6/-

THE PRACTICAL CAR RADIO HANDBOOK

By
F. C. Palmer
M.I.P.R.E.,
A.M.Inst.B.E.

- ★ Full Installation Instructions
- ★ Complete Interference Suppression Data
- ★ Car Aerial Fitting
- ★ Loudspeaker Fitting and Positioning
- ★ More than 200 Different Cars listed with Fitting and Suppression Data
- ★ Elimination of Wheel Static
- ★ Covers Long, Medium, Short and V.H.F. Reception
- ★ Fault Finding

191 BERNARD'S RADIO MANUALS

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LIST OF ILLUSTRATIONS

LIST OF CARS WITH DETAILED INSTRUCTIONS FOR FITTING CAR RADIOS, AERIALS AND LOUDSPEAKERS AND FULL INTERFERENCE SUPPRESSION DATA.

INTRODUCTION

A considerable amount of the strain of driving can be relieved by a properly installed car radio. Unfortunately, this pleasure can be completely spoiled by the presence of various sources of interference. The modern motor car, is a complexed source of electrical equipment, windscreen wiper, dynamo, ignition coil, petrol pumps, electric clock, and oil gauge transmitter, all will contribute to interference pulses in one way or another.

In addition to those electrical instruments given, we have what is called "wheel static" and "brake static", the former is usually termed "rolling static", since it only appears whilst the vehicle is in motion, the latter form of interference, is present when the brakes are applied, hence its name.

Although the book is mainly concerned with the correct remedy for preventing these interferences, other useful information will be given for each particular car. Such as the type of aerial required, and whether there is provision for the installation of a second loudspeaker, or conversely, if the design of the car calls for more than one speaker in the original installation. Furthermore, experience has shown, that whenever the car bonnet opens away from the windscreen, it is wise to mount if possible, the aerial at the off-side rear, in order to prevent "bonnet radiation" from the ignition system, providing of course, the engine is mounted at the front of the car. This source of interference may not show when the car is new, but after the bonnet hinges have a little rust on them, the bonnet is not so effectively earthed as it was previously, and a great deal of time and trouble will be necessary to reduce such interferences. It is essential, that whatever suppression is required for any particular vehicle, to mount the condenser as close to the source of interference as possible.

It is also very essential that after the various suppressors have been fitted, to close down the bonnet of the car before starting up the engine to see if interference is absent or not. No amount of suppression is of any use unless this simple task is done, and is overlooked far more than may be imagined.

Regarding suppressors, various types are employed for certain purposes. When the dynamo condenser is stated, it means a metal clad condenser, with a metal fixing lug, this lug goes to earth via the mounting bolt of the dynamo, or coil, to be suppressed, this applying also to petrol pumps.

When an electric clock, or windscreen wiper is required to be suppressed, we do not use the metal clad condenser with the metal fixing lug. This is because in the former case, the metal of the condenser may result in a short circuit of the ignition system. In such cases, we use a wire-end condenser with mica covered casing, which avoids this risk of short circuits, also in the case of windscreen wipers, the wire-end condenser is much more convenient to fit, and reduces the risk of short circuits. In every case of car radio installation, you MUST AT ALL TIMES DISCONNECT the battery, never forget this golden rule.

The author after several years experience in the installation and repair of car radio receivers, have found that to obtain the maximum sensitivity from car radios to adjust the aerial trimmer on the receiver at a station 200 metres, with only one section of the aerial exposed. Adjust for maximum signal gain, then pull up one or more other aerial sections, the resulting increase of signal strength being apparent. It might be wise at this point to state that some cars have provision made for a specific type of car radio to be fitted. This means that the fixing holes of the receiver will then match with those provided within the radio aperture on the car.

Special kits for various cars are made, which house the speaker, at times as an integral part of the radio receiver fixing. For the remedy of wheel or brake static, a kit of four brushes in metal holders, with full instructions for fitting are made by Smiths Radiomobile London. These are supplied to, and are available from, any Smiths Radiomobile Accredited Dealer, and NOT from S. Smith & Sons (Radiomobile) Ltd.

For those whose work brings them into contact with car radio suppression, it is hoped that this book will enable their work to be a little easier.

I. What is Radio Interference ?

Interference is the term applied to a field, caused by electro-magnetic forces, entering a receiver in waves and causing noises or patterns. Natural discharges in the atmosphere cause "atmospherics" in the same way, interference waves can be caused by making and breaking circuits, or by spark flash-over.

Interference in motor vehicles can be traced to any electrical equipment which, when operated, generates sparks or makes and breaks circuits; for example, spark plugs, ignition distributor, the contacts of regulator and cut-out, and the commutator of a dynamo. In the case of a flash-over at the electrodes of a spark plug or at switch contacts, the transient (travelling) waves thus caused may be spread throughout the entire high and low voltage systems of the vehicle, and be radiated by the wiring as interference waves.

The waves themselves are the result of voltage difference between any two metal masses, which leads naturally to a "charge-compensation". The compensation is effected by a flow of electricity, at the spark gap or in an electrical lead. The flow is not simply in one direction, until the electrical balance has been restored, but changes direction like a pendulum; this electrical activity is known as oscillation. The oscillation generates regular fluctuating voltages, not one fixed frequency, but of a whole frequency mixture. Also, like a pendulum, the initial energy is high, according to the voltage causing it, and dies away as the energy is dissipated.

The waves caused in this way may enter the radio receiver in various ways; through the aerial, through an imperfectly-screened receiver case, or even as conducted interference through the power supply to the receiver. In any particular wave-band, there will be found both transmitter and interference signals. If the transmitter signals are much stronger than those from the source of interference, reception will be good i.e., interference-free. This relationship, of transmitter signal strength to interference signal strength, is known as the transmitter-interference ratio. If, in the short, medium and long wave-bands, this ratio is lower than 30 : 1 (transmitter voltage at the aerial : interference voltage), reception cannot be considered satisfactory.

For ultra-short wave reception, conditions are more favourable, because the interference waves, generally propagated as AM (amplitude modulation), are suppressed to a minimum by the application of FM (frequency modulation) and amplitude limitation.

II. The Sources of Radio Interference in Motor Vehicles

The ignition system constitutes the main source of radio interference. The individual items causing interference are the spark plugs, ignition distributor, (jump-spark), and contact-breaker. The ignition system must be suppressed without fail. The generating system is also a considerable source of interference, the offending parts being the dynamo commutator and the regulator and cut-out contacts.

Other sources of interference are electric motors (windscreen wipers, interior heaters) electric petrol-pumps, and similar electrically-driven mechanisms. Starters, horns, switches and blinkers usually give rise to interference, though their period of operation is so short that it is usually considered unnecessarv to suppress them.

A further cause of radio interference in motor vehicles lies in poor electrical contact between metal parts. An electro-static (voltage) difference between adjacent masses. This heavy electric charge, in balancing itself periodically by flowing between the electrodes of a spark plug. In addition the electrical connections between bonnet (hood), wings, and similar body-parts, are relied upon to provide screening of the engine interference sources, i.e., to absorb such radiated interference harmlessly. If these body-parts are insulated from each other, they can no longer perform this useful function.

An electro-static charge may be built up in the road wheels, chiefly in the undriven ones. This will occur at high speeds, on dry roads and in dry atmospheres, and radio interference is caused by the (not altogether lacking) conduction path between the mass of the wheel and the mass of the vehicle.

Any electrical consumer or generator in which a spark is formed is connected by a lead to another part of the electrical system. If the point at which the spark arises be considered as an **"interference generator"**, then the lead to or from it is the **"interference transmitter aerial"**. Although a certain amount of interference reaches the receiver directly from the "interference generator", the greater source of interference is this "interference transmitter aerial", i.e., the electrical lead. When the actual source of interference (the "generator") has been determined, it can be assumed that all leads connected to it are radiating interference waves (are "transmitter aerials").

III. The Principles of Radio Interference Suppression

Firstly, it is necessary to understand that there are two categories of radio interference encountered in car radios; one is the interference caused by various electrical generators and consumers in the vehicle itself. This interference is the type referred to throughout this book, because it can be suppressed. The other type of interference is that caused by outside sources, such as neon signs, trolley-buses, overhead transmission lines, and other electrical equipment, as well as, of course, non-suppressed radio; **all interference may be suppressed only at its sources.** Now let us consider the four ways of suppressing radio interference :

1. Damping by means of Resistance.

Just as a pendulum can be braked, and thus its period of oscillation considerably reduced, so the oscillations setting up the interference can be damped. This is to swing in water or oil.

The resistance is fitted between the "interference generator" and the "interference transmitter aerial" and damps the oscillations passed to this "transmitter aerial". The reduced frequency thus transmitted by the lead can no longer interfere with radio reception. It is important that the "transmitter aerial" be kept as short as possible; a resistance is therefore fitted as close to the "generator" as practicable. In the case of ignition interference, for example, the resistances are built into the plug caps or even the plugs themselves (BOSCH R-series), and also into the distributor rotor or H.T. lead plug into the distributor cap.

Interference waves from the **leads conducting direct current** can be suppressed by chokes (filters). These chokes offer virtually no resistance to the direct current, but strongly resist the high-frequency altering currents. This resistance to a.c. by the choke reduces the interference oscillations.

2. Alternating-current short-circuit by means of a Capacitor.

These are "interference generators", not only in the sparks of the ignition system, but also where sparks are generated in dynamos and consumers, e.g., motors. To suppress this interference, damping resistances may be used, in the same way as in the ignition system, or chokes with low resistance to direct current, however, normal practice is to short-circuit the interference voltage (a fluctuating voltage) by means of a capacitor.

A capacitor consists of two large areas of metal film, separated from each other by an insulating medium. This insulating medium (usually a paper dielectric) prevents the flow of a direct current between the metal films, which, however, do not offer a resistance to alternating currents. The higher the frequency of the alternating current, the better the a.c. conductivity of the capacitor.

When a capacitor is connected to an "interference generator", e.g., to a commutator, the fluctuating voltage from this "generator" is short-circuited, but the direct voltage is not affected. Unfortunately, it is usually impossible to fit a capacitor at the point where the spark originates, e.g., at the commutator, and it must be connected at the terminal of the motor or dynamo. The terminals carrying interference waves must be "short-circuited" by means of capacitors without conduction-paths. A "normal" suppression capacitor is adequate for long, medium, and short-wave bands, and it is important that the capacitor-lead be kept as short as possible.

A short capacitor-lead is particularly important where high frequencies are encountered, i.e., in the V.H.F. wave-band. In this case, the capacitor-lead possesses a noticeable high frequency resistance (inductive). When suppressing interference in the V.H.F. wave-band, the "short-circuit" efficiency of the capacitor can be considerably offset by capacitor-leads of normal length. This causes the capacitor with its lead to operate as a shunt, while a part of the voltage available at the terminals of the "interference-generator" goes into the main lead, and thus throughout the whole electrical system of the vehicle. From there it is radiated as interference waves.

These difficulties, that arise in using a "normal" capacitor, are serious in short-wave reception and very serious in V.H.F. reception. They may be overcome by using **ultra-short-wave suppression feed-through or by-pass capacitors.** This type of capacitor prevents a voltage-leak to the entire electrical system, because the lead to the capacitor lies in the main current lead. The direct current flows unhindered through the terminal bolts, one of which represents a capacitor-film, or is connected to it. The fluctuating voltage, however, is short-circuited to the opposite pole of the "interference generator" by the opposing capacitor-film. Feed-through or by-pass capacitors are particularly suitable for high frequencies, as the short-circuit operation of this type of capacitor becomes more efficient with increased frequency.

Only with this method of connection and with the feed-through or by-pass capacitor can the high frequency resistance of the capacitor-lead be counteracted, whereas the use of a "normal" capacitor gives rise to difficulties with its feed-lead. Effective **short-**circuit is obtained from **short** leads.

It is most important that the suppressor-capacitor, when used for V.H.F. suppression, is secured to the housing of the "interference-generator", even if the space available makes this difficult.

3. Total Short-circuit by Earthing-strap.

A metal part in the vicinity of a powerful source of interference-wave radiation can be excited by it into oscillation, and eventually radiate interference-waves itself. This is known as secondary radiation. As examples, Bowden cables, thermometer capillaries, and even the bonnet (hood) can be affected by the ignition system. These parts re-radiate the interference-waves to the receiver aerial of the radio.

The interference voltage at the source of secondary radiation can be short-circuited by means of earthing-straps. These straps must be kept as short as possible, particularly in the case of V.H.F. reception.e The vehicle's bodywork, including the bonnet, in the vicinity of the receiver aerial, should also be connected to earth.

4. Screening by means of Metallic Enclosure.

It is known that metal casings offer an effective screen to electrical oscillations (Waves), provided that these casings are closed on all sides. In such cases, it is unimportant whether the electrical radiation is prevented from passing into or out of the casing.

This principle may also be applied to automotive practice; if the ignition system for example, is completely enclosed by a metal screen, the interference waves generated inside the screen cannot be radiated. This form of suppression is very efficient, but very expensive; it is generally applied to vehicles carrying radio-telephones or two-way radio equipment.

