SUZUKI

# RV125

## SUPPLEMENTARY SERVICE MANUAL

USE THIS MANUAL WITH:
RV125 SERVICE MANUAL (99500-31153-01E)



99501-31150-01E

# RV125K7 ('07-MODEL)

*This manual describes service data, service specifications, troubleshooting for FI system and servicing procedures which differ from those of the K6 ('06-model).*

*NOTE:*
- *Any differences between the K6 ('06-model) and K7 ('07-model) in specifications and service data are indicated with an asterisk mark (*).*
- *Please refer to the K6 ('06-model) service manual and service information for details which are not given in this manual.*

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SUZUKI MOTOR CORPORATION

# RV125K7 ('07-MODEL)

CONTENTS





## COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

| MODEL | CODE | COUNTRY or AREA | EFFECTIVE FRAME NO. |
|---|---|---|---|
| RV125 | E-02 | U.K. | JS1BT111200101909 – |
| | E-19 | E.U. | JS1BT1111001111063 – |

# ABBREVIATIONS USED IN THIS MANUAL

## A

| | |
|---|---|
| ABDC | : After Bottom Dead Center |
| AC | : Alternating Current |
| ACL | : Air Cleaner, Air Cleaner Box |
| API | : American Petroleum Institute |
| ATDC | : After Top Dead Center |
| A/F | : Air Fuel Mixture |

## B

| | |
|---|---|
| BBDC | : Before Bottom Dead Center |
| BTDC | : Before Top Dead Center |
| B+ | : Battery Positive Voltage |

## C

| | |
|---|---|
| CKP Sensor | : Crankshaft Position Sensor (CKPS) |
| CKT | : Circuit |
| CLP Switch | : Clutch Lever Position Switch (Clutch Switch) |
| CO | : Carbon Monoxide |
| CPU | : Central Processing Unit |

## D

| | |
|---|---|
| DC | : Direct Current |
| DMC | : Dealer Mode Coupler |
| DRL | : Daytime Running Light |
| DTC | : Diagnostic Trouble Code |

## E

| | |
|---|---|
| ECM | : Engine Control Module Engine Control Unit (ECU) (FI Control Unit) |
| ECT Sensor | : Engine Coolant Temperature Sensor (ECTS), Water Temp. Sensor (WTS) |
| ET sensor | Engine Temperature sensor |

## F

| | |
|---|---|
| FI | : Fuel Injection, Fuel Injector (Discharge pump; DCP) |
| FP | : Fuel Pump |
| FPR | : Fuel Pressure Regulator |
| FP Relay | : Fuel Pump Relay |

## G

| | |
|---|---|
| GEN | : Generator |
| GND | : Ground |

## H

| | |
|---|---|
| HC | : Hydrocarbons |
| HO2 Sensor | : Heated Oxygen Sensor (HO2S) |

## I

| | |
|---|---|
| IAP Sensor | : Intake Air Pressure Sensor (IAPS) |
| IAT Sensor | : Intake Air Temperature Sensor (IATS) |
| IG | : Ignition |
| ISC Valve | : Idle Speed control valve (ISCV) |

## L

| | |
|---|---|
| LCD | : Liquid Crystal Display |
| LED | : Light Emitting Diode (Malfunction Indicator Lamp) |
| LH | : Left Hand |

## M

| | |
|---|---|
| MAL-Code | : Malfunction Code (Diagnostic Code) |
| Max | : Maximum |
| MIL | : Malfunction Indicator Lamp (LED) |
| Min | : Minimum |

## N

| | |
|---|---|
| NOx | : Nitrogen Oxides |

## O

| | |
|---|---|
| OHC | : Over Head Camshaft |

## P

| | |
|---|---|
| PCV | : Positive Crankcase Ventilation (Crankcase Breather) |

## R

| | |
|---|---|
| RH | : Right Hand |
| ROM | : Read Only Memory |

## S

| | |
|---|---|
| SAE | : Society of Automotive Engineers |
| SDS | : Suzuki Diagnosis System |

## T

| | |
|---|---|
| TO Sensor | : Tip Over Sensor (TOS) |
| TP Sensor | : Throttle Position Sensor (TPS) |

# SPECIFICATIONS (RV125K7)

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 140 mm |
| Overall width | 860 mm |
| Overall height | 1 120 mm |
| Wheelbase | 1 385 mm |
| Ground clearance | 215 mm |
| Seat height | 770 mm |
| Dry mass | 118 kg |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, OHC |
| Number of cylinders | 1 |
| Bore | 57.0 mm |
| Stroke | 48.8 mm |
| Displacement | 125 $cm^3$ |
| Compression ratio | 9.2 : 1 |
| Fuel system | Fuel injection |
| Air cleaner | Polyurethane foam element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 500 ± 100 r/min |



## DRIVE TRAIN

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 3.470 (59/17) |
| Gear ratios, Low | 3.000 (33/11) |
| 2nd | 1.857 (26/14) |
| 3rd | 1.368 (26/19) |
| 4th | 1.095 (23/21) |
| 5th | 0.923 (24/26) |
| Top | 0.833 (20/24) |
| Final reduction ratio | 3.500 (49/14) |
| Drive chain | D.I.D. 428, 134 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Swingarm type, coil spring, oil damped |
| Front suspension stroke | 110 mm |
| Rear wheel travel | 136 mm |
| Caster | 26° |
| Trail | 91 mm |
| Steering angle | 45° (right & left) |
| Turning radius | 2.1 m |
| Front brake | Disc brake |
| Rear brake | Drum brake |
| Front tire size | 130/80-18 M/C 66P, tube type |
| Rear tire size | 180/80-14 M/C 78P, tube type |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (Transistorized) |
| Ignition timing | 13° B.T.D.C. at 1 500 r/min |
| Spark plug | NGK CR8E or DENSO U24ESR-N |
| Battery | 12 V 21.6 kC (6 Ah)/10 HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20 A |
| Headlight | 12 V 60/55 W |
| Brake light/Taillight | 12 V 21/5 W |
| Position light | 12 V 4 W.....E-19 |
| | 12 V 5 W.....E-02 |
| Turn signal light | 12 V 21 W |
| Speedometer light | 12 V 1.7 W |
| Neutral indicator light | 12 V 3.4 W |
| High beam indicator light | 12 V 1.7 W |
| Turn signal indicator light | 12 V 3.4 W |
| FI indicator light | 12 V 3 W |
| Fuel level indicator light | 12 V 3.4 W |



## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 6.5 L |
| Engine oil, oil change | 850 ml |
| filter change | 950 ml |
| overhaul | 1 200 ml |

*These specifications are subject to change without notice.*

# PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of kilometers and time for your convenience.

*NOTE:*
*More frequent servicing may be performed on motorcycles that are used under severe conditions.*

## PERIODIC MAINTENANCE CHART

| Item \ Interval | km | 1 000 | 4 000 | 8 000 |
|---|---|---|---|---|
| | months | 5 | 20 | 40 |
| Air cleaner element | | — | I | I |
| Exhaust pipe bolts and muffler mounting bolts | | T | T | T |
| Valve clearance | | I | I | I |
| Spark plug | | — | I | R |
| Fuel line | | I | I | I |
| | | Replace every 4 years | | |
| Engine oil | | R | R | R |
| Engine oil filter | | R | — | R |
| Throttle cable play | | I | I | I |
| Clutch | | I | I | I |
| Drive chain | | I | I | I |
| | | Clean and lubricate every 1 000 km | | |
| Brakes | | I | I | I |
| Brake hose | | — | I | I |
| | | Replace every 4 years | | |
| Brake fluid | | — | I | I |
| | | Replace every 2 years | | |
| Wheels and tires | | — | I | I |
| Steering | | I | — | I |
| Front fork | | — | — | I |
| Rear suspension | | — | — | I |
| Chassis nuts and bolts | | T | T | T |



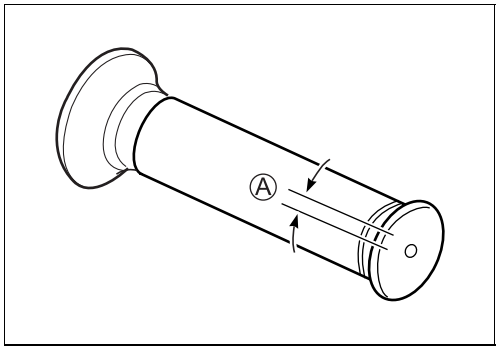
*NOTE:*
*I = Inspect and clean, adjust, replace or lubricate as necessary; R = Replace; T = Tighten*

# MAINTENANCE AND TUNE-UP PROCEDURES

This section describes the servicing procedures for each Periodic Maintenance item which differ from those of the RV125K6 ('06-MODEL).
For details other than the following items, refer to the RV125 Service Manual.

## THROTTLE CABLE PLAY

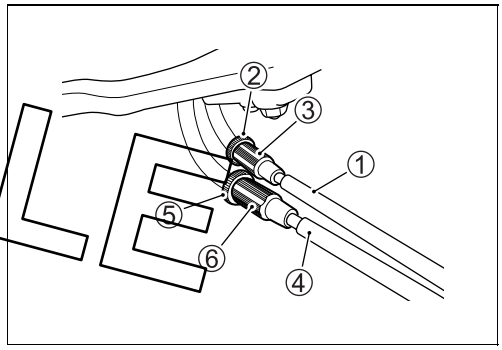
**Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.**




Adjust the throttle cable play Ⓐ with the following three steps.

First step:
- Loosen the lock-nut ② of the throttle returning cable ①.
- Turn in the adjuster ③ fully.

Second step:
- Loosen the lock-nut ⑤ of the throttle pulling cable ④.
- Turn the adjuster ⑥ in or out until the throttle cable play Ⓐ should be 2.0 – 4.0 mm at the throttle grip.
- Tighten the lock-nut ⑤ while holding the adjuster ⑥.




Third step:
- While holding the throttle grip at the fully closed position, slowly turn out the adjuster ③ of the throttle returning cable ① to feel resistance.
- Tighten the lock-nut ② while holding the adjuster ③.

**DATA Throttle cable play Ⓐ: 2.0 – 4.0 mm**

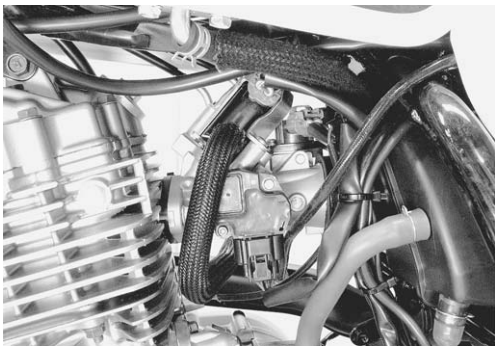
**⚠ WARNING**

**After the adjustment is completed, check that handlebars movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.**

## FUEL LINE

**Inspect initially at 1 000 km (5 months) and every 4 000 km (20 months) thereafter.**
**Replace every 4 years.**

Inspect the fuel hoses for damage and fuel leakage. If any defects are found, replace the fuel hose with a new one.



# SDS CHECK

Using SDS, sample the data at the time of new and periodic vehicle inspections.

After saving the sampled data in the computer, file them by model and by user.
The periodically filed data help improve the accuracy of troubleshooting since they can indicate the condition of vehicle functions that has changed with time.
For example, when a vehicle is brought in for service but the troubleshooting of a failure is not easy, comparing the current data value to the past filed data value at time of normal condition can allow the specific engine failure to be determined.
Also, in the case of a customer vehicle which is not periodically brought in for service with no past data value having been saved, if the data value of a good vehicle condition have been already saved as a master (STD), comparison between the same models helps facilitate the troubleshooting.

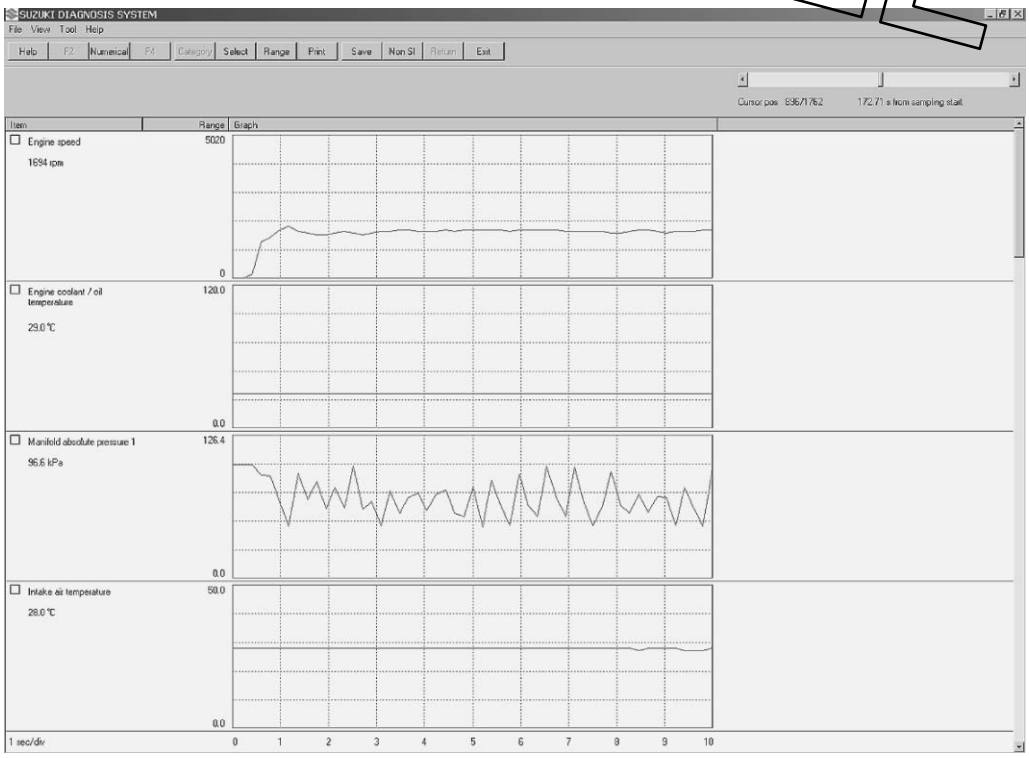
- Remove the right frame cover. (☞RV125K3 5-3)
- Set up the SDS tools. (☞Page 39)

TOOL **09904-41010: SDS set tool**
**99565-01010-009: CD-ROM Ver. 9**

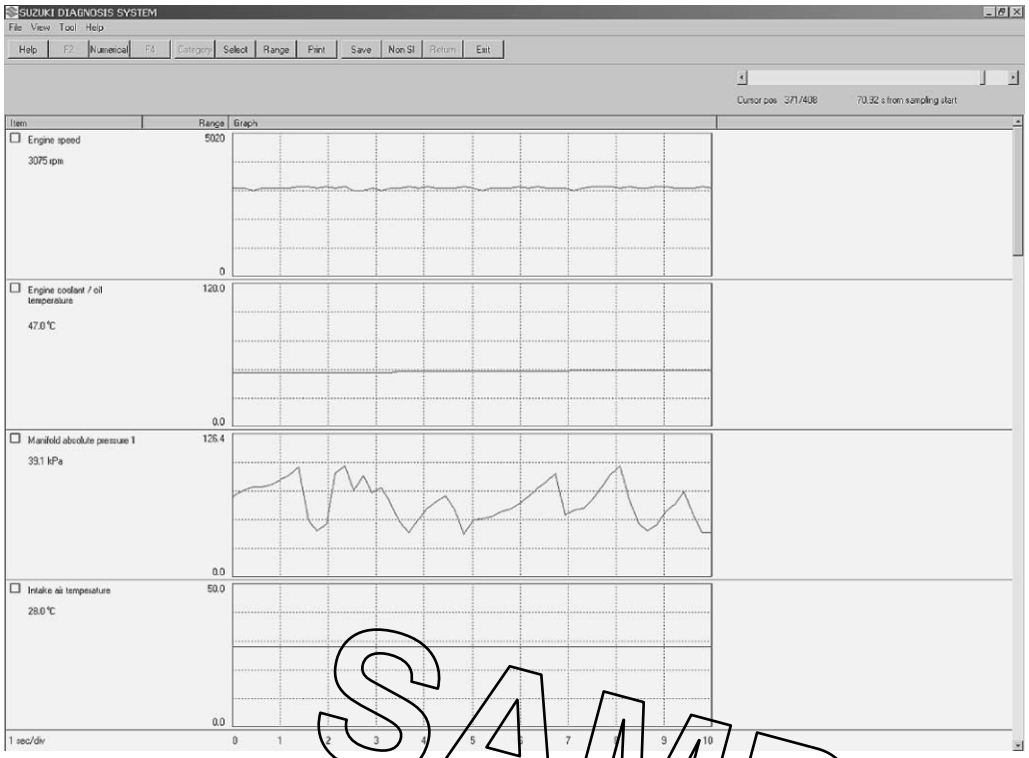
*NOTE:*
** Before taking the sample of data, check and clear the Past DTC. (☞Page 40)*
** A number of different data under a fixed condition as shown below should be saved and filed as sample.*



## SAMPLE:
## Data sampled from cold starting through warm-up

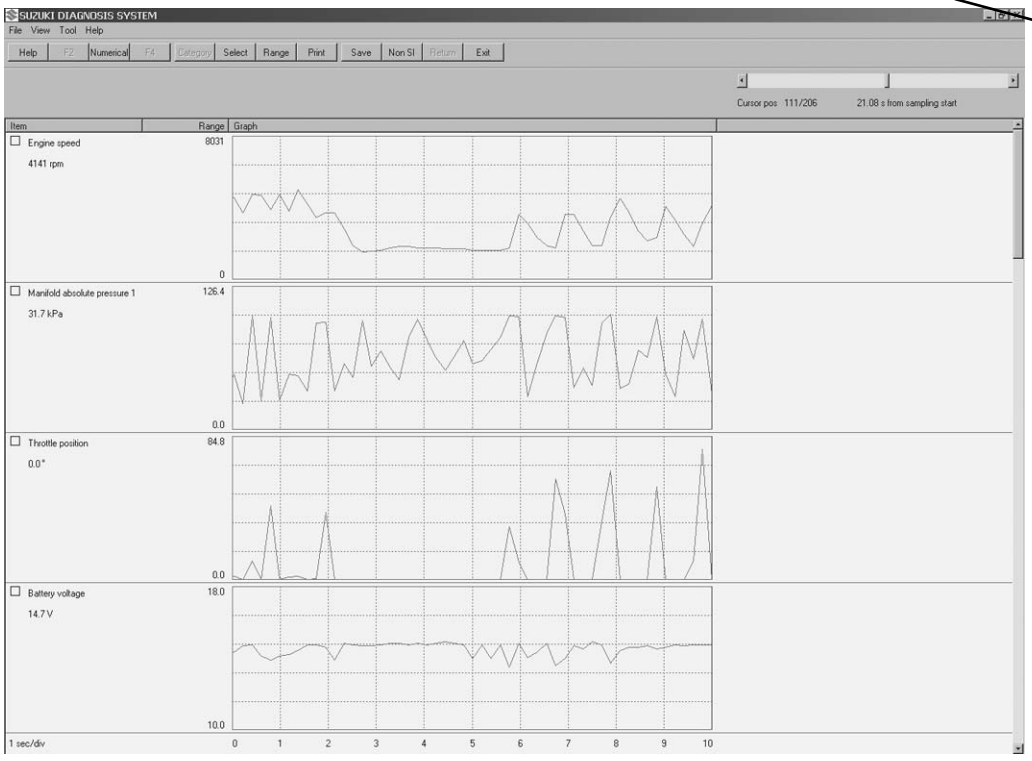


## Data at 3 000 r/min under no load

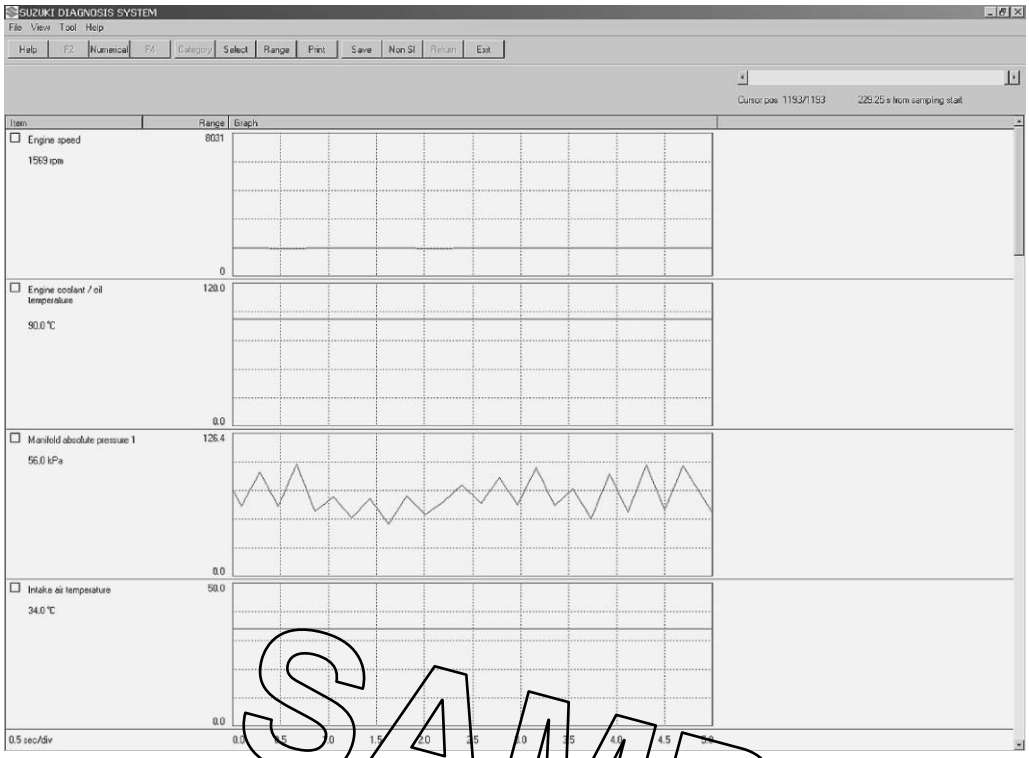





## Data at the time of racing

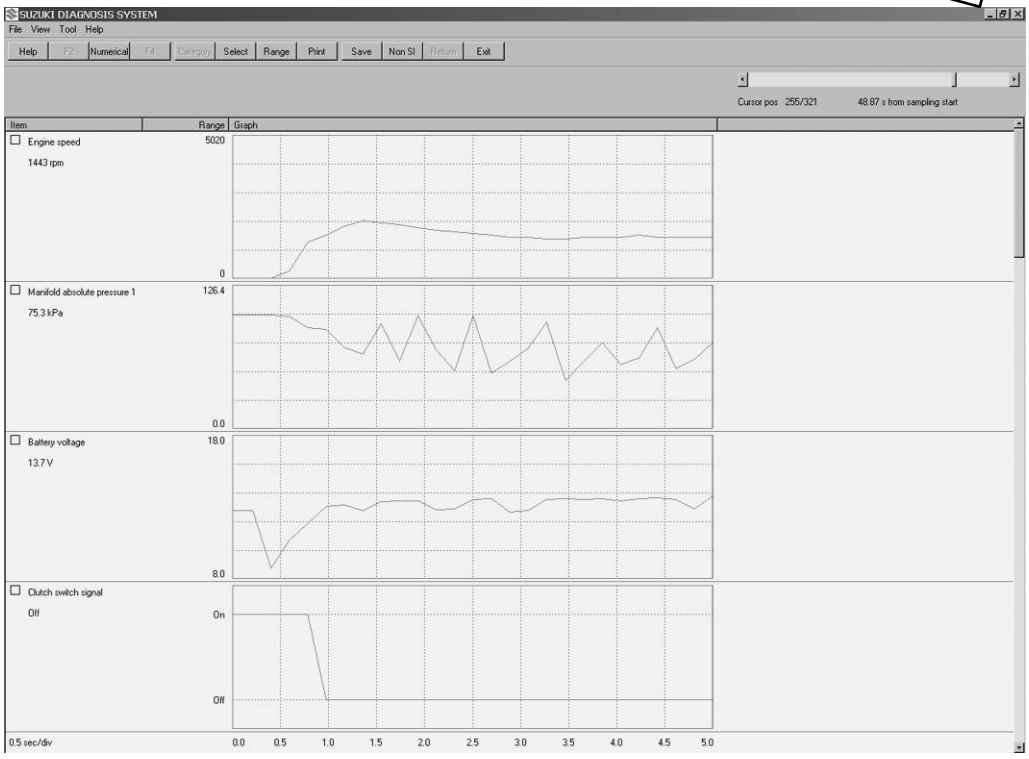


## Data of intake negative pressure during idling (90 °C)





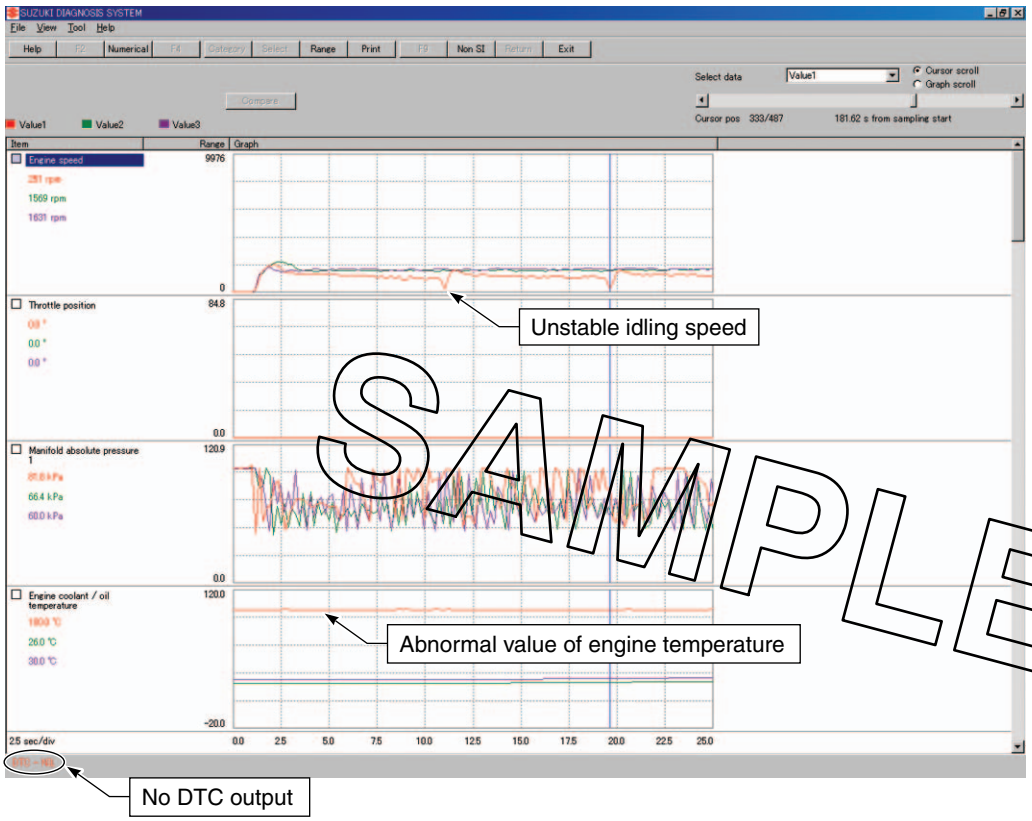

## Data of manifold absolute pressure operation at the time of starting



## Example of trouble

Three data; value 1 (current data 1), value 2 (past data 2) and value 3 (past data 3); can be made in comparison by showing them in the graph. Read the change of value by comparing the current data to the past data that have been saved under the same condition, then you may determine how changes have occurred with the pass of time and identify what problem is currently occurring.

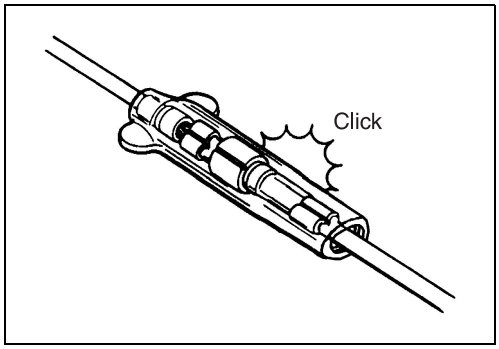
With DTC not output, if the value of engine temperature is found to be higher than the data saved previously, the possible cause may probably lie in a sensor circuit opened or ground circuit opened or influence of internal resistance value changes, etc.



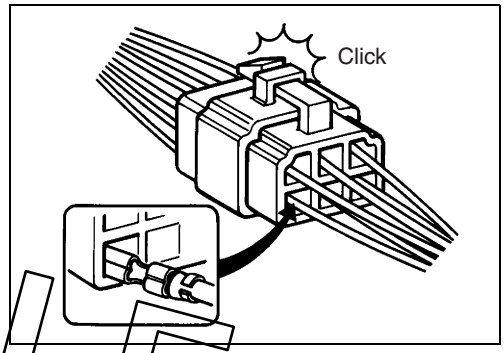
# FI SYSTEM DIAGNOSIS
## PRECAUTIONS IN SERVICING
When handling the component parts or servicing the FI system, observe the following points for the safety of the system.

### ELECTRICAL PARTS
**Connector/Coupler**

- When connecting a connector, be sure to push it in until a click is felt.

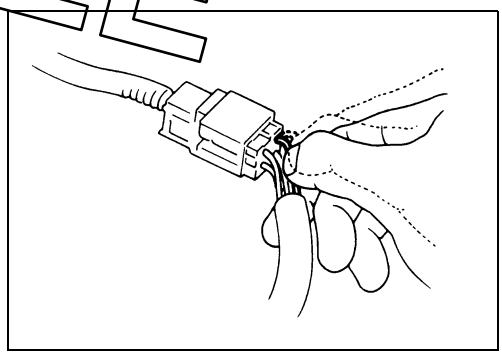



- With a lock type coupler, be sure to release the lock when disconnecting, and push in fully to engage the lock when connecting.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the connector/coupler for looseness or bending.
- Inspect each terminal for corrosion and contamination. The terminals must be clean and free of any foreign material which could impede proper terminal contact.

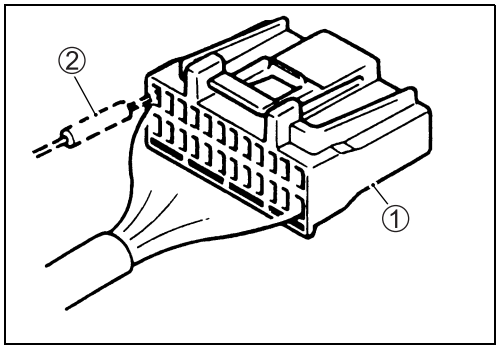





- Inspect each lead wire circuit for poor connection by shaking it by hand lightly. If any abnormal condition is found, repair or replace.

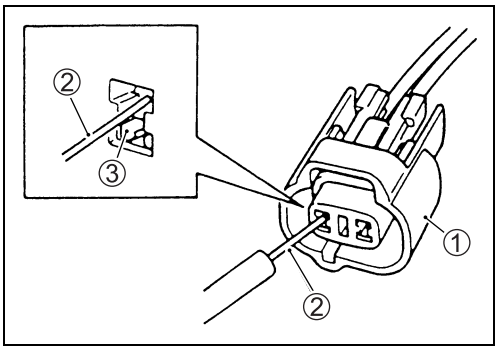


- When taking measurements at electrical connectors using a tester probe, be sure to insert the probe from the wire harness side (backside) of the connector/coupler.




