

SERVICE HANDBOOK

**SILVER WRAITH — SILVER DAWN — BENTLEY MK. VI.
R. TYPE BENTLEY — PHANTOM IV.**

SECTION M ELECTRICAL

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ELECTRICAL

BATTERY - DYNAMO - VOLTAGE REGULATOR AND CUT-OUT -
FUSES - STARTER MOTOR AND DRIVE - STARTER MOTOR SWITCH
- MICRO-SWITCH - IGNITION DISTRIBUTOR - IGNITION COIL
- SPARKING PLUGS - HEADLAMPS - PASS LAMPS - SIDE
LAMPS - STOP AND TAIL LAMP - NUMBER PLATE AND REVERSE
LIGHTS - SWITCHBOX - HORNS - TRAFFICATORS - DIRECTION
INDICATOR LIGHTS - WINDSCREEN WIPERS.

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The electrical system is earthed on the positive side of the battery to the chassis frame, and all switching is done in the negative leads.

The various wiring diagrams show the units with their electrical connections, the wiring being indicated in colours to correspond with actual coverings.

BATTERY:

The following are the recommended battery types:-

| Battery Maker's Designation | | Voltage | Normal Charging Current |
|-----------------------------|----------|---------|-------------------------|
| P & R Dagenite | Eride | | |
| 6 HZP9-S | 6 MXP9-R | 12 | 5 amperes |

The specific gravity figures given below apply to both makes of batteries:-

| Climate | Specific Gravity of Sulphuric Acid Solution (Corrected to 70°F) | |
|---|---|--------------------------|
| | Filling in for First Charge | Fully Charged |
| Temperate | 6 HZP9-S | 1.280 (1.270 - 1.285) |
| | 6 MXP9-R | |
| Tropical (i.e. where temperature is frequently over 90°F) | 1.190 | 1.210 (1.200 - 1.215) |

Battery terminals should be kept clean and well coated with Lanolin or Vaseline. Remove corrosion with a solution of ammonium carbonate, applying with a rag.

DYNAMO:

On early models, a 4½" Lucas dynamo was fitted, then a 5" Lucas dynamo; both of these were of the non-insulated type, i.e., the dynamo frame constituted the earth connection. Later, this was superseded by the Lucas 5" fully-insulated type, i.e., the dynamo earth connection being taken to a separate insulated terminal on the dynamo frame, which is suitably connected to chassis and this is now current production.

Performance Data: - RA.5 Dynamo.

| | |
|-----------------------|--|
| Cutting-in speed | - 800 - 850 r.p.m. at 13.0 dynamo volts. |
| Output | - 24 amps. at 14.00 - 15.50 r.p.m. at 13.5 dynamo volts. (Reading taken with regulator disconnected and using .55 ohm resistance load) |
| Rotation | - Clockwise, from driving end. |
| Brush Spring Tension | - 15 - 25 oza. |
| Armature Resistance | - 0.19 ohms. |
| Field Coil Resistance | - 6 ohms total. |
| Suppression | - 1 - mfd condenser. |

Dynamo Belt Tension:

The dynamo is driven by a Vee belt, off the crankshaft pulley, this belt also driving the water pump and fan.

The tension of the belt should be such that it can be moved transversely with the fingers through a total distance of 1" (i.e., $\frac{1}{2}$ " in each direction) when checked at a point equidistant between the crankshaft and fan pulleys, see Fig. M1.

To adjust belt, slacken dynamo securing nuts A, B, C & D and move dynamo towards or away from cylinder block as required.

To remove belt, slacken dynamo and move hard-up to cylinder block. Do not strain belts over pulleys and do not forcibly turn fan blades by hand.

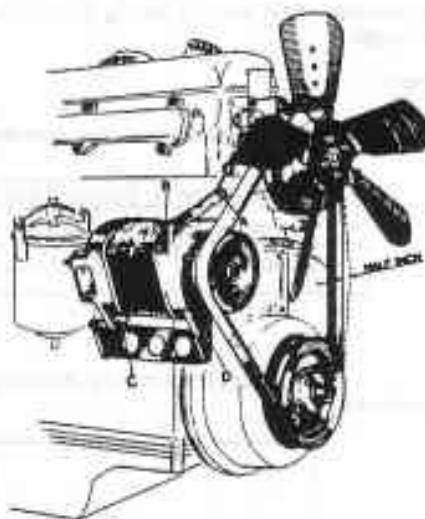


FIG. M1. DYNAMO BELT ADJUSTMENT.

Testing Dynamo in Position:

1. Inspect driving belt and adjust if necessary.
2. Check that dynamo and control box are correctly connected, i.e., dynamo terminals "F" and "D" respectively. If terminals are not marked, the "F" or field terminal can be identified as the small terminal.
3. With all lights and accessories switched off, disconnect wires from dynamo "F" and "D" terminals, connect terminals together with a short piece of wire, start engine and run at normal idling speed. Connect a 20 volt full scale moving coil voltmeter with its negative lead to terminal "D" and the positive lead to the chassis frame.

Gradually increase engine speed, when voltmeter reading should rise rapidly without fluctuation. No attempt must be made to force up reading by racing engine, 800 r.p.m. is sufficient.

4. A low reading (approximately, 1 volt) may indicate a fault in the field winding. A reading of 5 volts indicates a fault either in the armature or brushes.

5. Remove brush gear cover plate, hold back each brush spring, and move brush by gently pulling on its flexible connection. If movement is sluggish, remove brush and clean.

Brushes must always be replaced in original positions. If the brushes are so worn that they will no longer bed correctly on the commutator, or if core of flexible connector is exposed on brush face, new brushes must be fitted. If commutator is dirty, clean with petrol moistened cloth.

6. If a fault in the suppression condenser is suspected, this is most unlikely on the later fully insulated type, disconnect condenser and retest, if voltage now builds up, condenser is at fault. If there is no reading or a very low one, dynamo must be dismantled.

Dismantling:

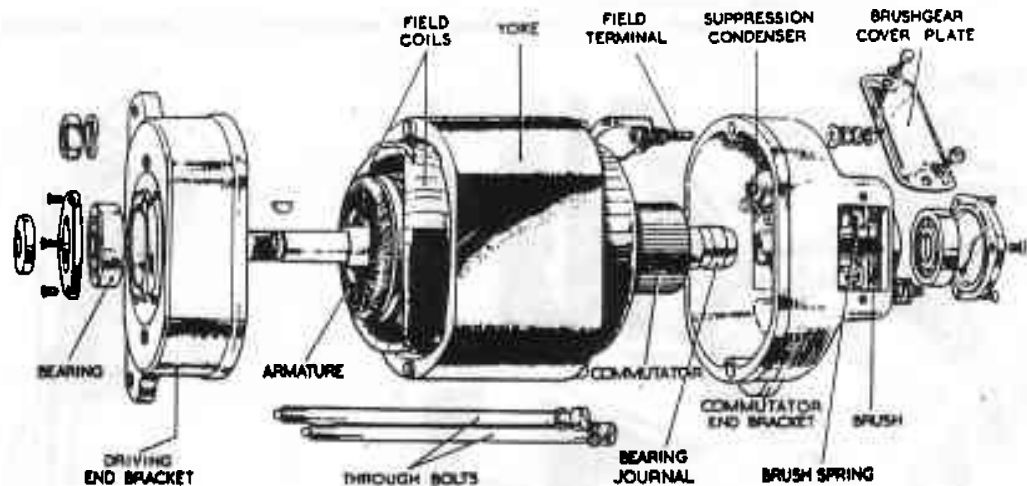


FIG. M2. DYNAMO - DISMANTLED.

