

ELECTRICAL EQUIPMENT

GENERAL DESCRIPTION

232. The vehicle is wired on the 24V nominal, negative earth system (Fig 42 and 43), the battery negative lead being connected to an earth stud fitted to a distribution box located at the rear left side of the fighting compartment (Fig 44(25)).

233. The engine is fitted with a fully waterproofed and tropicalized coil ignition system designed to give negative high tension. It is screened and filtered to suppress electrical interference to wireless equipment. For a description of the ignition equipment see EMERs Power S 522 and S 522/2. The ignition circuit is shown in Fig 45.

234. Two 12V 60Ah batteries are located one at each side of the rear of the fighting compartment (Fig 44(9) and (28)). They are connected in series and charged by a 2-speed generator fitted to the inlet side of the engine crankcase (23). The 2-speed feature permits the maximum generator output to be obtained at low engine speed (600 r.p.m.) as well as at high speeds. The generator is an insulated return unit, its negative side being earthed in the generator panel. Alternative marks of generator may be fitted: No.2, Mk 1 - FV175843 or No.2, Mk 2 - FV175866; both are described in EMER Power S 522.

235. The generator is fan ventilated and can be fitted with fording caps and a breather pipe so that it may be run completely sealed. The breather pipe is not fitted in Ferret vehicles because the engine compartment is waterproofed. Consequently, the fording caps which are housed on the generator panel should not be fitted to the generator except for very brief periods.

236. The maximum output of the generator is controlled by two carbon piles housed in a generator panel; one pile controls the maximum voltage at 27.8V-29.2V and the other limits the current to 25A. The generator panel (26) is located immediately forward of the distribution box; it is fitted with felt bushes to provide a resilient mounting. To earth the panel a copper braid is connected to the frame of the box and to an earth stud located between the panel and the distribution box. Alternative marks of generator panel may be fitted. Two fuses in the panel protect the charging and main indicator lamp circuits. The charging circuit is shown at Fig 46.

237. The battery and generator output leads are connected to the distribution box from whence the supply is connected to the various electrical components. Housed in the distribution box is an inter-vehicle starting socket, to facilitate the use of a slave battery should the vehicle batteries become discharged, a pair of inspection lamp sockets and two thermal magnetic circuit breakers. One of the circuit breakers is a 30A unit connected in series with the exterior and interior lamps, inspection lamp sockets, horn, smoke dischargers, windscreen wiper and the wireless set junction box. The second is a 10A unit connected in series with the engine electrical equipment, i.e., the starter solenoid, main indicator lamp, oil pressure warning lamp and switch, coolant thermometer, fuel gauge and instrument panel lamp. The ignition circuit is connected to a battery positive connection and hence is not affected by the circuit breakers except at starting.

