

CHAPTER VII

Electrical System

General - Battery - Battery Ignition - Magneto Ignition - Sparking Plugs - Electrical Fault Location.

General.

Four wiring diagrams are illustrated, Figs. **33**, **34**, **35** and **36**, each diagram being appropriate for the chassis series as listed on same.

The electrical system is earthed on the negative side of the battery to the chassis frame.

Battery.

The battery recommended for use on the car may be either of the following: -

Battery Maker's Type Designation.		Voltage	Normal Charging Current
Exide	P. & R. Dagnite.		
6-XSM-iL	6-TBS7-A	12	5 amperes.
6-XHR-iML	6-BGD9-5		

Never allow the liquid in the cells to fall below the tops of the separators.

Inspect the battery at regular intervals, as directed on page 21, and top up with distilled water, so as to maintain the level of the liquid at ½" above the tops of the plates.

Do not inspect the battery with the aid of a naked light, and on no account disconnect any of the battery terminals or connections when any charge or discharge current is passing, for such a course incurs risk of explosion and involves personal risk.

Battery Ignition.

The battery ignition consists of an ignition coil, **W**, and combined low-tension contact breaker, **X**, and high-tension distributor, **XI** as shown in Fig. **37**.

A ballast resistance, **Ri**, is connected in series with the low-tension winding of the coil. Its function is to limit the current taken by the coil at slow speed, or if the ignition switch be accidentally left on while the engine is stopped. It also secures practical equality of intensity of secondary spark at all speeds.

A condenser connected across the contact points is located in a pocket, **X2**, the condenser case and the main body of the contact breaker unit being together in direct electrical connection with the chassis frame.

The insulated terminal of the condenser is connected to the insulated contact, and they are brought out together to the insulated terminal to which the external low-tension connection is made.

In setting the points the gap opening should be .017" to .021".

A few drops of engine oil should be injected into lubricator, **Z** Fig. **37**, every 2,500 miles, as directed on page 22, in order to lubricate the centrifugal ignition timing mechanism. In addition, the oil so injected serves to maintain an oil seal arranged at the base of the ignition tower to protect the contacts from oily vapour from the crankcase, which is liable to cause pitting. At the same time, a trace only of grease should be smeared on the cam surface.

Every 5,000 miles, as directed on page 27, the pivot pin of the low-tension rocker arm should be lubricated by moving aside the retaining spring and putting one drop of oil on the exposed end of the pivot.

The high-tension distributor requires no attention beyond an occasional wiping of the interior with a clean, dry rag.

It is important that the outside of the coil casing should be kept clean. Also, the cover should occasionally be removed and the top of the coil cleaned with a dry rag. Misfiring is some times caused by an accumulation of dirt around the terminals and on the coil casing.

If the timing of the battery ignition should have been deranged, due, for instance, to removal of the cam operating the low-tension rocker, it can be re-set by reference to the flywheel markings which can be seen on removal of the clutch pit cover.

To carry out this operation, the crankshaft should be turned until the mark B.A.I. (battery, advanced ignition) on the flywheel registers with the mark on the casing when No. 1 piston is commencing its firing stroke. On some models the marks B.L.I. (battery, late ignition) will be found, in place of B.A.I. this should be set as above.

Owing to the fact that on later models a friction-damped spring drive is used for driving the valve gear and all auxiliaries, and that the starting handle operates to turn the crankshaft through the medium of this spring drive, it is important that the crankshaft be rotated for timing purposes from the *flywheel* end. Also, the starting handle should not have been used at all since the engine was last running.

With the ignition lever set fully advanced where the marking is B.A.I., and fully retarded in the case of B.L.I., set the contact breaker cam to be just on the point of causing the contact break (when turning forward) corresponding to No. 1 cylinder.

