DYNAMO OUTPUT CONTROL UNITS

Models RB106/2 and RB108

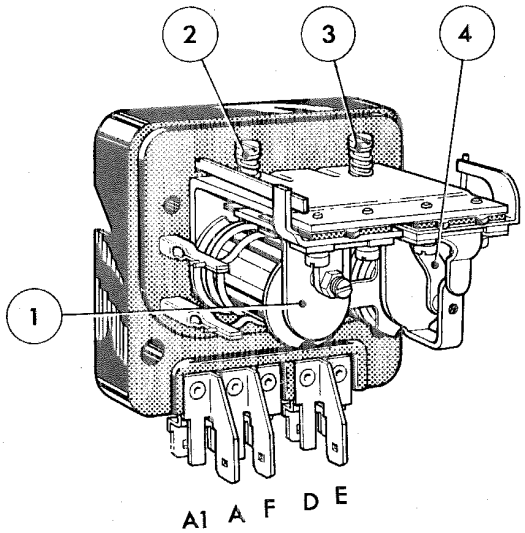

Fig. 1a Model RB106/2

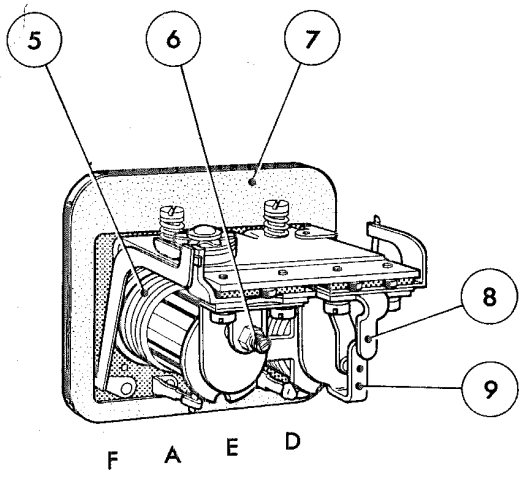

Fig. 1b Model RB108

1 Regulator moving contact
2 Regulator adjustment screw
3 Cut-out adjustment screw
4 Fixed contact blade
5 Regulator series windings
6 Regulator fixed contact screw
7 Gasket
8 Stop-arm
9 Armature tongue and moving contact

1. DESCRIPTION

These two control units are of the two-bobbin, compensated voltage control design and differ only in their base assembly and terminal arrangement. The RB106/2 is normally fitted to cars and light commercial vehicles to control the C40 dynamo. The RB108 is fitted to earlier motor cycles in 6 volt form, and tractors and stationary engines in 12 volt form. It is used to control lower output dynamos, i.e. E3 (motor cycle) and C40A (tractors etc.).

The regulator automatically controls the dynamo output to safe limits by varying the strength of the field circuit. This is effected by the action of opening and closing a pair of contacts to insert a resistance in the field circuit.

The voltage regulator has two regulating windings (one shunt and one series) wound on the voltage regulator bobbin. The shunt (or voltage) winding is connected directly across the dynamo armature (between terminal 'D' and earth). The series winding which carries dynamo output (battery charge and any load current), is wound on the bobbin in the same direction as the 'shunt' winding. Compensation is by means of the series winding which assists the shunt winding to make and break the regulator contacts.

The cut-out is an automatic switch which disconnects the dynamo from the battery when the dynamo terminal voltage is lower than that of the battery.

2. SERVICING

(a) Preliminary Check of Charging Circuit

Before disturbing any electrical adjustments, examine as follows to ensure that the fault does not lie outside the control box:

Check the battery by substitution or with a hydrometer.

Check the condition and tension of the dynamo driving belt.

Check the dynamo by disconnecting the cables from the two terminals on the commutator end bracket and, using an ammeter, link the large terminal 'D' to the small terminal 'F'. Connect a voltmeter between terminal 'D' and earth. Run engine, slowly increasing speed until the voltmeter reads battery volts. Ammeter should read 2–3A.

Inspect the wiring of the charging circuit and carry out continuity tests. Check the control box earth connections.

In the event of reported undercharging, ascertain that this is not due to low mileage.

(b) Checking the Regulator Electrical Setting

Connect a first-grade 0–20V moving coil voltmeter between control box terminals 'D' and 'E'.

