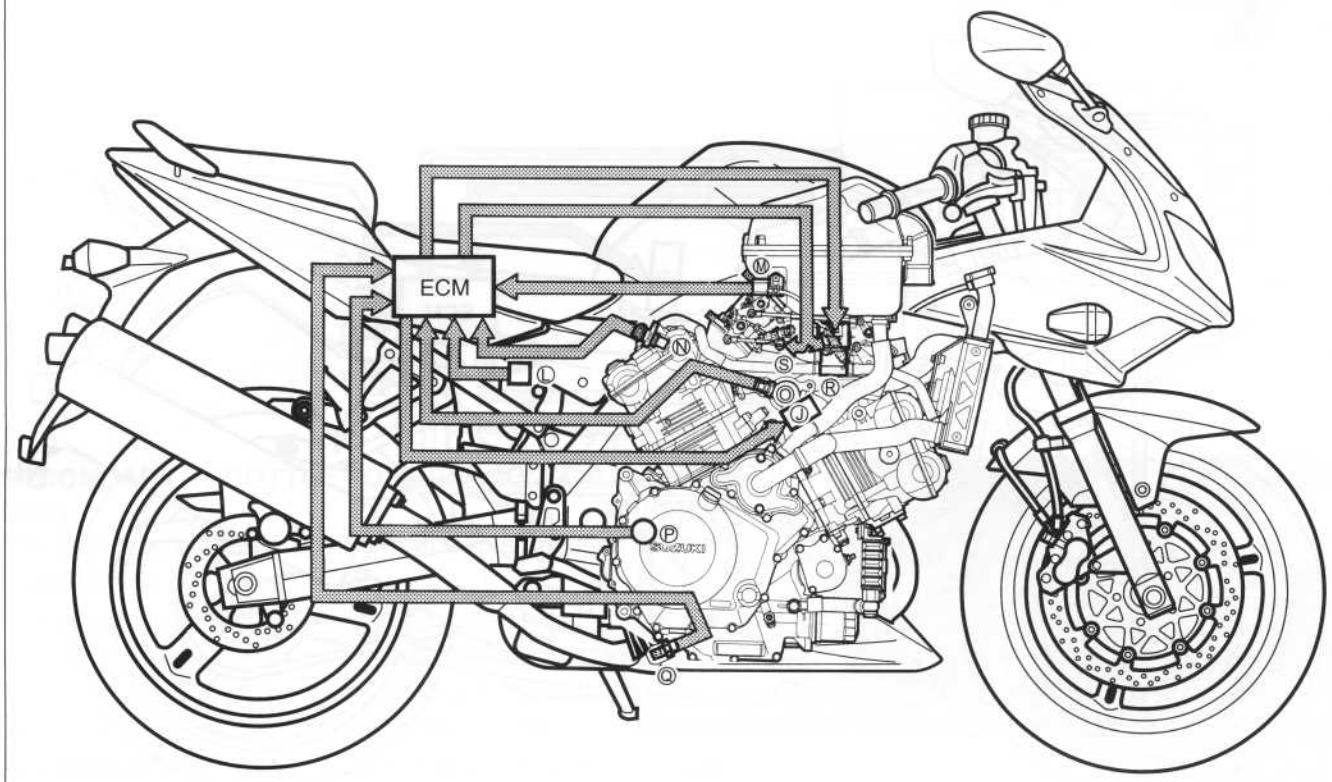




FI SYSTEM PARTS LOCATION

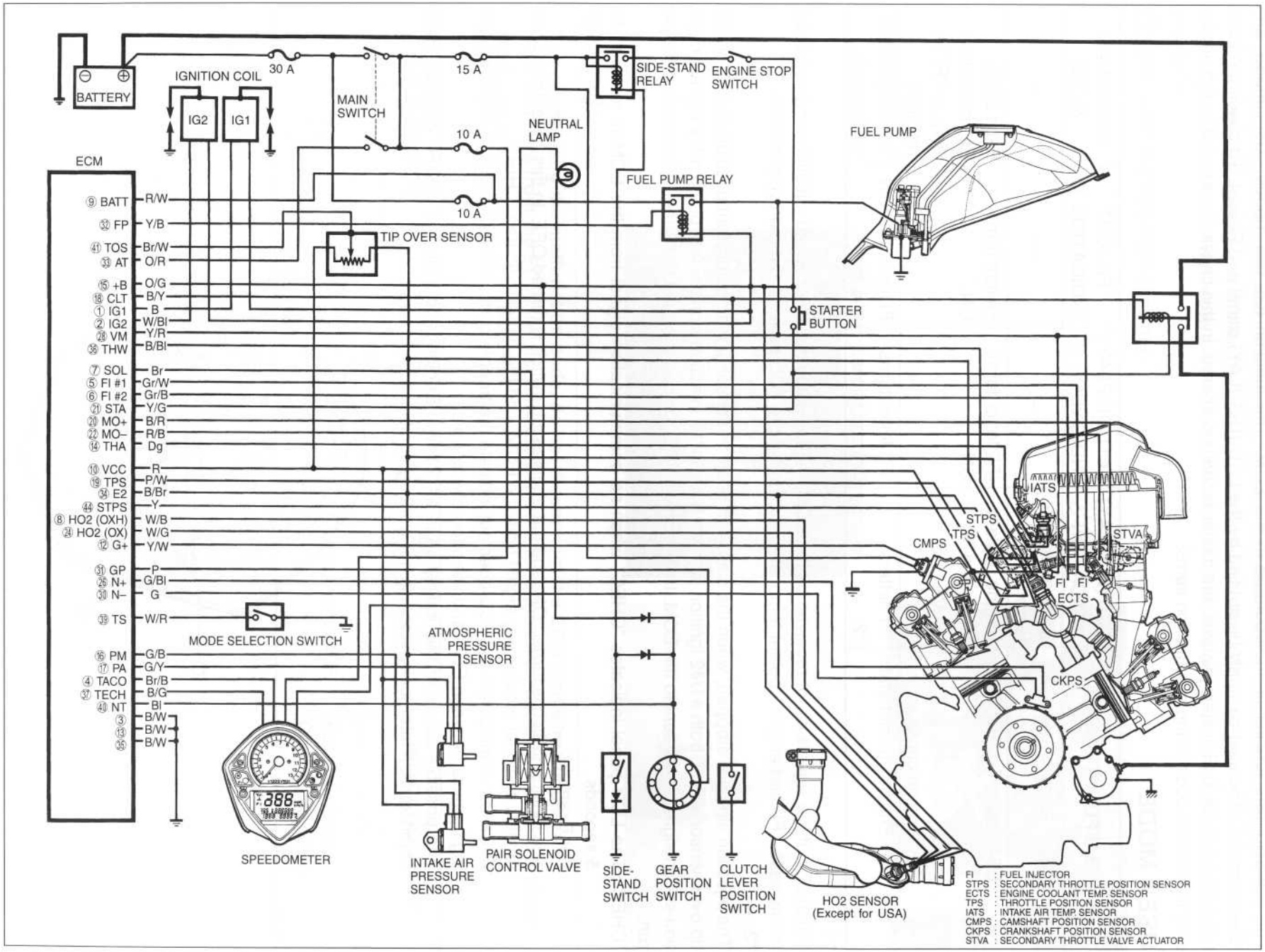


Ⓐ Speedometer
Ⓑ Secondary throttle position sensor (STPS)
Ⓒ Throttle position sensor (TPS)
Ⓓ Secondary throttle valve actuator (STVA)
Ⓔ Fuel pump relay (FP RELAY)
Ⓕ Atomospheric pressure sensor (APS)
Ⓖ Crankshaft position sensor (CKPS)
Ⓗ Speed sensor
Ⓘ Fuel pump (FP)
Ⓙ Ignition coil (IG COIL)
Ⓚ Intake air temperature sensor (IATS)



Ⓙ Ignition coil (IG COIL)
Ⓛ Tip over sensor (TOS)
Ⓜ Intake air pressure sensor (IAPS)
Ⓝ Camshaft position sensor (CMPS)
Ⓞ Engine coolant temperature sensor (ECTS)
Ⓟ Gear position switch
Ⓠ Heated oxygen sensor (HO2S) [For E-02, 19]
Ⓡ PAIR solenoid valve
Ⓢ Fuel injector (FI)

FI SYSTEM WIRING DIAGRAM



SELF-DIAGNOSIS FUNCTION

The self-diagnosis function is incorporated in the ECM. The function has two modes, "User mode" and "Dealer mode". The user can only be notified by the LCD (DISPLAY) panel and FI light. To check the function of the individual FI system devices, the dealer mode is prepared. In this check, the special tool is necessary to read the code of the malfunction items.

USER MODE

MALFUNCTION	LCD (DISPLAY) INDICATION Ⓐ	LCD (DISPLAY) INDICATION Ⓑ	FI LIGHT INDICATION Ⓒ	INDICATION MODE
"NO"	Engine coolant temp.	—	—	—
"YES"				
Engine can start.	Engine coolant temp. and "FI" letters *1	"FI" letter turns ON.	FI light turns ON.	Each 2 sec. Engine coolant temp. or "FI" is indicated.
Engine can not start.	"FI" letters *2	"FI" letter turns ON and blinks.	FI light turns ON and blinks.	"FI" is indicated continuously.

*1

When one of the signals is not received by the ECM, the fail-safe circuit works and injection is not stopped. In this case, "FI" and engine coolant temp. are indicated in the LCD panel and motorcycle can run.

*2

The injection signal is stopped, when the camshaft position sensor signal, crankshaft position sensor signal, tip over sensor signal, both #1/#2 ignition signals, both #1/#2 injection signals, fuel pump relay signal or ignition switch signal is not sent to the ECM. In this case, "FI" is indicated in the LCD panel. Motorcycle does not run.

"CHEC": The LCD panel indicates "CHEC" when no communication signal from the ECM is received for 5 seconds.

For Example:

The ignition switch is turned ON, and the engine stop switch is turned OFF. In this case, the speedometer does not receive any signal from the ECM, and the panel indicates "CHEC".

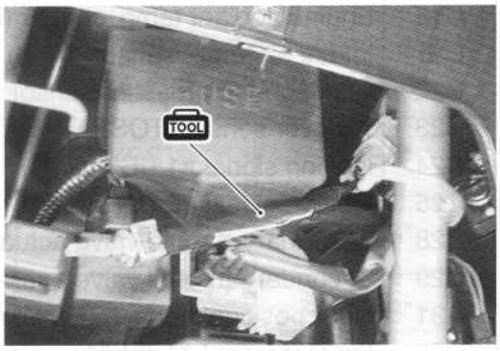
If "CHEC" is indicated, the LCD does not indicate the trouble code. It is necessary to check the wiring harness between ECM and speedometer couplers.

The possible cause of this indication is as follows; Engine stop switch is in OFF position. Sidestand/ignition inter-lock system is not working. Ignition fuse is burnt.

DEALER MODE

The defective function is memorized in the computer. Use the special tool's coupler to connect to the dealer mode coupler. The memorized malfunction code is displayed on the LCD (DISPLAY) panel. Malfunction means that the ECM does not receive signal from the devices. These affected devices are indicated in the code form.

09930-82720: Mode select switch



CAUTION

Before checking the malfunction code, do not disconnect the ECM lead wire couplers. If the couplers from the ECM are disconnected, the malfunction code memory is erased and the malfunction code can not be checked.

MALFUNCTION	LCD (DISPLAY) INDICATION Ⓐ	LCD (DISPLAY) INDICATION Ⓑ	INDICATION MODE
"NO"	C00	FI letter turns OFF.	—
"YES"	C** code is indicated from small numeral to large one.		For each 2 sec. Code is indicated.

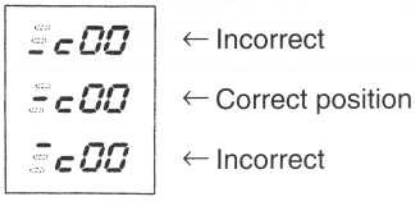
CODE	MALFUNCTION PART	REMARKS
C00	None	No defective part
C11	Camshaft position sensor (CMPS)	
C12	Crankshaft position sensor (CKPS)	Pick-up coil signal, signal generator
C13	Intake air pressure sensor (IAPS)	
C14	Throttle position sensor (TPS)	
C15	Engine coolant temp. sensor (ECTS)	
C21	Intake air temp. sensor (IATS)	
C22	Atmospheric pressure sensor (APS)	
C23	Tip over sensor (TOS)	
C24	Ignition signal #1 (IG coil #1)	For #1 cylinder
C25	Ignition signal #2 (IG coil #2)	For #2 cylinder
C28	Secondary throttle valve actuator (STVA)	
C29	Secondary throttle valve position sensor	
C31	Gear position signal (GP switch)	
C32	Injector signal #1 (FI #1)	For #1 cylinder
C33	Injector signal #2 (F1 #2)	For #2 cylinder
C41	Fuel pump control system (FP control system)	Fuel pump, fuel pump relay
C42	Ignition switch signal (IG switch signal)	Anti-theft
C44	Heated oxygen sensor (HO2S)	For E-02, 19
C49	PAIR control solenoid valve (PAIR valve)	

In the LCD (DISPLAY) panel, the malfunction code is indicated from small numeral to large numeral.

TPS ADJUSTMENT

1. Warm up the engine and adjust the engine idle speed to 1 200 ± 100 rpm.
2. Stop the engine.
3. Connect the special tool (Mode select switch) and select the dealer mode.
4. If the throttle position sensor adjustment is necessary, loosen the screws and turn the throttle position sensor and bring the line to middle.
5. Then, tighten the screws to fix the throttle position sensor.

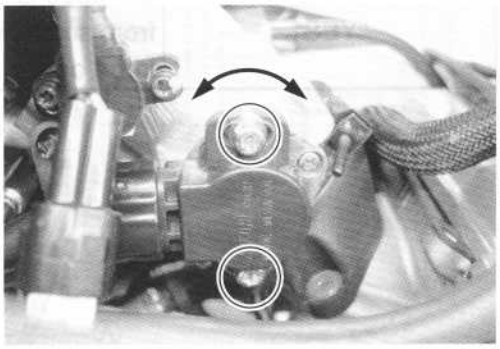
TOOL 09930-11950: Torx wrench



← Incorrect

← Correct position

← Incorrect



FAIL-SAFE FUNCTION

FI system is provided with fail-safe function to allow the engine to start and the motorcycle to run in a minimum performance necessary even under malfunction condition.

ITEM	FAIL-SAFE MODE	STARTING ABILITY	RUNNING ABILITY
Camshaft position sensor	When camshaft position signal has failed during running, the ECM determines cylinder as # before occurrence of such a failure.	"NO"	"YES"
		Motorcycle can run, but once engine stops, engine can not start.	
Intake air pressure sensor	Intake air pressure is fixed to 760 mmHg.	"YES"	"YES"
Throttle position sensor	TPS opening value is fixed to full open position.	"YES"	"YES"
Engine coolant temp. sensor	Engine coolant temperature value is fixed to 80°C.	"YES"	"YES"
Intake air temperature sensor	Intake air temperature value is fixed to 40°C.	"YES"	"YES"
Atmospheric pressure sensor	Atmospheric pressure is fixed to 760 mmHg.	"YES"	"YES"
Ignition signal #1 (IG coil #1)	#1 Ignition-off and #1 Fuel-cut	"YES"	"YES"
		#2 cylinder can run.	
Ignition signal #2 (IG coil #2)	#2 Ignition-off and #2 Fuel-cut	"YES"	"YES"
		#1 cylinder can run.	
Injection signal #1	#1 Fuel-cut	"YES"	"YES"
		#2 cylinder can run.	
Injection signal #2	#2 Fuel-cut	"YES"	"YES"
		#1 cylinder can run.	
HO2 sensor (For E-02, 19)	Feedback compensation is inhibited. (Air/fuel ratio is fixed to normal.)	"YES"	"YES"
Secondary throttle valve actuator	Secondary throttle valve is fixed in any position.	"YES"	"YES"
Secondary throttle position sensor	Secondary throttle valve is fixed in full close position.	"YES"	"YES"
Gear position signal	Gear position signal is fixed to 6th gear.	"YES"	"YES"
PAIR control solenoid valve	O2 feedback control is stopped and PAIR valve is fixed to open position.	"YES"	"YES"

The engine can start and can run even if the above signal is not received from each sensor. But, the engine running condition is not complete, providing only emergency help (by fail-safe circuit). In this case, it is necessary to bring the motorcycle to the workshop for complete repair.

FI SYSTEM TROUBLESHOOTING

CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer. For this purpose, use of such an inspection form will facilitate collecting information to the point required for proper analysis and diagnosis.

EXAMPLE: CUSTOMER PROBLEM INSPECTION FORM

User name:	Model:	VIN:	
Date of issue:	Date Reg.	Date of problem:	Mileage:

Malfunction indicator lamp condition (LED)	☐ Always ON ☐ Sometimes ON ☐ Always OFF ☐ Good condition
Malfunction display/code (LCD)	User mode: ☐ No display ☐ Malfunction display ( )
	Dealer mode: ☐ No code ☐ Malfunction code ( )

PROBLEM SYMPTOMS	
☐ **Difficult Starting**	☐ **Poor Drive ability**
☐ No cranking	☐ Hesitation on acceleration
☐ No initial combustion	☐ Back fire/☐ After fire
☐ No combustion	☐ Lack of power
☐ Poor starting at	☐ Surging
(☐ cold ☐ warm ☐ always)	☐ Abnormal knocking
☐ Other _____	☐ Engine rpm jumps briefly
	☐ Other _____
☐ **Poor Idling**	☐ **Engine Stall when**
☐ Poor fast idle	☐ Immediately after start
☐ Abnormal idling speed	☐ Throttle valve is opened
(☐ High ☐ Low) (r/min)	☐ Throttle valve is closed
☐ Unstable	☐ Load is applied
☐ Hunting (r/min to r/min)	☐ Other _____
☐ Other _____	
☐ OTHERS:	

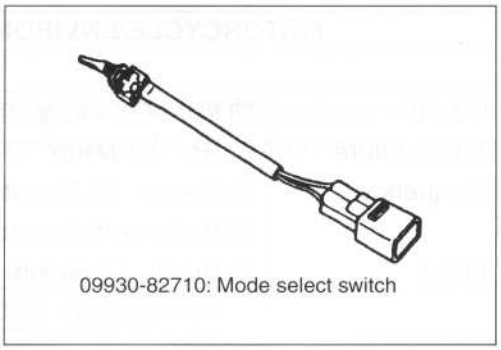
MOTORCYCLE/ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS	
Environmental condition	
Weather	☐ Fair ☐ Cloudy ☐ Rain ☐ Snow ☐ Always ☐ Other _____
Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (°F/ °C) ☐ Always
Frequency	☐ Always ☐ Sometimes (times/ day, month) ☐ Only once
	☐ Under certain condition
Road	☐ Urban ☐ Suburb ☐ Highway ☐ Mountainous (☐ Uphill ☐ Downhill)
	☐ Tarmacadam ☐ Gravel ☐ Other _____
Motorcycle condition	
Engine condition	☐ Cold ☐ Warming up phase ☐ Warmed up ☐ Always ☐ Other at starting
	☐ Immediately after start ☐ Racing without load ☐ Engine speed (r/min)
Motorcycle condition	During driving: ☐ Constant speed ☐ Accelerating ☐ Decelerating
	☐ Right hand corner ☐ Left hand corner
	☐ At stop ☐ Motorcycle speed when problem occurs (km/h, mile/h)
	☐ Other _____

NOTE:
The above form is a standard sample. It should be modified according to conditions characteristic of each market.

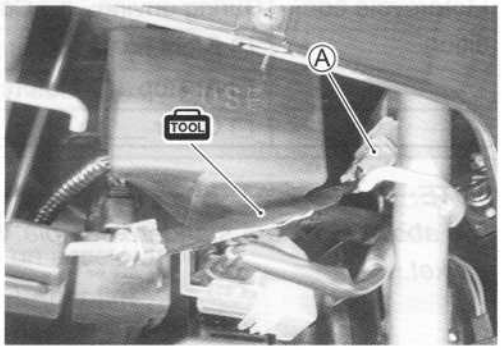
SELF-DIAGNOSTIC PROCEDURES

- Don't disconnect couplers from the ECM, battery cable from the battery, ECM ground wire harness from the engine or main fuse before confirming malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase memorized information in ECM memory.
- Malfunction code stored in ECM memory can be checked by the special tool.
- Before checking malfunction code, read SELF-DIAGNOSIS FUNCTION "USER MODE and DEALER MODE" (☞4-24, -25 and -26) carefully to have good understanding as to what functions are available and how to use it.
- Be sure to read "PRECAUTIONS for Electrical Circuit Service" (☞4-6) before inspection and observe what is written there.
- Remove the seat.
- Connect the special tool to the dealer mode coupler Ⓐ at the wiring harness, and start the engine or crank the engine for more than 4 seconds.
- Turn the special tool's switch ON and check the malfunction code to determine the malfunction part.

TOOL 09930-82720: Mode select switch



09930-82710: Mode select switch



SELF-DIAGNOSIS RESET PROCEDURE

- After repairing the trouble, turn OFF the ignition switch and turn ON again.
- If the malfunction code indicates (C00), the malfunction is cleared.
- Disconnect the special tool from the dealer mode coupler.

MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION CODE	DETECTED ITEM	DETECTED FAILURE CONDITION CHECK FOR
C00	NO FAULT	—
C11	Camshaft position sensor	The signal does not reach ECM for more than 3 sec. after receiving the starter signal.
		The camshaft position sensor wiring and mechanical parts (Camshaft position sensor, intake cam pin, wiring/coupler connection)
C12	Crankshaft position sensor	The signal does not reach ECM for more than 2 sec. after receiving the starter signal.
		The crankshaft position sensor wiring and mechanical parts (Crankshaft position sensor, wiring/coupler connection)
C13	Intake air pressure sensor	The sensor should produce following voltage. (0.50 V $\leqq$ sensor voltage < 4.85 V) Without the above range, C13 is indicated.
		Intake air pressure sensor, wiring/coupler connection
C14	Throttle position sensor	The sensor should produce following voltage. (0.20 V $\leqq$ sensor voltage < 4.80 V) Without the above range, C14 is indicated.
		Throttle position sensor, wiring/coupler connection
C15	Engine coolant temperature sensor	The sensor voltage should be the following. (0.15 V $\leqq$ sensor voltage < 4.85 V) Without the above range, C15 is indicated.
		Engine coolant temperature sensor, wiring/coupler connection
C21	Intake air temperature sensor	The sensor voltage should be the following. (0.15 V $\leqq$ sensor voltage < 4.85 V) Without the above range, C21 is indicated.
		Intake air temperature sensor, wiring/coupler connection
C22	Atmospheric pressure sensor	The sensor voltage should be the following. (0.50 V $\leqq$ sensor voltage < 4.85 V) Without the above range, C22 is indicated.
		Atm. pressure sensor, wiring/coupler connection
C23	Tip over sensor	The sensor voltage should be the following for more than 2 sec. after ignition switch turns ON. (0.20 V $\leqq$ sensor voltage < 4.80 V) Without the above value, C23 is indicated.
		Tip over sensor, wiring/coupler connection
C24 or C25	Ignition signal	Crankshaft position sensor signal is produced and ECM determines the ignition signal but signal from ignition coil is interrupted continuous by 4 times or more. In this case, the code C24 or C25 is indicated.
		Ignition coil, wiring/coupler connection, power supply from the battery

C28	Secondary throttle valve actuator	No operating voltage is supplied from the ECM, C28 is indicated. STVA can not operate.
		STVA lead wire/coupler, STVA
C29	Secondary throttle valve position sensor	The sensor should produce following voltage. (0.10 V ≦ sensor voltage < 4.90 V) Without the above range, C29 is indicated.
		Secondary throttle position sensor, wiring/coupler connection
C31	Gear position signal	Gear position signal voltage should be higher than the following for more than 2 seconds. (Gear position switch voltage ≧ 0.6 V) Without the above value, C31 is indicated.
		Gear position sensor, wiring/coupler connection, gearshift cam, etc.
C32 or C33	Fuel injector	Crankshaft position sensor signal is produced and ECM determines the injection signal but fuel injection signal is interrupted continuous by 4 times or more. In this case, the code C32 or C33 is indicated.
		Injector, wiring/coupler connection, power supply to the injector
C41	Fuel pump relay	No voltage is applied to fuel pump although fuel pump relay is turned ON, or voltage is applied to fuel pump although fuel pump relay is turned OFF.
		Fuel pump relay, connecting lead, power source to fuel pump relay
C42	Ignition switch	Ignition switch signal is not input in the ECM.
		Ignition switch, lead wire/coupler
C44	Heated oxygen sensor (HO2S) [For E-02, 19]	During O2 feedback control, O2 sensor voltage is higher or lower than the specification. No signal is detected during engine operation or no electrical power is supplied from the battery.
		HO2S lead wire/coupler connection Battery voltage supply to the HO2S
C49	PAIR control solenoid valve (PAIR valve)	When no operating voltage is supplied from the ECM, C49 is indicated. PAIR valve can not operate.
		PAIR valve lead wire/coupler

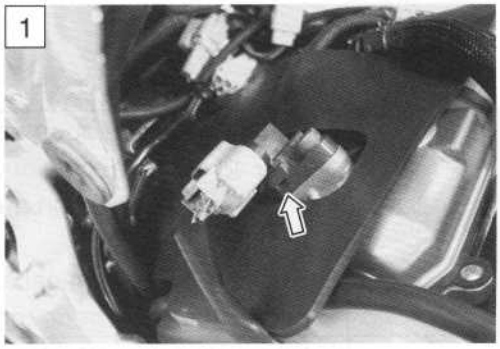
"C11" CMP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The CMP sensor signal does not reach ECM for more than 3 seconds after receiving the starter signal	• Metal particles or foreign materiel being attached on the CMP sensor and rotor tip • CMP sensor circuit open or short • CMP sensor malfunction • ECM malfunction

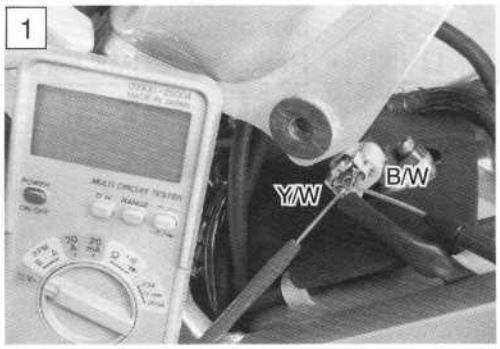
INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the CMP sensor coupler for loose or poor contacts.
   If OK, then measure the CMP sensor peak voltage.



4) Insert the needle pointed probes to the CMP sensor coupler and crank the engine a few seconds or start the engine, and measure the peak voltage.



DATA CMP sensor peak voltage: 3.7 V and more (⊕ Y/W – ⊖ B/W)

TOOL 09900-25008: Multi circuit tester
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

Is the peak voltage OK?

YES	Go to step 2.
NO	Replace the CMP sensor with a new one, if the rotor is OK.

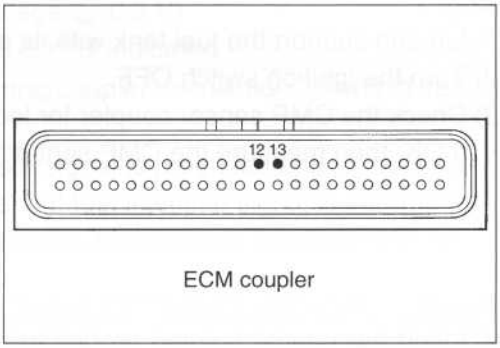
Step 2

1) Remove the CMP sensor.
2) If the metal particles or foreign material is attached on the CMP sensor and rotor tip, signal not flow correctly to the ECM. Clean the CMP sensor and rotor tip with a spray type carburetor cleaner and blow dry with compressed air and also change the engine oil if necessary.

2

Is the cleaning OK?

YES	• Y/W or B/W wire open or shorted to ground, or poor ⑫ or ⑬ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	• Loose or poor contacts on the CMP sensor coupler or ECM coupler. • Replace the CMP sensor with a new one.



ECM coupler

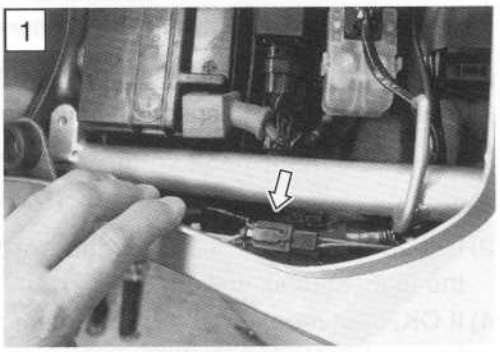
"C12" CKP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No CKP sensor signal for more than 2 seconds after receiving the starter signal	• Metal particles or foreign materiel being attached on the CKP sensor and rotor tip • CKP sensor circuit open or short • CKP sensor malfunction • ECM malfunction

INSPECTION

Step 1

1) Remove the seat (☞6-3) and left seat tail cover mounting screw.
2) Turn the ignition switch OFF.
3) Check the CKP sensor coupler for loose or poor contacts.
   If OK, then measure the CKP sensor resistance.

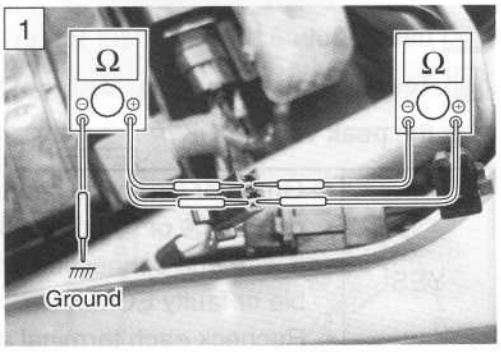


4) Disconnect the CKP sensor coupler and measure the resistance.

DATA **CKP sensor resistance: 130 – 240 Ω**
(Blue – Green)

5) If OK, then check the continuity between each terminal and ground.

DATA **CKP sensor continuity: ∞ Ω (Infinity)**
(Blue – Ground)
(Green – Ground)



TOOL **09900-25008: Multi circuit tester set**

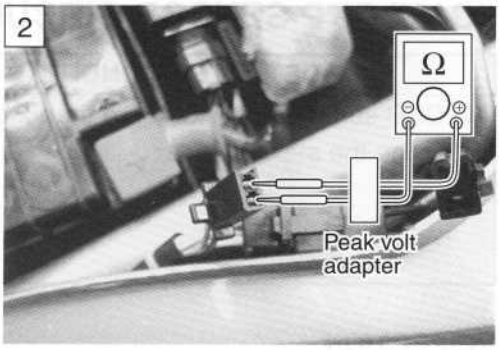
Tester knob indication: Resistance (Ω)

Are the resistance and continuity OK?

YES	Go to step 2.
NO	Replace the CKP sensor with a new one.

Step 2

1) Disconnect the CKP sensor coupler.



2) Crank the engine a few seconds with the starter motor, and measure the CKP sensor peak voltage at the coupler.

DATA CKP sensor peak voltage: 5.0 V and more (⊕ Blue – ⊖ Green)

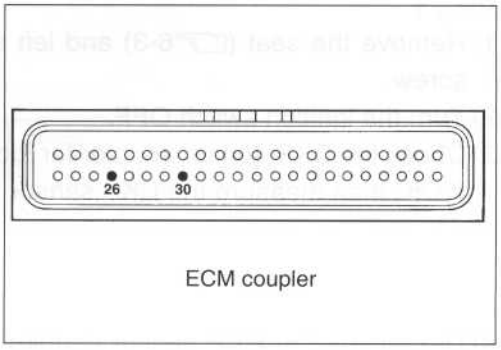
3) Repeat the above test procedure a few times and measure the highest peak voltage.

4) If OK, then measure the CKP sensor peak voltage at the ECM terminals. (N+/N– or ㉖/㉚)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the peak voltage OK?



ECM coupler

YES	• Green or G/Bl wire open or shorted to ground, or poor ㉖ or ㉚ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	• Loose or poor contacts on the CKP sensor coupler or ECM coupler. • Replace the CKP sensor with a new one.

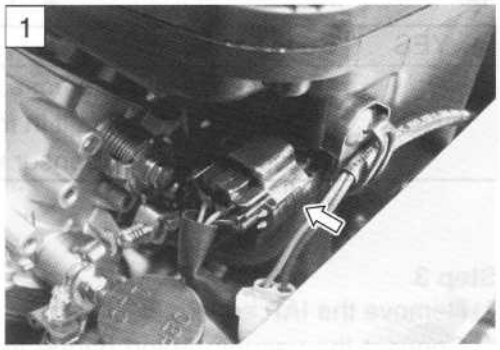
"C13" IAP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
IAP sensor voltage low or high (0.50 V ≦ Sensor voltage < 4.85 V) (without the above range) *NOTE:* *Note that atmospheric pressure varies depending on weather conditions as well as altitude.* *Take that into consideration when inspecting voltage.*	• Clogged vacuum passage between throttle body and IAP sensor • Air being drawn from vacuum passage between throttle body and IAP sensor • IAP sensor circuit open or shorted to ground • IAP sensor malfunction • ECM malfunction

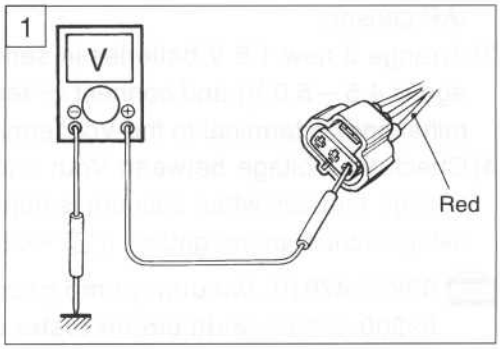
INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the IAP sensor coupler for loose or poor contacts.
   If OK, then measure the IAP sensor input voltage.



4) Disconnect the IAP sensor coupler.
5) Turn the ignition switch ON.
6) Measure the voltage at the Red wire and ground.
7) If OK, then measure the voltage at the Red wire and B/Br wire.

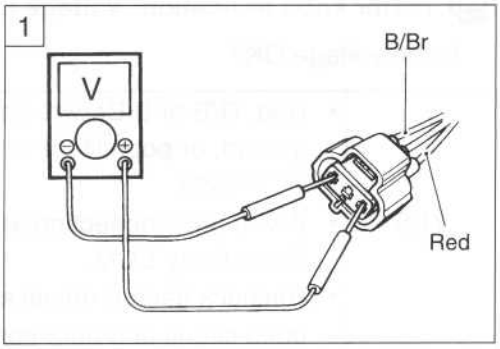


DATA IAP sensor input voltage: 4.5 – 5.5 V
(⊕ Red – ⊖ Ground)
(⊕ Red – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?



YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Red wire or B/Br wire.

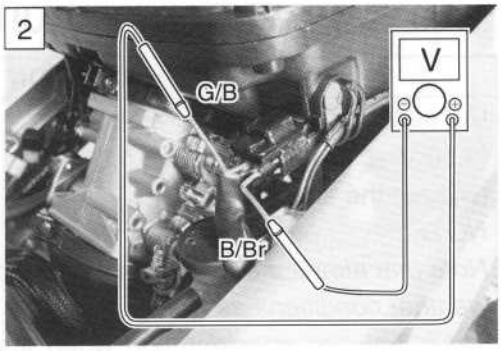
Step 2

1) Connect the IAP sensor coupler.
2) Insert the needle pointed probes to the lead wire coupler.
3) Start the engine at idle speed.
4) Measure the IAP sensor output voltage at the wire side coupler (between G/B and B/Br wires).

DATA IAP sensor output voltage: Approx. 2.5 V at idle speed (⊕ G/B – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)



YES	Go to Step 3.
NO	• Check the vacuum hose for crack or damage. • Open or short circuit in the G/B wire. • Replace the IAP sensor with a new one.

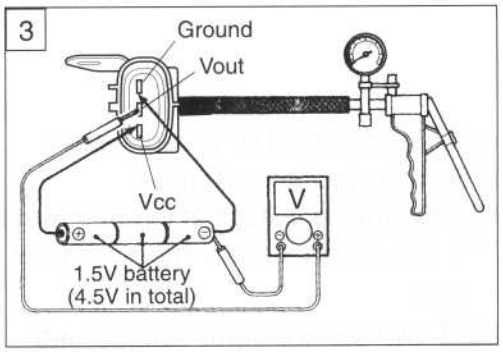
Step 3

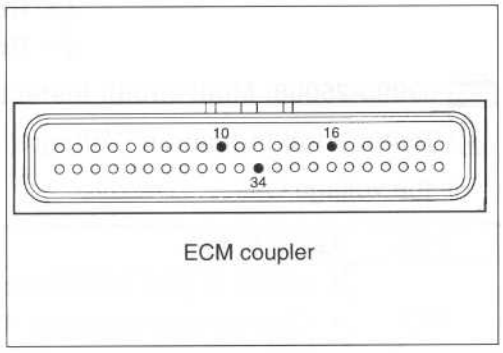
1) Remove the IAP sensor. (☞4-91)
2) Connect the vacuum pump gauge to the vacuum port of the IAP sensor.
3) Arrange 3 new 1.5 V batteries in series (check that total voltage is 4.5 – 5.0 V) and connect ⊖ terminal to the ground terminal and ⊕ terminal to the Vcc terminal.
4) Check the voltage between Vout and ground. Also, check if voltage reduces when vacuum is applied up to 400 mmHg by using vacuum pump gauge. (☞4-39)

TOOL 09917-47010: Vacuum pump gauge
09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?





ECM coupler

YES	• Red, G/B or B/Br wire open or shorted to ground, or poor ⑩, ⑯ or ㉞ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	If check result is not satisfactory, replace the IAP sensor with a new one.

Output voltage (Vcc voltage 4.5 – 5.0 V, ambient temp. 20 – 30 °C, 68 – 86 °F)

ALTITUDE (Reference)		ATMOSPHERIC PRESSURE		OUTPUT VOLTAGE
(ft)	(m)	(mmHg)	kPa	(V)
0 | 2 000	0 | 610	760 | 707	100 | 94	3.4 – 4.0
2 001 | 5 000	611 | 1 524	707 | 634	94 | 85	3.0 – 3.7
5 001 | 8 000	1 525 | 2 438	634 | 567	85 | 76	2.6 – 3.4
8 001 | 10 000	2 439 | 3 048	567 | 526	76 | 70	2.4 – 3.1

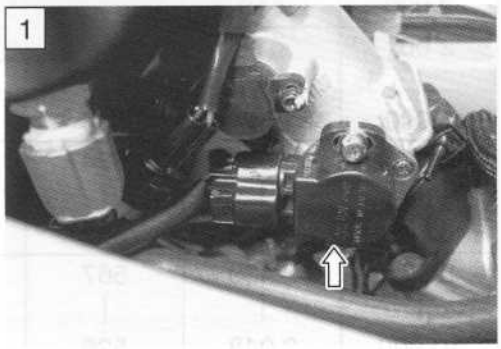
"C14" TP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high (0.20 V ≦ Sensor voltage < 4.80 V) (without the above range)	• TP sensor maladjusted • TP sensor circuit open or short • TP sensor malfunction • ECM malfunction

INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the TP sensor coupler for loose or poor contacts.
   If OK, then measure the TP sensor input voltage.
4) Disconnect the TP sensor coupler.

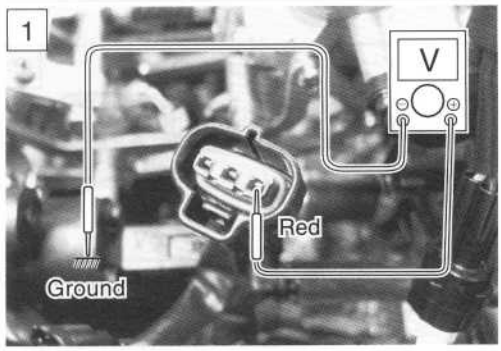


5) Turn the ignition switch ON.
6) Measure the voltage at the Red wire and ground.
7) If OK, then measure the voltage at the Red wire and B/Br wire.

DATA TP sensor input voltage: 4.5 – 5.5 V
(⊕ Red – ⊖ Ground)
(⊕ Red – ⊖ B/Br)

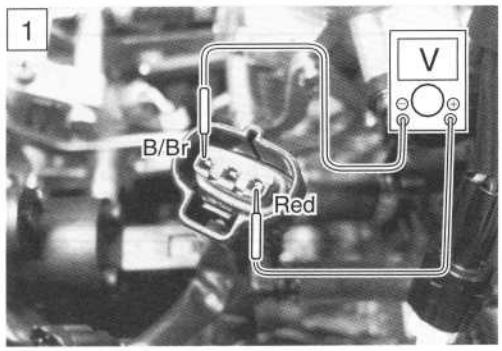
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)



Is the voltage OK?

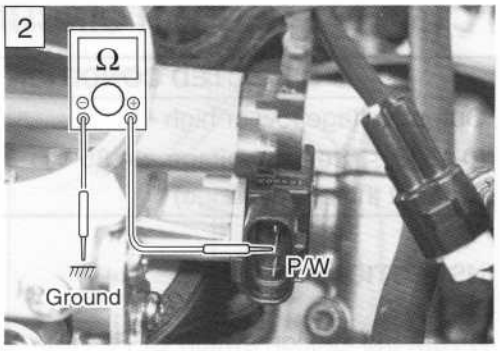
YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Red wire or B/Br wire.



Step 2

1) Turn the ignition switch OFF.
2) Disconnect the TP sensor coupler.
3) Check the continuity between P/W wire and ground.

DATA TP sensor continuity: ∞ Ω (Infinity)
(P/W – Ground)

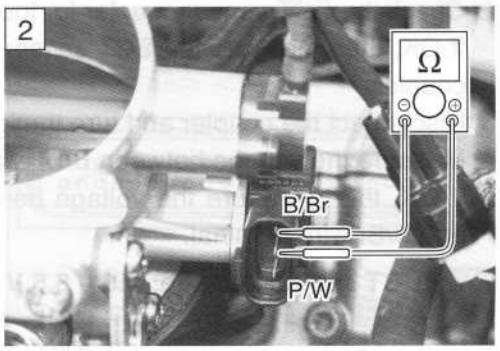


4) If OK, then measure the TP sensor resistance at the coupler (between P/W and B/Br wires).
5) Turn the throttle grip and measure the resistance.

DATA TP sensor resistance
Throttle valve is closed: Approx. 1.12 kΩ
Throttle valve is opened: Approx. 4.26 kΩ

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)



Are the resistance and continuity OK?

YES	Go to Step 3.
NO	• Reset the TP sensor position correctly. • Replace the TP sensor with a new one.

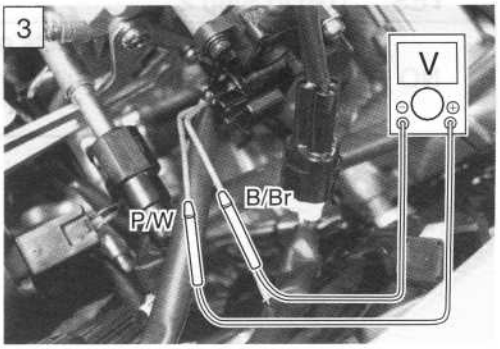
Step 3

1) Connect the TP sensor coupler.
2) Insert the needle pointed probes to the lead wire coupler.
3) Turn the ignition switch ON.
4) Measure the TP sensor output voltage at the coupler (between ⊕ P/W and ⊖ B/Br) by turning the throttle grip.

DATA TP sensor output voltage
Throttle valve is closed: Approx. 1.12 V
Throttle valve is opened: Approx. 4.26 V

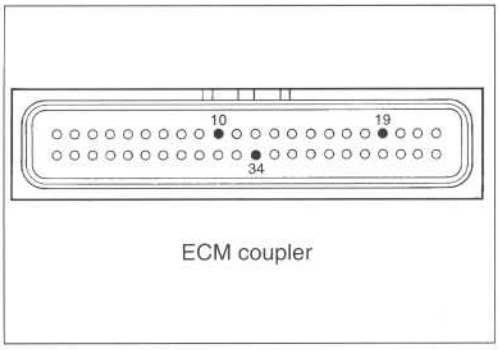
TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)



Is the voltage OK?

YES	• Red, P/W or B/Br wire open or shorted to ground, or poor ⑩, ⑲ or ㉞ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	If check result is not satisfactory, replace the TP sensor with a new one.



ECM coupler

"C15" ECT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high (0.15 V ≦ Sensor voltage < 4.85 V) (without the above range)	• ECT sensor circuit open or short • ECT sensor malfunction • ECM malfunction

INSPECTION

Step 1

1) Turn the ignition switch OFF.
2) Check the ECT sensor coupler for loose or poor contacts.
   If OK, then measure the ECT sensor voltage at the wire side coupler.
3) Disconnect the coupler and turn the ignition switch ON.
4) Measure the voltage between B/Bl wire terminal and ground.
5) If OK, then measure the voltage between B/Bl wire terminal and B/Br wire terminal.

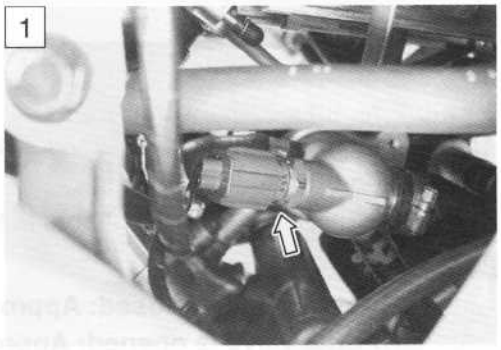
DATA ECT sensor voltage: 4.5 – 5.5 V
(⊕ B/Bl – ⊖ Ground)
(⊕ B/Bl – ⊖ B/Br)

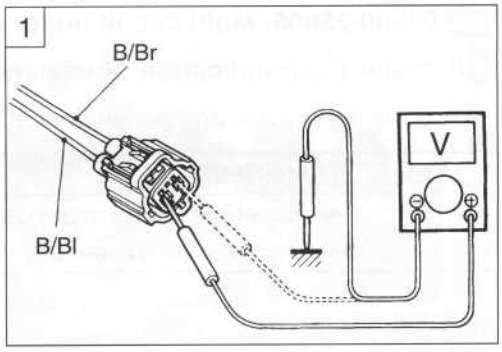
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the B/Bl wire or B/Br wire.