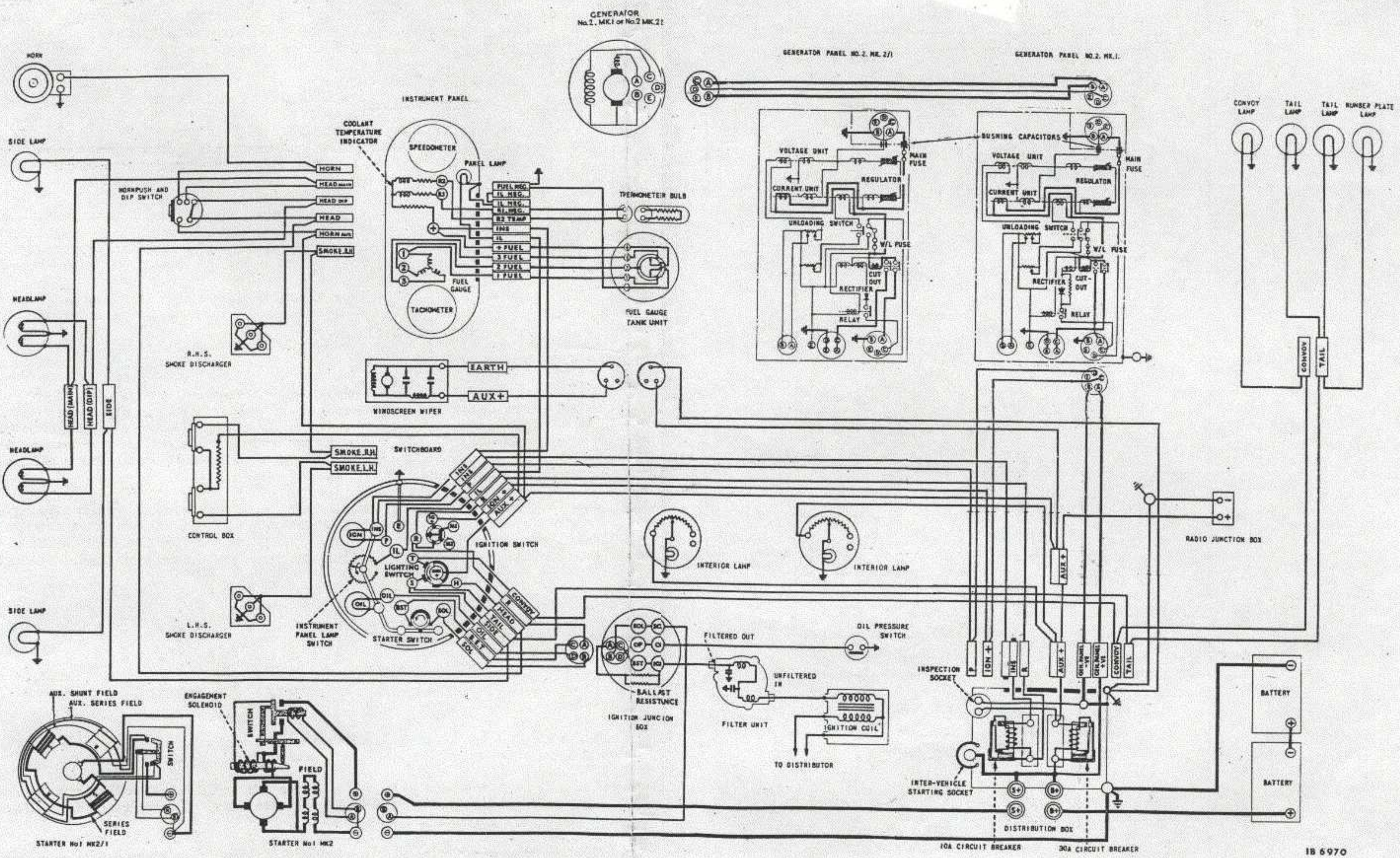


Fig 42 Vehicle wiring diagram

V 622

238. The starter motor (12) is of the axial type with a built-in solenoid switch which is operated via a switch located on the driver's switchboard. The switchboard ignition (control) switch must be ON for the starter to operate. It is an insulated return unit fitted to the exhaust side of the engine and its negative lead is connected, together with the battery negative lead, to the distribution box earth stud (Fig 45). Alternative marks of starter may be fitted: No.1, Mk 1; No.1, Mk 2 or No.1, Mk 2/1 (see Data). These are described in EMER Power S 522.
239. Six early vehicles fitted with B60, Mk 3A engines numbered 3837 to 3841 and 3905 incorporated a flywheel housing with a non-standard fixing flange (see note following para 42). The starter fitted to these engines is Simms type 524 SGR41B/3; it is generally similar to the No.1, Mk 1 starter.
240. The switchboard (Fig 44(32)) is located forward and to the left of the driver. It houses the starter switch, the external lighting switch, the ignition switch (para 349), instrument panel lamp switch, main indicator lamp (para 363) and the oil pressure warning lamp (para 362).
241. Located forward and to the right of the driver is the instrument panel (5). It houses a speedometer, engine speed tachometer, fuel gauge and a coolant thermometer.
242. A junction box (27), to which a wireless set may be connected, is fitted just above the generator panel.
243. The external lighting comprises two headlamps (2) and (31) and two side lamps (1) and (30) one of each being mounted on the front of each front wheelguard, two tail lamps (13) and (21) mounted one on the rear of each rear wheelguard, a number plate lamp (19) fitted centrally to the rear vertical plate above the number plate and a convoy lamp (20) located in the centre of the vehicle on the rear sloping plate. These lamps are controlled from the switchboard.
244. The headlamps employ twin filament bulbs and work on the double-dipping system of control in which dipswitch operation changes the filament in use and hence the light beams of both lamps change from the normal to the dipped position and vice versa. The dipswitch (6) is fitted immediately below the instrument panel within easy reach of the driver's right hand.
245. The cables to the number plate lamp and to the convoy lamp are coiled at the back of the lamp and are long enough to permit removal of the rear plate, complete with lamps, for engine servicing.
246. Two interior roof lamps (8) and (11) are fitted to the off and near side upper, centre panels of the fighting compartment. Each incorporates its own switch and dimmer resistance.
247. A horn (4) located on the right-hand wheelguard behind the headlamp is controlled by a switch incorporated in the headlamp dipswitch unit.
248. Smoke dischargers (3) and (29) are fitted to the wheelguards behind the headlamps, the grenades are fired from a switchbox (10) located on the left side of the vehicle just forward of the roof lamp.
249. A windscreen wiper (7) is secured to the frame of the driver's screen. The wiper lead terminates in a 3-pin plug which, when the screen is in use, fits in a socket located to the left-hand side, rear, of the driver above the smoke discharger switchbox.