Dynamo Output Control Units

Models RB106/2 and RB108

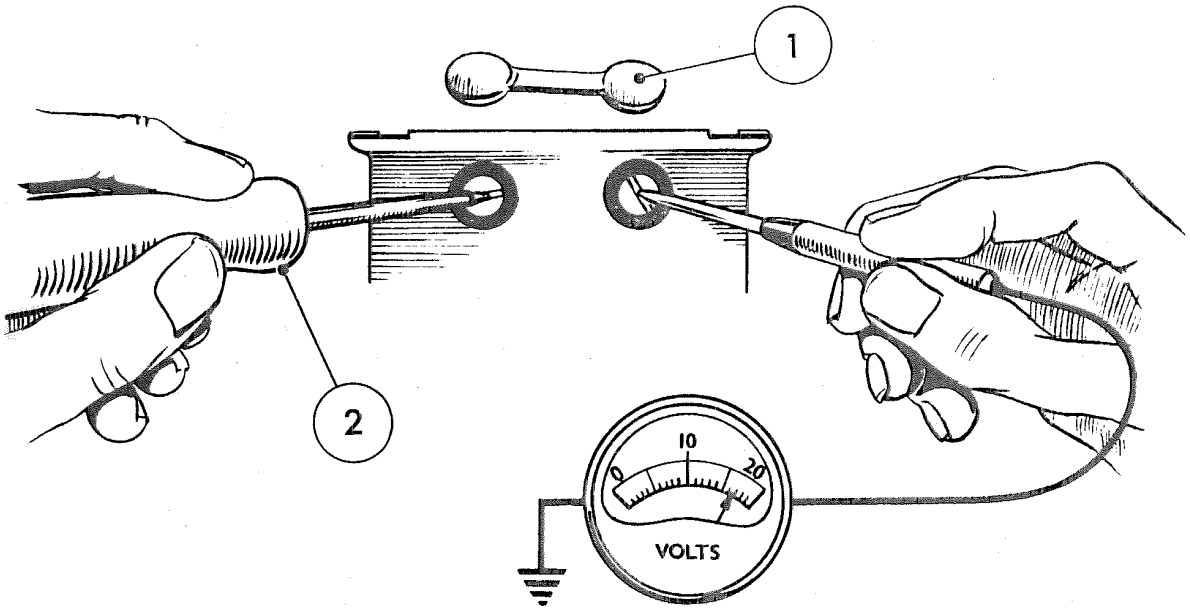

Fig. 2 Adjustment for RB108 Regulator

1 Linked rubber blanks
2 Screwdriver with insulated blade

Disconnect the cables from control box terminals 'A' and 'A1' and join them together. With model RB108 disconnect the cable from the 'A' terminal and ensure that the end of the cable does not contact any earthed parts of the vehicle.

Start and run the engine so that the dynamo is driven at 3,000 rev/min. Observe the voltmeter reading. This should lie between the following limits:

12V Units	16.0–16.5 volts
6V Units	8.0– 8.5 volts

NOTE 1. Refer to table on page 4 for special settings.

NOTE 2. Earlier RB108's (plug-in terminals) — remove the linked rubber blanks from the control box cover, and use test prods to measure the voltage between the exposed head of one of the adjustment screws and a good earth (see Fig. 2).

An unsteady reading may be due to dirty contacts (see 'Cleaning Contacts', para. 2f), but if the reading is outside the appropriate limits an adjustment must be made. Stop the engine.

(c) Regulator — Electrical Adjustment

Remove the control box cover (RB106/2).

With the voltmeter still connected as in the previous paragraph, re-start the engine and run the dynamo at 3,000 rev/min.

Turn the voltage regulator adjustment screw (clockwise to raise the setting or anti-clockwise to lower it), until the correct setting is obtained. Check the setting by reducing the dynamo speed (engine at tickover), and then again raising it to 3,000 rev/min.

NOTE. When the model RB108 is in an upright position, the right-hand hole gives access to the voltage regulator adjustment screw.

Restore the original connections and refit the cover (RB106/2) or rubber blanks (RB108).

(d) Checking Cut-out Relay Electrical Setting

Connect a first-grade 0–20V moving coil voltmeter between control box terminals 'D' and 'E'.

NOTE. Earlier RB108's (plug-in terminals) — remove the linked rubber blanks from the control box cover, and use test prods to measure the voltage between the exposed head of one of the adjustment screws and a good earth.

