LUCAS

TECHNICAL SERVICE

REPLACING THIRD BRUSH GENERATORS WITH COMPENSATED VOLTAGE CONTROL EQUIPMENT

TYPICAL WIRING MODIFICATIONS

JOSEPH LUCAS LTD · BIRMINGHAM · ENGLAND

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GENERAL INSTRUCTIONS

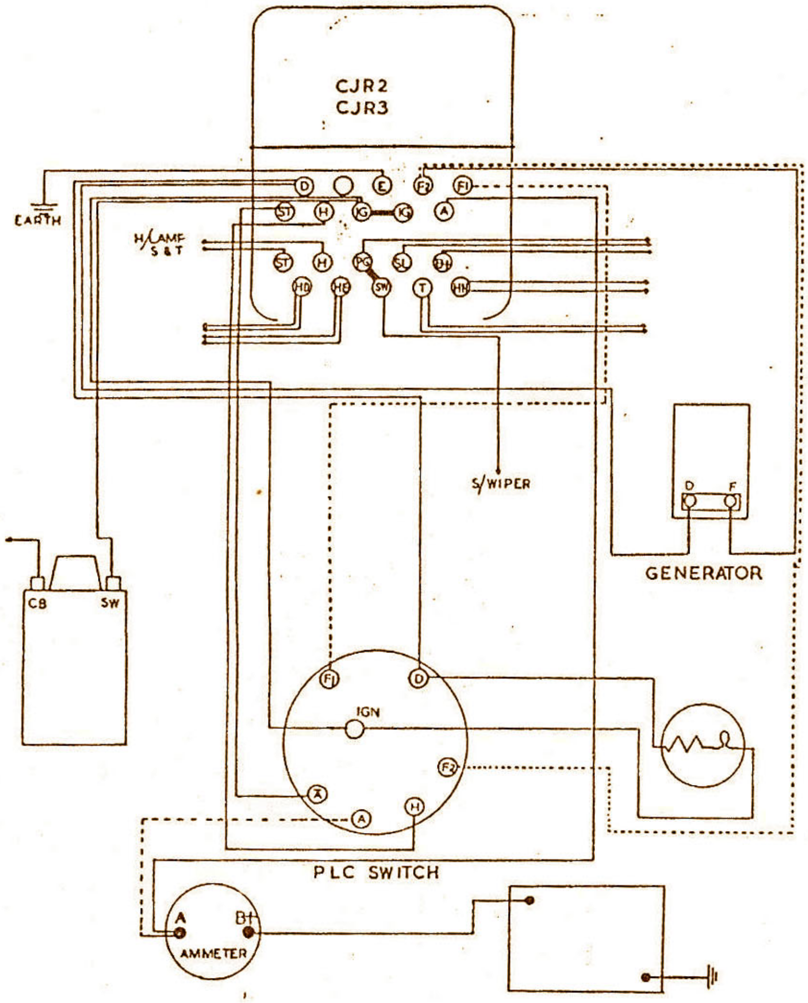
These illustrations show the four most common third brush control systems which are likely to be met on pre-war cars, together with the wiring alterations needed to accommodate a replacement voltage control box and two brush generator. In most instances the wires connected to the various terminals on the original control box are merely transferred to the similarly marked terminals on the replacement control box.

With the wiring completed, the 'Summer' or 'Half Charge' and the 'Winter' or 'Full Charge' positions on the panel lighting switch are not used, as the charging rate is automatically controlled by the new regulator. The side and headlamp switching remain in operation as before.

Where a 20 amp. full scale deflection ammeter was used, some difficulty may be experienced with the needle sticking due to the initial high charge (which is in excess of 20 amps. with a partially discharged battery) produced before the generator and control box become warm. These ammeters—which are undamped—can be somewhat misleading due to a slight flicker of the needle caused by the action of the regulator points. Where these difficulties arise they can be cured by fitting a modern type damped ammeter with a 30 amp. movement. The replacement generator and control box should not be interfered with in an attempt to cure these faults.

