ELECTRICAL SYSTEM

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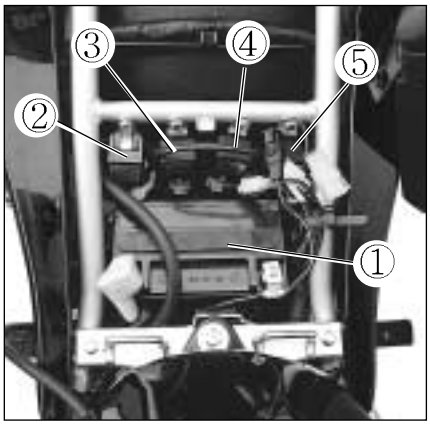
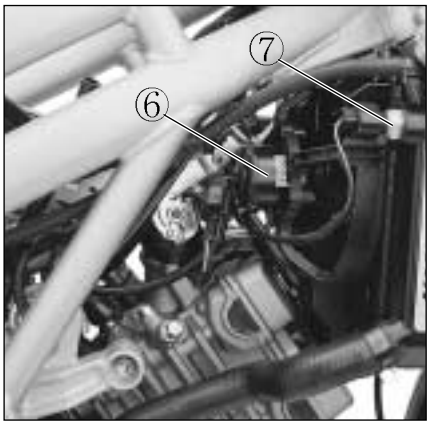
LOCATION OF ELECTRICAL COMPONENTS

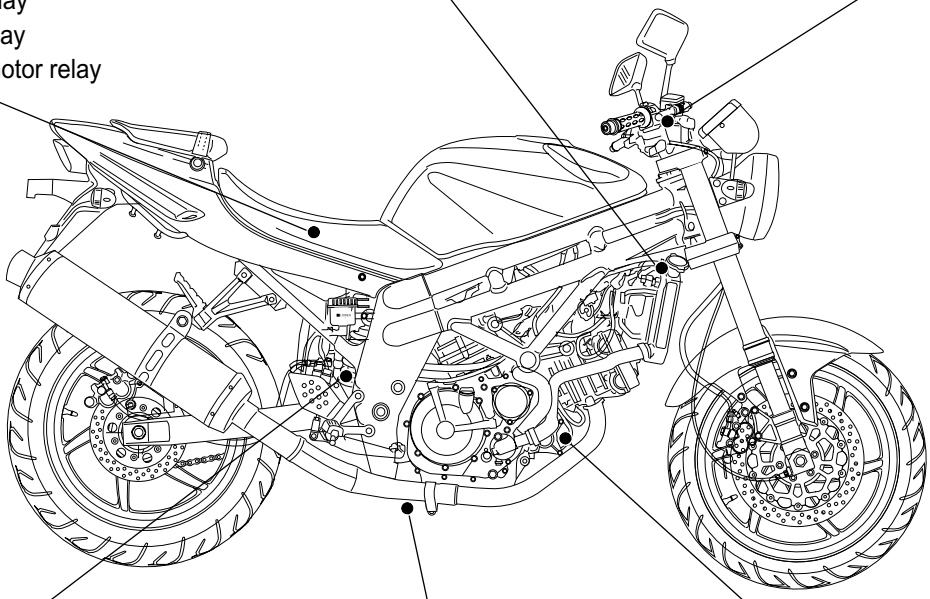


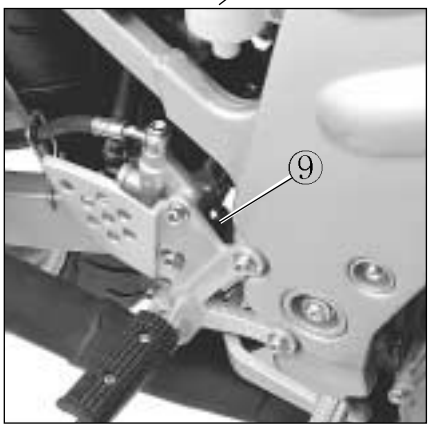


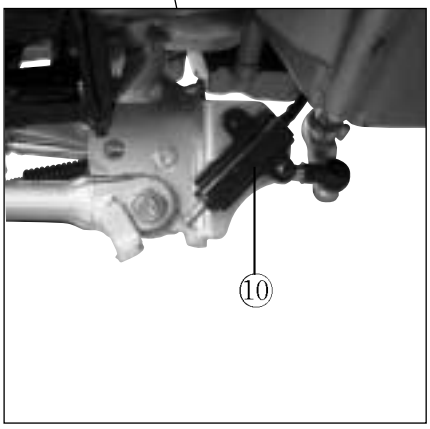
① Battery
② Turn signal relay
③ Head lamp relay
④ Side stand relay
⑤ Cooling fan motor relay

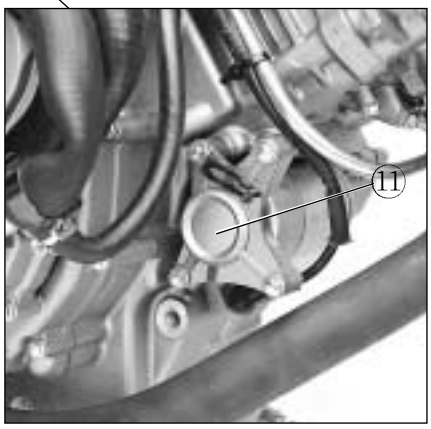
⑥ Cooling fan motor
⑦ Cooling fan thermo-switch

⑧ Front brake lamp switch





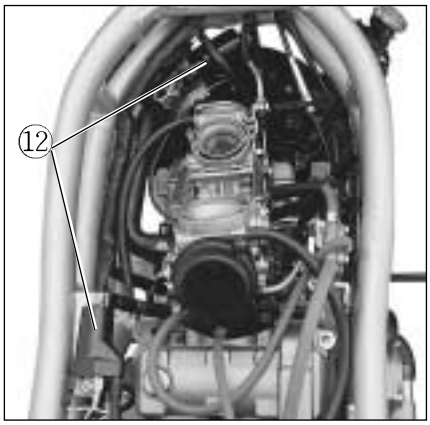




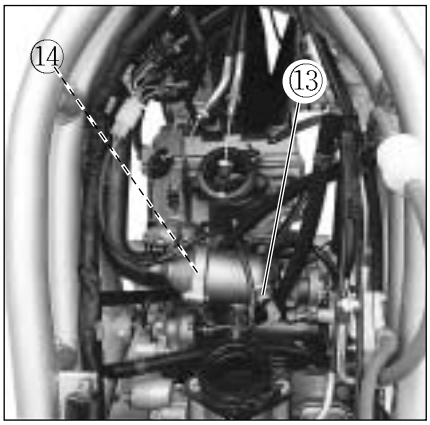
⑨ Rear brake lamp switch

⑩ Side stand switch

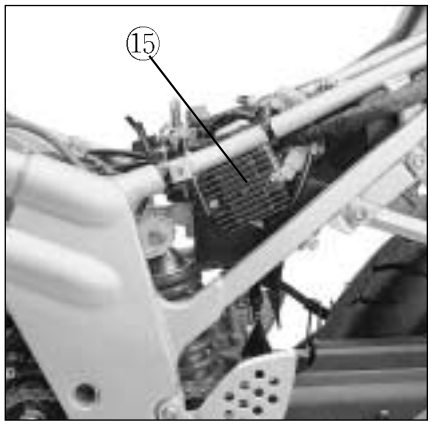
⑪ Starter motor



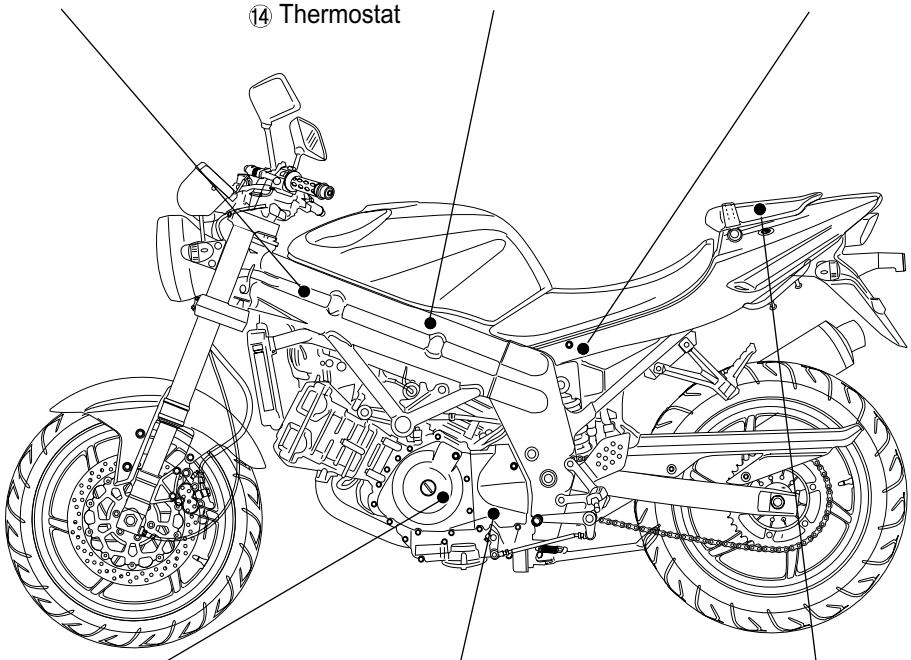
⑫ Ignition coil (NO.1 & NO.2)