Remove dynamo from engine, and before dismantling, mark yoke and end brackets to ensure correct alignment on assembly.

1. Take off drive pulley. Remove key from armature shaft.
2. Remove brush gear cover plates, hold back brush spring and slide brushes from holders. Disconnect field terminal. UnscREW and withdraw the two through bolts securing end brackets to yoke.
3. Pull commutator end bracket off yoke, bracket locates on two loose dowels passing through laminated yoke and is fitted with roller bearing for armature shaft. The driving end bracket and armature can now be lifted out. The end bracket carries the commutator shaft in a ball bearing which should not be needlessly disturbed.

If the bearing or armature requires replacement, press out shaft from end bracket using hand press.

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Re-assembly:

Re-assembling dynamo is approximately reverse of dismantling.

1. The end brackets locate over the dowel pins in the yoke, and must be replaced in original positions, relative to the yoke and each other.
2. Ensure that square insulating washers on field terminal fit correctly.
3. The distance piece on collar at the driving end must be replaced with chamfered edge towards machine.

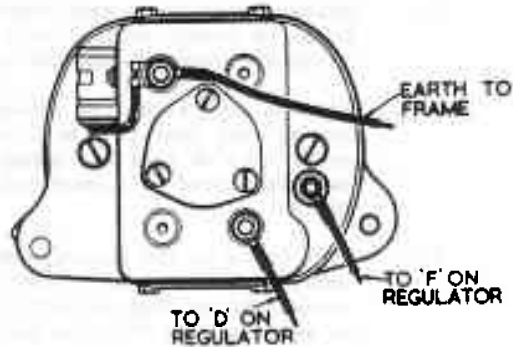


FIG. M3. DYNAMO CONNECTIONS.

Dynamo Earthing:

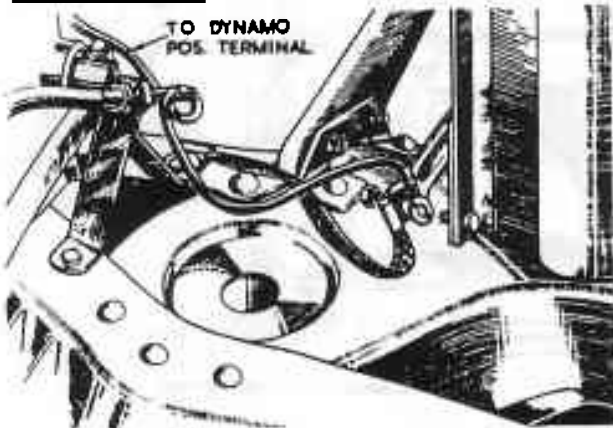


FIG. M4. DYNAMO EARTH CONNECTION.

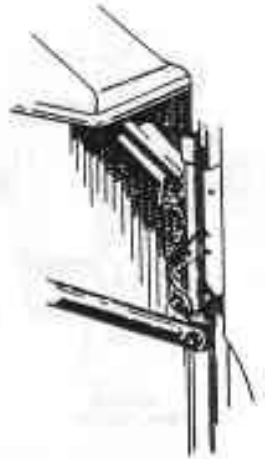


FIG. M5. RADIATOR BONDING STRIPS.

It is essential that the dynamo is correctly earthed to obviate any electrolytic action in the cooling system which may carry an excessive deposit of oxides to the radiator.

In cases where this trouble has been experienced, Figs. M4 & M5, show the service scheme for correct earthing of dynamo and bonding of matrix. On the early type of non-insulated dynamo, Tufnol bushes are now fitted to insulate the dynamo from the carrier bracket, and a separate earthing strip to the chassis frame is fitted.

VOLTAGE REGULATOR AND CUT-OUT:

The control unit also incorporates a choke condenser filter to prevent radio interference.

To Check and Adjust Regulator:

1. Withdraw cables from terminal "A1", and "A" if connected.

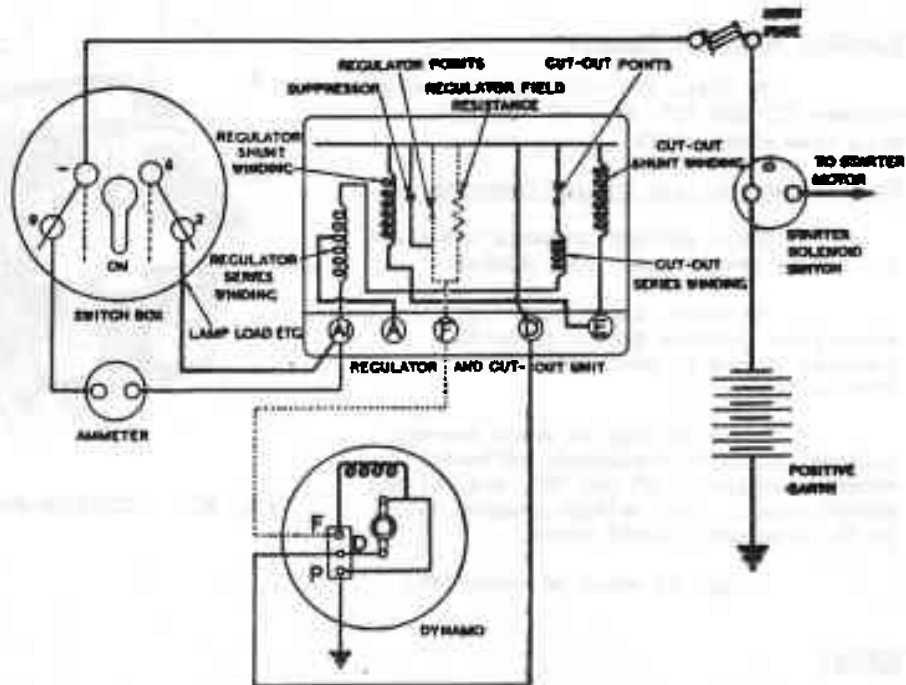


FIG. M6. CHARGING CIRCUIT.

2. Connect negative lead of a moving coil (0 - 20 volt) voltmeter to terminal "D", and the positive to earth.
3. Start engine and increase speed until voltmeter needle flicks and then steadies. This should occur between limits below.

Air Temperature - at Regulator

Settings

| | |
|-------|--------------------|
| 50°F | 16.0 - 16.6 volts. |
| 68°F | 15.7 - 16.3 volts. |
| 86°F | 15.4 - 16.0 volts. |
| 104°F | 15.1 - 15.9 volts. |

If the voltage at which the reading steadies is outside these limits, adjust regulator as under.

4. Hold adjusting screw (B, Fig. M7) and slacken off locknut "A". Turn adjusting screw clockwise to raise the setting, or anti-clockwise to lower.

