ELECTRICAL

MARK VII and XK 120 MODELS

CHASSIS NUMBERS

MARK VII

(Stamped on the chassis left-hand side member above rear engine mounting bracket)

710001 Right-Hand Drive

730001 Left-Hand Drive

XK 120

(Stamped on the chassis left-hand side member bracket to rear of twin exhaust down pipes)

Super Sports Model

660001 Right-Hand Drive

670001 Left-Hand Drive

Fixed Head Coupe Model

669001 Right-Hand Drive

679001 Left-Hand Drive

The instructions in this section are presented under the following main headings which appear as sub-titles on the pages concerned and in the order shown:—

INDEX TO CONTENTS

INDEX TO PLATES

ELECTRICAL DATA

(MARK VII AND XK 120 MODELS)

BATTERY

	Mark VII	XK 120
MAKE AND TYPE	Lucas 12 v. G.T.W.11A	Home: Lucas 6 v. S.T.X.W.11E (2 off) Export: Lucas 6 v. S.T.Z.W.11E (2 off)

TABLE OF SPECIFIC GRAVITY AND CHARGING RATES

No. of Plates in each cell	Ampere-hour capacity At 10-hour rate	Ampere-hour capacity At 20-hour rate	Volume of electrolyte required to half fill one cell	Initial Charging Current (amps.)	Normal Recharge Current (amps.)
11	63	72	½ pint	4½	7

SPECIFIC GRAVITY OF ELECTROLYTE (CORRECTED TO 60° F.)

Home trade and climates normally below 80° F. (27° C.)		Sub-tropical climates 80°-100° F. (27°-38° C.)		Tropical climates over over 100° F. (38° C.)	
Filling	Fully charged	Filling	Fully charged	Filling	Fully charged
1.350	1.280-1.300	1.320	1.250-1.270	1.300	1.220-1.240

MAXIMUM PERMISSIBLE ELECTROLYTE TEMPERATURE DURING CHARGE

Climates normally below 80° F. (27° C.)	Climates between 80°-100° F. (27°-38° C.)	Climates frequently above 100° F. (38° C.)
100° F. (38° C.)	110° F. (43° C.)	120° F. (49° C.)

CONTROL BOX

SETTING DATA

Cut-Out

Cut-in voltage	12.7-13.3 volts
Drop-off voltage..	9 -10 volts
Reverse current	3.0- 5.0 amps.

Regulator—Settings on open circuit

Temperature		Voltage
10° C. (50° F.)	Cold climate..	16.1-16.7 volts
20° C. (68° F.)	Normal temperature ..	15.8-16.4 volts
30° C. (86° F.)	Hot climate	15.6-16.2 volts
40° C. (104° F.)	Very hot	15.3-15.9 volts

DISTRIBUTOR

DESIGN DATA

Open Period	Closed Period	Firing Angles
22°±4°	38°±4°	0°, 60°, 120°, etc.,±1°

CENTRIFUGAL ADVANCE DATA

Service No.	Type	Rotation	Control begins (r.p.m.)	Intermediate (r.p.m.)	Intermediate (degrees)	Control ends (r.p.m.)	Control ends (degrees)
40198B	GC47	Clock	150-300	850	8-10½	1,380	16-18
40199B	GC48	Clock	450-580	1,050	6-8	1,600	13-15
40249B	GC49	Clock	140-300	850	8-10½	1,400	16-18
40263A	GC50	Clock	500-700	1,250	9-12	1,650	16-18
40276A	GC53	Clock	380-500	925	6½-8½	2,025	18-20

Note. R.p.m. and degrees given in the above table are distributor revolutions and degrees.

IGNITION COIL DATA

Service No.	Type	Primary Resistance (ohms)	Slow-Speed Sparking Gap mm.	Slow-Speed Sparking Gap ins.	High-Speed Test (Distributor r.p.m.)	Test Volts (max.)	Approximate Running Current at 1,000 r.p.m. (amps.)	Approximate Stall Current (amps.)
45012A	B12	4.0-4.4	11.0	0.44	3,500	12.5	1.0	2.9

DYNAMO

PERFORMANCE DATA

Nominal Voltage	12
Cutting-in Speed (r.p.m.)	900-1050
At Generator Volts	13.0
Maximum Output (amps.)	20
At r.p.m.	1500-1700
At Generator Volts	13.5
On Resistance Load (ohms)*	0.67
Field Resistance (ohms)	6.0

*Resistance load must be capable of carrying 20 amperes without overheating.

STARTER MOTOR

PERFORMANCE DATA

Nominal Voltage	12
Lock Torque (lbs.-ft.)	22
Current (amps.)	430-450
Voltage	7.8-7.4
Torque at 1,000 r.p.m. (lbs.-ft.)	8.3
Current (amps.)	200-220
Voltage	10.2-9.8

WINDSCREEN WIPER

TEST DATA

	Model CR.4	Model CRT.14
Normal Current Consumption (motor cold and driving both blades on wet screen)	1.75-3.0 amps.	2.0-3.25 amps.
Stall Current (motor cold)	5.5-6.5 amps.	7.5-8.5 amps.

(*Continued on page P.6*)

Armature Resistance (between adjacent commutator segments)	0.85-1.05 ohms	0.8-1.0 ohms
Field Coil Resistance	15-16 ohms	8.4-9.0 ohms
Field Current (approximate)	0.8 amps.	1.4 amps.

BULB REPLACEMENT DATA

(MARK VII MODEL)

Lamp.	Lucas Bulb No.	Volts	Watts	Application
Head. Left Hand	302	12	48/48	Home.
Right Hand	185	12	48	Home.
	303	12	48/48	Left-Hand Drive. Export.
	302	12	48/48	Right-Hand Drive. Export.
	Sealed Beam Units			U.S.A.
Fog	325	12	36	
Side	207	12	6	
	361	12	6/18	U.S.A.
Number Plate and Rear Boot	989	12	6	
Reverse	199	12	24	
Rear and Brake	361	12	6/18	
Panel Lights	987	12	2.2	
Trafficators, Interior Map Light	256	12	3	
Trafficator and Ignition Warning Lights	987	12	2.2	
Head Lamp Warning Light	987	12	2.2	

(XK 120 MODELS)

Lamp	Lucas Bulb No.	Volts	Watts	Application
Head. Left Hand	302	12	48/48	Home.
Right Hand	185	12	48	Home.
	303	12	48/48	Left-Hand Drive. Export.
	302	12	48/48	Right-Hand Drive. Export.
	Sealed Beam Unit			U.S.A. and Canada
Side	989	12	6	
Side/Flasher	361	12	6/18	Fixed Head Coupe.
Number Plate	989	12	6	
Reverse	199	12	24	
Rear and Brake	361	12	6/18	
Rear and Brake/Flasher	361	12	6/18	Fixed Head Coupe.
Panel	207	12	6	
Rear Boot	256	12	3	
Interior Lights	256	12	3	Fixed Head Coupe.
Ignition, Head Lamp and Petrol Level Warning Lights	987	12	2.2	
Flasher Warning Light	987	12	2.2	Fixed Head Coupe.

AMMETER. TO REMOVE AND REFIT
(MARK VII MODEL)

REMOVE CENTRE FACIA. Disconnect battery positive lead. Remove the two drive screws securing dash casing to centre facia panel. Remove seven control knobs, all being retained by a spring-loaded pin registering in a hole in the knob. Press in pins and withdraw knobs. Remove cigar lighter and ignition key. Remove two bolts, one from either side, securing lower edge of facia to support brackets. Remove two thumb screws, each passing through a top corner of the facia panel. Withdraw glove drawer slightly, and remove centre facia.

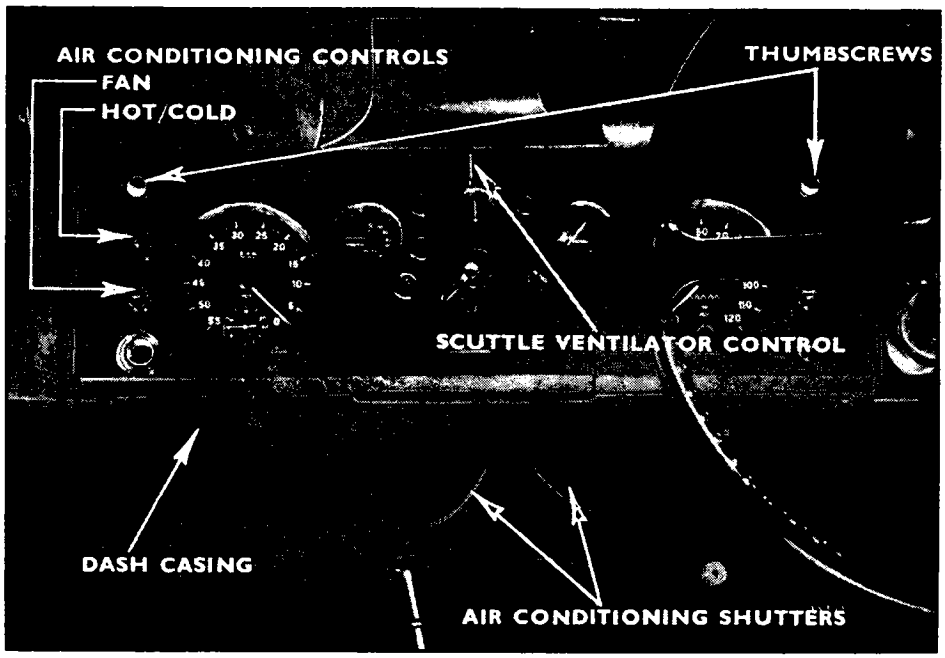


PLATE P.1. CENTRE FACIA. REMOVAL (Mark VII).

REMOVE AMMETER. Remove the two screws securing the ammeter to the instrument panel. Withdraw the ammeter slightly and from rear of instrument remove the wires, noting their respective positions. Remove ammeter.

REFIT. Refitting is the reverse of the removal procedure.

AMMETER. TO REMOVE AND REFIT
(XK 120 MODELS)

REMOVE CENTRE FACIA. Disconnect battery positive lead. Remove drive screws securing the dash casing and release casing. Remove two nuts (Fixed Head Coupe—two set screws) from each side of instrument panel, securing panel to facia structure. Withdraw instrument panel from rest of facia. (Plate P.2.)

REMOVE AMMETER. From rear of instrument panel remove the two screws securing the ammeter to the instrument panel. Draw instrument away from panel and remove wires, noting their respective position. Remove ammeter.

REFIT. Refitting is the reverse of the removal procedure.

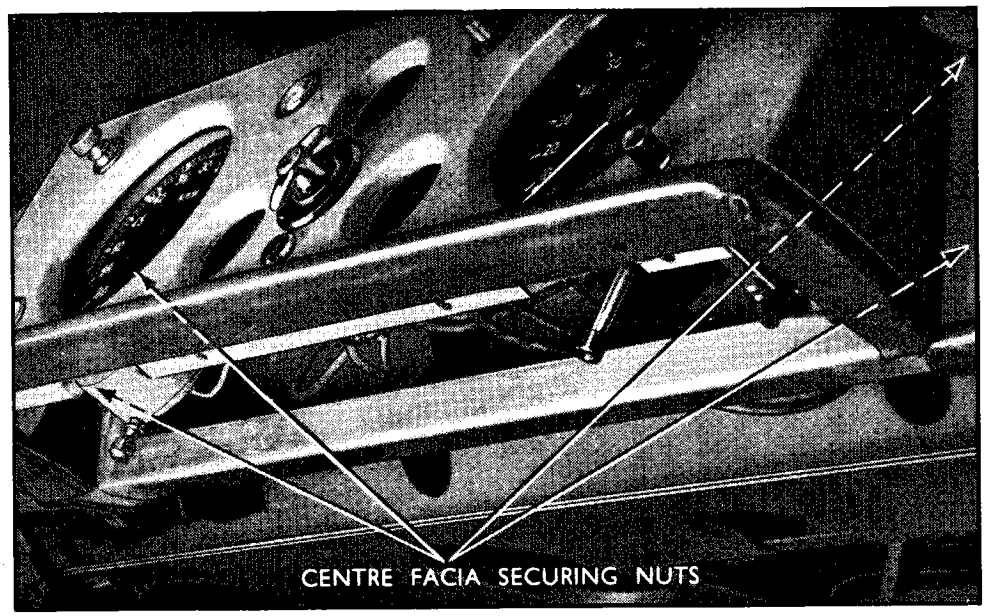


PLATE P.2. CENTRE FACIA. REMOVAL (Super Sports illustrated).

BATTERY. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

REMOVE. (MARK VII.) Disconnect the two terminals from the battery posts by unscrewing the two centre screws. Unscrew the two long bolts securing the strap at the front of the battery. Lift out battery.

REMOVE. (XK 120.) Pull the backs of the two seats forward. On the Super Sports model remove the battery cover box from behind the seats by unscrewing the screw at each end of the box. On the Fixed Head Coupe model unscrew the screw at each end of the rear locker one half-turn and pull locker lid forward.

Disconnect the four terminals from the battery posts by unscrewing the centre screws. Remove the bolts securing the straps at the front of the batteries. Lift out the two batteries.

REFIT. Refitting is the reverse of the above procedure.

BATTERY. MAINTENANCE
(MARK VII AND XK 120 MODELS)

Every 2,500 miles (4,000 kilometres) (or more frequently in very hot weather) examine the level of the electrolyte in the cells, and if necessary add **distilled** water to bring the level up to the tops of the separators.

The use of a Lucas Battery Filler will help to ensure that the correct electrolyte level is automatically maintained and also to prevent distilled water spilled over the top of the battery.

Never use a naked light when examining a battery, as the mixture of oxygen and hydrogen given off by the battery when on charge, and to a lesser extent when standing idle, can be dangerously explosive.

Examine the terminals. If they are dirty, clean them and coat them with petroleum jelly. Wipe away all dirt and moisture from the top of the battery, and ensure that the connections and the fixings are clean and tight.

The specific gravity of the electrolyte varies with the temperature; therefore, for convenience in comparing specific gravities, this is always corrected to 60° F., which is adopted as a reference temperature.

The method of correction is as follows:—
For every 5° F. below 60° F. deduct .002 from the observed reading to obtain the true specific gravity at 60° F.
For every 5° F. above 60° F. add .002 to the observed reading to obtain the true specific gravity at 60° F.

The temperature must be that actually indicated by a thermometer immersed in the electrolyte, and not the ambient temperature.

BATTERY. SERVICING
(MARK VII AND XK 120 MODELS)

BATTERY PERSISTS IN LOW STATE OF CHARGE. First consider the conditions under which the battery is used. Remember that if the battery is subjected to heavy loads without suitable opportunities for recharging, a low state of charge is only to be expected. A fault in the dynamo or regulator, or neglect during a period out of commission may also be responsible for the trouble.

Vent Plugs. See that the ventilating holes in each vent plug are clear, and that the rubber washer fitted under the vent plug is in good condition.

Level of Electrolyte. The surface of the electrolyte should be level with the tops of the separators. If necessary, top up with distilled water. Any loss of acid from spilling or spraying (as opposed to the normal loss of **water** by evaporation) should be made good by dilute acid of the same specific gravity as that already in the cell.

Cleanliness. See that the top of the battery is free from dirt or moisture which might provide a discharge path. Ensure that the battery connections are clean and tight.

Hydrometer Tests. Measure the specific gravity of the acid in each cell in turn with a hydrometer. The reading given by each cell should be approximately the same: if one cell differs appreciably from the others, an internal fault in that cell is indicated. This will probably be confirmed by the heavy discharge test described below.

The appearance of the electrolyte drawn into the hydrometer when taking a reading gives a useful indication of the state of the plates; if it is very dirty, or contains small particles in suspension, it is possible that the plates are in a bad condition.

DISCHARGE TEST. A heavy discharge tester consists of a voltmeter, 2 or 3 volts full scale, across which is connected a shunt resistance capable of carrying a current of several hundred amperes. Pointed prongs are provided for making contact with the inter-cell connectors. Press the contact prongs against the exposed positive and negative terminals of each cell. A good cell will maintain a reading of 1.2-1.5 volts, depending on the state of charge, for at least 6 seconds. If, however, the reading rapidly falls off, the cell is probably faulty and a new plate assembly may have to be fitted.

RECHARGING FROM AN EXTERNAL SUPPLY. If the above tests indicate that the battery is merely discharged, and is otherwise in a good condition, it should be recharged, either on the vehicle by a period of daytime running or on the bench from an external supply. (On the Mark VII model a battery charging socket is provided on the scuttle to the right-hand side of battery.) If the latter, the battery should be charged at the rate given on page P.4 until the specific gravity and voltage show no increase over three successive hourly readings. During the charge the electrolyte must be kept level with the tops of the separators by the addition of distilled water.

A battery that shows a general falling-off of efficiency, common to all cells, will often respond to the process known as "cycling". This process consists of fully charging the battery as described above, and then discharging it by connecting to a lamp board, or other load, taking about 5 amperes. The battery should be capable of providing this current for at least 7 hours before it is fully discharged, as indicated by the voltage of each cell falling to 1.8. If the battery discharges in a shorter time, repeat the "cycle" of charge and discharge.

BOOT LIGHT BULB. TO REPLACE
(MARK VII AND XK 120 MODELS)

MARK VII MODEL. The boot light bulb (bayonet fixing) is fitted to the number plate/reverse light bulb carrier, accessible from underneath the boot lid.

XK 120 MODELS. The boot light is situated in the underside of the boot lid.

Remove the boot light rim and plastic cover by unscrewing the two screws. Remove the festoon bulb by springing back the bulb holder.

BOOT LIGHT SWITCH. TO REPLACE
(XK 120 MODELS)

The boot light switch is situated at the rear of the boot lid aperture and is operated by a plate attached to the boot lid.

Remove the two screws securing the switch to the boot lid aperture surround. Withdraw switch sufficiently to enable the wire to be disconnected. Remove switch.

CHARGING AND INSPECTION LAMP SOCKET. DESCRIPTION
(MARK VII MODEL)

Situated under the bonnet between the voltage regulator and the battery is a two-pin plug, which may be used to "trickle" charge the battery or to illuminate an inspection lamp. (Plate P.12.)

COIL. MAINTENANCE, REMOVAL AND REFITTING
(MARK VII AND XK 120 MODELS)

LOCATION. The location of the coil on the Mark VII and XK 120 models is as follows:—

Mark VII	At front of right-hand wing valance.
XK 120. Super Sports (early cars)	Attached to cylinder block at rear of distributor.
XK 120. Super Sports (later cars) and Fixed Head Coupe	Attached to front carburetter flange.

MAINTENANCE The coil requires no attention other than the cleaning of the exterior, particularly between the terminals, and periodic checking of the terminal connections to ensure that they are clean and tight.

REMOVE. Disconnect both low tension wires from the coil by removing the two terminal nuts. Disconnect the high tension wire from the centre of the coil by unscrewing the knurled nut. Unscrew the two mounting bracket nuts and remove coil.

REFIT. Refitting is the reverse of the above procedure.

DISTRIBUTOR. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

REMOVE. Disconnect battery positive lead. Spring back clips and remove distributor cover.

Disconnect low tension wire from terminal on distributor body. Disconnect vacuum pipe by unscrewing union nut from vacuum advance unit. Slacken the distributor clamp plate pinch bolt, and withdraw distributor from cylinder block.

REFIT. Refitting is the reverse of the removal procedure, but it will be necessary to reset the ignition timing, as follows:—

Set micrometer adjustment to the centre of scale. Connect the low tension wire to terminal on distributor body. Fit the distributor to cylinder block with the vacuum advance unit facing to rear of engine. Rotate rotor arm until offset of driving dog engages with the offset in distributor drive shaft.

Turn engine until rotor arm is opposite the No. 6 cylinder (front) segment in the distributor cover, and the top dead centre arrow on the flywheel is 5° (two flywheel teeth approximate) before the arrow on the cylinder block.

Rotate the distributor body until the contact breaker points are just breaking, and tighten distributor clamp plate pinch bolt. Fit distributor cover, and connect up vacuum advance pipe.

Make final ignition setting on road test.

DISTRIBUTOR. DESCRIPTION AND MAINTENANCE

(MARK VII AND XK 120 MODELS)

GENERAL. One of the following types of distributor is fitted but the instructions under this heading apply equally to all types:—

	Mark VII	XK 120
7 to 1 compression ratio:		
(Early engines)	DVX6A, GC49, 40249B	
(Later engines)	DVX6A, GC50, 40263A	DVX6A, GC47, 40198B
8 to 1 compression ratio	DVX6A, GC53, 40276A	DVX6A, GC48, 40199B

Mounted on the distributor driving shaft, immediately beneath the contact breaker, is an automatic timing control mechanism. It consists of a pair of spring-loaded governor weights linked by lever action to the contact breaker cam. At slow engine speeds the spring force maintains the cam in a position in which the spark is slightly retarded. Under the centrifugal force imparted by high engine speeds the governor weights swing out, against the spring pressure, to advance the contact breaker cam and thereby the spark to suit engine conditions at the greater speed.

