

# FI SYSTEM DIAGNOSIS

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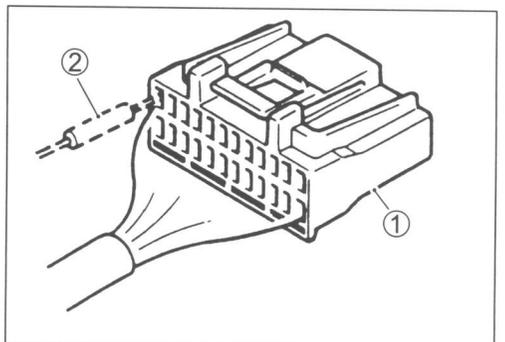
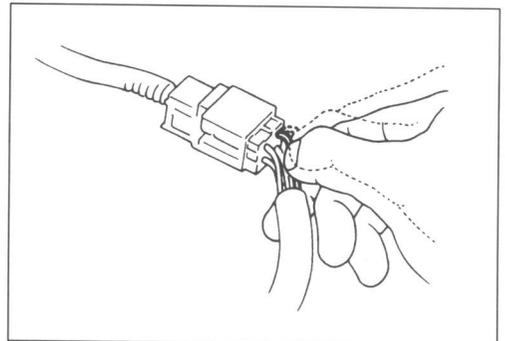
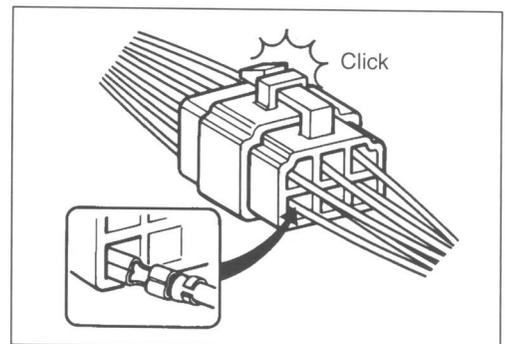
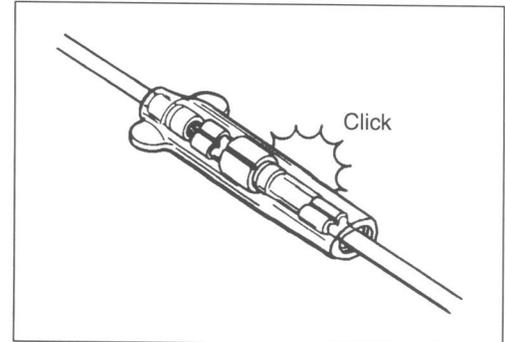
## PRECAUTIONS IN SERVICING

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

### ELECTRICAL PARTS

#### CONNECTOR/COUPLER

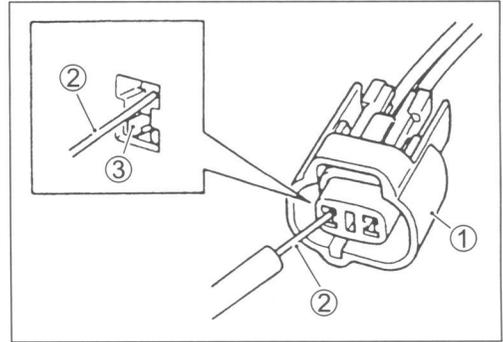
- When connecting a connector, be sure to push it in until a click is felt.
- With a lock type coupler, be sure to release the lock when disconnecting, and push in fully to engage the lock when connecting.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- 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.



- ① Coupler
- ② Probe

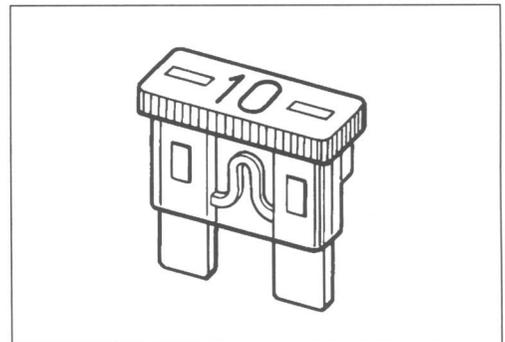
- When connecting meter probe from the terminal side of the coupler (where connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open. Connect the probe as shown to avoid opening of female terminal. Never push in the 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.

- ① Coupler
- ② Probe
- ③ Where male terminal fits



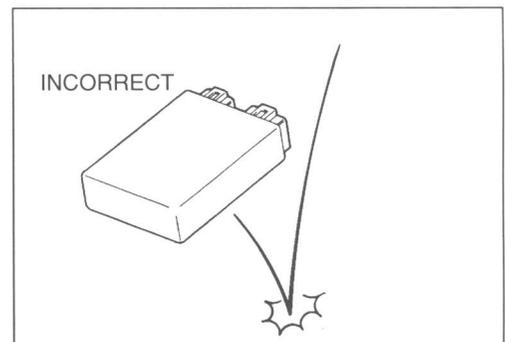
## FUSE

- When a fuse blows, always investigate the cause to 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.

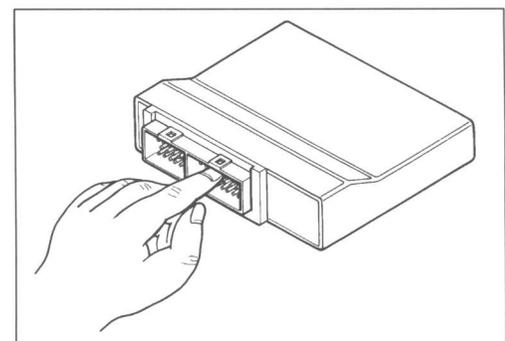


## ECM/VARIOUS SENSORS

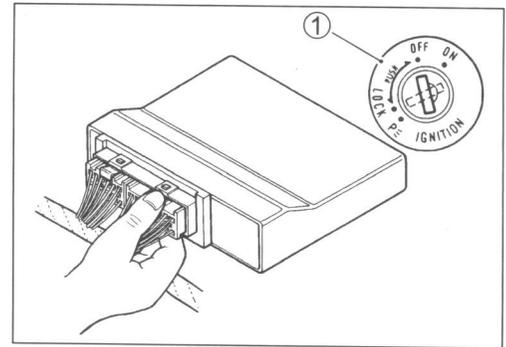
- Since each component is a high-precision part, great care should be taken not to apply any sharp impacts during removal and installation.



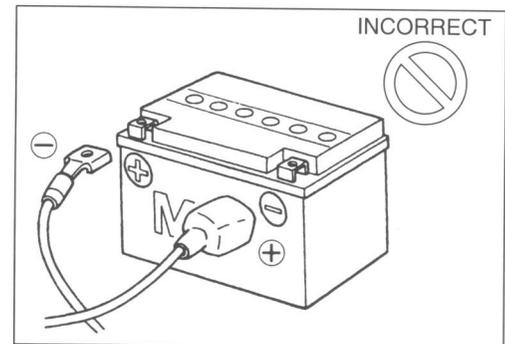
- Be careful not to touch the electrical terminals of the ECM. The static electricity from your body may damage this part.



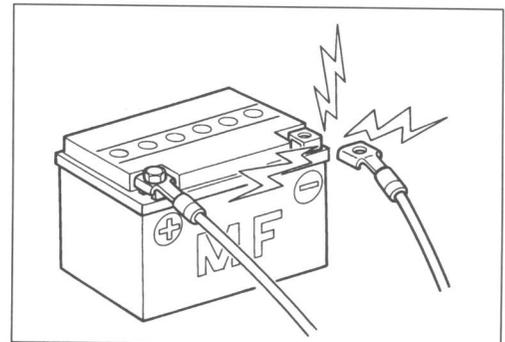
- When disconnecting and connecting the ECM, make sure to turn OFF the ignition switch ①, or electronic parts may get damaged.



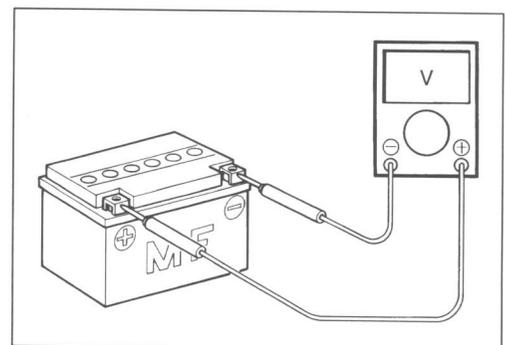
- Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the FI system instantly when reverse power is applied.



- 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 with a low voltage battery will lead to erroneous diagnosis.



- Never connect any tester (voltmeter, ohmmeter, or whatever) to the ECM when its coupler is disconnected. Otherwise, damage to ECM may result.
- Never connect an ohmmeter to the ECM with its coupler connected. If attempted, damage to 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

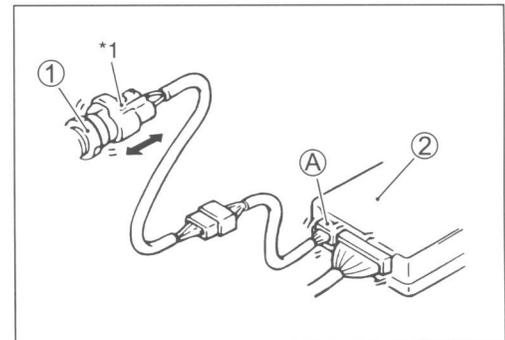
Possible causes for the open circuits are as follows. As the cause can exist in the connector/coupler or terminal, they need to be checked carefully.

- 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.

① Sensor

② ECM

\*1 Check for loose connection.



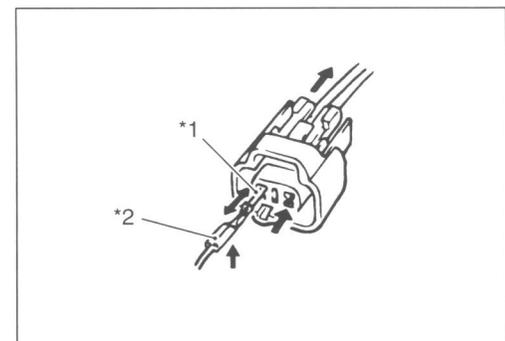
- Using a test male terminal, check the female terminals of the circuit being checked for contact tension. Check each terminal visually for poor contact (possibly caused by dirt, corrosion, rust, entry of foreign object, etc.). At the same time, check to make sure that each terminal is fully inserted 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.

\*1 Check contact tension by inserting and removing.

\*2 Check each terminal for bend and proper alignment.

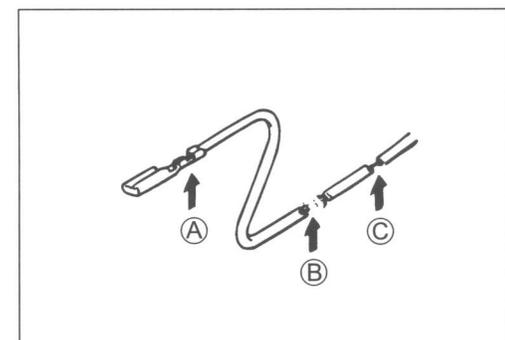


- Using continuity inspect or voltage check procedure as described below, inspect the wire harness terminals for open circuit and poor connection. Locate abnormality, if any.

(A) Looseness of crimping

(B) Open

(C) Thin wire (a few strands left)

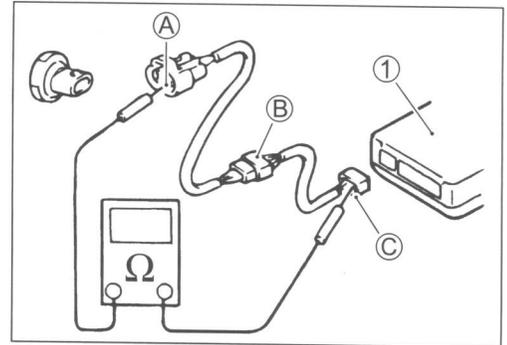


**Continuity check**

- Measure resistance across coupler (B) (between (A) and (C) in the figure).

If no continuity is indicated (infinity or over limit), the circuit is open between terminals (A) and (C).

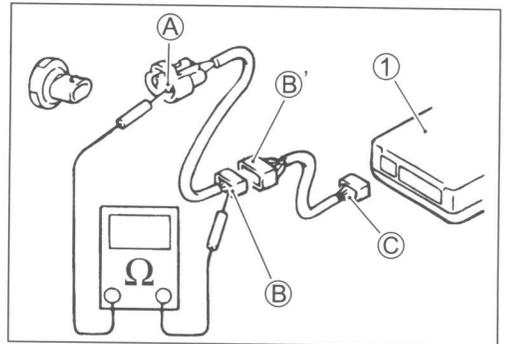
① ECM



- Disconnect the coupler (B) and measure resistance between couplers (A) and (B).

If no continuity is indicated, the circuit is open between couplers (A) and (B). If continuity is indicated, there is an open circuit between couplers (B)' and (C) or an abnormality in coupler (B)' or coupler (C).

① ECM



**VOLTAGE CHECK**

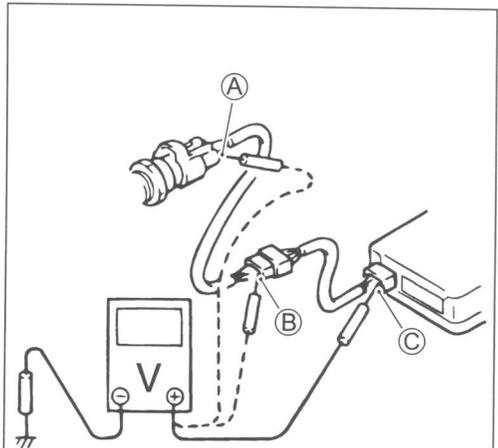
If voltage is supplied to the circuit being checked, voltage check can be used as circuit check.

- 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 (A) and (B).

**Voltage Between:**

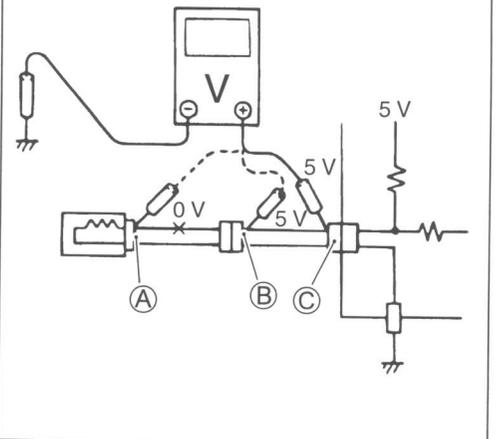
- (C) and body ground: Approx. 5 V
- (B) and body ground: Approx. 5 V
- (A) and body ground: 0 V



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

**Voltage Between:**

- (C) and body ground: Approx. 5 V
  - (B) and body ground: Approx. 5 V
  - (A) 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:**

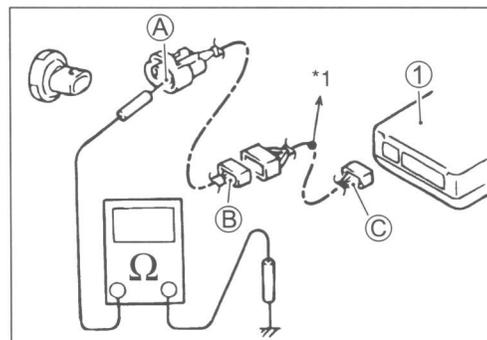
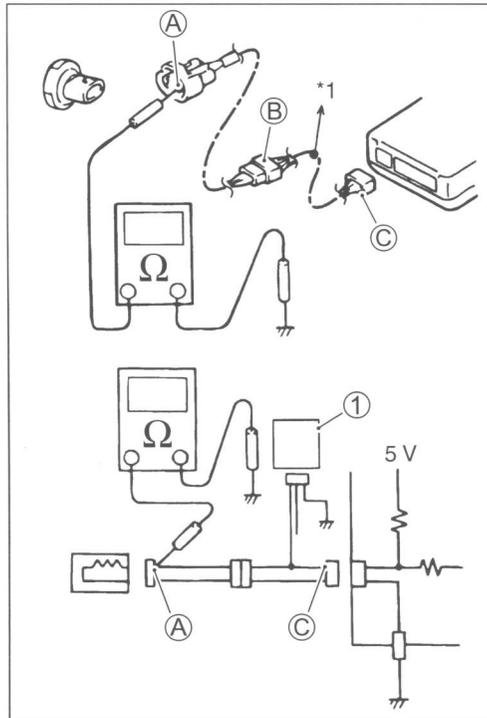
*If the circuit to be checked branches to other parts as shown, disconnect all connectors/couplers of those parts. Otherwise, diagnosis will be misled.*

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

① Other parts  
\*1 To other parts

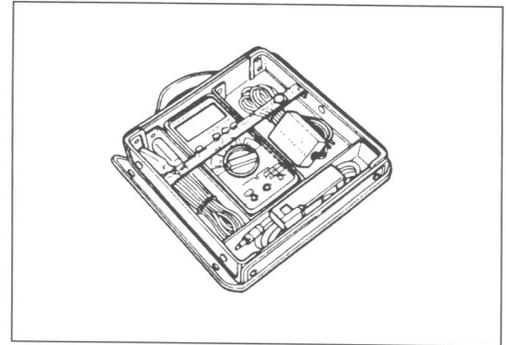
- Disconnect the connector/coupler included in circuit (coupler B) and measure resistance between terminal A and body ground. If continuity is indicated, the circuit is shorted to the ground between terminals A and B.

① ECM  
\*1 To other parts



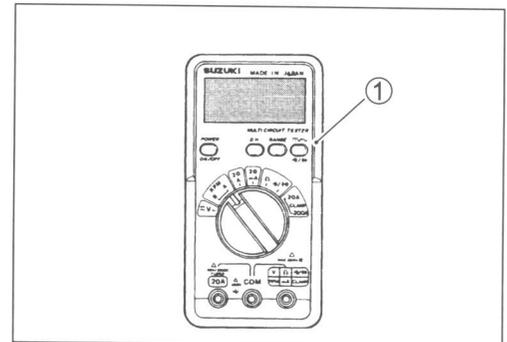
## USING THE MULTI-CIRCUIT TESTER

- Use the Suzuki multi-circuit tester set (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  $\oplus$  and  $\ominus$  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 ①,  $\infty$  will be shown as 10.00 M $\Omega$  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.



