

HYOSUNG

**Indsprøjtning
og elektrisk
anlæg.**

Udgivet april 2009

GV 250

GT 250 N/R

Ei Manual

ServiceManual



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HYOSUNG

GV250 Ei

GT250/R Ei

SERVICE MANUAL

FOREWORD

This manual contains an introductory description on HYOSUNG 「**GV250 EI**」 & 「**GT250/R EI**」 and procedures for its inspection / service and overhaul of its main components.

It covers the differences from Carbure type and please refer to the service manual of 「*Aquila 250* (99000-95310)」, 「*Comet 250 R* & *Comet 125 R* (99000HR8310)」 and 「*Comet 250* & *Comet 125* (99000-94710)」 for others which are not covered in this manual.

Other information considered as generally known is not included.

Read **GENERAL INFORMATION** section to familiarize yourself with outline of the vehicle and **MAINTENANCE** and other sections to use as a guide for proper inspection and service.

This manual will help you know the vehicle better so that you can assure your customers of your optimum and quick service.

- ❖ This manual has been prepared on the basis of the latest specification at the time of publication.
If modification has been made since then, difference may exist between the content of this manual and the actual vehicle.
- ❖ Illustrations in this manual are used to show the basic principles of operation and work procedures.
They may not represent the actual vehicle exactly in detail.

WARNING

This manual is intended for those who have enough knowledge and skills for servicing HYOSUNG vehicles. Without such knowledge and skills, you should not attempt servicing by relying on this manual only.

Instead, please contact your nearby authorized HYOSUNG motorcycle dealer.

NOTE

- 「**GV250**」 model : *Aquila 250*
- 「**GT250/R**」 model : *Comet 250/R*

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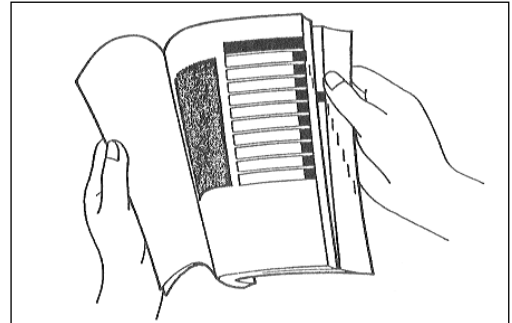
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HOW TO USE THIS MANUAL

















TO LOCATE WHAT YOU ARE LOOKING FOR :

1. The text of this manual is divided into sections.
2. As the title of these sections are listed on the previous page as GROUP INDEX, select the section where you are looking for.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. On the first page of each section, its contents are listed. Find the item and page you need.



SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing. The meaning of each symbol is also included in the table.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply THREAD LOCK "1324".
	Apply oil. Use engine oil unless otherwise specified.		Apply or use brake fluid.
	Apply SUPER GREASE "A".		Measure in voltage range.
	Apply SUPER GREASE "C".		Measure in resistance range.
	Apply SILICONE GREASE.		Measure in current range.
	Apply MOLY PASTE.		Measure in diode test range.
	Apply BOND "1215".		Measure in continuity test range.
	Use fork oil.		Use special tool.

ABBREVIATIONS USED IN THIS MANUAL

A

ABDC : After Bottom Dead Center
AC : Alternating Current
API : American Petroleum Institute
ATDC : After Top Dead Center

B

BBDC : Before Bottom Dead Center
BDC : Bottom Dead Center
BTDC : Before Top Dead Center

D

DC : Direct Current
DOHC : Double Over Head Camshaft

E

ECU : Engine Control Unit,
EI Control Unit
EI : Electric fuel Injection,
Electric fuel Injector
ET Sensor : Engine Temperature Sensor
(ETS)

F

FP : Fuel Pump

G

GP Switch : Gear Position Switch

I

IAP Sensor : Intake Air Pressure Sensor
(IAPS)
IAT Sensor : Intake Air Temperature Sensor
(IATS)
IG : Ignition
ISC Solenoid : Idle Speed Control Solenoid

L

LCD : Liquid Crystal Display
LED : Light Emitting Diode
LH : Left Hand

M

Max : Maximum
Min : Minimum

O

O₂ Sensor : Oxygen Sensor (O₂S)

R

RH : Right Hand
RO Switch : Roll Over Switch

S

SAE : Society of Automotive Engineers
SAV Solenoid : Secondary Air Valve Solenoid

T

TDC : Top Dead Center
TP Sensor : Throttle Position Sensor (TPS)

WIRE COLOR

B	: Black	Gr	: Gray	Sb	: Light blue
L	: Blue	Lg	: Light green	W	: White
Br	: Brown	O	: Orange	Y	: Yellow
G	: Green	R	: Red		

BL	: Black with Blue tracer	BBr	: Black with Brown tracer
BG	: Black with Green tracer	BO	: Black with Orange tracer
BR	: Black with Red tracer	BW	: Black with White tracer
BY	: Black with Yellow tracer	LB	: Blue with Black tracer
LG	: Blue with Green tracer	LR	: Blue with Red tracer
LW	: Blue with White tracer	LY	: Blue with Yellow tracer
BrB	: Brown with Black tracer	BrW	: Brown with White tracer
GB	: Green with Black tracer	GR	: Green with Red tracer
GY	: Green with Yellow tracer	GrB	: Gray with Black tracer
GrR	: Gray with Red tracer	GrW	: Gray with White tracer
OB	: Orange with Black tracer	OL	: Orange with Blue tracer
OG	: Orange with Green tracer	OR	: Orange with Red tracer
OW	: Orange with White tracer	OY	: Orange with Yellow tracer
RB	: Red with Black tracer	RW	: Red with White tracer
WB	: White with Black tracer	WL	: White with Blue tracer
WR	: White with Red tracer	YB	: Yellow with Black tracer
YL	: Yellow with Blue tracer	YG	: Yellow with Green tracer
YR	: Yellow with Red tracer		

GENERAL INFORMATION

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EXTERIOR PHOTOGRAPH



GV250 EI

EXTERIOR PHOTOGRAPH

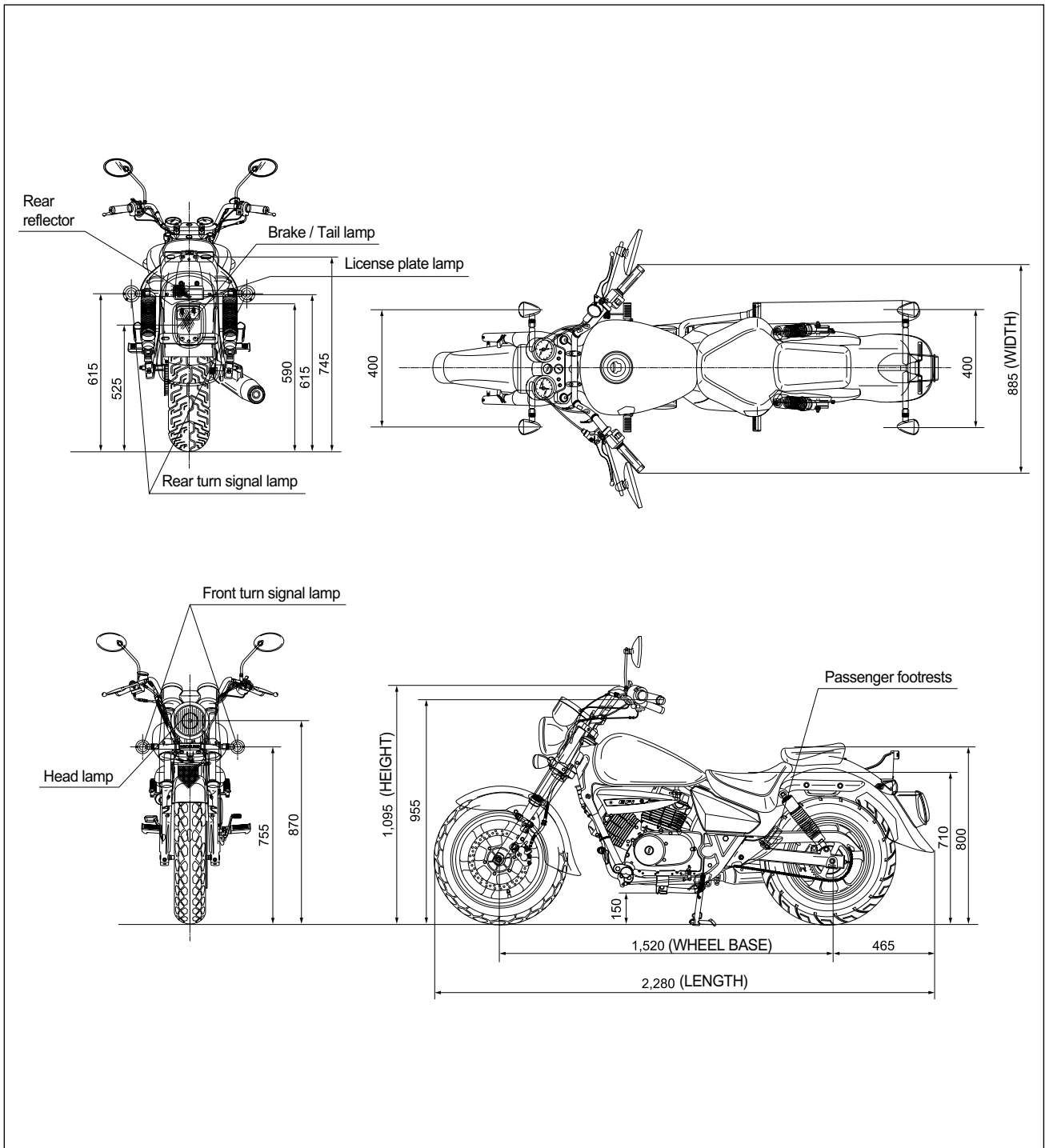


GT250R Ei

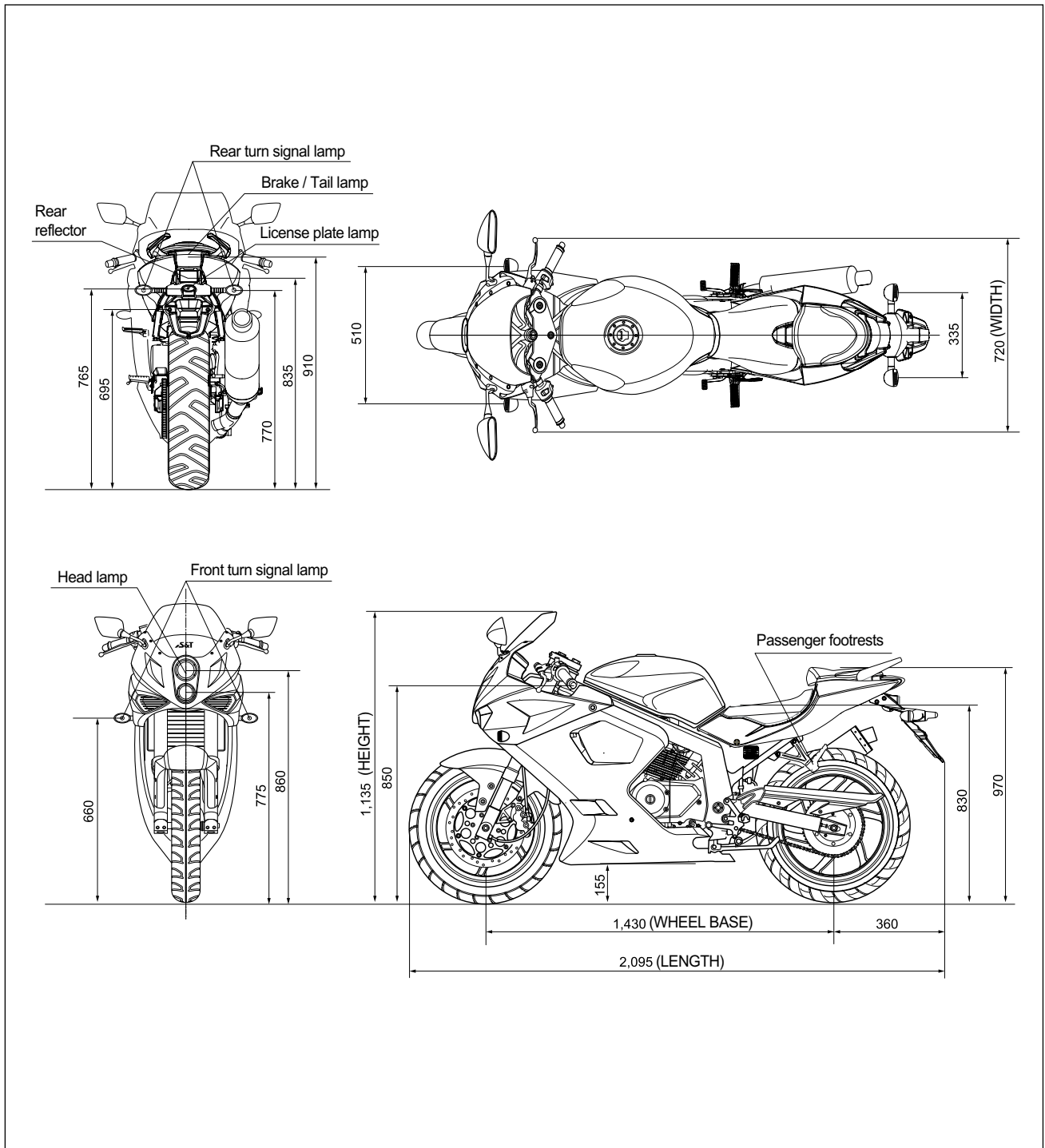


GT250 Ei

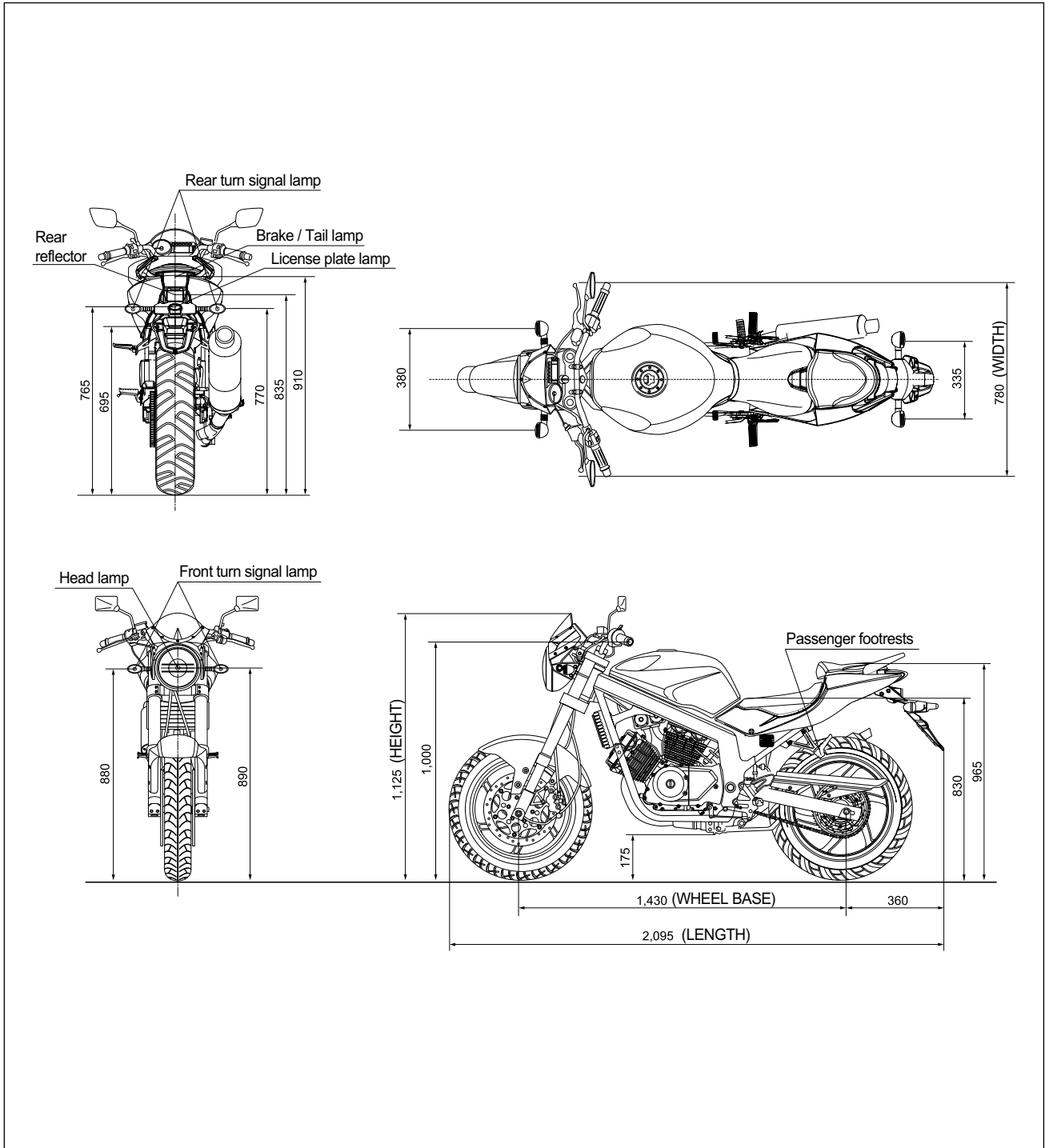
EXTERIOR ILLUSTRATION [*GV250 EJ*]



EXTERIOR ILLUSTRATION [*GT250REI*]



EXTERIOR ILLUSTRATION [*GT250EJ*]



FUNCTION OF EI SENSOR

★ ECU (Engine Control Unit, EI Control Unit)

: ECU decide the fuel injection volume and ignition time to adjust the fuel injector opening and closing rate which is considered the engine speed, intake air pressure, intake air volume, engine temperature, oxygen volume and throttle opening angle, etc.

★ EI (Electric fuel Injector)

: EI spray the fuel to intake pipe by ECU's injection signal.

Fuel which is needed combustion in the combustion chamber is supplied from the fuel tank.

★ ET sensor (Engine Temperature Sensor : ETS)

: ET sensor communicate the perceived engine temperature to ECU.

ET sensor is located the outside of the cylinder to measure the engine temperature.

★ GP switch (Gear Position Switch)

: GP switch is used when start / stop and control ECU as the converted electrical signal of the gear position is supplied ECU.

★ IAP sensor (Intake Air Temperature : IAPS)

: IAP sensor measure the pressure which is generated from the intake pipe and compare with the provided absolute pressure, then analogize the air volume indirectly and help to work the fuel injector properly.

★ IAT sensor (Intake Air Temperature Sensor : IATS)

: IAT sensor perceive the atmospheric temperature and is located the air cleaner case.

★ ISC solenoid (Idle Speed Control Solenoid)

: ISC solenoid is interlocked with the throttle body, so ECU control the engine idle speed.

★ O₂ sensor (Oxygen Sensor : O₂S)

: O₂ sensor measure the oxygen volume from the exhaust gas and convert the oxygen volume into voltage value, then communicate the output voltage to ECU.

★ Pick-up Coil

: Pick-up coil perceive the front and rear cylinder's engine speed and realtime of piston position.

★ RO switch (Roll Over Switch)

: RO switch is the fuel cut-off system when the motorcycle is leaned over 60° for upset accident.

★ SAV solenoid (Secondary Air Valve Solenoid)

: SAV solenoid supply the fresh air to the exhaust pipe for decrease of the exhaust gas.

★ TP sensor (Throttle Position Sensor : TPS)

: TP sensor detect the throttle opening angle and is located the throttle body.

It decide the fuel injection volume and compensate the ignition time as inform idle · acceleration · deceleration condition and throttle full opening etc. to ECU.

SPECIFICATIONS

⊙ DIMENSIONS AND MASS

ITEM	<i>BV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Overall length	2,280 mm (89.8 in)	2,095 mm (82.5 in)	←
Overall width	885 mm (34.8 in)	720 mm (28.4 in)	780 mm (30.7 in)
Overall height	1,095 mm (43.1 in)	1,135 mm (44.7 in)	1,125 mm (44.3 in)
Wheelbase	1,520 mm (59.8 in)	1,430 mm (56.3 in)	←
Ground clearance	150 mm (5.9 in)	155 mm (6.1 in)	175 mm (6.9 in)
Mass	175 kg (386 lbs)	185 kg (408 lbs)	175 kg (386 lbs)

⊙ ENGINE

ITEM	<i>BV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Type	Four-stroke, DOHC, air-cooled and oil-cooled	←	←
Number of cylinder	V-2 cylinder	←	←
Bore	57.0 mm (2.24 in)	←	←
Stroke	48.8 mm (1.92 in)	←	←
Piston displacement	249 cm ³ (15.2 in ³)	←	←
Fuel system	Electric fuel Injection	←	←
Starter system	Electric starter	←	←
Lubrication system	Wet sump	←	←

⊙ TRANSMISSION

ITEM	<i>BV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Clutch	Wet multi-plate type	←	←
Transmission	5-speed constant mesh	←	←
Gearshift pattern	1-down, 4-up	←	←
Reduction ratio	3.290	←	←
Gear ratio	1st	2.460	←
	2nd	1.560	←
	3rd	1.190	←
	4th	0.960	←
	5th	0.840	←
Drive chain	520HO, 116 links	520HO, 112 links	←

◎ CHASSIS

ITEM	<i>GV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Front suspension	Telescopic type	←	←
Rear suspension	Swingarm type	←	←
Steering angle	40 ° (right & left)	27 ° (right & left)	←
Caster	34 °	25.5 °	←
Trail	142 mm (5.59 in)	90 mm (3.54 in)	←
Front brake	Disk brake	Double disk brake	Disk brake
Rear brake	Drum brake	Disk brake	←
Front tire size	110/90 - 16 59S	110/70 - 17 54H	←
Rear tire size	150/80 - 15M/C 70S	150/70 - 17 69H	←
Front fork stroke	120 mm (4.72 in)	←	←

◎ ELECTRICAL

ITEM	<i>GV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Ignition type	ECU	←	←
Ignition timing	13 ° B.T.D.C. at 2,000 rpm and 30 ° B.T.D.C. at 6,000 rpm	←	←
Spark plug	CR8E	←	←
Battery	12 V 10 Ah (MF)	←	←
Fuse	30 A & 15 A	←	←
Head lamp	HI	12 V - H4 : 60 W × 1	12 V - H1 : 55 W × 1
	LO	12 V - H4 : 55 W × 1	12 V - H3 : 55 W × 1
Turn signal lamp	12 V - RY10 W × 4	←	←
Brake / Tail lamp	12 V - P21/5 W × 1	LED type	←
License plate lamp	12 V - W5 W × 1	←	←
Illumination lamp	12 V - 1.7 W × 2	LED type	←
High beam indicator lamp	12 V - 1.7 W × 1	LED type	←
Turn signal indicator lamp(right & left)	12 V - 1.7 W × 2	LED type	←
Neutral indicator lamp	12 V - 1.7 W × 1	LED type	←
Fuel meter lamp	12 V - 1.7 W × 1	LED type (Level type)	←
"FI"(Fuel Injection) check lamp	LED type	←	←

※ LED : Light Emitting Diode

◎ CAPACITIES

ITEM	<i>GV250 Ei</i>	<i>GT250 R Ei</i>	<i>GT250 Ei</i>
Fuel tank	14.0 ℓ	17.0 ℓ	←
Engine oil	Oil change	1,450 ml	←
	Oil and filter change	1,500 ml	←
	Engine overhaul	1,800 ml	←
Front fork oil capacity (One side)	260 cc	400 ± 2.5 cc	←

NOTE

The specifications are subject to change without notice.

EI SYSTEM DIAGNOSIS

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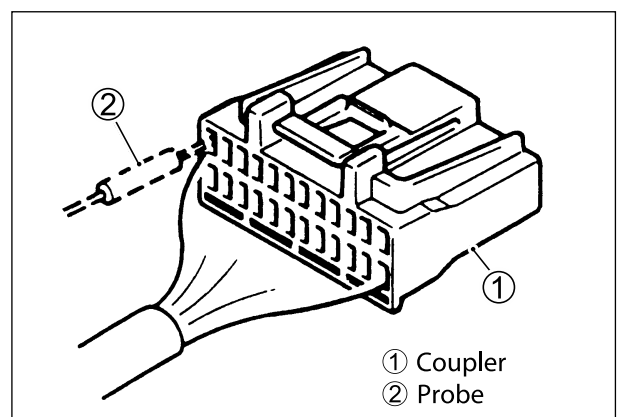
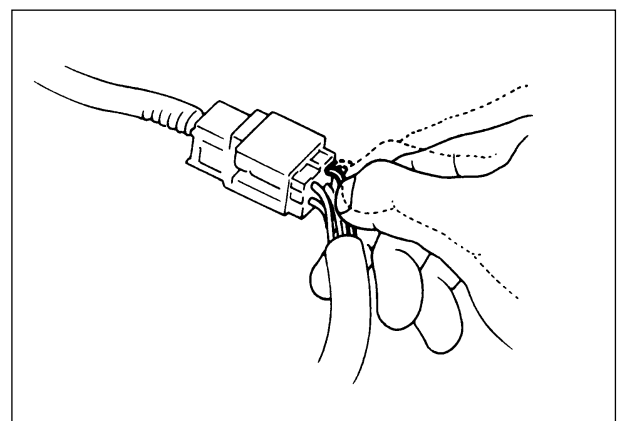
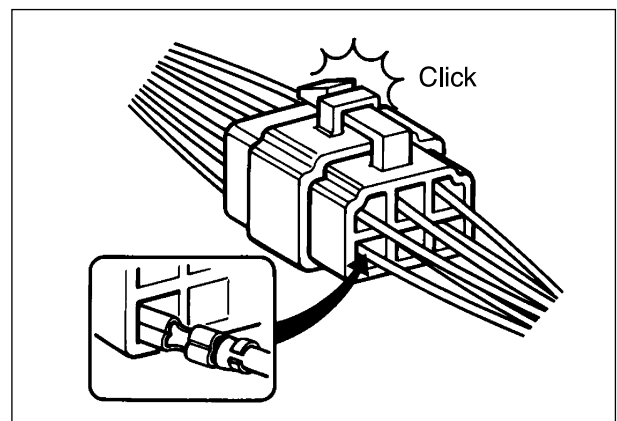
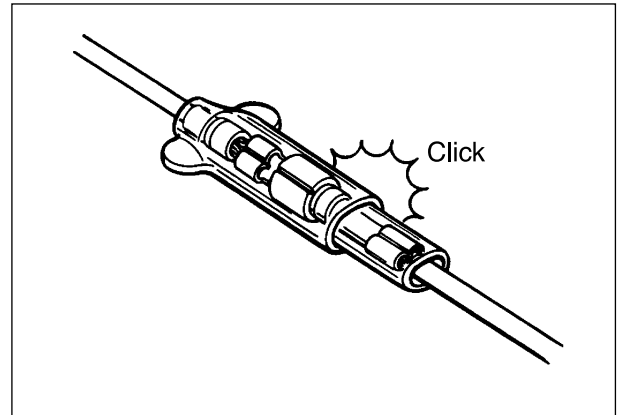
PRECAUTIONS IN SERVICING

When handling the component parts or servicing the EI 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 it in fully till the works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the connector / coupler for looseness or bending.
- Inspect each terminal for corrosion and contamination.
The terminals must be clean and free of any foreign material which could impede proper terminal contact.
- Inspect each lead wire circuit for poor connection by shaking it by hand lightly. If any abnormal condition is found, repair or replace.
- When taking measurements at electrical connectors using a tester probe, be sure to insert the probe from the wire harness side (backside) of the connector / coupler.

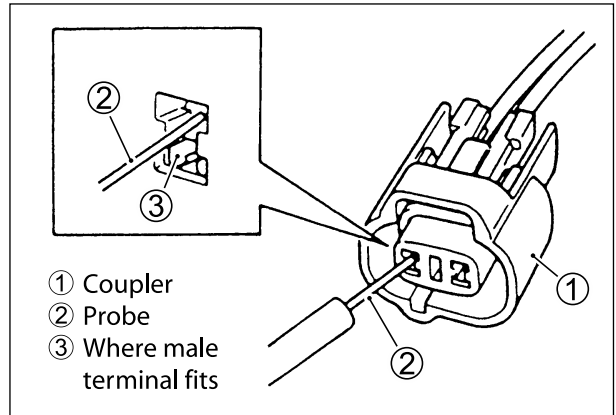


- When connecting meter probe from the terminal side of the coupler (connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open.

Connect the probe as shown to avoid opening of female terminal.

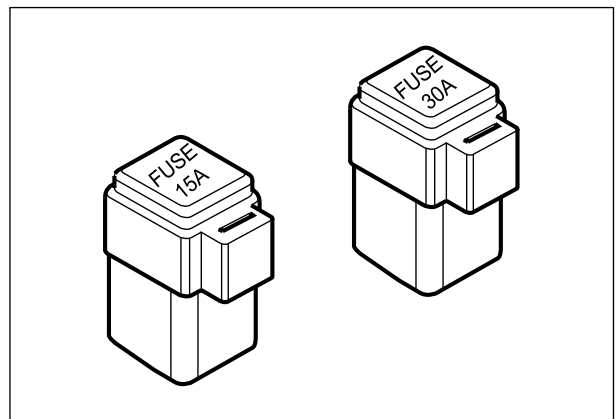
Never push in the probe where male terminal is supposed to fit.

- Check the male connector for bend and female connector for excessive opening. Also check the coupler for locking (looseness), corrosion, dust, etc.



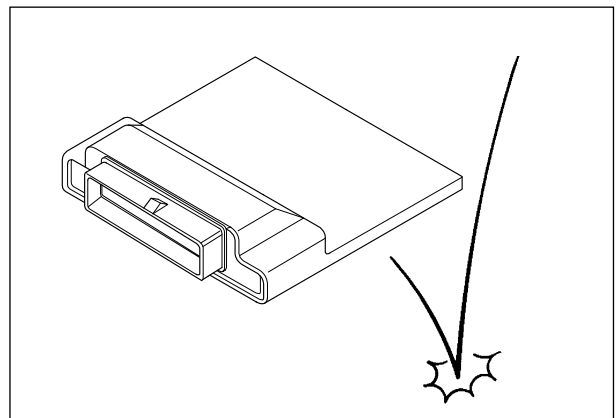
◎ FUSE

- When a fuse blows, always investigate the cause 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.

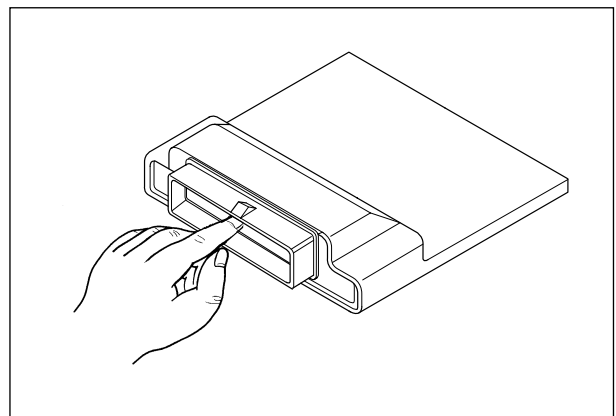


◎ ECU / VARIOUS SENSORS

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

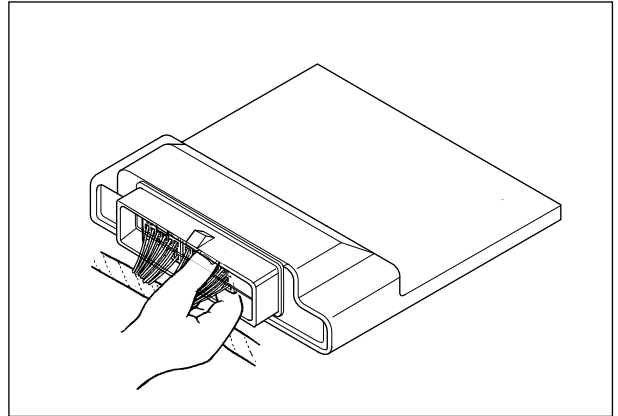


- Be careful not to touch the electrical terminals of the ECU. The static electricity from your body may damage this part.