Only a very small movement is necessary.
Re-tighten locknut and re-test.

When adjusting, do not run engine at more than half throttle or a false reading will be shown.

Cleaning Regulator Contacts:

To clean the vibrating contacts, unscrew "C" and "D", Fig. M7, and polish with fine emery cloth.

Cleaning and Setting Out-out Contacts:

Check out-out contacts are clean and making good contact when closed.

To clean, insert strip of fine glass paper between contacts, holding contacts closed by hand, draw paper through several times.

Check voltage at which out-out contacts close by connecting voltmeter between terminals "D" and "E", and raising engine speed. When voltage reaches 12.7 to 13.3, contacts should close.

Adjust by means of screw "F".

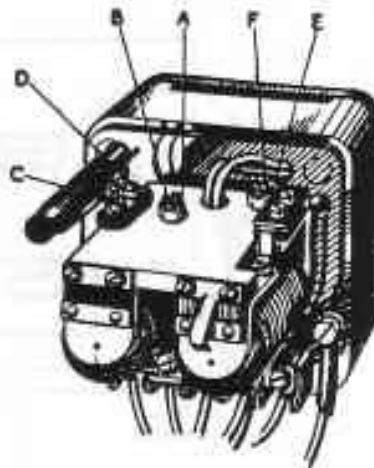


FIG. M7. REGULATOR CONTACTS.

FUSES:

The circuit fuses are one strand of No. 32 S.W.G. tinned copper wire.

The main fuse is 3 strands of No. 32 tinned copper wire. On early models, the main fuse is contained in the circuit fuse box, and on later models, the main fuse is in a separate box at the side of the circuit box.

STARTER MOTOR AND DRIVE:

The Starter motor and drive consists of a Lucas starter motor with a Rollis-Royce reduction gear and drive unit.

The reduction gear provides a gear ratio between motor and crankshaft of 16 : 1.

Testing Starter Motor in Position:

Switch on lamps and operate starter. If lights dim, but starter does not operate, suspect starter pinion jammed with flywheel gear ring or broken brush connection. In either case, the starter must be removed for examination.

Should the lamp retain full brilliance when starter is switch is operated, check switch, and if in order, examine all connections.

Starter drive clutch slip is indicated if the starter motor operates, but does not crank engine.

To Remove the Starter Motor:

1. Disconnect positive lead from battery and lead from starter motor.
2. Remove the four long setscrews securing motor to the clutch casing.

3. Withdraw the drive unit from the rear of the clutch casing and the motor from the front.

To refit, reverse the above procedure.

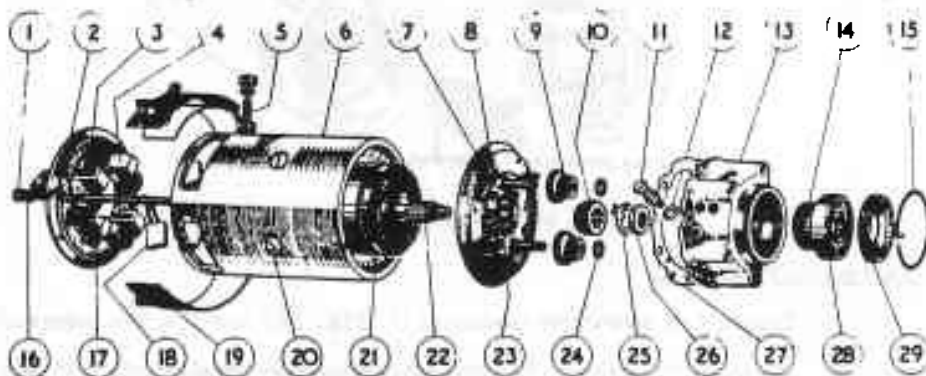


FIG. M8. STARTER MOTOR AND REDUCTION GEAR.

- | | |
|-----------------------------|---|
| 1. Through bolt. | 16. Flat spring washer. |
| 2. Commutator end bracket. | 17. Ball or roller bearing. |
| 3. Brush spring. | 18. Brush. |
| 4. Brush holder. | 19. Cover band and cork joint. |
| 5. Terminal. | 20. Retaining screw - field coil. |
| 6. Yoke. | 21. Field coil. |
| 7. Driving end bracket. | 22. Armature shaft. |
| 8. Annular support - Gears. | 23. Ball bearing. |
| 9. Compound pinion. | 24. Adjusting washer - compound pinion. |
| 10. Driving gear. | 25. Lock washer - armature shaft. |
| 11. Plug, lubricator. | 26. Nut - armature shaft. |
| 12. Joint washer. | 27. Joint washer (Vellumoid). |
| 13. Gear housing. | 28. Ball bearing - gear housing. |
| 14. Driven gear. | 29. Retaining nut - gear housing. |
| 15. Locking ring. | |

Examination of Commutator or Brushes:

Remove the cover band (19, Fig. M8), hold back each of the brush springs (3) and move the brush. If sluggish, remove brush (4) and ease sides with smooth file.

Test the brush spring tension with a spring balance, the correct tension is 30 - 40 ozs.

If new brushes are fitted, these are pre-formed so that no hand bedding is necessary. It is advisable to run these in by running motor for 15 minutes at 6 volts.

Clean commutator with petrol moistened cloth.

Secure the starter motor in a vice and test with 12 volt battery. If there is evidence of an internal fault, replace with a service unit.

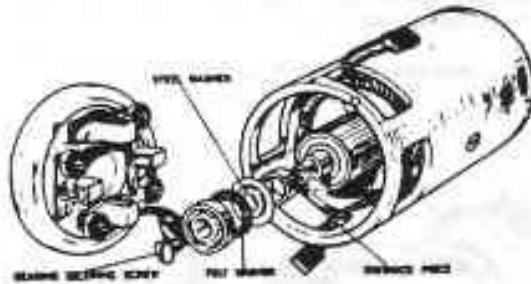


FIG. M9. COMMUTATOR END BEARING.

Starter Drive Gearbox:

Remove the aluminium casing, (13, Fig. M8) and the two compound pinions(9)

Examine the gears; if lubrication has been neglected, they may have picked up. Examine bronze bushes for scoring or seizure on pins. Check oil holes.

Pack bearings with H.M.P. grease and when re-assembling, note co-relation marks etched on teeth to ensure correct meshing in original positions.

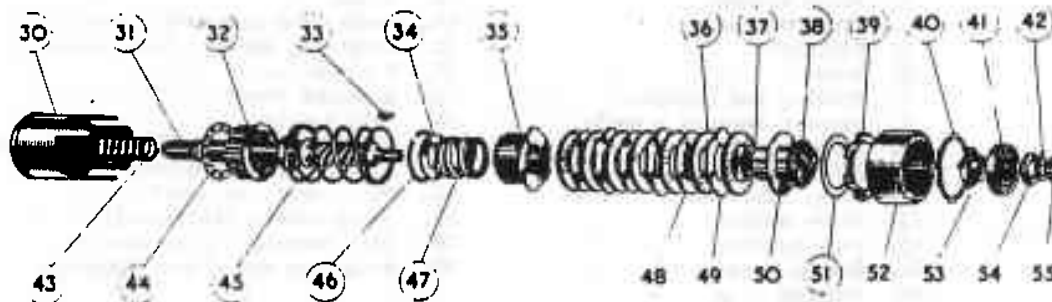


FIG. M10. DRIVE DISMANTLED.