### 09900-25008: Multi-circuit tester set

#### NOTE:

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

### 09900-25009: Needle pointed probe set

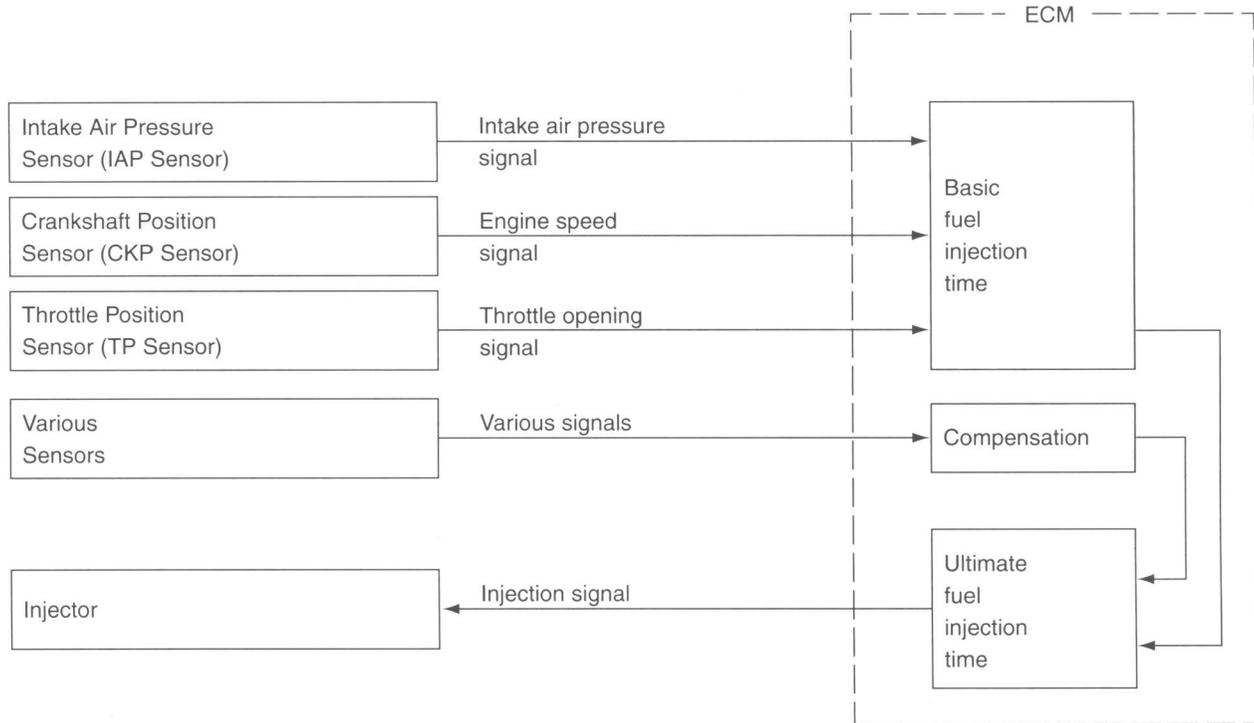


## FI SYSTEM TECHNICAL FEATURES

### INJECTION TIME (INJECTION VOLUME)

The factors to determine the injection time include the basic fuel injection time, which is calculated on the basis of 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)

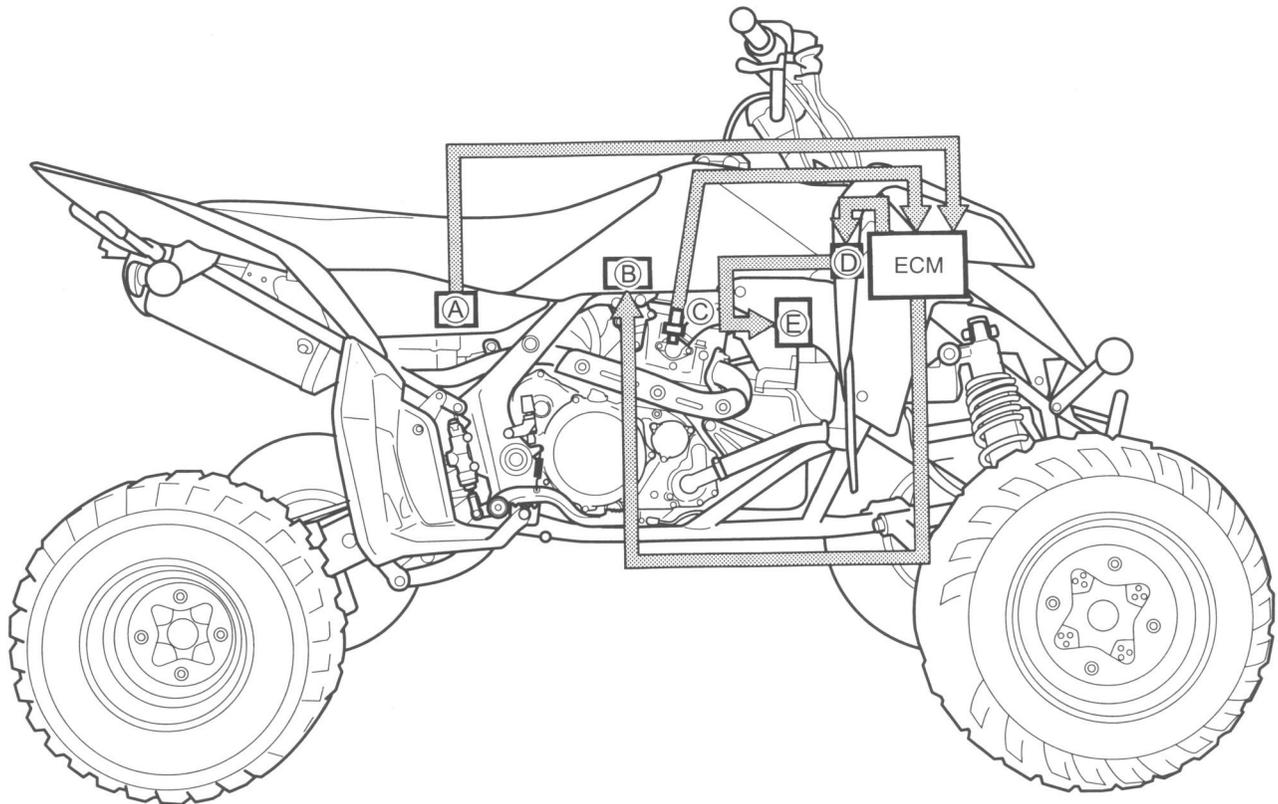
The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

SIGNAL	DESCRIPTION
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.
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.
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.

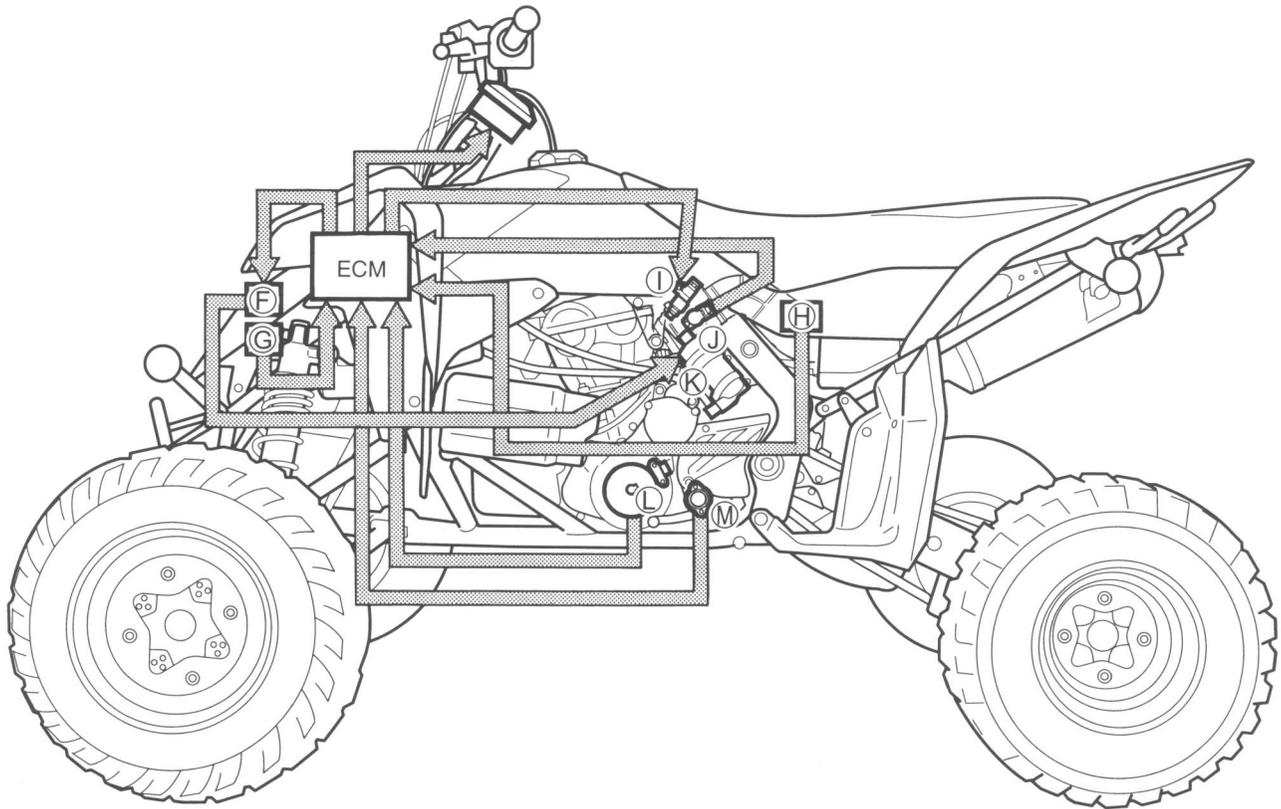
## INJECTION STOP CONTROL

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

## FI SYSTEM PARTS LOCATION

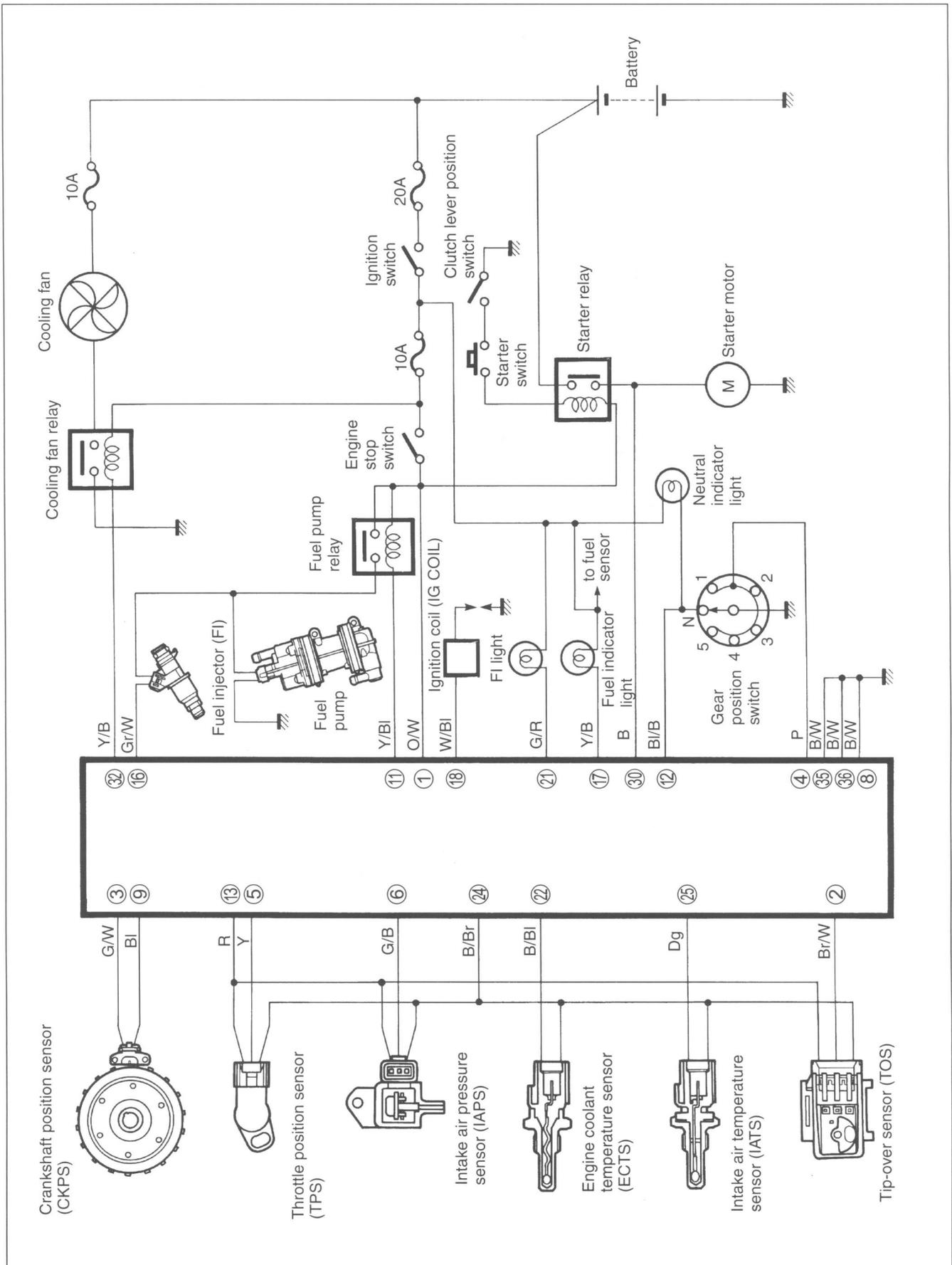


- |  |                             |
|--|-----------------------------|
| (A) Intake air temperature sensor (IATS)     | (B) Ignition coil (IG COIL) |
| (C) Engine coolant temperature sensor (ECTS) | (D) Cooling fan relay       |
| (E) Cooling fan                              |                             |

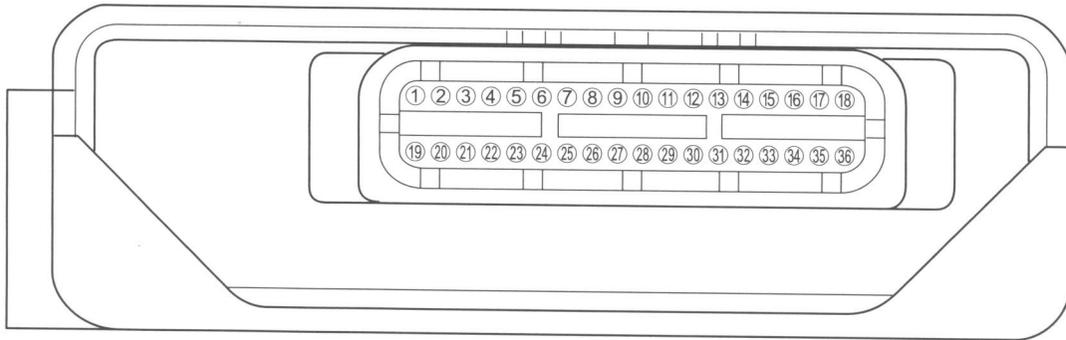


- |                                     |                         |
|-------------------------------------|-------------------------|
| Ⓕ Fuel pump relay (FP RERAY)        | Ⓖ Tip-over sensor (TOS) |
| Ⓖ Intake air pressure sensor (IAPS) | Ⓙ Fuel injector         |
| Ⓙ Throttle position sensor (TPS)    | Ⓚ Fuel pump (FP)        |
| Ⓚ Crankshaft position sensor (CKPS) | Ⓛ Gear position switch  |

# FI SYSTEM WIRING DIAGRAM



## ECM TERMINAL



TERMINAL NO.	CIRCUIT	TERMINAL NO.	CIRCUIT
①	Power source	⑱	—
②	TO sensor signal (TOS)	⑳	Blank
③	CKP sensor signal (CKP+)	㉑	FI/ECT indicator
④	GP switch signal (GP)	㉒	ECT sensor signal (ECT)
⑤	TP sensor signal (TP)	㉓	Blank
⑥	IAP sensor signal (IAP)	㉔	Sensors ground (E2)
⑦	Blank	㉕	IAT sensor signal (IAT)
⑧	ECM ground (E1)	㉖	Blank
⑨	CKP sensor signal (CKP-)	㉗	Blank
⑩	Serial data for self-diagnosis	㉘	Blank
⑪	Fuel pump (FP)	㉙	Mode select switch
⑫	Neutral switch (NT)	⑳	Starter motor (STA)
⑬	Power source for sensors (VCC)	㉛	—
⑭	—	㉜	—
⑮	—	㉝	Cooling fan relay (FAR)
⑯	Injector (#11)	㉞	Blank
⑰	Fuel indicator	㉟	Ground (E01)
⑱	Ignition coil	㊱	Ground (E02)

## 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 FI light. To check the function of the individual FI system devices, the dealer mode is provided. In this check, the special tool is necessary to read the code of the malfunction items.

### USER MODE

MALFUNCTION	FI LIGHT INDICATION
"NO"	—
"YES"	FI light turns ON.
Engine can start	*1
Engine can not start	FI light turns ON and blinks. *2

\*1

When one of the signals is not received by ECM, the fail-safe circuit works and injection is not stopped. In this case, FI light is lighted in the indicator panel and vehicle can run.

\*2

The injection signal is stopped, when the crankshaft position sensor signal, tip-over sensor signal, ignition signal, injector signal, fuel pump relay signal or ignition switch signal is not sent to ECM. In this case, FI light is lighted and blinked in the indicator panel. Vehicle can not run.

When ignition switch is turned ON, FI light is lit for 2 seconds and thereafter remains unlit.

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

If FI light is not lighted when turning the ignition switch to ON, the FI light does not indicate the trouble code. It is necessary to check the wiring harness between ECM and indicator panel couplers.

The possible cause of this indication is as follows;

Engine stop switch is in OFF position. Ignition fuse is burnt.

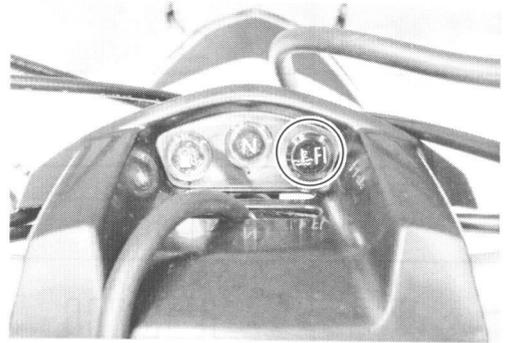
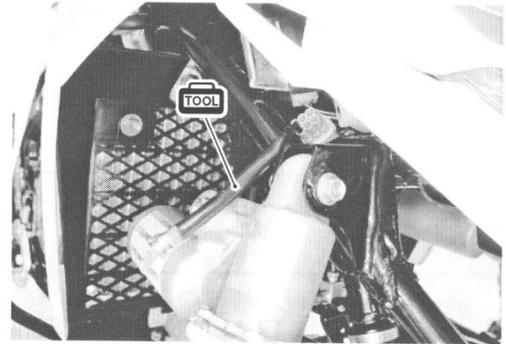
#### NOTE:

*The FI light blinks quickly two times a second when the engine coolant temperature becomes too high.*

## 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 FI light. 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**



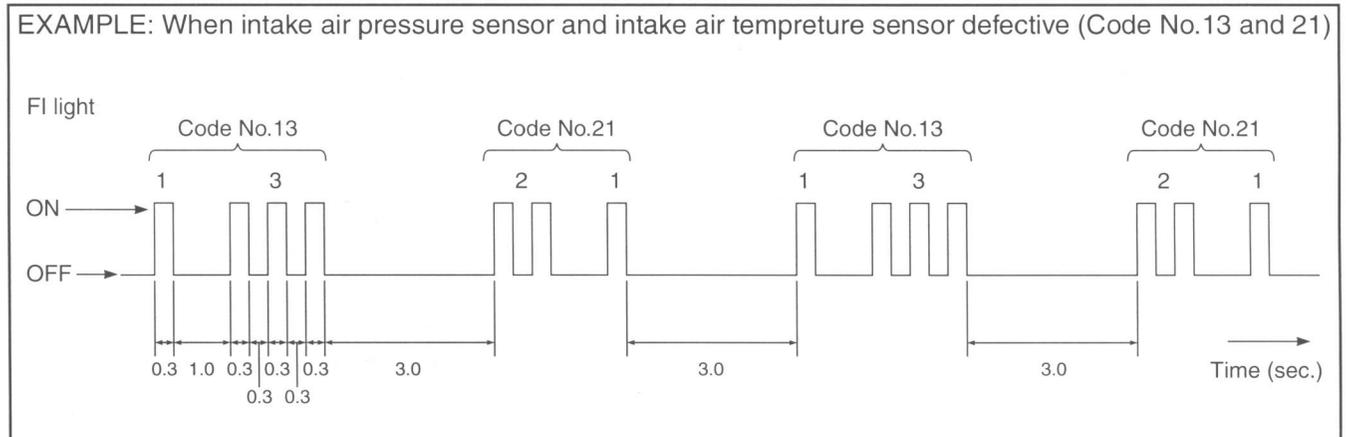
### CAUTION

**Before checking the malfunction code, do not disconnect the ECM lead wire couplers and turn the ignition switch OFF.**

**If the couplers from the ECM are disconnected, the malfunction code memory is erased and the malfunction code can not be checked.**

MALFUNCTION	FI LIGHT INDICATION	INDICATION MODE
"NO"	FI light turns OFF.	—
"YES"	FI light turns ON and blinks. (Code is indicated from small numeral to large one.)	Refer to "DIAGNOSTIC TROUBLE CODE TABLE" (☞ 4-18)

### DIAGNOSTIC TROUBLE CODE TABLE



DTC NO.	FI LIGHT FLASHING PATTERN	MALFUNCTION PART	REMARKS	
12		Crankshaft position sensor (CKPS)	Pick-up coil signal, signal generator	
13		Intake air pressure sensor (IAPS)		
14		Throttle position sensor (TPS)		
15		Engine coolant temperature sensor (ECTS)		
21		Intake air temperature sensor (IATS)		
23		Tip-over sensor (TOS)		
24		Ignition signal (IG coil)		
31		Gear position signal (GP switch)		
32		Injector signal (FI)		
41		Fuel pump control system (FP control system)		Fuel pump relay
60		Cooling fan control system		Cooling fan relay

In the FI light, the malfunction code is indicated from small code to large code.

