Shah Engineering Works
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Technical Support on Commutators

Troubles	causes
BLACKENING OR BURNING OF COMMUTATOR **The primary cause is abnormally high current resulting in sparking. Some things to check may include:**	1. Overload 2. Commutator problems such as poor TIR, flats, wear or high micas 3. Incorrect or mixed grade(s) fitted 4. Poor holder alignment/spacing 5. Low/variable spring pressure 6. Electrical faults such as low IR on armature or field windings resulting in Sparking 7. Neutral point wrongly set
BURNING OF FLEXIBLES **The primary cause is persistent unequal current distribution between brushes, because of:**	1. Unequal pressure on brushes 2. Brushes sticking in boxes 3. Incorrect commutating conditions (neutral point setting) 4. Mixing different grades on one machine. 5. Loose termination screws, dirty or burred terminals 6. Corrosion of the flexibles by gas 7. Flexibles too short, or too stiff, tending to hold brush off the commutator 8. Unequal spacing between brush holder spindles
COPPER PICKING **May result either from imperfect contact between commutator and brush, or from abnormal current.**	1. Poor mechanical condition of commutator 2. Proud mica 3. Unequal or low brush pressure 4. Brushes sticking in holders 5. Extended periods of light load running 6. For causes of abnormal current density see above “Blackening of Commutator”
CHATTERING/VIBRATION **(or excessive noise) Can be caused by:**	1. A slight reaction angle on the brush (i.e. the brush inclined slightly against the direction of rotation 2. Excessive clearance between brush and holder 3. Holders too far from the commutator, or brushes too long 4. Low spring pressure 5. Unsuitable grade of brush 6. Armature out of balance 7. Commutator out of true 8. Projecting mica 9. Long periods of operation at low or no load 10. Loose commutator bars
CHIPPING	1. Is generally the result of violent vibration 2. Poor holder alignment 3. Low spring pressure 4. Commutator faults such as excessive TIR or high bar to bar differences 5. Loose commutator bars
CORROSION OF FLEXIBLES BY GAS	1. May arise from contamination of the atmosphere by corrosive gases such as Chlorine and Sulphur fumes. 2. Where such atmospheric pollution is unavoidable, tinned flexibles should be used or the flexibles protected by sleeving.
FLATS **(low bar or bars on commutator) Caused usually by:**	1. Projecting mica. 2. Faulty connection between winding and commutator. 3. Imperfect machining. (A small flat left after turning or grinding, quickly develops into a bad flat). 4. A series of small flats is often caused by sparking or severe overload.

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