- | | |
|---|-----------------------------------|
| 30. Shell. | 43. Disengaging spring. |
| 31. Shaft. | 44. Fibre washer. |
| 32. Pinion. | 45. Engaging spring. |
| 33. Woodruff Key. | 46. Spring ring. |
| 34. Washer. | 47. Damping spring. |
| 35. End clutch plate and damping spring housing. | 48. Clutch disc with spigot. |
| 36. Clutch disc - Perodo. | 49. Clutch disc with projections. |
| 37. Spring ring. | 50. Outer clutch disc. |
| 38. Operating nut. | 51. Fibre distance washer. |
| 39. Clutch ring. | 52. Cover. |
| 40. Locking ring. | 53. Stop operating bush. |
| 41. Ball bearing. | 54. Plain washer. |
| 42. Lock washer. | 55. Nut. |

Starter Drive:

Dismantling:-

1. Remove small aluminium cover.
2. Mount drive vertically in vice, remove lock washer (42, Fig. M10) and ring nut (55).

Support the housing and drive out the assembly with an aluminium drift.
3. Remove the stop (53) and the locking ring (40).

Re-assembly:

1. Place fibre washer (44) over pinion (32), chamfer outermost. Place pinion in shell (30) and drop shaft (31) into shell through pinion, followed by engaging spring (45).
2. Place the assembly, consisting of end clutch plate (35), damping spring (47), washer (34), and spring ring (46), over shaft and into engaging spring and shell.
3. Assemble clutch discs, hold together with fingers, remove operating nut (38) and measure overall thickness of discs, this should be 1.108" - .010".

The normal thickness of each Ferodo disc is .094". If above limit, rub down, using medium glass paper. If below limit increase by selective assembly of Ferodo discs.
4. Soak the discs in engine oil for 30 minutes, then place the discs and operating nut over shaft, force down against spring by screwing the shaft up through the operating nut, and continue assembly.
5. Place fibre distance washer (51) into the clutch ring (39), chamfered outer diameter to ring, then place the ring and distance washer assembly on to the outer clutch disc (50) and hold down by turning shaft. Next fit cover (52) and retain with locking ring (40).
6. With stop operating bush (53) in position, key (33) in keyway, replace aluminium housing and bearing. Secure with plain washer (54) locking washer (42) and slotted ring nut (55). Lubricate bearing with H.M.P. grease and replace end cover.

Checking Clutch Slip:

The clutch must be set to slip within the limits of 15 to 35 lbs/ft.

To check with torque spanner, remove slotted ring nut (55) from the end of the drive and substitute $\frac{1}{2}$ " B.S.F. nut, to allow for standard adaptor.

Mount drive vertically in vice and check slip with torque spanner. If torque spanner is not available, see below.

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Locally manufacture a torque arm from a piece of mild steel 15" long (approximately), drilled and filed at one end to leave two or three projections in the form of teeth to engage with the teeth of the pinion (Fig. M10). A small hole should be drilled at the other end, to engage hook of spring balance, having 12" between hole centres.

Check as shown in Fig. M11, using spring balance at right angles to torque arm.

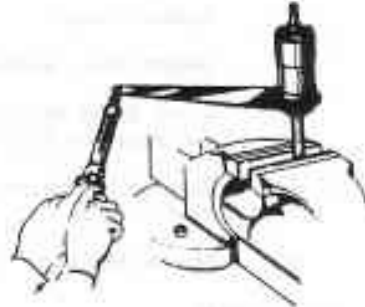


FIG. M11. CHECKING CLUTCH SLIP.

STARTER MOTOR SWITCH:

To test switch in position, disconnect cables from switch, correct test leads from 12 volt battery. The negative lead should be connected to terminal with grub screw, the positive lead held against the switch body or fixing bracket.

If switch is working, it will be heard to operate every time circuit is completed. If not, fit a replacement.

For emergency use or testing, the Solenoid may be manually operated by pressing in the rubber cap, which covers an extension of the switch movement.

MICRO-SWITCH:

On cars fitted with the Automatic Gearbox, a small micro-switch, fitted at the base of the steering column, is inserted in the starter motor circuit. This switch is operated by the gear range selector lever, to ensure that the engine can only be started with the gearbox in Neutral.

In cases of failure of the starter motor to operate, inspection should be made that the gear range lever is definitely operating the toggle lever on the switch. If necessary, move switch to reposition correctly on steering column. Ensure that correct operation of reversing lights is not disturbed.

IGNITION DISTRIBUTOR:

The distributor is of the three lobe (four lobe on Phantom IV) cam and twin contact breaker arm type. The automatic centrifugal advance mechanism is housed in the base of the distributor.

The firing order (embossed on the cover) is 1, 4, 2, 6, 3, 5, for Silver Wraith, Silver Dawn and Bentley, and 1, 6, 2, 5, 8, 3, 7, 4, for the Phantom IV.

The direction of rotation is clockwise, when viewed from the top.

Cleaning Contacts:

Lift rotor arm off spindle. Remove screws securing springs to anchorage. Remove contact plate locking screws "B" & "E", Fig. M12, remove the contact plates complete with breaker arm. The screws, G, H, & J, MUST NOT be disturbed, or distributor will require re-synchronizing.

Trim contacts as necessary. Leave the breaker arm on the pivots to allow contacts to be checked for true mating.

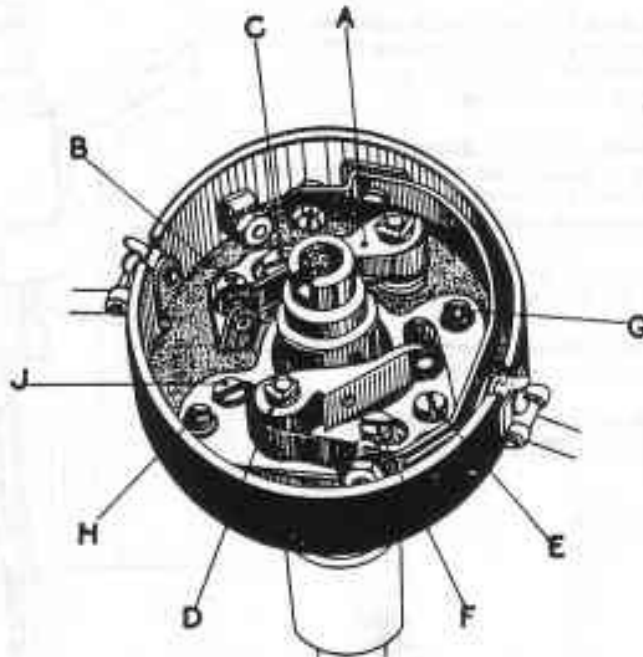


FIG. M12. DISTRIBUTOR CONTACT BREAKERS.