It is not possible to give wiring details for each vehicle which can be modernised in this way owing to the considerable number involved. The average age of vehicles fitted with third brush generators is ten years or more, and the likelihood of the wiring having been modified at some time or other further adds to the difficulty of producing individual wiring diagrams. The examples shown in this publication are the most common and set a pattern to be followed in all other modifications.

CJR2, CJR3 TO RF95 CONVERSION WIRING DETAILS



TYPICAL WIRING LAYOUT WITH ORIGINAL CONTROL BOX MODEL CJR2 OR CJR3

Wires shown dotted should be disconnected and taped up when fitting replacement box.

The wires in the terminals marked 'HD', 'HB', 'T', and 'HN' should be joined together when fitting replacement box.

Remove the original control box from its mounting without disconnecting the leads.

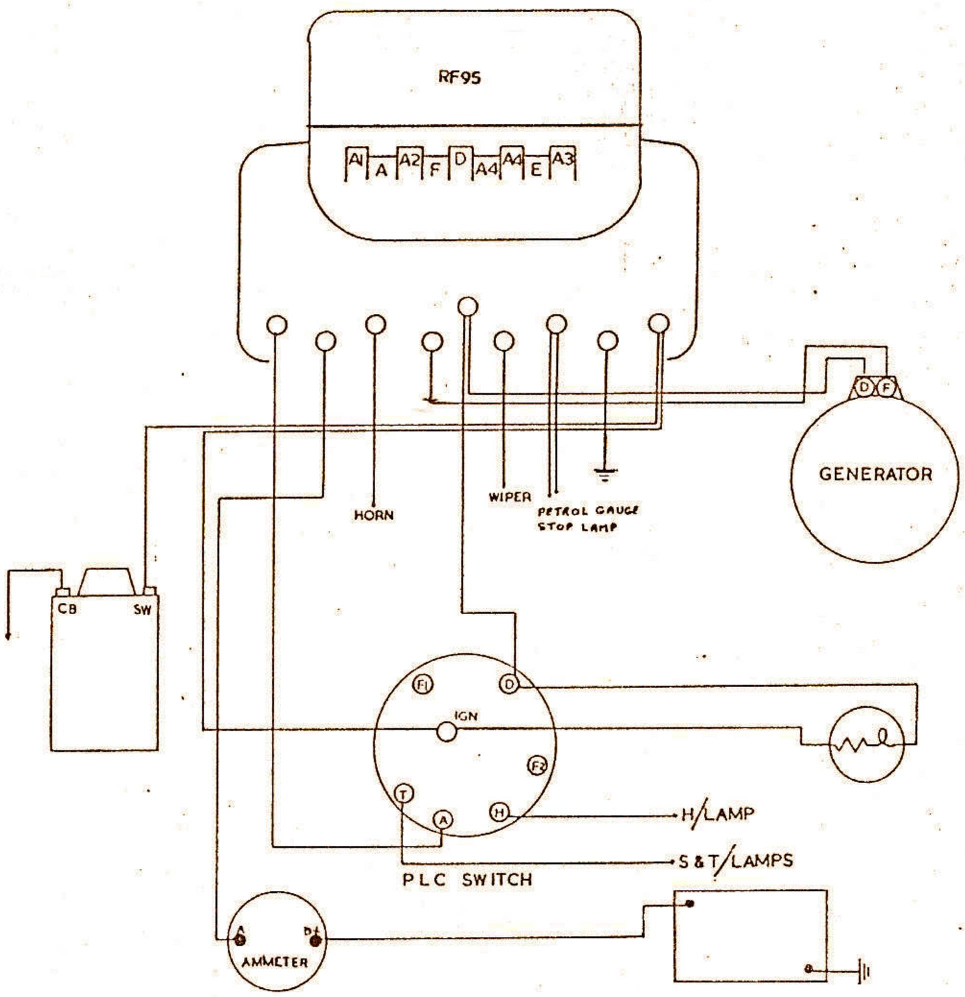
Fit the new control box and transfer wiring from the original terminals as follows:

Terminal Marking on Original Control Box	
'D'	Transfer to 'D' on replacement box.
'E'	Transfer to 'E' on replacement box—make sure that chassis earth point is clean and tight.
'F2'	Disconnect and tape up both ends of lead from 'F2' on PLC switch. Transfer the other lead (from generator 'F' terminal) to 'F' on replacement box.
'F1'	Disconnect lead and tape up.