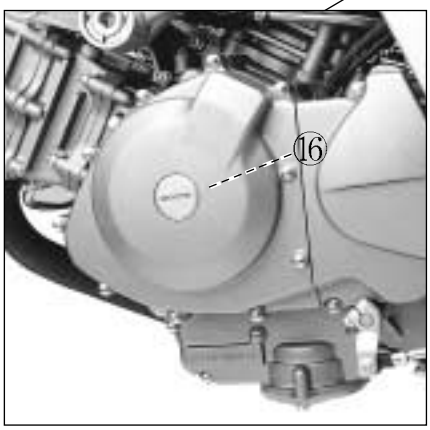


⑬ Engine coolant temperature sensor
⑭ Thermostat

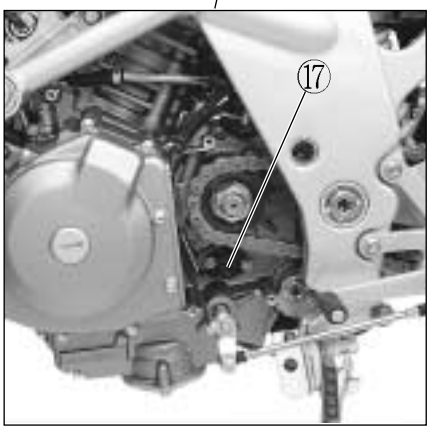


⑮ Regulator / Rectifier

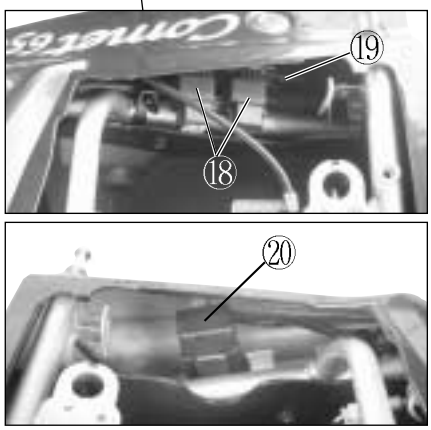




⑯ Magneto



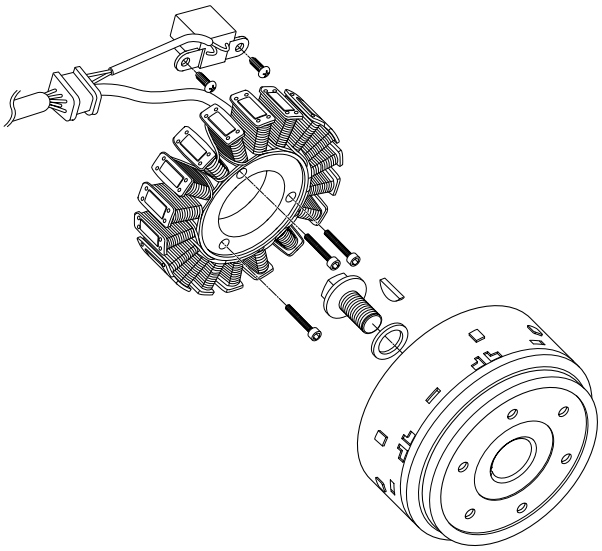
⑰ Gear position switch



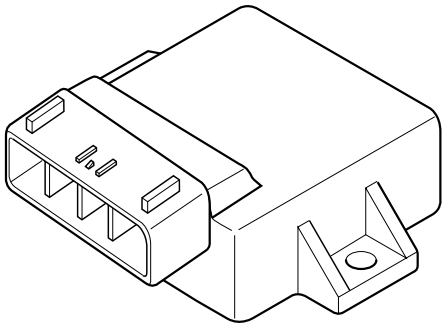
⑱ Fuse
⑲ Igniter
⑳ Pulse control unit

IGNITION SYSTEM

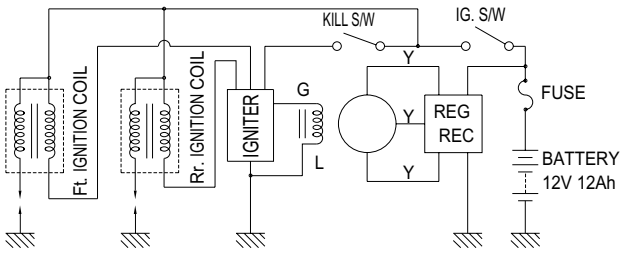
『Comet 650』is started as the battery discharged ignition system without a contact point. The battery ignition system is composed a rotor with four rotor tip, the igniter, the ignition coil and battery. This system ignites after get signal from ignition timing of pick-up with the electric energy of this battery and occur the 1st electric current. Therefore, a high voltage current is induced in the secondary winding of the ignition coil and results in strong spark between spark plug gap.

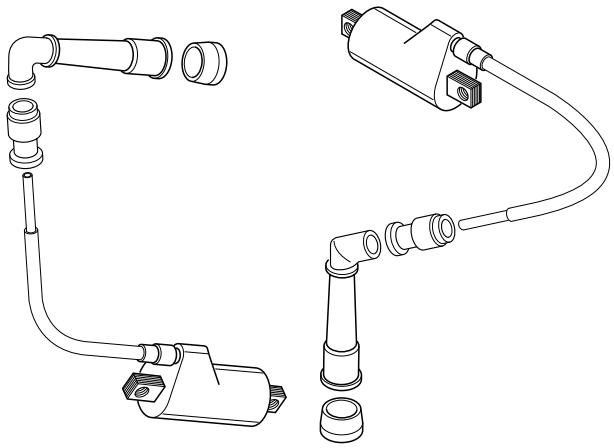


Magneto



Igniter





Ignition coil & Spark plug

⊙ INSPECTION

■ MAGNETO

Using the pocket tester, measure the resistance between the lead wires in the following table.

Pick-up coil	G - L 90 ~ 110 Ω
Charging coil	Y - Y 0.3 ~ 0.8 Ω

TOOL **Pocket Tester : 09900-25002**

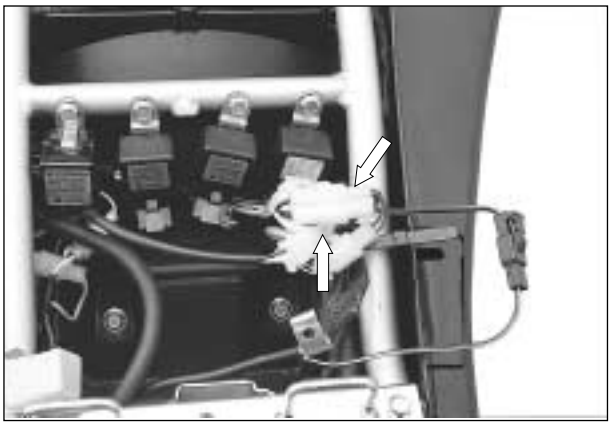
⚠ CAUTION

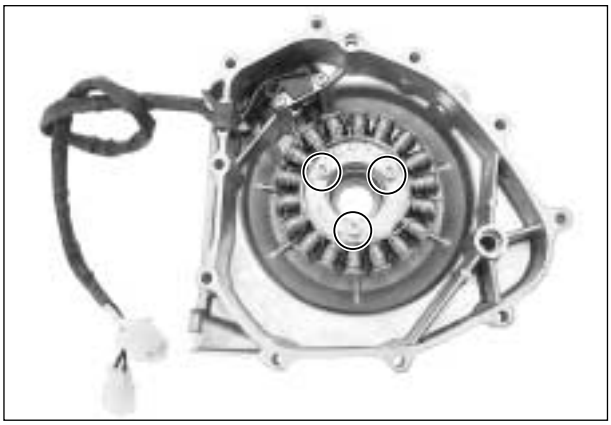
When mounting the stator on the magneto cover, apply a small quantity of THREAD LOCK "1324" to the threaded parts of screws.

1324 **THREAD LOCK "1324"**

WIRE COLOR

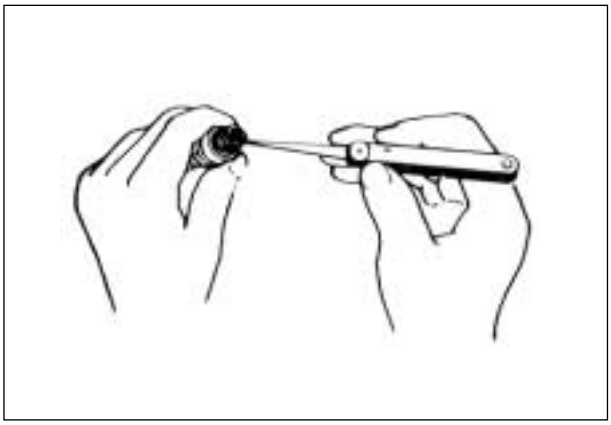
L : Blue
G : Green
Y : Yellow
BY : Black with Yellow tracer
OB : Orange with Black tracer
Br : Brown
BW : Black with White tracer
WL : White with Blue tracer
YG : Yellow with Green tracer





■ SPARK PLUG

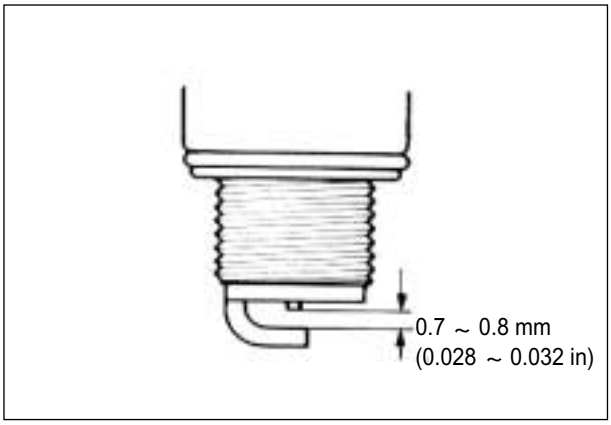
Clean the plug with a wire brush and pin. Use the pin to remove carbon, taking care not to damage the porcelain.



● Check the gap with a thickness gauge.

TOOL **Thickness gauge : 09900-20806**

Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.032 in)

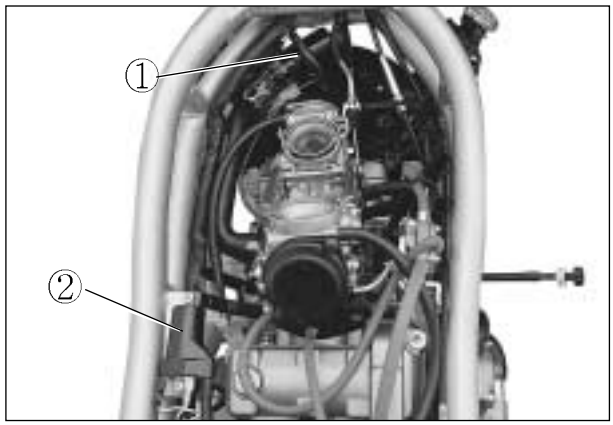


■ IGNITION COIL

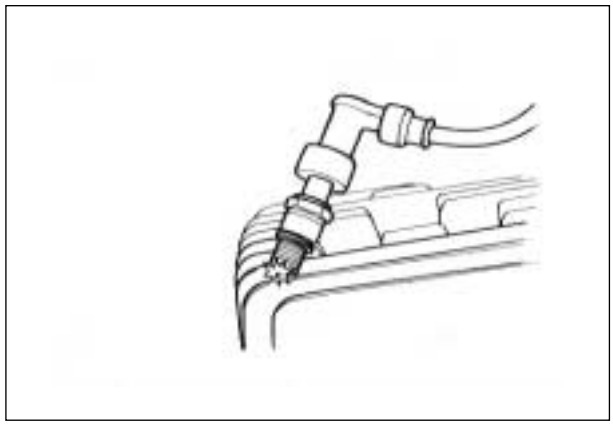
- Pull out the spark plug.
- Place it on the cylinder head after installing it at the plug cap to obtain ground.
- Push the electric starter switch to rotate the starter motor, to have the test of sparking performance.
- If spark doesn't emit or the spark bring out the orange color, replace the ignition coil.

⚠ CAUTION

The ignition coil is marked the "F" for front, and the "R" for rear.
If otherwise, it may occure severe damage to the engine.