① Coupler
② Probe

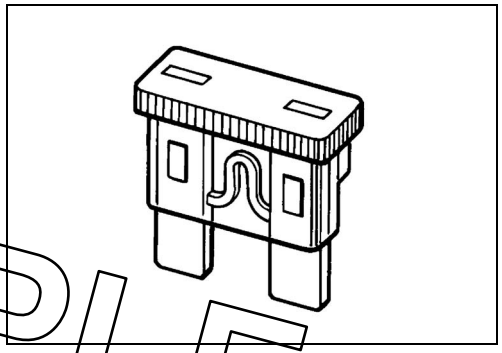
- When connecting meter probe from the terminal side of the coupler (where connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open.
  Connect the probe as shown to avoid opening of female terminal.
  Never push in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



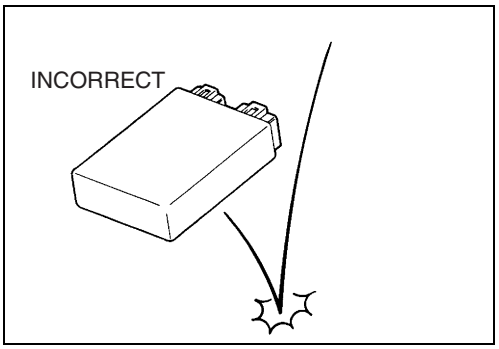


**SWITCH**

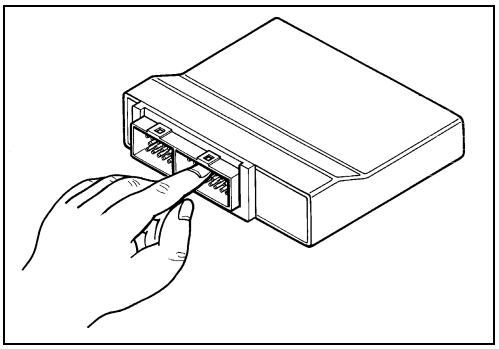
- Never apply grease material to switch contact points to prevent damage.

**ECM/VARIOUS SENSORS**

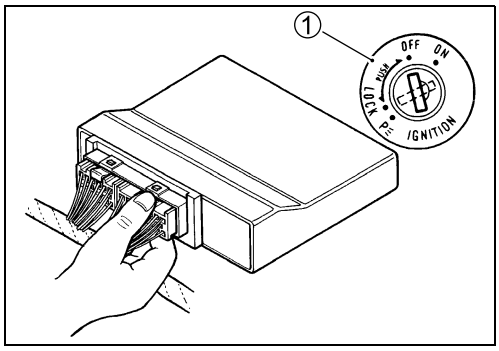
- Since each component is a high-precision part, great care should be taken not to apply any sharp impacts during removal and installation.



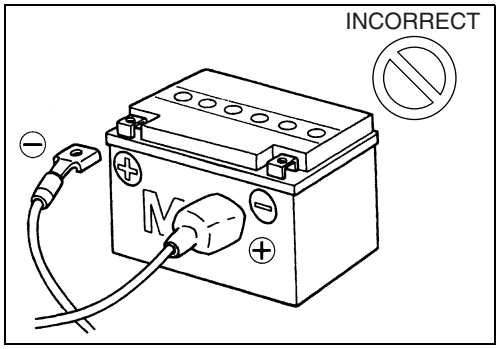

- Be careful not to touch the electrical terminals of the ECM. The static electricity from your body may damage this part.



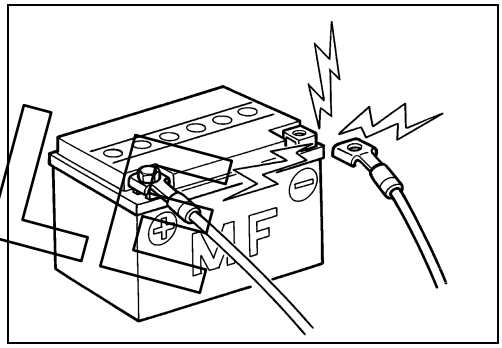
- When disconnecting and connecting the ECM, make sure to turn OFF the ignition switch ①, or electronic parts may get damaged.



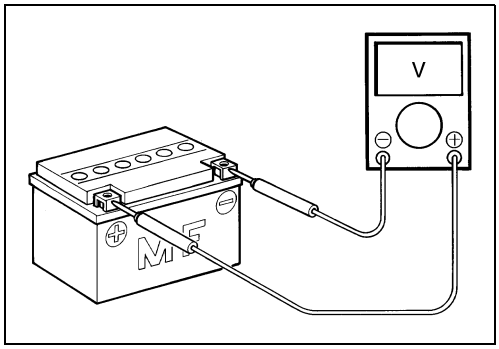

- Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the FI system instantly when reverse power is applied.




- 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

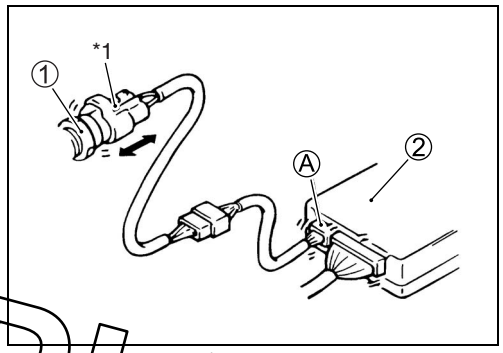
While there are various methods for electrical circuit inspection, described here is a general method to check for open and short circuit using an ohmmeter and a voltmeter.

### 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.

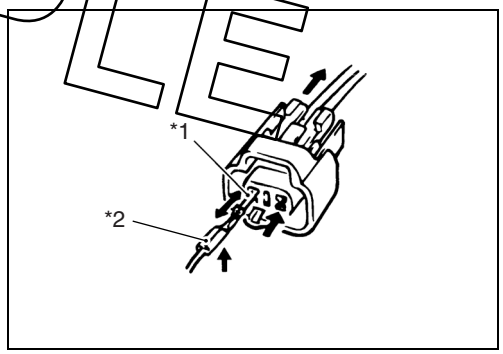
- Disconnect the negative cable from the battery.
- Check each connector/coupler at both ends of the circuit being checked for loose connection. Also check for condition of the coupler lock if equipped.




① Sensor
② ECM
*1 Check for loose connection.

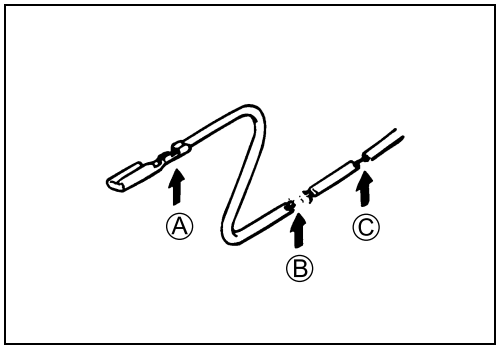


- Using a test male terminal, check the female terminals of the circuit being checked for contact tension.
  Check each terminal visually for poor contact (possibly caused by dirt, corrosion, rust, entry of foreign object, etc.). At the same time, check to make sure that each terminal is fully inserted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

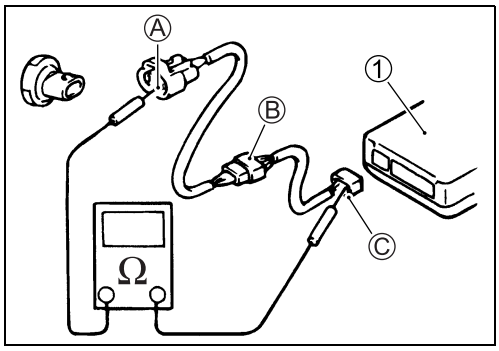
- Using continuity inspect or voltage check procedure as described below, inspect the wire harness terminals for open circuit and poor connection. Locate abnormality, if any.




Ⓐ Looseness of crimping
Ⓑ Open
Ⓒ Thin wire (a few strands left)

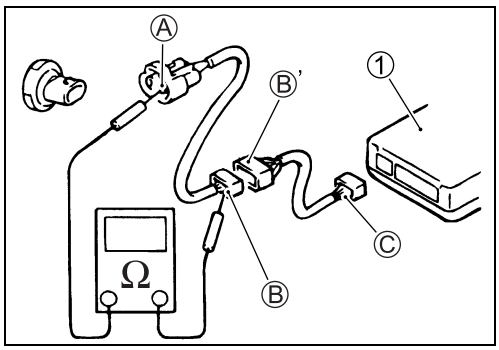
**Continuity check**

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




① ECM

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



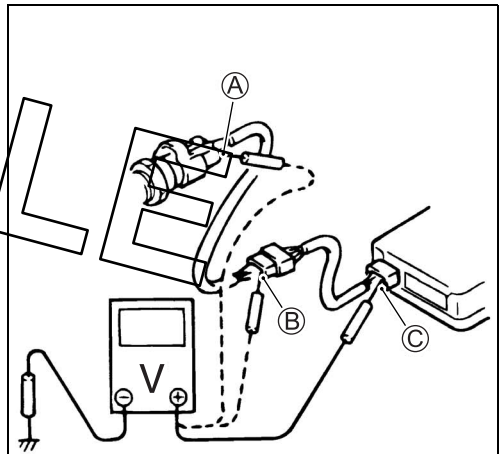

① ECM



**Voltage check**

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

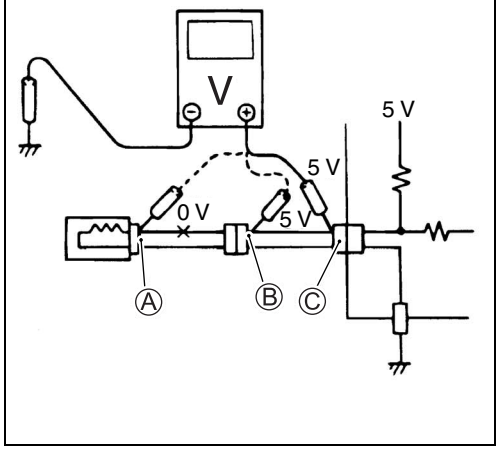
- With all connectors/couplers connected and voltage applied to the circuit being checked, measure voltage between each terminal and body ground.




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 Ⓐ and Ⓑ.

**Voltage Between:**

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




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

**Voltage Between:**

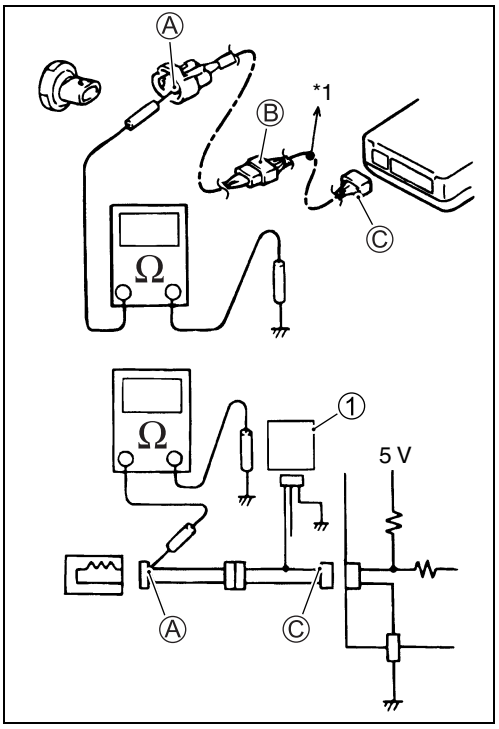
Ⓒ and body ground: Approx. 5 V
Ⓑ and body ground: Approx. 5 V ——— 2 V voltage drop
Ⓐ and body ground: 3 V

**Short circuit check (wire harness to ground)**

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

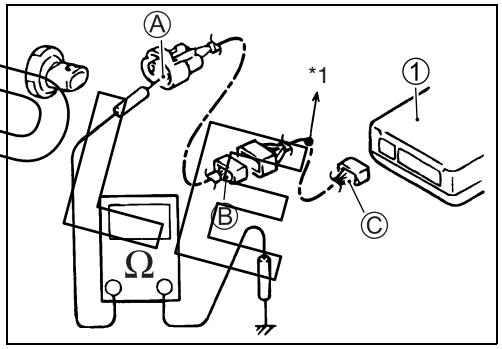
*NOTE:*
*If the circuit to be checked branches to other parts as shown, disconnect all connectors/couplers of those parts. Otherwise, diagnosis will be misled.*

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




① Other parts
*1 To other parts

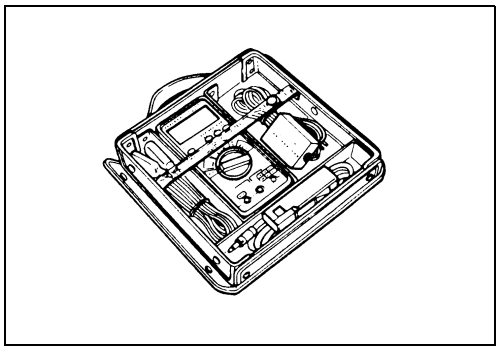
- Disconnect the connector/coupler included in circuit (coupler Ⓑ) and measure resistance between terminal Ⓐ and body ground.
  If continuity is indicated, the circuit is shorted to the ground between terminals Ⓐ and Ⓑ.




① ECM
*1 To other parts

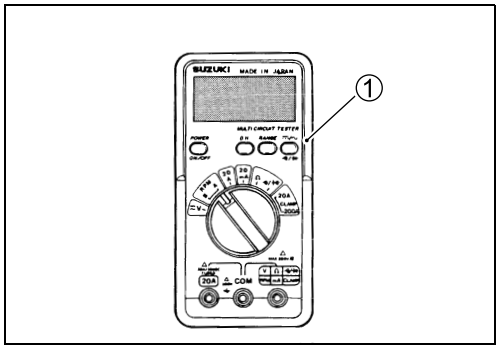
## USING THE MULTI-CIRCUIT TESTER

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

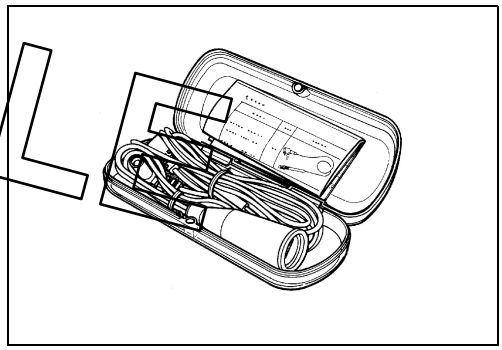



**TOOL 09900-25008: Multi-circuit tester set**

*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.*

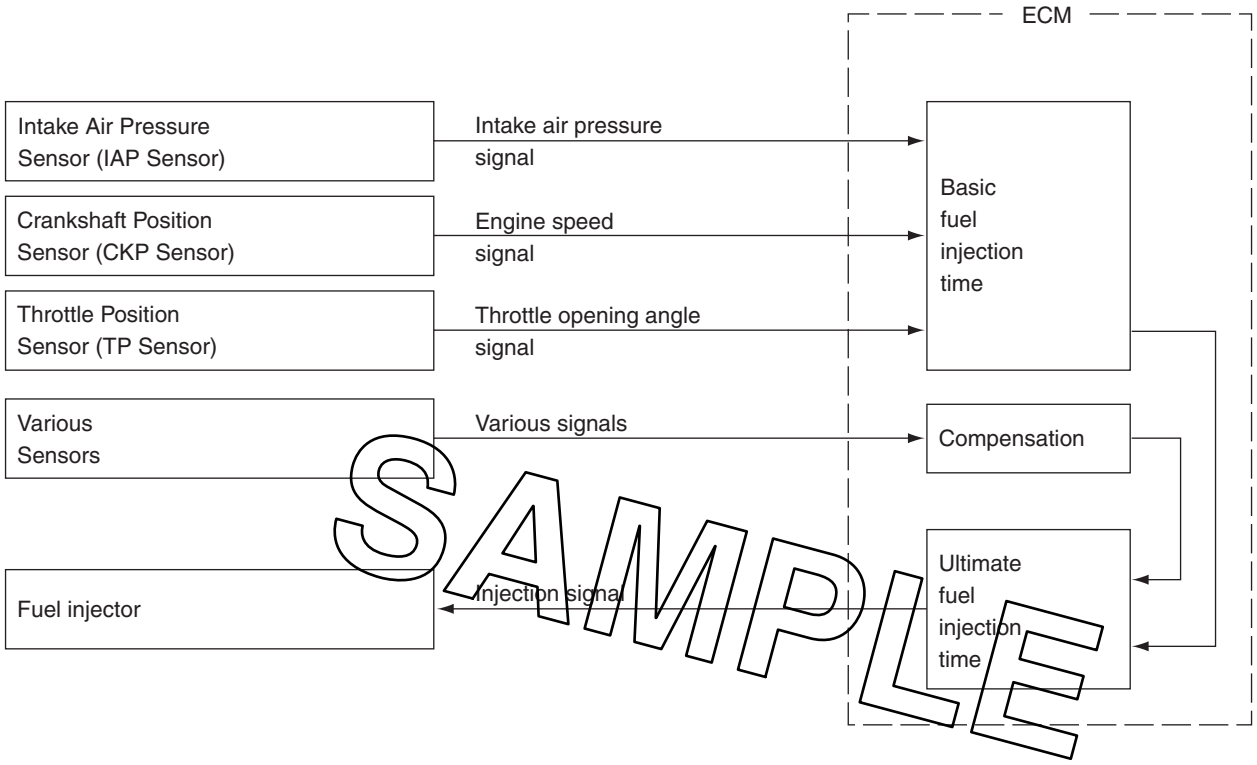


**TOOL 09900-25009: Needle pointed probe set**

# 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).

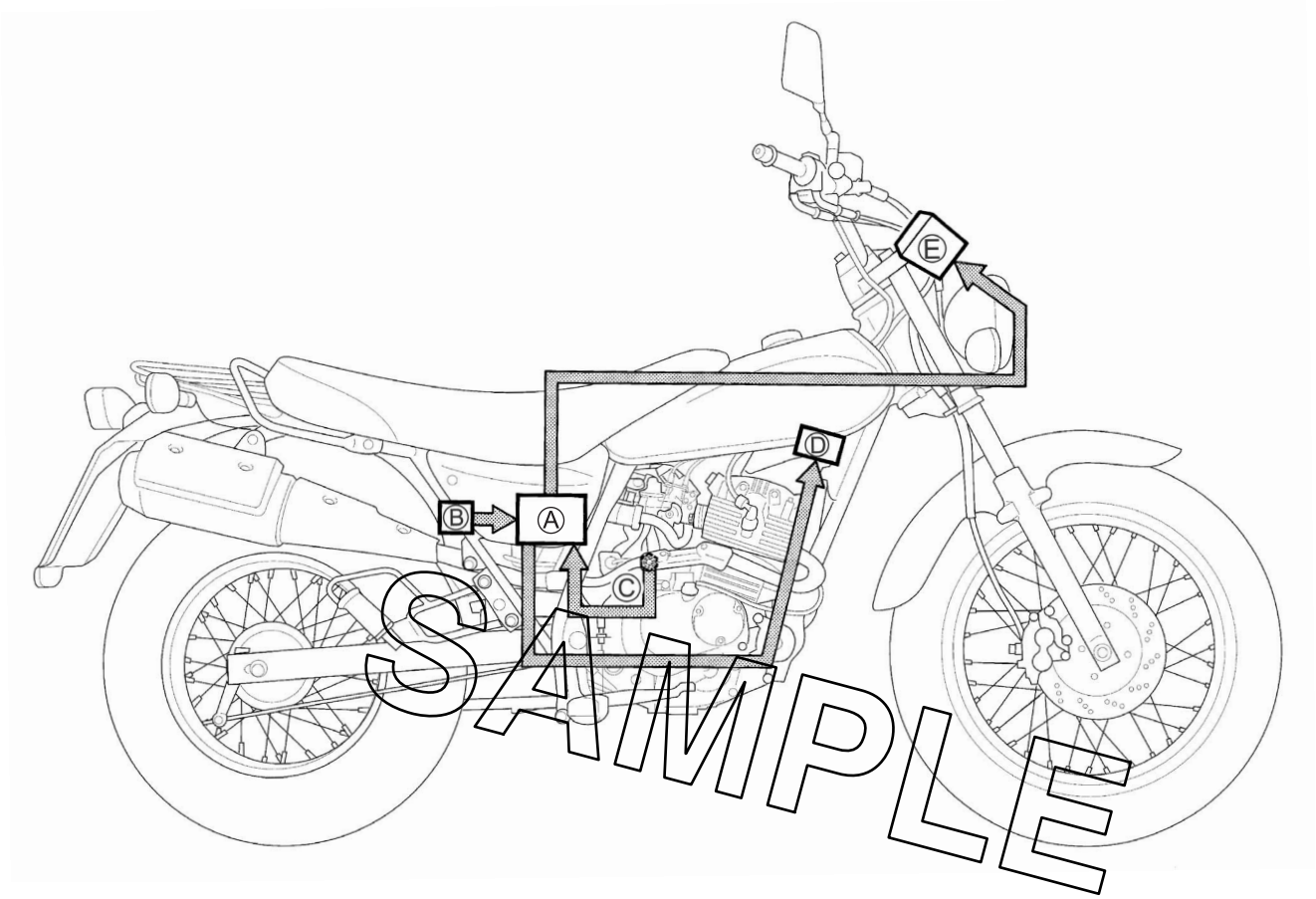
| SIGNAL | DESCRIPTION |
|---|---|
| ENGINE TEMPERATURE SENSOR SIGNAL | When engine temperature is low, injection time (volume) is increased. |
| INTAKE AIR TEMPERATURE SENSOR SIGNAL | When intake air temperature signal is low, injection time (volume) is increased. |
| HEATED OXYGEN SENSOR SIGNAL | Air/fuel ratio is compensated to the theoretical ratio from density of oxygen in exhaust gasses. The compensation occurs in such a way that more fuel is supplied if detected air/fuel ratio is lean and less fuel is supplied if it is rich. |
| ENGINE RPM SIGNAL | At high speed, the injection time (volume) is increased. When starting engine, additional fuel is injected during cranking engine. |
| ACCELERATION SIGNAL/ DECELERATION SIGNAL | During acceleration, the fuel injection time (volume) is increased in accordance with the throttle opening speed and engine rpm. During deceleration, the fuel injection time (volume) is decreased. |
| FUEL INJECTOR DRIVE CURRENT SIGNAL | ECM detects this current and compensates the injection time (volume). |



**INJECTION STOP CONTROL**

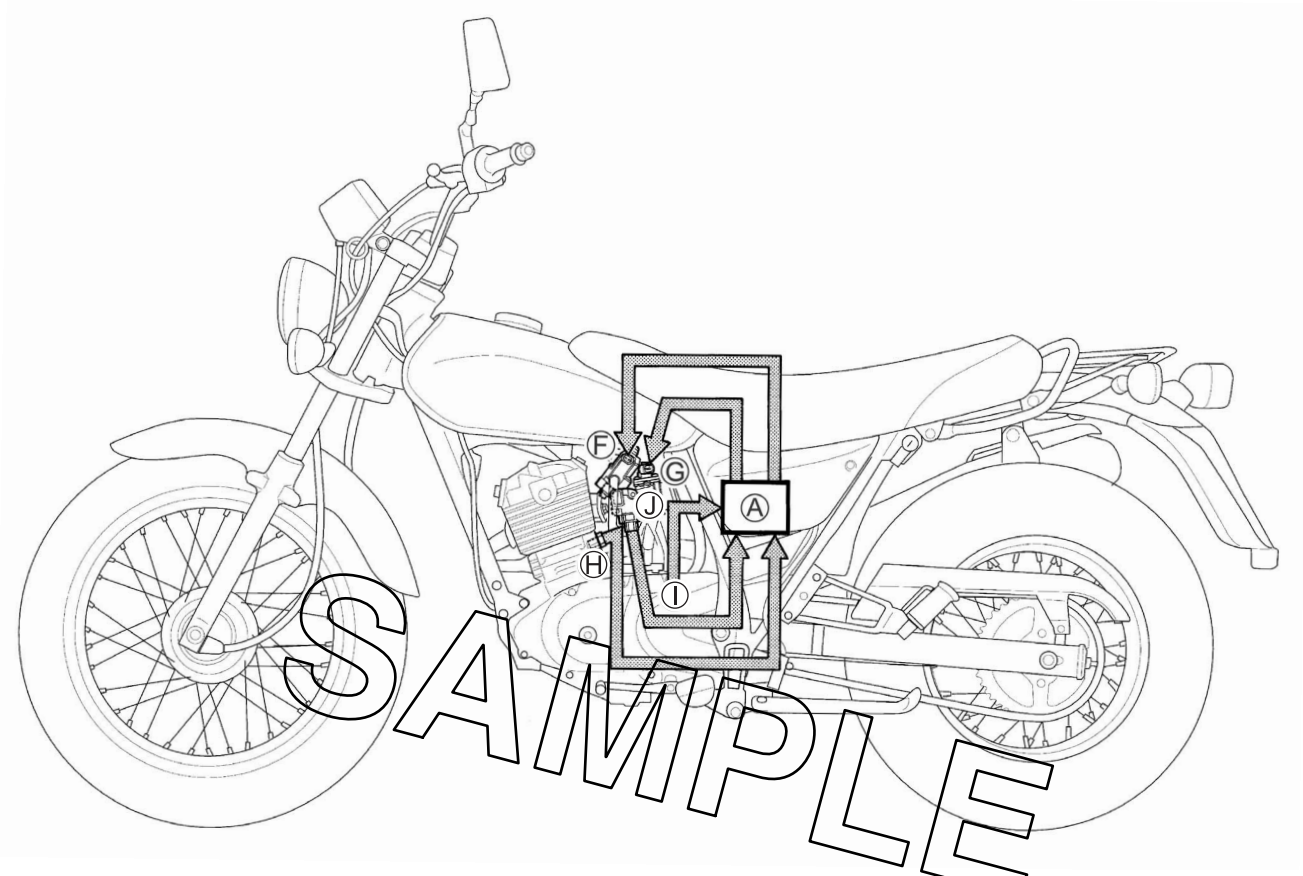
| SIGNAL | DESCRIPTION |
|---|---|
| TIP-OVER SENSOR SIGNAL (FUEL SHUT-OFF) | When the motorcycle tips over, the tip-over sensor sends a signal to the ECM. Then, this signal cuts OFF current supplied to the fuel injector and ignition coil. |
| OVER-REV. LIMITER SIGNAL | The fuel injector stops operation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

## FI SYSTEM PARTS LOCATION





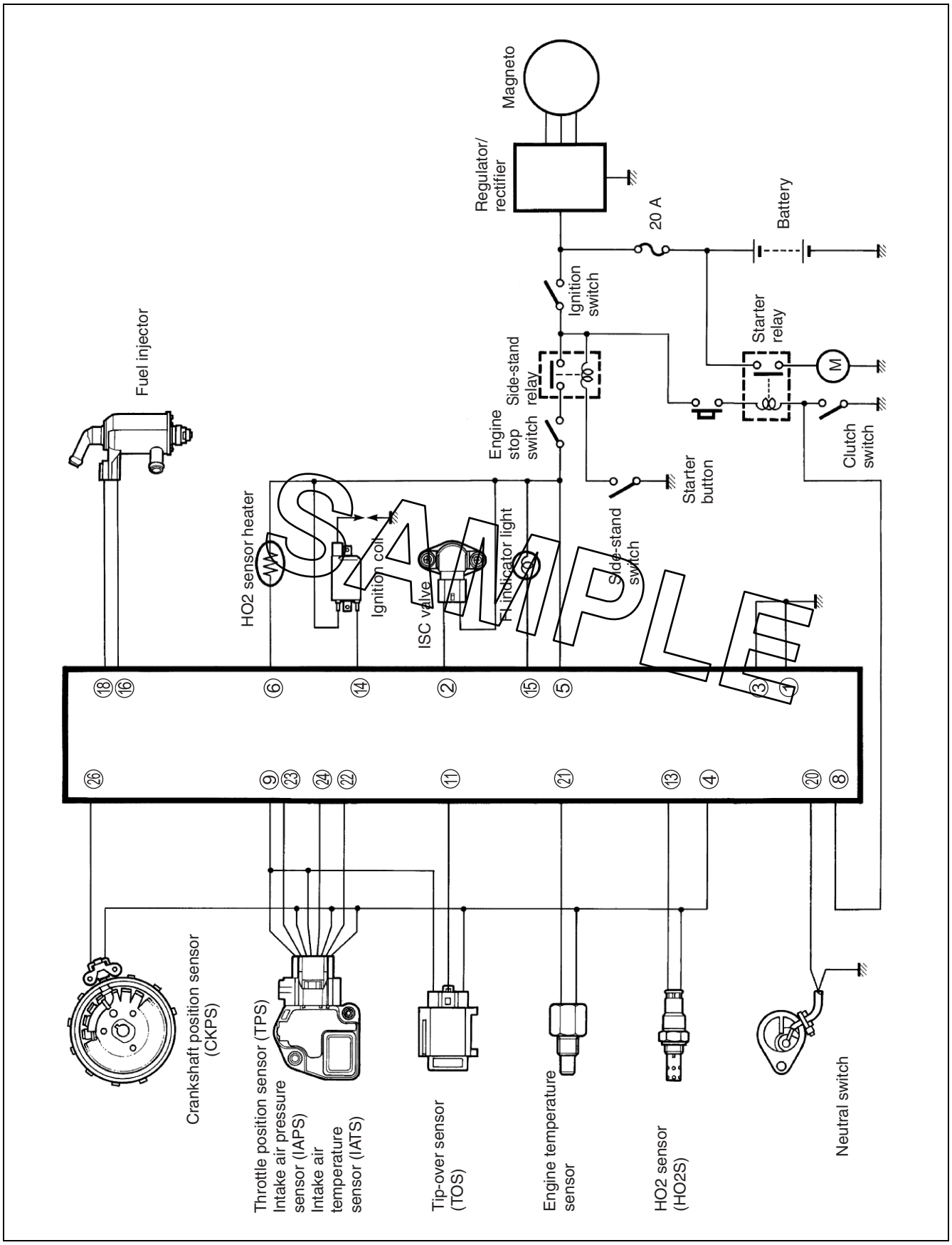

Ⓐ ECM
Ⓑ Tip-over sensor (TOS)
Ⓒ Heated oxygen sensor (HO2S)
Ⓓ Ignition coil (IG coil)
Ⓔ Speedometer






Ⓐ ECM
Ⓕ Fuel injector
Ⓖ ISC valve
Ⓗ Engine temperature sensor (ETS)
Ⓘ Crankshaft position sensor (CKPS)
Ⓙ Intake air pressure sensor/Throttle position sensor/Intake air temperature sensor (IAPS/TPS/IATS)

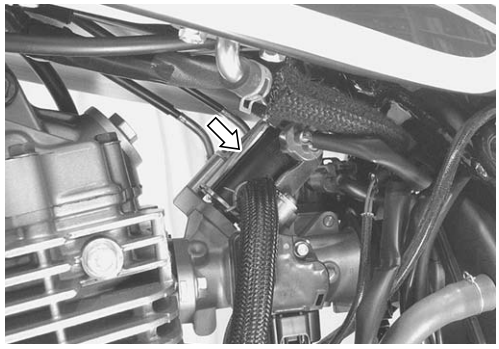
## FI SYSTEM WIRING DIAGRAM



**FUEL INJECTOR**

The system employs fuel injector (Discharge pump; DCP) that causes injection fuel to be pressurized within the pump.

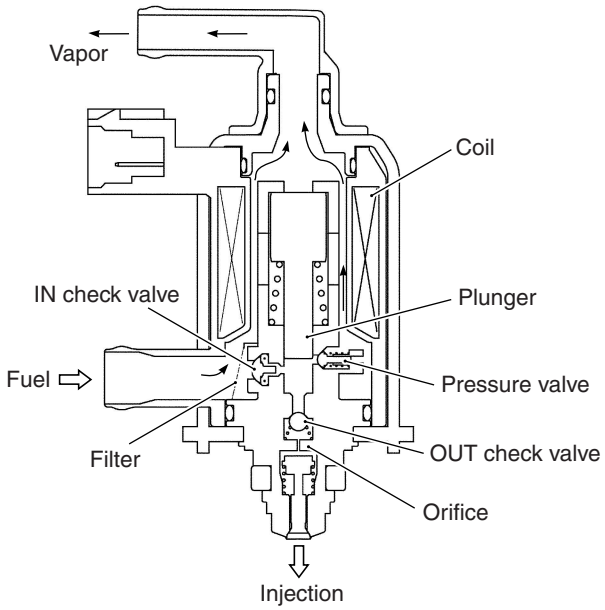
The fuel injector pressurizes gravity fed fuel with its plunger and injects the pressurized fuel into the intake pipe. With the pressure plunger controlled by ECM, necessary volume of fuel is injected at the best timing for the engine operating condition.