A vacuum-operated timing control is also fitted, designed to give additional advance under part-throttle conditions. The inlet manifold of the engine is in direct communication with one side of a spring-loaded diaphragm. This diaphragm acts through a lever mechanism to rotate the heel of the contact breaker about the cam, thus advancing the spark for part-throttle operating conditions. There is also a micrometer adjustment by means of which fine alterations in timing can be made to allow for changes in running conditions, e.g., state of carbonisation, change of fuel, etc. The combined effects of the centrifugal and vacuum-operated timing controls give added efficiency over the full operating range of the engine with a corresponding economy in fuel consumption.

MAINTENANCE. In general, lubrication and cleaning constitute normal maintenance procedure.

Lubrication—every 2,500 miles (4,000 kilometres). Take great care to prevent oil or grease from getting on or near the contacts.

Replenish the oil well with one or two teaspoonsful of good grade engine oil: this lubricates the automatic advance mechanism and also the distributor shaft.

Smear the cam and the pivot on which the contact breaker works with Mobilgrease No. 2 or an equivalent grease. Lift off the rotor arm by pulling vertically and apply to the spindle a few drops of thin machine oil to lubricate the cam bearing. It is not necessary to remove the exposed screw since it is either drilled or affords a clearance to permit passage of oil.

Replace the rotor arm, carefully locating its moulded projection in the keyway in the spindle and pushing it on as far as it will go in order to avoid the risk of the moulded cap being burned or tracked.

Cleaning—every 5,000 miles (8,000 kilometres). Thoroughly clean the moulded distributor cap, inside and out, with a soft dry cloth, paying particular attention to the spaces between the metal electrodes. Ensure that the small carbon brush moves freely in its holder.

Examine the contact breaker. The contacts must be quite free from grease or oil. If they are burned or blackened, clean them with very fine carborundum stone or emery cloth, then wipe with a petrol-moistened cloth. Cleaning is facilitated by removing the contact breaker lever. To do this, slacken the nut on the moulded terminal block and lift out the end of the contact breaker spring. The contact breaker lever may now be removed from its pivot. After cleaning, check the contact breaker setting. This should measure 0.012″ (.31 mm.). If the measurement is incorrect, keep the engine in the position giving maximum opening, slacken the two screws securing the fixed contact plate and adjust its position to give the required gap. Tighten the screws. Recheck the setting for other positions of the engine giving maximum opening.

DISTRIBUTOR. SERVICING
(MARK VII AND XK 120 MODELS)

Before starting to test, make sure that the battery is not fully discharged, as this will often produce the same symptoms as a fault in the ignition circuit.

TESTING IN POSITION TO LOCATE CAUSE OF UNEVEN FIRING.

Run the engine at a fairly fast idle speed.

Short circuit each plug in turn with, say, the blade of an insulated screwdriver or a hammer head placed across the terminal to contact the cylinder head. Short circuiting the defective plug will cause no noticeable change in the running note. On the others, however, there will be a pronounced increase in roughness.

Having thus located the defective cylinder, stop the engine and remove the cable from the sparking plug terminal. Restart the engine and hold the cable end about $\frac{3}{16}$" (4.8 mm.) from the cylinder head. If sparking is strong and regular, the fault lies with the sparking plug, and it should be removed, cleaned and adjusted, or a replacement fitted.

If, however, there is no spark, or only weak irregular sparking, examine the cable from the plug to the distributor for deterioration of the insulation, renewing the cable if the rubber is cracked or perished.

Clean and examine the distributor moulded cap for free movement of the carbon brush. If tracking has occurred, indicated by a thin black line, usually between two or more electrodes a replacement distributor cap must be fitted.

TESTING IN POSITION TO LOCATE CAUSE OF IGNITION FAILURE.

Spring back the clips on the distributor head and remove the moulded cap. Lift off the rotor, carefully levering with a screwdriver if necessary.

Check the contacts for cleanliness and correct gap setting. Switch on the ignition and turn the engine. Observe the ammeter reading, which should rise and fall with the closing and opening of the contacts if the low tension wiring is in order. When the reading does not fluctuate, either a short circuit or contacts remaining closed is indicated. No reading indicates a broken or loose connection in the low tension wiring or badly adjusted or dirty contacts.

LOW TENSION CIRCUIT— FAULT LOCATION.

If it is determined that the fault lies in the low tension circuit by the eliminating check above, switch on the ignition and turn the engine until the contact breaker points are fully opened. Refer to the wiring diagram and check the circuit with a voltmeter (0-20 volts) between the following points and a good earth. If the circuit is in order the voltage reading should be approximately 12 volts. No reading indicates a damaged cable or loose connections, or a breakdown in the section under test.

Battery to Ammeter. Connect the voltmeter between the ammeter terminal "B" and a good earth on the chassis.

Ammeter. Check the voltage to earth at the other ammeter terminal "A" and earth. No reading indicates a faulty ammeter.

Ammeter to Control Box. Connect the voltmeter between the control box terminal "A" and earth. No reading indicates a faulty lead or loose connection.

Control Box. Check the voltage to earth at the control box terminal "A1". No reading indicates a broken connection in the series winding.

Control Box to Ignition Switch. Connect the voltmeter between the ignition switch terminal, to which the lead from the control box is connected (via terminal "A" of the lighting switch) and a good earth. No reading indicates a faulty lead or loose connection.

Ignition Switch. Check the voltage between the other terminal of the ignition switch and earth. No reading indicates a fault in the switch.

Ignition Switch to Ignition Coil. Remove the lead from the ignition coil "SW" terminal, and connect the voltmeter between the free end of the cable and earth. This portion of the circuit is made by way of the control box "A3" terminal, and a voltage check should be made at this point also.
Remake the connection to the coil.

Ignition Coil. Disconnect the lead from the "CB" terminal of the coil and connect the voltmeter between the "CB" terminal and a good earth. No reading indicates a fault in the primary winding of the coil, necessitating coil replacement. If, however, the correct reading is obtained, remake the cable connection to the coil terminal.

Ignition Coil to Distributor. Disconnect the low tension cable to the distributor and connect the voltmeter between the end of the cable removed and earth. No reading indicates a faulty lead or loose connection. Reconnect the cable to the distributor.

Contact Breaker and Condenser. Connect the voltmeter across the contact points. If no reading is obtained, recheck with the condenser removed. If a reading is now given, the condenser is faulty and must be replaced. Measure the contact breaker spring tension. This should be 20-24 oz. (.56-.68 kg.), measured at the contacts.

HIGH TENSION CIRCUIT. If, after carrying out these tests, the fault has not been located, remove the high tension lead from the centre terminal of the distributor. Switch on the ignition and turn the engine until the contacts close. Flick open the contact breaker lever while the high tension lead from the coil is held about $\frac{3}{16}$" (4.8 mm.) from the cylinder block. If the ignition equipment is in good order, a strong spark will be obtained. If no spark occurs, a fault in the circuit of the secondary winding of the coil is indicated and the coil must be replaced.

The high tension cables must be carefully examined, and replaced if the rubber insulation is cracked or perished using 7mm. rubber covered ignition cable. To fit a new high tension cable to the ignition coil, pass the cable through the knurled, moulded nut, bare about $\frac{1}{4}$" (6 mm.) of the end cable, thread the wire through the brass washer (removed from the original cable) and bend back the strands. Finally screw the nut into its terminal.

To make connections to the terminals in distributor cap, remove the cap and slacken the screws on the inside of the moulding. Cut the cables to the length required and push firmly home in the holes in the moulding. Tighten the screws, which will pierce the rubber insulation to make good contact with the cable core. The connection to the centre terminal is made accessible by removing the small carbon brush.

The cables from the distributor to the sparking plugs must, of course, be connected in the correct firing order.

DISTRIBUTOR. TO DISMANTLE AND REASSEMBLE
(MARK VII AND XK 120 MODELS)

DISMANTLE. (Refer to Plates P.3 and P.4.) Before dismantling, carefully note the position in which the various components are fitted, in order to ensure their correct replacement on subsequent reassembly. As the driving dog is offset, note the relation between it and the rotor electrode, and maintain this relation in reassembling the distributor.

(i) Spring back the securing clips and remove the moulded cap. Lift the rotor arm off the top of the spindle. If tight, carefully lever off with a screwdriver. Remove the nut on the moulded terminal block and lift off the end of the contact breaker spring. The contact breaker lever can now be lifted from its pivot. Lift the insulating washer from the pivot. Remove the two screws, together with the spring and plain steel washers, securing the fixed contact plate, and remove the plate.

Unscrew the screw from the condenser band clip. Unscrew the terminal nut, lift off the spring washer and remove the condenser and connecting strip.

(ii) Undo the three screws fitted at the edge of the contact breaker base casting and lift them out. The screws are accessible through the apertures cut in the contact breaker plate. The contact breaker base can then be removed from the body of the distributor. Remove the jump ring from the underside of the contact breaker base, lift off the star-shaped spring and slide the contact breaker plate out of the base, first withdrawing the screw securing the earth connection to the base.

(iii) Undo the two nuts from the studs securing the vacuum unit to its bracket, pull the unit off its seating so that the studs are clear of the fixing bracket and rotate the vacuum unit to unscrew the connecting rod from the control barrel. Take care not to mislay the spring and serrated washer inside the barrel. Unscrew the control barrel from its sleeve and remove it. The sleeve can now be slid out of its housing.

(iv) Remove the driving dog from the shaft.

(v) Take out the screw from inside the top of the cam spindle and lift off the cam and cam foot. The automatic timing control is then accessible. Before dismantling, carefully note the positions in which the various components are fitted in order that they may be replaced correctly. To remove the automatic timing control and shaft assembly from the distributor, it must be pressed out of its bearing. The bearings must not be disturbed unless they are worn and need replacing. The bearing bush fitted at the lower end of the shank can be removed by driving it out with a suitable punch, while the ball bearing at the top can be removed by means of a shouldered mandrel locating on the inner journal of the bearing.

REASSEMBLE. If the bearings have been removed, the distributor should be assembled with new bearings fitted. Press the ball bearing into its housing at the top of the shank, using a shouldered mandrel which locates on the inner and outer journals of the bearing. The bearing bush at the lower end of the shank must also be fitted, using a shouldered mandrel.

Before fitting the bearing bush it should be allowed to stand completely immersed in thin oil for at least 24 hours. Place the distance collar over the shaft, fit the shaft in its bearings and replace the driving member. Assemble the automatic timing control, taking care that the parts are fitted in their original positions and that the control springs are not stretched. Place the cam on its spindle and tighten the locking screw.

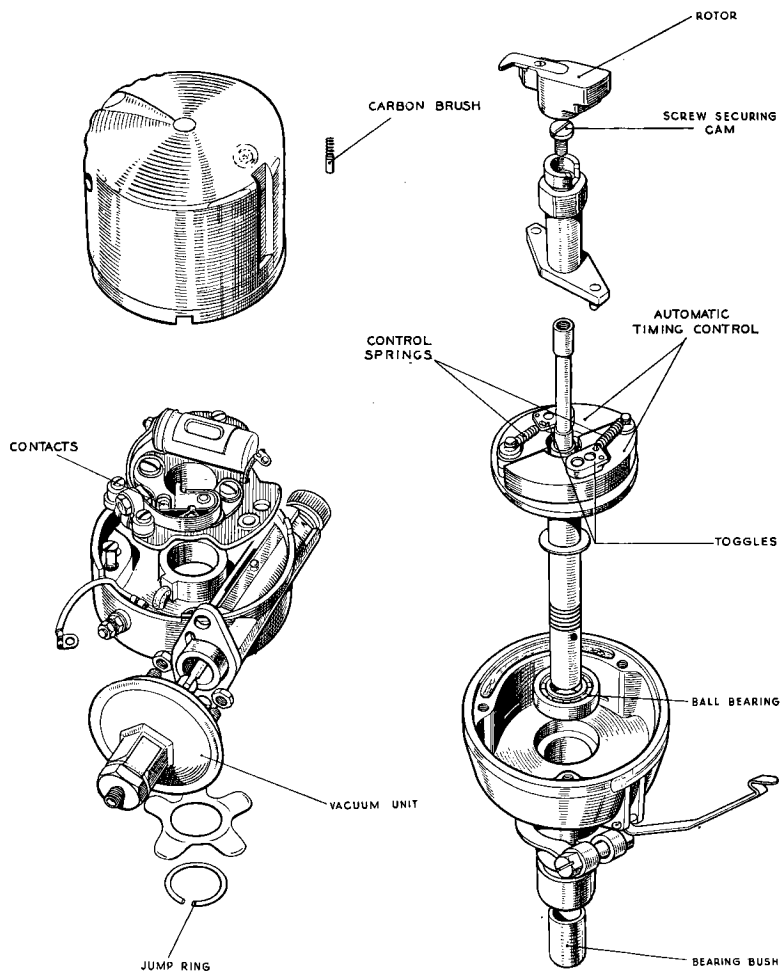


PLATE P.3. DISTRIBUTOR (Exploded view).

(i) Fit the sleeve of the micrometer adjustment into its housing in the contact breaker base, so that the timing scale appears in the window on the right of the body. Screw the control barrel fully home in the sleeve. With the barrel and sleeve pushed as far into the housing as they will go, screw the vacuum unit connecting rod into the barrel, taking care that the serrated washer is correctly fitted. Position the vacuum unit on its fixing plate so that the two studs fit through the holes provided. Place a spring washer over each stud and secure by tightening the locking nuts.

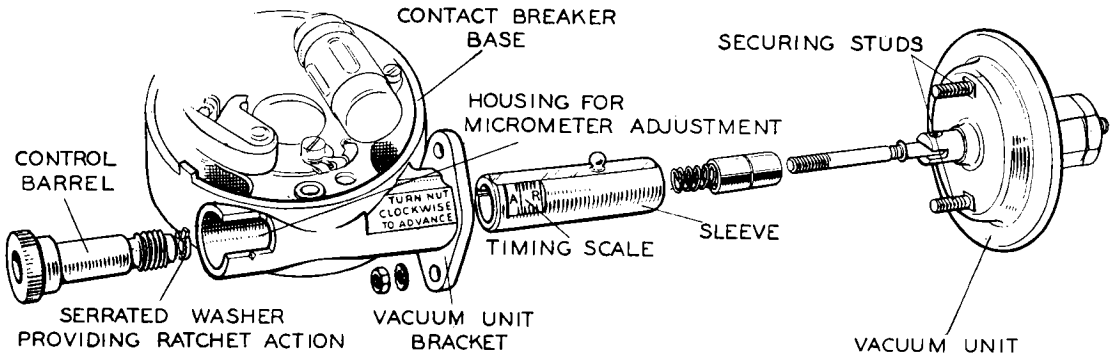


PLATE P.4. VACUUM ADVANCE MECHANISM (Exploded view).

(ii) See that the two cables are connected to the terminal and to the earthing screw in the base casting. Position the contact breaker plate in the base casting so that the peg fitted in the control barrel locates in the hole provided in the contact breaker plate. Place the star-shaped spring over the bearing sleeve on the underside of the base casting and secure by springing the jump ring into its location.

Place the contact breaker base on the distributor body and secure by means of the three screws.

(iii) Insert the terminal post on the condenser through the hole in the connector strip. Replace the spring washer and tighten the terminal nut. Secure the band clip by replacing and tightening the fixing screw.

Position the plate carrying the fixed contact on the contact breaker base and secure it by replacing and lightly tightening the two screws, first placing a spring washer and flat steel washer under the heads of each of the screws. The eyelet on the end of the cable connected to the earthing screw must be fitted under the head of one of the screws. Place the insulating washer over the contact breaker pivot pin and position the contact breaker lever on its pivot pin. Insert the square-headed bolt through the condenser connecting strip and the hole in the end of the contact breaker spring. Fit the bolt in the moulded junction block, place the eyelet on the end of the connector from the low tension terminal over the bolt, followed by a spring washer and secure by tightening the nut. Adjust the contact breaker setting to give a maximum opening of .012″ (.31 mm.).

Note. If it becomes necessary to renew the contacts, a replacement set comprising fixed and moving contacts must be fitted.

Place the rotor arm on the top of the spindle, locating the register correctly and push it fully home.
Fit the distributor moulding and secure by means of the spring clips.

CONTROL BOX. DESCRIPTION

(MARK VII AND XK 120 MODELS)

GENERAL. The control box houses the dynamo voltage regulator and the cut-out. Although combined structurally, the regulator and cut-out are electrically separate. Both are accurately adjusted during manufacture, and the cover protecting them is sealed and should not be removed unnecessarily. Connections are by means of the normal grub screw terminal.

THE REGULATOR. The regulator unit is arranged to work in conjunction with the shunt-wound dynamo described in the Dynamo section. The regulator is set to maintain a predetermined dynamo voltage at all speeds above the regulating point, the field strength being controlled by the automatic insertion of a resistance in the dynamo field circuit. When the dynamo voltage reaches a predetermined value, the magnetic field due to the shunt or voltage winding becomes sufficiently strong to attract the armature. This causes the contact to open, thereby inserting the resistance in the field circuit. The consequent reduction in field current lowers the dynamo voltage and this, in turn, weakens the magnetic field due to the voltage coil. The armature is allowed to return to its original position, thus closing the contacts, so that the voltage returns to the predetermined maximum. The cycle is then repeated, and the armature is set into vibration.

As the speed of the dynamo rises above that at which the regulator comes into operation the amplitude of vibration increases and the periods of interruption increase in length with the result that the mean value of the dynamo output undergoes practically no increase once the operating speed has been attained.

The series of current winding provides a compensation on this system of control, for if the control were arranged entirely on the basis of voltage there would be a risk of very seriously overloading the dynamo when the battery was in a low state of charge, particularly if the lamps were simultaneously in use. Under these conditions, with a battery of low internal resistance, the dynamo would be forced to give an output to bring the voltage of the system up to the same value as if the battery were fully charged. This would necessitate an extremely heavy current far beyond the normal capacity of the machine. The series winding assists the voltage coil, so that when the dynamo is delivering a heavy current into a discharged battery the regulator comes into operation at a somewhat reduced voltage, thus limiting the output accordingly. A split series winding is used, the centre tapping carrying the battery charging current while the complete winding carries lighting and ignition loads.

By means of a temperature compensation device the voltage characteristic of the dynamo is caused to conform more closely to that of the battery under all climatic conditions. In cold weather the voltage required to charge the battery increases, whilst in warm weather the voltage of the battery is lower. The method of compensation takes the form of a bi-metallic spring suspension for the armature of the regulator which causes the operating voltage of the regulator to be increased in cold weather and reduced in hot weather, and thereby to compensate for the variations in charging current which would otherwise occur due to the changing characteristics of the battery.

THE CUT-OUT. The cut-out is an automatic switch connected between dynamo and battery. It consists of a pair of contacts held open by a spring and closed magnetically when the engine is running fast enough to cause the dynamo voltage to exceed that of the battery. The battery will then be charged by the dynamo. On the other hand, when the speed is low or the engine is stationary the contacts open, thus disconnecting the dynamo from the battery and preventing current flowing from the battery through the windings.

CONTROL BOX. SERVICING
(MARK VII AND XK 120 MODELS)

Testing in Position to locate Fault in Charging Circuit. If the procedure given in the Dynamo Instructions shows the dynamo to be in order, proceed to check further as follows:—

(i) First ensure that the wiring between the battery and regulator is in order. To do this, disconnect the wire from the A terminal of the control box and connect the end of the wire removed to the negative terminal of the voltmeter. Connect the positive voltmeter terminal to an earthing point on the chassis. If a voltmeter reading is given, the wiring is in order and the regulator must be examined.

(ii) If there is no reading, examine the wiring between battery and control box for broken wires or loose connections.

(iii) Reconnect the wire to terminal A.

REGULATOR ADJUSTMENT. The regulator is carefully set during manufacture to suit the normal requirements of the standard equipment and in general it should not be necessary to make further adjustments. However, if the battery does not keep in a charged condition, or if the generator output does not fall when the battery is fully charged it may be advisable to check the setting and readjust if necessary.

It is important before altering the regulator setting when the battery is in a low state of charge to check that its condition is not due to a battery defect or to the generator belt slipping.

Electrical Setting. It is important that a good quality MOVING COIL VOLTMETER (0-20 volts) be available before attempting to adjust the regulator.

The electrical setting can be checked without removing the cover from the control box. Withdraw the cables from the terminals marked A and A1 at the control box and join the wires together.

Connect the negative lead of the moving coil voltmeter to the "D" terminal on the dynamo and connect the other lead from the meter to a convenient chassis earth. Slowly increase the speed of the engine until the voltmeter needle "flicks" and then steadies; this should occur at a voltmeter reading between the limits given on page P.4 for the appropriate temperature of the regulator. If the voltage at which the reading becomes steady occurs outside these limits, the regulator must be adjusted.