CJR2, CJR3 TO RF95 CONVERSION WIRING DETAILS

WIRING LAYOUT WITH REPLACEMENT CONTROL BOX MODEL RF95

Where wires to the original control box are not long enough to reach the replacement box we recommend that the existing wires are taken to a terminal block, Part No. 37101, and additional lengths of cable taken from this to the new box.



Terminal Marking on Original Control Box	
'ST'	Join leads together and tape up.
'H'	Join leads together and tape up.
'IG'	Transfer to 'A3' on replacement box.
'PG' **'SL'**	Transfer to 'A4' on replacement box.
'A'	Transfer to 'A' on replacement box.
'B+'	Transfer to 'A2' on replacement box.

Connect 'A' terminal of PLC switch to 'A1' on replacement box with 44/.012" cable.

Check that 'D' and 'F' leads are not reversed before starting the engine.

3. PERFORMANCE DATA

Model	Nominal Voltage	Cutting-in Speed (r.p.m.)	At Generator Volts	Max. Output (Amp.)	At r.p.m.	At Generator Volts	On Resistance Load (ohms) *	Field Resistance (ohms)
C39P, C39P-2	6	950—1050	6.5	13	1400—1600	7.0	0.54	2.7
C39PV	6	950—1050	6.5	21	1850—2100	7.0	0.33	2.7
C39PV-2	6	950—1050	6.5	23	1850—2100	7.0	0.3	2.7
C39P, C39P-2	12	1050—1200	13.0	11	1450—1700	13.5	1.23	6.1
C39PV	12	1050—1200	13.0	17	1850—2100	13.5	0.8	6.1
C39PV-2	12	1050—1200	13.0	19	1900—2150	13.5	0.71	6.1
C45PV-4	6	700—800	6.5	20	1400—1500	7.0	0.35	3.0
C45P-4	12	900—1050	13.0	13	1200—1350	13.5	1.04	6.0
C45PV-4, C45PVB, C45PVS	12	900—1050	13.0	20	1500—1700	13.5	0.67	6.0
†C45P-5	6	1100—1150	6.5	16	1325—1525	7.0	0.44	2.8
†C45PV-5	6	1000—1150	6.5	35	1950—2150	7.0	0.2	2.8
†C45P-5	12	1100—1250	13.0	13	1450—1650	13.5	1.04	6.0
†C45PV-5, †C45PVB-5, †C45PVS-5	12	1100—1250	13.0	22	1700—1900	13.5	0.61	6.0
C47PV-0	12	900—1050	13.0	$30 \pm 1\frac{1}{2}$	1550—1750	13.5	0.45	5.9

* The load resistors must be capable of carrying the maximum output current without overheating.

† The cutting-in and maximum output speeds given for C45P-5, C45PV-5, C45PVB-5 and C45PVS-5 generators relate to six-volt machines manufactured during and since November 1953 and to twelve-volt machines manufactured during and since October 1953. These generators, which can be identified by reference to the date-stamp on the yoke, are fitted with pole shoes shaped to produce tapering air gaps between pole shoe and armature.

Test data for generators of earlier manufacture having "parallel" or concentric air gaps are given below. For comparison, the two types of pole shoe are shown in Fig. 4.

Model	Nominal Voltage	Cutting-in Speed (r.p.m.)	At Generator Volts	Max. Output (Amp.)	At r.p.m.	At Generator Volts	On Resistance Load (ohms) *	Field Resistance (ohms)
C45P-5	6	700—800	6.5	16	1225—1425	7.0	0.44	3.0
C45PV-5	6	700—800	6.5	35	2500—2700	7.0	0.2	3.0
C45P-5	12	900—1050	13.0	13	1200—1350	13.5	1.04	6.0
C45PV-5, C45PVB-5, C45PVS-5	12	900—1050	13.0	22	1600—1800	13.5	0.61	6.0