**Operation**

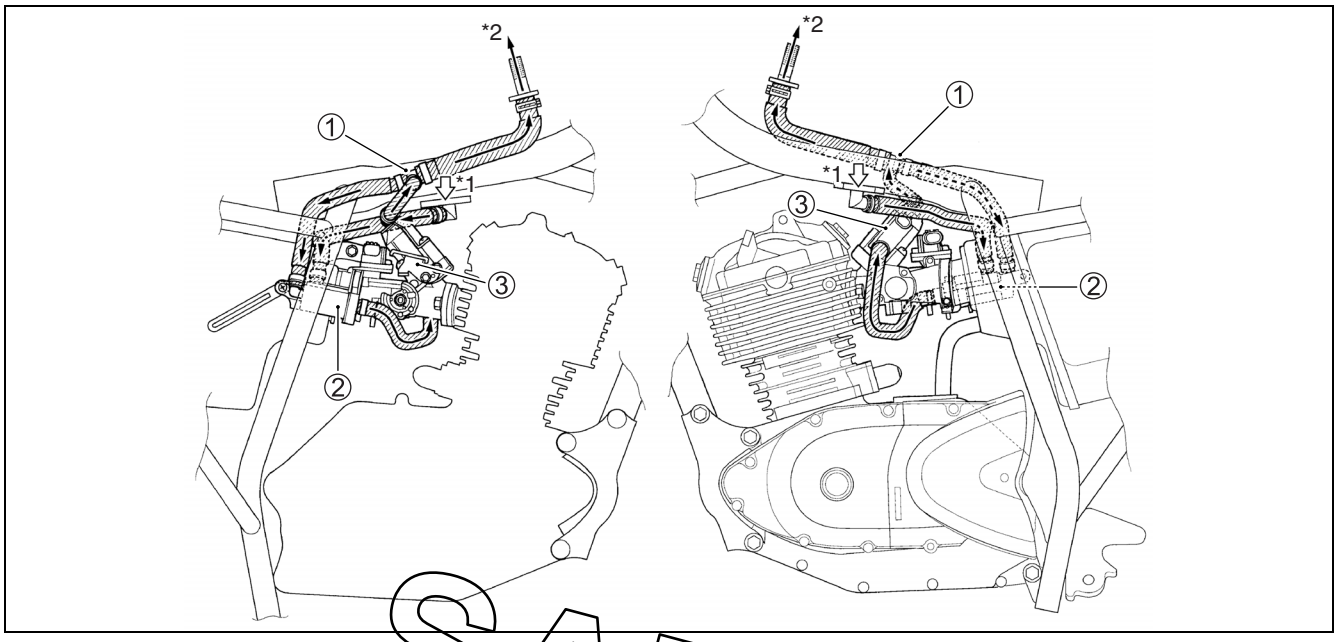
- When the plunger returns, fuel in the pump chamber enters through IN check valve.
- By the ECM signal, the coil is energized causing the plunger to pressurize fuel. This pressurization occurs after vapor inside the pump chamber has been bled through the pressure valve.
- When the pressurization begins, OUT check valve opens and the fuel pressure rises until the injection nozzle opens.
- The volume of fuel injection is controlled by the length of time in which the plunger compresses fuel.
- When the ignition switch is turned ON, the discharge pump starts to operate for 2 seconds for purging (initial operation).





**FUEL CIRCULATION**

From the fuel tank, fuel enters into the fuel injector through the fuel filter. Vapor generated here returns to the fuel tank.

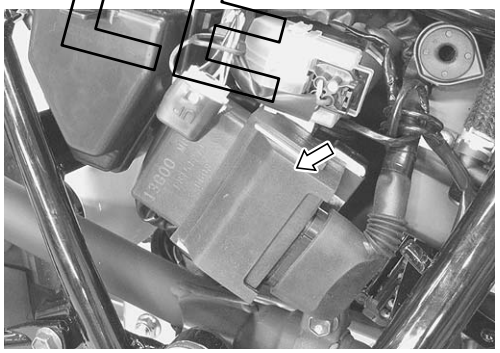



| | | | |
|---|---|---|---|
| ① | 3-way joint | *1 | From fuel tank |
| ② | Fuel filter | *2 | Fuel tank return |
| ③ | Fuel injector | | |



**ECM**

ECM (Engine Control Module) consists of CPU (Central Processing Unit), memory (ROM/RAM) and IN/OUT section. Signals from various sensors are sent to the input section and then to CPU. On the basis of information received, CPU performs calculation of necessary amount of fuel injection by means of a map that is programmed for various engine conditions and sends operation signal from the output section to fuel injector.



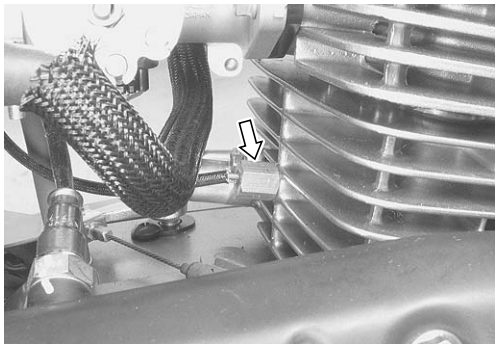
Light load: When the engine load is light, the fuel injection time (volume) is determined on the basis of intake air pressure and engine speed.

High load: When the engine load is high, the fuel injection time (volume) is determined on the basis of throttle valve opening and engine speed.

**ET SENSOR**

ET (Engine Temperature) sensor sends the signal of engine temperature as thermistor ohmic value, which is then detected by ECM. When the engine temperature is low, the injection volume increases.

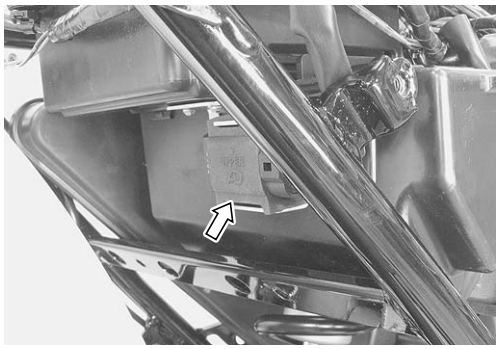
The thermistor ohmic value increases with the engine temperature low and it decreases with the temperature high.

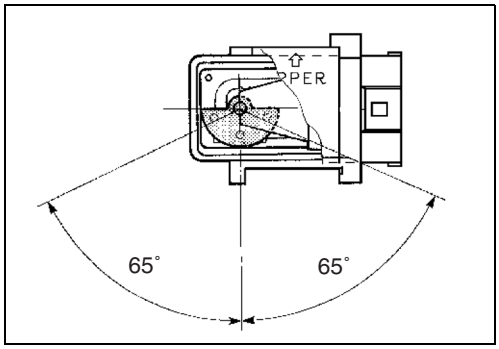


**TO SENSOR**

TO (Tip-Over) sensor detects the vehicle inclination. When the vehicle tips to more than 65°, a signal is sent to ECM. When this signal continues for more than 4 seconds, ECM interrupts current to fuel injector and ignition coil.

To restart the engine, turn the ignition switch OFF once and then attempt starting in the normal procedure.








**IAP/TP/IAT SENSOR**

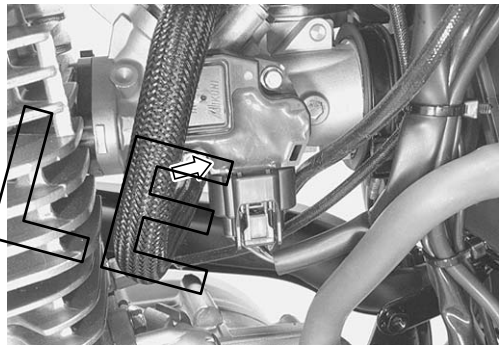
The IAP sensor/TP sensor/IAT sensor are combined into one.

**IAP sensor**

The value of intake air pressure is converted into an electrical signal and sent to ECM.

The base fuel injection time (volume) in light load is determined in accordance with this electrical signal (output signal).

The higher the intake air pressure, the higher the signal voltage becomes.



**TP sensor**

TP (Throttle Position) sensor is a sort of variable resistor and detects the throttle valve opening.

The sensor voltage is translated to throttle opening voltage and sent to ECM.

The base fuel injection time (volume) in high load is determined in accordance with this electrical signal (output signal).

The wider the throttle opening, the higher the signal voltage becomes.

**IAT sensor**

IAT (Intake Air Temperature) sensor senses the intake air temperature as ohmic value of thermistor and sends it to ECM.

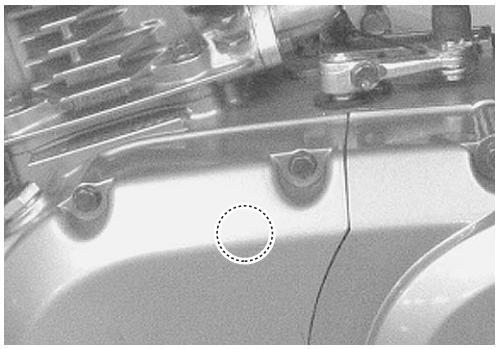
When the intake air temperature is low, the injection volume is increased.

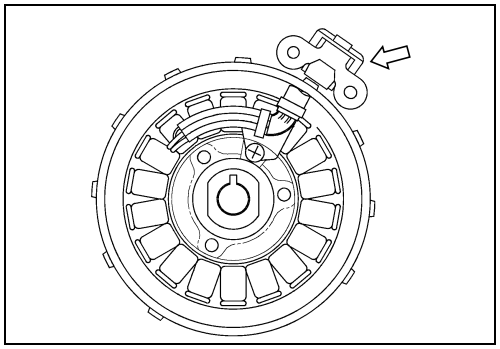
The thermistor ohmic value increases with the intake air temperature low and decreases with the temperature high.

**CKP SENSOR**

CKP (Crank position) sensor generates the reference ignition signal and sends it to ECM.

ECM calculates and determines the injection and ignition timings on the basis of this signal.





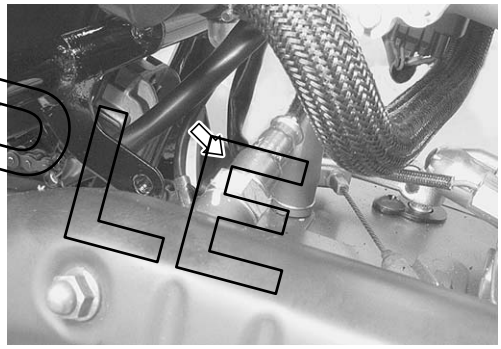


**HO2 SENSOR**

HO2 (Heated Oxygen) sensor is made of zirconia element (platinum plated) which changes output voltage depending on the oxygen concentration difference between its internal and external surfaces.

The terminal voltage change is dependent on the oxygen concentration in the exhaust gas. This detected voltage value therefore represents the oxygen concentration.

The terminal voltage decreases when the oxygen concentration is high, and increases when it is low.



*NOTE:*

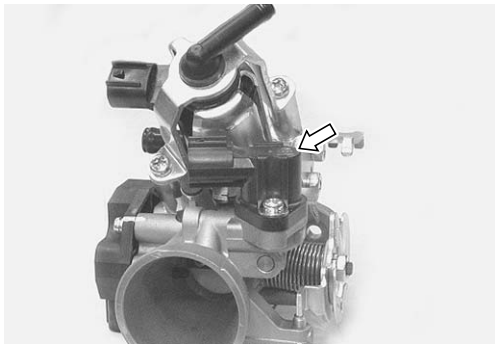
*As the zirconia element is not conductive below 250 °C, HO2 sensor will not function properly until the engine is at normal operating temperature.*

**ISC valve**

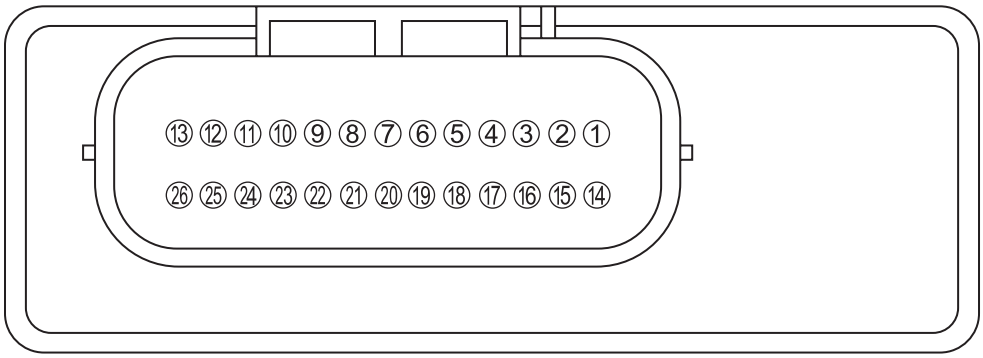
ISC (Idle Speed Control) valve controls the cold engine fast idle speed as well as warmed engine idle speed.

The air volume is adjusted by opening or closing the bypass port provided in the throttle port.

By controlling the fuel injection volume and air flow, the idle speed is maintained at a constant level, eliminating the need of manual adjustment.



## ECM TERMINAL




ECM coupler

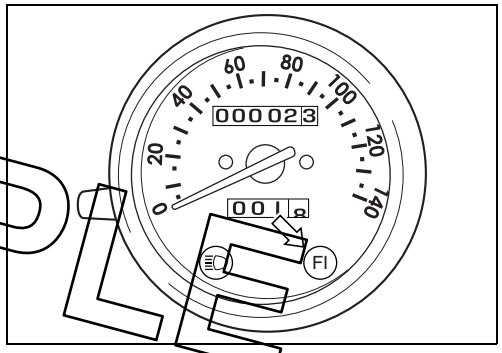
| TERMINAL NO. | CIRCUIT | TERMINAL NO. | CIRCUIT |
|---|---|---|---|
| ① | Power ground (E0) | ⑭ | Ignition coil |
| ② | ISC valve | ⑮ | FI indicator light |
| ③ | Control ground (E1) | ⑯ | Fuel injector ⊖ |
| ④ | Sensor ground (E2) | ⑰ | Mode select switch |
| ⑤ | Power source (+B) | ⑱ | Fuel injector ⊕ |
| ⑥ | HO2 sensor heater | ⑲ | — |
| ⑦ | — | ⑳ | Neutral switch |
| ⑧ | Clutch switch | ㉑ | ET sensor (ET) |
| ⑨ | Power source for sensors (VCC) | ㉒ | IAT sensor (IAT) |
| ⑩ | — | ㉓ | TP sensor (TP) |
| ⑪ | TO sensor (TO) | ㉔ | IAP sensor (IAP) |
| ⑫ | — | ㉕ | — |
| ⑬ | HO2 sensor (HO2) | ㉖ | CKP sensor (CKP) |

# 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 indicator 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 INDICATOR LIGHT INDICATION |
|---|---|---|
| "NO" | | — |
| "YES" | Engine can start | FI indicator light turns ON. *1 |
| | Engine can not start | FI indicator 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 indicator light is lighted and the motorcycle can run.

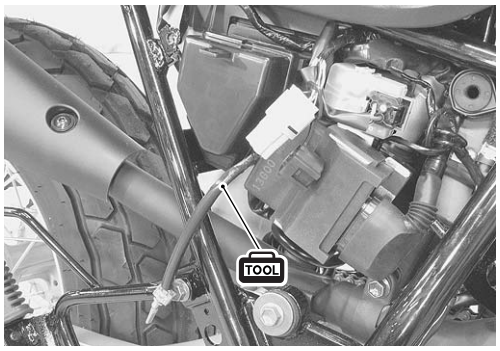
*2
The injection signal is stopped, when the crankshaft position sensor signal, tip-over sensor signal, ignition signal, injector signal or ignition switch signal is not sent to ECM. In this case, FI indicator light is ON and blinks and the motorcycle can not run.

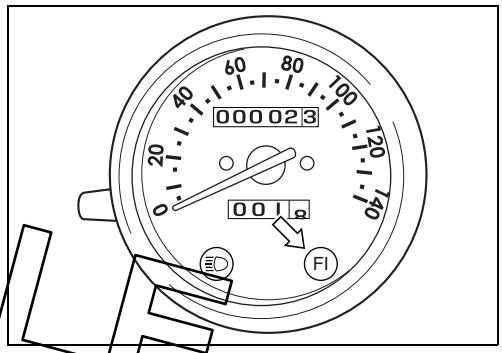
When the ignition switch is turned ON, FI indicator light is lit for 2 seconds and thereafter remains unlit.
When the ignition switch is turned ON and the engine stop switch is turned OFF, in this case, the speedometer does not receive any signal from ECM, and the speedometer does not light FI indicator light.
If FI indicator light is not lighted when turning the ignition switch to ON, the FI indicator light does not indicate the trouble code.
It is necessary to check the wiring harness between ECM and speedometer couplers.
The possible cause of this indication is as follows;
Engine stop switch is in OFF position. Fuse is burnt.
FI indicator bulb is burnt.

**DEALER MODE**

The defective function is memorized in the ECM. Use the special tool's coupler to connect to the dealer mode coupler. The memorized malfunction code is displayed by the flashing pattern of FI indicator light. Malfunction means that the ECM does not receive normal signal from the devices. These affected devices are indicated in the code form.

**TOOL 09930-82720: Mode select switch**




**CAUTION**

**Before checking DTC (Diagnostic Trouble Code), do not disconnect the ECM lead wire coupler. If the coupler from the ECM is disconnected, the DTC memory is erased and can not be checked.**

| MALFUNCTION | FI INDICATOR LIGHT INDICATION |
|---|---|
| "NO" | OFF |
| "YES" | ON and blinks |

The DTC is indicated from small code to large code.

## FAIL-SAFE FUNCTION

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

| ITEM | FAIL-SAFE MODE | STARTING ABILITY | RUNNING ABILITY |
|---|---|---|---|
| IAP sensor | Intake air pressure is fixed to 101 kPa (760 mmHg). | "YES" | "YES" |
| TP sensor | The throttle opening is fixed to full open position.<br>Ignition timing is also fixed. | "YES" | "YES" |
| IAT sensor | Intake air temperature value is fixed to 25 °C. | "YES" | "YES" |
| ET sensor | Engine temperature value is fixed to 80 °C. | "YES" | "YES" |
| HO2 sensor | Feedback compensation is inhibited. (Air/fuel ratio is fixed to normal.) | "YES" | "YES" |
| ISC valve | ISC operation is stopped. | "YES" | "YES" |

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

# FI SYSTEM TROUBLESHOOTING

## CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer. For this purpose, use of such an inspection form 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: |

| | |
|---|---|
| FI indicator light condition | ☐ Always ON ☐ Sometimes ON ☐ Always OFF ☐ Good condition |

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

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

* Engine oil level and leakage (☞RV125K3 2-10)
* Fuel level and leakage (☞Page 8 and 84)
* Clogged air cleaner element (☞RV125K3 2-4)
* Battery condition (☞RV125K3 6-31)
* Throttle cable play (☞Page 7)
* Broken fuse
* FI indicator light operation (☞Page 30)
* Exhaust gas leakage and noise (☞RV125K3 2-19)
* Each coupler disconnection

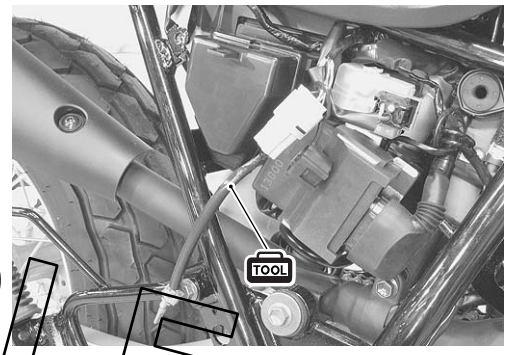
## SELF-DIAGNOSTIC PROCEDURES

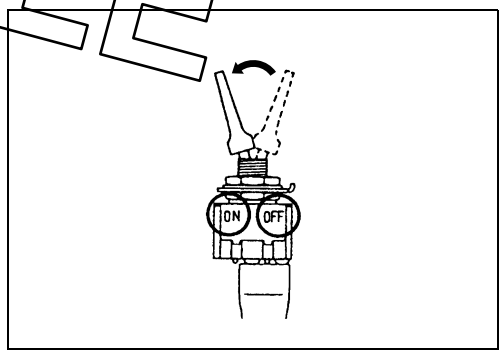
*NOTE:*

* *Do not disconnect the coupler from ECM, battery cable from battery, ECM ground wire from engine or main fuse before confirming the DTC (Diagnostic Trouble Code) stored in memory. Such disconnection will erase the memorized information in ECM memory.*
* *DTC stored in ECM memory can be checked by the special tool.*
* *Before checking DTC, read SELF-DIAGNOSIS FUNCTION "USER MODE and DEALER MODE" (☞Page 30 and 31) carefully to have good understanding as to what functions are available and how to use it.*
* *Be sure to read "PRECAUTIONS IN SERVICING" (☞Page 13) before inspection and observe what is written there.*

- Remove the right frame cover. (☞RV125K3 5-3)
- Connect the special tool to the dealer mode coupler at the wiring harness.
- Turn the special tool's switch ON and check the malfunction code to determine the malfunction part.

TOOL **09930-82720: Mode select switch**



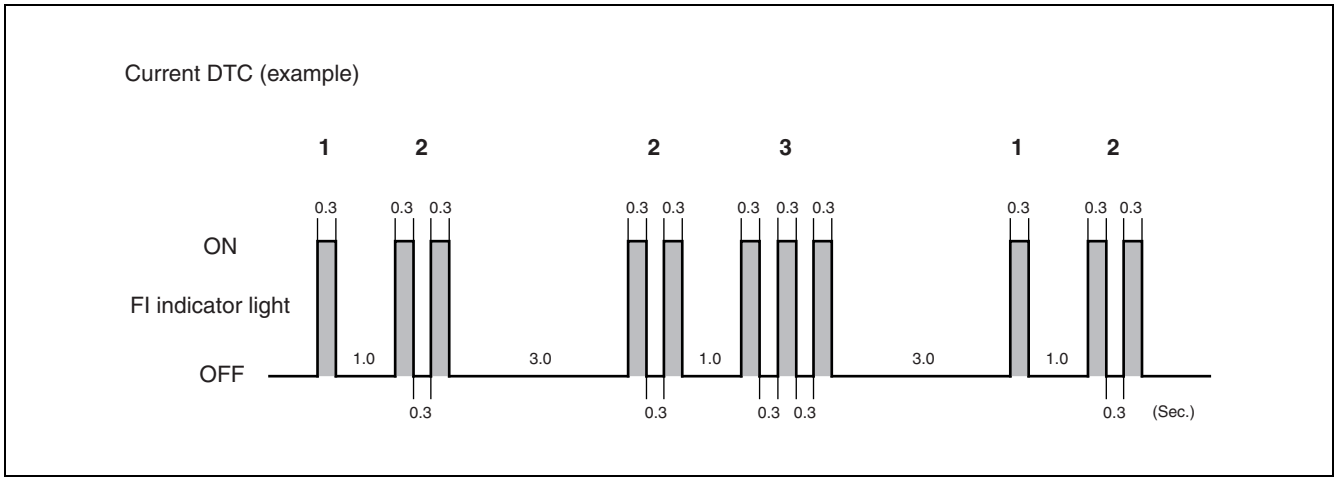



**UNDERSTANDING THE DTC (Diagnostic Trouble Code)**

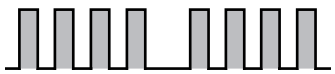
A two-digit DTC is shown through the flashing pattern of the FI indicator light.

The DTCs are displayed from a smaller number to a larger number in that order. When all the applicable DTCs have been displayed, the displaying of the DTCs repeat from the first one again.

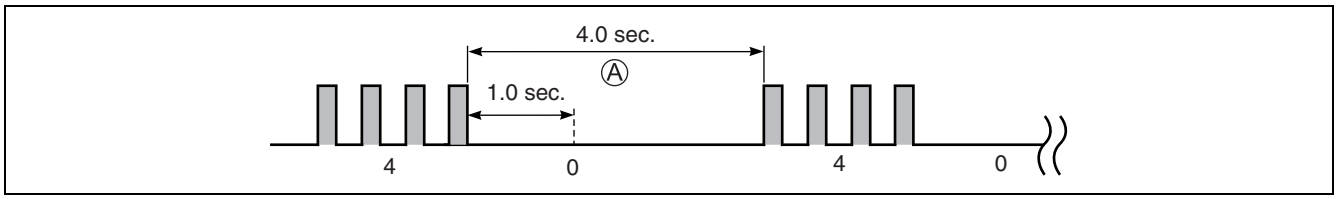
If no DTC is recorded, the FI indicator light will not turned on.



**DTC INDICATION CHART**

| FLASHING PATTERN | DTC No. | MALFUNCTION PART | REMARKS |
|---|---|---|---|
|  | 00 | None | |
|  | 12 | CKP sensor (☞Page 44) | Pick up coil signal |
|  | 13 | IAP sensor (☞Page 47) | |
|  | 14 | TP sensor (☞Page 52) | |
|  | 15 | ET sensor (☞Page 57) | |
|  | 21 | IAT sensor (☞Page 61) | |
|  | 23 | TO sensor (☞Page 65) | |
|  | 24 | Ignition coil (☞Page 68) | |
|  | 32 | Fuel injector (☞Page 69) | |
|  | *40 | ISC valve (☞Page 71) | |
|  | 42 | Ignition switch (☞Page 74) | |
|  | 44 | HO2 sensor (☞Page 75) | |

*40
C40 code has no first digit display. For this reason, the interval Ⓐ between the displays as shown below is longer than the others.



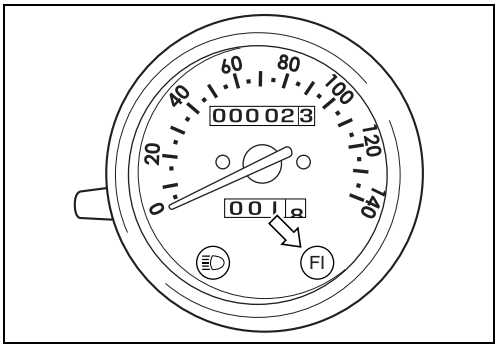

**SELF-DIAGNOSIS RESET PROCEDURE**

- After repairing the trouble, turn OFF the ignition switch and turn ON again.
- If the FI indicator light turns OFF, the malfunction is cleared.
- Disconnect the special tool from the dealer mode coupler.

*NOTE:*

** Even though the Current DTC is cleared, Past DTC (previous malfunction history code) still remains stored in the ECM. Therefore, erase the Past DTC memorized in the ECM using SDS.*

** DTC 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 DTC (Past DTC) using SDS.*



## USE OF SDS DIAGNOSTIC PROCEDURES

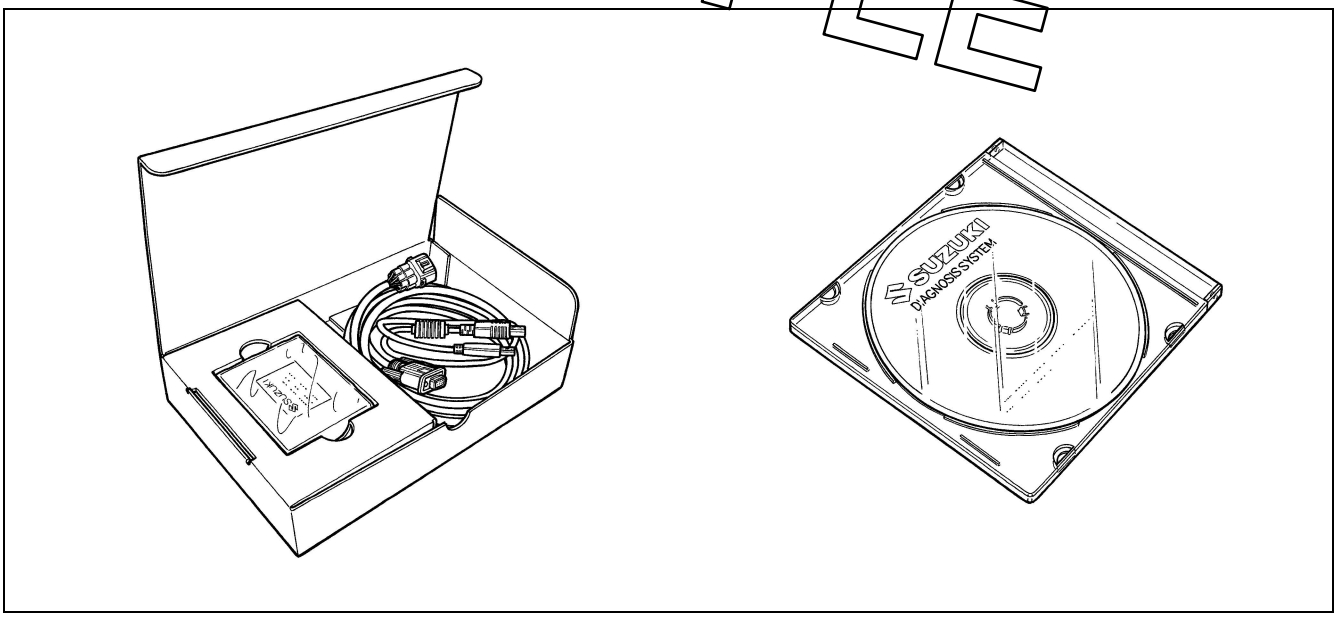
*NOTE:*

* *Do not disconnect the coupler from ECM, battery cable from battery, ECM ground wire from engine or main fuse before confirming the DTC (Diagnostic Trouble Code) stored in memory. Such disconnection will erase the memorized information in ECM memory.*
* *DTC stored in ECM memory can be checked by SDS.*
* *Be sure to read "PRECAUTIONS IN SERVICING" (☞Page 13) before inspection and observe what is written there.*

- Remove the right frame cover. (☞RV125K3 5-3)
- 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.
- SDS is not only used for detecting DTC 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.)

**TOOL 09904-41010: SDS set tool**
**99565-01010-009: CD-ROM Ver. 9**

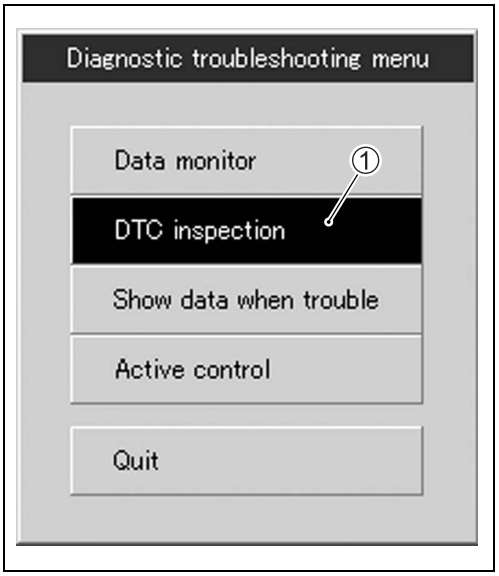




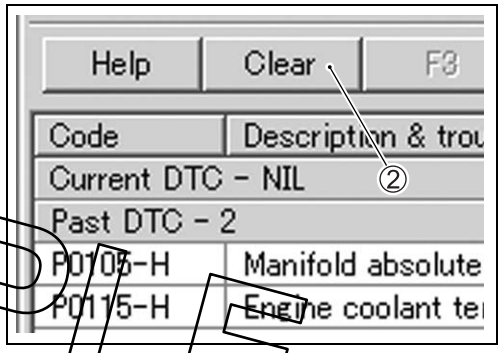
**USE OF SDS DIAGNOSIS RESET PROCEDURE**

- 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).

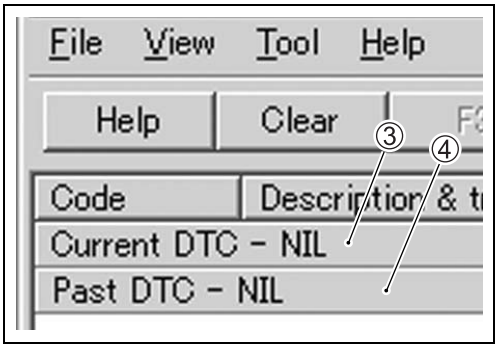





- Follow the displayed instructions.