Step 2

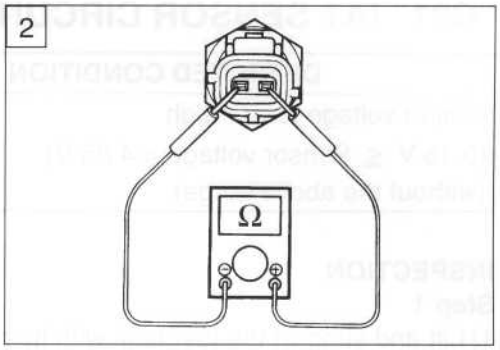
1) Turn the ignition switch OFF.
2) Measure the ECT sensor resistance.

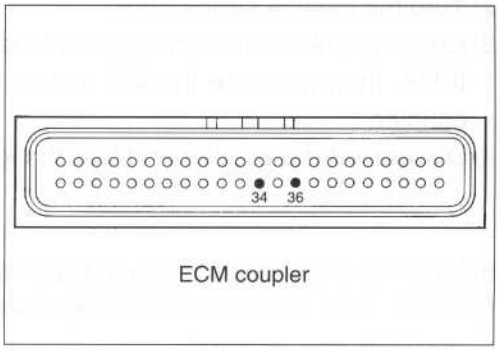
DATA ECT sensor resistance:
Approx. 2.45 kΩ at 20 °C (68 °F)
(Terminal – Terminal)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Refer to page 5-10 for details.
Is the resistance OK?





ECM coupler

YES	• B/Bl or B/Br wire open or shorted to ground, or poor ㉞ or ㊱ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Replace the ECT sensor with a new one.

Engine Coolant Temp	Resistance
20 °C (68 °F)	Approx. 2.45 kΩ
40 °C (104 °F)	Approx. 1.15 kΩ
80 °C (176 °F)	Approx. 0.318 kΩ
100 °C (212 °F)	Approx. 0.1836 kΩ

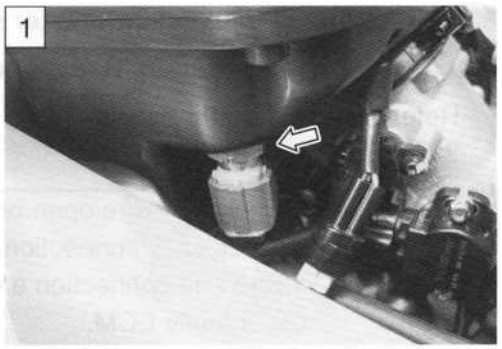
"C21" IAT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high (0.15 V ≦ Sensor voltage < 4.85 V) (without the above range)	• IAT sensor circuit open or short • IAT sensor malfunction • ECM malfunction

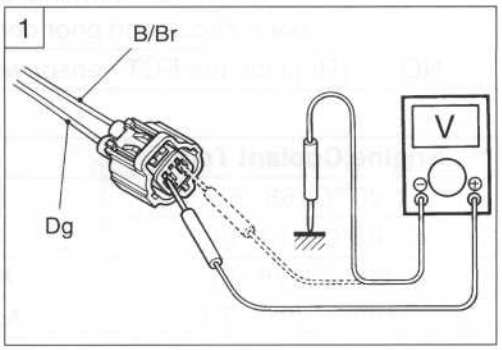
INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the IAT sensor coupler for loose or poor contacts.
   If OK, then measure the IAT sensor voltage at the wire side coupler.
4) Disconnect the coupler and turn the ignition switch ON.



5) Measure the voltage between Dg wire terminal and ground.
6) If OK, then measure the voltage between Dg wire terminal and B/Br wire terminal.



DATA IAT sensor voltage: 4.5 – 5.5 V
(⊕ Dg – ⊖ Ground)
(⊕ Dg – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Dg wire or B/Br wire.

Step 2

1) Turn the ignition switch OFF.
2) Measure the IAT sensor resistance.

DATA IAT sensor resistance: Approx. 2.45 kΩ at 20 °C (68 °F) (Terminal – Terminal)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

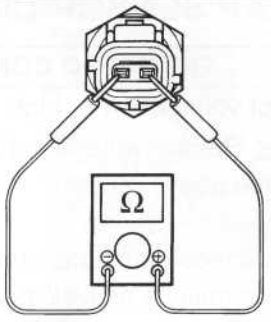
Is the resistance OK?

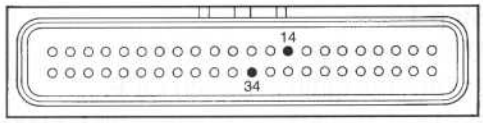
YES	• Dg or B/Br wire open or shorted to ground, or poor ⑭ or ㉞ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Replace the IAT sensor with a new one.

Intake Air Temp	Resistance
20 °C (68 °F)	Approx. 2.45 kΩ
40 °C (104 °F)	Approx. 1.14 kΩ
80 °C (176 °F)	Approx. 0.322 kΩ
100 °C (212 °F)	Approx. 0.189 kΩ

NOTE:
IAT sensor resistance measurement method is the same way as that of the ECT sensor. Refer to page 5-10 for details.

2





ECM coupler

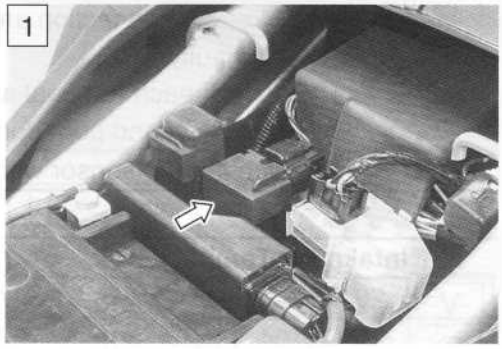
"C22" AP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
AP sensor voltage low or high (0.50 V ≦ Sensor voltage < 4.85 V) (without the above range) *NOTE:* *Note that atmospheric pressure varies depending on weather conditions as well as altitude.* *Take that into consideration when inspecting voltage.*	• Clogged air passage with dust • AP sensor circuit open or shorted to ground • AP sensor malfunction • ECM malfunction

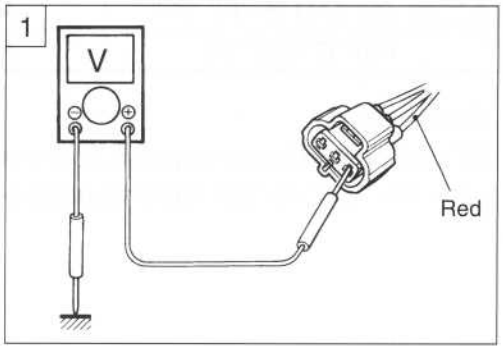
INSPECTION

Step 1

1) Remove the seat. (☞6-7)
2) Turn the ignition switch OFF.
3) Check the AP sensor coupler for loose or poor contacts.
   If OK, then measure the AP sensor input voltage.



4) Disconnect the AP sensor coupler.
5) Turn the ignition switch ON.
6) Measure the voltage at the Red wire and ground.
7) If OK, then measure the voltage at the Red wire and B/Br wire.



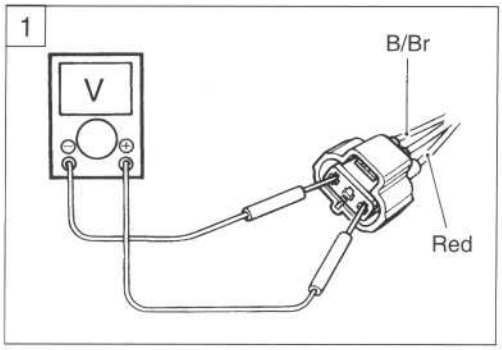
DATA AP sensor input voltage: 4.5 – 5.5 V
(⊕ Red – ⊖ Ground)
(⊕ Red – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Red wire or B/Br wire.



Step 2

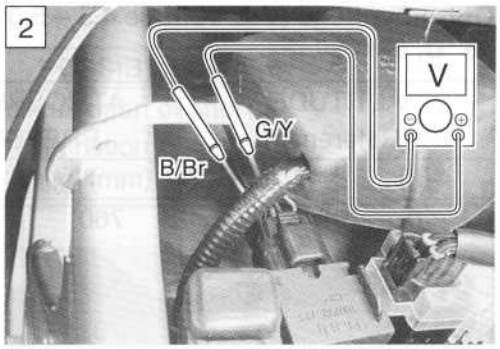
1) Connect the AP sensor coupler.
2) Insert the needle pointed probes to the lead wire coupler. Turn the ignition switch ON.
3) Measure the AP sensor output voltage at the wire side coupler (between G/Y and B/Br wires).

DATA AP sensor output voltage:
Approx. 4.0 V (760 mmHg, 100 kPa)
(⊕ G/Y – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

YES	Go to Step 3.
NO	• Check the air passage for clogging. • Open or short circuit in the G/Y wire. • Replace the AP sensor with a new one.



Step 3

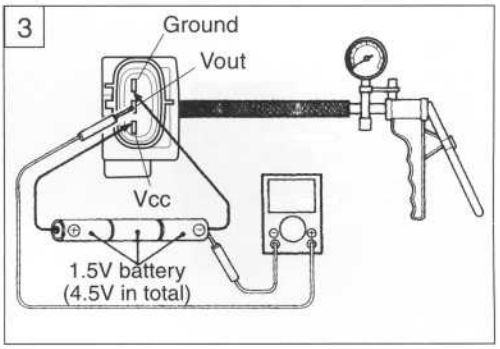
1) Remove the AP sensor.
2) Connect the vacuum pump gauge to the air passage port of the AP sensor.
3) Arrange 3 new 1.5 V batteries in series (check that total voltage is 4.5 – 5.0 V) and connect ⊖ terminal to the ground terminal and ⊕ terminal to the Vcc terminal.
4) Check the voltage between Vout and ground. Also, check if voltage reduces when vacuum is applied up to 400 mmHg by using vacuum pump gauge. (☞4-48)

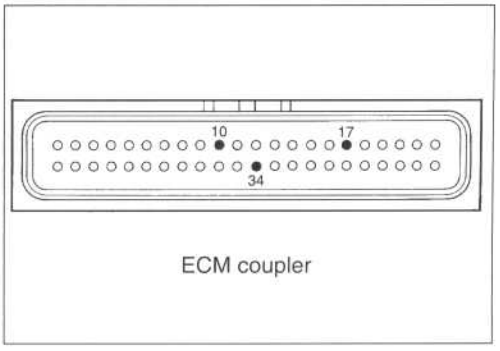
TOOL 09917-47010: Vacuum pump gauge
09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	• Red, G/Y or B/Br wire open or shorted to ground, or poor ⑩, ⑰ or ㉞ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	If check result is not satisfactory, replace the AP sensor with a new one.





ECM coupler

Output voltage (Vcc voltage 4.5 – 5.0 V, ambient temp. 20 – 30 °C, 68 – 86 °F)

ALTITUDE (Reference)		ATMOSPHERIC PRESSURE		OUTPUT VOLTAGE
(ft)	(m)	(mmHg)	kPa	(V)
0 | 2 000	0 | 610	760 | 707	100 | 94	3.4 – 4.0
2 001 | 5 000	611 | 1 524	707 | 634	94 | 85	3.0 – 3.7
5 001 | 8 000	1 525 | 2 438	634 | 567	85 | 76	2.6 – 3.4
8 001 | 10 000	2 439 | 3 048	567 | 526	76 | 70	2.4 – 3.1

"C23" TO SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high (0.20 V ≦ Sensor voltage < 4.80 V) (without the above range)	• TO sensor circuit open or short • TO sensor malfunction • ECM malfunction

INSPECTION

Step 1

1) Remove the frame cover. (☞6-7)
2) Turn the ignition switch OFF.
3) Check the TO sensor coupler for loose or poor contacts.
   If OK, then measure the TO sensor resistance.
4) Disconnect the TO sensor coupler.
5) Measure the resistance between Red wire and B/Br wire terminals.

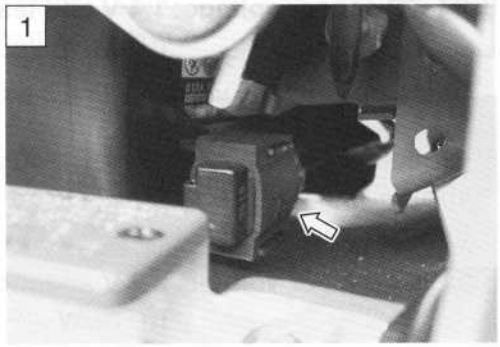
DATA TO sensor resistance: 19.1 – 19.7 kΩ (Red – B/Br)

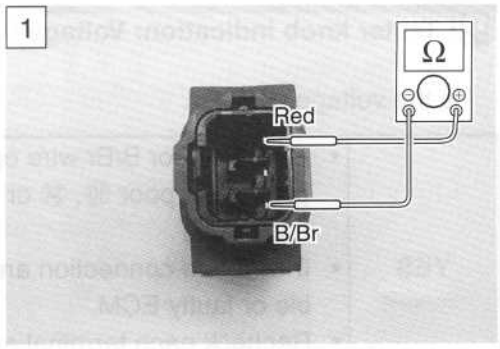
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Is the resistance OK?

YES	Go to Step 2.
NO	Replace the TO sensor with a new one.





Step 2

1) Connect the TO sensor coupler.
2) Insert the needle pointed probes to the lead wire coupler.
3) Turn the ignition switch ON.
4) Measure the voltage at the wire side coupler between Br/W and B/Br wires.

DATA TO sensor voltage: 1.4 V and less
(⊕ Br/W – ⊖ B/Br)

Also, measure the voltage when leaning of the motorcycle.

5) Dismount the TO sensor from its bracket and measure the voltage when it is leaned more than 65°, left and right, from the horizontal level.

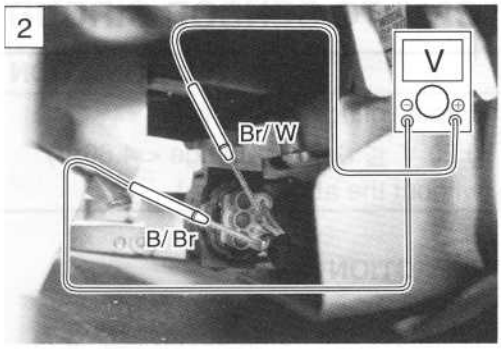
DATA TO sensor voltage: 3.7 V and more
(⊕ Br/W – ⊖ B/Br)

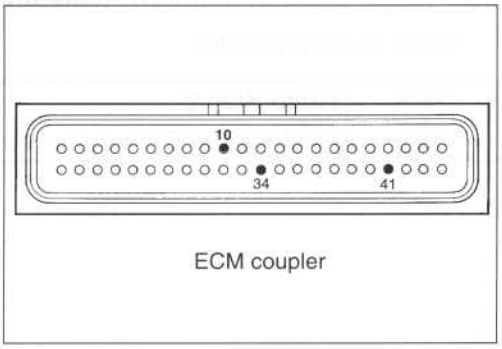
TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	• Red, Br/W or B/Br wire open or shorted to ground, or poor ⑩, ㉞ or ㊶ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Br/W wire or B/Br wire. • Replace the TO sensor with a new one.





ECM coupler

"C24" or "C25" IGINTION SYSTEM MALFUNCTION

***Refer to the IGNITION SYSTEM for details. (☞7-22)**

"C28" STV ACTUATOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The operation voltage does not reach the STVA. ECM does not receive communication signal from the STVA or STVA dose not operate the ECM signal.	• STVA malfunction • STVA circuit open or short • STVA motor malfunction

INSPECTION

Step 1

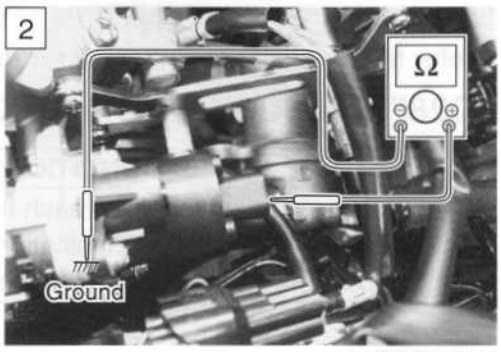
1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Remove the air cleaner element. (☞2-5)
4) Check the STVA lead wire coupler for loose or poor contacts.
5) Turn the ignition switch ON to check the STV operation.
   STV operating order:
   any position → 100% open → any position
   (Battery voltage ≧ 8.0 V)
   Is the operating order OK?

YES	Go to Step 2.
NO	• Loose or poor contacts on the STVA coupler. • Open or short circuit in the R/B wire and B/R wires.

Step 2

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. (☞4-75)
3) Check the STVA lead wire coupler for loose or poor contacts.
4) Disconnect the STVA lead wire coupler.
5) Check the continuity between R/B wire and ground.

DATA STVA continuity: ∞ Ω (Infinity)

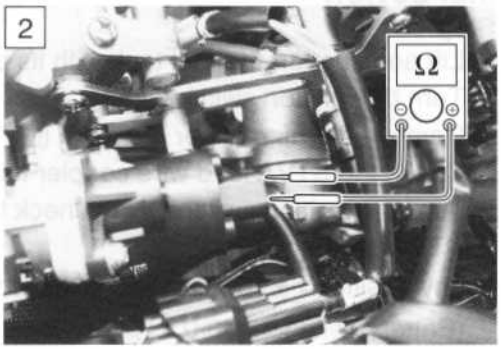


6) If OK, then measure the STVA resistance (between R/B wire and B/R wires).

DATA STVA resistance: 7 – 14 Ω
(R/B – B/R)

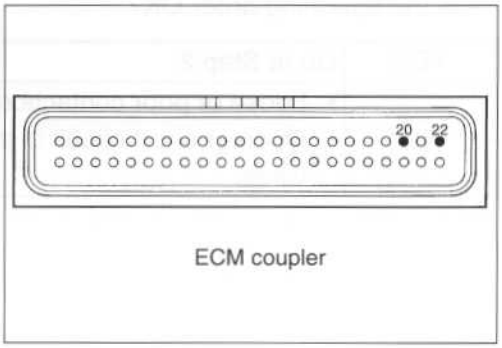
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)



Are the resistance and continuity OK?

YES	• Loose or poor contacts on the STVA coupler, or poor ⑳ or ㉒ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Replace the STVA with a new one.



ECM coupler

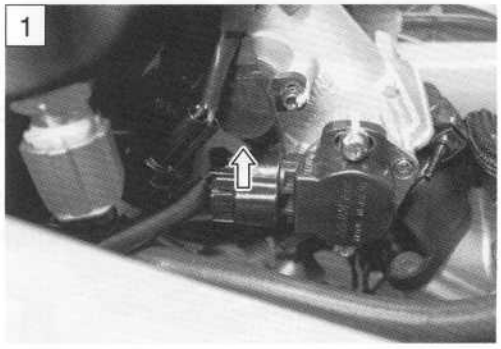
"C29" STP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high (0.10 V ≦ Sensor voltage < 4.90 V) (without the above range)	• STP sensor maladjusted • STP sensor circuit open or short • STP sensor malfunction • ECM malfunction

INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the STP sensor coupler for loose or poor contacts.
4) Disconnect the STP sensor coupler.

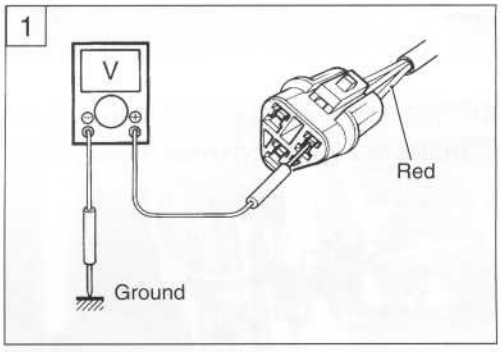


5) Turn the ignition switch ON.
6) Measure the voltage at the Red wire and ground.
7) If OK, then measure the voltage at the Red wire and B/Br wire.

DATA STP sensor input voltage: 4.5 – 5.5 V
(⊕ Red – ⊖ Ground)
(⊕ Red – ⊖ B/Br)

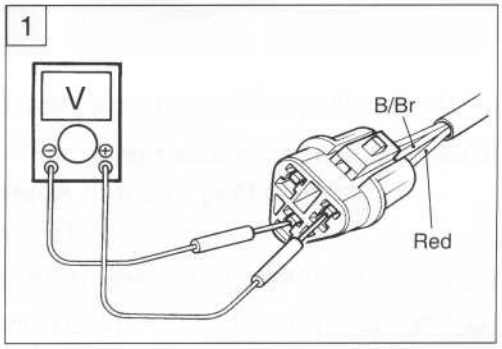
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)



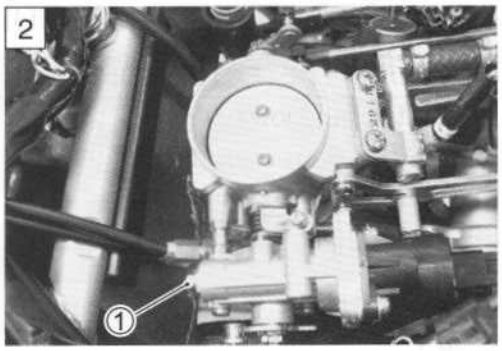
Is the voltage OK?

YES	Go to Step 2.
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit in the Red wire and B/Br wires.



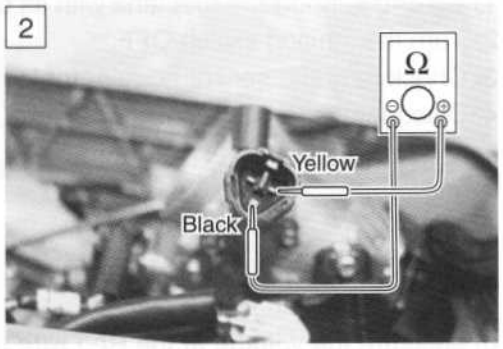
Step 2

1) Turn the ignition switch OFF.
2) Remove the air cleaner box (☞4-75) and disconnect the STP sensor coupler.
3) To set the ST valve to fully close position, turn the STVA motor shaft ① counterclockwise by fingers.

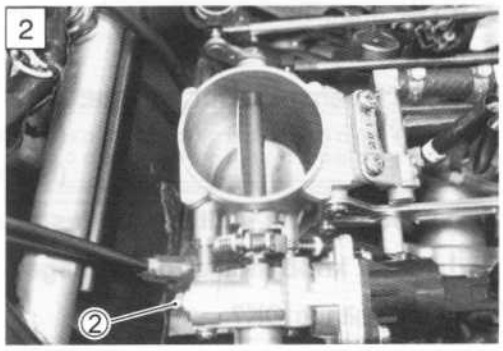


4) Measure the position sensor resistance at fully close position.

DATA STP sensor resistance
ST valve is fully closed: Approx. 0.58 kΩ (Yellow – Black)



5) Then, to set the ST valve to fully open position, turn the STVA motor shaft ② clockwise by fingers.



6) Measure the position sensor resistance at fully open position.