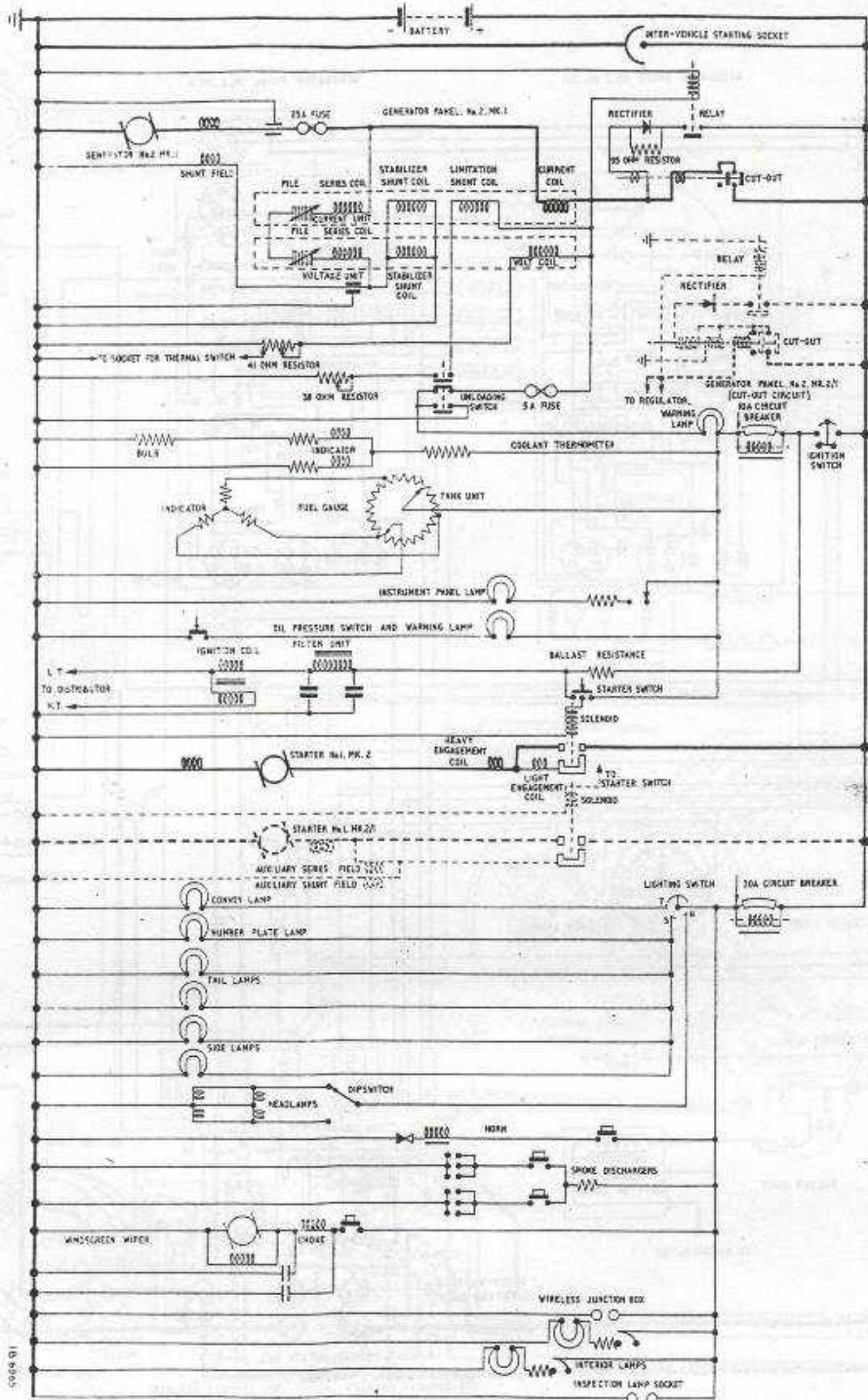