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

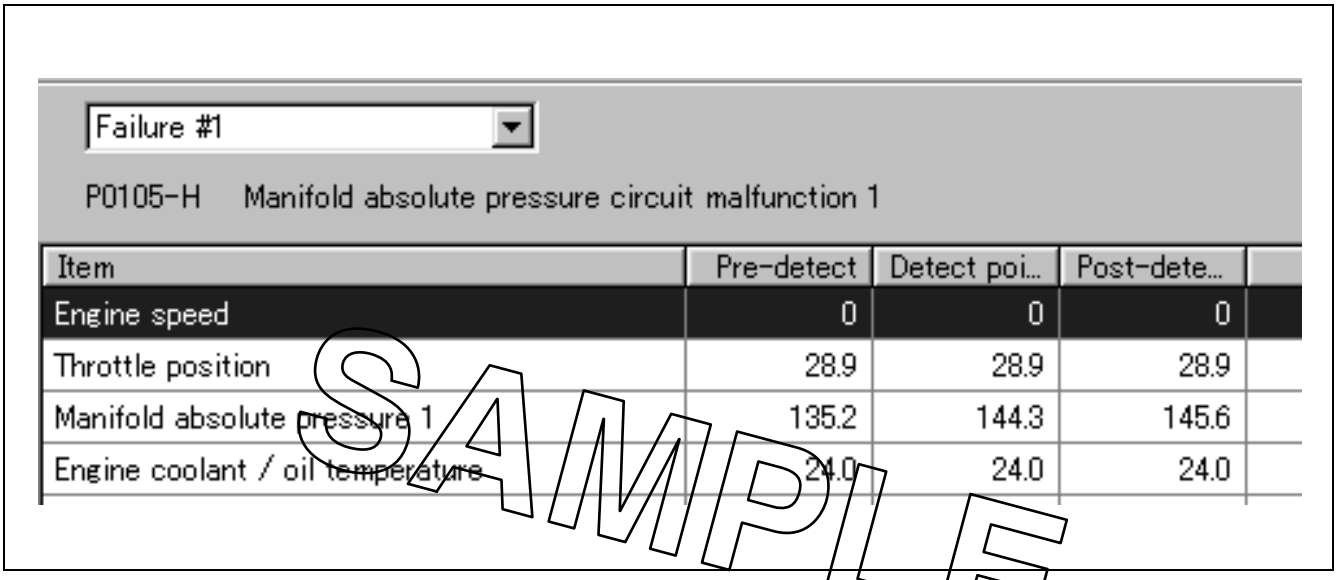


**SHOW DATA WHEN TROUBLE DISPLAING DATA AT THE TIME OF DTC)**

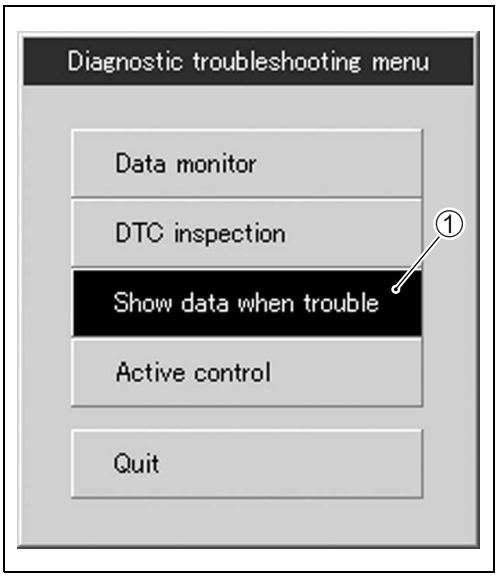
ECM stores the engine and driving conditions (in the form of data as shown in the figure) at the moment of the detection of a malfunction in its memory. This data is called "Show data when trouble".

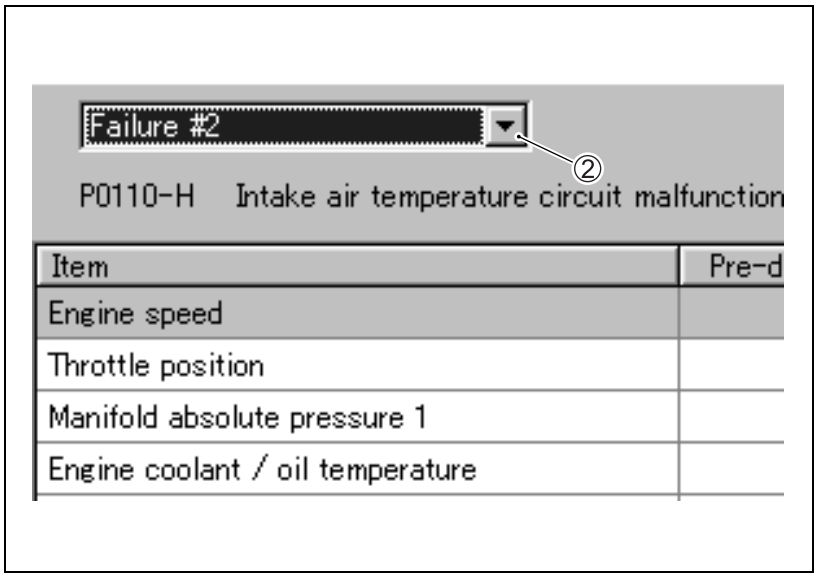
Therefore, it is possible to know engine and driving conditions (e.g., whether the engine was warm or not, where the motorcycle was running or stopped) when a malfunction was detected by checking the show data when trouble. This show data when trouble function can record the maximum of two Diagnostic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




- 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.



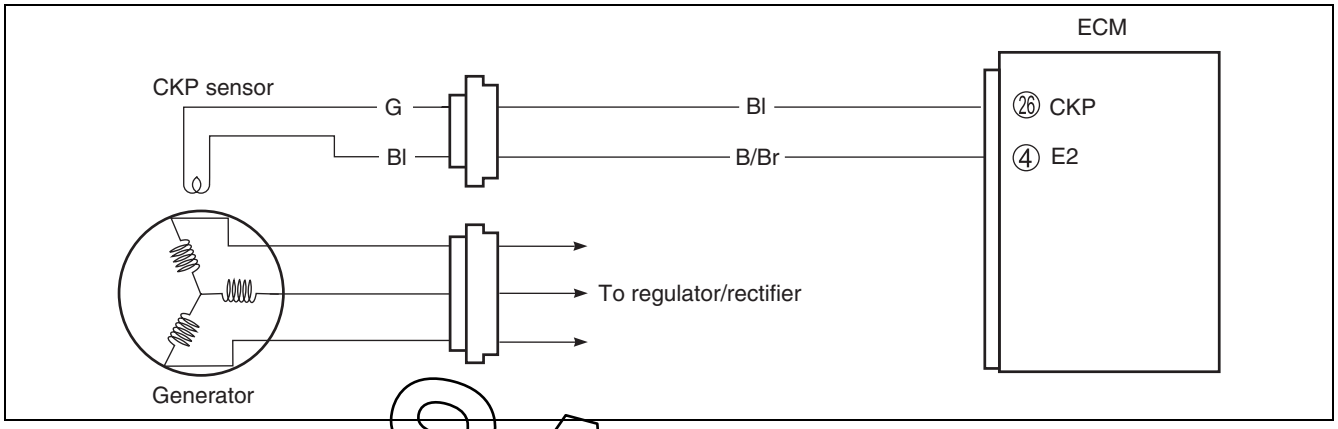
**DTC TABLE AND DEFECTIVE CONDITION**

| DTC No. | | DETECTED ITEM | DETECTED FAILURE CONDITION | CHECK FOR |
|---|---|---|---|---|
| 00 | | NO FAULT | ———— | ———— |
| 12 | | CKP sensor | The CKP sensor signal does not reach ECM for 4 sec. or more, after receiving the IAP sensor signal. | CKP sensor wiring and mechanical parts<br>CKP sensor, lead wire/coupler connection |
| P0335 | | | | |
| 13 | | IAP sensor | The sensor should produce following voltage.<br>0.2 V ≦ sensor voltage < 4.5 V<br>In other than the above range, 13 (P0105) is indicated. | IAP sensor, lead wire/coupler connection |
| P0105 | H | | Sensor voltage is higher than specified value. | IAP sensor circuit open or shorted to VCC or ground circuit open |
| | L | | Sensor voltage is lower than specified value. | IAP sensor circuit shorted to ground or VCC circuit open |
| 14 | | TP sensor | The sensor should produce following voltage.<br>0.3 V ≦ sensor voltage < 4.7 V<br>In other than the above range, 14 (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 |
| 15 | | ET sensor | The sensor voltage should be the following.<br>0.1 V ≦ sensor voltage < 4.7 V<br>In other than the above range, 15 (P0115) is indicated. | ET 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 |
| 21 | | IAT sensor | The sensor voltage should be the following.<br>0.1 V ≦ sensor voltage < 4.6 V<br>In other than the above range, 21 (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 |
|---|---|---|---|---|
| 23 | | TO sensor | The sensor voltage should be the following for 2 sec. and more, after ignition switch is turned ON.<br>0.2 V ≦ sensor voltage < 4.6 V<br>In other than the above value, 23 (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 |
| 24<br>P0351 | | Ignition signal | CKP sensor (pick-up coil) signal is produced, but signal from ignition coil is interrupted 10 times or more continuously. In this case, the code 24 (P0351) is indicated. | Ignition coil, wiring/coupler connection, power supply from the battery |
| 32<br>P0201 | | Fuel injector | CKP sensor (pickup coil) signal is produced, but fuel injector signal is interrupted 10 times or more continuously. In this case, the code 32 (P0201) is indicated. | Primary fuel injector, wiring/coupler connection, power supply to the injector |
| 40<br>P0505 | | ISC valve | When the ISC operation voltage remains at 1.0 V or lower continuously for 2 sec. or longer.<br>Idle speed is higher than the normal condition. | ISC valve circuit open or shorted to ground<br>Power source circuit open ISC valve is fixed to full open<br>Disconnected ISC valve hose |
| 42<br>P1650 | | Ignition switch | Ignition switch signal is not input to the ECM. | Ignition switch, lead wire/coupler, etc. |
| 44<br>P0130 | | HO2 sensor | HO2 sensor output voltage is not input to ECM during engine operation and running condition.<br>(Sensor voltage < 0.60 V)<br>In other than the above value, 44 (P0130) is indicated. | HO2 sensor circuit open or shorted to ground |
| 44<br>P0135 | | | The Heater can not operate so that heater operation voltage is not supply to the oxygen heater circuit, 44 (P0135) is indicated. | HO2 sensor lead wire/coupler connection<br>Battery voltage supply to the HO2 sensor |

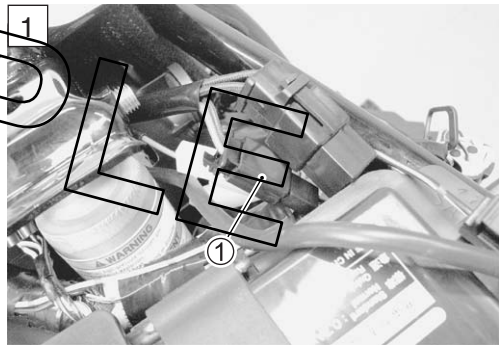
# "12" (P0335) CKP SENSOR CIRCUIT MALFUNCTION

| DETECTED CONDITION | POSSIBLE CAUSE |
|---|---|
| The CKP sensor signal does not reach ECM for 4 sec. or more, after receiving the IAP sensor signal. | • Metal particles or foreign material being stuck on the CKP sensor and rotor tip<br>• CKP sensor circuit open or short<br>• CKP sensor malfunction<br>• ECM malfunction |



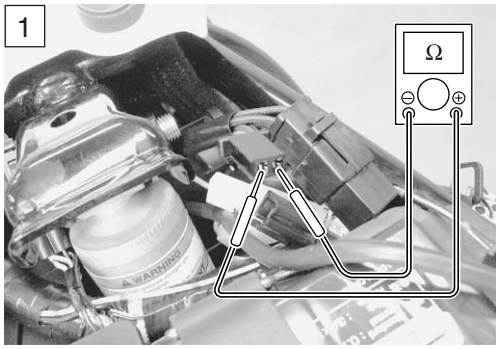



**INSPECTION**
**Step 1**
1) Turn the ignition switch OFF.
2) Remove the seat. (☞RV125K3 5-3)
3) Check the CKP sensor coupler ① for loose or poor contacts.
   If OK, then measure the CKP sensor resistance.




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

DATA **CKP sensor resistance: 172 – 288 Ω (G – Bl)**

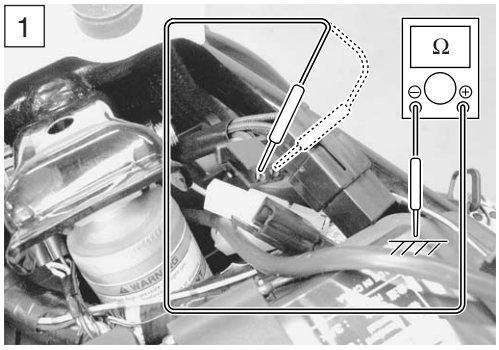


5) If OK, then check the continuity between each terminal and ground.

**DATA CKP sensor continuity: ∞ Ω (Infinity)**
**(G – Ground)**
**(Bl – Ground)**

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

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




Are the resistance and continuity OK?

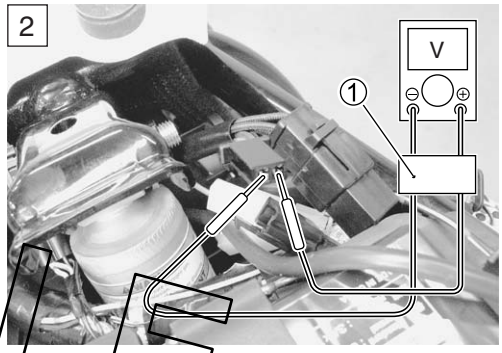
| | |
|---|---|
| YES | Go to step 2. |
| NO | Replace the CKP sensor with a new one. |

6) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**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: 2.0 V and more**
**(⊕ G – ⊖ Bl)**




① Peak volt adaptor

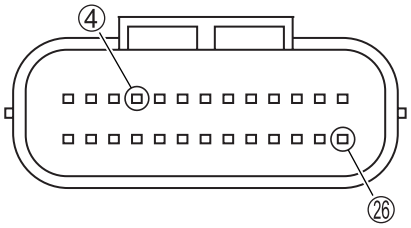
**TOOL 09900-25008: Multi-circuit tester set**

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

Is the voltage OK?

| | |
|---|---|
| YES | • Bl or B/Br wire open or shorted to ground.<br>• Loose or poor contacts on the CKP sensor coupler or ECM coupler (terminal ㉖ or ④).<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | • Inspect that metal particles or foreign material stuck on the CKP sensor and rotor tip.<br>• If there are no metal particles and foreign material, then replace the CKP sensor with a new one. |

2



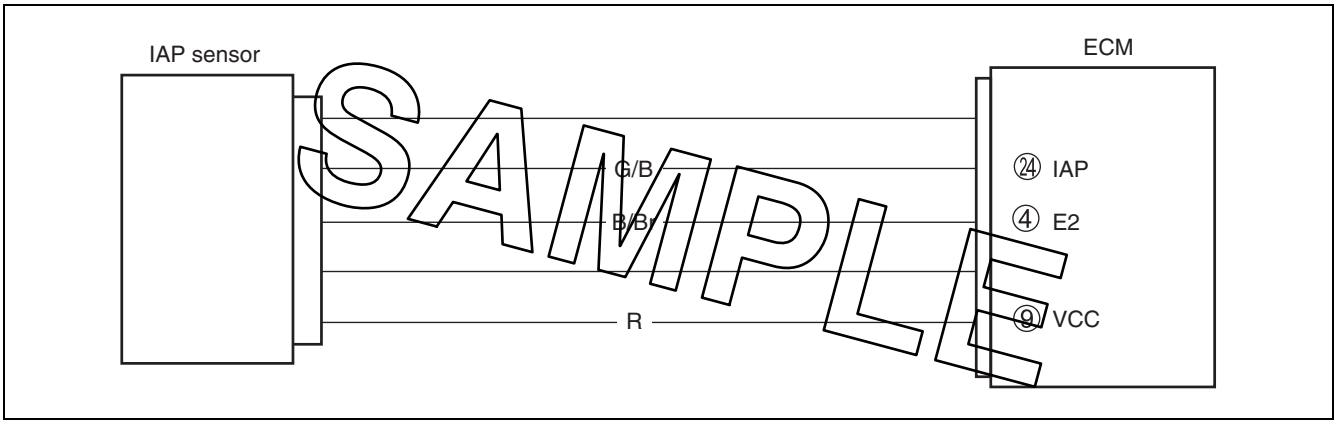

**CAUTION**

**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. (☞Page 40)

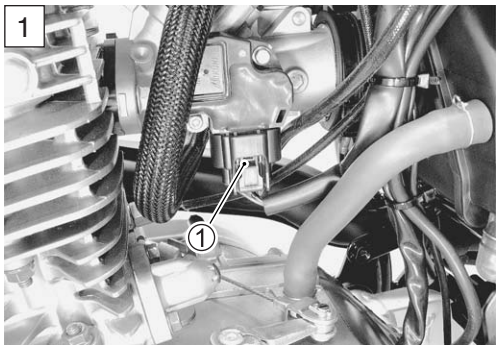
## "13" (P0105-H/L) IAP SENSOR CIRCUIT MALFUNCTION

| | | DETECTED CONDITION | POSSIBLE CAUSE |
|---|---|---|---|
| 13 | | IAP sensor voltage is not within the following range.<br>0.2 V ≦ Sensor voltage < 4.5 V<br>*NOTE:*<br>*Note that atmospheric pressure varies depending on weather conditions as well as altitude.*<br>*Take that into consideration when inspecting voltage.* | • Clogged vacuum passage between throttle body and IAP sensor.<br>• Air being drawn from vacuum passage between throttle body and IAP sensor.<br>• IAP sensor circuit open or shorted to ground.<br>• IAP sensor malfunction.<br>• ECM malfunction. |
| P0105 | H | Sensor voltage is higher than specified value. | • IAP sensor circuit open or shorted to VCC or ground circuit open. |
| | L | Sensor voltage is lower than specified value. | • IAP sensor circuit shorted to ground or VCC circuit open. |




*NOTE:*
*IAP sensor is incorporated in the TP sensor/IAT sensor.*

**INSPECTION**
**Step 1 (When indicating 13:)**
1) Turn the ignition switch OFF.
2) Check the IAP sensor coupler ① for loose or poor contacts.
   If OK, then measure the IAP sensor input voltage.

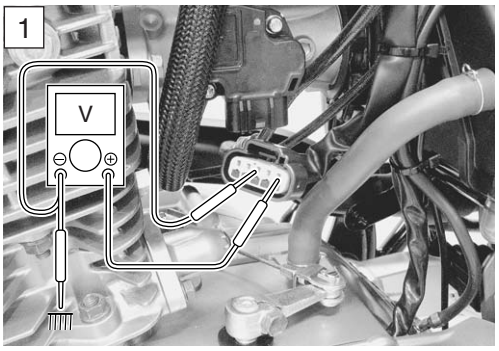


3) Disconnect the IAP sensor coupler.
4) Turn the ignition switch ON.
5) Measure the voltage at the R wire and ground.
6) If OK, then measure the voltage at the R wire and B/Br wire.

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

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

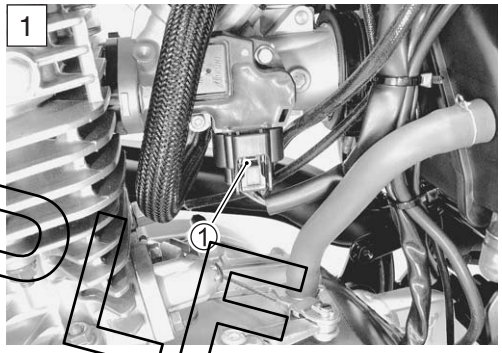
**Tester knob indication: Voltage (⎓)**




Is the voltage OK?

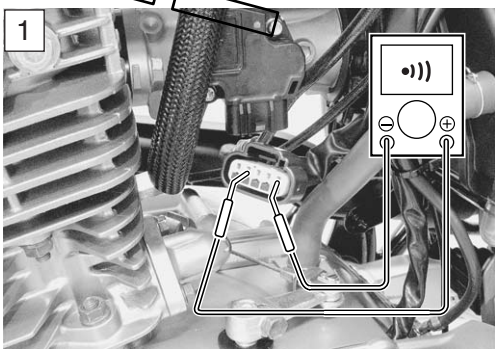
| | |
|---|---|
| YES | Go to Step 2. |
| NO | • Loose or poor contacts on the ECM coupler (terminal ⑨ or ④).<br>• Open or short circuit in the R wire or B/Br wire. |

**Step 1 (When indicating P0105-H:)**
1) Turn the ignition switch OFF.
2) Check the IAP sensor coupler ① for loose or poor contacts.
If OK, then check the IAP sensor lead wire continuity.






3) Disconnect the IAP sensor coupler.
4) Check the continuity between R wire and G/B wire.
If the sound is not heard from the tester, the circuit condition is OK.

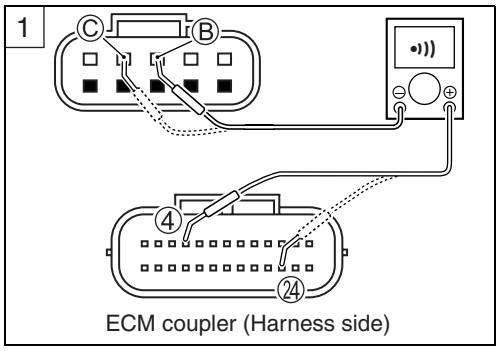


5) Disconnect the ECM coupler.
6) Check the continuity between G/B wire Ⓒ and terminal ㉔.
7) If OK, then check the continuity between B/Br wire Ⓑ and terminal ④.

**DATA IAP sensor lead wire continuity: Continuity (•))))**

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

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



ECM coupler (Harness side)

**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.**

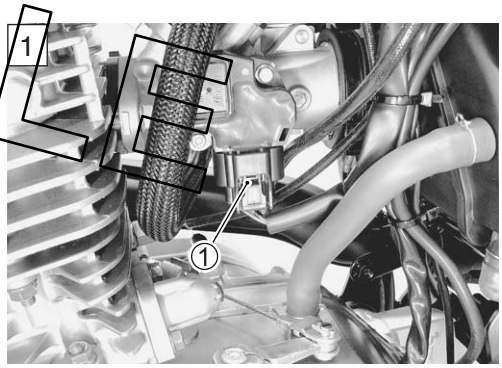
Is the continuity OK?

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

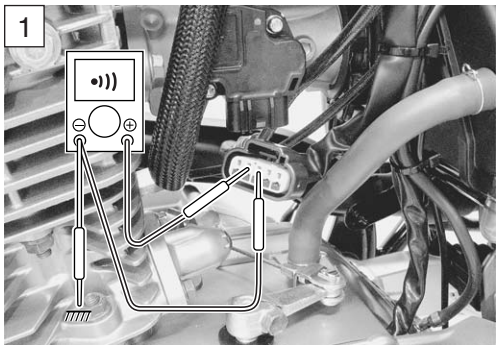
8) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)



**Step 1 (When indicating P0105-L:)**
1) Turn the ignition switch OFF.
2) Check the IAP sensor coupler ① for loose or poor contacts. If OK, then check the IAP sensor lead wire continuity.




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



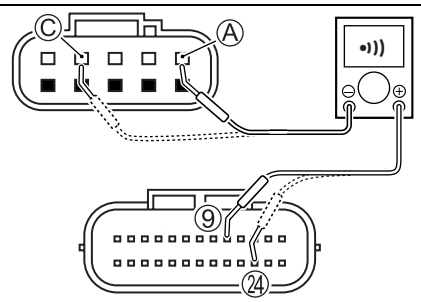
6) Disconnect the ECM coupler.
7) Check the continuity between R wire Ⓐ and terminal ⑨.
8) Also, check the continuity between G/B wire Ⓒ and terminal ㉔.

**DATA IAP sensor lead wire continuity: Continuity (•))))**

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

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

1




ECM coupler (Harness side)

**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 (☞Page 47) and go to Step 2. |
| NO | R or G/B wire open, or G/B wire shorted to ground |

9) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

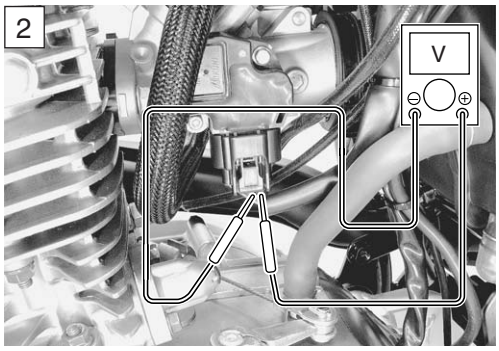
**Step 2**

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 (between G/B and B/Br wires).

**DATA IAP sensor output voltage: 2.0 – 3.5 V at idle speed (⊕ G/B – ⊖ B/Br)**

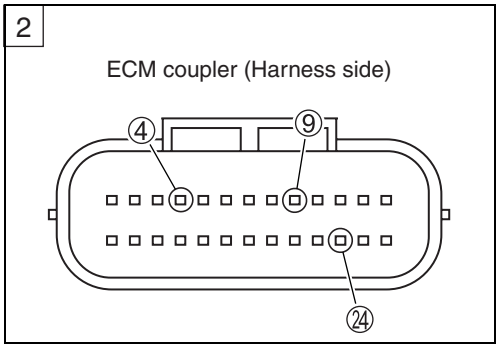
**TOOL 09900-25008: Multi-circuit tester set**
**09900-25009: Needle pointed probe set**

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




Is the voltage OK?

| | |
|---|---|
| YES | • G/B, R or B/Br wire open or shorted to ground, or poor ㉔, ⑨ or ④ connection<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | • Open or short circuit in the G/B wire<br>• If the wire are OK, replace the throttle body assembly with a new one. |



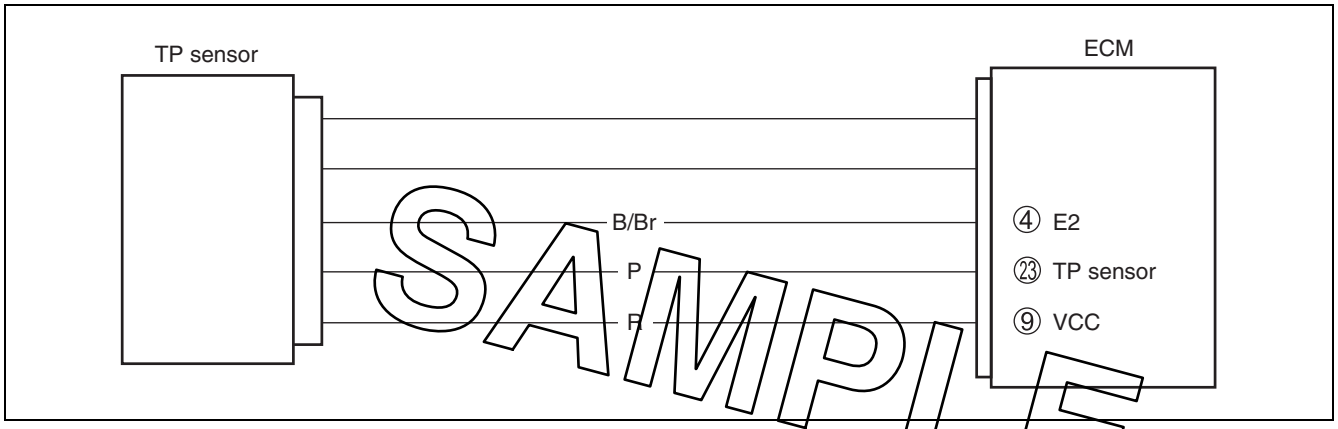

**CAUTION**

**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. (☞Page 40)

## "14" (P0120-H/L) TP SENSOR CIRCUIT MALFUNCTION

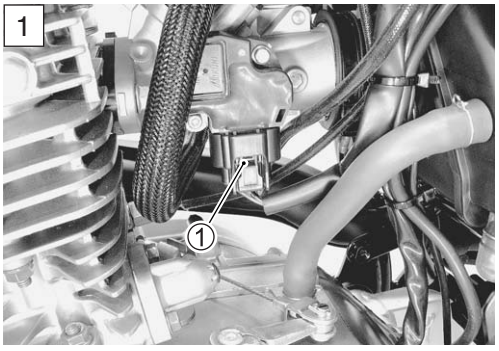
| DETECTED CONDITION | | | POSSIBLE CAUSE |
|---|---|---|---|
| 14 | | Output voltage is not within the following range.<br>Difference between actual throttle opening and opening calculated by ECM is larger than specified value.<br>0.3 V ≦ Sensor voltage < 4.7 V | • TP sensor maladjusted<br>• TP sensor circuit open or short<br>• TP sensor malfunction<br>• ECM malfunction |
| 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 |



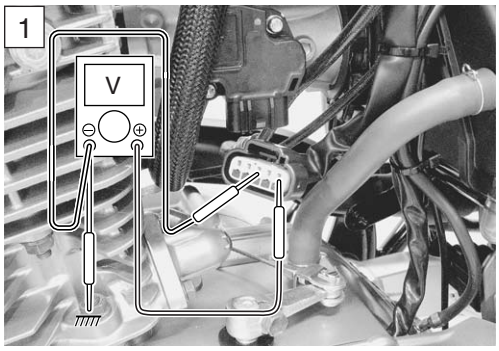



*NOTE:*
*TP sensor is incorporated in the IAP sensor/IAT sensor.*

**INSPECTION**
**Step 1 (When indicating 14:)**
1) Turn the ignition switch to OFF.
2) Check the TP sensor coupler ① for loose or poor contacts.
   If OK, then measure the TP sensor input voltage.



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




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

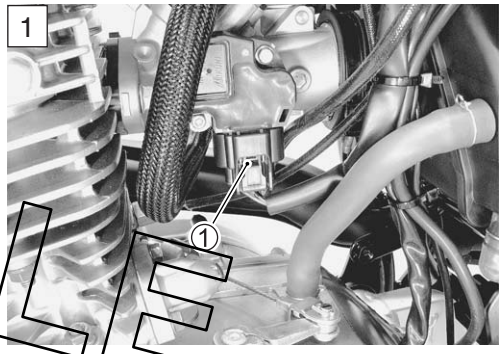
**TOOL 09900-25008: Multi-circuit tester set**

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

Is the voltage OK?

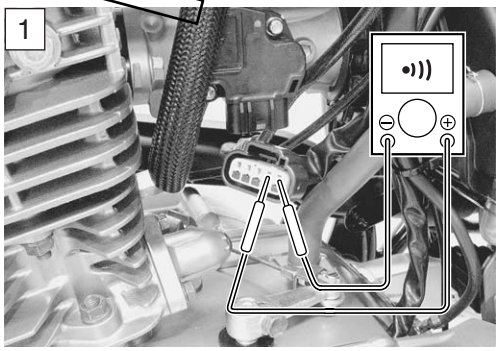
| | |
|---|---|
| YES | Go to Step 2. |
| NO | • Loose or poor contacts on the ECM coupler (terminal ⑨ or ④).<br>• Open or short circuit in the R wire or B/Br wire. |

**Step 1 (When indicating P0120-H:)**
1) Turn the ignition switch OFF.
2) Check the TP sensor coupler ① for loose or poor contacts.
If OK, then check the TP sensor lead wire continuity.






3) Disconnect the TP sensor coupler.
4) Check the continuity between P wire and R wire.
If the sound is not heard from the tester, the circuit condition is OK.



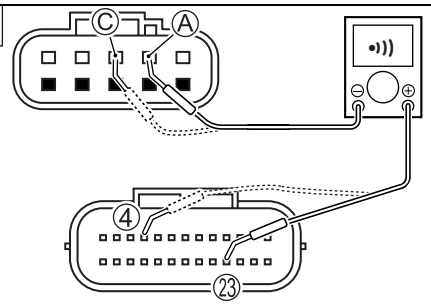
5) Disconnect the ECM coupler.
6) Check the continuity between P wire Ⓐ and terminal ㉓.
7) Also, check the continuity between B/Br wire Ⓒ and terminal ④.

**DATA TP sensor lead wire continuity: Continuity (•))))**

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

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

1




ECM coupler (Harness side)

**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?

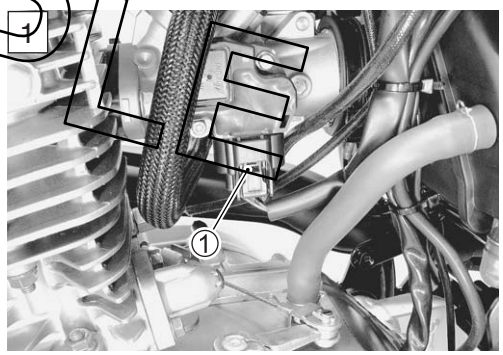
| | |
|---|---|
| YES | Go to Step 2. |
| NO | P wire shorted to VCC, or B/Br wire open |

8) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)



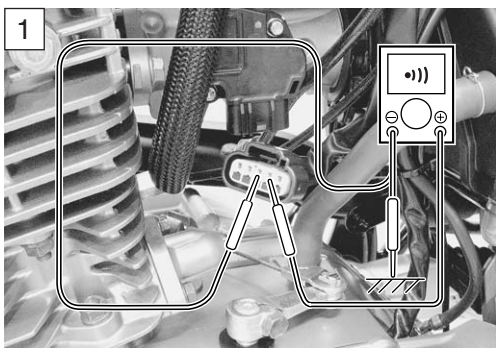
**Step 1 (When indicating P0120-L:)**
1) Turn the ignition switch OFF.
2) Check the TP sensor coupler ① for loose or poor contacts. If OK, then check the TP sensor lead wire continuity.