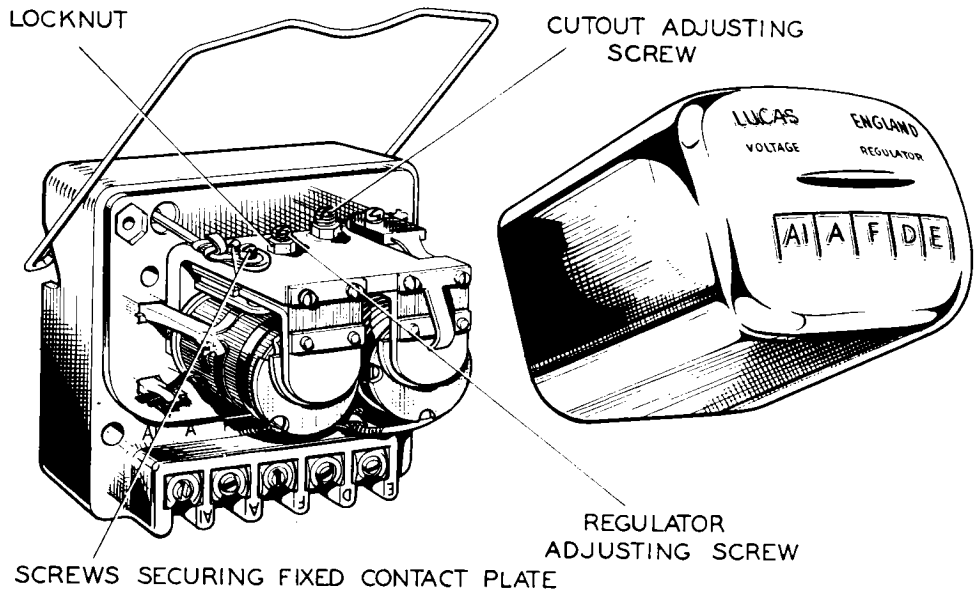


PLATE P.5. CONTROL BOX (Mark VII illustrated).

Shut off the engine and remove the control box cover. Release the lock nut holding the adjusting screw and turn the screw in a clockwise direction to raise the setting or in an anti-clockwise direction to lower the setting. Turn the screw a fraction of a turn only at a time and then tighten the lock nut. Repeat as above until the correct setting is obtained.

Remake the original connections.

When the dynamo is run at a high speed on open circuit it builds up a high voltage. Therefore, when adjusting the regulator do not run the engine up to more than half throttle or a false voltmeter reading will be obtained.

Mechanical Setting. The mechanical setting of the regulator is accurately adjusted before leaving the works and provided that the armature carrying the moving contact is not removed, the regulator will not require

mechanical adjustment. If, however, the armature has been removed from the regulator for any reason, the contacts will have to be reset. To do this, proceed as follows:—

Slacken the two armature fixing screws. Insert a .018" (.46 mm.) feeler gauge between the back of the armature and the regulator frame.

Press back the armature against the regulator frame and down on to the top of the bobbin core with gauge in position, and lock the armature by tightening the two fixing screws.

Check the gap between the underside of the arm and the top of the bobbin core. A shim is fitted to the underside of the arm and the gap should be .012"-.020" (.31-.51 mm.). If the gap is outside these limits correct by adding or removing shims at the back of the fixed contact.

Remove the gauge and press the armature down, when the gap between the contacts should be .006"-.017" (.15-.43 mm.).

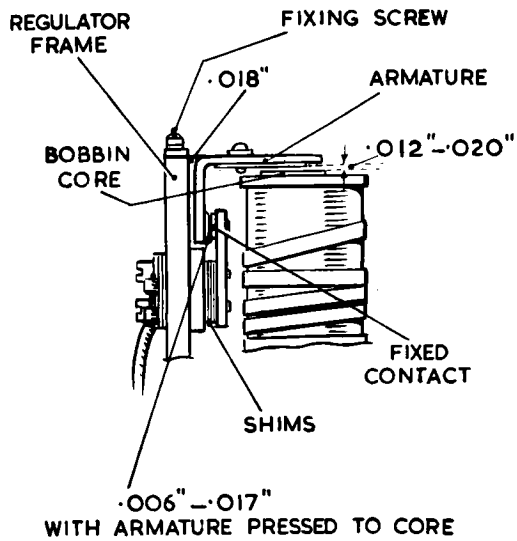


PLATE P.6. REGULATOR. MECHANICAL SETTING.

Cleaning Contacts. After long periods of service it may be found necessary to clean the vibrating contacts of the regulator. These are made accessible by slackening the screws securing the plate carrying the fixed contact. It will be necessary to slacken the upper screw a little more than the lower so that the contact plate can be swung outwards. Clean the contacts by means of fine carborundum stone or fine emery cloth.

Carefully wipe away all traces of dirt or other foreign matter. Finally tighten the securing screws.

CUT-OUT ADJUSTMENT. **Electrical Setting.** If the regulator setting is within the correct limits, but the battery is still not receiving current from the dynamo, the cut-out may be out of adjustment, or there may be an open circuit in the wiring of the cut-out and regulator unit. Remove the cable from the terminal marked A on the control box (ensuring that the bared end does not come into contact with the chassis). Remove the voltmeter lead from the "D" terminal of the unit and connect it to terminal A. Run the engine as before at a fairly low engine speed; the cut-out should operate, when a voltmeter reading should be given of the same value as that when the voltmeter was connected to terminal "D".

If there is no reading, the setting of the cut-out may be badly out of adjustment and the contacts not closing. To check the voltage at which the cut-out operates, remove the control box cover, and connect the voltmeter between the "D" terminal and earth. Start the engine and slowly increase its speed until the cut-out contacts are seen to close, noting the voltage at which this occurs. This should be 12.7-13.3 volts.

If the operation of the cut-out takes place outside these limits, it will be necessary to adjust. To do this, slacken the lock nut on the cut-out adjustment screw and turn the screw in a clockwise direction to raise the voltage setting or in an anti-clockwise direction to reduce the setting, testing after each adjustment by increasing the engine speed until the cut-out is seen to operate, and noting the corresponding voltmeter reading.

Tighten the lock nut after making the adjustment.

Mechanical Setting. If, for any reason, the cut-out armature has to be removed from the frame, care must be taken to obtain the correct gap settings on reassembly. The correct settings can be obtained as follows:—

Slacken the two armature fixing screws and also the two screws securing the fixed contact. Insert a .008″ (.20 mm.) gauge between the back of the armature and the cut-out frame, and a .011″-.105″ (.28-.38 mm.) gauge between the core face and the armature. A .005″ (.12 mm.) brass shim is fitted to the underside of the armature, and the gap must be measured between the core face and the underside of this shim.)

Press the armature down and back against the two gauges and tighten the armature fixing screws. With the gauges still in position, set the gap between the armature and the stop plate arm to .030″-.034″ (.76-.86 mm.).

Remove the gauges and tighten the screws securing the fixed contact. Insert a .025″ (.65 mm.) gauge between the core face and the armature. Press the armature down to the gauge. The gap between the contacts should now measure .002″-.006″ (.05-.15 mm.). Adjust the gap, if necessary, by adding or removing shims beneath the fixed contact plate.

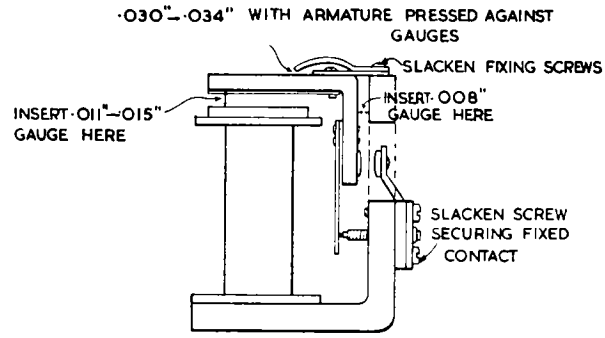


PLATE P.7. CUT-OUT. MECHANICAL SETTING.

Cleaning Contacts. If the cut-out contacts appear burnt or dirty, place a strip of fine glass paper between the contacts, then, with the contacts closed by hand, draw the paper through. This should be done two or three times with the rough side towards each contact. Do not use emery cloth or a carborundum stone for cut-out contacts.

DYNAMO. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

REMOVE. Disconnect the battery positive lead. Remove the connections from the dynamo, noting that the yellow wire is connected to terminal "D" (large terminal) and the yellow with green wire to terminal "F" (small terminal). Remove the adjusting set screw situated at the top of dynamo and push dynamo towards engine to release fan belt tension. Remove the two mounting bolts and nuts underneath the dynamo, disengage fan belt, and lift out dynamo.

REFIT. Refitting is the reverse of the above procedure. After the fan belt has been fitted, pull the dynamo outwards until the belt can be flexed approximately $\frac{1}{2}$″ (12 mm.) either way in the middle of the vertical run of the belt, and fully tighten adjusting set screw.

DYNAMO. DESCRIPTION AND MAINTENANCE

(MARK VII AND XK 120 MODELS)

DESCRIPTION. The dynamo is a specially finished shunt-wound two-pole two-brush machine, arranged to work in conjunction with a compensated voltage control regulator unit. A fan draws cooling air through the dynamo—inlet and outlet holes being provided in the end brackets of the unit. Ball bearings are fitted at each end of the armature shaft.

The output of the dynamo is controlled by the regulator and is dependent on the state of charge of the battery and the loading of the electrical equipment in use. When the battery is in a low state of charge, the dynamo gives a high output, whereas if the battery is fully charged, the dynamo gives only sufficient output to keep the battery in good condition without any possibility of overcharging. In addition, an increase in output is given to balance the current taken by lamps and other accessories when in use. Further, a high boosting charge is given for a few minutes immediately after starting up, thus quickly restoring to the battery the energy taken from it by the electric starting motor.

MAINTENANCE. **Lubrication.** No routine lubrication is necessary as the bearings are packed with grease before assembly.

Inspection of Brush Gear and Commutator. Every 12,000 miles (19,000 kilometres) remove the metal band cover to inspect the brush gear and commutator. Check that the brushes move freely in their holders by holding back the brush springs and pulling gently on the flexible connectors. If a brush is inclined to stick, remove it from its holder and clean its sides with a petrol-moistened cloth. Be careful to replace brushes in their original positions in order to retain the "bedding". Brushes which have worn so that they will not "bed" properly on the commutator must be renewed.

The commutator should be clean, free from oil or dirt and should have a polished appearance. If it is dirty, clean it by pressing a fine dry cloth against it while the engine is slowly turned over by hand. If the commutator is very dirty, moisten the cloth with petrol.

Belt Adjustment. Occasionally inspect the dynamo driving belt and adjust, if necessary, to take up any undue slackness by turning the dynamo on its mounting. Care should be taken to avoid overtightening the belt, which should have sufficient tension only to drive without slipping.

See that the machine is properly aligned, otherwise undue strain will be thrown on the dynamo bearings.

DYNAMO. TO DISMANTLE AND REASSEMBLE

(MARK VII AND XK 120 MODELS)

DISMANTLE. (Refer to Plate P.8.)

(i) Remove nut and withdraw the driving pulley.

(ii) Remove the cover band, hold back the brush springs and remove the brushes from their holders.

(iii) Remove the nut, spring washer and flat washer from the smaller terminal (i.e., the FIELD terminal) on the commutator end bracket.

(iv) Unscrew and withdraw the two through bolts.

(v) The commutator and bracket can now be withdrawn from the dynamo yoke.

(vi) The driving end bracket together with the armature can now be lifted out of the yoke.

(vii) The driving end bracket, which on removal from the yoke has withdrawn with it the armature and armature shaft ball bearing, need not be separated from the shaft unless the bearing is suspected and requires examination, or the armature is to be replaced; in this event the armature should be removed from the end bracket by means of a hand press.

REASSEMBLE. Reassembly is the reverse of the dismantling procedure.

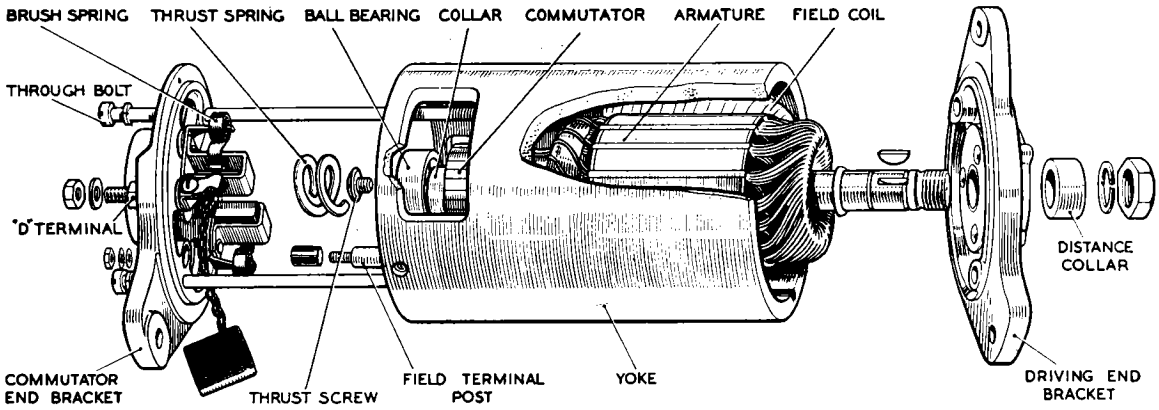


PLATE P.8. DYNAMO (Exploded view).

DYNAMO. SERVICING

(MARK VII AND XK 120 MODELS)

TESTING IN POSITION TO LOCATE FAULT IN CHARGING CIRCUIT.

In the event of a fault in the charging circuit, adopt the following procedure to locate the cause of trouble:—

(i) Inspect the driving belt and adjust if necessary.

(ii) Check that the dynamo and control box are connected correctly. The dynamo terminal "D" must be connected to control terminal "D" and dynamo terminal "F" to control box terminal "F".

(iii) Switch off all lights and accessories, disconnect the cables from terminals of dynamo marked "D" and "F", and connect the two terminals with a short length of wire.

(iv) Start the engine and set to run at normal idling speed.

(v) Clip the negative lead of a moving coil type voltmeter, calibrated 0-20 volts, to one dynamo terminal and the other lead to a good earthing point on the yoke.

(vi) Gradually increase the engine speed, when the voltmeter reading should rise rapidly and without fluctuation. Do not allow the voltmeter reading to reach 20 volts and do not race the engine in an attempt to increase the voltage. It is sufficient to run the dynamo up to a speed of 1,000 r.p.m. If there is no reading, check the brush gear as described in (vii) below. If there is a low reading of 4-5 volts the armature winding may be at fault (see Armature on page P.22).

(vii) Remove the cover band and examine the brushes and commutator. Hold back each of the brush springs and move the brush by pulling gently on its flexible connector. If the movement is sluggish, remove the brush from its holder and ease the sides by lightly polishing on a smooth file. Always replace brushes in their original positions. If the brushes are worn so that they do not bear on the commutator, or if the brush flexible is exposed on the running face, new brushes must be fitted and bedded to the commutator.

Test the brush spring tension with a spring scale. The tension of the springs when new is 36-44 oz. (.02-1.25 kg.). In service, it is permissible for this value to fall to 30 oz. (.85 kg.) before performance may be affected. Fit new springs if the tension is low.

If the commutator is blackened or dirty, clean it by holding a petrol-moistened cloth against it while the engine is turned slowly by hand cranking. Retest the dynamo as in (vi); if there is still no reading on the voltmeter, there is an internal fault and the complete unit, if a spare is available, should be replaced. Otherwise the unit must be dismantled for internal examination.

(viii) If the dynamo is in good order, remove the link from between the terminals and restore the original connections, taking care to connect dynamo terminal "D" to control box terminal "D" and dynamo terminal "F" to control box terminal "F". Proceed to test the regulator unit as described in the section covering the Control Box Instructions.

COMMUTATOR. A commutator in good condition will be smooth and free from pits or burned spots. Clean the commutator with a petrol-moistened cloth. If this is ineffective, carefully polish with a strip of fine glass paper while rotating the armature. To remedy a badly worn commutator, mount the armature with or without the drive end bracket in a lathe, rotate at a high speed and take a light cut with a very sharp tool. Do not remove more metal than is necessary. Polish the commutator with very fine glass paper.

Undercut the insulators between the segments to a depth of $\frac{1}{32}$" (.79 mm.) with a hack saw blade ground down to the thickness of the insulator.

ARMATURE. The testing of the armature winding requires the use of a volt drop test and growler. If these are not available, the armature should be checked by substitution. No attempt should be made to machine the armature core or to true a distorted armature shaft.

FIELD COILS. Measure the resistance of the field coils, without removing them from the dynamo yoke, by means of an ohm meter. A value of approximately 6 ohms should be obtained.

Continuity and Insulation Tests. If an ohm meter is not available, connect a 12 volt D.C. supply with an ammeter in series between the field terminal and dynamo yoke. The ammeter reading should be approximately 2 amperes. No reading on the ammeter indicates an open circuit in the field winding.

To test car for earthed field coils, unsolder and isolate the end of the field winding from the earth terminal on the dynamo yoke end: with a mains test lamp, check between the field terminal and yoke. If the lamp lights, the field coils are earthed. In either case, unless a substitute dynamo is available, the field coils must be replaced. To do this, carry out the procedure outlined below, using a pole shoe expander and a wheel-operated screwdriver.

(i) Remove the insulation piece which is provided to prevent the junction of the field coils from contacting with the yoke.

(ii) Mark the yoke and pole shoes in order that they can be fitted in their original positions.

(iii) Unscrew the two pole shoes retaining screws by means of the wheel-operated screwdriver.

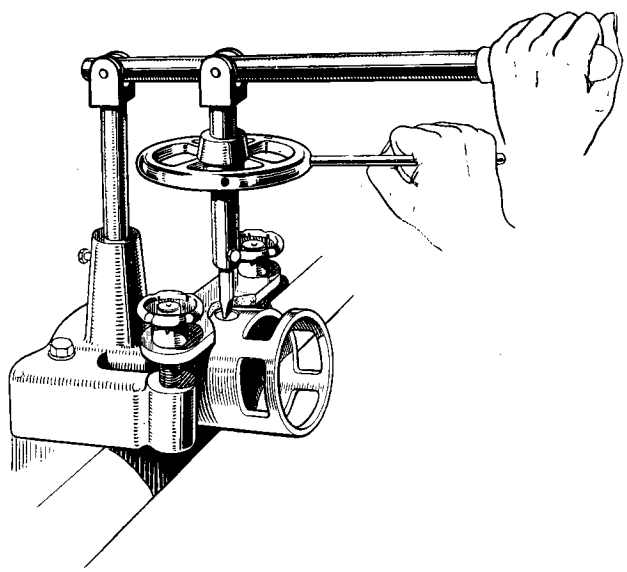


PLATE P.9. POLE SHOE SCREWS. REMOVAL.

(iv) Draw the pole shoes and coils out of the yoke and lift off the coils.

(v) Fit the new field coils over the pole shoes and replace them in position inside the yoke. Take care to ensure that the taping of the field coils is not trapped between the pole shoes and the yoke.

(vi) Locate the pole shoes and field coils by lightly tightening the fixing screw.

(vii) Insert the pole shoe expander, open it to the fullest extent and tighten the screws.

(viii) Finally tighten the screws by means of the wheel-operated screwdriver and lock them by caulking.

(ix) Replace the insulation piece between the field connections and the yoke.

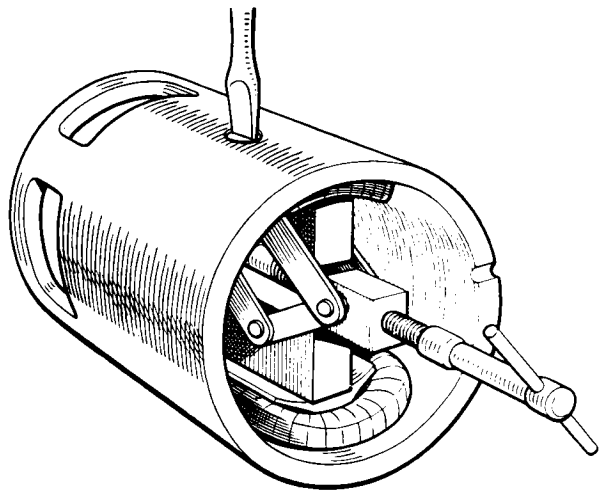


PLATE P.10. POLE SHOE EXPANDER IN OPERATION.

BEARINGS. Bearings which are worn to such an extent that they will allow side movement of the armature shaft must be replaced.

The ball bearing at the driving end is replaced as follows:—

(i) Knock out the rivets which secure the bearing retaining plate to the end bracket and remove the plate.

(ii) Press the bearing out of the end bracket and remove the corrugated washer, felt washer and oil-retaining washer.

(iii) Before fitting the replacement bearing see that it is clean and pack it with high melting point grease.

(iv) Place the oil retaining washer, felt washer and corrugated washer in the bearing housing in the end bracket.

(v) Locate the bearing in the housing and press it home by means of a hand press.

(vi) Fit the bearing retainer plate. Insert the new rivets from the inside of the end bracket and open the rivets by means of a punch to secure the plate rigidly in position.

The ball bearing at the commutator end is secured to the armature shaft by a thrust screw, and can be withdrawn with an extractor after the screw has been removed. See that the new bearing is clean and packed with high melting point grease, force it home against the shoulder on the armature shaft and insert and tighten the thrust screw.

ELECTRIC CLOCK. REMOVE, ADJUST AND REFIT

(MARK VII AND XK 120 MODELS)

GENERAL. The electric time clock is built into the revolution counter instrument and must be removed with the revolution counter.

REMOVE. (MARK VII.) Disconnect battery positive lead. Remove the two drive screws securing dash casing to centre facia panel. Remove seven control knobs, all being retained by a spring-loaded pin registering in a hole in the knob. Press in pins and withdraw knobs. Remove cigar lighter and ignition key. Remove two bolts, one from either side, securing lower edge of facia to support brackets. Remove two thumb screws, each passing through a top corner of the facia panel. Withdraw glove drawer slightly and remove centre facia. (Plate P.1.)