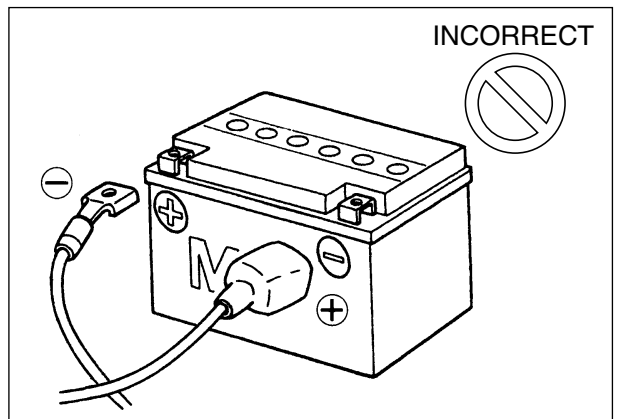


4-1-3 EI SYSTEM DIAGNOSIS

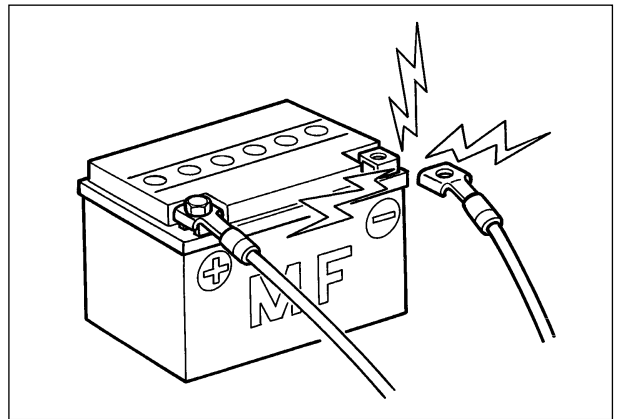
- When disconnecting and connecting the ECU, make sure to turn "OFF" the ignition switch, or electronic parts may get damaged.



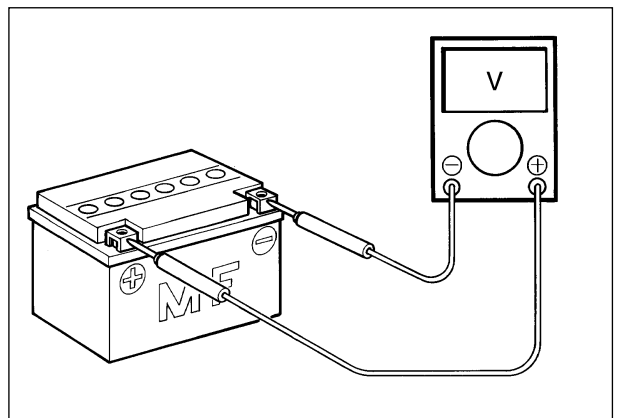
- Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the EI system instantly when reverse power is applied.



- 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 ECU which may result in serious damage.



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



- Never connect an ohmmeter to the ECU with its coupler connected. If attempted, damage to ECU or sensors may result.
- Be sure to use a specified voltmeter / ohmmeter. Otherwise, accurate measurements may not be obtained and personal injury may result.

⊙ USING TESTERS

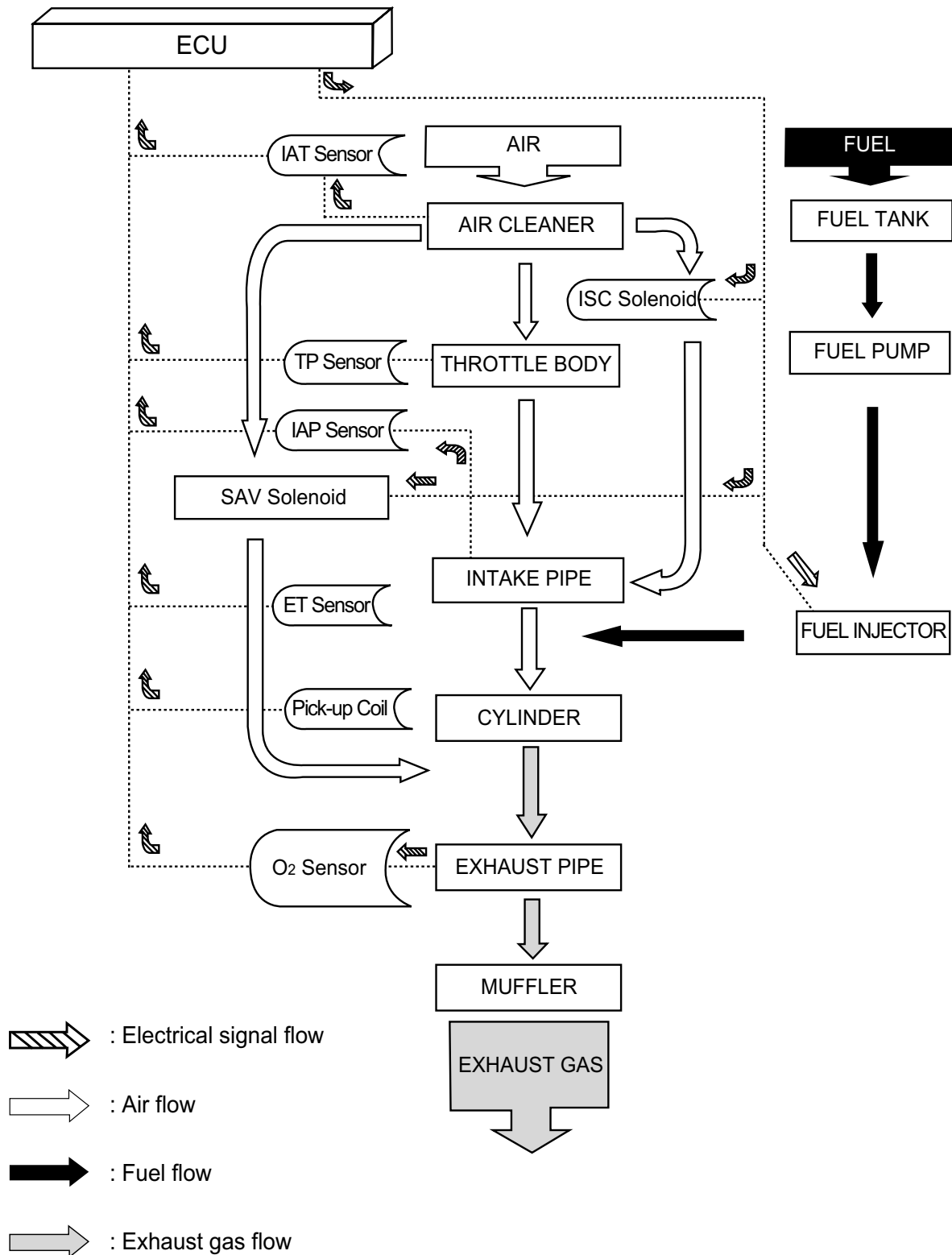
- Use well-charged batteries in the tester.
- Be sure to set the tester to the correct testing range.

▣ 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.
- After using the tester, turn the power off.

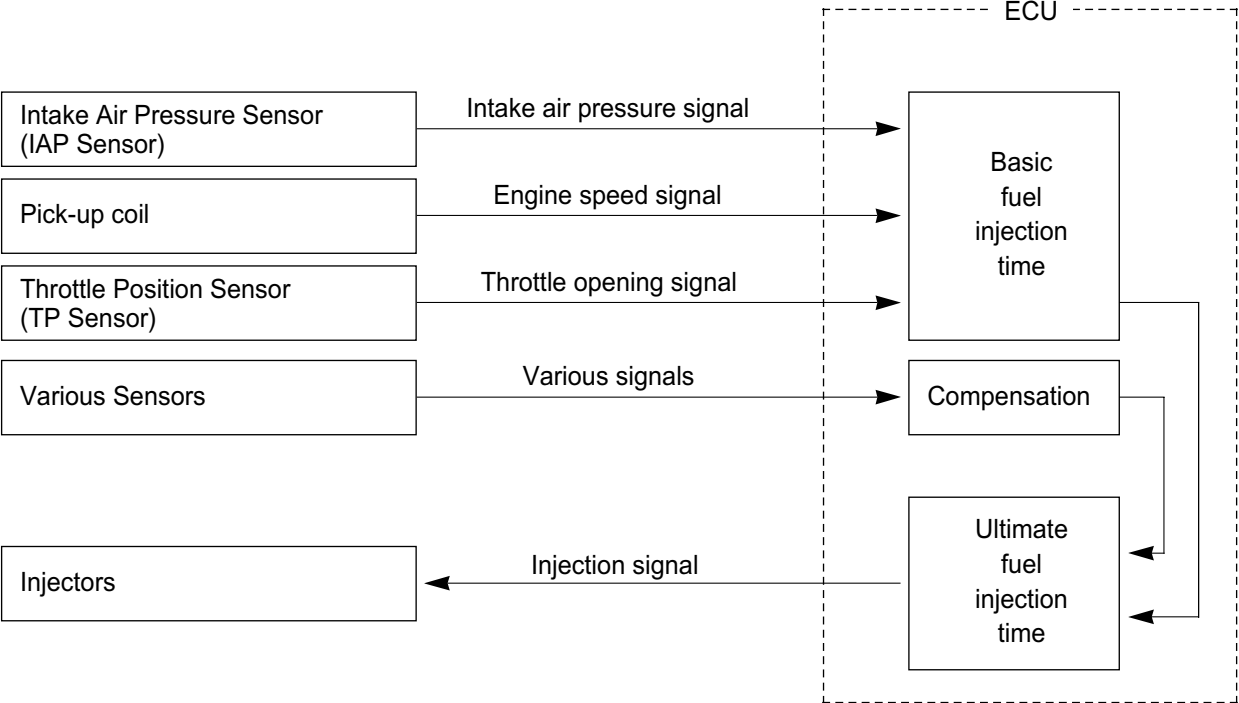
EI SYSTEM TECHNICAL FEATURES

⊙ 「GV250EI」 & 「GT250/REI」 EI SYSTEM'S CONTROL DIAGRAM



◎ 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.



4-1-7 EI SYSTEM DIAGNOSIS

⊙ COMPENSATION OF INJECTION TIME (VOLUME)

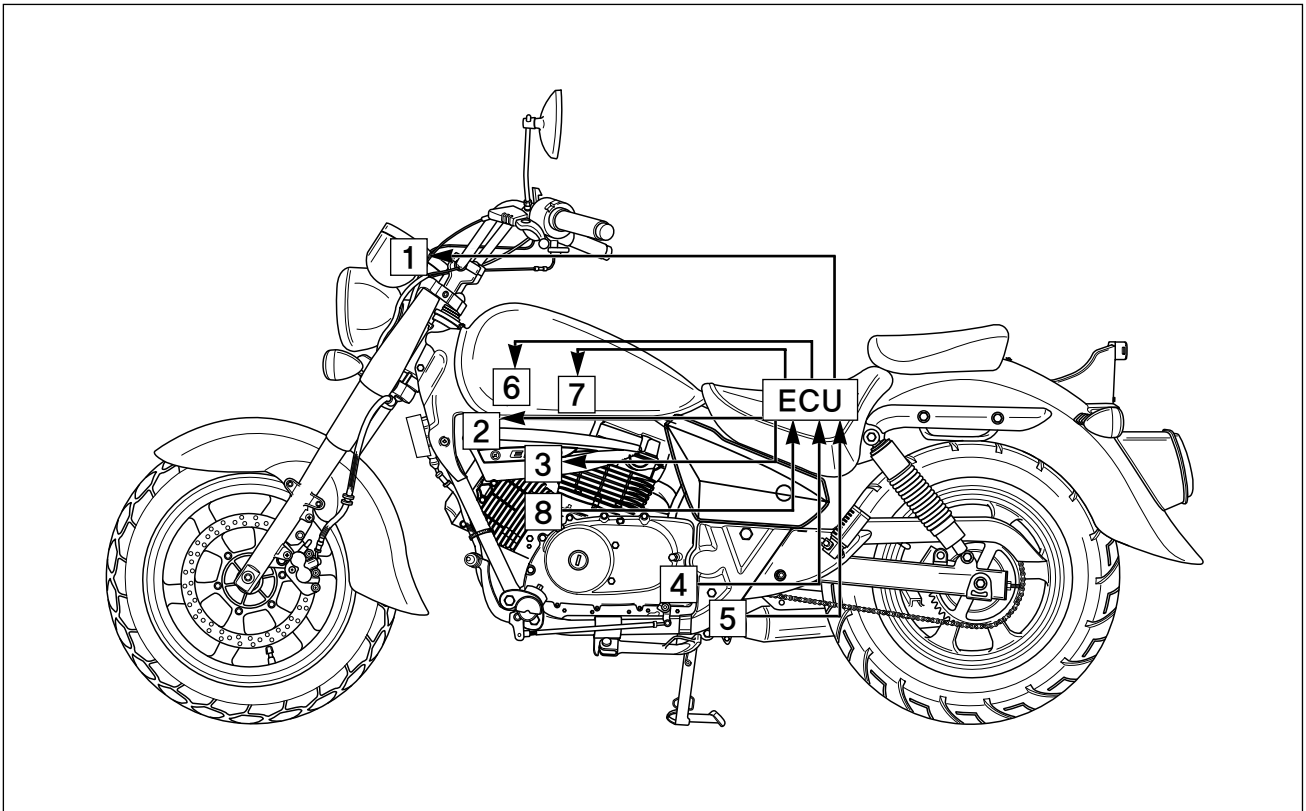
The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

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 is low, injection time (volume) is increased.
BATTERY VOLTAGE SIGNAL	ECU operates on the battery voltage and at the same time, it monitors the voltage signal for compensation of the fuel injection time (volume). A longer injection time is needed to adjust injection volume in the case of low voltage.
ENGINE RPM SIGNAL	At high speed, the injection time (volume) is increased.
STARTING SIGNAL	When starting engine, additional fuel is injected during cranking engine.
ACCELERATION SIGNAL / DECELERATION SIGNAL	During acceleration, the fuel injection time (volume) is increased in accordance with the throttle opening speed and engine rpm. During deceleration, the fuel injection time (volume) is decreased.

⊙ INJECTION STOP CONTROL

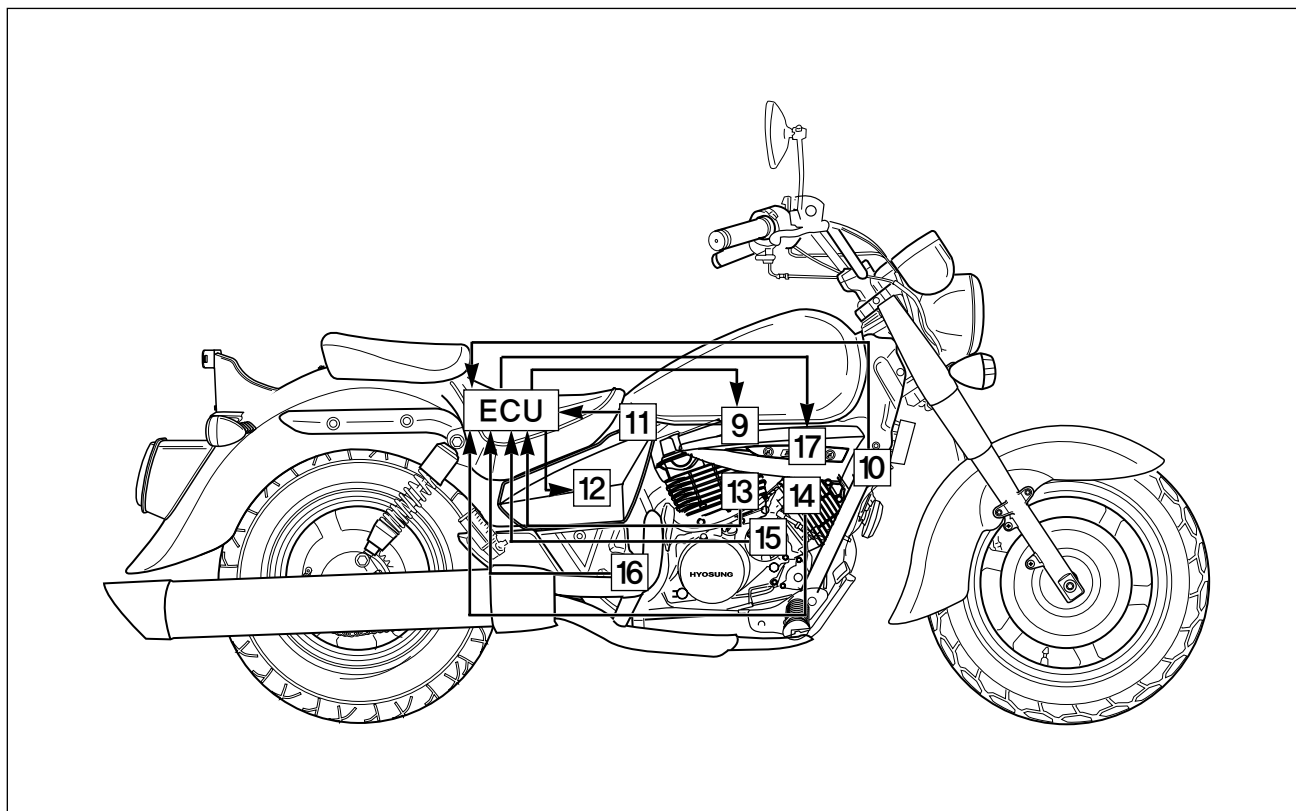
SIGNAL	DESCRIPTION
ROLL OVER SWITCH SIGNAL (FUEL CUT-OFF)	When the motorcycle rolls over, the roll over switch sends a signal to the ECU. Then, this signal cuts OFF current supplied to the fuel pump, fuel injector and ignition coil.
OVER-REV. LIMITER SIGNAL	The fuel injectors stop operation when engine rpm reaches rev. limit rpm.

◎ EI SYSTEM PARTS LOCATION [*GV250 Ei*]



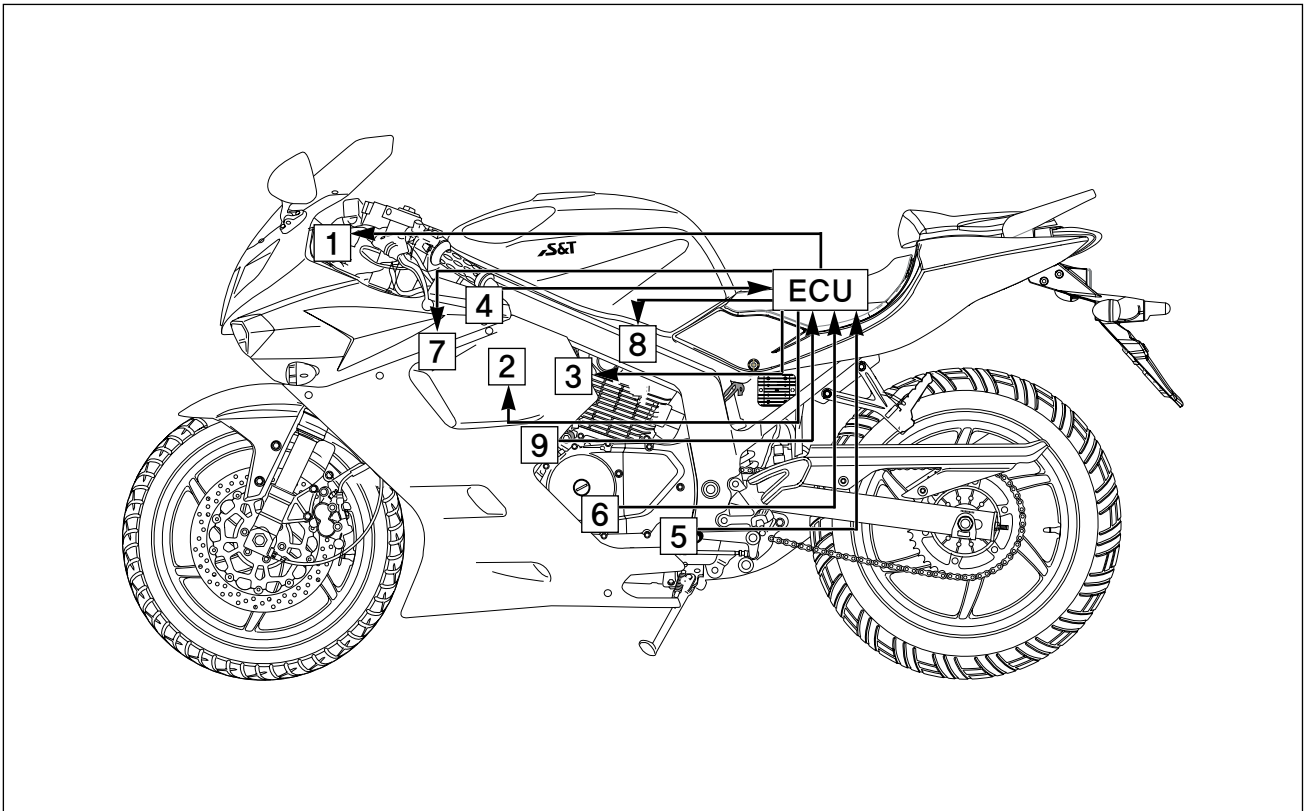
- | | |
|-----------------------|-----------------------|
| ① Speedometer | ⑤ GP switch |
| ② Ignition coil, NO.1 | ⑥ Fuel injector, NO.1 |
| ③ Ignition coil, NO.2 | ⑦ Fuel injector, NO.2 |
| ④ Pick-up coil | ⑧ TP sensor |

4-1-9 EI SYSTEM DIAGNOSIS



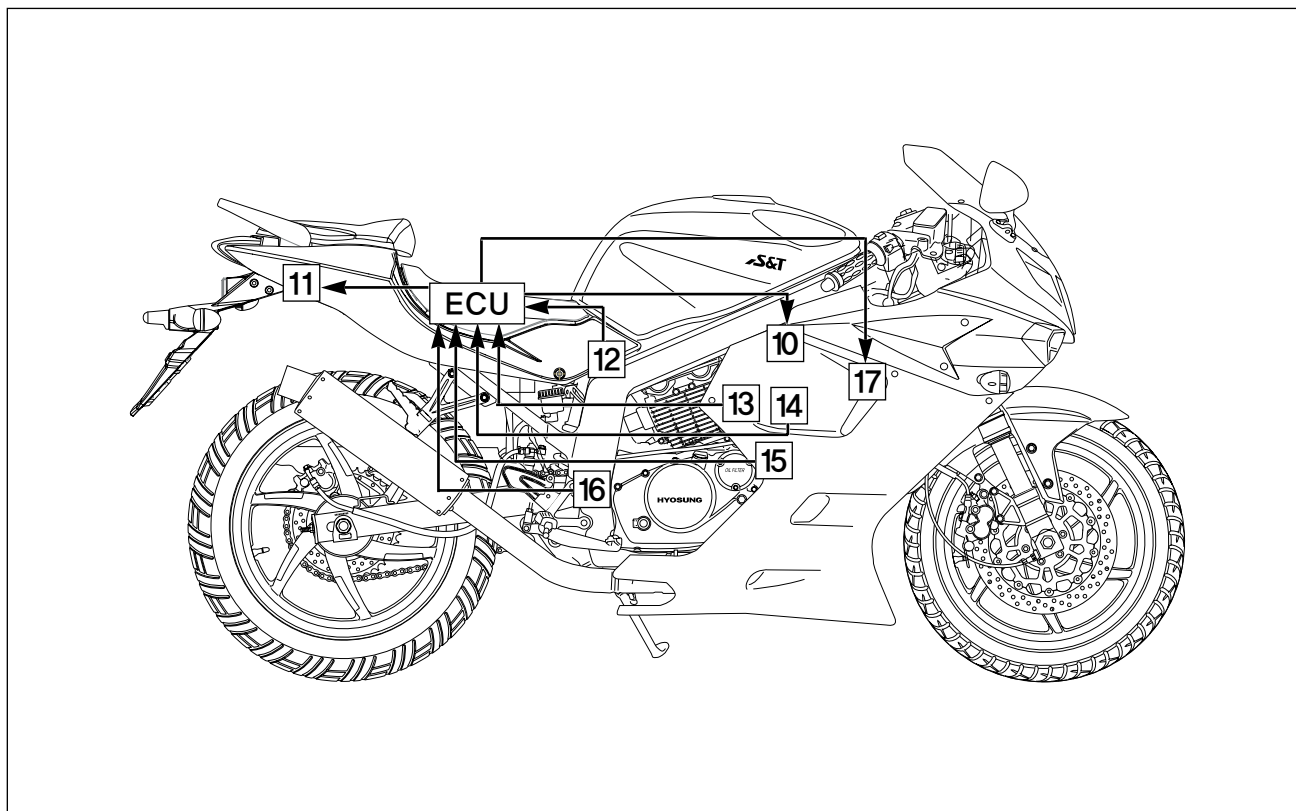
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|--------------------|--------------------|
| ⑨ ISC solenoid | ⑭ IAP sensor, NO.1 |
| ⑩ IAT sensor | ⑮ ET sensor |
| ⑪ RO switch | ⑯ Oxygen sensor |
| ⑫ Fuel pump relay | ⑰ SAV solenoid |
| ⑬ IAP sensor, NO.2 | |

◎ EI SYSTEM PARTS LOCATION [GT250i REI]



- | | |
|-----------------------|-----------------------|
| ① Speedometer | ⑥ Pick-up coil |
| ② Fuel injector, NO.1 | ⑦ Ignition coil, NO.1 |
| ③ Fuel injector, NO.2 | ⑧ Ignition coil, NO.2 |
| ④ IAT sensor | ⑨ TP sensor |
| ⑤ GP switch | |

4-1-11 EI SYSTEM DIAGNOSIS



- | | |
|--------------------|--------------------|
| ⑩ ISC solenoid | ⑭ IAP sensor, NO.1 |
| ⑪ Fuel pump relay | ⑮ ET sensor |
| ⑫ RO switch | ⑯ Oxygen sensor |
| ⑬ IAP sensor, NO.2 | ⑰ SAV solenoid |

SELF-DIAGNOSIS FUNCTION [*GT250I REI*]

The self-diagnosis function is incorporated in the ECU.


The function has two modes, "USER MODE" and "DEALER MODE".

The user can only be notified by the LCD(DISPLAY) panel ① and the "FI" check lamp "  " ②.

To check the function of the individual EI system devices, the dealer mode is prepared.

In this check, the special tool is necessary to read the code of the malfunction items.

⊙ USER MODE

The "FI" check lamp "  " ② comes on for about three seconds whenever the ignition switch is set to "ON" position with the engine stopped as a test of the injection system operation.

The check lamp must go off after three seconds.

MALFUNCTION	LCD (DISPLAY) INDICATION ①	"FI" CHECK LAMP INDICATION ②	INDICATION MODE
"NO"	Speedometer	—	—
"YES" Engine can start Engine can not start	Speedometer and "FI" letters A	"FI" check lamp comes on.	Each 2 sec. Speedometer or "FI" letters is indicated.
	"FI" letters B	"FI" check lamp comes on and blinks.	"FI" letters is indicated continuously.

A

When one of the signals is not received by ECU, the fail-safe circuit works and injection is not stopped.


In this case, "FI" letters and speedometer are indicated in the LCD panel ① and motorcycle can run.

B

The injection signal is stopped, when the pick-up coil signal, roll over switch signal, NO.1 & NO.2 ignition signals, NO.1 & NO.2 injector signals, fuel pump relay signal or ignition switch signal is not sent to ECU.

In this case, "FI" letters is indicated in the LCD panel ①. Motorcycle does not run.

"CHE" : The LCD panel ① indicates "CHE" letters when no communication signal from the ECU is received for 3 seconds.

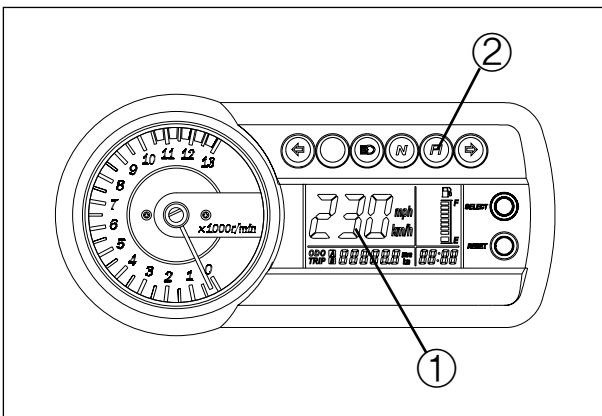
For example, The ignition switch is turned "ON" position, and the engine stop switch is turned "  " position.

In this case, the speedometer does not receive any signal from ECU, and the LCD panel ① indicates "CHE" letters.

If "CHE" letters is indicated, the LCD panel ① does not indicate the trouble code.

The possible cause of this indication is as follows, Engine stop switch is in "  " position. Ignition fuse is burnt.

It is necessary to check the wiring harness between ECU and speedometer couplers.



⊙ DEALER MODE

The defective function is memorized in the ECU.

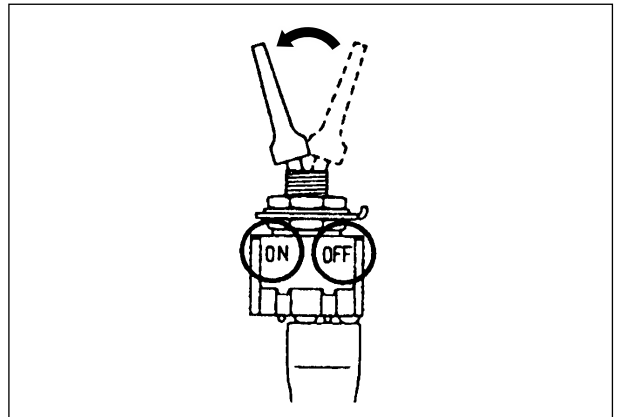
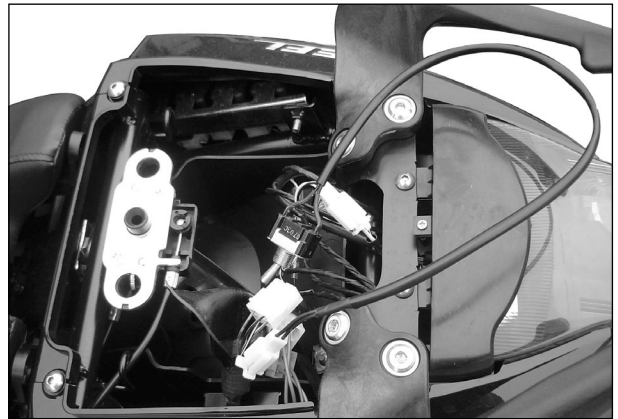
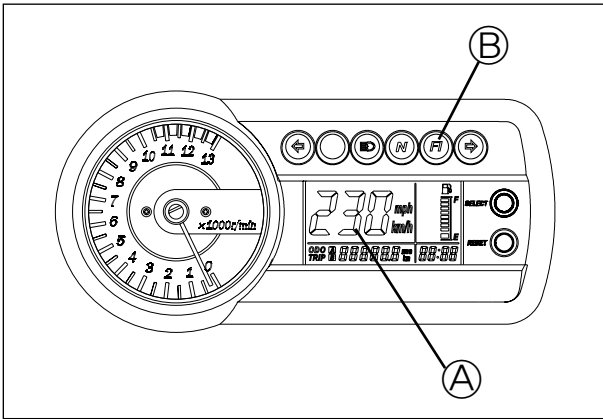
Use the special tool's coupler to connect to the dealer mode coupler. (Refer to page 4-1-20)

The memorized malfunction code is displayed on LCD (DISPLAY) panel **A**.

