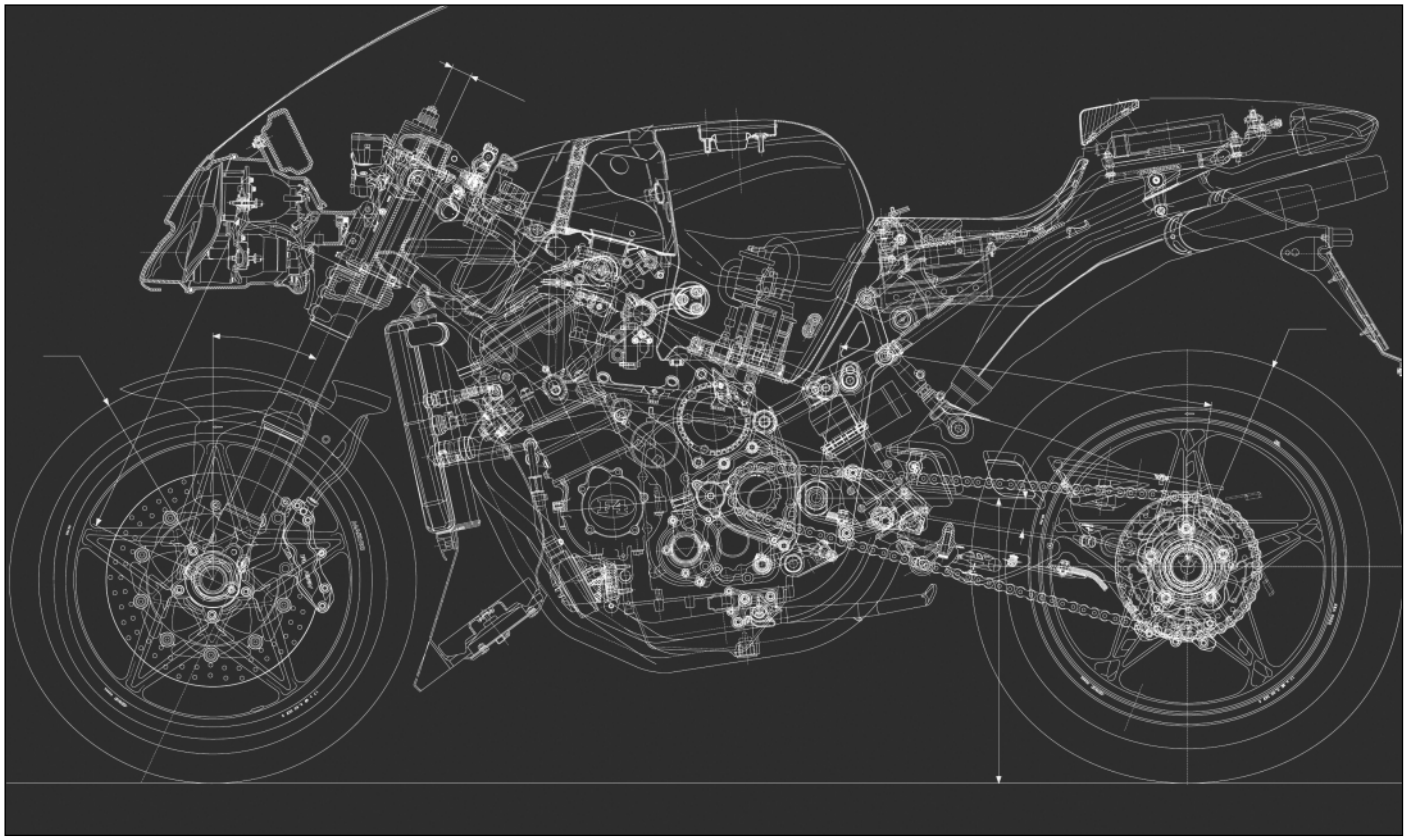

SECTION E

Revision 0

E

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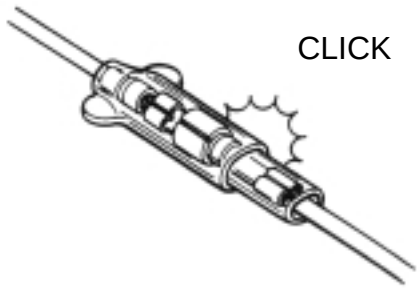
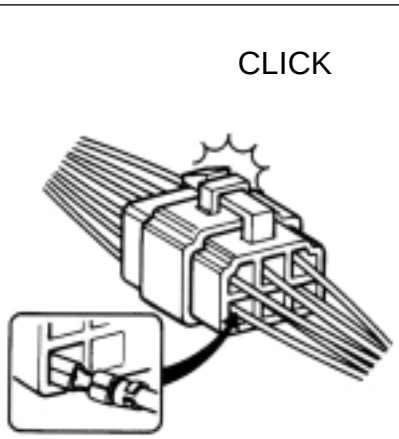
CONNECTORS

- When a connector is connected, check that it clicks into position.
- Check the connector for corrosion, dirt or a broken cover.



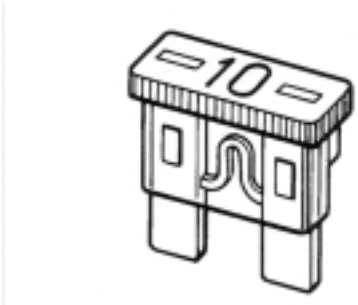
COUPLINGS

- Block couplings – ensure that the block is released before disconnecting it to push it completely home when connecting it.
- When disconnecting a coupling, ensure that the body of the coupling is gripped and do not pull it apart by the leads.
- Check that the terminals of the couplings are not slack or bent.
- Check that the terminals are not corroded or dirty.



FUSES

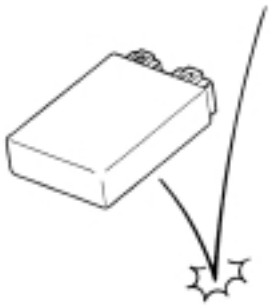
- When a fuse burns out, always investigate why the fuse has burnt out. Find the cause, repair and then substitute the fuse.
- Do not utilise a fuse of a different capacity from the original one.
- Do not utilise wire or any other substitute for the fuse.



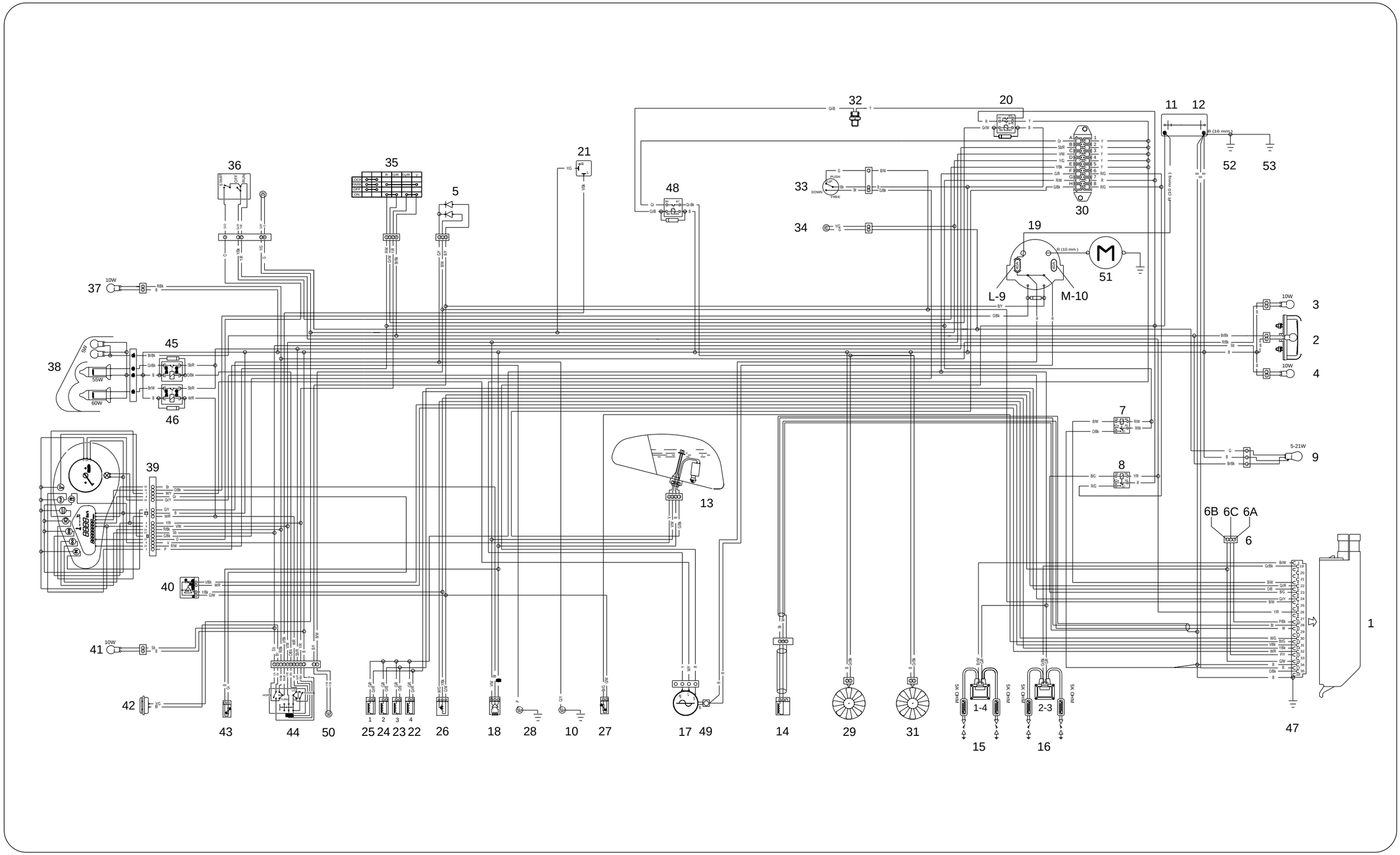
SEMICONDUCTOR PARTS

- Do not drop semiconductor parts such as those incorporated in the ECU.
- When checking these parts, carry out the instructions to the letter. The lack of using the correct procedure can cause grave damage.

INCORRECT



“F4 ORO” ELECTRICAL DIAGRAM



E

Parts list

Ref.	*Description*
1	CPU
2	Number plate light
3	Right indicator
4	Left indicator
5	Safety CPU
6	Diagnostic connector (6A – RX serial line, 6B – Ground, 6C – TX serial line
7	Latch relay
8	Power relay
9	Rear stop light
10	Neutral switch
11-12	Battery
13	Fuel probe – pump
14	R.p.m. sensor
15	Coil
16	Coil
17	Alternator
18	Speed sensor
19	Solenoid
20	General feed relay
21	Intermittency
22-23-24-25	Injectors
26	Butterfly potentiometer
27	Water temperature sensor – CPU
28	Oil switch

Parts list

Ref.	*Description*
29	Electric fan
30	Fuses
31	Electric fan
32	Fan thermal switch
33	Side stand switch
34	Rear stop switch
35	Ignition switch
36	Safety and Front stop switch
37	Right indicator
38	Front headlight
39	Instrument panel
40	Air temperature/pressure sensor
41	Left indicator
42	Horn
43	Water temperature sensor for instrument thermometer
44	Light switch
45	Dipped beam relay
46	Main beam relay
47	Frame/CPU earth
48	Fan relay
49	Battery recharge
50	Clutch switch
51	Starter motor
52	Frame earth
53	Engine earth

Wiring colour code

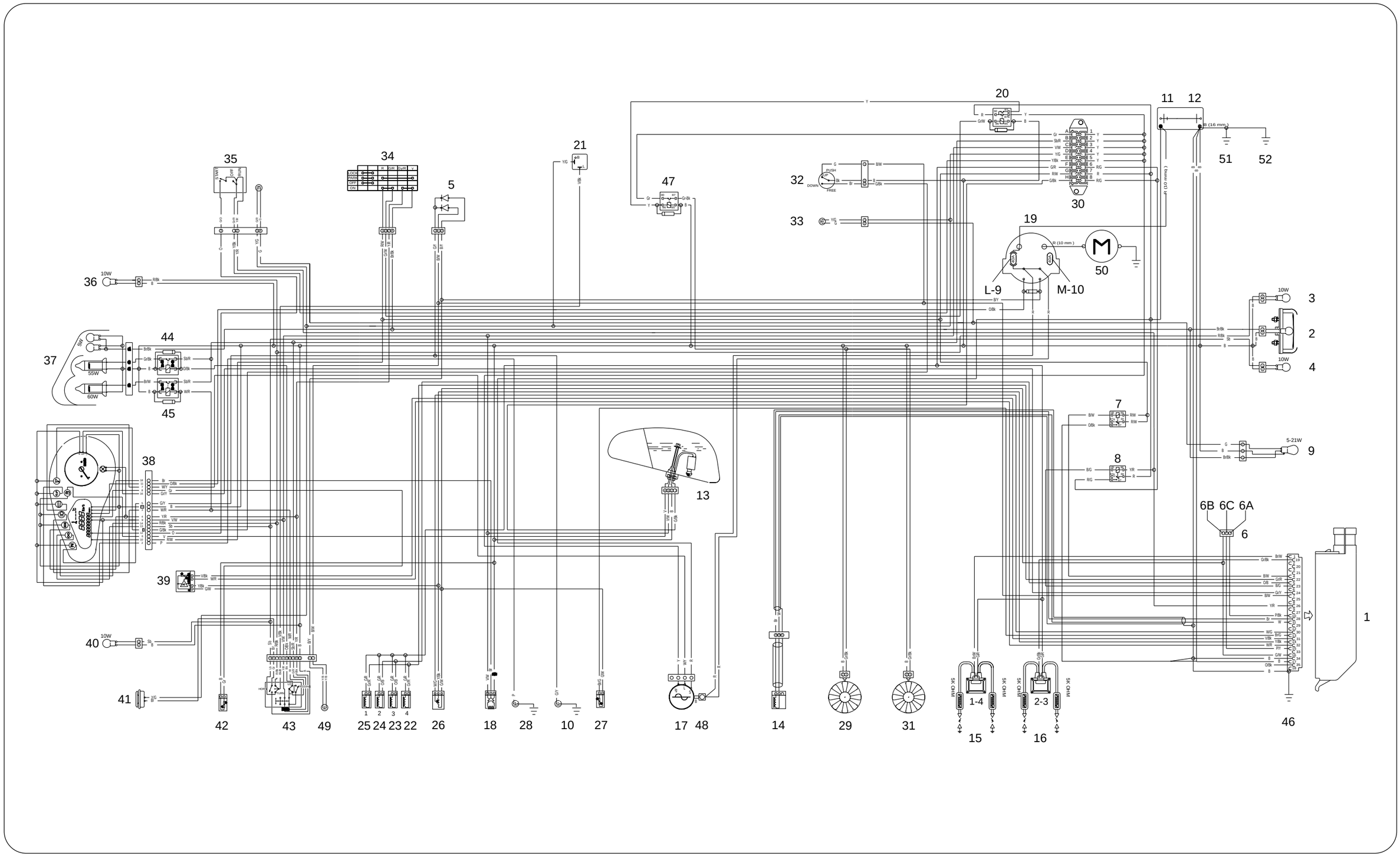
Letter(s)	*Colour*
R	Red
Y	Yellow
B	Blue
G	Green
W	White
Bk	Black
P	Pink
V	Violet
Sb	Sky blue
Gr	Grey
O	Orange
Br	Brown

In combined colors, background and marking colors have been pointed out. E.g. : Br/Bk.

Fuses list

Ref.	*Amps (A)*	*Use*
A-1	15	Cooling fan
B-2	15	Dipped and main beam headlight
C-3	7.5	Side lights – mileometer sensor – fuel tank probe
D-4	7.5	Stop light – horn – direction indicators
E-5	7.5	Ignition switch – starter button
F-6	15	Coils – injectors
G-7	7.5	Latch relay – general relay – instrument panel
H-8	15	Fuel pump
L-9	40	Battery recharge
M-10	40	Spare for battery recharge

ELECTRICAL DIAGRAM F4 “S” - “S 1 + 1”



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G-7	7.5	Latch relay – general relay – instrument panel
H-8	15	Fuel pump
L-9	40	Battery recharge
M-10	40	Spare for battery recharge

BATTERY

The battery mounted on this motorcycle is a sealed battery therefore no maintenance is required.

The batteries recommended are the following:
- FIAMM 6E9
- YUASA YTX9-BS

INITIAL BATTERY CHARGE

For the initial charging of the battery, the following must be carried out:

Filling with electrolyte

• Remove the aluminium tape (1) that seals the filling holes of the battery electrolyte.

• Insert the multiple funnel in the filling holes.
• Squeeze the electrolyte pack.
• Empty the electrolyte pack into the battery making sure that the pack is not dropped.
• Be careful to not spill any drops of electrolyte.

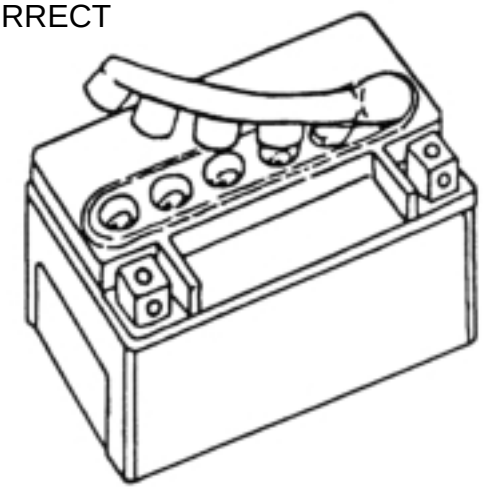
- After ensuring that all the electrolyte has been poured into the battery, remove the empty pack. Wait for twenty minutes.
- Insert the caps in the holes by pressing with force so that the upper part of the caps does not rise above the level of the battery.

Do not use batteries other than the recommended ones.
The recommended batteries are the following:
- FIAMM 6E9
- YUASA YTX9-BS
- Once installed, never remove the caps again.

- Proceed with charging following the method on the packet that the battery came in or as indicated in the following table.

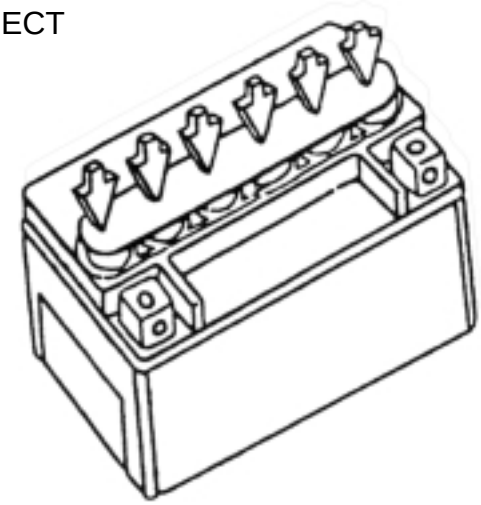
Charging method
It is preferable to charge the battery at a constant voltage to not overcharge battery as follows:

INCORRECT



Method	V (Voltage)	°C (temperature)	A (Amperage) (Charging current)	Charging time (hours)
Normal	14,4	20	0,25xC	12-24
Rapid	14,4	20	1xC	6-8

CORRECT



Wait at least twenty-four hours before positioning the battery in the compartment. This is strictly necessary for this motorcycle as the battery is positioned horizontally, as shown in the diagram below.

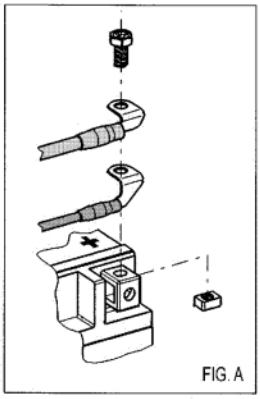


FIG. A

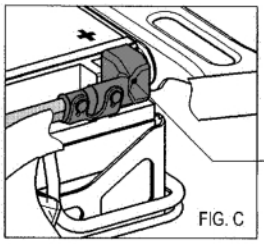


FIG. C

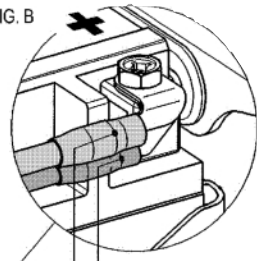
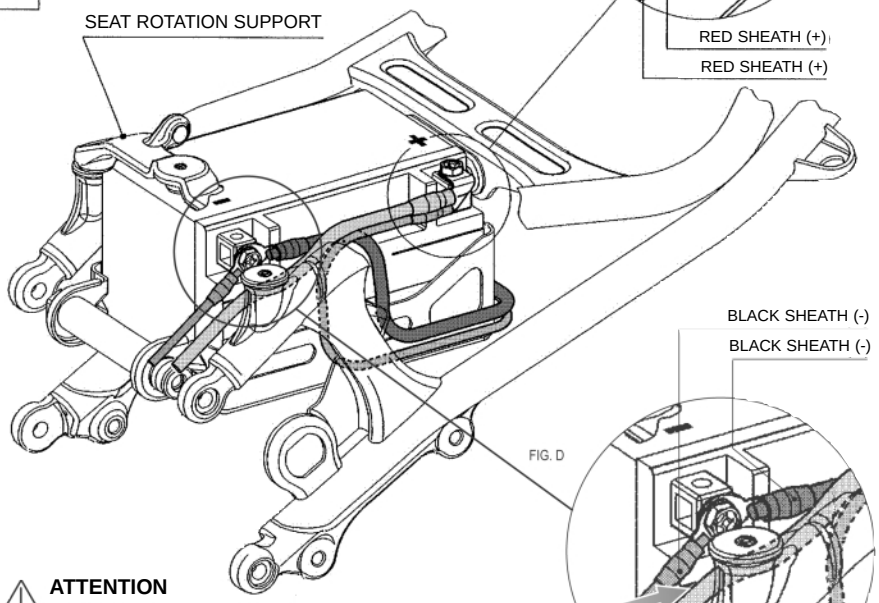


FIG. B



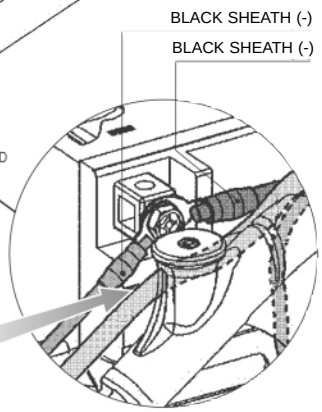


FIG. D

ATTENTION
Ensure that the upper cable of the positive terminal is positioned inside the upper framework (see fig. D).