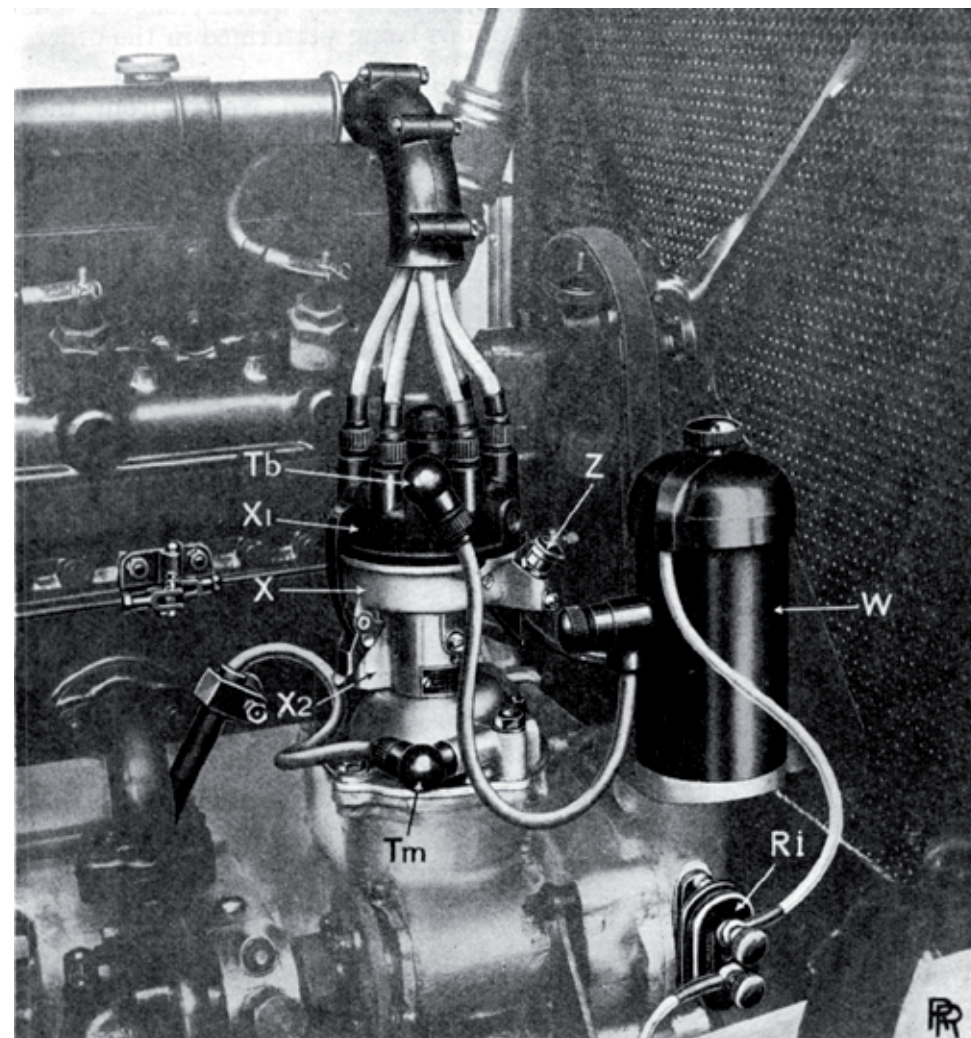


Fig. 37 - IGNITION COILS, DISTRIBUTOR AND BALLAST RESISTANCE.

A convenient method of determining precisely when the break takes place is by reference to the ammeter. With the ignition switched on, and someone watching the ammeter, the cam should be slowly rotated on the taper of its shaft in the normal direction of rotation until the required peak breaks contact as indicated by the reading of the ammeter. The screw securing the cam should then be tightened.

Magneto Ignition.

The magneto, of a special type, is fitted as a standby, and has no high-tension distributor, but a single high-tension lead, the terminal of which is fitted to the centre of the battery ignition distributor in place of that from the standard ignition when required. The magneto is arranged to be put into service very quickly should the necessity arise, the following operations being performed in the order named:-

1. Remove the battery igniton fuse marked No. 3 from the distribution box, inserting same in the dummy fuse holder in the cover.