Malfunction means that the ECU does not receive signal from the devices.

These affected devices are indicated in the code form.

 **Mode select switch : 09900-27000**



CAUTION


- ❖ Do not disconnect the ECU lead wire couplers, before checking the malfunction code, or the malfunction code memory is erased and the malfunction code can not be checked.
- ❖ Confirm the malfunction code after turn the ignition switch "ON" position or cranking the engine for few seconds.

MALFUNCTION	LCD (DISPLAY) INDICATION A	"FI" CHECK LAMP INDICATION B	INDICATION MODE
"NO"	C		—
"YES"	C**code is indicated from small numeral to large one.	"FI" check lamp goes off.	For each 2 sec., code is indicated.

SELF-DIAGNOSIS FUNCTION [*GV250 EI*]

The self-diagnosis function is incorporated in the ECU.


The function has two modes, "USER MODE" and "DEALER MODE".

The user can only be notified by the "FI" check lamp "  " ①.


To check the function of the individual EI system devices, the dealer mode is prepared.

In this check, the special tool is necessary to read the code of the malfunction items.

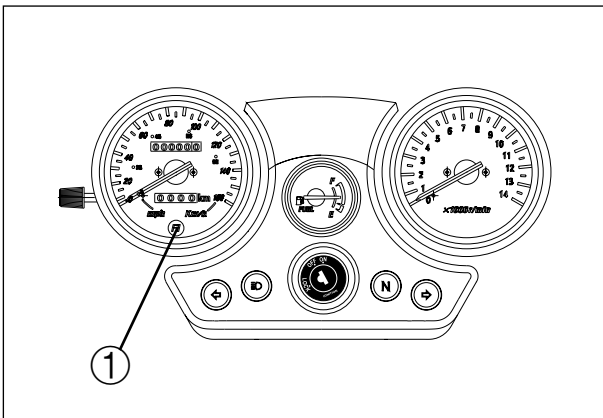
◎ USER MODE

The "FI" check lamp "  " ① comes on for about three seconds whenever the ignition switch is set to "ON" position with the engine stopped as a test of the injection system operation.

The check lamp must go off after three seconds.

If the "FI" check lamp "  " ① comes on during normal engine operation, it means that the electric fuel injection system is not operating correctly.

When this is the case, inspect the electric fuel injection system to refer to "Dealer mode".



⊙ DEALER MODE

The defective function is memorized in the ECU.

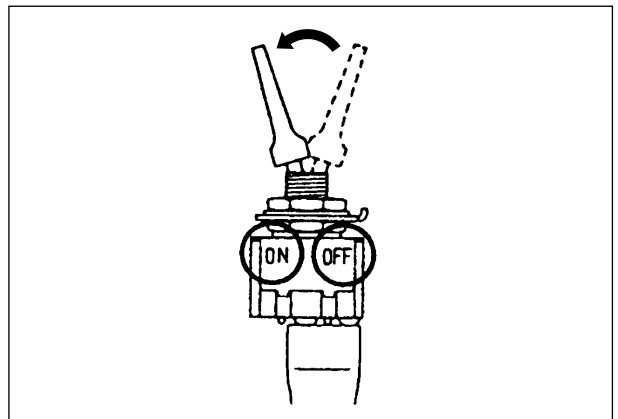
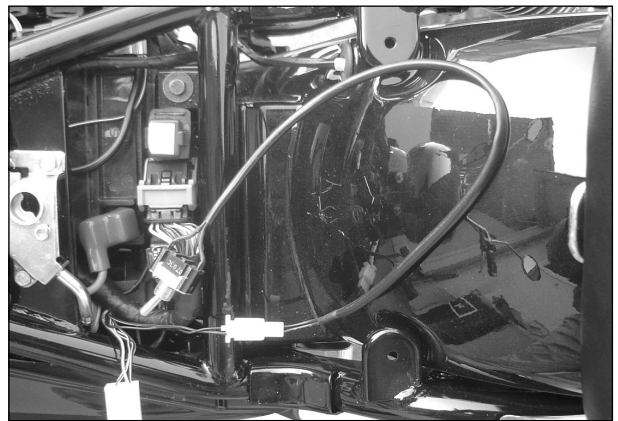
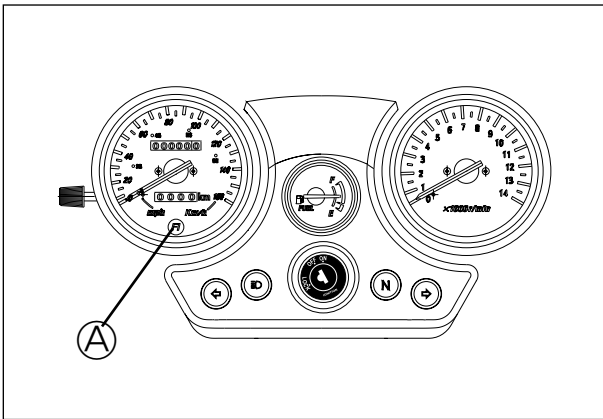
Use the special tool's coupler to connect to the dealer mode coupler. (Refer to page 4-1-20)

The memorized malfunction code is displayed with blinks signal of the "FI" check lamp "  " .

Malfunction means that the ECU does not receive signal from the devices.


These affected devices are displayed blinks signal of the "FI" check lamp "  " .

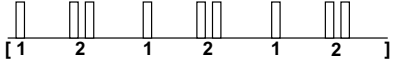
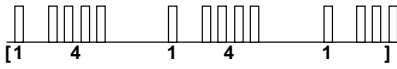
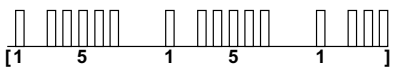


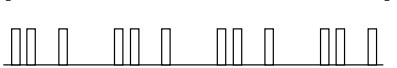

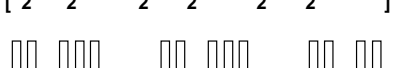

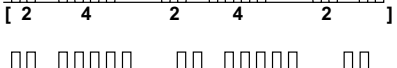


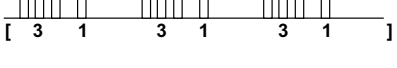




 **Mode select switch : 09900-27000**



CAUTION

- ❖ Do not disconnect the ECU lead wire couplers, before checking the malfunction code, or the malfunction code memory is erased and the malfunction code can not be checked.
- ❖ Confirm the malfunction code after turn the ignition switch "ON" position or cranking the engine for few seconds.

MALFUNCTION	"FI" CHECK LAMP INDICATION 
"NO"	"FI" check lamp goes off.
"YES"	Malfunction code is displayed from small numeral blinks signal to large one.

A CODE	B CODE	MALFUNCTION PART	REMARKS
C	—	None	No defective part
C12		Pick-up coil	
C14		Throttle position sensor (TPS)	
C15		Engine temperature sensor (ETS)	
C17		Intake air pressure sensor (IAPS), NO.1	For NO.1 cylinder
C18		Intake air pressure sensor (IAPS), NO.2	For NO.2 cylinder
C21		Intake air temperature sensor (IATS)	
C22		Oxygen sensor (O ₂ S)	
C23		Roll over switch (RO switch)	
C24		Ignition coil, NO.1	For NO.1 cylinder
C25		Ignition coil, NO.2	For NO.2 cylinder
C27		Idle speed control solenoid (ISC solenoid)	
C31		Gear position switch (GP switch)	
C32		Fuel injector, NO.1	For NO.1 cylinder
C33		Fuel injector, NO.2	For NO.2 cylinder
C37		Secondary air valve solenoid (SAV solenoid)	
C41		Fuel pump relay	
C43		Oxygen sensor heater (O ₂ S heater)	

※ **A** CODE : For 『GT250/REI』


B CODE : For 『GV250EI』

4-1-17 EI SYSTEM DIAGNOSIS

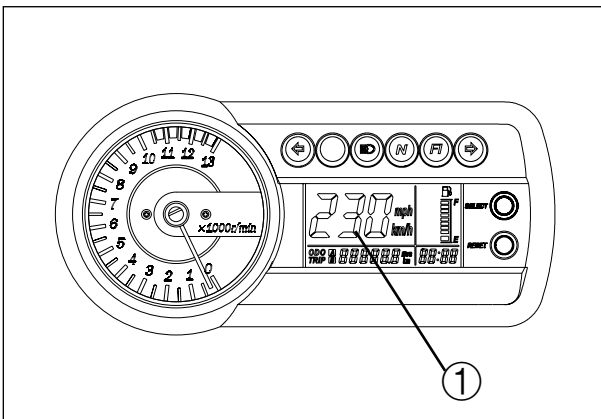
▣ **GT250i R E I**

In the LCD (DISPLAY) panel ①, the malfunction code is indicated from small code to large code.

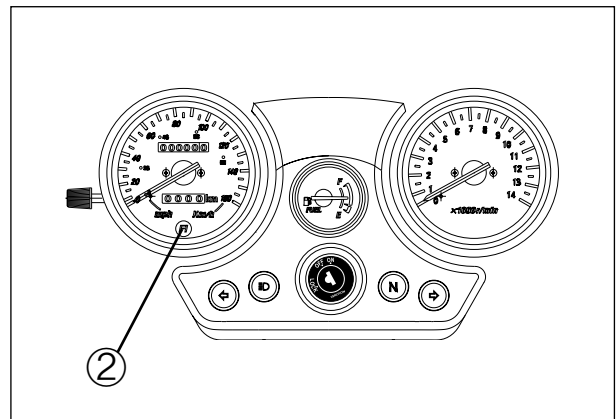
▣ **GV250 E I**

In the "FI" check lamp "  " ②, the malfunction code is displayed from small numeral blinks signal to large numeral blinks signal.

GT250i R E I



GV250 E I



EI SYSTEM TROUBLESHOOTING

CUSTOMER COMPLAINT ANALYSIS

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

EXAMPLE : CUSTOMER PROBLEM INSPECTION FORM

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

"FI" Check lamp	<input type="checkbox"/> Always ON <input type="checkbox"/> Sometimes ON <input type="checkbox"/> Always OFF <input type="checkbox"/> Good condition
Malfunction display / code (LCD panel) or Blinks signal ("FI" check lamp)	<input type="checkbox"/> No code <input type="checkbox"/> Malfunction code ()

PROBLEM SYMPTOMS

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

4-1-19 EI SYSTEM DIAGNOSIS

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

NOTE
<i>The above form is a standard sample. If should be modified according to conditions characteristic of each market.</i>

SELF-DIAGNOSTIC PROCEDURES

Don't disconnect couplers from ECU, battery cable from battery, ECU ground wire harness from engine or main fuse before confirming malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase memorized information in ECU memory.

Malfunction code stored in ECU memory can be checked by the special tool.

To check malfunction code, read SELF-DIAGNOSIS FUNCTION "DEALER MODE" (Refer to page 4-1-13, 15, 16 & 17) carefully to have good understanding as to what functions are available and how to use it.

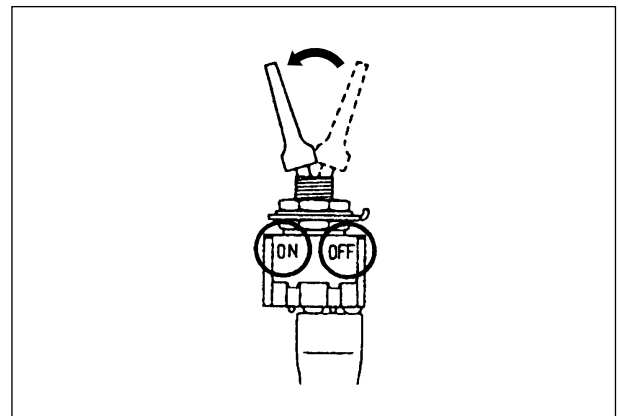
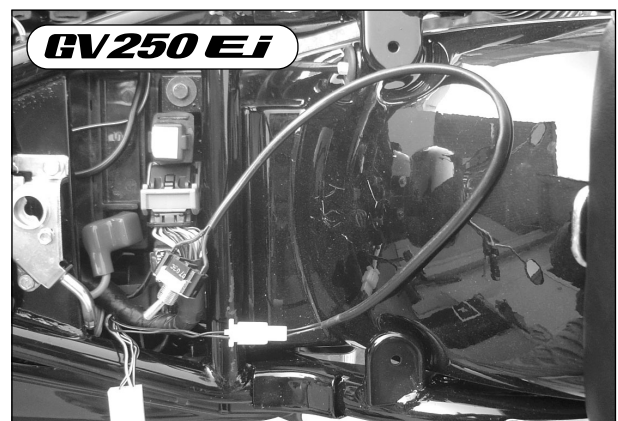
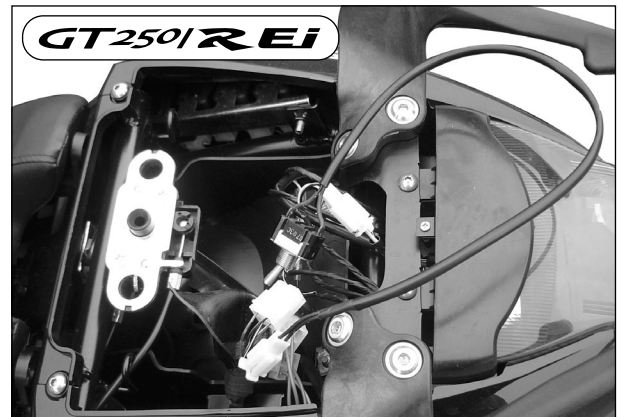
Be sure to read "PRECAUTIONS for Electrical Circuit Service" (Refer to page 4-1-1) before inspection and observe what is written there.

- Remove the rear seat. (*GT250i REI*)
- Remove the front seat. (*GV250 Ei*)
- Connect the special tool to the dealer mode coupler at the wiring harness, and the ignition switch is set to "ON" position.
- Turn the special tool's switch "ON" position and check the malfunction code to determine the malfunction part.

 Mode select switch : 09900-27000

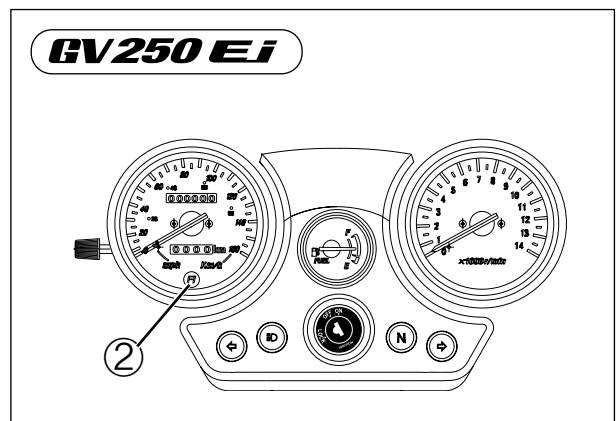
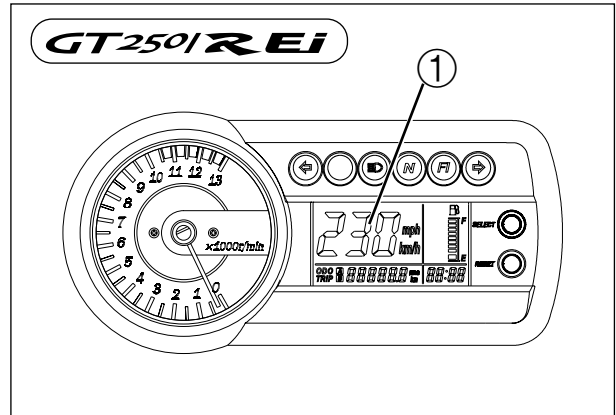
NOTE

- ❖ The dealer mode coupler is located under the rear seat. (*GT250i REI*)
- ❖ The dealer mode coupler is located under the front seat. (*GV250 Ei*)



SELF-DIAGNOSIS RESET PROCEDURE

- After repairing the trouble, turn the ignition switch “OFF” position and turn “ON” position again.
- If “C ” (LCD INDICATION ①) is indicates, the malfunction codes are cleared. (*GT250i R Ei*)
- If not blink (“FI” check lamp ②), the malfunction codes are cleared. (*GV250 Ei*)
- Disconnect the special tool from the dealer mode coupler.



MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION CODE	DETECTED ITEM	DETECTED FAILURE CONDITION
		CHECK FOR
C	NO FAULT	—
C12	Pick-up coil	The pick-up coil signal does not reach ECU for more than 3 sec. after ECU receiving the ignition switch signal. In this case, the code C12 is indicated.
		Pick-up coil wiring and mechanical parts. (Pick-up coil, lead wire coupler connection)
C14	Throttle position sensor (TPS)	The sensor should produce following voltage. $0.1\text{ V} \leq \text{sensor voltage} \leq 4.8\text{ V}$ Without the above range for 2 sec. and more, C14 is indicated.
		Throttle position sensor, lead wire / coupler connection.
C15	Engine temperature sensor (ETS)	The sensor voltage should be the following. $0.08\text{ V} \leq \text{sensor voltage} \leq 4.65\text{ V}$ Without the above range for 2 sec. and more, C15 is indicated.
		Engine temperature sensor, lead wire / coupler connection.
C17 / C18	Intake air pressure sensor (IAPS), NO.1 / NO.2	The sensor should produce following voltage. $0.5\text{ V} \leq \text{sensor voltage} \leq 4.5\text{ V}$ Without the above range for 6 sec. and more, C17 or C18 is indicated.
		Intake air pressure sensor, lead wire / coupler connection.
C21	Intake air temperature sensor (IATS)	The sensor voltage should be the following. $0.08\text{ V} \leq \text{sensor voltage} \leq 4.75\text{ V}$ Without the above range for 6 sec. and more, C21 is indicated.
		Intake air temperature sensor, lead wire / coupler connection.
C22	Oxygen sensor (O ₂ S)	The oxygen sensor signal is inputted in ECU since then 600 sec. after the engine run. When this is the case, ECU not receive the signal, C22 is indicated.
		Oxygen sensor, lead wire / coupler connection.
C23	Roll over switch (RO switch)	The switch resistance should be the following for more than 3 sec. after holding the motorcycle vertically and ignition switch turns "ON" position. switch resistance $\approx \infty \Omega$ (Infinity) Without the above value for 3 sec. and more, C23 is indicated.
		Roll over switch, lead wire / coupler connection.

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MALFUNCTION CODE	DETECTED ITEM	DETECTED FAILURE CONDITION
		CHECK FOR
C24 / C25	Ignition coil (IG coil), NO.1 / NO.2	Ignition signal is interrupted continuous by 31 times or more when ECU confirm ignition surge at each combustion chamber. In this case, the code C24 or C25 is indicated.
		Ignition coil, wiring / coupler connection, power supply from the battery.
C27	Idle speed control solenoid (ISC solenoid)	The idle speed control solenoid step should be the following. 0 step \leq solenoid step \leq 250 step Without the above range, C27 is indicated.
		Idle speed control solenoid, lead wire / coupler connection.
C31	Gear position switch (GP switch)	It judges from gear position voltage, engine speed and throttle position by ECU, when $0.15\text{ V} < \text{Gear position voltage} < 3.93\text{ V}$ for more 2 sec.. If gear position voltage get out of the above voltage, C31 is indicated.
		Gear position switch, wiring / coupler connection, gearshift cam etc.
C32 / C33	Fuel injector, NO.1 / NO.2	Injector signal is interrupted continuous for more than 1 sec. when ECU confirm injector running surge at each combustion chamber, C32 or C33 is indicated.
		Injector, wiring / coupler connection, power supply to the injector.
C37	Secondary air valve solenoid (SAV solenoid)	No voltage is applied from ECU to secondary air valve solenoid by 400 sec.. In this case, the code 37 is indicated.
		Secondary air valve solenoid, lead wire / coupler connection.
C41	Fuel pump relay	Voltage is applied continuous for more than 5 sec., battery voltage $\geq 3.2\text{ V}$ when fuel pump relay is "OFF" position or battery voltage $< 1.5\text{ V}$ when fuel pump relay is "ON" position. In this case, the code 41 is indicated.
		Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
C43	Oxygen sensor heater (O ₂ S heater)	The oxygen sensor heater signal is not inputted in ECU.
		Oxygen sensor heater, lead wire / coupler connection.

“C12” PICK-UP COIL CIRCUIT MALFUNCTION

GT250/R E _i CODE	GV250 E _i CODE
C12	
DETECTED CONDITION	POSSIBLE CAUSE
The pick-up coil signal does not reach ECU for more than 3 sec. after ECU receiving the ignition switch signal.	<ul style="list-style-type: none"> ● Metal particles or foreign material being attached on the pick-up coil and rotor tip. ● Pick-up coil circuit open or short. ● Pick-up coil malfunction. ● ECU malfunction.

INSPECTION

- 1) Remove the frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the pick-up coil coupler ① for loose or poor contacts.
If OK, then measure the pick-up coil resistance.

- 4) Disconnect the pick-up coil coupler ① and measure the resistance.

Pick-up coil resistance	Approx. 85 ~ 105 Ω (G – L)
--------------------------------	-------------------------------

Tester knob indication : Resistance (Ω)

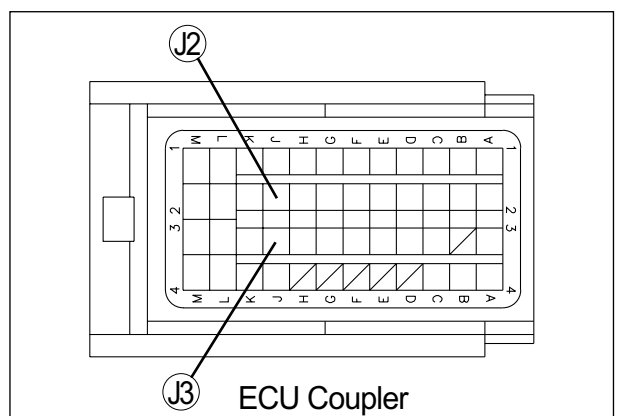
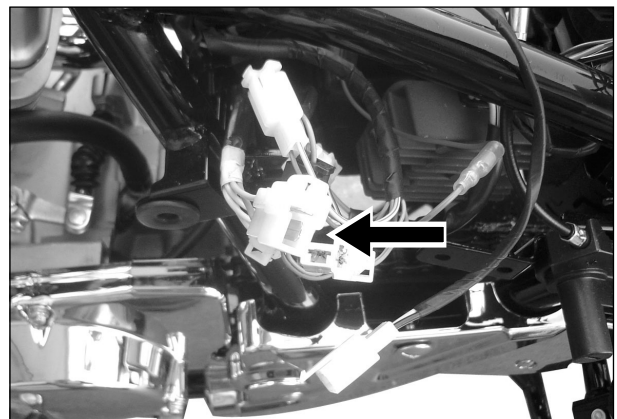
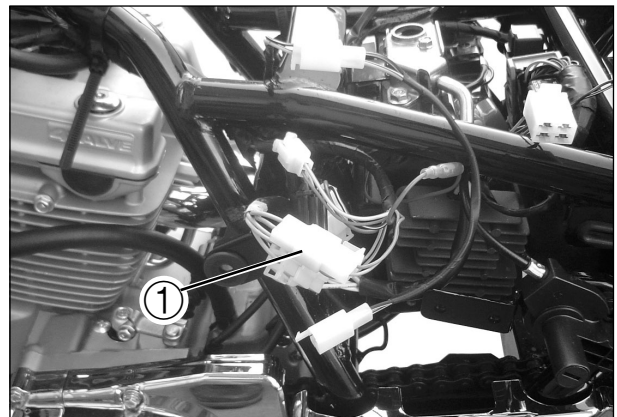
- 5) If OK, then check the continuity between each terminal and ground.

Pick-up coil continuity	∞ Ω (Infinity) (G – Ground) (L – Ground)
--------------------------------	--

Tester knob indication : Resistance (Ω)

Are the resistance and continuity OK?

YES	<ul style="list-style-type: none"> ● L or G wire open or shorted to ground, or poor ② or ③ connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the pick-up coil coupler or ECU coupler. ● Replace the pick-up coil with a new one.



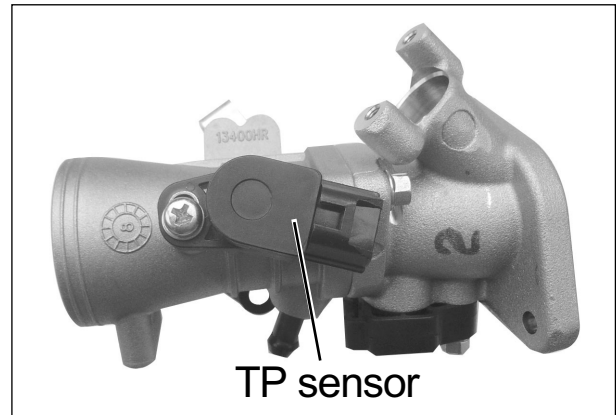
“C14” TP SENSOR CIRCUIT MALFUNCTION

<i>GT250/REI</i> CODE	<i>GV250 EJ</i> CODE
C14	
DETECTED CONDITION	POSSIBLE CAUSE
Output voltage is out of the specified range for 2 sec. and more. $0.1\text{ V} \leq \text{Sensor voltage} \leq 4.8\text{ V}$	<ul style="list-style-type: none"> ● TP sensor circuit open or short. ● TP sensor malfunction. ● ECU malfunction.

INSPECTION

◆ Step 1

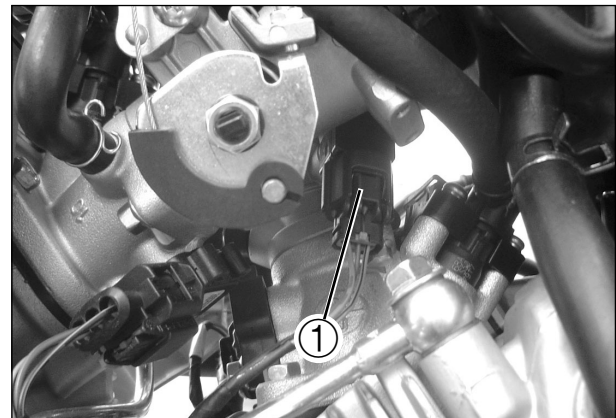
- 1) Turn the ignition switch “OFF” position.
- 2) Check the TP sensor coupler for loose or poor contacts.
If OK, then measure the TP sensor input voltage.
- 3) Disconnect the TP sensor coupler ①.



- 4) Turn the ignition switch “ON” position.
- 5) Measure the voltage at the OB wire and ground.
- 6) If OK, then measure the voltage at the OB wire and GR wire.

TP sensor input voltage	4.5 ~ 5.5 V (⊕ OB — ⊖ Ground) (⊕ OB — ⊖ GR)
--------------------------------	---

Tester knob indication : Voltage (---)



Is the input voltage OK?

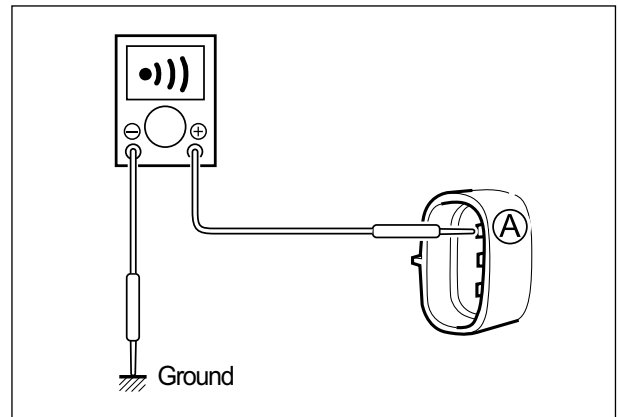
YES	Go to Step 2.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the ECU coupler. ● Open or short circuit in the OB wire or GR wire.

◆ Step 2

- 1) Remove the frame cover.
- 2) Turn the ignition switch "OFF" position.
- 3) Disconnect the TP sensor coupler.
- 4) Check the continuity between Ⓐ(LY) and ground.

TP sensor continuity	∞ Ω (Infinity) (Ⓐ - Ground)
-----------------------------	--------------------------------

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



Is the continuity OK?

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

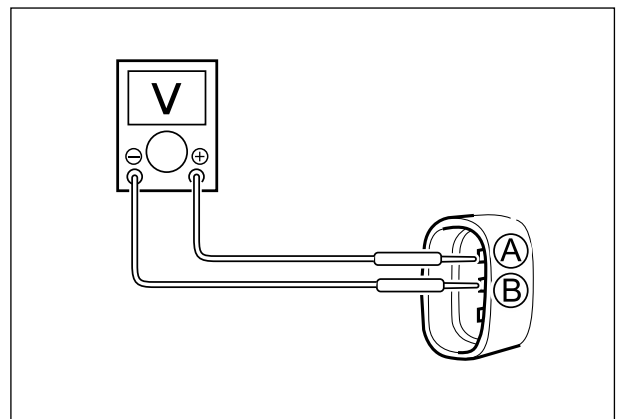
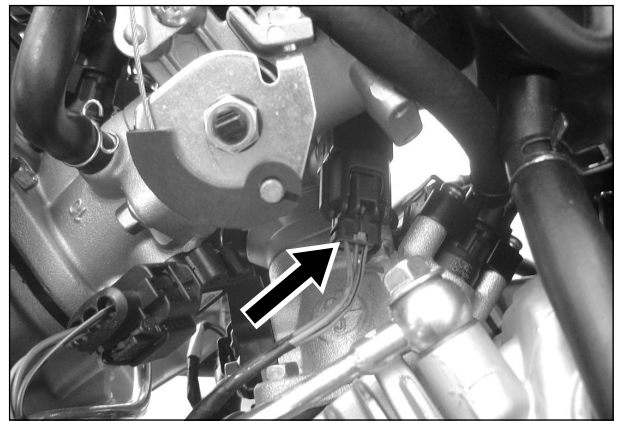
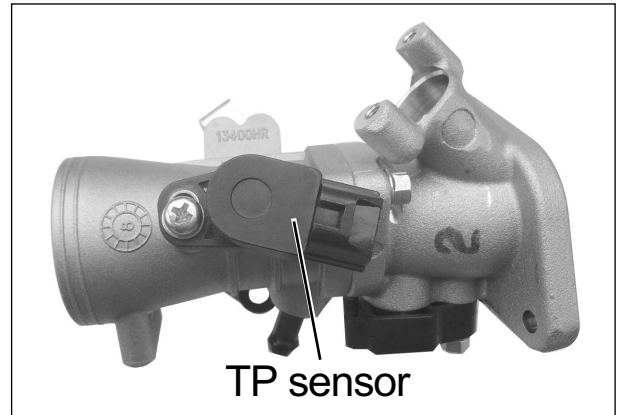
4-1-27 EI SYSTEM DIAGNOSIS

◆ Step 3

- 1) Connect the TP sensor coupler.
- 2) Insert the needle pointed probes to the lead wire coupler.
- 3) Turn the ignition switch "ON" position.
Measure the TP sensor output voltage at the coupler [between ⊕ (A:LY) and ⊖ (B:GR)] by turning the throttle grip.