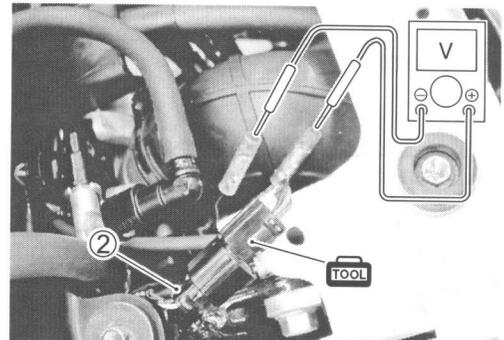
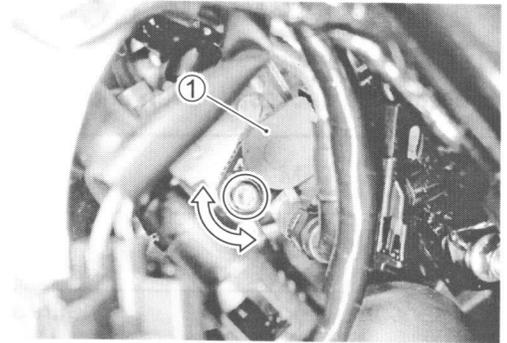
## TPS ADJUSTMENT

1. Adjust the engine rpm to 1 800 r/min. (☞ 2-12)
2. If the throttle position sensor adjustment is necessary, remove the fuel tank cover (☞ 7-6), fuel pump (☞ 5-6) and follow the procedure below.
3. Loosen the screw and turn the throttle position sensor ① and connect the TP sensor coupler ② to the test harness.
4. Turn the ignition switch ON.
5. Adjust the TP sensor ① until the output voltage comes within the specified value.
6. Then, tighten the screw to fix the throttle position sensor.

**DATA** TP sensor output voltage: 0.58 – 0.62 V  
(+ Yellow – - B/Br)

**TOOL** 09900-25008: Multi-circuit tester set  
09900-28630: TPS test wire harness  
09930-11950: Torx wrench

7. Check the engine idle speed. (☞ 2-12)



## FAIL-SAFE FUNCTION

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

ITEM	FAIL-SAFE MODE	STARTING ABILITY	RUNNING ABILITY
IAP sensor	Intake air pressure is fixed to 101 kPa (768 mmHg).	“YES”	“YES”
TP sensor	The throttle opening is fixed to close position. Ignition timing is also fixed.	“YES”	“YES”
ECT sensor	Engine coolant temperature value is fixed to 80 °C (176 °F). Cooling fan is fixed on position.	“YES”	“YES”
IAT sensor	Intake air temperature value is fixed to 40 °C (104 °F).	“YES”	“YES”
Gear position signal	Gear position signal is fixed to Neutral gear.	“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 vehicle 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 such as below will facilitate collecting information 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	<input type="checkbox"/> Always ON <input type="checkbox"/> Sometimes ON <input type="checkbox"/> Always OFF <input type="checkbox"/> Good condition
Malfunction indicator lamp/code	User mode: <input type="checkbox"/> No indicator lamp <input type="checkbox"/> Malfunction indicator lamp (        )
	Dealer mode: <input type="checkbox"/> No code <input type="checkbox"/> Malfunction code (        )

PROBLEM SYMPTOMS	
<input type="checkbox"/> <b>Difficult Starting</b> <input type="checkbox"/> No cranking <input type="checkbox"/> No initial combustion <input type="checkbox"/> No combustion <input type="checkbox"/> Poor starting at <input type="checkbox"/> cold <input type="checkbox"/> warm <input type="checkbox"/> always <input type="checkbox"/> Other _____	<input type="checkbox"/> <b>Poor Driveability</b> <input type="checkbox"/> Hesitation on acceleration <input type="checkbox"/> Back fire/ <input type="checkbox"/> After fire <input type="checkbox"/> Lack of power <input type="checkbox"/> Surging <input type="checkbox"/> Abnormal knocking <input type="checkbox"/> Engine rpm jumps briefly <input type="checkbox"/> Other _____
<input type="checkbox"/> <b>Poor Idling</b> <input type="checkbox"/> Abnormal idling speed <input type="checkbox"/> High <input type="checkbox"/> Low) (        r/min) <input type="checkbox"/> Unstable <input type="checkbox"/> Hunting (        r/min to        r/min) <input type="checkbox"/> Other _____	<input type="checkbox"/> <b>Engine Stall when</b> <input type="checkbox"/> Immediately after start <input type="checkbox"/> Throttle valve is opened <input type="checkbox"/> Throttle valve is closed <input type="checkbox"/> Load is applied <input type="checkbox"/> Other _____
<input type="checkbox"/> OTHERS:	

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

**NOTE:**

The above form is a standard sample. The form should be modified according to conditions and characteristics of each market.

**VISUAL INSPECTION**

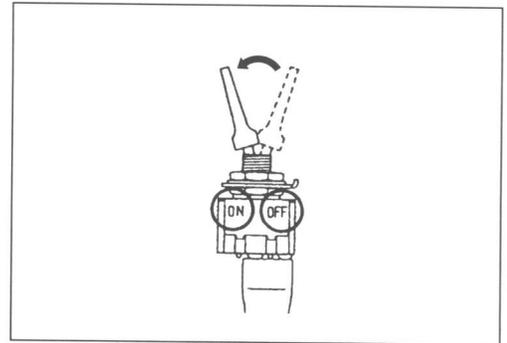
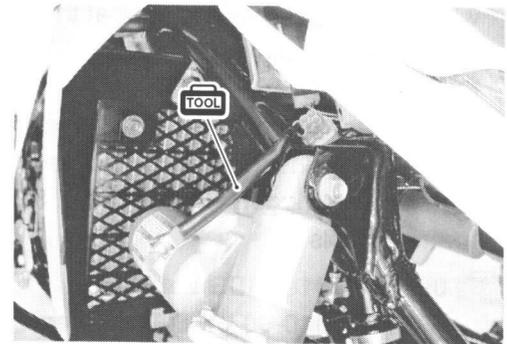
- Prior to diagnosis using the mode select switch or SDS, perform the following visual inspections. The reason for visual inspection is that mechanical failures (such as oil leakage) cannot be displayed on the indicator panel with the use of mode select switch or SDS.
- \* Engine oil level and leakage (☞ 2-13)
- \* Engine coolant level and leakage (☞ 2-15)
- \* Fuel level and leakage (☞ 2-11 and 8-25)
- \* Clogged air cleaner element (☞ 2-3)
- \* Battery condition (☞ 8-31)
- \* Throttle cable play (☞ 2-11)
- \* Vacuum hoses looseness, bend and disconnection
- \* Burnt fuse
- \* FI light operation (☞ 4-16 and 8-23)
- \* Each warning light operation (☞ 8-23 to -25)
- \* Exhaust gas leakage and noise (☞ 2-4)
- \* Each coupler disconnection
- \* Clogged radiator fins (☞ 6-6)

## SELF-DIAGNOSTIC PROCEDURES

### NOTE:

- \* Do not disconnect couplers from the ECM, the battery cable from the battery, ECM ground wire harness from the engine or main fuse before confirming the malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase the 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" (☞ 4-16, -17) carefully to have good understanding as to what functions are available and how to use it.
- \* Be sure to read "PRECAUTIONS IN SERVICING" (☞ 4-3) before inspection and observe what is written there.
- 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.

 **09930-82720: Mode select switch**

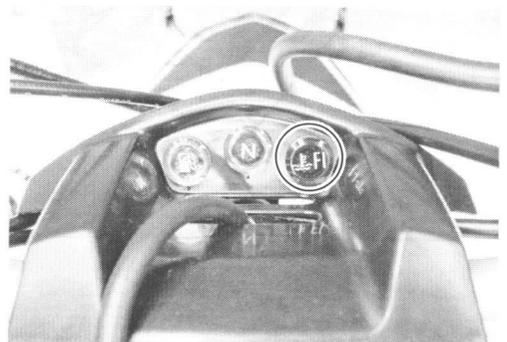


## SELF-DIAGNOSIS RESET PROCEDURE

- After repairing the trouble, turn OFF the ignition switch and turn ON again.
- If the malfunction code does not indicate, the malfunction is cleared.
- Disconnect the special tool from the dealer mode coupler.

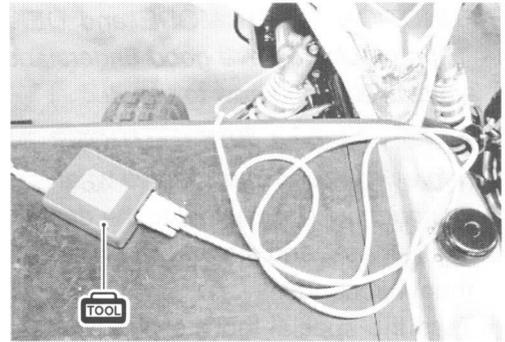
### NOTE:

- \* Even though the malfunction code (FI light blinks) is not indicated, the previous malfunction history code still remains stored in the ECM. Therefore, erase the history code memorized in the ECM using SDS.
- \* The malfunction code is memorized in the ECM also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS.

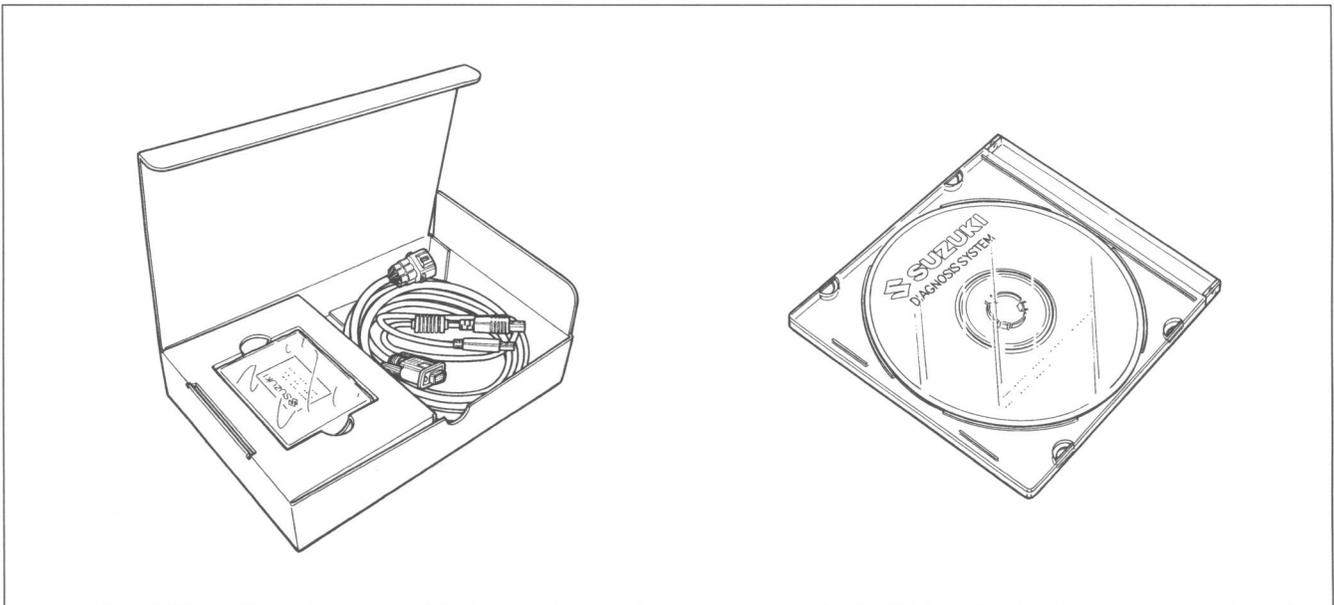


## USE OF SDS DIAGNOSTIC PROCEDURES

- \* Do not disconnect couplers from ECM, the battery cable from the battery, ECM ground wire harness from the engine or main fuse before confirming the malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase the memorized information in ECM memory.
- \* Malfunction code stored in ECM memory can be checked by the SDS.
- \* Be sure to read "PRECAUTIONS IN SERVICING" (☞ 4-3) before inspection and observe what is written there.
- Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- Read the DTC (Diagnostic Trouble Code) and show data when trouble (displaying data at the time of DTC) according to instructions displayed on SDS.
- Not only is SDS used for detecting Diagnostic Trouble Codes but also for reproducing and checking on screen the failure condition as described by customers using the trigger.
- How to use trigger. (Refer to the SDS operation manual for further details.)



 **09904-41010: SDS set tool**  
**99565-01010-007: CD-ROM Ver. 7**



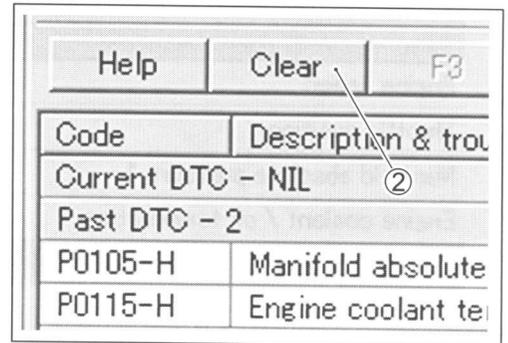
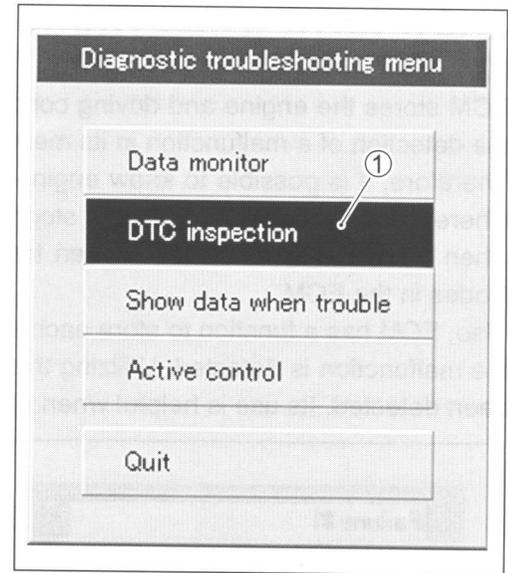
## USE OF SDS DIAGNOSIS RESET PROCEDURE

- After repairing the trouble, turn OFF the ignition switch and turn ON again.
- Click the DTC inspection button ①.
- Check the DTC.
- The previous malfunction history code (Past DTC) still remains stored in the ECM. Therefore, erase the history code memorized in the ECM using SDS tool.

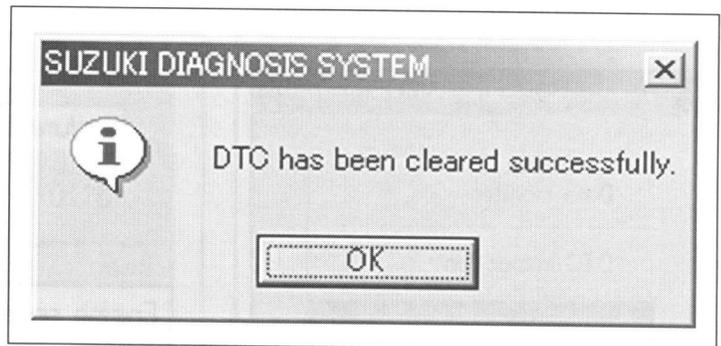
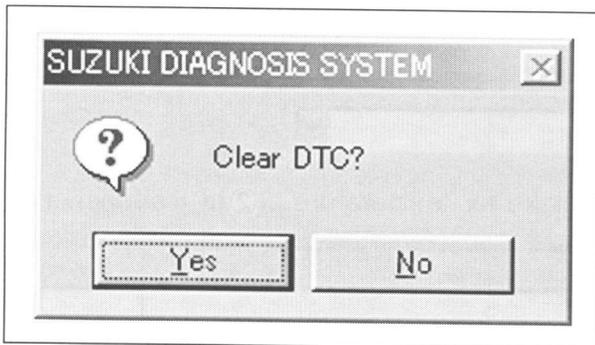
**NOTE:**

The malfunction code is memorized in the ECM also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS.

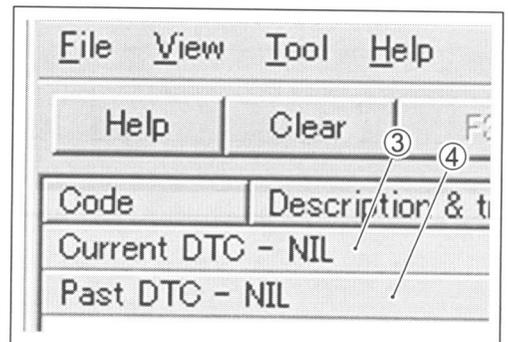
- Click "Clear" ② to delete history code (Past DTC).



- Follow the displayed instructions.



- Check that both "Current DTC" ③ and "Past DTC" ④ are deleted (NIL).



## SHOW DATA WHEN TROUBLE (DISPLAING DATA AT THE TIME OF DTC)

ECM stores the engine and driving conditions (in the form of data as shown in the figure) at the moment of the detection of a malfunction in its memory. This data is called “Show data when trouble”.

Therefore, it is possible to know engine and driving conditions (e.g., whether the engine was warm or not, where the vehicle was running or stopped) when a malfunction was detected by checking the show data when trouble. This show data when trouble function can record the maximum of two Diagnostic Trouble Codes in the ECM.

Also, ECM has a function to store each show data when trouble for two different malfunctions in the order as the malfunction is detected. Utilizing this function, it is possible to know the order of malfunctions that have been detected. Its use is helpful when rechecking or diagnosing a trouble.

Item	Pre-detect	Detect poi...	Post-dete...	Fix point
Engine speed	0	0	0	0
Throttle position	0.5	0.5	0.5	0.5
Manifold absolute pressure 1	100.9	100.9	100.9	100.9
Engine coolant / oil temperature	-30.0	-30.0	-30.0	-30.0
Gear position	---	---	---	---

- Click “Show data when trouble” ① to display the data. By clicking the drop down button ②, either “Failure #1” or “Failure #2” can be selected.



