

Ignition System

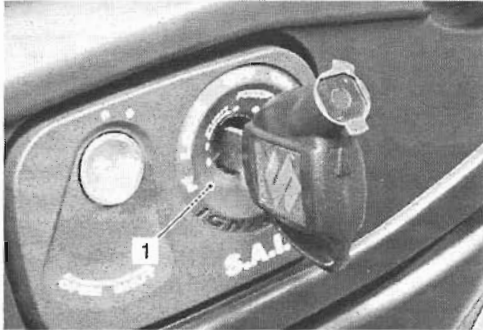
General Description

Immobilizer Description (For E-02, 19, 24, 54)

B705H21801001

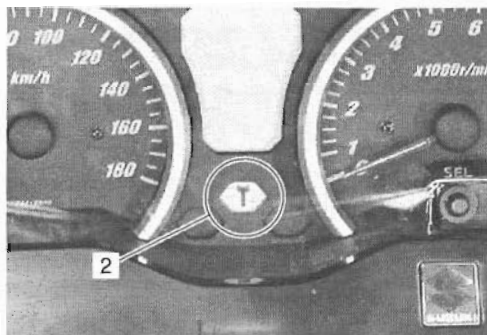
The immobilizer, an anti-theft system, is installed as a standard equipment.

The immobilizer verifies that the key ID agrees with ECM ID by means of radio communication through the immobilizer antenna. When the ID agreement is verified, the system makes the engine ready to start.



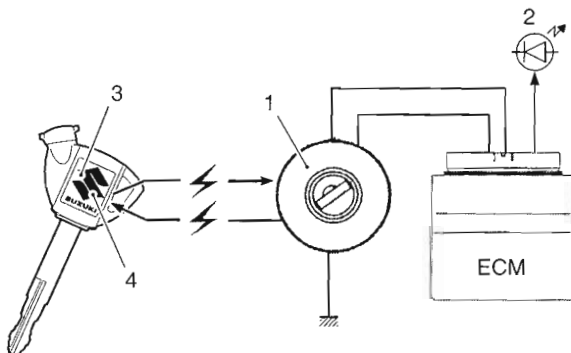
I705H1180001-02

1. Immobilizer antenna



I705H1180002-01

2. Indicator light



I705H1180003-01

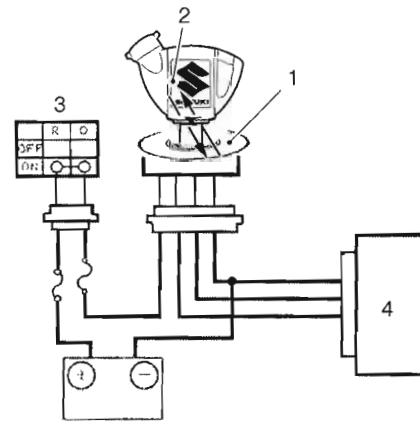
1. Immobilizer antenna	3. Transponder
2. Indicator light	4. ID

Operation

When the ignition switch is turned ON with the engine stop switch in ON, the immobi-antenna and ECM are powered ON.

The ECM transmits a signal to the transponder through the immobi-antenna in order to make comparison between the key ID and ECM ID.

With the signal received, the transponder transmits the key ID signal to ECM so that ECM can make comparison with its own ID, and if it matches, the engine is made ready to start.

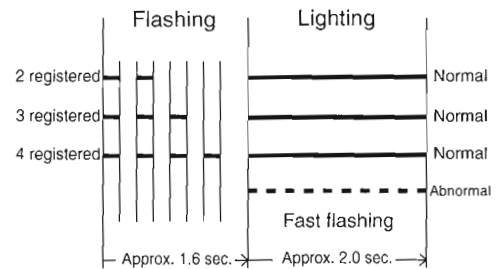


I705H1180004-01

1. Immobilizer antenna	3. Ignition switch
2. Transponder	4. ECM

Also, when the ignition switch is turned ON, the indicator light flashes as many as the number of IDs registered in ECM. Thereafter, if the IDs are in agreement, the indicator light turns on for two seconds to notify of completion in successful communication.