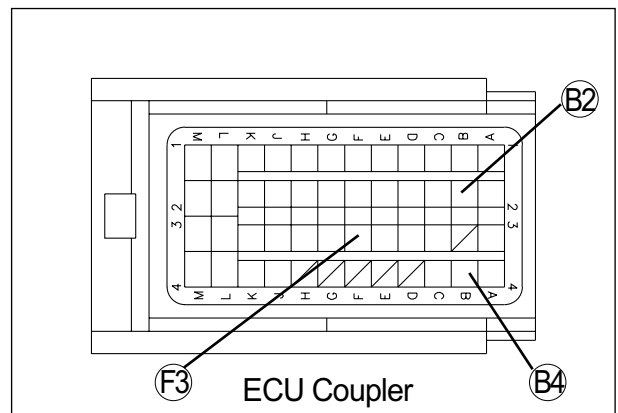
TP sensor output voltage	
Throttle valve is closed	Approx. 0.3 V
Throttle valve is opened	Approx. 4.5 V

 Tester knob indication : Voltage (---)



Is the output voltage OK?

YES	<ul style="list-style-type: none"> ● OB, LY or GR wire open or shorted to ground, or poor (B2), (F3) or (B4) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	If check result is not satisfactory, replace TP sensor with a new one.

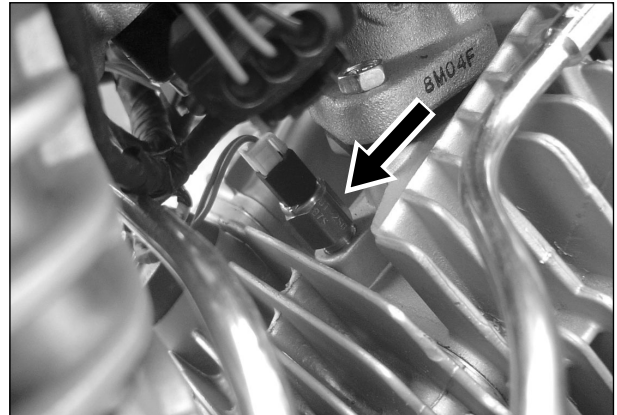


“C15” ET SENSOR CIRCUIT MALFUNCTION

<i>GT250/REi</i> CODE	<i>BV250 Ei</i> CODE
C15	
DETECTED CONDITION	POSSIBLE CAUSE
Output voltage is out of the specified range for 2 sec. and more. $0.08\text{ V} \leq \text{Sensor voltage} \leq 4.65\text{ V}$	<ul style="list-style-type: none"> ● ET sensor circuit open or short. ● ET sensor malfunction. ● ECU malfunction.

▣ INSPECTION

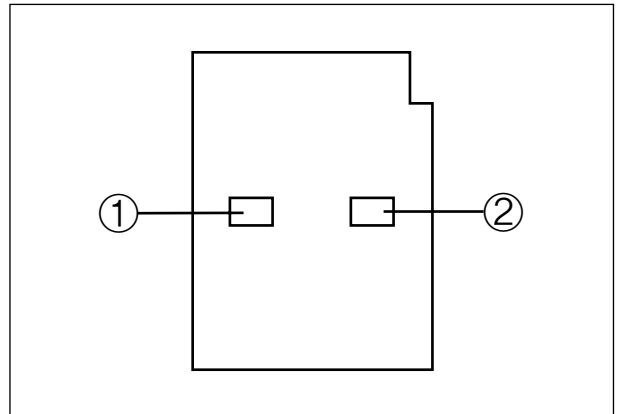
- 1) Turn the ignition switch “OFF” position.
- 2) Check the ET sensor coupler for loose or poor contacts.
If OK, then measure the ET sensor resistance.



- 3) Disconnect the ET sensor coupler.
- 4) Measure the resistance between the terminals ① and ②.

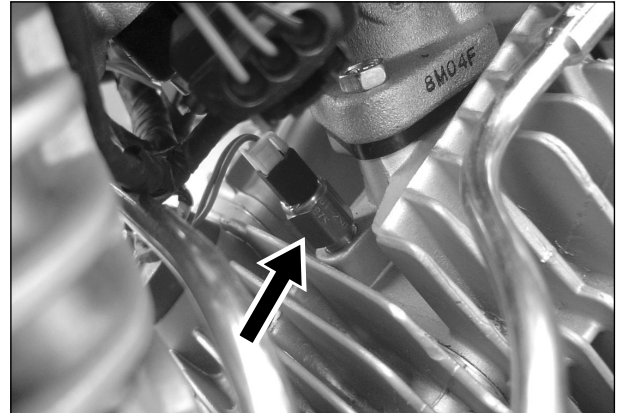
ET sensor resistance	0.102 ~ 81.000 KΩ [When Engine temperature is -20°C ~ 180°C (-4°F ~ 356°F)]
-----------------------------	---

Tester knob indication : Resistance (KΩ)



4-1-29 EI SYSTEM DIAGNOSIS

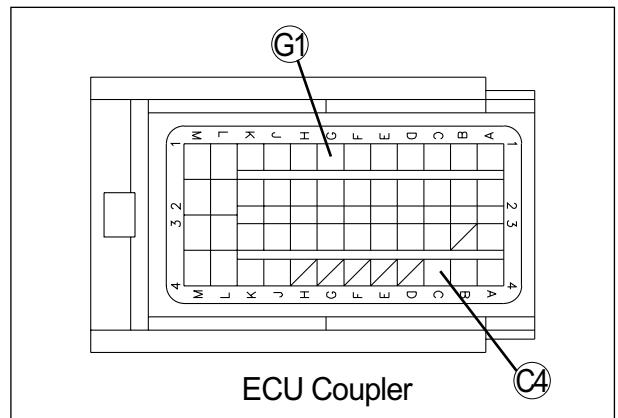
ET sensor resistance	
Engine Temp.	Resistance (To ECU)
-20 °C (-4 °F)	Approx. 75.5 kΩ
0 °C (32 °F)	Approx. 28.7 kΩ
20 °C (68 °F)	Approx. 12.2 kΩ
40 °C (104 °F)	Approx. 5.6 kΩ
60 °C (140 °F)	Approx. 2.8 kΩ
80 °C (176 °F)	Approx. 1.5 kΩ
120 °C (248 °F)	Approx. 0.5 kΩ
140 °C (284 °F)	Approx. 0.3 kΩ
160 °C (320 °F)	Approx. 0.2 kΩ
180 °C (356 °F)	Approx. 0.13 kΩ



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

Is the resistance OK?

YES	<ul style="list-style-type: none"> ● Br or GR wire open or shorted to ground, or poor (G1) or (C4) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the ET sensor with a new one.



“C17” or “C18” IAP SENSOR CIRCUIT MALFUNCTION

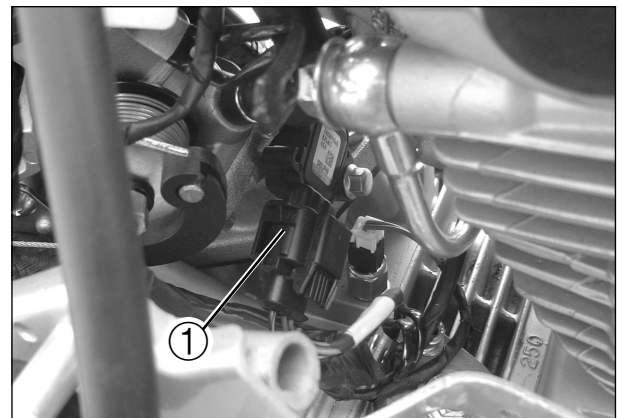
<i>GT250/R</i> EI CODE	<i>GV250</i> EI CODE
C17	 [1 7 1 7]
C18	 [1 8 1 8]

DETECTED CONDITION	POSSIBLE CAUSE
<p>IAP sensor voltage is out of the specified range for 6 sec. and more. $0.5\text{ V} \leq \text{Sensor voltage} \leq 4.5\text{ V}$ NOTE : <i>Note that atmospheric pressure varies depending on weather conditions as well as altitude.</i> <i>Take that into consideration when inspecting voltage.</i></p>	<ul style="list-style-type: none"> ● Clogged vacuum passage between throttle bodies and IAP sensors. ● Air being drawn from vacuum passage between throttle bodies and IAP sensors. ● IAP sensor circuit open or shorted to ground. ● IAP sensor malfunction. ● ECU malfunction.

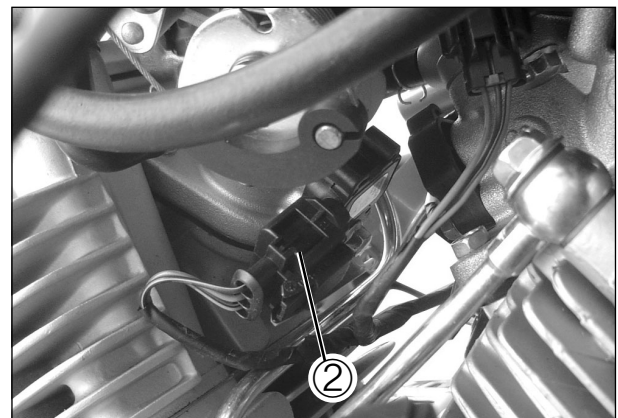
▣ INSPECTION

◆ Step 1

- 1) Remove the fuel tank.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the IAP sensor NO.1 coupler ① and NO.2 coupler ② for loose or poor contacts.
If OK, then measure the IAP sensor input voltage.



- 4) Disconnect the IAP sensor couplers NO.1 ① and NO.2 ②.
- 5) Turn the ignition switch “ON” position.
- 6) Measure the voltage at the OB wire and ground.
If OK, then measure the voltage at the OB wire and GR wire.



IAP sensor input voltage	$4.5 \sim 5.5\text{ V}$ (⊕ OB — ⊖ Ground) (⊕ OB — ⊖ GR)
---------------------------------	---

Tester knob indication : Voltage (---)

Is the input voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the ECU coupler. ● Open or short circuit in the OB wire or GR wire.

4-1-31 EI SYSTEM DIAGNOSIS

◆ Step 2

- 1) Connect the IAP sensor couplers NO.1 ① and NO.2 ②.
- 2) Insert the needle pointed probes to the lead wire coupler.
- 3) Start the engine at idle speed.
- 4) Measure the IAP sensor output voltage at the wire side coupler [between BL(NO.1) or BY(NO.2) and GR wires].

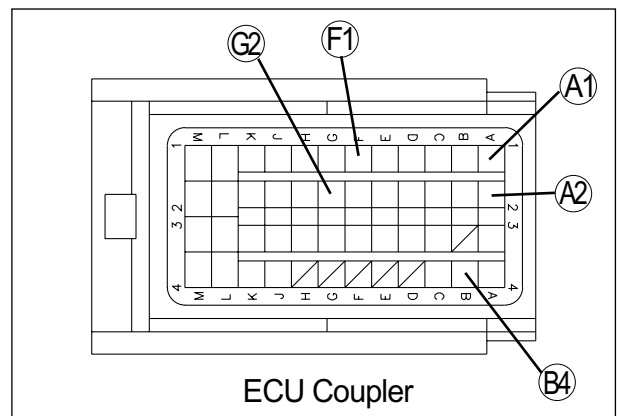
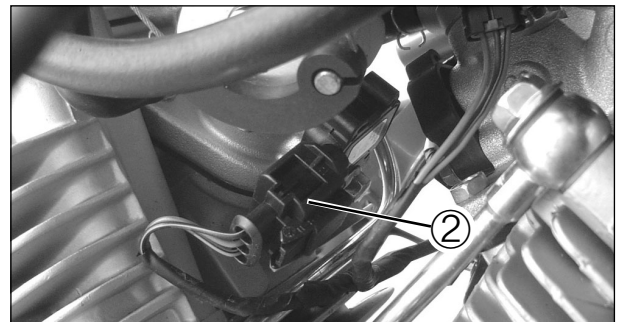
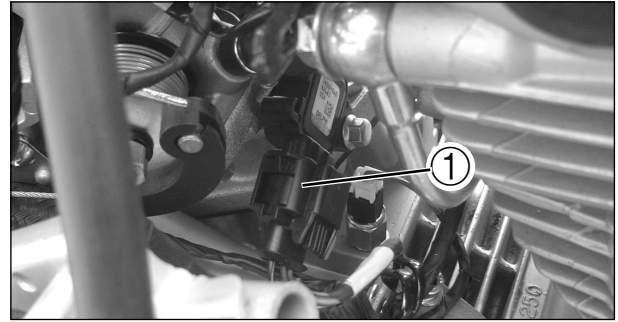
IAP sensor output voltage

Approx. 3.7 ~ 3.9 V
when ignition switch "ON"
([NO.1] ⊕ BL - ⊖ GR,
[NO.2] ⊕ BY - ⊖ GR)

 Tester knob indication : Voltage (---)

Is the output voltage OK?

YES	<ul style="list-style-type: none"> ● OB(NO.1), OB(NO.2), BL(NO.1), BY(NO.2) or GR wire open or shorted to ground, or poor A1 (NO.1), A2 (NO.2), F1 (NO.1), G2 (NO.2) or B4 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	If check result is not satisfactory, replace IAP sensor with a new one.



Output voltage (Input voltage 5 V, ambient temp. 25 °C, 77 °F)

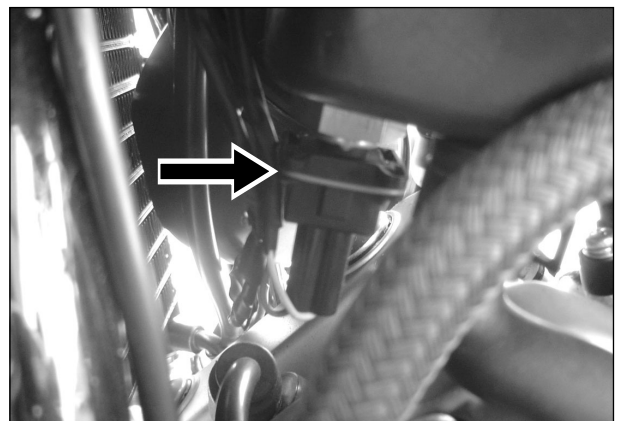
ALTITUDE (Reference)		ATMOSPHERIC PRESSURE		OUTPUT VOLTAGE
(ft)	(m)	(mmHg)	kPa	(V)
0	0	760	100	Approx. 3.7 ~ 3.9
2 000	610	707	94	
2 001	611	707	94	Approx. 3.3 ~ 3.7
5 000	1 524	634	85	
5 001	1 525	634	85	Approx. 3.0 ~ 3.3
8 000	2 438	567	76	
8 001	2 439	567	76	Approx. 2.7 ~ 3.0
10 000	3 048	526	70	

“C21” IAT SENSOR CIRCUIT MALFUNCTION

GT250/REI CODE	GV250 EI CODE
C21	
DETECTED CONDITION	POSSIBLE CAUSE
Output voltage is out of the specified range for 6 sec. and more. $0.08\text{ V} \leq \text{Sensor voltage} \leq 4.75\text{ V}$	<ul style="list-style-type: none"> ● IAT sensor circuit open or short. ● IAT sensor malfunction. ● ECU malfunction.

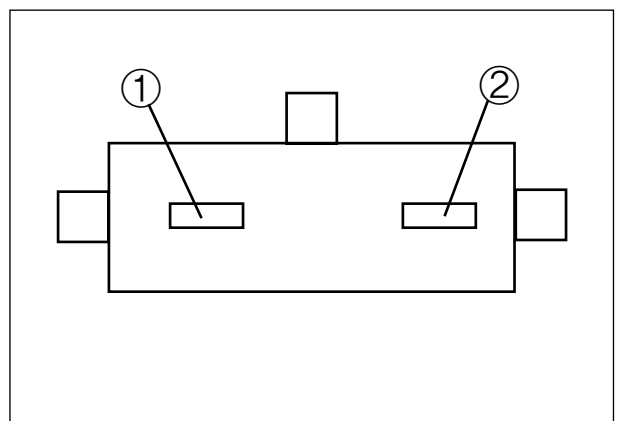
INSPECTION

- 1) Remove the fuel tank.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the IAT sensor coupler for loose or poor contacts.
If OK, then measure the IAT sensor resistance.
- 4) Disconnect the IAT sensor coupler.



- 5) Measure the resistance between the terminals ① and ②.

IAT sensor resistance	0.081 ~ 48.352 KΩ [When Intake air temperature is -40°C ~ 130°C (-40°F ~ 266°F)]
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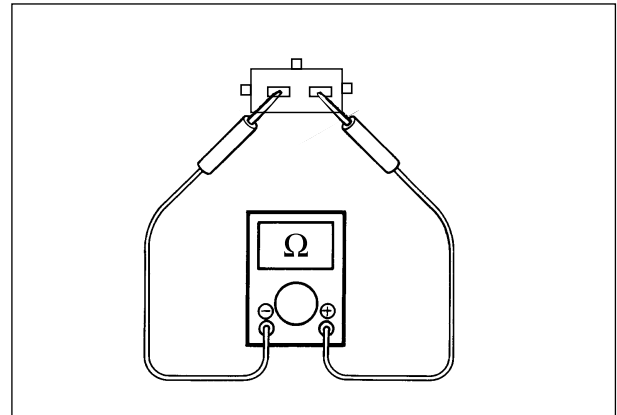


Tester knob indication : Resistance (KΩ)

4-1-33 EI SYSTEM DIAGNOSIS

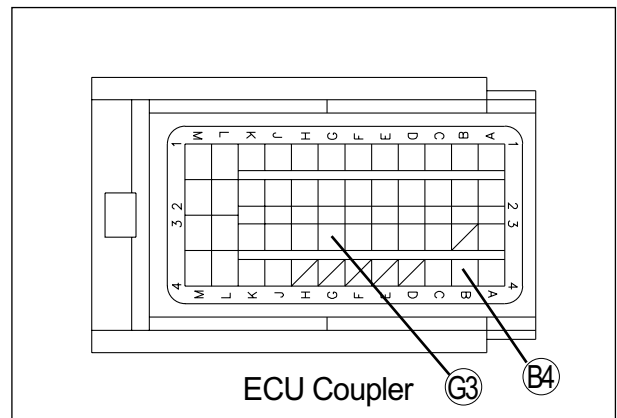
IAT sensor resistance	
Intake Air Temp.	Resistance
-40 °C (-40 °F)	44.642 KΩ ± 5%
-20 °C (-4 °F)	14.958 KΩ ± 5%
0 °C (32 °F)	5.734 KΩ ± 5%
20 °C (68 °F)	2.438 KΩ ± 5%
40 °C (104 °F)	1.141 KΩ ± 5%
60 °C (140 °F)	0.579 KΩ ± 5%
80 °C (176 °F)	0.315 KΩ ± 5%
100 °C (212 °F)	0.182 KΩ ± 5%
120 °C (248 °F)	0.111 KΩ ± 5%
130 °C (266 °F)	0.088 KΩ ± 5%

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



Is the resistance OK?

YES	<ul style="list-style-type: none"> ● Lg or GR wire open or shorted to ground, or poor G3 or B4 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the IAT sensor with a new one.

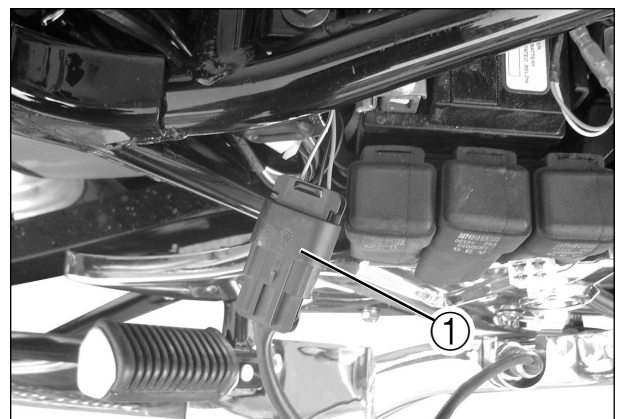
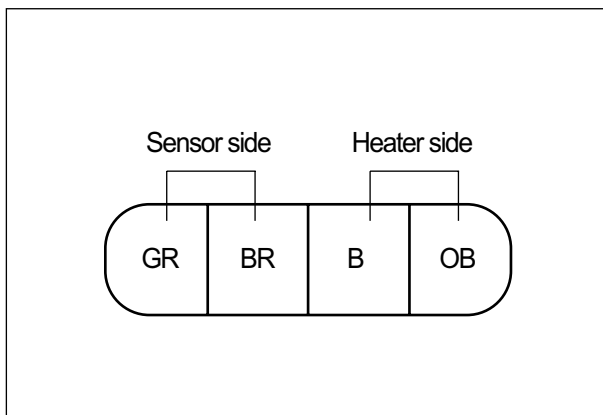
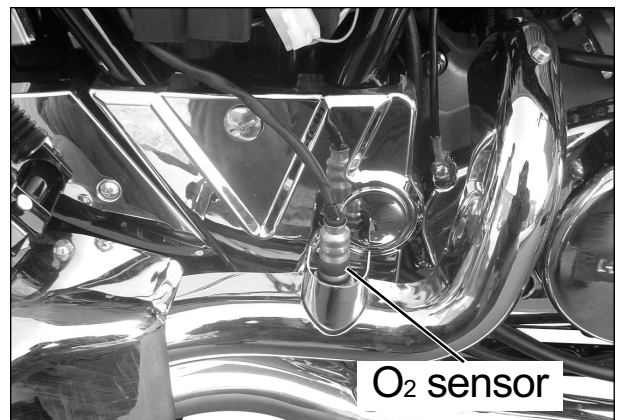


“C22” OXYGEN SENSOR CIRCUIT MALFUNCTION

GT250/REI CODE	GV250 EI CODE
C22	
DETECTED CONDITION	POSSIBLE CAUSE
Oxygen sensor signal is not inputted in ECU since then 600 sec. after the engine run.	<ul style="list-style-type: none"> ● Oxygen sensor, Oxygen sensor heater circuit open or short. ● Oxygen sensor, Oxygen sensor heater malfunction. ● ECU malfunction.

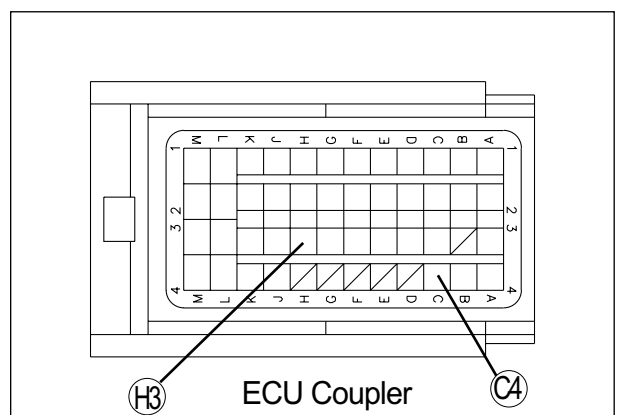
▣ INSPECTION

- 1) Remove the front seat and frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the Oxygen sensor coupler ① for loose or poor contacts.



Is OK?

YES	<ul style="list-style-type: none"> ● BR or GR wire open or shorted to ground, or poor ③ or ④ connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the Oxygen sensor.

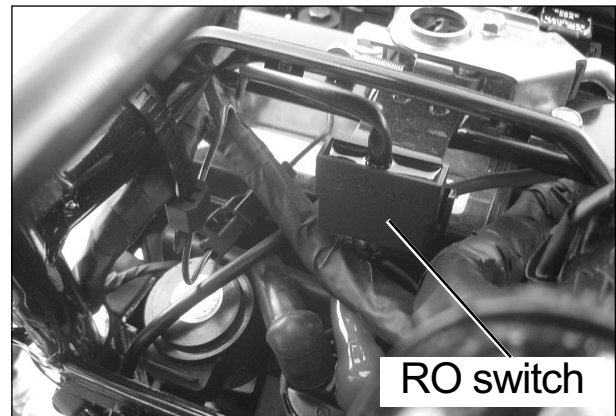


“C23” RO SWITCH CIRCUIT MALFUNCTION

<i>GT250/R E I</i> CODE	<i>GV250 E I</i> CODE
C23	
DETECTED CONDITION	POSSIBLE CAUSE
The switch resistance should be the following for more than 3 sec. after holding the motorcycle vertically and ignition switch turns “ON” position. Switch resistance $\approx \infty \Omega$ (Infinity)	<ul style="list-style-type: none"> ● RO switch circuit short or leaned more than 60°. ● RO switch malfunction. ● ECU malfunction.

▣ INSPECTION

- 1) Remove the front seat.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the RO switch coupler for loose or poor contacts.
If OK, then measure the RO switch resistance.
- 4) Disconnect the RO switch coupler.



- 5) Measure the resistance at the wire coupler (switch side) between GR and YL wires of the RO switch at horizontal place.

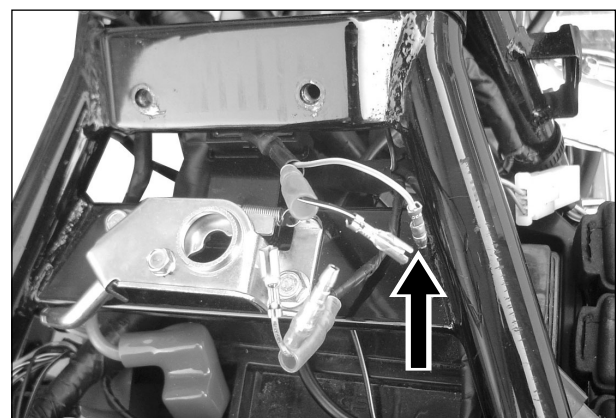
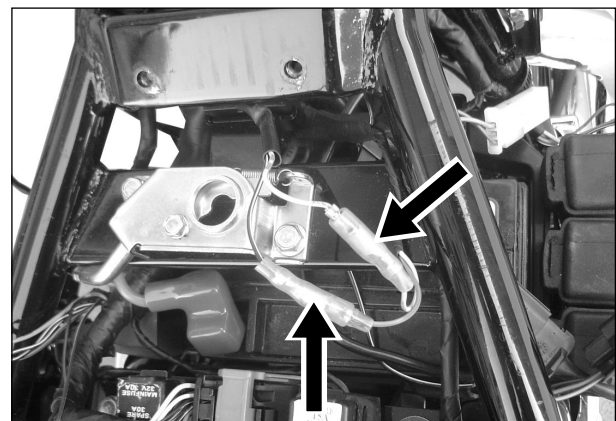
RO switch resistance	$\infty \Omega$ (Infinity) at normal condition (⊕ GR – ⊖ YL)
-----------------------------	--

Also, measure the resistance when leaning of the motorcycle.

- 6) Measure the resistance when it is leaned more than 60°, left and right, from the horizontal level.

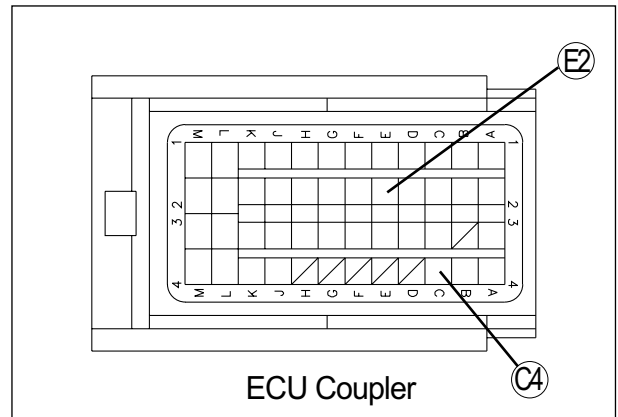
RO switch resistance	0Ω at leaned more than 60° (⊕ GR – ⊖ YL)
-----------------------------	--

Tester knob indication : Resistance (Ω)



Is the resistance OK?

YES	<ul style="list-style-type: none"> ● YL or GR wire open or shorted to ground, or poor (E2) or (C4) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the ECU coupler. ● Open or short circuit in the YL wire or GR wire. ● Replace the RO switch with a new one.



“C24” or “C25” IGNITION COIL MALFUNCTION

Refer to the IGNITION COIL for details. (Refer to page 5-5)

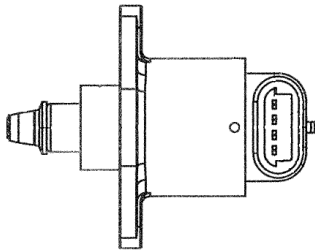
<i>GT250i REI</i> CODE	<i>GV250 Ei</i> CODE
C24	
C25	

“C27” ISC SOLENOID RANGE ABNORMAL

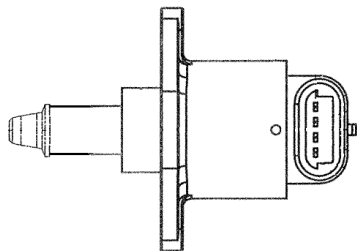
GT250/R Ei CODE	GV250 Ei CODE
C27	
DETECTED CONDITION	POSSIBLE CAUSE
ISC solenoid's step is out of the specified range. 0 step ≤ Solenoid step ≤ 250 step	<ul style="list-style-type: none"> ● ISC solenoid malfunction. ● ISC solenoid's step is out of the specified range. ● ECU malfunction.

INSPECTION

- 1) Remove the front seat.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the ISC solenoid coupler for loose or poor contacts.
- 4) Turn the ignition switch “ON” position to check the ISC solenoid operation.

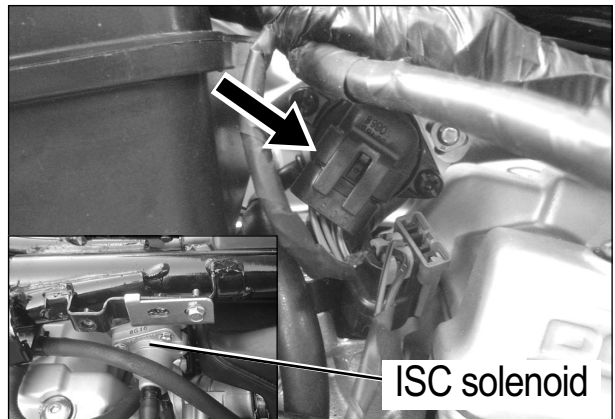


[When Ignition switch “OFF”]

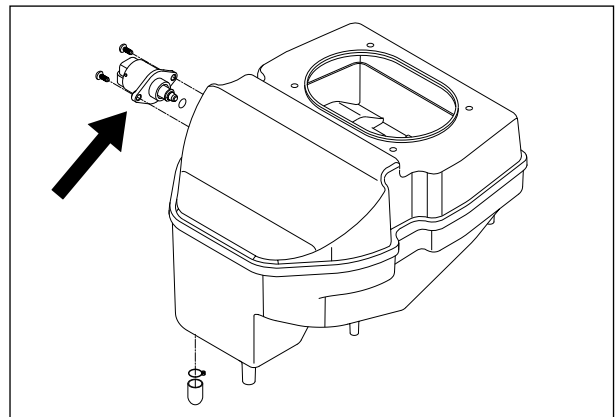


[When Ignition switch “ON”]

GV250 Ei

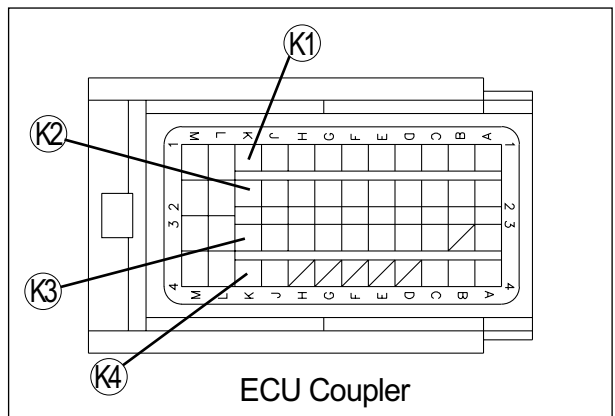


GT250/R Ei



Is OK?

YES	<ul style="list-style-type: none"> ● LY, G, BBr or YL wire loose or poor contacts on the ISC solenoid coupler, or poor (K1), (K2), (K3) or (K4) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the ISC solenoid with a new one.