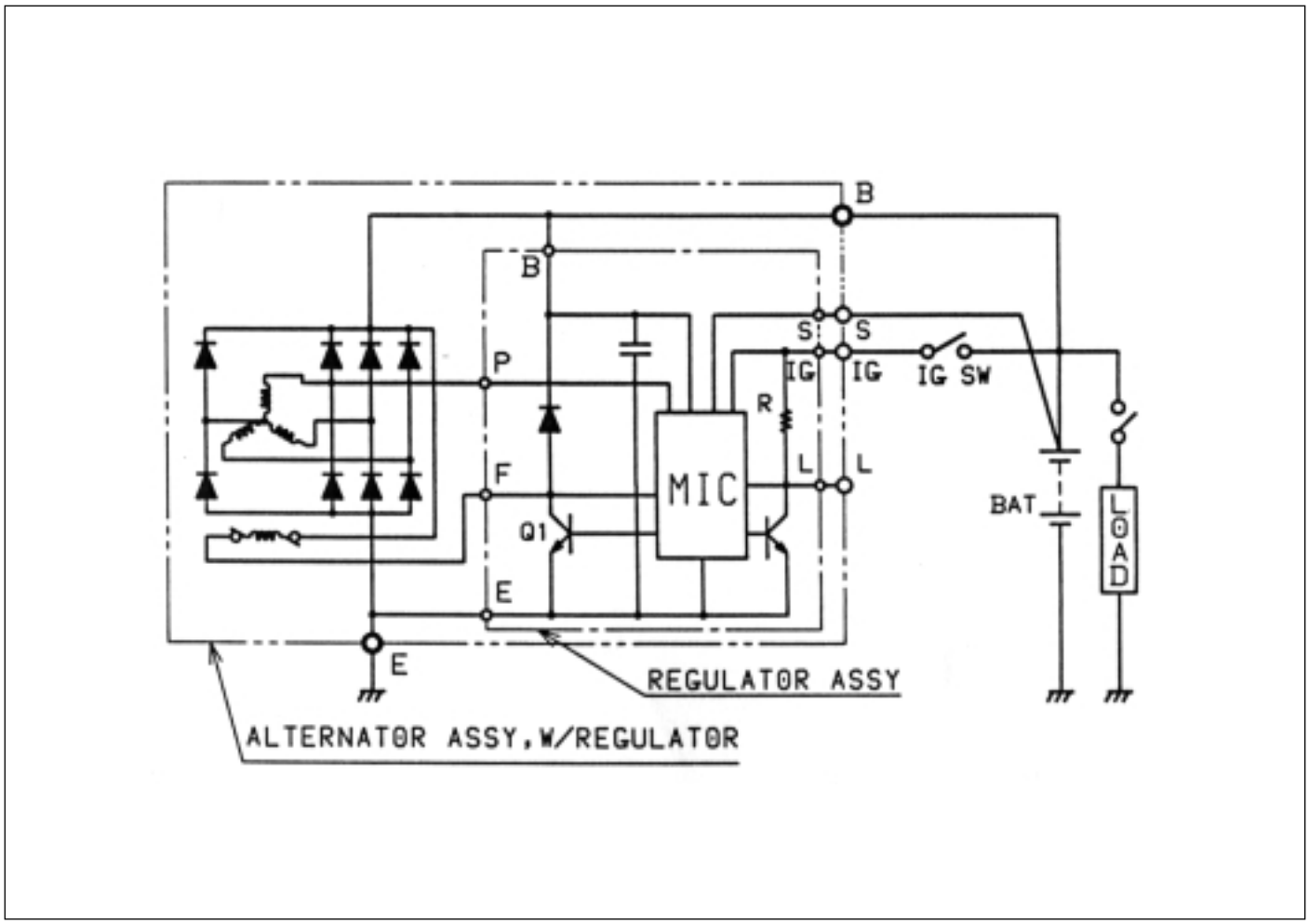
E

- Check the voltage charge after ~ thirty minutes at the battery terminals.
  Voltage ≥ 12,5 Volt.

E

CHARGING SYSTEM

The system of the charging circuit illustrated as follows is substantially composed of a generator and a rectifier/regulator, enclosed in one component.
The alternating current (AC) is transformed into direct current (DC) by the rectifier, regulated and therefore utilised for charging the battery.

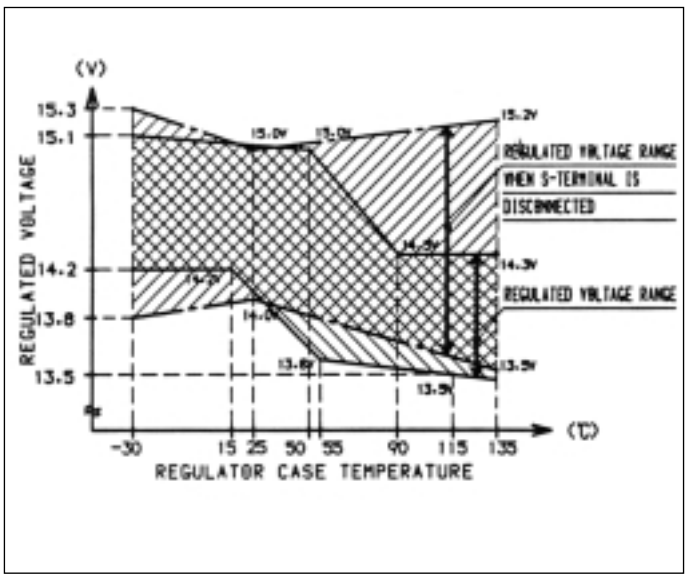


Warning function

- Disconnection of the coil
- Disconnection of the regulator
- Disconnection of terminal B (voltage at terminal S is less than 13 volts).

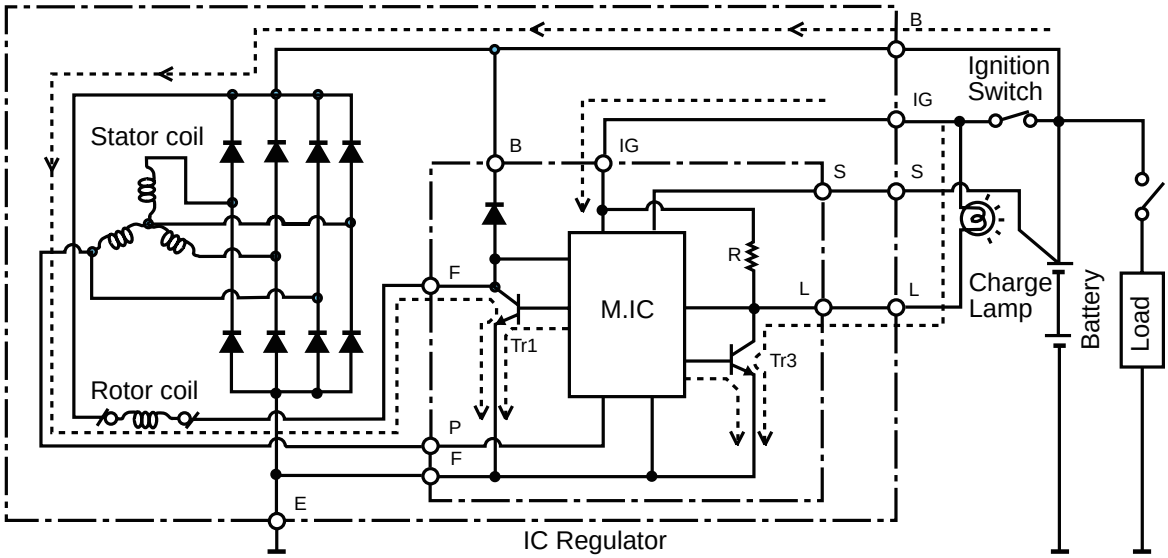
Any one of these abnormalities switches on the warning light on the instrument panel.

As shown in the figure, the temperature influences the characteristics of the regulator with steps of variation of the regulated voltage.



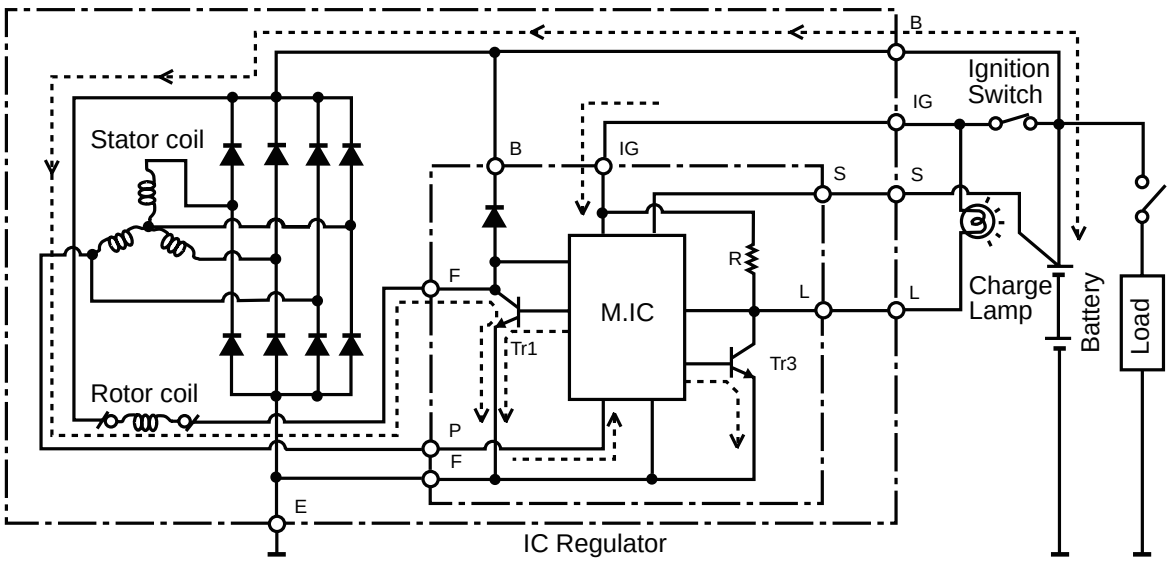
In the preceding diagram is illustrated the complete charging circuit. The input circuit of the regulator includes the integrated M-IC that, being complex in its various functions will be simply indicated as M-IC.

(1) Ignition switch “ON” with engine off.



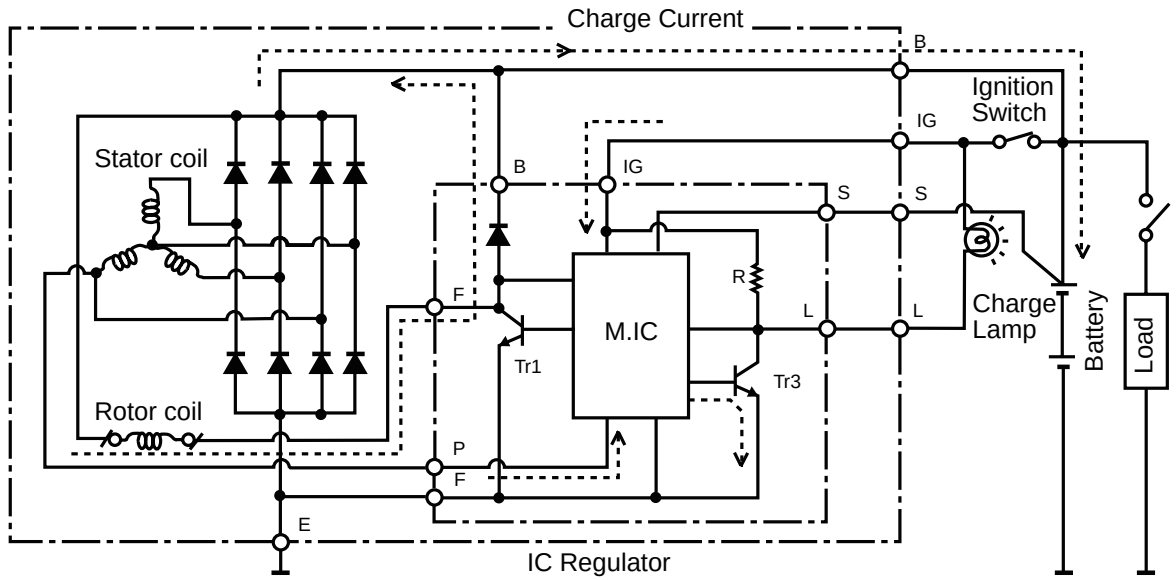
The M-IC reveals the battery voltage applied to the IG terminal and activates Tr_1. The initial current passes via the rotor coil (to reduce the battery charge to the minimum when it is in this condition), Tr_1 passes from “ON” to “OFF” intermittently thereby reducing the absorption of the system to 0.17A.
During this period the generator is not functioning and does not generate any voltage. The voltage at point P is 0V and M-IC revealing this value, activates Tr_3 which switches on the warning light.

(2) Recharging (voltage less than the regulated voltage).



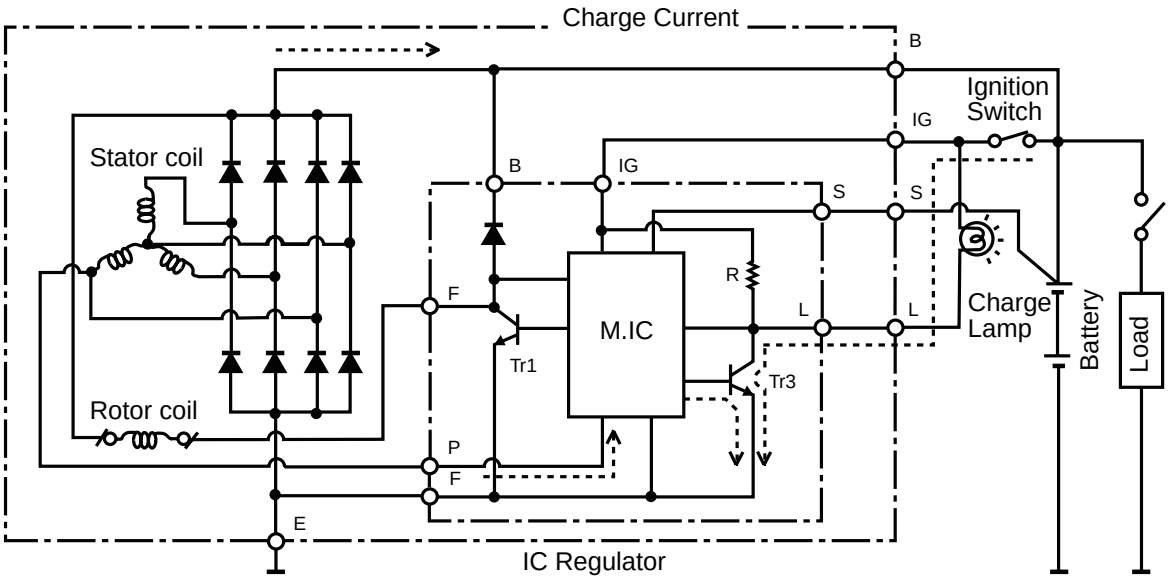
Once the engine is switched on, the M-IC makes the Tr_1 pass from an intermittent “ON” and “OFF” condition to a stabilised “ON” condition to guarantee an abundant flow of current and a rapid recharge.
At this point, the M-IC disactivates also Tr_3 that switches off the warning light.
When the voltage at terminal B exceeds the battery voltage, then the battery starts recharging.

(3) Recharge (voltage more than the regulated voltage).



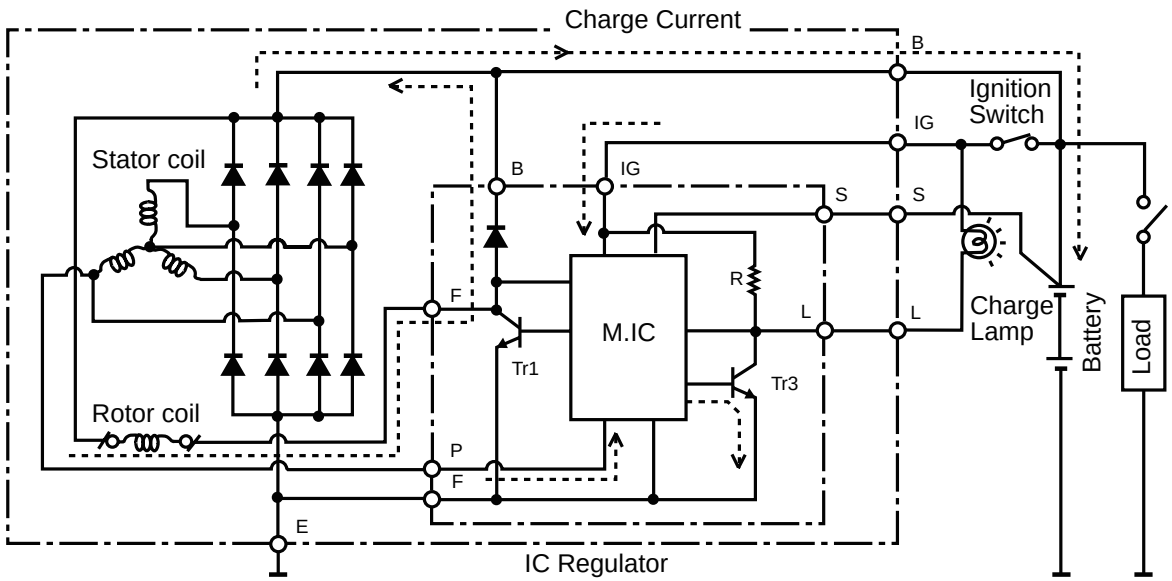
The moment in which the Tr_1 is stabilised in the “ON” position the voltage at terminal B increases and when the voltage at terminal S exceeds the regulated voltage (approximately 14.5V at 25°), the I-MC realises it and puts the Tr_1 in the “OFF” position. This condition is maintained until the voltage at terminal S does not become less than the regulated voltage.

(4) Rotor coil disconnected.



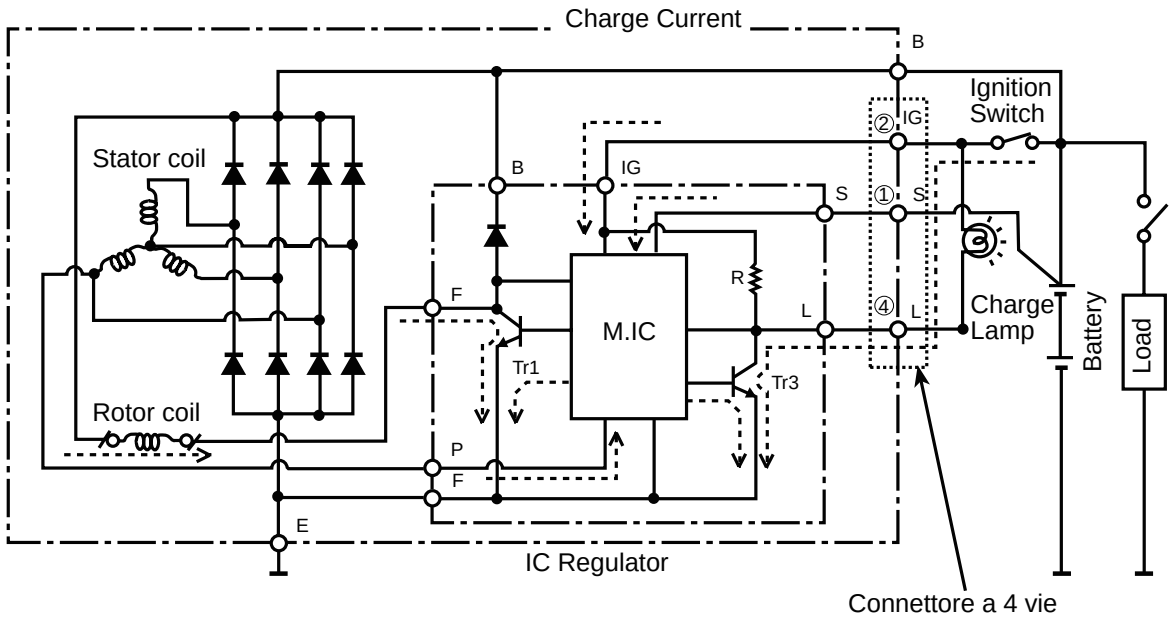
If the rotor coil is disconnected whilst the generator is functioning, the generator interrupts the current and the voltage at terminal P goes to zero.
The M-IC reveals this condition and through the Tr_3 switches on the warning light.