- | | |
|---------------------|------------------------|
| A. Breaker Arm. | F. Adjusting Screw. |
| B. Locking Screw. | (Gap adjustment). |
| (Contact plate). | G. Locking Screw. |
| C. Adjusting Screw. | (Synchronizing plate). |
| (Gap adjustment). | H. Locking Screw. |
| D. Breaker Arm. | (Synchronizing plate). |
| E. Locking Screw. | J. Adjusting Screw. |
| (Contact plate). | (Synchronizing). |

Adjusting Contact Breaker Gaps:

The gaps should be set .019" to .021".

Dwell 42°

Turn engine until the fibre hub of the breaker arm (A, Fig. M12), is on a lobe of the cam, giving maximum opening. Loosen contact plate locking screw "B" and turn adjusting screw "C" to obtain correct gap. Repeat operations for other arm.

Removing Distributor:

Remove distributor cover. Turn engine until the rotor arm is in line with No. 1 cylinder firing position as indicated on the moulded cover.

Remove the two nuts securing the housing to the cylinder block, lift off complete assembly.

DO NOT slacken the clamping plate screw, (P, Fig. M13), as the clamping plate should be left in position; i.e., clamped to the distributor so as not to disturb timing.

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Remove the nut which secures the clamping plate to the housing "U". Remove setscrew "S" retaining the distributor to the housing.

Check cover of distributor for "tracking", indicated by a thin black line between the electrodes, in which case, a replacement must be fitted.

Automatic Governor Advance Curve:
(Silver Wraith, Silver Dawn and Bentley).

The automatic governor should conform to the following limits:-

| Advance degrees | Distributor | |
|-----------------|-------------|-----------|
| | MIN. RPM. | MAX. RPM. |
| Start | 210 | 230 |
| 1 | 220 | 250 |
| 3 | 280 | 330 |
| 6 | 440 | 500 |
| 9 | 640 | 710 |
| 12 | 870 | 960 |
| 15 | 1155 | 1255 |
| 17 | 1350 | 1450 |

The full advance should not be more than $17\frac{1}{2}$ distributor degrees.

Re-Timing Ignition and Synchronizing

C.B. Arms:

1. Jack up the near rear wheel.
2. Engage 4th speed and switch on ignition.
3. With the rotor arm set on No. 1 cylinder (approximately 11 o'clock), rotate rear wheel in a forward direction until timing pointer is opposite T.D.C. mark on flywheel. Check that contacts "break".

Either of the following methods of determining precisely when the contact points separate may be used:-

- (a) With the ignition switched on and a small bulb connected in series with the contact breaker points, see Fig. M14. In this case the bulb will light as the contact points "break".
- (b) With the ignition switched on, observation of the ammeter will show when the points are in contact, a discharge of approximately 2 amperes will register, when the points "break", the needle returns to zero.

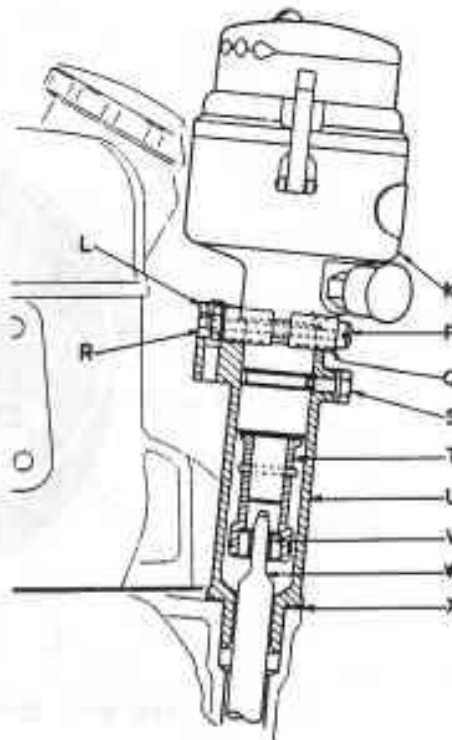


FIG. M13. DISTRIBUTOR.

- K. Distributor.
- L. Nut - Clamping Plate to Housing.
- P. Screw - Clamping Plate.
- Q. Clamping Plate.
- R. Packing Washer.
- S. Setscrew.
- T. Driven Sleeve.
- U. Distributor Housing.
- V. Driven Flates.
- W. Driving Shaft.
- X. Vellumoid Joint.

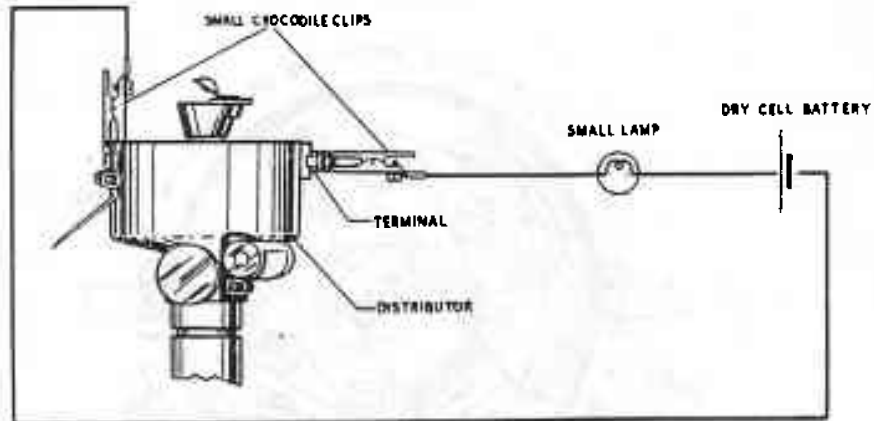


FIG. M14. CHECKING CONTACT BREAKER.

4. Slacken screw "P" (Fig. M13), and rotate distributor head clockwise until bulb goes out, if not already so, then rotate anti-clockwise until it lights. Re-tighten screw "P", turn back rear wheel and check.

It should be noted that with premium grade fuels, the ignition may be set 2° before T.D.C.

Turn the engine again until the rotor arm is set on No. 6 cylinder (approximately 5 o'clock) and set flywheel exactly as for No. 1 cylinder. Slack off screws "G" & "H", Fig. M12. Rotate screw "J" in a clockwise direction until the bulb goes out, if not already so, then rotate in anti-clockwise direction until the bulb lights. Re-tighten and check.

In the case of the Phantom IV, the contact breaker points must be synchronized with the synchronizing tool STD.410 as under.

5. Synchronizing Phantom IV - switch on the ignition, and with the test bulb connected, place the special synchronizing tool STD.410, Fig. M15., on the cam with the "M" side of the spring in the slot of the cam.

Turn the cam clockwise until the graduations on the "M" side of the tool are near the slot in the rim of the distributor base, see Fig. M16. Continue turning until the breaker arm "A", Fig. M12., just breaks contact and note exactly the graduation on the tool that aligns with the edge of the slot.



FIG. M15. TOOL STD.410.

Continue turning until the similar graduation on the "N" side of the tool aligns with the same edge. Loosen screws "A" & "H", turn adjusting screw "J" until breaker arm "D" just breaks contact.

Check by turning cam again and re-tighten. Re-check opening of arm "D", if not between .019" to .021", re-adjust and re-synchronize.