It is an advantage that most modern vehicles have metal bodywork and a metal screen around the engine. These already provide a considerable screening effect. How good this effect is, can be ascertained by letting the engine run, switching the radio on, and lifting the bonnet. However, the gap between the bonnet and the bodywork, as well as poor electrical contact between bonnet and body, allow interference-waves to reach the receiver aerial. An earthing-strap will suppress most of this interference.

IV. How to go about Suppressing Radio Interference

A. General.

It is assumed that the electrical system of the vehicle is in order. It is thus important, before beginning radio interference suppression, that all terminals are tight, all leads in good condition, and that there are no loose contacts.

The stages of radio interference suppression are :

1. Spark plugs.
2. Ignition distributor.
3. Ignition coil.
4. Regulator.
5. Dynamo
6. Ancillaries e.g., windscreen wiper, interior heater, small motors.

With each stage accomplished, a check should be made to see whether the suppression is edequate. If not, go on to the next stage. If all the six above stages of suppression have been carried out, and interference is still in evidence, four further stages may be contemplated.

7. Earthing-straps.
8. Improving the layout of the vehicle's electrical leads (separating H.T. and L.T. leads).
9. During electro-static interference.
10. Checking the aerial base for good earth.

In the case of diesel engines, stages 1, 2, 3, and 8 are superflous.

B. Suppression in the long and medium wave-bands

1. Spark plugs.

Where a suppressed rotor is, or can be fitted in the distributor of a battery-ignition system, 1,000-ohm plug-caps are used. Where the rotor is not suppressed, use 10,000-ohm plug-caps.

2. Ignition Distributor.

For distributors use 5,000-ohm suppressor-connectors, connected into all H.T. leads close to the distributor-cap.

Note : vehicle distributors should have a maximum resistance per ignition circuit (i.e. coil to plug) of 10,000-ohms; vehicles with distributors should generally have a maximum resistance 6,000-ohms per ignition circuit for long and medium wave-bands, and 15,000-ohms for short and V.H.F. wave-bands.

It is recommended that, if more than 5,000-ohms per circuit is applied, the plug gap be 0.004" greater than that specified by the vehicle manufacturer.

3. Ignition Coil.

A 3 mfd. suppressor-capacitor is connected to terminal (SW) of the ignition coil.

4 and 5. Dynamo and Regulator.

Dynamos with a rating of up to 450 W maximum may be fitted with a capacitor of no more than 0.5 mfd. at terminal D. A capacitor of greater capacitance will severely damage the regulator (cut-out) contacts. A capacitor may never be fitted to terminal F. Dynamos with attached regulators.

A capacitor of 3 mfd. is connected to terminal + of the regulator. Make sure that there is good electrical connection between the capacitor and dynamo body.

If this suppression is not sufficient a capacitor of 0.5 mfd. should be connected to terminal D of the regulator.

Dynamo with separate (remote) regulator.

If the regulator is unscreened a capacitor of 3 mfd. is connected to terminal +, and also to terminal E, the vehicle has insulated return. Terminal D of the dynamo is fitted with a capacitor of **maximum** 0.5 mfd. If the regulator is mounted at some distance from the dynamo, an improvement in interference suppression will result if an earthing-strap is connected between dynamo and regulator.

6. Ancillaries — small motors.

Windscreen wiper motors, fan motors, heater motors, etc., may be fitted with a 0.5 mfd. capacitor, or if necessary, with a 3 mfd. capacitor, connected to the current input terminal. The capacitor must have good earth connection through its bracket.

Flashers.

Generally the flasher unit is very difficult to suppress, and as it is operated comparatively seldom, it may be considered unnecessary to fit suppression equipment. However, if suppression is required input terminal may be provided with a 3 mfd. capacitor. No capacitor may be connected to the other terminals, as damage to the flasher contacts would result.

7. Earthing-straps.

Earthing-straps are of particular advantage if the engine-block is mounted on the insulators (rubber), and if the battery return-current is not carried by a separate strap. They are useful also if metallic connections are inadequate between engine, chassis radiator, bulkhead and bonnet.

Earthing-strap may be fitted between :

Rear of engine-block and chassis.
Front of engine-block and chassis.
Rear of engine-block and bulkhead.
Front of engine-block and radiator.
Bonnet and bulkhead.

Regulator and dynamo.

It may occur that operating levers, linkages, Bowden cables, pipes and capillaries may carry interference waves into the passenger compartment of the vehicle, through the bulkhead. This may be overcome by connecting earthing-straps between the offending parts and the bulkhead.

8. Separating the leads.

It is important that H.T. and L.T. leads are kept well apart, and that ignition leads are kept as short as possible. This reduces the possibility of radiation transfer from the H.T. and L.T. leads, which are powerful interference-wave transmitters, to the wiring of the vehicle.

9. Electrostatic interference.

High speeds on dry roads may lead to an electrostatic charge of the rubber tyres, due to continual flexing and friction. This electric charge, in balancing itself with the lower voltage in the chassis, make itself apparent as a loud "rustling" in the loudspeaker.

Terminal Markings of all Automobile Electrical Equipment as used by various Manufacturers.

Makers name	Armature	Field	Battery	Charge control lamp	Earth or Insulated return	Polarity
American Bosch (ABC)	Arm	Field	Bat.	—	GND	neg. Earth
Autolight (Ford)	A	F	Bat.	—	GND	neg. Earth
Bosch (early)	D–/61	DF	51 B +	61	31 B – D –	neg. Earth
Bosch (current)	D–/61 A	DF F	B Bat.	61	B – D –	neg. Earth
CAV	D	DF	B	—	—	pos. Earth
Dalco	GEN	Field	Bat.	—	GND	neg. Earth
DKW	1 R	20	1a B	1	M	neg. Earth
Fiat	51	67	30	51	31	neg. Earth
French equipment	DYN	EXC	BAT.	—	Masse	neg. Earth
Lucas	D	F	A	WL	E	pos. Earth

Wheel-contacts, fitted inside the grease-retainer (spindle-cap), provide a good electrical contact between wheel and spindle, better than the contact provided by greasy bearings. This prevents an electrostatic charge from being built up, and thus eliminates the interference from that source Wheel-contacts are generally required only on non-driven wheels.

C. Suppression in the short wave-band.

In the long and medium wave-bands, one is exclusively concerned with amplitude-modulated transmitters while in the V.H.F. wave-band, frequency-modulated transmitters are found. Between these two categories, the short wave transmitter works at a high transmission frequency, while still being amplitude-modulated. This leads to considerable difficulty in interference suppression.

It is possible that a full V.H.F. interference suppression is not sufficient, and that it must be supplemented by special measures. The best procedure is to start with medium wave suppression; if that is not enough, fit V.H.F. suppression material. The short wave-band is a critical band, requiring many earthing-straps.

The ignition system and the regulator set the greatest problem. It is important that earth connections of all capacitors are perfect, and that the earths of the dynamo and regulator are connected.

D. Suppression in the V.H.F. wave-band.

(The interference suppressions described below is also effective in the long, medium and short wave-bands).

1. Spark plugs.

It is recommended that spark-plugs with built-in 5,000-ohm wire-wound resistances be fitted in conjunction with unsuppressed plug-caps. However, if 1,000-ohm plug are already available, they may be retained.

2. Ignition distributor.

The rotor should be replaced by one with a built-in 5,000-ohm resistance. In addition, distributors should be provided with a 1,000-ohm suppressor-connector, in each H.T. lead, as close as possible to the distributor cap. The most efficient form of interference suppression at the distributor is the screening of the distributor cap. See also the previous note concerning the ohmic values of the resistance in the individual ignition circuits.

3. Ignition coil.

Interference suppression is carried out in exactly the same way as for the medium wave-band.

4 and 5. Dynamo and Regulator.

Suppression in the V.H.F. wave-band can, with a few exceptions, be carried out only by the use of feed-through or by-pass capacitors. Thus, if the normal suppression capacitors prove ineffective, these special capacitors must be used.

Dynamos with a rating of up to 450-W. max. may be fitted with a capacitor of no more than 0.5 mfd. at terminal D+. A capacitor of high value will severely damage the regulator (cut-out) contacts. At terminal F of the regulator, only a choke may be connected, or damage to the regulator (voltage and current) contacts will result.

Dynamos with attached regulator.

A special capacitor of 2.5 mfd. is connected to terminal B+ of the regulator. If necessary, a capacitor of maximum 0.5 mfd. is connected to terminal D of the regulator. Make sure that the brackets of the capacitors are well earthed.

Dynamos with separate (remote) regulator, up to 450-W. maximum output.

Terminals B + and D are fitted with 2.5 mfd. and maximum 0.5 mfd. capacitors respectively, as described in the preceding paragraph. In addition, a by-pass capacitor of 0.5 mfd. is connected to terminal D of the dynamo.

If this equipment does not provide sufficient interference suppression, choke is fitted into the lead between terminals F of the regulator and dynamo. (Note the connection : lead with cable-shoe or tag is connected to terminal F of the regulator). An earthing-strap must be provided between the regulator and the dynamo.

Dynamos of over 450-W. maximum output.
The leads between terminals D, F, and E of the dynamo and regulator must be screened with metal braiding. In both cases, the short leads between suppressor and regulator terminal must be screened with metal braiding.

6. Ancillaries — small motors etc.
All small motors such as wiper motors, fan motors and heater motors, are to be fitted with a feed-through capacitor of 0:05 mfd. the lead of which is connected to the input terminal of the motor, and the input (battery) lead connected to the capacitor terminal (series connection).

The capacitor must be fastened directly to the motor, a special bracket being made if necessary. The efficiency of the interference suppression depends entirely on the connection of the casing of the capacitor with the body of the motor.

Heater motors or wiper motors in the vicinity of a sensitive V.H.F. receiver aerial may not be satisfactory suppressed in this way. In this case, two ferrite chokes, are fitted in series into the input and return leads of the motor. A small capacitor is also used. This provides interference suppression in the V.H.F. and short wave-bands, and partly for the medium wave-band. For the long wave-band, the wiper motor may, if necessary be fitted with a parallel capacitor of larger value.

A little experiment may be necessary to determine the capacitor required for each source of interference, such as petrol-gauge transmitters of thermometer contact. All other suppression in the V.H.F. wave-band is carried out in the same way as for the long, medium and short wave-bands.

V. Checking the Effectiveness of the Suppression

When the electrical system has been suppressed, a test of the suppression efficiency is carried out. The vehicle is taken to an interference-free area, outside the town and remote from overhead transmission lines. With the engine switched off, check the operation of the radio and tune the aerial (checking battery voltage if necessary). This test also ensures that the spot chosen is free from interference.

To check for interference from the vehicle, the volume control of the receiver is turned to "full" and the tone control to "high". In the long, medium and short wave-bands (amplitude-modulated bands), the station selector must be set between stations, so that no station is audible.

Start engine.
If loud interference is evident, additional suppression (according to section V A, paragraphs 7-10) is carried out. In particular, the earth connection at the aerial base must be checked.

In the V.H.F. wave-band (the frequency-modulated band), the station selector is set to the middle of a transmission (station). The efficiency of the suppression is then shown in the adjoining bands; the further one can tune to the right and left of the transmission-centre without interference, the better the suppression. This test should be carried out with stations of various strengths, because reception will vary considerably when the vehicle is moving. This variation in reception is caused by the position of the aerial on the vehicle, by the topography of the countryside, by the relative directions of travel and transmission, and by the transmitter field-strength.

For this reason, it is inadvisable to move vehicle during the V.H.F. test, or during the fitting of additional suppression equipment. Even if the vehicle is moved only a few inches, one or other transmitter will be received at a different strength, which could lead to false evaluation of the suppression already carried out.

The sources of interference are ascertained as follows :

1. Ignition — switch the ignition on and off, with engine running.
2. Dynamo — speed up the engine (preferably running downhill), and switch off the ignition. A howling in the loudspeaker, varying with engine speed, can be traced to the commutator.
3. Regulator — tested in the same way as the dynamo. A clicking may be heard, made by the regulator contacts.
4. Ancillary equipment, such as wiper motors, heaters, etc. — tested by switching on and off.
5. Electro-static interference from the wheels — found at over 25 m.p.h. on dry roads and in dry atmospheres; checked by gentle brake application. The interference disappears when the brake-linings touch the drums.

ALFA ROMEO GUILIETTA 1956

AERIAL
A wing aerial is fitted to the drive side front wing.
SPEAKERS
The speaker fits under the rear parcel shelf, remove the spare wheel to give access to loudspeaker mounting area.
SUPPLY
Connect the fuse lead to the accessory terminal in distribution box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Connect a 1 mfd. condenser to generator charging terminal. Earth under generator fixing screw.
(2) Connect a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting screw.
(3) Connect a 5,000-ohm resistor in main H.T. lead as near distributor as practicable.