(5) Disconnection of terminal S of the regulator.



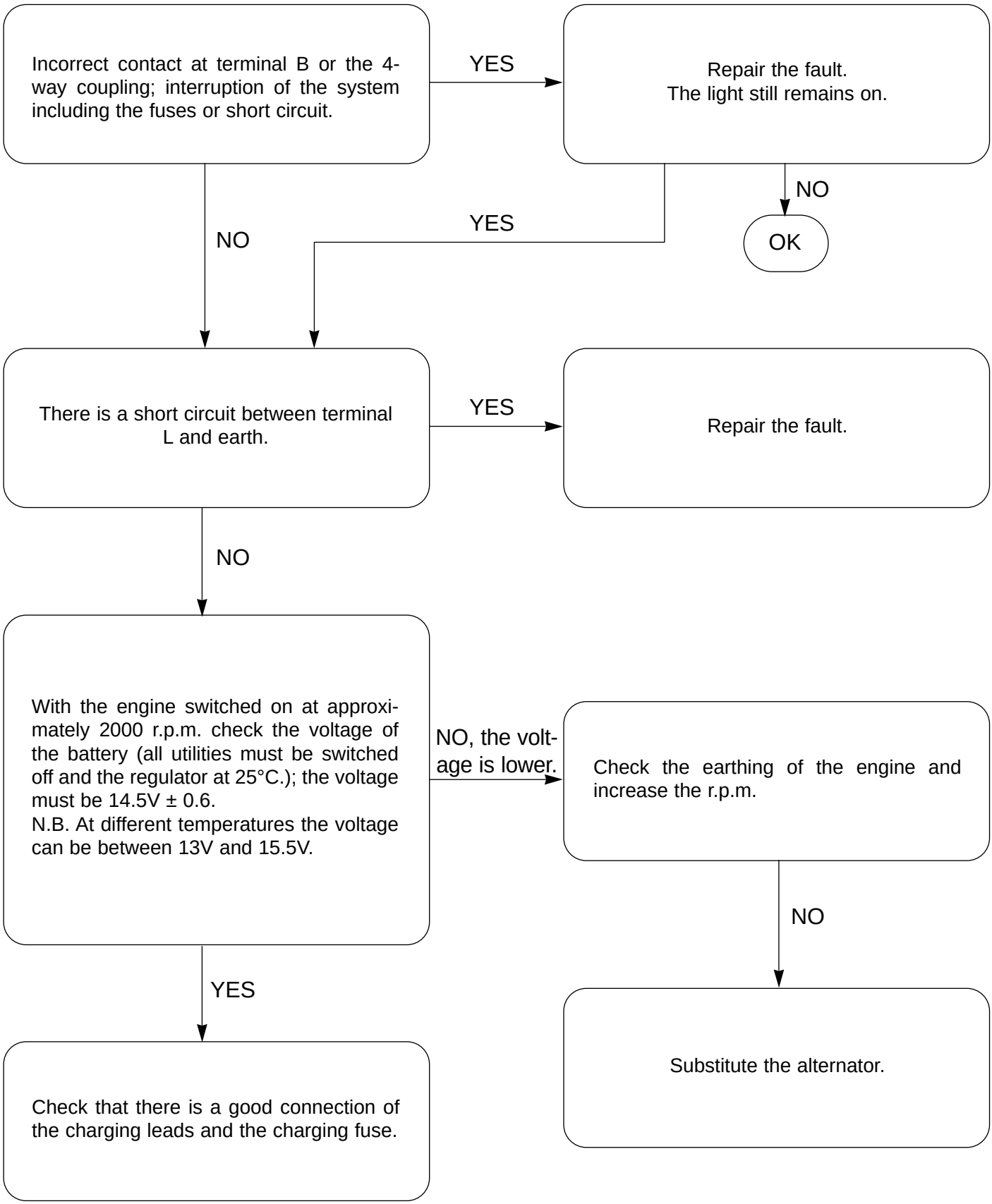
If a reference voltage does not arrive at terminal S whilst the alternator is functioning, the M-IC reveals it and through Tr_3 switches on the warning light.
At this point the M-IC, to maintain the voltage at terminal B between 13.3V and 16.3V activates and disactivates Tr_1.

(6) Terminal B disconnected.



If terminal B is disconnected whilst the alternator is functioning, the voltage of the battery gradually drops until it starts discharging. As long as the voltage at terminal S is more than 13V the M-IC maintains the voltage at terminal B at 20V, protecting the alternator and the rectifier in the moment in which the voltage at terminal S drops under 13V. The M-IC reveals it through Tr_3 and activates the warning light.

A list of possible problems that could occur when the warning light is switched on.



BATTERY EFFICIENCY CHECK

Battery current loss check

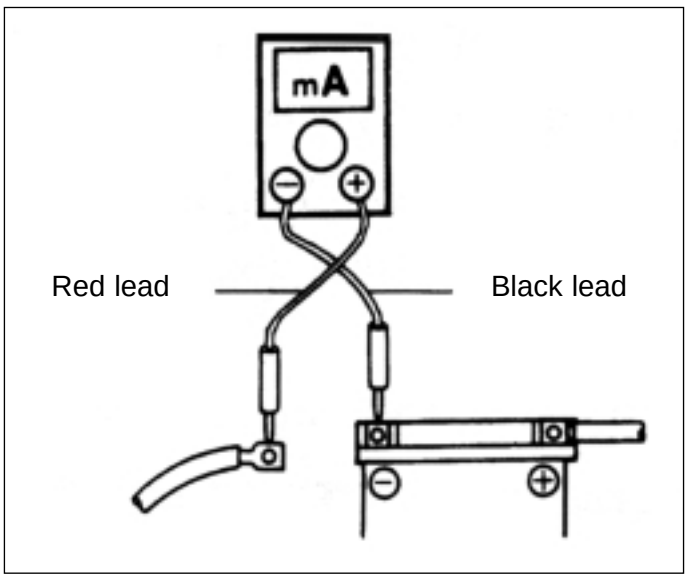
- Remove the tail unit as described in chapter C “Bodywork”.
- Turn the ignition switch to the “OFF” position.
- Disconnect the cable from the negative (-) pole of the battery.
- Connect the multi-tester between the negative (-) terminal and the negative (-) cable of the battery.

Losses are indicated if the tester measures more than 2-2.5mA.

Battery current loss: less than 1mA.

First of all when using an ampmeter, utilise a high range of the multi-tester because the current losses in the case of malfunctioning could be elevated.

If losses are found, search for the part where the tester measures less than 2-2.5mA by removing couplings and connectors one at a time.



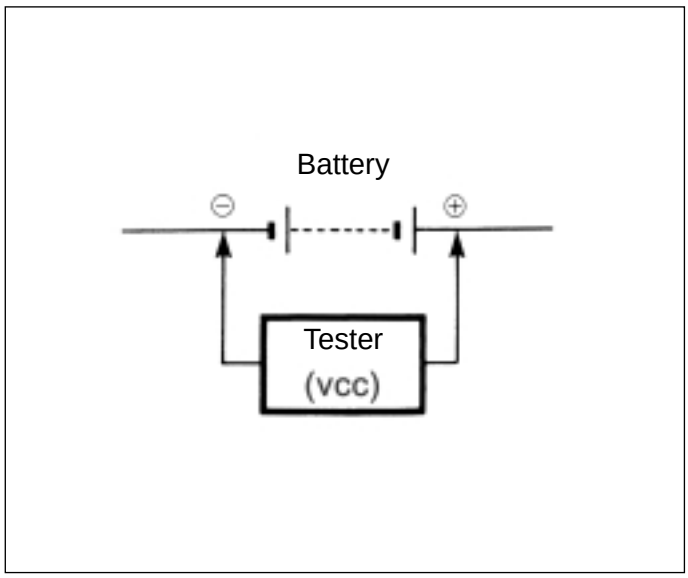
Charge feed check

- Remove the tail unit as described in chapter C “Bodywork”.
- Switch on the engine and run it at 2000 r.p.m. with the light switch in the “ON” position and the selector on main beam HI.

Measure the DC voltage between the positive (+) and the negative (-) terminals of the battery with a multi-tester. If the tester indicates less than 12.6V or more than 14.3V the cause will be found in the generator.

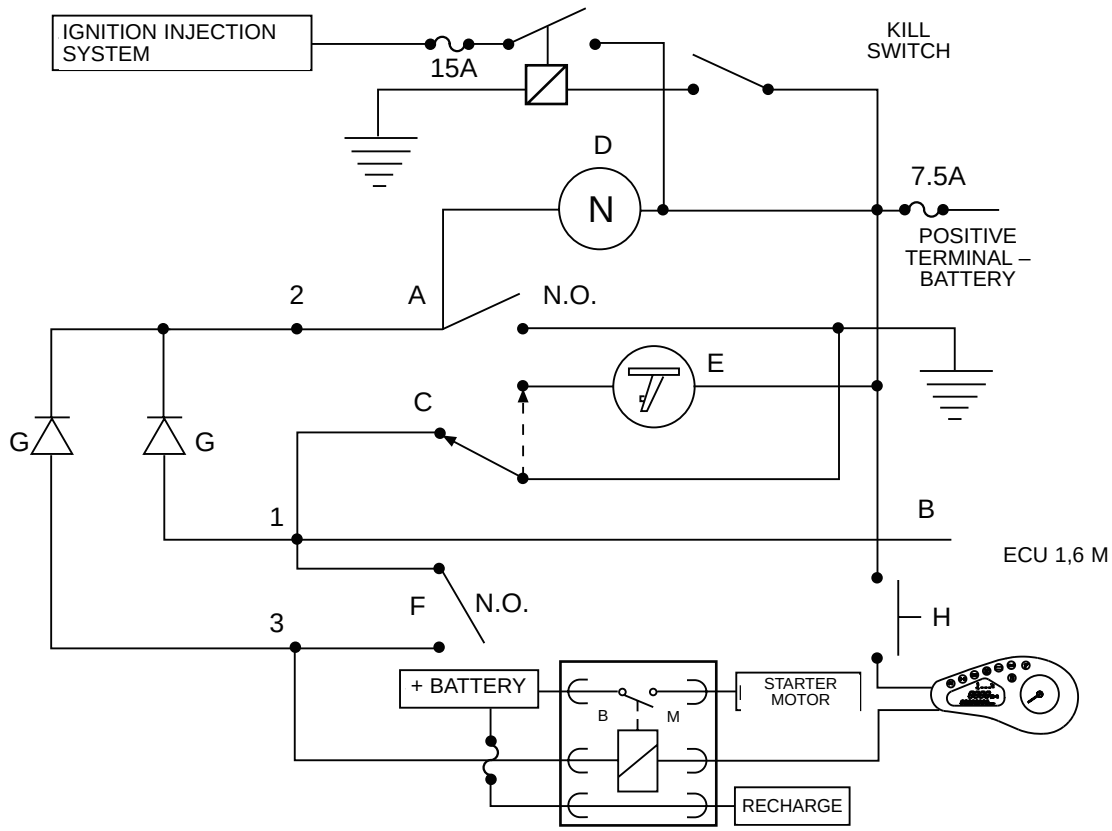
N.B. **When carrying out this check, ensure that the battery is fully charged.**

Feed charge
Standard: 12.6V – 14.3V at 2000 r.p.m.



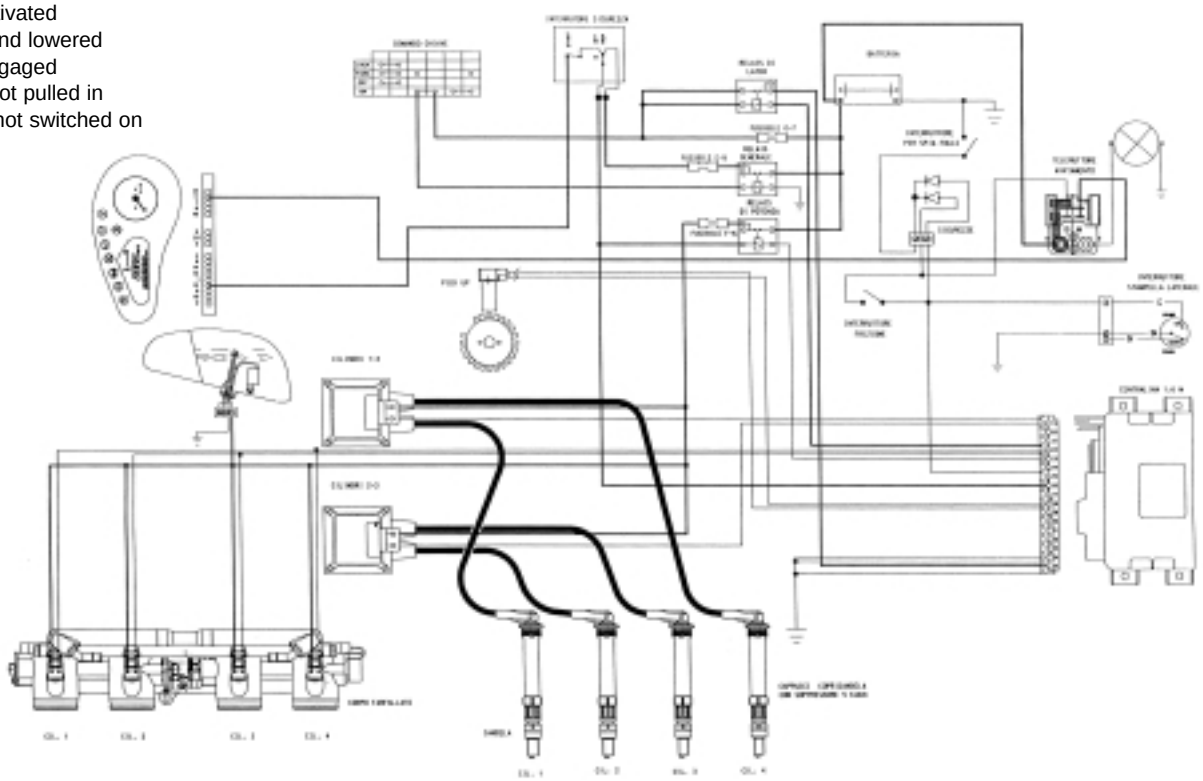
STARTER SYSTEM

The diagram below represents the starter system.

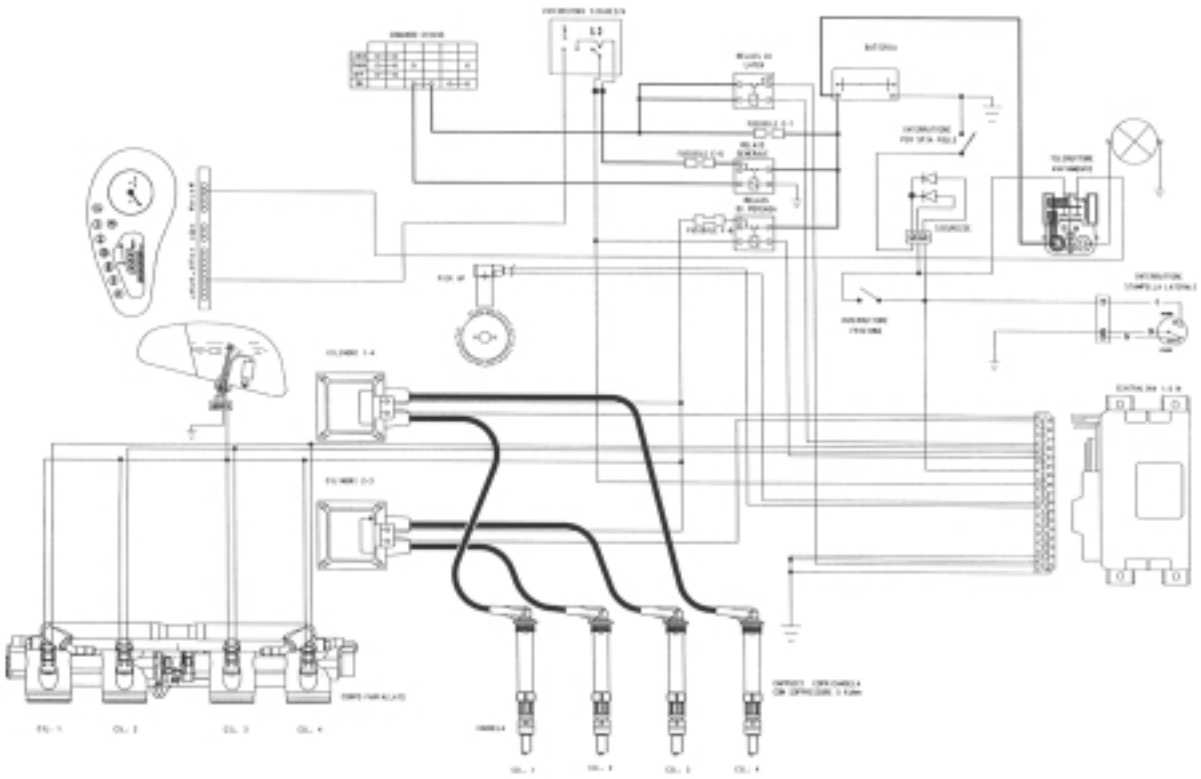


A – with neutral engaged, the contact is closed.
B – for ECU with “Pull up” input to battery voltage or for negative coil ignition feed relay.
C – side stand switch
D – Neutral warning light
E – Side stand lowered warning light position
F – Clutch switch
G – 1N5404 diode
H – Engine start switch

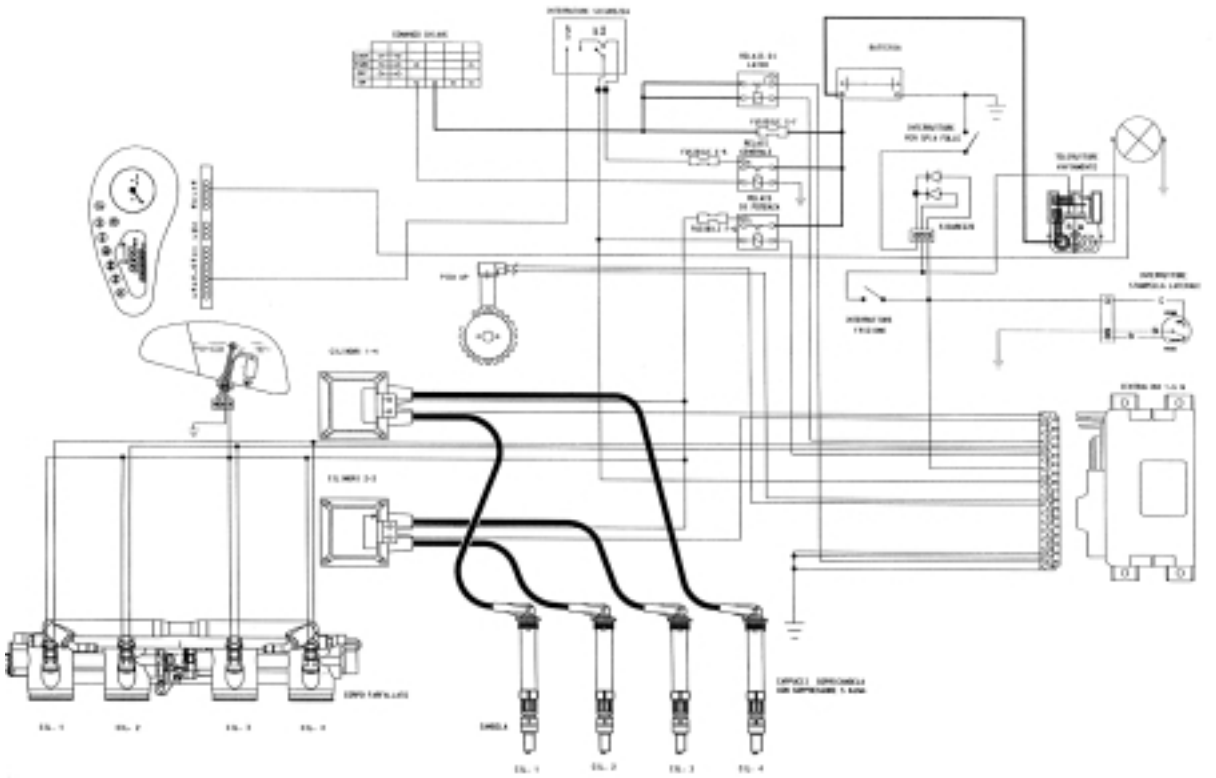
Ignition key in the “ON” position
Safety switch in the “RUN” position
Start activated
Side stand lowered
Gear engaged
Clutch not pulled in
Engine not switched on



