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## TELECOMMUNICATIONS REGULATION CIRCULAR

### SUPPRESSION OF INDUCTIVE INTERFERENCE FROM SMALL LIGHTING PLANTS

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TELECOMMUNICATION REGULATORY SERVICE

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SUPPRESSION OF INDUCTIVE INTERFERENCE  
FROM SMALL LIGHTING PLANTS

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1. In normal operation, small electric lighting plants usually cause radio interference on modern sensitive receivers. Commutation, even when no visible sparking occurs at the brushes, may set up a harsh continuous noise, and periodic staccato clicking from the ignition system occurs in synchronism with the firing of the engine.
2. Commutation interference is least with clean, well adjusted commutator and brushes. A worn, grooved or pitted commutator may have to be dressed in a lathe, but slight imperfections can be cleared by the use of a small piece of No. 00 sandpaper held in contact with the commutator as the machine revolves. Care must be taken not to produce hollows. The mica inserts between segments must be undercut; however the mica is normally undercut sufficiently that further undercutting is very infrequently required.
3. The brushes must seat well, must fit the brush holders so as to move freely but not chatter, and must have firm but flexible spring pressure.
4. Cleanliness of brushes and commutator is very important. An occasional light touch of a lint-free cloth to which a trace of vaseline has been applied will keep these parts in good condition for considerable periods.
5. With most plants the brushes are supported in a ring holder which may be rotated a few degrees. In general, with the machine operating under normal load, the ring should be rotated backward and forward noting the positions at which sparking is a minimum and securing it midway between these positions. A more accurate method is to set the ring for minimum interference on a radio set.
6. Interference from the ignition system can be materially reduced, if not entirely eliminated, by the use of a simple surge trap connected to the lighting lines. This trap also serves to suppress such commutation interference as may be present after the commutator has been cleaned.
7. The capacitor surge trap consists of two capacitors of approved type, usually 0.1 microfarad. Installation is made as follows:
  - (a) There are two terminal connections on each capacitor, except in special units covered in note below. A short wire is run from one terminal of one unit to one terminal of the second unit. The question of polarity does not enter here so no special precautions are necessary in selecting the two terminals which are to be joined by a common connector. All wires used in connecting the surge trap must be as short as possible. Even several centimetres seriously affects the usefulness of the trap.

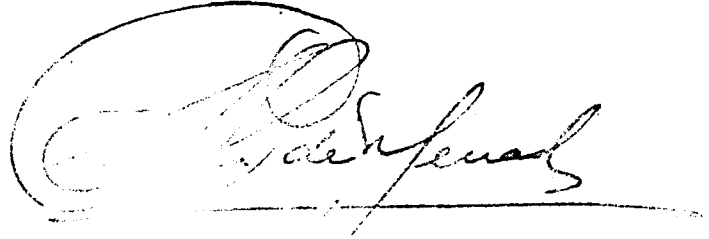
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- (b) The free terminals of the capacitors are then connected to the lighting lines - one terminal to each line. Connection is made at the switchboard - under the same nuts which secure the outgoing lighting wires.
- (c) A wire is tapped on to the common connector referred to in (a) and its free end secured under any convenient nut or bolt in the engine frame.

NOTE: Some manufacturers have on the market, two capacitors combined in one unit, the common connector joining the capacitors being brought out to a third terminal. This terminal should be connected to the engine frame as in (c). The other two terminals are connected to the lighting lines as in (b).

- 8. Ignition interference may be further reduced by inserting a non-inductive resistance of roughly 10 kilohms (such as is used for automobile ignition systems) in the high tension lead directly at the spark plug. This occasionally proved more effective than the capacitor method in relieving the clicking interference, but does not arrest any commutator interference which may be present. A combination of both methods has been used with success.
- 9. Connecting wires should be as short as possible and to facilitate this, capacitors can be mounted on a small bracket directly at the switchboard.
- 10. The above methods are usually effective when dealing with plants which are insulated from ground. While it is often assumed that a plant mounted on wooden skids or platform is insulated from ground, it is actually grounded if the exhaust pipe runs to a muffler drum in the ground and, where permissible, a section of piping of some insulating material should be inserted in the exhaust line. Glazed porcelain pipe, asbestos or other heat resisting insulating material will be suitable.
- 11. Where complete insulation from ground is necessary in the case of plants mounted on concrete bases, slotted washers of shellacked fibre under the corners and under the nut holding down the base may be used. A bushing of varnished cambric or other suitable material must be slipped over the bolt here to prevent electrical contact between the engine base and holding-down bolts.
- 12. Only in extreme cases should it be necessary to insert choke coils in the circuit. If required, they are installed close to the point where the dynamo leads come out of the machine housing. Satisfactory results are sometimes obtained when installation is made where the lighting lines leave the switchboard; this is a more convenient point at which to open up the circuit and preliminary test can be made here without much difficulty.

13. Choke coils for this purpose consist of approximately 100 turns of D. C. C. copper wire in a single layer or bank wound on an insulating cylinder of approximately 8 centimetres diameter. The wire used must be sufficiently large to carry the load without overheating.

A handwritten signature in cursive script, appearing to read "John deMercado", written over a horizontal line.

Dr. John deMercado  
Director General  
Telecommunication  
Regulatory Service