ASTON MARTIN DB4 SALOON

AERIAL
A wing aerial, mounted on off-side front wing.
SPEAKERS
Provision is made for a rear loudspeaker if required.
SUPPLY
Connect to terminal block on bulkhead, to terminal with purple lead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit 1 mfd. condenser to 'SW' terminal on coil, and earth to coil mounting bolt.
(2) Fit 1 mfd. condenser to dynamo output terminal (thick lead) and earth to dynamo mounting bolt.
(3) Fit 1 mfd. condenser to snap connector of feed to the wiper motor—green lead—and earth to wiper bracket.
(4) Fit 1 mfd. condenser to supply terminal on petrol pump. Earth to bolt retaining earth return to petrol pump.
(5) Fit 1 mfd. condenser to 'D' terminal on regulator box. Earth to wing valance.
If Short Wave Radio is used.
Fit plug suppressor in each plug lead, if not fitted previously.

AUSTIN SEVEN
Saloon and Special De Luxe (850)
Countryman, Van and Pick up (850)
Cooper and Cooper S.

AERIAL
A wing aerial mounted on driver's side front wing is required.
SPEAKERS
On saloon versions, the speaker is fitted below apertures provided in the rear parcel shelf. The speaker on the Countryman, Van, and Pick up, is mounted in the left hand finisher panel, above the front parcel tray.
SUPPLY
Connect fuse lead to A.1 terminal of the regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' lead on the ignition coil, earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output lead, (brown lead with yellow tracer), earth the condenser to dynamo mounting bolt.
(3) Fit a 1 mfd. condenser to petrol pump terminal, earth to petrol mounting bracket.
(4) Fix short lead from wiper motor earth—on casing—earth other end of lead to hole in gusset plate immediately forward of motor.
(5) Resistive type H.T. leads are fitted to the engines of the above vehicles, therefore, plug suppressors cut lead suppressors, etc., must not be fitted, otherwise arching may take place inside the cable.
(6) The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN A.35

AERIAL
A wing aerial mounted on the driver's side is required.
SPEAKERS
A front speaker is required, which is fitted on the parcel shelf.
SUPPLY
Connect fuse lead to A.2 terminal on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo main output terminal (yellow lead). Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil (white lead). Earth to coil mounting bolt.
(3) The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN A.40 Mk. II SALOON & COUNTRYMAN

AERIAL
The aerial is fitted on the windscreen scuttle, on the passenger's side of car.
SPEAKERS
A front speaker is required which fits in the grille provided in the centre of the facia roll top.
SUPPLY
Connect fuse lead to spare male blade on rear of ignition switch, (brown lead with blue tracer).
SUPPRESSION
(1) Fit a 1 mfd. condenser to dynamo main output terminal (brown lead with yellow tracer). Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil, (white lead). Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to petrol pump (white lead). This may be located to the right hand side of the spare wheel in the luggage compartment. Earth to bolt, on petrol pump mounting bracket.

AUSTIN A.55 SERIES II

AERIAL
A rear aerial is required, and is fitted to off-side rear, where provision is made.
SPEAKERS
A front speaker fitted under the radio unit, provision is made for a rear speaker.
SUPPLY
Connect fuse lead to spare male blade on A.1 terminal.

SUPPRESSION

The ignition and condenser leads must be kept as short as possible. It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output lead, earth to dynamo mounting bolt.

(2) Fit a 1 mfd. condenser to the 'SW' terminal of ignition coil. Earth to coil fixing bolt.

(3) Fit a 1 mfd. condenser to petrol pump. Earth to nearest bolt.

(4) If Short Wave Radio, fit plug suppressors.

(5) The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN A.60 SALOON and COUNTRYMAN

AERIAL

A rear aerial is fitted to off-side rear, an access hole is provided through skin.

SPEAKERS

A front speaker is required which fits in the grille provided in the centre of the facia roll top. Provision is made for a rear speaker.

SUPPLY

Connect fuse lead to spare male terminal on A.1 terminal.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output terminal (brown lead with yellow tracer). Earth to coil mounting bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil (white lead). Earth to coil mounting bolt.

(3) Fit a 1 mfd. condenser to petrol pump (white lead). Earth to nearest bolt.

AUSTIN A.99

AERIAL

A wing aerial is fitted to front off-side wing.

SPEAKERS

A front speaker is required, at the top of facia roll top, in the apertures provided. Provision is made for a rear speaker.

SUPPLY

Connect fuse lead to brown lead with blue tracer at the snap connector which is provided behind the centre of facia panel.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to the 'SW' terminal on ignition coil. Earth to coil mounting bolt.

(2) Fit a 1 mfd. condenser to dynamo output terminal (yellow lead). Earth to dynamo mounting bolt.

(3) Fit a 1 mfd. condenser to the supply lead (white lead) on one of the two petrol pumps. Earth to pump mounting bracket.

(4) **If Short Wave Radio.**

(5) Fit two 1 mfd. condensers to dynamo output terminal. Earth to dynamo mounting bolt.

(6) Fit a plug suppressor to each plug.

(7) Fit a bonding strip between lower front exhaust pipe clip, and adjacent cage nut in chassis.

AUSTIN A.110

AERIAL

A wing aerial is fitted to passenger's side front wing.

SPEAKERS

A front speaker is required, fitted to the underside of the grille provided in the centre of the roll top above facia. Provision is made for a rear speaker.

SUPPLY

Connect fuse lead to brown lead with blue tracer at the snap connector which is provided behind the centre of facia panel.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to the 'SW' (white lead) terminal on ignition coil. Earth to dynamo rear mounting bolt.

(2) Fit a 1 mfd. condenser to the dynamo output terminal (brown lead with yellow tracer). Earth to dynamo rear mounting bolt.

(3) Fit a 1 mfd. condenser to supply lead of petrol pump (white lead). Earth to pump mounting bracket.

(4) The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN 1100

AERIAL

A wing aerial is fitted to off-side front wing.

SPEAKERS

A front speaker is required and is fitted to the facia roll top from under. Provision is made for a rear speaker.

SUPPLY

Connect fuse lead to the brown lead with white tracer, at the snap connector alongside the radio position.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to 'SW' terminal of ignition coil (white lead). Earth to coil mounting bolt.

(2) Fit a 1 mfd. condenser to the output terminal of dynamo. Earth to dynamo fixing bolt.

(3) Fit a 1 mfd. condenser to petrol pump, white lead. Earth to pump mounting bolt.

(4) This vehicle is fitted with suppressed ignition cables. Any attempt to cut and fit plug suppressors will result in failure of the cables.

AUSTIN WESTMINSTER

AERIAL

A wing aerial is fitted on front off-side wing.

SPEAKERS

A front speaker is fitted below instrument switches (dash board).

SUPPLY

Connect fuse lead to A.1 terminal on control box.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output lead (thick lead). Earth to dynamo fixing bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth to coil mounting bolt.

(3) The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN HEALEY SPRITE

AERIAL
A wing aerial, mounted on near-side front.
SPEAKERS
Front loudspeaker only.
SUPPLY
Connect to A.1 terminal on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.
(2) Fit 1 mfd. condenser to large terminal on the dynamo. Earth to dynamo rear mounting bolt. The distributor incorporates a built-in resistor in the main H.T. lead.

AUSTIN HEALEY SPRITE Mk. III

AERIAL
A wing aerial is mounted on the windscreen scuttle on the left hand side of the vehicle.
SPEAKERS
A front speaker is required, which fits around the radio.
SUPPLY
Connect fuse lead to the brown lead from the wiring harness, at the snap connector which is behind the ignition switch.
SUPPRESSION
It is vital to clean to bare metal, at all points where an earth connection is made.
(1) Fit a 1 mfd. codenser to the 'SW' terminal on ignition coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to the output terminal on the dynamo (large terminal). Earth to dynamo fixing bolt.

AUSTIN HEALEY 3000 BN7 & BT7

AERIAL
A wing aerial, mounted on left hand side.
SPEAKERS
Front loudspeaker only.
SUPPLY
Connect to A.2 terminal on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit 1 mfd. condenser to dynamo output terminal (large terminal) earth to dynamo mounting bolt.
(2) Fit 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.
(3) Fit 1 mfd. condenser to petrol pump. Earth to pump mounting bolt.
(4) Fit plug suppressors, if Short Wave Radio. A built-in resistor is incorporated in the H.T. lead.

AUSTIN HEALEY 3000 Mk. III B.J.8

AERIAL
A wing aerial mounted in the wing on the left hand side of the vehicle.
SPEAKERS
A front speaker is required, which is fitted around the radio.
SUPPLY
Connect fuse lead to brown lead with snap connector, behind speaker grille.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on the ignition coil (white lead). Earth to coil mounting bracket.
(2) Fit a 1 mfd. condenser to the large output terminal of the dynamo (brown lead with yellow tracer). Earth to dynamo fixing bolt.
(3) Fit a 1 mfd. condenser to the petrol pump this is located underneath the body inboard of the right hand rear wheel. Earth condenser under the bolt head to which pump earth wire is connected.
(4) N.B. Ensure that the condenser and its connecting wire are positioned so that they cannot be fouled by adjacent hand brake cable which is flexed vertically by axle.

B.M.W. "ISETTA"

AERIAL
A wing type aerial is mounted on the near-side nacelle, or, alternatively, a side mounting aerial may be mounted on the door.
SPEAKERS
The speaker fits within the fibre door board trim, adjacent to the instrument panel.
SUPPLY
Connect the fuse lead to the live terminal block below the instrument panel.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the charging terminal of generator. Earth under adjacent screw.
(2) Fit a 1 mfd. condenser to the "switch" terminal of ignition coil. Earth to coil mounting bracket.
(3) Fit a 1 mfd. condenser across windscreen wiper motor supply terminals.
(4) Fit a 5,000-ohm resistor in the main H.T. lead, as near to coil as possible.

BORGWARD ISABELLA

AERIAL
The aerial is mounted in the drive side wing.
SPEAKERS
The speaker is mounted below the grille in the dash top.
SUPPLY
Connect the fuse lead to accessory terminal (No. 54) on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 5,000-ohm resistor in the main lead as near the distributor as possible.
(2) Fit a 1 mfd. condenser to D + terminal on generator. Earth under earthing screw on case.
(3) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil bracket screw.
(4) If Short Wave Receiver. Fit a nipple and plug suppressor to each plug.

CITROEN DS.19 BRITISH 1960

AERIAL
A wing aerial is fitted to drive side front wing. It is necessary to remove the wing for this purpose, and also for engine maintenance.
SPEAKERS
The speaker is fitted to the rear parcel shelf, and it will be required to use the speaker as template.

SUPPLY
Connect the fuse lead to terminal post found behind clock position on bulkhead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Remove clock from dash, and fit a 1 mfd. condenser to supply terminals. Replace and re-connect clock.
(2) Fit a 1 mfd. condenser to the 'SW' terminal on coil. Earth to coil mounting bracket.
(3) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo mounting bracket.

CITROEN DS.19 1960 FRENCH

AERIAL
A wing aerial is fitted to the drive side front wing. It is necessary to remove wing for this purpose, and also for engine maintenance.
SPEAKERS
The speaker is mounted below centre dash. A rear speaker may be fitted to rear parcel shelf using speaker as a template.
SUPPLY
Connect the fuse lead to terminal post found behind the glove box near centre line of car.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to dynamo output terminal, on the control box. Earth under mounting bracket.
(3) If Short wave Receiver, fit plug suppressors.
WARNING: This vehicle has NEGATIVE CHASSIS.

CITROEN ID.19 BRITISH 1960

AERIAL
The aerial is mounted on the drive side wing. The wing is removable for engine maintenance, and is necessary to fit aerial with the wing removed.
SPEAKERS
The speaker is fitted on the rear parcel shelf. No provision is made for this, and it will be necessary to use speaker holes as template, and cut away the metal tray area, within the limits of the four fixing holes of the speaker.
SUPPLY
Connect fuse lead to terminal post which will be found behind clock position on bulkhead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to adjacent screw.
(3) If Short Wave Radio, fit a plug suppressor to each plug.

DAIMLER 2½ Litre V8 SALOON

AERIAL
The aerial is fitted to the drive side wing.
SPEAKERS
The speaker is fitted to finisher panel under the radio aperture, which is also part of the finisher panel. Provision is made for rear loudspeaker fitting.
SUPPLY
Locate wiring loom behind ammeter, and remove tape securing brown lead terminated with "Lucar" type connector. Connect this lead to 14 amp "Lucar" type blade on the amp-meter. Locate brown L.T. lead which is terminated with a snap connector below rear of newspaper tray, and connect fuse lead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.
(3) Fit a 0.25 mfd. condenser to oil gauge transmitter. Earth to suitable bolt on the engine block near the transmitter.

DAIMLER DART

AERIAL
The aerial is fitted to top of rear wing, as far back as possible.
SPEAKERS
The front speaker is mounted on the front of the battery box on passenger's side.
SUPPLY
Connect fuse lead to live point on fuse block.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bracket.
(3) Fit POLYFOIL, which can be readily purchased anywhere. Affix with PLIOBOND to cover the underside of the bonnet lid. With length of braid, bond bonnet lid from left-hand hinge to the earthing braid of the battery.