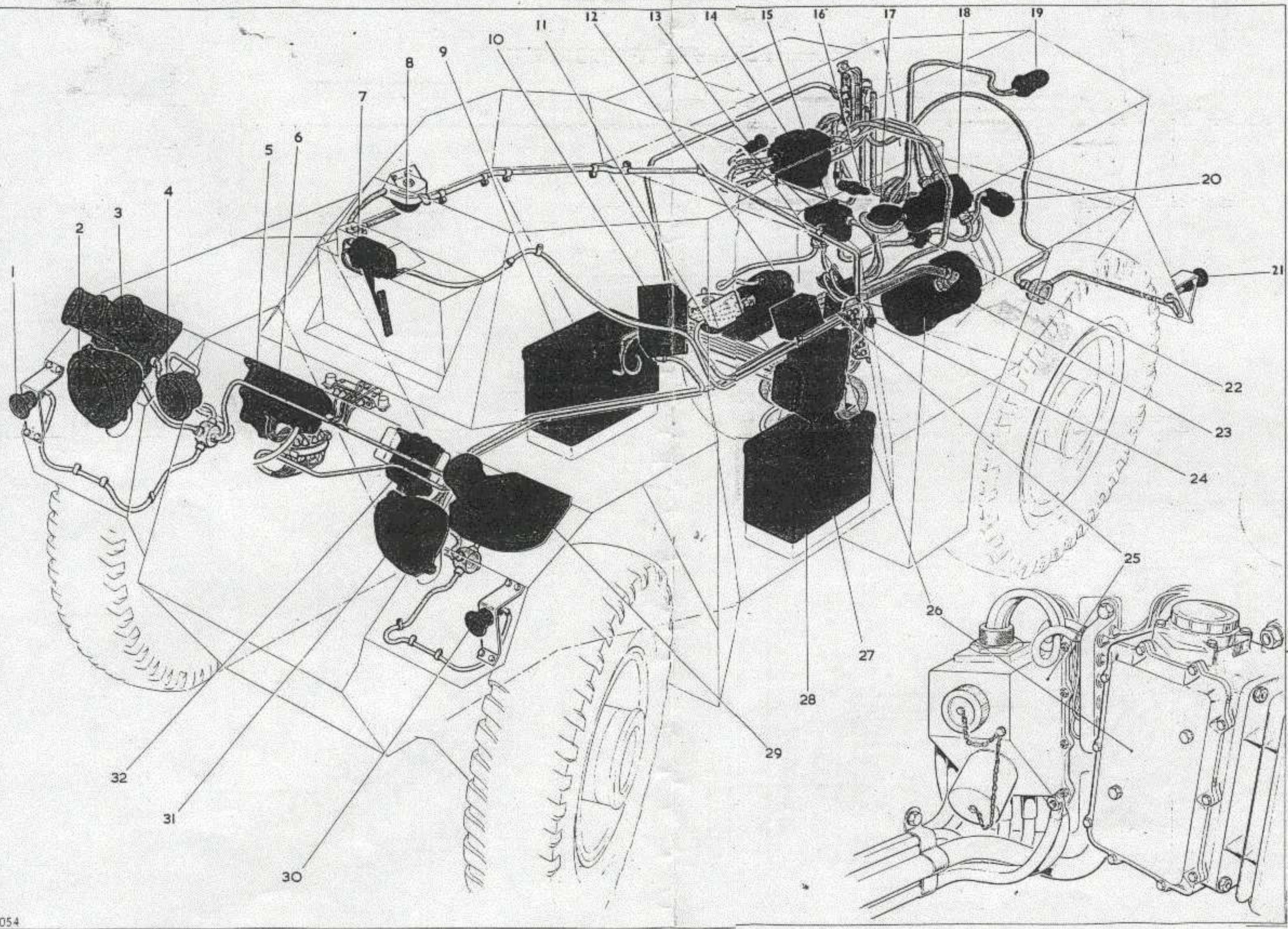