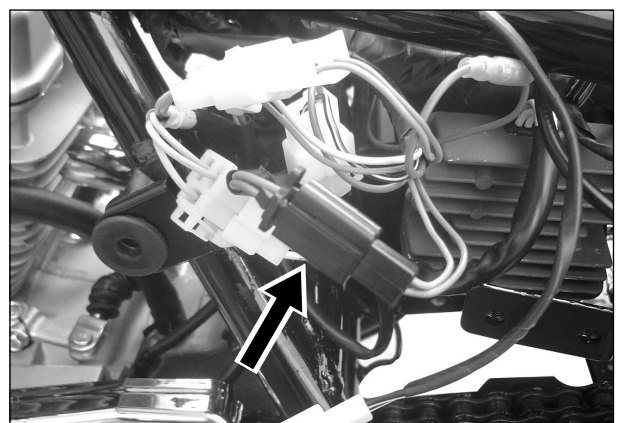
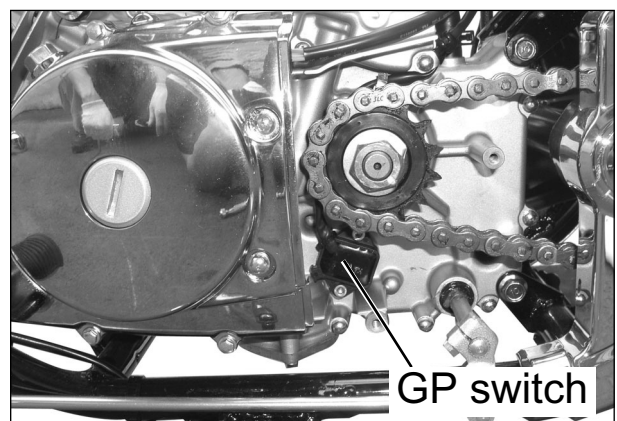
“C31” GP SWITCH CIRCUIT MALFUNCTION

GT250/REI CODE	GV250 EI CODE
C31	

DETECTED CONDITION	POSSIBLE CAUSE
GP switch voltage is out of the specified range for 2 sec. and more. $0.15\text{ V} < \text{Switch voltage} < 3.93\text{ V}$	<ul style="list-style-type: none"> ● GP switch circuit open or short. ● GP switch malfunction. ● ECU malfunction.

INSPECTION

- 1) Remove the frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the GP switch coupler for loose or poor contacts.
If OK, then measure the GP switch resistance.
- 4) Park the motorcycle on a firm, flat surface vertically.
- 5) Turn the side-stand to up-right position.
- 6) Make sure the engine stop switch is in the “○” position.
- 7) Insert the needle pointed probes to the GP switch coupler.
- 8) Turn the ignition switch “ON” position.
- 9) Measure the resistance at the wire side coupler between GL wire and L wire, when shifting the gearshift lever from 1st to Top.

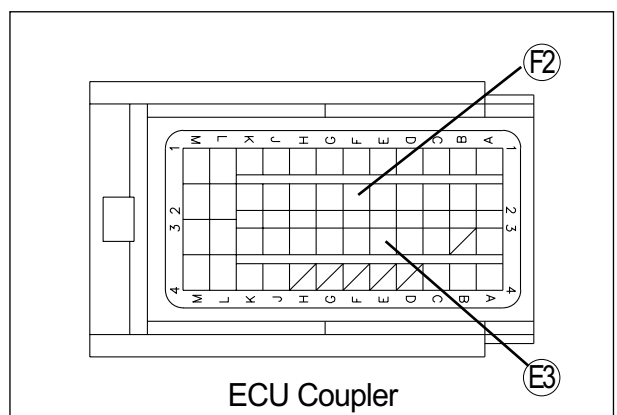


GP switch resistance	$100\ \Omega \sim 2.0\ \text{k}\Omega$ (GL – L)
-----------------------------	--

Tester knob indication : Resistance (kΩ)

Is the resistance OK?

YES	<ul style="list-style-type: none"> ● GL or L wire open or shorted to ground, or poor (F2) or (E3) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Open or short circuit in the GL or L wire.



“C32” or “C33” FUEL INJECTOR CIRCUIT MALFUNCTION

GT250/EI CODE	BV250 EI CODE
C32	
C33	

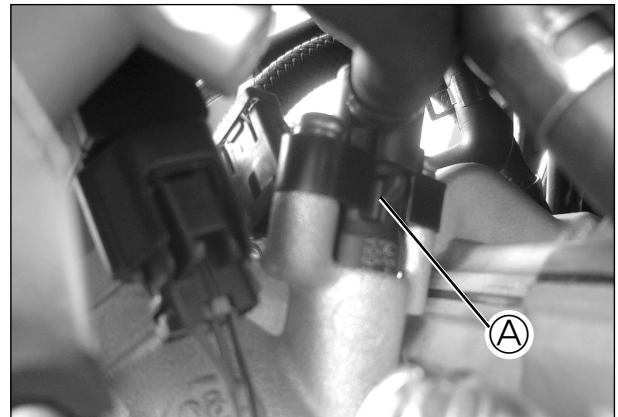
DETECTED CONDITION	POSSIBLE CAUSE
Injector signal is interrupted continuous for more than 1 sec. when ECU confirm injector running surge at each combustion chamber.	<ul style="list-style-type: none"> ● Injector circuit open or short. ● Injector malfunction. ● ECU malfunction.

INSPECTION

◆ Step 1

- 1) Remove the fuel tank and frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the injector couplers NO.1 ① and NO.2 ② for loose or poor contacts.
If OK, then measure the injector resistance.

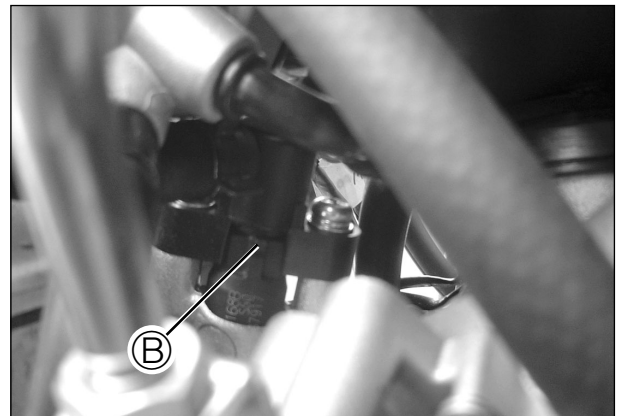
※ ① : Fuel injector NO.1
 ② : Fuel injector NO.2



- 4) Disconnect the injector couplers NO.1 ① and NO.2 ② and measure the resistance between terminals.

Injector resistance	11.4 ~ 12.6 Ω at 20 °C (68°F)
----------------------------	----------------------------------

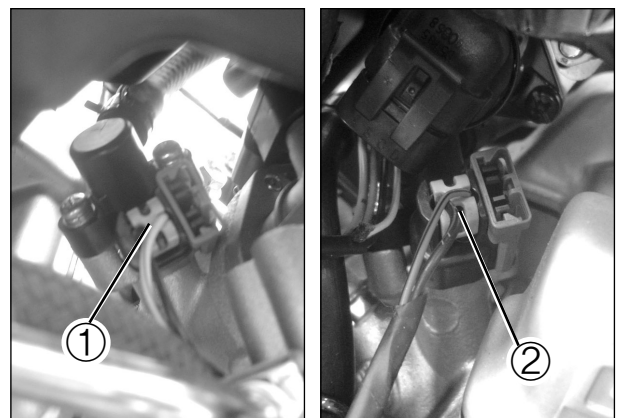
Tester knob indication : Resistance (Ω)



- 5) If OK, then check the continuity between injector terminals and ground.

Injector continuity	∞ Ω (Infinity)
----------------------------	----------------

Tester knob indication : Resistance (Ω)



Are the resistance and continuity OK?

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

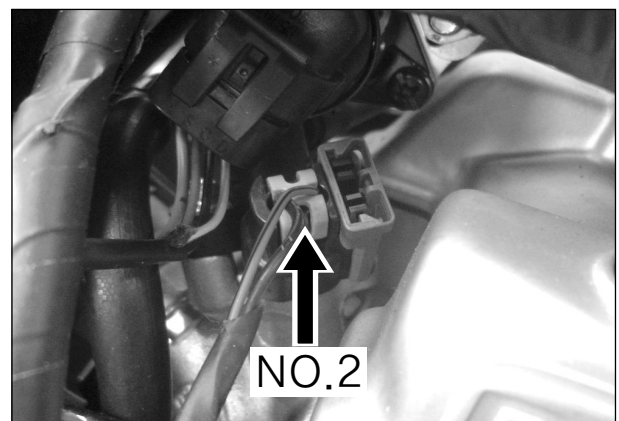
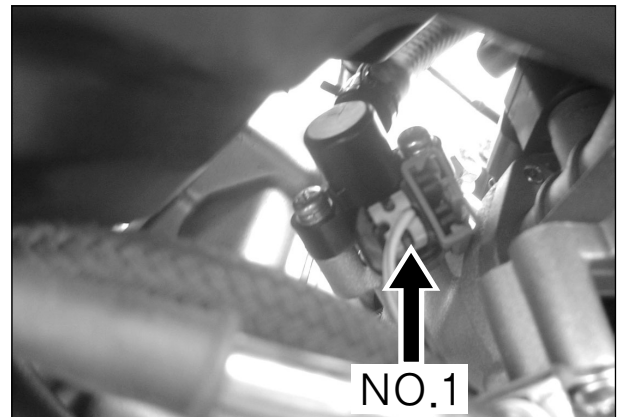
◆ Step 2

- 1) Turn the ignition switch "ON" position.
- 2) Measure the injector voltage between YR(NO.1), RB(NO.2) wire and ground.

Injector voltage	Battery voltage ([NO.1] ⊕ YR – ⊖ Ground, [NO.2] ⊕ RB – ⊖ Ground)
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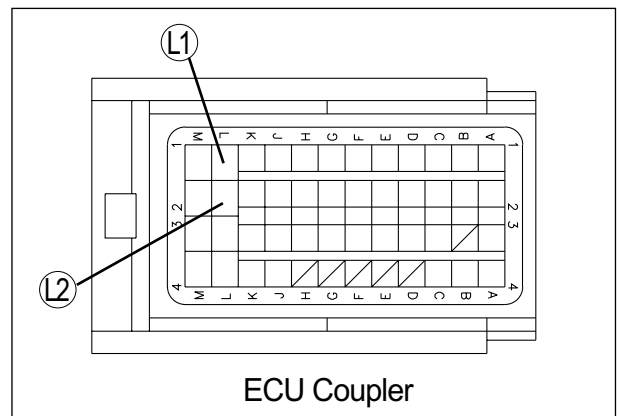
 **Tester knob indication : Voltage (---)**

NOTE
<i>Injector voltage can be detected only 3 seconds after ignition switch is turned "ON" position.</i>



Is the voltage OK?

YES	<ul style="list-style-type: none"> ● YR(NO.1) or RB(NO.2) wire open or shorted to ground, or poor ① (NO.1) or ② (NO.2) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Inspect the fuel pump or fuel pump relay. (Refer to page 4-2-4)



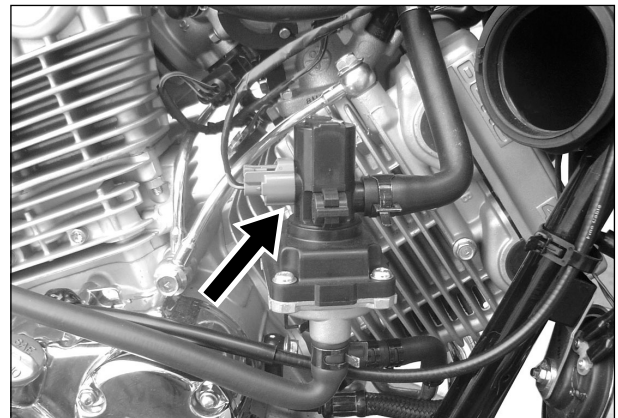
“C37” SAV SOLENOID MALFUNCTION

GT250/REI CODE	GV250 E _i CODE
C37	 [3 7 3 7]

DETECTED CONDITION	POSSIBLE CAUSE
No voltage is applied from ECU to SAV solenoid by 400 sec..	<ul style="list-style-type: none"> ● SAV solenoid circuit open or short. ● SAV solenoid malfunction. ● ECU malfunction.

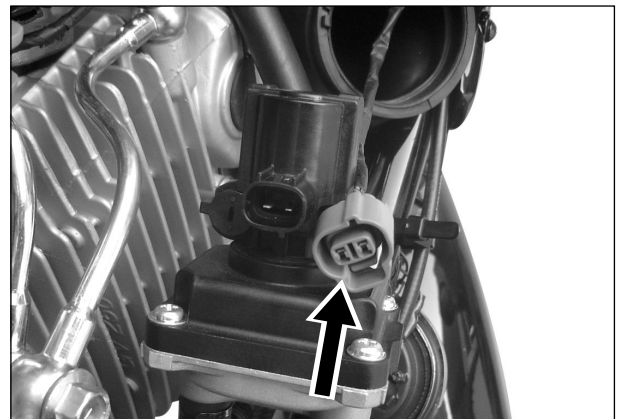
▣ INSPECTION

- 1) Remove the frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the SAV solenoid coupler for loose or poor contacts.
- 4) Connect the SAV solenoid coupler.
- 5) Turn the ignition switch “ON” position.
- 6) Measure the voltage at the wire side coupler between BL wire and ground.



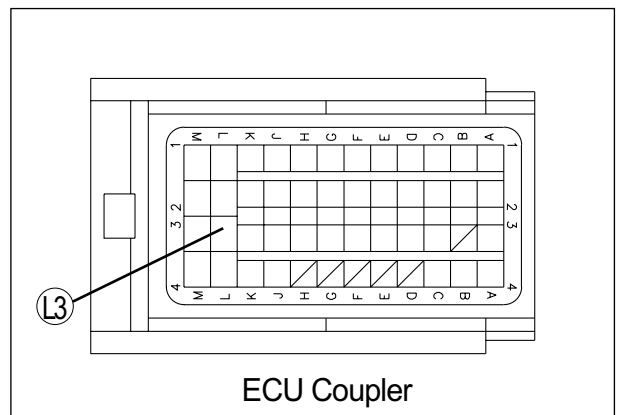
SAV solenoid voltage	Battery voltage (⊕ BL – ⊖ Ground)
-----------------------------	--

Tester knob indication : Voltage (---)



Is the voltage OK?

YES	<ul style="list-style-type: none"> ● BL wire open or shorted to ground, or poor (L3) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the SAV solenoid with a new one.



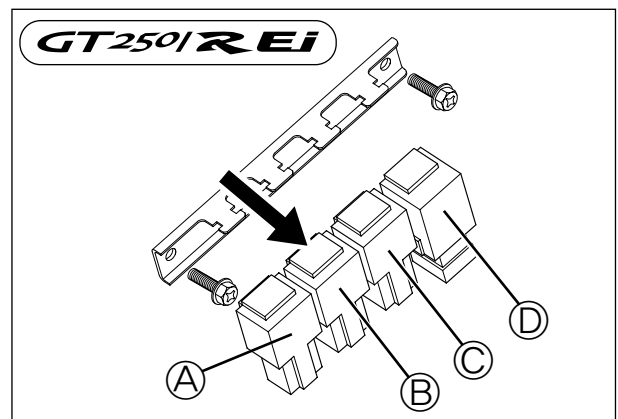
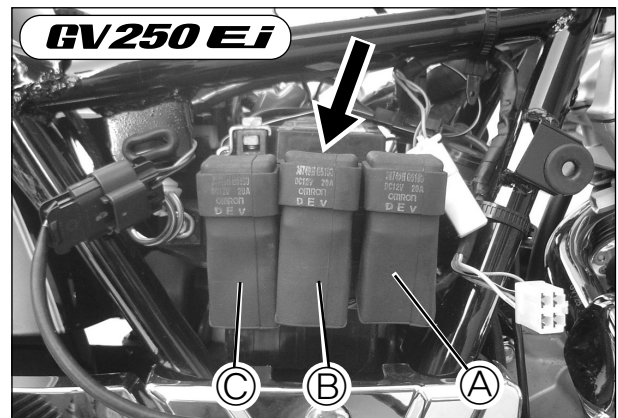
“C41” FUEL PUMP RELAY CIRCUIT MALFUNCTION

<i>GT250i REi</i> CODE	<i>GV250 Ei</i> CODE
C41	
DETECTED CONDITION	POSSIBLE CAUSE
Voltage is applied continuous for more than 5 sec., battery voltage ≥ 3.2 V when fuel pump relay is “OFF” position or battery voltage < 1.5 V when fuel pump relay is “ON” position.	<ul style="list-style-type: none"> ● Fuel pump relay circuit open or short. ● Fuel pump relay malfunction. ● ECU malfunction.

▣ INSPECTION

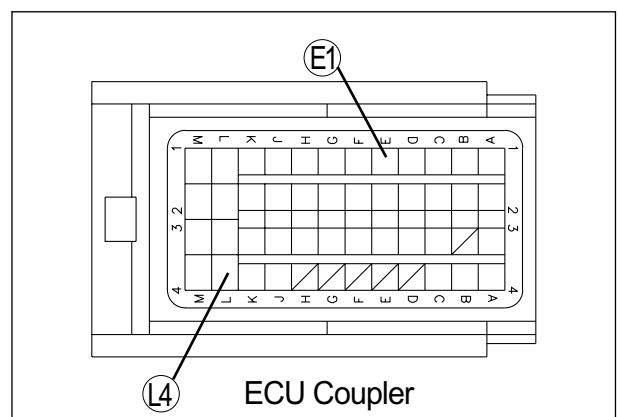
- 1) Remove the frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the fuel pump relay coupler for loose or poor contacts.
If OK, then check the insulation and continuity.
Refer to page 4-2-4 for details.

- ※ (A) : Head lamp relay
 (B) : Fuel pump relay
 (C) : Main relay
 (D) : Turn signal relay



Is the Fuel pump relay OK?

YES	<ul style="list-style-type: none"> ● GW or BBr wire open or shorted to ground, or poor (L4) or (E1) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection. ● Inspect the fuel injectors. (Refer to page 4-1-39)
NO	Replace the fuel pump relay with a new one.

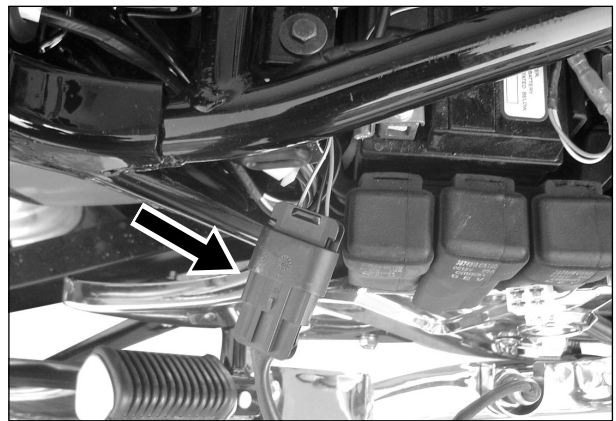


“C43” OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION

GT250/REI CODE	GV250 E _i CODE
C43	
DETECTED CONDITION	POSSIBLE CAUSE
Oxygen sensor heater signal is not inputted in ECU.	<ul style="list-style-type: none"> ● Oxygen sensor, Oxygen sensor heater circuit open or short. ● Oxygen sensor, Oxygen sensor heater malfunction. ● ECU malfunction.

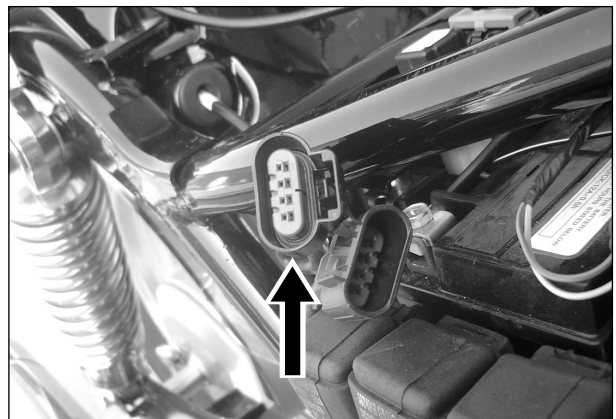
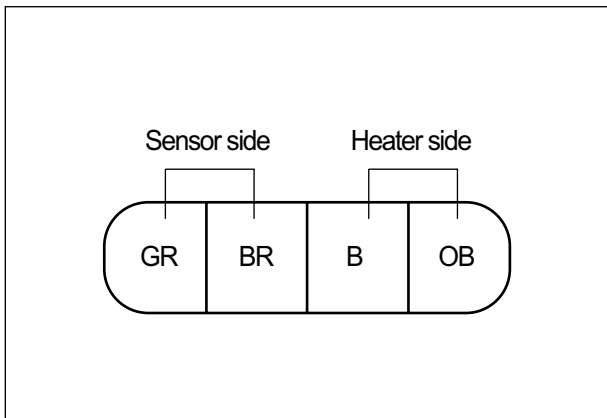
INSPECTION

- 1) Remove the frame cover.
- 2) Turn the ignition switch “OFF” position.
- 3) Check the Oxygen sensor heater coupler for loose or poor contacts.
If OK, then measure the Oxygen sensor heater voltage.
- 4) Disconnect the coupler and then turn the ignition switch “ON” position.
- 5) Measure the voltage between OB wire terminal and B (or ground) wire terminal.



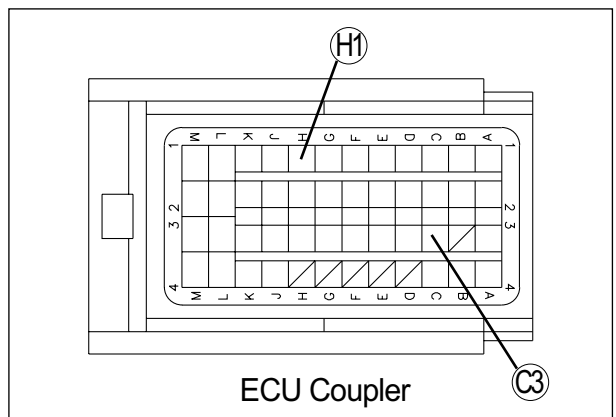
Oxygen sensor heater voltage	Battery voltage (⊕ OB – ⊖ B) (⊕ OB – ⊖ Ground)
-------------------------------------	--

Tester knob indication : Voltage (---)



Is the voltage OK?

YES	<ul style="list-style-type: none"> ● OB or B wire open or shorted to ground, or poor or connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the Oxygen sensor with a new one.



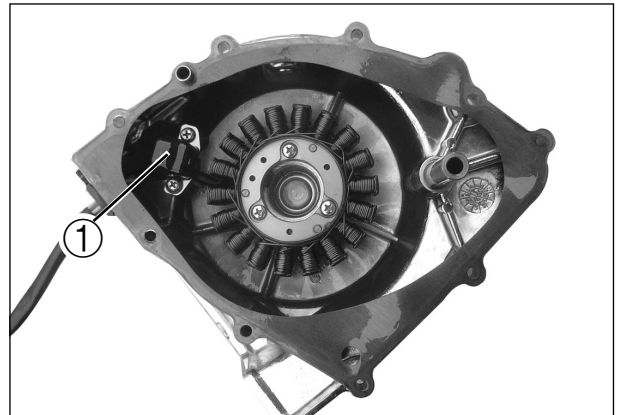
SENSORS

⊙ PICK-UP COIL INSPECTION

The pick-up coil ① is installed in the magneto cover.
(Refer to page 4-1-24)

⊙ PICK-UP COIL REMOVAL AND INSTALLATION

- Remove the magneto cover.
- Install the magneto cover in the reverse order of removal.

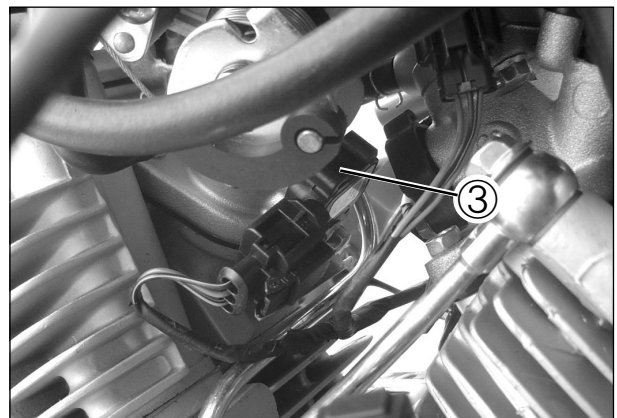
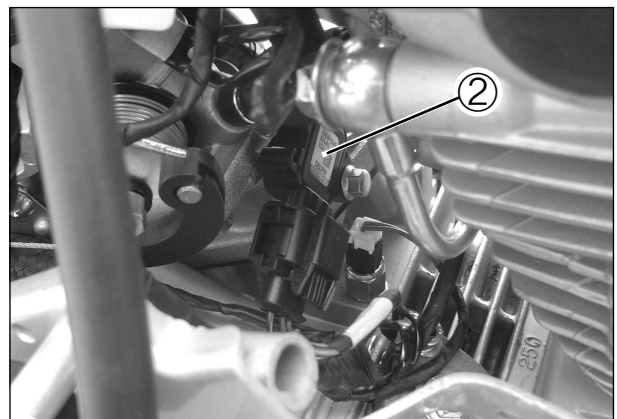


⊙ IAP SENSOR INSPECTION

The intake air pressure (IAP) sensor NO.1 ② and NO.2 ③ are installed at each intake pipe.
(Refer to page 4-1-30)

⊙ IAP SENSOR REMOVAL AND INSTALLATION

- Remove the fuel tank.
- Remove the IAP sensor NO.1 & NO.2 from each intake pipe.
- Install the IAP sensor NO.1 & NO.2 in the reverse order of removal.



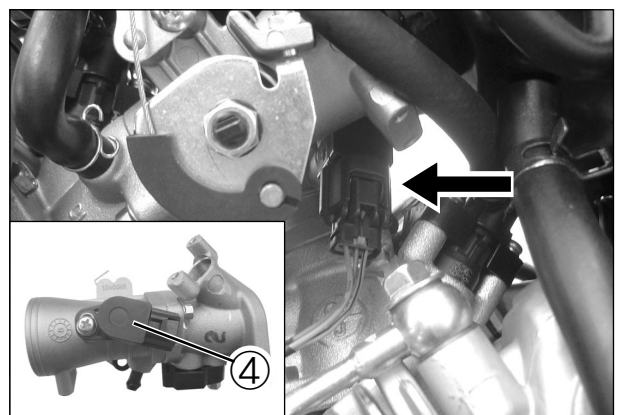
⊙ TP SENSOR INSPECTION

The throttle position (TP) sensor ④ is installed at the throttle body. (Refer to page 4-1-25)

⊙ TP SENSOR REMOVAL AND INSTALLATION

⚠ CAUTION

Never remove or adjust the TP sensor.



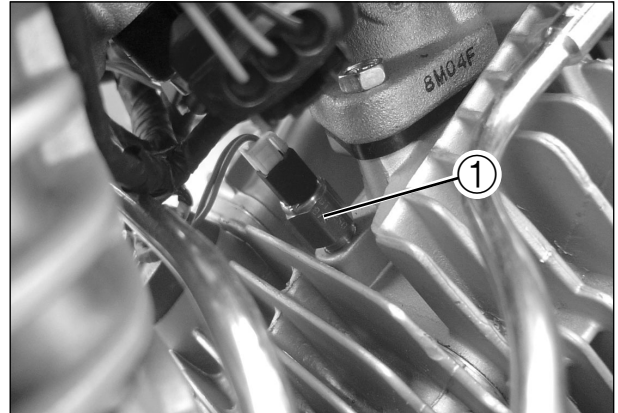
⊙ ET SENSOR INSPECTION

The engine temperature (ET) sensor ① is installed at the front cylinder. (Refer to page 4-1-28)

⊙ ET SENSOR REMOVAL AND INSTALLATION

- Remove the ET sensor.
- Install the ET sensor in the reverse order of removal.

🔧 ET sensor : 5 ~ 8 N · m (0.5 ~ 0.8 kgf · m)

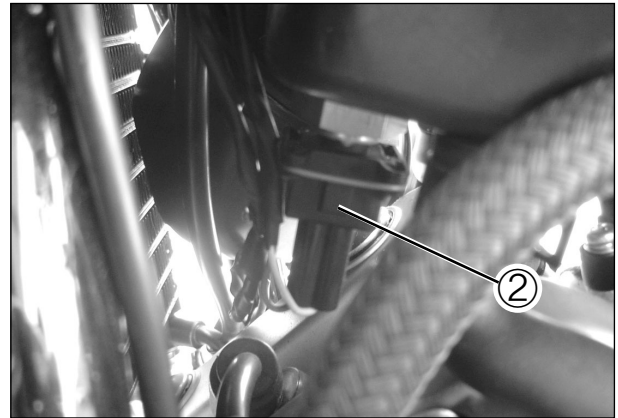


⊙ IAT SENSOR INSPECTION

The intake air temperature (IAT) sensor ② is installed at the downside of the air cleaner case. (Refer to page 4-1-32)

⊙ IAT SENSOR REMOVAL AND INSTALLATION

- Remove the fuel tank.
- Remove the IAT sensor from the air cleaner case.
- Install the IAT sensor in the reverse order of removal.



⊙ RO SWITCH INSPECTION, REMOVAL AND INSTALLATION

The roll over (RO) switch ③ is located in the downside of the front seat lock. (Refer to page 4-1-35)

- Remove the front seat.
- Remove the RO switch from the frame.
- Install the RO switch in the reverse order of removal.