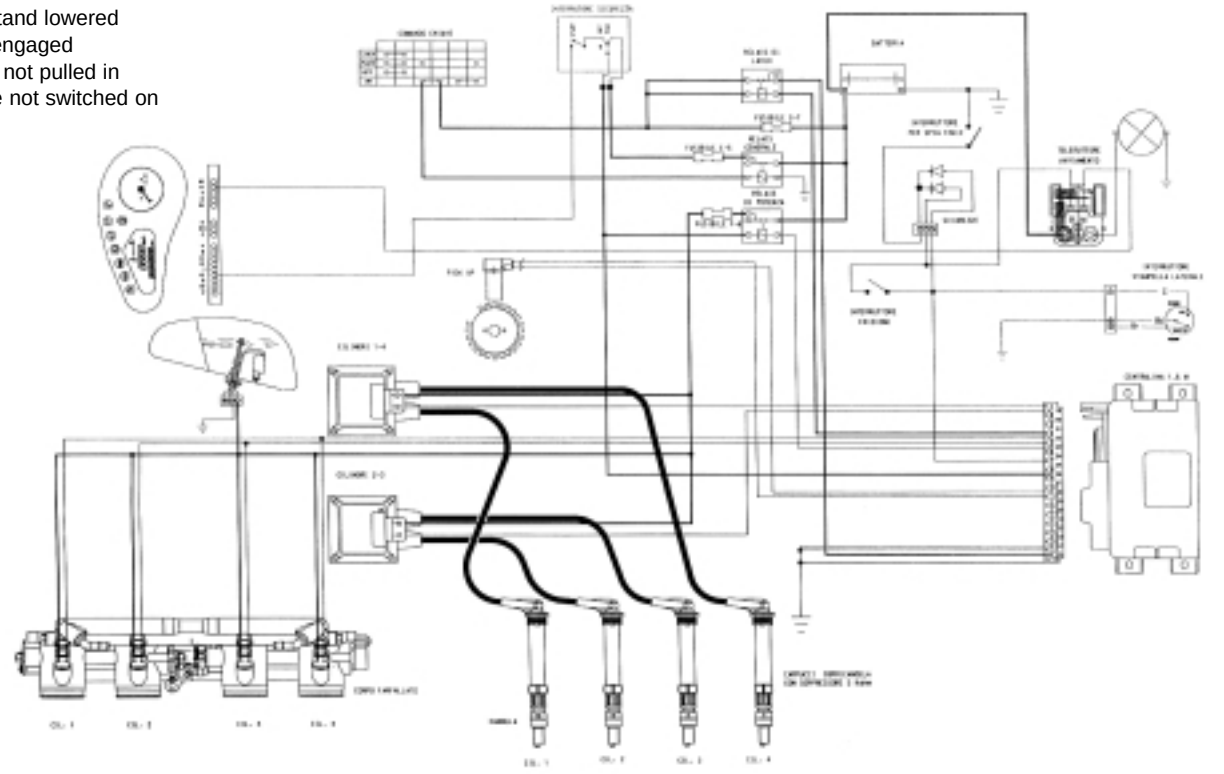
Ignition key in the “ON” Position
Safety switch in the “OFF” Position



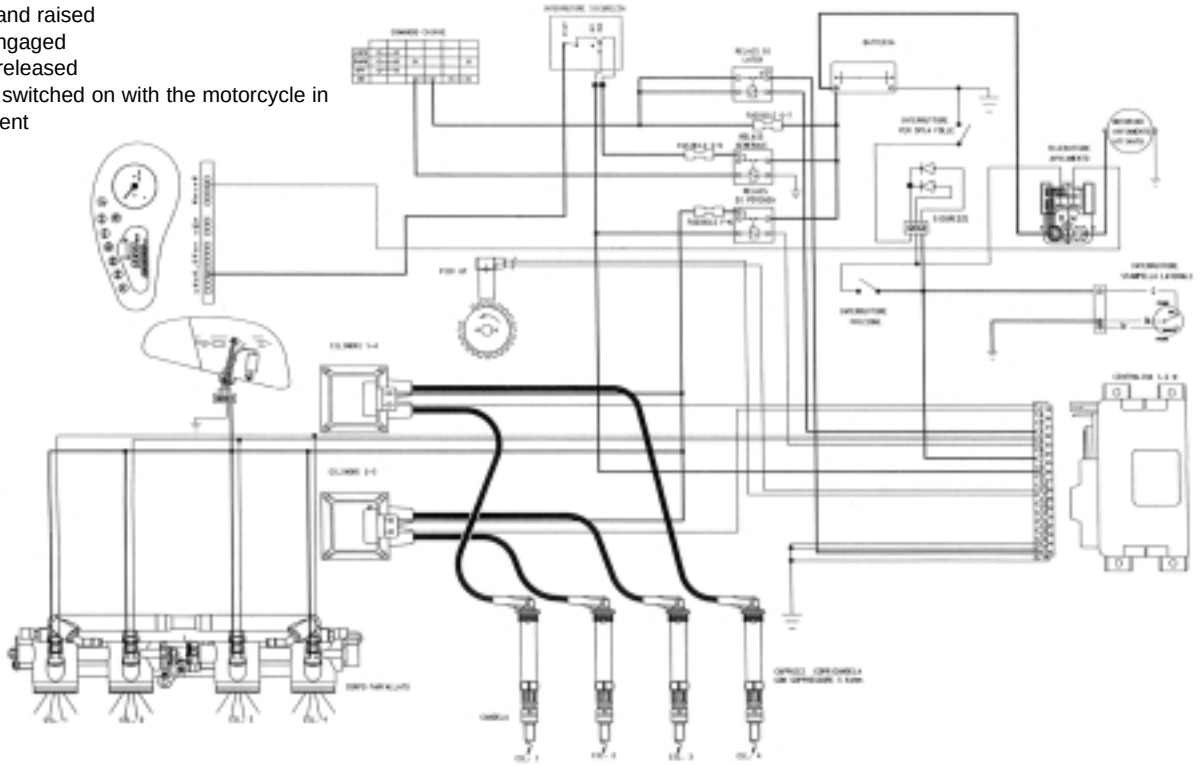
Ignition key in the “OFF” position



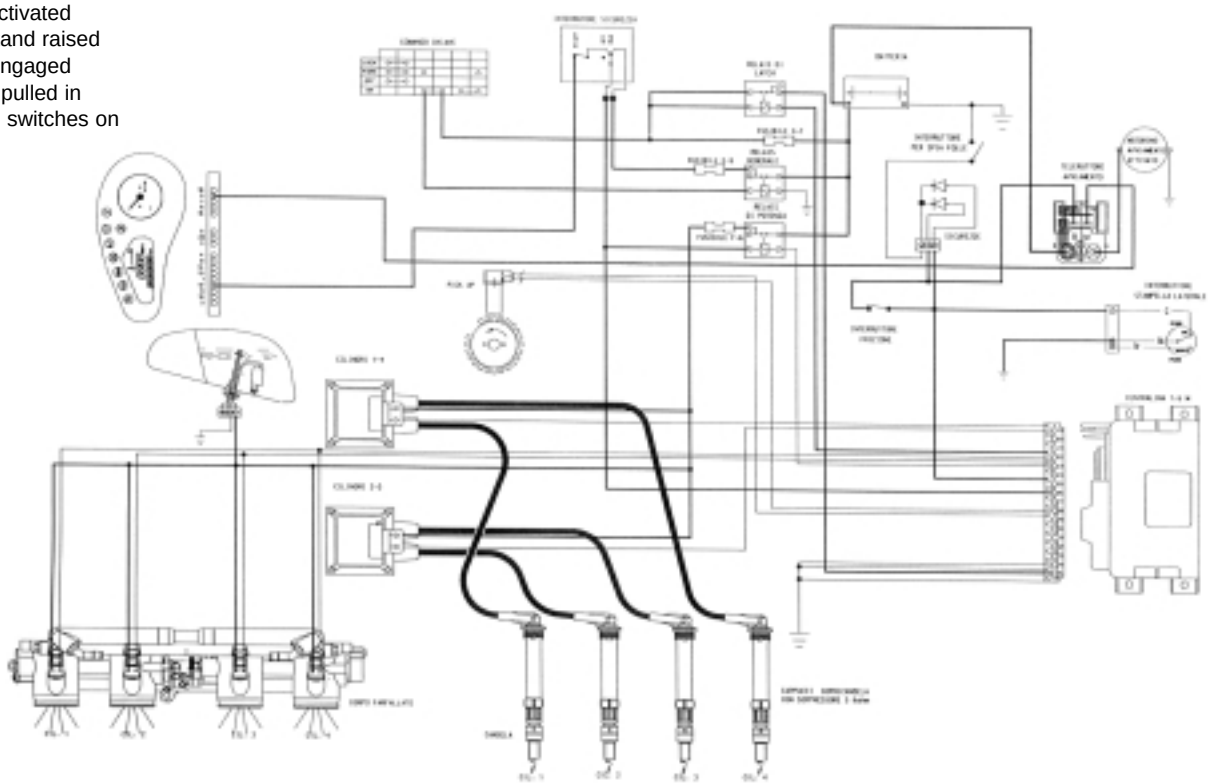
Ignition key in the “ON” position
Safety switch in the “RUN” position
Start disactivated
Side stand lowered
Gear engaged
Clutch not pulled in
Engine not switched on



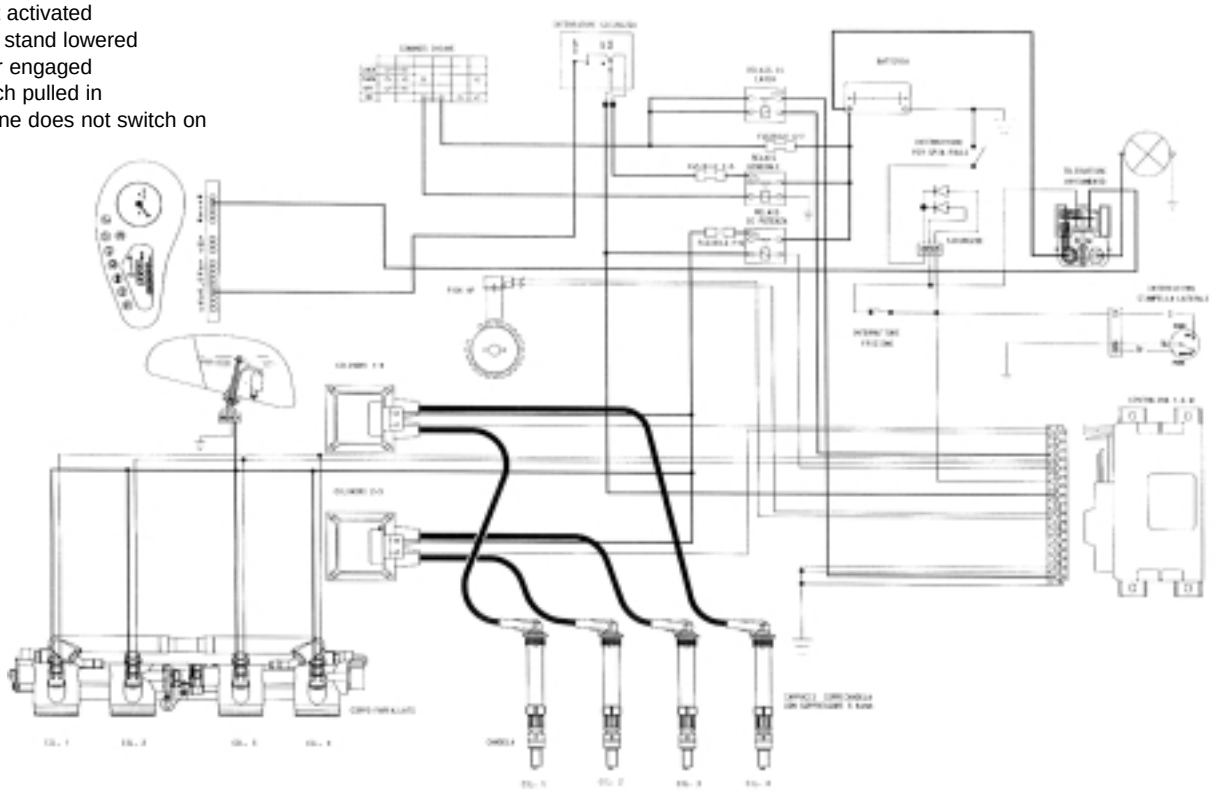
Ignition key in the “ON” position
Safety switch in the “RUN” Position
Start activated
Side stand raised
Gear engaged
Clutch released
Engine switched on with the motorcycle in movement



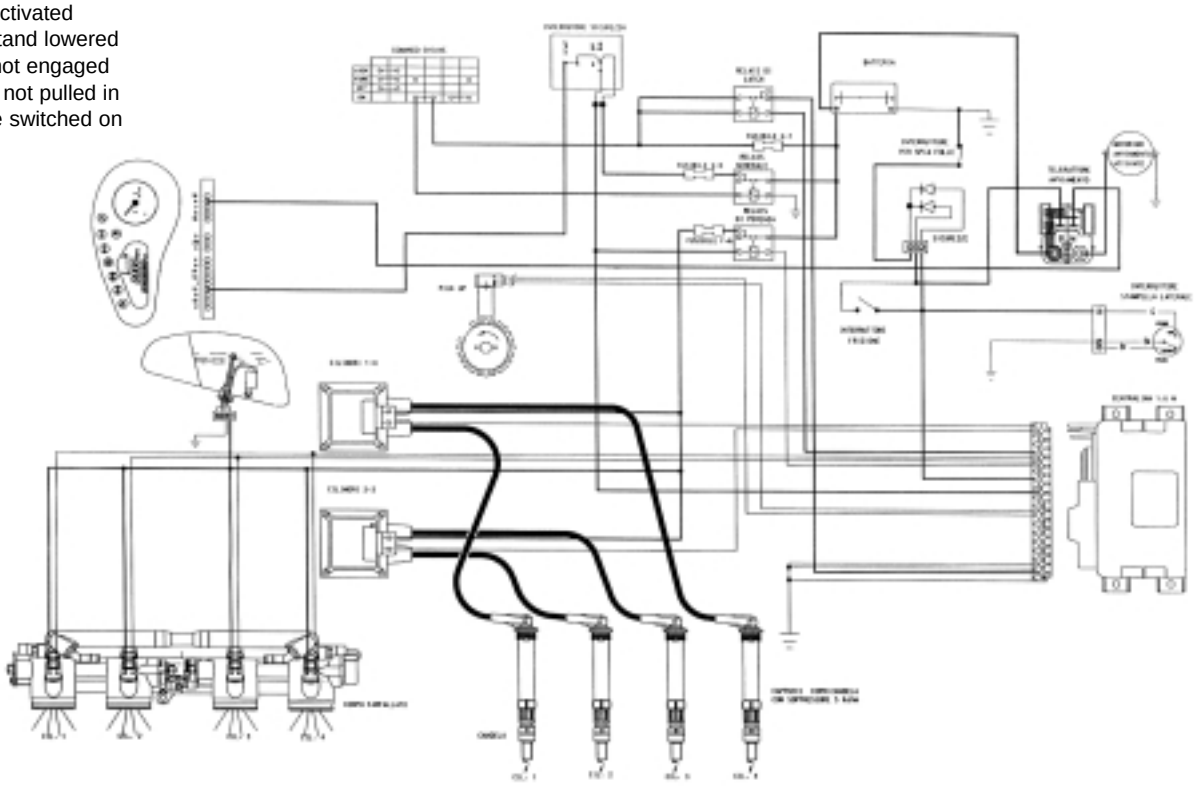
Ignition key in the “ON” position
Safety switch in the “RUN” position
Start activated
Side stand raised
Gear engaged
Clutch pulled in
Engine switches on



Ignition key in the “ON” position
Safety switch on the “RUN” position
Start activated
Side stand lowered
Gear engaged
Clutch pulled in
Engine does not switch on



Ignition key in the “ON” position
Safety switch in the “RUN” position
Start activated
Side stand lowered
Gear not engaged
Clutch not pulled in
Engine switched on



STARTER SYSTEM DIAGNOSTICS

The starter motor does not turn

With the gearchange in neutral and the neutral warning light lit up on the instrument panel, switch the ignition key to the “ON” position with the kill switch at the “RUN” position.
Check that the click of the starter relay can be heard when the starter button is pressed.

— The click is heard → Check that the starter motor turns when connected directly to the positive (+) terminal of the battery (do not utilise a thin lead because the flow of current is elevated).

- The motor turns → Defective starter relay. Starter motor cable: slack connection or no connection.
- The motor does not turn → Defective starter motor. See page 28.

The click is not heard.

Pull in the clutch level

— The click is heard → Starter safety central unit faulty. See page 29.

The click is not heard

Measure the voltage of the starter relay at the relay connectors (between BL-G + and Ar-N -) when the starter button is pressed.

— Voltage missing. → Defective ignition switch. Defective engine kill switch. Defective gearchange position switch. Defective diode. Defective general relay. Defective starter button. Defective clutch level position switch. Defective contact connector. Open circuit of the wiring. Faulty fuse (E-5). Defective instrument panel (see page 41).

Voltage present.

Check the starter relay. See page 29.

— Incorrect → Defective starter relay.

Correct → Defective starter relay contact.

N.B.
With the side stand in the up position, the starter motor turns when the gearchange is in neutral or when the gear is engaged and the clutch lever pulled in.

Check the side stand switch. See page 32.

— Incorrect → Defective side stand switch.

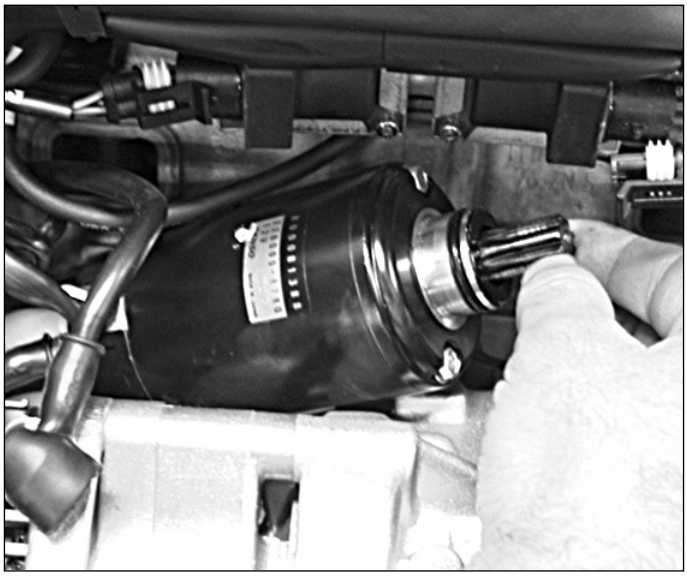
Correct → Open circuit in the wiring. Defective connector contact.

Other

The engine does not turn even if the starter motor turns. → Defective starter engagement.

STARTER MOTOR REMOVAL

- Remove the fuel tank (see chapter C “Bodywork”).
- Drain off the engine coolant, completely emptying the cylinder passageways via the two screws situated on the front part of the cylinders.
- Remove the coils from the frame support.
- Remove the blow-by cover.
- Disconnect the cable of the pick-up.
- Disconnect the alternator connector.
- Remove the coolant liquid pump by disconnecting the rubber union from the conduit that brings the coolant liquid to the cylinders. Remove the conduit of the cylinder cooling system.
- Disconnect the cable of the starter motor.
- Remove the two fixing screws of the starter motor.
- Remove the starter motor by extracting it as indicated in the figure.



STARTER MOTOR CHECK

If a fault has been diagnosed in the starter motor, it is necessary to proceed as follows with the check:

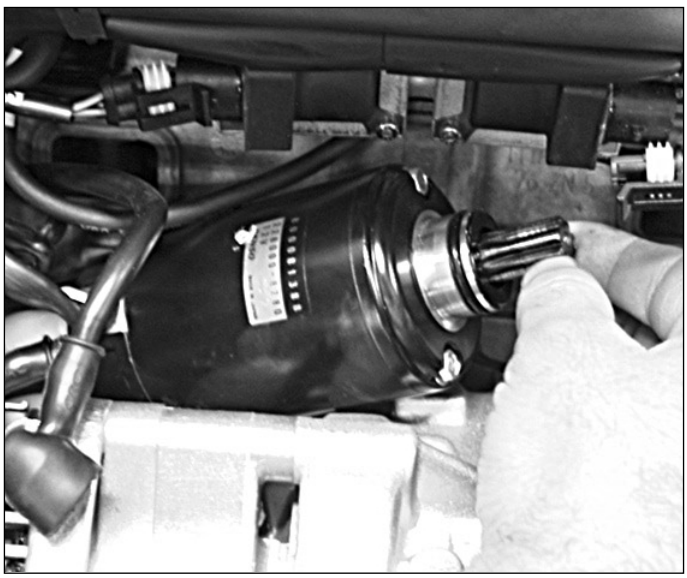
- Connect a tester between earth and the starter motor terminal.
- Check that there is continuity between the positive pole and the engine earth. If there is no continuity, substitute the starter motor.

