

BRUSH BEDDING

TECHNICAL NOTE ■ STA BE 16-41 GB

The bedding process consists in giving to the contact face of a new brush the exact curvature of the commutator or the ring, in such a manner as to assure good mechanical and electrical contact when the brush is put into service.

Bedding requires particular care when:

- the brush material is very hard,
- the machine rotates at high speed and/or vibrates,
- the brush spring pressure is low,
- the radius of curvature of the commutator is very small - **especially if split brushes are involved** (*fig. 1 reverse side*).

Should the bedding be incorrect or incomplete, there is a risk that the brushes may make contact with the commutator by the central wafer only, which will take all the load and may or may not be at the brush centre. The consequences could be very serious both for the commutator as well as for the brush.

Remark: New brushes are, generally, supplied with preformed contact faces, that is to say, with the surface machined to the radius requested.

This radius is only approximate and does not permit dispensing with the bedding operation.

The advantage of preforming is that it considerably shortens the time taken for the bedding operation.

METHODS OF BEDDING

- 1 - Brush bedding for commutators or rings of small to medium diameter up to say 500 mm dia (20") may be preformed on grinding wheel of a diameter equal to that of the commutator or ring.

Naturally, during the grinding operation it is necessary for the brush to be maintained rigidly on the wheel, **not by hand**, but by means of a suitable brush-holder fixed at 2 or 3 mm from the wheel; on completion, always blow away carefully any dust on the surface so that no abrasive grains could form a crust on it.

The method is rapid but only approximate.

It is suitable for large series of motors of the same type (Traction Motors, for example).

- 2 - Bedding is more often carried out on the machine itself, in accordance with various procedures depending upon the importance and sensitivity of the machine.

a - By an abrasive paper or cloth of medium grain (grain 60) applied to the whole or part of the commutator (or of the ring) with an appropriate tool or by hand. New brushes are placed into position in their brush-holders and allowed to press against the abrasive side of the cloth. The paper is oscillated circumferentially until it is observed that all contact surfaces are completely bedded (*fig. 2 reverse side*).

On heavy machines it is necessary to bed the brushes arm by arm with a to and fro movement by hand (*fig. 3 reverse side*); be sure the paper or cloth makes contact with the commutator well outside the area covered by the brush otherwise the true curvature of the commutator will not be formed on the contact surface resulting in a reduced contact area badly defined (*fig. 4 reverse side*).

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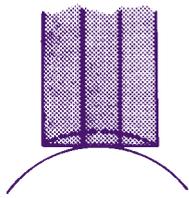


fig. 1

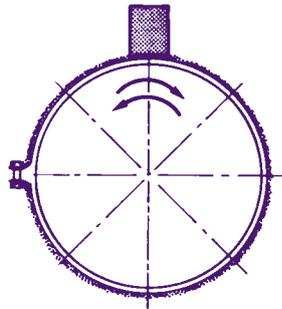


fig. 2

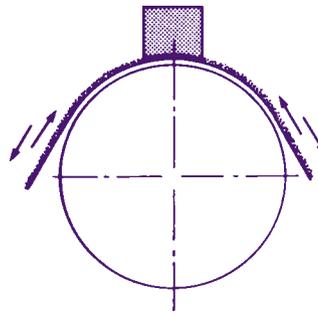


fig. 3

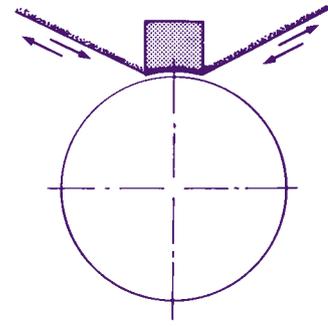


fig. 4

b - By a bedding stone, which is used on large or very large machines whilst rotating and whilst open and always under much reduced voltage.

The abrasive dust acts as a grinding agent wearing the carbon exactly to the shape of the commutator.

This method is good when it is not abused because the dust from the stone will slightly wear the metal of the commutator or rings. It is only applicable for bedding necessitating the removal of only a small amount of carbon.

Very important

After bedding by whatever method, it is necessary to thoroughly blow out the commutator and the contact surfaces of the brushes in order to completely remove the abrasive dust and carbon dust. This operation must be carried out with brushes held out of the brush-holders.

REMARKS

1 - Sometimes, for high speed rings new brushes are supplied with straight, unradiused but cross grooved contact surfaces. Nevertheless, it is still necessary to bed and in this case with particular care.

2 - For reversing machines, the grinding must be carried out successively for both working directions.

For unidirectional machines it is obvious that the brushes must be ground in the direction of normal rotation.

3 - It should also be borne in mind that even well-bedded brushes run the risk of vibrating when put to use on commutators (or rings) which have been turned with a diamond tool, that is to say "brightly polished".

We recommend that such polished surfaces should always be made matt by a fine-grained cloth, in order to facilitate the deposit of graphite on the friction tracks and thus accelerate the formation of the skin.

4 - When individual brushes are replaced one by one on large machines, it is acceptable, when quite necessary, to put brushes into service which have only a pre-formed radius without actually carrying out the grinding process provided the number of the brushes to be changed is small compared with the total number of brushes in use (about 20 %) and provided there is a fair degree of distribution around the commutator.

Brushes fitted in this way become bedded by normal frictional wear and if their number is within the limits above indicated they will not adversely affect the operation of the other brushes during this natural bedding period.

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