

CHART OF COMMON DIFFICULTIES ON ROTATING ELECTRICAL MACHINES

| SYMPTOMS | | | | | | | | | | | | | | | | | | | | | | | | | | | | SYMPTOMS | | |
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| M | SERRATION AND GROOVING OF COMMUTATOR OR SLIP RING | | | | | | | | | | | | | | | | | | | | | | | | | | | N | WEAR OF SLIP RING ON ONE POLARITY | |
| L | EXCESSIVE COMMUTATOR WEAR - SURFACE BLACKENED | | | | | | | | | | | | | | | | | | | | | | | | | | | O | COPPER PICKING IN BRUSH FACE | |
| K | COPPER DRAGGING | | | | | | | | | | | | | | | | | | | | | | | | | | | P | BRUSH CHATTER | |
| J | EXCESSIVE COMMUTATOR OR SLIP RING WEAR - BRIGHT SURFACE | | | | | | | | | | | | | | | | | | | | | | | | | | | Q | COMMUTATOR SURFACE STREAKY | |
| I | UNEQUAL BRUSH WEAR | | | | | | | | | | | | | | | | | | | | | | | | | | | R | COMMUTATOR HAS UNSYMMETRICAL BURN MARKS | |
| H | RAPID BRUSH WEAR - WHILE COMMUTATION GOOD | | | | | | | | | | | | | | | | | | | | | | | | | | | S | COMMUTATOR HAS SYMMETRICAL BURN MARKS | |
| G | FLEXIBLE BURNT OUT OR DISCOLOURED | | | | | | | | | | | | | | | | | | | | | | | | | | | T | COMMUTATOR HAS WAVY PATTERN | |
| F | BRUSHES AND BRUSH HOLDERS TOO HOT | | | | | | | | | | | | | | | | | | | | | | | | | | | U | GHOST MARKS ON STEEL SLIP RINGS | |
| E | COMMUTATOR - SLIP RING - TOO HOT | | | | | | | | | | | | | | | | | | | | | | | | | | | V | GLAZED CONTACT SURFACE OF BRUSH | |
| D | SPARKING VICIOUS AND TRAILING AROUND COMMUTATOR | | | | | | | | | | | | | | | | | | | | | | | | | | | W | FITTED CONTACT SURFACE OF BRUSH | |
| C | GREEN PIN SPARKS | | | | | | | | | | | | | | | | | | | | | | | | | | | X | CHIPPING OF BRUSH EDGES OR BRUSH BREAKAGE | |
| B | SPARKING AT THE ENTERING EDGE | | | | | | | | | | | | | | | | | | | | | | | | | | | Y | FAILURE TO DEVELOP A PROTECTIVE SKIN | |
| A | SPARKING AT THE LEAVING EDGE | | | | | | | | | | | | | | | | | | | | | | | | | | | Z | INSUFFICIENT VOLTAGE ON SELF EXCITING MACHINE | |
| PROBABLE CAUSE OF TROUBLE | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | REMEDY | | |
| 1 | INTERPOLE FIELD TOO STRONG | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | WEAKEN INTERPOLE FIELDS BY DIVERT OR BY INCREASING GAP | |
| 2 | INTERPOLE FIELD TOO WEAK | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | STRENGTHEN INTERPOLE FIELDS BY REDUCING AIR GAP |
| 3 | INTERPOLE AIR GAP TOO SMALL | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | ENLARGE AIR GAP TO DECREASE EFFECTIVE INTERPOLE FLUX |
| 4 | INTERPOLE AIR GAP TOO LARGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | REDUCE AIR GAP TO INCREASE EFFECTIVE INTERPOLE FLUX |
| 5 | AIR GAPS UNEVEN (BEARINGS WORN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | RENEW BEARINGS AND REALIGN MACHINE |
| 6 | OVERLOAD OF MACHINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | REDUCE AND LIMIT LOAD ON MACHINE |
| 7 | VIBRATION FROM EXTERNAL CAUSES, i.e. PRIME MOVER, NEARBY FORGE HAMMER etc. | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7 | LOCATE AND REMOVE CAUSE OF VIBRATION OR MOUNT MACHINE ON SHOCK ABSORBERS |
| 8 | VIBRATION FROM INTERNAL CAUSES, i.e. OUT OF BALANCE, POOR ALIGNMENT etc. | | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | BALANCE ARMATURE AND CHECK FOR BEARING WEAR |
| 9 | QUASI ELECTROLYTIC WEAR OF SLIP RING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 9 | REVERSE THE POLARITY OF RINGS PERIODICALLY |
| 10 | OIL AND DIRT ON COMMUTATOR OR SLIP RING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 10 | CLEAN COMMUTATOR OR SLIP RING |
| 11 | RESISTANCE BETWEEN BRUSHES AND BRUSH ARMS NOT UNIFORM | | | | | | | | | | | | | | | | | | | | | | | | | | | | 11 | CLEAN AND TIGHTEN THE CONNECTIONS |
| 12 | GRAINS OF ABRASIVE IN THE BRUSH CONTACT FACE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | REBED AND CLEAN THE BRUSH FACE |
| 13 | FAULTS IN ARMATURE WINDING OR EQUALISER CONNECTIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | 13 | LOCATE AND CURE FAULT OR CONSULT MANUFACTURER |
| 14 | MICA PROUD | | | | | | | | | | | | | | | | | | | | | | | | | | | | 14 | RECESS MICA, OR USE MORE ABRASIVE BRUSH |