Remove four round-headed screws; two at top, two at bottom of instrument panel, fixing panel to dash structure.

Withdraw instrument panel. Disconnect feed wire to the electric clock by removing screw. Disconnect the two earth wires from back of instrument case. Disconnect revolution counter cable by rotating knurled ring. Remove three screws securing instrument carrier and withdraw revolution counter.

To detach the clock from the revolution counter instrument, remove the two screws securing the flange of clock to rear of instrument and lift out clock.

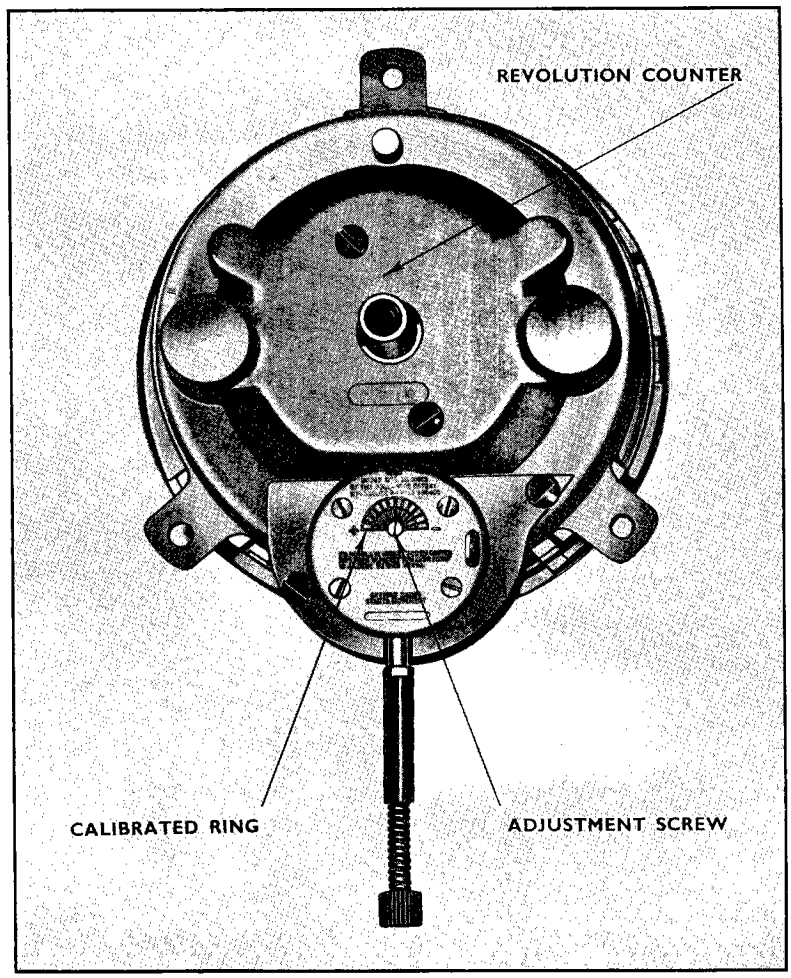


PLATE P.11. ELECTRIC CLOCK. ADJUSTMENT.

REMOVE. (XK 120.) Disconnect battery positive lead. Remove the drive screws securing dash casing and release casing. Remove two nuts each side of instrument panel, securing panel to facia structure. Withdraw instrument panel from rest of facia. Disconnect feed wire to the electric clock by removing screw. Disconnect two earth wires from back of instrument case. (Plate P.2.)

Disconnect revolution counter cable by rotating knurled ring. Remove three screws securing instrument to instrument carrier and withdraw revolution counter.

To detach the clock from the revolution counter instrument, remove the two screws securing the flange of clock to rear of instrument and lift out clock.

ADJUST. Situated on the rear of the time clock is a small screw surrounded by a semi-circular scale. If the clock is gaining, turn screw towards minus sign (—); if clock is losing, turn screw towards positive sign (+). (Plate P.11.)

REFIT. Refitting is the reverse of the above procedure.

Note. The action of setting the hands automatically restarts the clock.

FUSES. DESCRIPTION
(MARK VII AND XK 120 MODELS)

Should any component in the electrical system fail to function it is possible that the fuse protecting that component has blown.

If a replacement fuse of the correct capacity also blows, this indicates a fault in the circuit servicing the affected component and a careful examination should, therefore, be carried out to ascertain the fault.

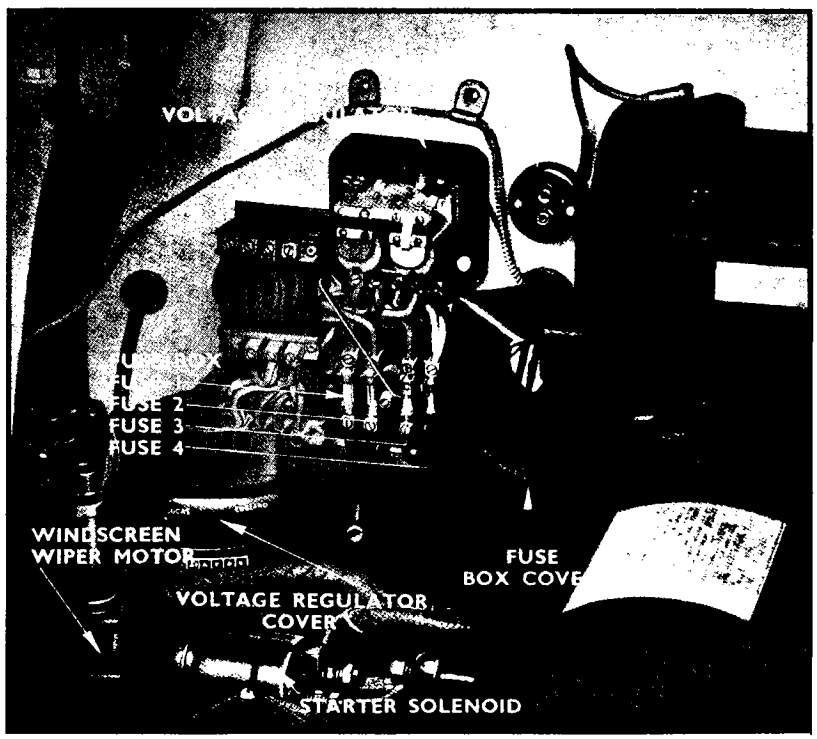


PLATE P.12. FUSES (Mark VII).

The fuses are situated on the engine side of the scuttle, and serve the various circuits as follows. (See Plate P.12 for the Mark VII model and Plate P.13 for the XK 120 models.)

	Mark VII	XK 120
Voltage Regulator.	—	"Aux." Interior lights (Fixed Head Coupe only).
	—	"Aux. Ign." Brake light, petrol gauge, windscreen wipers, petrol warning light, flasher lights and flasher unit, horn relay, air conditioner motor.
Fuse Box.	Fuse 1. Side and tail lights, rear licence plate lights, boot light.	Fuse 1. Cigar lighter.
	Fuse 2. Head lamps and head lamp warning light.	Fuse 2. Side and tail lights, reverse light, number plate light, boot light.
	Fuse 3. Panel lights, interior lights, map light, cigar lighter.	Fuse 3. Head lamp dipper.
	Fuse 4. Self-start carburetter, petrol gauge, screen wipers, air conditioner motor, stop lamps, horn relay, reverse lights, trafficators or flasher units and flasher lights.	Fuse 4. Head lamps, head lamp warning light.

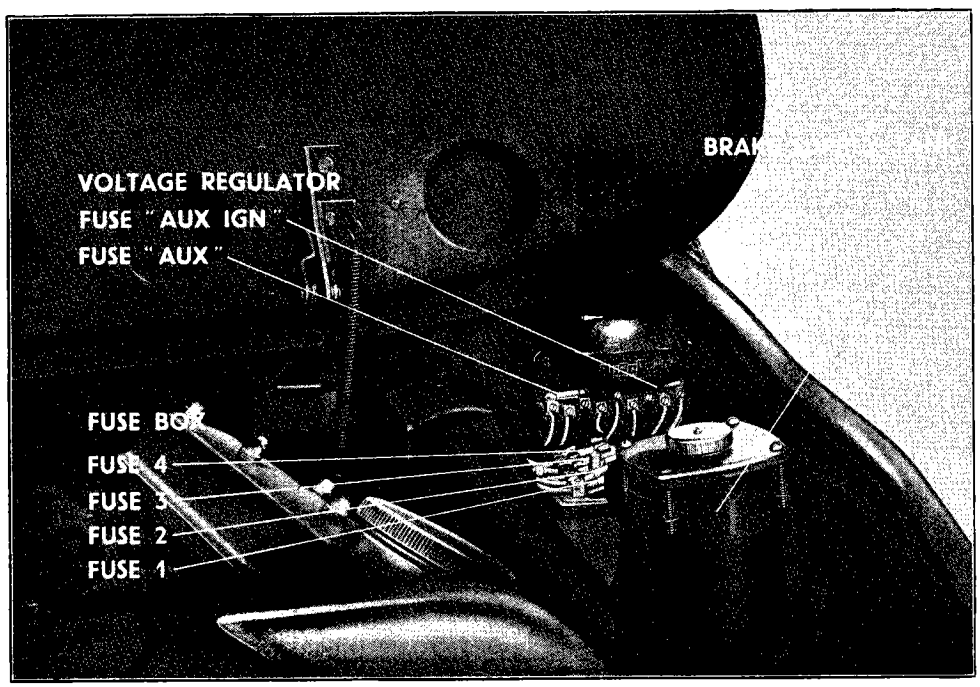


PLATE P.13. FUSES (XK 120).

FOG/PASS LAMP BULBS. TO REPLACE

(MARK VII MODEL)

It will be seen from Plate P.14 that the fog lamps are generally similar in construction to the head lamps, since both contain a light unit and pre-focus type bulb. To remove the light unit, unscrew the rim securing screw and lift out the rim and rubber dust excluder. (Three spring-loaded adjustment screws will be visible by means of which the setting can be adjusted as required.) Press the light unit in against the tension of the adjustment screw springs and turn it in an anti-clockwise direction until the heads of the screws can be disengaged through the slotted holes in the light unit rim. Do not disturb the screws when removing the light unit otherwise the lamp setting will be altered.

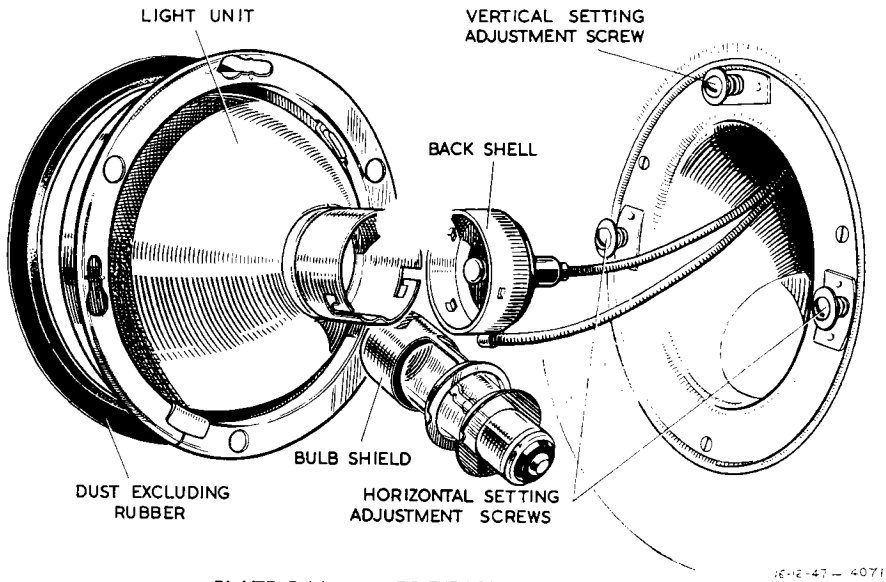


PLATE P.14. FOG/PASS LAMP (Mark VII).

FOG/PASS LAMPS. TO SET BEAM

(MARK VII MODEL)

Remove the lamp rim and dust excluder by unscrewing the rim securing screw.

If vertical adjustment is required, set the light unit to the required position by means of the vertical adjustment screw at the top of the reflector unit. (See Plate P.14.) To raise the beam rotate screw in a clockwise direction; to lower beam rotate screw in an anti-clockwise direction.

If horizontal adjustment is required, set the light unit by means of the two adjusting screws, one on each side of the light unit. To turn the beam to the left, rotate the left-hand screw clockwise, and to turn the beam to the right, rotate the right-hand screw clockwise.

HEAD LAMPS. DESCRIPTION

(MARK VII AND XK 120 MODELS)

GENERAL. The head lamps incorporate a Lucas light unit, consisting essentially of a combined reflector and front glass assembly, which by means of a mounting flange is secured in the body housing. The bulb which is of the Lucas pre-focus design is located accurately in the reflector and secured by a bayonet fixed backshell. The backshell also provides the contacts to the bulb. The bulb and bulb holder are so designed that the bulb is correctly positioned in relation to the reflector and no focusing is required.

DIPPING. Dipping of the head lamp beams is achieved by the use of double-filament bulbs in one or both head lamps. On home models a double-filament bulb is fitted in the nearside lamp and a single-filament bulb in the offside lamp. For overseas markets double-filament bulbs are fitted in both head lamps.

The double-filament bulbs are designed so that the dipping filament turns the dipped beam to left or right according to the requirements of the countries concerned: for example, with right-hand drive cars the dipped beam is turned to the left.

HEAD LAMP BULBS. TO REPLACE

(MARK VII AND XK 120 MODELS)

First remove the front rim by unscrewing the rim securing screw and lifting off the rim. Slacken the four screws which secure the flange of the light unit and turn the unit in an anti-clockwise direction to detach the flange from the securing screws, when the light unit can be lifted out of the lamp body. Twist the backshell in an anti-clockwise direction and pull it off. The bulb can then be removed.

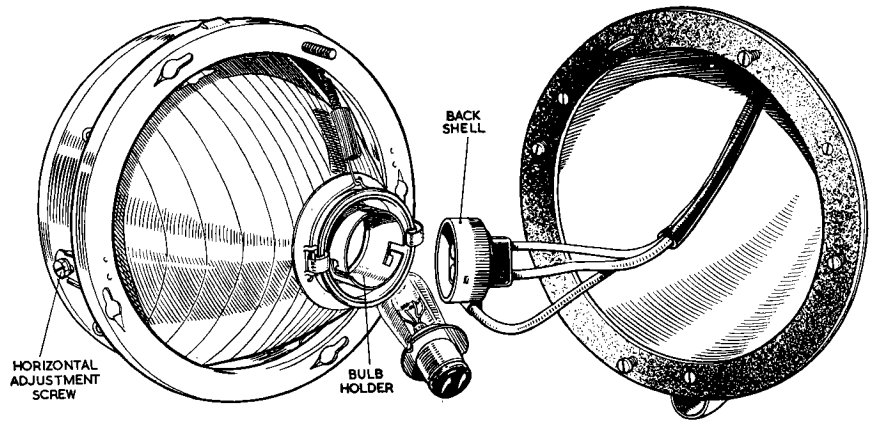


PLATE P.15. HEAD LAMP. BULB REMOVAL.

Enter the replacement bulb in the holder, taking care to locate it correctly. Engage the projections on the inside of the backshell with the slots in the holder. Press on and secure by twisting to the right. Position the light unit to the lamp body so that the vertical-trim adjusting screw locates in the slot in the body rim, and so that the heads of the four fixing screws protrude through the holes in the flange of the light unit. Twist the light unit in a clockwise direction and secure by tightening the four screws.

HEAD LAMPS. TO SET BEAM

(MARK VII AND XK 120 MODELS)

SETTING. (Refer to Plate P.16.) The head lamps must be set so that the beams of light are directed straight ahead and are parallel with the ground and with each other. If adjustment is necessary, proceed as follows:—

Remove the front rim by unscrewing the rim securing screw. If vertical adjustment is required, set the light unit to the correct position by means of the vertical-trim adjusting screw at the top of the reflector unit. Turn the screw in a clockwise direction to raise the beam, or in an anti-clockwise direction to lower it. If

horizontal adjustment is required, set by means of the two adjusting screws which are located one on each side of the light unit.

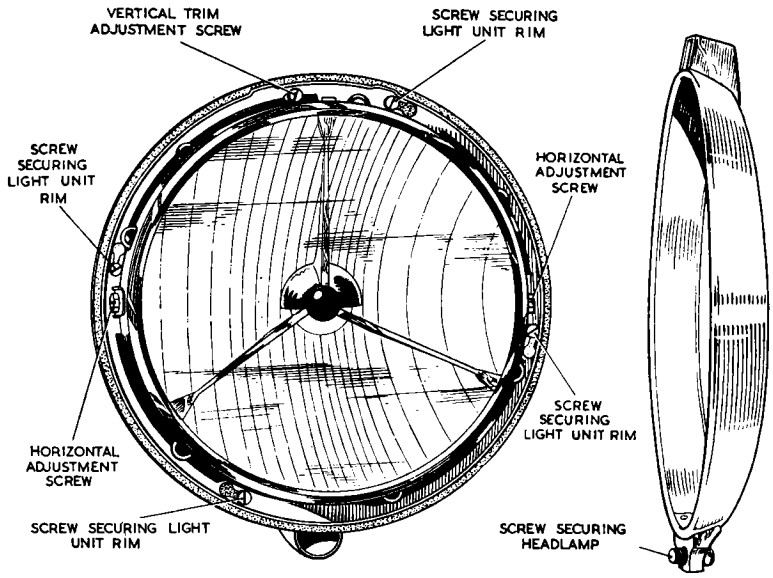


PLATE P.16. HEAD LAMP. BEAM ADJUSTMENT.

HORNS. TO REMOVE, ADJUST AND REFIT

(MARK VII AND XK 120 MODELS)

REMOVE. (MARK VII.) The twin horns are mounted to a bracket situated on the left-hand wing valance.

Remove the two bolts and nuts securing each horn to the mounting bracket. Draw each horn clear and remove centre screw from dome cover and remove cover. Disconnect the two wiring connections and remove horn.

REMOVE. (XK 120.) The horns are attached to brackets on the front end of the chassis frame side members, and are accessible from under each front wing.

Remove the two bolts and nuts securing each horn to its bracket, noting the earth wire eyelet under one of the bolt heads. Draw horn clear and remove centre screw from dome cover and remove cover. Disconnect the two wiring connections and remove horn.

ADJUST. Adjustment does not alter the pitch of the note, but merely takes up wear of moving parts. Slacken the lock nut on the fixed contact and rotate the adjusting nut until the contacts are just separated (indicated by the horn failing to sound). Turn the adjusting nut half a turn in the opposite direction and secure in this position by tightening the lock nut. (Plate P.17.) If the note is still unsatisfactory, do not dismantle the horn but return it to a Lucas Service Depot or Service Agent for examination.

REFIT. Refitting is the reverse of the above procedure.

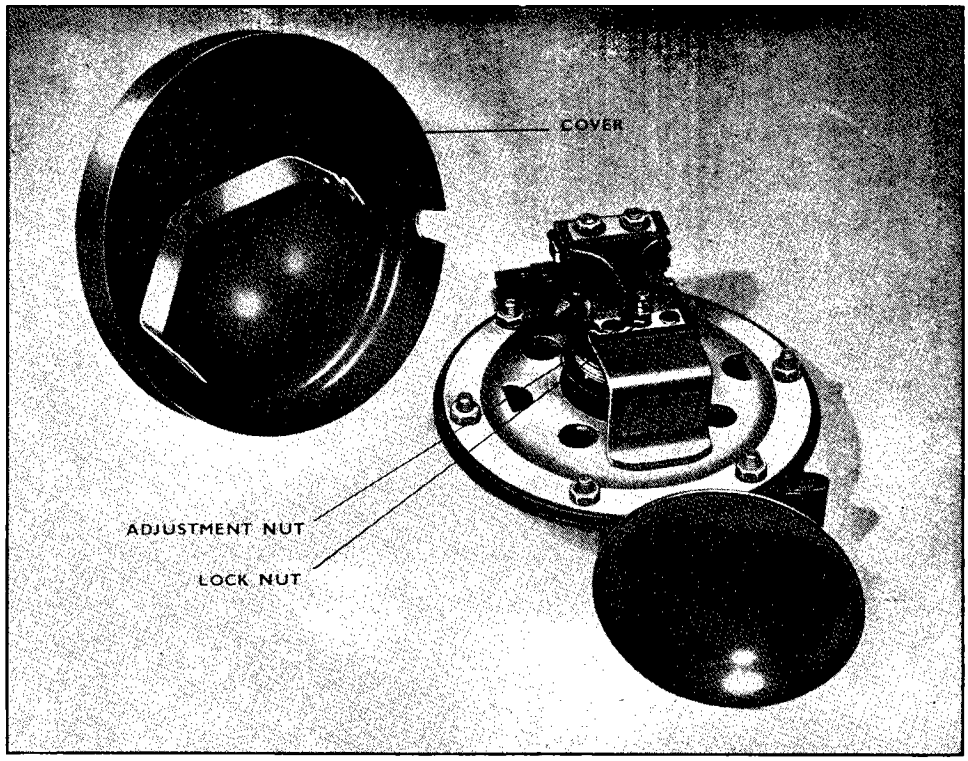


PLATE P.17. HORN.