If the indicator light (LED) flashes fast, it notifies of communication error or disagreement of ID.



I705H1180006-01

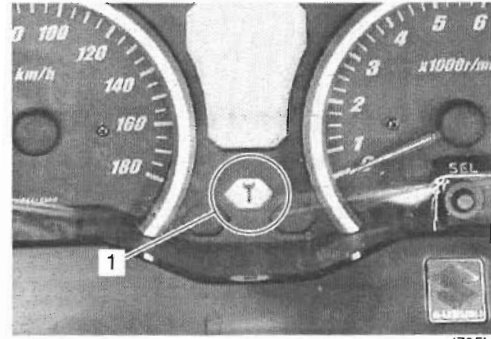
1H-2 Ignition System:

NOTE

If the indicator light flashes fast, turn the ignition switch OFF then ON to make judgment again as there is possible misjudgment due to environmental radio interference.

⚠ CAUTION

When the battery performance is lowered in winter (low temperature), the system may at times makes a re-judgment at the time of beginning the starter motor operation. In this case, the indicator light operation starts immediately after the starter operation.



I705H1180007-01

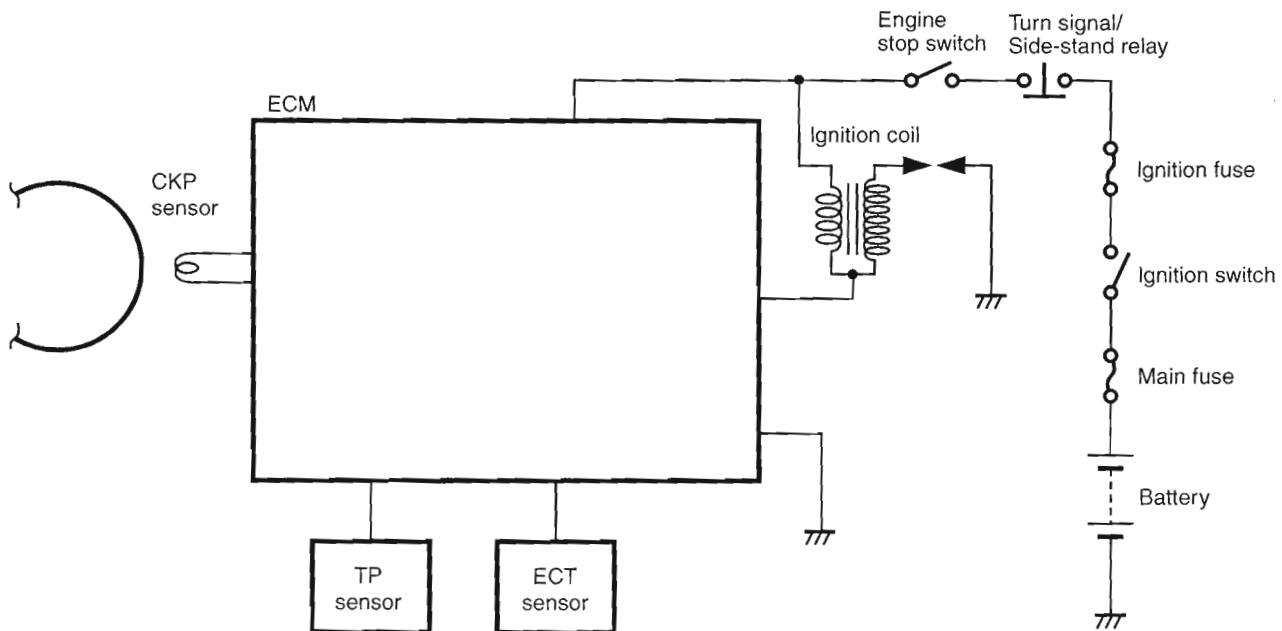
NOTE

In the case that the LED flashes fast, remains lit or unlit, the probable cause of such a failure may be due to abnormal condition in the key, key cylinder, wiring harness or ECM. (If such a failure exists, contact your distributor or dealer.)