STARTER MOTOR ASSEMBLY

Assemble the starter motor in the reverse order of removal. Pay attention to the following points:

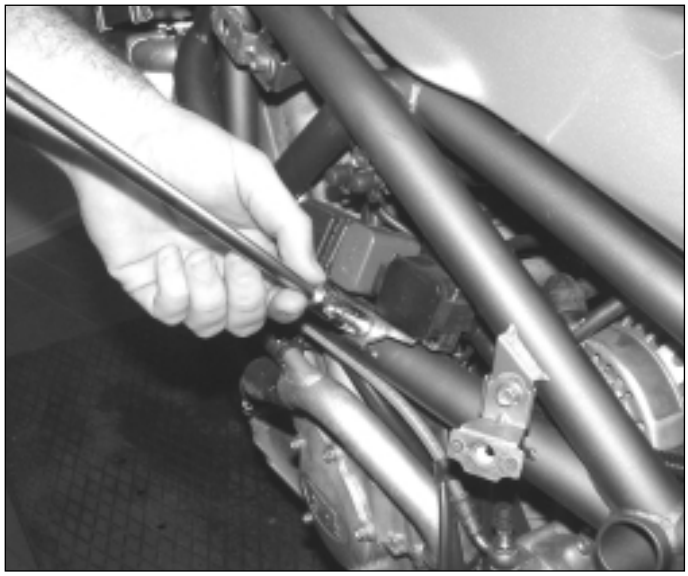
Substitute the O-ring with a new one to avoid oil leakage and the ingress of humidity.

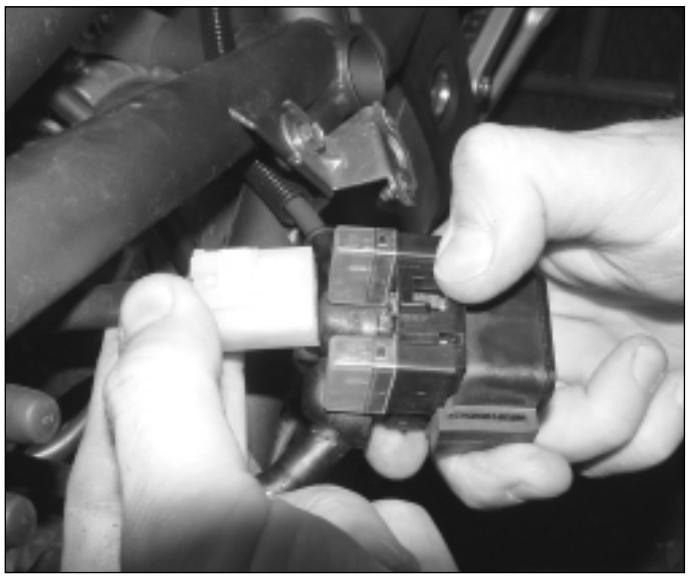
- Apply grease to the oil seal lip.
- Apply a small quantity of MOLYKOTE to the rotor shaft.
- Apply a small quantity of LOCTITE 243 to the bolts of the starter motor.

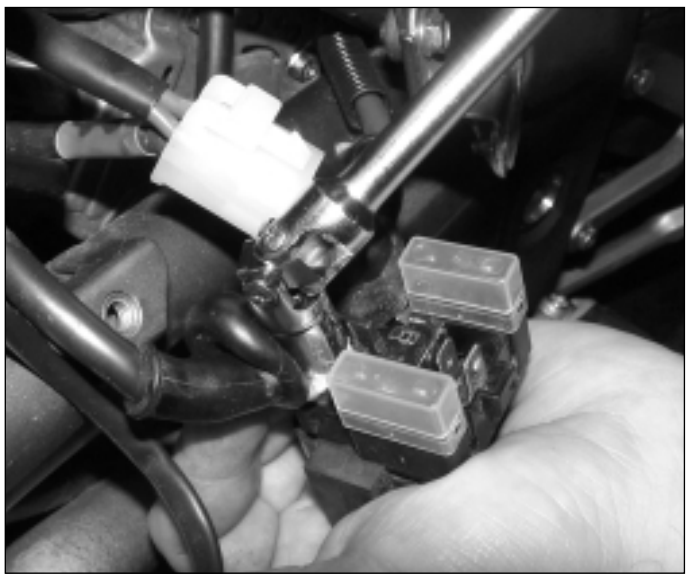


STARTER RELAY CHECK

- Remove the left side fairing panel as described in chapter C “Bodywork”.
- Remove the support plate of the relay (1) from the frame.
- Remove the relay from the support plate.
- Disconnect the starter relay coupling (2).
- Disconnect the cables from the positive and negative poles of the battery to avoid short circuits during assembly.
- Disconnect the cables (3) of the starter motor and the positive cable of the battery from the relay.





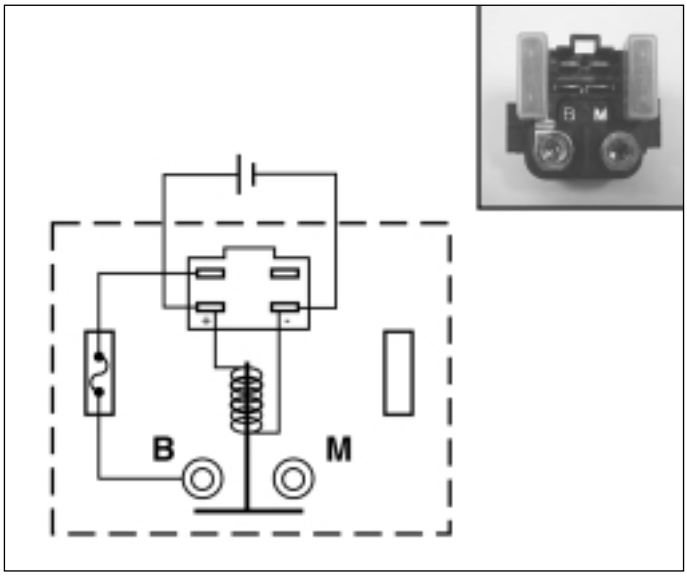


Apply 12 volts to the terminals (1) and (2) of the relay and check the continuity between terminals B-M.

Do not apply the battery voltage to the starter relay for more than five seconds to avoid overheating and therefore damaging the winding.

- Using a multi-tester, check that the winding is on open circuit or if a resistance is present. The winding is in good condition if the value of the resistance revealed is as indicated.

Multi-tester dial indication: ohm Ω
Starter relay resistance
Standard: 3 – 6 Ω



E

IGNITION/SIDE STAND SAFETY SYSTEM PARTS CHECK

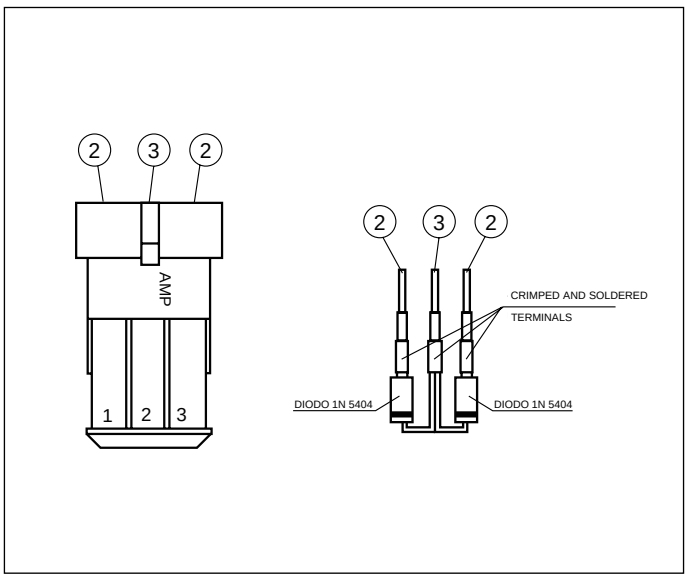
If the safety system does not function in the correct way, check each component. If anomalies are encountered, substitute the component with a new one.

DIODES

The diodes (1) are situated under the seat on the left as indicated in the figure.
• Disconnect the diodes.

Utilising a multi-tester measure the voltage between the terminals as indicated in the following table.

	+ probe of the tester on::		
(-) probe of the tester on:		(2)	(3)
	(2)		1,4÷1,5
	(3)	0,4÷0,6	



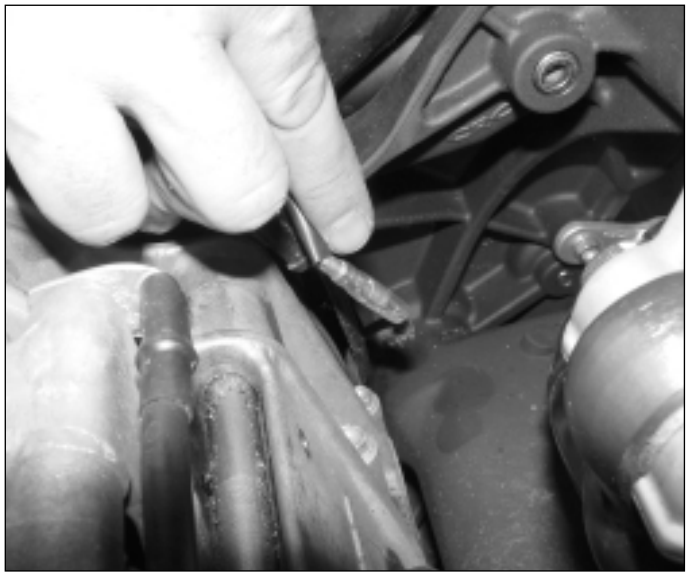
Multi-tester dial indication: Diode test

N.B. **If the measurement revealed by the tester is less than 1.4V, substitute the battery of the multi-tester with the probes of the disconnected tester.**

GEARCHANGE POSITION SWITCH

The coupling of the gearchange position lead is situated underneath the fuel tank. To remove the fuel tank, see chapter C “Bodywork”.

- Disconnect the gearchange position switch lead and utilising a multi-tester, check the continuity between the black lead and earth with the gears in neutral.



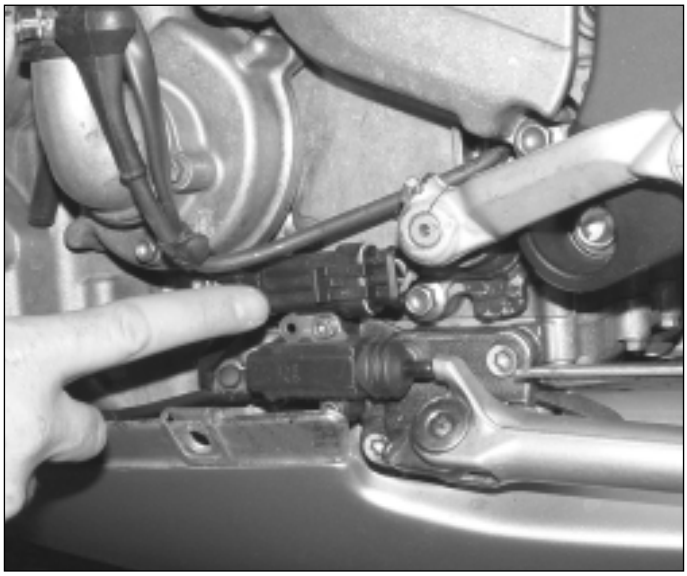
	Black	Engine earth
ON (neutral)	○———	———○
OFF (neutral excluded)		

When the coupling of the gearchange position switch is connected and disconnected, be sure to turn the ignition switch to the “OFF” position to avoid damaging the electronic parts.

SIDE STAND SWITCH

The coupling of the side stand switch is situated under the pinion wheel transmission casing on the left of the motorcycle.

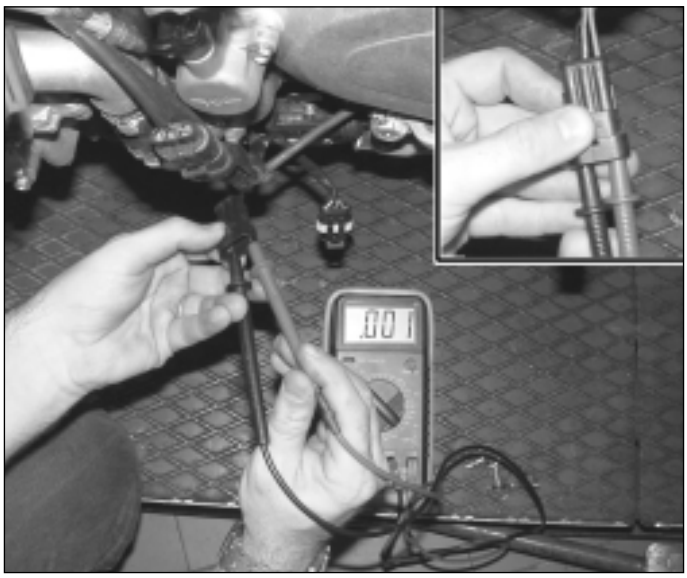
- Remove the left side fairing panel.
- Disconnect the coupling of the side stand switch lead and measure the continuity as follows.



Utilising a multi-tester, check the continuity as indicated in the table.

	Green	Brown	Black
ON (raised)	○		○
OFF (lowered)		○	○

If it is necessary to substitute the side stand switch after carrying out the previously described tests, proceed as indicated in chapter G “Frame”.



IGNITION SYSTEM

DESCRIPTION

As with the injection system, the ignition system is controlled by the ECU. The system belongs to the family of integrated systems of digital electronic ignition with advance, static timing and electronic fuel injection of the semi-phased intermittent type (injected and ignition simultaneously to cylinders 1 – 4 and 2 – 3).

This ignition system consists of an engine crankshaft position sensor (pick-up), an ECU, two ignition coils and four spark plugs.

1) The feed of the ignition coil is supplied by the battery via the power relay and is controlled by the ECU with regards to the position of the switches of the side stand and the gearchange.
2) The ignition timing is precisely controlled with regards to the engine r.p.m. and the position of the accelerator. Other than this basic condition, also the temperature, intake air pressure and the temperature of the engine coolant influence the ignition timing.

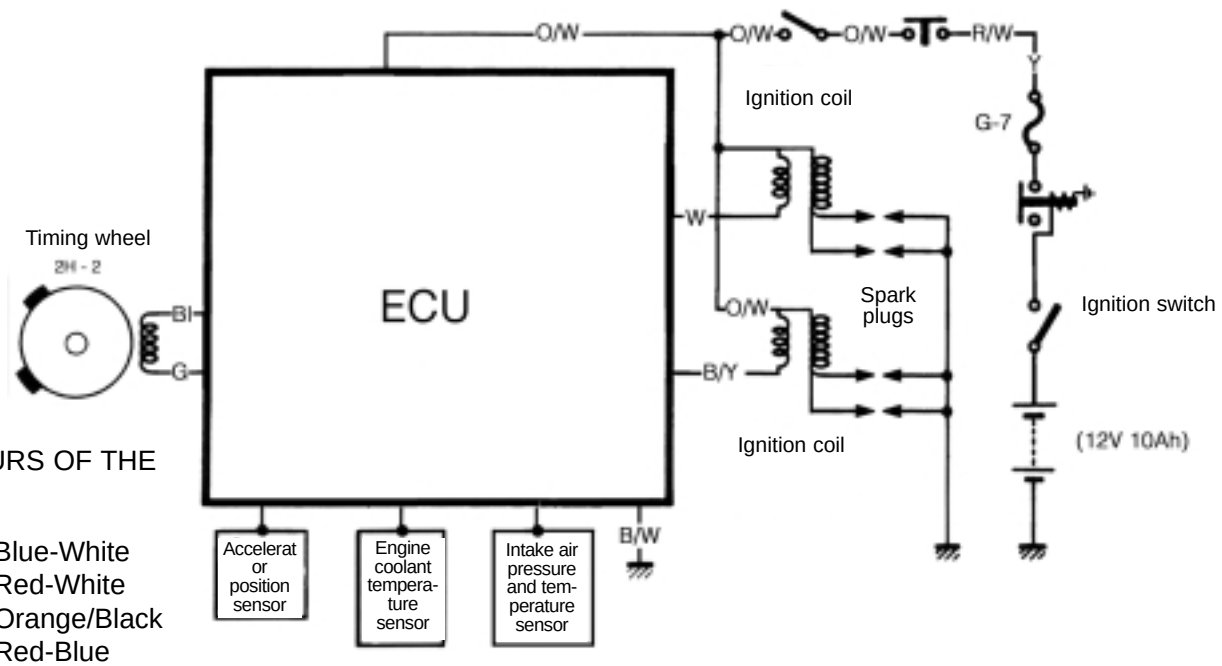
The following devices influence the ignition timing with the purpose of deactivating or activating the ignition system.

Crankshaft position sensor:
On the extreme left of the crankshaft is a pick-up sensor that produces a form of wave when it encounters the teeth of the timing wheel.
The form of wave generated is sent to the ECU that perceives the movement of the engine and calculates the number of r.p.m.
This signals determines the ignition timing and the signal that is sent to the revcounter.
If this signal is not sent to the ECU the ignition and injection systems do not function.

Accelerator position sensor:
This sensor is situated on the throttle body and is constituted of a potentiometer, the mobile part of which is controlled by the throttle valve shaft. The parameter measured is the butterfly position from minimum to fully open. On the basis of this signal the ECU determines the ignition timing with regards to the engine r.p.m.
The basic ignition advance is determined by two factors: the accelerator position and the number of r.p.m. of the engine.

Engine coolant temperature sensor:
This sensor affects the ignition advance when the temperature of the coolant liquid is less than 60°C., gradually returning to the basic advance when the temperature of the coolant liquid increases.

Intake air pressure and temperature sensor:
This sensor affects the ignition advance when the temperature and the pressure of the intake air vary: the ignition advance diminishes for elevated air temperature and increases for low pressure of the intake air.



COLOURS OF THE LEADS

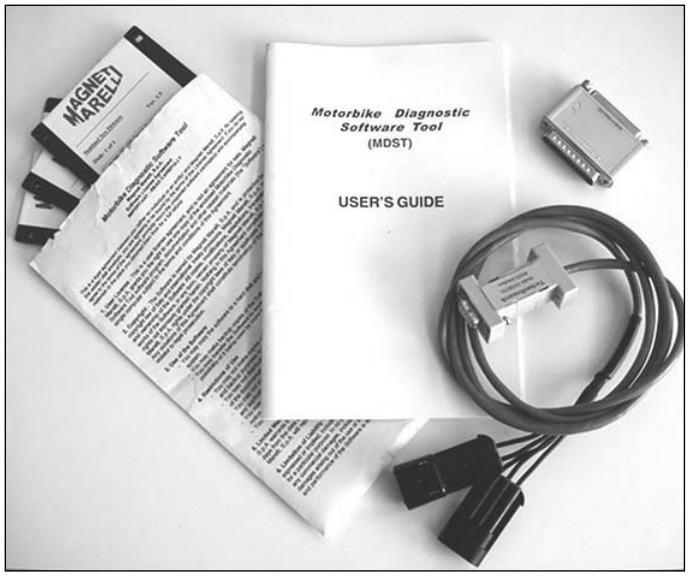
B/W	Blue-White
R/W	Red-White
O/BK	Orange/Black
R/B	Red-Blue
B/G	Blue-Green
Y/R	Yellow-Red
R/G	Red-Green
R	Red

N.B. The ignition interruption circuit is incorporated in the ECU to avoid over-revving the engine. If the motor reaches 13300 r.p.m., this circuit interrupts the primary current of the ignition to all spark plugs.

The engine could function at more than 13300 r.p.m. without a load, even if the interruption circuit functions and therefore could damage the engine. Never spin the engine at more than 13300 r.p.m. without a load.

