SERVICE

A MONTHLY DIGEST OF

RADIO AND ASSOCIATED MAINTENANCE

January
1932

EDITORIAL

THIS is more of a request than an editorial. Several suggestions have been received to the extent that in view of the limited refrigerators and the much greater number of calls for automobile radio service, that we publish refrigerator data in alternate issues and publish auto-radio data when ever possible. We shall try to comply with these requests. A survey of automobile radio receivers now is in progress and such information shall be published in every issue of SERVICE during 1932.

With respect to refrigerator data, the Crosley, Sparton and Fada boxes will be discussed in full detail dur ing the year.

The Montgomery-Ward line of re ceivers has received little attentior in the supplements to the Perpetua Trouble Shooter's Manual. The Feb ruary and March 1932 supplement will contain as many of these receiv ers as it is possible to crowd into these two issues.

Page 3 of this issue contains series number information. We would ap preciate comments concerning the value of such data. We feel that it is worthwhile information. Let us have your reactions.

JOHN F. RIDER.

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Service Notes

Notes on Philco Peak Frequencies

The following information is a correction of the peak frequencies mentioned in the Nov.-Dec. 1931 copy of SERVICE. Philco superheterodynes, depending upon the model, are peaked at one of two intermediate frequencies. The stipulation that all Philco receivers are peaked at 260 KC should be changed to read 175 and 260 KC.

The Philco receivers shown in the basic manual and in the supplementary sheets should be peaked as follows:

All of the Philcos in the 11 tube model 112 series are adjusted at a peak frequency of 175 KC.

All of the Philcos in the model 90 series are adjusted at a frequency of 175 KC. Also 490 and 490 A models.

All of the Philcos in the model 51 series are adjusted at a frequency of 175 KC.

All of the Philcos in the model 35 series are adjusted at a frequency of 260 KC.

All of the Philcos in the model 70 series are adjusted at a frequency of 260 KC. Also 470 and 470-A models.

It might be a very good idea to check the peak frequency specifications in the manual and to make these notations wherever they are required upon the wiring diagrams.

Serial Numbers of All-American Mohawk Receivers

As previously stated we feel that there is a very definite advantage in knowing the range of serial numbers which are assigned to any one model receiver of any one manufacture because it enables a means of recognizing or determining a model number when nothing but the serial number and the manufacture are known. The following information received through the courtesy of Mr. C. M. Sell, Service Manager of the All American Mohawk Corporation should be marked upon the pages designated. These page numbers designate the pages in the manual and suplementary service sheets.

Model	Serial Number	Page No.
Model D	2,000,001—up	26
Model H	4,000,001—up	19
Model K	8,000,001—up	24 E
Model C-6	6,000,001—up	24 C
Model J	6,100,001—up	24 A
Model P	6,115,001—up	24 BA
Model DC	7,000,001—up	24 BB
Model S-6	1,400,001—up	24 F
Model S-7	1,100,001—up	24 H
Model S-8	1,200,001—up	24 J
Model S-10	1,300,001—up	not printed as yet
Model B-7	1,500,001—up	not printed as yet
Model S-80	1,700,001—up	not printed as yet
Model B	100,001—up	not printed as yet

Power Transformer Notes

Considering the interest displayed in power transformer replacements, the following information may be of value.

Power transformers have definite frequency specifications which govern their application upon power circuits having those frequency specifications. However it is possible to use a 25 cycle transformer upon a 60 cycle line without fear of damaging the transformer, but there may be a variation of tube operating potentials under such conditions. Even this is not absolutely true in every case. The design of the power transformer and the design of the receiver system has some effect upon the possible variation in operating potentials.

On the other hand a 60 cycle transformer is not applicable for use upon a 25 cycle line. Damage to the transformer will invariably be the final result. As a rule, a 60 cycle transformer is suitable without any trouble upon a 50 cycle line, but it is not satisfactory for use upon a 40 cycle line. Thus when selecting transformers for replacement work, be certain to specify the frequency rating.

Another item in connection with power transformers is power rating. While it is true that a transformer remains a transformer, all are not rated in like fashion. That is to say all do not supply the same number of watts output at the various voltages. While it is true that two different

transformers may be identical in the output voltage ratings, they may differ in the wattage ratings of the respective windings. The use of a transformer which is not of the correct wattage capacity will result in low filament or heater voltages when the excessive load represented by the tubes in the receiver is applied.

An open circuit between the two taps of a tapped primary upon a power transformer does not destroy the utility of that transformer. This is true only when the open is not located in the main portion of the primary winding. Thus if a power transformer has a 105, 115 and a 125 volt tap and an open circuit develops between the 105 and 115 volt tap, assuming that the winding is normally used upon a 125 volt line, it is possible to use that transformer until suitable replacement is made. For that matter continued use is also possible. All that is required is the use of a voltage reducing resistance in conjunction with the operation of the transformer at the lowest voltage tap upon the primary and the reduction of the line voltage by means of the voltage reducing resistance so that the voltage input into the transformer does not exceed the stipulated 105 volts.

A receiver designed for 110 volt operation can be used upon a 220 volt line if another transformer of the 'step-down' type with a primary winding rated at 220 volts and a secondary winding rated at 110 volts and of proper wattage rating is connected between the 220 volt line and the power transformer in the receiver. In other words the primary of the receiver power transformer is joined to the secondary of the 220 volt transformer and the primary of the latter unit is connected to the 220 volt line. With respect to power rating, the 220 volt transformer must be capable of supplying the current required by the receiver system. In other words the two power ratings must conform.

The operation may be reversed in the event that the receiver is intended for 220 volt AC operation and the available power supply is 110 volts. In such cases, the supplementary transformer must be of the 'step-up' variety so that its output will be 220 volts. The low side of this transformer will be rated at 110 volts and the high side at 220 volts. The power rating of the 110 volt transformer should conform with the power rating of the transformer in the receiver.

Filter Condenser Replacements

It might be well to bear the following in mind when the occasion arises to replace a filter condenser which was punctured because of high voltage. There are certain instances where fairly low values of filter capacity are used across the output of the rectifier system, that is as the input filter condenser, with the thought in mind of limiting the output DC voltage, which as it happens is greatly influenced by the value of the input filter condenser. Wherever possible avoid the use of a replacement condenser with the same voltage rating as previously used, but rated at a higher value of capacity. Increasing the capacity in this position will raise the output voltage and there exists a very great probability of puncturing the replacement unit. If replacement is to be made, use a condenser rated at the same capacity as the one removed and if possible one with somewhat higher voltage rating. If an identical duplicate is not available, always select one with a higher voltage rating rather than a lower voltage rating. This is particularly true when the capacity of the replacement unit is greater than that of the condenser which was removed from the circuit.

The above operating characteristic of the power pack should be remembered when an increase of filter capacity is decided upon as a possible remedy for excessive hum.

Electrolytic Filter Condenser Operation

Recognizing the prevalent use of electrolytic filter condensers in power packs, it is well to bear in mind that the filter action of a filter system using such condensers and which have been inactive for a prolonged period of time will not be as good as after the system has been in use for several hours. Thus it is possible that a receiver which employs such units and which has been inactive for several weeks or months will be subject to excessive hum for several hours after being placed into operation.

Continued operation will restore the electrolytic condensers to their correct operation condition and the hum will eventually decrease to its normal value, which as a rule is of a negligible level.

Ground Circuits

Strange as it may seem the grounding circuits are often times responsible for a great deal of trouble in a radio receiver. By virtue of the character of the system very little thought is given to the possibility of the trouble arising from such sources and the defect is classed as being mysterious.

One such trouble is excessive hum. If you have exhausted every possible reason for hum and every circuit and unit shows satisfactory continuity it might be well to check the ground connection in the eliminator and the condition of the actual junctions between the ground circuit and the various filter and bypass condensers. In very many cases, excessive hum is due to high resistance junctions which appear normal to the eye, yet electrically are defective. If one lead from a number of condensers is supposed to terminate at ground, do not ground these units at various points along the chassis. If possible ground at one point. Wherever possible avoid using friction contacts as grounds for the common leads of filter condensers which are subject to a charging current. A fairly high AC voltage may be built up across a poor contact and passed into the voltage divider and into the various tube circuits.

Different points along a shield do not make very good grounds. While it is true that such grounds are used, they should be suspected as possible reasons for hum when everything else checks normal. Current carrying circuits should never be used as grounds. Thus in battery operated systems, wherein one side of the filament supply is grounded, do not connect other grounded circuits to the negative lead of the B supply when a long lead connects the B minus with the grounded filament leg. If possible connect the required grounds directly to the grounded filament leg.

Imperfect friction grounds to the rotors of tuning condensers give rise to two popular forms of trouble. One of these is total cessation of operation at certain parts of the dial or low volume output at these part of the dial. The other is oscillation.

Everything is to be gained and little lost by the use of a short ground lead between the receiver and the ground point in the home. This circuit is apt to function as a noise pickup system. The shorter the lead the less the noise and shielding is oftentimes a help. Its function as a noise pickup circuit has been noted in connection with short wave convertors. The difference in noise pickup in bad location with a short and long ground lead was appreciable.

U. S. Radio and Television Model 99 Series

This receiver is shown upon pages 632H to K. Special reference is made to the tapped input coil to the combination mixer and oscillator. According to advice received from the service department of this manufacturer the following is the function of that circuit. This winding in the pre-selector unit is coupled by a very small primary connected directly to the secondary of the 1st RF transformer in that system. The secondary of the 2nd transformer is tapped, the tap connection going to the grid of -24 1st detector. By tapping this coil the selectivity is increased due to the setting up of series resonance to the desired signal and anti-resonance to frequencies near the unwanted or image frequency signal. (In this case the image frequency signal is at all times 524 KC higher than the desired broadcast signal).

In this receiver the 1st IF transformer and the oscillator system constitutes one unit and consists of four windings, all of these coils being in inductive relation.

Referring to pages 632-I and 632-H the tuned circuit P1, P2 is resonant at a frequency of 262 KC. The circuit S1, S2 (at top and with the letters IF shown between S1, S2) is also resonant at the same frequency. The two coils P1, P2 and S1, S2 as stated are the primary and secondary, respectively of the 1st IF transformer. Circuit P1, P2, P1 constitutes the primary of the oscillator and circuit S1, S2 (lower winding, that one which has the yellow lead and white lead associated with it) is the secondary. This circuit is tuned by the 3rd section of the three gang condenser and is always resonant at a frequency of 262 KC above the frequency to which the RF circuits are tuned. A surge of energy fed into the secondary of the oscillator inductively causes this circuit to begin to oscillate at its resonant frequency of 262 KC. above the RF frequency. This oscillator frequency is fed back through the tap in the secondary coil into the grid circuit of the 1st detector. There, the oscillating signal is amplified and fed inductively through the primary system in the plate circuit of the tube back into the secondary, thus sustaining the oscillations at the frequency to which

the oscillator secondary circuit is tuned.

The first 224 tube also functions as the 1st detector or mixer and is of the bias type. Bias voltage for this tube is established by the plate current returning to the cathode through the 3,000 ohm resistor. This resistor is by-passed with a .01 MFD condenser. The bias voltage is influenced to some extent by the oscillatory current and will vary within a range of about ¾ volt, depending on the frequency setting to which the receiver is tuned.

The following may be marked upon the chassis layout shown upon page 632-I. The 600 KC oscillator trimmer is designed upon the layout. The 1400 KC trimmer is located on top of the tuning condenser and is connected across the oscillator tuning condenser.

U. S. Radio and Television Model 7 Series

This receiver employs a combination IF and oscillator structure similar to that found in the 99, and the latter receiver is referred to for descriptive material.

Concerning Changes Made in Receivers

We wish to call attention to the fact that quite a few of the diagrams contained in the supplementary service show various changes instituted during the manufacture of receivers and which complicate servicing unless these changes are recognized. We have received numerous letters from subscribers relative to just this matter. We would suggest that when the necessity arises to check a wiring diagram, attention be paid to the changes recorded in the diagram or accompanying data as related to serial numbers. In the majority of instances the changes made upon a chassis are recorded as being made upon chassis above a certain serial number. This means that prior to the checking of a receiver it may be very advantageous to also check the serial number and to examine all of the available notes concerning that receiver.

Installation Notes

Covering RCA Victor Automobile Radio Model M-30

The following material is taken from the service manual issued by the RCA-Victor Co. Inc. and constitutes the installation notes applicable to the model RCA-Victor automobile radio receiver. The service notes, wiring diagram, chassis layout, etc., will be shown in the February 1932 supplement to Rider's "Perpetual Trouble Shooter's Manual". The copyright upon the material to follow in this article is owned by the RCA-Victor Co. Inc. Certain references made in this text apply to the service data which will be furnished next month.

AUBURN 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side under cowl close to right side of car, as high as possible.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with steering column, as high as possible.

LOCATION OF "B" BATTERY BOX—Under right rear floor, diagonally and close to cross-member, plug to front.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type near distributor.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out screw, connect pigtail to inside cut-out terminal.
Coil: Fasten under rear coil mounting nut, connect pigtail to rear coil terminal.
Ammeter: Fasten under right upper instrument board screw, pigtail to battery terminal of ammeter.

SPECIAL NOTES—Ground cable shields to coincidental lock cable. Avoid running antenna lead-in or any cables through engine compartment. Ground antenna lead-in shield to antenna hanger stud if plate antenna is used.

BUICK 1930

40 Series

BATTERY TERMINAL GROUNDED—

LOCATION OF RECEIVER—Right side under cowl, close to right side of car and as high as possible.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker 6" left of center of bulkhead and as high as possible.

LOCATION OF "B" BATTERY BOX—Under right rear floor, behind crossmember, plug to the front.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mounted at right angle to plugs under cover plate of engine.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw. Connect pigtail to inside cut-out terminal.
Coil: Fasten under outside coil bracket bolt, connect pigtail to outside coil terminal.
Ammeter: Fasten under panel mounting screw below ammeter, connect pigtail to terminal giving best results.

SPECIAL NOTES—Avoid running antenna lead-in or any connecting cables through engine compartment. If roof antenna is used, lead-in should be shielded and come down right windshield column.

BUICK 50 SERIES 1932

8 Cylinder

BATTERY TERMINAL GROUNDED—

LOCATION OF RECEIVER—1" below cowl compartment and 12" from right side of car under cowl.

LOCATION OF LOUDSPEAKER—Close to left side of car under cowl, above windshield wiper tube. Tube must be bent to clear.

LOCATION OF "B" BATTERY BOX—Under right side between radius rod and frame channel, plug to the rear.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just back of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Splice-in type, in each plug wire near distributor.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to inside cut-out terminal.
Coil: Fasten under outside coil bracket bolt, connect pigtail to outside coil terminal.
Ammeter: Fasten under bottom circuit breaker screw, connect pigtail to terminal giving best results.

Line of loudspeaker in line with cowl ventilator

SPECIAL NOTES—Bend wiper tube down to clear speaker. Put tape around generator capacitor to prevent short circuit. Avoid running antenna lead-in or any connecting cables through engine compartment. There is room for "B" Battery behind rear seat back cushion in some bodies. If roof antenna is used, lead-in should be shielded and come down right windshield column. If roof antenna is used, it may be necessary to place a switch-in in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel so that the dome light light is disconnected during operation.

BUICK 60 SERIES 1932

8 Cylinder

BATTERY TERMINAL GROUNDED—

LOCATION OF RECEIVER—1" below cowl compartment and ½" to right of "spark control" entrance on bulkhead under cowl.

LOCATION OF LOUDSPEAKER—Vertical centerlever when open. Lower edge of speaker even with end of lever.

LOCATION OF "B" BATTERY BOX—Battery box cannot be used. Place "B" battery sections, in original packing, behind rear seat back cushion.

LOCATION OF ANTENNA PLATE—On right frame channel.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plub-in type.
Plugs: Splice-in type, in each plug wire.
APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw and connect pigtail to inside cut-out terminal.
Coil: Fasten under outside coil bracket bolt and connect pigtail to outside coil terminal.
Ammeter: Fasten under bottom circuit breaker screw, connecting pigtail for best results.
SPECIAL NOTES—Put tape around generator capacitor to prevent short circuit. Avoid running antenna lead-in or any connecting cables through engine compartment. There is room for "B" Battery behind rear seat back cushion in some bodies. If roof antenna is used, lead-in should be shielded and come down right windshield column. If roof antenna is used it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel so that the dome light line may be opened during operation.

BUICK 80 SERIES 1932
8 Cylinder

BATTERY TERMINAL GROUNDED—
LOCATION OF RECEIVER—Same as 60 series.
LOCATION OF LOUDSPEAKER—Close to left side of car under cowl, bottom 2" lower than "Ride Control" rod.
LOCATION OF "B" BATTERY BOX—Same as 60 series.
LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just back of battery.
APPLICATION OF IGNITION SUPPRESSORS—Same as 60 series.
APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to inside cut-out terminal.
Coil: Fasten under outside coil bracket bolt, connect pigtail to outside coil terminal.
Ammeter: Fasten under bottom circuit breaker screw, connecting pigtail to terminal that gives best results.
SPECIAL NOTES—Same as 60 series.

BUICK 90 SERIES 1932
8 Cylinder

BATTERY TERMINAL GROUNDED—
LOCATION OF RECEIVER—Same as 60 series.
LOCATION OF LOUDSPEAKER—Close to left side of car under cowl, bottom 1½" lower than "Ride Control" rod.
LOCATION OF "B" BATTERY BOX—Under right side, between radius rod and frame channel, front hanger just back of storage battery.
APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Splice-in type, in each plug wire.
APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to inside cut-out terminal.
Coil: Fasten under outside coil bracket bolt, connect pigtail to outside coil terminal.
Ammeter: Fasten under bottom circuit-breaker screw, connecting pigtail to the terminal that gives best results.
SPECIAL NOTES—Same as 60 series.

CADILLAC 1931
V-8

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).
LOCATION OF RECEIVER—Close to right side of car under cowl, 7" above intersection of toeboard and bulkhead.
LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with center of bulkhead under cowl and as high as possible.
LOCATION OF "B" BATTERY BOX—Under right rear floor, behind storage battery hanger, plug to the rear.
LOCATION OF ANTENNA PLATE—On right frame channel, front hanger in line with rear end of starting motor.
APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type, near distributor.
Plugs: Mounted at right angle to plugs.
APLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to front cut-out terminal.
Coil: Fasten under upper junction box wing nut, connect pigtail to coil wire terminal in junction box.
Ammeter: Make hole and bolt to bottom edge of instrument panel, connect for best results.
SPECIAL NOTES—Move hole for thermometer wire 4½" to the left in bulkhead. If roof an-

tenna is used, it may be necessary to bond to the bulkhead, pipes and control rods that enter from the engine compartment. Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Avoid running antenna lead-in or any connecting cables through engine compartment. Remove primary wire, connecting coil and junction box, from secondary manifold, shield up to armor and solder thereto. Support wire along radiator brace rod with metal clamps.

CADILLAC 1931
V-12

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car under cowl, 6" above intersection of toe-board and bulkhead.

LOCATION OF LOUDSPEAKER—As high as possible under cowl, between circuit breaker and gas line entrance. Stand off from bulkhead to clear gas line.

LOCATION OF "B" BATTERY BOX—Battery box cannot be used. Two strong waterproof cans, each to contain two sections of "B" Battery, may be constructed so as to fasten securely between the right frame channel and running board apron in front and back of running board light.

LOCATION OF ANTENNA PLATE—Do not recommend use.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Two plug-in type.
Plugs: Splice-in type near plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under top screw of bearing plate, connect pigtail to generator terminal.
Coil: Fasten to coil clamp bolt, connect pigtail to coil terminal connected to wire from switch.
Ammeter: Make hole and bolt to bottom edge of instrument panel, connecting pigtail for best results.

SPECIAL NOTES—Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Avoid running antenna lead-in or any connecting cables through engine compartment. If roof antenna is used, it may be necessary to bond to the bulkhead, pipes and control rods that enter from the engine compartment.

CADILLAC 1931
V-16

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—1½" above toe-board riser and 2½" from right side of car under cowl. Mounting bracket to stand off 2¾" from bulkhead.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with center of starting pedal and bottom edge 3½" above toe-board riser.

LOCATION OF "B" BATTERY BOX—Battery box cannot be used. A heavy waterproof can may be constructed to fasten very securely between the right frame channel and the fender well underneath the front fender.

LOCATION OF ANTENNA PLATE—Under right running board. See special note for mounting instructions.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Two splice-in type, near distributor.
Plugs: Splice-in type near plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under top screw of bearing plate, connect pigtail to generator terminal.
Coil: Fasten to coil clamp bolt, connect pigtail to coil terminal connected to wire from switch.
Ammeter: Fasten under upper right instrument board nut, try pigtail connections for best results.

SPECIAL NOTES—If roof antenna is used, it may be necessary to bond to the bulkhead pipe control rods that enter from the engine compartment. Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Avoid running antenna lead-in or any connecting cable through engine compartment. If plate antenna is used remove inside bolts from front and rear brackets and mount under right running board. Drill brackets for five- sixteenth inch bolts and fasten with antenna hanger studs. Spage plate 5" below edge of running board.

CHEVROLET 1930
6 Cylinder

BATTERY TERMINAL GROUNDED—

LOCATION OF RECEIVER—Close to right side of car under cowl and as high as possible.

LOCATION OF LOUDSPEAKER—Close to left side of car under cowl and as high as possible.

LOCATION OF "B" BATTERY BOX—Under right rear floor diagonally behind cross member, plug to the rear.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.
Coil: None used.
Ammeter: Fasten under lower gas gauge mounting screw, connect pigtail to battery terminal of ammeter.

SPECIAL NOTES—If roof antenna is used it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel. Remove red wire from starting switch and two yellow wires that connect to ignition coil, shield each one separately, and reconnect. Bond shields to bulkhead. If roof antenna is used, lead-in should be shielded and come down right windshield column. Tape should be placed over metal braid on "B" cable and cable tacked up to floor boards. "A" Battery wire should be connected directly to storage Battery. Avoid running antenna lead-in or any connecting cables through engine compartment. There is room for "B" Battery behind rear seat back cushion in some bodies. If a roof antenna is used, it may be necessary to shield the toe-board with copper screen.

CHEVROLET ALL MODELS 1932
6 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Close to right side of car under cowl and 14" above floor board.

LOCATION OF LOUDSPEAKER—6" above intersection of toe-board and bulkhead, vertical center line 5" from left side of car under cowl.

LOCATION OF "B" BATTERY BOX—Below tool tray under right front seat, between brake rod and right frame channel, plug to the rear.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just back of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.
Coil: Fasten under inside coil retaining bolt, try connecting pigtail to each coil terminal for best results.
Ammeter: Make hole and bolt to lower edge of instrument panel, connecting pigtail to the ammeter terminal that gives best results.

SPECIAL NOTES—If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel. Remove red wire from starting switch and two yellow wires that connect to ignition coil, shield each one separately, and reconnect. Bond shields to bulkhead. If roof antenna is used, lead-in should be shielded and come down right windshield column. Care must be taken when attaching antenna plate not to squeeze gas line. There is room for "B" battery behind rear seat back cushion in some bodies. "A" battery wire should be connected directly to storage battery. Avoid running antenna lead-in or any connecting cables through engine compartment. Tape should be placed over metal braid on "B" cable and cable tacked up to floor boards. If a roof antenna is used, it may be necessary to shield the toe-board with copper screen.

CHRYSLER 1931
6 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car under cowl, 1½" above intersection of toe-board and bulkhead.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with brake pedal arm, as high as possible and clear of cowl ventilator.

LOCATION OF "B" BATTERY BOX—Below metal floor under left front seat just behind crossmember. Plug to the rear.

LOCATION OF ANTENNA PLATE—On left frame

channel front hanger just ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out connection.
Coil: Fasten under upper coil mounting screw, connect pigtail to right coil terminal.
Ammeter: Fasten under panel brace nut, try pigtail connections for best results.

SPECIAL NOTES—Right cowl ventilator lever must be offset 2" to open over receiver. Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Care must be taken when attaching antenna plate not to squeeze gas line. Shield secondary wire from coil to distributor and bond shield to bulkhead. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Avoid running antenna lead-in or any connecting cables through engine compartment. If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light, on the lower right hand edge of instrument panel.

CHRYSLER 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car under cowl, bottom even with intersection of toe-board and bulkhead.

LOCATION OF LOUDSPEAKER—Vertical center-line of loudspeaker in line with left cowl ventilator lever when open, as high as possible and clear.

LOCATION OF "B" BATTERY BOX—Below tool tray under left front seat.

LOCATION OF ANTENNA PLATE—Same as 6 cylinder model.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out connection.
Coil: Fasten under upper coil mounting screw, connect pigtail to right coil terminal.
Ammeter: Fasten under lower gas gauge nut, try pigtail connections for best results.

SPECIAL NOTES—Right cowl ventilator lever must be bent up 1". Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Shield secondary wire from coil to distributor and bond shield to bulkhead. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Avoid running antenna lead-in or any connecting cable through engine compartment. Care must be taken when attaching antenna plate not to squeeze gas line. If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel so that the dome light line may be opened when the receiver is in operation.

CHRYSLER IMPERIAL 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car under cowl, 1" above intersection of toe-board and bulkhead.

LOCATION OF LOUDSPEAKER—Vertical center-line of loudspeaker in line with starting pedal, as high as possible.

LOCATION OF "B" BATTERY BOX—Below tool tray under left front seat, plug to the rear.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just back of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type near distributor.
Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.
Coil: Fasten under lower coil mounting nut. Connect pigtail to right coil terminal.
Ammeter: Fasten under right circuit breaker mounting screw.
Connect pigtail to the terminal that gives best

results.

SPECIAL NOTES—Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Avoid running antenna lead-in or any connecting cable through engine compartment. Shield secondary wire from coil to distributor and bond shield to bulkhead. Care must be taken when attaching antenna plate not to squeeze gas line. If roof antenna is used, it may be necessary to place a switch in the wire fro mthe ammeter to the dome light on the lower right hand edge of instrument panel.

DE SOTO COUPE 1931
6 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car under cowl, as high as possible.

LOCATION OF LOUDSPEAKER—Left side of car above steering column.

LOCATION OF "B" BATTERY BOX—Not used. Place "B" battery sections, in original packing, in rear compartment.

LOCATION OF ANTENNA PLATE—Under chassis in front of rear wheels, a hanger to each side channel.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.

Coil: None used.

Ammeter: Fasten under panel brace screw, connect pigtail to light wire terminal of ammeter.

SPECIAL NOTES—Avoid running antenna lead-in or any connecting cables through engine compartment. Ground antenna lead-in shield to antenna lead-in shield to antenna hanger stud if plate antenna is used. Roof antenna installed at factory, lead-in down right windshield pillar. Test for ground before using.

DODGE 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Close to right side of car, under cowl, bottom even with intersection of toe-board and bulkhead.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with clutch pedal arm, as high as possible and clear of cowl ventilator.

LOCATION OF "B" BATTERY BOX—Under left rear floor behind cross member, plug to the front.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—

Distributor: Plug-in- type.

Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.

Coil: Fasten under upper coil mounting nut, connect pigtail to right coil terminal.

Ammeter: Fasten under lower instrument mounting screw, try pigtail connections for results.

SPECIAL NOTES—Speedometer cable, wiper tube, and choke and heater wires must be moved 4" to the left on bulkhead. Right ventilator lever must be bent up. Roof antenna installed at factory, lead-in down right windshield column. Test for ground before using. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Care must be taken when attaching antenna plate not to squeeze gas line. Shield secondary line from coil to distributor and bond shield to bulkhead. Avoid running antenna lead-in or any connecting cables through engine compartment. If roof antenna is used, it may be necessary to place a switch in the wire from the the ammeter to the dome light on the lower right hand edge of the instrument panel.

ESSEX 1930
6 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Right side close to side of car and high as possible.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with steering column, high as possible.

LOCATION OF "B" BATTERY BOX Not used. "B" battery placed behind rear seat back.

LOCATION OF ANTENNA PLATE—On left frame

channel, front hanger just ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear generator terminal.
Coil: None used.
Ammeter: Fasten with bolt through bulkhead left of junction box, connect pigtail to left terminal of junction box.

SPECIAL NOTES—Avoid running antenna lead-in or any connecting cables through engine compartment. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. If roof antenna is used, lead-in should be shielded and come down right windshield column.

FORD A 1930 and 1931
4 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side, parallel to side of car under cowl with special mounting plate fastened to standard plate.

LOCATION OF LOUDSPEAKER—Left side, fastened to side of car under cowl with a special mounting plate.

LOCATION OF "B" BATTERY BOX—Fasten to rear floor between drive shaft and left radius rod, plug to the front.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger 5" ahead of storage battery.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear generator terminal.
Coil: None used.
Junction Box: Bolt to bulkhead left of junction box, connect pigtail to left terminal of junction box.

SPECIAL NOTES—"A" battery wire should be connected directly to the storage battery. Tape should be placed over metal braid on "B" cable and cable tacked up to floor board. Avoid running antenna lead-in or connecting cables through engine compartment. There is room for "B" battery behind rear seat cushion in some bodies.

HUDSON 1931
8 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Under cowl, center of bulkhead, high as possible.

LOCATION OF LOUDSPEAKER—Under cowl, right side of bulkhead, high as possible.

LOCATION OF "B" BATTERY BOX—Under left rear floor, behind cross-member, plug to the front.

LOCATION OF ANTENNA PLATE—Under chassis just ahead of "B" battery box a hanger to each side channel.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Plug-in type.
Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to bottom cut-out terminal.
Coil: None used.
Ammeter: Fasten under lower ammeter mounting screw, connect pigtail to light wire terminal.

SPECIAL NOTES—Remove wire connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Tape should be placed over metal braid on "B" cable tacked up to floor boards. Avoid running antenna lead-in or any connecting cables through engine compartment. Put tape around generator capacitor to prevent short circuit.

LINCOLN 1931
8 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Right side, between cowl compartment and new center instrument panel brace, high as possible.

LOCATION OF LOUDSPEAKER—Left of center, high as possible.

LOCATION OF "B" BATTERY BOX—In special container under left side of rear floor. Standard container cannot be used.

LOCATION OF ANTENNA PLATE—On left frame

channel, front hanger just ahead of storage battery.

Distributor: Two splice-in type, near distributor.

Plugs: Mount at right angle to plugs and swing to meet wires.

APPLICATION OF FILTER CAPACITORS—

APPLICATION OF IGNITION SUPPRESSORS—

Generator: Fasten unde inside cut-out mounting screw, connect pigtail to bottom cut-out terminal.

Coil: Bolt to coil mounting plate, connect pigtail to battery terminal of coil. Requires one for each coil.

Ammeter: Fasten under clamp nut to right of clock, try pigtail connection for best results.

SPECIAL NOTES—Remove both instrument panel braces and replace with one in center. Move coils to special bracket fastened under two right front gear case nuts. Lengthen and shield wires from switch to coils. Change secondary lines and protect coils from wetting. Fasten speedometer cable to bulkhead. Avoid running antenna lead-in or any connecting cable through engine compartment.

OAKLAND 1931

8 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Right side, under cowl, 4½" above intersection of toe-board and bulkhead, close to right side of car.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with clutch pedal arm 5" above intersection of toe-board and bulkhead.

LOCATION OF "B" BATTERY BOX—Under right rear seat, behind crossing-member, plug to the front.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just behind front running board brace.

APPLICATION OF IGNITION SUPPRESSORS—

Distributor: Splice-up type, near distributors.

Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under right cut-out mounting screw, connect pigtail to rear cut-out terminal.

Coil: Fasten under upper left speedometer nut, connect pigtail to right coil terminal.

Ammeter: Fasten under bottom speedometer nut, try pigtail connections for best results.

SPECIAL NOTES—If roof antenna is used, lead-in should be shielded and come down right windshield column. Avoid running antenna lead-in or any connecting cables through engine compartment. Shield secondary wire from coil to distributor and bond shield to bulkhead. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of the instrument panel. If roof antenna is used, it may be necessary to bond to the bulkhead pipes and control rods that pass through from the engine compartment.

OLDSMOBILE 1931

6 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Right side, under cowl, 6" above intersection of toe-board and bulkhead, close to right side of car.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with center of steering column, 5" above intersection of toe-board and bulkhead.

LOCATION OF "B" BATTERY BOX—Under left front seat, plug to the back.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just ahead of brake control cross shaft.

APPLICATION OF IGNITION SUPPRESSORS—

Distributor: Plug-in type.

Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.

Ammeter: Fasten under right instrument clamp screw nut, connect pigtail for best results.

SPECIAL NOTES—Remove primary wire connecting coil and breaker from wiring cable, shield andn bond to bulkhead or engine. Shield secondary wire from coil to distributor and bond shield to bulkhead. Avoid running antenna lead-in or any connecting cables through engine compartment. If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of the instrument panel so that the dome light can be disconnected during operation of the receiver.

PACKARD 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side, under cowl, high as possible, close to right side of car.

LOCATION OF LOUDSPEAKER—Left side, high above clutch pedal, on special brackets fastened to cowl bolt and left steering column bolt on instrument panel.

LOCATION OF "B" BATTERY BOX—Battery box not used. "B" battery put in space to the rear under front seat cushion.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type near distributor.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under outside cut-out mounting screw, connect pigtail to outside cut-out terminal.
Coil: Fasten to special coil bracket, connect pigtail to switch wire terminal.
Ammeter: Make hole in bottom edge of instrument panel, bolt to this, try pigtail connection to ammeter terminal that gives best results.

SPECIAL NOTES—Remove switch mechanism from base of coil. Solder connecting wires in coil together, cover with fibre disc, cut metal disc and solder in base of coil. Mount coil in horizontal position to bottom of radiator brace under hood. Reassemble switch and solder connecting terminals to outside of contact plate. Make connections from ammeter to switch and from switch to coil. Remount switch. Shield wire from switch to coil and bond to bulkhead. "A" battery wire should be connected directly to storage battery. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Ground antenna lead-in shield to antenna hanger stud if plate antenna is used. Avoid running lead-in or any connecting cables through engine compartment.

PACKARD 1932
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side, under cowl, between cowl compartment and center of bulkhead, high as possible.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with foot throttle arm, as high as possible.

LOCATION OF "B" BATTERY BOX—Under left rear floor, behind crossmember, plug to the front.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just ahead of brake control cross-shaft.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type, under distributor.
Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—
Generator: Fasten under cut-out mounting screw, try connections for best result.
Coil: Fasten to special coil bracket, connect pigtail to switch wire terminal.
Ammeter: Fasten under left ammeter clamp nut, try pigtail connections for best results.

SPECIAL NOTES—Separate coil and switch in same manner as 1930 Series except coil is to be clamped to left radiator brace under hood. "A" battery wire should be connected directly to storage battery. Put tape around generator capacitor to prevent short cricuit. If roof antenna is used, lead-in should be shielded and come down right windshield pillar. Avoid running antenna lead-in or any connecting cables through engine compartment. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine. Ground antenna lead-in shield to antenna hanger stud if plate antenna is used.

PIERCE ARROW 1931
8 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side, under cowl, 6" above intersection of toe-board and bulkhead, 2½" from right side of car.

LOCATION OF LOUDSPEAKER—Vertical centerline in line with steering column and 6" above intersection of bulkhead and steering column.

LOCATION OF "B" BATTERY BOX—Under left rear floor, close to frame, plug ahead.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just ahead of lower front fender bracket.

APPLICATION OF IGNITION SUPPRESSORS—
Distributor: Splice-in type, near distributor.

Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connecting pigtail to rear-cut-out terminal.

Coil: Fasten under right coil mounting screw, connect pigtail to top terminal of coil.

Ammeter: Fasten under bottom speedometer nut, connect pigtail for best results.

SPECIAL NOTES—Roof antenna installed at the factory, lead-in down right windshield column. Test for ground before using. Avoid running antenna lead-in or any connecting cables through engine compartment. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to bulkhead or engine.

PLYMOUTH 1931
4 Cylinder

BATTERY TERMINAL GROUNDED + (Make internal change in receiver).

LOCATION OF RECEIVER—Right side, under cowl, 2'' out from bulkhead and 5'' above intersection of toe-board and bulkhead, close to right side of car.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with hole for freewheeling control, 8'' above intersection of toe-board and bulkhead.

LOCATION OF ''B'' BATTERY BOX—Under left rear floor, behind crossmember, plug to the left.

LOCATION OF ANTENNA PLATE—On left frame channel, front hanger just behind storage battery.

APPLICATION OF IGNITION SUPPRESSORS—

Distributor: Plug-in type.

Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.

Coil: Fasten under upper coil mounting nut, connect pigtail to right coil terminal.

Ammeter: Fasten under lock nut under speedometer, connect pigtail to terminal that gives best results.

SPECIAL NOTES—Roof antenna installed at the factory, lead-in down right windshield column. Test for ground before using. If roof antenna is used, it may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of instrument panel. Avoid running antenna lead-in or any connecting cables through engine compartment. Shield secondary wire from coil to distributor and bond shield to bulkhead. Remove primary wire, connecting coil and breaker, from secondary manifold, shield and bond to engine or bulkhead.

PONTIAC 1931
6 Cylinder

BATTERY TERMINAL GROUNDED —

LOCATION OF RECEIVER—Right side, under cowl, 5'' above intersection of toe-board and bulkhead, close to right side of car.

LOCATION OF LOUDSPEAKER—Vertical centerline of loudspeaker in line with clutch pedal arm, 5'' above intersection of toe-board and bulkhead.

LOCATION OF ''B'' BATTERY BOX—Under left rear floor, behind crossmember, plug to the front.

LOCATION OF ANTENNA PLATE—On right frame channel, front hanger just ahead of brake control cross shaft.

APPLICATION OF IGNITION SUPPRESSORS—

Distributor: Plug-in type.

Plugs: Mount vertically on plugs.

APPLICATION OF FILTER CAPACITORS—

Generator: Fasten under outside cut-out mounting screw, connect pigtail to rear cut-out terminal.

Coil: Fasten under upper left speedometer nut, connect pigtail to battery terminal of coil.

Ammeter: Fasten under bottom speedometer nut, connect pigtail for best results.

SPECIAL NOTES—Move throttle control to wiper tube hole. Put choke control through new hole below wiper and throttle. If roof antenna is used, lead-in should be shielded and come down right windshield column. It may be necessary to place a switch in the wire from the ammeter to the dome light on the lower right hand edge of the instrument panel and bond to bulkhead pipes and control rods that enter from the engine compartment. Shield secondary wire from coil to distributor and bond shield to bulkhead. Remove primary wire connecting coil and breaker, from secondary manifold, shield and bond to engine or bulkhead.

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***Editorial Note.

The February issue of SERVICE will contain installation data covering the Studebaker series of cars.

The publishers of SERVICE will appreciate any type of service information related to automobile radio operation installation and service.