1




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

1



6) Disconnect the ECM coupler.
7) Check the continuity between P wire Ⓐ and terminal ㉓.
8) Also, check the continuity between R wire Ⓑ and terminal ⑨.

**DATA TP sensor lead wire continuity: Continuity (•))))**

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

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

**CAUTION**

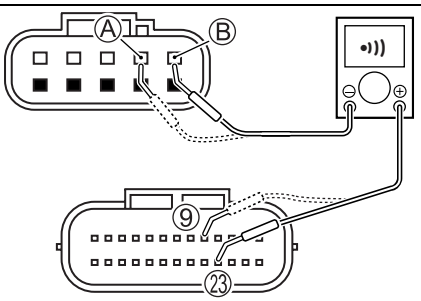
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

Is the continuity OK?

| | |
|---|---|
| YES | Go to Step 1 (☞Page 52) and go to Step 2. |
| NO | R wire or P wire open, or P wire shorted to ground |

9) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

1




ECM coupler (Harness side)

**Step 2**

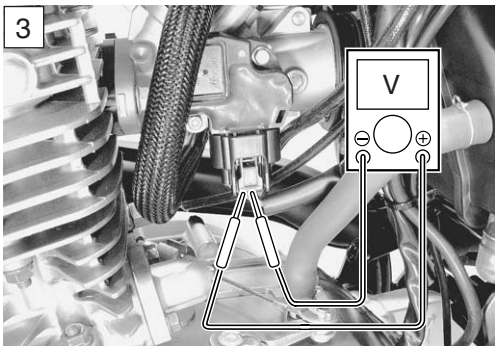
1) Connect the TP sensor coupler.
2) Turn the ignition switch ON.
3) Measure the TP sensor output voltage (between ⊕ P and ⊖ B/Br) by turning the throttle grip.

**DATA TP sensor output voltage**
**Throttle valve is closed: Approx. 0.7 V**
**Throttle valve is opened: Approx. 3.9 V**

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

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

3

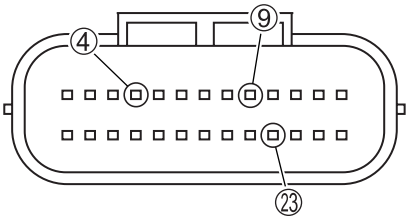



Is the voltage OK?

| | |
|---|---|
| YES | • P, R or B/Br wire open or shorted to ground, or poor ㉓, ⑨ or ④ connection<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | If check result is not satisfactory, replace the throttle body assembly with a new one. |

3

ECM coupler (Harness side)



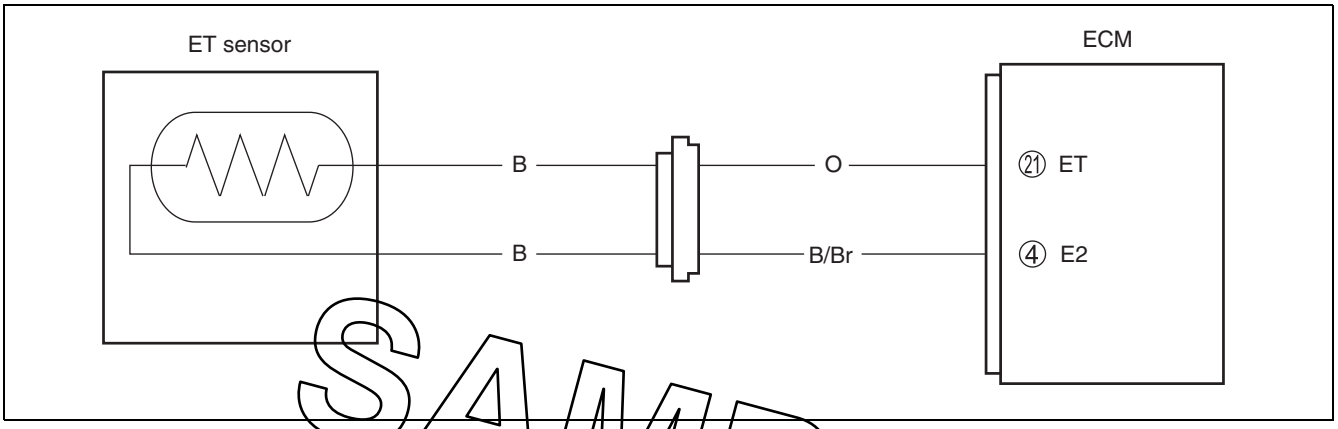

**CAUTION**

**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. (☞Page 40)

## "15" (P0115-H/L) ET SENSOR CIRCUIT MALFUNCTION

| DETECTED CONDITION | | | POSSIBLE CAUSE |
|---|---|---|---|
| 15 | | Output voltage is not within the following range.<br>0.1 V ≦ Sensor voltage < 4.7 V | • ET sensor circuit open or short<br>• ET sensor malfunction<br>• ECM malfunction |
| P0115 | H | Sensor voltage is higher than specified value. | • ET sensor circuit open or ground circuit open |
| | L | Sensor voltage is lower than specified value. | • ET sensor circuit shorted to ground |

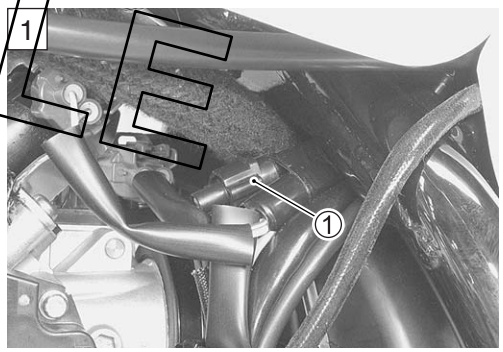




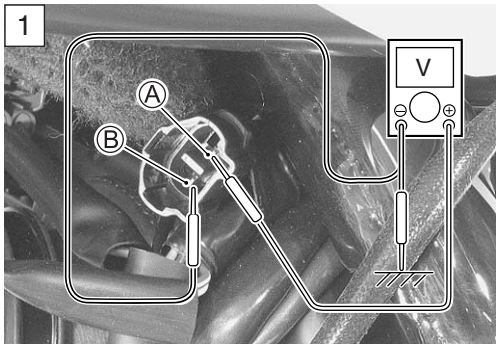

**INSPECTION**

**Step 1 (When indicating 15:)**

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




3) Disconnect the coupler and turn the ignition switch ON.
4) Measure the voltage between O wire terminal Ⓐ and ground.
5) If OK, then measure the voltage between O wire terminal Ⓐ and B/Br wire terminal Ⓑ.




**DATA ET sensor voltage: 4.5 – 5.5 V**
**(⊕ O – ⊖ Ground)**
**(⊕ O – ⊖ B/Br)**

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

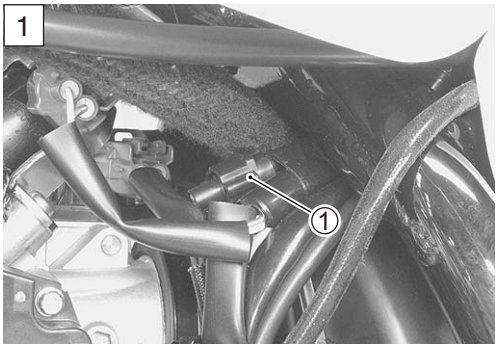
**Tester knob indication: Voltage (⎓)**

Is the voltage OK?

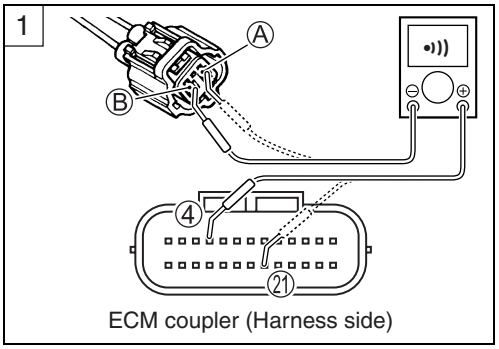
| | |
|---|---|
| YES | Go to Step 2. |
| NO | • Loose or poor contacts on the ECM coupler (terminal ㉑ or ④).<br>• Open or short circuit in the O wire or B/Br wire |

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

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




3) Disconnect the ET sensor coupler and ECM coupler.
4) Check the continuity between O wire Ⓐ and terminal ㉑.
5) Also, check the continuity between B/Br wire Ⓑ and terminal ④.



ECM coupler (Harness side)

**DATA ET sensor 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.**



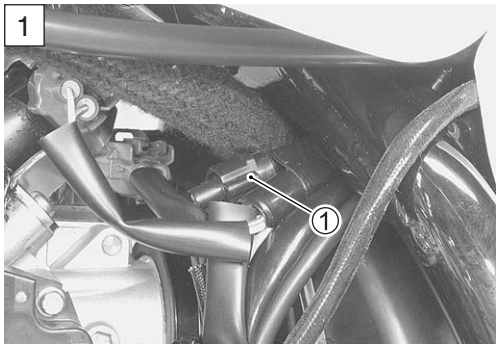
Is the continuity OK?

| | |
|---|---|
| YES | Go to Step 2. |
| NO | O or B/Br wire open |

6) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

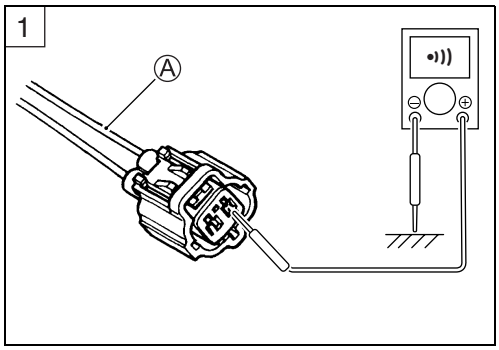
**Step 1 (When indicating P0115-L:)**

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




3) Disconnect the ET sensor coupler.
4) Check the continuity between O wire Ⓐ and ground.
   If the sound is not heard from the tester, the circuit condition is OK.

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




Are the continuity and voltage OK?

| | |
|---|---|
| YES | Go to Step 2. |
| NO | • O wire shorted to ground<br>• If wire is OK, go to Step 2. |

5) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**Step 2**

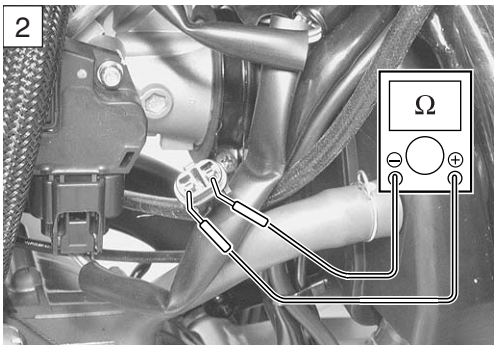
1) Turn the ignition switch OFF.
2) Disconnect the ET sensor coupler.
3) Measure the ET sensor resistance between B wires.

**DATA ET sensor resistance: Approx. 5 – 13 kΩ at 20 – 40 °C (B – B)**

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

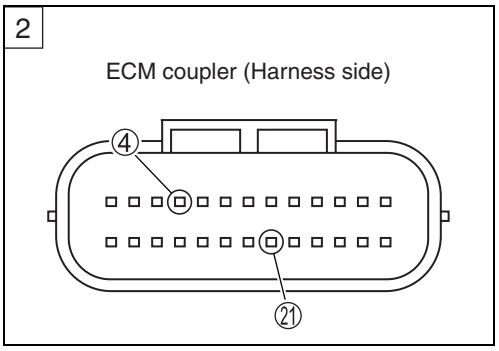
**Tester knob indication: Resistance (Ω)**

Refer to page 79 for details.




Is the resistance OK?

| | |
|---|---|
| YES | • O or B/Br wire open or shorted to ground, or poor ㉑ or ④ connection.<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | Replace the ET 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.**

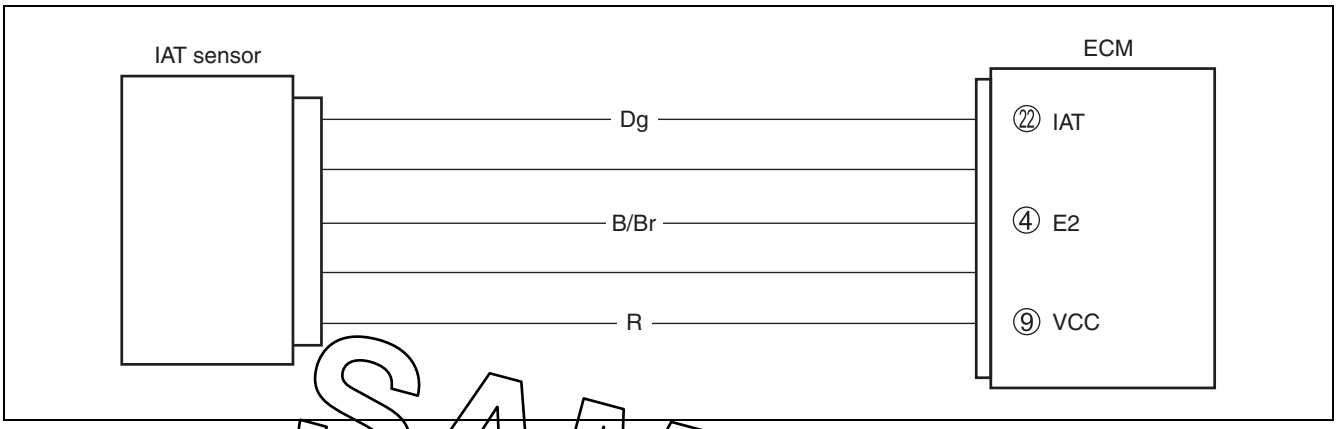
4) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**DATA ET sensor specification**

| Engine temperature | Resistance |
|---|---|
| 20 °C | Approx. 13.0 kΩ |
| 40 °C | Approx. 6.2 kΩ |
| 80 °C | Approx. 1.7 kΩ |
| 100 °C | Approx. 1.0 kΩ |

# "21" (P0110-H/L) IAT SENSOR CIRCUIT MALFUNCTION

| DETECTED CONDITION | | | POSSIBLE CAUSE |
|---|---|---|---|
| 21 (P0110) | | Output voltage is not within the following range. 0.1 ≦ Sensor voltage ≦ 4.6 V | • IAT sensor circuit open or short.<br>• IAT sensor malfunction.<br>• ECM malfunction. |
| 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. |

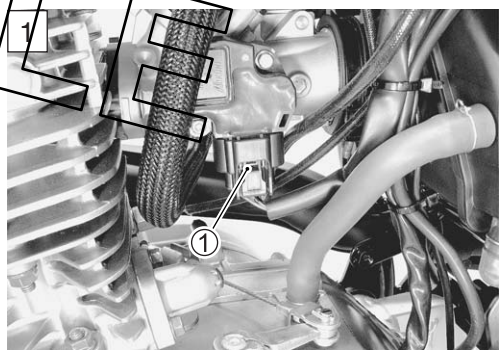




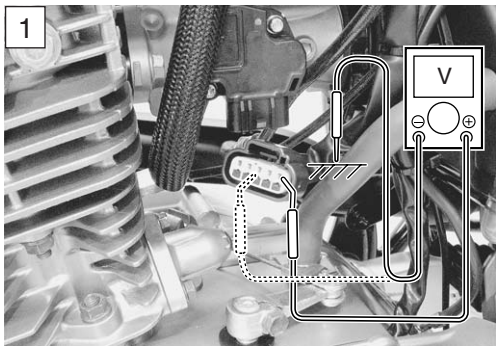

*NOTE:*
*IAT sensor is incorporated in the IAP sensor/TP sensor.*

**INSPECTION**

**Step 1 (When indicating 21:)**
1) Turn the ignition switch OFF.
2) Check the IAT sensor coupler ① for loose or poor contacts.
   If OK, then measure the IAT sensor voltage at the wire side coupler.
3) Disconnect the IAT sensor coupler and turn the ignition switch ON.



4) Measure the voltage between Dg wire terminal and ground.
5) Also, measure the voltage between Dg wire terminal and B/Br wire terminal.




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

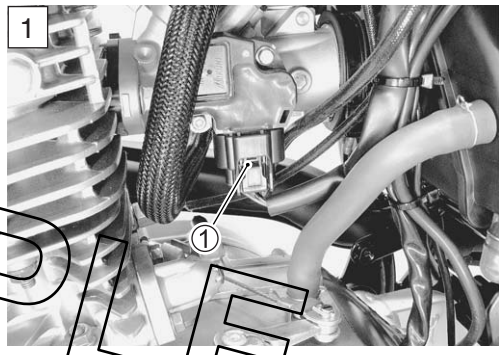
**TOOL 09900-25008: Multi-circuit tester set**
**09900-25009: Needle pointed probe set**

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

Is the voltage OK?

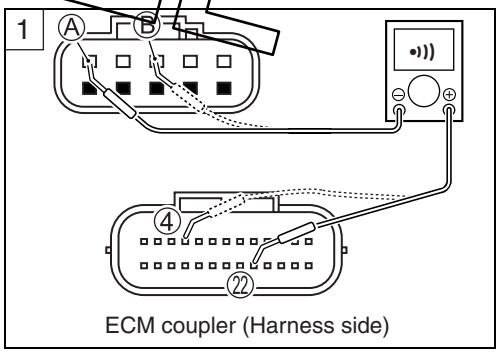
| | |
|---|---|
| YES | Go to Step 2. |
| NO | • Loose or poor contacts on the ECM coupler (Terminal ㉒ or ④).<br>• Open or short circuit in the Dg wire or B/Br wire. |

**Step 1 (When indicating P0110-H:)**
1) Turn the ignition switch OFF.
2) Check the IAT sensor coupler for loose or poor contacts.
If OK, then check the IAT sensor lead wire continuity.






3) Disconnect the IAT sensor coupler and ECM coupler.
4) Check the continuity between Dg wire Ⓐ and terminal ㉒.
5) Also, check the continuity between B/Br wire Ⓑ and terminal ④.



ECM coupler (Harness side)

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

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

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

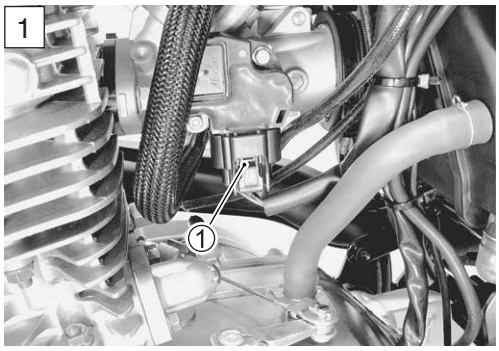
Is the continuity OK?

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

6) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

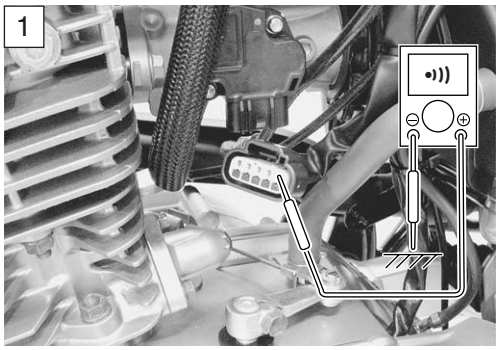
**Step 1 (When indicating P0110-L:)**

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



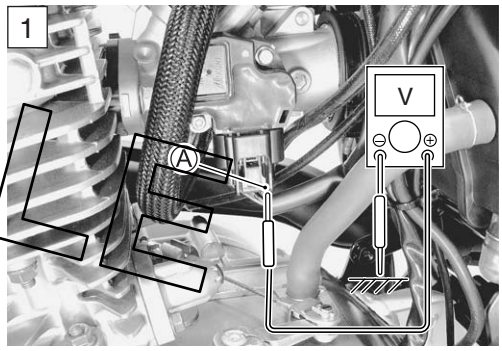

3) Disconnect the IAT sensor coupler.
4) Check the continuity between Dg wire and ground. If the sound is not heard from the tester, the circuit condition is OK.

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




5) Connect the IAT sensor coupler and turn the ignition switch ON.
6) Measure the voltage between Dg wire Ⓐ and ground.

**IAT sensor output voltage: Approx. 2.5 V at 23 °C**
**Approx. 1.8 V at 40 °C**
**(⊕ 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 | • Dg wire shorted to ground<br>• If wire is OK, go to Step 2. |

7) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**Step 2**

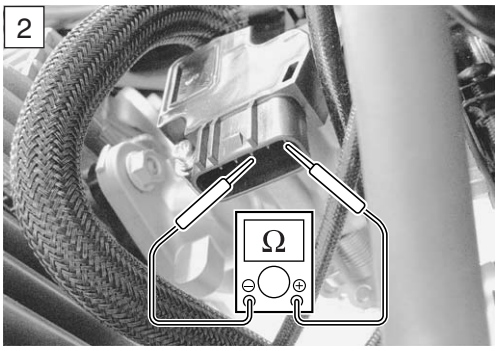
1) Turn the ignition switch OFF.

2) Measure the IAT sensor resistance.

**DATA IAT sensor resistance: Approx. 2.56 kΩ at 20 °C**
**Approx. 1.20 kΩ at 40 °C**
**(Terminal – Terminal)**

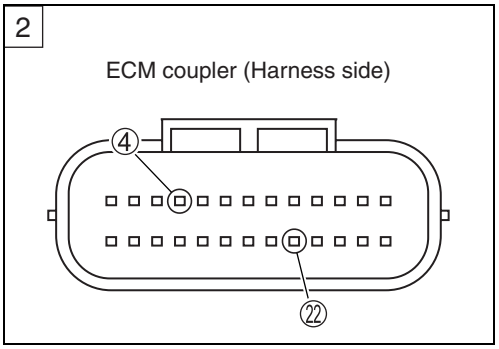
**TOOL 09900-25008: Multi-circuit tester set**

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



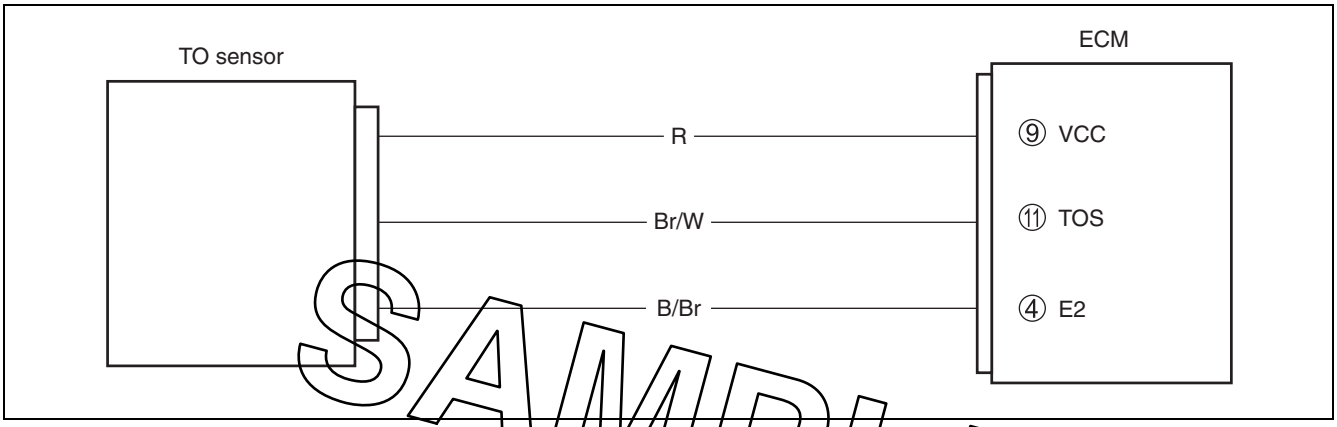

Is the resistance OK?

| | |
|---|---|
| YES | • Dg or B/Br wire open or shorted to ground, or poor ㉒ or ④ connection.<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | Replace the throttle body assembly with a new one. |



# "23" (P1651-H/L) TO SENSOR CIRCUIT MALFUNCTION

| DETECTED CONDITION | | | POSSIBLE CAUSE |
|---|---|---|---|
| 23 | | The sensor voltage should be the following for 2 sec. and more, after ignition switch is turned ON.<br>0.2 V ≦ Sensor voltage < 4.6 V | • TO sensor circuit open or short<br>• TO sensor malfunction<br>• ECM malfunction |
| 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 |

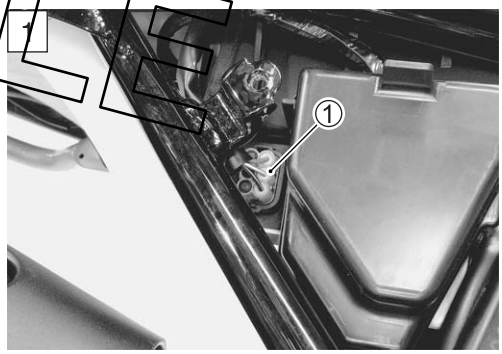





**INSPECTION**

**Step 1 (When indicating 23:)**

1) Turn the ignition switch OFF.
2) Remove the right frame cover. (☞RV125K3 5-3)
3) Check the TO sensor coupler ① for loose or poor contacts.
   If OK, then measure the TO sensor resistance.
4) Disconnect the TO sensor coupler.

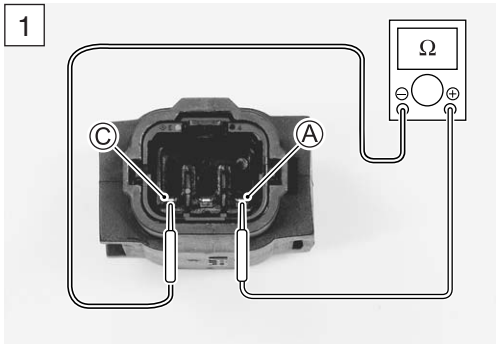



5) Measure the resistance between terminal Ⓐ and terminal Ⓒ.

**DATA TO sensor resistance: 16.5 – 22.3 kΩ**
**(Terminal Ⓐ – Terminal Ⓒ)**

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

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

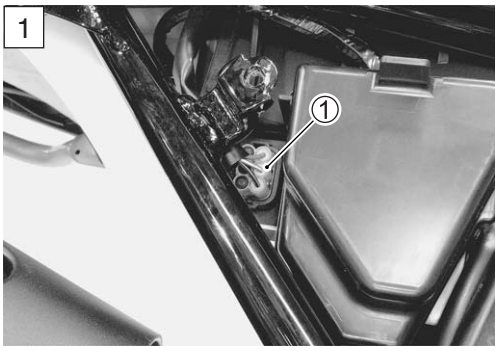



Is the resistance OK?

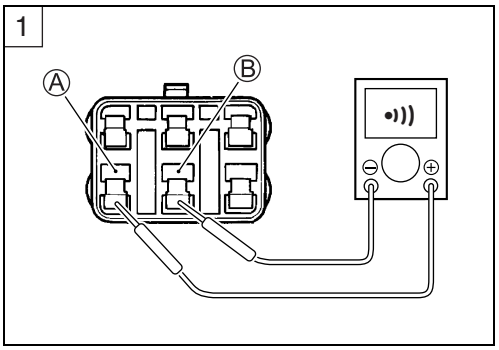
| | |
|---|---|
| YES | Go to Step 2. |
| NO | Replace the TO sensor with a new one. |

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

1) Turn the ignition switch OFF.
2) Remove the right frame cover.
3) Check the TO sensor coupler ① 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 R wire Ⓐ and Br/W wire Ⓑ.
   If the sound is not heard from the tester, the circuit condition is OK.

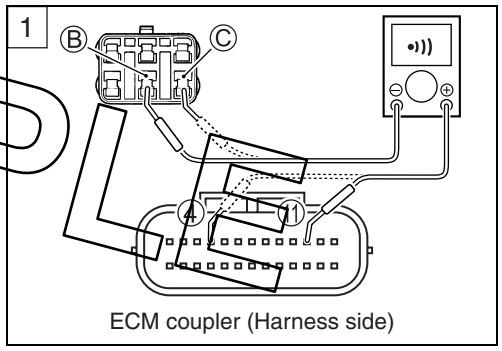



6) Disconnect the ECM coupler.
7) Check the continuity between Br/W wire Ⓑ and terminal ⑪.
8) Also, check the continuity between B/Br wire Ⓒ and terminal ④.

**DATA TO sensor lead wire continuity: Continuity (•))**

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

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



ECM coupler (Harness side)

**CAUTION**

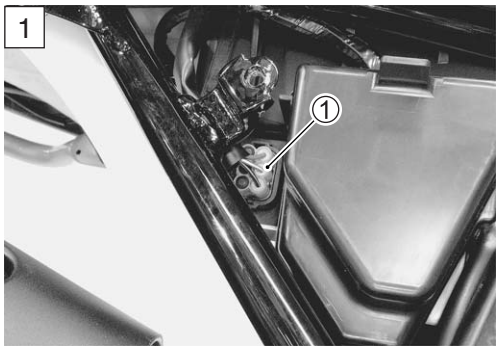
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

Is the continuity OK?

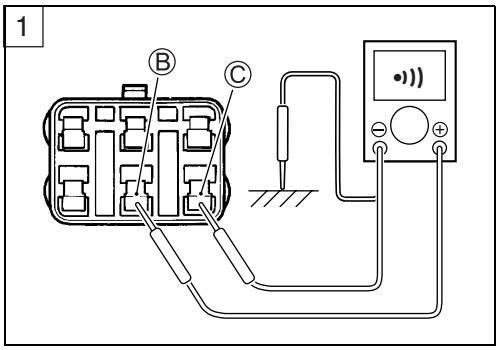
| | |
|---|---|
| YES | Go to Step 2. |
| NO | Br/W wire shorted to VCC, or B/Br wire open. |

9) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**Step 1 (When indicating P1651-L:)**
1) Turn the ignition switch OFF.
2) Remove the right frame cover.
3) Check the TO sensor coupler ① 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 Ⓑ and ground.
6) Also, check the continuity between Br/W wire Ⓑ and B/Br wire Ⓒ. If the sound is not heard from the tester, the circuit condition is OK.

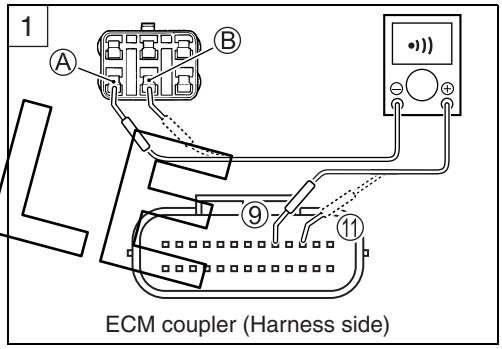



7) Disconnect the ECM coupler.
8) Check the continuity between R wire Ⓐ and terminal ⑨.
9) Also, then check the continuity between Br/W wire Ⓑ and terminal ⑪.

**DATA TO sensor lead wire continuity: Continuity (•))))**

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

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



ECM coupler (Harness side)

**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 | R or Br/W wire open, or Br/W wire shorted to ground. |

10) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**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 between Br/W and B/Br wires.

**DATA TO sensor voltage (Normal): 0.4 – 1.4 V**
**(⊕ Br/W – ⊖ B/Br)**

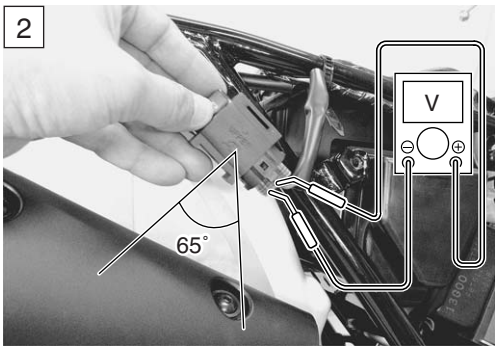
2


Also, measure the voltage as the motorcycle is leaned.