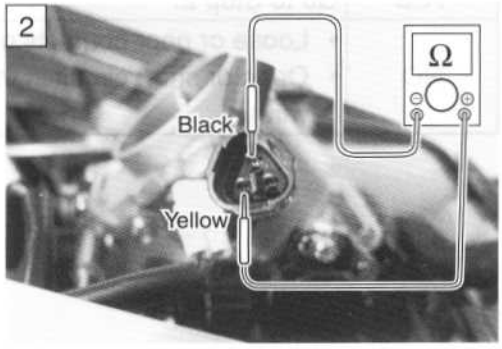
DATA STP sensor resistance
ST valve is fully opened: Approx. 4.38 kΩ (Yellow – Black)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

CAUTION

Do not use the tool for turning the STVA shaft to prevent breakdown.

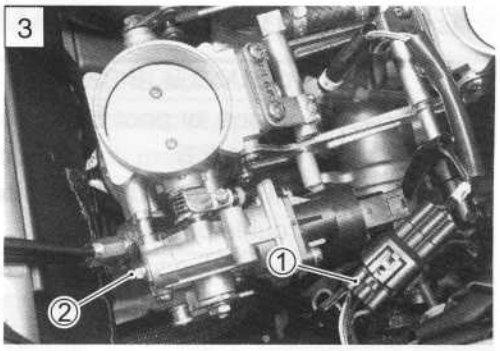


Is the resistance OK?

YES	Go to Step 3.
NO	• Reset the STP sensor position correctly. • Replace the STP sensor with a new one.

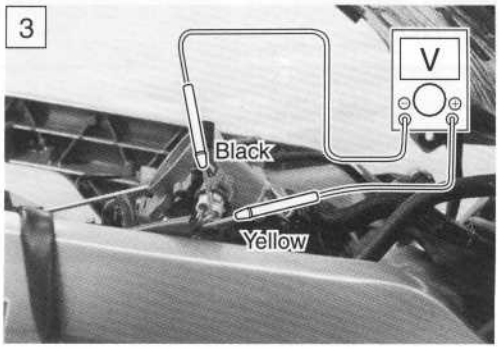
Step 3

1) Turn the ignition switch OFF and connect the STP sensor coupler.
2) Insert the needle pointed probes into the back side of the position sensor lead wire coupler.
3) Disconnect the STVA motor/injector coupler ①.
4) To set the ST valve to fully close position, turn the STVA motor shaft ② counterclockwise by fingers.

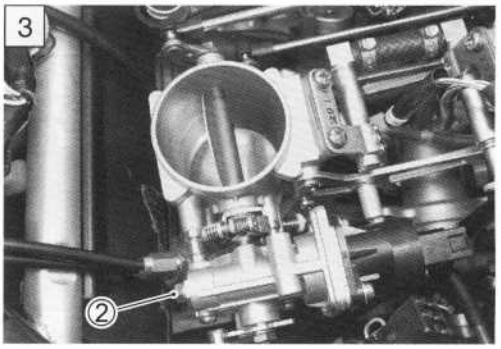


5) Turn the ignition switch ON.
6) Measure the position sensor output voltage at fully close position.

DATA STP sensor output voltage
ST valve is fully closed:
Approx. 0.58 V at input voltage is 5.0 V
(⊕ Yellow – ⊖ Black)



7) Then, to set the ST valve to fully open position, turn the STVA motor shaft ② clockwise by fingers.

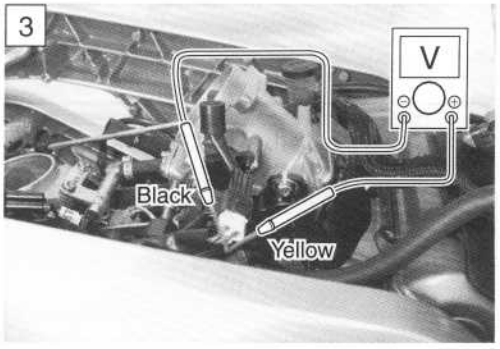


8) Measure the position sensor output voltage at fully open position.

DATA STP sensor output voltage
ST valve is fully opened:
Approx. 4.38 V at input voltage is 5.0 V
(⊕ Yellow – ⊖ Black)

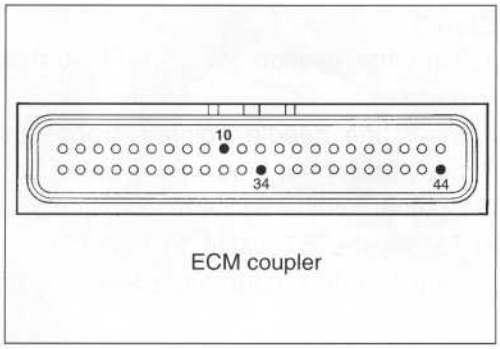
TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)



Is the voltage OK?

YES	• Red, Yellow or B/Br wire open or shorted to ground, or poor ⑩, ㉞ or ㊹ connection. (☞4-23) • If the wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	If check result is not satisfactory, replace the STP sensor with a new one.



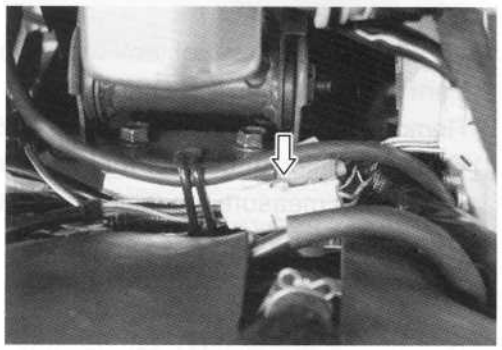
ECM coupler

"C31" GEAR POSITION (GP) SWITCH CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No Gear Position switch voltage Switch voltage low (Switch voltage ≧ 0.6 V) (without the above range)	• Gear Position switch circuit open or short • Gear Position switch malfunction • ECM malfunction

INSPECTION

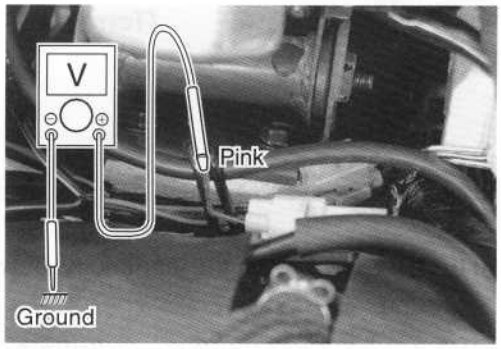
1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the GP switch coupler for loose or poor contacts.
   If OK, then measure the GP switch voltage.
4) Support the motorcycle with a jack.
5) Turn the side-stand to up-right position.
6) Turn the engine stop switch ON.
7) Insert the needle pointed probe to the lead wire coupler.
8) Turn the ignition switch ON.
9) Measure the voltage between Pink wire and ground, when shifting the gearshift lever from 1st to top.



DATA GP switch voltage: 0.6 V and more
(⊕ Pink – ⊖ Ground)

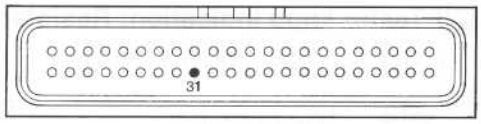
TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)



Is the voltage OK?

YES	• Pink wire open or shorted to ground, or poor ㉛ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or fautrly ECM. Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	• Open or short circuit in the Pink wire. • Replace the GP switch with a new one.



ECM coupler

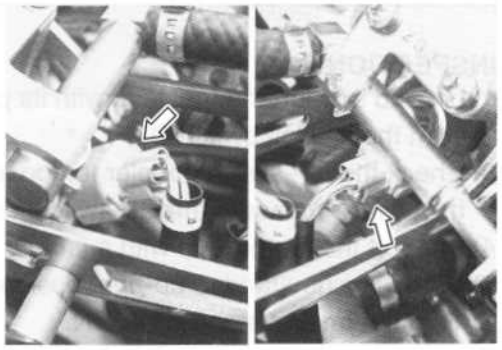
"C32" or "C33" FUEL INJECTOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
CKP signals produced and ECM determines the injection signal but fuel injection signal is interrupted continuous by 4 times or more.	• Injector circuit open or short • Injector malfunction • ECM malfunction

INSPECTION

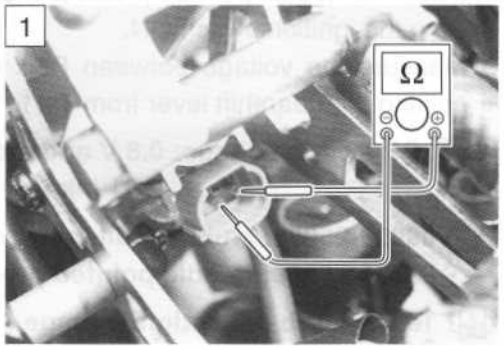
Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Remove the air cleaner box. (☞4-75)
4) Check the injector coupler for loose or poor contacts.
   If OK, then measure the injector resistance.



5) Disconnect the injector coupler and measure the resistance between terminals.

DATA **Injector resistance: 11 – 13 Ω at 20 °C (68 °F)**
(Terminal – Terminal)



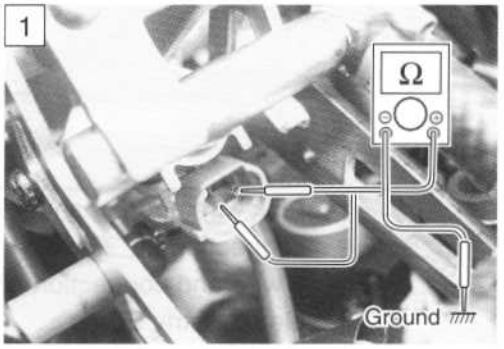
6) If OK, then check the continuity between each terminal and ground.

DATA **Injector continuity: ∞ Ω (Infinity)**
(Terminal – Ground)

TOOL **09900-25008: Multi circuit tester set**

Tester knob indication: Resistance (Ω)

Is the resistance OK?



YES	Go to Step 2.
NO	Replace the injector with a new one. (☞4-78 and -83)

Step 2

1) Turn the ignition switch ON.
2) Measure the injector voltage between Y/R wire and ground.

DATA Injector voltage: Battery voltage
(⊕ Y/R – ⊖ Ground)

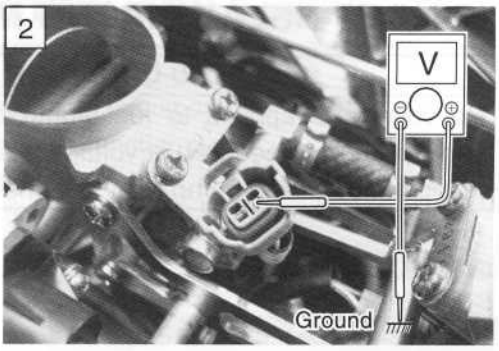
NOTE:
Injector voltage can be detected only 3 seconds after ignition switch is turned ON.

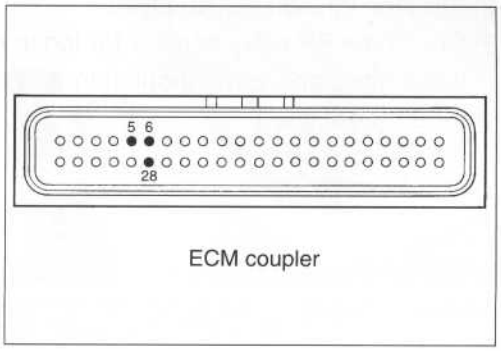
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	• Gr/W, Gr/B or Y/R wire open or shorted to ground, or poor ⑤, ⑥ or ㉘ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Open circuit in the Y/R wire or FP relay circuit malfunction.





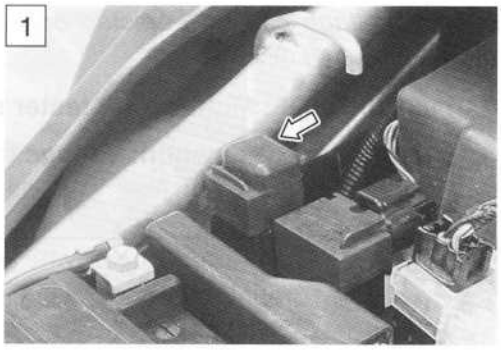
ECM coupler

"C41" FP RELAY CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No voltage is applied to fuel pump although fuel pump relay is turned ON, or voltage is applied to fuel pump although fuel pump relay is turned OFF.	• Fuel pump relay circuit open or short • Fuel pump relay malfunction • ECM malfunction

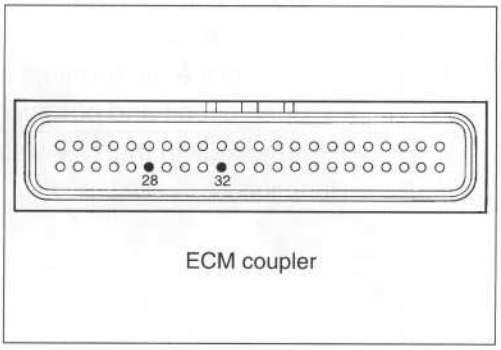
INSPECTION
Step 1
1) Remove the seat. (☞6-7)
2) Turn the ignition switch OFF.
3) Check the FP relay coupler for loose or poor contacts.
   If OK, then check the insulation and continuity. Refer to page 4-68 for details.

1



Is the FP relay OK?

YES	• Y/B or Y/R wire open or shorted to ground, or poor ㉘ or ㉜ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Replace the FP relay with a new one.



ECM coupler

"C42" IG SWITCH CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Ignition switch signal is not input in the ECM.	• Ignition system circuit open or short • ECM malfunction

INSPECTION
***Refer to the IGNITION SWITCH INSPECTION for details.**

- Lift and support the fuel tank with its prop stay. (☞4-65)
- Remove the air cleaner box. (☞4-75)
- Inspect the ignition switch. (☞7-35)

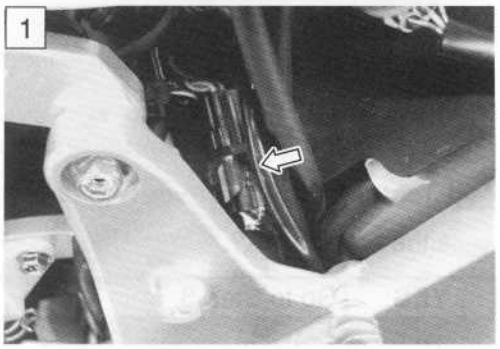
"C44" HO2 SENSOR (HO2S) CIRCUIT MALFUNCTION (FOR E-02, 19)

DETECTED CONDITION	POSSIBLE CAUSE
During O2 feedback control, O2 sensor voltage is higher or lower than the specification. The heater circuit disconnection is detected during engine operation, or no electrical power is supplied from battery.	• HO2 sensor or its circuit open or short • Fuel system malfunction • ECM malfunction

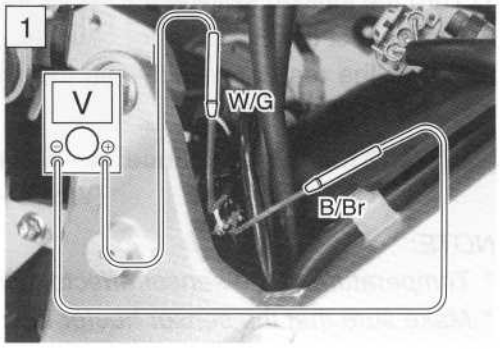
INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the HO2 sensor coupler for loose or poor contacts.
4) Insert the needle pointed probes to the HO2 sensor lead wire coupler.
5) Warm up the engine enough.
6) Measure the HO2 sensor output voltage at the coupler (between W/G or B and B/Br or Gr wires) when idling condition.
7) Measure the HO2 sensor output voltage while holding the engine speed at 3 000 r/min.



DATA HO2 sensor output voltage at idle speed:
0.4 V and less (⊕ W/G or B – ⊖ B/Br or Gr)
HO2 sensor output voltage at 3 000 r/min:
0.6 V and more (⊕ W/G or B – ⊖ B/Br or Gr)



TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	Go to Step 2.
NO	Replace the HO2 sensor with a new one.

Step 2

1) Turn the ignition switch OFF.
2) Turn the ignition switch ON and measure the heater voltage between O/W wire (ECM side) and ground.
3) If the tester voltage indicates the battery voltage for few seconds, it is good condition.

DATA Heater voltage: Battery voltage
(⊕ O/W – ⊖ Ground)

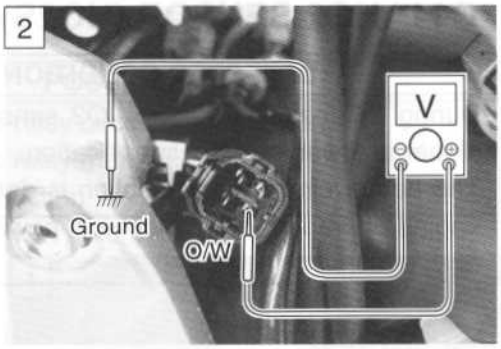
NOTE:
Battery voltage can be detected only during few seconds after ignition switch is turned ON.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Is the voltage OK?

YES	Go to Step 3.
NO	Replace the HO2 sensor with a new one.



Step 3

1) Turn the ignition switch OFF.
2) Disconnect the HO2 sensor coupler.
3) Check the resistance between the terminals (White – White) of the HO2 sensor.

DATA HO2 heater resistance: 4 – 5 Ω (at 23 °C/73.4 °F)
(White – White)

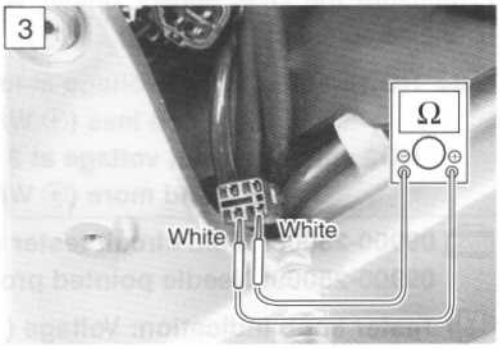
NOTE:
** Temperature of the sensor affects resistance value largely.*
** Make sure that the sensor heater is at correct temperature.*

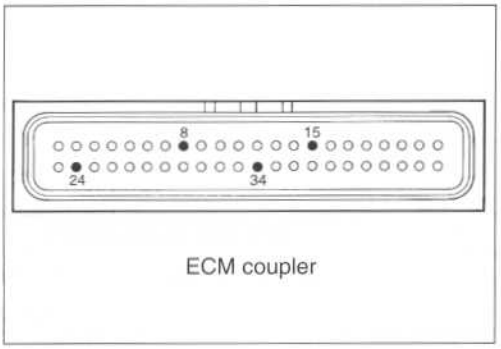
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Is the resistance OK?

YES	• W/G, W/B, O/G or B/Br wire open or shorted to ground, or poor ⑧, ⑮, ㉔ or ㉞ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	Replace the HO2 sensor with a new one.





ECM coupler

"C49" PAIR CONTROL SOLENOID VALVE

DETECTED CONDITION	POSSIBLE CAUSE
No signal from PAIR valve after starting the engine	• PAIR valve circuit open or short • PAIR valve malfunction • ECM malfunction

INSPECTION

Step 1

1) Lift and support the fuel tank with its prop stay. (☞4-65)
2) Turn the ignition switch OFF.
3) Check the PAIR valve coupler for loose or poor contacts.
   If OK, then measure the PAIR valve resistance.
4) Disconnect the PAIR valve coupler.

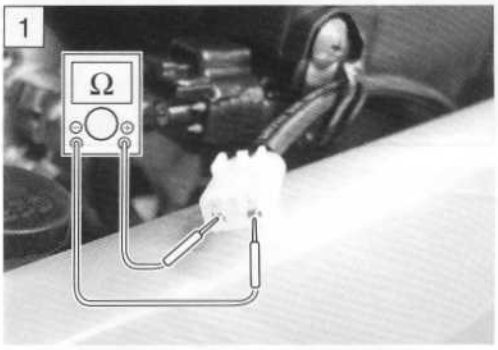
5) Measure the resistance between Red and Black wire terminals.

DATA PAIR valve resistance: 20 – 24 Ω (at 20 °C/68 °F)
(Red – Black)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Is the resistance OK?



YES	Go to Step 2.
NO	Replace the PAIR valve with a new one.

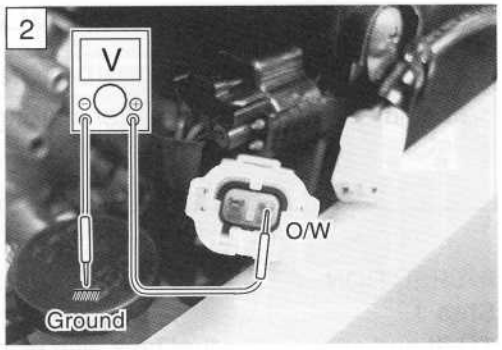
Step 2

1) Disconnect the PAIR valve coupler.
2) Turn the ignition switch ON.
3) Measure the voltage between O/W and Brown wire terminals.

DATA PAIR valve voltage: Battery voltage (⊕ O/W – ⊖ Ground)

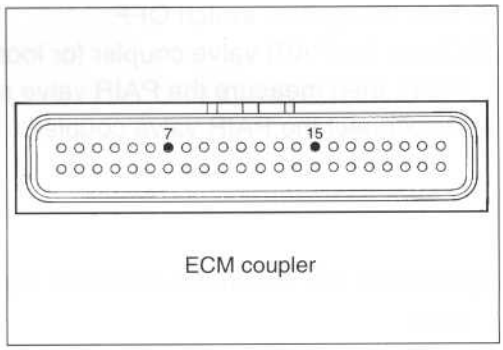
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)



Is the voltage OK?

YES	• Brown or O/G wire open or shorted to ground, or poor ⑦ or ⑮ connection. (☞4-23) • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. (☞4-6)
NO	• Loose or poor contacts on the ECM coupler. • Open or short circuit. • Replace the PAIR valve with a new one.



ECM coupler

FUEL SYSTEM

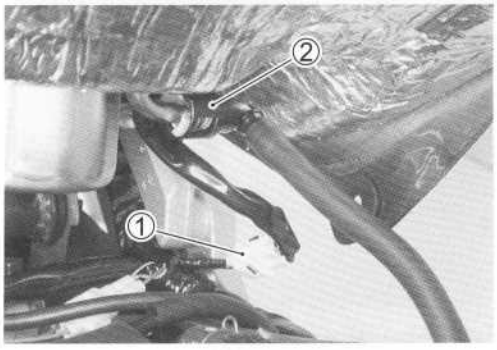
FUEL TANK LIFT-UP

- Remove the seat. (☞6-7)
- Remove the fuel tank mounting bolts.

- Lift and support the fuel tank with its prop stay.

FUEL TANK REMOVAL

- Lift and support the fuel tank with its prop stay. (☞above)
- Disconnect the fuel pump lead wire coupler ①.
- Place a rag under the fuel feed hose and disconnect the feed hose ② from the fuel tank.



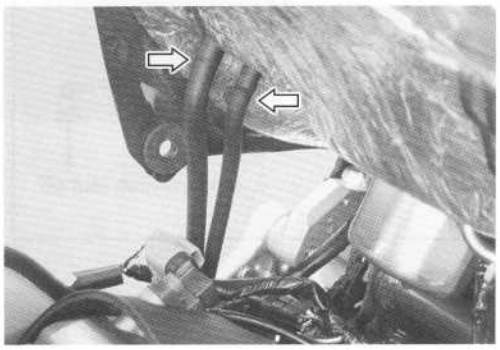
CAUTION

When removing the fuel tank, do not leave the fuel feed hose ② on the fuel tank side.