Item	Pre-d
Engine speed	
Throttle position	
Manifold absolute pressure 1	
Engine coolant / oil temperature	
Gear position	

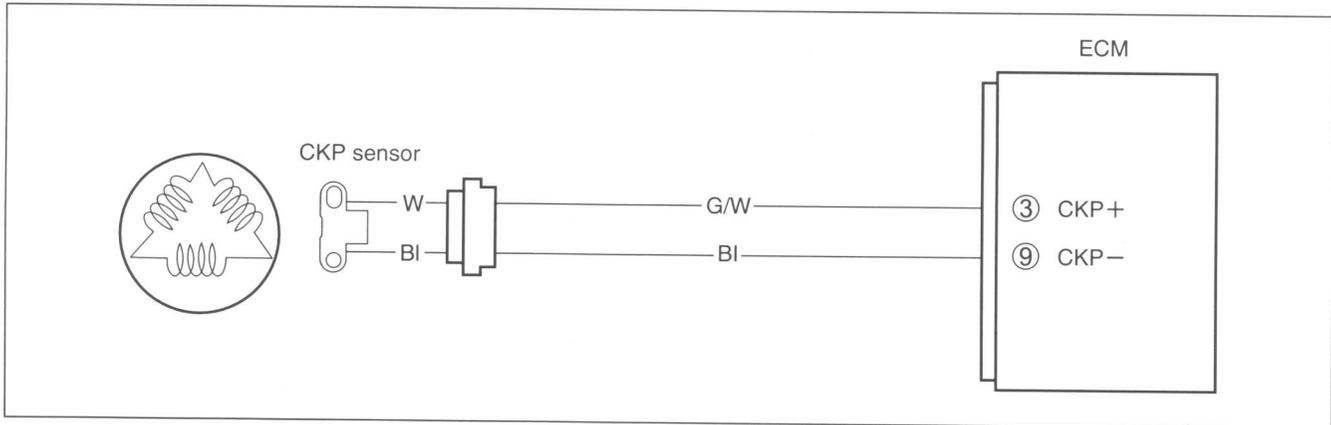
## MALFUNCTION CODE AND DEFECTIVE CONDITION

DTC No.		DETECTED ITEM	DETECTED FAILURE CONDITION	CHECK FOR		
C12		CKP sensor	The signal does not reach ECM for 1 sec. or more, after receiving the IAP sensor input signal.	CKP sensor wiring and mechanical parts CKP sensor, lead wire/coupler connection		
P0335						
C13		IAP sensor	The sensor should produce following voltage. $0.5\text{ V} \leq \text{sensor voltage} < 4.4\text{ V}$ In other than the above range, C13 (P0105) is indicated.	IAP sensor, lead wire/coupler connection		
P0105	H				Sensor voltage is higher than specified value.	IAP sensor circuit shorted to VCC or ground circuit open
	L				Sensor voltage is lower than specified value.	IAP sensor circuit open or shorted to ground or VCC circuit open
C14		TP sensor	The sensor should produce following voltage. $0.5\text{ V} \leq \text{sensor voltage} < 4.8\text{ V}$ In other than the above range, C14 (P0120) is indicated.	TP sensor, lead wire/coupler connection		
P0120	H				Sensor voltage is higher than specified value.	TP sensor circuit shorted to VCC or ground circuit open
	L				Sensor voltage is lower than specified value.	TP sensor circuit open or shorted to ground or VCC circuit open
C15		ECT sensor	The sensor voltage should be the following. $0.1\text{ V} \leq \text{sensor voltage} < 4.8\text{ V}$ In other than the above range, C15 (P0115) is indicated.	ECT sensor, lead wire/coupler connection		
P0115	H				Sensor voltage is higher than specified value.	ECT sensor circuit open or ground circuit open
	L				Sensor voltage is lower than specified value.	ECT sensor circuit shorted to ground
C21		IAT sensor	The sensor voltage should be the following. $0.2\text{ V} \leq \text{sensor voltage} < 4.8\text{ V}$ In other than the above range, C21 (P0110) is indicated.	IAT sensor, lead wire/coupler connection		
P0110	H				Sensor voltage is higher than specified value.	IAT sensor circuit open or ground circuit open
	L				Sensor voltage is lower than specified value.	IAT sensor circuit shorted to ground

DTC No.		DETECTED ITEM	DETECTED FAILURE CONDITION	CHECK FOR
C23		TO sensor	The sensor voltage should be the following for 1 sec. and more, after ignition switch is turned ON. $0.3\text{ V} \leq \text{sensor voltage} < 4.6\text{ V}$ In other than the above value, C23 (P1651) is indicated.	TO sensor, lead wire/coupler connection
P1651	H		Sensor voltage is higher than specified value.	TO sensor circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	TO sensor circuit open or shorted to ground or VCC circuit open
C24		Ignition signal	CKP sensor (pick-up coil) signal is produced, but signal from ignition coil is interrupted 5 times or more continuously. In this case, the code C24 (P0351) is indicated.	Ignition coil, wiring/coupler connection, power supply from the battery
P0351				
C31		Gear position signal	Gear position signal voltage should be higher than the following for 3 seconds and more. Gear position switch voltage $> 0.9\text{ V}$ If lower than the above value, C31 (P0705) is indicated.	GP switch, wiring/coupler connection, gearshift cam, etc.
P0705				
C32		Fuel injector	CKP sensor (pickup coil) signal is produced, but fuel injector signal is interrupted 8 times or more continuously. In this case, the code C32 (P0201) is indicated.	Fuel injector, wiring/coupler connection, power supply to the injector
P0201				
C41	Fuel pump relay	Fuel pump relay	Fuel pump relay signal is not input to ECM.	Fuel pump relay, lead wire/coupler connection.
P0230				
C60	Cooling fan relay	Cooling fan relay	Cooling fan relay signal is not input to ECM.	Cooling fan relay, lead wire/coupler connection
P0480				

## “C12” (P0335) CKP SENSOR CIRCUIT MALFUNCTION

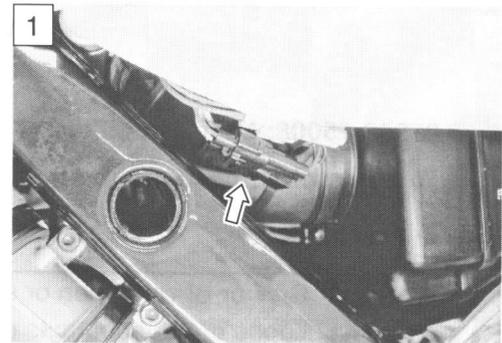
DETECTED CONDITION	POSSIBLE CAUSE
The signal does not reach ECM for 1 sec. or more, after receiving the IAP sensor input signal.	<ul style="list-style-type: none"> <li>• Metal particles or foreign material being stuck on the CKP sensor and rotor tip</li> <li>• CKP sensor circuit open or short</li> <li>• CKP sensor malfunction</li> <li>• ECM malfunction</li> </ul>



### INSPECTION

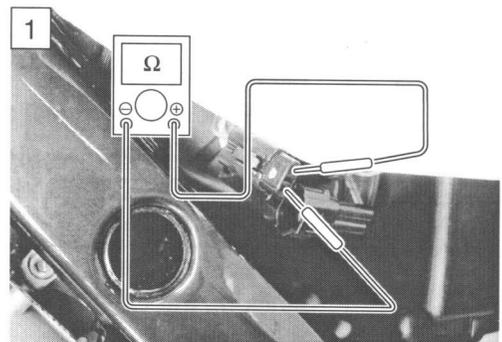
#### Step 1

- 1) Turn the ignition switch OFF.
- 2) Check the CKP sensor coupler for loose or poor contacts.  
If OK, then measure the CKP sensor resistance.



- 3) Disconnect the CKP sensor coupler and measure the resistance.

**DATA** CKP sensor resistance: 155 – 232 Ω  
(White – Blue)



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

**DATA** CKP sensor resistance:  $\infty \Omega$  (Infinity)  
 (White – Ground)  
 (Blue – Ground)

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

**Tester knob indication: Resistance ( $\Omega$ )**

Are the resistance and continuity OK?

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

5) After repairing the trouble, clear the DTC using SDS tool.  
 (☞ 4-25)

**Step 2**

- 1) Crank the engine a few seconds with the starter motor, and measure the CKP sensor peak voltage at the coupler.
- 2) Repeat the above test procedure a few times and measure the highest peak voltage.

**DATA** CKP sensor peak voltage: 0.5 V and more  
 (+ White – - Blue)

① Peak volt adaptor

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

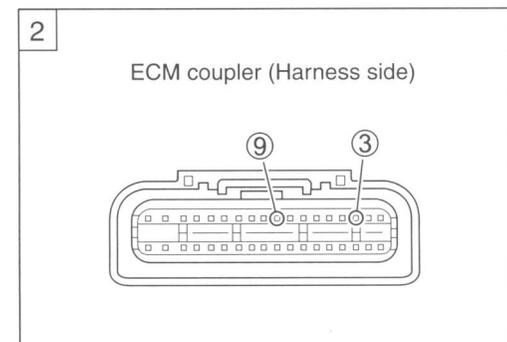
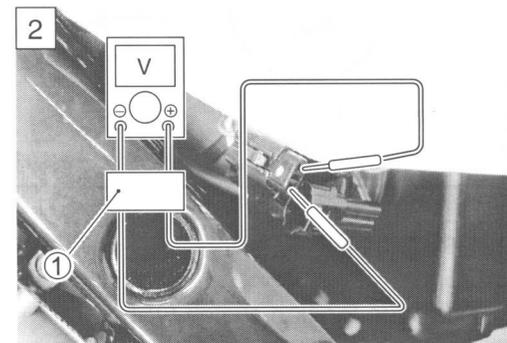
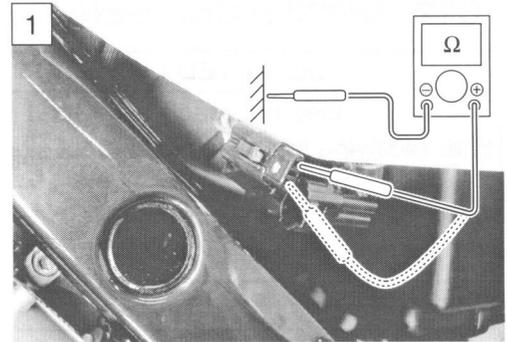
**Tester knob indication: Voltage (V)**

Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>• G/W or BI wire open or shorted to ground.</li> <li>• Loose or poor contacts on the CKP sensor coupler or ECM coupler (terminal ③ or ⑨).</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	<ul style="list-style-type: none"> <li>• Inspect that metal particles or foreign material stuck on the CKP sensor and rotor tip.</li> <li>• If there are no metal particles and foreign material, then replace the CKP sensor with a new one.</li> </ul>

**CAUTION**

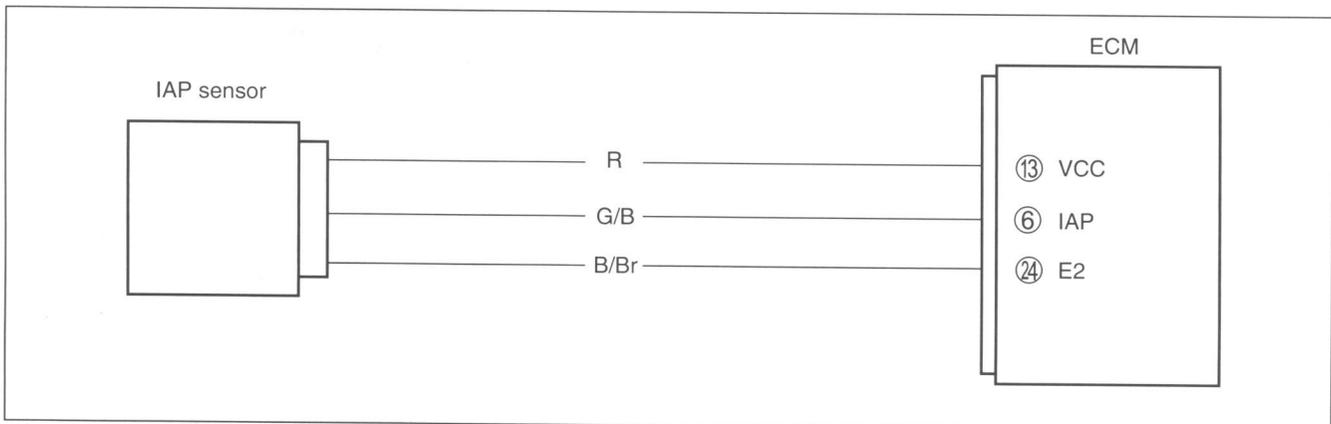
When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.



3) After repairing the trouble, clear the DTC using SDS tool.  
 (☞ 4-25)

## “C13” (P0105-H/L) IAP SENSOR CIRCUIT MALFUNCTION

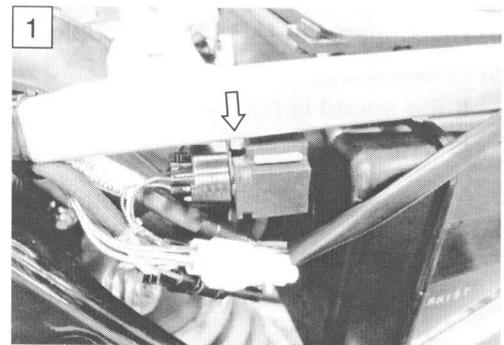
		DETECTED CONDITION	POSSIBLE CAUSE
C13		IAP sensor voltage is not within the following range. $0.5\text{ V} \leq \text{Sensor voltage} < 4.4\text{ V}$ <i>NOTE:</i> Note that atmospheric pressure varies depending on weather conditions as well as altitude. Take that into consideration when inspecting voltage.	<ul style="list-style-type: none"> <li>• Clogged vacuum passage between throttle body and IAP sensor.</li> <li>• Air being drawn from vacuum passage between throttle body and IAP sensor.</li> <li>• IAP sensor circuit open or shorted to ground.</li> <li>• IAP sensor malfunction.</li> <li>• ECM malfunction.</li> </ul>
P0105	H	Sensor voltage is higher than specified value.	<ul style="list-style-type: none"> <li>• IAP sensor circuit shorted to VCC or ground circuit open.</li> </ul>
	L	Sensor voltage is lower than specified value.	<ul style="list-style-type: none"> <li>• IAP sensor circuit open or shorted to ground or VCC circuit open.</li> </ul>



### INSPECTION

#### Step 1 (When indicating C13:)

- 1) Turn the ignition switch OFF.
- 2) Remove the rear fender. (7-8)
- 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 (V)**

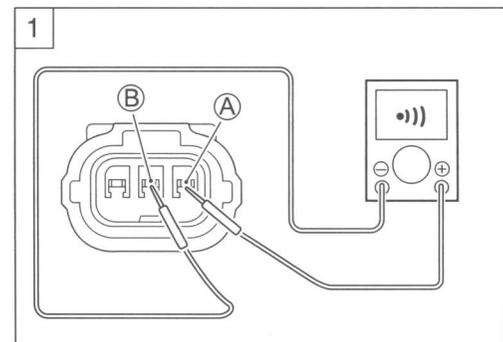
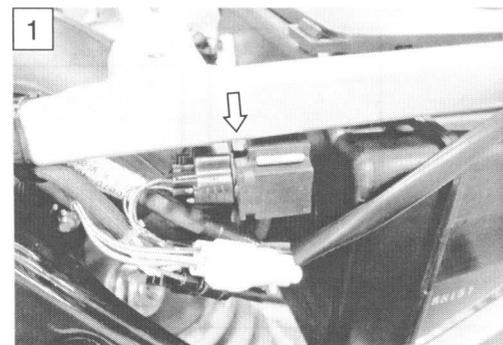
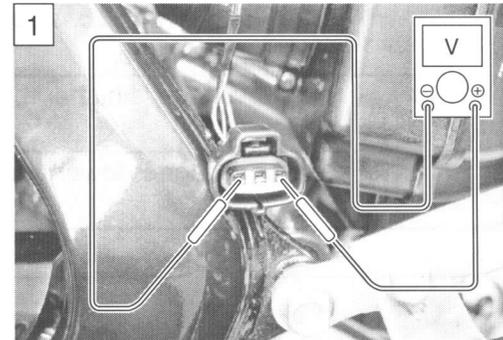
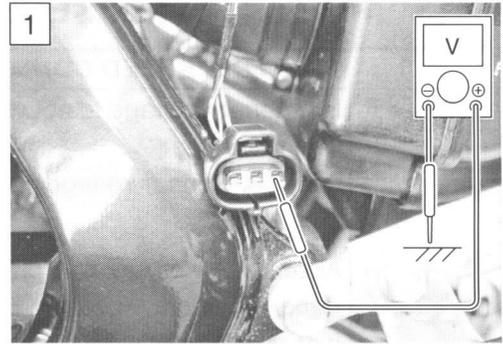
Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>• Loose or poor contacts on the ECM coupler (terminal 13 or 24).</li> <li>• Open or short circuit in the Red wire or B/Br wire.</li> </ul>

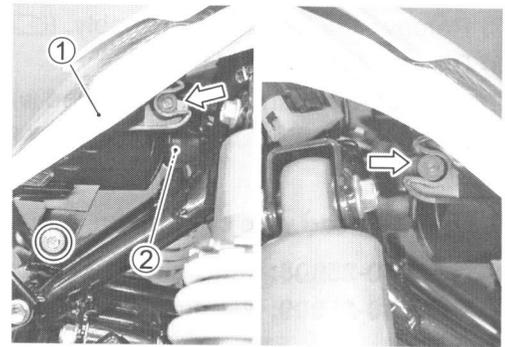
**Step 1 (When indicating P0105-H:)**

- 1) Turn the ignition switch OFF.
- 2) Remove the rear fender. (➡ 7-8)
- 3) Check the IAP sensor coupler for loose or poor contacts.  
 If OK, then check the IAP sensor lead wire continuity.

- 4) Disconnect the IAP sensor coupler.
- 5) Check the continuity between Red wire (A) and G/B wire (B).  
 If the sound is not heard from the tester, the circuit condition is OK.



- 6) Remove the headlight assembly ① and disconnect the headlight coupler ②.

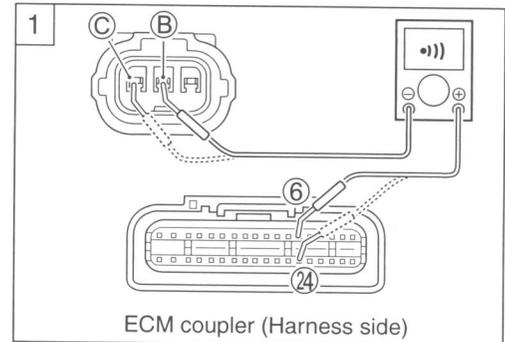


- 7) Disconnect the ECM coupler.
- 8) Check the continuity between G/B wire ⑥ and terminal ④.
- 9) If OK, then check the continuity between B/Br wire ③ and terminal ④.

**DATA** IAPS lead wire continuity: Continuity (•••)

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

**Tester knob indication: Continuity test (•••)**



**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

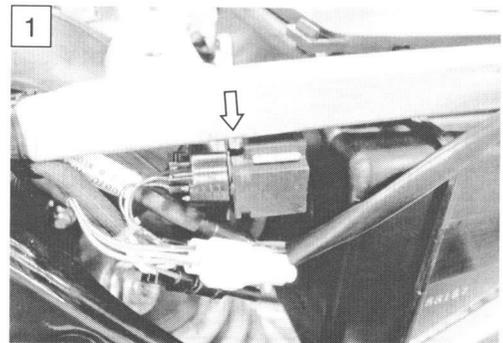
Is the continuity OK?

YES	Go to Step 2.
NO	G/B wire shorted to VCC, or B/Br wire open.

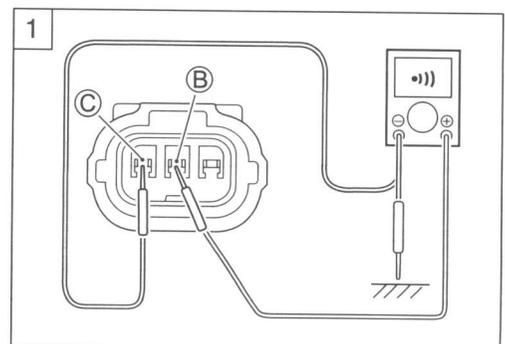
- 10) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

**Step 1 (When indicating P0105-L:)**

- 1) Turn the ignition switch OFF.
- 2) Remove the rear fender. (☞ 7-8)
- 3) Check the IAP sensor coupler for loose or poor contacts. If OK, then check the IAP sensor lead wire continuity.