Switch on the headlamps to load the charging system, and to give a more easily recognisable flick back of the voltmeter pointer at the instant of contact closure.

Dynamo Output Control Units

Models RB106/2 and RB108

Start the engine and while slowly increasing its speed observe the voltmeter pointer. The flick back should occur within the limits 12.75–13.25 volts, or 6.3–6.7 volts (6 volt units). If it does not an adjustment must be made.

Stop the engine.

(e) Cut-out Relay Electrical Adjustments

(i) Method of Cut-in Voltage Adjustment

Remove the control box cover (RB106/2) or remove the rubber blanks (RB108). Keep the voltmeter connected as in the previous paragraph. Turn the cut-out relay adjustment screw (clockwise to raise the setting or anti-clockwise to lower it) until the correct setting is obtained.

Recheck the setting by increasing the engine speed slowly from zero.

Stop the engine, disconnect the voltmeter and either refit the cover (RB106/2) or the rubber blanks (RB108).

(ii) Method of Drop-off Adjustment

RB106/2 — Disconnect the cables from the control box terminal 'A' and 'A1' and join the cables together. RB108 — Remove cable to terminal 'A'.

Connect the voltmeter between terminal 'A' and earth.

Start the engine and run up to charging speed.

Slowly decelerate and observe the voltmeter pointer. Opening of the contacts, indicated by the voltmeter pointer dropping to zero should occur between the limits 8.5–11.0 volts, 4.8–5.5 volts (6 volt units).

If the voltmeter reading is within the limits, stop the engine and restore the original connections. If the drop-off occurs outside these limits, remove the control box cover and adjust the contact pressure as follows:

Stop the engine, RB106/2 — Remove the control box cover. RB108 — Remove the control box from its mounting and remove the cover, secured to the base by a rolled-over edge.

Adjust the height of the fixed contact by carefully bending the fixed contact blade towards the bobbin to reduce the drop-off voltage or away from it to raise the drop-off voltage.

Recheck the setting and if necessary, re-adjust until the correct drop-off voltage setting is obtained.

Restore the original connections and refit the cover. With the RB108, refit the cover, bending back the rolled-over edge into its former position round the base.

(f) Cleaning Contacts

(i) Regulator Contacts

To clean the voltage regulator contacts, use fine carborundum stone or silicon carbide paper.

(ii) Cut-out Relay Contacts

To clean the cut-out relay contacts use a strip of fine glass-paper, never carborundum stone or emery cloth.

(g) Adjustment of Air Gap Settings

Air gap settings are accurately adjusted during assembly and do not normally require any further attention. If, however, an armature is removed for any reason (e.g. contact renewal) care must be taken to obtain the correct setting on re-assembly.

(i) Voltage Regulator (Fig. 3)

Slacken the two armature securing screws and screw back the voltage adjustment screw until it is clear of the armature tension spring. Unlock the fixed contact until it is clear of the armature contact. Insert a 0.021" (0.533 mm) feeler gauge between the armature and the core face. Press the armature down squarely on to the gauge and re-tighten the armature securing screws. Keeping the gauge in position and the armature pressed down, screw in the adjustable contact until it just touches the armature contact and lock it in this position.

Finally, re-adjust the voltage regulator electrical setting as described in para. 2(c).

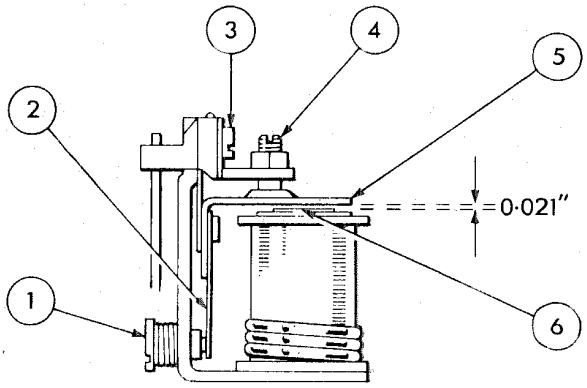

Fig. 3 Voltage Regulator Adjustment

1 Voltage adjustment screw
2 Armature tension spring
3 Armature securing screws
4 Fixed contact adjustment screw
5 Armature
6 Core face and shim

(ii) Cut-out Relay (Fig. 4)

Slacken the two armature securing screws and screw back the adjustment screw until it is clear of the armature tension spring. Press the armature squarely down against the core face (no gauge required) and re-tighten the armature securing screws. With the armature pressed down against the core face, adjust the gap between the armature stop arm and the armature tongue to 0.025″–0.040″ (0.63–1.02 mm). The gap is adjusted by bending the stop arm. Release the armature and screw in the voltage adjustment screw until the armature tongue contacts the stop arm.