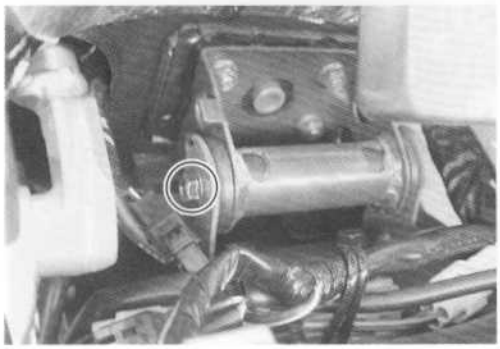
⚠ WARNING

Gasoline is highly flammable and explosive.
Keep heat, spark and flame away.

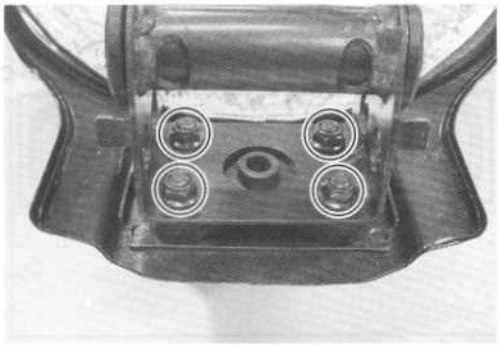
- Remove the air vent hose and fuel drain hose.



- Remove the fuel tank mounting bolt.
- Remove the fuel tank.



- Remove the fuel tank bracket.

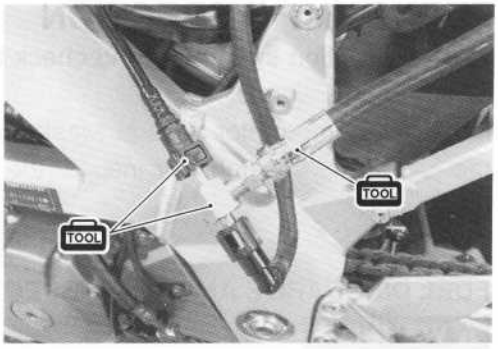


- Remove the fuel tank stay and its rubber cushion.

FUEL TANK INSTALLATION

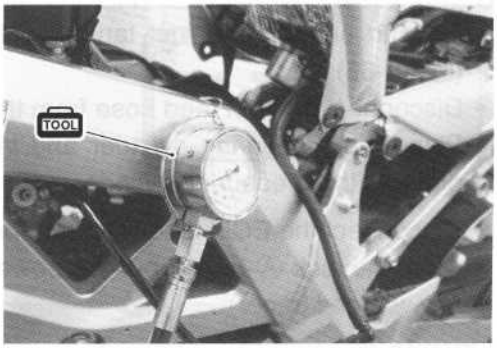
- Installation is in the reverse order of removal.

FUEL PRESSURE INSPECTION



- Lift and support the fuel tank with the fuel tank prop stay. (☞4-65)
- Place a rag under the fuel feed hose.
- Disconnect the fuel feed hose from the fuel delivery pipe.
- Install the special tools between the fuel tank and fuel delivery pipe.

TOOL 09940-40211: Fuel pressure gauge adaptor
09940-40220: Fuel pressure gauge hose attachment
09915-77331: Oil pressure gauge
09915-74521: Oil pressure gauge hose



Turn the ignition switch ON and check the fuel pressure.

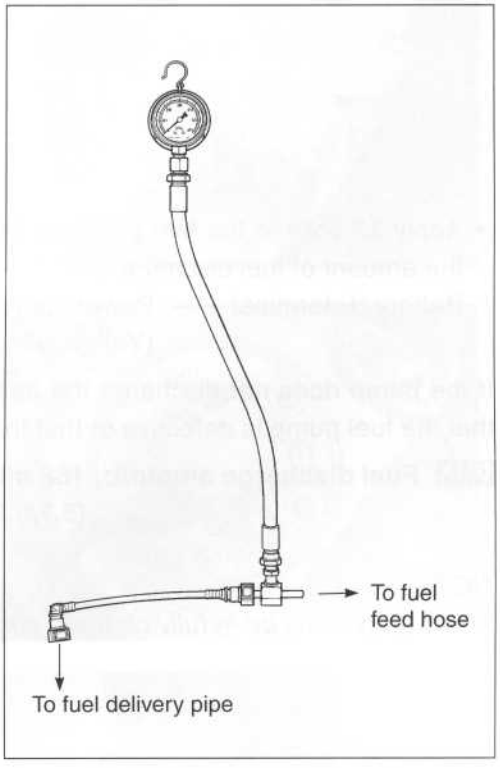
DATA Fuel pressure: Approx. 300 kPa (3.0 kgf/cm², 43 psi)

If the fuel pressure is lower than the specification, inspect the following items:

* Fuel hose leakage
* Clogged fuel filter
* Pressure regulator
* Fuel pump

If the fuel pressure is higher than the specification, inspect the following items:

* Fuel pump check valve
* Pressure regulator



⚠ WARNING

*** Before removing the special tools, turn the ignition switch to OFF position and release the fuel pressure slowly.**
*** Gasoline is highly flammable and explosive. Keep heat, sparks and flame away.**

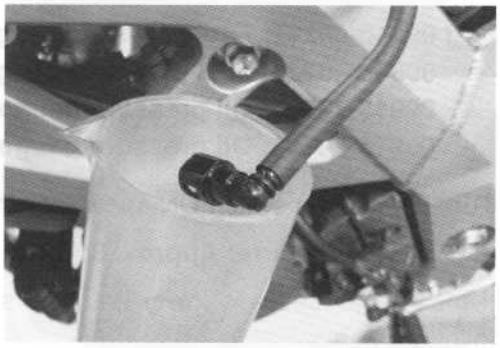
FUEL PUMP INSPECTION

Turn the ignition switch ON and check that the fuel pump operates for few seconds.
If the fuel pump motor does not make operating sound, replace the fuel pump assembly or inspect the fuel pump relay and tip over sensor.

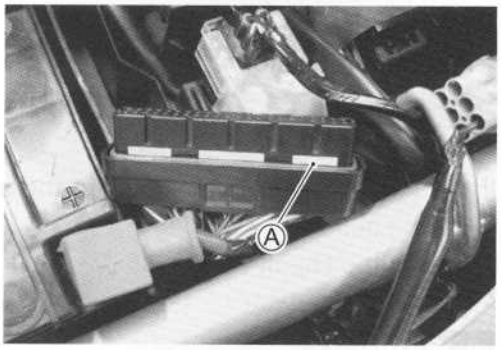
FUEL DISCHARGE AMOUNT INSPECTION

⚠ WARNING

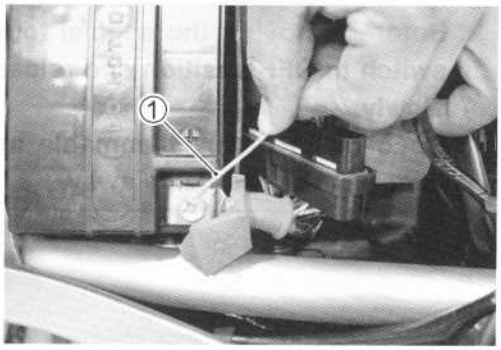
Gasoline is highly flammable and explosive.
Keep heat, spark and flame away.



- Lift and support the fuel tank with the fuel tank prop stay. (☞4-65)
- Disconnect the fuel feed hose from the fuel delivery pipe.
- Place the measuring cylinder and insert the fuel feed hose end into the measuring cylinder.
- Disconnect the ECM lead wire coupler.
- Push the lock Ⓐ to pull out the power source lead wire (Yellow with red tracer).



- Apply 12 volts to the fuel pump for 10 seconds and measure the amount of fuel discharged.
  Battery ⊕ terminal —— Power source lead wire ①
  (Yellow with red tracer)



If the pump does not discharge the amount specified, it means that the fuel pump is defective or that the fuel filter is clogged.

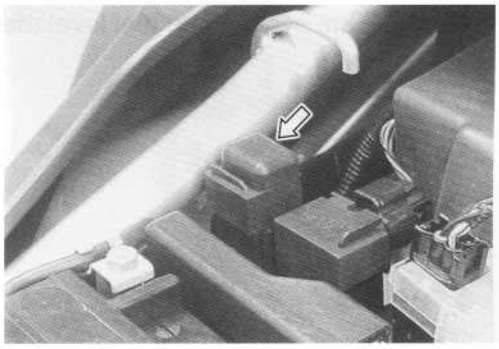
DATA **Fuel discharge amount: 168 ml and more/10 sec.**
(5.7/5.9 US/Imp oz)/10 sec.

NOTE:
The battery must be in fully charged condition.

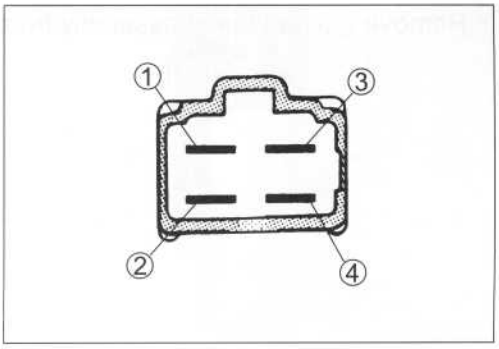
FUEL PUMP RELAY INSPECTION

Fuel pump relay is located behind the ECM.

- Remove the seat.
- Remove the fuel pump relay.

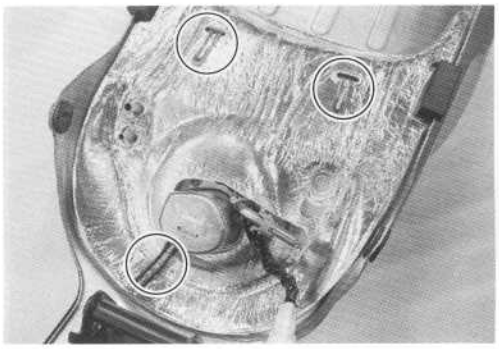


First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.
If there is no continuity, replace it with a new one.

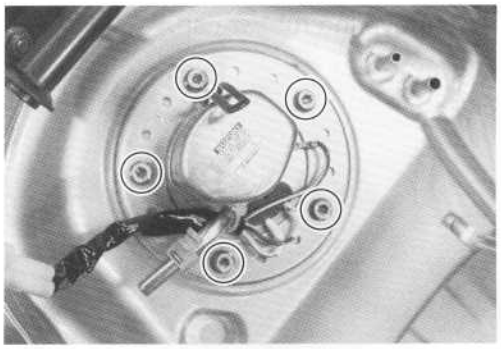


FUEL PUMP AND FUEL FILTER REMOVAL

- Remove the fuel tank. (☞4-65)
- Remove the heat shield.



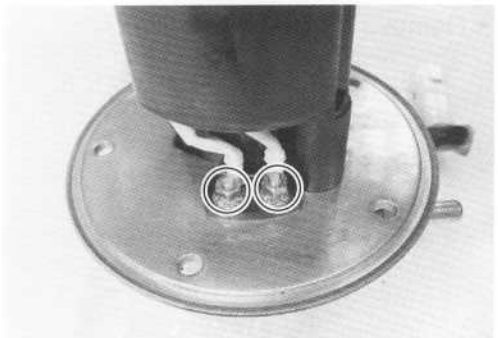
- Remove the fuel pump assembly by removing its mounting bolts diagonally.



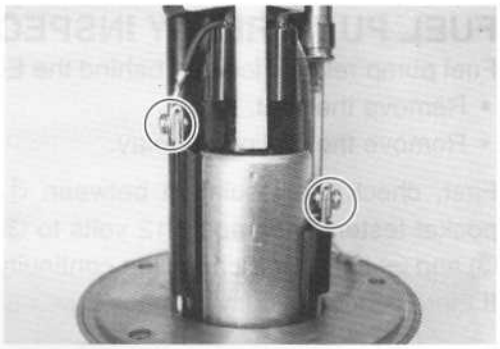
⚠ WARNING

Gasoline is highly flammable and explosive.
Keep heat, spark and flame away.

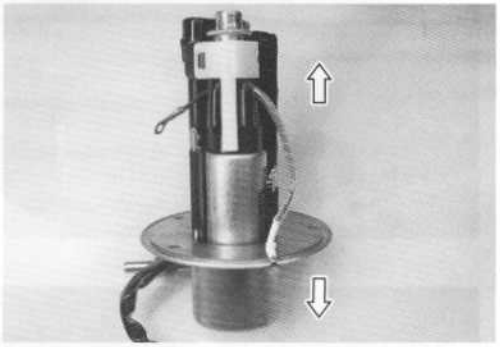
- Remove the nuts.



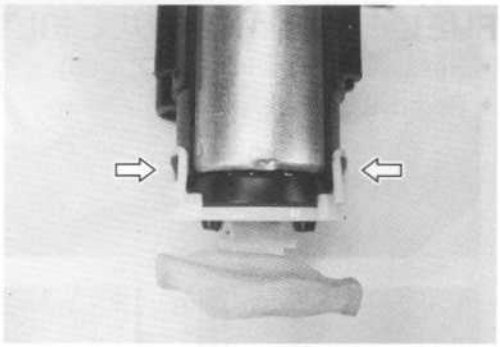
- Remove the screws and fuel level thermistor.



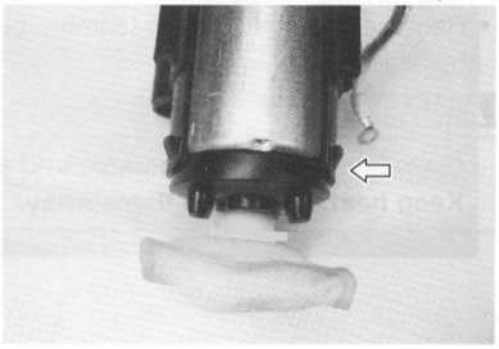
- Remove the fuel pump assembly from the fuel pump plate.



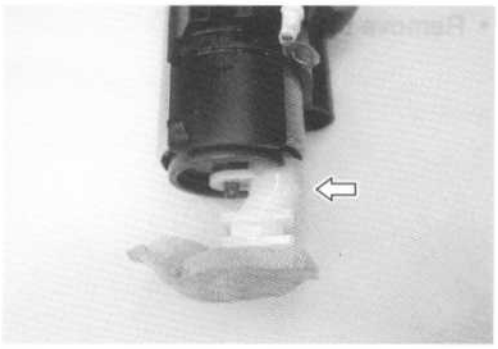
- Remove the fuel pump holder.



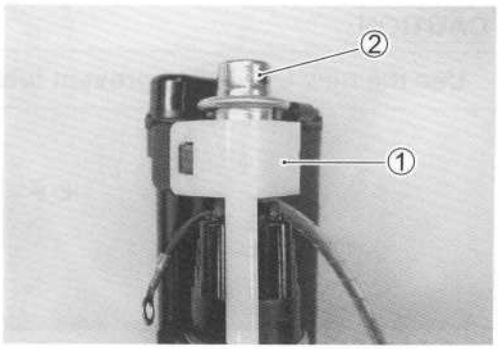
- Remove the rubber cap.



- Remove the fuel mesh filter.



- Remove the fuel pressure regulator holder ① and the fuel pressure regulator ②.



- Remove the fuel pump.

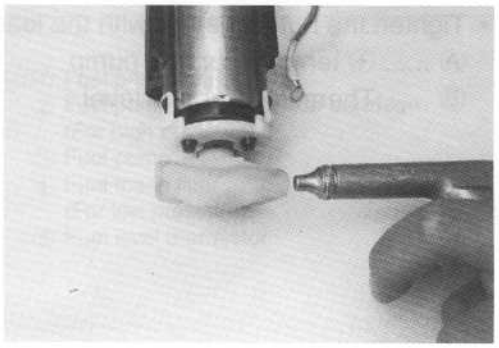
FUEL MESH FILTER INSPECTION AND CLEANING

If the fuel mesh filter is clogged with sediment or rust, fuel will not flow smoothly and loss in engine power may result.

- Blow the fuel mesh filter with compressed air.

NOTE:

If the fuel mesh filter is clogged with many sediment or rust, replace the fuel filter cartridge with a new one.



FUEL PUMP CASE BUSHING INSPECTION

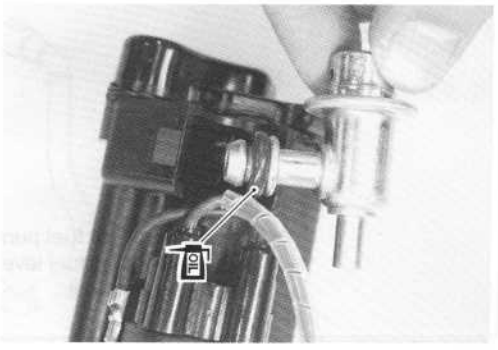
- Inspect the fuel pump case rubber bushing for damage.

THERMISTOR INSPECTION (☞7-29)

FUEL PUMP AND FUEL MESH FILTER INSTALLATION

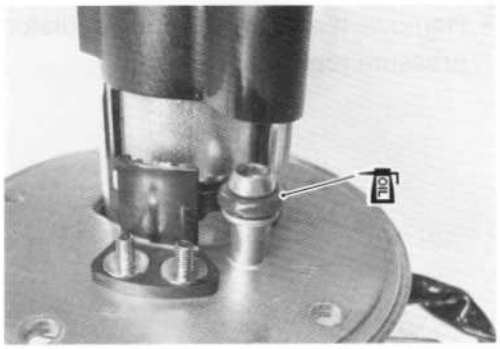
Install the fuel pump and fuel mesh filter in the reverse order of removal, and pay attention to the following points:

- Install the new O-rings to the fuel pressure regulator and fuel pipe.
- Apply thin coat of the engine oil to the O-rings.

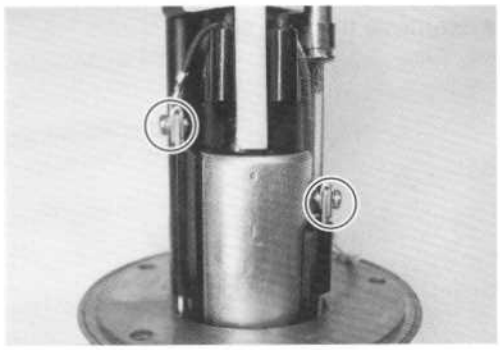


CAUTION

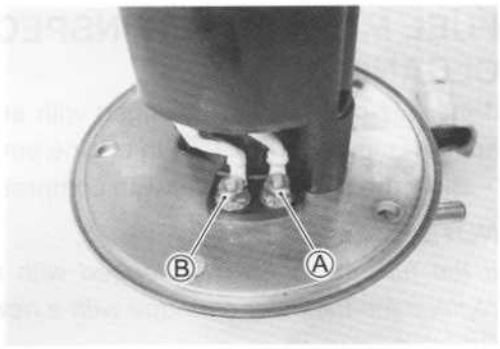
Use the new O-rings to prevent fuel leakage.

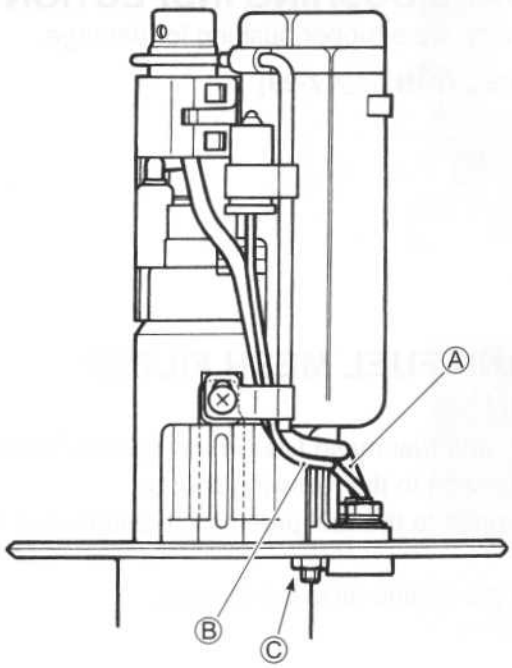


- Tighten the screws together with the lead wire terminals and fuel level thermistor.



- Tighten the nuts together with the lead wire terminals.
  Ⓐ ..... ⊕ terminal for fuel pump
  Ⓑ ..... Thermistor for fuel level





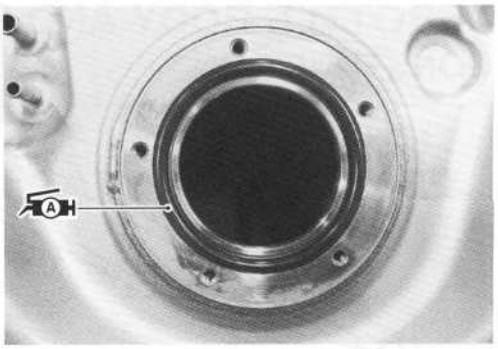
Ⓐ: ⊕ terminal for fuel pump
Ⓑ: Thermistor for fuel level
Ⓒ: Ground terminal

- Install the new O-ring and apply grease to it.

⚠ WARNING

The O-ring must be replaced with a new one to prevent fuel leakage.