Schematic and Routing Diagram

Ignition System Diagram

B705H21802001



I705H1180008-04

Diagnostic Information and Procedures

Ignition System Symptom Diagnosis

B705H21804001

Condition	Possible cause	Correction / Reference Item
Spark plug not sparking	Damaged spark plug.	<i>Replace.</i>
	Damaged spark plug cap.	<i>Replace.</i>
	Fouled spark plug.	<i>Clean or replace.</i>
	Wet spark plug.	<i>Clean and dry or replace.</i>
	Defective ignition coil.	<i>Replace.</i>
	Open or short in high-tension cord.	<i>Replace.</i>
	Defective CKP sensor.	<i>Replace.</i>
	Defective ECM.	<i>Replace.</i>
Engine stalls easily (No spark)	Fouled spark plug.	<i>Clean or replace.</i>
	Defective CKP sensor.	<i>Replace.</i>
	Defective ECM.	<i>Replace.</i>
Spark plug is wet or quickly becomes fouled with carbon	Excessively rich air/fuel mixture.	<i>Consult FI system.</i>
	Incorrect gasoline.	<i>Change.</i>
	Dirty air cleaner element.	<i>Replace.</i>
	Incorrect spark plug (Cold type).	<i>Change to hot type spark plug.</i>
Spark plug quickly becomes fouled with oil or carbon	Worn piston ring.	<i>Replace.</i>
	Worn piston.	<i>Replace.</i>
	Worn cylinder.	<i>Replace.</i>
	Excessive valve-stem to valve-guide clearance.	<i>Replace.</i>
	Worn valve stem oil seal.	<i>Replace.</i>
Spark plug electrodes overheat or burn	Incorrect spark plug (Hot type).	<i>Change to cold type spark plug.</i>
	Overheated engine.	<i>Tune-up.</i>
	Loose spark plug.	<i>Tighten.</i>
	Excessively lean air/fuel mixture.	<i>Consult FI system.</i>

1H-4 Ignition System:

No Spark or Poor Spark

B705H21804002

Troubleshooting

NOTE

Make sure the engine stop switch is in the "RUN" position and side-stand is in up-right position. Grasp the front or rear brake lever. Make sure the fuse is not blown and the battery is fully-charged before diagnosing.

Step	Action	Yes	No
1	Check the ignition system couplers for poor connections. <i>Is there connection in the ignition system couplers?</i>	Go to step 2.	Poor connection of couplers.
2	Measure the battery voltage between input lead wires (O/W and W) at the ECM with the ignition switch in the "ON" position. <i>Is the voltage OK?</i>	Go to Step 3.	<ul style="list-style-type: none"> Faulty ignition switch. Faulty turn signal/ side-stand relay. Faulty engine stop switch. Broken wire harness or poor connection of related circuit couplers.
3	Measure the ignition coil primary peak voltage. Refer to "Ignition Coil Inspection (Page1H-5)". NOTE This ignition coil primary peak voltage inspection method is applicable only with the multi-circuit tester and the peak volt adaptor. <i>Is the peak voltage OK?</i>	Go to step 4.	Go to step 5.
4	Inspect the spark plug. Refer to "Spark Plug Inspection and Cleaning in Section 0B (Page0B-4)". <i>Is the spark plug OK?</i>	Go to Step 5.	Faulty spark plug.
5	Inspect the ignition coil. Refer to "Ignition Coil Inspection (Page1H-5)". <i>Is the ignition coil(-s) OK?</i>	Go to step 6.	Faulty ignition coil(-s).
6	Measure the CKP sensor peak voltage and its resistance. Refer to "CKP Sensor Inspection (Page1H-6)". NOTE The CKP sensor peak voltage inspection is applicable only with the multi-circuit tester and peak volt adaptor. <i>Is the peak voltage and resistance OK?</i>	<ul style="list-style-type: none"> Faulty ECM. Poor connection of ignition couplers. 	<ul style="list-style-type: none"> Faulty CKP sensor. Metal particles or foreign material being stuck on the CKP sensor and rotor tip.