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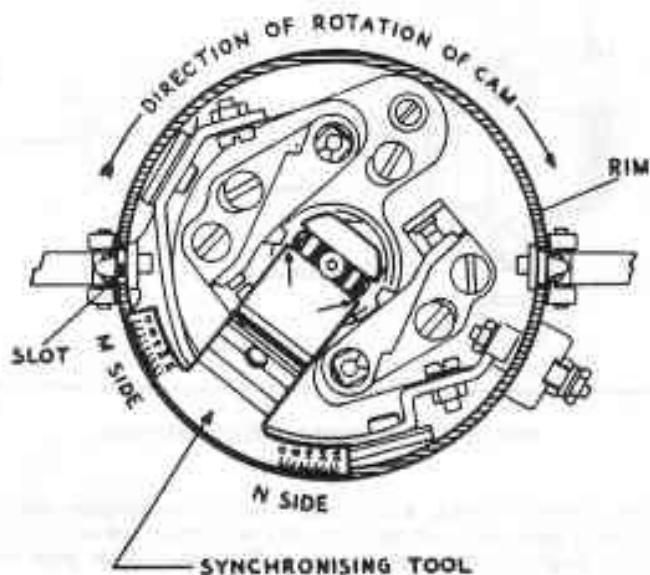


FIG. M16. SYNCHRONIZING TOOL IN POSITION.

The graduations on the tool represent engine degrees, and the markings on the "M" side are 60 distributor degrees or 120 engine degrees from the "N" side. The contact breaker arm must not vary more than 2 engine degrees.

Ignition Timing: (Automatic Gearbox Models)

The car should be run up on a ramp or over a pit. Examination of the lower bell-housing cover will show the small inspection hole on the side.

The preferable method is to note the position of the pointer and then to remove the cover. Operate the starter motor to approximately line up the flywheel marking, replace the cover for a temporary check. Remove the cover and prise the flywheel round into correct position, then permanently replace the cover.

Another method is to use the starting handle to turn the engine, which obviates the need for removing the bell-housing cover. It must be remembered that the starting handle operates through the friction damped spring drive unit, and therefore, allowance must be made for the wind-up of the spring drive unit. If it is decided to use this method, the timing should be set .300" late of the IGN.TDC mark on the periphery of the flywheel.

The contact breaker should now be adjusted by rotating in an anti-clockwise direction, so that the cam is just on the point of causing the contact break when revolving in the normal direction, while at the same time the high-tension rotor is opposite No. 1 distributor contact, the rotor being in the fully retarded position.

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IGNITION COIL:

The ignition coil is wound for the positive earth system.

The coil terminals are marked "CB" for contact breaker and "SW" for switch lead. Connect the lead from the radio suppressor to the "SW" terminal.

The outside of the coil casing should be kept clean; misfiring is occasionally caused by an accumulation of dirt around the terminals.

SPARKING PLUGS:

The sparking plugs for the Silver Wraith, Silver Dawn and Bentley may be either Champion Type N8 or Lodge Type CLN, 14 m/m.

The gaps for the above plugs should be .025" where no television suppressor is incorporated in the high tension lead to the distributor, and .030" when this suppressor is fitted.

The sparking plugs for the Bentley Continental Sports Saloon are Champion N.A.8 only.

The sparking plugs for the Phantom IV are Champion N8 only.

HEADLAMPS:

On the Silver Wraith and Phantom IV the headlamps are Lucas Type R.100.

On the Silver Dawn and Bentley the headlamps are the Lucas "Built-in" Type either Mark I or Mark II. These lamps incorporate a Light Unit, which consists essentially of a reflector and front glass assembly provided with a mounting flange, by means of which it is secured in the body housing. Normally, the pre-focus flange type bulb is fitted. For France, an adaptor and 3-pinned bulb is fitted, and for North America, the regulation "Sealed Beam" unit is fitted. The bulbs are correctly positioned in relation to the focal point of the reflector, and it is not necessary to re-focus when a new bulb is fitted.

Mark II headlamps incorporate a fuse unit in the lamp shell, these fuses are rated at 15 amperes.

Changing Bulb, R.100 Type:

The lamp front and reflector can be swung downwards, Fig. M17, if the screw at the top is slackened off. The bulb holder can then be removed from the base of the reflector.

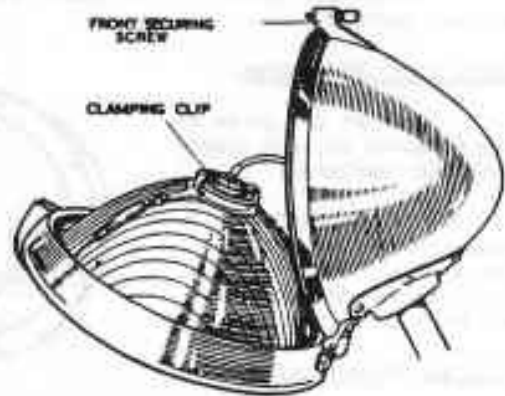


FIG. M17. HEADLAMP R.100.

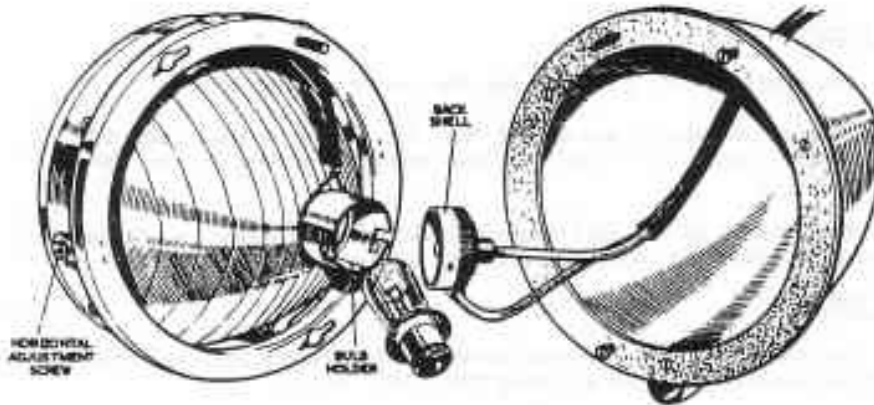


FIG. M18. HEADLAMPS, MK.I, CHANGING BULB.

Changing Bulb, Mk.I Type:

Slacken the screw at the bottom of the lamp, lift off the rim, removing it from the bottom first. Slacken the screws securing the flange of the Light Unit and turn unit anti-clockwise to detach.

Twist back-shell of bulb holder in an anti-clockwise direction and remove and extract bulb.

Changing Bulb, MK.II Type:

Slacken off screw at bottom of outer rim and remove rim and dust excluder.

Push Light Unit inwards against the spring-loaded screws, turn unit anti-clockwise and withdraw. Remove bulb as for Mk.I.

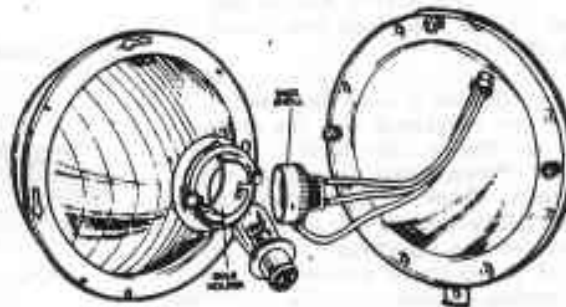


FIG. M19. HEADLAMPS, MK.II, CHANGING BULB.