| 15 | COMMUTATOR OR SLIP RING ECCENTRIC | | | | | | | | | | | | | | | | | | | | | | | | | | | | 15 | TURN OR REGRIND PREFERABLY AT NEAR RATED SPEED |
| 16 | COMMUTATOR RISER CONNECTIONS OPEN CIRCUITED | | | | | | | | | | | | | | | | | | | | | | | | | | | | 16 | RE SOLDER CONNECTIONS |
| 17 | HIGH OR LOW COMMUTATOR SEGMENTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | 17 | TIGHTEN COMMUTATOR, TURN, OR REGRIND |
| 18 | COMMUTATOR LOOSE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 18 | TIGHTEN COMMUTATOR, REMICA IF NECESSARY, TURN OR REGRIND |
| 19 | FLATS ON COMMUTATOR OR SLIP RING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 19 | LOCATE AND REMOVE CAUSE OF FLATTING, TURN OR REGRIND |
| 20 | SPRING PRESSURE TOO LOW | | | | | | | | | | | | | | | | | | | | | | | | | | | | 20 | ADJUST SPRING PRESSURE TO THAT RECOMMENDED FOR BRUSH GRADE |
| 21 | SPRING PRESSURE TOO HIGH | | | | | | | | | | | | | | | | | | | | | | | | | | | | 21 | ADJUST SPRING PRESSURE TO THAT RECOMMENDED FOR BRUSH GRADE |
| 22 | SPRING PRESSURE UNEQUAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | 22 | ADJUST SPRING PRESSURE UNIFORMLY TO THAT RECOMMENDED FOR BRUSH GRADE |
| 23 | BRUSH GRADE UNSUITABLE FOR MACHINE AND DUTY | | | | | | | | | | | | | | | | | | | | | | | | | | | | 23 | SELECT ONE OF OUR ALTERNATIVE GRADES OR ASK FOR OUR RECOMMENDATION |
| 24 | BRUSH ARC OF CONTACT EXCESSIVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 24 | REDUCE THE EFFECTIVE THICKNESS OF BRUSH, PREFERABLY CONSULT MANUFACTURER |
| 25 | BRUSH ARC OF CONTACT INSUFFICIENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 | APPLY A SUITABLE CIRCUMFERENTIAL STAGGER, PREFERABLY CONSULT MANUFACTURER |
| 26 | BRUSH FLEXIBLE CONNECTION FAULTY | | | | | | | | | | | | | | | | | | | | | | | | | | | | 26 | FIT A NEW BRUSH WITH A SOUND FLEXIBLE CONNECTION |
| 27 | BRUSH FLEXIBLE TOO SHORT OR TOO STIFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | 27 | USE BRUSHES WITH FLEXIBLE OF CORRECT LENGTH AND FLEXIBILITY |
| 28 | IMPERFECT BRUSH BEDDING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 28 | BED BRUSHES BY OUR RECOMMENDED METHOD |
| 29 | RADIAL BRUSH HOLDERS MOUNTED AT SMALL REACTION ANGLE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 29 | ADJUST HOLDERS TO A RADIAL POSITION, AND CORRECT DISTANCE FROM COMMUTATORS SEE No. 34 |
| 30 | REACTION TYPE HOLDER MOUNTED TRAILING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | REVERSE HOLDERS OR DIRECTION OF ROTATION |
| 31 | BRUSH STICKING OR SLUGGISH IN BRUSH HOLDER | | | | | | | | | | | | | | | | | | | | | | | | | | | | 31 | CHECK THAT BRUSH SIZE IS CORRECT, CLEAN BRUSHES AND HOLDERS, REMOVE ANY BURRS |
| 32 | BRUSHES TOO LOOSE IN BRUSH HOLDER (HOLDERS WORN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | 32 | IF HOLDERS WORN REPLACE WITH NEW ONES, ORDER BRUSHES OF CORRECT DIMENSIONS |
| 33 | TERMINAL CONNECTIONS LOOSE OR DIRTY | | | | | | | | | | | | | | | | | | | | | | | | | | | | 33 | CLEAN TERMINALS AND TERMINAL BLOCK, TIGHTEN SCREWS |
| 34 | BRUSH HOLDER MOUNTED TOO FAR FROM COMMUTATOR OR SLIP RING | | | | | | | | | | | | | | | | | | | | | | | | | | | | 34 | ADJUST HOLDER TO BE 3/32 in. OR 2mm. FROM COMMUTATOR |
| 35 | INCORRECT BRUSH POSITION | | | | | | | | | | | | | | | | | | | | | | | | | | | | 35 | ADJUST HOLDERS TO CORRECT POSITION |
| 36 | UNEQUAL BRUSH HOLDER SPACING OR ALIGNMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | 36 | CORRECT SPACING AND ALIGNMENT OF HOLDERS |
| 37 | HUMIDITY OF ATMOSPHERE LOW | | | | | | | | | | | | | | | | | | | | | | | | | | | | 37 | HUMIDIFY THE COOLING AIR OR DRAW AIR FROM NORMAL HUMIDITY SOURCE |
| 38 | HUMIDITY OF ATMOSPHERE EXCESSIVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38 | ENCLOSE MACHINE OR DRAW COOLING AIR FROM NORMAL HUMIDITY SOURCE |
| 39 | DUSTY ATMOSPHERE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39 | REMOVE CAUSE IF POSSIBLE OR INSTALL FILTER |
| 40 | GAS OR ACID FUMES IN ATMOSPHERE | | | | | | | | | | | | | | | | | | | | | | | | | | | | 40 | ARRANGE CLEAN AIR COOLING |
| 41 | LONG PERIODS AT LOW OR STEADY LOADS | | | | | | | | | | | | | | | | | | | | | | | | | | | | 41 | CHANGE BRUSH GRADE, ASK FOR OUR RECOMMENDATION |