INSTRUMENT PANEL COMPONENTS. TO REPLACE
(MARK VII MODEL)

HEAD LAMP WARNING LIGHT. The head lamp warning light can be removed without disturbing the centre facia panel.

Remove the dash casing by unscrewing the drive screws, and withdraw bulb holder from rear of speedometer. The warning light bulb is screwed into its holder.

GENERAL. To gain access to the following instrument panel components it will be necessary to remove the centre facia panel as described below.

REMOVE CENTRE FACIA. Disconnect battery positive lead. Unscrew the drive screws securing dash casing and remove casing. Remove seven control knobs, all being retained by a spring-loaded pin registering in a hole in the knob. Press in pins and withdraw knobs. Remove cigar lighter and ignition key. Remove two bolts, one from either side securing lower edge of facia to support brackets. Remove two thumb screws, each passing through a top corner of the facia panel. Withdraw glove drawer slightly, and remove centre facia. (Plate P.1.)

SWITCHES. The following switches are removed in the manner described below.

Windscreen wiper switch.
Panel and interior light switch.
Map light switch.
Petrol change-over switch.
Lighting switch.
Ignition switch.
Air conditioner fan switch.

Remove centre facia panel as described in the foregoing paragraph.

Disconnect the wiring connections to switch at rear of instrument panel, noting their respective positions.

Remove the set screw(s) or nut securing switches to the instrument panel, and withdraw switch.

Starter switch

Remove centre facia panel as described in the foregoing paragraph. Disconnect the wires from the rear of the switch. Remove the starter switch push button by pressing in the spring-loaded pin through the hole in the side of the button. Unscrew the chromium-plated nut securing the switch to the front of the instrument panel, and withdraw switch to rear.

WARNING LIGHTS. Remove centre facia panel as described in the foregoing paragraph.

To remove the ignition or trafficator warning light bulb, unscrew the bulb from its holder on the front of the instrument panel.

To remove the bulb holder, unscrew the two screws securing the bulb holder retainers.

Withdraw the bulb holder through the instrument panel and disconnect the wires at the rear of holder.

CIGAR LIGHTER HOLDER. Remove centre facia panel as described in the foregoing paragraph. Disconnect the terminal wire at the rear of cigar lighter holder. Remove the nut securing the bridge piece, noting the insulating washers, and remove bridge piece. Remove the nut securing the earth wire connector plate, noting the insulating washer. Withdraw the cigar lighter holder from front of instrument panel.

INSTRUMENT PANEL COMPONENTS. TO REPLACE

(XK 120 MODELS)

CIGAR LIGHTER HOLDER. Disconnect the battery positive lead. Remove the dash casing by unscrewing the drive screws. Disconnect the wire from the cigar lighter terminal by unscrewing the nut. Remove the nut securing the bridge piece, noting the insulating washers, and remove bridge piece. Remove the nut securing the earth wire connector plate, noting the insulating washer. Withdraw the cigar lighter holder from front of instrument panel.

LIGHTING SWITCH. Disconnect the battery positive lead. From the centre of switch unscrew the chromium-plated screw and withdraw the switch control. Remove the dash casing by unscrewing the drive screws. From the rear of switch disconnect the wires, noting their respective positions. Remove the two nuts securing the lighting switch to the instrument panel posts and withdraw switch to rear.

HEAD LAMP WARNING LIGHT. Remove the dash casing by unscrewing the drive screws. From the rear of instrument panel withdraw the warning light bulb holder from bottom of speedometer. The warning light bulb is screwed into its holder.

IGNITION WARNING LIGHT. Remove the dash casing by unscrewing the drive screws. Withdraw the bulb holder complete from the spring clip on the instrument panel. The ignition warning light bulb is screwed into its holder.

PETROL WARNING LIGHT. Remove the dash casing by unscrewing the drive screws. Slacken the central nut of the petrol and oil gauge until the contact plate can be removed from the rear of the warning light bulb. Remove the bulb holder complete from rear of instrument. To remove bulb, screw out from holder.

When refitting bulb holder to instrument, ensure that the spring contact bears against the side of holder.

GENERAL. To gain access to the following instrument panel components it will be necessary to remove the centre facia panel as described below:—

REMOVE CENTRE FACIA. Disconnect battery positive lead. Remove drive screws securing dash casing and release casing. Remove two nuts (Fixed Head Coupe—two set screws) each side of instrument panel, securing panel to facia structure. Withdraw instrument panel from rest of facia. (Plate P.2.)

If it is required to withdraw the centre facia panel further away from the facia structure, it will be necessary to remove the revolution counter and speedometer cable by unscrewing the knurled nut at the rear of the instruments, and remove the oil pressure and water temperature gauge by unscrewing the two set screws securing the gauge retainers.

PANEL LIGHTS. Remove the centre facia as described above. Remove the bulb holder complete by turning in an anti-clockwise direction until the holder is released from the spring clips on the instrument panel.

The bulb is fitted to the holder with a bayonet fixing.

SWITCHES. The following switches are removed in the manner described below:—

Panel light switch. Windscreen wiper switch. Starter switch.

Remove the centre facia panel as described above. Disconnect the wires from rear of switch. Slacken the nut securing the switch to rear of instrument panel. Unscrew the bezel at front of panel and withdraw switch to rear.

Ignition switch

Remove the centre facia panel as described above. Remove ignition key. Disconnect the wires from rear of switch, noting their respective positions. Remove the two nuts securing the switch to the instrument panel and withdraw switch to rear.

Oil level switch

Remove the centre facia panel as described above. Disconnect the wires from the switch, noting their respective positions. Unscrew the bakelite switch and withdraw switch and push button to the rear.

INTERIOR LIGHT BULB. TO REPLACE
(MARK VII AND XK 120 F.H. COUPE MODELS)

Disconnect the battery positive lead. Remove the plastic cover by depressing the spring clip at bottom and prising cover outwards. The festoon bulb can now be removed by springing back the bulb holder.

MANETTE CONTROL. TO REMOVE AND REFIT
(MARK VII MODEL)

REMOVE. Disconnect battery positive lead. Set the road wheels in the straight ahead position. Disconnect the four manette control wires from the junction box fitted to the wing valance on the steering column side. Unscrew the two grub screws in the steering wheel hub and withdraw manette control complete with wiring harness.

REFIT. Set the road wheels in the straight ahead position. Pass the wiring harness down the centre of the inner column, centralise the trafficator hand control and ensure that the split portion of the cancelling ring is in line with this control. (Plate P.18.) Enter the manette control tube in the inner column and feel the key of the manette control tube into the keyway of the stator tube. (It may be necessary to rotate the manette control each way slightly to accomplish this.) Ensure that the trafficator hand control and split portion of the cancelling ring are in the top centre position and push manette control fully home into the steering wheel hub. Secure with the two grub screws through the side of the steering wheel hub. Check that the trafficators cancel evenly on each side of the straight ahead position.

Note. If, when the manette control tube has been engaged with the stator tube, the trafficator hand control is not at the top centre position it will be necessary to slacken the clamp bolt in the bracket attached to the bottom end plate of the steering box to enable the manette control to be turned to the correct position.

MANETTE CONTROL. TO REMOVE AND REFIT
(XK 120 MODEL)

REMOVE. Disconnect battery positive lead. Set road wheels in straight ahead position. On the Super Sports model disconnect the manette control wire from the horn relay box fitted

to the wing valance on the steering column side. On the Fixed Head Coupe model disconnect the four wires from the rubber snap connectors.

Unscrew the two grub screws in the steering wheel hub and withdraw the manette control complete with wiring harness.

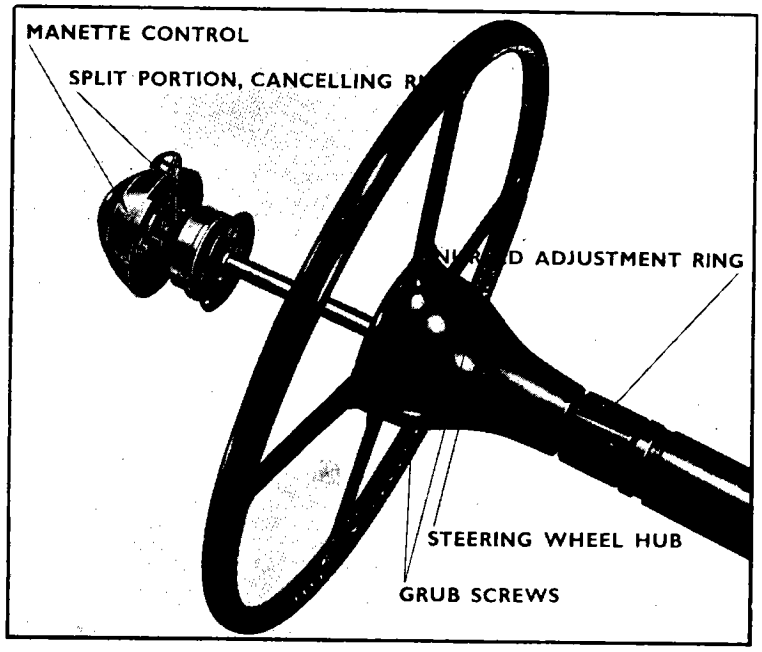


PLATE P.18. MANETTE CONTROL.

REFIT. **Super Sports Model.** Set the road wheels in the straight ahead position. Pass the horn wire down the centre of the inner column and enter the manette control tube into the steering wheel hub with the head of the "Jaguar" on the horn push upright. Feel the key of the manette control tube into the keyway of the stator tube. (It may be necessary to rotate the manette control each way slightly to accomplish this.) Push manette control fully home into the steering wheel hub and secure with the two grub screws through the side of the steering wheel hub.

Note. If, when the manette control tube has been engaged with the stator tube, the head of the "Jaguar" on the horn push is not upright, it will be necessary to slacken the clamp bolt in the bracket attached to the bottom end plate of the steering box to enable the manette control to be turned to the correct position.

Fixed Head Coupe Model. Set the road wheels in the straight ahead position. Pass the wiring harness down the centre of the inner column, centralise the trafficator hand control and ensure that the split portion of the cancelling ring is in line with this control. (Plate P.18.) Enter the manette control tube in the inner column and feel the key of the manette control tube into the keyway of the stator tube. (It may be necessary to rotate the manette control each way slightly to accomplish this.) Ensure that the trafficator hand control and split portion of the cancelling ring are in the top centre position and push manette control fully home into the steering wheel hub. Secure with the two grub screws through the side of the steering wheel hub. Check that the trafficators cancel evenly on each side of the straight ahead position.

Note. If, when the manette control tube has been engaged with the stator tube, the trafficator hand control is not at the top centre position it will be necessary to slacken the clamp bolt in the bracket attached to the bottom end plate of the steering box to enable the manette control to be turned to the correct position.

MAP AND PANEL LIGHT BULBS. TO REPLACE
(MARK VII MODEL)

MAP LIGHT BULB. From underneath the polished wood rail at the bottom of windscreen withdraw the plastic map light cover downwards out of its spring clip. The festoon bulb can now be removed by springing back the bulb holder.

When refitting the plastic map light cover note that the spring clips should be inserted inside the cover and the ends of the clips engaged with the holes at each side.

PANEL LIGHT BULBS. From underneath the polished wood rail at the bottom of windscreen withdraw the violet panel light glass downwards and unscrew the bulb.

MAP LIGHT DOOR SWITCHES. TO REMOVE AND REFIT
(MARK VII MODEL)

REMOVE. The map light door switches are situated at the front of each front door aperture, adjacent to the door sealing rubbers.

Disconnect the battery positive lead. Remove the two drive screws securing the door light switch to the door aperture surround and withdraw switch. From the rear of switch disconnect the wire and remove switch.

REFIT. Refitting is the reverse of the removal procedure.

NUMBER PLATE AND REVERSE LAMP BULBS. TO REPLACE
(MARK VII MODEL)

The number plate illumination lamp contains four bulbs, of which one serves to light up the boot compartment and another as a reverse light.

Access to the bulbs is obtained by lifting the boot lid. When replacing either the number plate bulbs or the reverse light bulb, remove the bulb holder bracket by unscrewing the two cheese-headed screws securing the bulb carrier to the body of the lamp and remove the complete bulb carrier downwards.

The boot light bulb is on the underside of the carrier and can be removed without disconnecting the bulb carrier from the lamp body.

NUMBER PLATE AND REVERSE LAMP BULBS. TO REPLACE
(XK 120 MODELS)

Disconnect the battery positive lead. Remove the two chromium screws at each side of lamp glass and withdraw chromium-plated cover. The bulbs are now accessible, the large central bulb being the reverse light and the two outer bulbs the number plate lights.

REVERSE LIGHT SWITCH. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

The reverse light switch is situated on the gearbox top cover forward of the gear lever.

REMOVE GEARBOX COWL. (MARK VII.) Remove the gear lever knob. Remove the centre carpets. Remove the gearbox cowl by unscrewing the round-headed screws.

REMOVE GEARBOX COWL. (XK 120.) Remove both seat cushions. Remove the set screw at each end of the seat runners and remove seats. Remove the centre arm rest by removing the two screws at front and the two screws at rear.

Remove the gear lever knob and remove centre carpet. Remove the gearbox cowl by unscrewing the securing screws.

REMOVE SWITCH. Disconnect the battery positive lead. Disconnect the two wires from the switch. Unscrew the switch from the gearbox top cover.

REFIT. Refitting is the reverse of the removal procedure.

SIDE LAMP BULBS. TO REPLACE

(MARK VII AND XK 120 MODELS)

EARLY TYPE. The front rim of bulb holder assembly are secured by an internal spring. To expose the bulb holder, lever the rim out of its housing and withdraw the assembly.

LATER TYPE. The front rim and bulb holder assembly are secured by a single retaining screw. To expose the bulb holder, slacken the screw and withdraw the assembly.

SPARKING PLUGS. SERVICING

(MARK VII AND XK 120 MODELS)

GENERAL. The sparking plug is of great importance in satisfactory engine performance, and every care should be taken to fit the correct type when replacements are necessary. There is little to be gained by experimenting with different plugs as the make and type fitted as standard is best suited to the requirements of the engine.

Sparking Plug Type. **Mark VII and XK 120**

7 to 1 compression ratio .. Champion L.10S

8 to 1 compression ratio .. Champion N.A.8

MAINTENANCE. Paint splashes, accumulation of grime and dust, etc., on the top half of the insulator are often responsible for poor plug performance. Plugs should be wiped frequently with a clean rag.

Plugs should be cleaned and tested at regular intervals on special plug cleaning equipment. Plugs which are allowed to remain oily and dirty with corroded electrodes will seriously impair the efficient running of the engine and waste petrol. It will be found economical to fit a new set of sparking plugs approximately every 10,000 miles (16,000 kilometres).

GAP SETTING. The correct gap setting of sparking plugs (i.e., the width between the firing point of the centre electrode and the earth electrode) is essential to good engine performance, and the recommended gap setting is .022″ (.56 mm.).

REFITTING. When refitting the plugs make sure that the copper washers are not defective in any way. If they have become worn and flattened, fit new ones to ensure obtaining a gas-tight joint.

When installing plugs, first screw the plug down by hand as far as possible, then use spanner for tightening only. Always use a tubular box spanner to avoid possible fracture of the insulator, and do not in any circumstances use a moveable wrench.

STARTER MOTOR. TO REMOVE AND REFIT

(MARK VII AND XK 120 MODELS)

REMOVE. Disconnect battery positive lead. Remove the starter lead from the terminal on the end plate. Remove the two securing bolts, nuts and spring washers and withdraw starter.

REFIT. Refitting is the reverse of the above procedure, but after the starter has been refitted the securing bolts should be slackened slightly, the starter operated for a few turns and then the bolts finally tightened. Do not omit to refit the earth strap to the top securing bolt.

STARTER MOTOR. DESCRIPTION AND MAINTENANCE
(MARK VII AND XK 120 MODELS)

GENERAL. The electric starting motor is a four-pole four-brush machine having an extended shaft which carries the engine starter drive. One of two patterns ("R.E." or "Eclipse") is fitted and full service instructions for each are given in the "Servicing" section. Both patterns are arranged to give an inboard type drive.

The starting motor is of a similar construction to the dynamo except that heavier copper wire is used in the construction of armature and field windings. (The latter are connected to form a series-parallel field circuit as it must be remembered that the current consumption of the motor is very high.) For example, the average 12-volt starter under lock conditions takes 450-500 amperes at about 7 volts.

To crank the engine, the starting motor is connected to the battery via a solenoid-operated switch controlled remotely by a pilot switch mounted on the instrument panel.

MAINTENANCE. The only maintenance normally required by the starting motor is the occasional checking of the brush gear and commutator. About every 10,000 miles (16,000 kilometres) remove the metal band cover. Check that the brushes move freely in their holders by holding back the brush springs and pulling gently on the flexible connectors. If a brush is inclined to stick, remove it from its holder and clean its sides with a petrol-moistened cloth. Be careful to replace brushes in their original positions in order to retain the "bedding".

Brushes which have worn so that they will not "bed" properly on the commutator must be renewed.

The commutator should be clean, free from oil or dirt and should have a polished appearance. If it is dirty, clean it by pressing a fine dry cloth against it while the starter is turned by hand by means of a spanner applied to the square extension of the shaft.

Access to the squared shaft is gained by removing the thimble-shaped metal cover. If the commutator is very dirty, moisten the cloth with petrol.

If any difficulty is experienced with the starting motor not meshing correctly with the flywheel, it may be that the drive requires cleaning. The pinion should move freely on the screwed sleeve; if there is any dirt or other foreign matter on the sleeve it must be washed off with paraffin.

In the event of the pinion becoming jammed in mesh with the flywheel, it can usually be freed by turning the starter motor armature by means of a spanner, applied to the shaft extension at the commutator end. This is accessible by removing the cap.

STARTER MOTOR. SERVICING
(MARK VII AND XK 120 MODELS)

TESTING IN POSITION. (i) Switch on the lamps and operate the starter control. If the lights go dim, but the starting motor is not heard to operate, an indication is given that current is flowing through the starting motor windings but that the armature is not rotating for some reason; possibly the pinion is meshed permanently with the geared ring on the flywheel. In this case, the starting motor must be removed from the engine for examination.

(ii) Should the lamps retain their full brilliance when the starter switch is operated, check the circuits for continuity from battery to starting motor and the pilot and starter switches and examine the connections at these units. If a switch is found to be faulty, fit a new unit. If the supply voltage is found to be applied to the starting motor when the switch is operated, an internal fault in the motor is indicated and the latter must be removed from the engine for examination.

(iii) Sluggish or slow action of the starting motor is usually caused by poor connection in the wiring, giving rise to a high resistance in the motor circuit. Check as described above.

(iv) If the motor is heard to operate, but does not crank the engine, indication is given of damage to the drive.

BENCH TESTING AND EXAMINATION OF BRUSH GEAR AND COMMUTATOR.

(i) If it is necessary to remove the starting motor from the engine, first proceed as follows:—

Disconnect the cable from the positive battery terminal to avoid any danger of causing short circuits. Disconnect the heavy cable from the starting motor.

(ii) After removing the starting motor from the engine, secure the body in a vice and test by connecting it with heavy gauge cables to a 12-volt battery. One cable must be connected to the starter terminal and the other held against the body or end bracket. Under these light load conditions, the starter should run at a very high speed.

(iii) If the operation of the starting motor is unsatisfactory, remove the cover band and examine the brushes and commutator. Hold back each of the brush springs and move the brush by pulling gently on its flexible connector. If the movement is sluggish, remove the brush from its holder and ease the sides by lightly polishing on a smooth file. Always replace brushes in their original positions. If the brushes are worn so that they will not bear on the commutator or if the brush flexible is exposed on the running face they must be replaced.

Check the tension of the brush springs with a spring scale. The correct tension is 30-40 ozs. (.85-1.13 kg.) and new springs should be fitted if the tension is low.

If the commutator is blackened or dirty, clean it by holding a petrol-moistened cloth against it while the armature is rotated.

(iv) Retest the starter as described under (ii). If the operation is still unsatisfactory, the unit must be dismantled for detailed inspection and testing.

Dismantle. (i) Remove the cover band, hold back the brush springs and lift the brushes from their holders.

(ii) Unscrew the terminal nuts from the terminal post.

(iii) Screw the two through bolts from the commutator end bracket. Remove the commutator end bracket from the yoke.

(iv) Remove the driving end bracket complete with armature and drive from the starting motor yoke. If it is necessary to remove the armature from the driving end bracket it can be done by means of a hand press after the drive has been dismantled.

Replacement of Brushes. If the brushes are worn so that they do not bear on the commutator, or if the flexible connectors are exposed on the running face, they must be replaced.

Two of the brushes are connected to terminal eyelets attached to the brush boxes on the commutator end bracket and two are connected to the field coils. (Plate P.19.)