Repair Instructions

Spark Plug Removal and Installation

B705H21806001

Refer to "Spark Plug Removal and Installation in Section 0B (Page0B-3)".

Spark Plug Inspection and Cleaning

B705H21806002

Refer to "Spark Plug Inspection and Cleaning in Section 0B (Page0B-4)".

Ignition Coil Inspection

B705H21806003

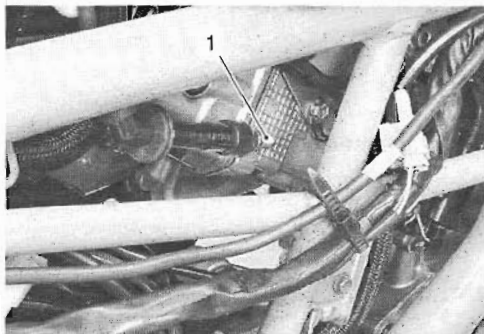
Refer to "Electrical Components Location in Section 0A (Page0A-7)".

Ignition Coil Primary Peak Voltage

- 1) Remove the left footboard. Refer to "Footboard Removal and Installation in Section 9D (Page9D-21)".
- 2) Disconnect the spark plug cap.
- 3) Connect new spark plug (1) to the spark plug cap and ground it on the cylinder.

NOTE

Be sure that the spark plug is connected properly and the battery used is in fully-charged condition.



I705H1180014-02

- 4) Connect the multi-circuit tester with the peak voltage adaptor as follows.

▲ WARNING

Do not touch the tester probes and spark plug to prevent an electric shock while testing.

NOTE

Do not disconnect the ignition coil lead wires.

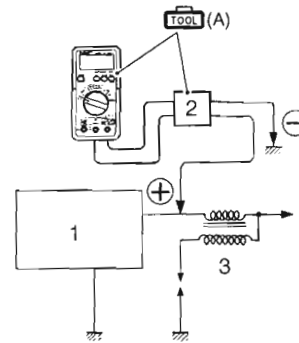
Special tool

(A): 09900-25008 (Multi-circuit tester set)

Tester knob indication

Voltage (---)

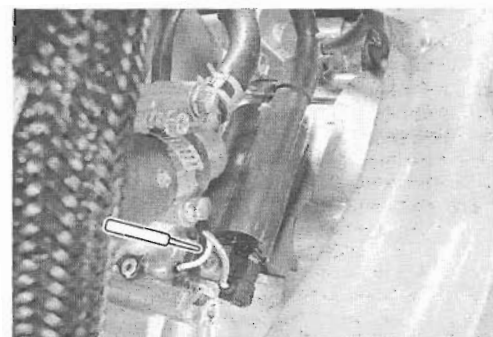
	(+) probe	(-) probe
Ignition coil:	W lead wire connector	Ground



I705H1180009-03

1. ECM	3. Ignition coil
2. Peak voltage adapter	

- 5) Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.



I705H1180015-01

1H-6 Ignition System:

- Repeat above procedures a few times and measure the highest ignition coil primary peak voltage. If the voltages are lower than standard values, inspect the ignition coil and the CKP sensor.

Ignition coil primary peak voltage 150 V and more

- After measuring the ignition coil primary peak voltage, reinstall the removed parts.

Ignition Coil Resistance

- Remove the left footboard. Refer to "Footboard Removal and Installation in Section 9D (Page9D-21)".
- Disconnect the spark plug cap.
- Disconnect the ignition coil lead wires.
- Measure the ignition coil resistance in both the primary and secondary windings.