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

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

2

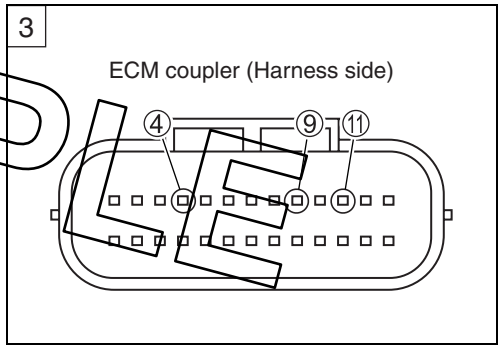



**TOOL 09900-25008: Multi-circuit tester set**
**09900-25009: Needle pointed probe set**

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

Is the voltage OK?

3




| | |
|---|---|
| YES | • R, Br/W or B/Br wire open or shorted to ground, or poor ⑨, ⑪ or ④ connection<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | • Loose or poor contacts on the ECM coupler<br>• Open or short circuit<br>• Replace the TO 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.**

6) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)



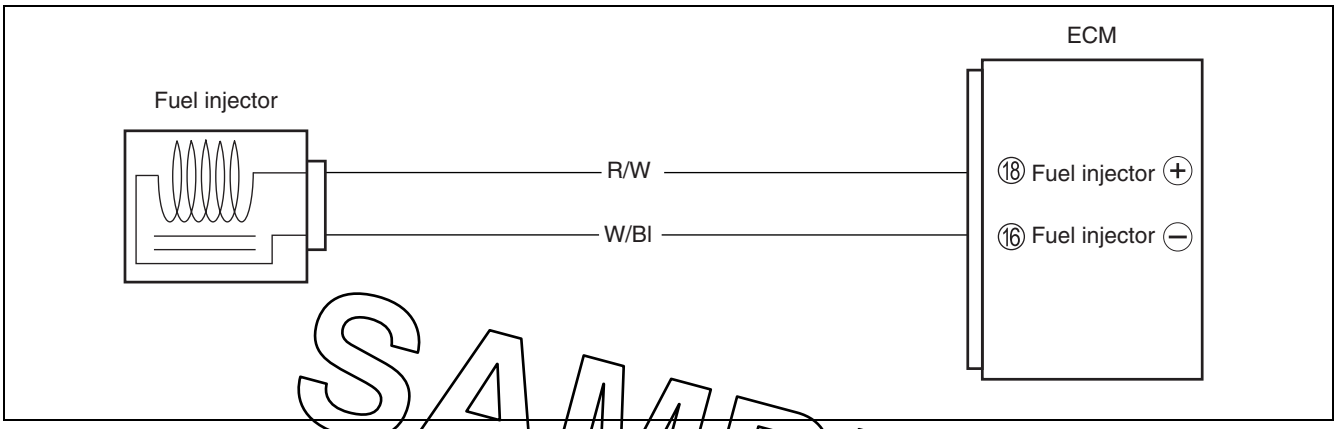
## "24" (P0351) IGNITION SYSTEM MALFUNCTION

*** Refer to the IGNITION SYSTEM for details. (☞RV125K3 6-18)**

# "32" (P0201) FUEL INJECTOR CIRCUIT MALFUNCTION

*NOTE:*
*When the ignition switch is turned to ON position, the fuel injector starts to operate approx. 2 sec. as purge operation (initial operation)*

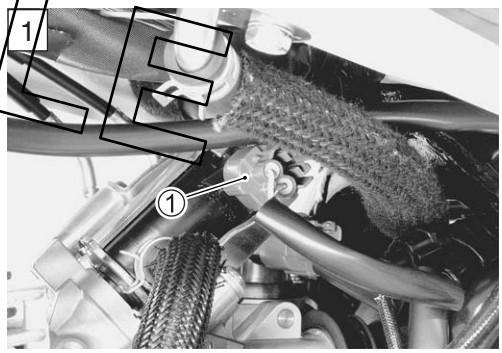
| DETECTED CONDITION | POSSIBLE CAUSE |
|---|---|
| When the fuel injector current in each detection is low for consecutive10 times or more. | • Fuel injector circuit open or short<br>• Fuel injector malfunction<br>• ECM malfunction |





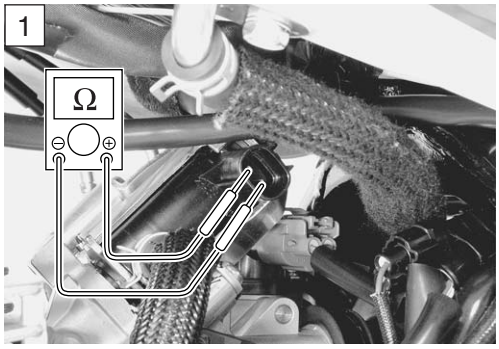

**INSPECTION**

**Step 1**
1) Turn the ignition switch OFF.
2) Check the fuel injector coupler ① for loose or poor contacts.
   If OK, then measure the fuel injector resistance.
3) Disconnect the fuel injector coupler.




4) Measure the fuel injector resistance.

DATA **Fuel injector resistance: Approx. 1.9 Ω at 20 °C (Terminal – Terminal)**

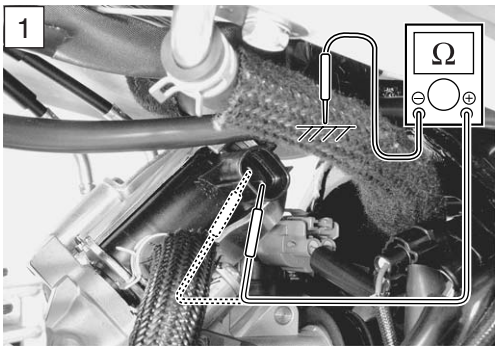


5) If OK, then check the continuity between each terminal and ground.

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

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

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




Are the resistance and continuity OK?

| | |
|---|---|
| YES | Go to Step 2. |
| NO | Replace the fuel injector with a new one. (☞Page 88) |

6) After repairing the trouble, clear the DTC using the SDS tool. (☞Page 40)

**Step 2**

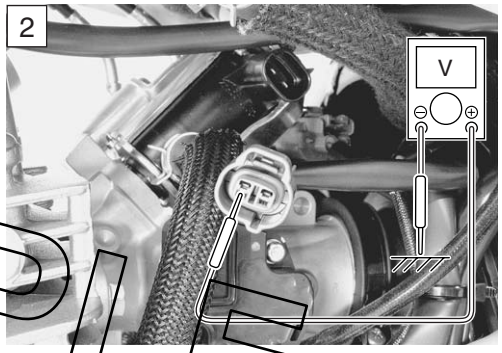
1) Turn the ignition switch ON.
2) Measure the fuel injector voltage between R/W wire and ground.

**DATA Fuel injector voltage: (Battery voltage – 1.0 V) and more**
**(⊕ R/W – ⊖ Ground)**

*NOTE:*
*(Ex.) It is possible that 11.5 V measured when the battery voltage is 12.5 V.*

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

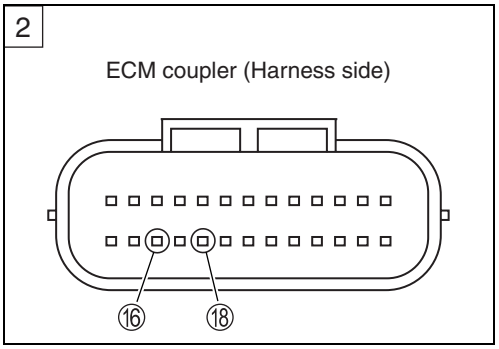
**Tester knob indication: Voltage (⎓)**






Is the voltage OK?

| | |
|---|---|
| YES | • R/W or W/Bl wire open or shorted to ground, poor ⑱ or ⑯ connection.<br>• If wire and connection is OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | Open circuit in the R/W wire or ECM malfunction. |



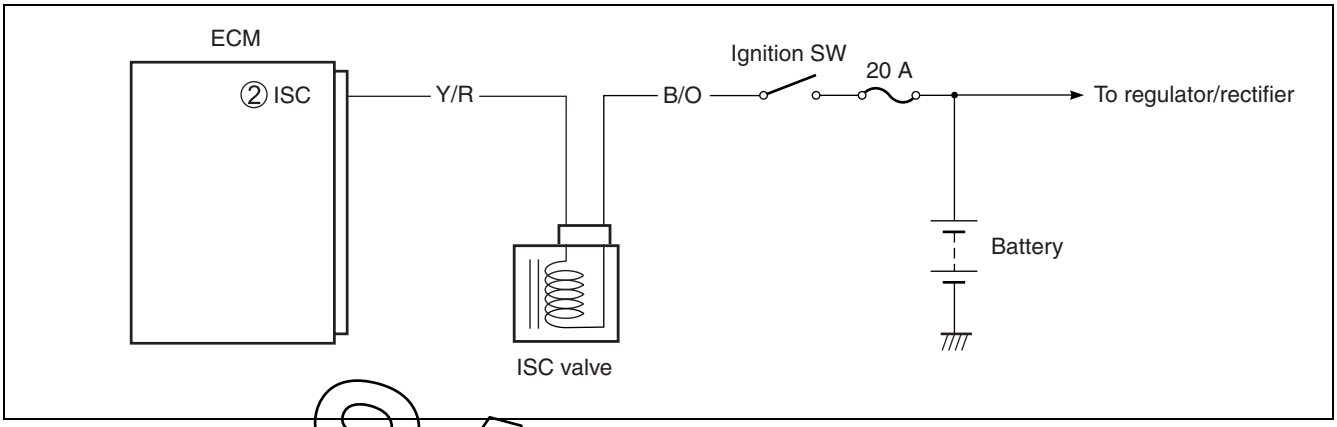

**CAUTION**

**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. (☞Page 40)

# "40" (P0505) ISC VALVE CIRCUIT MALFUNCTION

| DETECTED CONDITION | | POSSIBLE CAUSE |
|---|---|---|
| 40<br>(P0505) | When the ISC operation voltage remains at 1.0 V or lower continuously for 2 sec. or longer.<br>Idle speed is higher than the normal condition. | • ISC valve circuit open or shorted to ground<br>• ISC valve malfunction<br>• ECM malfunction |

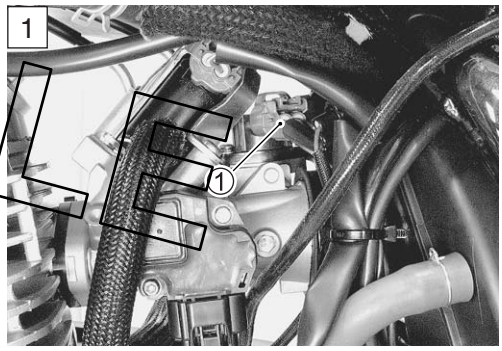





**INSPECTION**

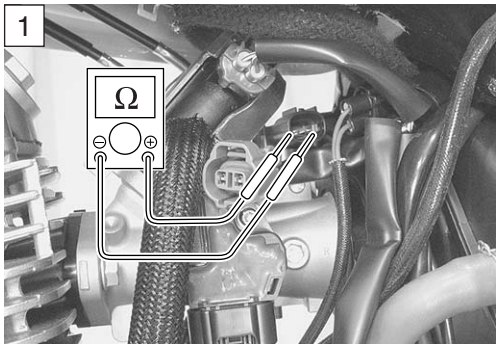
**Step 1**

1) Turn the ignition switch OFF.
2) Check the ISC valve coupler ① for loose or poor contacts.
   If OK, then check the ISC valve resistance.
3) Disconnect the ISC valve coupler.




4) Measure the ISC valve resistance.

DATA **ISC valve resistance: Approx. 35 Ω**
**(Terminal – Terminal)**



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

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

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

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


Are the resistance and continuity OK?

| | |
|---|---|
| YES | Go to Step 2. |
| NO | Replace the ISC valve with a new one. (☞Page 88) |

6) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

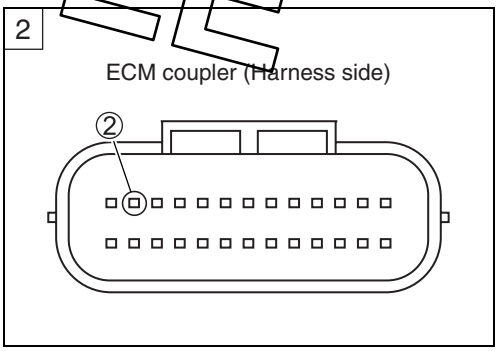
**Step 2**

1) Turn the ignition switch ON.
2) Measure the ISC valve voltage between B/O wire and ground.

**DATA ISC valve voltage: Battery voltage**
**(⊕ B/O – ⊖ Ground)**

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

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


Is the voltage OK?

| | |
|---|---|
| YES | • B/O or Y/R wire open or shorted to ground, or poor ② connection<br>• If wire and connection is OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | Open circuit in the B/O wire |

**CAUTION**

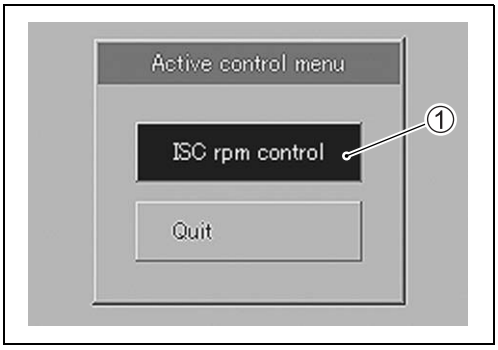
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

3) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

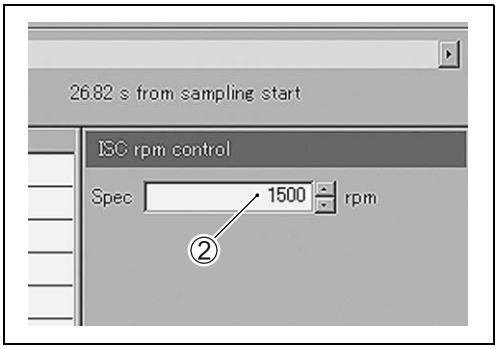
## ACTIVE CONTROL INSPECTION (ISC RPM CONTROL)

### Check 1

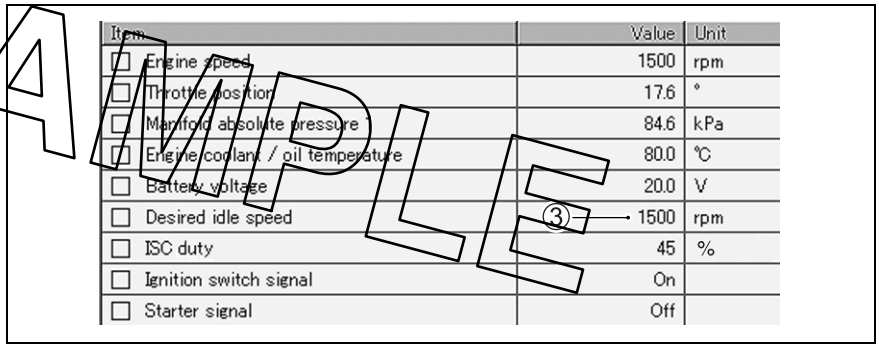
1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
2) Check that the engine is running.
3) Make sure that the engine temperature on data monitor is indicated 80 °C or more.
4) Click the "Active control".
5) Click the "ISC rpm control" ①.




6) Check that the "Spec" ② is idle speed 1 500 ± 100 rpm.
7) Check that the "Desired idle speed" ③ is within the specified idle rpm.

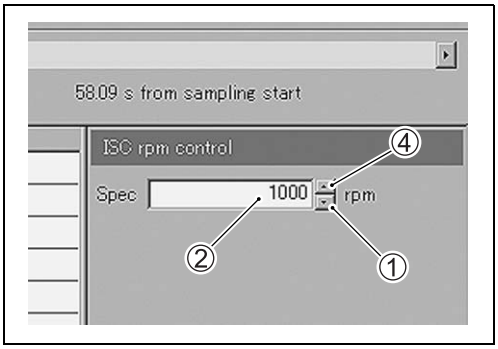


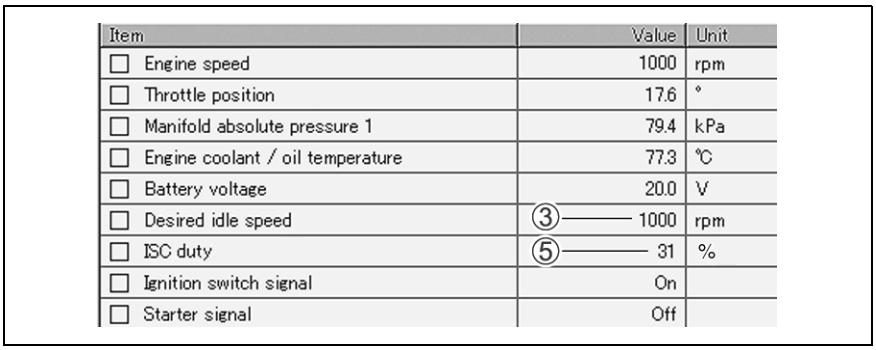



### Check 2

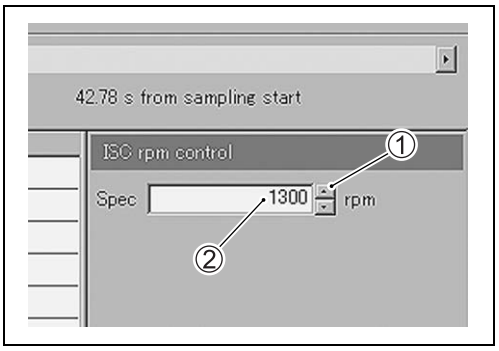
1) Click the button ① and decrease the "Spec" ② to 1 000 rpm slowly.
2) Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. At the same time, check that the air volume of the ISC duty decreases.
3) Click the button ④ and increase the "Spec" ② slowly.
4) Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. Also, check that the air volume ⑤ of the ISC duty increases.



**Check 3**

1) Click the button ① and increase the "Spec" ② to 1 300 rpm slowly.
2) Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. Also, check that the air volume ④ of the ISC duty increases.




| Item | Value | Unit |
|---|---|---|
| Engine speed | 1300 | rpm |
| Throttle position | 17.6 | ° |
| Manifold absolute pressure 1 | 76.8 | kPa |
| Engine coolant / oil temperature | 79.8 | ℃ |
| Battery voltage | 20.0 | V |
| Desired idle speed | ③ 1300 | rpm |
| ISC duty | ④ 35 | % |
| Ignition switch signal | On | |
| Starter signal | Off | |

**Check 4**

1) Increase the "Spec" ① to 1 900 rpm.
2) Check that the "Desired idle speed" ② is approx. 1 900 rpm.
3) Check that the "Engine speed" ③ is close to 1 900 rpm.

*NOTE:*
*Be careful not to increase the "Spec" to more than 3 000 rpm, or the "Engine speed" may reach the upper limit.*


| Item | Value | Unit |
|---|---|---|
| Engine speed | ③ 1930 | rpm |
| Throttle position | 17.6 | ° |
| Manifold absolute pressure 1 | 68.9 | kPa |
| Engine coolant / oil temperature | 79.2 | ℃ |
| Battery voltage | 20.0 | V |
| Desired idle speed | ② 1900 | rpm |
| ISC duty | 53 | % |
| Ignition switch signal | On | |
| Starter signal | Off | |



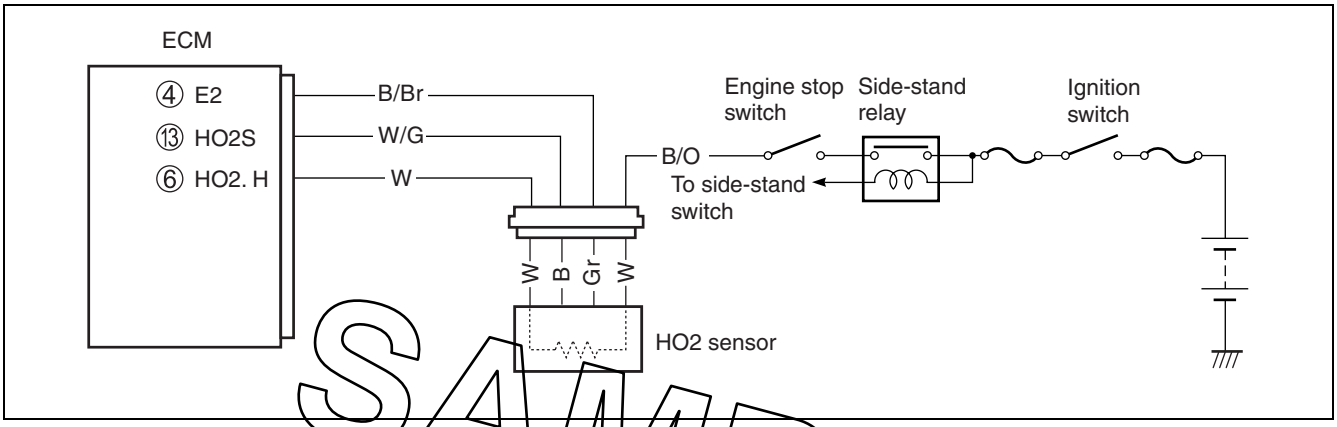
If the ISC valve does not function properly, replace the ISC valve (☞Page 88) or inspect the ISC valve (☞Page 91).

## "42" (P01650) IG SWITCH CIRCUIT MALFUNCTION

*** Refer to the RV125K3 6-28 for details.**

# "44" (P0130/P0135) HO2 SENSOR (HO2S) CIRCUIT MALFUNCTION

| DETECTED CONDITION | | POSSIBLE CAUSE |
|---|---|---|
| 44<br>(P0130) | HO2 sensor output voltage is not input to ECM during engine operation and running condition.<br>(Sensor voltage < 0.60 V) | • HO2 sensor circuit open or shorted to ground.<br>• Fuel system malfunction.<br>• ECM malfunction. |
| 44<br>(P0135) | The heater can not operate so that heater operation voltage is not supply to the oxygen heater circuit. | • Battery voltage supply to the HO2 sensor. |

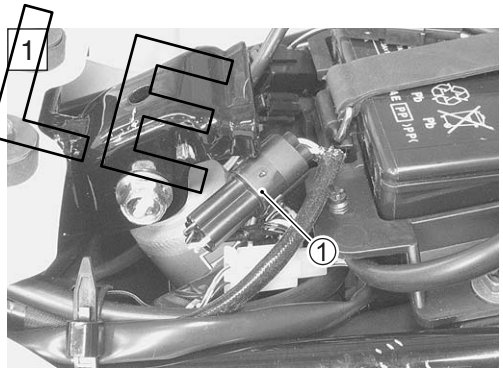





## INSPECTION

**Step 1 (When indicating 44/P0130:)**

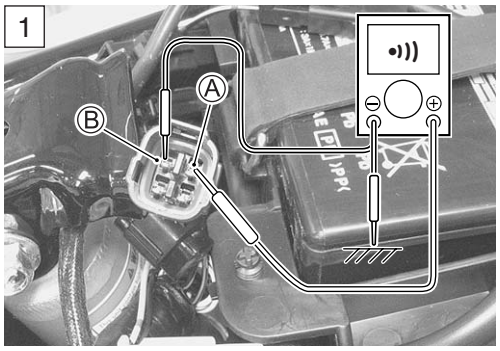
1) Turn the ignition switch OFF.
2) Remove the seat.
3) Check the HO2 sensor coupler ① for loose or poor contacts. If OK, then check the HO2 sensor lead wire continuity.




4) Disconnect the HO2 sensor coupler.
5) Check the continuity between W/G wire Ⓐ and ground.
6) Also, check the continuity between W/G wire Ⓐ and B/Br wire Ⓑ. If the sound is not heard from the tester, the circuit condition is OK.

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

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

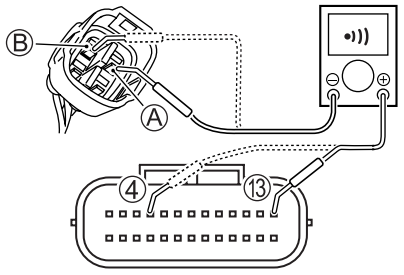


7) Disconnect the ECM coupler.
8) Check the continuity between W/G wire Ⓐ and terminal ⑬.
9) Also, check the continuity between B/Br wire Ⓑ and terminal ④.

**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.**

1




ECM coupler (Harness side)

**DATA HO2 sensor lead wire continuity: Continuity (•)))**

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

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

Is the continuity OK?

| | |
|---|---|
| YES | Go to Step 2. (When indicating 44/P0130:) |
| NO | W/G wire shorted to ground, or W/G or B/Br wire open. |

10) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)



**Step 2 (When indicating 44/P0130:)**
1) Connect the ECM coupler and HO2 sensor coupler.
2) Warm up the engine enough.
3) Measure the HO2 sensor output voltage between W/G wire and B/Br wire, when idling condition.

**DATA HO2 sensor output voltage at idle speed:**
**0.3 – 1.0 V (⊕ W/G – ⊖ B/Br)**

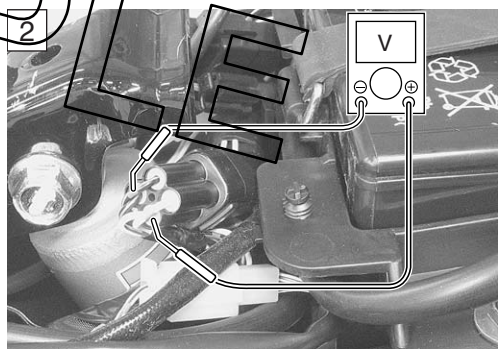
4) If OK, measure the HO2 sensor output voltage while holding the engine speed at 5 000 r/min.

**DATA HO2 sensor output voltage at 5 000 r/min:**
**0.6 V and more (⊕ W/G – ⊖ B/Br)**

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

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

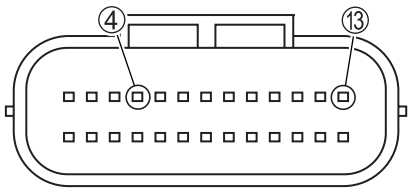
2



Is the voltage OK?

| | |
|---|---|
| YES | • W/G wire or B/Br wire open or shorted to ground, or poor ⑬ or ④ connection.<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | Replace the HO2 sensor with a new one. |

2




**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.**

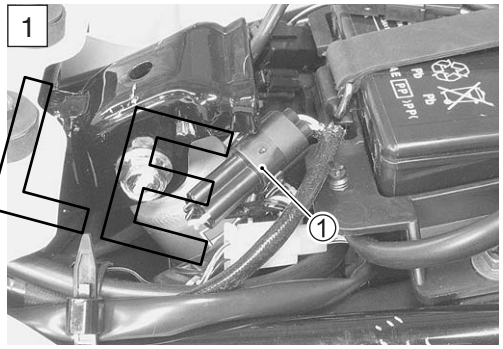
5) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)



**Step 1 (When indicating 44/P0135:)**

1) Turn the ignition switch OFF.
2) Remove the seat.
3) Check the HO2 sensor ① for loose or poor contacts.
   If OK, then measure the HO2 sensor resistance.

1




4) Disconnect the HO2 sensor coupler and measure the resistance between terminals.

*NOTE:*

** Temperature of the sensor affects resistance value largely.*

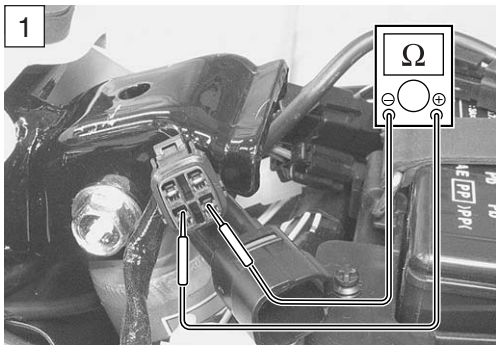
** Make sure that the sensor heater is at correct temperature.*

**DATA HO2 heater resistance: 6.5 – 8.9 Ω at 23 °C (W – W)**

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

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

1



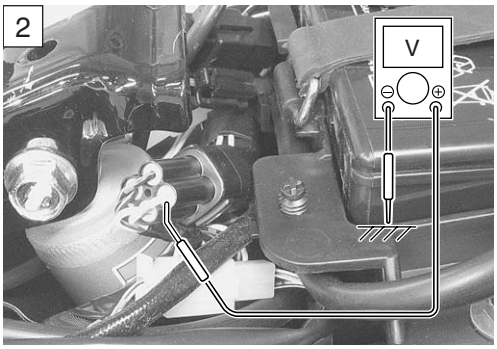

Is the voltage OK?

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

5) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

**Step 2 (When indicating 44/P0135:)**

1) Connect the HO2 sensor coupler.
2) Insert the needle pointed probes to the HO2 sensor coupler.
3) Turn the ignition switch ON and measure the heater voltage between W wire (harness side) and ground.
4) If the tester voltage indicates the battery voltage, it is good condition.



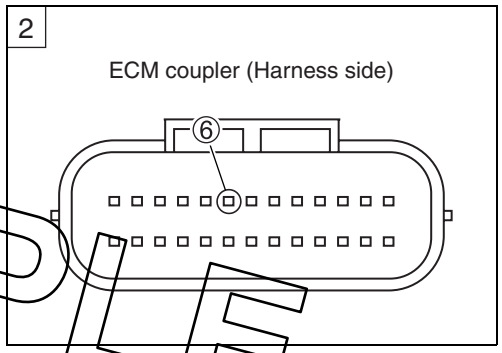

**DATA Heater voltage: Battery voltage**
**(⊕ W – ⊖ Ground)**

*NOTE:*
*Battery voltage can be detected only before starting the engine.*

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

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

Is the voltage OK?




| | |
|---|---|
| YES | • B/O or W wire open or shorted to ground, or poor ⑥ connection.<br>• Recheck each terminal and wire harness for open circuit and poor connection.<br>• If wire and connection are OK, intermittent trouble or faulty ECM.<br>• Replace the ECM with a known good one, and inspect it again. |
| NO | • Open or short circuit in the W wire or B/O wire.<br>• Loose or poor contacts on the ECM coupler (terminal ⑥) or HO2 sensor coupler. |

**CAUTION**

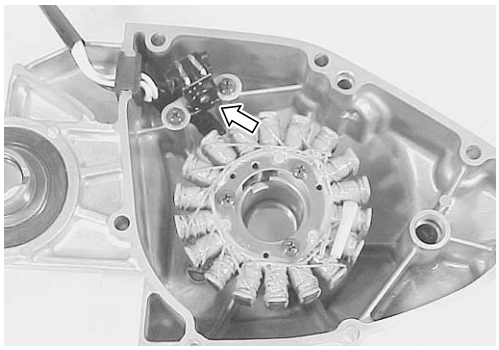
**When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent the terminal damage or terminal bend.**

5) After repairing the trouble, clear the DTC using SDS tool. (☞Page 40)

# SENSORS

## CKP SENSOR INSPECTION

The crankshaft position sensor is installed in the generator cover. (☞Page 44)

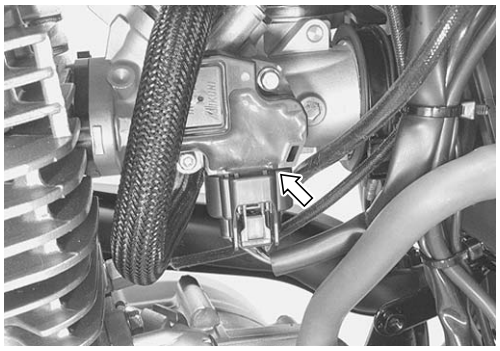


## CKP SENSOR REMOVAL AND INSTALLATION

- Remove the generator cover. (☞RV125K3 3-14)
- Install the generator cover in the reverse order of removal.

## IAP/TP/IAT SENSOR INSPECTION

The intake air pressure sensor/throttle position sensor/intake air temperature sensor are combined into one and installed in the throttle body. (☞Page 47, 52 and 61)



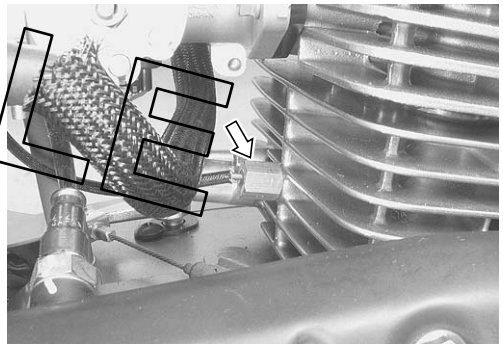
**CAUTION**

**Do not attempt to remove the IAP/TP/IAT sensor from the throttle body. It is available only as a throttle body assembly.**

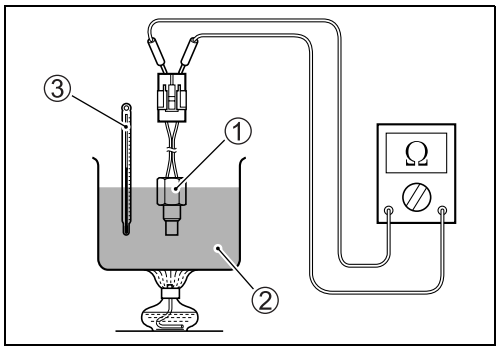


## ET SENSOR INSPECTION

The engine temperature sensor is installed in the cylinder. (☞Page 57)



- Remove the ET sensor. (☞Page 80)
- Check the ET sensor by testing it at the bench as shown in the figure. Connect the ET sensor ① to a circuit tester and place it in the oil ② contained in a pan, which is placed on a stove.
- Heat the oil to raise its temperature slowly and read the column thermometer ③ and the ohmmeter.