- 4) Disconnect the IAP sensor coupler.
- 5) Check the continuity between G/B wire ⑥ and ground.
- 6) Also, check the continuity between G/B wire ⑥ and B/Br wire ③. If the sound is not heard from the tester, the circuit condition is OK.



- 7) Remove the headlight assembly. (☞ 4-33)
- 8) Disconnect the ECM coupler.
- 9) Check the continuity between Red wire (A) and terminal (13).
- 10) Also, check the continuity between G/B wire (B) and terminal (6).

**DATA** IAPS lead wire continuity: Continuity (•••)

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

**Tester knob indication: Continuity test (•••)**

**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

Is the continuity OK?

YES	Go to Step 1 (☞ 4-31) and go to Step 2.
NO	Red wire or G/B wire open, or G/B wire shorted to ground

- 11) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

**Step 2**

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

**DATA** IAP sensor output voltage: Approx. 2.7 V at idle speed  
(+ G/B - - B/Br)

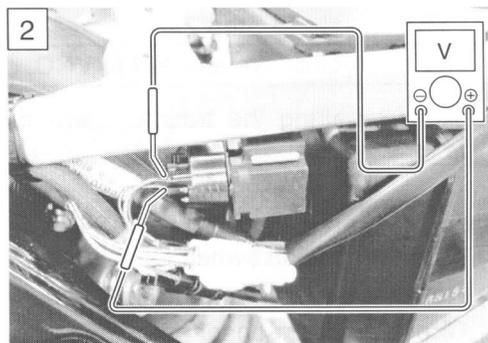
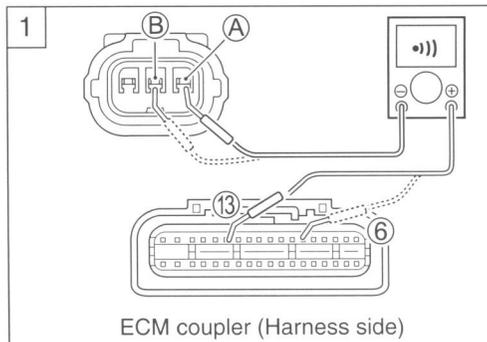
**TOOL** 09900-25008: Multi-circuit tester set  
09900-25009: Needle pointed probe set

**Tester knob indication: Voltage (---)**

Is the voltage OK?

YES	Go to Step 3.
NO	<ul style="list-style-type: none"> <li>• Check the vacuum hose for crack or damage.</li> <li>• Open or short circuit in the G/B wire</li> <li>• If vacuum hose and wire are OK, replace the IAP sensor with a new one.</li> </ul>

- 4) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)



**Step 3**

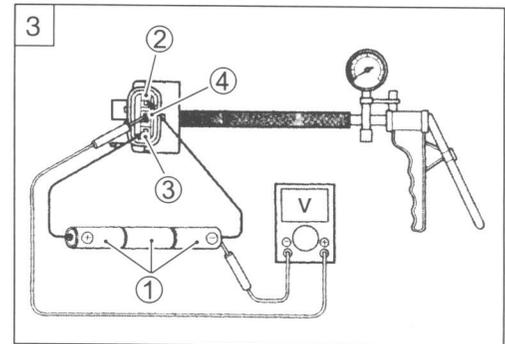
- 1) Turn the ignition switch OFF.
- 2) Remove the IAP sensor.
- 3) Connect the vacuum pump gauge to the vacuum port of the IAP sensor.

Arrange 3 new 1.5 V batteries in series ① (check that total voltage is 4.5 – 5.0 V) and connect  $\ominus$  terminal to the ground terminal ② and  $\oplus$  terminal to the VCC terminal ③.

- 4) Check the voltage between Vout ④ and ground. Also, check if voltage reduces when vacuum is applied up to 53 kPa (400 mmHg) by using vacuum pump gauge. (↗ 4-36)

**TOOL** 09917-47011: Vacuum pump gauge  
09900-25008: Multi-circuit tester set

**Tester knob indication: Voltage (---)**

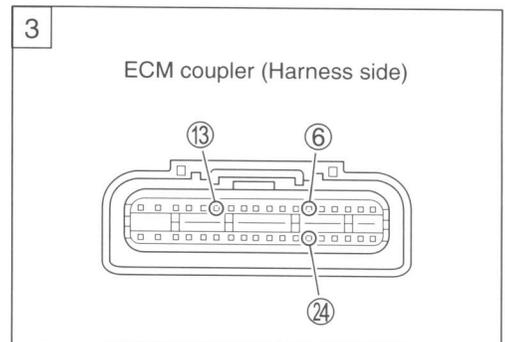


Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>• G/B, Red or B/Br wire open or shorted to ground, or poor ⑥, ⑬ or ⑳ connection</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	If check result is not satisfactory, replace the IAP sensor with a new one.

**CAUTION**

**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**



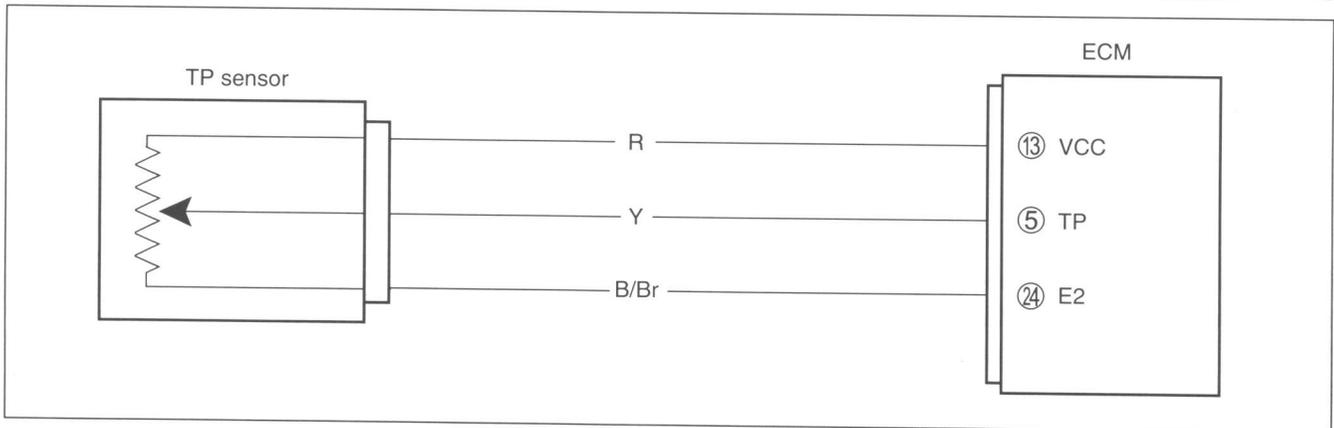
- 5) After repairing the trouble, clear the DTC using SDS tool. (↗ 4-25)

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	3.1 – 3.6
2 001   5 000	611   1 524	707   634	94   85	2.8 – 3.4
5 001   8 000	1 525   2 438	634   567	85   76	2.6 – 3.1
8 001   10 000	2 439   3 048	567   526	76   70	2.4 – 2.9

## “C14” (P0120-H/L) TP SENSOR CIRCUIT MALFUNCTION

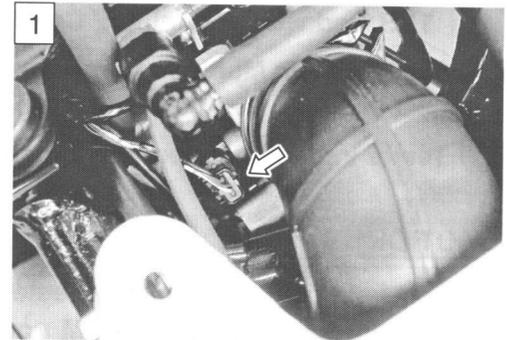
DETECTED CONDITION		POSSIBLE CAUSE
C14	Output voltage is not within the following range. Difference between actual throttle opening and opening calculated by ECM is larger than specified value. $0.5\text{ V} \leq \text{Sensor voltage} < 4.8\text{ V}$	<ul style="list-style-type: none"> <li>TP sensor maladjusted</li> <li>TP sensor circuit open or short</li> <li>TP sensor malfunction</li> <li>ECM malfunction</li> </ul>
P0120	H Sensor voltage is higher than specified value.	<ul style="list-style-type: none"> <li>TP sensor circuit shorted to VCC or ground circuit open</li> </ul>
	L Sensor voltage is lower than specified value.	<ul style="list-style-type: none"> <li>TP sensor circuit open or shorted to ground or VCC circuit open</li> </ul>



### INSPECTION

#### Step 1 (When indicating C14:)

- Turn the ignition switch OFF.
- Remove the fuel tank cover. (7-6)
- Check the TP sensor coupler for loose or poor contacts.  
If OK, then measure the TP sensor input voltage.
- Disconnect the TP sensor coupler.
- Turn the ignition switch ON.
- Measure the voltage at the Red wire (A) and ground.
- If OK, then measure the voltage at the Red wire (A) and B/Br wire (B).



**DATA** TP sensor input voltage: 4.5 – 5.5 V

(+ Red – – Ground)

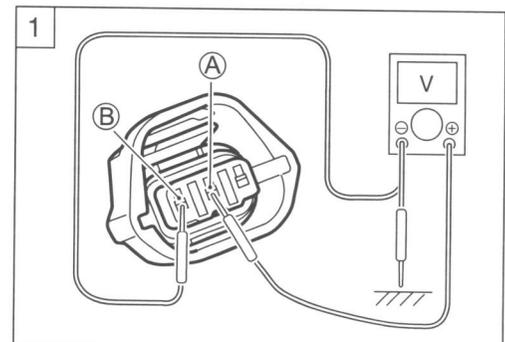
(+ Red – – B/Br)

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

**Tester knob indication: Voltage (---)**

Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>Loose or poor contacts on the ECM coupler (terminal 13 or 31).</li> <li>Open or short circuit in the Red wire or B/Br wire.</li> </ul>

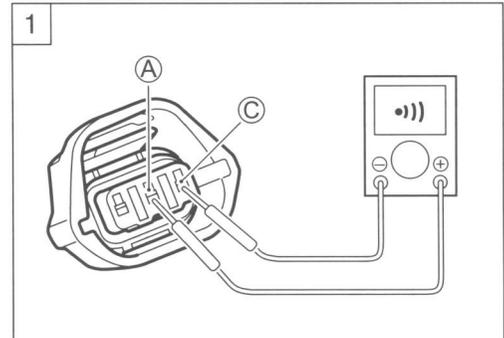


**Step 1 (When indicating P0120-H:)**

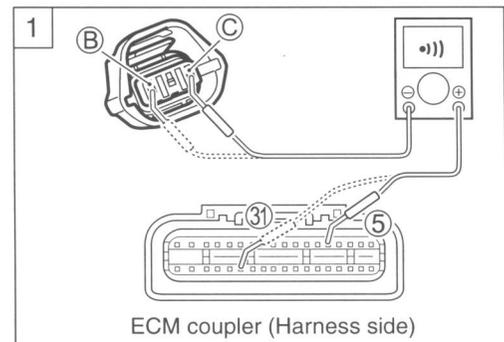
- 1) Turn the ignition switch OFF.
- 2) Remove the fuel tank cover. (👉 7-6)
- 3) Check the TP sensor coupler for loose or poor contacts.  
If OK, then check the TP sensor lead wire continuity.



- 4) Disconnect the TP sensor coupler.
- 5) Check the continuity between Yellow wire ③ and Red wire ①.  
If the sound is not heard from the tester, the circuit condition is OK.



- 6) Remove the headlight assembly. (👉 4-33)
- 7) Disconnect the ECM coupler.
- 8) Check the continuity between Yellow wire ③ and terminal ⑤.
- 9) Also, check the continuity between B/Br wire ② and terminal ③.



**DATA** TPS lead wire continuity: Continuity (•||)

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

**Tester knob indication: Continuity test (•||)**

**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

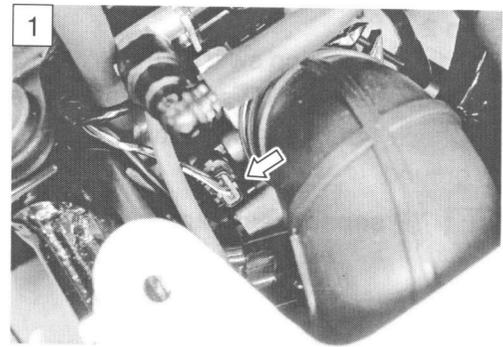
Is the continuity OK?

YES	Go to Step 2.
NO	Yellow wire shorted to VCC, or B/Br wire open

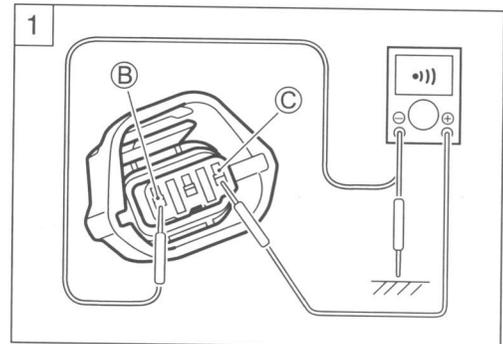
- 10) After repairing the trouble, clear the DTC using SDS tool. (👉 4-25)

**Step 1 (When indicating P0120-L:)**

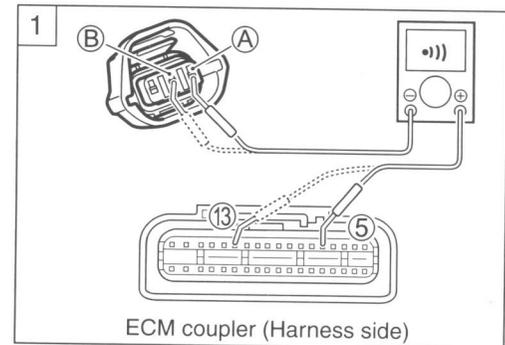
- 1) Turn the ignition switch OFF.
- 2) Remove the fuel tank cover. (☞ 7-6)
- 3) Check the TP sensor coupler for loose or poor contacts.  
If OK, then check the TP sensor lead wire continuity.



- 4) Disconnect the TP sensor coupler.
- 5) Check the continuity between Yellow wire ③ and ground.
- 6) Also, check the continuity between Yellow wire ③ and B/Br wire ②. If the sound is not heard from the tester, the circuit condition is OK.



- 7) Remove the headlight assembly. (☞ 4-33)
- 8) Disconnect the ECM coupler.
- 9) Check the continuity between Yellow wire ③ and terminal ⑤.
- 10) Also, check the continuity between Red wire ① and terminal ⑬.



**DATA** TPS lead wire continuity: Continuity (••)

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

09900-25009: Needle pointed probe set

**Tester knob indication: Continuity test (••)**

**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

Is the continuity OK?

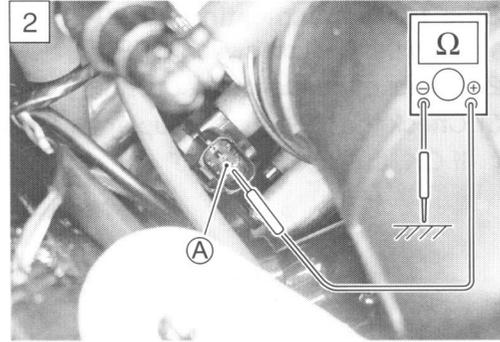
YES	Go to Step 1 (☞ 4-37) and go to Step 2.
NO	Red wire or Yellow wire open, or Yellow wire shorted to ground

- 11) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

**Step 2**

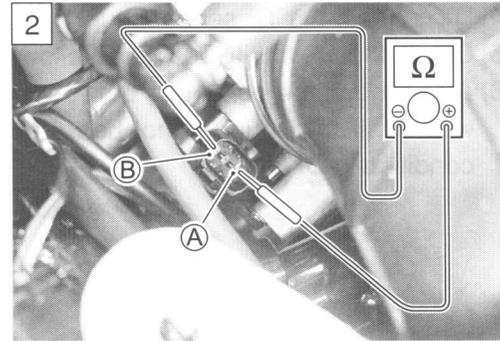
- 1) Turn the ignition switch OFF.
- 2) Disconnect the TP sensor coupler and ECM coupler.
- 3) Check the continuity between terminal Ⓐ (Yellow wire) and ground.

**DATA** TP sensor resistance:  $\infty \Omega$  (Infinity)  
(Terminal Ⓐ – Ground)



- 4) If OK, then measure the TP sensor resistance at the terminals [between terminal Ⓐ (Yellow wire) and terminal Ⓑ (B/Br wire)].
- 5) Push the throttle lever and measure the resistance.

**DATA** TP sensor resistance  
Throttle valve is closed: Approx. 1.4 k $\Omega$   
Throttle valve is opened: Approx. 4.2 k $\Omega$

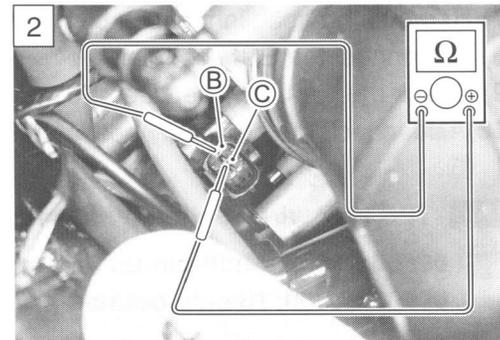


- 6) If OK, then measure the TP sensor resistance at the terminals [between terminal Ⓒ (Red wire) and terminal Ⓑ (B/Br wire)].

**DATA** TP sensor resistance: Approx. 5.0 k $\Omega$   
(Terminal Ⓒ – Terminal Ⓑ)

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

**Tester knob indication: Resistance ( $\Omega$ )**



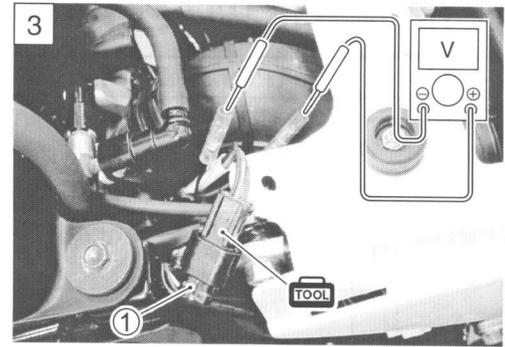
Are the continuity and resistance OK?

YES	Go to Step 3.
NO	<ul style="list-style-type: none"> <li>• Reset the TP sensor position correctly.</li> <li>• Replace the TP sensor with a new one.</li> </ul>

- 7) After repairing the trouble, clear the DTC using SDS tool.  
( 4-25)

**Step 3**

- 1) Connect the TP sensor coupler ① to the test harness.
- 2) Turn the ignition switch ON.
- 3) Measure the TP sensor output voltage at the coupler (between ⊕ Yellow and ⊖ B/Br) by pushing the throttle lever.



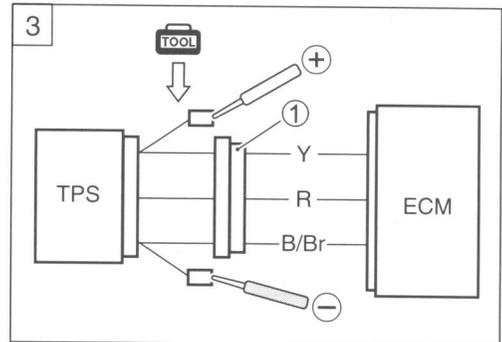
**DATA** TP sensor output voltage

Throttle valve is closed: Approx. 0.6 V

Throttle valve is opened: Approx. 3.8 V

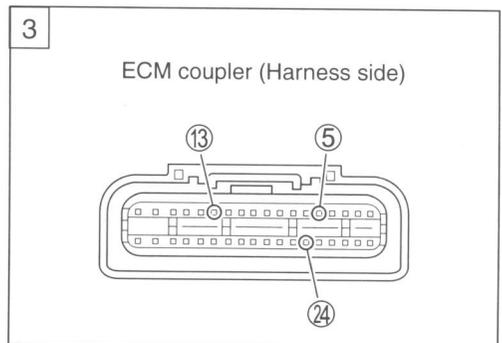
- TOOL** 09900-25008: Multi-circuit tester set
- 09900-28630: TPS test wire harness

**Tester knob indication: Voltage (---)**



Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>• Yellow, Red or B/Br wire open or shorted to ground, or poor ⑤, ⑬ or ⑳ connection</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	If check result is not satisfactory, replace TP sensor with a new one.