Special tool

 : 09900-25008 (Multi-circuit tester set)

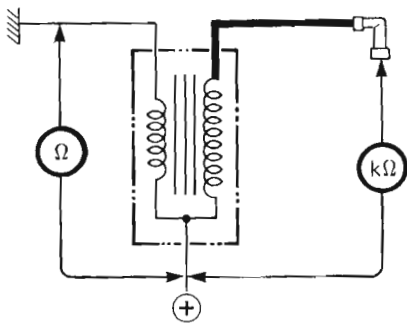
Ignition coil resistance

Primary: Approx. 1.2 – 3.5 Ω ((+) terminal – (-) terminal)

Secondary: Approx. 15 – 30 k Ω ((+) terminal – Spark plug cap)

Tester knob indication

Resistance (Ω)



I705H1180020-01

- After measure the ignition coil resistance, reinstall the removed parts.

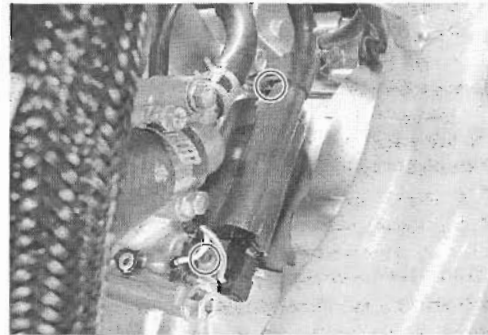
Ignition Coil Assembly Removal and Installation

B705H21806004

Refer to "Electrical Components Location in Section 0A (Page0A-7)".

Removal

- Remove the front frame cover and left footboard. Refer to "Footboard Removal and Installation in Section 9D (Page9D-21)".
- Disconnect the spark plug cap.
- Disconnect the lead wires and remove the ignition coil assembly.



I705H1180021-01

Installation

Install the ignition coil assembly in the reverse order of removal.

Spark Plug Removal and Installation

B705H21806005

Refer to "Spark Plug Inspection and Cleaning in Section 0B (Page0B-4)".

Spark Plug Inspection

B705H21806006

Refer to "Spark Plug Inspection and Cleaning in Section 0B (Page0B-4)".

CKP Sensor Inspection

B705H21806007

Refer to "Electrical Components Location in Section 0A (Page0A-7)".

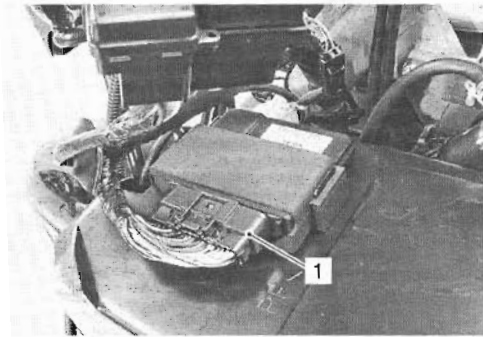
CKP Sensor Peak Voltage

- Remove the meter panel. Refer to "Meter Panel Removal and Installation in Section 9D (Page9D-14)".

- 2) Disconnect the ECM coupler (1).

NOTE

Make sure that all of the couplers are connected properly and the battery is fully-charged.



I705H1180017-01

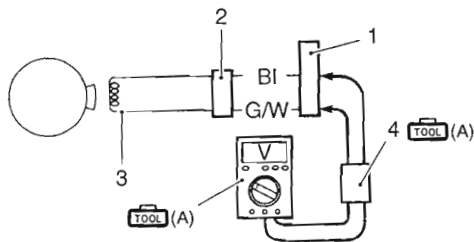
- 3) Connect the multi-circuit tester with the peak volt adaptor as follows.