Setting and Focussing:

When setting the lamps, the measurements between ground level and lamp centres are made with the car loaded with five persons.

The headlamps must be set so that the beams are directed straight ahead and are parallel with the ground and with each other.

R.100 Type - To adjust, slacken fixing nut at the base of the lamp and move the lamp on its adjustable mounting as required.

Cover up one lamp while testing the other. If the lamp gives a uniform long-range beam without a dark centre, the bulb needs no adjustment. The bulb holder can be moved backwards or forwards for focussing when the clip at the back of the reflector is slackened. After adjustment, retest with reflector and front fitted.

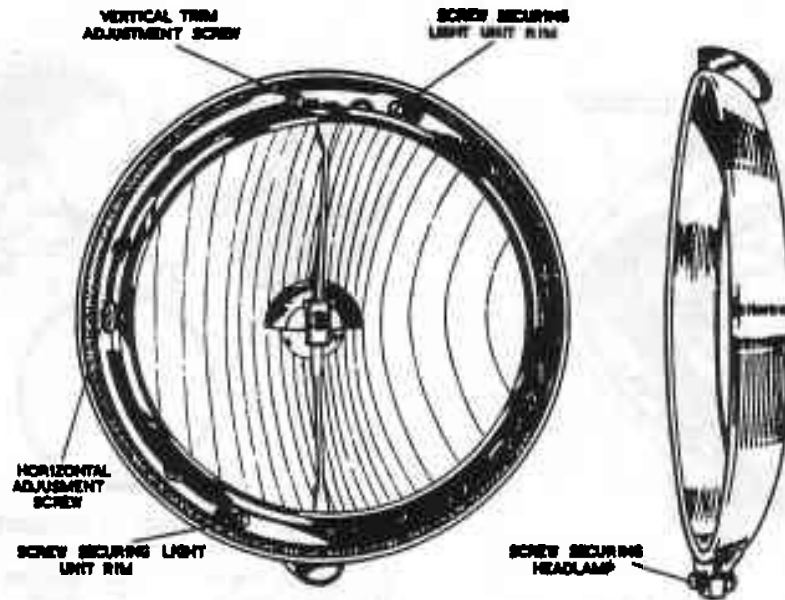


FIG. M20. HEADLAMP, Mk.I, FOCUSING.

Mk.I Type - To adjust, remove front rim. If vertical adjustment is required, set with vertical true adjustment screw at top of reflector unit. Turn screw clockwise to raise the beam and anti-clockwise to lower.

If horizontal adjustment is necessary, slacken off the two horizontal adjustment screws, one each side of Light Unit. The reflector may then be positioned as required.

Mk.II Type - To adjust, remove front rim. Adjustment is by setting one of the three spring-loaded screws which retain the Light Unit. The top screw is for vertical beam trimming and the side screws for trimming horizontally.

PASS LAMPS:

The Silver Wraith and Bentley pass-lamps are similar, as illustrated in Fig. M22. They are fitted with a removable light unit, the rim being screwed at the bottom with either a spring clip or screw.

The Phantom IV and Silver Dawn pass-lamps are similar, as illustrated in Fig. M23. They are fitted with a removable light unit; the rim forming a clip, secured at the bottom by a screw.

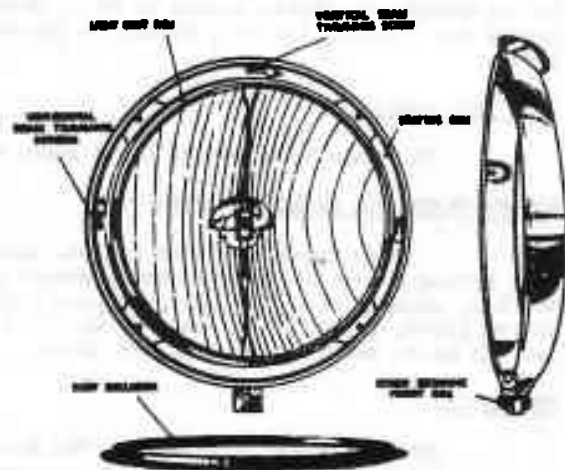


FIG. M21. HEADLAMP, Mk.II, FOCUSING.

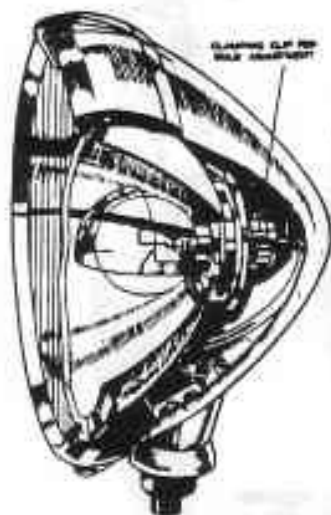


FIG. M22. PASS-LAMP.

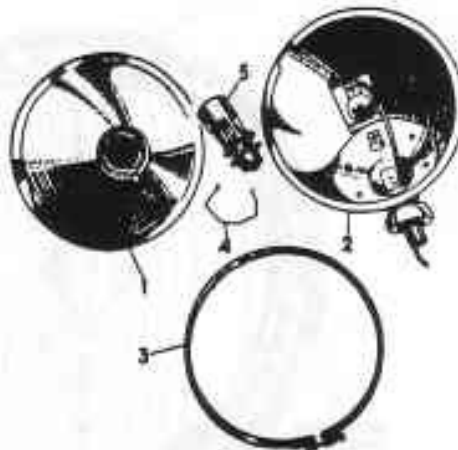


FIG. M23. PASS-LAMP - DISMANTLED.

- | | |
|----------------|-----------------|
| 1. Light Unit. | 4. Spring ring. |
| 2. Lamp bowl. | 5. Bulb. |
| 3. Rim. | |

To change the bulb, remove light unit, the bulb holder can then be removed from back of reflector.

When setting the lamps, set the nearside lamp or centre lamp .250" off centre to allow for camber of road.

SIDE LAMPS:

To renew the bulb, remove the securing screw from the top and withdraw the assembly. To obtain access to bulb, detach the front portion by holding firmly and twisting the rear portion a quarter of a turn to release the spring catch.

STOP TAIL LAMP:

To renew bulb, remove small screw and withdraw front rim and glass.

NUMBER PLATE AND REVERSE LIGHTS:

Three types have been fitted, inspection will show that to remove the bulb either remove securing screw to remove glass and rim, or where no screw is visible, unscrew glass and rim to expose bulbs. On cars fitted with the square number plate, remove fibre cover in boot lid by pulling off spring clips to expose nut and bolts securing lamp to boot cover.

SWITCHBOX:

The switchbox incorporates the Master Switch, which controls all the electrical system except clock, roof lamp and inspection lamp; the ignition switch, the starter button, and a Yale lock.