①Front cylinder ignition coil ②Rear cylinder ignition coil

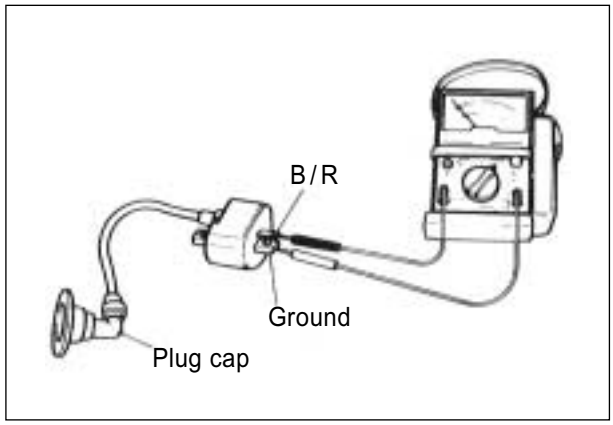


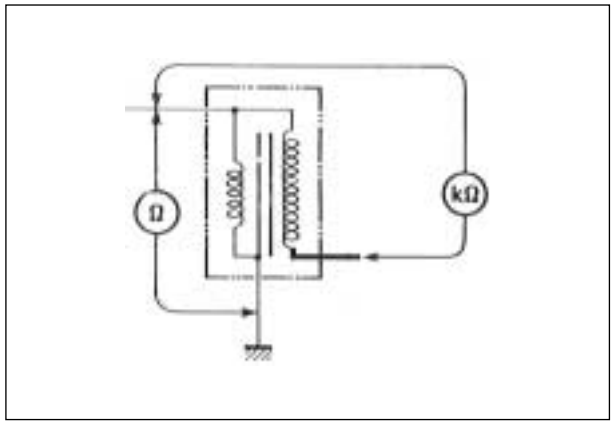
■ IGNITION COIL (Checking with Pocket Tester)

- A pocket tester or an ohm meter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings. Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with approximate ohmic values.

Ignition coil resistance		
Primary	3.5～5.5 Ω	Tester knob indication × 1 Ω range
Secondary	20 ～31 kΩ	Tester knob indication × 1kΩ range
Check to attached plug cap		

TOOL **Pocket tester : 09900-25002**



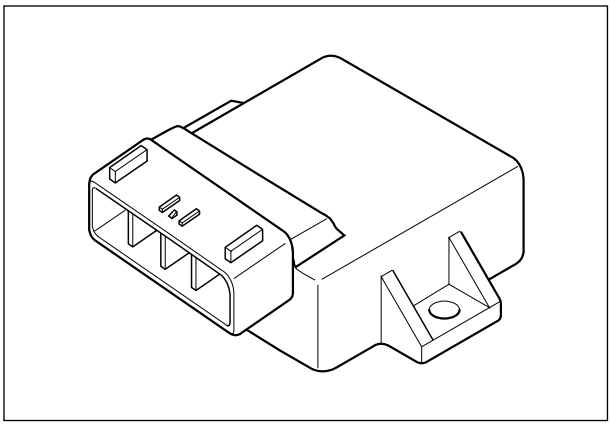


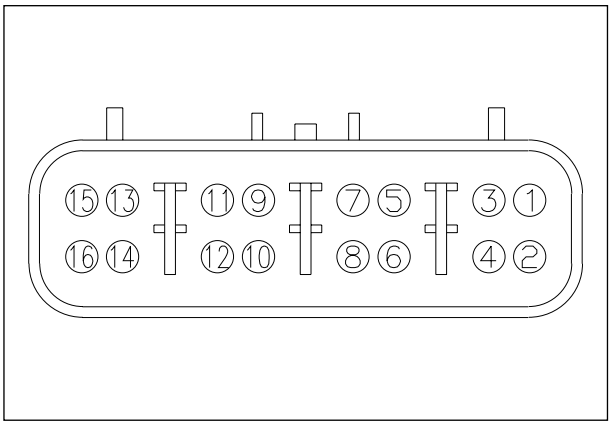
■ **IGNITER**

Using the pocket tester(R × 1kΩ range), measure the resistance between the terminal in the following table.

⚠ CAUTION

- ❖ **Numberical value may differ a little according to the tester.**
- ❖ **Please remind that there may be a defect which can not be identified even though the measurement by using the tester indicates a low voltage.**
- ❖ **The range of measurement adjust a [x 1kΩ] unit.**





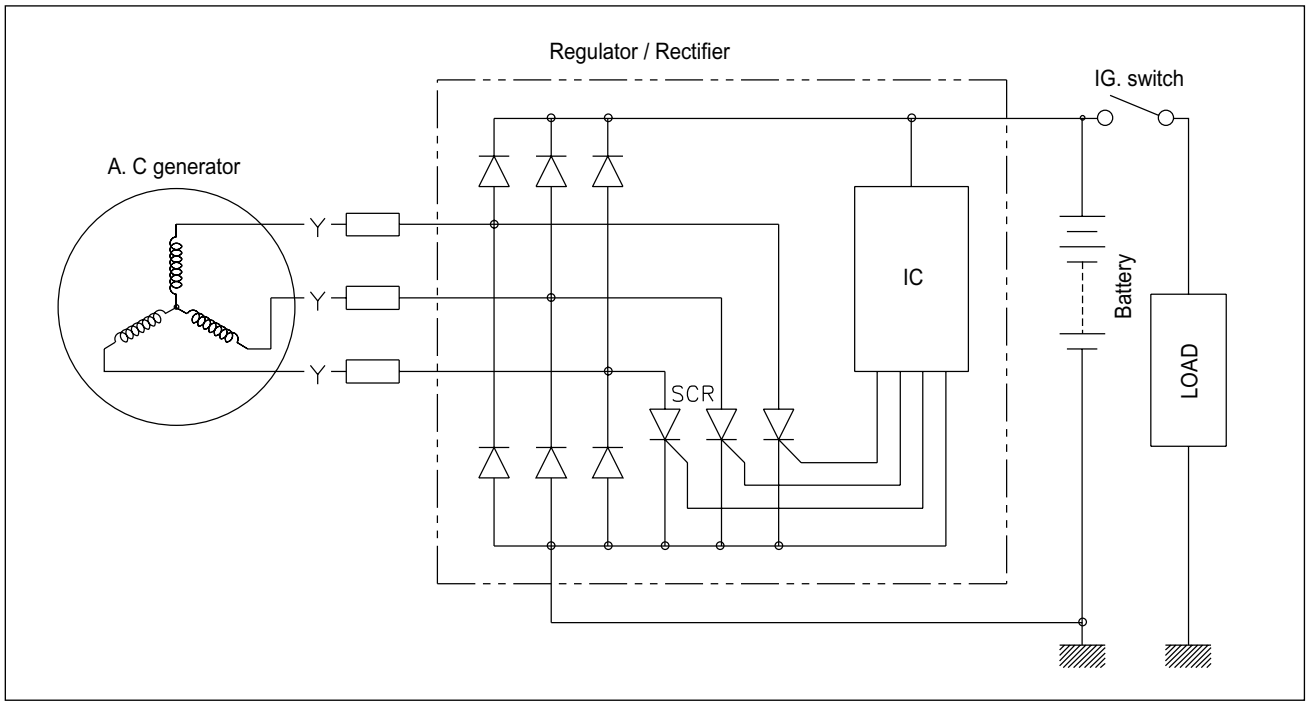
TOOL **Pocket Tester : 09900-25002**

Unit : kΩ

⊖ TESTER PROBE	⊕ TESTER PROBE ①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
①		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
②	OFF		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
③	310	320		22.5	27.5	OFF	11.5	46	29.5	27	28	22.5	66	37	11.5	26.6
④	225	230	3.7		3.5	OFF	10.5	12	4.8	3.4	3.8	0	57.5	8	8.9	2.8
⑤	225	230	12	3.5		OFF	12	15.2	3.3	1.7	2.2	3.5	61	11.4	10.8	1.1
⑥	OFF	OFF	OFF	OFF	OFF		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
⑦	255	260	27	13.9	17.9	OFF		32.1	19.2	17.7	18.2	14	49	25.5	5.9	17.1
⑧	OFF	OFF	OFF	OFF	OFF	OFF	OFF		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
⑨	230	235	13.7	4.8	3.3	OFF	13.5	17		3	1.1	4.9	63	13	12.1	2.3
⑩	230	235	12	3.2	1.7	OFF	10.9	15	3.0		1.7	3.2	60	11	10	0.7
⑪	225	230	12.5	3.9	2.1	OFF	12.1	15.6	1.1	1.9		3.9	62	11.9	11	1.2
⑫	220	225	8.7	0	3.5	OFF	10.6	12.2	4.9	3.3	3.8		58	8	9	2.9
⑬	410	415	225	187	100	OFF	210	235	189	189	190	187		220	205	183
⑭	250	255	22	10.7	9.1	OFF	22	26.5	10.3	8.8	9.1	10.7	86		20.4	8
⑮	250	260	20.5	9.2	12.5	OFF	5.8	26	14.2	12.4	13	9.1	42.5	19.5		11.9
⑯	220	225	11.3	2.9	1.1	OFF	11	14.2	2.3	0.8	1.1	2.9	60	10.8	10.1	

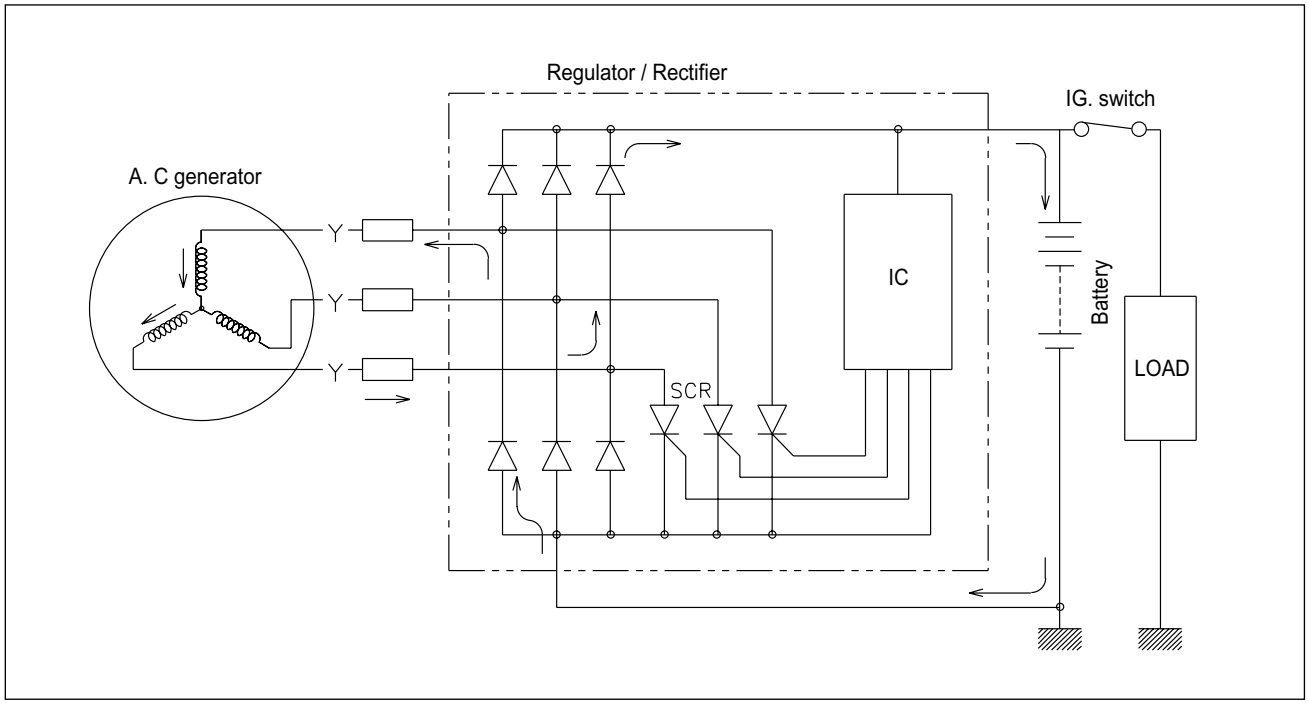
CHARGING SYSTEM

The circuit of the charging system is indicated in figure, which is composed of the AC generator, regulator / rectifier unit and battery. The AC current generated from the AC generator is converted by the rectifier and is turned into the DC current, then it charges the battery.