Fig 43 Schematic wiring diagram



- 1 Side lamp
- 2 Headlamp
- 3 Smoke discharger
- 4 Horn
- 5 Instrument panel
- 6 Horn push and dipswitch
- 7 Windscreen wiper
- 8 Roof lamp
- 9 Battery
- 10 Smoke discharger switchbox
- 11 Roof lamp
- 12 Starter
- 13 Tail lamp
- 14 Distributor
- 15 Ignition junction box
- 16 Thermometer bulb
- 17 Fuel gauge tank unit
- 18 Ignition coil
- 19 Number plate lamp
- 20 Convoy lamp
- 21 Tail lamp
- 22 Ignition filter unit
- 23 Generator
- 24 Oil pressure switch
- 25 Distribution box
- 26 Generator panel
- 27 Wireless set junction box
- 28 Battery
- 29 Smoke discharger
- 30 Side lamp
- 31 Headlamp
- 32 Switchboard

Fig 144 Installation diagram showing components in red and conduits in green

1.B.7054

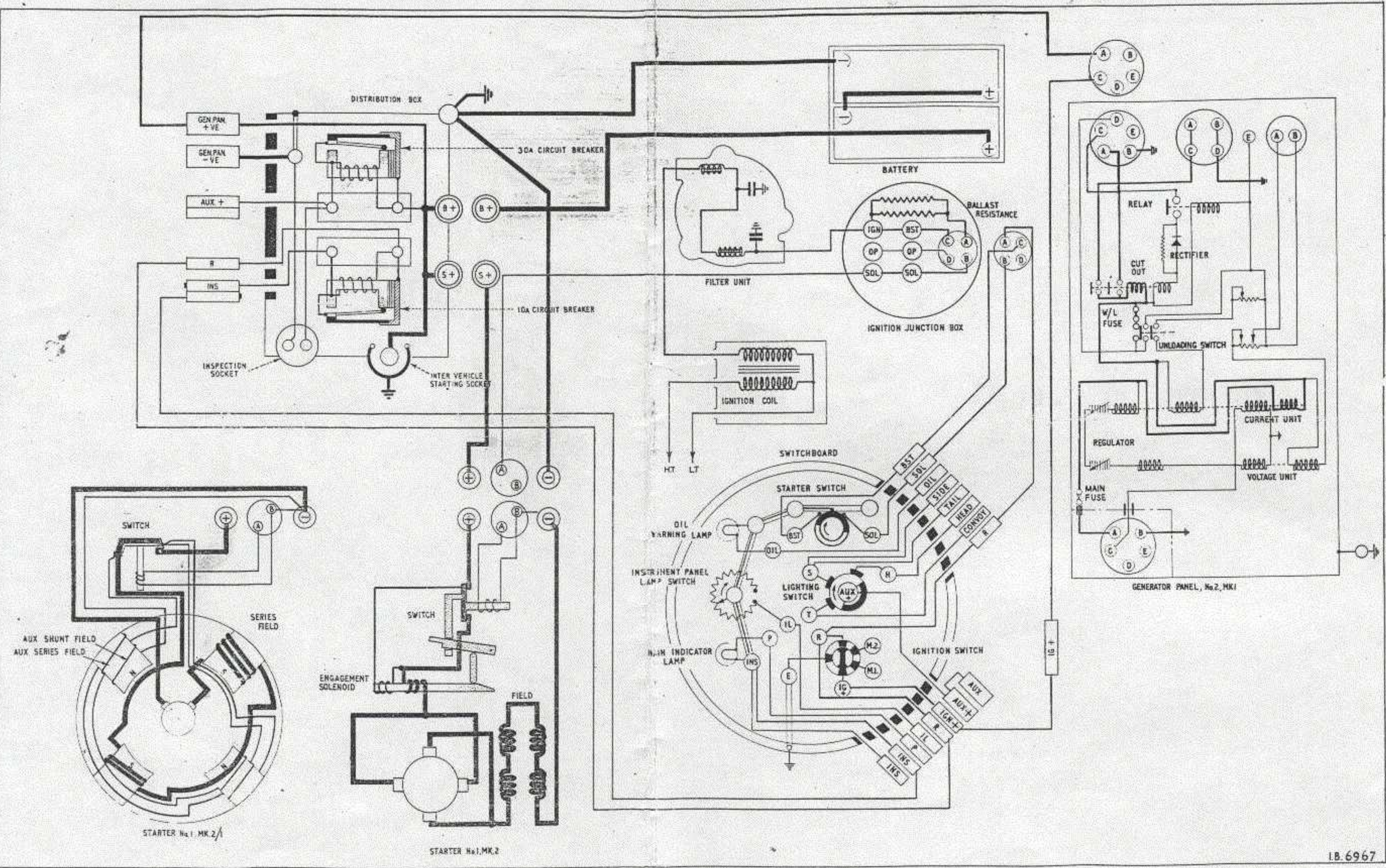


Fig 45 Starter and ignition circuits (red)