• If the ET sensor ohmic value does not change in the proportion indicated, replace it with a new one.

**DATA Engine temperature sensor specification**

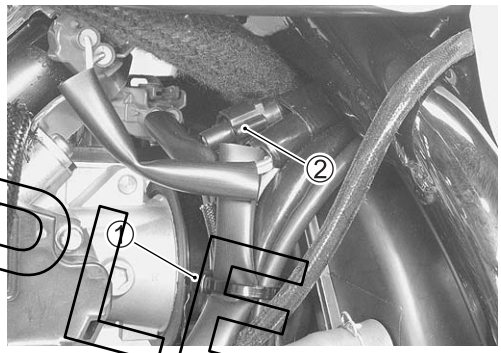
| Temperature | Resistance |
|---|---|
| 20 °C | Approx. 13.0 kΩ |
| 40 °C | Approx. 6.2 kΩ |
| 80 °C | Approx. 1.7 kΩ |
| 100 °C | Approx. 1.0 kΩ |

**CAUTION**

*** Take special care when handling the ET sensor. It may cause damage if it gets a sharp impact.**
*** Do not contact the ET sensor and the column thermometer with a pan.**

## ET SENSOR REMOVAL AND INSTALLATION

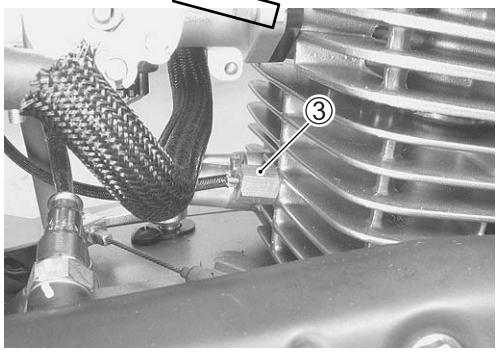
• Remove the clamp ①.
• Disconnect the coupler ②.





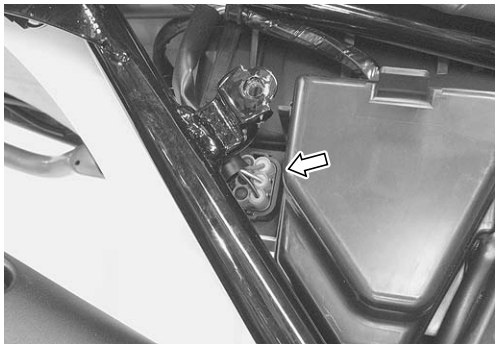

• Remove the ET sensor ③.
• Install the ET sensor in the reverse order of removal.

**ET sensor: 9 N·m (0.9 kgf-m)**




## TO SENSOR INSPECTION

The tip-over sensor is located between the tool box and rear fender. (☞Page 65)



## TO SENSOR REMOVAL AND INSTALLATION


- Remove the right frame cover. (☞RV125K3 5-3)
- Remove the rear fender bolts.
- Remove the TO sensor.
- Install the TO sensor in the reverse order of removal.

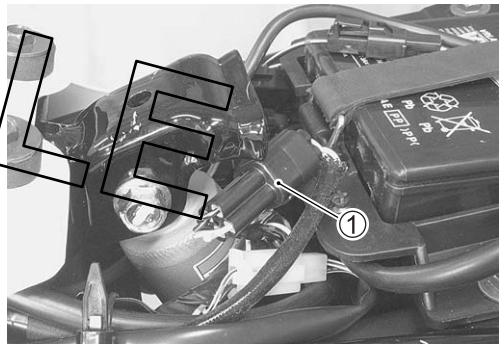
*NOTE:*
*When installing the TO sensor, the arrow mark Ⓐ must be pointed upward.*

## HO2 SENSOR INSPECTION

The heated oxygen sensor is installed in the exhaust pipe. (☞Page 75)

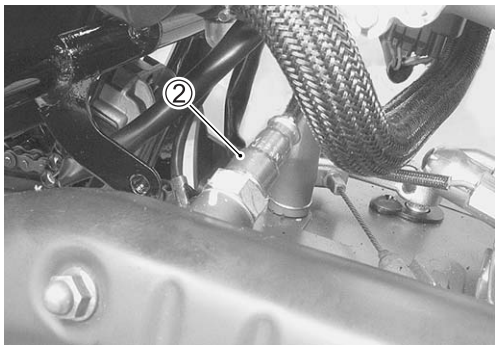


## HO2 SENSOR REMOVAL AND INSTALLATION




- Remove the seat. (☞RV125K3 5-3)
- Remove the right frame cover. (☞RV125K3 5-3)
- Disconnect the coupler ①.

• Remove the HO2 sensor ②.




**⚠ WARNING**

**Do not remove the HO2 sensor while it is hot.**

**CAUTION**

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

• Installation is in the reverse order of removal.

**CAUTION**

**Do not apply oil or other materials to the HO2 sensor air holes.**

• Tighten the HO2 sensor to the specified torque.

**HO2 sensor: 25 N·m (2.5 kgf-m)**

# FUEL SYSTEM
## FUEL TANK
### REMOVAL

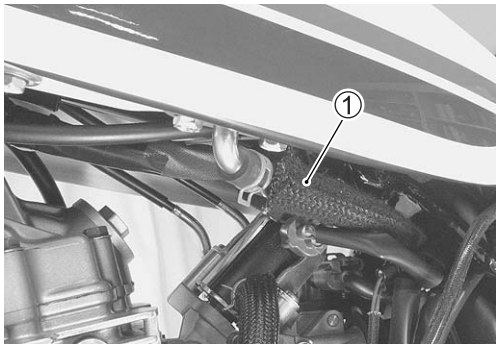
**CAUTION**

*** Drain out fuel before removing the fuel tank.**
*** Do not drain fuel while engine is hot.**

**⚠ WARNING**

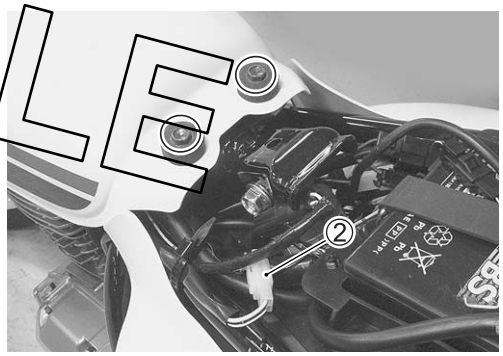
**Gasoline is highly flammable and explosive.**
**Keep heat, spark and flame away.**

- Remove the seat. (☞RV125K3 5-3)
- Place a rag under the hose joint and disconnect the fuel hose ①.

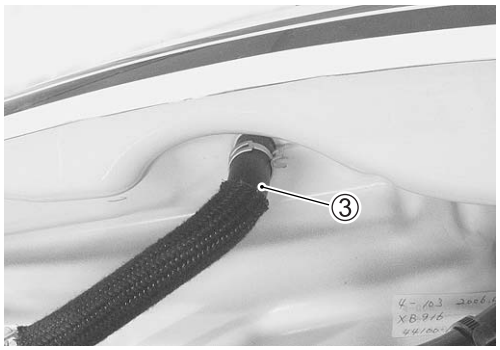




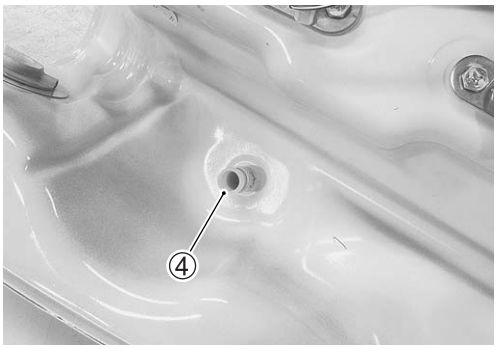

- Disconnect the fuel level switch lead wire coupler ②.
- Remove the fuel tank bolts.



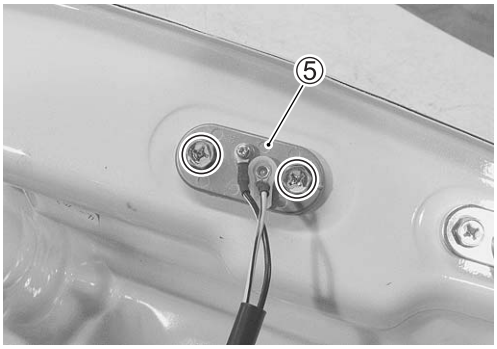

- Disconnect the fuel hose ③.
- Remove the fuel tank.



• Remove the inlet tube filter ④.




• Remove the fuel level switch ⑤.

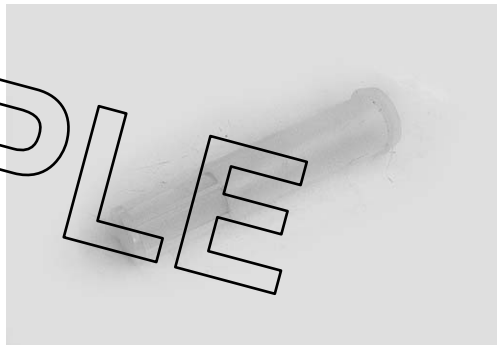



**INSPECTION**

**Inlet tube filter**

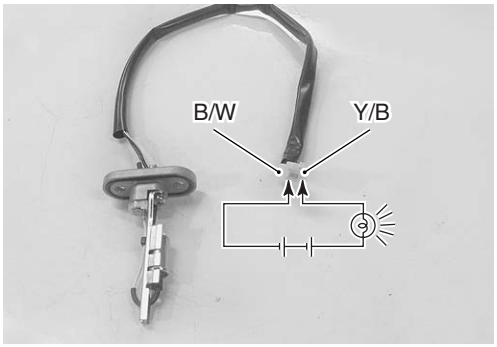
• Inspect the inlet tube filter for clogging or any damage.
• If necessary, clean the inlet tube filter using compressed air.



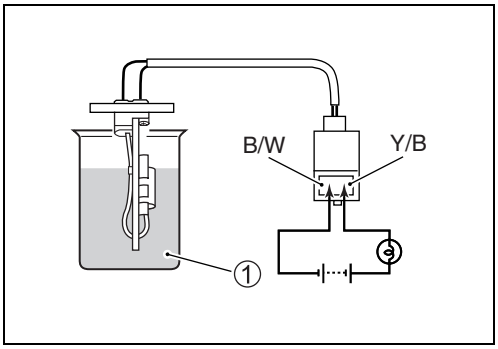


**Fuel level switch**

• Connect a 12 V battery and bulb (12 V 3.4 W) to the fuel level switch as shown. It is possible that the bulb comes on in 20 – 30 sec. after the connection.



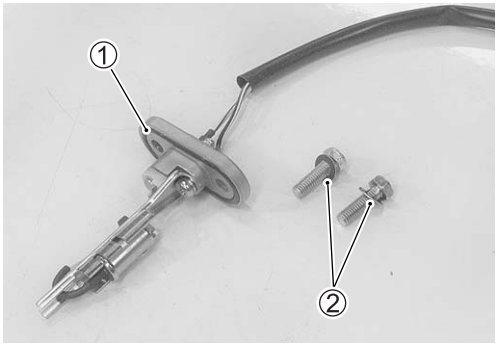

• Immerse the fuel level switch into kerosen ① and make sure that the bulb goes off. If not, replace the fuel level switch with a new one.



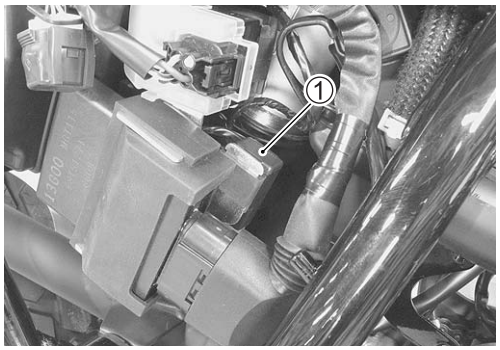
### INSTALLATION
Installation is in the reverse order of removal. Pay attention to the following point:

**⚠ WARNING**

**Gasoline is very explosive. Extreme care must be taken. The gaskets (① and ②) must be replaced with new ones to prevent fuel leakage.**

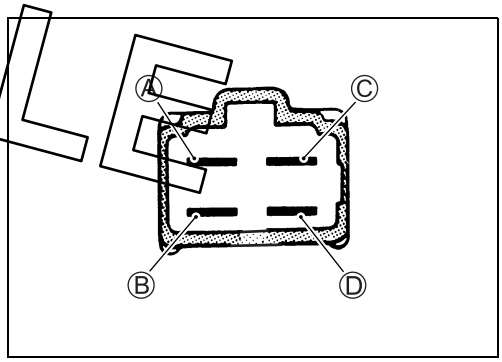



## FUEL LEVEL INDICATOR CHECK RELAY
### REMOVAL AND INSTALLATION
Fuel level indicator check relay is located behind the ECM.
- Remove the right frame cover. (☞RV125K3 5-3)
- Remove the fuel level indicator check relay ①.
- Install the fuel level indicator check relay in the reverse order of removal.






### INSPECTION
- First check the insulation between Ⓐ and Ⓑ terminals with tester. Then apply 12 V to Ⓒ and Ⓓ terminals, ⊕ to Ⓒ and ⊖ to Ⓓ, and check the continuity between Ⓐ and Ⓑ.
  If there is no continuity, replace the fuel level indicator check relay with a new one.




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

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

# FUEL FILTER

## REMOVAL

**CAUTION**

*** Drain out fuel before removing the fuel filter.**
*** Do not drain fuel while engine is hot.**

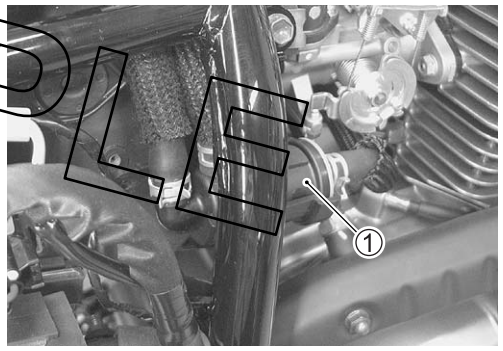
**⚠ WARNING**

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

- Remove the right frame cover. (☞RV125K3 5-3)
- Remove the screws.

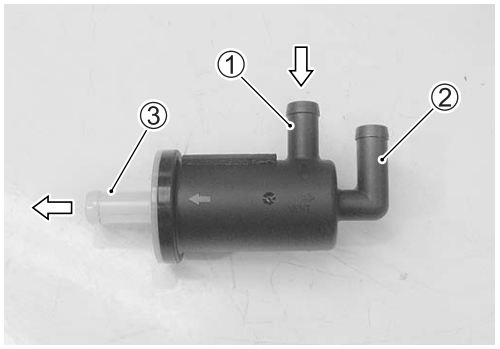


- Place a rag under the hose joint and disconnect the fuel hoses.
- Remove the fuel filter ①.




## INSPECTION

- When gosoline is poured lightly to the fuel filter from the port ①, the gasoline should flow out through the port ③ smoothly.
- Also, check for clogging from the port ② to ③.
- If any defects are found, replace the fuel filter with a new one.




**⚠ WARNING**

**Always use extreme caution when handling gasoline.**

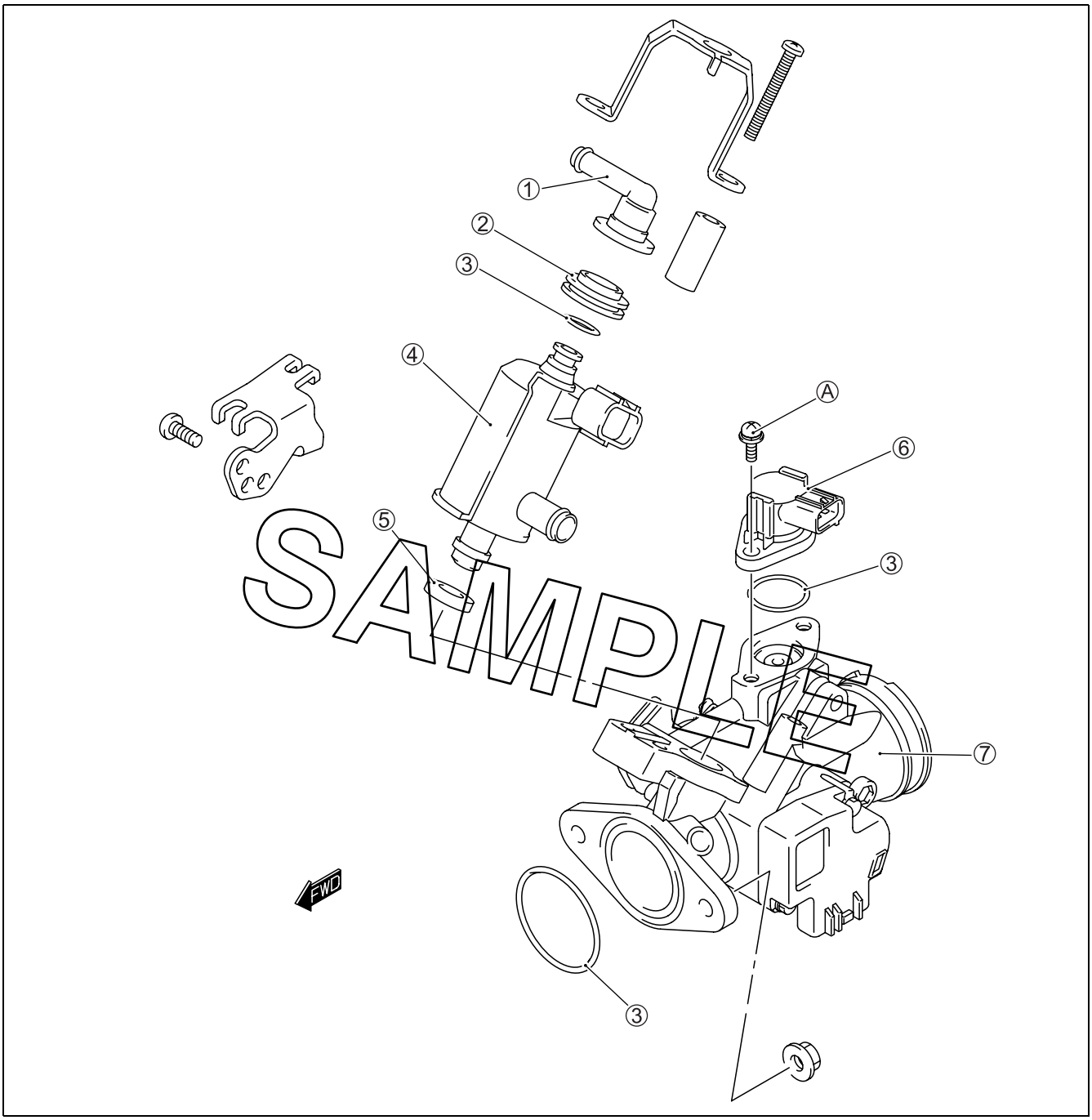
## INSTALLATION

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

- Rout the fuel hoses properly. (☞Page 95)

# THROTTLE BODY

## CONSTRUCTION






| | | | |
|---|---|---|---|
| ① | Return pipe | ⑤ | Cushion seal |
| ② | Upper cushion | ⑥ | ISC valve |
| ③ | O-ring | ⑦ | Throttle body |
| ④ | Fuel injector | Ⓐ | ISC valve screw |

| ITEM | N·m | kgf-m |
|---|---|---|
| Ⓐ | 2 | 0.2 |

## REMOVAL AND DISASSEMBLY

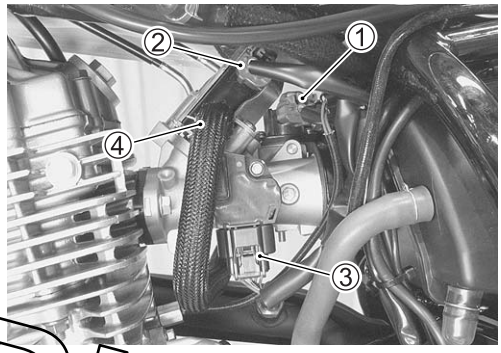
**CAUTION**

*** Drain out fuel before removing the throttle body.**
*** Do not drain fuel while engine is hot.**
*** The throttle body is assembled precisely in factory. Do not disassemble it other than shown in this manual.**

**⚠ WARNING**

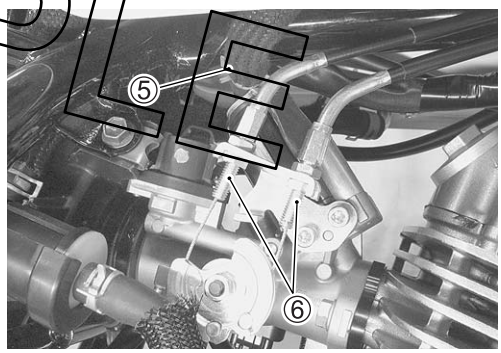
**Gasoline is highly flammable and explosive.**
**Keep heat, spark and flame away.**

- Remove the seat. (☞RV125K3 5-3)
- Remove the frame covers. (☞RV125K3 5-3)
- Disconnect the ISC valve coupler ①, Fuel injector coupler ② and IAP/TP/IAT sensor coupler ③.
- Place a rag under the hose joint and disconnect the fuel hose ④.

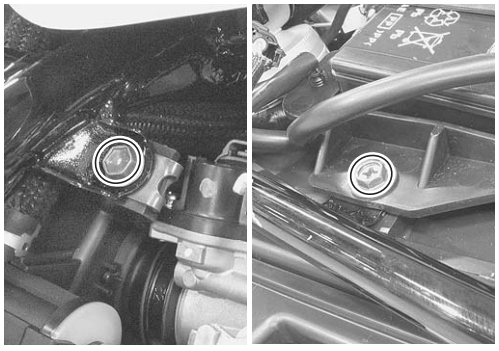




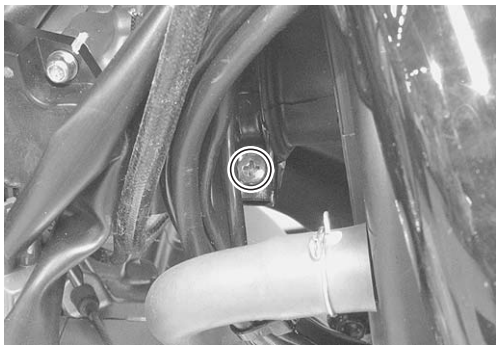

- Disconnect the fuel hose ⑤.
- Disconnect the throttle cables ⑥ from their drum.




- Remove the air cleaner bolts.



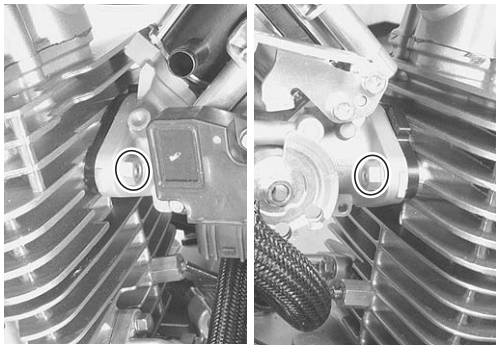
• Loosen the air cleaner outlet tube clamp screw.



• Remove the intake pipe nuts.
• Move the air cleaner box backward and remove the throttle body.

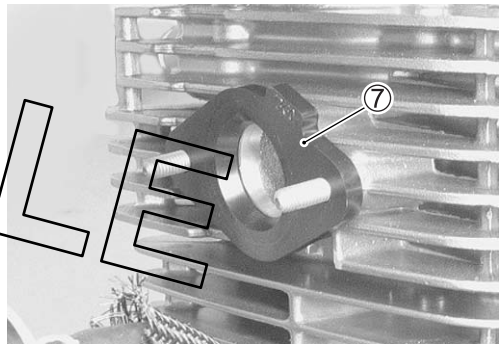
**CAUTION**

**Do not snap the throttle valve from full open to full close after disconnecting the throttle cables. It may cause damage to the throttle valve and throttle body.**

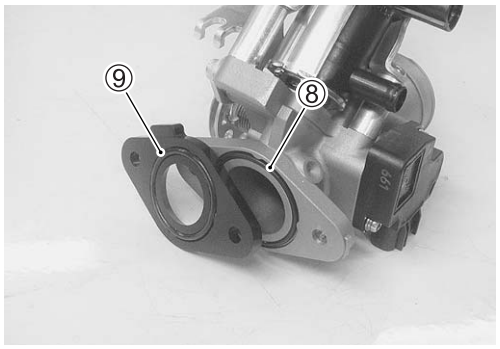




• Remove the insulator ⑦.



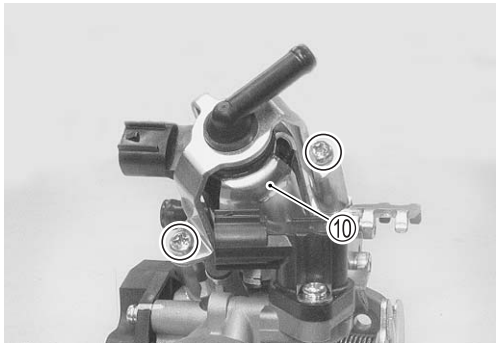

• Remove the O-rings ⑧ and ⑨.



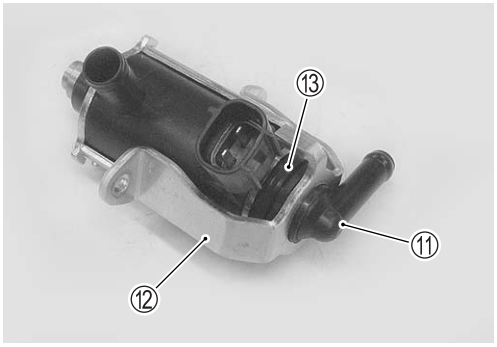

• Remove the fuel injector ⑩.

**CAUTION**

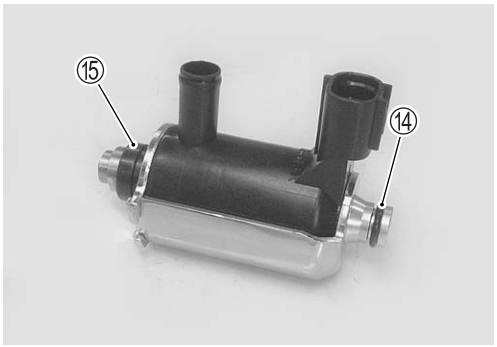
*** Ensure that the fuel injector is not exposed to dust, etc.**
*** Be careful not to expose the fuel injector to excessive shock.**



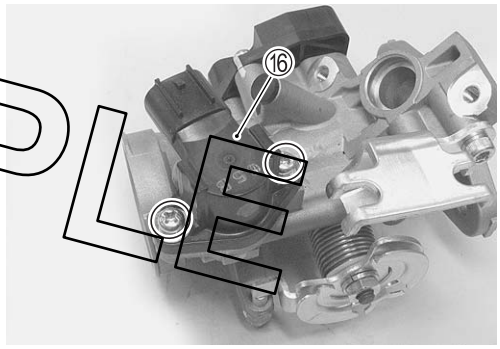
• Remove the return pipe ⑪, bracket ⑫ and upper cushion ⑬.




• Remove the O-ring ⑭ and cushion seal ⑮.



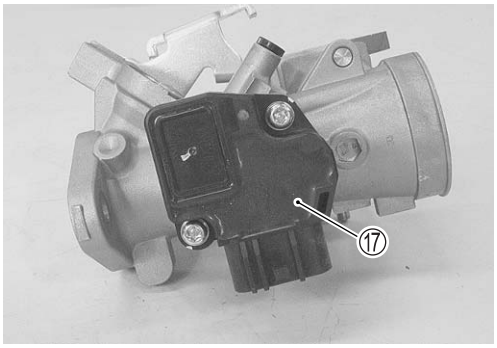

• Remove the ISC valve ⑯.





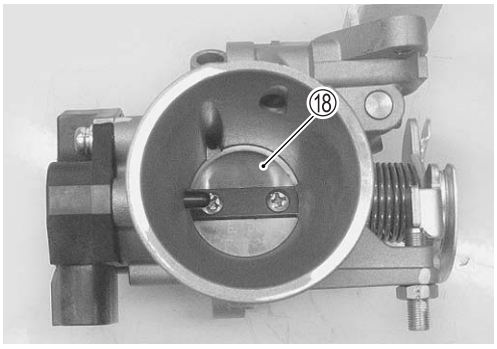

**CAUTION**

**Never remove the IAP/TP/IAT sensor ⑰ from the throttle body.**



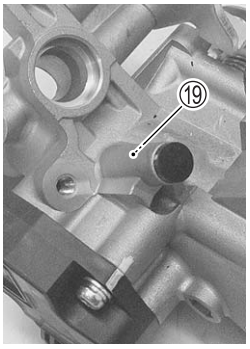

**CAUTION**

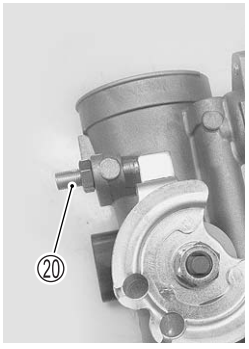
*** Never remove the throttle valve ⑱ from the throttle body.**
*** Never use carburetor cleaning chemicals to the throttle body assembly.**
*** Never use compressed air to the passage ways.**



**CAUTION**

**Avoid removing the adjustetr ⑲ and throttle stop screw ⑳.**




**INSPECTION**

Check following items for any damage or clogging.

* O-ring
* Throttle valve
* Injector cushion seal

**ISC valve**

- Remove the O-ring.
- Visually inspect the ISC valve for wear, damage or carbon deposit, replace it with a new one if necessary.

*NOTE:*

The ISC valve can be checked without removing it. (☞Page 91)

If the resistance is not within the standard range, replace the ISC valve with a new one.



**REASSEMBLY AND INTSTALLATION**

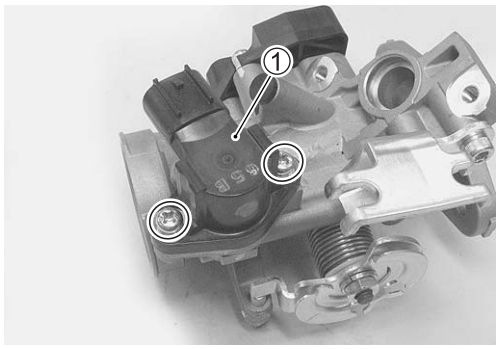
Reassembly and installation is in the reverse order of removal and disassembly. Pay attention to the following points:

- Install the ISC valve ①.

**CAUTION**

**Replace the O-ring with a new one.**

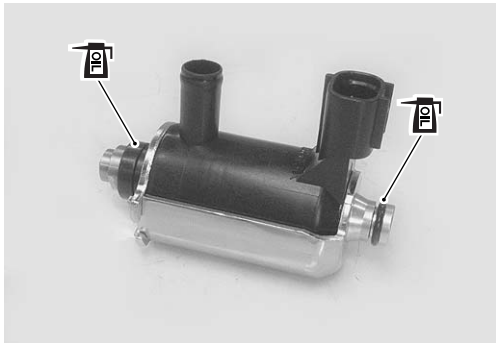
**ISC valve screw: 2 N·m (0.2 kgf-m)**




- Apply thin coat of engine oil to the cushion seal and O-ring.