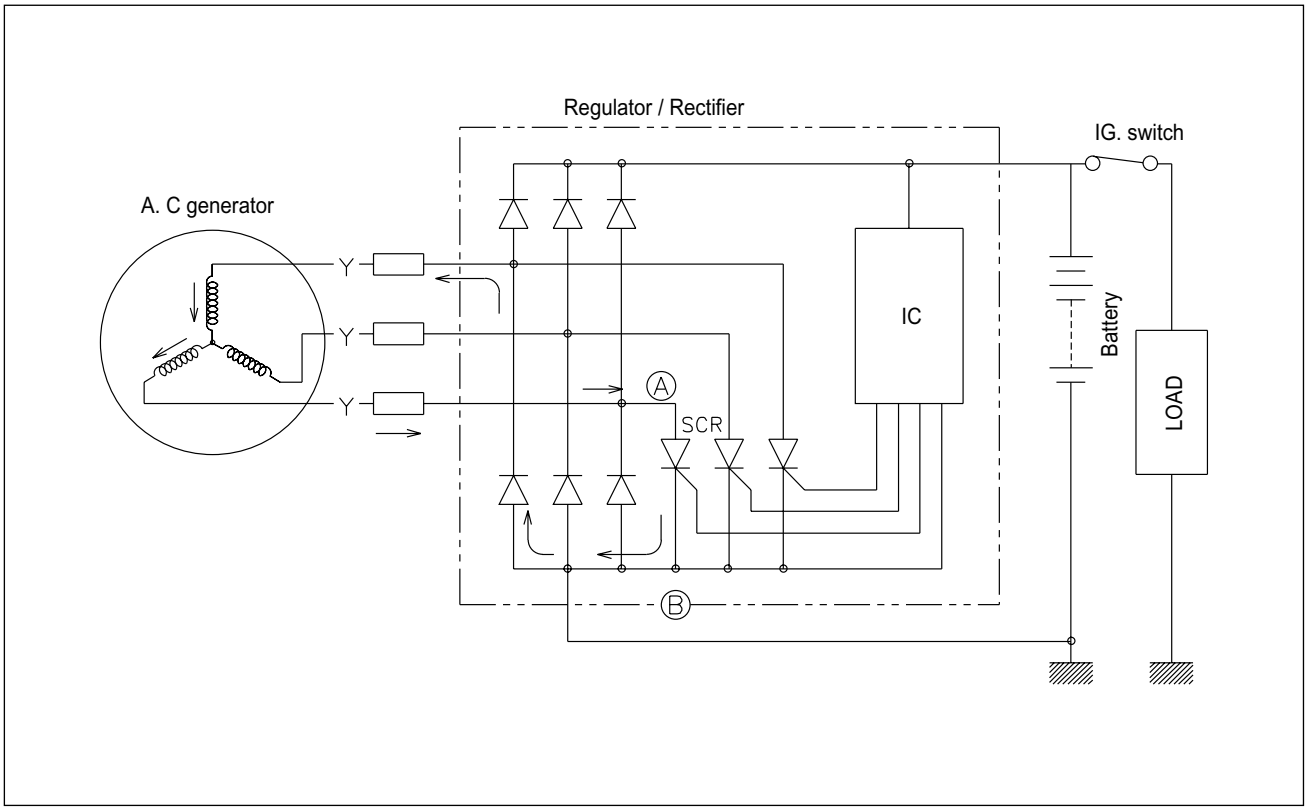


⊙ FUNCTION OF REGULATOR

While the engine rpm is low and the generated current of the AC generator is lower than the adjusted voltage of the regulator, the regulator does not function, incidentally the generated current charges the battery directly.



When the engine rpm become higher, the generated voltage of the AC generator also becomes higher and the voltage between points Ⓐ and Ⓑ of the regulator according becomes high, and when it reaches the adjusted voltage of the control unit, consequently the control unit becomes "ON" condition. On the "ON" condition of the control unit, signal will be sent to the SCR (Thyristor) gate probe and SCR will become "ON" condition. Then the SCR becomes conductive to the direction from point Ⓐ to point Ⓑ. Namely at the state of this, the current generated from the AC generator gets through SCR without charging the battery and returns to the AC generator again. At the end of this state, since the AC current generated from the AC generator flows into the point Ⓑ, reverse current tends to flow to SCR, then the circuit of SCR turns to "OFF" mode and begins to charge the battery again. Thus these repetitions maintain charging constant voltage to the battry and protect it from overcharging.



⊙ INSPECTION

■ CHARGING OUTPUT CHECK

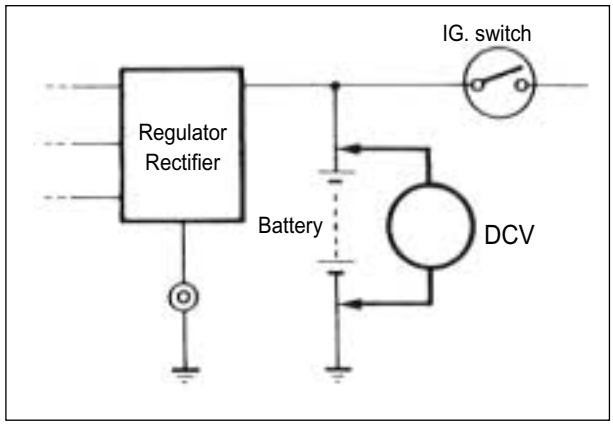
Start the engine and keep it running at 5,000 rpm.
Using the pocket tester, measure the DC voltage between the battery terminal ⊕ and ⊖.
If the tester reads under 13.5V or over 15.0 V, check the magneto no-load performance and regulator / rectifier.

⚠ CAUTION

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

TOOL **Pocket tester : 09900-25002**

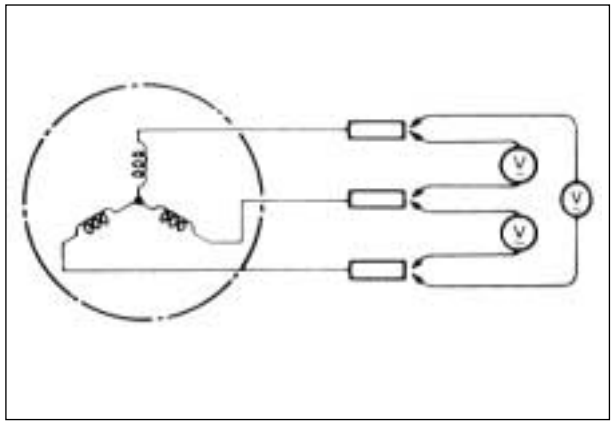
Standard charge	13.5～15.0V (at 5,000 rpm)



■ 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 tester reads under 70 V the magneto is faulty.

Standard NO-load performance of magneto	Over 70 V (at 5,000 rpm)



■ REGULATOR / RECTIFIER

● Disconnect the coupler.

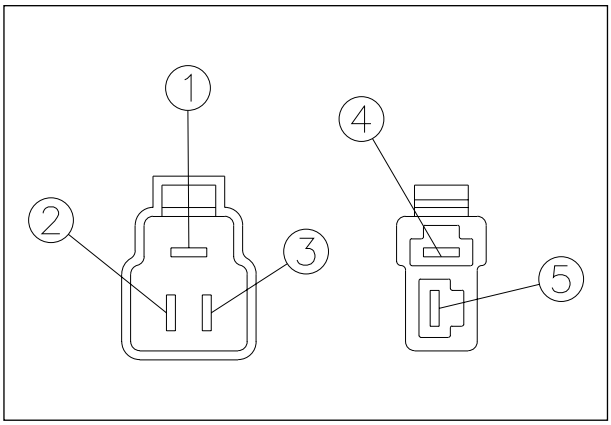
● Using the pocket tester (× 1 MΩ range), measure the resistance between the terminals in the following table.

If the resistance checked is incorrect, replace the regu lator / rectifier.

TOOL **Pocket tester : 09900-25002**

Unit : MΩ

⊖ Tester probe \ ⊕ Tester probe	①	②	③	④	⑤
①		3 ~ 4 MΩ	3 ~ 4 MΩ	1 ~ 2 MΩ	1 ~ 2 MΩ
②	3 ~ 4 MΩ		3 ~ 4 MΩ	1 ~ 2 MΩ	1 ~ 2 MΩ
③	3 ~ 4 MΩ	3 ~ 4 MΩ		1 ~ 2 MΩ	1 ~ 2 MΩ
④	1 ~ 2 MΩ	1 ~ 2 MΩ	1 ~ 2 MΩ		32 kΩ
⑤	1 ~ 2 MΩ	1 ~ 2 MΩ	1 ~ 2 MΩ	32 kΩ	



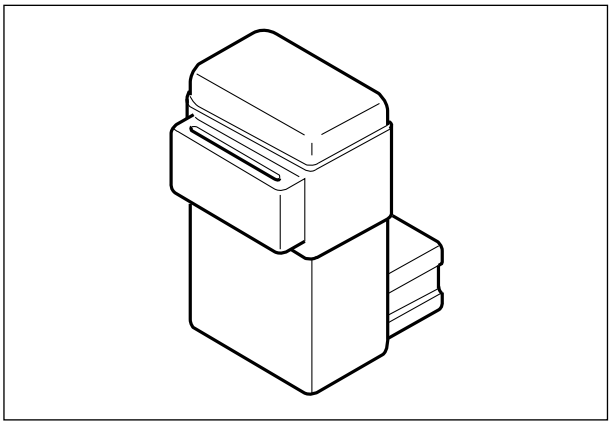
■ PULSE CONTROL UNIT

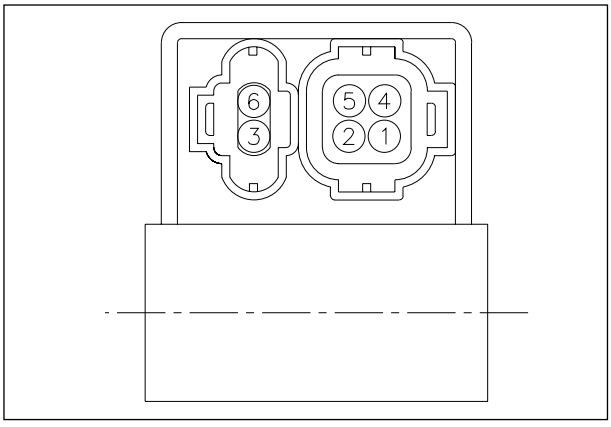
● Using the pocket tester (R × 1 kΩ range), measure the resistance between the terminals in the following table.