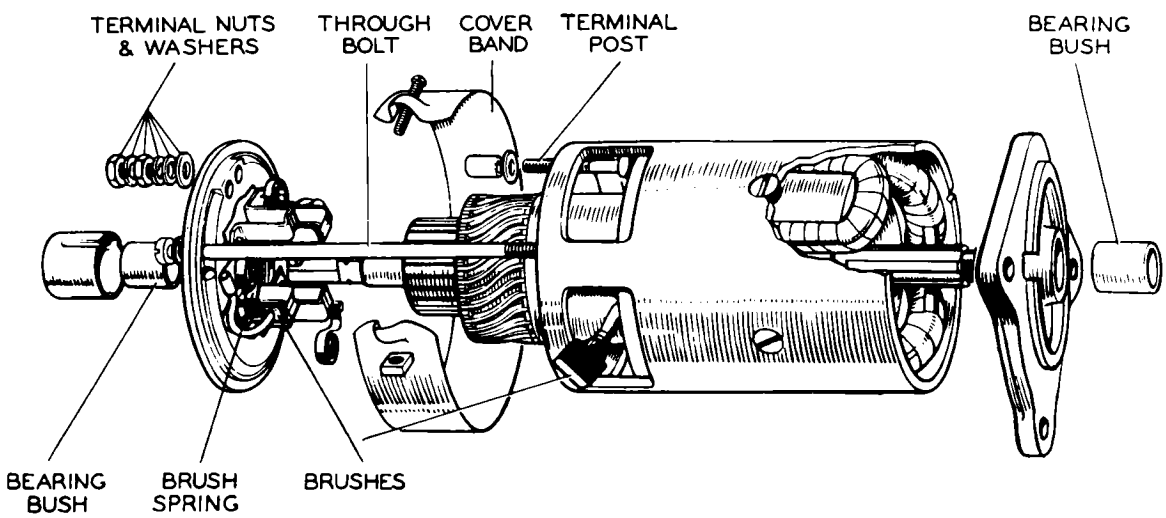


PLATE P.19. STARTER MOTOR (Exploded view).

The flexible connectors must be removed by unsoldering and the connectors of the new brushes secured in their place by soldering.. The brushes are reformed so that bedding to the commutator is unnecessary.

Commutator. A commutator in good condition will be smooth and free from pits and burned spots. Clean the commutator with a petrol-moistened cloth. If this is ineffective, carefully polish with a strip of fine glass paper, while rotating the armature. To remedy a badly worn commutator, dismantle the starter drive as described later and mount the armature in a lathe, rotate at a high speed and take a light cut with a very sharp tool. Do not remove any more metal that is necessary. Finally polish with a very fine glass paper. The insulators between the commutator segments **must not be undercut.**

Armature. Examination of the armature may reveal the cause of failure, for example, conductors lifted from the commutator due to the starting motor being engaged while the engine is running and causing the armature to be rotated at an excessive speed. A damaged armature must in all cases be replaced—no attempt should be made to machine the armature core or to true a distorted armature shaft.

CHECKING FIELD COILS. **Continuity.** Test the field coils for continuity by connecting a 12-volt battery with a 12-volt bulb in series between those points of the field coils at which the brushes are connected. Failure of the lamp to light indicates an open circuit in the wiring of the field coils.

Insulation. Lighting of the lamp does not necessarily mean that the field coils are in order, as it is possible that one of them may be earthed to a pole shoe or to the yoke. This may be checked with a test lamp connected from the supply mains, the test leads being connected to one of the field coil tapping points, and to a clean part of the yoke. Should the lamp light, it indicates that the field coils are earthed to the yoke.

In either case, unless a replacement starting motor is available, the field coils must be replaced. To do this, carry out the procedure outlined below, using a pole shoe expander and a wheel-operated screwdriver. (Plates P.10 and P.9.)

Remove the insulation piece which is provided to prevent the intercoil connectors from contacting with the yoke.

Mark the yoke and pole shoes in order that they can be fitted in their original positions. Unscrew the four pole shoe retaining screws by means of the wheel-operated screwdriver. Draw the pole shoes and coils out of the yoke and lift off the coils. Fit the new field coils over the pole shoes and place them in position inside the yoke. Take care to ensure that the taping of the field coils is not trapped between the pole shoes and the yoke. Locate the pole shoes and field coils by lightly tightening the fixing screws. Insert the pole shoe expander, open it to the fullest extent and tighten the screws.

Finally tighten the screws by means of the wheel-operated screwdriver. Replace the insulation piece between the field coil connections and the yoke.

BEARINGS. Bearings which are worn to such an extent that they will allow excessive side play of the armature shaft must be replaced. To replace the bearing bushes, proceed as follows:—

(i) Press the bearing bush out of the end bracket.

(ii) Press the new bearing bush into the end bracket using a shouldered, highly polished mandrel of the same diameter as the shaft which is to fit in the bearing. Porous bronze bushes must not be opened out after fitting, or the porosity of the bush may be impaired.

Note. Before fitting a new porous bronze bearing bush it should be completely immersed for 24 hours in clean thin engine oil. In cases of extreme urgency this period may be shortened by heating the oil to 100° C. when the time of immersion may be reduced to 2 hours.

REASSEMBLY. The reassembly of the starting motor is the reverse of the dismantling procedure.

STARTER DRIVE (Rubber Coupling Type) TO DISMANTLE AND REASSEMBLE

(XK 120 MODELS)

DISMANTLE. Having removed the armature as described in the section dealing with starting motors, the drive can be removed from the armature shaft as follows:—

Remove the retaining pin (A) from the centre sleeve (B), and then slide the drive back along the shaft and remove the key (C). Withdraw the drive unit from the shaft.

The drive can be dismantled as follows:—
Remove the retaining ring (D) from inside the end of the pinion and barrel assembly (E) and then withdraw the pinion and barrel assembly and washers (F).

Unscrew the location nut (G). This nut is held in position on the centre sleeve (B) by caulking. When reassembling, therefore, it will be necessary to fit a new sleeve.

Remove the washer (H), restraining spring (J), control nut (K) and withdraw the screwed sleeve (L). Remove the centre coupling plate (M), friction washer (N) and rubber unit assembly (O). Finally remove cushioning spring (P) and transmission plate (Q).

REASSEMBLE. Reassembly is the reverse of the above procedure.

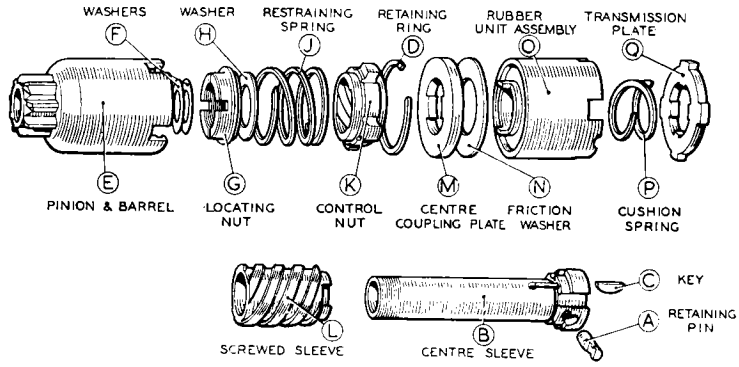


PLATE P.20. STARTER DRIVE (Rubber Coupling Type).

STARTER DRIVE (Eclipse Type). TO DISMANTLE AND REASSEMBLE
(MARK VII AND XK 120 MODELS)

DISMANTLE. Having removed the armature as described in the section dealing with starting motors, the drive can be removed from the armature shaft as follows:—

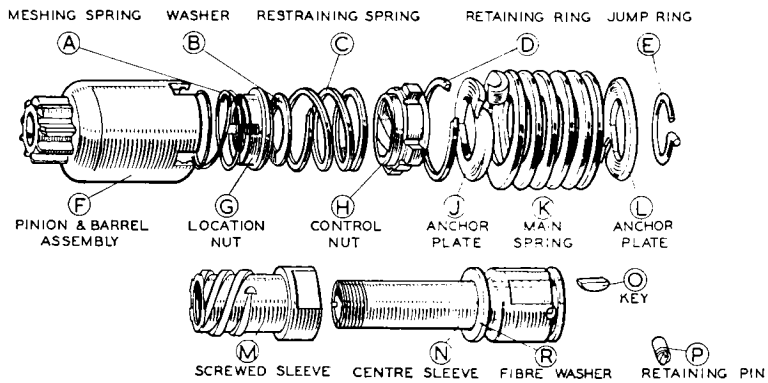


PLATE P.21. STARTER DRIVE (Eclipse Type).

Press in the anchor plate (L) and main spring (K) and pull out the retaining pin (P) and then slide the drive back along the shaft and remove the key (O). Withdraw the drive unit from the shaft.

The drive can be dismantled as follows:—

Remove the retaining ring (D) from inside the end of the pinion and barrel assembly (F) and slide off the pinion and barrel assembly (F) and meshing spring (A). Unscrew the location nut (G). This nut is held in position on the centre sleeve (N) by caulking. When reassembling, therefore, it will be necessary to fit a new sleeve.

Remove the washer (B), restraining spring (C), control nut (H) and withdraw the screwed sleeve (M). Remove the anchor plate (J), main spring (K) and fibre washer (R). The other anchor plate (L) can be removed from the centre sleeve assembly (N) by withdrawing the jump ring (E).

REASSEMBLE. The drive must be reassembled and fitted to the starter shaft by reversing the above procedure. Take care to caulk the centre sleeve to the location nut.

STARTER SOLENOID SWITCH. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

GENERAL. The starter solenoid switch incorporates a manual push button to enable the engine to be turned from the engine compartment with the ignition switched off.

REMOVE. The starter solenoid switch is situated on the right-hand side of the scuttle at rear of engine compartment.

Disconnect the battery positive lead. Pull back the rubber protectors over the solenoid switch terminals and disconnect the starter cable and wires, noting their respective positions. Also disconnect the solenoid switch wire from its terminal. Unscrew the two nuts securing the solenoid switch to the scuttle. Remove solenoid switch.

REFIT. Refitting is the reverse of the removal procedure.

STOP LIGHT SWITCH. TO REMOVE AND REFIT
(MARK VII AND XK 120 MODELS)

REMOVE. The stop light switch is situated at the front end of the brake hydraulic master cylinder.

Disconnect the two wires from the stop lamp switch. Unscrew the stop lamp switch from the end of the master cylinder. Take care not to operate the brake pedal or leave the switch removed for more than a short space of time, otherwise it will be necessary to bleed the brakes as described in Section L "Brakes".

REFIT. Refitting is the reverse of the above procedure.

TAIL/STOP BULBS. TO REPLACE
(MARK VII AND XK 120 MODELS)

Prise out the chromium-plated rim from the rubber lamp body. Prise out the lamp glass.

The bulb which has a bayonet fixing can now be removed by pressing in and rotating. Note that in order to ensure the correct action of the twin filament bulb, the bulb can only be fitted one way round in the holder.

TRAFFICATORS. TO REMOVE AND REFIT
(MARK VII MODEL)

REMOVE. Disconnect the battery positive lead. From the inside of the door pillar remove the trim pad by prising outwards. Remove the square polished wood capping by sliding downwards. Remove the long polished wood fillet by sliding downwards.

Remove the two set screws securing the trafficator bracket to the door pillar. Withdraw trafficator and disconnect the wire. Remove trafficator.

REFIT. Refitting is the reverse of the removal procedure.

TRAFFICATORS. MAINTENANCE
(MARK VII MODEL)

In normal service the trafficators need very little maintenance apart from the lubrication procedure described below, which should be carried out every 5,000 miles (8,000 kilometres). It is important to use only the slightest trace of oil, as any excess may adversely affect operation.

To lubricate the mechanism, lift the trafficator arm and apply **one drop** of thin machine oil to the catch pin between the arm and the operating mechanism.

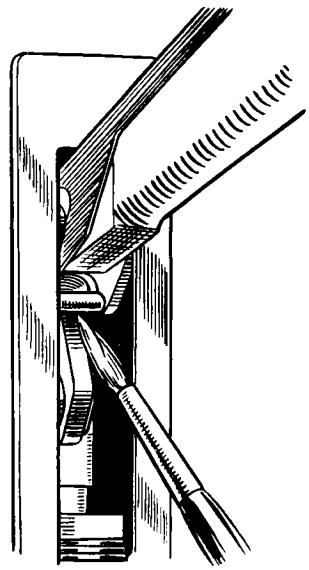


PLATE P.22. TRAFFICATOR. LUBRICATION.

Withdraw the screw at the end of the arm and slide off the arm cover. Move to one side the connecting wire to the bulb and apply a drop of thin oil to the felt pad at the top of the arm. When replacing the arm cover, slide it along the arm until the side plates or tongues engage with the slots below the pivot bearing. Replace the cover securing screw.

TRAFFICATOR BULB. TO REPLACE
(MARK VII MODEL)

Remove the screw at the end of the arm and lift off the arm cover. The bulb is of the tubular festoon type, and is located between two ribs within the translucent moulding. Remove the defective bulb and replace with the recommended type.

TRAFFICATOR ARM. TO REPLACE
(MARK VII MODEL)

The trafficator must first be removed from the car as described on page P.40.
Unscrew the single securing screw linking the trafficator bracket with the car fixing plate. Take off the arm cover and remove the bulb. If the old bulb contact and cable are in good condition and it is decided not to replace them, open the clip securing the cable to the arm.

If, however, the old cable and contact need replacing, slacken the screw securing the terminal assembly; remove the terminal plate and unsolder the cable, temporarily replacing the screw to hold the solenoid in position.

Drill out the rivet securing the arm. Place the new arm in position so that the catch pin locates correctly between the lifting plate and the locking plate, and secure by fitting a new rivet. Solder the free end of the braided cable to the tag on the terminal plate and refit the plate in position. Before finally tightening the securing screw, fit the cable neatly between the coil and the insulating strip, so that although firmly held there is no danger of the insulation being damaged by sharp edges. There must be sufficient slack to allow the arm to move freely without straining the cable or bending it sharply. Finally fit the bulb and arm cover securing screw.

WINDSCREEN WIPERS. DESCRIPTION

(MARK VII AND XK 120 MODELS)

SINGLE-SPEED TYPE. The single-speed type of wiper is fitted to the XK 120 models and early Mark VII cars.

The arrangement, as described below, consists essentially of a motor and gearbox mounted under the bonnet, and a flexible cable rack mechanism which transmits the drive from the motor to the wiper spindles, which are mounted at the bottom of the screen.

The flexible cable rack consists of an inner core of steel wire around which is wound a wire helix forming the rack. The rack, which is contained in an armoured outer casing, is given a reciprocating motion by means of a crank in the wiper gearbox, and engages with gears on the wiper spindles to drive the wiper arms.

The wipers consist of motor and gearbox and two wheel boxes, one for each of the two wiper arms.

The motor is controlled by a separately mounted switch and parking is effected by switching off at the end of a stroke.

Note. Later XK 120 cars are fitted with model C.R.T.14 windscreen wiper assemblies, the motor of which incorporates a protective device in the form of a thermostat which, under conditions of excessive heating cuts off the current supply to the motor until normal conditions are restored. If the blades are prevented from moving (as for examples by ice or packed snow on the windscreen in extreme winter conditions) the thermostat will operate as soon as the motor becomes hot; normal working will be resumed, if the obstruction has been removed, when the motor has cooled. The cooling-down period will depend on general operating conditions, and may be as long as ten minutes. Excessive heating from any other cause will also temporarily stop the wiper, but again the wiper will automatically restart as soon as the temperature falls.

TWO-SPEED TYPE. This type of windscreen wiper assembly which is fitted to later Mark VII cars is designed to give two working speeds. The control switch has three positions: "High Speed", "Normal" and "Park". The first position is intended for use when driving through heavy rain, whilst switching to "Park" causes the arm and blade assemblies to come to rest correctly parked, irrespective of their positions at the moment of switching.

WINDSCREEN WIPERS. MAINTENANCE

(MARK VII AND XK 120 MODELS)

The moving parts, being packed with grease before assembly, need no lubrication and no adjustment is necessary. Thus the only maintenance consists of the occasional inspection of the rubber wiping blades, which become worn after long service and have to be renewed.

WINDSCREEN WIPERS. SERVICING

(MARK VII AND XK 120 MODELS)

If the wiper fails to operate, or operates unsatisfactorily, switch on the wiper and note the current being supplied to the motor, either on the instrument panel ammeter or preferably on a moving-coil ammeter, 0-20 amps., connected in the wiper circuit. Then proceed as follows:—

Wiper takes No Current. Examine the fuse protecting the wiper. If it has blown, examine the wiring of the motor circuit, and that of all other circuits protected by the fuse, for evidence of chafed leads or short circuits. Replace any leads which are badly worn or chafed, if necessary fitting protective sleeving over the leads to prevent a recurrence of the fault. For internal faults causing blown fuse see "Wiper takes Abnormally High Current".

Wiper takes Abnormally Low Current. First ensure that the battery is not discharged, as this will obviously result in a falling off in performance of the motor. If the current is that normally taken by the field coils only a fault in the armature, commutator or brush gear must be suspected.

Remove the screws securing the commutator end cover and lift off the cover. Clean the commutator with a cloth moistened with petrol, and carefully remove any carbon dust from between the commutator segments.

Check that the brushes bear firmly on the commutator. If they are loose, and do not make contact, the tension spring must be renewed. If they are stiff they should be freed by working them backwards and forwards by hand.

Wiper takes Abnormally High Current. The normal current consumption of the wiper is given in "Electrical Data". If the ammeter reading is greatly in excess of this value the armature windings, commutator or bearings may be at fault. Check that the armature can revolve freely, and that a blow on the motor end bracket has not thrown the bearing out of line. A screw and lock nut are provided in the commutator end cover to take up the end thrust of the armature. The screw has a special hard alloy tip, and under normal conditions should not require adjustment.

Remove the commutator end cover and clean the commutator, paying particular attention to any pieces of carbon that may be short circuiting adjacent segments.

Remove the brush gear and withdraw the two screws securing the fibre plate. Pull the plate carefully away from the motor body, and examine the two leads to the field coil for chafed insulation, burning and other signs of a short circuit. (This, a very occasional fault, will be indicated either by repeated blowing of the fuse with the circuit wiring in order, **or** by the motor operating even when the switch is in the "OFF" position. An insulation test from each terminal of the motor to the body will confirm the fault.) If a short circuit has occurred, remove the fibre plate by softening the solder at the top of the brush lever posts and freeing the leads. Slip a new piece of sleeving over the chafed leads and arrange them so that they do not rub against sharp edges.

When reassembling, care must be taken that both the wire from the field coil and the thicker lead to the terminal are correctly held by the solder at the top of the brush lever posts.

Finally recheck the insulation of each motor terminal to earth.

If the performance of the motor is still unsatisfactory, the fault may be due to the armature. Check by substitution, and if necessary fit a new armature.

Sluggish operation with excessive current consumption may also be caused either by frictional losses in a badly-positioned driving cable or by the wiper spindle binding in its hole in the scuttle. See that the run of the driving cable contains no sharp bends (minimum radius of bend, 9 inches (23 cm.)) and, if necessary, add suitable distance pieces under the motor mounting bolts to straighten the run of the cable.

Motor operates but does not drive the Wiper Arms. Examine the wiper arms, making sure that they are firmly secured to the wheel box spindles. Remove the cover of the gearbox and examine the mechanism. Rotation of the armature should cause a push-pull motion of the cable rack. When overhauling, the gears must be lubricated by packing the gearbox with a grease of the zinc oxide type.

To detach the cable rack from the gearbox, proceed as follows:—

Remove gearbox cover. On earlier wipers, remove the split pin and washer from the crank pin on the final gear.

Lift off the connecting link. Disengage the outer casing, cable rack and cross head from the gearbox. Replace the gearbox cover to prevent the ingress of dirt. Remove the wiper arms from the wheel box spindles. The flexible cable rack can now be withdrawn from the outer casing for inspection.

See that the gears in the wheel boxes are undamaged and can engage correctly with the flexible rack. Before refitting the flexible cable rack into the outer casing, grease it thoroughly with Duckham's H.B.B. or an equivalent grease.

WINDSCREEN WIPER BLADES. TO REMOVE AND REFIT

(MARK VII AND XK 120 MODELS)

REMOVE. Pull the arm away from the windscreen and disengage the blade by swivelling it upwards.

REFIT. Hold the wiper arm with one hand and the blade with the other, insert the curved wrist of the arm into the slotted spring fastening of the blade; swivel the two components into engagement with a closing action. (Plate P.23.)

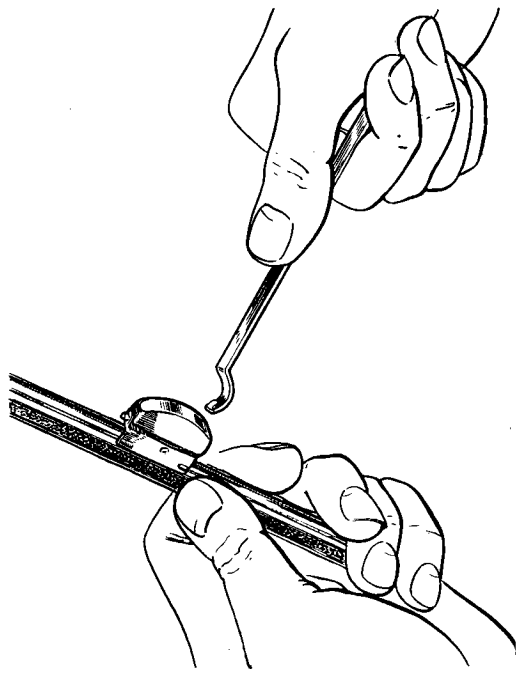


PLATE P.23. WINDSCREEN WIPER BLADE. REFITTING.