FUEL SYSTEM AND THROTTLE BODY

CONTENTS

FUEL SYSTEM	62 (4-2-1)
REMOVAL AND DISASSEMBLY	63 (4-2-2)
REASSEMBLY AND INSTALLATION	64 (4-2-3)
FUEL PRESSURE INSPECTION	65 (4-2-4)
FUEL PUMP RELAY INSPECTION	65 (4-2-4)
FUEL MESH FILTER INSPECTION AND CLEANING	66 (4-2-5)
FUEL GAUGE INSPECTION	66 (4-2-5)
THROTTLE BODY	67 (4-2-6)
REMOVAL	68 (4-2-7)
CLEANING	69 (4-2-8)
INSPECTION	69 (4-2-8)
INSTALLATION	70 (4-2-9)

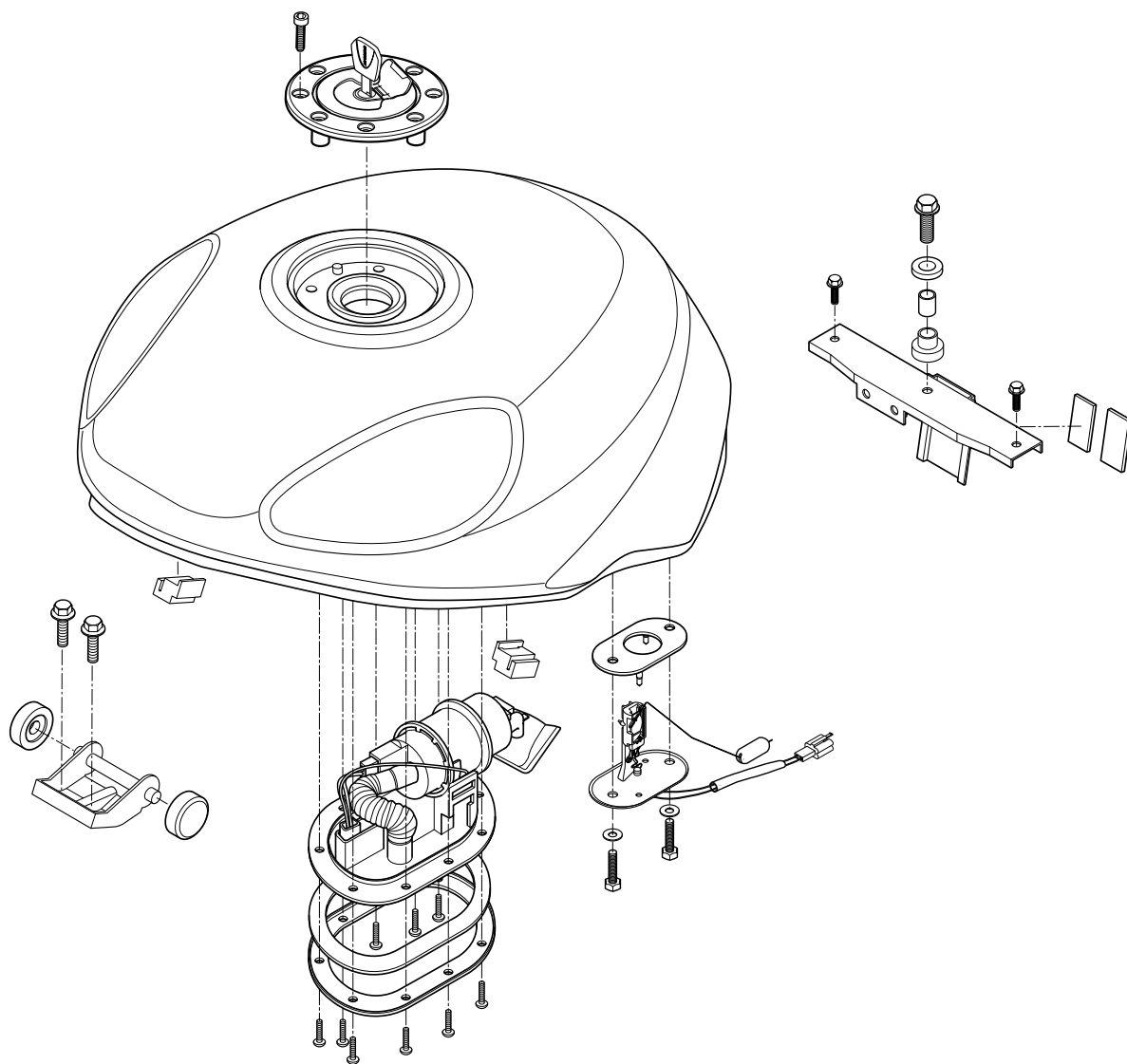
4-2

CAUTION

Gasoline must be handled carefully in an area well ventilated and away from fire or spark.

FUEL SYSTEM

GT250i REI



4-2-3 FUEL SYSTEM AND THROTTLE BODY

- Remove the fuel tank rearward.

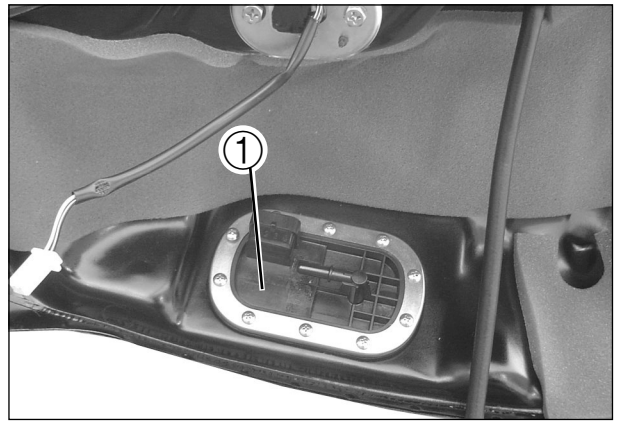
CAUTION

As gasoline leakage may occur in this operation, keep away from fire and sparks.

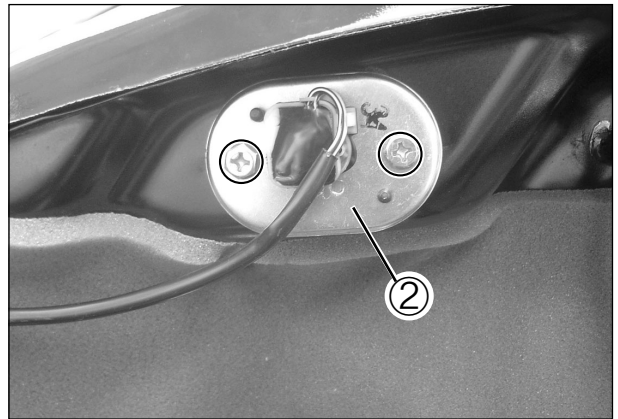
- Remove the fuel pump assembly ① by removing its mounting bolts diagonally.

WARNING

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



- Remove the fuel gauge ②.



REASSEMBLY AND INSTALLATION

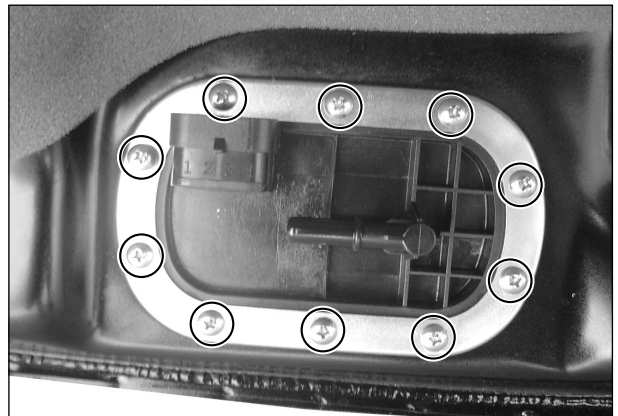
Reassembly and installation the fuel tank in the reverse order of removal and disassembly.

- When installing the fuel pump assembly, first tighten all the fuel pump assembly mounting bolts lightly in diagonal stages, and then tighten them in the above tightening order.

NOTE

Apply a small quantity of the **THREAD LOCK "1324"** to the thread portion of the fuel pump mounting bolt.

 **THREAD LOCK "1324"**



FUEL PRESSURE INSPECTION

- Remove the front seat.
- Place a rag under the fuel injector hose.
- Disconnect the fuel injector hose from the fuel hose joint.
- Install the special tool between the fuel tank and fuel hose joint.

 **Fuel pump pressure gauge**
: 09915-54510

Turn the ignition switch "ON" position and check the fuel pressure.

Fuel pressure of fuel pump	Approx. 3.4 ~ 3.7 kgf/cm ² (333 ~ 363 kPa, 48.4 ~ 52.6 psi)
-----------------------------------	---

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

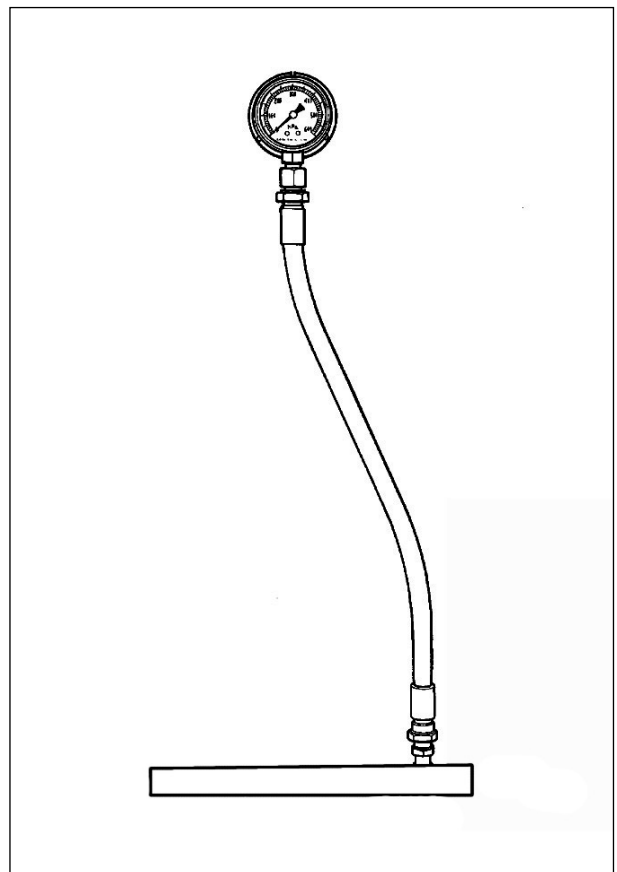
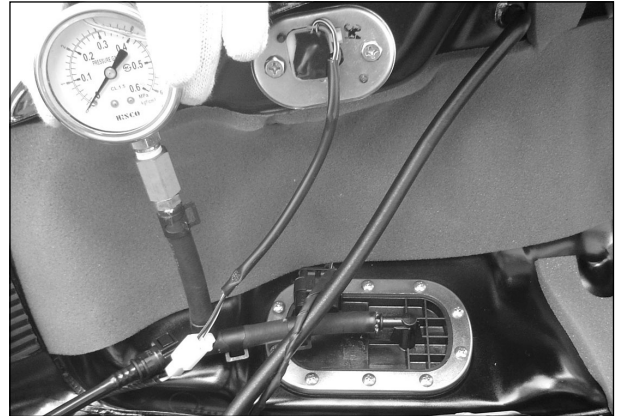
- * Fuel hose leakage
- * Clogged fuel filter
- * Pressure regulator
- * Fuel pump

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

- * Fuel pump check valve
- * Pressure regulator

WARNING

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

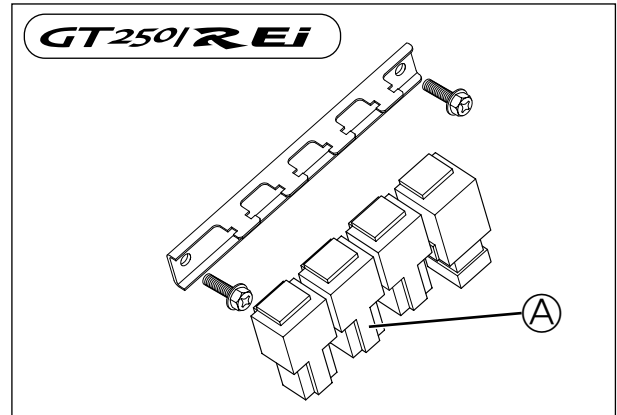


FUEL PUMP RELAY INSPECTION

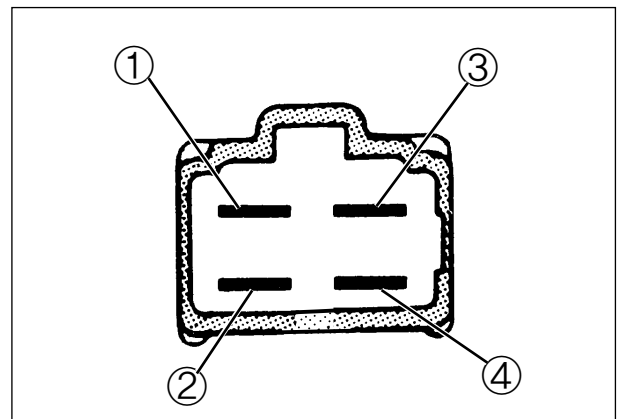
『GV250 E_J』's fuel pump relay is located on the left side of the frame, and 『GT250₁ R E_J』's fuel pump relay is located in the rear side of the side cover.

- Remove the frame cover. (GV250 E_J)
- Remove the side cover. (GT250₁ R E_J)
- Remove the fuel pump relay (A).



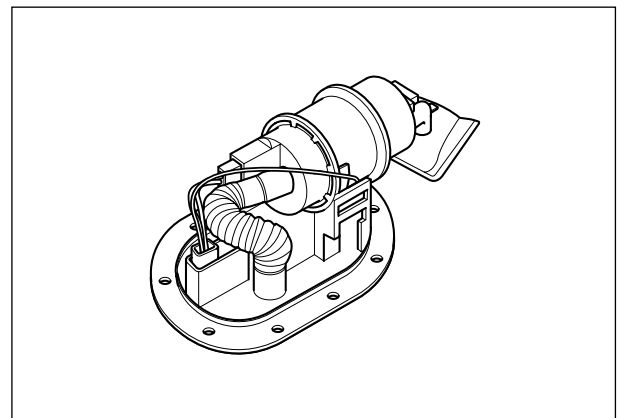


First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②. If there is no continuity, replace it with a new one.



FUEL MESH FILTER INSPECTION AND CLEANING

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



NOTE

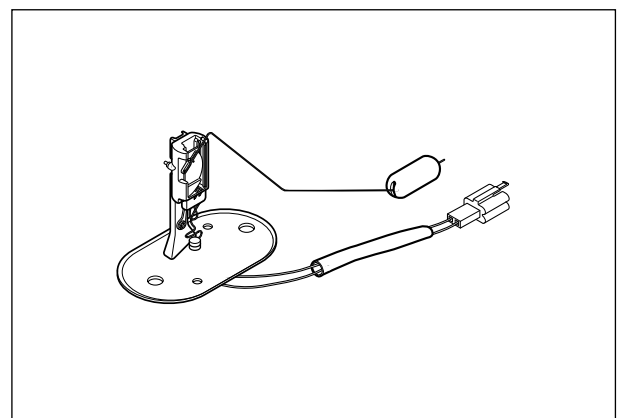
If the fuel mesh filter is clogged with many sediment or rust, replace the fuel filter cartridge with a new one.

FUEL GAUGE INSPECTION

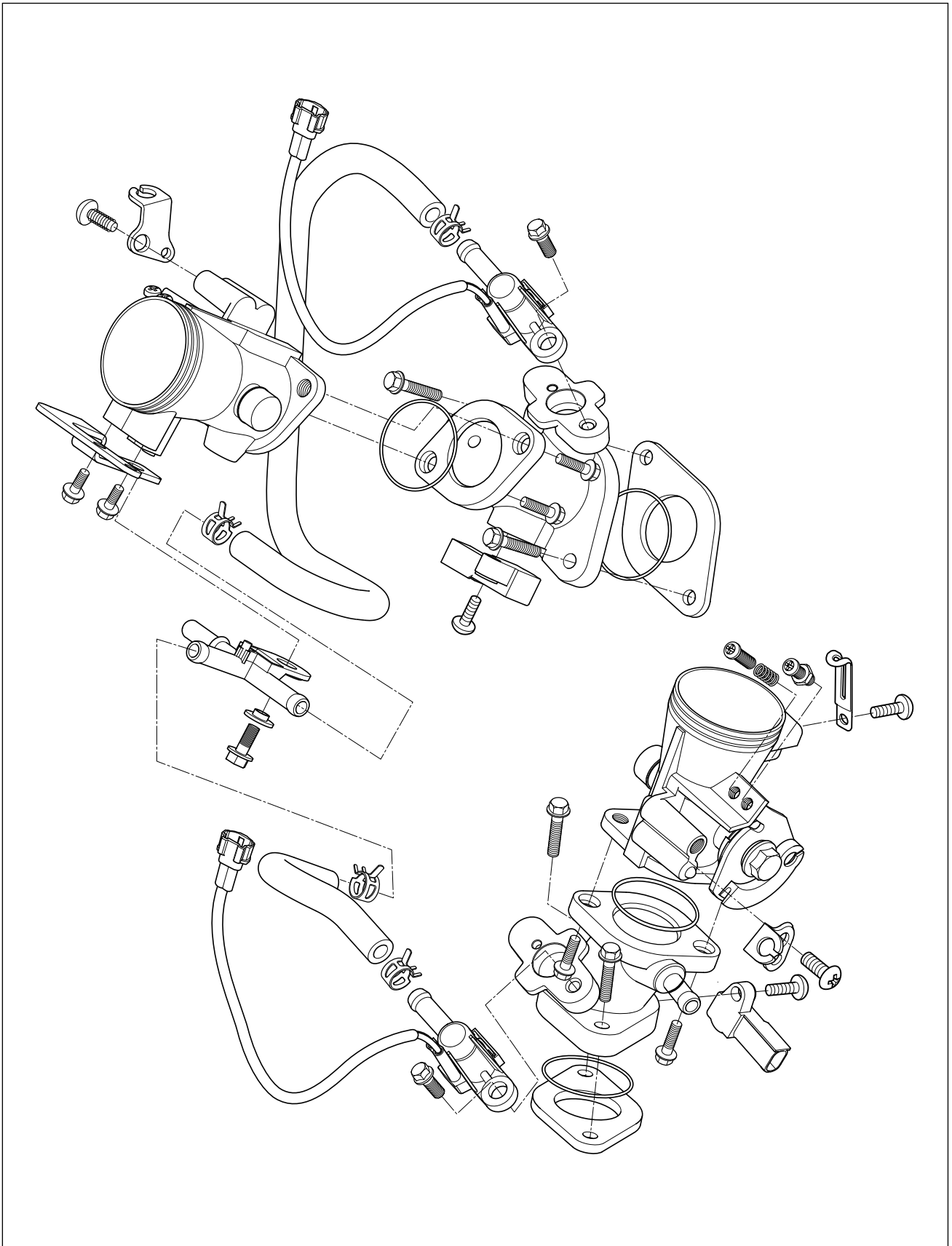
- Measure resistance between the terminals when float is at the position instead below.

Fuel float position	Resistance between terminals
F	Approx. 95 ~ 105 Ω
1/2	Approx. 38 Ω
E	Approx. 4 ~ 10 Ω

- If the resistance measured is out of the specification, replace the gauge with a new one.
- Inspect the fuel level meter.



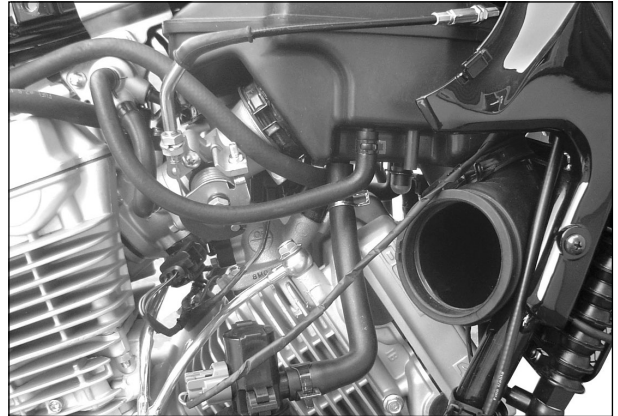
THROTTLE BODY



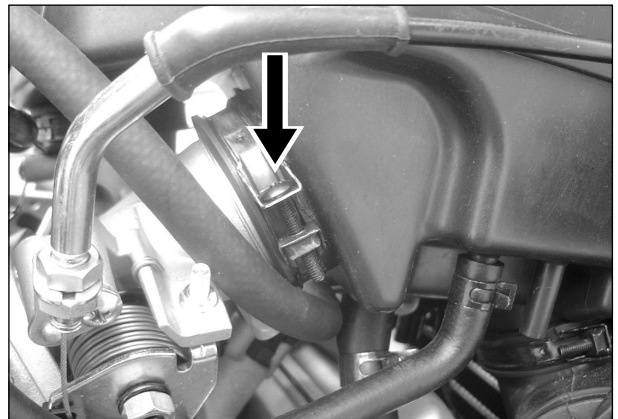
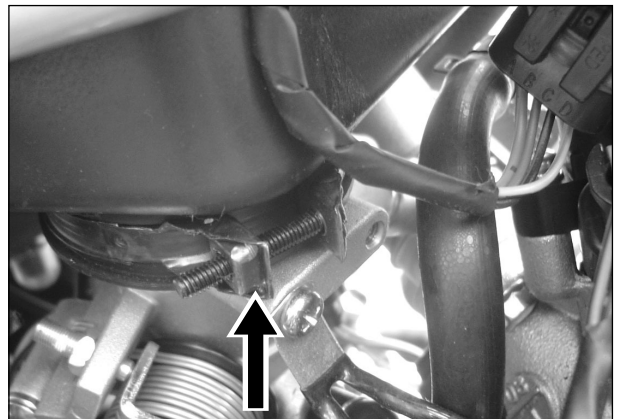
4-2-7 FUEL SYSTEM AND THROTTLE BODY

REMOVAL

- Remove the fuel tank.
- Disconnect the fuel hoses.
- Remove the all couplers to related the throttle body.



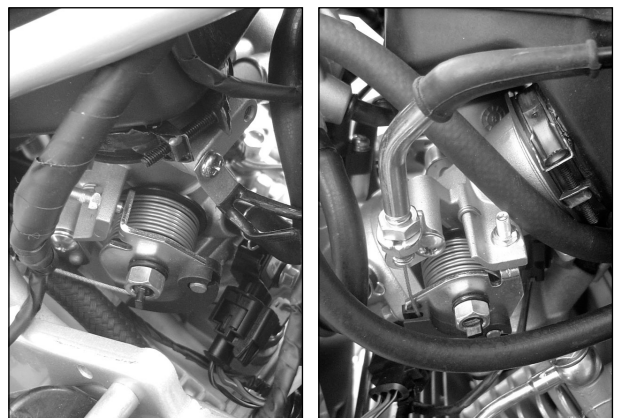
- Loosen the throttle body clamp screws.



- Remove the air cleaner box.
- Disconnect the throttle cables from their drum.
- Dismount the throttle body assembly.

CAUTION

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



CLEANING

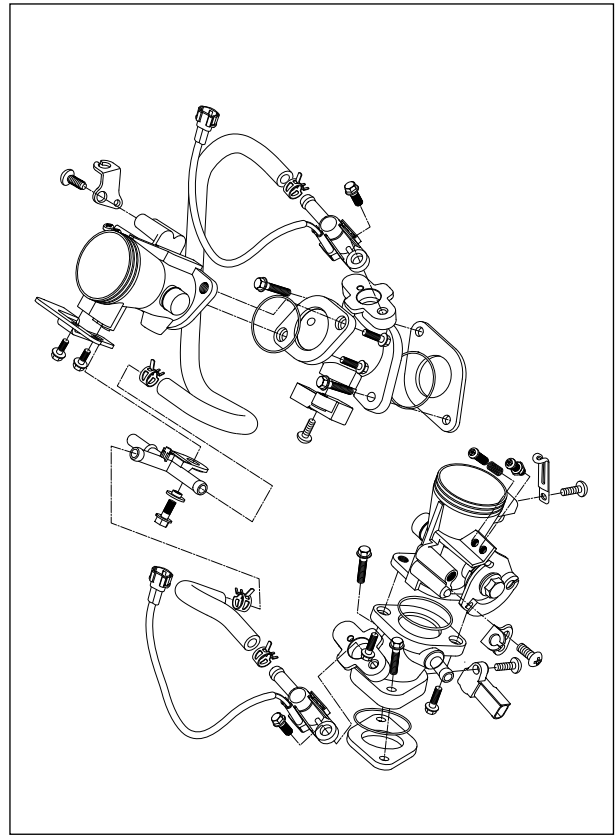
- Clean all passageways with a spray-type throttle body cleaner and blow dry with compressed air.

WARNING

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

CAUTION

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



INSPECTION

- Check following items for any damage or clogging.
 - * O-ring
 - * Throttle shaft bushing and seal
 - * Injector cushion seal
 - * Fuel injector
 - * Throttle body
 - * Intake pipe
 - * Throttle valve
 - * Vacuum hose

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

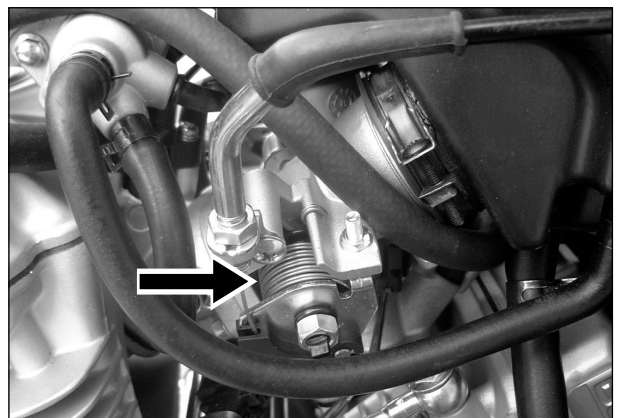
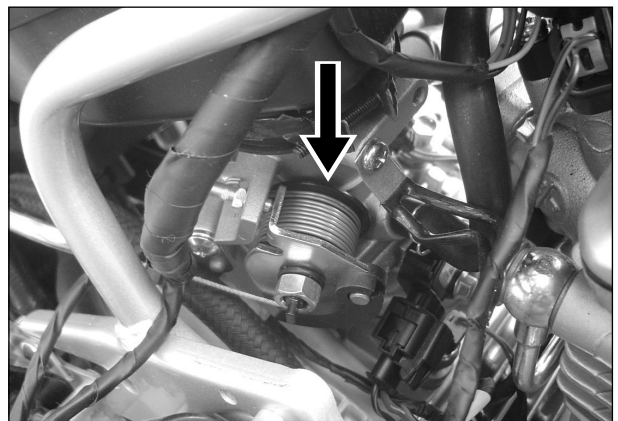
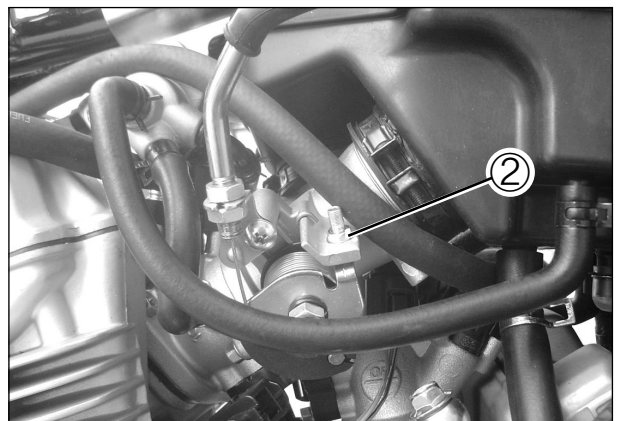
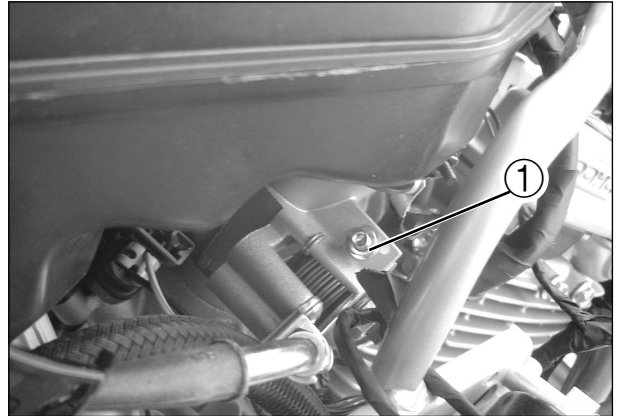
INSTALLATION

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

 **CAUTION**

Never operate the idle nuts ①(NO.1) and ②(NO.2) to avoid variations of the carburetion setting.

- Connect the throttle cable to the throttle cable drum.
- Adjust the throttle cable play with the cable adjuster.

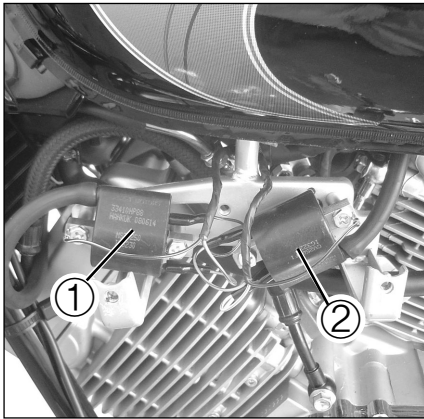


ELECTRICAL SYSTEM

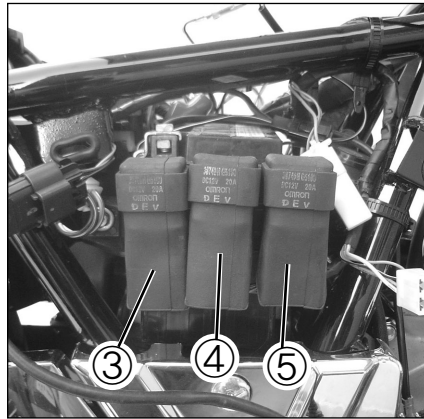
CONTENTS

<i>LOCATION OF ELECTRICAL COMPONENTS</i>	72 (5-1)
<i>IGNITION SYSTEM</i>	74 (5-3)
<i>CHARGING SYSTEM</i>	76 (5-7)

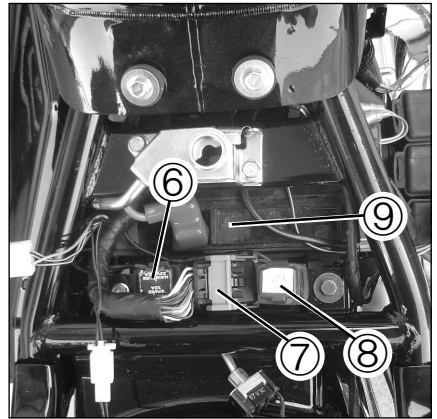
LOCATION OF ELECTRICAL COMPONENTS



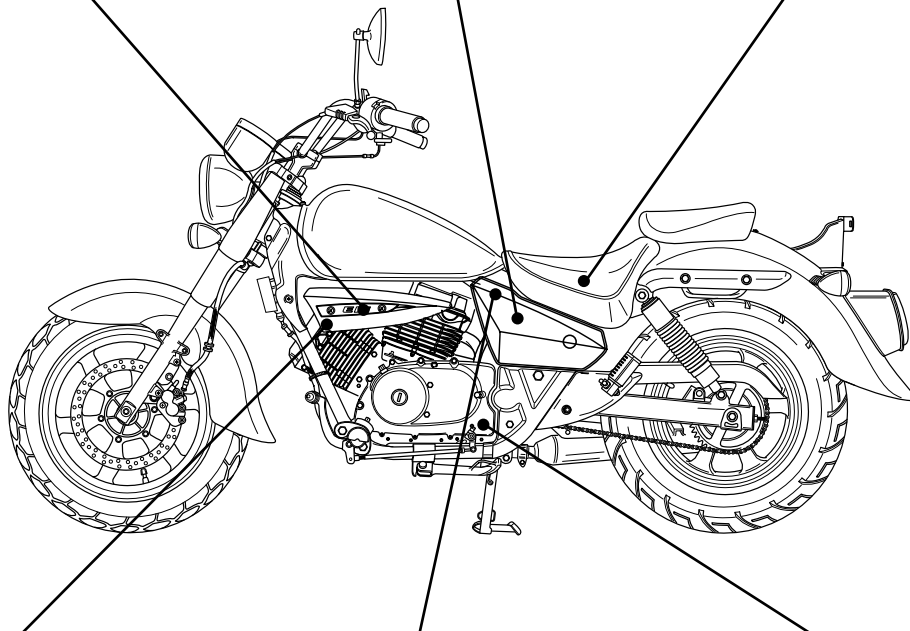
① Ignition coil NO.1
② Ignition coil NO.2



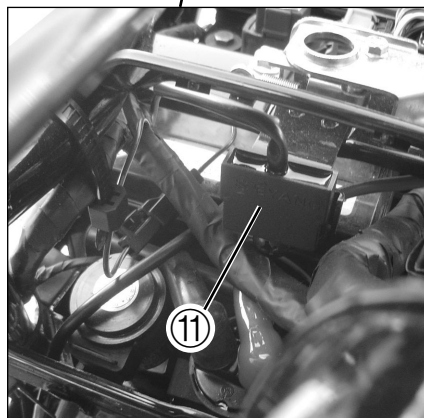
③ Main relay
④ Fuel pump relay
⑤ Head lamp relay



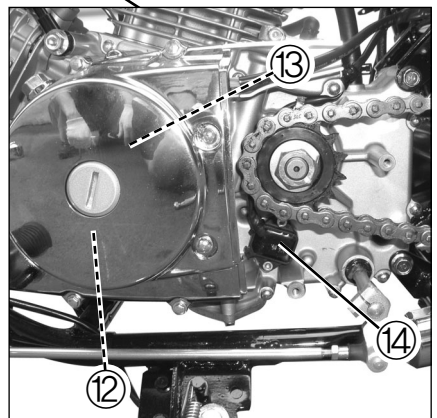
⑥ Main fuse (30A)
⑦ ECU
⑧ Head lamp fuse (15A)
⑨ Battery



