MOTOR GENERATOR AND ALTERNATOR SETS

1. GENERAL

1.01 This section is issued to give for scheduling purposes, the procedures for cleaning, inspecting, lubricating, and testing motor generator and alternator sets.

1.02 When adjustments or replacements are to be made, the necessary precautions should be taken to maintain service. Make no attempt to remove a machine from service during periods of heavy traffic to correct minor faulty conditions detected by inspection. If emergency repairs necessitate removing a machine from service, give the reserve equipment a thorough operating test before substituting so that no service interruptions will occur.

2. APPARATUS

2.01 Flashlight, portable extension lamp, or other light source.

2.02 KS-14666 cleaning cloths or KS-14668.

2.03 Megger, Evershed.

2.04 Sandpaper, No. 00 and No. 0000.

2.05 Balance, spring 0 - 6 lbs (by 2 oz. graduations).

2.06 Lubricating Oil as specified.

2.07 KS-6824 Sealing Compound.

3. SAFETY PRECAUTIONS

3.01 Work on machines that are in operation only when absolutely necessary. If such work is required, be sure adequate lighting is available.

3.02 Avoid possible accident from loose clothing when working near machines. Neckties and loose sleeves are especially hazardous.

3.03 When it is necessary to work on a machine follow these precautions:

a. Shut machine down
b. Remove AC fuses
c. Disconnect machine from battery
d. Post "Man at Work" sign on switches

3.04 Tools should be taped when working around energized bus-bars or switches.

3.05 Use extreme care in sanding commutators. Be careful of protruding parts that would cut the hands. Do not let the sandpaper get away.

3.06 Polishing the commutator should be done with the paddle described in Section 171-110-701 so that the hands are clear of the rotating armature.

3.07 Generators that start automatically should be clearly labeled "Danger, Auto-Start".

4. METHOD

(A) General Inspection

4.01 Inspect the general appearance and cleanliness of all parts of the machines. Use a KS-14666 cleaning cloth to clean the armature, brushes, brush holders, wiring, and all other exposed surfaces.

4.02 See that the commutator is free of grease, oil, and moisture.

4.03 See that the commutator has a uniform chocolate brown or bronze color film, highly polished to a glaze. Do not mistake this for a burned commutator and do not sand it off to get a clean surface.

4.04 Inspect the brushes to see that each brush works easily in and out of its holder.

4.05 Check the brushes for correct pressure and angle. Too high pressure will cause wear on the commutator and brush. Too low pressure will let the brush chatter and cause even more wear.

4.06 See that the brushes are staggered to use as much of the useful area of the commutator as possible.

4.07 See that the commutator mica is properly undercut. Most machines are designed for an undercut of 1/16 to 1/8 of an inch.

4.08 See that there is very little sparking at the brushes.

4.09 Inspect for brushes appearing to be oscillating in and out at the brush holder. This condition indicates the commutator is out of round. Refer this matter to the supervisor.

4.10 Check that the bearings or any part of the machines are not excessively hot. If the hand cannot be comfortably left on any part check the temperature with a thermometer. The allowable temperature is 80°C. (176°F.) for bearings and 90°C. (194°F) for windings and Frame. Take the temperature by either dipping in the oil of an oil ring bearing (note: make sure the thermometer does not strike the shaft or interfere with the oil ring), or by placing the bulb of the thermometer as near to the area to be measured as possible (note: cover the part of the thermometer that is not in contact with a piece of felt or equivalent).

(B) General Lubrication

4.11 Grease should be added to a bearing very carefully

a. Shut down machine
b. Remove drain plug
c. Add grease slowly until fresh grease comes out of the drain
d. Start and run machine hot until grease stops draining out
e. Clean out around drain and replace plug.

4.12 Additions of oil in the sleeve type bearings should be made with the set stopped to avoid over filling and leaking of oil.

(C) Test for Current Leaks

4.13 To test for current leaks between the brush holder studs and frame or between the commutator bars and frame, lift all except one brush from the commutator. Attach the megger terminals to the brush that is resting on the commutator and the frame of the machine. Disconnect positive negative and field leads on generator.

4.14 Set the megger level by using the indicator provided for that purpose on the face of the meter.

4.15 Operate the megger and see that the reading is one hundred megohms or more. This operation tests for crosses between both the commutator and frame and the brush holder stud and frame. If the reading is less than one hundred megohms lift the brush and test the brush holder and commutator separately. If either when tested individually shows a reading of less than one hundred megohms, proceed as outlined in paragraphs 4.17 and 4.19.

4.16 Test each of the remaining brush holder studs with the brushes raised and the megger connected to the brush holder stud and the frame.

4.17 If any stud shows a reading of less than one hundred megohms, proceed as follows:

(a) Wash the exposed surfaces of the mica insulating washers with petroleum spirits, thoroughly cleaning any metallic or other deposit lodged in cracks or chips in the enamel coating of the insulators.

(b) Make a second megger test and if the resistance is still below 100 megohms, remove the stud and bushings and thoroughly clean them with petroleum spirits. Reassemble them when dry and again apply the megger.

(c) If the resistance has not been raised to the proper value by these procedures, replace the mica insulation.

4.18 After the test has been completed and any trouble found has been cleared, clean the holder studs, using petroleum spirits sparingly. Remove any foreign matter from cracks and chips in the enamel.

4.19 A coating of KS-6824 sealing compound should then be applied over the old finish on the frame end of the brush holder stud and insulation.

(D) Compensator Oil

4.20 Replace the oil in the starting compensator in accordance with other BSP sections covering hand starting compensators.

5. REPORTS

5.01 The required record of this routine should be entered on the proper form.