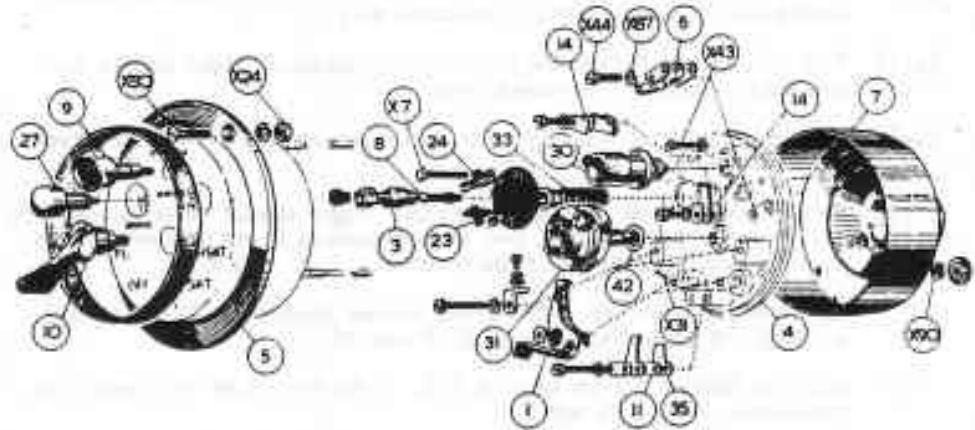


FIG. M24. SWITCHBOX - DISMANTLED.

- | | |
|----------------------------|--------------------|
| 1. Main contact arm. | 11. Packing. |
| 3. Brush, starter contact. | 14. Packing. |
| 4. Switch base. | 23. Backing plate. |
| 5. Body. | 24. Contact plate. |
| 6. Brush accessories. | 27. Starter push. |
| 7. Cover. | 30. Spindle. |
| 8. Carbon contact. | 31. Spindle, main. |
| 9. Operating lever. | 33. Spring. |
| 10. Operating lever. | 35. Stop, brush. |
| | 42. Thrust washer. |

To Examine and Test Switchbox:

Remove switch from facia board and then remove base plate. Note, do not dismantle further than is necessary to replace worn or defective parts.

- (i) Check that the Master Switch and Ignition Switch turn freely without end play or radial slackness. The movement from one position to another, controlled by the cams operating on spring loaded balls, should be definite but without harshness or appreciable slackness.
- (ii) The two solid contacts to terminals 4 and 5, should be free on thin pivots and each have a pressure where in contact of not less than 14 ozs.
- (iii) Check the bedding of the four fixed contacts of the Starter Switch on the moving contact.

Grease all contacts with vaseline and re-assemble switch, check electrical operation by connecting negative terminal to a 12 volt battery, and with a 12 volt lamp in series with the battery positive.

- (i) With Master Switch in OFF position and the Ignition and Starter Switches ON, no light should be obtained by connecting lead to any terminal.

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- (ii) With the Master Switch at P.L. and the other switches on, light should be obtained at No. 5 terminal only.
- (iii) With the Master Switch only in the ON position, light should be obtained from No. 8 terminal only.
- (iv) With Master Switch and Ignition ON, light should be obtained from terminals 2, 6, 8 and 11.
- (v) With Master Switch in S & T position, light should be obtained from terminals 2, 5, 6 and 8. Now link terminals 8 and 2 together and light should be obtained from terminals 2, 6 and 8.
- (vi) With the Ignition OFF and starter button depressed, light should be obtained from terminals 2, 6, 8 and 10.
- (vii) With the Master Switch at H. S & T, light should be obtained from terminals 2, 4, 5, 6 and 8.

HORNS:

The horns are of Lucas manufacture.

Testing the Relay:

Operate the horn push and note if the relay armature moves and the contacts close. If not, there is a fault in the relay itself, or in the wiring. Remove the horn push leads from the relay unit and connect a 12 volt supply across the terminals, if the relay is in order, the contacts will close. It is set to operate at 7 - 8 volts.

Adjustment:

If the contacts are dirty, clean with glass-paper.

When adjusting, disconnect the supply lead from the other horn, also remove the fuse as it is likely to blow.

Adjustment does not alter the pitch of a horn note, but takes up wear of moving parts.

TRAFFICATORS:

The trafficators are of Lucas manufacture.

Servicing:

If the arm is sluggish in rising, apply a drop of thin oil to the catch pin between the arm and operating mechanism, see Fig. M26.

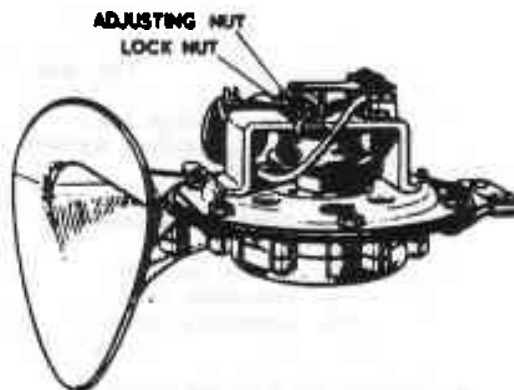


FIG. M25. HORN.



FIG. M26. LUBRICATING CATCH PIN.

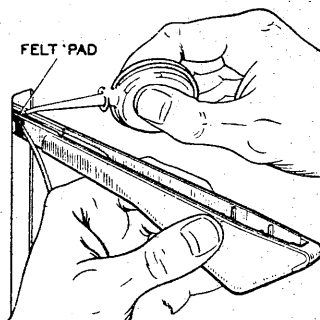


FIG. M27. LUBRICATING FELT PAD.

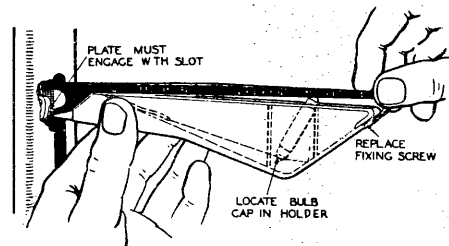


FIG. M28. REPLACING COVER PLATE.

To oil the felt pad in the top of the arm, lubricate the spindle bearing, see Fig. M27. Withdraw the screw on the underside of the arm, slide off the metal cover.

Failure to light up, usually indicates a bulb failure or imperfect contact.

DIRECTION INDICATOR LIGHTS:

The winking light type of direction indicator is fitted to certain export models, and is operated by a flasher unit mounted on the valance plate.

When the signal system is operating properly, the lights flash about 90 times per minute. If either front or rear signal bulb is burned out, the reduced current will increase the flasher speed and the pilot bulb on the fascia board will not light.

A clicking noise in the flasher unit makes an audible signal when the circuit is on, and this is purposely created as an additional warning that the unit is operating correctly.

The signal flasher is a sealed unit and is non-adjustable, and if service is necessary it must be by replacement.

WINDSCREEN WIPERS:

Early cars were fitted with the Houdaille Co's. "Berkshire" wiper. Later, the Lucas single speed wiper was fitted, on current production, the Lucas 2 speed wiper is standard.

It should be noted that the 2 speed wiper motor incorporates a thermostatically controlled cut-out which cuts off the current supply if the wiper is overloaded.

Complaints of wiper motor failure may be due to the normal operation of the cut-out, which may operate if the wiper is run at high speed on dry or partly dry screen.

The thermostat will reset itself if the wiper is switched off and left for 10 - 15 minutes.