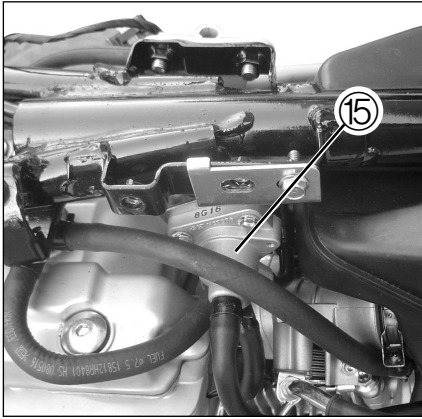
⑩ IAT sensor



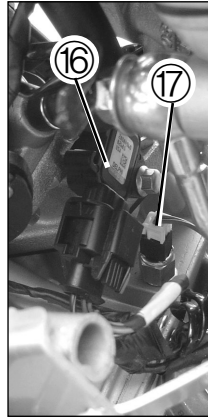
⑪ RO switch



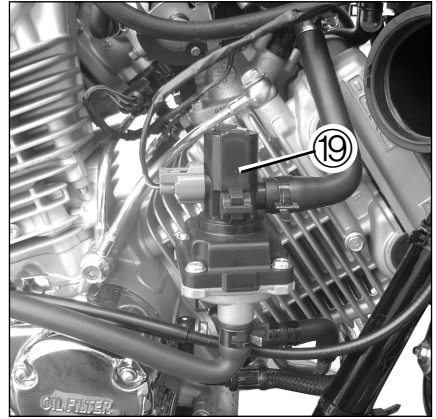
⑫ Magneto
⑬ Pick-up coil
⑭ GP switch



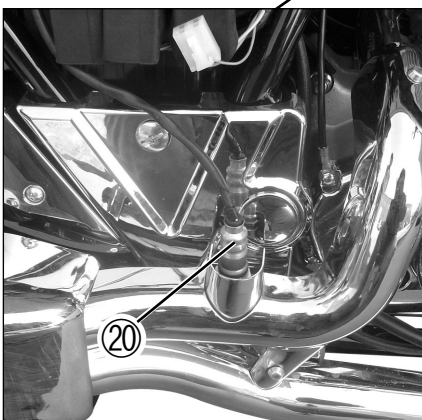
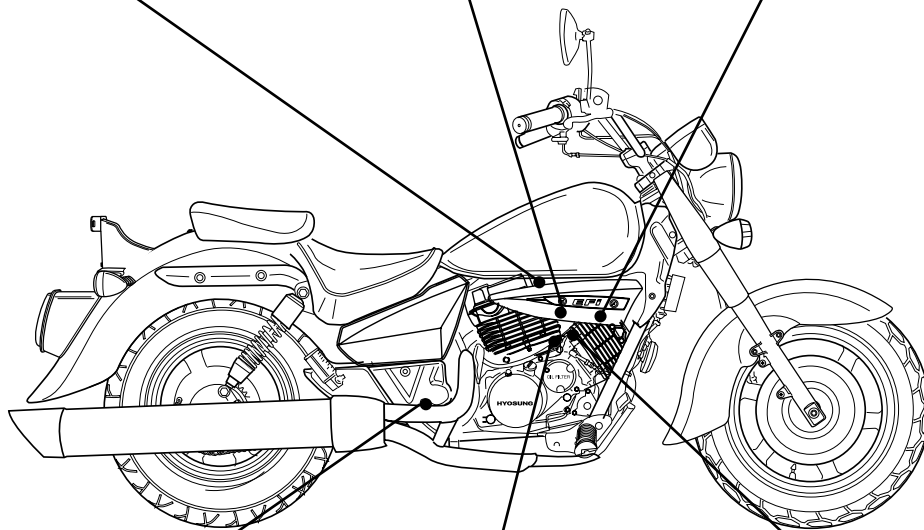
⑮ ISC solenoid



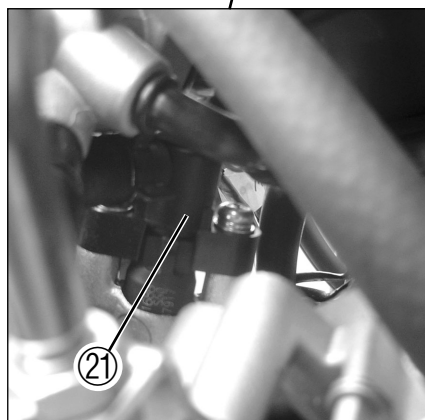
⑯ IAP sensor NO.1
⑰ ET sensor
⑱ IAP sensor NO.2



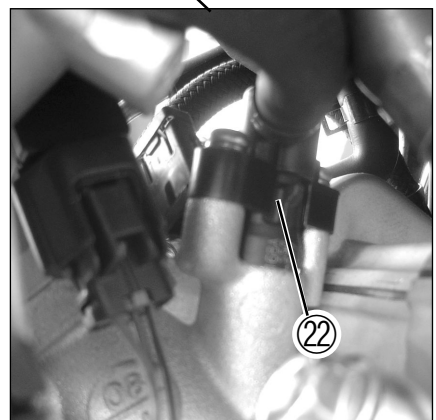
⑲ SAV solenoid



⑳ Oxygen sensor

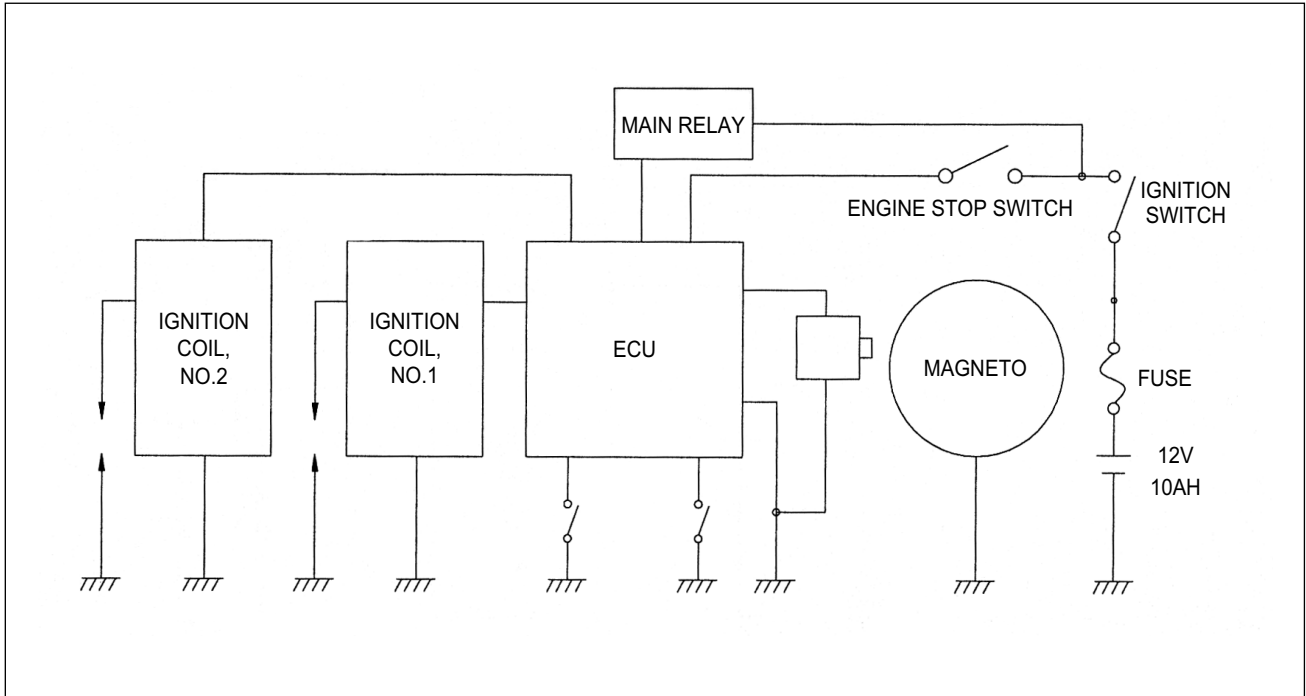


㉑ Fuel injector NO.2



㉒ Fuel injector NO.1

IGNITION SYSTEM



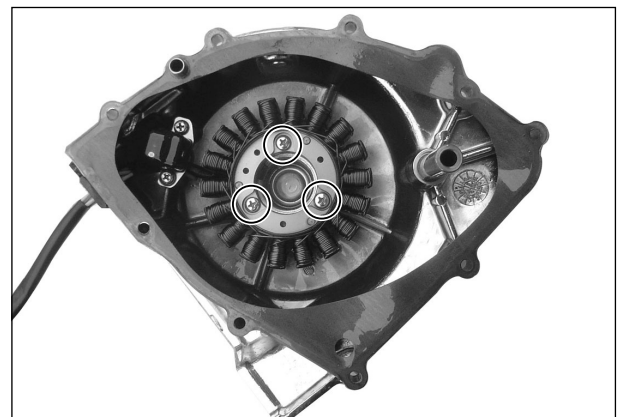
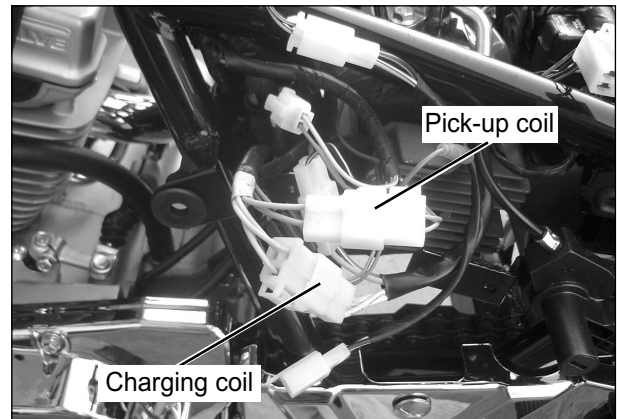
INSPECTION

MAGNETO

Using the pocket tester, measure the resistance between the lead wires in the following table. If the resistance is not within the specified value, replace the magneto coil, with a new one.

Stator coil resistance	Standard
Pick-up coil	G - L Approx. 85 ~ 105 Ω
Charging coil	Y - Y Approx. 0.2 ~ 1.0 Ω

Tester knob indication : Resistance (Ω)



CAUTION

When mounting the stator on the magneto cover, apply a small quantity of **THREAD LOCK "1324"** to the threaded parts of screws.

THREAD LOCK "1324"

IGNITION COIL RESISTANCE INSPECTION

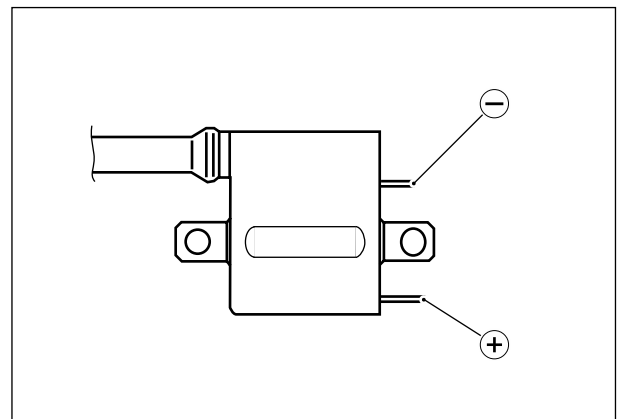
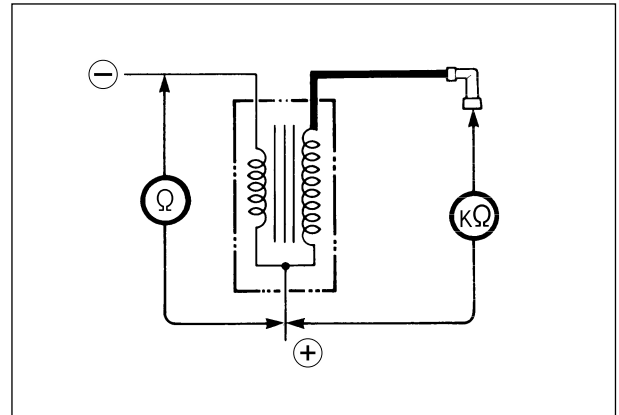
Disconnect the ignition coil lead wire.

Measure the ignition coil resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

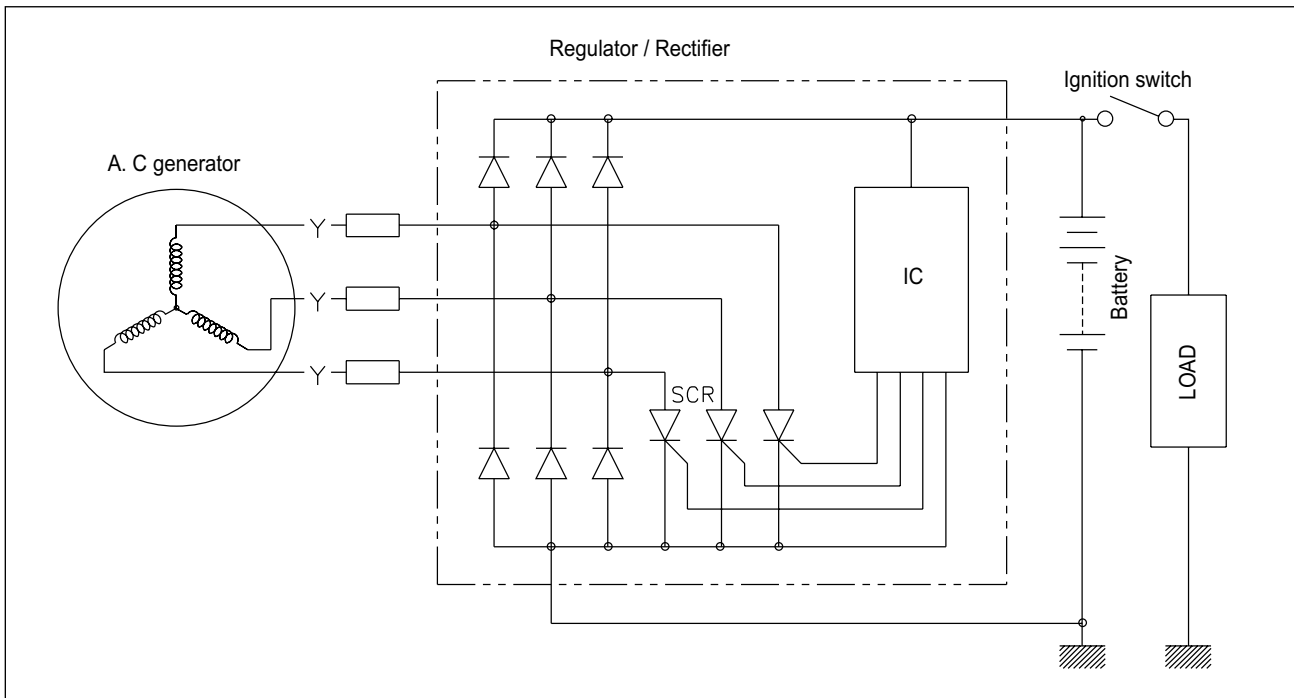
IGNITION COIL / PLUG CAP RESISTANCE

Primary	3.5 ~ 5.5 Ω (\oplus Terminal - \ominus Terminal)
Secondary	20 ~ 31 K Ω (Plug cap - \oplus Terminal)

 Tester knob indication : Resistance (K Ω)



CHARGING SYSTEM



⊙ INSPECTION

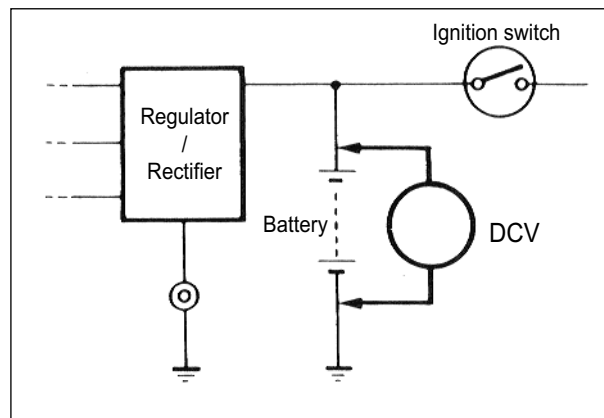
▣ CHARGING OUTPUT CHECK

Start the engine and keep it running at 5,000 rpm. Using the pocket tester, measure the DC voltage between the battery terminal ⊕ and ⊖. If the voltage is not within the specified value, check the magneto no-load performance and regulator / rectifier.

	CAUTION
When making this test, be sure that the battery is full-charged condition.	

Charging output (Regulated voltage)	13.5 ~ 15.0 V (at 5,000 rpm)
--	---------------------------------

Tester knob indication : Voltage (---)



▣ MAGNETO NO-LOAD PERFORMANCE

Disconnect the three lead wires from the magneto terminal.

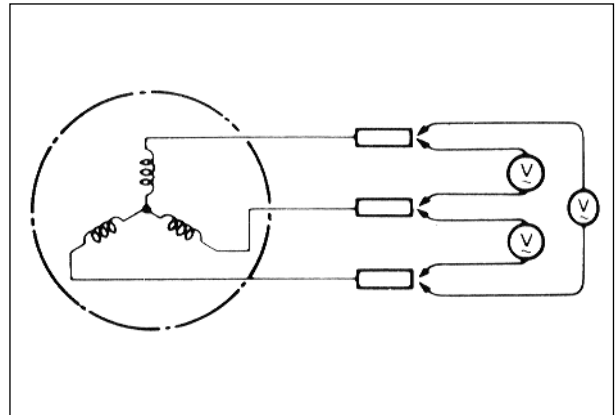
Start the engine and keep it running at 5,000 rpm.

Using the pocket tester, measure the AC voltage between the three lead wires.

If the voltage is under the specified value, replace the magneto with a new one.

Magneto no-load performance	Standard
	More than 60 V (at 5,000 rpm)

 Tester knob indication : Voltage (---)



▣ REGULATOR / RECTIFIER

Disconnect the regulator / rectifier couplers.

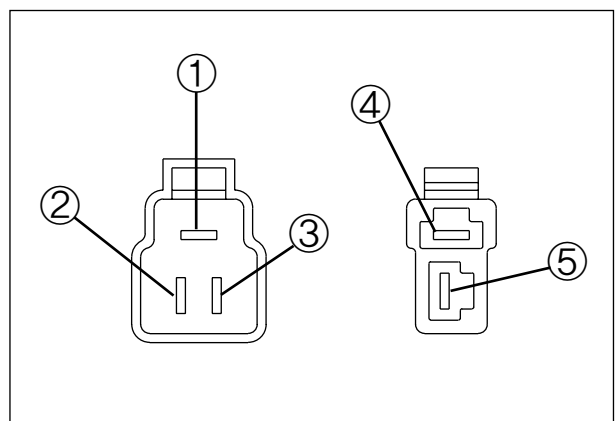
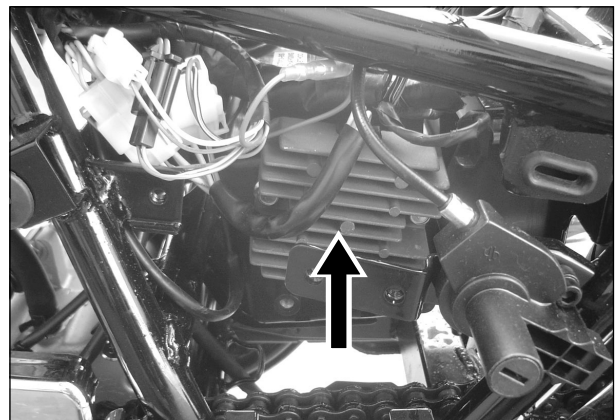
Measure the voltage between the terminals using the pocket tester as indicated in the table below.

If the voltage is not within the specified value, replace the regulator / rectifier with a new one.

Unit : V

		⊕ Tester probe					
⊖ Tester probe	①		①	②	③	④	⑤
	①		0	0	0	0	0.4~0.7
	②	0		0	0	0	0.4~0.7
	③	0	0		0	0	0.4~0.7
	④	0.4~0.7	0.4~0.7	0.4~0.7		0	0.5~1.2
	⑤	0	0	0	0		0

 Tester knob indication : Diode test (+←)



SERVICING INFORMATION

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TROUBLESHOOTING

⊙ MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION CODE	DETECTED ITEM	DETECTED FAILURE CONDITION
		CHECK FOR
C	NO FAULT	—
C12	Pick-up coil	The pick-up coil signal does not reach ECU for more than 3 sec. after ECU receiving the ignition switch signal. In this case, the code C12 is indicated.
		Pick-up coil wiring and mechanical parts. (Pick-up coil, lead wire coupler connection)
C14	Throttle position sensor (TPS)	The sensor should produce following voltage. $0.1\text{ V} \leq \text{sensor voltage} \leq 4.8\text{ V}$ Without the above range for 2 sec. and more, C14 is indicated.
		Throttle position sensor, lead wire / coupler connection.
C15	Engine temperature sensor (ETS)	The sensor voltage should be the following. $0.08\text{ V} \leq \text{sensor voltage} \leq 4.65\text{ V}$ Without the above range for 2 sec. and more, C15 is indicated.
		Engine temperature sensor, lead wire / coupler connection.
C17 / C18	Intake air pressure sensor (IAPS), NO.1 / NO.2	The sensor should produce following voltage. $0.5\text{ V} \leq \text{sensor voltage} \leq 4.5\text{ V}$ Without the above range for 6 sec. and more, C17 or C18 is indicated.
		Intake air pressure sensor, lead wire / coupler connection.
C21	Intake air temperature sensor (IATS)	The sensor voltage should be the following. $0.08\text{ V} \leq \text{sensor voltage} \leq 4.75\text{ V}$ Without the above range for 6 sec. and more, C21 is indicated.
		Intake air temperature sensor, lead wire / coupler connection.
C22	Oxygen sensor (O ₂ S)	The oxygen sensor signal is inputted in ECU since then 600 sec. after the engine run. When this is the case, ECU not receive the signal, C22 is indicated.
		Oxygen sensor, lead wire / coupler connection.
C23	Roll over switch (RO switch)	The switch resistance should be the following for more than 3 sec. after holding the motorcycle vertically and ignition switch turns "ON" position. switch resistance $\approx \infty \Omega$ (Infinity) Without the above value for 3 sec. and more, C23 is indicated.
		Roll over switch, lead wire / coupler connection.

MALFUNCTION CODE	DETECTED ITEM	DETECTED FAILURE CONDITION
		CHECK FOR
C24 / C25	Ignition coil (IG coil), NO.1 / NO.2	Ignition signal is interrupted continuous by 31 times or more when ECU confirm ignition surge at each combustion chamber. In this case, the code C24 or C25 is indicated.
		Ignition coil, wiring / coupler connection, power supply from the battery.
C27	Idle speed control solenoid (ISC solenoid)	The idle speed control solenoid step should be the following. O step \leq solenoid step \leq 250 step Without the above range, C27 is indicated.
		Idle speed control solenoid, lead wire / coupler connection.
C31	Gear position switch (GP switch)	It judges from gear position voltage, engine speed and throttle position by ECU, when $0.15\text{ V} < \text{Gear position voltage} < 3.93\text{ V}$ for more 2 sec.. If gear position voltage get out of the above voltage, C31 is indicated.
		Gear position switch, wiring / coupler connection, gearshift cam etc.
C32 / C33	Fuel injector, NO.1 / NO.2	Injector signal is interrupted continuous for more than 1 sec. when ECU confirm injector running surge at each combustion chamber, C32 or C33 is indicated.
		Injector, wiring / coupler connection, power supply to the injector.
C37	Secondary air valve solenoid (SAV solenoid)	No voltage is applied from ECU to secondary air valve solenoid by 400 sec.. In this case, the code 37 is indicated.
		Secondary air valve solenoid, lead wire / coupler connection.
C41	Fuel pump relay	Voltage is applied continuous for more than 5 sec., battery voltage $\geq 3.2\text{ V}$ when fuel pump relay is "OFF" position or battery voltage $< 1.5\text{ V}$ when fuel pump relay is "ON" position. In this case, the code 41 is indicated.
		Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
C43	Oxygen sensor heater (O ₂ S heater)	The oxygen sensor heater signal is not inputted in ECU.
		Oxygen sensor heater, lead wire / coupler connection.

⊙ ENGINE

Complaint	Symptom and possible causes	Remedy
<p>Engine will not start or is hard to start.</p>	<p>Compression too low</p> <ol style="list-style-type: none"> 1. Tappet clearance out of adjustment. 2. Worn valve guides or poor seating of valves. 3. Mistimed valves. 4. Excessively worn piston rings. 5. Worn-down cylinder bore. 6. Starter motor cranks too slowly. 7. Poor seating of spark plugs. <p>Plug not sparking</p> <ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Wet spark plugs. 3. Defective ignition coils. 4. Open or short in high-tension cord. 5. Defective pick-up coil. 6. Defective ECU. 7. Open-circuited wiring connections. <p>No fuel reaching the intake manifold</p> <ol style="list-style-type: none"> 1. Clogged fuel filter or fuel hose. 2. Defective fuel pump. 3. Defective fuel pressure regulator. 4. Defective fuel injector. 5. Defective fuel pump relay. 6. Defective ECU. 7. Open-circuited wiring connections. <p>Incorrect fuel / air mixture</p> <ol style="list-style-type: none"> 1. Defective fuel pump. 2. Defective fuel pressure regulator. 3. Defective pick-up coil. 4. Defective IAP sensor. 5. Defective ECU. 6. Defective ET sensor. 7. Defective IAT sensor. 	<p>Adjust. Repair or replace. Adjust. Replace. Replace. See electrical section. Retighten.</p> <p>Clean. Clean and dry. Replace. Replace. Replace. Replace. Repair or replace.</p> <p>Clean or replace. Replace. Replace. Replace. Replace. Replace. Check and repair.</p> <p>Replace. Replace. Replace. Replace. Replace. Replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<p>Engine idles poorly.</p>	<ol style="list-style-type: none"> 1. Tappet clearance out of adjustment. 2. Poor seating of valves. 3. Defective valve guides. 4. Worn down camshafts. 5. Too wide spark plug gaps. 6. Defective ignition coils. 7. Defective pick-up coil. 8. Defective ECU. 9. Defective fuel pump. 10. Imbalanced throttle valve or SAV solenoid. 11. Damaged or cracked vacuum hose. 	<p>Adjust. Replace or repair. Replace. Replace. Adjust or replace. Replace. Replace. Replace. Replace. Adjust. Replace.</p>
<p>Engine stalls often</p>	<p>Incorrect fuel / air mixture</p> <ol style="list-style-type: none"> 1. Defective IAP sensor or circuit. 2. Clogged fuel filter. 3. Defective fuel pump. 4. Defective fuel pressure regulator. 5. Defective ET sensor. 6. Defective IAT sensor. 7. Damaged or cracked vacuum hose. <p>Fuel injector improperly operating</p> <ol style="list-style-type: none"> 1. Defective fuel injectors. 2. No injection signal from ECU. 3. Open or short circuited wiring connection. 4. Defective battery or low battery voltage. <p>Control circuit or sensor improperly operating</p> <ol style="list-style-type: none"> 1. Defective ECU. 2. Defective fuel pressure regulator. 3. Defective IAT sensor. 4. Defective pick-up coil. 5. Defective ET sensor. 6. Defective fuel pump relay. <p>Engine internal parts improperly operating</p> <ol style="list-style-type: none"> 1. Fouled spark plugs. 2. Defective pick-up coil or ECU. 3. Clogged fuel hose. 4. Tappet clearance out of adjustment. 	<p>Repair or replace. Clean or replace. Replace. Replace. Replace. Replace. Replace.</p> <p>Replace. Repair or replace. Repair or replace. Replace or recharge.</p> <p>Replace. Replace. Replace. Replace. Replace. Replace.</p> <p>Clean. Replace. Clean. Adjust.</p>

7-2-2 SERVICING INFORMATION

Complaint	Symptom and possible causes	Remedy
<p>Noisy engine.</p>	<p>Excessive valve chatter</p> <ol style="list-style-type: none"> 1. Too large tappet clearance. 2. Weakened or broken valve springs. 3. Worn tappet or cam surface. 4. Worn and burnt camshaft journal. 	<p>Adjust. Replace. Replace. Replace.</p>
	<p>Noise seems to come from piston</p> <ol style="list-style-type: none"> 1. Worn down pistons or cylinders. 2. Combustion chambers fouled with carbon. 3. Worn piston pins or piston pin bore. 4. Worn piston rings or ring grooves. 	<p>Replace. Clean. Replace. Replace.</p>
	<p>Noise seems to come from cam chain</p> <ol style="list-style-type: none"> 1. Stretched chain. 2. Worn sprockets. 3. Tension adjuster not working. 	<p>Replace. Replace. Repair or replace.</p>
	<p>Noise seems to come from clutch</p> <ol style="list-style-type: none"> 1. Worn splines of countershaft or hub. 2. Worn teeth of clutch plates. 3. Distorted clutch plates, driven and drive. 4. Worn clutch release bearing. 5. Weakened clutch dampers. 	<p>Replace. Replace. Replace. Replace. Replace the primary driven gear.</p>
	<p>Noise seems to come from crankshaft</p> <ol style="list-style-type: none"> 1. Rattling bearings due to wear. 2. Worn and burnt big-end bearings. 3. Worn and burnt journal bearings. 	<p>Replace. Replace. Replace.</p>
	<p>Noise seems to come from transmission</p> <ol style="list-style-type: none"> 1. Worn or rubbing gears. 2. Worn splines. 3. Worn bearings. 4. Worn or rubbing primary gears. 	<p>Replace. Replace. Replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
<p>Engine runs poorly in high speed range.</p>	<p>Defective engine internal / electrical parts</p> <ol style="list-style-type: none"> 1. Weakened valve springs. 2. Worn camshafts. 3. Valve timing out of adjustment. 4. Too narrow spark plug gaps. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coils. 7. Defective pick-up coil. 8. Defective ECU. 9. Clogged fuel hose, resulting in inadequate fuel supply to injector. 10. Defective fuel pump. 11. Defective SAV solenoid. 12. Clogged air cleaner element. <p>Defective air flow system</p> <ol style="list-style-type: none"> 1. Clogged air cleaner element. 2. Defective throttle valve. 3. Sucking air from throttle body joint. 4. Defective ECU. <p>Defective control circuit or sensor</p> <ol style="list-style-type: none"> 1. Low fuel pressure. 2. Defective IAT sensor. 3. Defective pick-up coil. 4. Defective IAP sensor. 5. Defective ECU. 6. Defective SAV solenoid. 	<p>Replace. Replace. Adjust. Adjust. Replace ECU.</p> <p>Replace. Replace. Replace. Clean and prime. Replace. Replace. Clean.</p> <p>Clean or replace. Adjust or replace. Repair or replace. Replace.</p> <p>Repair or replace. Replace. Replace. Replace. Replace.</p>

7-3-1 SERVICING INFORMATION

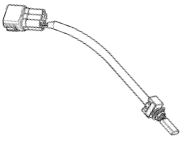

Complaint	Symptom and possible causes	Remedy
<p>Engine lacks power.</p>	<p>Defective engine internal / electrical parts</p> <ol style="list-style-type: none"> 1. Loss of tappet clearance. 2. Weakened valve springs. 3. Valve timing out of adjustment. 4. Worn piston rings or cylinders. 5. Poor seating of valves. 6. Fouled spark plugs. 7. Incorrect spark plugs. 8. Clogged injectors. 9. Clogged air cleaner element. 10. Sucking air from throttle valve or vacuum hose. 11. Too much engine oil. 12. Defective fuel pump or ECU. 13. Defective pick-up coil and ignition coils. <p>Defective control circuit or sensor</p> <ol style="list-style-type: none"> 1. Low fuel pressure. 2. Defective IAT sensor. 3. Defective pick-up coil. 4. Defective IAP sensor. 5. Defective ECU. 6. Defective SAV solenoid. 7. Defective GP switch. 	<p>Adjust. Replace. Adjust. Replace. Repair. Clean or replace. Adjust or replace. Clean. Clean. Retighten or replace. Drain out excess oil. Replace. Replace.</p> <p>Repair or replace. Replace. Replace. Replace. Replace. Replace. Replace.</p>
<p>Engine overheats.</p>	<p>Defective engine internal parts</p> <ol style="list-style-type: none"> 1. Heavy carbon deposit on piston crowns. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Sucking air from intake pipes. 5. Use incorrect engine oil. 6. Defective oil cooler. <p>Lean fuel / air mixture</p> <ol style="list-style-type: none"> 1. Short-circuited IAP sensor / lead wire. 2. Short-circuited IAT sensor / lead wire. 3. Sucking air from intake pipe joint. 4. Defective fuel injectors. 5. Defective ET sensor. <p>The other factors</p> <ol style="list-style-type: none"> 1. Ignition timing too advanced due to defective timing advance system (ET sensor, pick-up coil, GP switch and ECU). 2. Drive chain is too tight. 	<p>Clean. Add oil. Replace or clean. Retighten or replace. Change. Clean or replace.</p> <p>Repair or replace. Repair or replace. Repair or replace. Replace. Replace.</p> <p>Replace. Adjust.</p>

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke.	<ol style="list-style-type: none"> 1. Too much engine oil in the engine. 2. Worn piston rings or cylinders. 3. Worn valve guides. 4. Cylinder wall scored or scuffed. 5. Worn valves stems. 6. Defective stem seals. 7. Worn side rails. 	Check with inspection window, drain out excess oil. Replace. Replace. Replace. Replace. Replace. Replace.
Slipping clutch.	<ol style="list-style-type: none"> 1. Weakened clutch springs. 2. Worn or distorted pressure plates. 3. Distorted clutch plates or pressure plates. 	Replace. Replace. Replace.
Dragging clutch.	<ol style="list-style-type: none"> 1. Some clutch springs weakened while others are not. 2. Distorted pressure plates or clutch plates. 	Replace. Replace.
Transmission will not shift.	<ol style="list-style-type: none"> 1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl. 	Replace. Replace. Replace.
Transmission will not shift back.	<ol style="list-style-type: none"> 1. Broken return spring on shift shaft. 2. Rubbing or sticky shift shaft. 3. Distorted or worn gearshift forks. 	Replace. Repair or replace. Replace.
Transmission jumps out of gear.	<ol style="list-style-type: none"> 1. Worn shifting gears on driveshaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift stopper. 	Replace. Replace. Replace.