1.B.6967

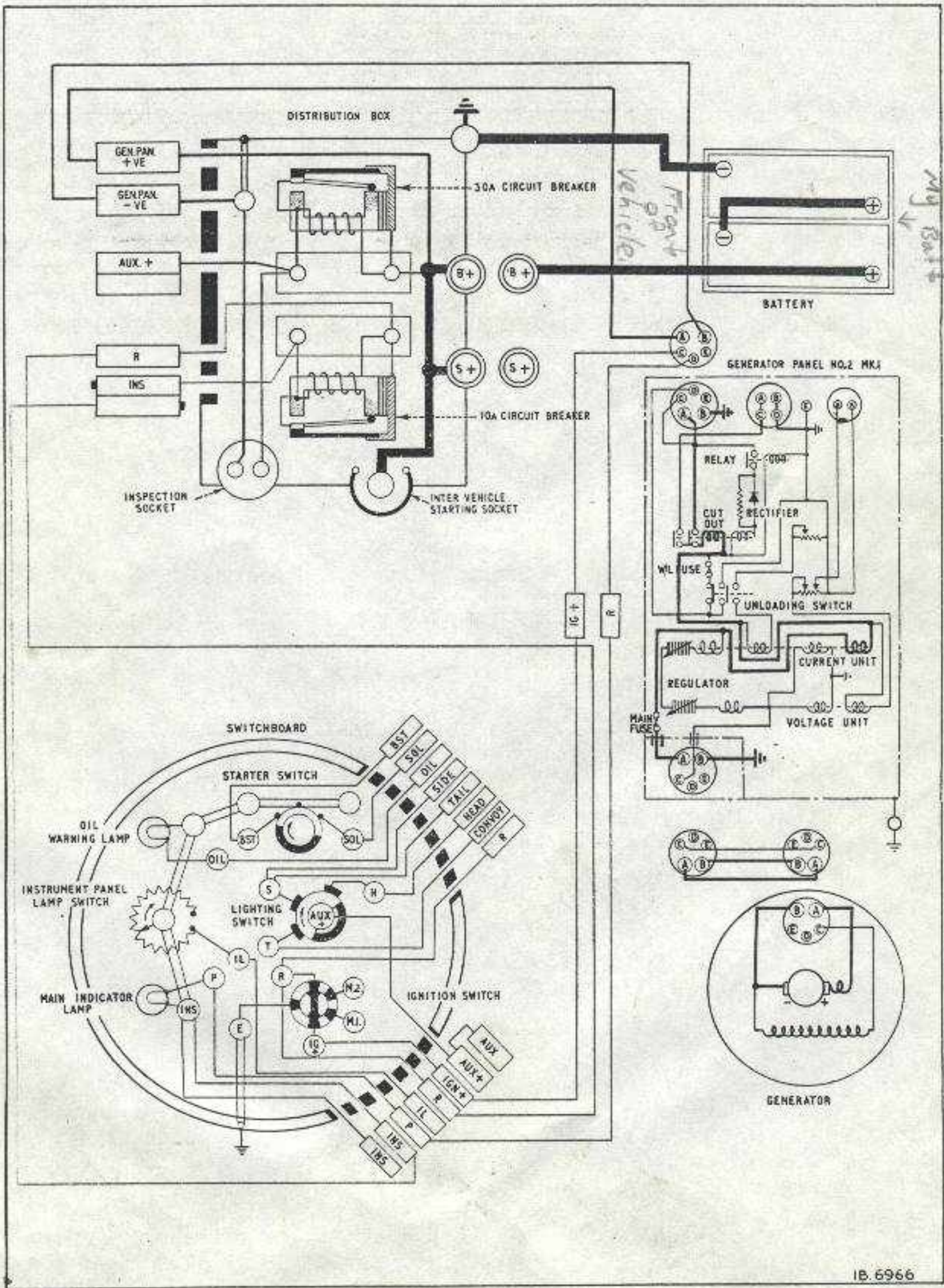