TOOL **Pocket tester : 09900-25002**

Unit : kΩ

⊖ TESTER PROBE \ ⊕ TESTER PROBE	①	②	③	④	⑤	⑥
①		10~500	10~500	off	10~500	off
②	off		off	off	1~100	off
③	10~500	10~300		off	10~500	off
④	10~500	10~300	10~500		10~500	off
⑤	10~500	10~500	10~500	off		off
⑥	off	off	off	off	off	

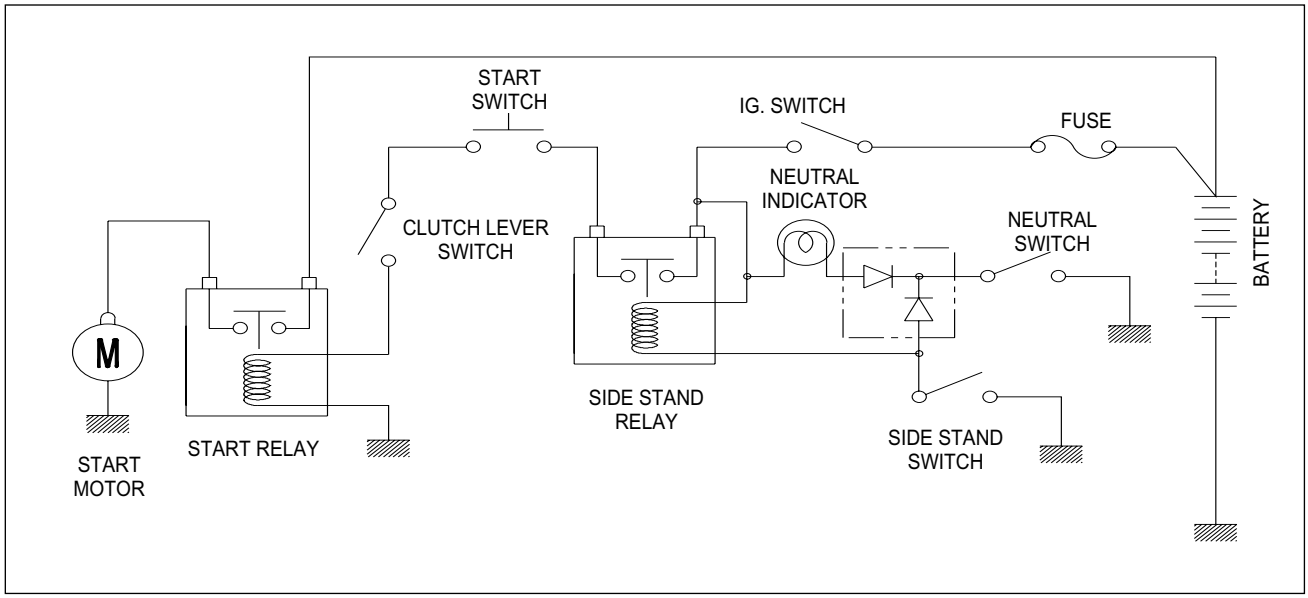




STARTER SYSTEM AND SIDE STAND IGNITION INTERLOCK SYSTEM

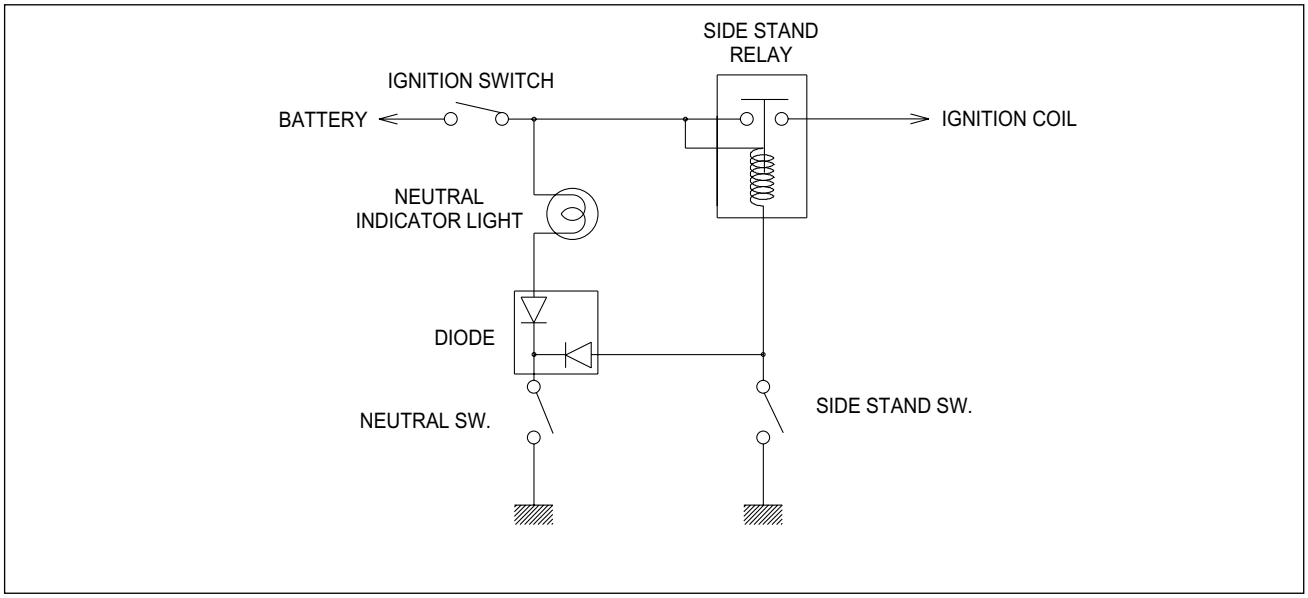
⊙ STARTER SYSTEM DESCRIPTION

The starter system consists of the following components : the starter motor, starter relay, clutch lever position switch, igniter, side stand switch, gear position switch, starter switch, engine stop switch, ignition switch and battery.
Pressing the starter switch (on the right handlebar switch) energizes the starter relay, causing the contact points to close, thus completing the circuit from the starter motor to the battery.

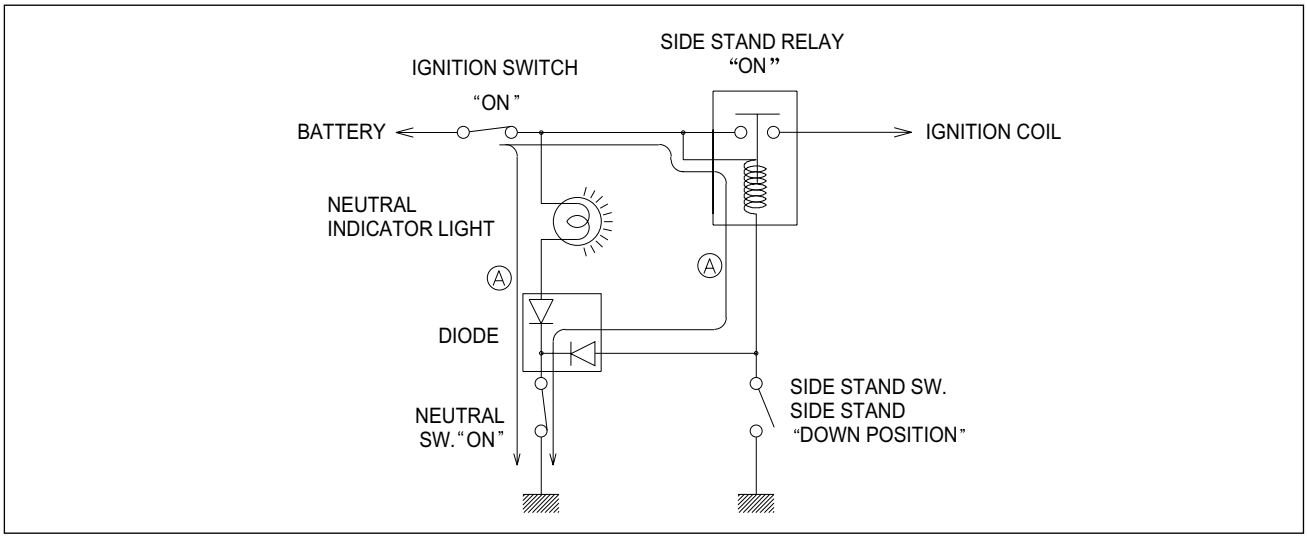


⊙ SIDE STAND / IGNITION INTERLOCK SYSTEM DESCRIPTION

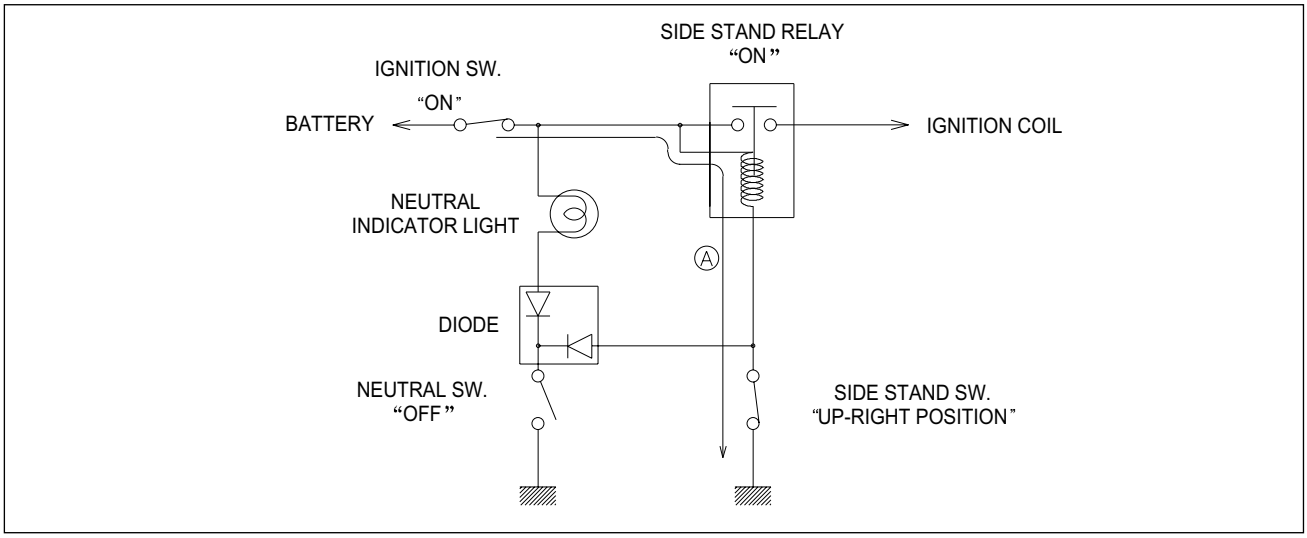
This side stand / ignition interlock system prevents the motorcycle from being started with side stand down.
The system is operated by an electric circuit provided between the battery and ignition coil.
The circuit consists of the igniter, neutral indicator light and switches.
The ignition coils will send voltage to the spark plugs dependant on what gear the transmission is in and whether the side stand is either up or down.
The gear position and side stand switches work together in this system.
The ignition coil work only in two situations as follows.