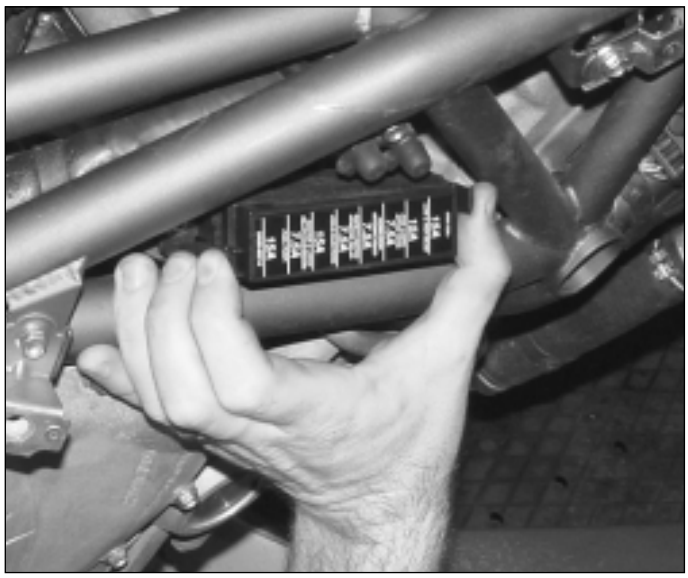
IGNITION AND INJECTION SYSTEM DIAGNOSTICS

- For the diagnosis of the ignition and injection system there exists a Weber-Marelli diagnostic exchange software capable of individualising and recording the faults present or that were present previously on the motorcycle. This software is equipped with a guide booklet to carry out checks on each individual component of the system.
- The check can be carried out by observing the following described operations:

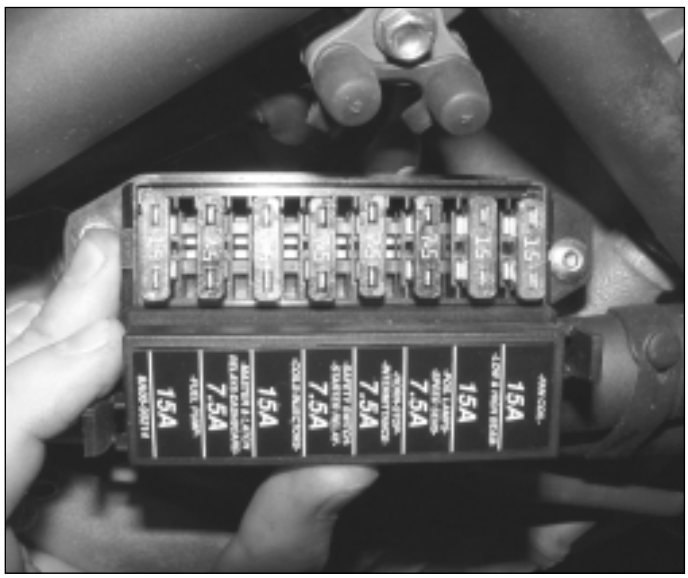


FUSES

The fuses are situated on the right of the motorcycle. To reach them it is necessary to remove the right fairing side panel.
Remove the cover.



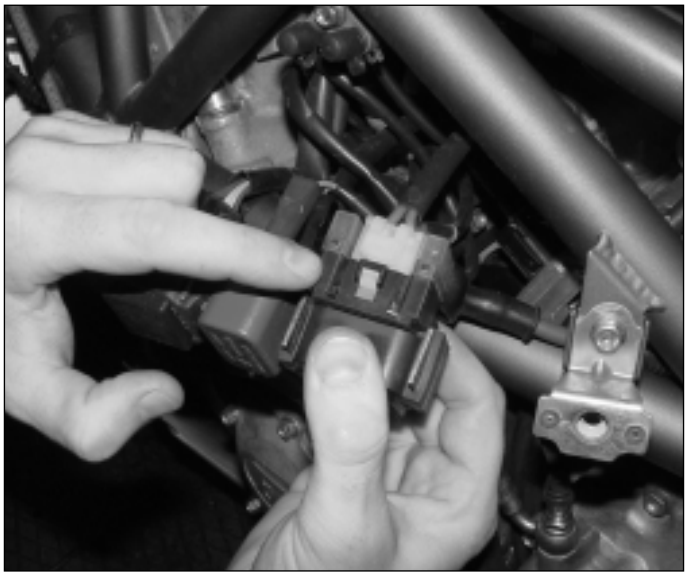
Substitute the burnt fuse and replace the cover (find the electrical fault before replacing the fuse).
To identify the position and the function of the fuses, consult the information written on the adhesive and in the electrical diagram. The reference letters indicated in the figure correspond to those shown in the diagram.



Fuses list

Ref.	*Amperage* (A)	*Utilisation*
A-1	15	Cooling fan
B-2	15	Dipped and main beam headlight
C-3	7.5	Side lights – mileometer sensor – fuel tank probe
D-4	7.5	Stop light – horn – direction indicators
E-5	7.5	Starter activating/deactivating switch – starter button
F-6	15	Coils – injectors
G-7	7.5	"LATCH" relay – general relay – Instrument panel
H-8	15	Fuel pump
L-9	40	Battery recharge
M-10	40	Spare for battery recharge

The charge fuse is situated on the left side of the motorcycle in the position indicated on the starter relay.

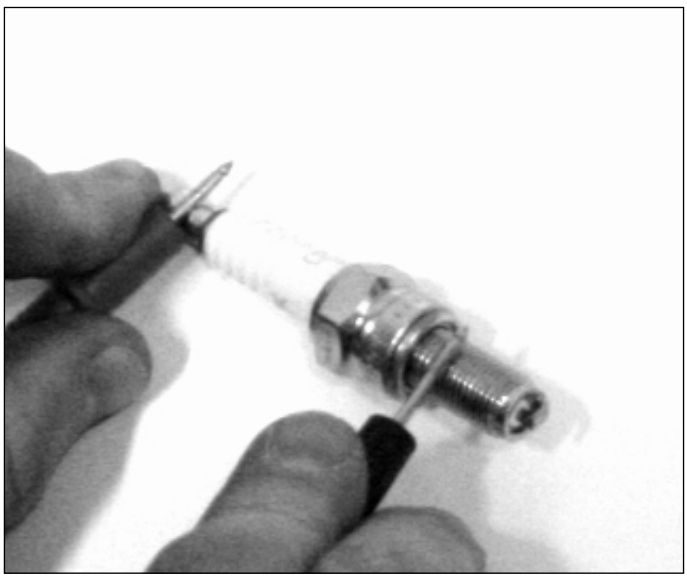


To accede to this component it is necessary to remove the following parts:
- Left fairing side panel
- Remove the screw of the ignition switch support, intermittent relay and general relay.
- Remove the entire assembly.
- Remove the plastic covers on both fuses.
- Substitute the left fuse with the pare one as shown in the figure.
- Before proceeding with the reassembly, it is recommended to place a new 40A spare fuse in position.

SPARK PLUGS

Remove the components of the motorcycle to remove the spark plugs as described in chapter B “Maintenance”.
Remove the spark plugs.

Check the resistance between the electrode and the screw cap of the spark plug as shown in the figure.

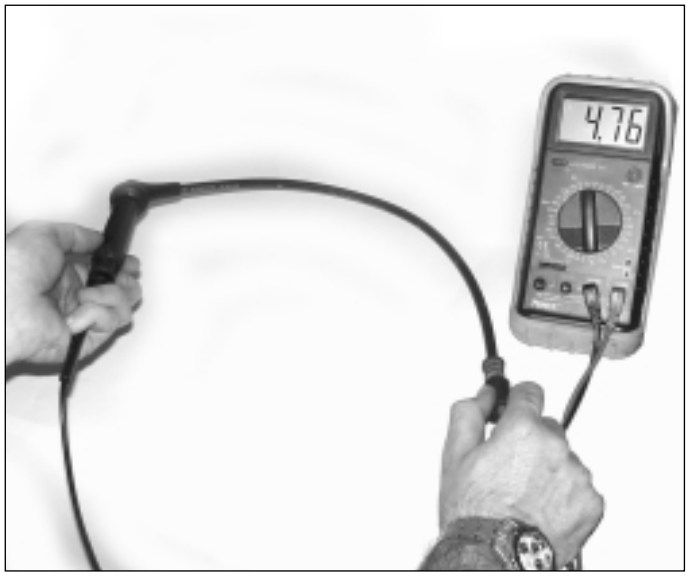


Permitted resistance: 4.5 – 5.5 K

Carry out the test on all the spark plugs.

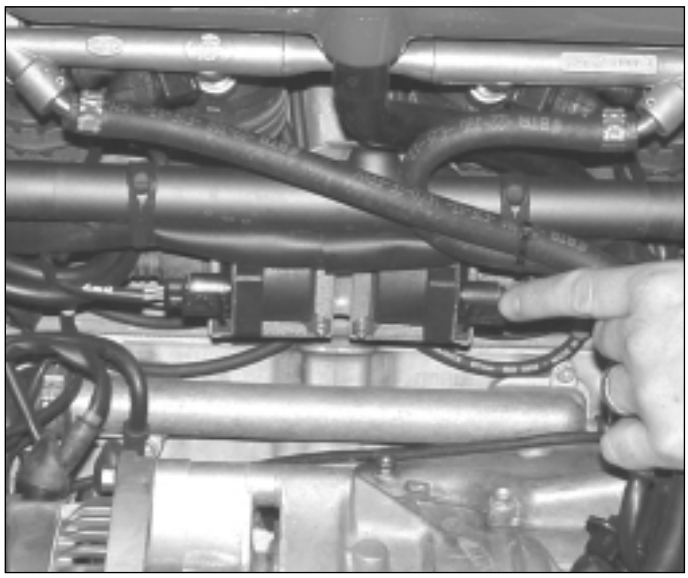
Carry out the same check on the four HT leads.
Check the resistance at each end of the HT leads.

Permitted resistance 4.5 – 5.5 K

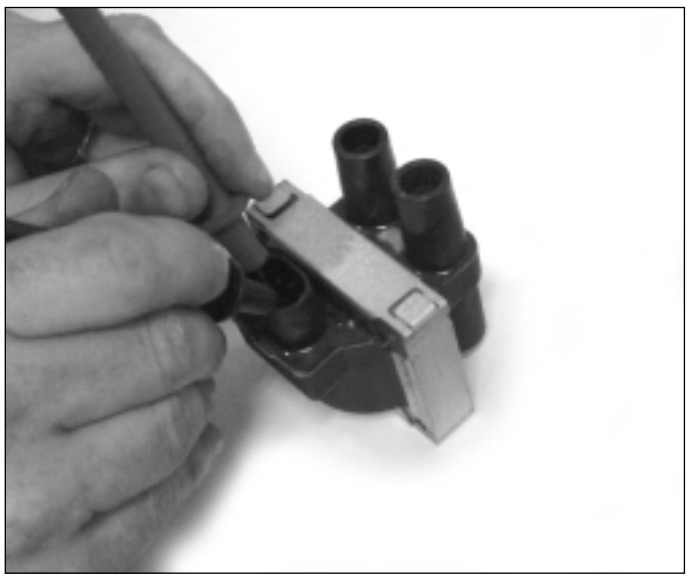


IGNITION COILS

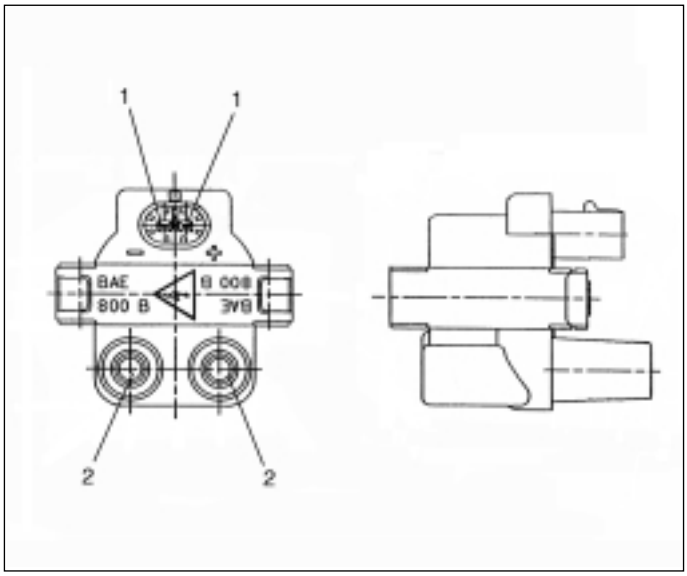
To check the HT coils it is necessary to remove various components before removing the coils.



Carry out the test on both coils relative to the cylinders.



Check the resistance of the primary winding (connectors 1 – 1) and the secondary winding (connectors 2 –2) of the coils.



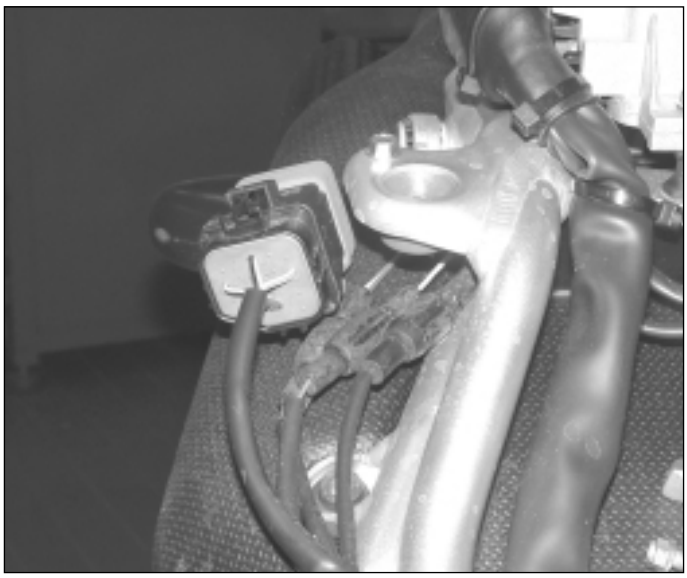
Primary winding resistance: 570 m ± 50 m (between connectors 1 – 1)
Secondary winding resistance: 7330 Ω ± 500 Ω between the cable-spark plug connectors)

If the values shown are not within the above limits, substitute the components.

E

LATCH RELAY

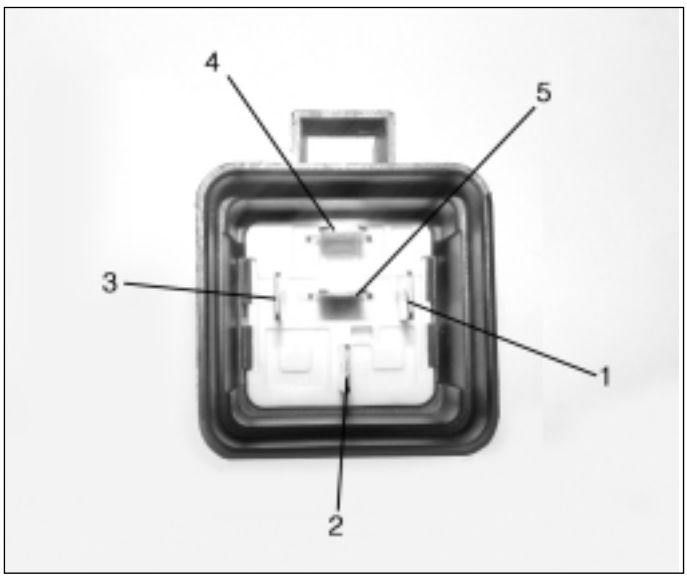
The Latch relay is situated under the tail unit on the right side of the motorcycle.
Disconnect the relative connectors, free the relay from its rubber support.



The Latch relay is identified by the colour of the leads on its connectors.

85	B/w	Blue/White
86	R/W	Red/White
87	O/BK	Orange/Black
30	R/B	Red/Blue

The first thing to check is the isolation between the terminals (2) and (4) with a tester.
Apply 12V to the terminals (1) and (3) and check the continuity between terminals (4) and (2). If there is no continuity, substitute the relay with a new one.

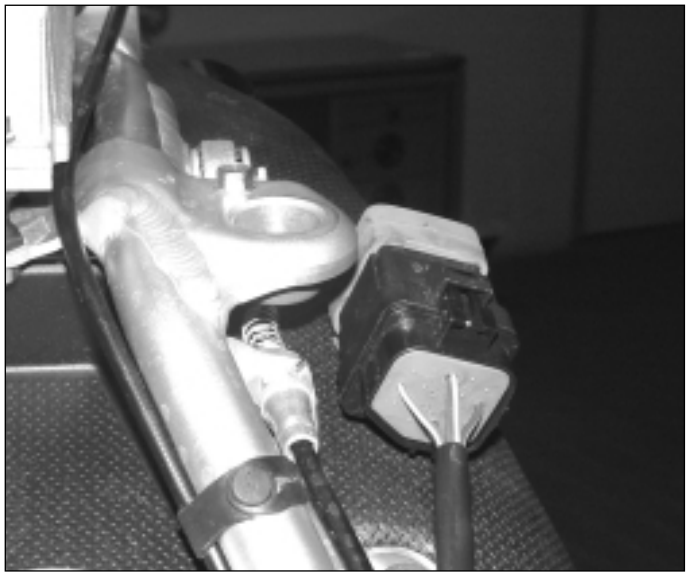


POWER RELAY

The power relay is situated under the tail unit on the left side like the Latch relay and is identified by the colours of its connectors.

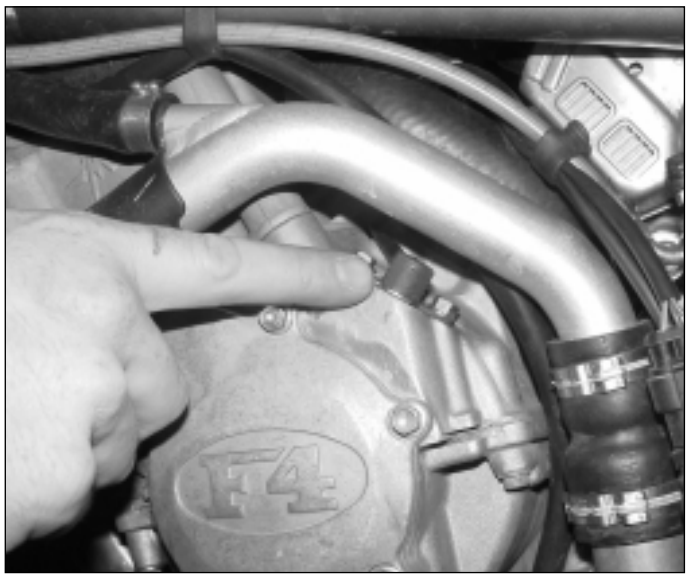
85	B/G	Blue/Green
86	Y/R	Yellow/Red
87	R/G	Red/Green
30	R	Red

Check the power relay in the same way as the Latch relay.



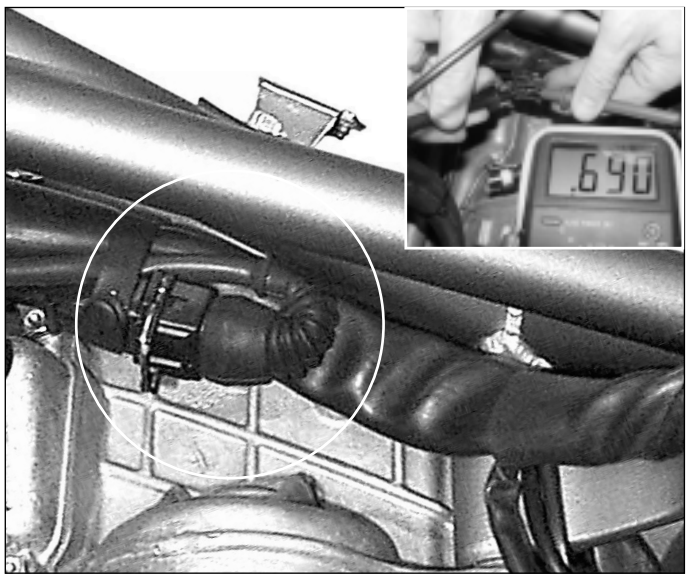
ENGINE PICK-UP

The engine pick-up is situated on the left side of the motorcycle. To check this component it is necessary to identify the relative connector positioned as shown in the figure, inside the frame on the right side of the motorcycle.



After having disconnected the pick-up connector, measure the resistance between the two points identified by a (+) and a (-) that are indicated on the connector.

Pick-up resistance value: ~ 680 – 700 Ω

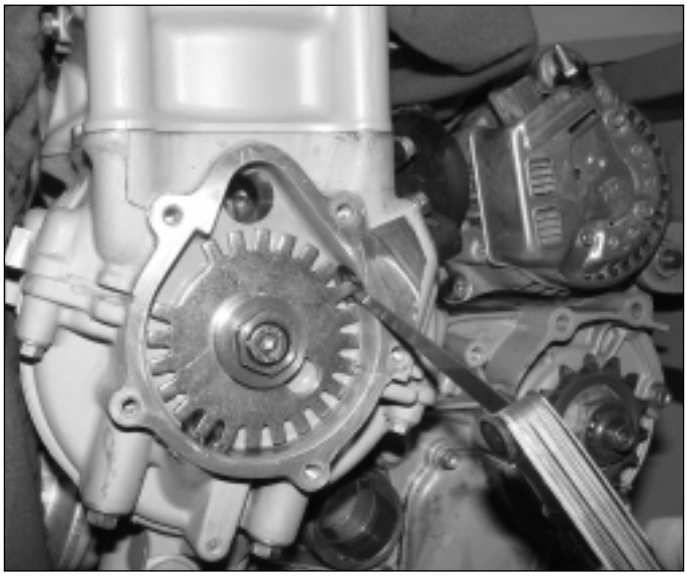


TIMING WHEEL GAP

To guarantee the correct functioning of the pick-up it is necessary to measure the gap between the pick-up and the timing wheel by utilising a feeler gauge as shown in the figure.