**CAUTION**

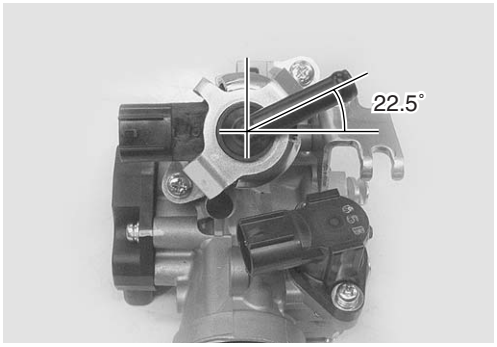
**Replace the cushion seal and O-ring with new ones.**



• Install the injector as shown.

**CAUTION**

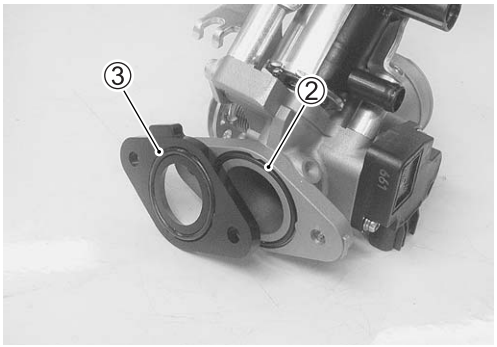
**Never turn the injector while pushing it.**




• Install the O-rings ② and ③.

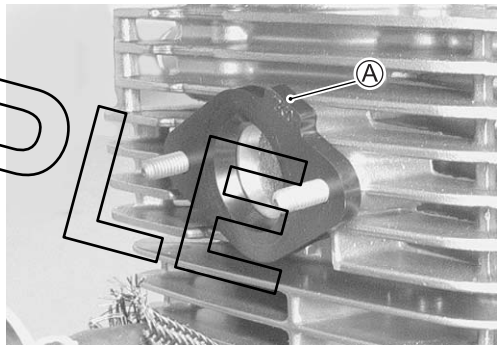
**CAUTION**

**Replace the O-rings with new ones.**



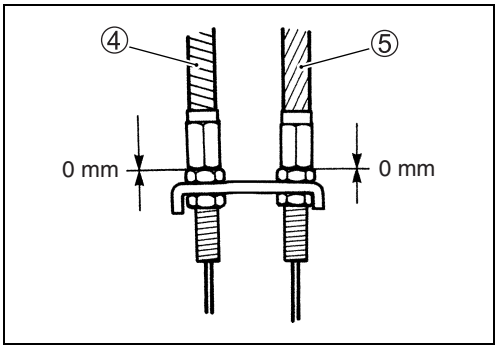

• Install the insulator.

*NOTE:*
*Set the insulator so the O-ring faces to the engine side and tab Ⓐ upward.*

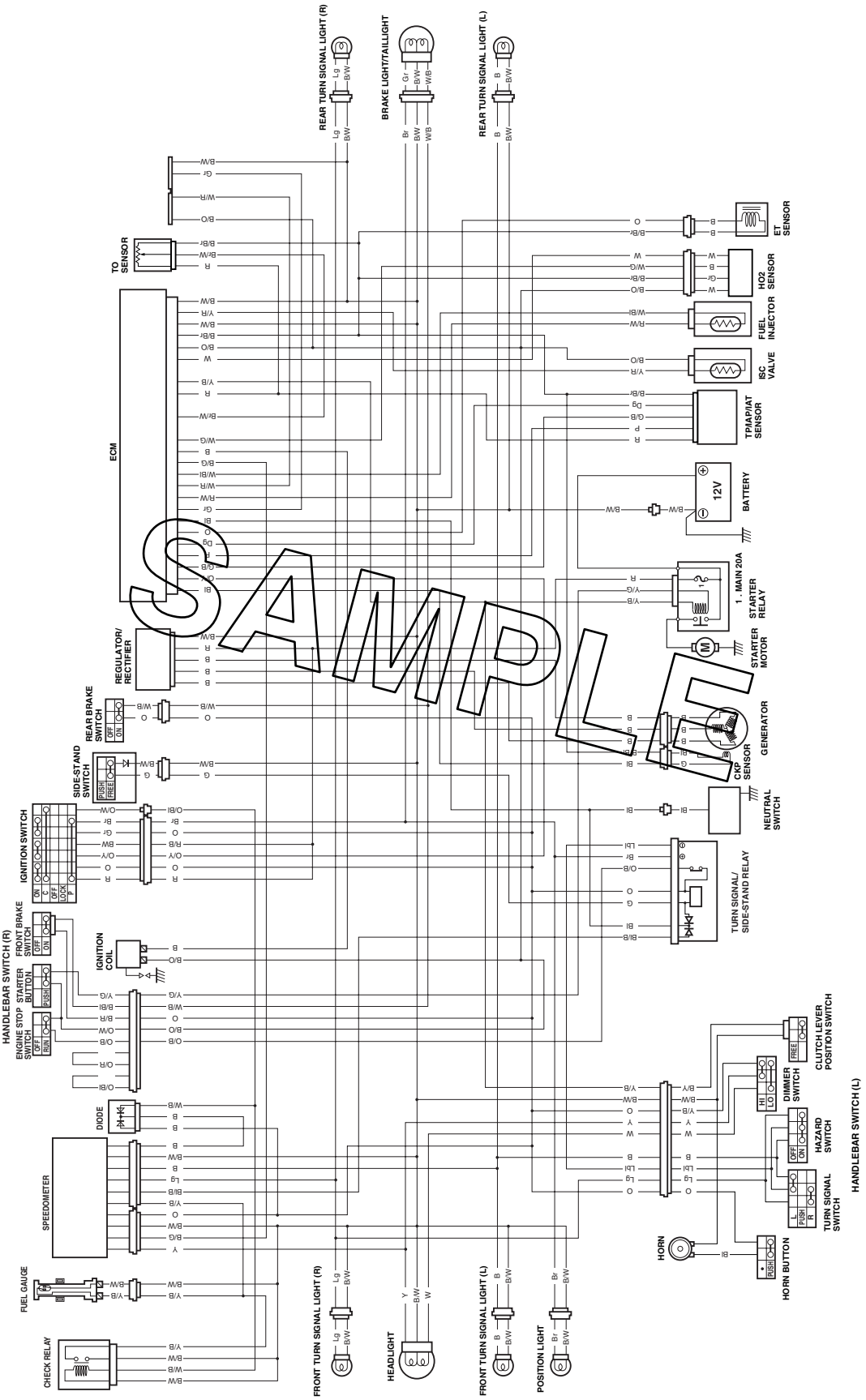




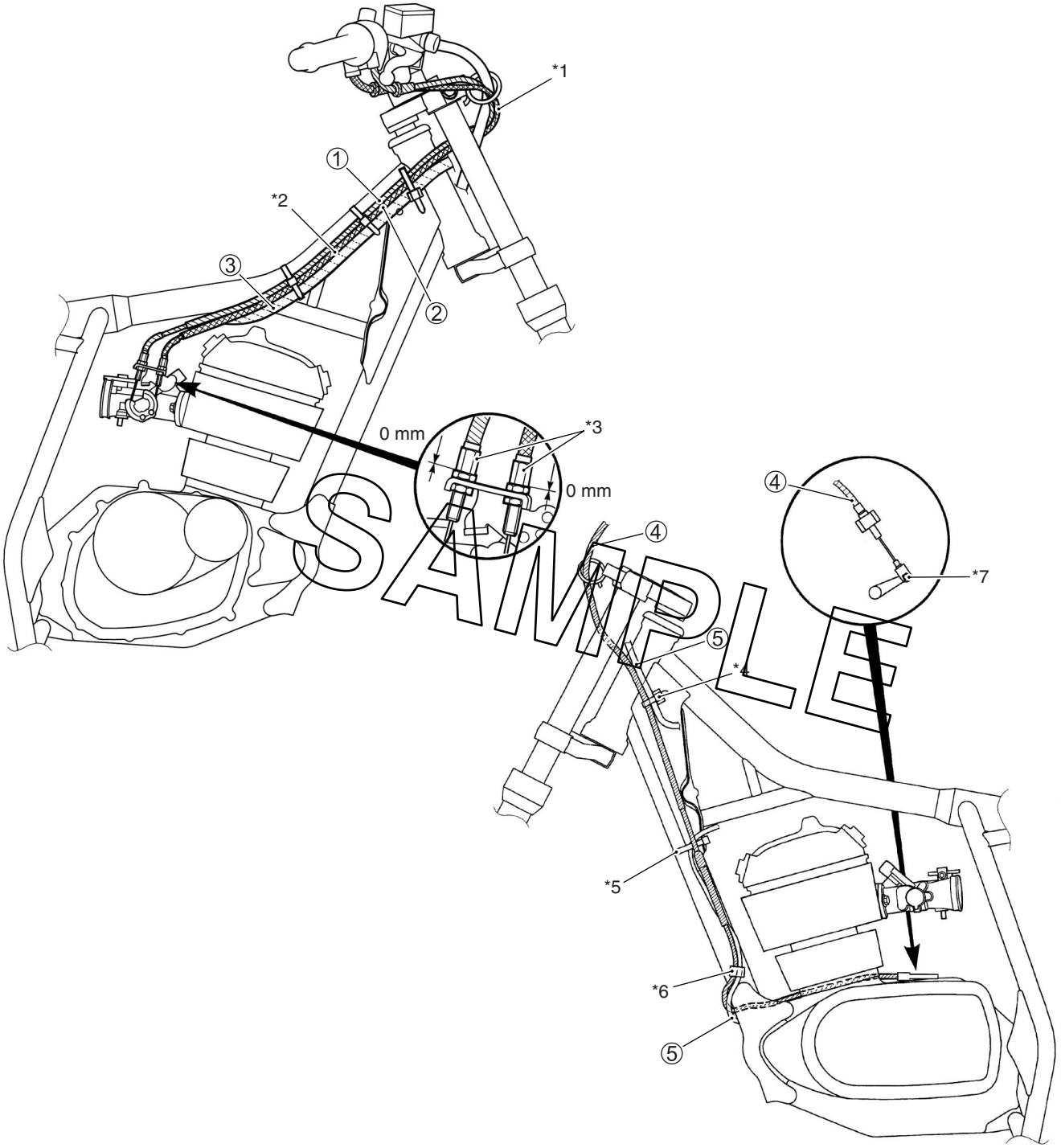

• Install the throttle body.
• Connect the throttle pulling cable ④ and throttle returning cable ⑤ to the throttle cable drum.
• Loosen each throttle cable lock-nut.
• Turn in each throttle cable adjuster fully and locate each outer cable so that the clearance is 0 mm.
• Tighten each lock-nut.
• Adjust the throttle cable play. (☞ Page 7)
• Rout the harness and fuel hoses properly. (☞ Page 94 and 95)



# WIRING DIAGRAM



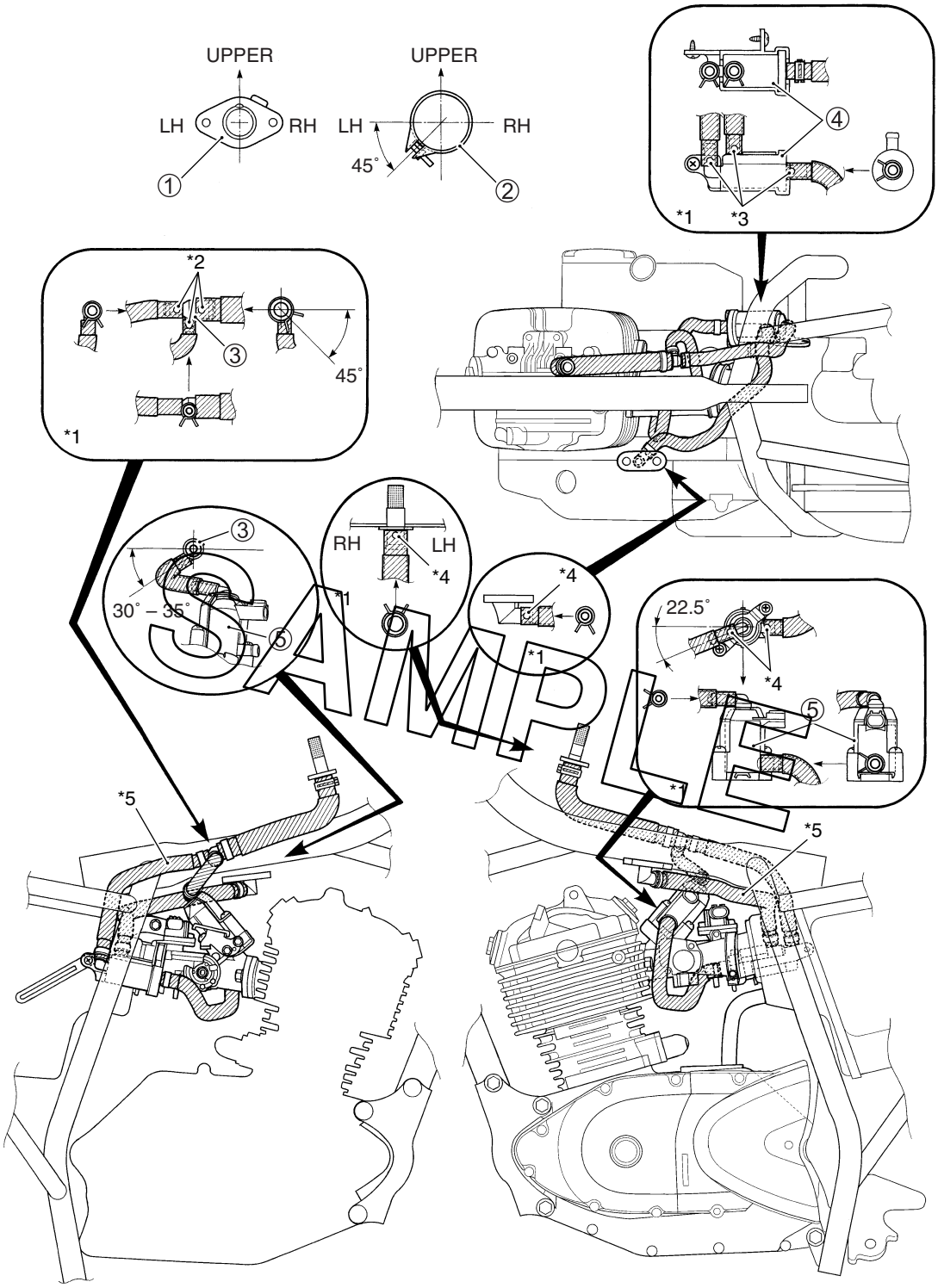
# CABLE AND HOSE ROUTING
## CABLE ROUTING





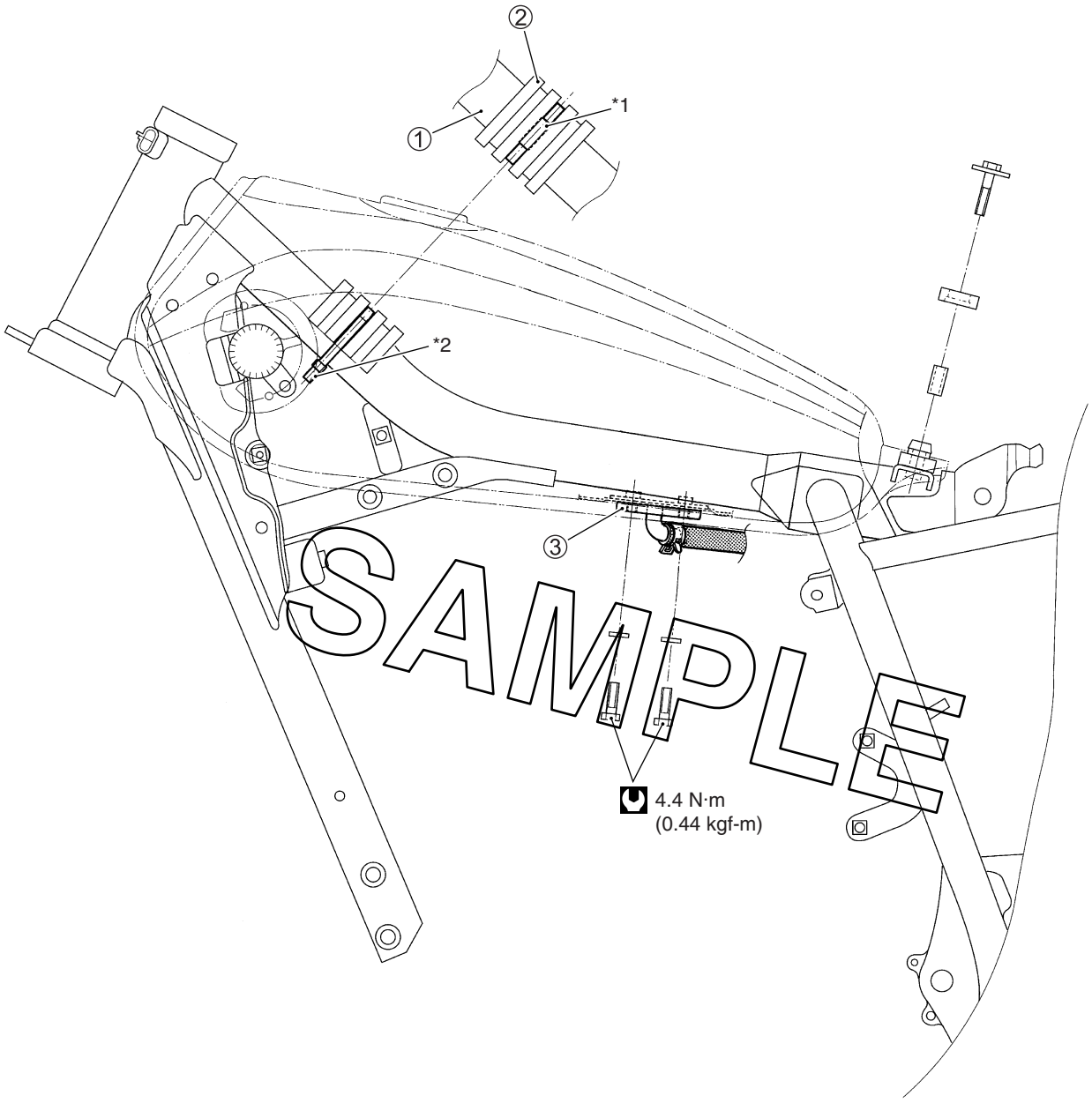

| | | | | | |
|---|---|---|---|---|---|
| ① | Throttle cable No.1 | *1 | Pass the throttle cables in front of the brake hose. | *4 | Set the clamp as shown. |
| ② | Throttle cable No.2 | | | *5 | Clamp the harness only. |
| ③ | Wiring harness | *2 | Pass the throttle cables above the wiring harness. | *6 | Set the upper end of clutch cable protector to the lower end of clamp. |
| ④ | Clutch cable | | | | |
| ⑤ | Harness | *3 | Set the thread part of throttle cables to lowest position. | *7 | Cotter pin must face upper side. |

## HOSE ROUTING




| | | | |
|---|---|---|---|
| ① | Throttle body insulator | *1 | Assemble the hoses, union and clamps in the proper direction as shown. |
| ② | Air cleaner outlet tube clamp | *2 | Yellow marking |
| ③ | Fuel hose 3-way union | *3 | White marking |
| ④ | Fuel filter | *4 | Red marking |
| ⑤ | Fuel injector | *5 | Fuel hose must be free from sag. |

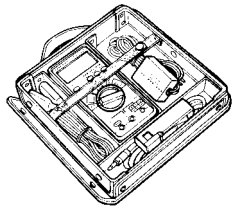
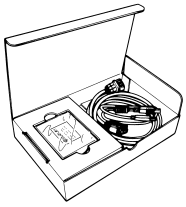
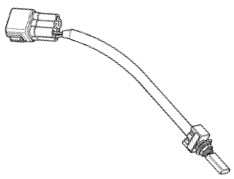
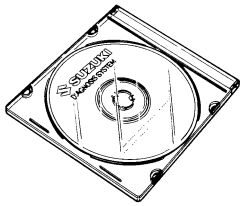
# FUEL TANK INSTALLATION






| | | | |
|---|---|---|---|
| ① | Frame | *1 | Align the recess of cushion with the positioning plate. |
| ② | Cushion | *2 | Cut the clamp so the end 10 mm remains. |
| ③ | Fuel tank joint | | |

# SPECIAL TOOLS

| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| **09900-25008 Multi-circuit tester set** | **09900-25009 Needle pointed probe set** | **09904-41010 SDS set tool** | **09930-82720 Mode select switch** | **99565-01010-009 CD-ROM Ver. 9** |

*NOTE:*
*When order the special tool, please confirm whether it is available or not.*

# TIGHTENING TORQUE

| ITEM | N·m | kgf-m |
|---|---|---|
| ET sensor | 9 | 0.9 |
| HO2 sensor | 25 | 2.5 |
| ISC valve screw | 2 | 0.2 |

# SERVICE DATA

## VALVE + GUIDE

Unit: mm

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 25.5 | — |
| | EX. | 22.5 | — |
| Valve clearance (when cold) | IN. | 0.03 – 0.08 | — |
| | EX. | 0.13 – 0.18 | — |
| Valve guide to valve stem clearance | IN. | 0.010 – 0.037 | — |
| | EX. | 0.030 – 0.057 | — |
| Valve guide I.D. | IN. & EX. | 5.000 – 5.012 | — |
| Valve stem O.D. | IN. | 4.975 – 4.990 | — |
| | EX. | 4.955 – 4.970 | — |
| Valve stem deflection | IN. & EX. | — | 0.35 |
| Valve stem runout | IN. & EX. | — | 0.05 |
| Valve head thickness | IN. & EX. | — | 0.5 |
| Valve stem end length | IN. & EX. | — | 1.7 |
| Valve seat width | IN. & EX. | 0.9 – 1.1 | — |
| Valve head radial runout | IN. & EX. | — | 0.03 |
| Valve spring free length (IN. & EX.) | INNER | — | 31.3 |
| | OUTER | — | 33.6 |
| Valve spring tension (IN. & EX.) | INNER | 38.1 – 43.9 N (3.9 – 4.4 kgf) at length 26.78 mm | — |
| | OUTER | 89.6 – 103 N (9.1 – 10.5 kgf) at length 29.78 mm | — |



## CAMSHAFT + CYLINDER HEAD

Unit: mm

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 33.720 – 33.760 | 33.420 |
| | EX. | 33.310 – 33.357 | 33.010 |
| Camshaft journal oil clearance | IN. & EX. | 0.032 – 0.066 | 0.150 |
| Camshaft journal holder I.D. | IN. & EX. | 22.012 – 22.025 | — |
| Camshaft journal O.D. | IN. & EX. | 21.959 – 21.980 | — |
| Camshaft runout | IN. & EX. | — | 0.10 |
| Rocker arm I.D. | IN. & EX. | 12.000 – 12.018 | — |
| Rocker arm shaft O.D. | IN. & EX. | 11.977 – 11.995 | — |
| Cylinder head distortion | — | | 0.05 |
| Cylinder head cover distortion | — | | 0.05 |

## CYLINDER + PISTON + PISTON RING

Unit: mm

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 100 – 1 500 kPa (11 – 15 kgf/cm²) | | | 800 kPa (8.0 kgf/cm²) |
| Piston-to-cylinder clearance | 0.040 – 0.050 | | | 0.120 |
| Cylinder bore | 57.000 – 57.015 | | | 57.090 |
| Piston diam. | 56.955 – 56.970 Measure at 8 mm from the skirt end. | | | 56.880 |
| Cylinder distortion | — | | | 0.05 |
| Piston ring free end gap | 1st | R | Approx. 7.2 | 5.8 |
| | 2nd | R | Approx. 5.0 | 4.0 |
| Piston ring end gap | 1st | | 0.20 – 0.32 | 0.7 |
| | 2nd | | 0.20 – 0.32 | 0.7 |
| Piston ring to groove clearance | 1st | | — | 0.18 |
| | 2nd | | — | 0.15 |
| Piston ring groove width | 1st | | 1.01 – 1.03 | — |
| | 2nd | | 1.01 – 1.03 | — |
| | Oil | | 2.01 – 2.03 | — |
| Piston ring thickness | 1st | | 0.970 – 0.990 | — |
| | 2nd | | 0.970 – 0.990 | — |
| Piston pin bore | 14.002 – 14.008 | | | 14.030 |
| Piston pin O.D. | 13.992 – 14.000 | | | 13.980 |



## CONROD + CRANKSHAFT

Unit: mm

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 14.006 – 14.014 | 14.040 |
| Conrod deflection | — | 3.0 |
| Conrod big end side clearance | 0.10 – 0.45 | 1.0 |
| Conrod big end width | 15.95 – 16.00 | — |
| Crank web to web width | 53.0 ± 0.1 | — |
| Crankshaft runout | — | 0.08 |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pressure (at 60 °C) | Above 15 kPa (0.15 kgf/cm²) Below 35 kPa (0.35 kgf/cm²) at 3 000 r/min | — |

## CLUTCH

Unit: mm

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15 | — |
| Drive plate thickness | 2.95 – 3.15 | 2.65 |
| Drive plate claw width | 11.8 – 12.0 | 11.5 |
| Driven plate distortion | — | 0.10 |
| Clutch spring free length | 32.6 | 31.0 |

## DRIVE TRAIN + DRIVE CHAIN

Unit: mm (Except ratio)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 3.470 (59/17) | | — |
| Final reduction ratio | | 3.500 (49/14) | | — |
| Gear ratios | Low | 3.000 (33/11) | | — |
| | 2nd | 1.857 (26/14) | | — |
| | 3rd | 1.368 (26/19) | | — |
| | 4th | 1.095 (23/21) | | — |
| | 5th | 0.923 (24/26) | | — |
| | Top | 0.833 (20/24) | | — |
| Shift fork to groove clearance | | 0.10 – 0.30 | | 0.50 |
| Shift fork groove width | | No. 1 | 5.0 – 5.1 | — |
| | | No. 2 | 5.5 – 5.6 | — |
| Shift fork thickness | | No. 1 | 4.8 – 4.9 | — |
| | | No. 2 | 5.3 – 5.4 | — |
| Countershaft length (Low to 2nd) | | $88.0^{+0.1}_{-0}$ | | — |
| Drive chain | Type | DID 428 | | — |
| | Links | 134 | | — |
| | 20-pitch length | — | | 259.0 |
| Drive chain slack | | 15 – 25 | | — |
| Gearshift lever height | | 20 (between footrest top and gearshift lever top) | | — |



## * FUEL INJECTOR + ISC VALVE

| ITEM | SPECIFICATION | NOTE |
|---|---|---|
| Fuel injector resistance | 1.9 Ω at 20 °C | |
| Fuel injector voltage | (Battery voltage – 1.0 V) and more | |
| ISC valve resistance | Approx. 35 Ω | |
| ISC valve voltage | Battery voltage | |

## * FI SENSORS

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| CKP sensor resistance | 172 – 288 Ω | | |
| CKP sensor peak voltage | 2.0 V (When cranking) and more | | ⊕ G – ⊖ Bl |
| IAP sensor input voltage | 4.5 – 5.5 V | | |
| IAP sensor output voltage | Approx. 2.0 – 3.5 V at idle speed | | ⊕ G/B – ⊖ B/Br |
| TP sensor input voltage | 4.5 – 5.5 V | | |
| TP sensor output voltage | Closed | Approx. 0.7 V | ⊕ P – ⊖ B/Br |
| | Opened | Approx. 3.9 V | |
| IAT sensor input voltage | 4.5 – 5.5 V | | |
| IAT sensor output voltage | Approx. 2.5 V at 23 °C/1.8 V at 40 °C | | |
| IAT sensor resistance | Approx. 2.56 kΩ at 20 °C/1.20 kΩ at 40 °C | | |
| ET sensor input voltage | 4.5 – 5.5 V | | |
| ET sensor resistance | Approx. 5 – 13 kΩ at 20 – 40 °C | | |
| TO sensor resistance | 16.5 – 22.3 kΩ | | |
| TO sensor voltage | Normal | 0.4 – 1.4 V | ⊕ Br/W – ⊖ B/Br |
| | Leaning 65° | 3.7 – 4.4 V | |
| HO2 sensor output voltage | 0.3 – 1.0 V at idle speed | | ⊕ W/G – ⊖ B/Br |
| | 0.6 V and more at 5 000 r/min | | |
| HO2 sensor resistance | 6.5 – 8.9 Ω at 23 °C | | W – W |



## * THROTTLE BODY

| ITEM | SPECIFICATION |
|---|---|
| I.D. No. | 13G0 |
| Bore size | 26 mm |
| Fast idle r/min. | 1 800 r/min at -20 – 0 °C<br>1 650 r/min at 0 – 20 °C<br>1 600 r/min at 20 – 60 °C |
| Idle r/min. | 1 500 ± 100 r/min/Warmed engine |
| Throttle cable play | 2.0 – 4.0 mm |

## ELECTRICAL

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Spark plug | | Type | DENSO: U24ESR-N<br>NGK: CR8E | |
| | | Gap | 0.7 – 0.8 mm | |
| Spark performance | | Over 8 mm at 1 atm. | | |
| Ignition coil resistance | | Primary | 1.6 – 2.7 Ω | ⊕ tap – ⊖ tap |
| | | Secondary | 18 – 26 kΩ | Plug cap – ⊕ tap |
| Generator coil resistance | | 0.4 – 0.8 Ω | | Y – Y |
| | | ∞ Ω | | Ground – Y |
| Ignition coil primary peak voltage | | More than 200 V | | ⊕: B, ⊖: Ground |
| Generator no-load voltage (when engine is cold) | | More than 60 V (AC) at 5 000 r/min | | |
| Regulated voltage | | 14.0 – 15.5 V at 5 000 r/min | | |
| Starter relay resistance | | 3 – 6 Ω | | |
| Battery | Type designation | YTX7L-BS | | |
| | Capacity | 12 V 21.6 kC (6 Ah)/10 HR | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | STANDARD/SPECIFICATION | |
|---|---|---|---|
| | | E-02 | E-19 |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | 5 | 4 |
| Brake light/Taillight | | 21/5 | ← |
| Turn signal light | | 21 | ← |
| Speedometer light | | 1.7 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| FI indicator light | | 3 | ← |
| Fuel level indicator light | | 3.4 | ← |

## BRAKE + WHEEL

Unit: mm

| ITEM | | STANDARD/SPECIFICATION | | LIMIT |
|---|---|---|---|---|
| Rear brake pedal free travel | | 20 – 30 | | — |
| Rear brake pedal height | | 5 – 15 | | — |
| Brake drum I.D. | | Rear | — | 110.7 |
| Brake disc thickness | | Front | 4.0 ± 0.2 | 3.5 |
| Brake disc runout | | Front | — | 0.30 |
| Master cylinder bore | | Front | 12.700 – 12.743 | — |
| Master cylinder piston diam. | | Front | 12.657 – 12.684 | — |
| Brake caliper cylinder bore | | Front | 30.230 – 30.306 | — |
| Brake caliper piston diam. | | Front | 30.150 – 30.200 | — |
| Brake fluid type | | DOT 4 | | — |
| Wheel rim runout | | Axial | — | 2.0 |
| | | Radial | — | 2.0 |
| Wheel axle runout | | Front | — | 0.25 |
| | | Rear | — | 0.25 |
| Wheel rim size | Front | 18 M/C × MT 2.50 | | — |
| | Rear | 14 M/C × MT 4.50 | | — |
| Tire size | Front | 130/80-18 M/C 66P | | — |
| | Rear | 180/80-14 M/C 78P | | — |
| Tire tread depth | Front | — | | 4.0 |
| | Rear | — | | 4.0 |



## SUSPENSION

Unit: mm

| ITEM | STANDARD/SPECIFICATION | LIMIT |
|---|---|---|
| Front fork stroke | 110 | — |
| Front fork spring free length | 382.9 | 375 |
| Front fork oil level | 171 | — |
| Front fork oil type | SUZUKI FORK OIL #10 or an equivalent fork oil | — |
| Front fork oil capacity (each leg) | 230 ml | — |
| Rear wheel travel | 136 | — |
| Swingarm pivot shaft runout | — | 0.6 |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE (SOLO AND DUAL RIDING) | kPa | $kgf/cm^2$ |
|---|---|---|
| FRONT | 125 | 1.25 |
| REAR | 125 | 1.25 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | Gasoline used should be graded 91 octane or higher. An unleaded gasoline type is recommended. | | |
| Fuel tank capacity | 6.5 L | | |
| Engine oil type | SAE 10W-40, API SF/SG or SH/SJ with JASO MA | | |
| Engine oil capacity | Change | 850 ml | |
| | Filter change | 950 ml | |
| | Overhaul | 1 200 ml | |

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