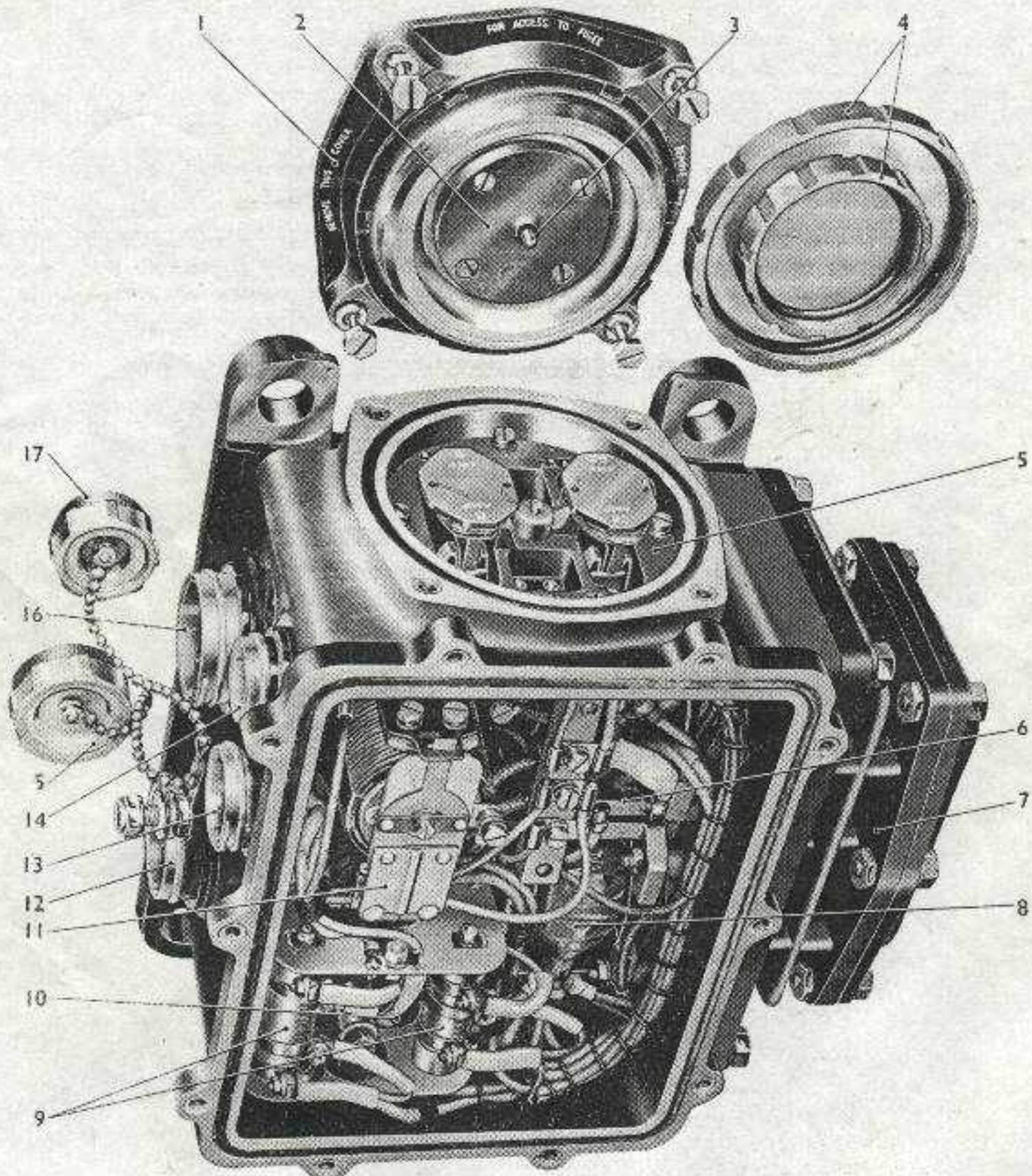