DAIMLER S.P.250 (Standard Gear Box)

AERIAL
The aerial is mounted on the rear valance next to the drive side tail lamp housing.
SPEAKERS
The speaker is mounted with the radio unit in an assembly mounted on the gear box tunnel, forward of the gear lever.
SUPPLY
Connect fuse lead to negative terminal on the battery.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
Note: This is a fibreglass body, therefore a special suppression kit is required. This consists of metal covers to screen the plugs.
(1) Fit bond under the ignition coil bracket together with a 1 mfd. condenser, and connect lead to 'SW' terminal on coil.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo bracket.
(3) Fit a 1 mfd. condenser to A.4 terminal. Earth to coil with bond, and earth other end of bond to forward plug screen wing nut.
(4) Fit a 1 mfd. condenser to fuel pump. Earth to pump body.

DAIMLER MAJESTIC & MAJESTIC MAJOR

AERIAL
The aerial is fitted on the drive side front wing.
SPEAKERS
The front speaker is mounted under the passenger's side bulkhead shelf. Provision for rear speaker on rear parcel shelf.
SUPPLY
Connect the fuse lead to the A.4 terminal on fuse block.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to coil bracket.
(3) Fit plug suppressors.

D.K.W. JUNIOR

AERIAL
The aerial is fitted to drive side scuttle top.
SPEAKERS
The speaker is fitted in existing centre dash position.
SUPPLY
Connect the fuse lead to spare live terminal at rear of lighting switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to ganged "switch" terminals of ignition coils. Earth under coil bracket.
(2) Fit a 1 mfd. condenser to main terminal of the generator. Earth under generator earth screw.
(3) If Short Wave Receiver. Fit a plug suppressor to each lead.

DODGE SERIES 410 CAB 12 VOLT

AERIAL
The aerial is fitted to the drive side wing.
SPEAKERS
A front speaker is required, and is fitted to underside of loudspeaker aperture which is situated centrally in the top facia roll.
SUPPLY
Connect fuse lead to auxillary position on fuse junction box, situated on left hand side scuttle panel.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to the 'B' terminal of the voltage regulator. Earth under the regulator fixing bolt.

FIAT 600

AERIAL
The aerial is mounted in the drive side scuttle.
SPEAKERS
The speaker is mounted under the passenger's side dash.
SUPPLY
Connect the fuse lead to distribution box under dash. Disconnect heavy red cable from terminal No. 30, strip insulation behind nipple, and solder supply lead to this point. Insulate joint.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bracket.
(2) Fit a 1 mfd. condenser to generator charging terminal. Earth to bracket bolt.
(3) Connect a suppressor in main H.T. lead, 5,000-ohms. As near distributor as possible.
(4) If Short Wave Receiver. Fit a plug suppressor in each lead, as near to plug as possible.

FIAT 1100 1956

AERIAL
The aerial is fitted to drive side scuttle top.
SPEAKERS
The speaker is mounted against bulkhead to near side of heater unit.
SUPPLY
Connect fuse lead to accessory terminal on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to charging terminal of generator. Earth under adjacent fixing screw.
(3) Fit a 5,000-ohm resistor in main H.T. lead.
(4) If Short Wave Receiver. It may be necessary to fit a 12,500-ohm resistor in each plug lead.

FIAT 1300, 1500

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The speaker fits on bulkhead on passenger's side, as high up as possible.
SUPPLY
Connect fuse lead to fuse box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bracket.
(3) Fit suppressor resistors to main H.T. lead, 5,000-ohms, and 12,500-ohms to plugs.

FIAT 1800/2100 1961 NEGATIVE EARTH

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
A front speaker is required, and fits in the grille provided.
SUPPLY
Connect fuse lead to fuse box and connect to spare positive terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to ignition coil 'SW' terminal. Earth to coil mounting bracket.

FIAT 1800, 2100, 2300 1961 NEGATIVE CHASSIS

AERIAL
The aerial fits on drive side wing.
SPEAKERS
The speaker fits in grille in the dash top.
SUPPLY
Connect fuse lead to fuse box, and connect to spare positive terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bracket.

FORD TAUNUS 17M. 1960

AERIAL
The aerial is fitted to the drive side wing.
SPEAKERS
The loudspeaker is mounted under the grille provided in the dash top.
SUPPLY
Connect fuse lead to ignition switch accessory terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to generator output terminal. Earth to earthing screw.
(3) If Short Wave Receiver. Fit a 1 mfd. condenser to temperature transmitter on forward engine block. Earth to thermostat mounting bolt.
(4) Fit a 1 mfd. condenser to B + terminal on control box. Earth to mounting bracket.

FORD ANGLIA DE LUXE 1960

AERIAL
The aerial is mounted on the passenger's side front wing.
SPEAKERS
The loudspeaker is mounted under the centre of the parcel tray.
SUPPLY
Connect the fuse lead to A.1 terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil bracket.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bracket.
(3) If Short Wave Receiver. Fit plug suppressors.

FORD PREFECT & ANGLIA DE LUXE & SQUIRE 1958/9

AERIAL
The aerial is mounted on the passenger's side scuttle.
SPEAKERS
The speaker is fitted behind the grille in the centre facia.
SUPPLY
Connect the fuse lead to control box to A.1 terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil bracket.

FORD ANGLIA 1960/61

AERIAL
The aerial is fitted to passenger's side front wing.
SPEAKERS
The speaker is fitted below front parcel tray.
SUPPLY
Connect fuse lead to A.1 terminal on the control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bracket.

FORD CONSUL CLASSIC 315 & CAPRI

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The speaker is mounted under the grille provided in the top of the facia.
SUPPLY
Connect the fuse lead to ignition switch terminal No. 4 on LUCAS, to ACC on A. C. DELCO.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil bracket.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth under mounting bolt.

FORD CONSUL, CONSUL 375, ZEPHYR & ZODIAC 1959/61

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
A front speaker is required, fitting behind the centre facia panel. Rear speaker provision.
SUPPLY
Connect fuse lead to terminal on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to mounting bracket.

FORD CORSAIR

AERIAL
A wing aerial fitted to drive side front wing is required.
SPEAKERS
A front speaker is fitted to parcel shelf under radio unit. Provision for rear speaker is made on parcel shelf.
SUPPLY
Connect fuse lead to blade on ignition switch (which is linked to another blade occupied by a blue lead).

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to large terminal on dynamo. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth to coil mounting bracket.
(3) Fit a 1 mfd. condenser to instrument supply regulator, which is plugged into back of the speedometer. Connect to blade marked 'B' and earth condenser under left hand fixing screw of instrument. Ensure that condenser leads cannot be trapped by movement of heater operating levers, and that levers do not foul capacitor body.

FORD CORTINA LOTUS SALOON, FORD CORTINA SALOON & ESTATE CAR 1962, 1963 & 1964, STANDARD & DE LUXE CORTINA G.T.

AERIAL
A wing aerial fitted to the drive side front wing is required.
SPEAKERS
SALOON ONLY : The speaker is fitted on the rear parcel shelf where provision is made. **ESTATE ONLY :** The speaker is fitted to the left hand side rear luggage compartment trim board. Use the speaker holes as a template. Cut away within the speaker fixing holes.
SUPPLY
Connect fuse lead to spare blade on rear of ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal (thick lead). Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of the ignition coil. Earth to coil fixing bolt.
(3) N.B. These vehicles are fitted with SUPPRESSOR CABLES in the ignition H.T. circuit. These cables must not be cut or plug suppressors fitted, otherwise ignition failure will result.
(4) Connect a 1 mfd. condenser to the instrument voltage stabiliser, which is mounted to the rear of the speedometer. The connection must be made ONLY to the 'B' terminal which is marked on the paxolin panel, and has the white leads connected to it. Earth to adjacent screw on facia strut.

FORD ZODIAC Mk. III 1962/3/4

AERIAL
A wing aerial fitted to drive side of front wing is required.
SPEAKERS
A front speaker provision is found in the centre facia roll top. A rear speaker provision is also present.
SUPPLY
Connect fuse lead to spare accessory terminal on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth under adjacent screw.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth under mounting bolt.
(3) Fit a 1 mfd. condenser to the red lead with black tracer, on the electric clock. Earth to terminal on clock.
(4) Fit a 1 mfd. condenser to the 'B' terminal on the electric instrument supply regulator. Earth under adjacent screw.
(5) N.B. This vehicle is fitted with suppressed cables in the H.T. ignition circuit. Any attempt to cut and fit plug suppressors, will result in failure of the leads.

FORD ZEPHYR 4 Mk. III 1962-64
FORD ZEPHYR 6 Mk. III 1962-64

AERIAL
A wing aerial fitted to drive side front wing is required.
SPEAKERS
A front speaker is required which is fitted to provision provided in centre facia roll top, above radio aperture. Rear provision.
SUPPLY
Connect fuse lead to spare accessory terminal on the ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth under adjacent screw.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth under mounting bracket bolt.
(3) N.B. This vehicle is fitted with suppressed cables in the H.T. ignition circuit. Any attempt to cut and fit plug suppressors, will result in failure of the leads.

FORD THAMES 10/12 and 15 Cwt. VAN & PICK UP

AERIAL
The aerial is fitted to passenger side scuttle.
SPEAKERS
A front speaker is fitted in passenger's side facia, using speaker as template for marking off. Cut area within the limits of speaker fixing holes.
SUPPLY
Connect fuse lead to A.1 terminal on Control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to mounting bracket.

FORD CUSTOMLINE 1956, FORD FAIRLANE

AERIAL
The aerial is mounted on drive side wing.
SPEAKERS
The speaker fits under grille provided on dash top.
SUPPLY
Connect the fuse lead to accessory terminal on the ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to generator charging terminal. Earth to adjacent fixing screw.

(3) Remove the battery connection to the small instrument voltage regulator—situated above and behind instruments—and connect battery lead choke in this lead.

(4) Connect a short lead to each of the ends of 25 mfd. condenser, and connect + ve end of condenser together with lead just removed, to battery lead terminal on instrument voltage regulator. Connect – ve lead of condenser to adjacent earth screw on panel.

HEINKEL CABIN CRUISER 1956

AERIAL

A wing aerial is fitted to the drive side headlamp 'blister'.

SPEAKERS

The speaker is fitted in the existing speaker position.

SUPPLY

Connect the fuse lead to live terminal on lighting switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Cut the H.T. lead, and insert a 5,000-ohm resistor in this lead as near the plug as possible.

(2) Fit a 1 mfd. condenser to the 'SW' terminal of the ignition coil. Earth to coil bracket.

(3) Connect a bond across engine mountings.

HILLMAN IMP

AERIAL

A wing aerial is fitted to drive side. This has a "double skin" and an "ENOX" CUTTER is required for this operation.

SPEAKERS

The speaker is fitted to drive side rear quarter trim panel.

SUPPLY

Connect fuse lead to spare 14 amp 'LUCAR' type blade on ignition switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

(2) Connect a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.

HILLMAN MINX DE LUXE SERIES III

AERIAL

A wing aerial is fitted to the left hand side of front wing.

SPEAKERS

The speaker is fitted on extreme right hand side of parcel shelf below steering wheel. Provision is made for rear speaker.

SUPPLY

Connect fuse lead to accessory terminal at rear of ignition switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.

HILLMAN SUPER MINX II

AERIAL

The aerial is mounted on left hand front wing.

SPEAKERS

A front speaker fits into the bracket provided in grille, top centre facia roll. Rear speaker position is provided.

SUPPLY

Connect fuse lead to spare 14 amp 'LUCAR' type blade on ignition switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to 'SW' terminal on ignition coil. Earth between the coil bracket, and the engine bracket, to which coil is secured.

(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

HILLMAN MINX SERIES III
(A, B & C) SALOON & CONVERTIBLE

AERIAL

A wing aerial is fitted to left hand side of front wing.

SPEAKERS

Provision is made for a front speaker assembly, which is positioned between the steering column surround, and side scuttle. Provision is made for a rear speaker on parcel shelf.

SUPPLY

Connect fuse lead to terminal No. 4 of ignition switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

N.B. No attempt should be made to suppress the dynamos on 'EASIDRIVE' models as these are suppressed at the factory.

(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.

HILLMAN MINX SERIES V
HILLMAN HUSKY SERIES V

AERIAL

The aerial is fitted to left hand side front wing.

SPEAKERS

The speaker fits between steering column and side scuttle. Provision is made for rear speaker on parcel shelf.

SUPPLY

Connect fuse lead to spare 'LUCAR' type blade on ignition switch.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

NEW HUMBER HAWK & NEW HUMBER SUPER SNIPE 1959 MODEL (SALOON, LIMOUSINE & ESTATE CAR)

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The speaker fits into aperture above centre facia, a speaker grille is provided. A rear speaker may be fitted to rear parcel shelf, using speaker as template. Cut a suitable size hole through metal tray within the limits of speaker fixing holes.
SUPPLY
Connect fuse lead to No. 4 terminal of combined ignition and starter switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to mounting bolt.
(2) Fit a 1 mfd. condenser to terminal 'SW' of the ignition coil. Earth to coil mounting bracket.

HUMBER HAWK SERIES II & HUMBER SUPER SNIPE SERIES III

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The speaker fits into aperture above centre facia, a speaker grille is provided. A rear speaker may be fitted to rear parcel shelf, using speaker as template. Cut a suitable size hole through metal tray within the limits of speaker fixing holes.
SUPPLY
Connect fuse lead to terminal No. 4, of combined ignition and starter switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to bolt securing dynamo.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bracket.

HUMBER SUPER SNIPE IV HUMBER HAWK III

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The speaker fits into aperture above centre facia, a speaker grille is provided. A rear speaker may be fitted to rear parcel shelf, using speaker as template. Cut a suitable size hole through metal tray, within the limits of speaker fixing holes.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to bolt securing the dynamo mounting bracket.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of ignition coil. Earth to coil mounting bracket.
(3) Fit a 1 mfd. condenser to supply terminal of the clock. Earth to clock retaining bracket. Ensure live lead of condenser is insulated from possible short-circuit.

HUMBER SCEPTRE

AERIAL
A wing aerial is fitted on the drive side of front wing.
SPEAKERS
The front loudspeaker is fitted under the grille, which is situated centrally on the top facia roll. The rear speaker is mounted centrally under the rear parcel shelf.
SUPPLY
Connect fuse lead to spare 'LUCAR' type blade on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) If an electric clock is fitted. Connect a 1 mfd. condenser to live terminal of supply. Earth to clock retaining bracket.

JAGUAR Mk. VII, Mk. VIII, Mk. IX

AERIAL
The aerial is mounted on the drive side.
SPEAKERS
The speaker is fitted beneath the under scuttle casing on the left hand side of the car.
SUPPLY
Connect fuse lead to negative terminal of ammeter.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo assembly bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth under coil fixing bolt.

JAGUAR MARK X SALOON

AERIAL
The aerial is fitted on the drive side wing.
SPEAKERS
The front speaker fits into the provision provided on the right hand side of radio unit. Rear loudspeaker provision, with leads all wired. They may be identified by white clear plastic covering.
SUPPLY
Connect fuse lead to spare blade on ammeter.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(3) Fit a 0.25 mfd. condenser to oil gauge transmitter. Earth to suitable sump bolt.

JAGUAR 2.4, 3.4 & 3.8 LITRE Mk. 2 SALOON

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The speaker is fitted behind the bezel and grille provided in the front finisher panel.

SUPPLY
Connect fuse lead to brown lead terminated with snap connector, situated below rear of centre newspaper tray. Locate wiring loom behind the ammeter, and remove tape securing brown lead terminated with 'LUCAR' type connector. Connect lead to 14 amp. 'LUCAR' type blade on ammeter.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.
(3) Fit a 1 mfd. condenser to supply on petrol pump. Earth to pump fixing bolt.
(4) Fit a 0.25 mfd. condenser to oil gauge transmitter. Earth to suitable sump bolt.
(5) Fit a 1 mfd. condenser to the battery feed at clock. Earth to the inner scuttle panel behind the centre instrument panel.

JAGUAR 3.4S & 3.8S

AERIAL
The aerial is fitted on drive side front wing.
SPEAKERS
The speaker is fitted to grille provided on left hand side of radio unit facia.
SUPPLY
Connect fuse lead to feed side (brown lead) of fuse panel, No. 7, located on bulkhead behind the centre instrument panel.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth under coil fixing screw.
(3) Fit a 1 mfd. condenser to each petrol pump feed. Earth under pump fixing bolt.
(4) Fit 0.25 mfd. condenser to oil pressure indicator transmitter. Earth under suitable filter fixing bolt.

JAGUAR 'E' TYPE G.T. MODEL-FIXED HEAD COUPE

AERIAL
A wing aerial is fitted to drive side front wing.
SPEAKERS
The speakers fit on either side of radio unit in the provision provided.
SUPPLY
Connect fuse lead to spare 14 amp 'LUCAR' type blade on ammeter.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to bolt securing the stay bracket for the front wheel valance plate.
(3) Fit a 0.25 mfd. condenser to oil gauge transmitter. Earth under suitable sump bolt.
(4) Connect a 1 mfd. condenser to live feed of clock. Earth to bottom bolt securing the steering column bracket to bulkhead.

JAGUAR 'E' TYPE GRAND TOURING MODEL FIXED HEAD & OPEN TWO-SEATER

AERIAL
A wing aerial is fitted on the drive side scuttle panel.
SPEAKERS
Two speakers fit on either side of radio unit, in the provision provided, and must be connected so that they operate in anti-phase.
SUPPLY
Connect fuse lead to spare 14 amp. 'LUCAR' type blade on ammeter.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Connect a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to bolt securing the stay bracket for front wheel valance plate.
(3) Fit a 0.25 mfd. condenser to oil gauge transmitter. Earth to suitable bolt on sump.

JENSEN

AERIAL
The aerial is fitted on the rear wing on driver's side.
SPEAKERS
The speaker is fitted on the rear parcel shelf.
SUPPLY
Connect the fuse lead to live terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo bracket.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bracket.
(3) Fit plug suppressors if not already fitted.
(4) Use POLYFOIL, which can be purchased anywhere, affix with PLIOBOND, to cover half the inside of bonnet over the plugs, distributor, etc., taking an earthing strip from the rear end of the POLYFOIL material to the nearest point on the chassis.
(5) It may be necessary to bond the twin exhaust pipes at the bend, to the chassis.

M.G.A. SPORTS & COUPE & TWIN-CAM

AERIAL
The aerial is mounted in the drive side wing.
SPEAKERS
The speaker is mounted behind the aperture provided in the centre of the facia.
SUPPLY
Connect the fuse lead to A.2 terminal on the control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil bracket.
(3) Fit a 1 mfd. condenser to 'A' terminal on the control box. Earth to nearest point.

M.G.B.

AERIAL
The aerial is fitted to drive side front wing.

SPEAKERS
The speaker fits in front of gear lever, in provision provided.

SUPPLY
Connect fuse lead to brown lead from wiring harness at the snap connector, which is provided behind the centre of the facia panel.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Connect a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Connect a 1 mfd. condenser to dynamo output terminal (brown lead with yellow tracer). Earth to dynamo mounting bolt.
(3) Connect a 1 mfd. condenser to petrol pump (white lead). This unit may be located on the chassis, near to the right hand wheel underneath the car. Earth to pump mounting bracket.

M.G. MAGNETTE Mk. IV

AERIAL
The aerial may be fitted to drive side front wing, or, rear mounting at right hand side boot surround.

SPEAKERS
A front speaker fits below the radio unit in the housing provided. Provision made for rear speaker mounting.

SUPPLY
Connect fuse lead to spare male blade on A.1 terminal.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo mounting bolt.
(3) Fit a 1 mfd. condenser to supply lead of the electric clock. Earth to clock retaining bracket.

M.G. MIDGET

AERIAL
The aerial is fitted on the windscreen scuttle on the passenger's side of the car.

SPEAKERS
The speaker is fitted to the vertical bulkhead, centrally below the facia.

SUPPLY
Connect fuse lead to spare male blade A.1 terminal on regulator box.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) The distributor incorporates a built-in resistor in the main H.T. lead.

M.G. 1100

AERIAL
The aerial is mounted on drive side front wing.

SPEAKERS
The front speaker is fitted below the grille provided in the top centre of the facia panel. Provision is made on rear parcel shelf for rear speaker.

SUPPLY
Connect fuse lead to purple lead of wiring harness at the snap connector behind right hand end of facia panel using four-way connector.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to petrol pump. Earth to pump mounting bracket.
(4) The distributor incorporates a built-in resistor in the main H.T. lead.

MERCEDES BENZ 180, 180D, 190 SALOON, 219, 220A, 220S, 1957

AERIAL
The aerial is mounted on drive side wing.

SPEAKERS
The speaker is fitted under radio unit, above, and behind blanking panel.

SUPPLY
Connect the fuse lead to terminals marked 30 on rear of lighting switch.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to output terminal of generator. Earth to adjacent fixing screws.
(3) Fit a bond between O/S bonnet stay — using existing hole in stay bracket, and adjacent wing/valance fixing screw.
(4) Insert resistor 5,000-ohm in main H.T. lead as near distributor as possible.

MERCEDES BENZ 220S & S.E. 1960

AERIAL
A wing aerial is fitted to drive side wing.

SPEAKERS
The speaker is fitted under dash lining board vertical surface—above transmission tunnel. A rear speaker may be fitted to rear parcel shelf.

SUPPLY
Connect fuse lead to fuse No. 3 on firewall mounted fuse block adjacent to left hand kick panel.

SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to adjacent fixing screw.
(2) Fit a 1 mfd. condenser to output terminal of the generator. Earth to adjacent fixing screw.
(3) Remove centre bolt securing hinge adjacent to aerial. Clean to bare metal the surfaces around bolt hole. Replace bolt, attach bond, and replace nut and washer. Drill a 0.137″ diameter hole (No. 30 drill) in top valance, and secure bonding to valance, using No. 8 drive screw and washer.

MERCEDES BENZ 300 & 300B 1955

AERIAL
The aerial is mounted on drive side wing.
SPEAKERS
The speaker fits below the centre dash. A rear speaker may be fitted to rear parcel shelf.
SUPPLY
Connect fuse lead to terminal No. 51 on regulator box.
SUPPRESSION
No suppression is necessary.

MORRIS COOPER AND COOPER S. MORRIS MINI-MINOR SALOON & TRAVELLER

AERIAL
The aerial is mounted on the passenger's side front wing.
SPEAKERS
Saloon: The speaker is fitted to the rear parcel shelf where provision is provided. **Traveller:** The speaker is mounted in the left hand trim finisher panel, above front parcel tray.
SUPPLY
Connect fuse lead to spare male blade on the regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to supply lead on petrol pump. Earth to pump mounting bracket.
(4) Fit earthing lead to small cheese head screw on terminal end plate (motor body) of the windscreen wiper motor. Earth other end of lead to hole provided in gusset plate forward of wiper motor.
(5) The distributor incorporates a built-in resistor in the main H.T. lead.

MORRIS MINOR 1,000 SALOON TOURER & TRAVELLER

AERIAL
The aerial is mounted in the wing drive side.
SPEAKERS
The speaker is fitted on parcel tray against scuttle trim panel, on passenger's side of car.
SUPPLY
Connect fuse lead to A.1 terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to petrol pump. Earth to pump mounting bracket.
(4) The distributor incorporates a built-in resistor in the main H.T. lead.

MORRIS OXFORD SERIES V & VI SALOON & TRAVELLER

AERIAL
The aerial may be fitted to either side front wing. Or to the rear, right hand side boot surround.
SPEAKERS
A front speaker mounts behind the grille that is provided in the centre facia with the radio unit immediately below in the aperture provided. Provision for rear speaker mounting.
SUPPLY
Connect fuse lead to spare male blade on A.1 terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to supply terminal of clock. Earth to clock retaining bracket.
(4) If necessary, fit plug suppressors.

MORRIS 1100

AERIAL
The aerial is fitted on the drive side front wing.
SPEAKERS
The front speaker is fitted below the grille provided in the top centre of the facia panel. A rear speaker may be fitted below apertures provided in the centre of the rear parcel shelf.
SUPPLY
Connect fuse lead to purple lead of wiring harness, at the snap connector behind right hand end of facia panel, using four-way connector.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to petrol pump. Earth to pump mounting bracket.
(4) The distributor incorporates a built-in resistor in the main H.T. lead.

PEUGEOT 403 1958

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The speaker fits above the radio unit behind the grille provided in centre of dash.
SUPPLY
Connect fuse lead to accessory terminal control on three-terminal block behind dash.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to charging terminal of generator. Earth under adjacent fixing screw.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth under coil fixing screw.
(3) Insert a 5,000-ohm resistor in main H.T. lead as near distributor as possible.

PEUGEOT 404

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The speaker is mounted under the centre rear parcel shelf.
SUPPLY
Connect the fuse lead to terminal block on kick panel, and connect to post with No. 13 leads.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'BAT' terminal on coil. Earth under coil bracket screw.
(2) Fit a 1 mfd. condenser to generator output terminal. Earth under coil bracket screw.
(3) Connect a resistor 5,000-ohm in H.T. lead as near distributor as possible.
(4) If Short Wave Receiver. Fit plug suppressors as near plug as possible.

PORSCHE 1,500, 1,600 1956

AERIAL
The aerial is mounted on drive side wing.
SPEAKERS
The speaker is fitted behind the kick panel trim on near side. Use speaker as template.
SUPPLY
Connect the fuse lead to distribution block on bulkhead under near side of dash.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to charging terminal of generator. Earth to adjacent screw.

PORSCHE COUPE, HARD TOP & CABRIOLET

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The speaker is mounted in the recess provided in the near side kick panel.
SUPPLY
Connect the fuse lead to terminal No. 2 on distribution block under dash.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bracket.
(2) Fit a 1 mfd. condenser to charging terminal of the generator. Earth to adjacent screw.

RENAULT 750cc. 1956

AERIAL
The aerial is fitted on the drive side wing.
SPEAKERS
The speaker is mounted over an aperture cut in the bulkhead on drive side.
SUPPLY
Connect the fuse lead to live terminal at rear of lighting switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to charging terminal of generator. Earth to generator fixing screw.

RENAULT DAUPHINE

AERIAL
The aerial is fitted to drive side wing.
SPEAKERS
The speaker is mounted under dash below radio unit position, and to the right on firewall.
SUPPLY
Connect the fuse lead to accessory terminal at rear of ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 5,000-ohm resistor in main H.T. lead.
(2) Fit a 1 mfd. condenser to generator charging terminal. Earth under adjacent fixing screw.
(3) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth under coil fixing screw.
(4) If Short Wave Receiver. Remove existing plug adaptors, and connect plug suppressors to each lead.

RILEY 1.5

AERIAL
The aerial may be fitted to either side of front wing.
SPEAKERS
The speaker fits behind dash facia where provision is provided.
SUPPLY
Connect fuse lead to A.2 terminal on the regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) The distributor incorporates a built-in resistor in the main H.T. lead.

RILEY 4/Sixty-Eight

AERIAL
The aerial is fitted on right hand side boot surround, rear. Provision is made for fitting.
SPEAKERS
The front speaker is fitted in the housing provided on the centre of the front parcel tray. Provision is made for rear speaker.
SUPPLY
Connect fuse lead to spare male blade on A.1 terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(3) The distributor incorporates a built-in resistor in the main H.T. lead.
(4) If Short Wave Radio. Fit plug suppressors.

RILEY 4/Seventy-Two

AERIAL
The aerial may be fitted to drive side front wing, or rear mounting at right hand side boot surround.
SPEAKERS
A front speaker fits below the radio unit in the housing provided. Provision made for rear speaker mounting.

SUPPLY
Connect fuse lead to spare male blade on A.1 terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to output terminal of dynamo. Earth to dynamo mounting bolt.
(3) Fit a 1 mfd. condenser to supply lead of the electric clock. Earth to clock retaining bracket.

RILEY ELF Mk. I & Mk. II

AERIAL
The aerial is mounted in the passenger's side, front wing.
SPEAKERS
The speaker is fitted to rear parcel shelf in the provision provided.
SUPPLY
Connect fuse lead to A.1 terminal on the regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.
(2) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo mounting bolt.
(3) Fit an earth lead from earth screw of wiper motor body, and earth other end to gusset plate immediately forward of wiper motor, where a hole is provided.
(4) The distributor incorporates a built-in resistor in the main H.T. lead.

ROVER 80, 100, 1960

AERIAL
A roof aerial is fitted to the header panel.
SPEAKERS
The front speaker fits to the face plate assembly, which also forms part of the radio unit housing. Provision for rear speaker fitting.
SUPPLY
Connect the fuse lead to fuse box assembly near terminal strip.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of the coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to 'A.1' on fuse box. Earth under P.K. screw securing the terminal block to bulkhead.

ROVER 95 & 110

AERIAL
A roof aerial is fitted to the header panel.
SPEAKERS
The front speaker fits to the face plate assembly, which also forms part of the radio unit housing. Provision for rear speaker fitting.
SUPPLY
Connect fuse lead to spare 14 amp. 'LUCAR' type blade on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.
(3) Fit a 1 mfd. condenser to supply connection of main petrol pump. Earth to fixing bolt of petrol pump support bracket.

ROVER 3 LITRE SALOON & COUPE 1963

AERIAL
A roof aerial is fitted to the header panel.
SPEAKERS
The front speaker fits to the radio unit housing, after removal of glove box, rear speaker.
SUPPLY
Connect the fuse lead to the spare 14 amp. 'LUCAR' type connection on the ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the output terminal of the dynamo. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of the coil. Earth to coil mounting bolt.
(3) Fit a 1 mfd. condenser to supply connection of main tank petrol pump. Earth to fixing bolt of petrol pumps' support bracket.
(4) Fit a 1 mfd. condenser to the 14 amp. 'LUCAR' type blade on oil pressure gauge. Earth under the top right hand adjacent bolt.

ROVER 2,000 SALOON

AERIAL
A roof aerial is fitted to the header panel.
SPEAKERS
The front speaker fits below the radio unit where provision is made.
SUPPLY
Connect the fuse lead to the accessory terminal of the ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the output terminal of the dynamo. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil mounting bolt.

LAND ROVER

AERIAL
The aerial is fitted to drive side windscreen support bracket, with special holder required.
SPEAKERS
The front speaker fits to the front parcel shelf.
SUPPLY
Connect the fuse lead to terminal 'B', or A.1 on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(3) Fit a bond across the drive side bonnet hinge.

SAAB

AERIAL
The aerial is fitted to drive side wing.
SPEAKERS
The speaker is mounted in centre of rear parcel shelf.
SUPPLY
Connect fuse lead to live terminal on fuse block.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to charging terminal of generator. Earth to fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil bracket.
(3) Wheel static removers must be fitted to the rear hubs. Remove rear hub caps, and insert the static removers in the hub caps. Bend the legs to ensure firm contact between the end of the stub axle, and the hub cap.
(4) Fit H.T. suppressor in main lead as near to the distributor cap as possible (5,000-ohm.).

SIMCA ARONDE, ELYSEE, ETOILE, MONTLHERY, GRAND LARGE, MONACO & CHATELAINE 1959/60

AERIAL
The aerial is fitted to drive side of wing front.
SPEAKERS
The speaker is fitted in passenger's side kick panel trim board. Use speaker as a template for the fixing holes.
SUPPLY
Connect the fuse lead to terminal IV on rear of the ignition switch if BRITISH. If FRENCH: Locate red lead on terminal panel (rear of fuse box) on left hand side of firewall in saloon. (1) Remove cable from block and cut cable 2" from end. (2) Bare both ends for ½", and solder to each, nipple. (3) Pass power supply lead to the above location, and using adaptor, inter-connect the three nipples.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Insert a 5,000-ohms resistor in main H.T. lead, as near distributor as possible.
(3) Fit a 1 mfd. condenser to generator output terminal. Earth under adjacent screw.
(4) If Short Wave, connect a plug suppressor in each plug lead. **Note:** The above models are built in both Britain and France. All French built models have NEGATIVE ground electrical systems. British built models from type A chassis No. 1104821K50 have positive ground electrical systems.

SINGER GAZELLE SERIES III

AERIAL
The aerial is fitted to the left hand front wing.
SPEAKERS
The front speaker fits in the area of the parcel shelf between steering column and side scuttle.
SUPPLY
Connect fuse lead to No. 4 terminal of ignition and combined starter switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(3) If clock fitted, connect a 1 mfd. condenser to lead of clock. Earth to clock retaining bracket.
(4) 'EASIDRIVE' fitted cars have generator suppression fitted at factory, and the generator should not be interfered with.

SINGER GAZELLE SERIES V

AERIAL
The aerial is fitted to the left hand wing.
SPEAKERS
The front speaker fits in the area of parcel tray between steering column and side scuttle. There is provision for rear speaker mounting.
SUPPLY
Connect fuse lead to spare 'LUCAR' type blade on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

SINGER VOGUE

AERIAL
The aerial fits to the left hand side front wing.
SPEAKERS
The front speaker fits below grille provided on top facia roll.
SUPPLY
Connect the fuse lead to No. 4 terminal on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bolt.
(3) 'EASIDRIVE' fitted cars have generators suppressed at factory. Therefore the generator should not be interfered with.

SINGER VOGUE II

AERIAL
A wing aerial fits to the left hand side front wing.
SPEAKERS
The front speaker fits below the grille provided in the top facia roll.
SUPPLY
Connect fuse lead to spare 14 amp. 'LUCAR' type blade on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth between the coil bracket, and engine fixing bracket.
(3) Fit a 1 mfd. condenser to the 'B' terminal on the voltage regulator. Earth under regulator fixing bolt.

STANDARD ATLAS VAN & PICK UP

AERIAL
The aerial is fitted on drive side wing.
SPEAKERS
The front speaker fits on the parcel tray.
SUPPLY
Connect the fuse lead to light switch, and use the (brown/blue wire) terminal.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output lead. Earth to fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(3) If Short Wave Receiver. Fit plug suppressors.
(4) Do not fit plug suppressors where resistive ignition cables are used.

STANDARD EIGHT & TEN

AERIAL
The aerial is mounted on the front drive side wing.
SPEAKERS
The speaker is mounted with the radio control unit as an assembly on the front parcel shelf.
SUPPLY
Connect the fuse lead to the A.1 terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bolt.

STANDARD ENSIGN

AERIAL
The aerial fits on the drive side wing.
SPEAKERS
The speaker fits on the front parcel shelf.
SUPPLY
Connect the fuse lead to the A.1 terminal on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil fixing bolt.
(3) Fit a 1 mfd. condenser to A.1 terminal. Earth to bulkhead.

STANDARD PENNANT

AERIAL
The aerial is mounted on the drive side wing.
SPEAKERS
The front speaker is mounted on the control or radio unit, behind the grille provided in the centre facia.
SUPPLY
Connect the fuse lead to the A.1 terminal on regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to mounting bracket.

STANDARD VANGUARD Mk. III

AERIAL
The aerial is mounted on the right hand side front wing.
SPEAKERS
The speaker fits behind the aperture left after removal of the glove box, centre of dash. The radio unit also fits into this space.
SUPPLY
Connect fuse lead to A.1 terminal on the regulator box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of the coil. Earth to coil fixing bolt.
(3) Fit a 1 mfd. condenser to A.1 terminal on control box. Earth to bulkhead.

SUNBEAM ALPINE SERIES II

AERIAL
The aerial fits to the left hand wing.
SPEAKERS
The front speaker fits into a special housing with the radio unit under the instrument panel centre.
SUPPLY
Connect fuse lead to spare accessory terminal of ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bolt.
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to adjacent fixing screw.

SUNBEAM ALPINE SERIES III

AERIAL
The aerial is fitted to scuttle panel on left hand side.
SPEAKERS
The front speaker fits to a special housing which also contains the radio unit, under instrument panel.
SUPPLY
Connect fuse lead to spare blade on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to adjacent bolt near dynamo.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

SUNBEAM RAPIER SERIES III

AERIAL
The aerial is mounted on the left hand side wing.
SPEAKERS
The front speaker fits to parcel shelf between steering column and side scuttle panel. Provision for rear speaker mounting.
SUPPLY
Connect fuse lead to No. 4 terminal of combined ignition and starter switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

TRIUMPH SPITFIRE 4

AERIAL
The aerial is fitted on drive side front wing.
SPEAKERS
The speaker is fitted to parcel tray front, on the left hand side.
SUPPLY
Connect fuse lead to spare accessory terminal on ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bolt.

TRIUMPH SPORTS 1959

AERIAL
The aerial fits on drive side wing.
SPEAKERS
The speaker fits with the radio unit housing on the gear box housing.
SUPPLY
Connect the fuse lead to the A.1 terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bracket.
(3) Fit a 1 mfd. condenser across the windscreen wiper motor terminals.

TRIUMPH VITESSE & HERALD SALOON, CONVERTIBLE, ESTATE CAR & COUPE

AERIAL
A rear aerial may be mounted on the right hand side above the luggage compartment lid on the Saloon and Coupe, but on the right side tail fin on the Estate car.
SPEAKERS
The front speaker fits centrally under the dash with the receiver unit housing above.
SUPPLY
Connect the fuse lead to the A.1 terminal on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil mounting bolt.

TRIUMPH 2,000

AERIAL
The aerial is best fitted to rear right hand side wing.
SPEAKERS
The speaker fits with radio unit in the front glove box, which is removed. Provision for rear speaker fixing on rear parcel shelf extreme right or left of shelf.
SUPPLY
Connect fuse lead to spare blade on the ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bolt.

VANDEN PLAS PRINCESS 3 LITRE 1960

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The front speaker is fitted to the parcel tray near the steering column. Provision is made for rear loudspeaker fitting on rear parcel shelf.
SUPPLY
Connect the fuse lead to brown lead with blue tracer at the snap connector which is provided behind the centre of facia panel.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(2) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo mounting bolt.
(3) Fit a 1 mfd. condenser to the supply terminal of the petrol pump. Earth to pump mounting bracket.

NEW VAUXHALL VICTOR STANDARD, SUPER, DE LUXE, VX4/90 & ESTATE CAR

AERIAL
The aerial is fitted to the drive side wing.
SPEAKERS
SALOON: Provision is made for the speaker to be fitted on the rear parcel shelf. **ESTATE:** The speaker fits to the rear quarter trim panel board.
SUPPLY
Connect the fuse lead to fuse box to terminal on saloon side of bulkhead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

VAUXHALL CRESTA & VELOX 1963

AERIAL
The aerial fits to drive side front wing.
SPEAKERS
Provision is made for speaker to be fitted at rear parcel shelf.
SUPPLY
Connect the fuse lead to spare terminal of fuse block (No. 1 terminal) at top of bulkhead on drive side.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.

VAUXHALL CRESTA & VELOX

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The speaker is fitted to rear parcel shelf where provision is made.
SUPPLY
Connect the fuse lead to snap connector (green/white lead) at rear of ignition switch.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil fixing bolt.

VAUXHALL VIVA STANDARD & DE LUXE SALOON

AERIAL
The aerial is mounted on the drive side front wing.
SPEAKERS
The speaker fits to a location provided in the rear parcel shelf.
SUPPLY
Connect the fuse lead to No. 1 (forward connection) situated under right hand facia.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output lead. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to the 'SW' terminal of the coil. Earth to coil mounting bracket.
(3) **N.B.:** This vehicle is normally fitted with suppressed ignition cables. In such cases, do not fit suppressor plugs.

VOLKSWAGEN SALOON 1958-60 STANDARD AND DE LUXE

AERIAL
The aerial is fitted on the drive side scuttle and an angle type aerial is required with 90° movement.
SPEAKERS
The speaker fits behind dash in the grille provided.
SUPPLY
Connect fuse to live side of "Radio' fuse in fuse block behind dash.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing screw.
(2) Fit a 1 mfd. condenser to generator output terminal. Earth to adjacent fixing screw.
(3) If Short Wave Radio. Connect a 5,000-ohm resistor in the main H.T. lead as near distributor as possible.
(4) If necessary, fit plug suppressors to each plug lead.

VOLKSWAGEN KARMANN-GHIA 1958

AERIAL
The aerial fits on drive side front wing.
SPEAKERS
The speaker fits under the grille provided in top facia roll.
SUPPLY
Connect the fuse lead to live side of fuse marked 'Radio' in fuse block under dash.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to charging terminal of generator. Earth under adjacent fixing screw.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth under coil fixing screw.
(3) Fit a 5,000-ohm resistor in main H.T. lead as near distributor as possible.

VOLVO 122S 1960

AERIAL
The aerial fits on the drive side front wing.
SPEAKERS
The speaker fits behind the grille provided in the dash, above near side parcel shelf. A rear speaker may be fitted to rear parcel shelf.
SUPPLY
Connect the fuse lead to ignition switch terminal carrying thin RED lead.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to generator main terminal. Earth under generator earthing screw.
(2) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil bracket.
(3) Remove distributor cover, pull off rotor arm, and replace by special suppressed rotor arm provided in installation kit. **PS.** The Author did not find this last step necessary, as the rotor arm was not then available, but no interference resulted.

WOLSELEY 1,500

AERIAL
The aerial is mounted on the drive side front wing.
SPEAKERS
The speaker is fitted behind the grille provided in the centre of dash above radio unit position.
SUPPLY
Connect the fuse lead to A.2 on control box.
SUPPRESSION
It is vital to clean to bare metal at all points where an earth connection is made.
(1) Fit a 1 mfd. condenser to the dynamo output terminal. Earth to dynamo fixing bolt.
(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil fixing bolt.
(3) The distributor incorporates a built-in resistor in the H.T. lead.
(4) If Short Wave Receiver. Fit plug suppressors to plug leads.

WOLSELEY 16/60

AERIAL
The aerial is fitted to drive side front wing.
SPEAKERS
The front speaker fits into provision provided below radio unit facia. Provision for rear speaker on rear parcel shelf.
SUPPLY
Connect the fuse lead to A.1 terminal on control box.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bolt.

(2) Fit a 1 mfd. condenser to 'SW' terminal of coil. Earth to coil mounting bolt.

(3) Fit a 1 mfd. condenser to supply terminal of electric clock. Earth to clock retaining bracket.

WOLSELEY 6/99, 110

AERIAL

The aerial is fitted to passenger's side front wing.

SPEAKERS

The front speaker fits into aperture provided in the centre of the facia roll-top. Provision is made for rear speaker mounting on rear parcel shelf.

SUPPLY

Connect the fuse lead to terminal on rear of cigar lighter.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to the 'SW' terminal of coil. Earth to coil mounting bracket.

(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo fixing bolt.

(3) Fit a 1 mfd. condenser to the supply terminal of one of the two petrol pumps. Earth to pump bracket.

WOLSELEY HORNET Mk. I & Mk. II.

AERIAL

The aerial is mounted on the passenger's side front wing.

SPEAKERS

The speaker is fitted to the rear parcel shelf from within the boot, where provision is provided.

SUPPLY

Connect the fuse lead to spare male blade on back of ignition switch. If heater prevents this, then connect fuse lead to A.1 terminal on regulator box.

SUPPRESSION

It is vital to clean to bare metal at all points where an earth connection is made.

(1) Fit a 1 mfd. condenser to 'SW' terminal on coil. Earth to coil mounting bolt.

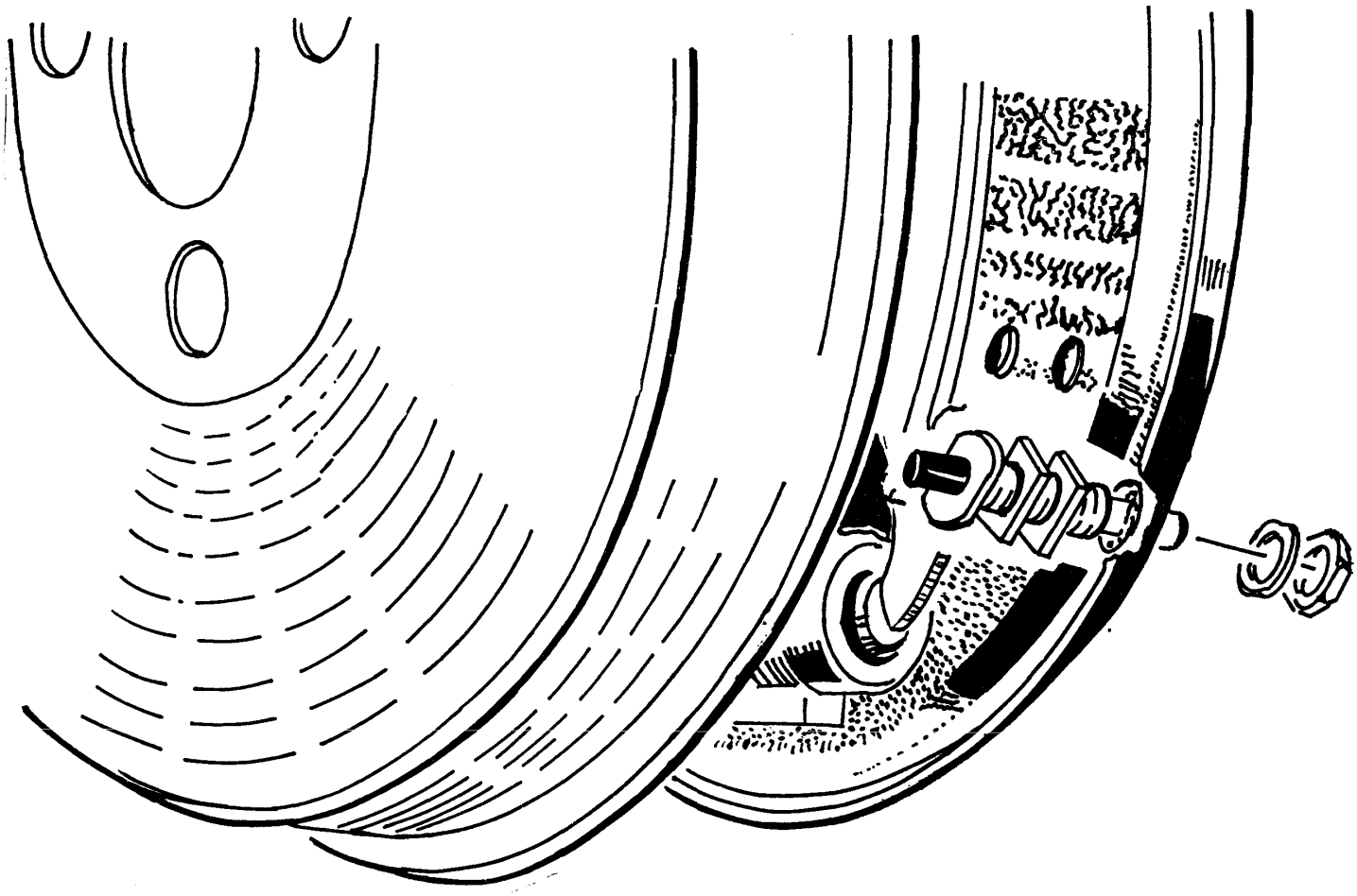
(2) Fit a 1 mfd. condenser to dynamo output terminal. Earth to dynamo mounting bolt.

(3) Fit a 1 mfd. condenser to white lead (supply lead) on petrol pump. Earth to pump mounting bracket.

(4) Connect a short lead from cheese head screw on the terminal of wiper motor. Earth other end to gusset plate immediately forward of wiper motor where a hole is provided.

N.B.: Resistive type H.T. leads are fitted to the above vehicles. Therefore, plug suppressors must not be fitted, otherwise arching may take place inside the cable.

ELIMINATING ROLLING STATIC OF WHEELS AND BRAKE DRUMS

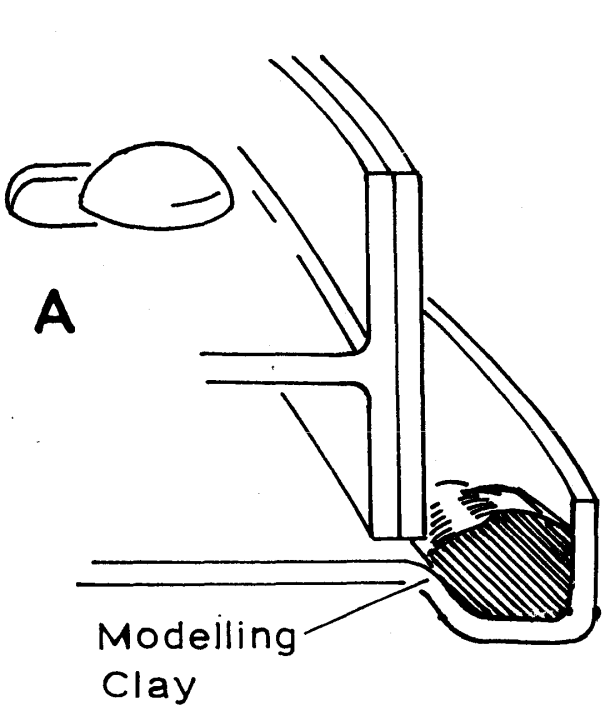


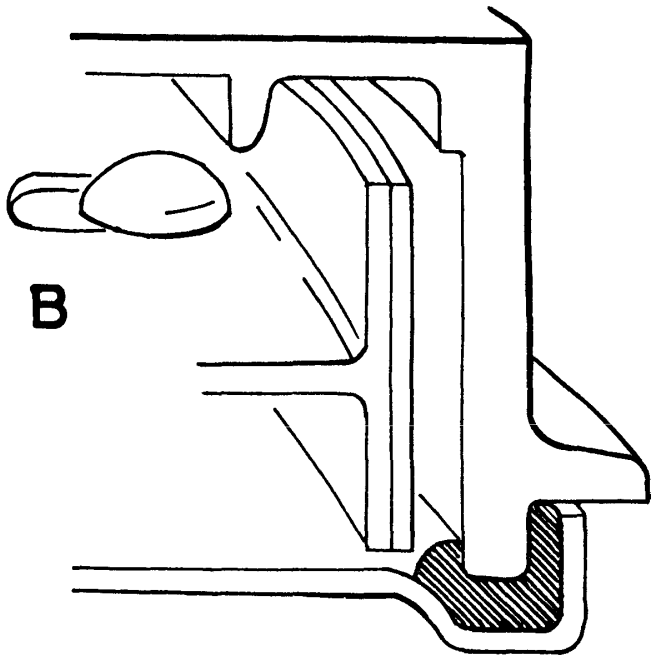
CAUTION

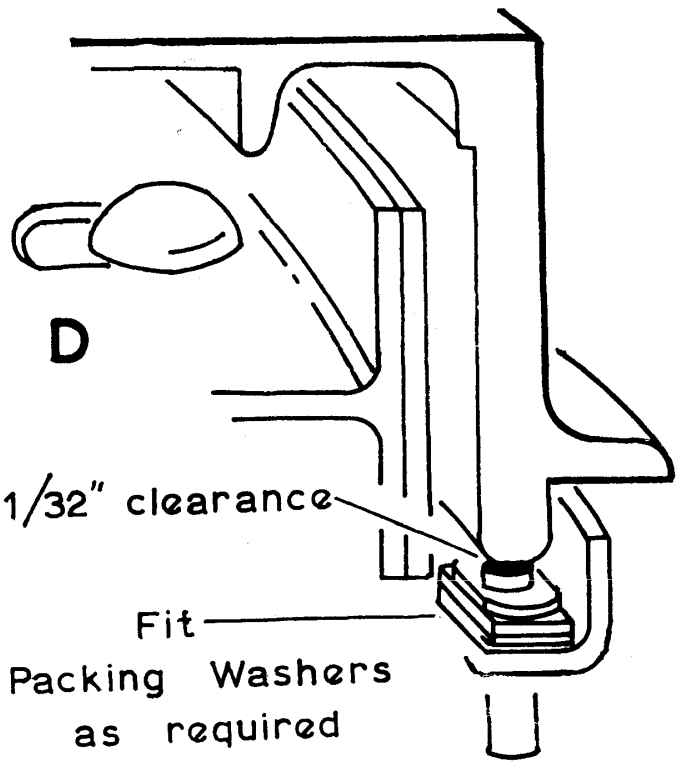
We strongly urge the close collaboration of a skilled motor mechanic in the dismantling and re-assembly of wheels and brake drums.