99000-25030: SUZUKI SUPER GREASE "A" (USA)
99000-25010: SUZUKI SUPER GREASE "A" (Others)

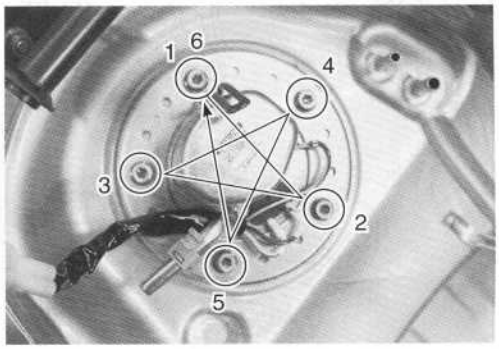


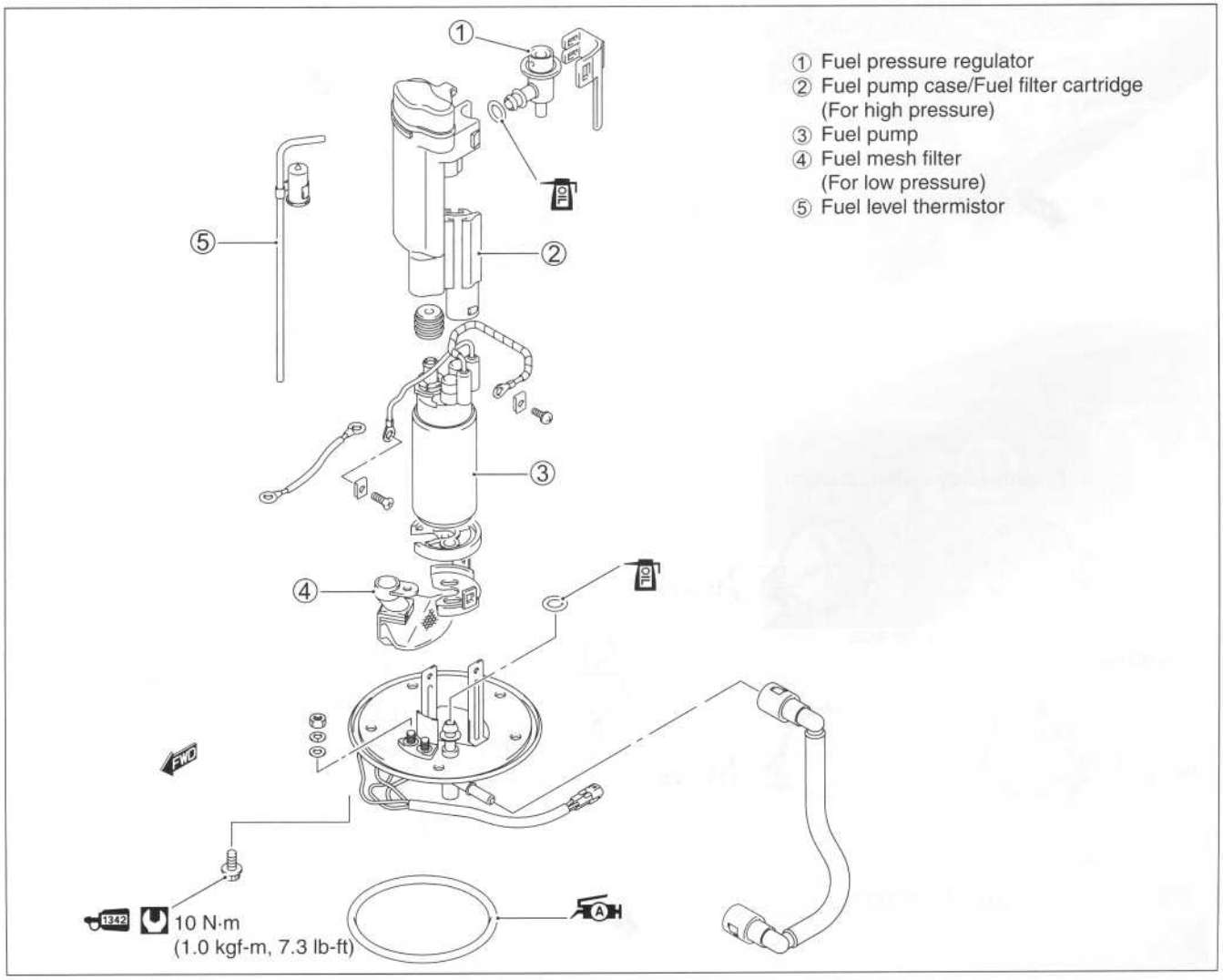
- When installing the fuel pump assembly, first tighten all the fuel pump assembly mounting bolts lightly in the ascending order of numbers, and then tighten them to the specified torque in the above tightening order

Fuel pump mounting bolt: 10 N·m (1.0 kgf-m, 7.3 lb-ft)

NOTE:
Apply a small quantity of the THREAD LOCK to the thread portion of the fuel pump mounting bolt.

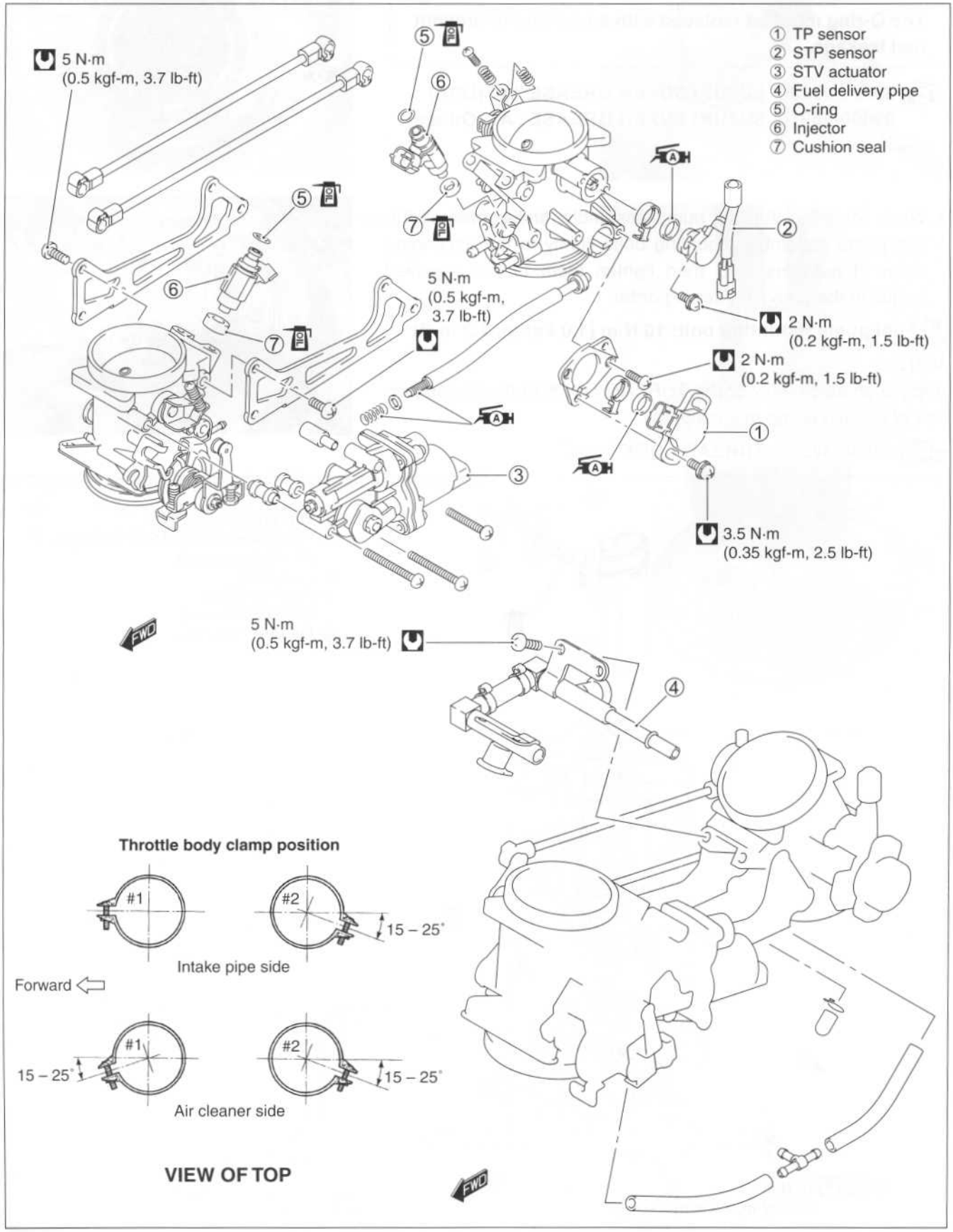
1342 99000-32050: THREAD LOCK "1342"





① Fuel pressure regulator
② Fuel pump case/Fuel filter cartridge (For high pressure)
③ Fuel pump
④ Fuel mesh filter (For low pressure)
⑤ Fuel level thermistor

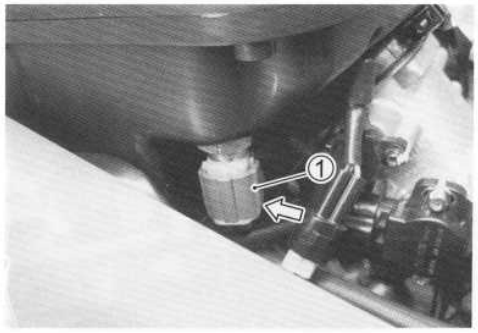
THROTTLE BODY AND STV ACTUATOR
CONSTRUCTION



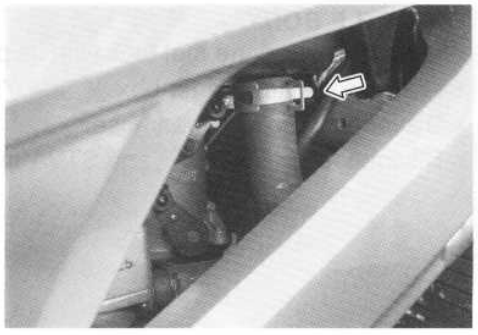
AIR CLEANER AND THROTTLE BODY REMOVAL

AIR CLEANER BOX

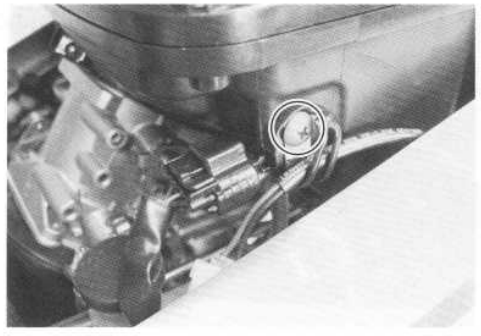
- Lift and support the fuel tank with its prop stay. (☞4-65)
- Disconnect the IAT sensor coupler.



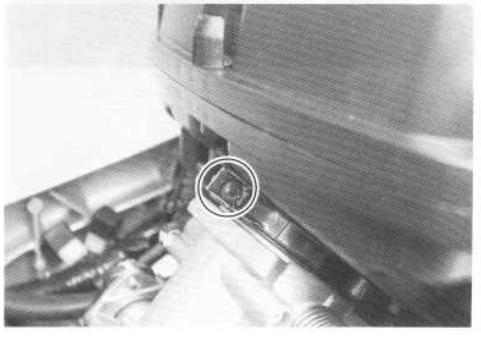
- Disconnect the crankcase breather hose.



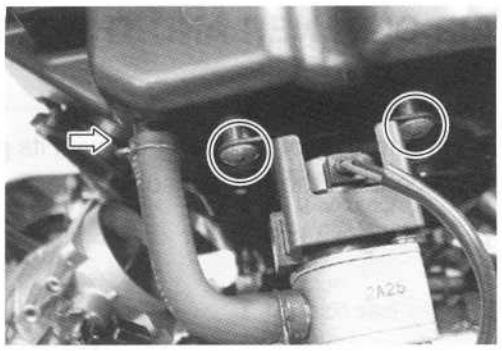
- Remove the screw.



- Loosen the throttle body clamp screws.

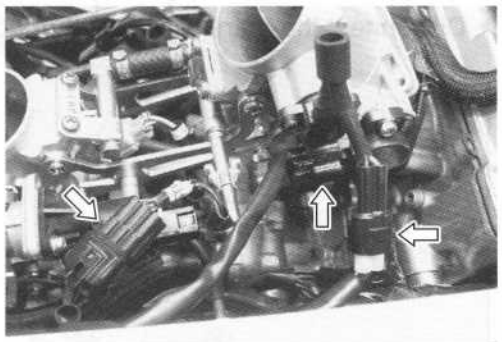


- Disconnect the PAIR hose.
- Remove the PAIR valve.
- Remove the air cleaner box.

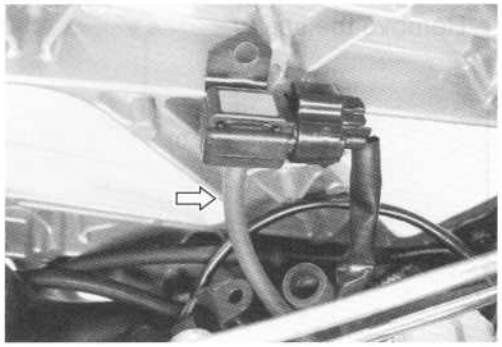


THROTTLE BODY

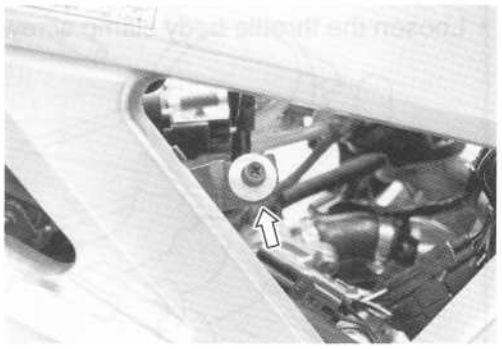
- Lift and support the fuel tank with its prop stay. (☞4-65)
- Remove the air cleaner box. (☞4-75)
- Disconnect the fuel feed hose.
- Disconnect the TP, STP and STVA motor/injector coupler.



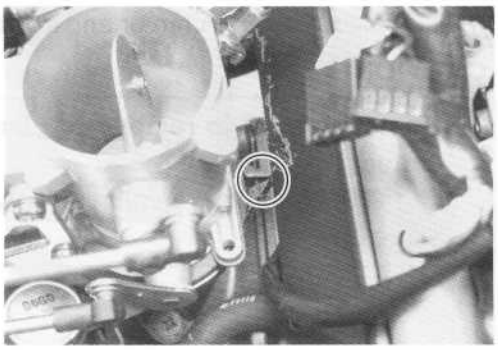
- Disconnect the IAP sensor vacuum hose.

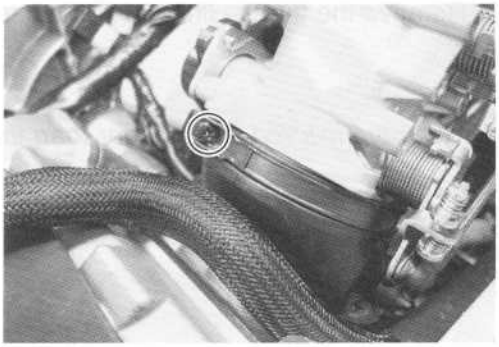


- Disconnect the idle stop screw.



- Loosen the throttle body clamp screws.

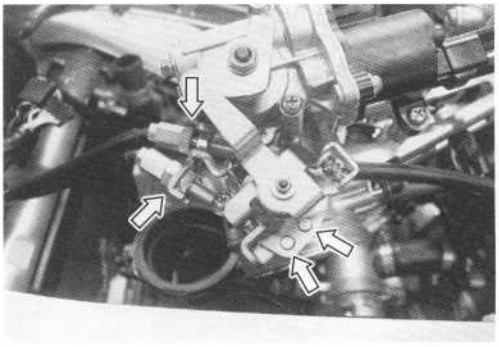




- Disconnect the throttle cables from their drum.
- Dismount the throttle body assembly.

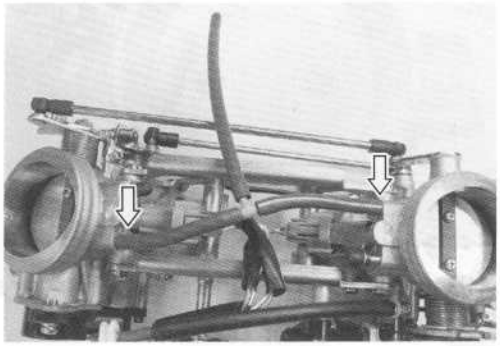
CAUTION

*** Be careful not to damage the throttle cable bracket and fast idle lever when dismounting or remounting the throttle body assembly.**
*** After disconnecting the throttle cables, do not snap the throttle valve from full open to full close. It may cause damage to the throttle valve and throttle body.**

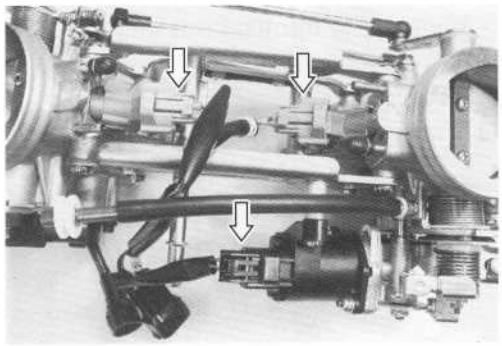


THROTTLE BODY DISASSEMBLY

- Remove the IAP sensor vacuum hose.



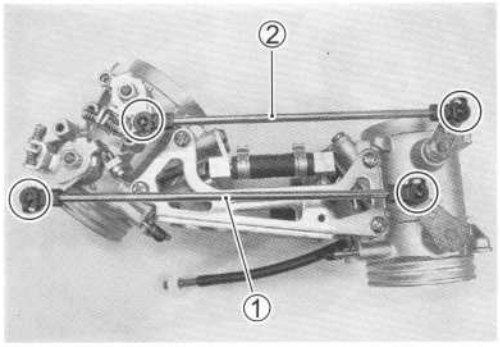
- Disconnect the STVA motor and injector couplers.



CAUTION

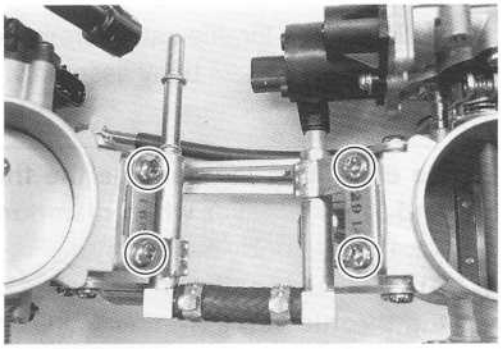
*** Do not attempt to remove or disassemble the STVA motor.**
*** The STVA motor is available only as a throttle body assembly.**

- Remove the throttle link rod ① and secondary throttle link rod ②.

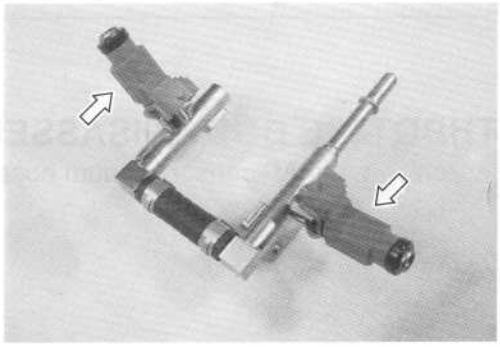


NOTE:
The throttle link rod ① is longer than the secondary throttle link rod ②.

- Remove the fuel delivery pipe.

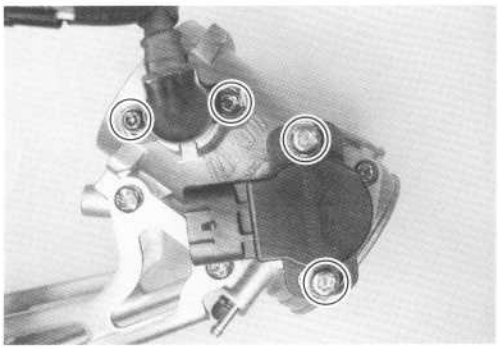


- Remove the fuel injectors.

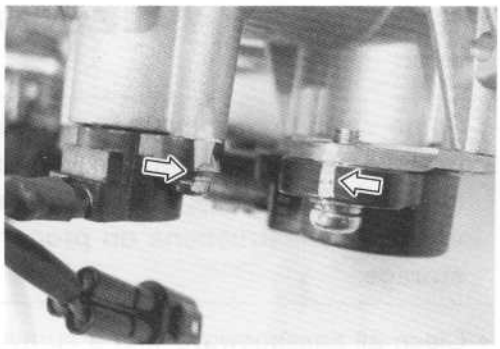


- Remove the TPS and STPS with the special tool.

09930-11950: Torx wrench
09930-11960: Torx wrench

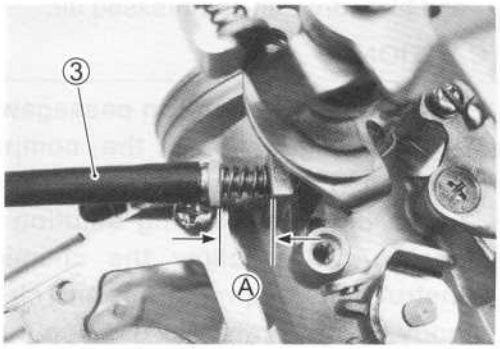


NOTE:
Prior to disassembly, mark each sensor's original position with a paint or scribe for accurate reinstallation.



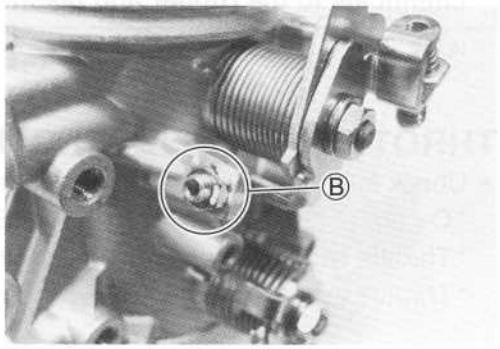
- Remove the idle stop screw ③.

NOTE:
Measure the length Ⓐ for accurate reinstallation.



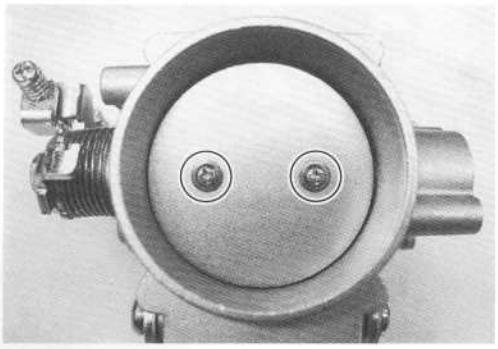
CAUTION

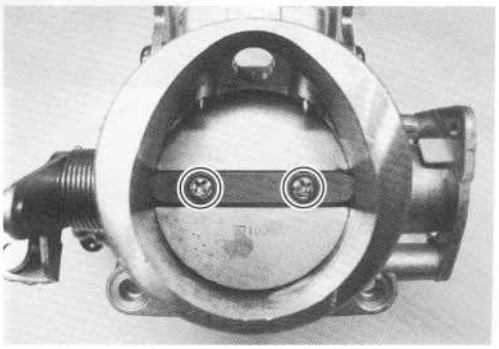
Avoid removing the STV adjuster Ⓑ unless absolutely necessary.



CAUTION

Never remove the throttle valve and secondary throttle valve.





THROTTLE BODY CLEANING

⚠ WARNING

Some carburetor cleaning chemicals, especially dip-type soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.

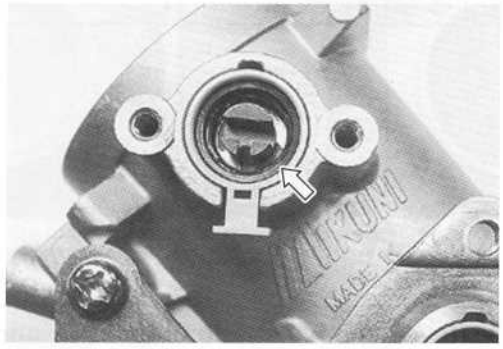
- Clean all passageways with a spray type carburetor cleaner and blow dry with compressed air.

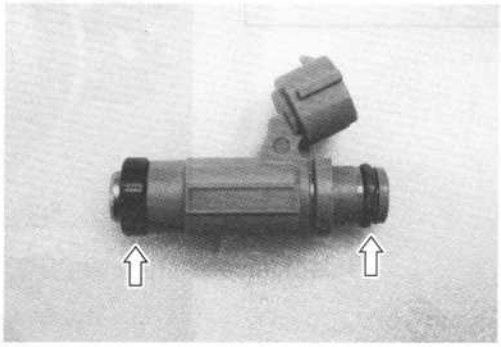
CAUTION

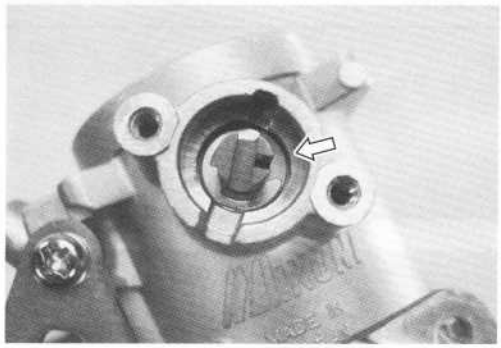
Do not use wire to clean passageways. Wire can damage passageways. If the components cannot be cleaned with a spray cleaner it may be necessary to use a dip-type cleaning solution and allow them to soak. Always follow the chemical manufacturer's instructions for proper use and cleaning of the throttle body components. Do not apply carburetor cleaning chemicals to the rubber and plastic materials.