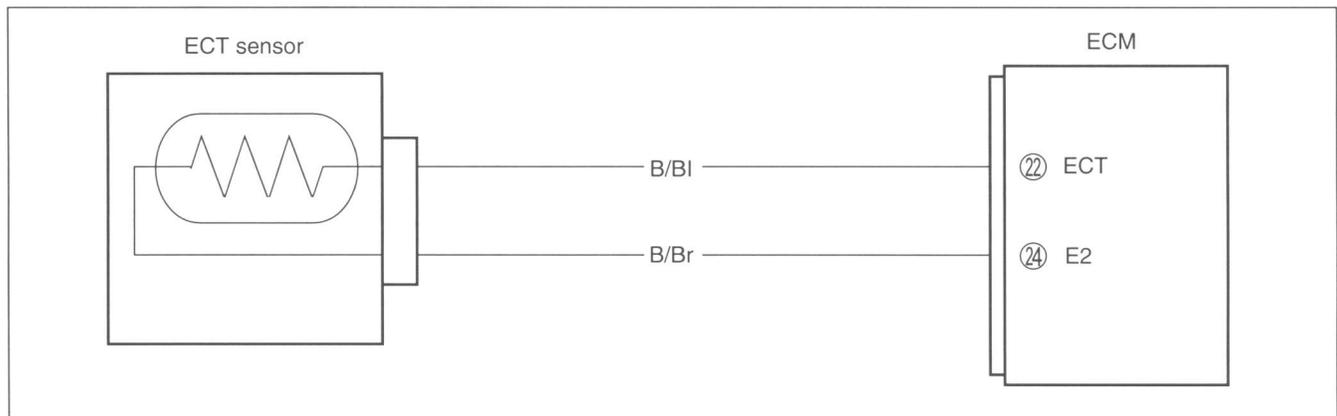
**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

- 4) After repairing the trouble, clear the DTC using SDS tool. (4-25)

### “C15” (P0115-H/L) ECT SENSOR CIRCUIT MALFUNCTION

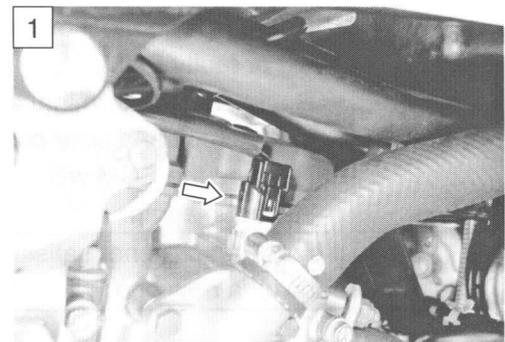
DETECTED CONDITION		POSSIBLE CAUSE
C15	Output voltage is not within the following range. $0.1\text{ V} \leq \text{Sensor voltage} < 4.8\text{ V}$	<ul style="list-style-type: none"> <li>ECT sensor circuit open or short</li> <li>ECT sensor malfunction</li> <li>ECM malfunction</li> </ul>
P0115	H Sensor voltage is higher than specified value.	<ul style="list-style-type: none"> <li>ECT sensor circuit open or ground circuit open</li> </ul>
	L Sensor voltage is lower than specified value.	<ul style="list-style-type: none"> <li>ECT sensor circuit shorted to ground</li> </ul>



#### INSPECTION

##### Step 1 (When indicating C15:)

- 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/BI wire terminal (A) and ground.
- 5) If OK, then measure the voltage between B/BI wire terminal (A) and B/Br wire terminal (B).

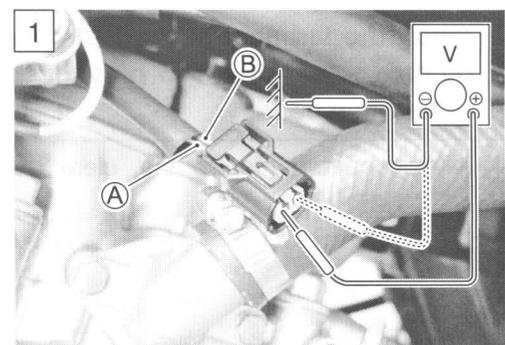


**DATA** ECT sensor voltage: 4.5 – 5.5 V  
 (+ B/BI – (–) Ground)  
 (+ B/BI – (–) B/Br)

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

**Tester knob indication: Voltage (V)**

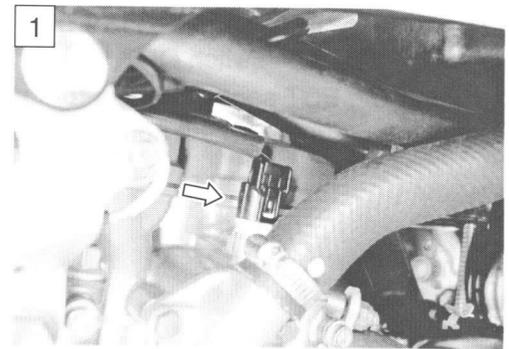
Is the voltage OK?



YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>Loose or poor contacts on the ECM coupler (terminal 22 or 24).</li> <li>Open or short circuit in the B/BI wire or B/Br wire</li> </ul>

**Step 1 (When indicating P0115-H:)**

- 1) Turn the ignition switch OFF.
- 2) Check the ECT sensor coupler for loose or poor contacts.  
If OK, then check the ECT sensor lead wire continuity.

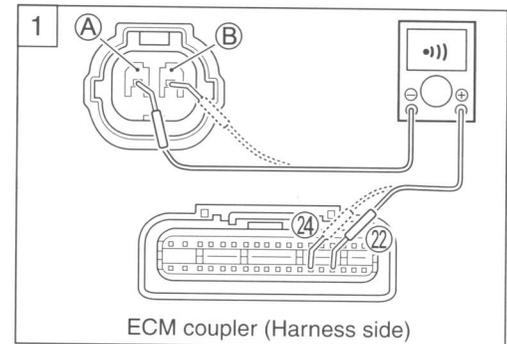


- 3) Remove the headlight assembly. (➡ 4-33)
- 4) Disconnect the ECT sensor coupler and ECM coupler.
- 5) Check the continuity between B/BI wire (A) and terminal (22).
- 6) Also, check the continuity between B/Br wire (B) and terminal (24).

**DATA** ECTS lead wire continuity: Continuity (•••)

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

**Tester knob indication: Continuity test (•••)**



**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

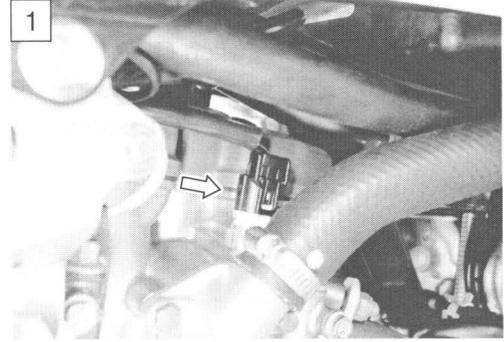
Is the continuity OK?

YES	Go to Step 2.
NO	B/BI or B/Br wire open

- 7) After repairing the trouble, clear the DTC using SDS tool. (➡ 4-25)

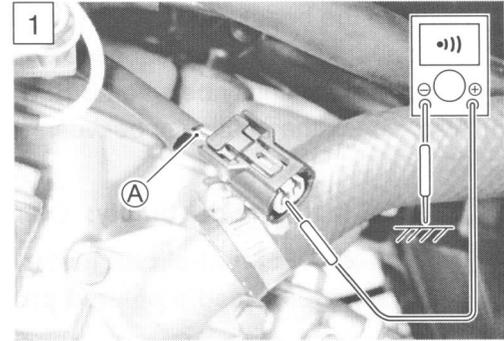
**Step 1 (When indicating P0115-L:)**

- 1) Turn the ignition switch OFF.
- 2) Check the ECT sensor coupler for loose or poor contacts.  
If OK, then measure the output voltage.



- 3) Disconnect the ECT sensor coupler.
- 4) Check the continuity between B/BI wire (A) and ground.  
If the sound is not heard from the tester, the circuit condition is OK.

**Tester knob indication: Continuity test (•••)**

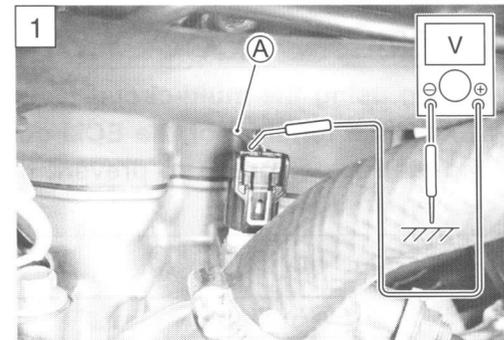


- 5) Connect the ECT sensor coupler.
- 6) Insert the needle pointed probe to the lead wire coupler.
- 7) Turn the ignition switch ON.
- 8) Measure the voltage between B/BI wire (A) and ground.

**DATA** ECT sensor output voltage: 0.15 – 4.85 V  
(+ B/BI – - Ground)

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

**Tester knob indication: Voltage (V)**



Are the continuity and voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>• B/BI wire shorted to ground</li> <li>• If wire is OK, go to Step 2.</li> </ul>

- 9) After repairing the trouble, clear the DTC using SDS tool.  
( 4-25)

**Step 2**

- 1) Turn the ignition switch OFF.
- 2) Remove the fuel tank and fuel tank lower cover. (☞ 5-4)
- 3) Disconnect the ECT sensor coupler.
- 4) Measure the ECT sensor resistance.

**DATA** ECT sensor resistance:

**Approx. 2.6 kΩ at 20 °C (68 °F)**  
(Terminal – Terminal)

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

**Tester knob indication: Resistance (Ω)**

Refer to page 6-10 for details.

Is the resistance OK?

YES	<ul style="list-style-type: none"> <li>• B/BI or B/Br wire open or shorted to ground, or poor ② or ④ connection.</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	Replace the ECT sensor with a new one.

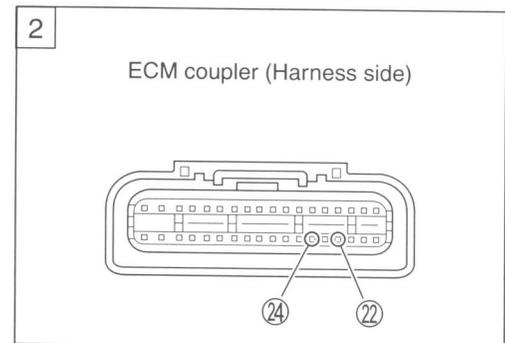
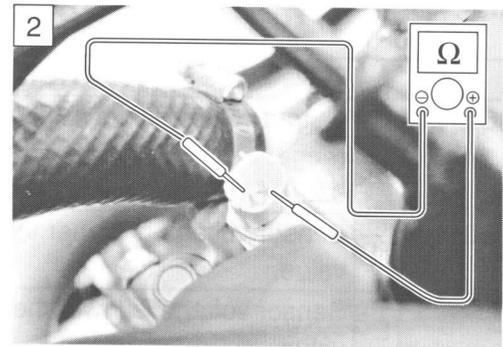
**CAUTION**

**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

- 5) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

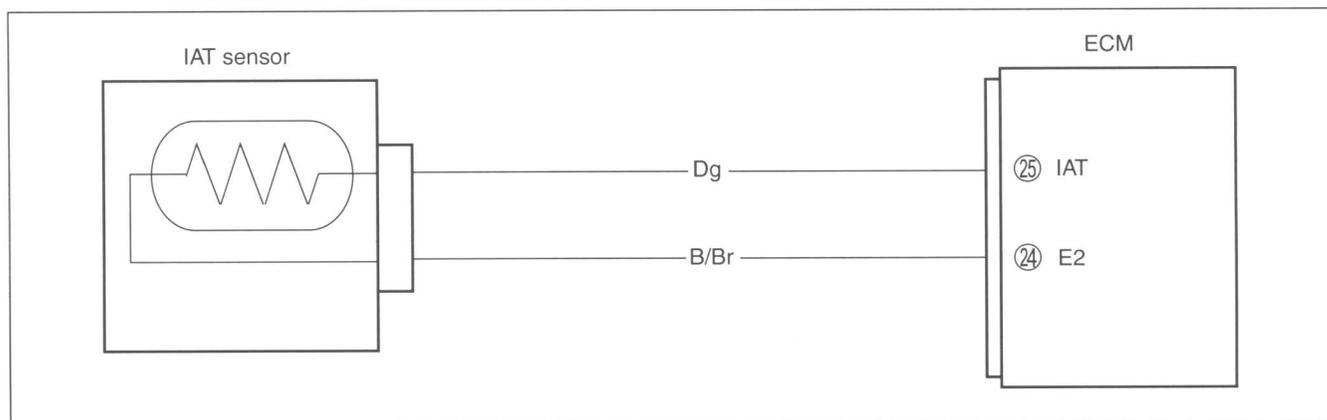
**DATA** ECT sensor specification

Engine Coolant Temp	Resistance
20 °C (68 °F)	Approx. 2.6 kΩ
50 °C (122 °F)	Approx. 0.772 kΩ
80 °C (176 °F)	Approx. 0.279 kΩ
110 °C (230 °F)	Approx. 0.118 kΩ



## “C21” (P0110-H/L) IAT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
C21	Output voltage is not within the following range. $0.2\text{ V} \leq \text{Sensor voltage} < 4.8\text{ V}$	<ul style="list-style-type: none"> <li>IAT sensor circuit open or short</li> <li>IAT sensor malfunction</li> <li>ECM malfunction</li> </ul>
P0110	H	<ul style="list-style-type: none"> <li>IAT sensor circuit open or ground circuit open</li> <li>IAT sensor circuit shorted to ground</li> </ul>
	L	



### INSPECTION

#### Step 1 (When indicating C21:)

- Turn the ignition switch OFF.
- Remove the seat. (↗ 7-6)
- Check the IAT sensor coupler for loose or poor contacts.  
If OK, then measure the IAT sensor voltage at the wire side coupler.
- Disconnect the coupler and turn the ignition switch ON.

- Measure the voltage between Dg wire terminal (A) and ground.
- If OK, then measure the voltage between Dg wire terminal (A) and B/Br wire terminal (B).

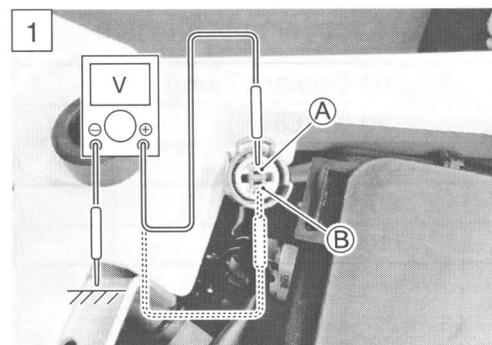
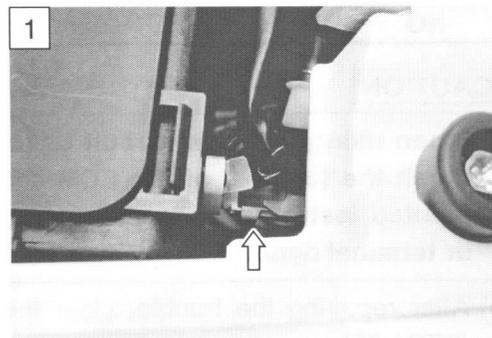
**DATA** IAT sensor input voltage: 4.5 – 5.5 V  
 (+ Dg – (–) Ground)  
 (+ Dg – (–) B/Br)

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

**Tester knob indication: Voltage (---)**

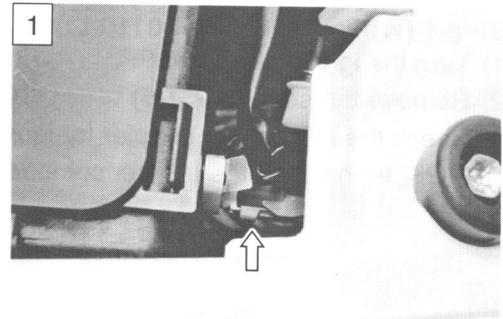
Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>Loose or poor contacts on the ECM coupler (terminal 24 or 25)</li> <li>Open or short circuit in the Dg wire or B/Br wire</li> </ul>



**Step 1 (When indicating P0110-H:)**

- 1) Turn the ignition switch OFF.
- 2) Remove the seat. (☞ 7-6)
- 3) Check the IAT sensor coupler for loose or poor contacts.  
If OK, then check the IAT sensor lead wire continuity.

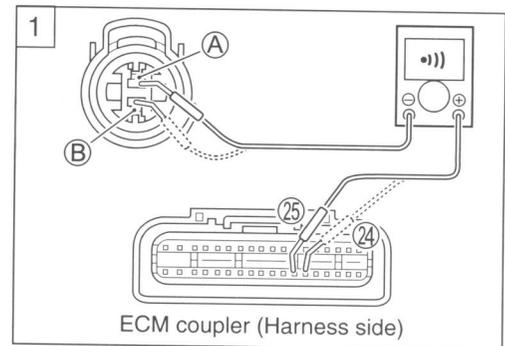


- 4) Remove the headlight assembly. (☞ 4-33)
- 5) Disconnect the IAT sensor coupler and ECM coupler.
- 6) Check the continuity between Dg wire (A) and terminal (25).
- 7) Also, check the continuity between B/Br wire (B) and terminal (24).

**DATA** IATS lead wire continuity: Continuity (•••)

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

**Tester knob indication: Continuity test (•••)**



**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

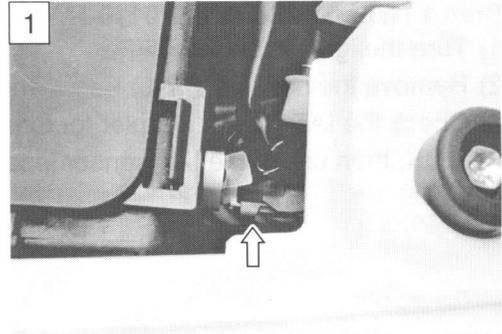
Is the continuity OK?

YES	Go to Step 2.
NO	Dg wire or B/Br wire open

- 8) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

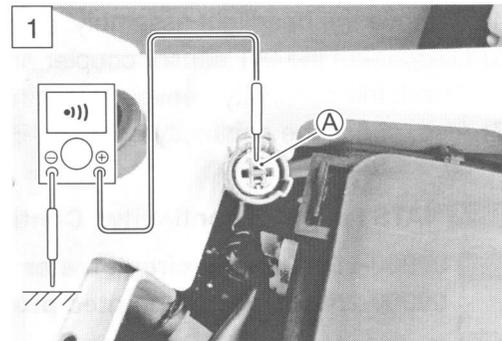
**Step 1 (When indicating P0110-L:)**

- 1) Turn the ignition switch OFF.
- 2) Remove the seat. (☞ 7-6)
- 3) Check the IAT sensor coupler for loose or poor contacts.  
If OK, then check the IAT sensor lead wire continuity.



- 4) Disconnect the IAT sensor coupler.
- 5) Check the continuity between Dg wire (A) and ground. If the sound is not heard from the tester, the circuit condition is OK.

