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Section A201.101
Issue B, 2-15-37-0
T. P. T. & T. Co.

CHARGING GENERATORS AND MOTOR GENERATOR SETS

1. GENERAL

1.01 This section outlines the procedure for inspecting and testing of charging generators and motor generator sets of the following general types:

Commercial Type Charging Generators

M Type Charging Generators

Induction Motors

Motors - Direct Current - One-quarter Horsepower or Larger

1.02 This section replaces Section A201.101, Issue A, and has been reissued to eliminate reference to particular sections of other divisions of these practices, to break down the method to facilitate scheduling and to clarify certain other points of the former issue.

1.03 The routine inspection of gas, gasoline or other emergency engines, either direct or belt connected to generators is covered under separate sections of these practices.

1.04 This inspection or any repairs found necessary should be made at a time when there is a minimum danger of apower failure or any reasonable probability that the machine will be required to carry the office load.

1.05 This routine contemplates that the normal day to day maintenance is being performed. This includes cleaning, brush and commutator maintenance, lubrication and keeping the machine in good running order. This routine is, therefore, a general check-up to insure that the normal maintenance is adequate and effective and to detect excessive wear or deterioration that may, if not properly cared for, shorten the life of the machine.

1.06 The various items listed under methods are enumerated to outline a procedure for making the inspections and tests. The inspections and tests shall be a definite check-up to see that the requirements of the Div. A 400, section applicable, are met and not a casual inspection. Reference shall also be made to the division A 300, A 500, and A 700, Sections for Operating Methods, Ordering of Piece Parts and Replacement Procedures, tools, gauges and materials required.

1.07 When the inspection of either member of a direct connected unit indicates repairs are necessary, both members (i.e., the motor and generator) shall be checked before proceeding, to insure that the difficulty encountered is not caused by a fault in the other member of the unit or the coupling.

1.08 Where test runs or capacity tests are specified in the A 400 division sections, the matter shall be checked with the supervisor in charge to insure that batteries or equipment are not injured by the excess current or voltage.

1.09 For convenience of scheduling this routine is divided into

the following major operations:

a) Check of maintenance and care in connection with operation.

b) Check for wear or reconditioning requirements.

c) Replacement of Lubricants.

d) Test Run.

2. TOOLS AND MATERIALS

2.01 Test Receiver and Condenser - Portable Lamp or Flashlight, tools, gauges and materials listed in the A 400 division sections covering the type of machine being inspected and tested.

2.02 Materials, oils and greases as required and listed in the division A 700 sections of these practices.

2.03 Brushes for replacement as listed in a Division A 500 section of these practices.

3. METHOD

A) Check of Maintenance and Care in Connection with Operation.

3.01 Inspect the general appearance and cleanliness of all parts of the machine, including the brushes, brush holders, armature windings and ends, inside of frame, couplings, etc.

3.02 Observe that all screws and bolts are secure and that all screw or soldered electrical connections are tight and making good electrical contact.

3.03 Check for freedom of moving parts by rotating the machine slowly by hand; observe whether or not there is any bind in bearings or couplings.

3.04 NONE Check the condition of leather coupling of direct-connected sets by determining the amount of lost motion or play in the coupling. Observe that the driving member of the set is pulling the driven member through the medium of the separator and not pushing against either the leather or metal fingers of the coupling.

3.05 Observe that the bearings have been properly lubricated during operation as required for the particular type of bearing on the machine being inspected.

3.06 Observe that oil gauges, where provided, are not cracked or broken, are free from leaks and indicate the level of oil distinctly.

3.07 Inspect for leakage of oil around the bearing housings and drain plugs.

3.08 Observe that the brush holder yoke is positioned in accordance with requirements.

3.09 Check the length, fit, alignment and spacing of brushes and brush holders with requirements as outlined in the Div. A 400. Section covering the particular machine being inspected.

3.10 Check the brush pressure against requirements.

3.11 Inspect the commutation surface for scoring, pitting, high, low or loose segments, flat spots, high mica or other deformation of the surface.

Note: Ridges around the commutator in the direction of rotation are not necessarily objectionable

until they impair commutation or are the cause of noise.

3.12 Observe that the commutation surface has been properly lubricated on those machines where this is required and that no lubrication has been applied to the commutator on machines where no lubrication is required.

B) Check for Wear or Reconditioning Requirements

3.13 Check the air gap at all points between the armature and pole faces. Less than minimum air gap between the armature and pole face of the lower half of the frame, indicates worn bearings.

3.14 Check the bearings for excessive wear, note whether or not there is excessive wear even though the clearance between armature and pole pieces meets requirements.

3.15 Remove any foreign objects or tools which might fall or be drawn into the machine.

3.16 Start the machine as covered under the Division A 300 section applicable and place it under normal load conditions.

3.17 After the machine has operated for a sufficient length of time to warm up to its running temperature, observe whether or not there is excessive noise or vibration. Vary the load from minimum to full load and note whether excessive noise or vibration is present at any particular load conditions.

3.18 With the machine operating as covered by 3.17, observe the commutation and note whether or not there is excessive sparking under any load condition.

3.19 On charging generators, make a listening test with a test receiver and condenser in series bridged across the generator leads at the machine. Observe whether or not there is excessive noise before concluding that visible sparking is objectionable.

3.20 Check that the voltage is within prescribed limits.

3.21 Check electrical connections for excessive heating or for drop in potential by means of a receiver or low range voltmeter bridged across the individual connection.

3.22 Check for end play on machines for which end play is specified in the A 400 division section applicable to the particular unit being inspected.

3.23 Inspect the oil rings for proper operation on machines so equipped.

3.24 Check the temperature of the machine as required.

3.25 Stop the machine.

3.26 From an inspection of the commutator and the commutation noted under paragraph 3.18 and 3.19 determine whether or not resurfacing is advisable.

Caution - Excessive or unnecessary resurfacing shall be avoided as this materially shortens the life of the armature.

C) Replacement of Lubricants

3.27 On machines having oil rings or where otherwise specified, the bearing shall be drained and refilled with fresh oil as specified for the particular machine.

D) Test Run

3.28 Make a test run if deemed advisable.

4. PROCEDURE

4.01 Unless one or more of the tests or inspection items covered under paragraph 3, above, indicates that a major repair is necessary, the complete inspection shall be made before making any minor corrections or changing the oil in the bearings.

4.02 If it is determined that new bearings are required, the replacement of them shall be made before any resurfacing of the commutator is attempted. Consideration should be given to having the commutator trued in a lathe at this time.

4.03 If the commutator should require resurfacing or turning down, this shall be done before re-setting or adjusting of the brushes.

4.04 Repairs other than the foregoing, whether of a major or minor nature or if only minor repairs or adjustments are required, these shall be made as near as possible in their logical order.

4.05 It is intended that the oil in the bearings will be replaced once each year. However, should repairs be required that necessitate ordering material or parts, this may be extended to 18 months, so that the change of oil can be completed as the last operation in the completion of this routine, prior to a final test run if this is deemed advisable.

4.06 A test run, although not required on machines which have been in service for some time, may be advisable, following repairs of more or less of a major nature. The advisability of making a test run shall be decided upon, only after thorough consideration by the supervisor in charge.

5. REPORTS

5.01 A complete report of the conditions found and repairs made or recommended shall be made for each motor, generator or motor-generator set.