■ **TRANSMISSION :** Neutral - "ON"
Side stand - Down
Clutch lever - Pull



■ **TRANSMISSION :** Neutral - "OFF"
Side stand - Up
Clutch lever - Pull



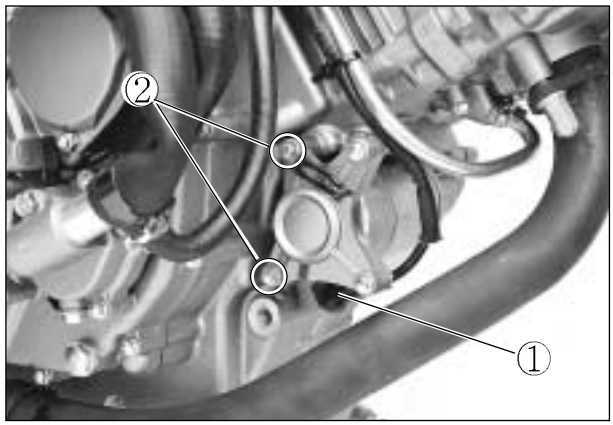
『Comet650』is equipped with the side stand ignition interlock system.
If the transmission is in neutral or side stand up, you can only start the engine with pulling in the clutch lever.

No	Neutral switch	Clutch lever	Side stand	Engine Start
1	●	●	△	Possible
2	△	●	●	Possible
3	●	△	△	Impossible
4	△	●	△	Impossible
5	△	△	●	Impossible

NOTE	
●	*On or Up.*
△	*Off or Down*

⊙ STARTER MOTOR REMOVAL AND DISASSEMBLY

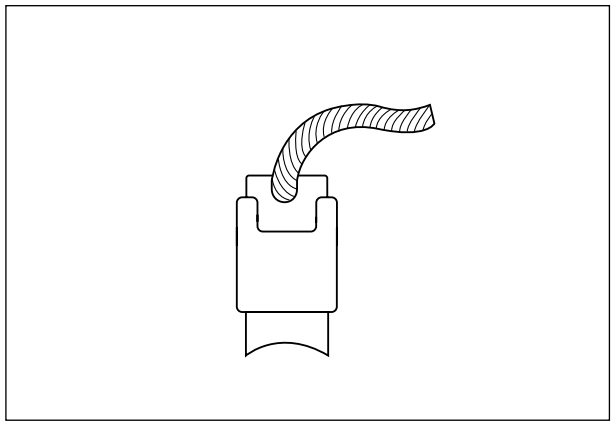
- Disconnect the starter motor lead wire ①.
- With loosening the bolt ②, remove the starter motor.
- Disassemble the starter motor.



⊙ STARTER MOTOR INSPECTION

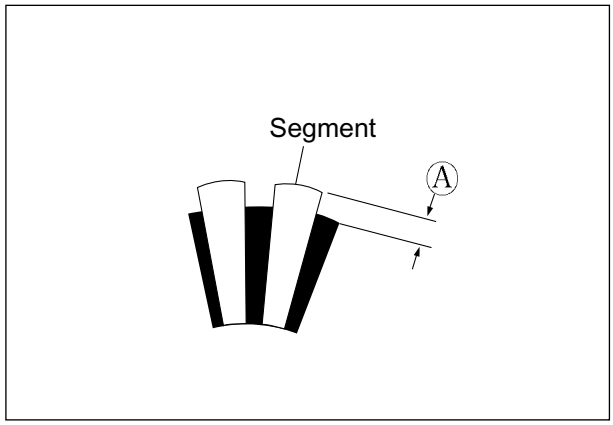
■ CARBON BRUSH

Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.
If the brush has failed, replace the brush sub assy.



■ COMMUTATOR

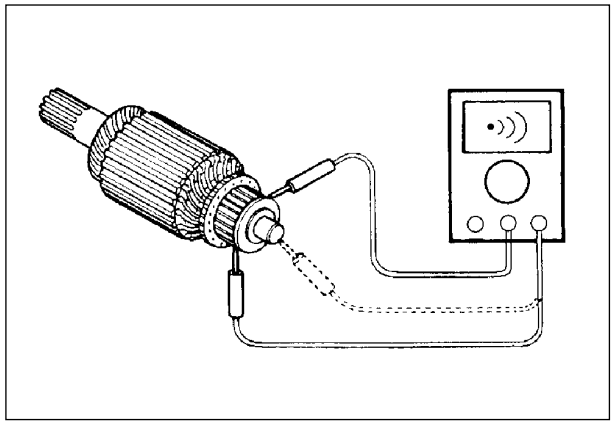
Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ.
If the commutator is abnomally worn, replace the armature.
When surface is discolored, polish it with #400 sand paper and clean it with dry cloth.



■ ARMATURE COIL INSPECTION

Check for continuity between each segment.
Check for continuity between each segment and the armature shaft.
If there is no continuity between the segments or there is continuity between the segment and shaft, replace the starter motor with a new one.

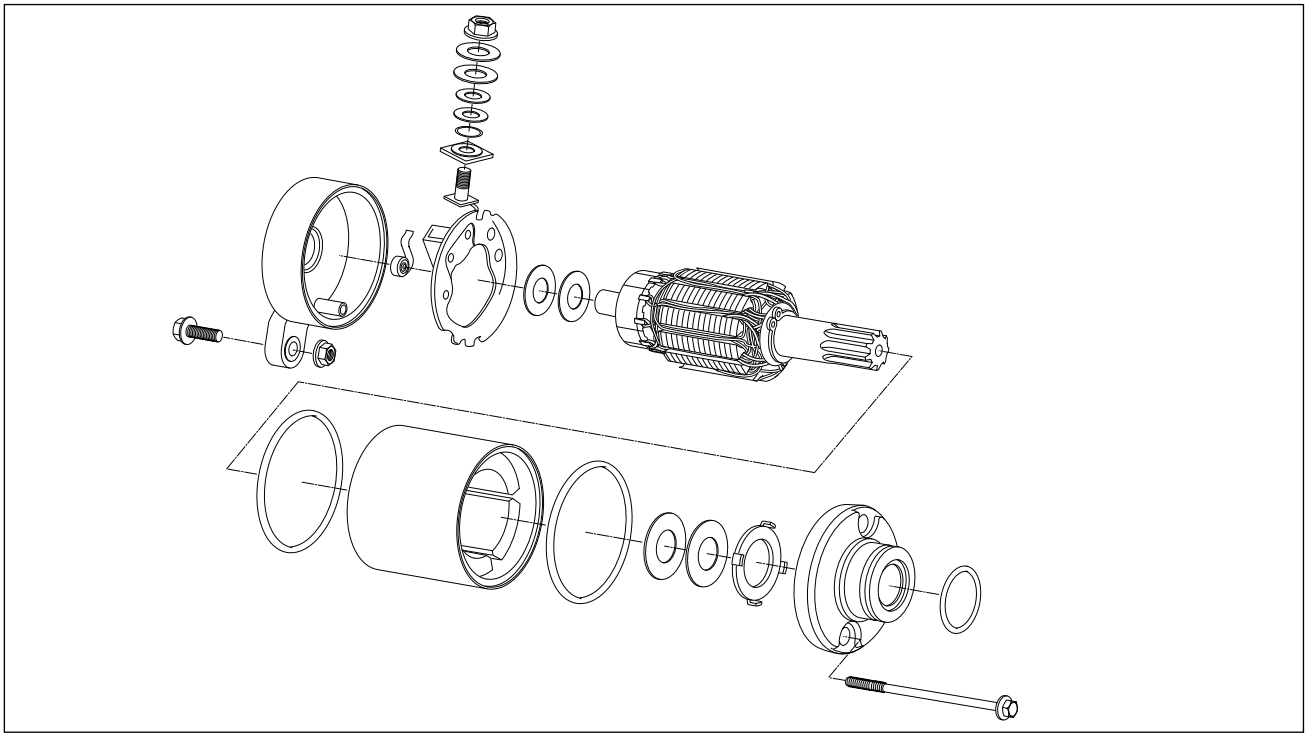
TOOL **Pocket tester : 09900-25002**



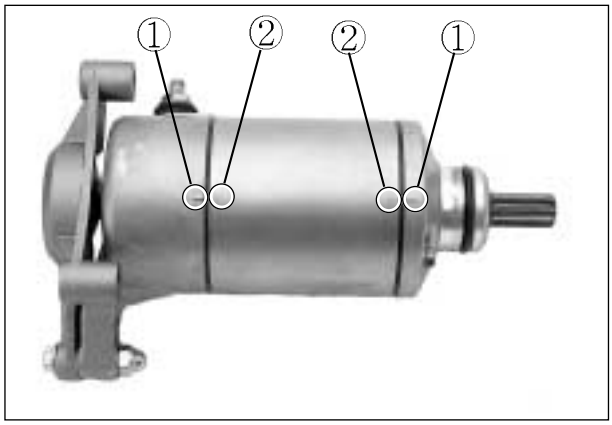
■ **STARTER MOTOR REASSEMBLY**

Reassemble the starter motor. Pay attention to the following points :

● Reassembly the starter motor as shown in the illustration.

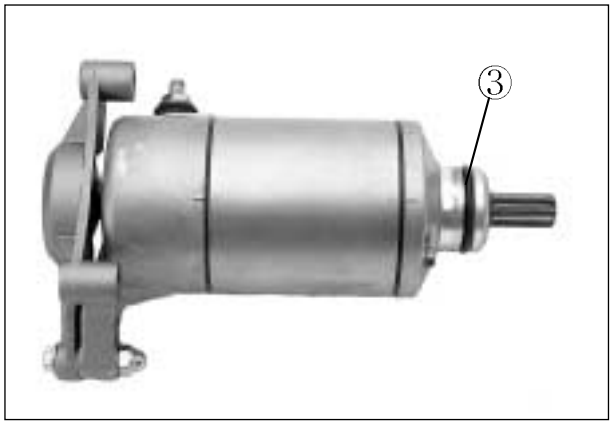


● Align the mark ① on the housing with the line ② on the housing end.



● Apply SUPER GREASE "A" to the O-ring ③ and remount the starter motor.

SUPER GREASE "A"



SWITCHES

Measure each switch for continuity using a tester. If any abnormality is found, replace the respective switch assemblies with new ones.