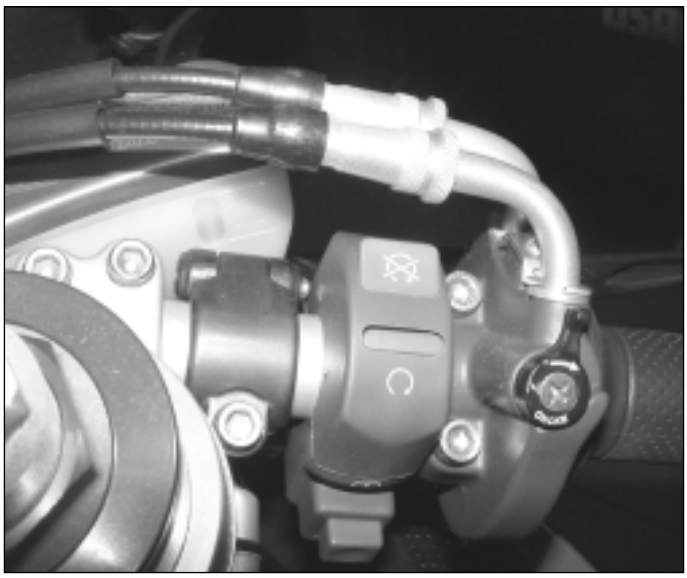
Gap width: 0.6 – 0.7 mm

To carry out this check it is necessary to remove the cover of the timing wheel by consulting the Workshop Engine Manual.

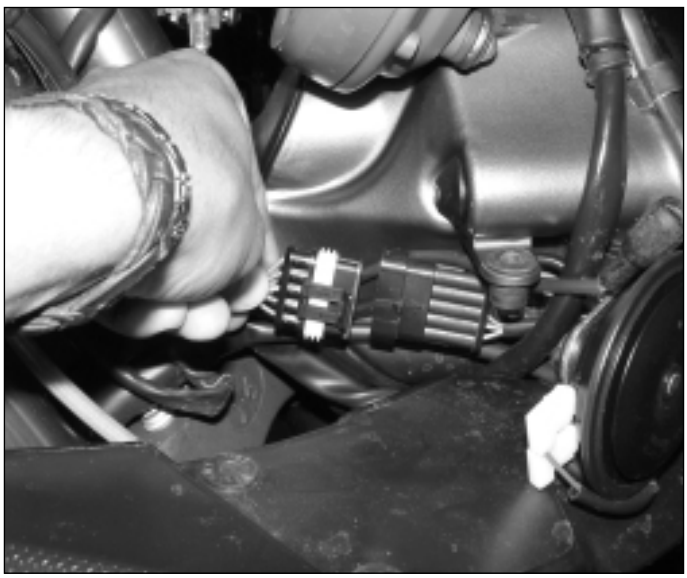


RUN OFF SAFETY SWITCH (di sicurezza)

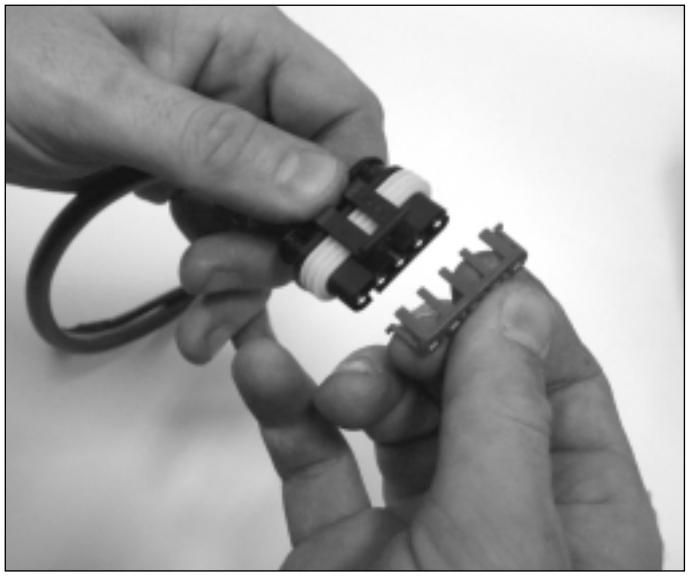
Remove the right fairing side panel as described in chapter C “Bodywork”.



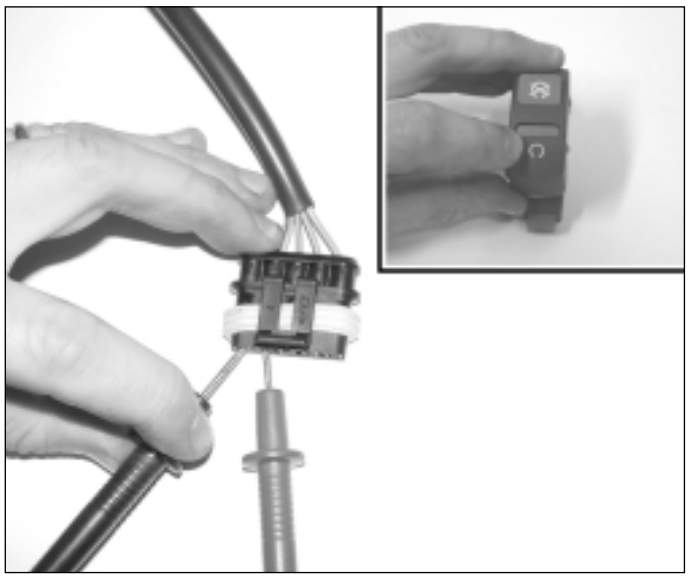
Remove the relative connector to the right hand control group as indicated in the figure.



Remove the plug part of the connector.



With the switch in the “RUN” position, check the continuity between pins (1) and (2).

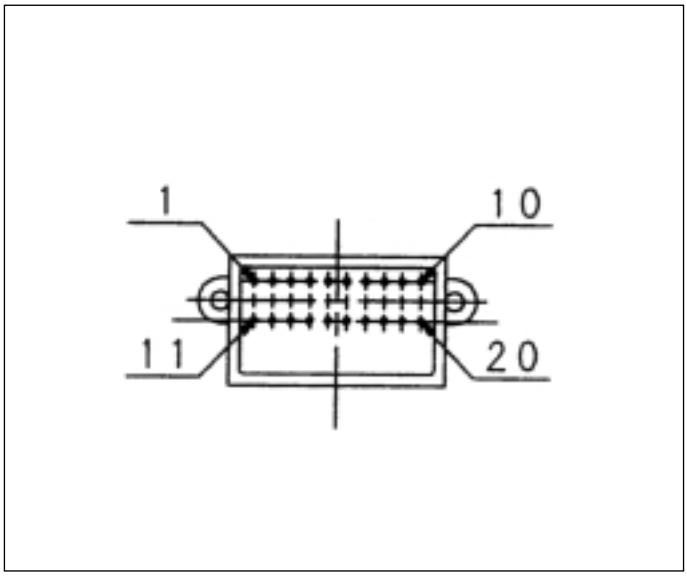


INSTRUMENTATION

If faults are found in the instrumentation, it is necessary to check the main wiring and the various components assisted by the same instrumentation. To carry out the various checks after having removed the fairing side panels and the nose fairing as described in chapter C “Bodywork”, it is necessary to remove the rubber cap and then the connector situated behind the instrumentation.

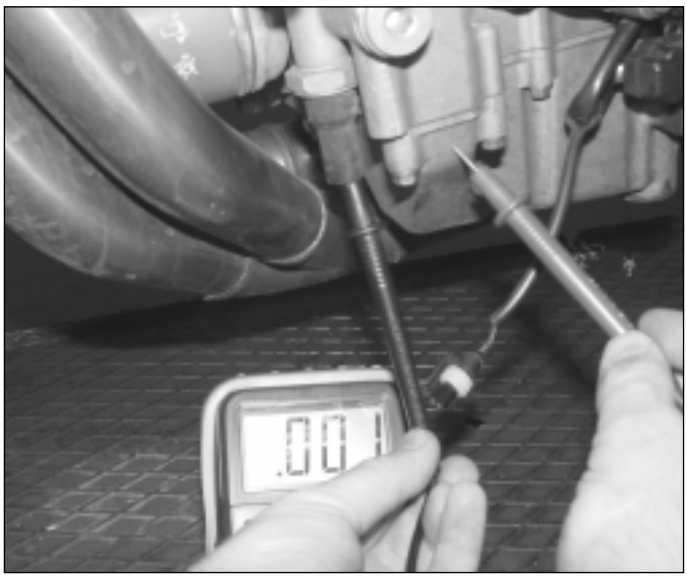
Consult the diagram below to identify the contacts of the various components:

1	Side stand	11	Starter relay output
2	Oil press	12	Engine starter switch
3	High beam	13	Turn-L
4	Lights	14	Turn-R
5	Neutral	15	Open
6	Low fuel	16	Ta pulse
7	CHG	17	Open
8	Temp sensor	18	Sp pulse
9	IGN	19	Open
10	Battery	20	GND



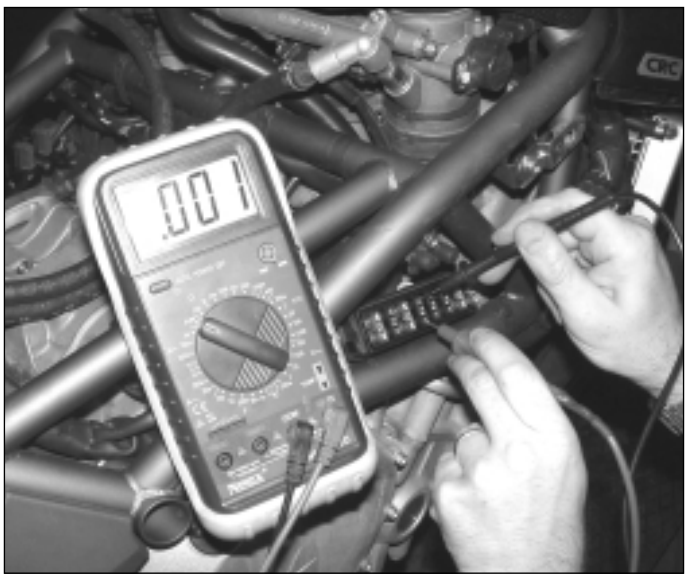
OIL PRESSURE SENSOR

To check the good functioning of this component with the engine switched off, it is necessary to find the continuity between the contact of the sensor and the earth of the motorcycle as shown in the figure.
With the engine switched on, the contact must be interrupted.

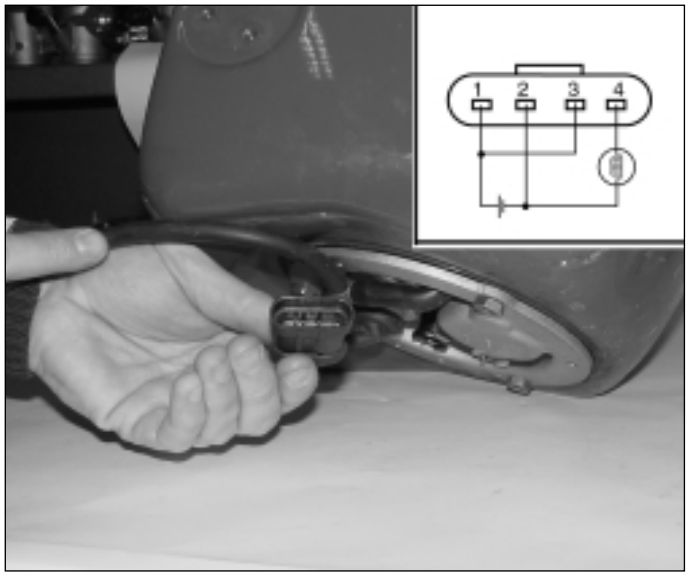


FUEL LEVEL WARNING LIGHT CHECK SWITCH

After verified the fault in the fuel level warning light system, check in the fuse box on the right side of the motorcycle the good condition of the fuses (position C3 or 11-3 – see page 35).

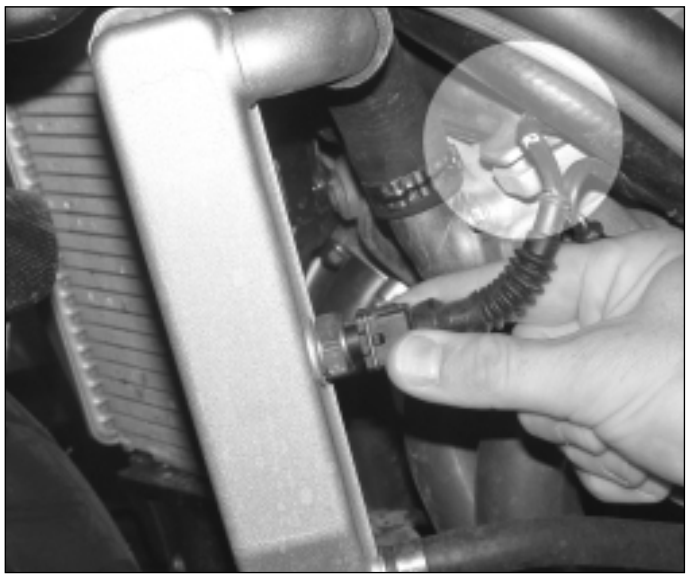


Having ascertained the good condition of the fuses in question, proceed as follows:
With the fuel tank removed from the motorcycle and empty of fuel, connect a small circuit composed of 12V battery and a light bulb of 12V – 1.7W to the connector of the fuel level indicator as shown in the diagram.
If the switch is in a good condition, the light bulb should light up after several seconds.
Pour some fuel into the fuel tank and confirm that the light bulb switches off after having poured more fuel into the tank than the maximum required for the reserve.



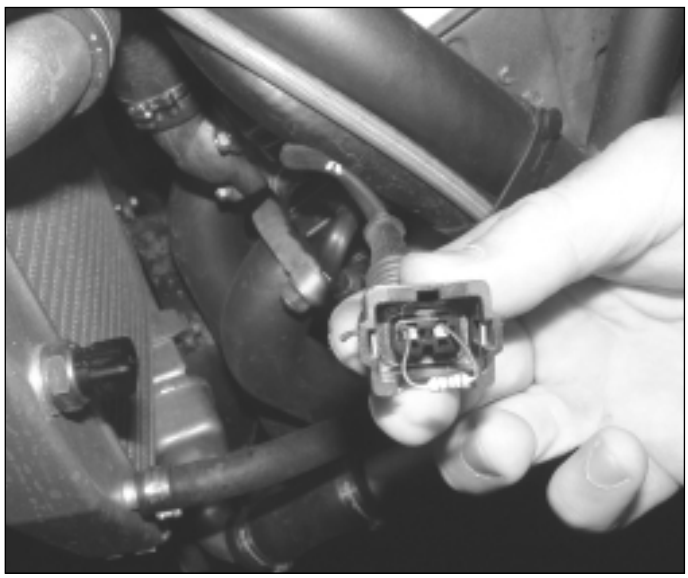
ENGINE COOLANT TEMPERATURE INDICATOR CHECK

Remove the connector of the engine coolant temperature sensor marked on the lead with an R.



Connect between the two connections of the connector a resistance as shown in the table.
Turn the ignition key to the “ON” position.
At this point the display should indicate the relative temperature to the resistance applied. It is sufficient to carry out the test at 50°C. and at 100°C. with the respective resistances of 1.150 kΩ and 0.204 kΩ

TEMP. °C	RESIST. kΩ	TEMP. °C	RESIST. kΩ
- 40	100,950	+ 40	1,598
- 30	53,100	+ 50	1,150
- 20	29,121	+ 60	0,746
- 10	16,599	+ 70	0,565
0	9,750	+ 80	0,377
+ 10	5,970	+ 90	0,275
+ 20	3,747	+ 100	0,204
+ 25	3,000	+ 110	0,153
+ 30	2,547	+ 125	0,102



If the checks previously carried out show a correct functioning of the indicator of the engine coolant temperature, but with the temperature sensor connected it does not function correctly, the cause can be identified in the engine coolant temperature sensor mounted on the radiator.
To substitute the sensor, consult chapter L “Cooling system”.

KEY IGNITION SWITCH

If there is no 12V input between pin (9) and (20) of the instrument panel connector with ignition switch in the “ON” position, the cause can be identified by a fault in fuses (7) or (3).

- If the fuses are in good condition, check the continuity between pin (9) of the instrument panel connector and point C3 of the fuse box.
- Check the presence of a 12V input between pins (10) and (20) of the connector. If this does not occur, check the condition of the fuse G7.

STARTER RELAY ACTIVATION

- Check that there is a 12V input between pin (11) and (20) with the safety switch in the “RUN” position and the starter button pressed.
- If there is no voltage, check the presence of voltage input between pin (12) and (20).
- If there is no voltage input between pin (12) and (20), check the condition of fuse E5 after which check the right hand control as follows:
  1) Disconnect the connector of the right hand control.
  2) Check the continuity between the contacts (1) and (3) with the safety switch in the “RUN” Position and the starter button pressed.
  3) Having verified the good functioning of the right hand control, the cause can be identified as damage to the instrument panel.

13 - LEFT DIRECTION INDICATOR

If the left direction indicator warning light does not function, there must be the presence of voltage input intermittently between pin (13) and pin (20).
If the presence of input voltage is verified, the continuity between pin (13) of the instrument panel and pin (5) of the left hand control connector must be checked.

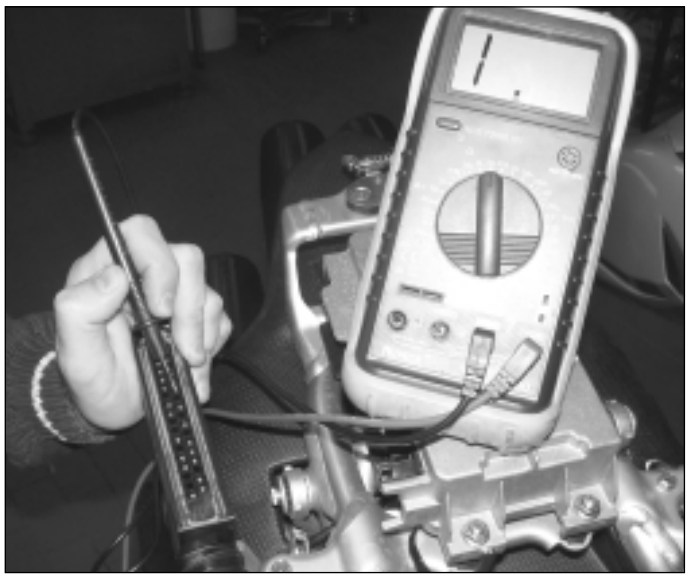
14 - RIGHT DIRECTION INDICATOR

If the right direction indicator warning light does not function, there must be the presence of voltage input intermittently between pin (14) and pin (20).
If the presence of input voltage is verified, the continuity between pin (14) of the instrument panel and pin (7) of the right hand control connector must be checked.

16 - R.P.M. SENSOR

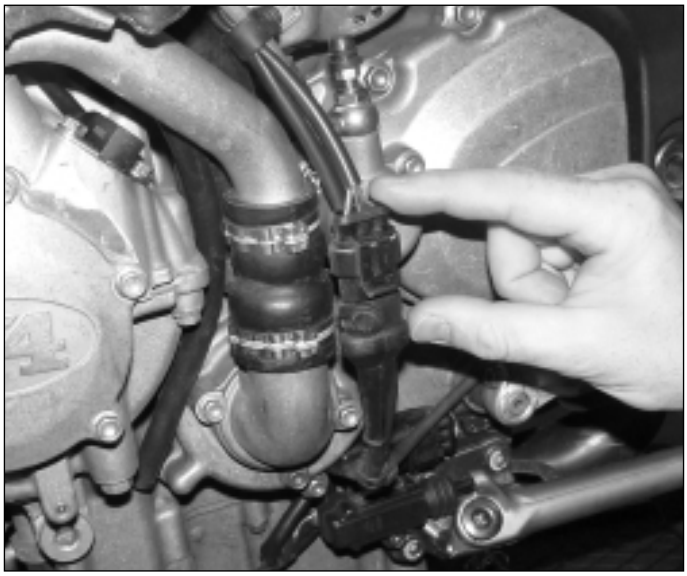
If the r.p.m. of the engine is not signalled on the instrument panel with the engine switched on, check:

- The continuity between pin (16) of the instrument panel and pin (20) of the CPU.
- If the cause is verified, the fault will be found in the CPU.