Special tool

TOOL (A): 09900-25008 (Multi-circuit tester set)

Tester knob indication: Voltage (---)

ECM coupler	(+) probe G/W	(-) probe BI
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I705H1180022-03

1. ECM coupler	3. CKP sensor
2. CKP sensor coupler	4. Peak voltage adaptor

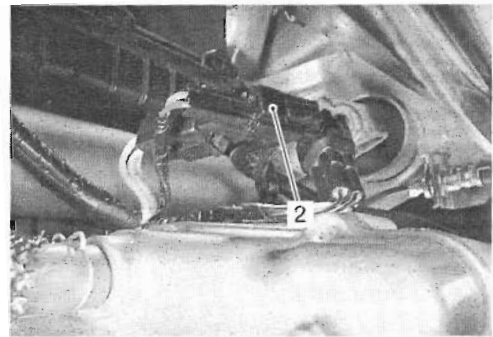
- 4) Measure the CKP sensor peak voltage in the following procedures:
- Press the starter button and allow the engine to crank for a few seconds, and then measure the CKP sensor peak voltage.
- 5) Repeat the above procedures a few times and measure the highest CKP sensor peak voltage.

CKP sensor peak voltage

4.5 V and more (G/W – BI)

- 6) If the peak voltage measured on the ECM coupler is lower than the standard value, measure the peak voltage on the CKP sensor coupler as follows.

- a) Disconnect the CKP sensor coupler (2).



I705H1180011-03

- b) Connect the multi-circuit tester with the peak voltage adaptor.

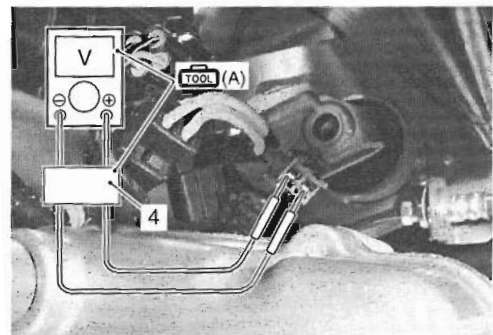
Special tool

TOOL (A): 09900-25008 (Multi-circuit tester set)

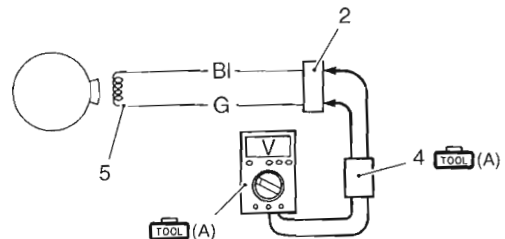
Tester knob indication

Voltage (---)

CKP sensor coupler	(+) probe G	(-) probe BI
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I705H1180012-04



I705H1180023-04

2. CKP sensor coupler
4. Peak volt adaptor
5. CKP sensor

1H-8 Ignition System:

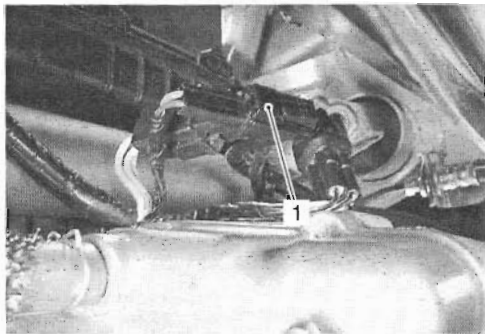
- c) Measure the CKP sensor peak voltage in the same manner as on the ECM coupler. If the peak voltage on the CKP sensor lead wire couplers is within specification, but on the ECM coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the CKP sensor must be replaced and rechecked.

CKP sensor peak voltage 4.5 V and more (G – BI)

- 7) After measuring the CKP sensor peak voltage, reinstall the removed parts.

CKP Sensor Resistance

- 1) Disconnect the CKP sensor coupler (1).

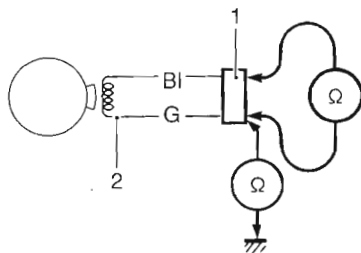


1705H1180025-01

- 2) Measure the resistance between the lead wires and ground. If the resistance is not within the specified value, the CKP sensor must be replaced. Refer to "CKP Sensor Removal and Installation (Page1H-8)".

