

PREVENTIVE MAINTENANCE

TECHNICAL NOTE ■ STA BE 16-20 GB

By preventive maintenance is meant that the care given to machines ensures that they are maintained in good condition and are able to function well.

The proposals which follow only concern machines with brushes and commutators (or rings) which do not give cause for criticism during service.

The rules for preventive maintenance vary necessarily according to the type and size of machines, the particular conditions of service, the length of the running and rest periods.

However, it has seemed advisable to regroup the maintenance operations considered by us as essential into an orderly arrangement in such a way as to present to maintenance personnel a check-list entirely or partly applicable to their particular equipment.

Short of dismantling the machine, preventive maintenance can be stated to be composed of the following chronologically arranged generalities:

- checks during running down from the time current is switched off, till the machine has stopped,
- cleaning,
- electrical inspection and mechanical measurements,
- checks before starting up.

CHECKS DURING SLOWING DOWN

- Watch for vibrations and noises which may appear during slow speed running and which may affect either the frame, the bearings, or even the brushes.
- Note whether any beating occurs on the elastic joints of the couplings.
- By means of a location spot traced on the shaft of the machine check that the rotor does not stop in a preferential position.
- As soon as the machine stops, measure by any appropriate means the temperature of the commutator and/or each of the rings.

CLEANING

- Thoroughly blow out the rotor and stator with dry compressed air from both ends of the machine i.e. commutator (or rings) end and opposite end.
- In order to be effective, the blowing should displace and remove all the dust to the outside of the machine.

A simple displacement of the dust in the interior of the machine can be more of a **nuisance than a benefit**.

- Blow out and clean the filters with a solvent and dry.
- Wipe all insulators with a dry rag.
- Brush between the commutator bars with a fibre glass or nylon brush.

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MEASUREMENTS OR INSPECTION

- Check for concentricity of the commutator (or ring) contact surfaces by applying a comparator to the top of a brush. Repeat on each brush of one arm.
- Insulation resistance of windings to be measured four times. When warm, when cold, before and after blowing.
- Measure with a spring balance the pressure applied by the brush holder pressure fingers on the top of the brushes.
- If necessary, measure the wear of the bearings by checking clearances at 90° apart (3, 6, 9 and 12 o'clock) with a set of appropriate feelers.
- Measure, if necessary, the length of all the brushes on one arm to see if there is abnormal wear.

CHECK BEFORE STARTING UP

A - Commutators or rings

- Examine the bar chamfers and look for incipient pitting or shading of the bars or burning of the trailing edges and oil leakage (if the skin appears a little too thick, it is advantageous to pass a grinding stone grain “M” over the commutator or the rings at the moment of putting the machine back into operation).
- Examine the groove edges of helically grooved rings (a cutting edge on the rim of a helical groove always brings about rapid wear of the brush and for incipient marks or burns).
- Carefully check that surface of the commutator or slip-rings is not polluted with oil.

B - Brush-holder and brushes

- Note first that there is no copper dust deposited on the brush-holders or their supports.
- Check that the contact edges of the brushes are not chipped or burnt and that the surfaces do not have any vibration or burn marks.
- Examine if necessary the interior of the brush boxes for smoothness and cleanliness.
- Check that the brush flexibles are not oxidised, burnt or frayed.
- After putting the brushes back into their brush-holders verify:
 - that they are sliding normally in their boxes,
 - that the pressure fingers are in their correct position at the middle of the top of the brushes,
 - that the flexibles are not pinched by the pressure fingers.

PARTICULAR PRECAUTIONS IN THE CASE OF LONG STOPPAGES OF THE MACHINES

- Protect the commutators or rings from damage and oil leaks by the use of strips of cardboard or clean rag.
- Remove all brushes especially if the machine has to spend some time in a humid, salty or chemical atmosphere or better still, interpose between the brush and the commutator or rings, a strip of insulating material.

Note: see Technical Notes STA: BE 16-1; BE 16-3; BE 16-15; BE 16-26; BE 16-27; BE 16-28; BE 16-31; BE 16-33; BE 16-34; BE 16-35; BE 16-40; BE 16-46; BE 16-48.

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