Fig 46 Charging circuit (red) and indicator lamp circuit (green)



IP6627

- | | |
|-----------------------------|---|
| 1 Fuse cover | 11 Cut-out |
| 2 Switch diaphragm assembly | 12 Generator connection socket |
| 3 Switch operating plunger | 13 Radio battery connection plug |
| 4 Fording caps | 14 Battery thermal switch connection socket |
| 5 Switch and fuse base | 15 Waterproof cap for (13) |
| 6 Current unit | 16 Vehicle battery and ignition connection plug |
| 7 Regulator assembly | 17 Waterproof cap for (14) |
| 8 Voltage unit | |
| 9 Resistors | |
| 10 Capacitor | |

Fig 47 Generator panel No.2, Mk 1

250. The majority of the equipment is waterproofed, tropicalized and, where necessary, suppressed to prevent interference to wireless equipment.

251. Connections to most units are made by means of plugs and sockets or by nipple connectors; rubber blocks housing nipple connectors are suitably disposed throughout the vehicle thus facilitating the maintenance of the electrical system. Most cables are contained in braided flexible metallic conduits.

252. Copper braid is used to connect the generator panel to a vehicle earth stud, para 236, the distribution box to another earth stud located just forward of the generator panel, and also the engine to earth.

BATTERY No.2, MK 1 - FV157937

253. Battery No.2, Mk 1 is a 12V 60Ah lead-acid unit and two are connected in series to give a 24V supply. For a description of this type of battery see "EMER POWER J 305, Lead-acid Batteries".

Special features

254. Several special features are incorporated. The batteries are supplied by the manufacturer in a dry-charged condition which makes them available for use two hours after the initial filling. Full instructions for putting them into service are given on the tie-on label supplied with each. The dry-charge will be impaired if the seals have been accidentally broken but such a battery will operate satisfactorily if given an initial charge in the normal way.

255. Synthetic micro-porous separators are used. The bottom of each plate has two projections which are handed to fit against two of four sludge plates incorporated in the bottom of the toughened rubber cell case. This helps to reduce damage to the plates should the battery be subjected to mechanical shock. The cells are bonded into an aluminium alloy container.

256. Each battery is fitted with two cable take-off plates. Each battery cable terminal is secured by two bolts with captive washers and nuts. To prevent reversal of connections, the tops of the plates are marked positive and negative respectively and in addition the pitch of the holes in the positive plate is 1.0 in. and that of the negative plate 0.875 in. To prevent crushing by the cable bolts, strengthening bushes are cast in the take-off plates.

257. The design of the terminals is such that the cable ends should be connected to the outside face of the take-off plate with the cable running towards the centre of the battery. The bolt heads with their captive washers are fitted on the inside face of the take-off plate.

Modifications

258. Several modifications of the battery have been approved since its introduction. Originally the 6V and 8V inter-cell connectors were specially shaped and incorporated two No.2 B.A. inserts to provide a mounting for a battery thermal switch when required. The shape of these connectors was subsequently changed and two holes suitable for type Z No.10 self tapping screws superseded the 2 B.A. inserts. A later modification changed the special 8V inter-cell connector to a standard type.