WINDSCREEN WIPER ARMS. TO REMOVE AND REFIT

(MARK VII AND XK 120 MODELS)

SINGLE-SPEED WIPER TYPE

REMOVE. To remove the arm slacken the collet nut and tap sharply to loosen the collet and pull arm off the spindle.

REFIT. Refitting is the reverse of the above procedure, but do not fully tighten the collet nut until the arm is positioned to wipe over the correct area of the screen and the blades lie unobtrusively at the bottom of the screen when in the parked position.

TWO-SPEED WIPER TYPE. (Later Mark VII cars)

REMOVE. Raise the arm and press back the spring catch in the head piece and withdraw from spindle.

REFIT. Press the head pieces on to the spindles at the correct parking angle (that is lying against the glass along the lower edge of the windscreen) until the spring catch is heard to clip over the end of the spindle drum.

Switch on the ignition and turn the wiper control switch to "N". The area of "wipe" of each blade should be approximately symmetrical and terminate a short distance from the centre pillar, due allowance being made for high speed working on a wet screen. Rotate the wiper control switch to "P" when the blades should come to rest against the glass along the lower edge of the windscreen.

TO ADJUST. To alter the position of the wiped area adjust the position of the arms on their spindles. Do NOT attempt to rotate the arms on the spindles, but press back the spring catch in the head piece and withdraw from spindle. Refit in the desired position. The spline fixing provides adjustment in steps of 5°.

Adjustment of the wiped area may affect the self-parking position. If so, the following adjustment can be made by turning the knurled nut to be found adjacent to the cable outlet on the motor gearbox attached to the right-hand wing valance. (Plate P.24.) To raise the self-parking position rotate the knurled nut in a **clockwise** direction. To lower, turn nut in an **anti-clockwise** direction.

Note. Turn the adjusting nut one or two serrations at a time and test for correct operation at each adjustment.

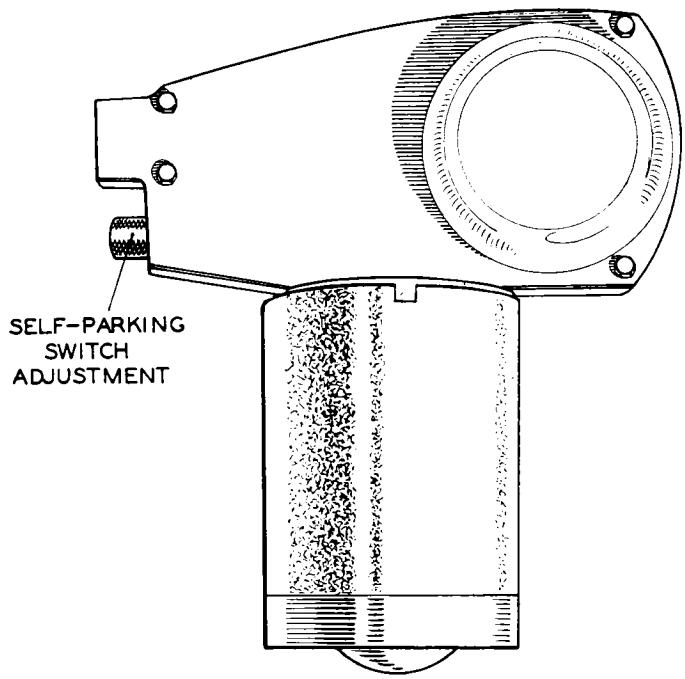


PLATE P.24. SELF-PARKING ADJUSTMENT NUT (Two-Speed Wiper).

WINDSCREEN WIPER MOTOR. TO REMOVE AND REFIT

(MARK VII AND XK 120 MODELS)

REMOVE. (MARK VII.) The windscreen wiper motor is located at the rear of the right-hand wing valance. Disconnect the battery positive lead, and the two wires from the wiper motor. Remove the cover plate from the motor gear housing by unscrewing the three set screws.

Remove the link connecting the final gear to the end of the inner cable and release cable from drive gear housing. From underneath the wing remove the three nuts securing the motor to the wing valance and remove motor.

REMOVE. (XK 120.) The windscreen wiper motor is located on the right-hand side of the scuttle at rear of engine compartment. Disconnect the battery positive lead. Remove the cover plate from the motor gear housing by unscrewing the three set screws.

Remove the link connecting the final gear to the end of the inner cable and release cable from drive gear housing. Remove the motor from its mounting bracket by unscrewing the three nuts. Disconnect the two wires from the motor and remove motor.

REFIT. Refitting is the reverse of the removal procedure.

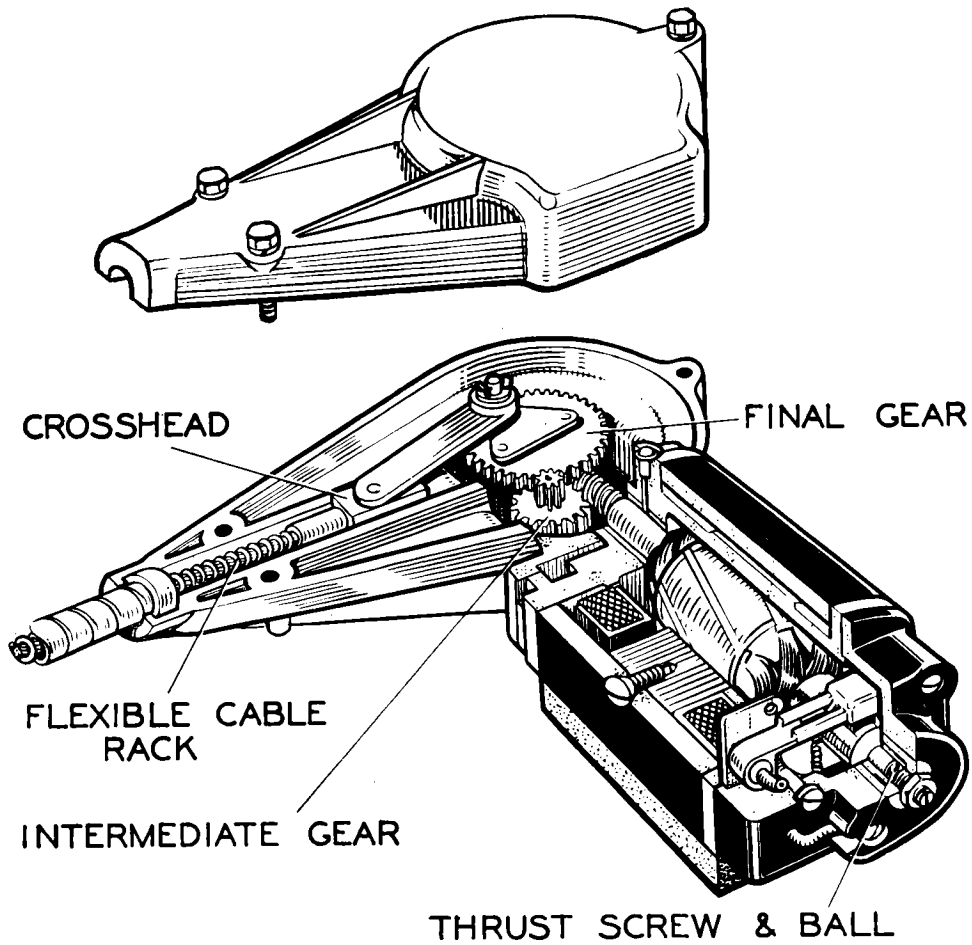


PLATE P.25. WINDSCREEN WIPER MOTOR (Single-Speed Type).

WINDSCREEN WIPER ASSEMBLY. TO REMOVE AND REFIT

(MARK VII MODEL)

REMOVE WIPER ARMS. Remove wiper arms as described on page P.44.

REMOVE SCREEN RAIL CAPPING From underneath the polished wooden rail at the bottom of windscreen unscrew the two nuts securing the rail to its mounting brackets and remove the rail.

DISCONNECT WHEEL BOXES. Remove the right-hand demister nozzle by unscrewing the two drive screws. Slacken the right-hand outer cable clamp screw of the right-hand wheel box.

REMOVE MOTOR AND INNER CABLE. Disconnect the two wires from the wiper motor situated on the right-hand wing valance.

From underneath the wing remove the three nuts securing the motor to the wing valance, and support motor.

Remove the cable grommet from scuttle and withdraw drive cable into engine compartment.

REMOVE WHEEL BOXES. Remove the left-hand demister nozzle by unscrewing the two drive screws.

Remove the large chromium nut securing each wheel box and spindle to the outside of scuttle.

Withdraw the wheel boxes and outer connecting cable into the car.

REFIT. Refitting is the reverse of the removal procedure. For the instructions on the refitting of the wiper arms, see page P.44.

WINDSCREEN WIPER ASSEMBLY. TO REMOVE AND REFIT

(XK 120 MODELS)

REMOVE WIPER ARMS. Slacken the chromium-plated collet nut, tap sharply to loosen the collet and pull arm off the spindle.

DISCONNECT FACIA PANEL. **Super Sports Model.** Remove the casing from above the facia panel by unscrewing the drive screws. Remove the dash casing from underneath facia panel by unscrewing the drive screws.

Disconnect the revolution counter and speedometer cables by unscrewing the knurled nuts at the rear of the instruments. Disconnect the pipe from the oil gauge by unscrewing the union nut.

Remove the grab rail from the passenger side of the facia panel by unscrewing the two nuts at rear of panel.

Disconnect the facia panel from its mounting brackets by unscrewing the two round-head screws at each side of the centre facia panel. Withdraw the facia panel sufficiently to gain access to the wheel boxes.

REMOVE WINDSCREEN RAIL CASING. **Fixed Head Coupe Model.** Remove the polished wood side cappings from the door pillars by lifting the door sealing rubber and unscrewing the two screws in the door aperture flange.

Remove the driving mirror bracket by unscrewing the two screws. Remove the screw accessible when the driving mirror bracket has been removed.

From underneath the polished wood screen rail unscrew the screw at each end and remove screen rail casing.

REMOVE MOTOR AND INNER CABLE. Slacken the right-hand outer cable clamp screw of the right-hand wheel box. Remove the motor from its mounting bracket on the scuttle by unscrewing the three nuts. Disconnect the two wires from the motor and support motor.

Remove the cable grommet from the scuttle and withdraw drive cable into engine compartment.

REMOVE WHEEL BOXES. Remove the two nuts securing each wheel box and withdraw the wheel boxes and connecting outer cable into the car.

REFIT. Refitting is the reverse of the removal procedure.

EQUIPMENT SPECIFICATIONS

JAGUAR XK120 1949–54: XK140 1955–57: XK150 1958–60

Ammeter	1949-57	36071A/B
"	1958-60	36237A
Battery	1949-53	SG11E
"	1954	STG11E
" (Fixed Head Coupé)	1955-57	STG11E
" (other models)	1955-57	GT11A
" (all models)	1958-60	STG11E
Coil, ignition	1949-54	*45012A/D
" "	1955	*45054D
" "	1956-60	*45067B/H
Control box	1949-54	*37076E
" "	1955-59	*37189D/J
" " Later	1959-60	37297A/B
Distributor		
7–1 compression ratio	1949-53	40198A/D
ditto Later	1953-54	40249A/B
ditto	1955-57	40435A
ditto	1958-60	40578B/D
8–1 compression ratio	1949-54	*40199E
(Standard)	1955-57	*40436A
"	1958-60	40576A/D
(Competition)	1955-57	*40199E
(Special equipment)	1955-57	*40293A
9–1 compression ratio	1955-57	40445A/B
" " "	1959-60	40616A/B
3.8 litre		
8–1 compression ratio	1960	40640A/D
9–1 " "	1960	40665B
Flasher unit	1953-56	*35003A
" "	1957-60	35010A
Flasher relay	1953-59	33117A
Fuse box	1949-54	37110A
" " Later	1954-58	*37100D
" "	1959-60	37263B
" "	1955	033240
" "	1956-58	033239
" "	1959-60	033242
Generator	1949	*22429D/E
"	1950-52	*22429F/H
"	1953-59	*22462B/E
" Later	1959-60	22496B/D
Horn		
Low note	1949-52	*69032A
" "	1953-54	*69011F
" " (Export)	1953-54	*70063A
" "	1955-60	*70063D/F
High note	1949-52	*69033A
" "	1953-54	*69012F
" " (Export)	1953-54	*70071A
" "	1955-60	*70071D/F
Horn relay	1949-51	*33116B
" Later	1951-54	33135B
Junction box	1951-52	78265B
LAMPS		
Boot	1949-57	56015A
Flasher, front	1955-60	52271A
" " (U.S.A.)	1957-60	52343A
" " (Switzerland)	1960	52500A
LAMPS—*continued*		
Fog	1952-54	*55055B
"	1955-56	55128B/D
"	1957-60	55174D/E
" (France)	1955-60	55133B/F
Head, Home		
R.H.D., dip left (L.H.)	1949-50	50838A
" non-dip (R.H.)	1949-50	*50839A
" dip left (L.H.)	1951-54	50778A
" non-dip (R.H.)	1951-54	*50779A
R.H.D., dip left	1955	*51505A
" "	1956-60	51762A
Head, Export		
R.H.D., dip left	1949-50	50838A
" " "	1951-54	50778A
" " "	1955	*51505A
" " "	1956-60	51762A
L.H.D., dip right	1949-50	A50838A
" " "	1951-54	A50778A
" " "	1955	*51506A
" " "	1956-60	51763A
Head, Export Europe (not France) (except countries listed)	1949-50	B50838A
" " "	1951-54	B50778A
	1955-60	51507A
Head, Export France	1949-50	*50840A
" " "	1951-54	51194A
" " "	1955-60	51563A
" " " Later	1960	58588A
Head, Export Holland and Switzerland	1955-60	51565A/B

JAGUAR XK120 1949–54: XK140 1955–57: XK150 1958–60—*continued*

Unit	Year	Part No.
LAMPS—*continued*		
Head, Export Switzerland	1952-54	51478A
Head, Export Norway and Sweden	1952-54	51480A
ditto	1955-59	51564A/B
Head, Export Norway and Germany	1959-60	51564B
Head, Export Sweden	1960	58362A
Head, Export Austria	1960	58633A
Head, Export Italy	1959-60	58293A
Head, Export U.S.A.	1949-50	50841A
" " "	1951-54	50781B
" " "	1955-59	51562A/B
" " "	1960	58546A/D
Number plate and reverse	1949-50	53161D
ditto	1951-57	*53159B
ditto	1958-60	53215A
ditto (France)	1957	53551A
ditto	1958-60	53556A
Side	1949-52	*52150B
"	1953-60	52175A/D
Indicator window	—	573449
Spring clip	—	571888
Side (U.S.A.)	1952-54	52176A
" (Sports)	1954	52176A
" (Switzerland)	1960	52449A/D
Stop tail	1949-50	*53151D
" "	1951-54	53178D
Stop tail and flasher		
Left hand	1955-59	*53350H
Right hand	1955-59	*53351H
Left hand	1960	53738A
Right hand	1960	53739A
U.S.A. (left hand)	1960	53755A
" (right hand)	1960	53756A
Starting motor	1949	26042A
" " Later	1949-52	24042E
" "	1953-60	26062A
Steering column control (Sports)	1949-52	32809H
"	1953-54	32847D
(Coupé)	1952-54	32847D
Steering column control	1955-60	32902F/H
Slip ring (serviced by Jaguar)	1955-58	*38261A
ditto	1959-60	38263A
SWITCHES		
Boot lamp	1949-57	*31222A
Dipper	1949-60	31284A/D
Flasher	1955-58	31250H
Knob (Open 2-seater)	—	311075
" (Coupé)	—	311301
Flasher	1959-60	31776A
Striker plate (serviced by Jaguar)	—	348480
Foglamp	1953-54	31228A
Knob	—	314437
Heater or fan	1951-54	*78262A
Knob	—	768473
Heater or fan	1955-57	*78209A
Knob	—	768473
Heater or fan	1958	31529A
" " "	1959-60	*78262B
Knob "	—	768473
SWITCHES—*continued*		
Ignition	1949-60	31287A/D
Interior light	1949-52	31228A
Knob	—	314437
Interior light	1953-57	*31389A
Knob	—	*317515
Interior light	1958-60	31527A
Lighting	1949-52	31056A
"	1953-54	31387A
Knob	—	317603
Lighting	1955-59	31426A/E
Knob	—	317603
Lighting (alternative until 1960)	1955-60	31524A
Knob	—	317603
Panel	1949-52	31228A
Knob	—	314437
Panel	1953-54	*78218A
Knob	—	768913
Panel	1955-57	78253B
Knob	—	768913
Panel	1958-60	31528A
Petrol/Oil	1949-52	31229A
Reverse lamp	1949-60	*31077A
Solenoid, starting motor	1949-60	*76411D/E
Solenoid operating	1949-52	31361A
"	1953-60	31253E
Knob "	—	*317370
Stop lamp	1954-60	31082B/H
Windshield wiper	1949-52	31228A
Knob	—	314437
Windshield wiper (Coupé)	1953-54	31304A
Knob	—	317602
Windshield wiper (Sports)	1953-54	*31391A
Knob	—	317602
Windshield wiper	1955-60	*31427A/D
Knob	1955-57	*318168
"	1958-60	312613
Terminal block	1958-60	37101B
Warning lights		
Flasher	1953-55	38048A
Bulb holder	1956-57	554734
Bezel and glass	1956-57	305721
Bulb	1956-57	987
Ignition	1949-52	*38020A
"	1953-55	38048A
Bulb holder	1956-57	554734
Bezel and glass	1956-57	305720
Bulb	1956-57	987
Windshield wipers		
Motor	1949	*75088L
" (Sports)	1950	*75084K
"	1951	*75084L
" (Coupé)	1952-54	75143A
"	1952	*75084L
"	1953-54	75143A
Windshield wipers—*cont'd*		
Motor	1955-57	*75233A
" (left hand drive)	1958-60	75308A
" (right hand drive)	1958-60	75319A
Wheelbox (Sports)	1949-54	72590A/K
" (Coupé)	1952-54	72630A/F
"	1955-57	72649B
"	1958	72698A
"	1959-60	72715A
Crosshead and rack assy. (Sports)	1949-50	738987
" Cut to 36 1/16"	1951-54	736177
(Coupé) " " 31 5/16"	1952-54	738764
Cut to 34 11/16"	1955-57	741263
L.H.D. Cut to 41 11/16"	1958	744256
" Later	1958-60	744254
R.H.D.	1958-60	744254
(Open 2-seater) Cut to 39 11/16"	1959-60	744256
Outer casing Motor to wheelbox (Sports)	1949-50	739833
"	1951-54	739870
(Coupé)	1952-54	739855
"	1955	740952
(Open 2-seater)	1956-57	745153
(Coupé)	1956-57	740952
Left hand drive	1958	745554
" " Later	1958-60	747248
Right hand drive	1958-60	747248
(Open 2-seater)	1959-60	54710186
Wheelbox to wheelbox (Sports)	1949-54	*739933
(Coupé)	1952-54	739937
"	1955	740953
(Open 2-seater)	1956-57	745127
(Coupé)	1956-57	740953
(XK150)	1958-60	745555
End tube	1949-54	740031
"	1955-58	740746
Ferrule, casing retaining	1958-60	740715
Grommet, wheelbox	1949-54	734458
Arm	1949-50	*736411
" left hand	1951-54	*737625
" " "	1955	*741295
" " "	1956-57	745081
" left hand drive	1958	741845
" " " "	1959	745651
" " " "	1960	54711570
" right hand	1951-54	*737624
" " "	1955	*741294
" " "	1956-57	745080
" right hand drive	1958	741844
" " " "	1959	745650
" " " "	1960	54711569
Blade	1949-50	736428
"	1951-52	*737572
"	1953-57	741680
"	1958	738734
"	1959-60	54710656
Overdrive equipment (optional)		
Relay	1956-57	33157B/D
"	1958-60	33174B
Switches:		
Interrupter	1956-60	*31077E
Rotary throttle	1956-57	31402A
"	1958-60	31504B/D
Solenoid transmission gear	1956-58	*76505B
ditto	1959-60	76515A