Pocket tester : 09900-25002

IGNITION SWITCH				
	R	O	BW	BR
ON	○	○		
OFF			○	○
LOCK			○	○

ENGINE STOP SWITCH		
	O	OB
⊗		
∩	○	○

HAZARD SWITCH		
	Sb	Gr
ON	○	○
OFF		

STARTER SWITCH		
	OB	YR
ON	○	○
OFF		

DIMMER SWITCH			
	YW	Y	W
HI	○	○	
LO	○		○

HORN SWITCH		
	BBr	BW
ON	○	○
OFF		

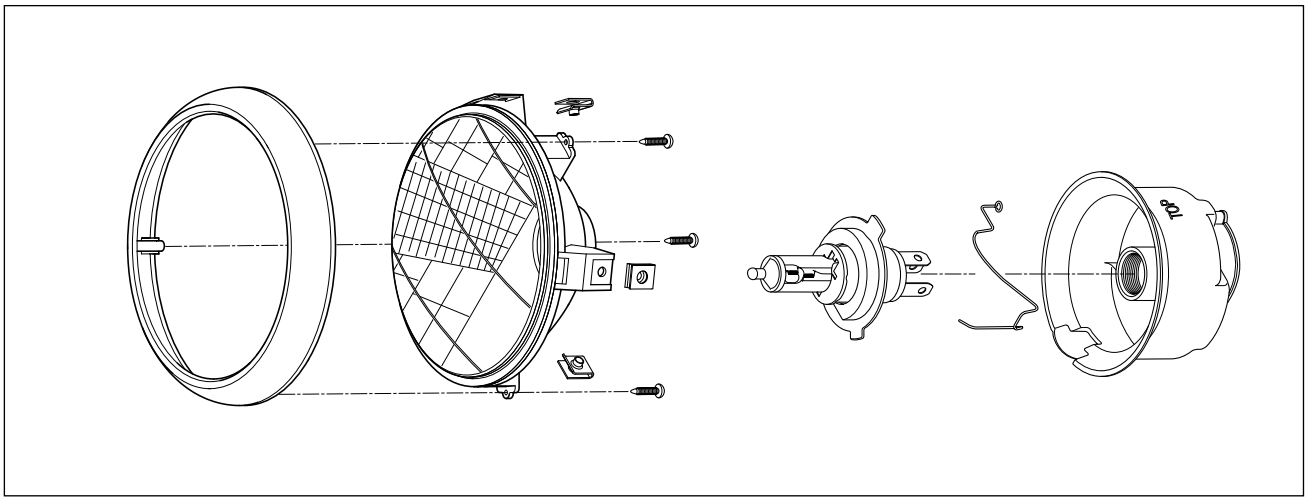
TURN SIGNAL SWITCH			
	Lg	Sb	B
L		○	○
PUSH			
R	○	○	

FRONT/REAR BRAKE LAMP SWITCH		
	O	WB
ON	○	○
OFF		

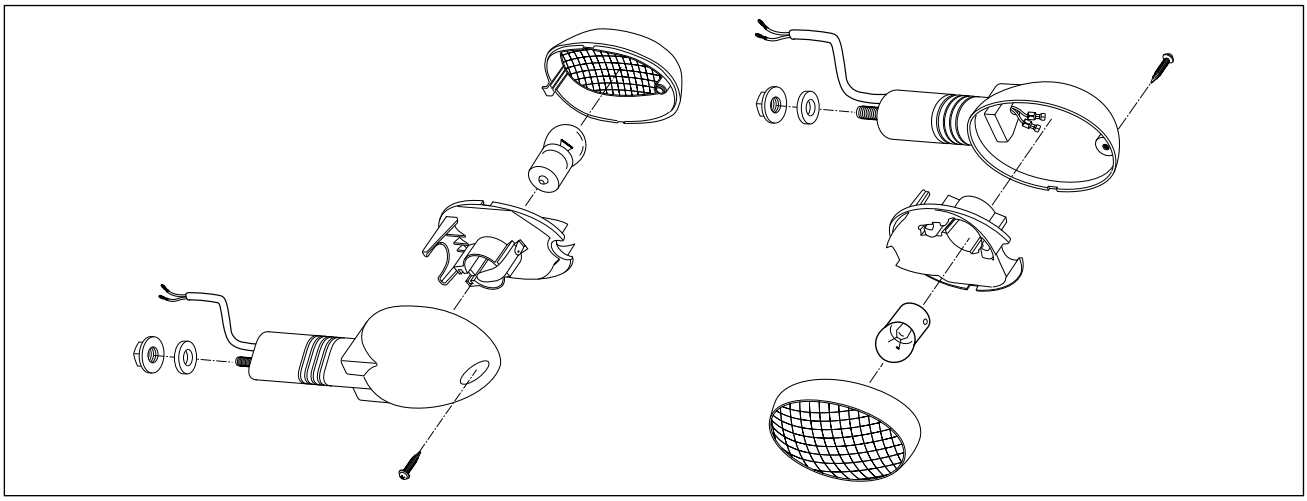
PASS SWITCH		
	O	Y
ON	○	○
OFF		

LAMP

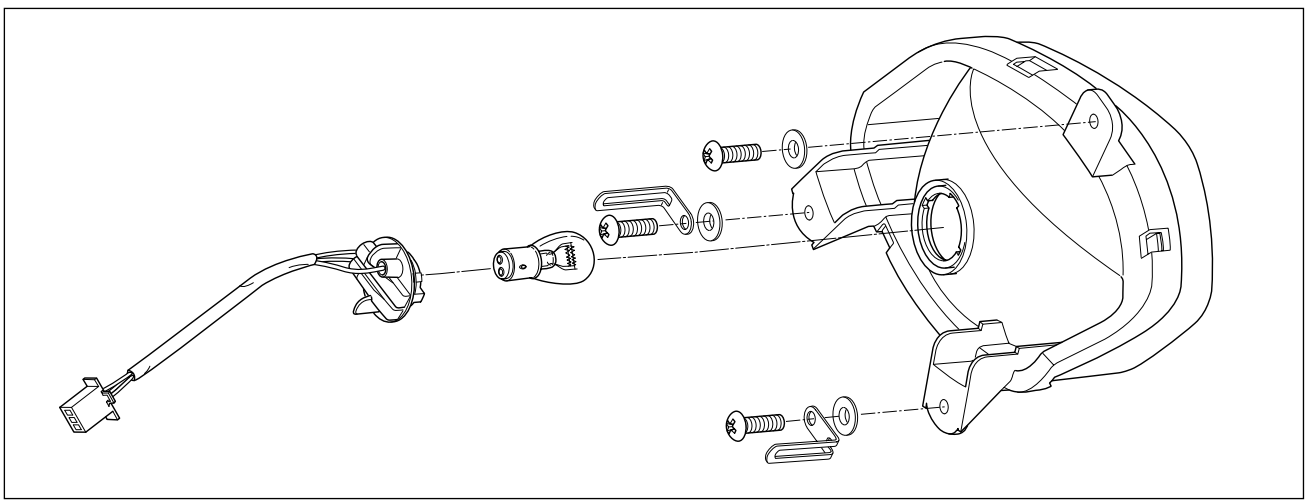
⊙ HEADLAMP



⊙ TURN SIGNAL LAMP

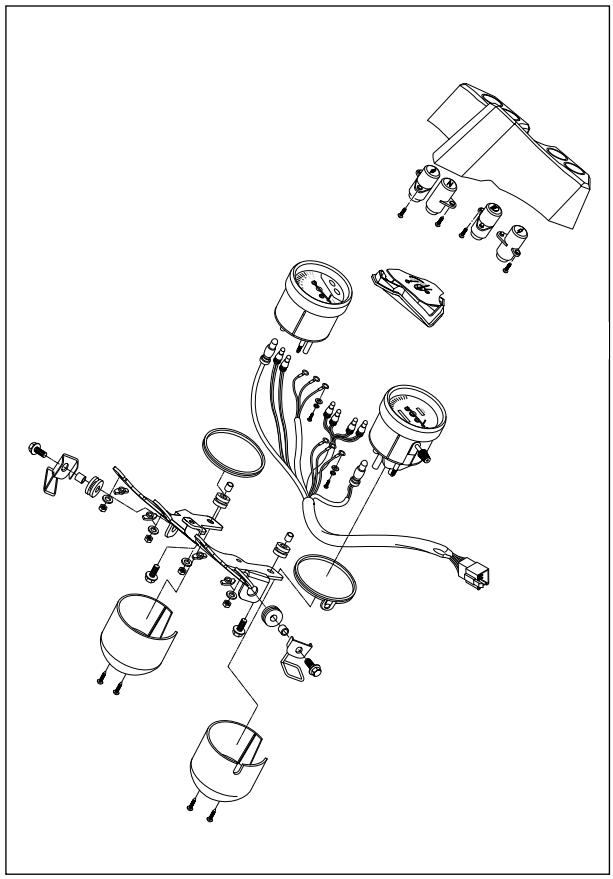


⊙ TAIL / BRAKE LAMP



⊙ COMBINATION METER

Remove the combination meter.
Disassemble the combination meter as shown in the illustration.



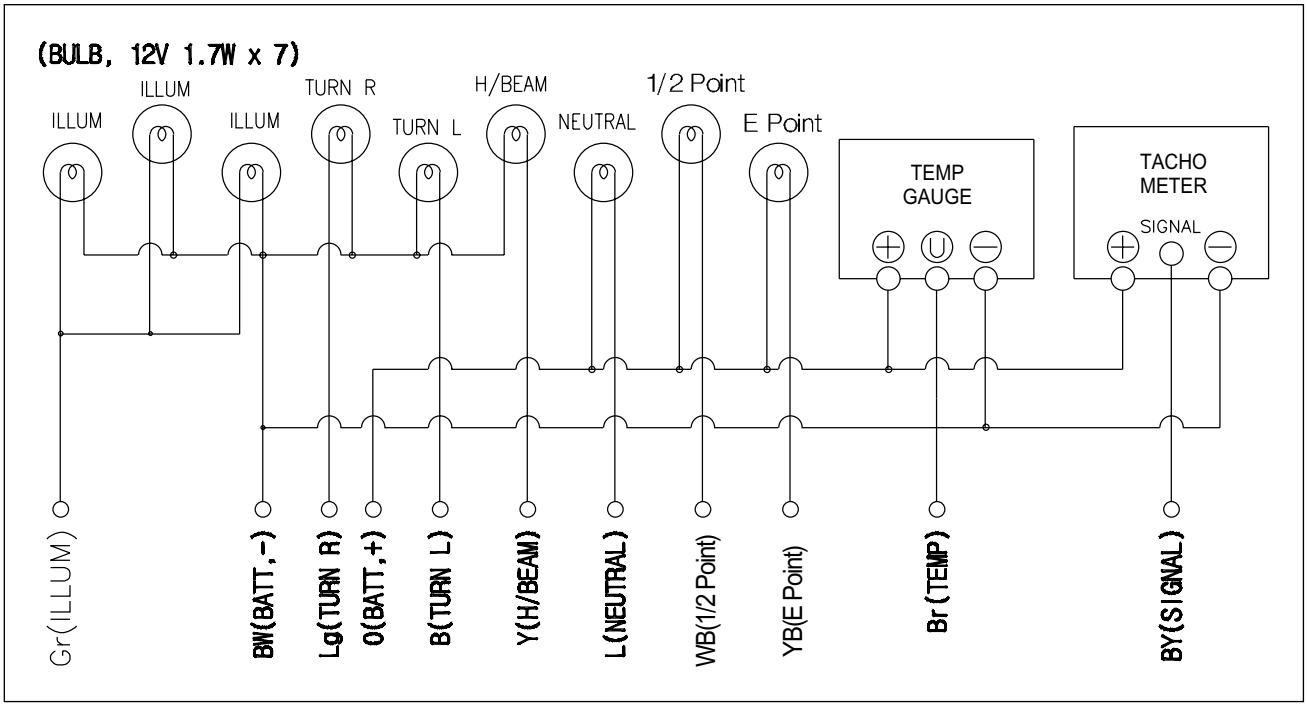
■ INSPECTION

Using the pocket tester, check the continuity between lead wires in the following illustration.
If the continuity measured incorrect, replace the respective part.

TOOL **Pocket tester : 09900-25002**

⚠ CAUTION

When making this test, it is not necessary to remove the combination meter.