⊙ ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coils or spark plug caps. 2. Defective spark plugs. 3. Defective pick-up coil. 4. Defective ECU. 5. Defective RO switch. 6. Open-circuited wiring connections. 	Replace. Replace. Replace. Replace. Replace. Check and repair.
Spark plug soon become fouled with carbon.	<ol style="list-style-type: none"> 1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold. 	Inspect EI system. Inspect EI system. Change. Clean or replace. Replace by hot type plug.
Spark plug become fouled too soon.	<ol style="list-style-type: none"> 1. Worn piston rings. 2. Pistons or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal. 	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loose. 4. Mixture too lean. 	Replace by cold type plug. Tune up. Retighten. Inspect EI system.
Magneto charge, but charging rate is below the specification.	<ol style="list-style-type: none"> 1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of magneto. 3. Defective regulator / rectifier. 4. Defective cell plates in the battery. 	Repair or retighten. Replace. Replace. Replace the battery.
Magneto overcharges.	<ol style="list-style-type: none"> 1. Internal short - circuit in the battery. 2. Resistor element in the regulator / rectifier damaged or defective. 3. Regulator / rectifier poorly grounded. 	Replace the battery. Replace. Clean and tighten ground connection.
Magneto does not charge.	<ol style="list-style-type: none"> 1. Open - or short - circuited lead wire, or loose lead connections. 2. Short - circuited, grounded or open stator coil. 3. Short - circuited or punctured regulator / rectifier. 	Repair or replace or retighten. Replace. Replace.
Unstable charging.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration resulting in intermittent shorting. 2. Magneto internally shorted. 3. Defective regulator / rectifier. 	Repair or replace. Replace. Replace.
Starter switch is not effective.	<ol style="list-style-type: none"> 1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay / ignition interlock switch. 5. Defective main fuse. 	Recharge or replace. Replace. Repair or replace. Replace. Replace.

SPECIAL TOOLS

Special tools	Part Number · Part Name · Description
	09900-27000 Mode select switch
	Inspect EI system sensor.
	09915-54510 Fuel pump pressure gauge
	Measure fuel pressure of fuel pump.

TIGHTENING TORQUE

⊙ EI SYSTEM PARTS

ITEM	N · m	kgf · m
Engine temperature sensor (ET sensor)	5 ~ 8	0.5 ~ 0.8
Fuel injector mounting bolt	5 ~ 8	0.5 ~ 0.8
Intake air temperature sensor (IAT sensor)	5 ~ 8	0.5 ~ 0.8

SERVICE DATA

⊙ EI SENSORS

ITEM	SPECIFICATION		NOTE
IAP sensor input voltage	4.5 ~ 5.5 V		
IAP sensor output voltage	Approx. 3.7 ~ 3.9 V when ignition switch "ON"		
TP sensor input voltage	4.5 ~ 5.5 V		
TP sensor output voltage	Closed	Approx. 0.3 V	
	Opened	Approx. 4.5 V	
IAT sensor resistance	0.081 ~ 48.352 K Ω [When Intake air temperature is -40°C ~ 130°C (-40°F ~ 266°F)]		
IAT sensor resistance (each temperature)	Refer to page 48 (4-1-33)		
RO switch resistance	$\infty \Omega$ (Infinity) [at normal condition]		
	0 Ω [at leaned more than 60°]		
GP switch resistance	100 Ω ~ 2.0 K Ω		
Oxygen sensor heater voltage	Battery voltage		
SAV solenoid voltage	Battery voltage		
ET sensor resistance	0.102 ~ 81.000 K Ω [When Engine temperature is -20°C ~ 180°C (-4°F ~ 356°F)]		
ET sensor resistance [To ECU] (each temperature)	-20°C (-4°F)	Approx. 75.5 K Ω	
	0°C (32°F)	Approx. 28.7 K Ω	
	20°C (68°F)	Approx. 12.2 K Ω	
	40°C (104°F)	Approx. 5.6 K Ω	
	60°C (140°F)	Approx. 2.8 K Ω	
	80°C (176°F)	Approx. 1.5 K Ω	
	120°C (248°F)	Approx. 0.5 K Ω	
	140°C (284°F)	Approx. 0.3 K Ω	
	160°C (320°F)	Approx. 0.2 K Ω	
180°C (356°F)	Approx. 0.13 K Ω		

7-19-2 SERVICING INFORMATION

⊙ THROTTLE BODY

ITEM	SPECIFICATION	NOTE
I.D. No.	13400H88	
Bore size	∅ 28	
Idle rpm	1,400 ~ 1,600 rpm	
Throttle cable play	0.5 ~ 1.0 mm (0.02 ~ 0.04 in)	

⊙ FUEL INJECTOR + FUEL PUMP

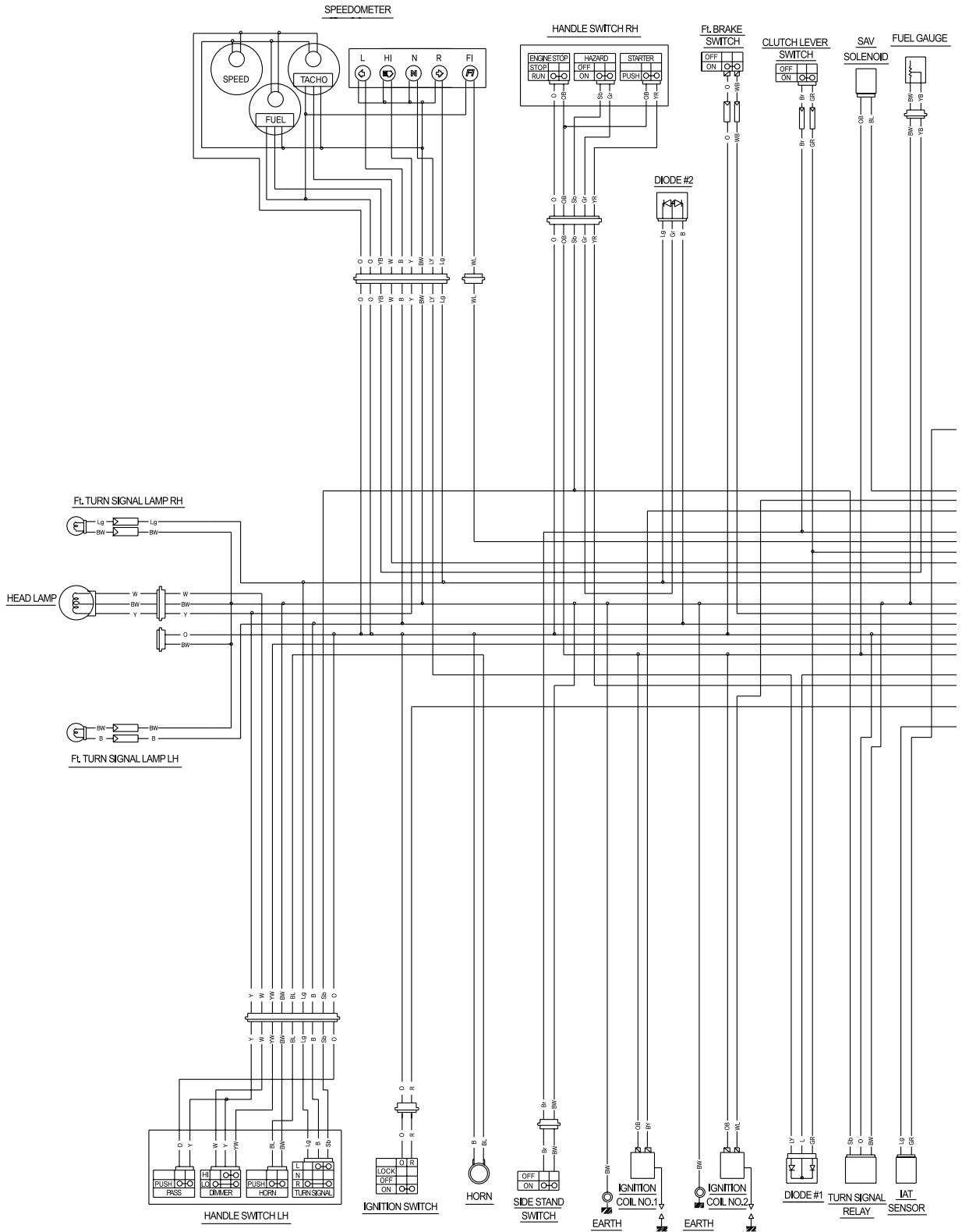
ITEM	SPECIFICATION	NOTE
Fuel injector resistance	11.4 ~ 12.6 Ω at 20°C (68°F)	
Fuel injector voltage	Battery voltage	
Fuel pressure of fuel pump	Approx. 3.4 ~ 3.7 kgf/cm ² (333 ~ 363 kPa, 48.4 ~ 52.6 psi)	

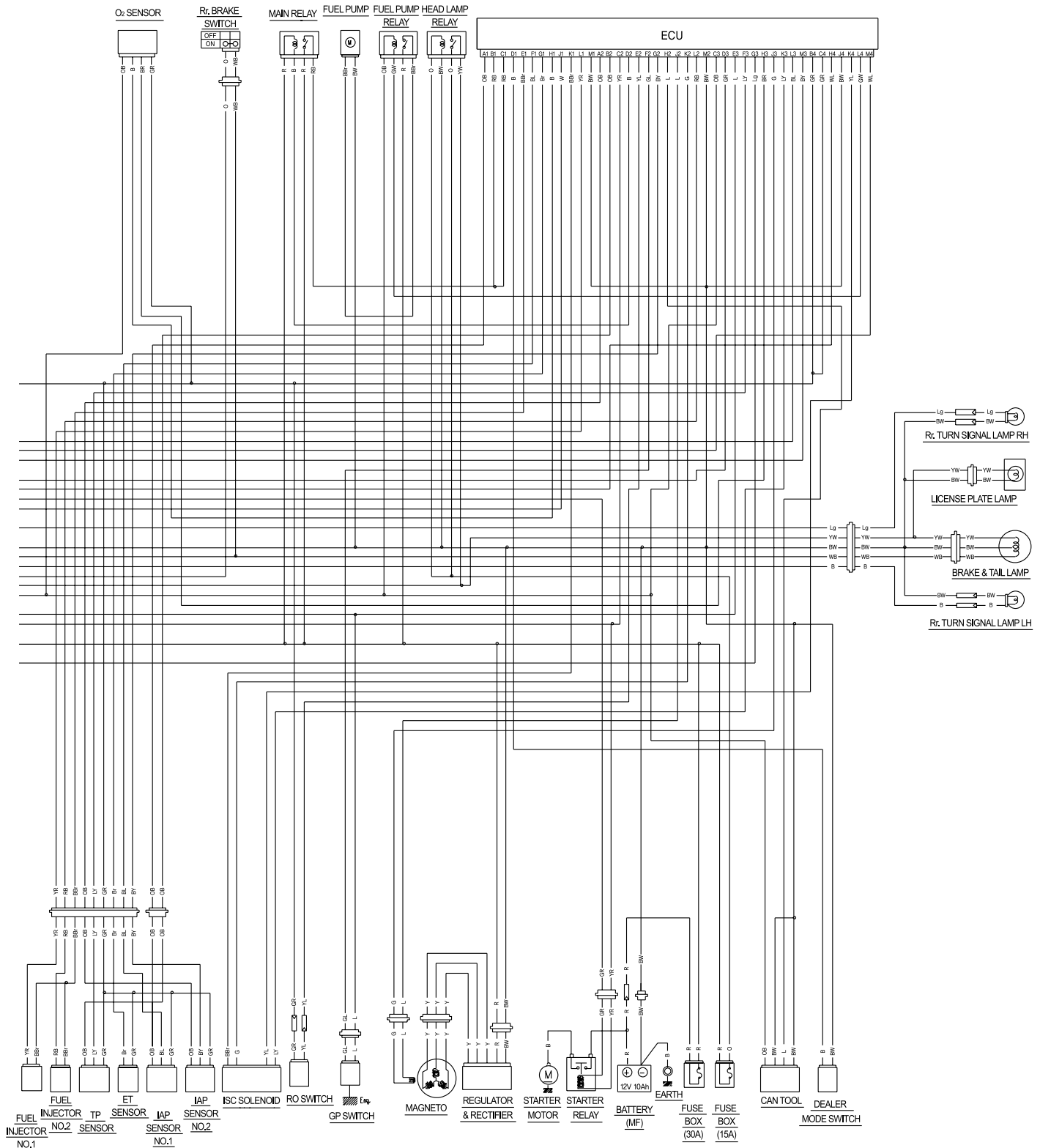
⊙ ELECTRICAL

Unit : mm (in)

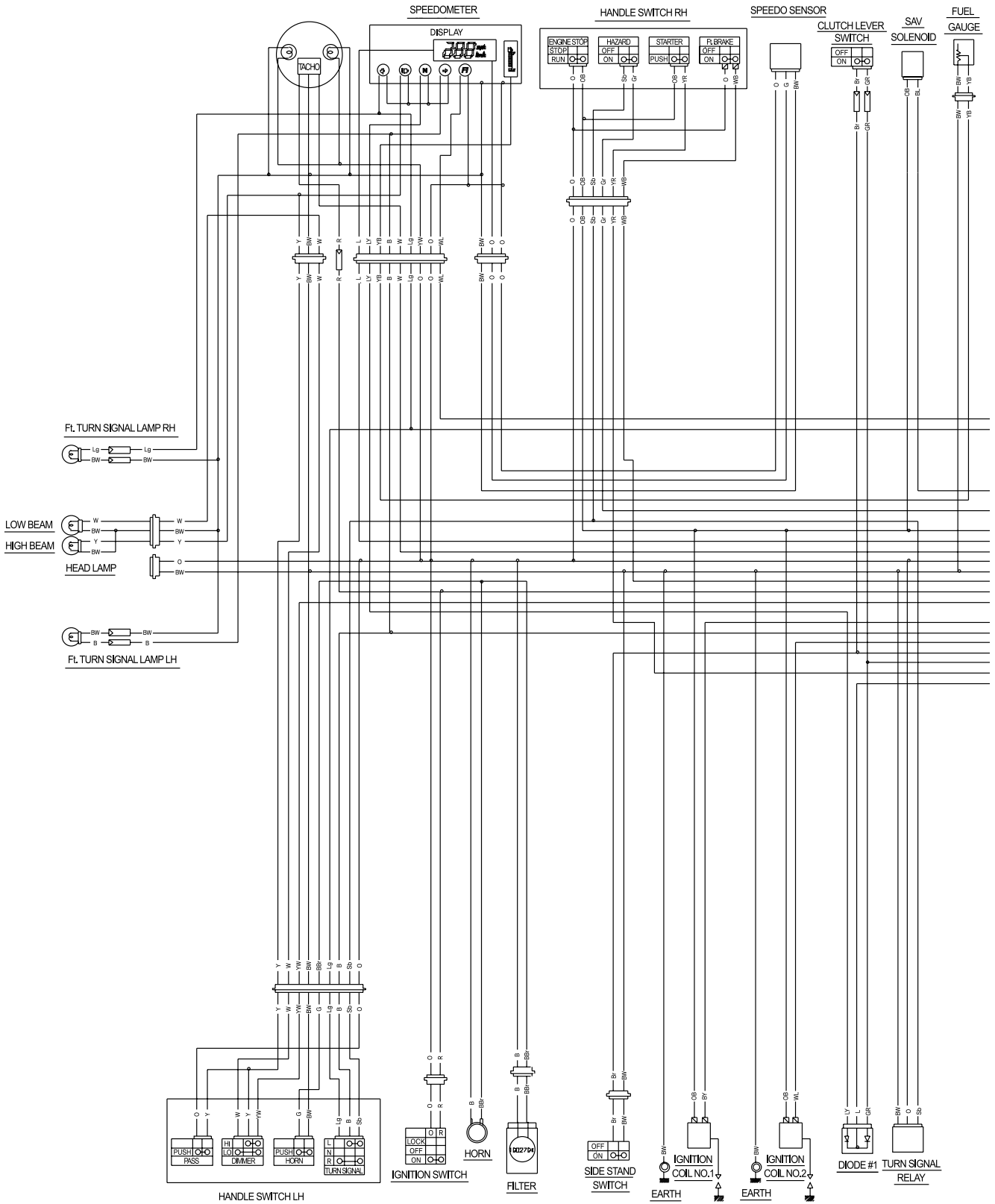
ITEM	STANDARD		NOTE
Ignition timing	BTDC 13° / 2,000 rpm ~ 30° / 6,000 rpm		
Spark plug	Type	CR8E	
	Gap	0.7 ~ 0.8 (0.028 ~ 0.032)	
	Hot type	CR7E	
	Standard type	CR8E	
	Cold type	CR9E	
Spark performance	More than 8 mm (0.32 in)		
Ignition coil primary peak voltage	150 V and more		
Ignition coil resistance	Primary	3.5 ~ 5.5 Ω	
	Secondary	20 ~ 31 KΩ	
Stator coil resistance	Pick-up coil	Approx. 85 ~ 105 Ω	G-L
	Charging coil	Approx. 0.2 ~ 1.0 Ω	Y-Y
Magneto no-load performance	More than 60 V / 5,000 rpm		
Charging output (Regulated voltage)	13.5 ~ 15.0 V / 5,000 rpm		
Battery	Type	YTX12-BS	
	Capacity	12V 10Ah	
	Standard electrolyte S.G.	1.320 at 20°C (68°F)	
Fuse size	Main	30A	
	Head lamp	15A	

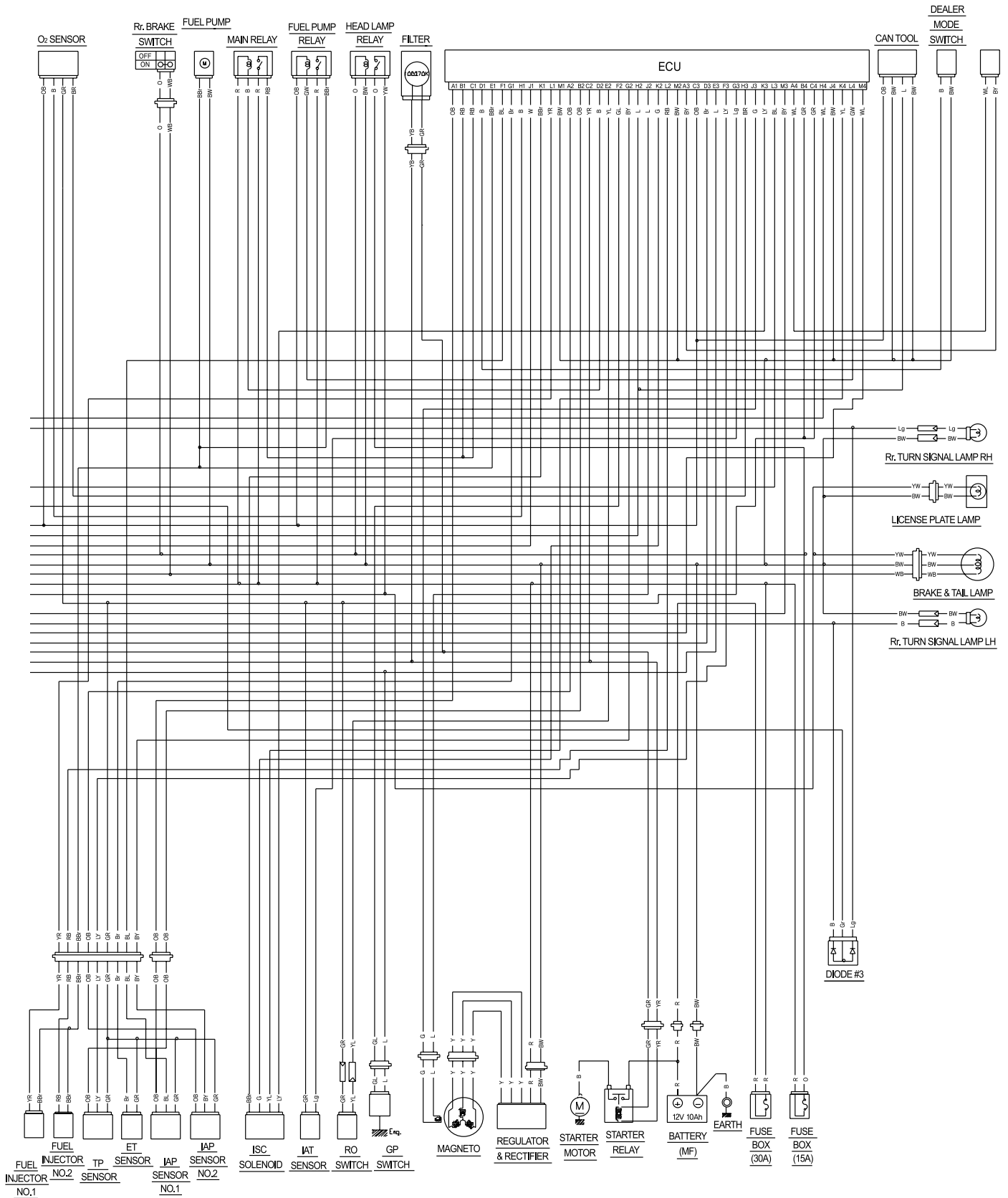
WIRING DIAGRAM (GV250 Ei)



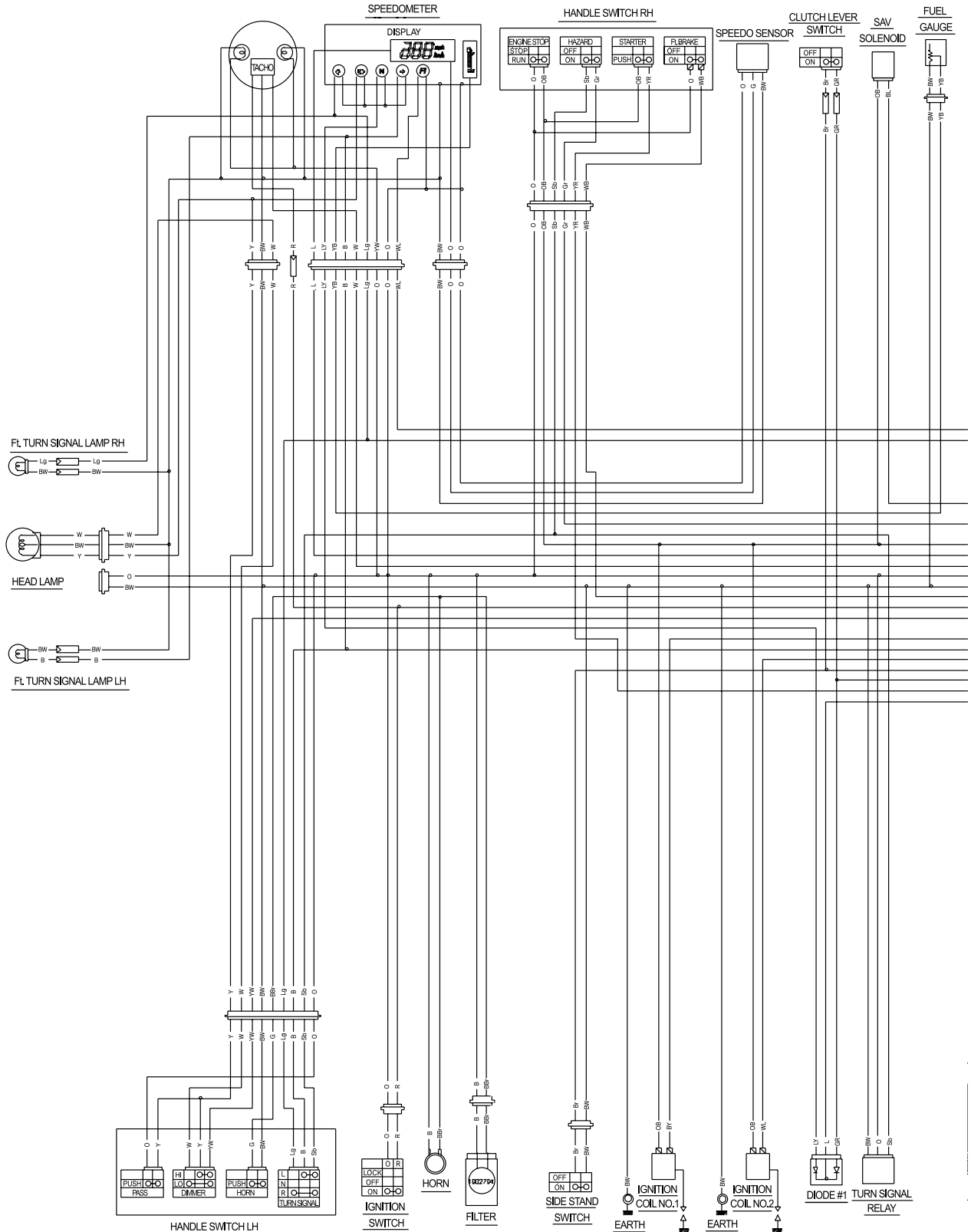


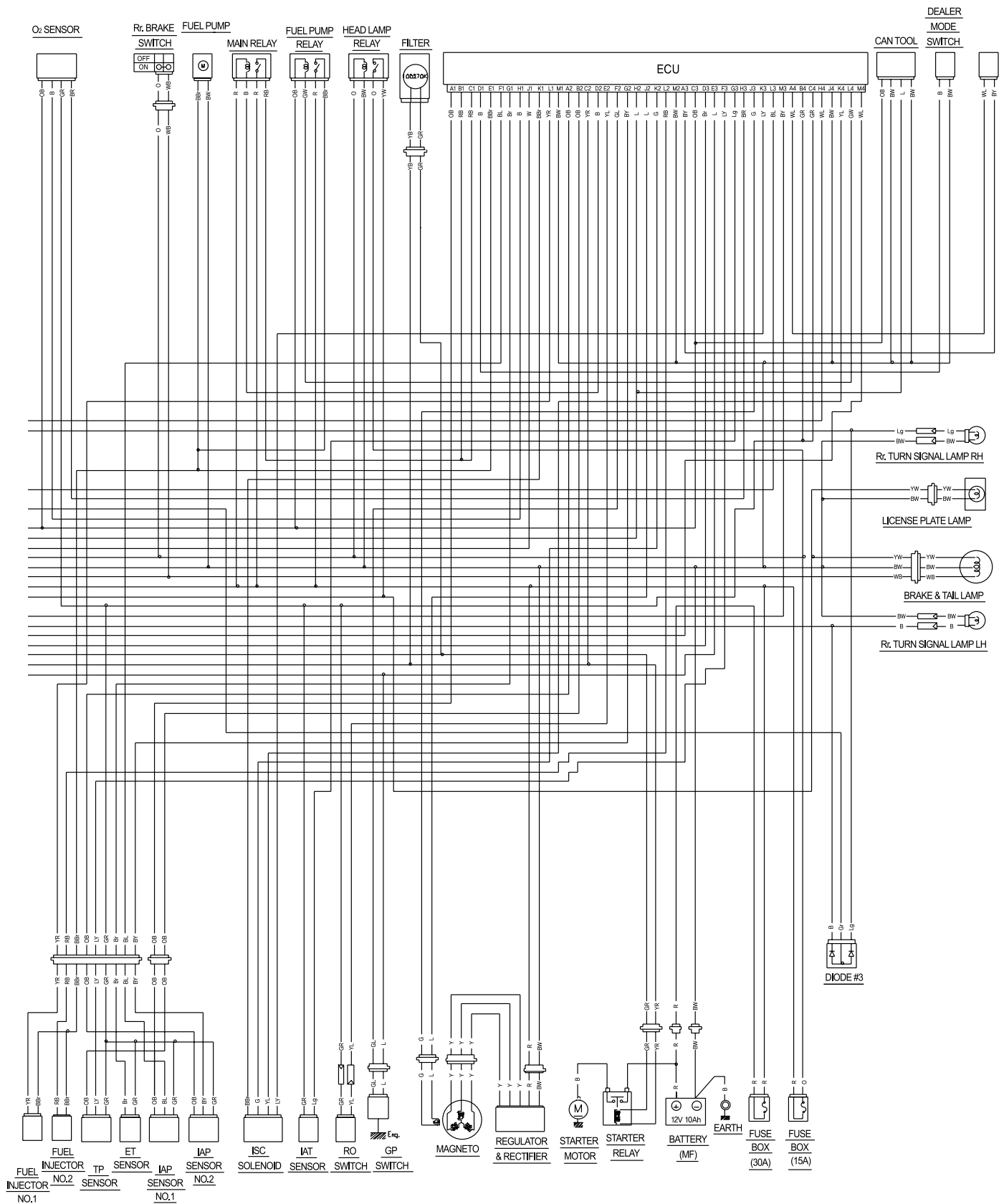
WIRING DIAGRAM (GT250REI)





WIRING DIAGRAM (*GT250EJ*)





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