Tester knob indication Resistance (Ω)

CKP sensor resistance Approx. 190 – 290 Ω (G – BI) $\infty \Omega$ (G – Ground)



1705H1180024-02

1. CKP sensor coupler	2. CKP sensor
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- 3) After measuring the CKP sensor resistance, reinstall the removed parts.

CKP Sensor Removal and Installation

B705H21806008

Refer to "CKP Sensor Removal and Installation in Section 1C (Page1C-1)".

Engine Stop Switch Inspection

B705H21806009

Refer to "Engine Stop Switch Inspection in Section 9B (Page9B-10)".

Ignition Switch Inspection

B705H21806010

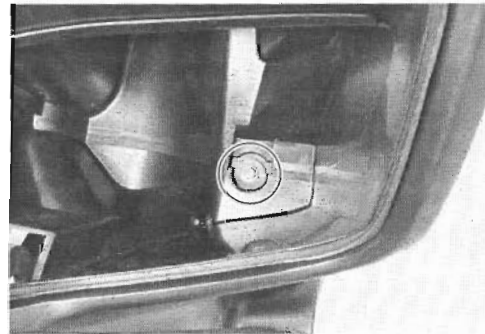
Refer to "Ignition Switch Inspection in Section 9B (Page9B-11)".

Ignition Switch Removal and Installation

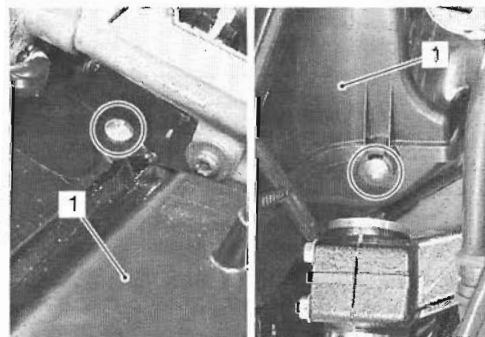
B705H21806011

Removal

- 1) Disconnect the battery (–) cable.
- 2) Remove the front leg shield. Refer to "Front Leg Shield Cover Removal and Installation in Section 9D (Page9D-13)".
- 3) Remove the right front box inner cover (1).



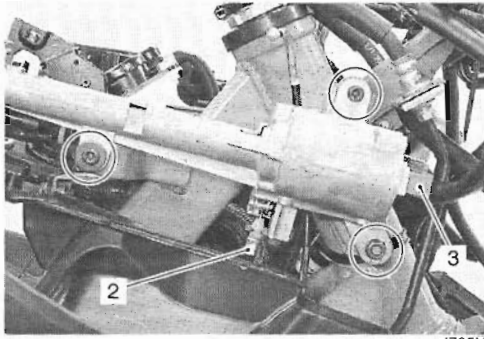
1705H1180026-01



1705H1180027-01

- 4) Disconnect the immobilizer coupler. (Only for E-02, 19, 24, 54)
- 5) Disconnect the ignition switch coupler (2).
- 6) Remove the ignition switch.

7) Disconnect the seat-lock cable (3).



I705H1180028-01

Installation

Installation is in the reverse order of removal.

Specifications

Service Data

B705H21807001

Electrical

Unit: mm (in)

Item	Standard / specification		Note
Spark performance	Over 8.0 (0.3) at 1 atm.		
CKP sensor resistance	190 – 290 Ω		G – BI
CKP sensor peak voltage	4.5 V and more		(+) probe: G/W, (-) probe: BI
Ignition coil resistance	Primary	1.2 – 3.5 Ω	
	Secondary	15 – 30 kΩ	
Ignition coil primary peak voltage	150 V and more (When cranking)		(+) probe: W, (-) probe: Ground

Special Tools and Equipment

Special Tool

B705H21808001

<p>09900–25008 Multi-circuit tester set ☞ (Page1H-5) / ☞ (Page1H-6) / ☞ (Page1H-7) / ☞ (Page1H-7)</p>		
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