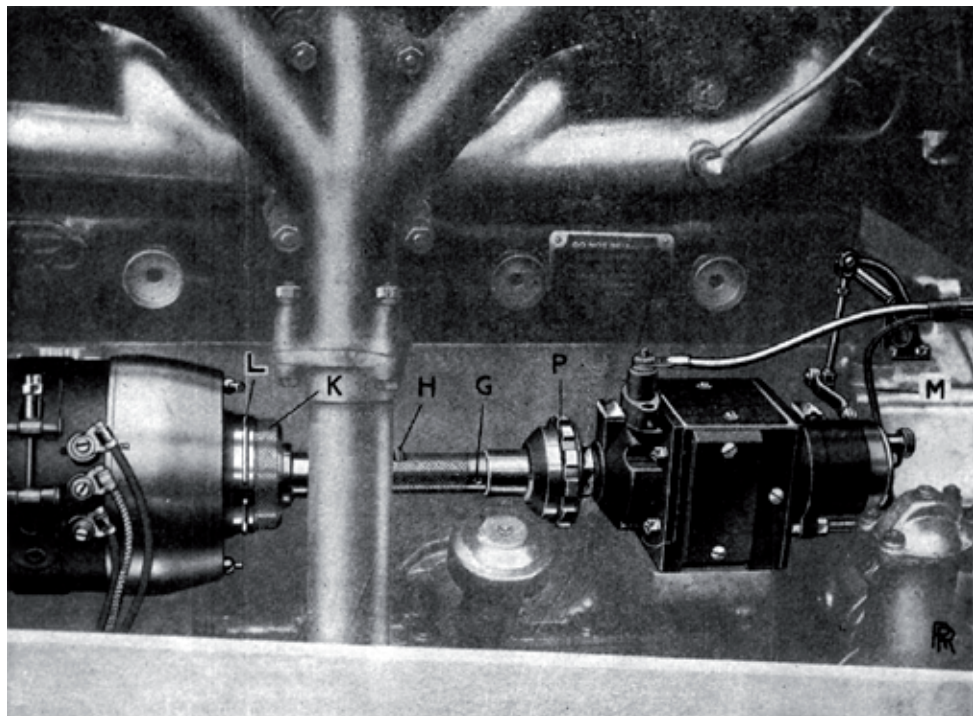


Fig. 38 -MAGNETO,

2. Pull out the high-tension terminal **Tb** (Fig. **37**) of the battery ignition from the distributor and replace with the high-tension magneto lead **Tm**, which is carried in a special holder on the ignition tower when not in use. Insert the battery high-tension lead in the holder.
3. Press down the catch **H** (Fig. **38**) projecting from the magneto drive shaft and turn the shaft gently by hand until the teeth are felt to engage.

The engine is then ready for running on the magneto, the thumb lever on the switch box being used for switching on and off in the same way as for the battery ignition.

Owing to the fact that the magneto is capable of giving a good spark when retarded, no attempt should be made to start the engine on the magneto ignition, either by hand or by the starter, without first fully retarding the ignition. Also when running on this ignition it will be necessary, in order to obtain the best results, to use the ignition lever as the engine speed increases or fall off.

When changing back from magneto to battery ignition the operations detailed in the preceding paragraphs 1, 2 and 3, must be reversed, the magnetoe being disconnected by sliding the shaft towards the rear against the pressure of an internal spring until it is felt that the catch is holding the engaging teeth clear of each other, when it will be possible to rotate the shaft by hand.

It is important that this uncoupling of the drive should be effected before running again on the battery ignition.

*For chassis series as per Fig. **33** the following will apply:-*

When re-timing the magneto reference should be made to the timing markings on the flywheel by removing the clutch pit cover. The crankshaft should be turned until the T.D.C. (top dead centre) mark registers with the timing mark on the flywheel casing. In this position the low-tension contacts should be breaking when the ignition lever is fully retarded.

*For chassis series as per Fig. **34**, **35** and **36**, as follows:-*

The magneto timing is set by reference to the mark M.A.I. (magneto, advanced ignition) on the flywheel. When this mark registers with the mark on the casing the low-tension contacts should be just breaking with the ignition lever fully advanced and No. 1 piston approaching the firing position.

Sparking Plugs.

The sparking plugs recommended are KLG, M30 or Champion No. 7 18 m/m.

Every 5,000 miles, as directed on page 28, they should be removed and cleaned. The width of the gaps should be checked and, if necessary, reset to .020".

Electrical Fault Location.

In case of faulty operation, proceed to investigate as follows: -

1. Failure of any part of the system separately may be due to a blown fuse in the distribution box.
2. Failure of incorrect operation of the system may be due to the fusing of the emergency battery fuse due to an earth

Repeated failure of a properly fitted fuse indicates a fault on the system.

If the dynamo does not charge: -

1. Brushes sticking, due probably to oiliness. Clean brushes and holders with rag moistened with petrol.
2. Melting of dynamo armature or field fuse, which latter may be due to:-
 - (a) Dirty cut-out contacts, which clean.
 - (b) Discontinuity or bad contact in Dynamo battery circuit. See that lights are in order and examine battery terminal connections.
 - (c) Sticking dynamo negative brushes.
3. On later series if regulator is fitted:-

Ascertain whether dynamo or regulator is at fault by removing cover and connecting terminal **I** to **E**, and terminal **A** to **+**. This will short-circuit the regulator. Then, start engine gently and increase speed slowly. If dynamo is in order, the output will be delivered and the defect will lie in the regulator.

If dynamo output is low, this may be due to battery being fully charged, but if low with lights on, i.e. ammeter indicates an abnormal discharge, the regulator may be sticking in such a manner as permanently to insert the field resistance.

If dynamo gives an excessive charge and blows fuse when speeded up, this may be due to regulator sticking or to a break in the regulator shunt coil circuit. Check regulator wiring connections.

In the case of defective operation which is traceable to the regulator, the unit must be removed and returned for rectification to Rolls-Royce Ltd.

If, with the fuses intact, and the lights in order, the ignition: -

- (a) Misses.
 1. First confirm right condition of sparking plugs.
 2. Assure correct condition of contact breaker points, and adjust gap .017" to .021", if necessary.
 3. If missing still continues, test ignition circuit as below.
- (b) Fails.
 1. With battery ignition switched on, see by ammeter, while engine is being cranked, that the coil is taking current intermittently. If no current, test with a small voltmeter (to frame) availability of battery voltage on ballast resistance terminals then at coil terminals.

If, with battery in order, starter motor is sluggish or does not turn, examine commutator and brushes. Clean oily brushes and holders with a rag moistened with petrol. If motor turns without turning engine, examine Bijur drive.

If battery will not retain charge: -

1. Ascertain that no circuit is left switched on.
2. Test each individual cell with a small voltmeter, with all lights on.
3. See that no cell of the battery leaks acid.