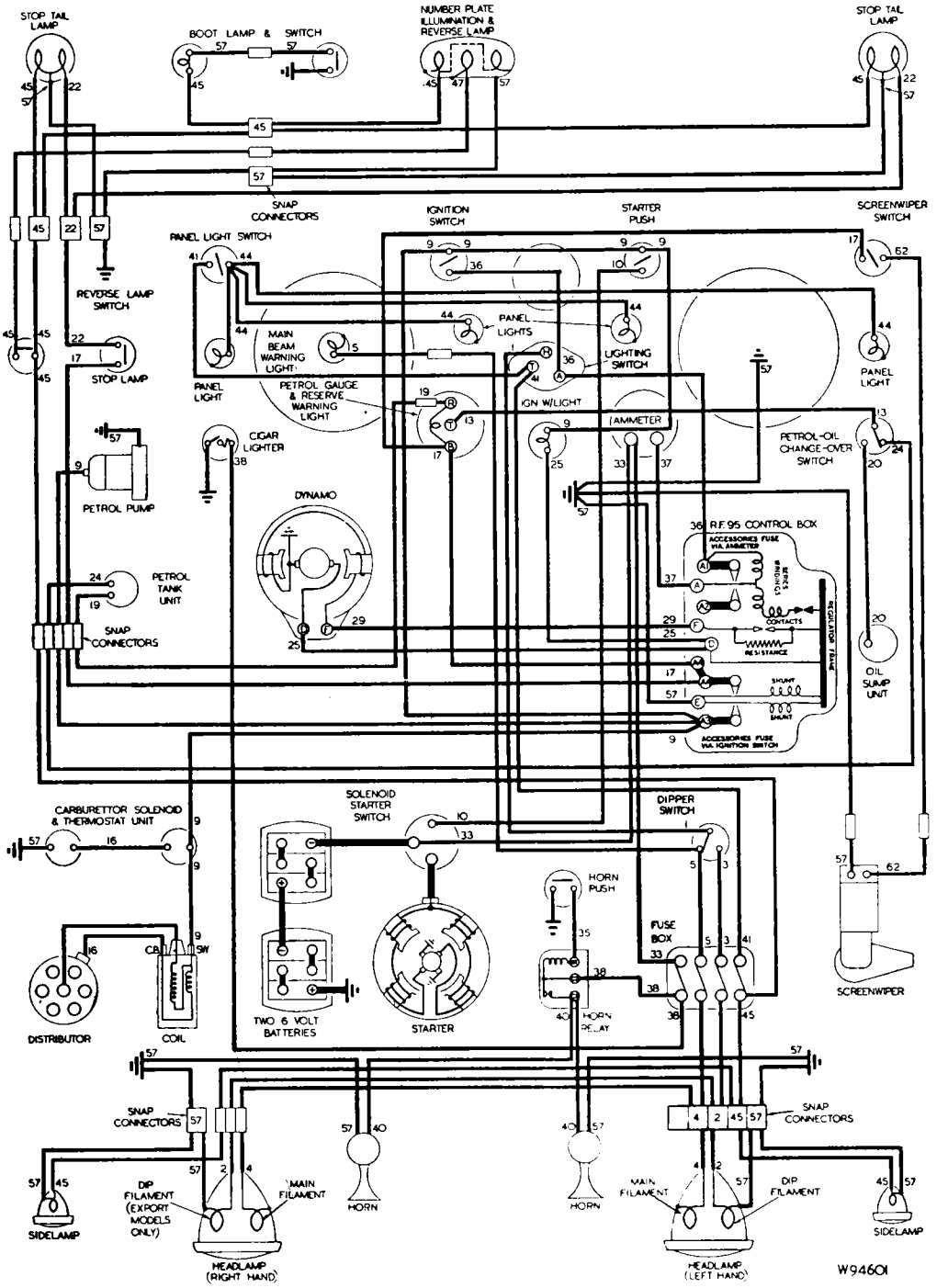
XK150 Models. Fixed Head, Drop Head Coupé, Open 2-seater and XK150S

Ammeter	BM4	36237A
Battery (2-off)	STG11E	—
Coil, ignition	HA12	*45067H (45075)
Control box	RB310	37297B
Distributor		
7.1 compression ratio	DMBZ6A	40578A/D
8.1 compression ratio	DMBZ6A	40576B
9.1 compression ratio	DMBZ6A	40616B
8.1 compression ratio (3.8 litre)	DMBZ6A	40640B
9.1 compression ratio (3.8 litre)	DMBZ6A	40665B
Distributor (XK150S)		
8.1 compression ratio (3.4 litre)	DMBZ6A	40670A
9.1 compression ratio (3.4 litre)	DMBZ6A	40616B
9.1 compression ratio (3.8 litre)	DMBZ6A	40617A/D
Flasher unit	FL5	35010A
Fuse box	SF4	37263B
Fuse box	SF6	54038009
Generator	C45PVS-6	22496B
Horn—Low note	HF1748	*70063F (069448)
High note	HF1748	*70071F (069474)
Lamps:		
Flasher, front	S63	52271B
Flasher, front (Export U.S.A.)	S63	52343B
Flasher, front (Export Switzerland)	S13	52500A
Fog	SFT576	55174E
Fog (Export France)	SFT576	55133F/H
Head		
Home and Export, right hand drive, dip left	J700	51762A
Export, left hand drive, dip right	J700	51763A
Export Austria	PF700	58633A
Export Europe (except countries stated)	PF700	51507A
Export France	PF700EF	51563B
Export France (later)	PF700	58588A
Export Norway, Sweden and Germany	PF700	51564B
Lamps, Head—*continued*		
Export Switzerland and Holland	PF700	51565B
Export Sweden	PF700	58632A
Export Italy	PF700	58293A
Export U.S.A.	PF700	51562B
Export U.S.A. (later)	F700	58669A
Number plate illumination, boot and reverse	512	53215A
Number plate illumination, boot and reverse (Export France)	512	53556A
Side	513	52175D
Side (Export Switzerland)	563	52499A
Stop tail, flasher and reflex		
Left hand	627	53738A
Right hand	627	53739A
Left hand (Export U.S.A.)	627	53755A
Right hand (Export U.S.A.)	627	53756A
Starting motor	M45G	26062A
Steering column control	CC5	32902H
Slip ring (serviced by Jaguar)	CRS1	38263A
Switches:		
Dipper	FS22-1	31284D
Cap, rubber	—	54334682
Direction indicator	37SA	31776B
Heater/Fan	CHR1	78262B
Knob	—	768473
Ignition	S45	31287F
Interior light	PS9	31527A
Lighting	PRS7	31524E
Knob	—	317603
Panel light	PS9	31528A
Reverse lamp	SS10-1	*31077E (31542)
Solenoid, starting motor	ST950 2ST	*76411E (76464)
Solenoid operating	SS9	31253E
Knob	—	317370
Stop light	HL2	31082H
Switches—*continued*		
Windshield wiper	PRS7	31427E
Knob	—	312613
Washer, rubber, switch panel	—	315209
Terminal block	TB6	37101B
Windshield wipers:		
Motor, right hand drive	DR3	75319B
Motor, left hand drive	DR3	75308B
Crosshead and rack	—	744254
Crosshead and rack (cut to 39$\frac{11}{32}$")	—	†744256
Outer casing (motor to wheelbox)	—	747248
Outer casing (motor to wheelbox)	—	†54710186
Outer casing (wheelbox to wheelbox)	—	745555
Outer casing (short, wheelbox)	—	740746
Ferrule, outer casing retaining	—	740715
Wheelbox	—	72715A
Arm, right hand drive (2 off)	—	54711569
Arm, left hand drive (2 off)	—	54711570
Blade	—	54711614
BORG WARNER TRANSMISSION		
Solenoid, gear holding	11S	76516B
Solenoid, brake line	BVS1	76502E
Starting motor	M45G	26097D
Switches:		
Hydraulic pressure	HPS1	31393A
Rotary inhibitor	55SA	31680A
Throttle	TOS1	31392A
LAYCOCK DE NORMANVILLE OVERDRIVE		
Relay	SB60	33174B
Solenoid, transmission gear	11S	76515A/B
Switches:		
Rotary throttle	12SA	31504D
Top gear	SS10-1	*31077E (31542)

* When ordering, quote part number shown in brackets † Open 2-seater

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR XK120 CARS
(1950-54)
HOME AND RIGHT HAND DRIVE EXPORT MODELS



KEY TO CABLE COLOURS

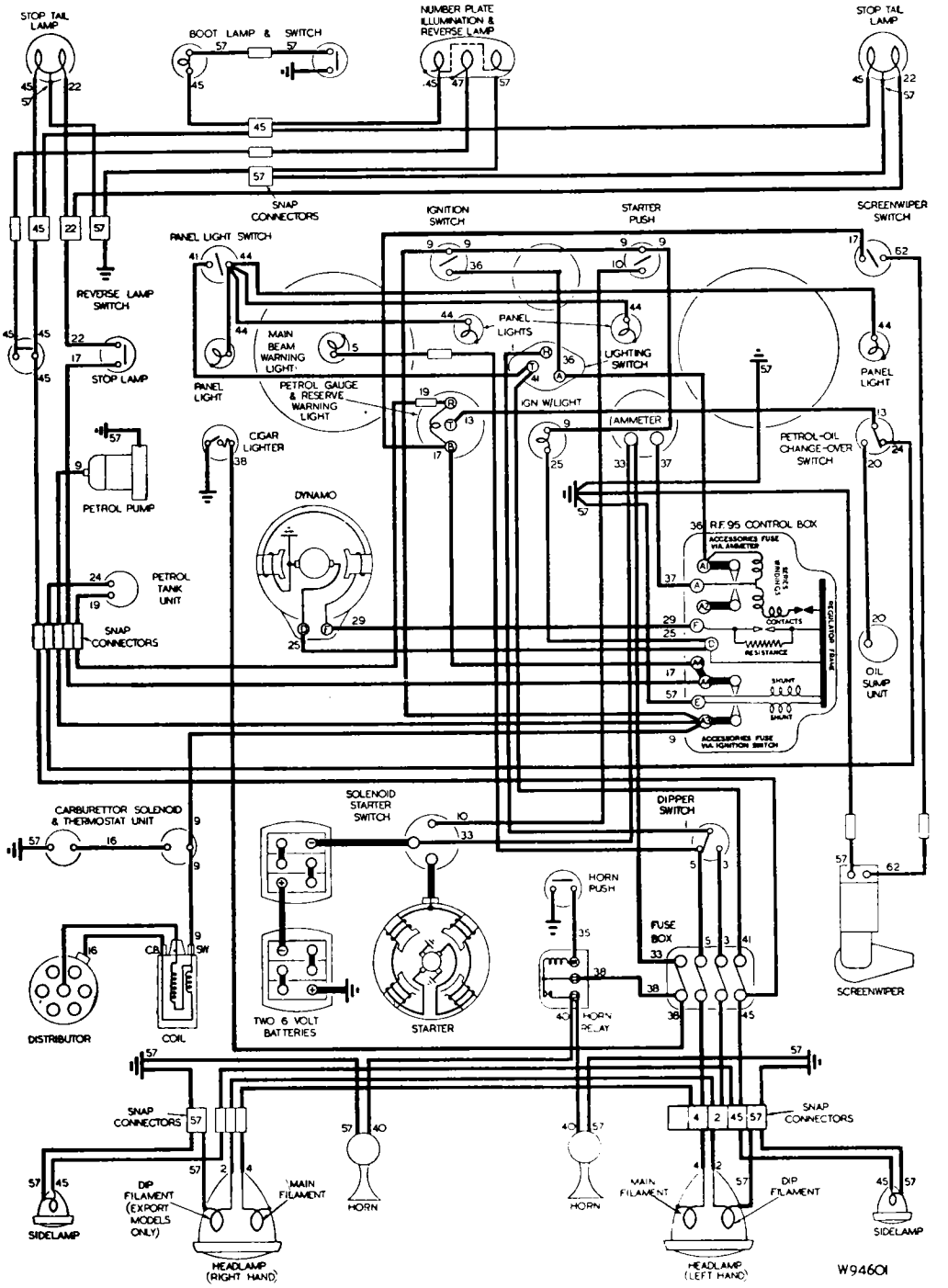
1 BLUE	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
2 BLUE with RED	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
3 BLUE with YELLOW	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
4 BLUE with WHITE	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
5 BLUE with GREEN	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
6 BLUE with PURPLE	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
7 BLUE with BROWN	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
8 BLUE with BLACK	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
9 WHITE	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
10 WHITE with RED	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
11 WHITE with YELLOW	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
12 WHITE with BLUE	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	65 DARK GREEN
13 WHITE with GREEN	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE	66 LIGHT GREEN
14 WHITE with PURPLE				

WIRING DIAGRAM
No. W94601
12-VOLT

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR XK120 CARS
(1950-54)
HOME AND RIGHT HAND DRIVE EXPORT MODELS



KEY TO CABLE COLOURS

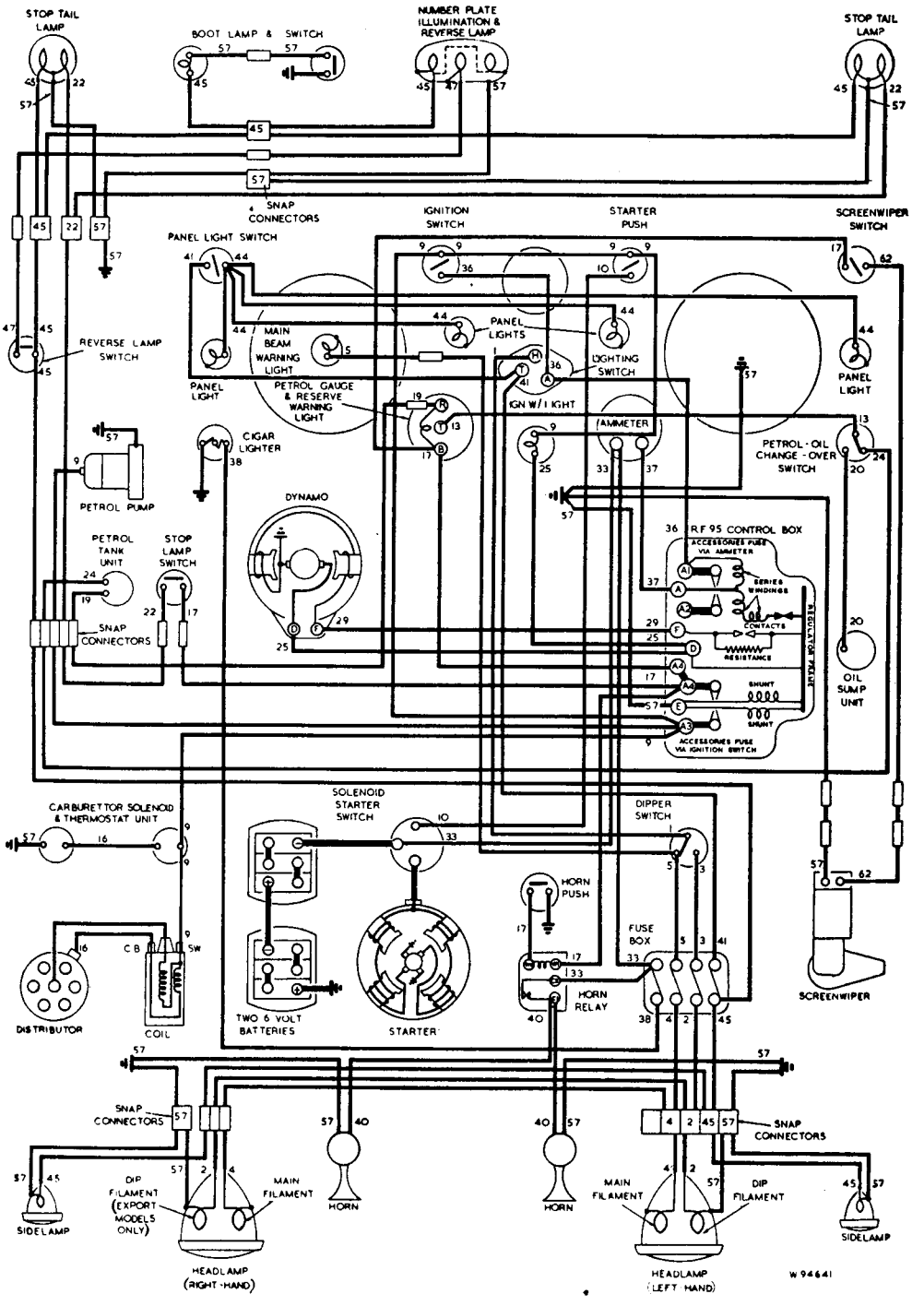
1 BLUE	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
2 BLUE with RED	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
3 BLUE with YELLOW	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
4 BLUE with WHITE	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
5 BLUE with GREEN	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
6 BLUE with PURPLE	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
7 BLUE with BROWN	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
8 BLUE with BLACK	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
9 WHITE	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
10 WHITE with RED	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
11 WHITE with YELLOW	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
12 WHITE with BLUE	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	65 DARK GREEN
13 WHITE with GREEN	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE	66 LIGHT GREEN
14 WHITE with PURPLE				

WIRING DIAGRAM
No. W94601
12-VOLT

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR XK120 CARS
(1950-54)
LEFT HAND DRIVE EXPORT MODELS



KEY TO CABLE COLOURS

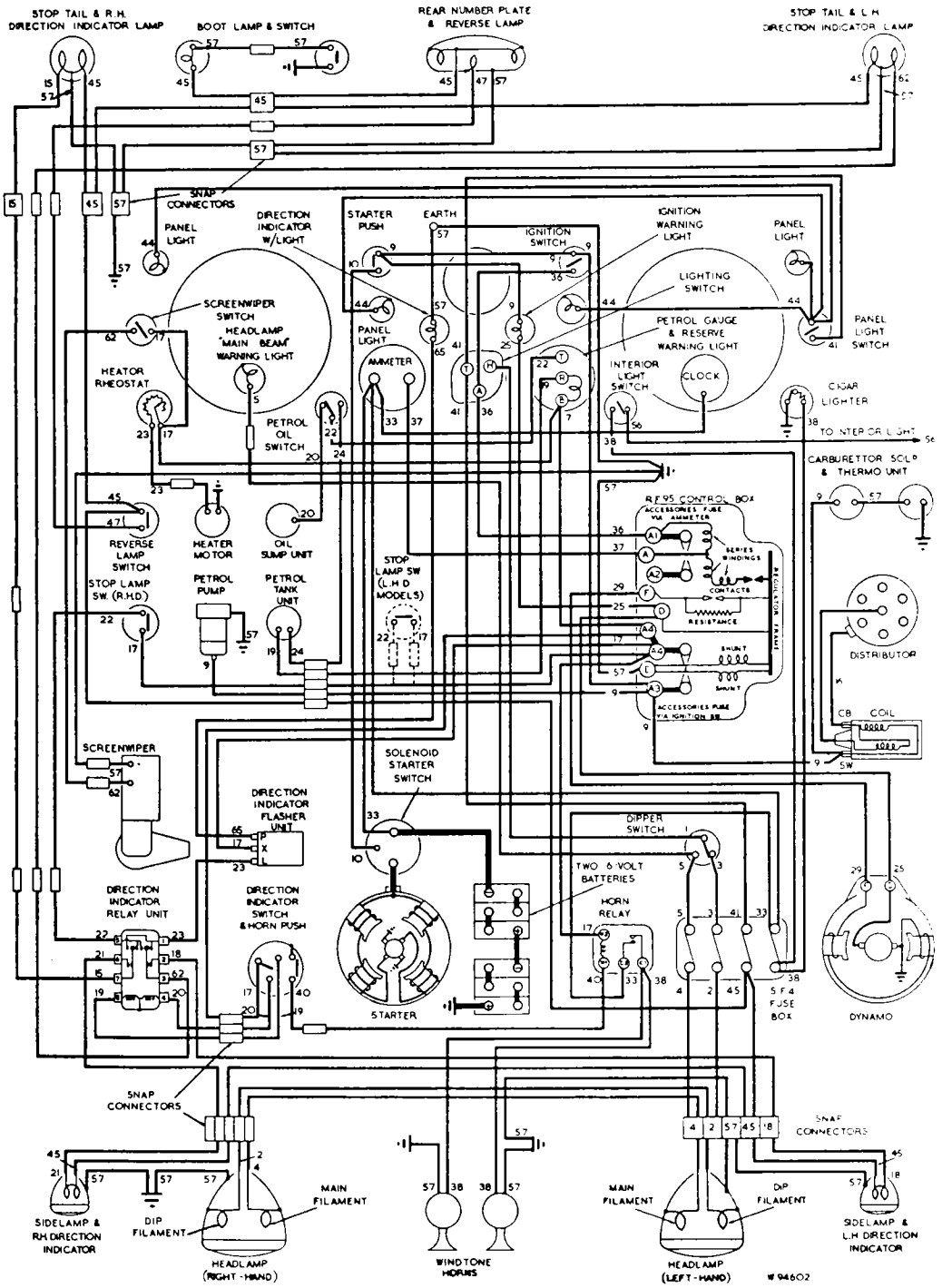
1 BLUE	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
2 BLUE with RED	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
3 BLUE with YELLOW	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
4 BLUE with WHITE	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
5 BLUE with GREEN	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
6 BLUE with PURPLE	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
7 BLUE with BROWN	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
8 BLUE with BLACK	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
9 WHITE	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
10 WHITE with RED	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
11 WHITE with YELLOW	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
12 WHITE with BLUE	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	65 DARK GREEN
13 WHITE with GREEN	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE	66 LIGHT GREEN
14 WHITE with PURPLE				

WIRING DIAGRAM
No. W94641
12-VOLT

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR XK120 FIXED HEAD COUPE
(1952-54)
HOME & EXPORT MODELS



KEY TO CABLE COLOURS

1 BLUE	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
2 BLUE with RED	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
3 BLUE with YELLOW	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
4 BLUE with WHITE	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
5 BLUE with GREEN	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
6 BLUE with PURPLE	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
7 BLUE with BROWN	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
8 BLUE with BLACK	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
9 WHITE	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
10 WHITE with RED	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
11 WHITE with YELLOW	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
12 WHITE with BLUE	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	65 DARK GREEN
13 WHITE with GREEN	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE	66 LIGHT GREEN
14 WHITE with PURPLE				

WIRING DIAGRAM
No. W94602
12-VOLT

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE