

INSTALLATION AND OPERATING

# INSTRUCTIONS

FOR



SINGLE UNIT

SUPER - HETERODYNE

# CAR RADIO

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MODELS JL and JM

**RADIO CORPORATION PTY. LTD.**

DIVISION OF ELECTRONIC INDUSTRIES LTD.

# ASTOR CAR RADIO



## MODELS

**"JL"**  
**6 VOLT**

**AND**

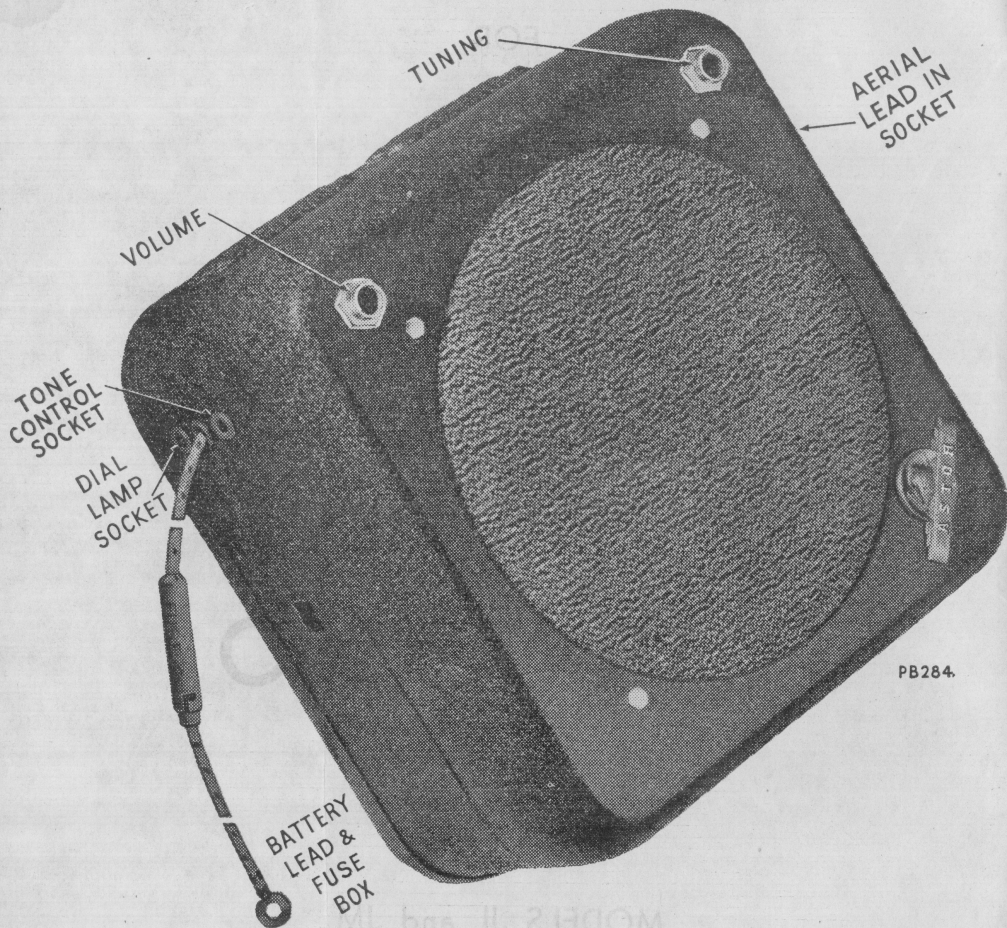
**"JM"**  
**12 VOLT**

The Astor Models "JL" and "JM" are 6 tube superheterodyne car radio receivers designed to operate from 6 and 12 volts respectively.

The tuning range is from 535 Kc. (Kilocycles) to 1610 Kc., providing adequate coverage of the Australian Standard Broadcast Band.

The receivers comprise the best in automotive engineering, having built-in noise filters and completely shielded units of the power supply. The construction of both 6 and 12 volt models is identical, each having the speaker mounted in the metal case of the receiver, thus making a single unit which occupies less space in the car and provides a more simple installation.

The remote control unit which incorporates a tone control is supplied in a separate package for 6 and 12-volt operation.



TUNING

AERIAL  
LEAD IN  
SOCKET

VOLUME

TONE  
CONTROL  
SOCKET

DIAL  
LAMP  
SOCKET

BATTERY  
LEAD &  
FUSE  
BOX

PB264.

# INSTALLATION

## ANTENNA

The fitting of the antenna to the car is one of the most important parts of a Car Radio installation. The Antenna, to perform its function satisfactorily, must be constructed of the correct material, and must be well insulated from the car body. Full installation instructions, which should be carefully adhered to, are supplied with each antenna package.

Three different types of antennae are available for the modern turret-top type cars.

<u>Antenna Type</u>	<u>Part Number</u>
(a) A two section Telescopic Whip type for mounting between the top cowl and the hood, parallel with the wind screen	M 180
(b) A three section Telescopic Whip type for mounting on either side cowl.	M 175
(c) A four section Telescopic Whip type for mounting on either corner of the top cowl.	M 187

### Antenna Maintenance :

Approximately six times a year fully extend the extension rods and clean off all foreign matter with a cloth dampened with benzine. After cleaning, rub over the rods with a cloth slightly smeared with petroleum jelly. Work the rods up and down two or three times, then clean off all excess petroleum jelly. Use only benzine and petroleum jelly; do not allow the benzine to flow down the extension rod joints.

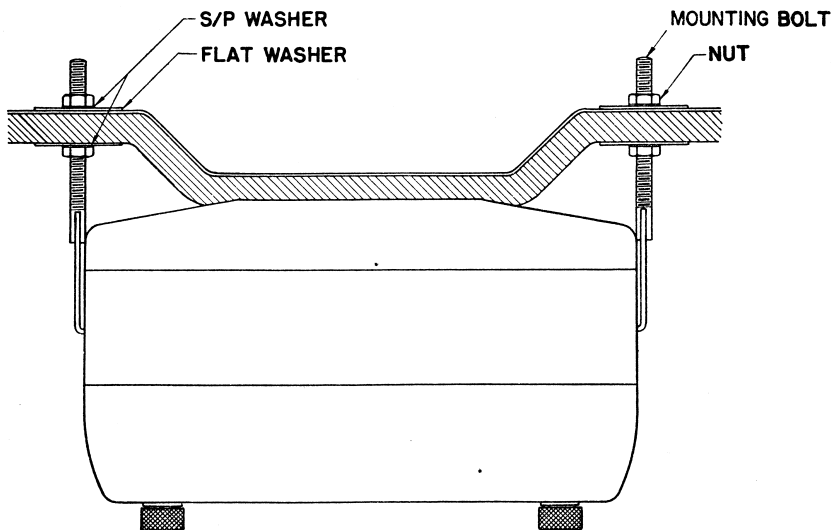
## RECEIVER

The receiver may be installed on any car with Positive or Negative ground without any changes of wiring.

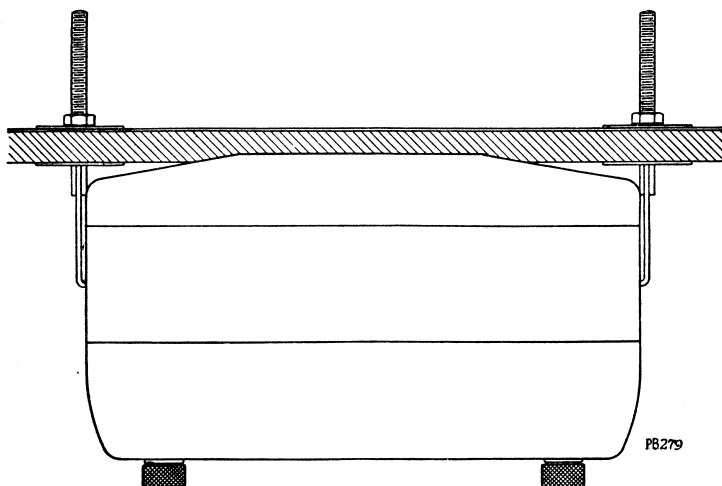
Before permanently installing the receiver in the car, remove the front section of the case to make sure that all the tubes and the vibrator are pushed well down into their sockets. Refit front section.

If a storage battery is available, having the same voltage as that of the receiver, carry out a preliminary test for normal operation. The receiver may be placed on the footboard of the car with the antenna lead and control unit temporarily connected for this test.





PLAN VIEW OF RECEIVER MOUNTED ON FORMED FIRE WALL



PLAN VIEW OF RECEIVER MOUNTED ON FLAT FIRE WALL

Fig. 2.

## **MOUNTING RECEIVER**

The receiver is designed to be mounted on the fire wall of the car, and at a convenient height to allow the control cables to make a direct connection or a gradual downward sweep with as wide a bend as possible.

The control cables should be tentatively mounted on the instrument panel while the mounting position for the receiver is being determined, bearing in mind the fittings on both sides of the fire wall, and making sure that no rods or wires will touch the receiver case.

When the location for the receiver has been decided, mark the positions of the receiver mount bolt holes on the fire wall of the car, using the drilling template supplied with the receiver. Drill two 5/16 in. dia. holes at the positions indicated on template, and thoroughly clean off all paint and grease from around the holes on the engine side of the fire wall to ensure that the nuts and washers make a good ground connection. Mount receiver in position with the two mounting bolts provided. Care should be taken when mounting on a formed fire wall not to overstrain the mounting to prevent distorting the receiver case. (Refer fig. 2.)

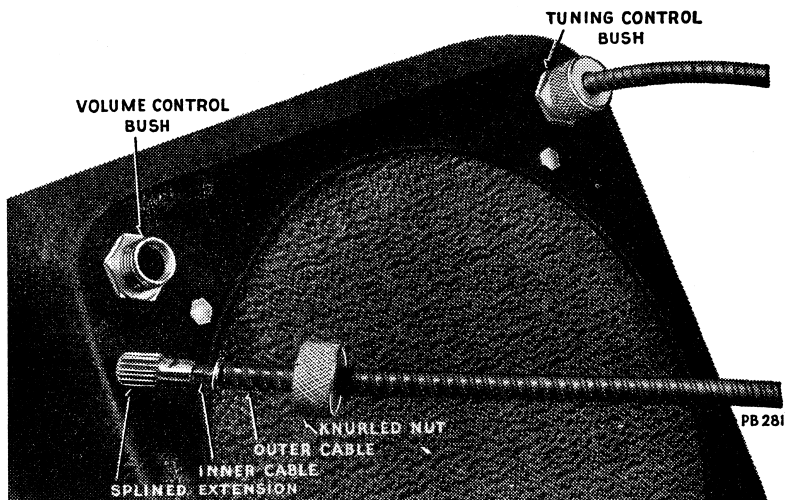
## **MOUNTING TUNING CONTROLS**

Instructions for mounting the tuning control head to the instrument panel are contained in each control unit package.

### **ATTACHING AND ADJUSTING CONTROL CABLES TO RECEIVER**

#### **Universal Type Control**

1. Insert the plain ends of the inner cables into the rear of the control head.
2. Next insert the splined ends of the inner cables in through the bushes in the receiver case, and push into rubber mouldings on the condenser and volume control spindles.
3. Slide the ends of the outer cables into the back of the control head and fasten in place with grub screws; also lock cables in place on receiver case with knurled nuts.
4. To lock the inner cables in place in the control head it is necessary to turn the tuning knobs until the grub screws in the spindles are visible through the 3/16 in. dia. holes in the rear underside of the control head. Tighten these screws which lock the inner cables.
5. To bring the dial pointer and condenser into alignment, turn the tuning knob (right hand knob) to the left for the full travel of the pointer, and then to the right for the full travel. This operation automatically brings the pointer and condenser into alignment, and no further adjustment is necessary.



Custom Built Control. Refer Instruction Leaflet supplied in each unit.

## RECEIVER LEAD CONNECTIONS

*Refer to diagram Fig. 1.*

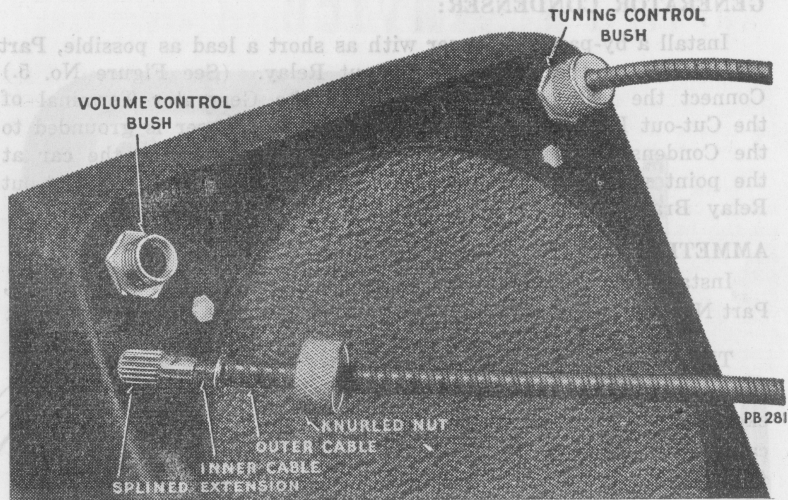
1. Plug the end of the antenna lead-in into the receiver lead-in socket.
2. Insert the single prong plug of the shielded lead on tuning control unit into the tone control socket situated in front of the battery lead on receiver case.
3. Plug the dial lamp lead from tuning control unit into the rubber grommet behind battery lead on receiver case.
4. Fasten the clip on the receiver battery lead to the **BATTERY SIDE OF THE AMMETER**, making sure that all ammeter connections are clean and bright before fastening the clip.

## INTERFERENCE SUPPRESSION

No spark plug suppressors are required.

### DISTRIBUTOR SUPPRESSOR:

Remove high tension lead from centre of Distributor and fit Suppressor. Insert high-tension lead securely in outer end of Suppressor.



Custom Built Control. Refer Instruction Leaflet supplied in each unit.

## GENERATOR CONDENSER:

Install a by-pass Condenser with as short a lead as possible, Part No. PC545, on the Generator Cut-out Relay. (See Figure No. 5.) Connect the lead of the Condenser to the Generator Terminal of the Cut-out Relay. The other side of the Condenser is grounded to the Condenser Case, which forms the other contact to the car at the point where the Condenser Bracket is mounted in the Cut-out Relay Bracket.

## AMMETER BY-PASS CONDENSER:

Install a by-pass Condenser with as short a lead as possible, Part No. PC545, from the Ammeter to the grounded instrument panel.

The foregoing completes the installation of the Receiver, and with the exception of possibly a few isolated cases, the Receiver will operate perfectly without interference from the ignition system of the car.

A few cases may be encountered where ignition or other interference still persists, and in these cases reference should be made to the following sections of this Instruction Book.

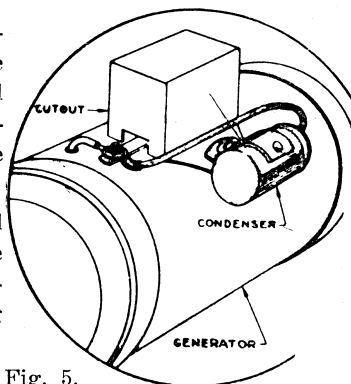


Fig. 5.

# OPERATION

## TUNING CONTROLS

The **VOLUME CONTROL** is the left-hand knob; turning this knob clockwise increases the receiver volume.

The receiver **ON/OFF** switch is located on the same shaft as the volume control. To switch the receiver off turn volume control knob fully anti-clockwise until a "click" is felt.

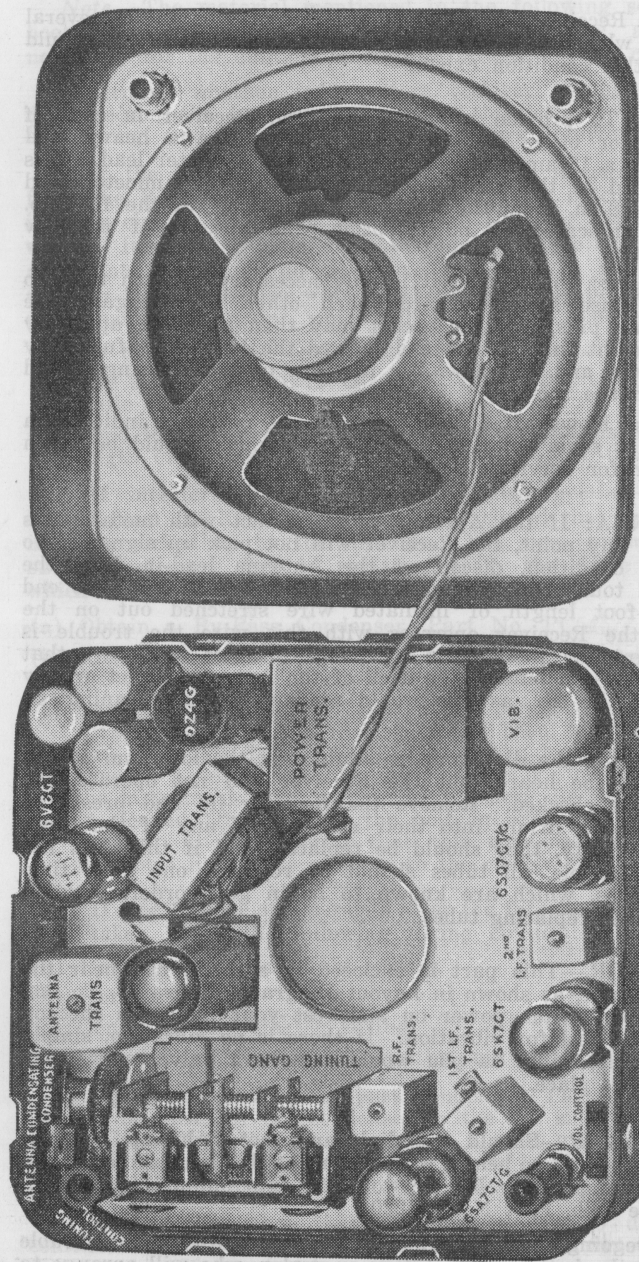
The **STATION SELECTOR** is the right-hand knob.

The **TONE CONTROL** knob in the form of a thumb wheel is also located on the front of the control unit head. Adjustment of this control gives the operator a choice of response from bass to treble.

## OPERATING INSTRUCTIONS

Switch the receiver on and allow a few moments for the valves to heat up. Turn the volume control to about half full on, tune in the desired station to a position where the background noise is at a minimum and re-adjust volume and tone controls to suit. It is important that the receiver be accurately tuned, otherwise distortion and background noise will be introduced. The tone control can also be used as a "static modifier."

P.B. 283



# SERVICE

Should the Receiver become inoperative, it may be due to several minor causes, which are easily rectified. The following items should be tested if this condition exists:—

1. **FUSE:** To provide protection for the Receiver in case of short circuits or other trouble which would place a heavy load on the battery, a 15 amp. fuse is located in the ammeter lead. This fuse is enclosed in the metal socket located in the ammeter lead approximately 8 in. from the terminal. "Blowing" of the 15 amp. fuse will be indicated by no reception, and absence of the low mechanical hum.

To gain access to the fuse it is only necessary to push the two ends of the fuse socket towards each other to disengage the bayonet locking pins, and the socket may then be taken apart by means of a slight turn of one end toward the left. The fuse may then be removed and, if "blown," a new one of equal rating should be inserted in the socket.

If the fuse blows after being replaced, it probably indicates a short circuit at some point in the Receiver, which should be taken to the Dealer for service.

2. **ANTENNA:** If the Antenna is in contact with metal parts of the car at any point, the Receiver will not pick up signals. To test for this condition, disconnect the Antenna lead-in from the Receiver, and touch the Antenna socket contact with the bare end of a twenty-foot length of insulated wire stretched out on the ground. If the Receiver operates with this wire the trouble is in the car Antenna installation. During this test take care that the bare wire does not touch the shell of the Antenna socket or any metal part of the car, as this would render the test meaningless.

3. **TUBES.**—If the dial lamp is alight and the low hum of the power unit can be heard, but the Receiver will not operate, the tubes should be checked. Remove the Receiver lid and press the tubes and vibrator firmly into their sockets. If any of the tubes are obviously faulty, they should be replaced, and if this does not clear up the trouble, all tubes should be replaced one at a time with other tubes, which are known to be in good order. Switch receiver off when replacing tubes.

4. **VIBRATOR.**—This part is enclosed in a metal can near the power transformer, as shown in Layout Diagram, Figure 6. To test Vibrator, simply switch power on and rest your finger on the top of this can and feel for vibration. If there is no vibration, simply withdraw Vibrator just as you would remove a valve, and insert a new one in its place.

5. **DIAL LAMP.**—Should the dial lamp not light up, but the radio programme can be heard, replacement of this lamp is necessary. Replacement Lamp, Type 51, 6-8 volt, .15 amp., miniature bayonet base, G3½ size bulb, Part No. PM220.

If the foregoing tests have not located the cause of the trouble contact the authorised service station or dealer, who will arrange to have the Receiver serviced for you.

## ADDITIONAL INTERFERENCE ELIMINATION

*Note.*—The material mentioned in the following section of this book is not supplied with the Receiver Package, as it is only necessary for the elimination of interference in odd cases.

Determine whether noise enters receiver through Antenna by disconnecting the Antenna lead-in from the Receiver while the motor is running, and noting the effect on spark interference.

1. If the interference continues with the Antenna disconnected from the Receiver, it is an indication that it is coming from the ignition circuit, and being fed into the Receiver through the radio wiring. Inspect the installation thoroughly to see that the ammeter and pilot light leads do not come too close to any high tension wiring. Determine also whether the Receiver is properly grounded, or is insulated by paint, which will have to be removed.

- (a) Do not bring the lead-in through the engine compartment.
- (b) Use static collectors in the front wheel caps to eliminate wheel static encountered on some types of roads.
- (c) Bond the exhaust pipe or muffler to the chassis by means of a length of braided wire and Parker-Kalon self-tapping screws.

2. If interference is eliminated by disconnecting the Antenna lead-in from the Receiver, it may be concluded that the interference is being picked up by the Antenna. The most common source of such interference lies in radiation from the dome light wiring, which can be eliminated as follows:—

- (a) Obtain a By-Pass Condenser, Part No. PC545.
- (b) Remove the insulation from approximately one-half inch of the dome light wire close to the windshield corner post.
- (c) Connect one condenser lead to the portion of the dome light wire from which the insulation has been removed, and solder and tape this joint. Secure the other lead of the condenser beneath a convenient nut, such as the one on the bolt holding the instrument panel supporting bracket. Be sure that all paint is cleaned from around the bolt in order to provide a good ground. It is essential that this condenser be connected to the dome light wire as close to the corner post as possible.

3. If interference still persists after the foregoing precautions have been taken, check the following wiring circuits:—

- (a) Head light or tail light wiring.
- (b) Horn wiring.
- (c) Generator and starter wiring.
- (d) Coil wiring. *Caution.*—Do not by-pass coil to distributor circuit.

To do this, obtain a by-pass condenser, Part No. PC545, and connect one lead of the condenser to the hot side of the suspected unit. Connect the condenser case to a good ground on the metal part of the car body or frame. In the majority of cases this procedure will indicate where the trouble lies.

Usually noise from these circuits is due to dirty or loose contacts or connections; when located and corrected the trouble disappears. If, as in some cases, the noise is not due to bad connections, mount the condenser permanently, and solder the leads



in the proper location. Do not solder to rear of instrument panel, as the heat from the iron may blister the paint.

#### 4. Noise can be caused by the electric windshield wiper.

**Remedy:**—Connect a by-pass condenser, Part No. PC545, from hot lead of wiper motor to ground, as close to the motor as possible.

5. **BONDING.**—Using braided wire, bond to the fire wall all oil pipes and rods passing through the fire wall. Solder one end of the braided wire to these pipes, etc., and fasten the other end to the fire wall on the engine side with self-threading screw, so as to secure the best possible connections. It will be necessary in some cases to bond the upper section of the windshield wiper tubing to the fire wall or instrument panel. To do this, solder a piece of braided wire to the tubing and ground the braided wire at the nearest point, which will give the best ground connection. (**Caution.**—Do not attempt to solder the braid to the back of the instrument panel, for doing so will blister the paint.) In some cases it may be necessary to bond the motor block to the fire wall. This should be done by using a piece of shield braid of large cross section, and as short as possible, leaving enough slack to compensate for normal up and down movement of the engine.

The connection should be made preferably under one of the rear head bolts, but in case this causes a water leak, the connection should be made to the point giving the best electrical and mechanical contact. The paint should be cleaned away from the points of connection, and the end connected to the fire wall should be soldered, or placed under the head of a large screw, inserted through a hole drilled in the fire wall after the paint has been thoroughly cleaned off.

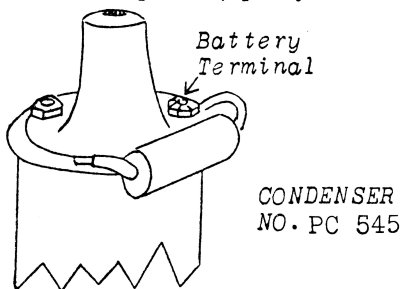
6. **THE GENERATOR.**—In order to determine whether the generator is causing any noise in the radio reception, accelerate the engine and cut off the switch. Then, if a whine, decreasing in pitch as the engine stops, is noticed, the generator is causing interference. If cleaning the commutator does not remedy this, another condenser should be installed from the generator side of the cut-out to a good ground on the frame of the generator. On the other hand, if no noise is noticed immediately when the switch is turned off, you can be reasonably sure that the generator is not causing any interference.

7. **MISCELLANEOUS.**—The entire ignition system must be checked and put in perfect condition, including the distributor rotor and contact points, generator brushes, spark plugs, and all light wiring, starting motor cable, generator cable, instrument panel wiring and stop light switch. Examine for loose connections or leaky high tension cable in the ignition system.

By-pass supply terminal of the coil to ground with a condenser, Part No. PC545, *having as short a lead as possible.* (See Figure No. 7.)

If low tension wires are in the same manifold or supporting tube as the high tension wire of the ignition system, they should be re-routed.

Remove low tension supply leads for the coil, horn, etc., as far as possible from the high tension leads. If possible, partly shield them by placing them in the panel sections of the chassis frame. If necessary, re-position the low tension wiring from the instrument panel to underneath the engine hood, running the leads below rather than through the fire wall. In some extreme cases, it will be found necessary to shield the low tension wiring.



Make sure that the dome light switch is in the "live" rather than the "ground" lead. *Solder this lead to brass rim. If coil has no metal rim, solder to metal can or metal coil base.*

Fig. 7

Make sure that the instrument panel and fire wall are actually grounded to the frame of the car.

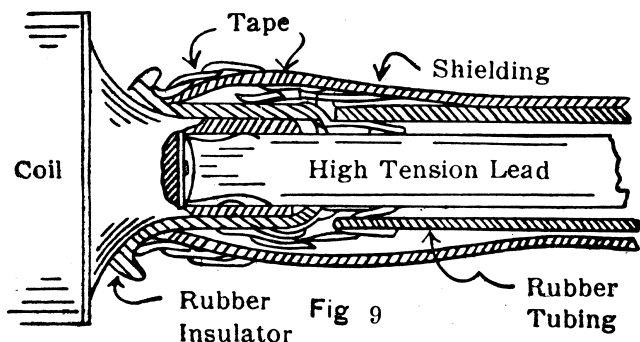
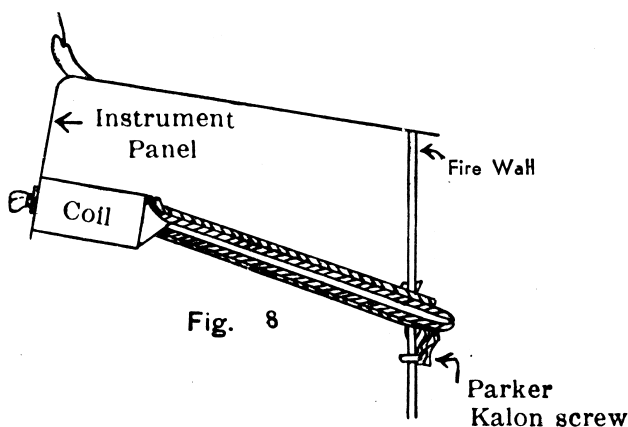
If the distributor is manually retractable for timing, bridge the joint with flexible copper braid.

On cars where the Ignition Coil is mounted on the instrument panel, the radiated field from this coil is very strong, and will affect the Antenna direct or through either the passenger or the driver.

Obtain a rubber insulator of the type used on alligator clips, and of a size to slip over the protruding snout of the coil. Cut off enough of the small end of the insulator to enlarge the hole, so the high tension wire will slip through. Obtain a piece of rubber tubing which will also slide over the high tension wire; cut the tubing to a length which will permit it to extend from the end of the insulator through the dash for two inches. Cut a piece of shield braid one inch longer than the rubber tubing. Slip the tubing over the high tension lead, and the shield braid over the tubing. Slide the high tension wire through the small end of the insulator, and insert the head in the coil snout as far as it will go. Pull the insulator forward over the coil snout, and wrap two turns of tape around the high tension lead, pulling the lead forward and taping it to the insulator so that the lead will not slide out of position.

Pull the rubber tubing forward until it touches the insulator tape, and tape the tube to the insulator. Now pull the shielding forward until it extends half-way over the coil snout. Tape the shielding down so that it cannot short to the primary. Split approx. one half inch of the end of the shield, extending through the fire

wall, and use the split portion as a pigtail for grounding. (See Figures Nos. 8 and 9.)



In assembling the car, oftentimes paint or the like prevents a good ground connection being made between the various metal parts of the car which form the ground circuit. These poor connections are not apparent from the standpoint of the operation of the car, as the voltage applied across the connections from the battery is enough to make a sufficiently good contact for that purpose. However, when a car radio is installed it is particularly desirable to maintain all the metal parts of the car at the same ground potential so that no radiation of spark interference will flow from the engine block to the fire wall, thence to the frame of the car for example, in order to reach the lower ground potential. Bonding all of the oil pipes, cables, choke, and spark controls, etc., on the engine side of the fire wall tends to prevent radiation from the ignition circuit entering the radio set compartment under the cowl. Once the cause of interference is understood it is fairly easy to trace it to its source and to take the necessary steps for eliminating it.