

# Shah Engineering Works

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## Technical Support on Commutators

Troubles	causes
<p><b><u>BLACKENING OR BURNING OF COMMUTATOR</u></b>                      The primary cause is abnormally high current resulting in sparking. Some things to check may include:</p>	<ol style="list-style-type: none"> <li>1. Overload</li> <li>2. Commutator problems such as poor TIR, flats, wear or high micas</li> <li>3. Incorrect or mixed grade(s) fitted</li> <li>4. Poor holder alignment/spacing</li> <li>5. Low/variable spring pressure</li> <li>6. Electrical faults such as low IR on armature or field windings resulting in Sparking</li> <li>7. Neutral point wrongly set</li> </ol>
<p><b><u>BURNING OF FLEXIBLES</u></b>                      The primary cause is persistent unequal current distribution between brushes, because of:</p>	<ol style="list-style-type: none"> <li>1. Unequal pressure on brushes</li> <li>2. Brushes sticking in boxes</li> <li>3. Incorrect commutating conditions (neutral point setting)</li> <li>4. Mixing different grades on one machine.</li> <li>5. Loose termination screws, dirty or burred terminals</li> <li>6. Corrosion of the flexibles by gas</li> <li>7. Flexibles too short, or too stiff, tending to hold brush off the commutator</li> <li>8. Unequal spacing between brush holder spindles</li> </ol>
<p><b><u>COPPER PICKING</u></b>                      May result either from imperfect contact between commutator and brush, or from abnormal current.</p>	<ol style="list-style-type: none"> <li>1. Poor mechanical condition of commutator</li> <li>2. Proud mica</li> <li>3. Unequal or low brush pressure</li> <li>4. Brushes sticking in holders</li> <li>5. Extended periods of light load running</li> <li>6. For causes of abnormal current density see above "Blackening of Commutator"</li> </ol>
<p><b><u>CHATTERING/VIBRATION</u></b>                      (or excessive noise) Can be caused by:</p>	<ol style="list-style-type: none"> <li>1. A slight reaction angle on the brush (i.e. the brush inclined slightly against the direction of rotation</li> <li>2. Excessive clearance between brush and holder</li> <li>3. Holders too far from the commutator, or brushes too long</li> <li>4. Low spring pressure</li> <li>5. Unsuitable grade of brush</li> <li>6. Armature out of balance</li> <li>7. Commutator out of true</li> <li>8. Projecting mica</li> <li>9. Long periods of operation at low or no load</li> <li>10. Loose commutator bars</li> </ol>
<p><b><u>CHIPPING</u></b></p>	<ol style="list-style-type: none"> <li>1. Is generally the result of violent vibration</li> <li>2. Poor holder alignment</li> <li>3. Low spring pressure</li> <li>4. Commutator faults such as excessive TIR or high bar to bar differences</li> <li>5. Loose commutator bars</li> </ol>
<p><b><u>CORROSION OF FLEXIBLES BY GAS</u></b></p>	<ol style="list-style-type: none"> <li>1. May arise from contamination of the atmosphere by corrosive gases such as Chlorine and Sulphur fumes.</li> <li>2. Where such atmospheric pollution is unavoidable, tinned flexibles should be used or the flexibles protected by sleeving.</li> </ol>
<p><b><u>FLATS</u></b>                      (low bar or bars on commutator )                      Caused usually by:</p>	<ol style="list-style-type: none"> <li>1. Projecting mica.</li> <li>2. Faulty connection between winding and commutator.</li> <li>3. Imperfect machining. (A small flat left after turning or grinding, quickly develops into a bad flat).</li> <li>4. A series of small flats is often caused by sparking or severe overload.</li> </ol>

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