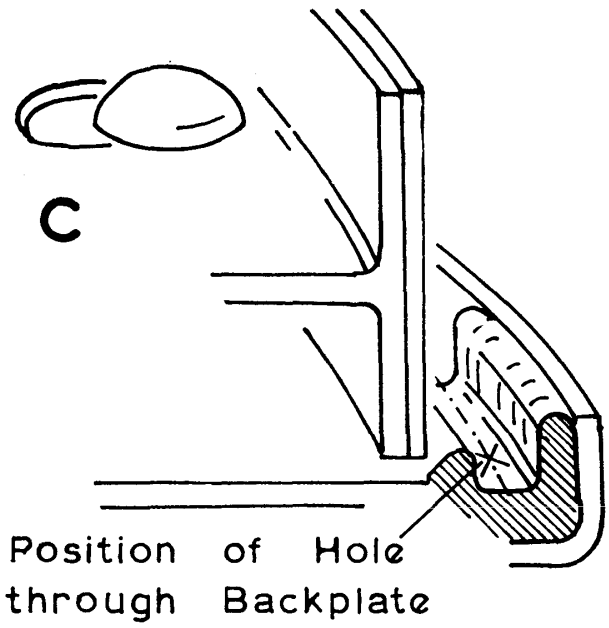
1. Remove wheels and drums at front and/or rear of vehicle as necessary.

2. Carefully decide mounting position of brush assembly. In many cases a suitable location will be found on either side of back-plate bottom centre, as in illustration. (Never fit at bottom centre). Ensure adequate clearance when wheel is at full lock and under all conditions of suspension.









NOTE

In certain cases, there may be residual interference which can be treated by means of a bond connected between back-plate and chassis. One end of the bond may be attached to brush assembly and the other end to the nearest convenient point to chassis. Ensure that both ends of attachment are cleaned to bare metal. Bond material should be woven copper braid, ¼" to 1" wide.

3. Press modelling clay into back-plate recess at mounting position and temporarily replace brake drum to make impression in modelling clay. See Fig. A and B.

4. Remove drum and drill $\frac{5}{16}$" hole in back-plate. Hole should register with centre of brake drum flange. See Fig. C.

5. Clean area around hole and blow out all swarf, etc. To prevent rust, apply smear of petroleum jelly around front and rear faces of hole.

6. Fit assembly as shown in Fig. D. Rectangular packing washers, as supplied, should be fitted to allow 1/32" (approx.) clearance between front face of brush holder and brake drum. See also NOTE overleaf.

7. Smooth-off the face of drum flange, employing fine-cut file **large enough to file flat across diameter of flange.** Finish with fine emery cloth wrapped around file.
   If this is not done, brush wear will be excessive.

8. Thoroughly clean brake drum and replace.

LOUDSPEAKER INSTALLATIONS FOR CARS

For the guidance of those not familiar with speaker installation in motor vehicles, some useful points will be given, since if a mistake is made, it might prove costly to remedy.

It will have been noted that some cars are provided with the choice of having two speakers. One is fitted in the front, near the radio unit, whilst the other is fitted to the rear parcel shelf, where the larger dimensions give an excellent rear speaker baffle.

Now where it is stated that provision for a rear speaker exists in a particular car this means that, (a) the metal shelf have been cut for a certain size speaker, (b) that holes are provided for the speaker fixing, and (c) holes are also for the fitting of the loudspeaker bezel.

The bezel may feed through the parcel shelf, through the speaker fixing holes in the metal shelf, and then through the speaker holes, where it is held in position by B.A. nuts.

On the other hand, the speaker may be fitted to the holes provided in the parcel shelf (metal tray), and fixed to them by P.K. screws etc., whilst the speaker bezel, fits around the speaker in holes provided in the metal tray for this purpose.

It is to be noted then, that the speaker is held in its position, by the bezel, or by other means such as stated.

Within the car, on the rear parcel shelf, there will not be any signs of speaker provision given. This is because the owner may not wish to fit an additional speaker.

Some cars have provision for certain type of speakers, and care must be given to this point, since this will make the fitting of the second speaker much more quicker, and neat, so taking advantage of the facilities provided.

Should there not be any such provision for a second speaker on the rear parcel shelf, one may still be fitted.

Taking care that the parcel shelf is not "DOUBLE SKIN", a suitable speaker may be offered to the under side of the shelf to note if it is possible for the speaker to be fitted.

It will be seen if there is, (a) space enough, (b) if the speaker is not too large for the space available, and (c) to note that if a speaker is fitted in a certain position, it will not be damaged by luggage, or tools etc.

Returning to within the car again, on the rear parcel shelf, it will be apparent that a start must be made in some way.

A hole must be cut in the leather cover of the shelf, and it is at this stage, that extreme care must be taken.

The hole must NEVER be larger then the bezel which must cover it, for neatness, and for protection of the speaker cone.

To give some idea of the work involved, three drawings are given, which will illustrate the principles required.

Figure (a) shows an elliptical speaker, with a rectangular bezel ABCD. Whilst the speaker aperture may be cut to the size of the speaker cone in the metal shelf, the top of the shelf which may be hardboard covered with leather, is cut just a little smaller than the bezel, to allow for shrinkage.

The dotted lines indicate where the hole should appear, and it will be seen that this is well covered by the bezel after it has been fitted. Therefore as a first step, before cutting any of the top parcel shelf, to note where the bezel fixing holes are.

It does not matter if they assist in the speaker fixing or not, locate the holes, and with a fine screwdriver or sharp needle, push from under the metal shelf (within the boot) so that holes appear through the leather which covers the shelf on top.

This then, is the limit, which may be cut from the top of the shelf, and as previously stated, to cut the square or rectangle a ¼ of an inch within the bezel fixing holes, also through the hardboard underneath.

This first step is of course obvious, since only the bezel will be seen on top of the parcel shelf, it is clear that we cannot have any unsightly gaps around it showing.

Figure (b) shows a round speaker, with a square bezel, ABCD. Again cut to the size of the square bezel, or a ¼ inch just inside the bezel fixing holes.

Figure (c) shows a round speaker with a rectangular bezel ABCD. It will once again be seen that the first step to avoid any mistakes, will be to locate the bezel fixing holes—or where they are going to be in the event of no provision being made — and thus carry on from there. Of course, do not fit the speaker until the desired size hole has been cut, or it may become damaged.

Our next step is to wire up the front and rear speakers, so that we may have the following system of operations.

We can have (a) either the front speaker only, or (b) the rear speaker only, or (c) we can share the signal between the two speakers. A circuit diagram is given, the value of the speaker control is 25 to 50 ohms.

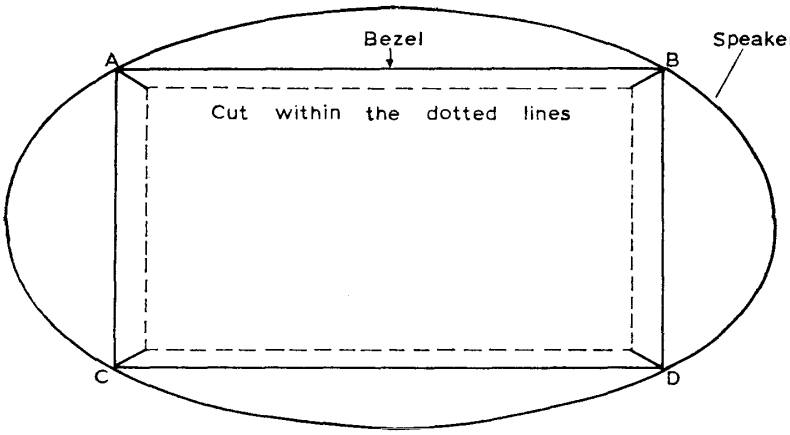


Fig. (A)

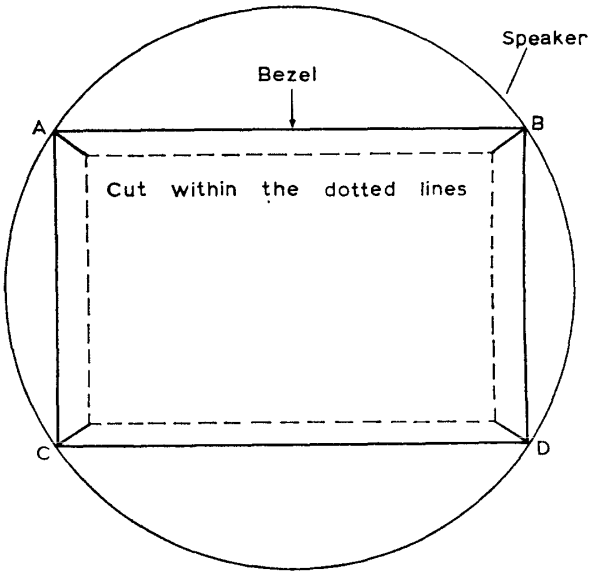


Fig. (C)

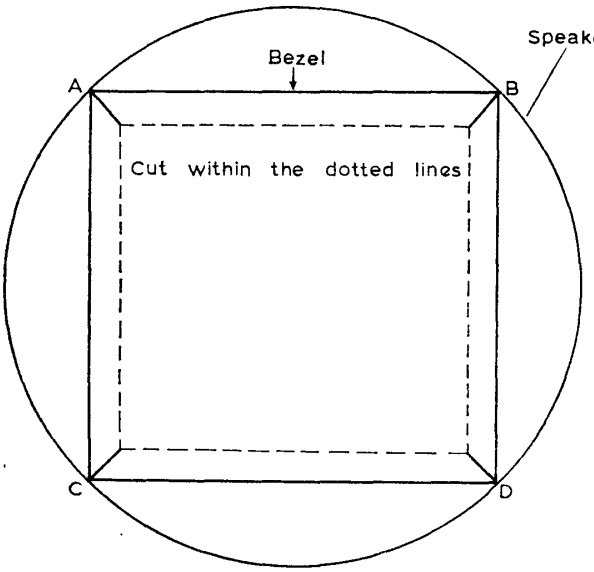
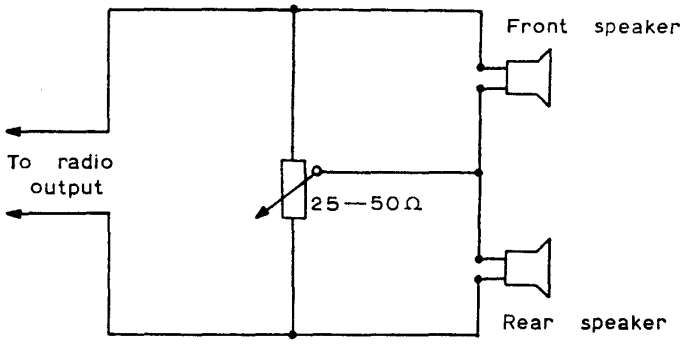


Fig. (B)



Balance control circuit for two speaker installation

AERIAL INSTALLATIONS FOR CARS

The method of mounting aerials depends upon the type of car that is being fitted with radio, etc.

On metal cars, i.e., the wings are of metal, we use the Q-max chassis cutters. The usual size required are $\frac{7}{8}$ inch for most wing type aerial, and $\frac{1}{8}$ inch for roof aerials, and for those mounted on the side scuttle, i.e., 90° angled aerials.

Now on those cars of fibreglass construction, we do not use the above cutters, since the wing, etc., would split with serious results as to cost of replacement.

In such cases, we can use a drill, then a round file, which quickly allows the hole to be made to the desired size.

Or, we can use the ENOX cutter, a saw type cutter which is fitted in a hand drill, the size use for wings is 6/8ths inch.

It will be recalled on the instruction for the HILLMAN IMP, this cutter was specified, never use this cutter in an electric drill, as the heat generated would burn up the paint work of the wing, again resulting in costly respraying.

Care must be taken at all times when working on cars, and it must be understood, that many cars have provision for specific type radio installations, which means the radio, speakers, etc., are supplied from the radio factory, the correct size for the particular vehicle concerned. The fixing holes will match with the brackets provided in the car, and never fit a radio without first disconnecting the battery.

In this respect, after the radio has been fitted, close all doors so the interior light does not function, switch off the radio.

Then hold the disconnected battery lead in one hand, and just touch the battery live terminal, if a spark results, you have a short circuit which must be cleared before re-connecting.

If no spark appears, connect lead, do not screw lead to battery post at this stage, and get into car and, (1) Switch on the ignition, to see if this works, if not, you may have a short at this point, or the lead may have pulled off from the switch. Do not take any risks, get out and take the battery lead off again, and check if there is a short, etc.

Suppression, no hard and fast rules can be given regarding suppression, in one instance the removal of the condensers from the dynamo of a car resulted in perfect interference free reception.