BATTERY

⊙ CAUTION OF BATTERY TREATMENT

The battery needs attention generally as it occur flammability gas.
If you don't follow the instruction in the below, there may be a explosion and severe accident.
Therefore, please pay attention to the following points.

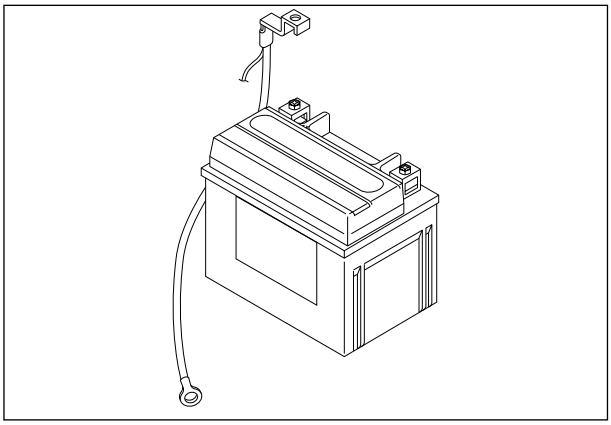
- Prohibit positively battery from contacting to short, spark or firearms.
- The recharge of battery should be done in the wide place where the wind is well ventilated.
  Please don't recharge it at the sight of wind-proof.

⊙ CAUTION OF BATTERY ELECTROLYTE TREATMENT

- Pay attention for the battery electrolyte not to stains the chassis or the humanbody.
- If stains the chassis or the humanbody, at once wash a vast quantity of water.
  When it be stained, clothes should come into being a hole or painting should take off.
  Consult a doctor.
- When the battery electrolyte was dropped to the surface of land, wash a vast quantity of water.
  Neutralize by hydroxide, bicarbonate of soda and so on.

⊙ CAUTION OF MAINTENANCE FREE BATTERY TREATMENT

- Do not remove the aluminum tape to seal the battery electrolyte filler hole untill use as battery of completely seal type.
- Do not use it except the battery electrolyte.
- When pour into the battery electrolyte, necessarily use the electrolyte of the specified capacity.
- Do not open the sealing cap after recharging the battery eletrolyte.



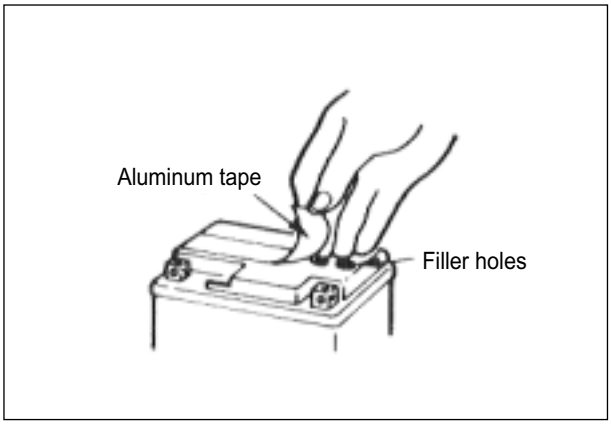
- Filling electrolyte.

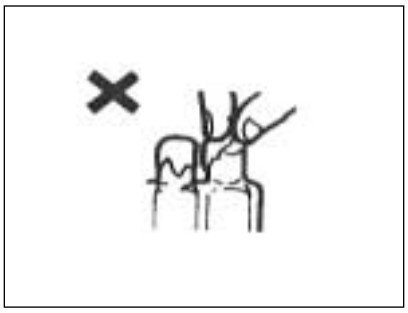
① Put the battery on even land and remove the aluminum tape sealing.

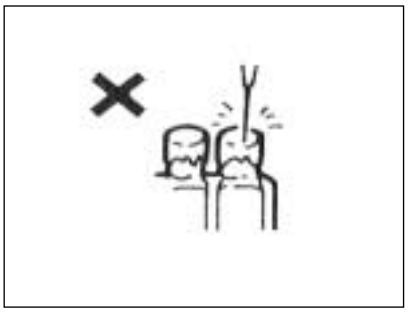
② Remove the cap at the electrolyte container.

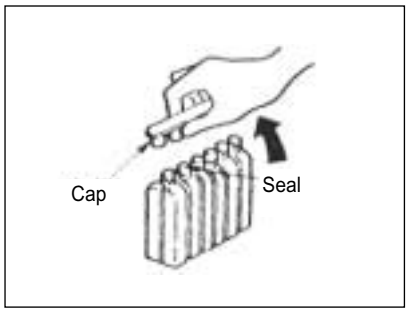
⚠ CAUTION

Do not remove the seal of the electrolyte container, not prick with sharp thing.





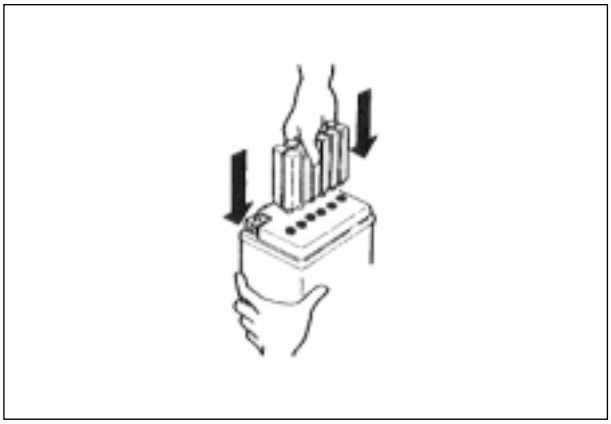


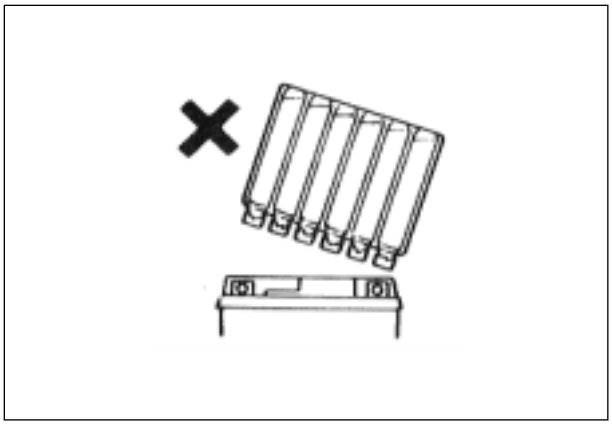


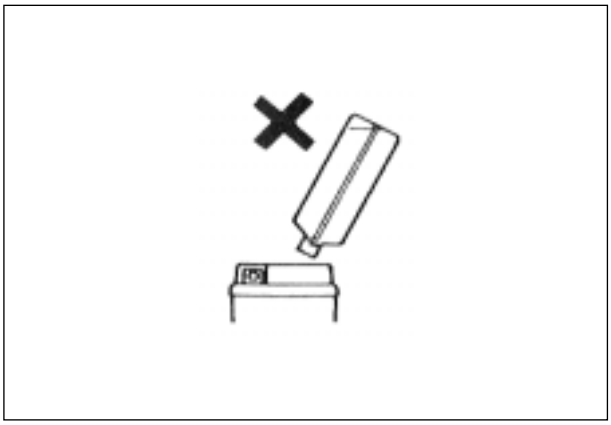
③ Pouring of battery electrolyte
When insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall.
Take precaution not to allow any fluid to spill.

⚠ CAUTION

The pouring of electrolyte may not be done if the electrolyte container is pushed slopely.



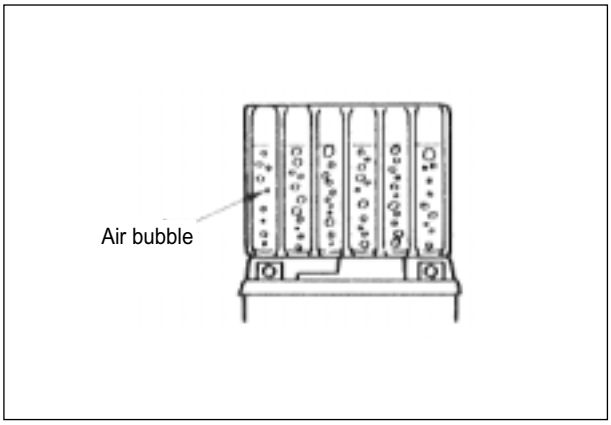




④ Confirmation of pour
Make sure that air bubbles are coming up each electrolyte container, and keep this position for more than about 20 minutes.

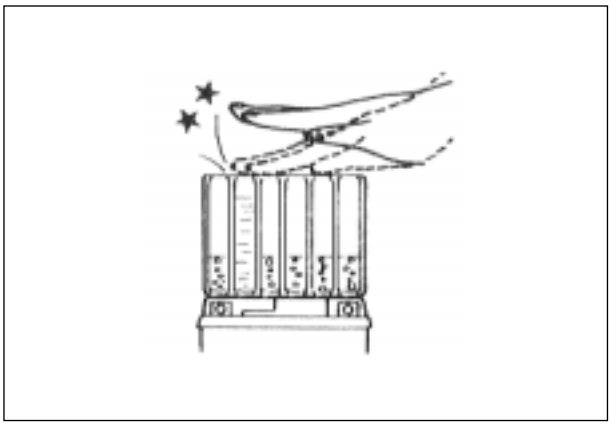
⚠ CAUTION

If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.



⑤ Separation of electrolyte container

After confirming that you entered the electrolyte into battery completely, remove the electrolyte containers from the battery.

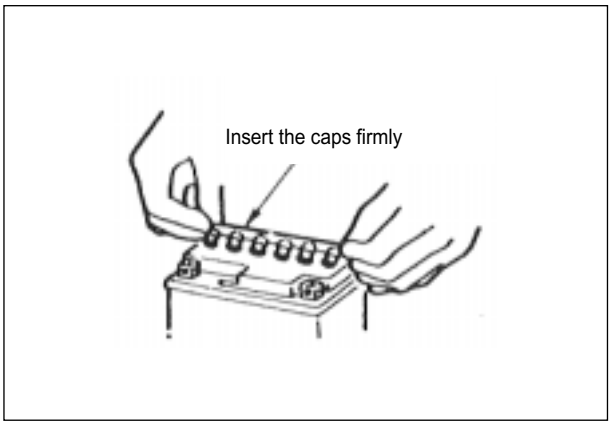


⚠ CAUTION

Draw the empty receptacle out slowly because there may be a chance which remaining electrolyte vaporize.

⑥ Insert the caps

Insert the cap into the filler holes, pressing it firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.



⊙ SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

⊙ RECHARGING OPERATION

- Using the pocket tester, check the battery voltage. If the voltage reading is less than the 12.0V (DC), recharge the battery with a battery charger.

How to charge	
Standard	1.2 A × 5~10 hours
Fast	6 A × 30 minutes

⚠ CAUTION

When recharging the battery, remove the battery from the motorcycle.

NOTE

Do not remove the caps on the battery top while recharging.

⚠ CAUTION

Be careful not to permit the charging current to exceed 6A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a pocket tester.
- If the battery voltage is less than the 12.5V, recharge the battery again.
- If battery voltage is still less than 12.5V, after recharging, replace the battery with a new one.
- When the motorcycle is not used for a long period, check the battery every 1 month to prevent the battery discharge.