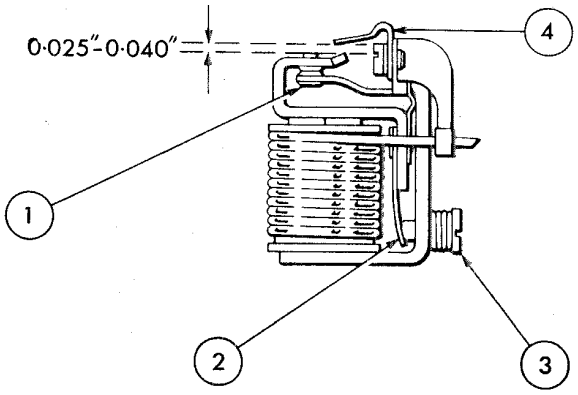

Fig. 4 Cut-out Adjustment

1 'Follow-through' 0.010″–0.020″
2 Armature tension spring
3 Cut-out adjustment screw
4 Stop arm

Adjust the fixed contact blade to give a 'follow-through' or blade deflection, of 0.010″–0.020″ (0.25–0.51 mm) when the armature is pressed squarely down against the core face.

Finally, re-adjust the cut-out relay electrical settings as described in para. 2(e).

3. TECHNICAL DATA

Resistance Values at 20°C (68°F)

Carbon Resistors

6 volt units	36–45 ohms
12 volt units	60–75 ohms

Wire Wound Resistors

6 volt units	27–33 ohms
12 volt units	55–65 ohms

Shunt Winding Resistance

Check between terminals 'D' and 'E'

6 volt units	13–15 ohms
12 volt units	50–56 ohms

Special Settings

Part No.	*Associated Dynamo*	*Regulator O/C voltage at 20°C 3,000 rev/min*
37272	C45P5	17.2–17.8
37274	C45P5	17.0–17.4
37381	C45P6	16.0–16.3

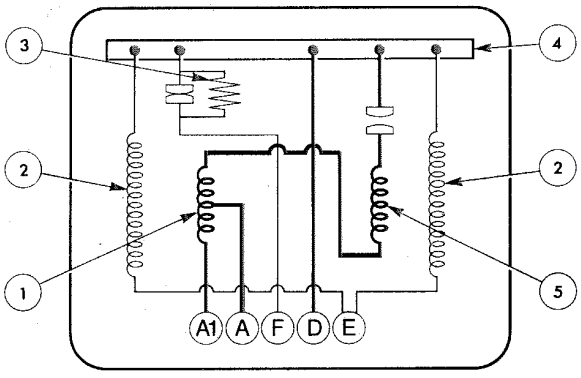

Fig. 5 Regulator Internal Connections Model RB106/2

1 Regulator tapped series coil
2 Shunt coils
3 Field resistance
4 Regulator and cut-out frame
5 Cut-out series coil

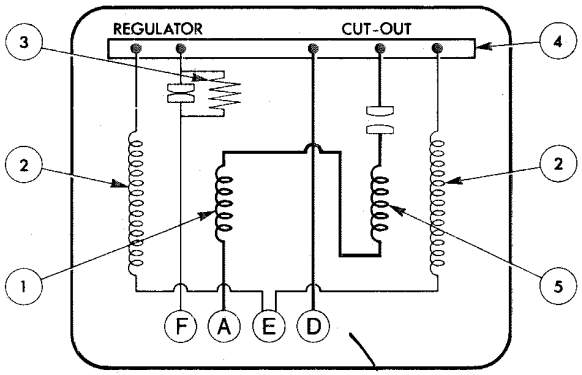

Fig. 6 Regulator Internal Connections Model RB108

1 Regulator series coil
2 Shunt coils
3 Field resistance
4 Regulator and cut-out frame
5 Cut-out series coil