THROTTLE BODY INSPECTION

- Check following items for any damage or clogging.
  - * O-ring
  - * Throttle shaft bushing and seal
  - * Throttle valve
  - * Secondary throttle valve
  - * Injector cushion seal
  - * Vacuum hose





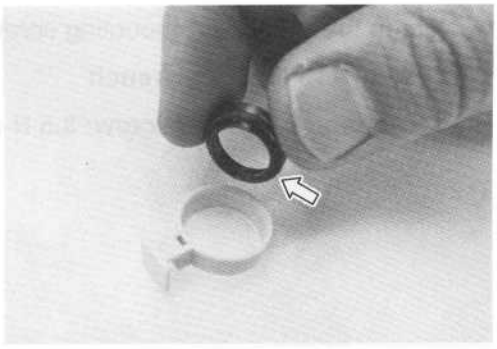


THROTTLE BODY REASSEMBLY

Reassemble the throttle body in the reverse order of disassembly. Pay attention to the following points:

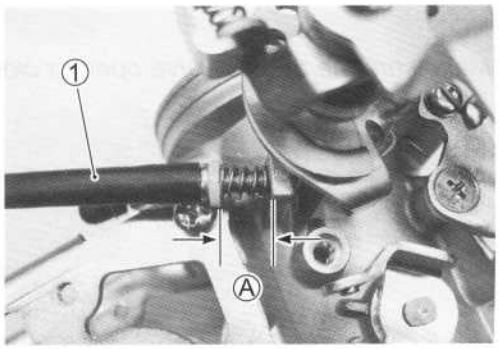
- Install the seal.

NOTE:
The flanged side of the seal faces the mechanical seal and fit them to the throttle shaft.



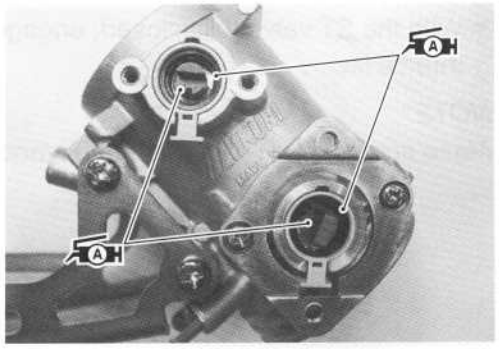
- Install the idle stop screw ①.

NOTE:
Make the idle stop screw's exposed length Ⓐ as same as it had been before removal.

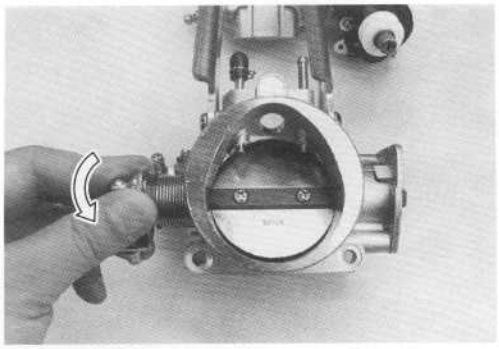


- Apply a small quantity of grease to the shaft ends and seal lips.

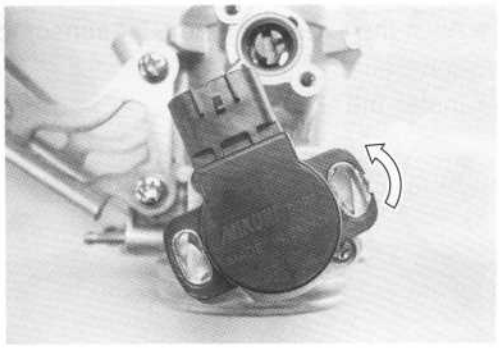
99000-25030: SUZUKI SUPER GREASE "A" (USA)
99000-25010: SUZUKI SUPER GREASE "A" (Others)



- With the throttle valve fully closed, install the TP sensor.



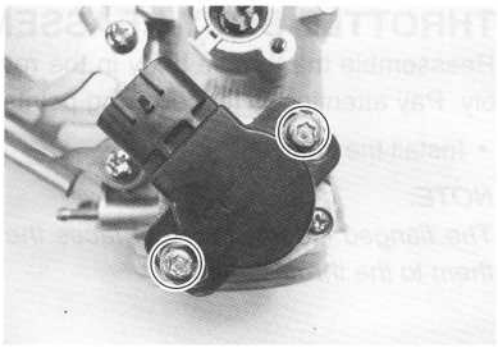
- Turn the TP sensor counterclockwise and install the mounting screws.



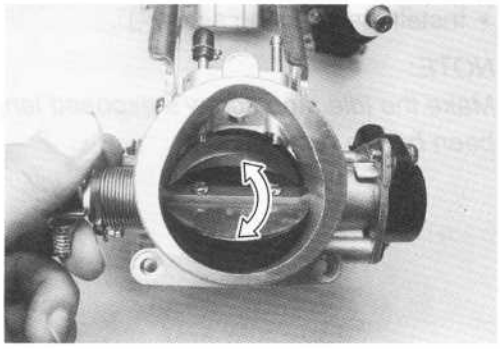
- Tighten the TP sensor mounting screws.

09930-11950: Torx wrench

TP sensor mounting screw: 3.5 N·m (0.35 kgf-m, 2.5 lb-ft)

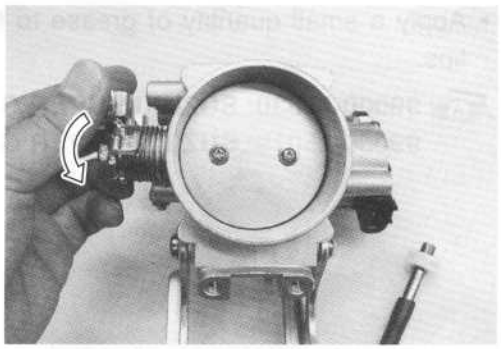


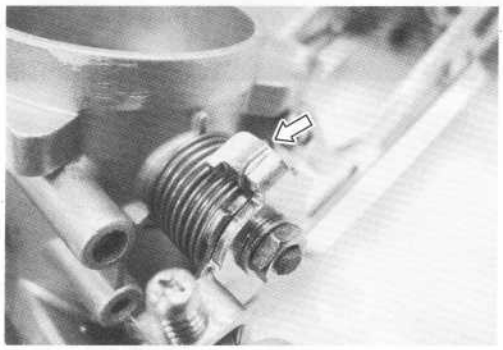
NOTE:
Make sure the throttle valve open or close smoothly.



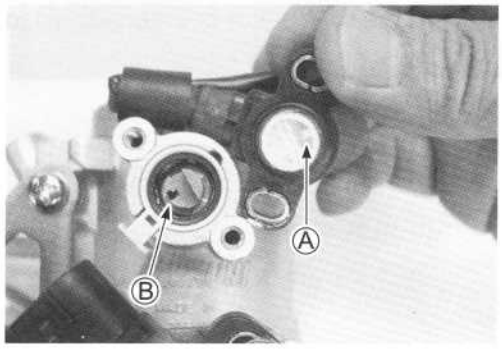
- With the ST valve fully closed, engage the return spring to the throttle lever.

NOTE:
Make sure the ST valve operation smoothly.





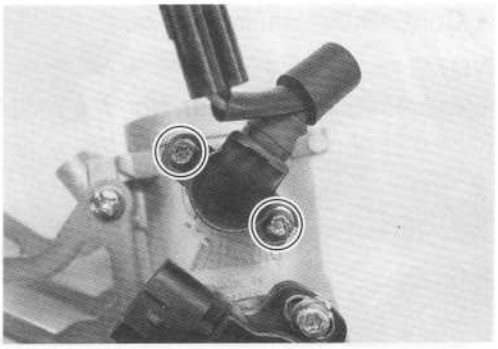
- Align the boss Ⓐ of the STP sensor to the groove Ⓑ of the ST valve shaft.
- Install the STP sensor.



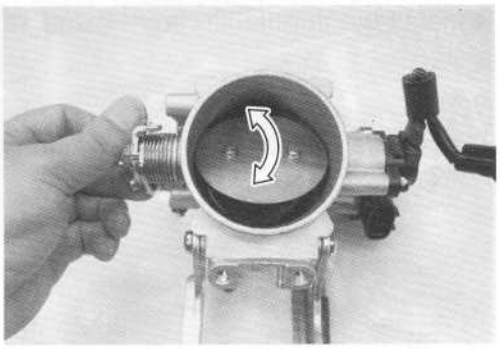
- Tighten the STP sensor mounting screws.

09930-11960: Torx wrench

STP sensor mounting screw: 2 N·m (0.2 kgf-m, 1.5 lb-ft)



NOTE:
Make sure the ST valve open or close smoothly.

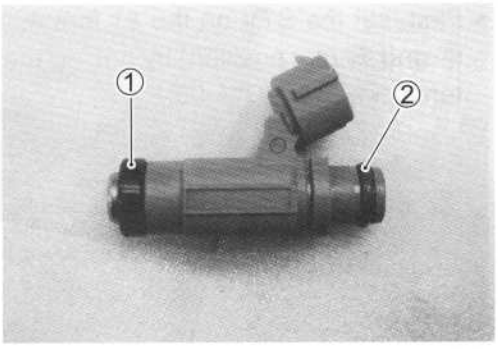


- Apply thin coat of the engine oil to the new fuel injector cushion seal ①, and install it to the fuel injector.

CAUTION

Replace the cushion seal and O-ring with a new one.

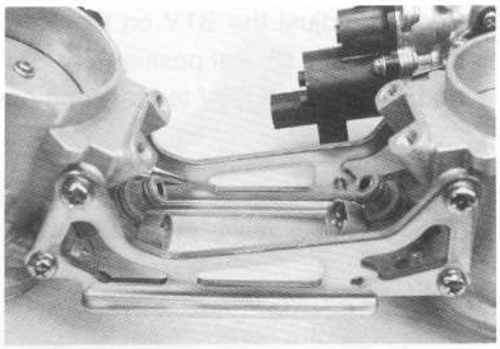
- Install the O-ring ② to the fuel injector.
- Apply thin coat of the engine oil to the new O-ring ②.



- Install the fuel injectors by pushing them straight to each throttle body.

CAUTION

Never turn the injector while pushing it.



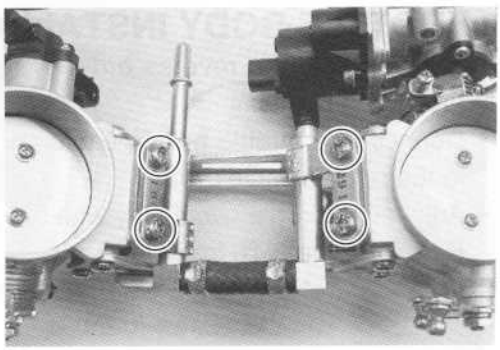
- Install the fuel delivery pipe assembly to the throttle body assembly.

CAUTION

Never turn the fuel injectors while installing them.

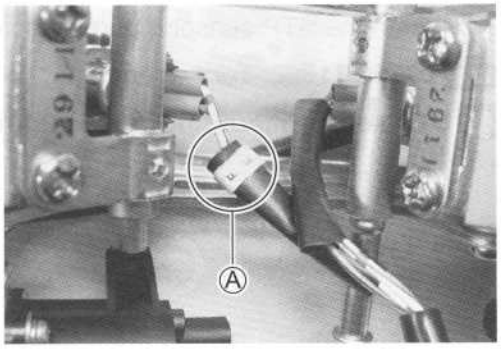
- Tighten the fuel delivery pipe mounting screws.

Fuel delivery pipe mounting screw:
5 N·m (0.5 kgf-m, 3.7 lb-ft)



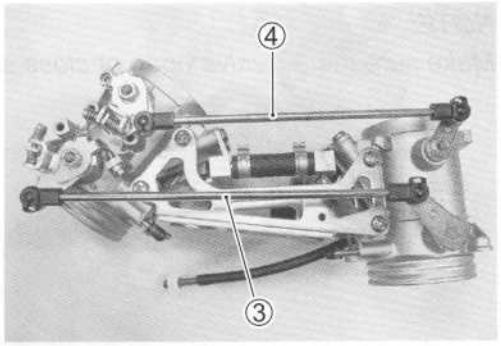
• Connect the fuel injector couplers to the fuel injectors.

NOTE:
The fuel injector coupler No. 1 (FRONT) can be distinguished from that of the No. 2 (REAR) by the "F" mark Ⓐ.

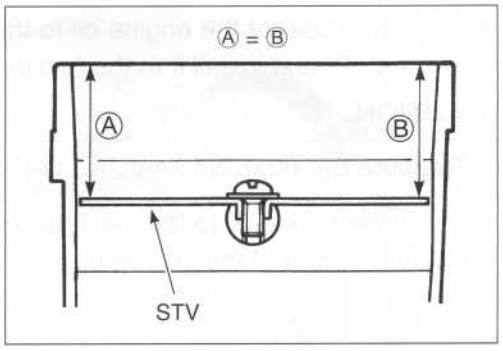


• Install the throttle link rod ③ and secondary throttle link rod ④.

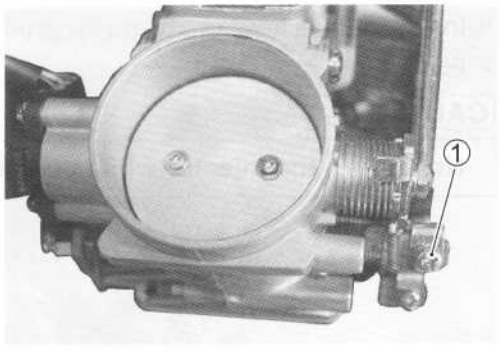
NOTE:
The throttle link rod ③ is longer than the secondary throttle link rod ④.



• First, set the STV on the #1 throttle body to the same height Ⓐ and Ⓑ (flat position) by turning the STVA motor shaft counterclockwise. (☞4-55)



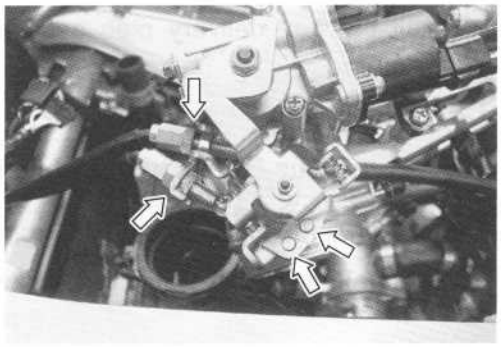
• Second, adjust the STV on the #2 throttle body to the same height Ⓐ and Ⓑ (flat position) by turning the balance screw ① and check each STV to the same opening.



THROTTLE BODY INSTALLATION

Installation is in the reverse order of removal. Pay attention to the following points:

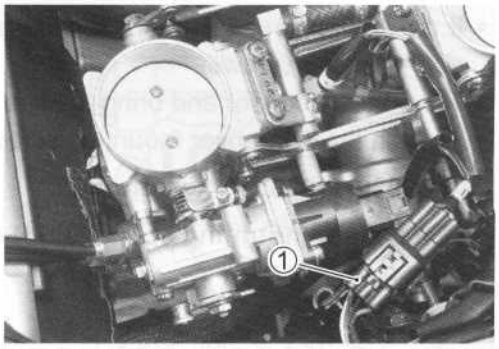
• Connect the throttle pulling cable and throttle returning cable to the throttle cable drum.
• Adjust the throttle cable play with the cable adjusters. Refer to page 2-16 for details.



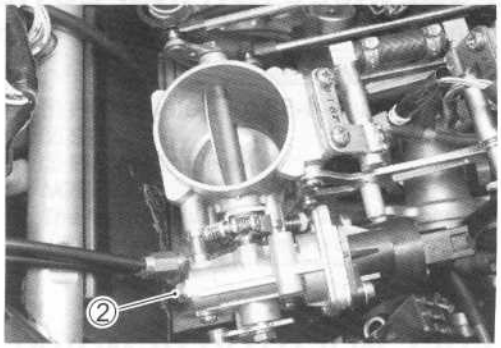
STP SENSOR ADJUSTMENT

If the STP sensor adjustment is necessary, measure the sensor voltage and adjust the STP sensor positioning as follows:

- Insert the needle pointed probes into the back side of the position sensor lead wire coupler.
- Disconnect the STVA motor/injector coupler ①.

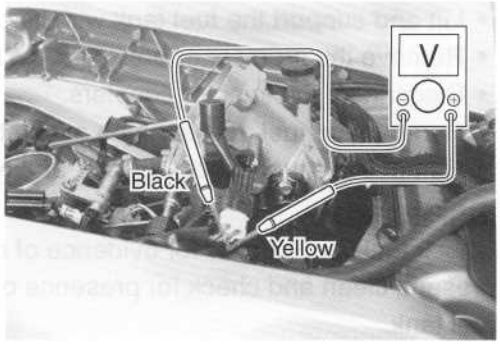


- Turn the ignition switch ON.
- To set the ST valve to fully open position, turn the STVA motor shaft ② clockwise by fingers.



- Measure the position sensor output voltage at fully open position.

DATA STP sensor output voltage
ST valve is fully opened:
Approx. 4.38 V at input voltage is 5.0 V
(⊕ Yellow – ⊖ Black)



TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

- If the STP sensor output voltage is out of specification, loosen the STP sensor mounting screws and adjust the STP sensor output voltage to specification.
- Tighten the STP sensor mounting screws.

TOOL 09930-11960: Torx wrench

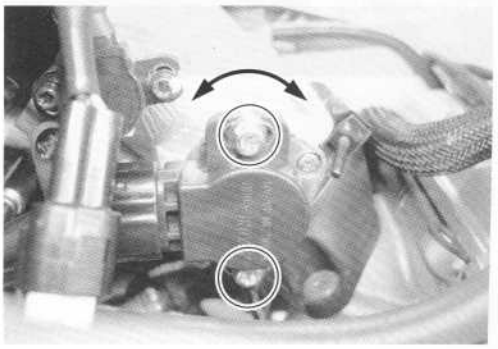
STP sensor mounting screw: 2 N·m (0.2 kgf-m, 1.5 lb-ft)

TP SENSOR ADJUSTMENT

After checking or adjusting the throttle valve synchronization, adjust the TP sensor positioning as follows:

- After warming up engine, adjust the idling speed to 1 200 ± 100 rpm.
- Stop the warmed-up engine and connect the special tool to the dealer mode coupler. (☞4-25)

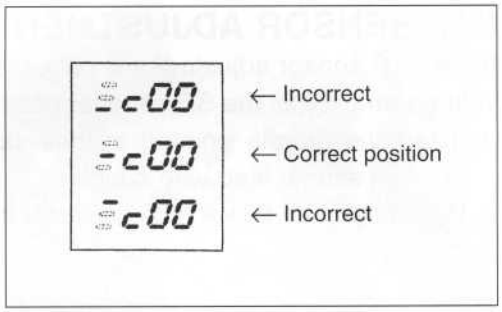
TOOL 09930-82720: Mode select switch



- If the TP sensor adjustment is necessary, loosen the TP sensor mounting screws.
- Turn the TP sensor and bring the line to middle.
- Tighten the TP sensor mounting screws.

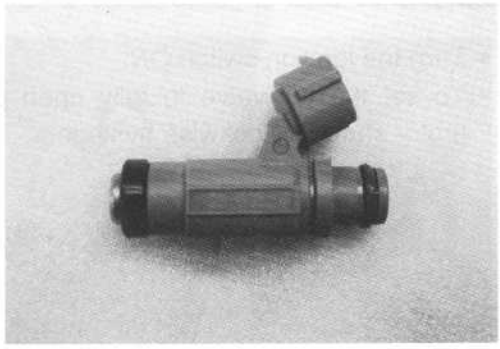
TOOL 09930-11950: Torx wrench

TP sensor mounting screw: 3.5 N·m (0.35 kgf-m, 2.5 lb-ft)



FUEL INJECTOR INSPECTION

The fuel injector can be checked without removing it from the throttle body.
Refer to page 4-58 for details.



FUEL INJECTOR REMOVAL

- Lift and support the fuel tank with its prop stay. (☞4-65)
- Remove the air cleaner box. (☞4-75)
- Disconnect the injector couplers.
- Remove the fuel delivery pipe assembly. (☞4-78)
- Remove the fuel injectors No. 1 and No. 2. (☞4-78)

INSPECTION

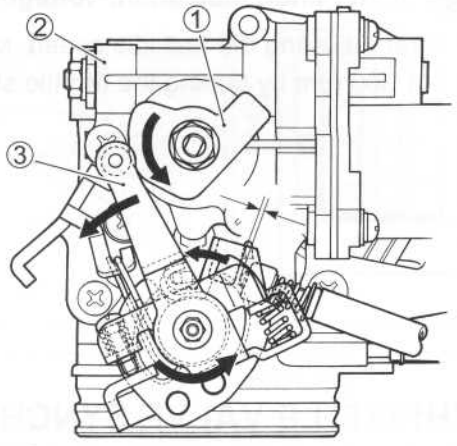
Check fuel injector filter for evidence of dirt and contamination. If present, clean and check for presence of dirt in the fuel lines and fuel tank.

FUEL INJECTOR INSTALLATION

- Apply thin coat of the engine oil to new injector cushion seals and O-rings. (☞4-83)
- Install the injector by pushing it straight to the throttle body. Never turn the injector while pushing it. (☞4-83)

FAST IDLE INSPECTION

The fast idle system is automatic type.
When the fast idle cam is turned by the secondary throttle valve actuator, the cam pushes the lever on the throttle valve shaft causing the throttle valve to open and raise the engine speed. When the engine has warmed up, depending on the water temperature and ambient temperature as shown in the following table, the fast idle is cancelled allowing the engine to resume idle speed.



① Fast idle cam
② STVA
③ Fast idle link lever
NOTE:
The fast idle link lever opens throttle valve a little to increase the engine speed.

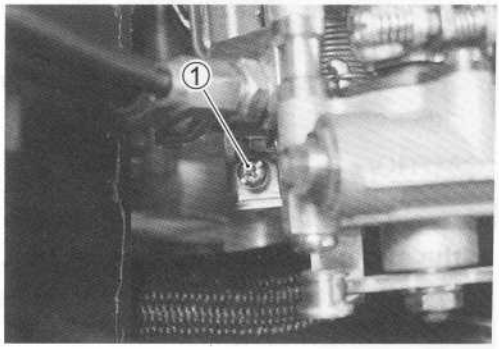
DATA

Ambient Temp.	Fast idle rpm	Fast idle cancelling Water Temp.
– 5 °C (– 23 °F)	2 000 – 2 600 rpm	10 – 20 °C (50 – 68 °F)
15 °C (59 °F)	1 900 – 2 500 rpm	20 – 30 °C (68 – 86 °F)
25 °C (77 °F)	1 900 – 2 500 rpm	28 – 38 °C (82 – 100 °F)

If, under the above conditions, the fast idle cannot be cancelled, the cause may possibly be short-circuit in the engine coolant temperature sensor or wiring connections or maladjusted fast idle.