 **Tester knob indication: Continuity test (••••)**

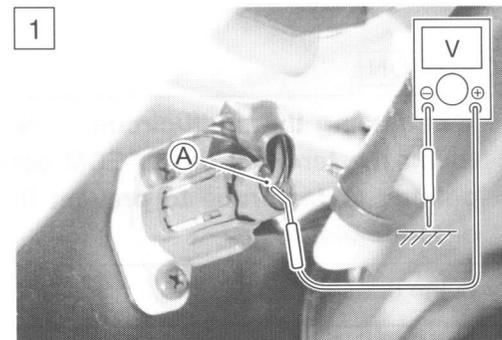


- 6) Connect the IAT sensor coupler.
- 7) Insert the needle pointed probe to the lead wire coupler.
- 8) Turn the ignition switch ON.
- 9) Measure the voltage between Dg wire (A) and ground.

**DATA** IAT sensor output voltage: 0.15 – 4.85 V  
(+ Dg – - Ground)

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

 **Tester knob indication: Voltage (---)**



Are the continuity and voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> <li>• Dg wire shorted to ground</li> <li>• If wire is OK, go to Step 2.</li> </ul>

- 10) After repairing the trouble, clear the DTC using SDS tool.  
(☞ 4-25)

**Step 2**

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

**DATA** IAT sensor resistance: **Approx. 2.6 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	<ul style="list-style-type: none"> <li>• Dg or B/Br wire open or shorted to ground, or poor ②⑤ or ②④ connection</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	Replace the IAT sensor with a new one.

**CAUTION**

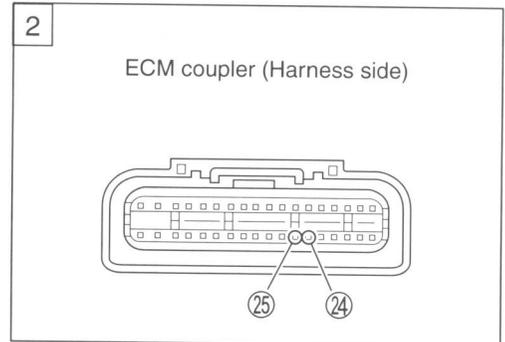
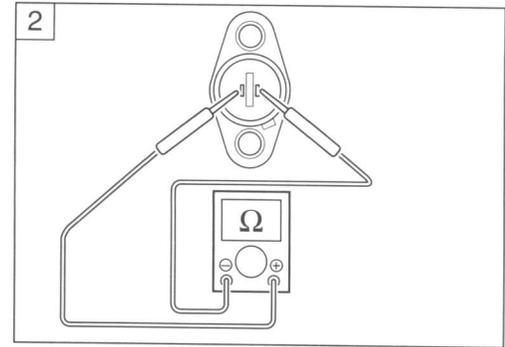
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

**DATA** IAT sensor specification

Intake Air Temp	Resistance
20 °C (68 °F)	Approx. 2.6 kΩ
50 °C (122 °F)	Approx. 0.772 kΩ
80 °C (176 °F)	Approx. 0.280 kΩ
110 °C (230 °F)	Approx. 0.118 kΩ

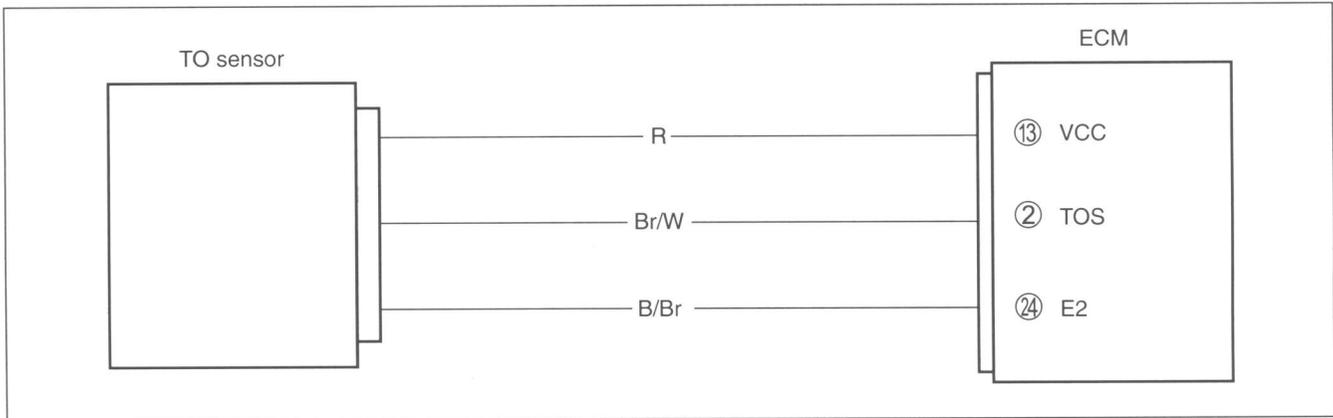
**NOTE:**

IAT sensor resistance measurement method is the same way as that of the ECT sensor. Refer to page 6-10 for details.



### “C23” (P1651-H/L) TO SENSOR CIRCUIT MALFUNCTION

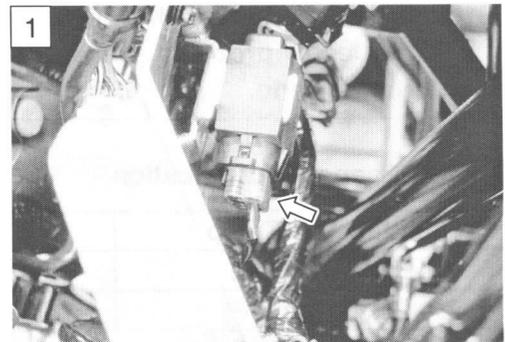
DETECTED CONDITION		POSSIBLE CAUSE
C23	The sensor voltage should be the following for 1 sec. and more, after ignition switch is turned ON. $0.3\text{ V} \leq \text{Sensor voltage} < 4.6\text{ V}$	<ul style="list-style-type: none"> <li>• TO sensor circuit open or short</li> <li>• TO sensor malfunction</li> <li>• ECM malfunction</li> </ul>
P1651	H	• TO sensor circuit shorted to VCC or ground circuit open
	L	• TO sensor circuit open or shorted to ground or VCC circuit open



#### INSPECTION

##### Step 1 (When indicating C23:)

- 1) Turn the ignition switch OFF.
- 2) Remove the front fender. (🔧 7-6)
- 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 terminal (A) (Red wire) and terminal (B) (B/Br wire).

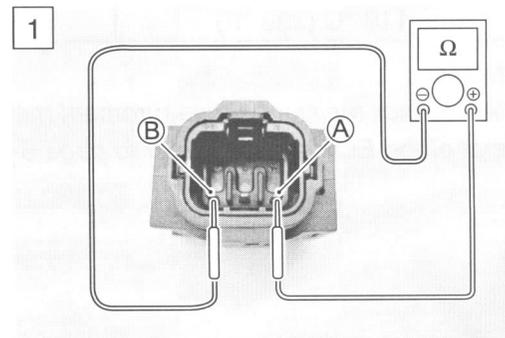
**DATA** TO sensor resistance: 15.0 – 25.0 kΩ  
(Terminal (A) – Terminal (B))

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

**Tester knob indication: Resistance (Ω)**

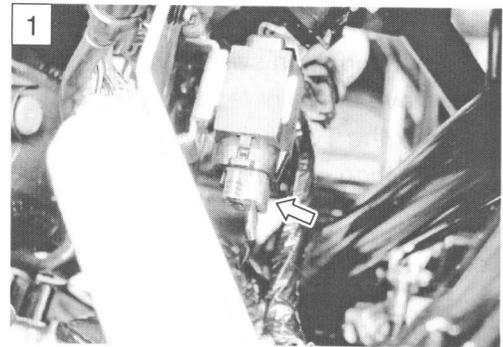
Is the resistance OK?

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

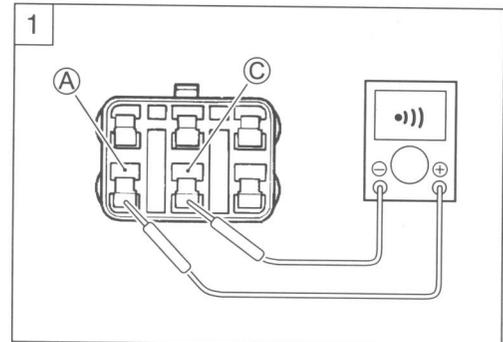


**Step 1 (When indicating P1651-H:)**

- 1) Turn the ignition switch OFF.
- 2) Remove the front fender. (↖ 7-6)
- 3) Check the TO sensor coupler for loose or poor contacts.  
If OK, then check the TO sensor lead wire continuity.



- 4) Disconnect the TO sensor coupler.
- 5) Check the continuity between Red wire (A) and Br/W wire (C).  
If the sound is not heard from the tester, the circuit condition is OK.



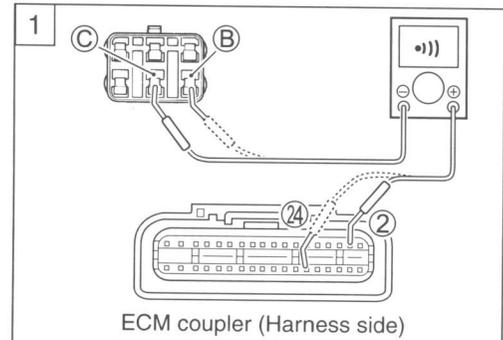
- 6) Remove the headlight assembly. (↖ 4-33)
- 7) Disconnect the ECM coupler.
- 8) Check the continuity between Br/W wire (C) and terminal (2).
- 9) Also, check the continuity between B/Br wire (B) and terminal (24).

**DATA** TOS lead wire continuity: Continuity (•••)

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

09900-25009: Needle pointed probe set

**Tester knob indication: Continuity test (•••)**



**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

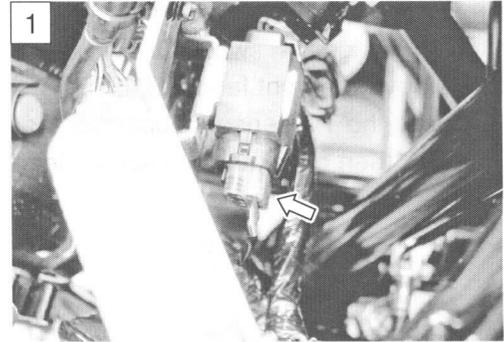
Is the continuity OK?

YES	Go to Step 2.
NO	Br/W wire shorted to VCC, or B/Br wire open.

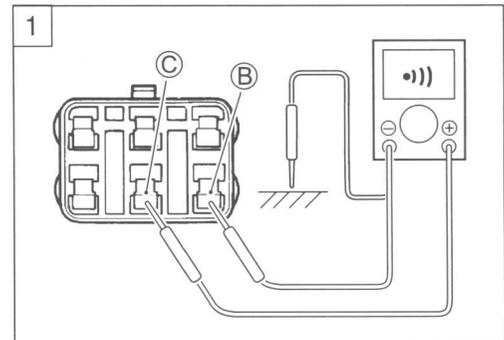
- 10) After repairing the trouble, clear the DTC using SDS tool. (↖ 4-25)

**Step 1 (When indicating P1651-L:)**

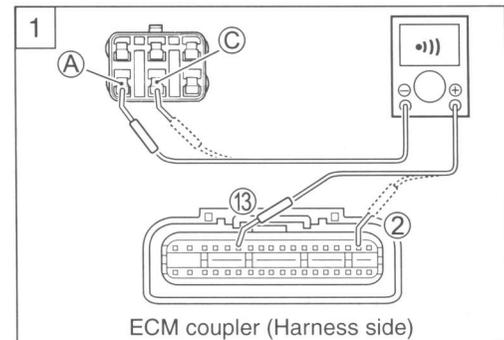
- 1) Turn the ignition switch OFF.
- 2) Remove the front fender. (☞ 7-6)
- 3) Check the TO sensor coupler for loose or poor contacts.  
If OK, then check the TO sensor lead wire continuity.



- 4) Disconnect the TO sensor coupler.
- 5) Check the continuity between Br/W wire ③ and ground.
- 6) Also, check the continuity between Br/W wire ③ and B/Br wire ②. If the sound is not heard from the tester, the circuit condition is OK.



- 7) Remove the headlight assembly. (☞ 4-33)
- 8) Disconnect the ECM coupler.
- 9) Check the continuity between Red wire ① and terminal ⑬.
- 10) Also, then check the continuity between Br/W wire ③ and terminal ②.



**DATA** TOS lead wire continuity: Continuity (•||)

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

**Tester knob indication: Continuity test (•||)**

**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

Is the continuity OK?

YES	Go to Step 2.
NO	Red or Br/W wire open, or Br/W wire shorted to ground.

- 11) After repairing the trouble, clear the DTC using SDS tool. (☞ 4-25)

**Step 2**

- 1) Connect the TO sensor coupler and ECM 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 (Normal): 0.4 – 1.4 V  
(⊕ Br/W – ⊖ B/Br)

Also, measure the voltage when leaning the vehicle.

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

**DATA** TO sensor voltage (Leaning): 3.7 – 4.4 V  
(⊕ Br/W – ⊖ B/Br)

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

**Tester knob indication: Voltage (V)**

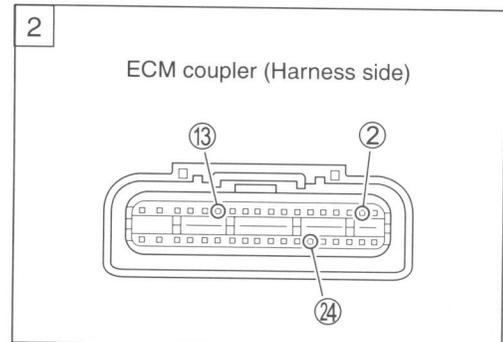
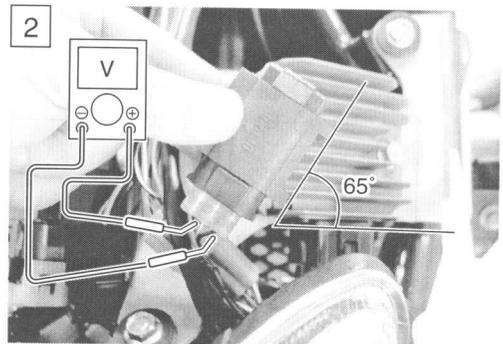
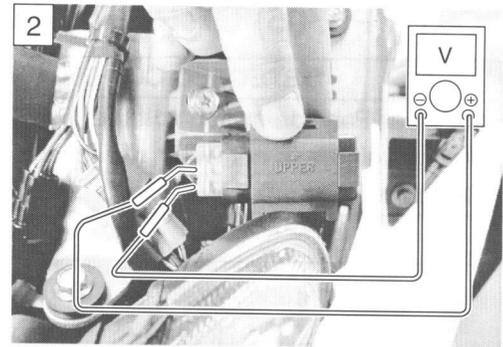
Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>• Br/W, Red or B/Br wire open or shorted to ground, or poor ②, ⑬ or ⑭ connection</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	<ul style="list-style-type: none"> <li>• Loose or poor contacts on the ECM coupler</li> <li>• Open or short circuit</li> <li>• Replace the TO sensor with a new one.</li> </ul>

**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

- 6) After repairing the trouble, clear the DTC using SDS tool. (P4-25)

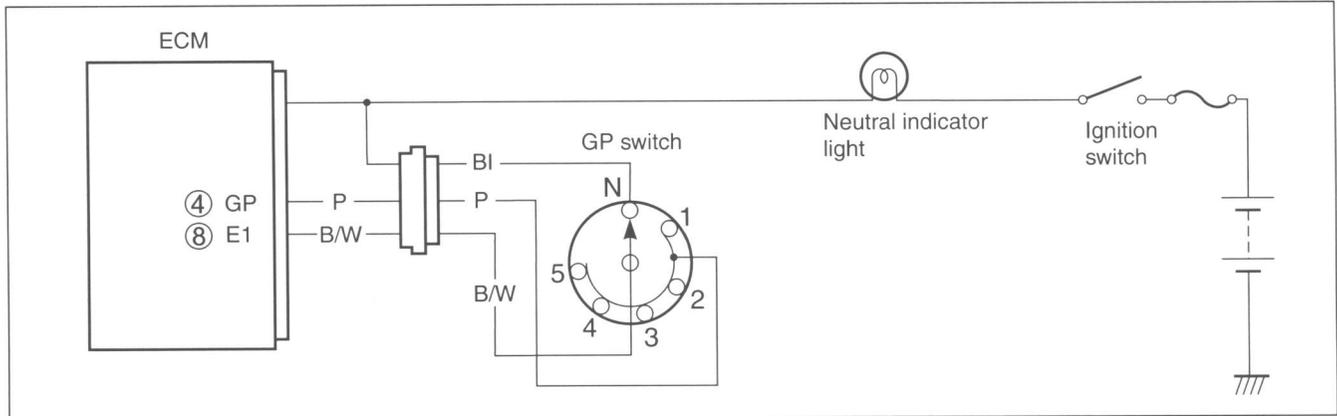


**“C24” (P0351) IGNITION SYSTEM MALFUNCTION**

\* Refer to the IGNITION SYSTEM for details. (P8-17)

## “C31” (P0705) GP SWITCH CIRCUIT MALFUNCTION

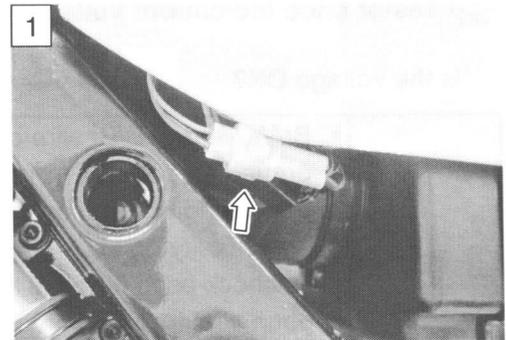
DETECTED CONDITION	POSSIBLE CAUSE
No Gear Position switch voltage Switch voltage is not within the following range. Switch voltage > 0.9 V	<ul style="list-style-type: none"> <li>• Gear Position switch circuit open or short</li> <li>• Gear Position switch malfunction</li> <li>• ECM malfunction</li> </ul>



### INSPECTION

#### Step 1

- 1) Turn the ignition switch OFF.
- 2) Check the GP switch coupler for loose or poor contacts.  
If OK, then measure the GP switch voltage.

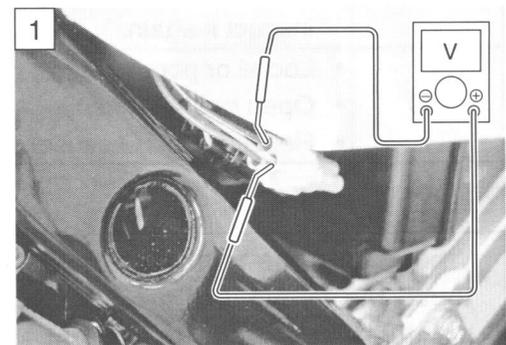


- 3) Insert the needle pointed probes to the lead wire coupler.
- 4) Turn the ignition switch ON.
- 5) Measure the voltage at the wire side coupler between Pink wire and B/W wire, when shifting the gearshift lever from 1st to Top.