N.B. **In the case of substitution of the CPU: with the ignition key in the "OFF" position wait approximately fifteen seconds before disconnecting the same.**

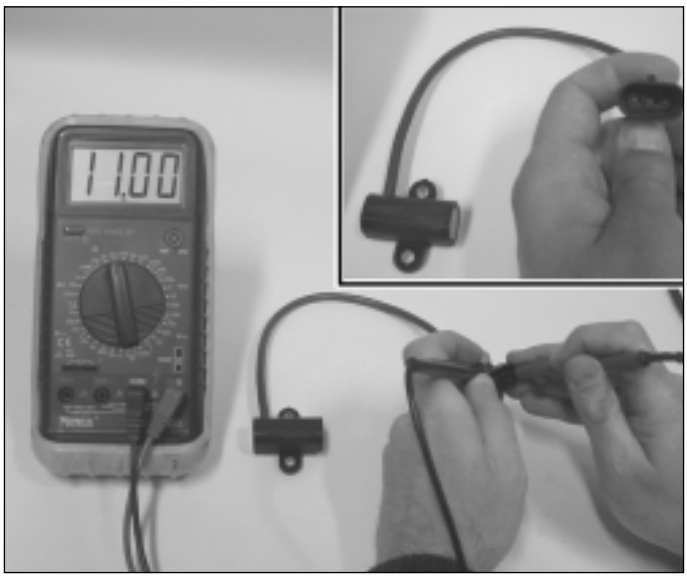
18 – SPEED SENSOR



If the speed of the motorcycle is not indicated on the instrument panel, proceed as follows:

- Check the condition of the fuse C3 (or 11-3).

- If the fuse in question is in good condition, proceed with the check of the speed sensor as follows:
  1) Remove the sensor from the motorcycle as described in the “F4 workshop engine manual (Code 8A00A1592).”
  2) Disconnect the connector, check that there 10 kΩ is measured between terminals (1) and (2) of the connector.



MAIN BEAM – DIPPED BEAM HEADLIGHT

If the dipped beam or main beam headlight does not function, check the condition of fuse B2 in the fuse box. After which, proceed with the substitution of the light bulb of the headlight.

Dipped beam

- Pull off the protective cover.

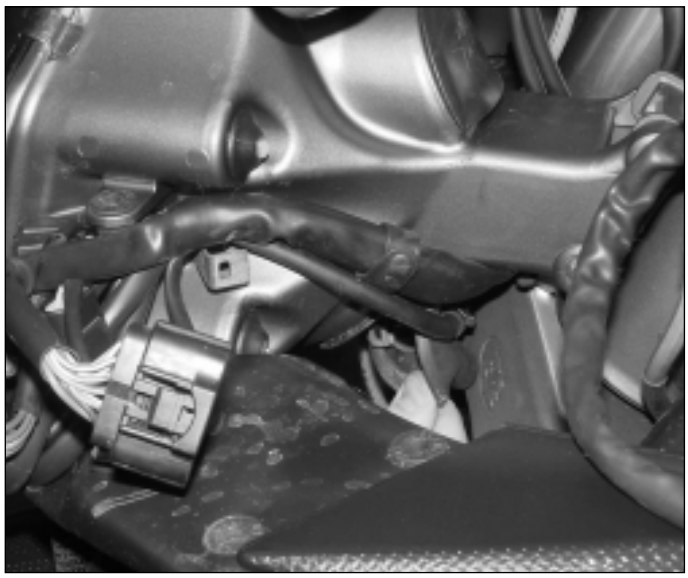
- Unhook the retaining spring.
- Extract the light bulb.
- Disconnect the connector.

Do not touch the glass of the light bulb with the hands. If the glass comes into contact with the hands, clean thoroughly with a degreasing product.

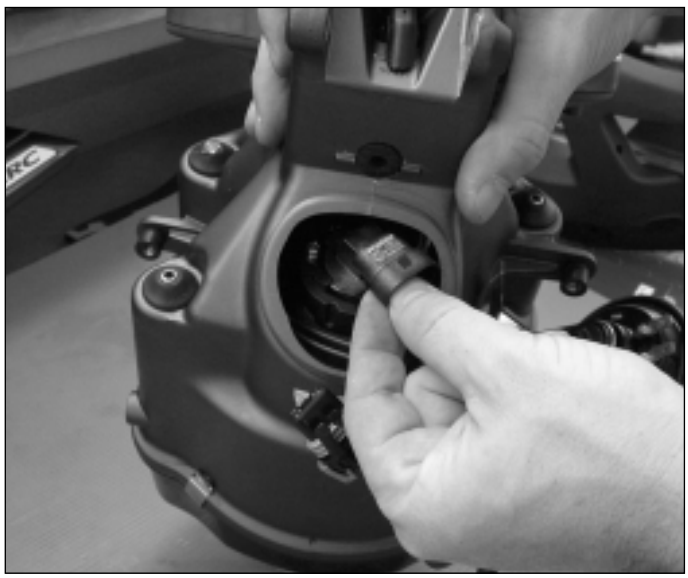
- Connect the connector.
- Insert the new light bulb.
- Hook up the retaining spring.
- Reinsert the protective cover.

Main beam

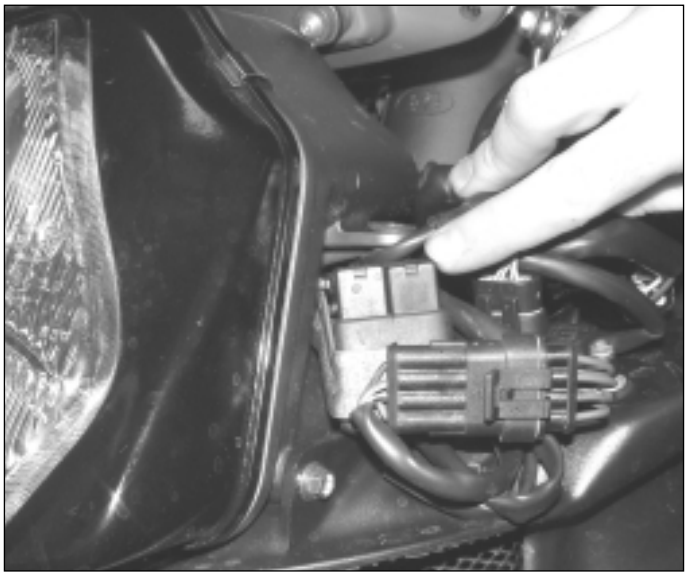
- Pull off the protective cover.



- Disconnect the connector.
- To extract the light bulb, rotate it in an anti-clockwise direction.
- Insert the new light bulb and rotate it in a clockwise direction to block it.
- Connect the connector.
- Reinsert the protective cover.



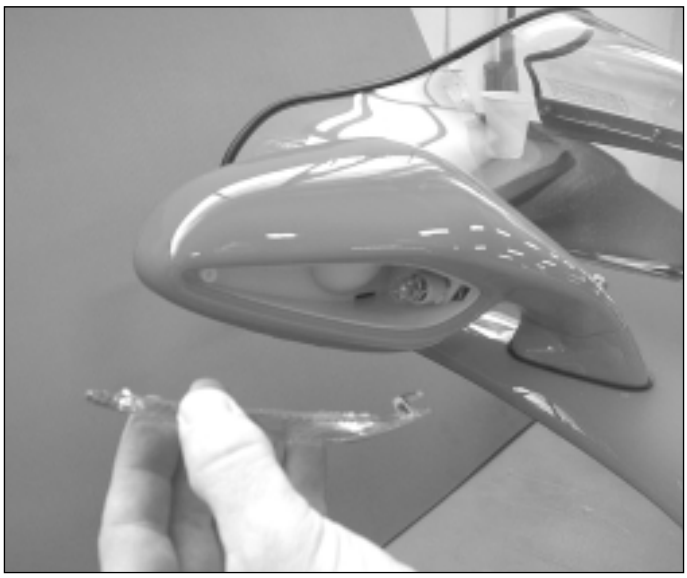
After having checked the bulbs of the headlight, the relative fuses and the controls as described herewith, carry out a check of the headlight relay mounted on the front right of the motorcycle as shown in the figure.



E

DIRECTION INDICATORS

If the direction indicator lights do not function, check the condition of fuse D4 in the fuse box, after which proceed with the substitution of the light bulbs.



Front direction indicators

- Remove the glass.
- Extract the light bulb.
- Insert the new light bulb.
- Replace the glass.

Rear direction indicators

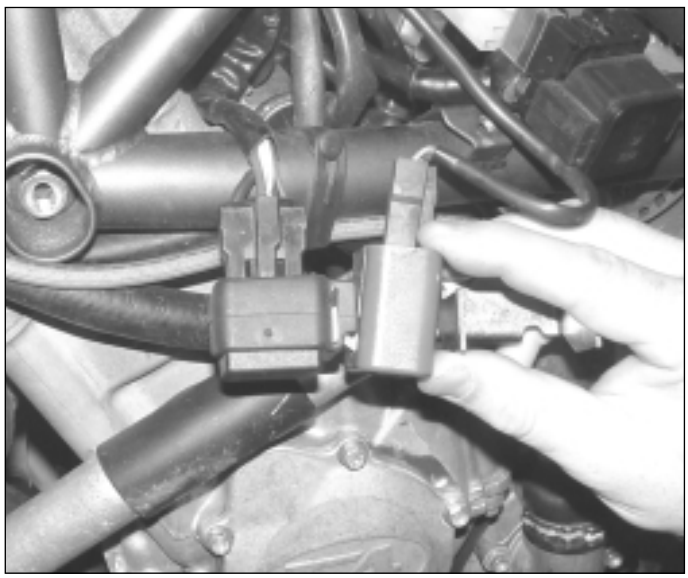
- Remove the glass.

- To extract the light bulb, press down and rotate it in an anti-clockwise direction.
- Insert the new light bulb and rotate it in a clockwise direction to block it.
- Replace the glass.

- If a light bulb of the direction indicators is faulty, the other light bulb remains continuously alight.
- Check the direction indicator control.
- Select the indicator control on the faulty side.
- Disconnect the connector of the left side control assembly and check the continuity between the control connector pin indicated as follows:

Left direction indicator 5-6
Right direction indicator 6-7

- Proceed with the check of the direction indicator intermittency (1).



Stop and rear light

If the stop or rear light do not function, check the condition of fuse C3 in the fuse box, after which proceed with the substitution of the light bulbs.

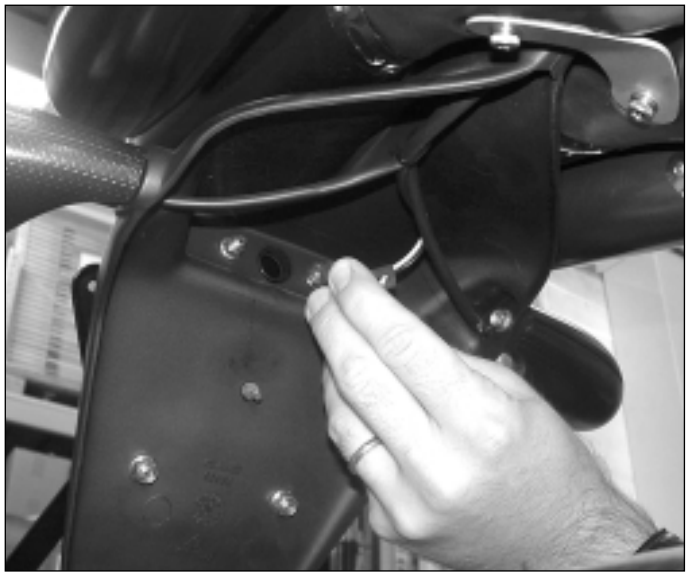
- Lift up the seat.
- Extract the light bulb holder by rotating it in an anti-clockwise direction.
- To extract the light bulb, press down and rotate it in an anti-clockwise direction.
- Insert the new light bulb and rotate it in a clockwise direction to block it.
- Reinsert the bulb holder and rotate it in a clockwise direction to block it.

Number plate light

If the number plate light bulbs do not function, check the condition of fuse C3 in the fuse box, after which proceed with the substitution of the light bulbs.

- Extract the light bulb holder.

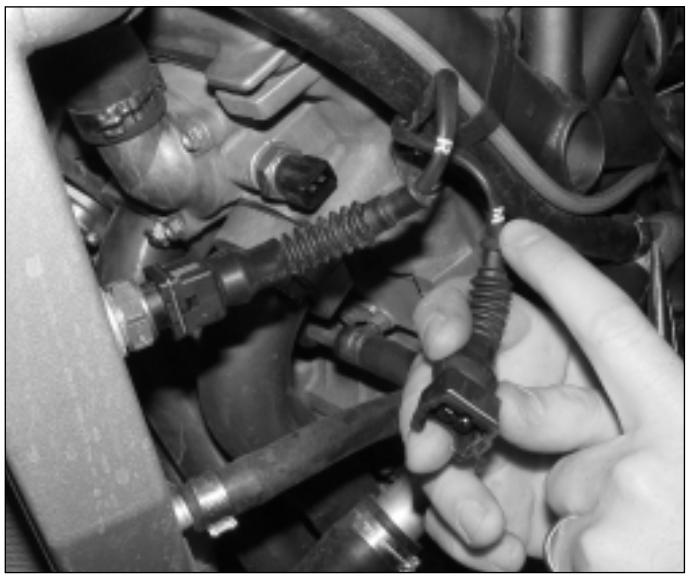
- Extract the light bulb.
- Insert the new light bulb.
- Reinsert the light bulb holder.



COOLING FAN SYSTEM

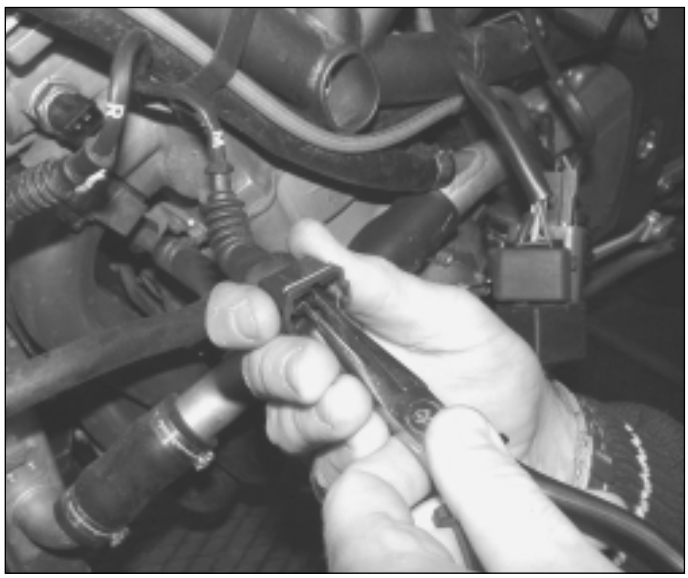
If there is a fault in the functioning of the cooling fan, proceed with the following check:

- Check the condition of fuse A1.
- If the fuse is in good condition, check the cooling fan relay mounted on the right side of the motorcycle as indicated in page 38.



- If the relay is in good condition but does not become excited, disconnect the connector of the temperature sensor marked by an M on the lead. Make a bridge between the two contacts as shown in the figure.
- With the ignition switch in the “ON” position the fan should operate and the voltage at the Yellow-Black/White lead of the fan relay connector should be 12V.
- Check the continuity of the system.
- Check the condition of the thermal switch on the radiator. The functioning interval is as described in chapter L “Cooling system”.

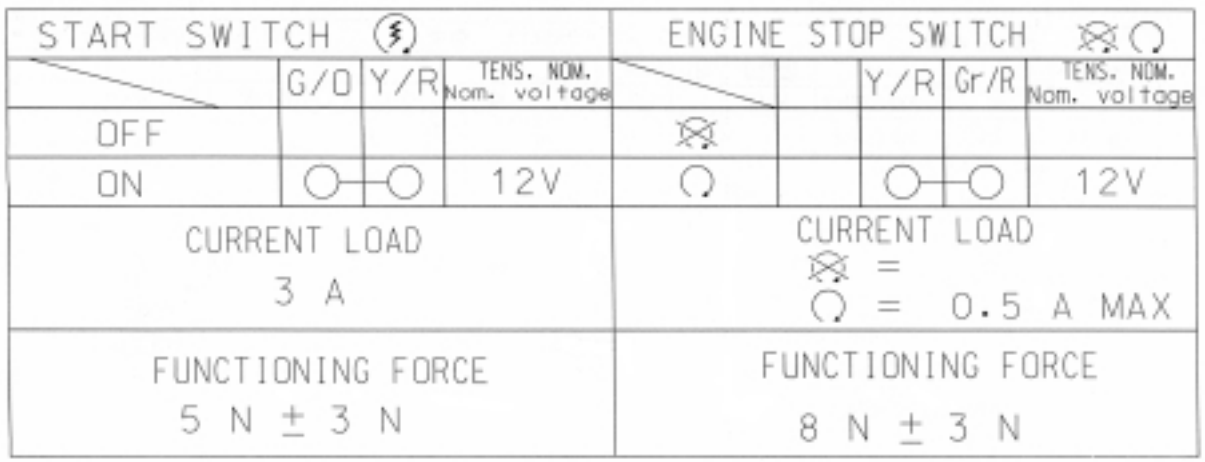
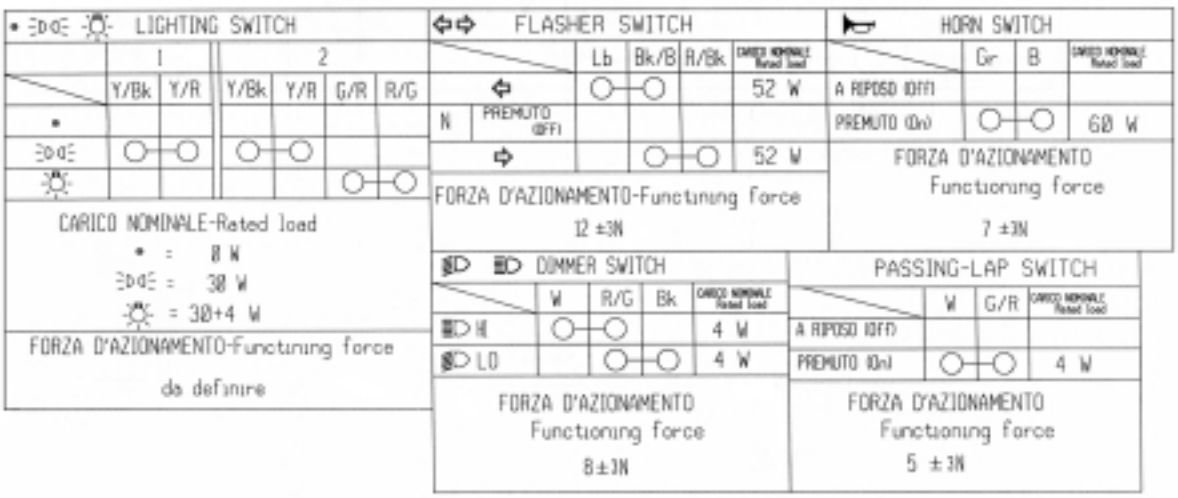
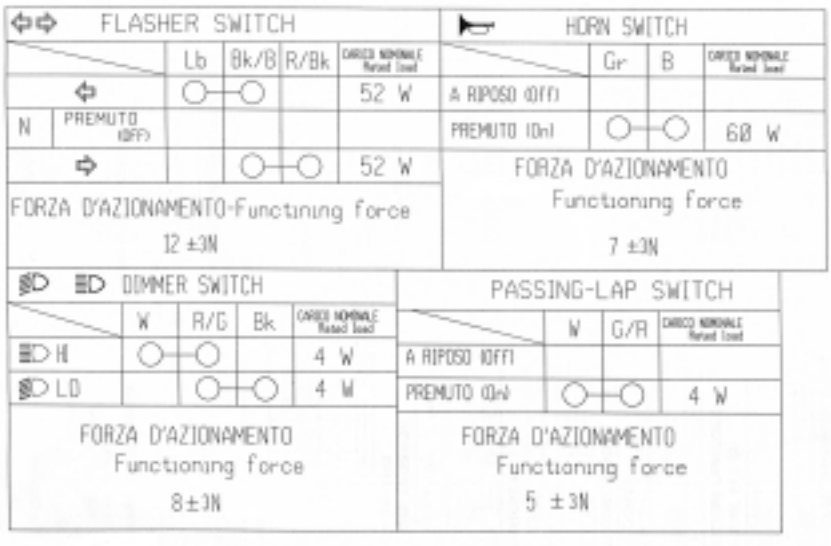
Closed	97° C	OFF→ON
Open	92° C	ON→OFF



KLAXON

A fault in the klaxon system should be checked at various points:

- Check the condition of fuse D4 in the fuse box on the right side of the motorcycle.
- If the fuse is in good condition, disconnect the connector of the left control and check the continuity between contact 34 of the control with the klaxon button pressed as in the following page under “Switches”.
- Check the continuity of the winding of the klaxon.

SWITCHES

Check the continuity of each switch with a tester. If there is any anomaly, substitute the respective switch unit with a new one.