FAST IDLE ADJUSTMENT

- Lift and support the fuel tank with its prop stay. (☞4-65)
- Remove the air cleaner box. (☞4-75)
- Disconnect the STVA motor/injector coupler.
- Insert the needle pointed probes to the TP sensor coupler.
- Open the STV fully by turning the motor shaft. (☞4-55)
- Turn the ignition switch ON.
- With the STV held at this position, measure the output voltage of the TP sensor.
- If the TP sensor output voltage is out of specification, turn the fast idle adjusting screw ① and adjust the output voltage to specification (1.16 V).

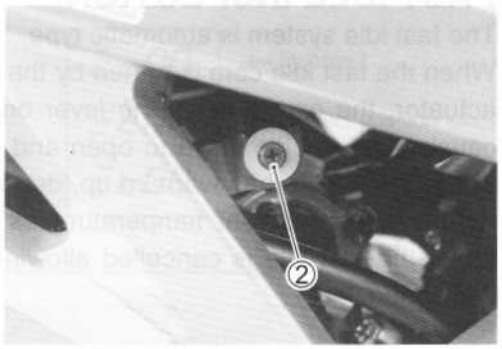


DATA TP sensor output voltage: 1.16 V

TOOL 09900-25008: Multi circuit tester
09900-25009: Needle pointed probe set

Tester knob indication: Voltage (⎓)

- After adjusting the fast idle speed, set the idle speed to 1 100 – 1 300 rpm by turning the throttle stop screw ②.

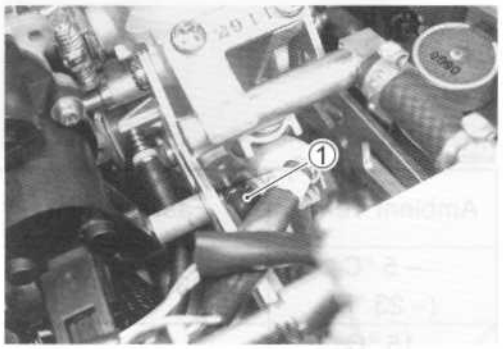


THROTTLE VALVE SYNCHRONIZATION

Check and adjust the throttle valve synchronization between two cylinders.

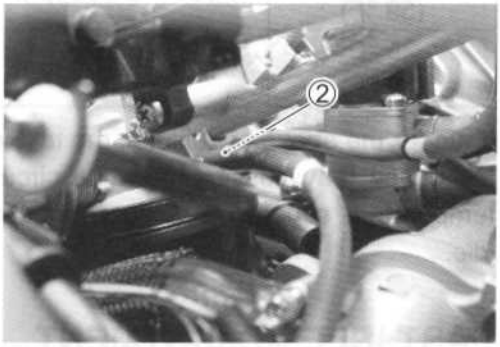
CALIBRATING EACH GAUGE (For vacuum balancer gauge)

- Lift and support the fuel tank. (☞4-65)
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the air cleaner box. (☞4-75)
- Connect the IAT and IAP sensor couplers.
- Remove the rubber cap ① from the No. 1 throttle body.



- Connect one of the four rubber hoses of the vacuum balancer gauge to the nipple ② on the No. 1 throttle body.

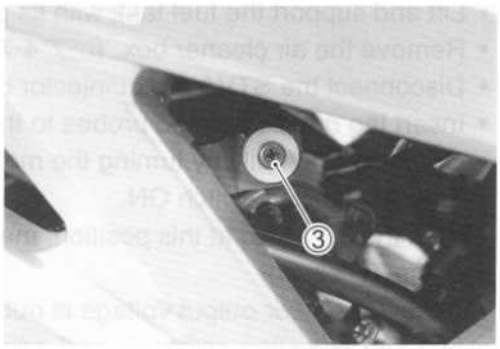
09913-13121: Vacuum balancer gauge



- Start up the engine and keep it running at 1 200 rpm by turning throttle stop screw ③.

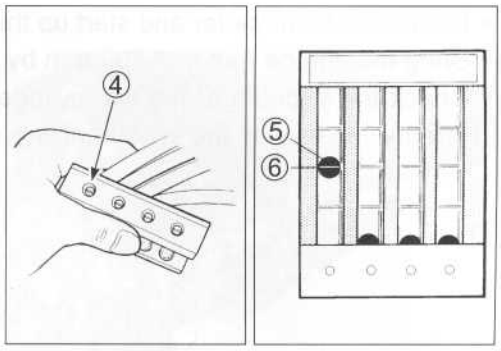
CAUTION

Avoid drawing dirt into the throttle body while running the engine without air cleaner box. Dirt drawn into the engine will damage the internal engine parts.



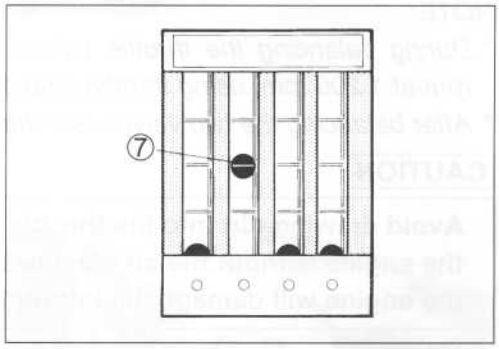
- Turn the air screw ④ of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ⑤ in the tube to the center line ⑥.

NOTE:
The vacuum gauge is positioned approx. 30° from the horizontal level.



- After making sure that the steel ball stays steady at the center line, disconnect the hose from the No. 1 throttle body nipple and connect the next hose to this nipple.
- Turn air screw to bring the other steel ball ⑦ to the center line.

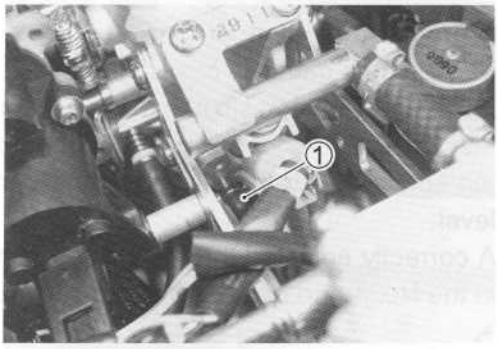
The balancer gauge is now ready for use in balancing the throttle valves.

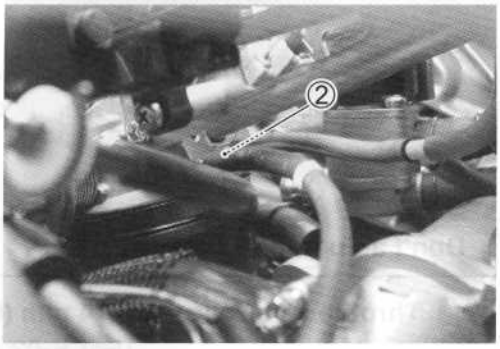


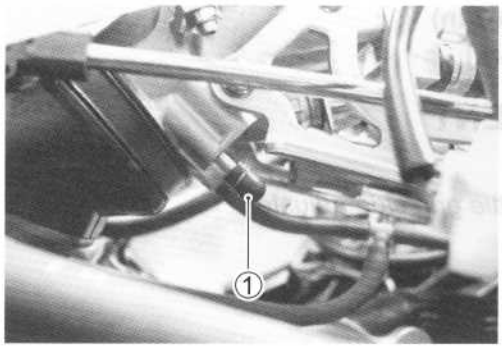
THROTTLE VALVE SYNCHRONIZATION

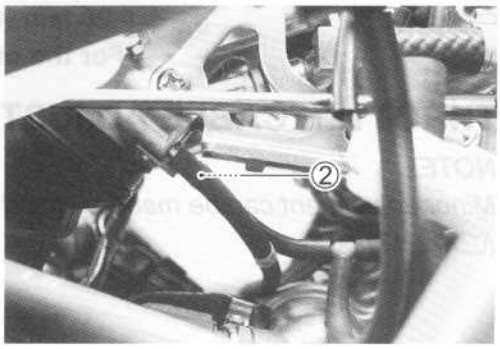
- Lift and support the fuel tank. (☞4-65)
- Remove the air cleaner box. (☞4-75)
- Connect the IAT and IAP sensor couplers.
- To synchronize throttle valves, remove the rubber caps ① from each vacuum nipple and connect the vacuum balancer gauge hoses to the vacuum nipples ② respectively.

TOOL 09913-13121: Vacuum balancer gauge

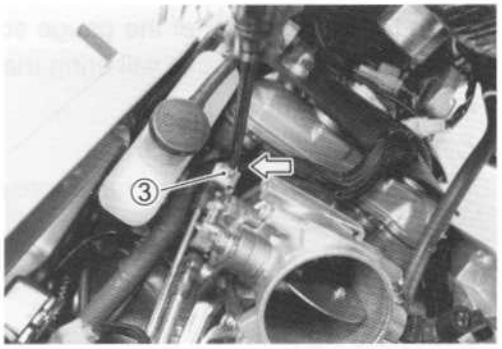








- Connect a tachometer and start up the engine.
- Bring the engine rpm to 1 200 rpm by the throttle stop screw.
- Check the vacuum of the two cylinders and balance the two throttle valves with the synchronizing screw ③.



NOTE:

** During balancing the throttle valves, always set the engine rpm at 1 200 rpm, using throttle stop screw.*

** After balancing the two valves, set the idle rpm to 1 200 rpm.*

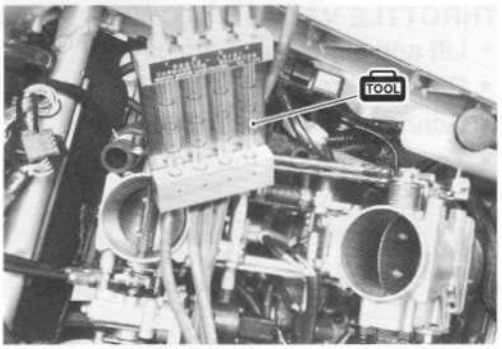
CAUTION

Avoid drawing dirt into the throttle body while running the engine without the air cleaner box. Dirt drawn into the engine will damage the internal engine parts.

(For vacuum balancer gauge)

The vacuum gauge is positioned approx. 30° from the horizontal level, and in this position the two balls should be within one ball dia. If the difference is larger than one ball, turn the synchronizing screw on the throttle body and bring the ball to the same level.

A correctly adjusted throttle valve synchronization has the balls in the No. 1 and No. 2 at the same level.

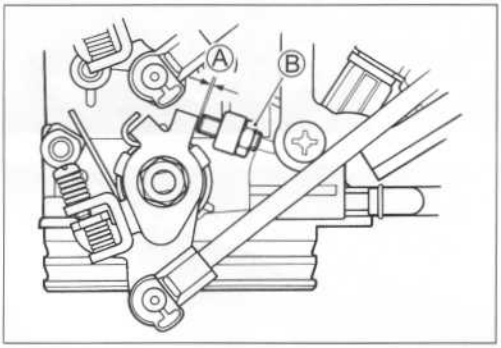


NOTE:

Make sure that the throttle lever should have a gap Ⓐ (between the throttle lever and throttle lever stopper screw) during synchronization.

CAUTION

Don't adjust the screw Ⓑ.



DATA **Throttle lever gap Ⓐ: 0.14 mm (0.006 in)**
[For E-02, 19]
0.20 mm (0.007 in)
[For the others]

THROTTLE CABLE ADJUSTMENT

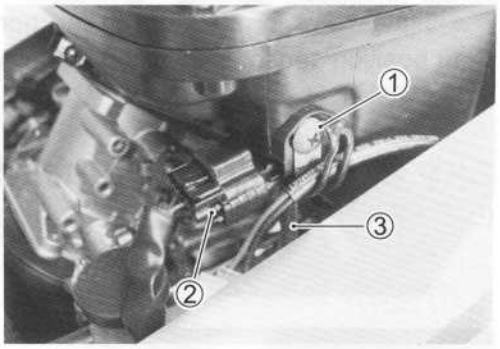
NOTE:

Minor adjustment can be made by the throttle grip side adjuster. *(☞2-17)*

SENSOR

IAP SENSOR INSPECTION

The intake air pressure sensor is located at the rear side of the air cleaner box. (☞4-37)



IAP SENSOR REMOVAL/INSTALLATION

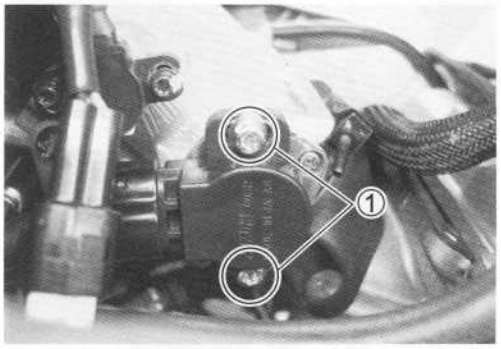
- Lift and support the fuel tank. (☞4-65)
- Remove the IAP sensor by removing the screw ① and disconnect the coupler ② and vacuum hose ③.
- Installation is in the reverse order of removal.

TP SENSOR INSPECTION

- The throttle position sensor is installed on the No. 2 throttle body. (☞4-40)

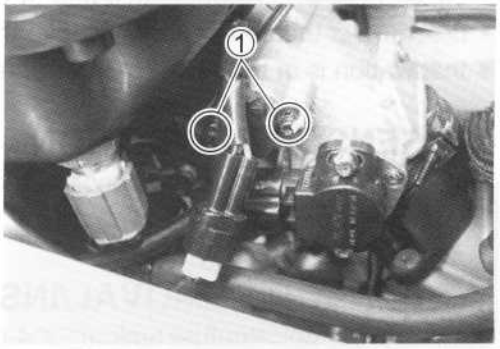
TP SENSOR REMOVAL/INSTALLATION

- Lift and support the fuel tank. (☞4-65)
- Remove the TP sensor setting screws ① and disconnect the coupler.
- Install the TP sensor to the No. 2 throttle body. Refer to page 4-85 for TP sensor setting procedure.



STP SENSOR INSPECTION

The secondary throttle position sensor is installed on the No. 2 throttle body. (☞4-53)

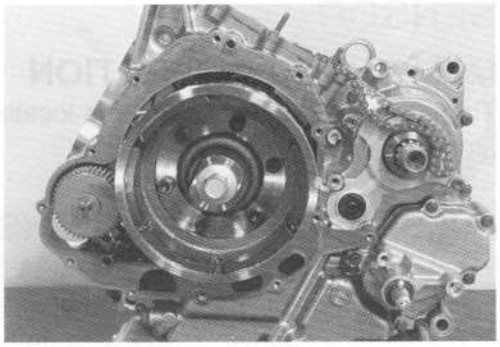


STP SENSOR REMOVAL/INSTALLATION

- Lift and support the fuel tank. (☞4-65)
- Remove the STP sensor setting screws ① and disconnect the coupler.
- Install the STP sensor to the No. 2 throttle body. Refer to pages 4-85 for STP sensor setting procedure.

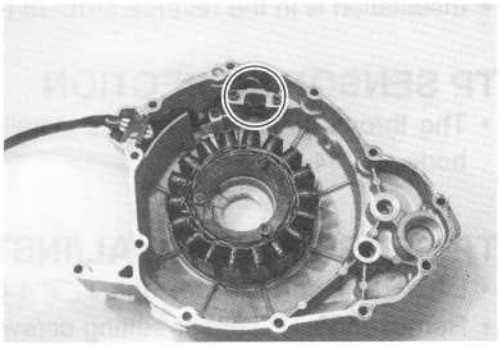
CKP SENSOR INSPECTION

The signal rotor is mounted on the generator rotor and crankshaft position sensor is installed in the generator cover. (☞4-35)



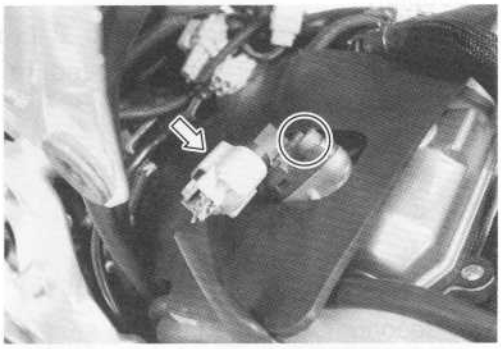
CKP SENSOR REMOVAL/INSTALLATION

(☞3-77)



CMP SENSOR INSPECTION

The signal rotor is installed on the No. 2 intake camshaft, and the camshaft position sensor is installed on the No. 2 cylinder head cover. (☞4-33)

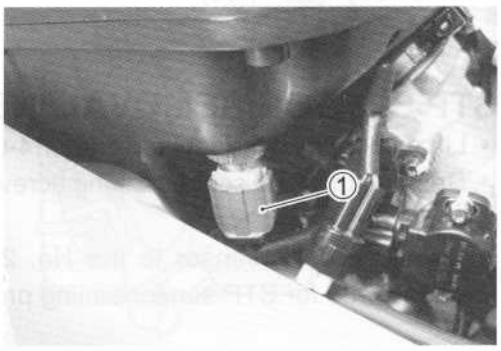


CMP SENSOR REMOVAL/INSTALLATION

- Lift and support the fuel tank. (☞4-65)
- Disconnect the coupler and remove the CMP sensor.
- Installation is in the reverse order of removal. (☞3-4)

IAT SENSOR INSPECTION

The intake air temperature sensor is installed at the rear side of the air cleaner box. (☞4-44)



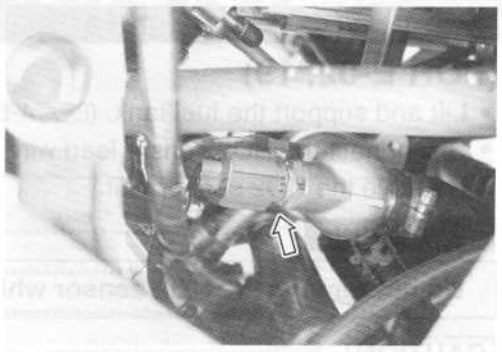
IAT SENSOR REMOVAL/INSTALLATION

- Lift and support the fuel tank. (☞4-65)
- Disconnect the IAT sensor coupler ① and remove the IAT sensor from the air cleaner box.
- Installation is in the reverse order of removal.

IAT sensor: 18 N·m (1.8 kgf-m, 13.0 lb-ft)

ECT SENSOR INSPECTION

The engine coolant temperature sensor is installed on the thermostat case. (☞4-42 and 5-10)

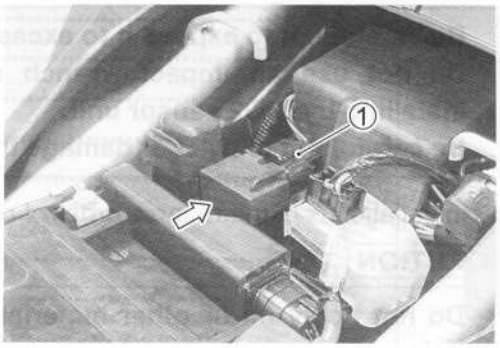


ECT SENSOR REMOVAL/INSTALLATION

(☞5-10)

AP SENSOR INSPECTION

The atmospheric pressure sensor is located under the seat. (☞4-46)

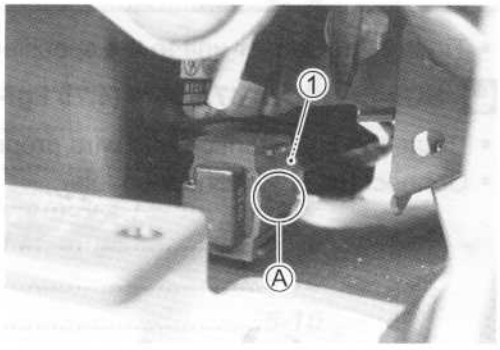


AP SENSOR REMOVAL/INSTALLATION

- Remove the seat. (☞6-7)
- Disconnect the coupler ① and remove the AP sensor.
- Installation is in the reverse order of removal.

TO SENSOR INSPECTION

The tip over sensor is located in front of the battery holder. (☞4-49)



TO SENSOR REMOVAL/INSTALLATION

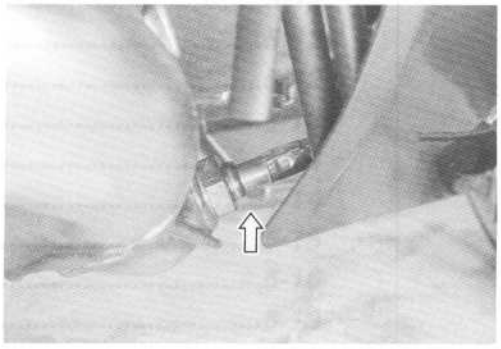
- Remove the frame cover. (☞6-7)
- Disconnect the coupler ① and remove the TO sensor.
- Installation is in the reverse order of removal.

NOTE:

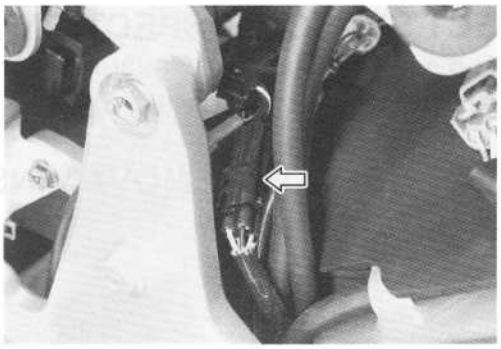
When installing the TO sensor, bring the "UPPER" letter Ⓐ on it to the top.

HO2 SENSOR INSPECTION (FOR E-02, 19)

The heated oxygen sensor is installed on the exhaust pipe. (☞4-61)



HO2 SENSOR REMOVAL/INSTALLATION (FOR E-02, 19)



- Lift and support the fuel tank. (☞4-65)
- Disconnect the HO2 sensor lead wire coupler.
- Remove the HO2 sensor unit.

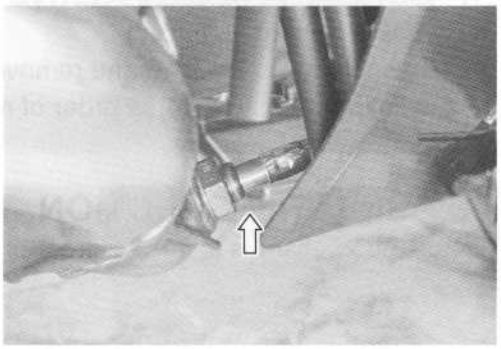
⚠ WARNING

Do not remove the HO2 sensor while it is hot.

CAUTION

Be careful not to expose it to excessive shock.
Do not use an impact wrench while removing or installing the HO2 sensor unit.
Be careful not to twist or damage the sensor lead wire.

- Installation is in the reverse order of removal.



CAUTION

Do not apply oil or other materials to the sensor air hole.

- Tighten the sensor unit to the specified torque.

HO2 SENSOR: 47.5 N·m (4.75 kgf-m, 34.3 lb-ft)

- Route the HO2 sensor lead wire properly. (☞8-14)
- Connect the HO2 sensor coupler.