**DATA** GP switch voltage: 0.9 V and more  
(+ Pink – B/W)

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

**Tester knob indication: Voltage (---)**



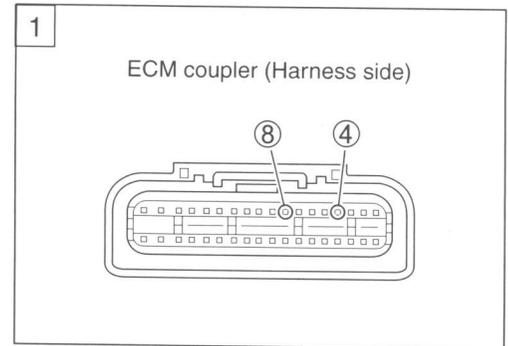
Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>• Pink wire open or shorted to ground</li> <li>• If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>• Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>• Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	<ul style="list-style-type: none"> <li>• Pink or B/W wire open, or Pink wire shorted to ground</li> <li>• Loose or poor contacts on the ECM coupler (terminal ④ or ⑧)</li> <li>• If wire and connection are OK, replace the GP switch with a new one.</li> </ul>

**CAUTION**

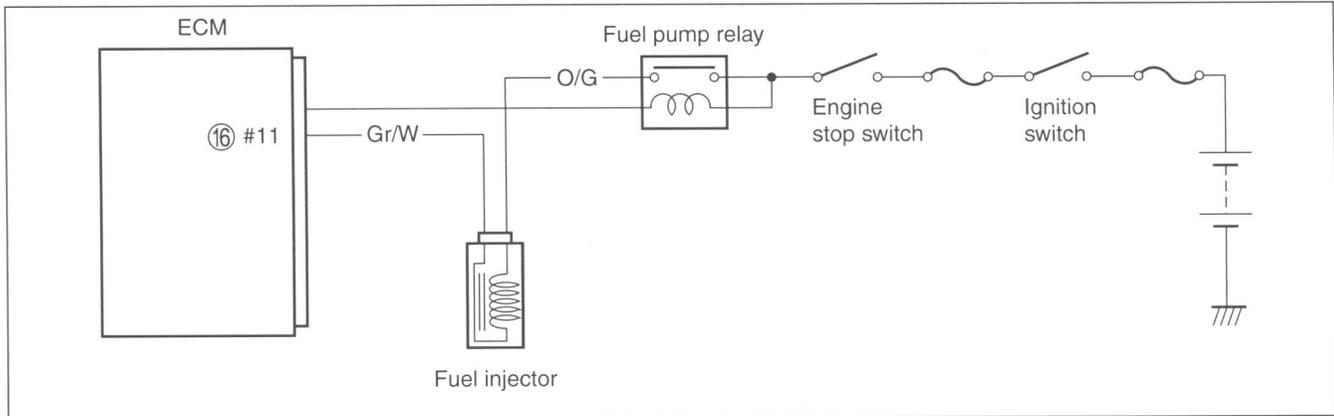
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

6) After repairing the trouble, clear the DTC using SDS tool.  
 (📄 4-25)



## “C32” (P0201) FUEL INJECTOR CIRCUIT MALFUNCTION

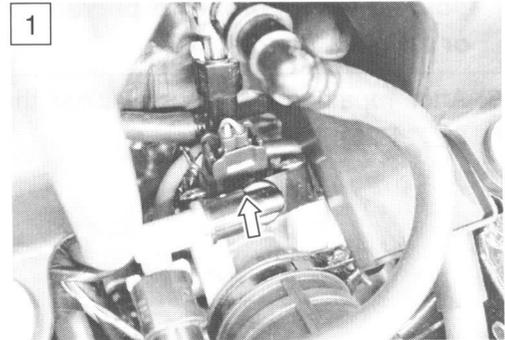
DETECTED CONDITION	POSSIBLE CAUSE
CKP signal is produced but fuel injector signal is interrupted by 8 times or more continuously.	<ul style="list-style-type: none"> <li>• Injector circuit open or short</li> <li>• Injector malfunction</li> <li>• ECM malfunction</li> </ul>



### INSPECTION

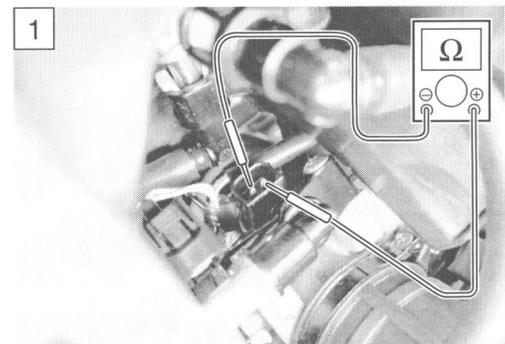
#### Step 1

- 1) Turn the ignition switch to OFF.
- 2) Remove the fuel tank cover. (☞ 7-6)
- 3) Check the injector coupler for loose or poor contacts.  
If OK, then measure the injector resistance.



- 4) Disconnect the injector coupler and measure the resistance between terminals.

**DATA** Injector resistance: 9 – 17  $\Omega$  at 20 °C (68 °F)  
(Terminal – Terminal)



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

**DATA** Injector resistance:  $\infty \Omega$  (Infinity)

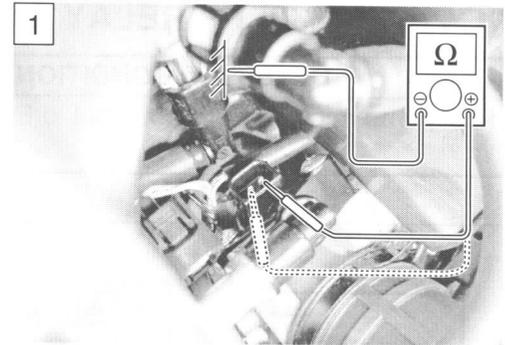
**TOOL** 09900-25008: Multi-circuit tester set

**Tester knob indication: Resistance ( $\Omega$ )**

Are the resistance and continuity OK?

YES	Go to Step 2.
NO	Replace the injector with a new one. (↗ 5-18)

6) After repairing the trouble, clear the DTC using SDS tool. (↗ 4-25)



**Step 2**

1) Turn the ignition switch to ON.

2) Measure the injector voltage between O/G wire and ground.

**DATA** Injector voltage: Battery voltage  
( $\oplus$  O/G –  $\ominus$  Ground)

**NOTE:**

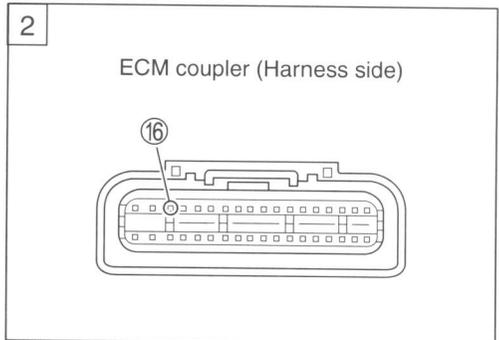
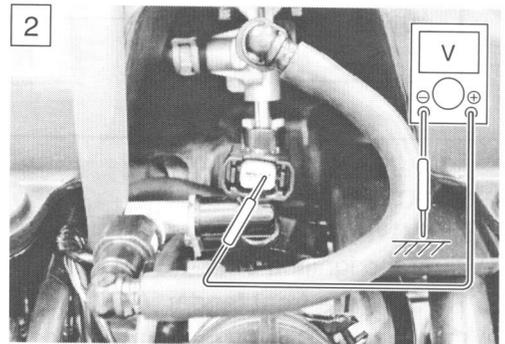
Injector voltage can be detected only 3 for seconds after ignition switch is turned ON.

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

**Tester knob indication: Voltage (V)**

Is the voltage OK?

YES	<ul style="list-style-type: none"> <li>Gr/W wire open or shorted to ground, or poor ⑯ connection.</li> <li>If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	Open circuit in the O/G wire



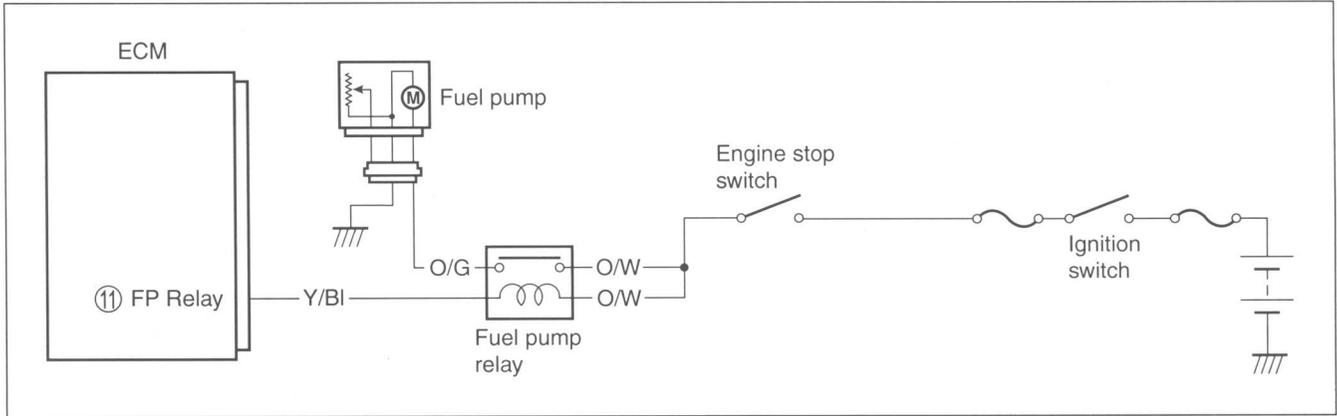
**CAUTION**

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

3) After repairing the trouble, clear the DTC using SDS tool. (↗ 4-25)

### “C41” (P0230) FP RELAY CIRCUIT MALFUNCTION

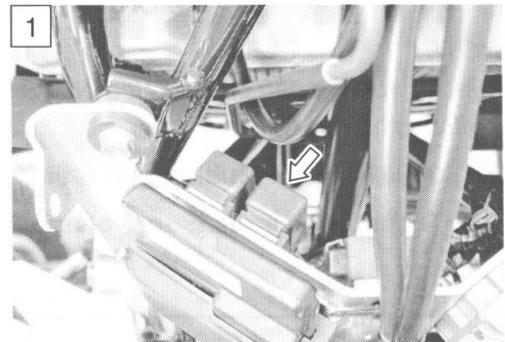
DETECTED CONDITION	POSSIBLE CAUSE
Fuel pump relay signal is not input to ECM.	<ul style="list-style-type: none"> <li>Fuel pump relay circuit open or short</li> <li>ECM malfunction</li> </ul>



#### INSPECTION

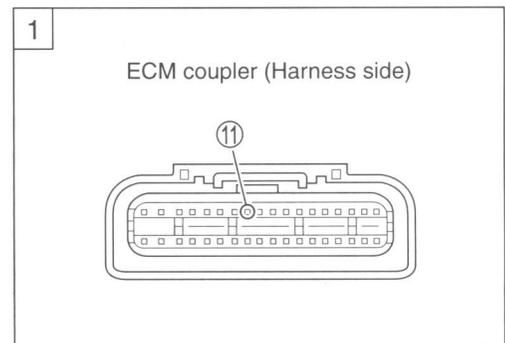
##### Step 1 (When indicating C41:)

- 1) Turn the ignition switch OFF.
- 2) Remove the front fender. (↗ 7-6)
- 3) Check the FP relay coupler for loose or poor contacts.  
If OK, then check the FP relay. (↗ 5-8)



Is the FP relay OK?

YES	<ul style="list-style-type: none"> <li>O/W or Y/BI wire open or shorted to ground, or poor ⑪ connection</li> <li>If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	Replace the FP relay with a new one.



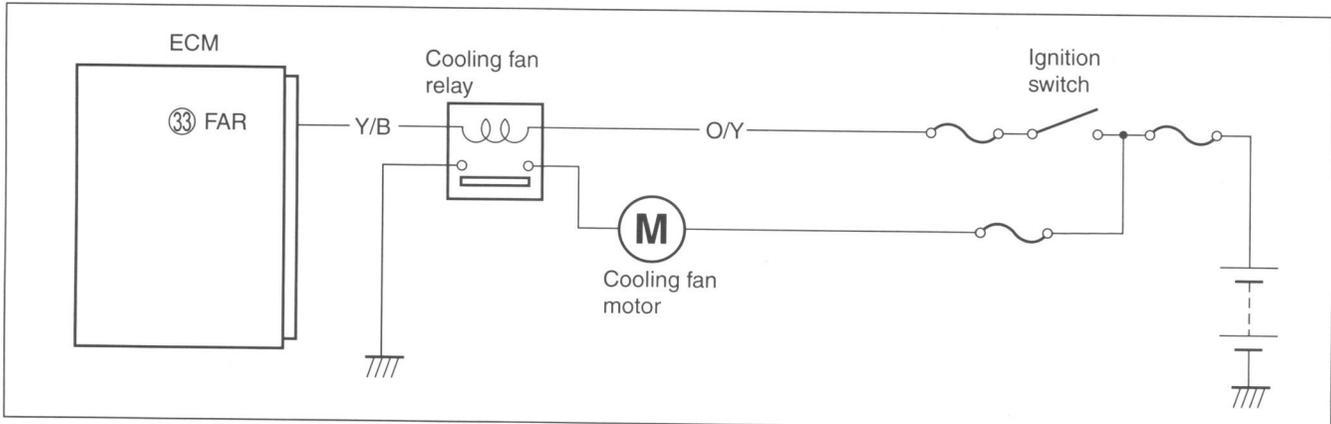
#### CAUTION

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.

- 4) After repairing the trouble, clear the DTC using SDS tool.  
(↗ 4-25)

## “C60” (P0480) COOLING FAN RELAY CIRCUIT MALFUNCTION

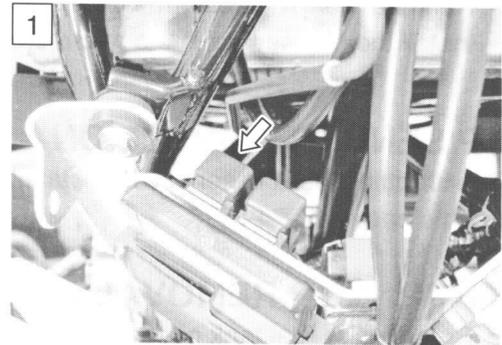
DETECTED CONDITION	POSSIBLE CAUSE
Cooling fan relay signal is not input to ECM.	<ul style="list-style-type: none"> <li>Cooling fan relay circuit open or short</li> <li>ECM malfunction</li> </ul>



### INSPECTION

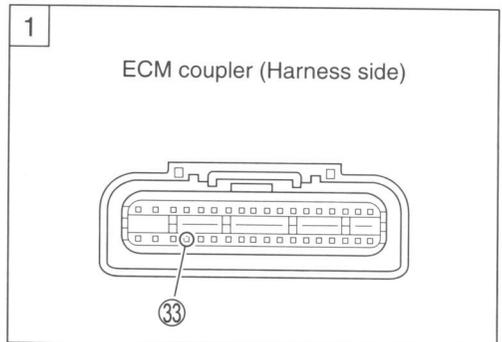
#### Step 1

- Turn the ignition switch OFF.
- Remove the front fender. (↗ 7-6)
- Check the cooling fan relay coupler for loose or poor contacts.  
If OK, then check the cooling fan relay. (↗ 6-10)



Is the cooling fan relay OK?

YES	<ul style="list-style-type: none"> <li>O/Y and Y/B wire open or shorted to ground, or poor 33 connection</li> <li>If wire and connection are OK, intermittent trouble or faulty ECM.</li> <li>Recheck each terminal and wire harness for open circuit and poor connection.</li> <li>Replace the ECM with a known good one, and inspect it again.</li> </ul>
NO	Replace the cooling fan relay with a new one.



### CAUTION

**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

- After repairing the trouble, clear the DTC using SDS tool. (↗ 4-25)

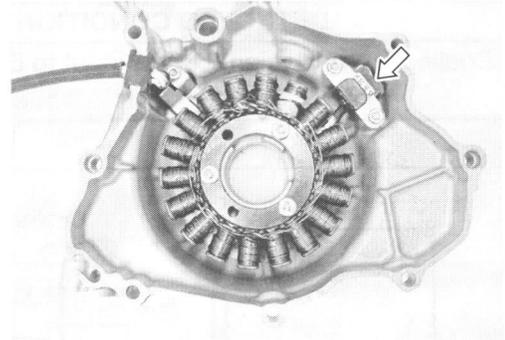
## SENSORS

### CKP SENSOR INSPECTION

The crankshaft position sensor is installed at the inside of the generator cover. (☞ 4-29)

### CKP SENSOR REMOVAL AND INSTALLATION

- Remove the generator cover. (☞ 3-15)
- Remove the CKP sensor. (☞ 3-43)
- Install the CKP sensor in the reverse order of removal.

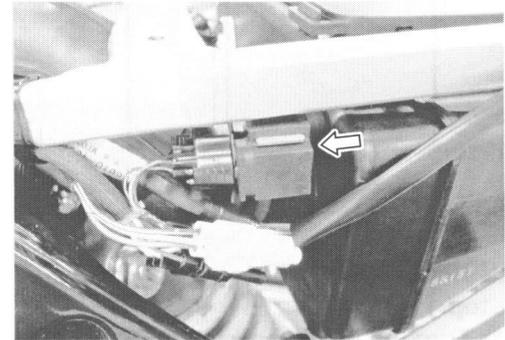


### IAP SENSOR INSPECTION

The intake air pressure sensor is installed at the left side of the seat rail. (☞ 4-31)

### IAP SENSOR REMOVAL AND INSTALLATION

- Remove the rear fender. (☞ 7-8)
- Remove the IAP sensor from the seat rail.
- Install the IAP sensor in the reverse order of removal.

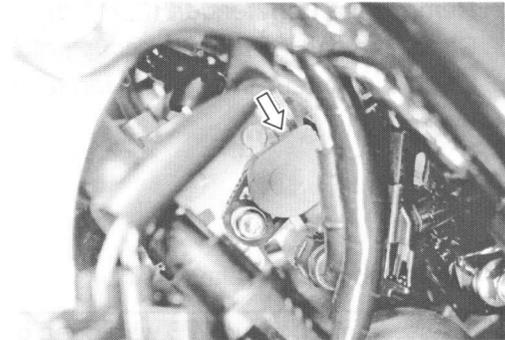


### TP SENSOR INSPECTION

The throttle position sensor is installed at the left side of the throttle body. (☞ 4-37)

### TP SENSOR REMOVAL AND INSTALLATION

- Remove the fuel tank cover. (☞ 7-6)
- Remove the fuel pump. (☞ 5-6)
- Remove the TP sensor. (☞ 5-14)
- Install the TP sensor in the reverse order of removal.



### TPS ADJUSTMENT

- Adjust the TP sensor. (☞ 4-19)

### ECT SENSOR INSPECTION

The engine coolant temperature sensor is installed on the right side of the cylinder. (☞ 4-42)

### ECT SENSOR REMOVAL AND INSTALLATION

- Remove the ECT sensor. (☞ 6-10)
- Install the ECT sensor in the reverse order of removal.

 ECT sensor: 12 N·m (1.2 kgf·m, 8.5 lb·ft)

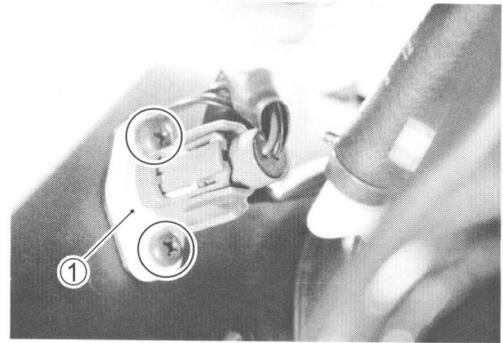


## IAT SENSOR INSPECTION

The intake air temperature sensor is installed at the right side of the air cleaner box. (☞ 4-46)

## IAT SENSOR REMOVAL AND INSTALLATION

- Remove the seat. (☞ 7-6)
- Remove the IAT sensor ① from the air cleaner box.
- Install the IAT sensor in the reverse order of removal.



## TO SENSOR INSPECTION

The tip-over sensor is located in rear of the headlight assembly. (☞ 4-50)

## TO SENSOR REMOVAL AND INSTALLATION

- Remove the front fender. (☞ 7-6)
- Remove the TO sensor from the bracket.
- Install the TO sensor in the reverse order of removal.

### NOTE:

When installing the TO sensor, the arrow mark Ⓐ must be pointed upward.

