

Innovating tomorrow's solutions today

Morgan Advanced Materials offer Morganite & National Carbon Brushes Material Grades you can trust

Chart of common difficulties on Rotating Electrical Machines

Symptoms				Symptoms				
M Serration and grooving of commutator or slip ring						Wear of slip ring on one polarity	N	
L Excessive commutator wear-surface blackened						Copper picking in brush face	0	
K Copper dragging						Brush chatter	Р	
Excessive commutator wear or slip ring wear-bright surface						Commutator surface streaky	0	
Unequal brush wear						Commutator has unsymmetrical burn marks	R	
H Rapid brush wear- while commutation good						Commutator has symmetrical burn marks	S	
G Elexible burnt out or discoloured						Commutator has wavy pattern	Т	
 F Brushes and brush holders too hot 						Ghost marks on steel slip rings		
F Commutator-slip ring-too hot						Glazed contact surface of brush	V	
D Sparking vicious and trailing around commutator	_					Pitted contact surface of brush	V W/	
C Green in sparks						Chipping of brush adges or brush breakage	×	
B Sparking at entering edge						Enilphing of brush edges of brush breakage	×	
Sparking at leaving edge						Insufficient voltage on self exciting machines	7	
				T 11 V W	x x 7		Z	
	vv	,	v v	· · · ·	A 1 2	Weaken interpole by divert or by increase gap	1	
 Interpole field too woold 		v		^		Strongthan interpole fields by reducing air gap	2	
 Interpole lield too weak Interpole sin sector areall 		^		v		Enlarge air gap to decrease effective interpole flux	2	
 Interpole air gap too small Interpole air gap too small 		v		^		Reduce air gap to decrease effective interpole riux		
 Interpole air gap too large Air (Interpole air gap too large 		X	X X	X		Reduce air gap to increase ellective interpole gap		
 Air gaps uneven (bearings worn?) 	XX	X	X X	X		Renew bearings and realign machine	5	
Overload machine	X XXX	XX	X	x x		Reduce and limit load on machine	6	
 Vibration from external causes, i.e. Prime mover: Nearby forge hammer etc Nilitation from external causes, i.e. Prime mover: Nearby forge hammer etc 	X	XX X X	XXX X	XXX	XXX	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	X	XX X X	X X X	XXX	XX	Balance armature and check for bearing wear	8	
9 Quasi electrolytic wear of slip ring			X	X		Reverse the polarity of rings periodically	9	
Oil and dirt on commutator or slip ring		X X X	XX		XX	Clean commutator or slip ring	10	
Resistance between brushes and brush arms not uniform	X X	X	X	X	X	Clean and tighten the connections		
Grains of abrasive in brush contact face		XXX		X	X	Ke-bed and clean the brush face	12	
13 Faults in armature winding or equaliser connections	X X X		XX	X	X	Locate and cure fault or consult manufacturer	13	
14 Mica proud	X X X	X	X X X	X	XXX	Recess mica, or use more abrasive brush	14	
Commutator or slip ring eccentric	X	x x x	X X X X	X	X	I urn or re grind preferably at near rated speed	15	
Commutator riser connections open circuited	XXXX		X	X	X	Re-solder connections	10	
High or low commutator segments	XX	X	XX	X		Tighten commutator, turn, or re-grind	17	
Commutator loose		X		X	X	l ignten commutator, re-mica if necessary, turn or re-grind	10	
 Plats on commutator or slip ring 20 Continue statute la 		X		X	X	Adjust spring prospring to that as as page and a d for brush grade	20	
20 Spring pressure too low	× × × × ×	× × × × × ×		× ×	× ×	Adjust spring pressure to that recommended for brush grade	20	
 21 Spring pressure too high 22 Good Annual Annu	X X .	x x x x			X	Adjust spring pressure to that recommended for brush grade	21	
 22 Spring pressure unequal 22 Device the formula in the formula				X X	X	Adjust spring pressure uniformly to that recommended for brush grade	22	
 23 Brush grade unsuitable for machine duty 24 Device the second seco		x x x x x	X X X	XX	XX	Select one of our alternative grades or ask for our recommendation	23	
24 Brush arc of contact excessive	XXX		X X	X		Reduce the effective thickness of brush, preferably consult manufacturer	24	
 25 Brush arc of contact insufficient 26 Device a structure of contact insufficient 	X X X	X	XX		X	Apply suitable circumferential stagger, preferably consult manufacturer	25	
 26 Brush flexible connection faulty 27 Device the structure stiff 	X X X	X	X		X	Fit a new brush with a sound flexible connection	26	
 27 Brush flexible too short or too stiff 28 Is a fact to be to be a life of too stiff 		X	X		X	Use brushes with flexible of correct length & flexibility	27	
 20 Imperfect brush bedding in 20 Derived and the second secon		X	X	X	XX	Bed brusnes by our recommended method	28	
 29 Radial brush holders mounted at small reaction angle 20 Reaction angle 	X X X X	x x x	X X XX	X	XXX	Adjust holders to a radial position, & correct distance from comm	29	
30 Reaction type holder mounted trailing	X X X X X X	X X X	X X XX	X	XXX	Reverse holders or direction of rotation	30	
 Brush sticking or sluggish in brush holder 	XX XX	XX X	XXX	x x	X	Check that brush size is correct, clean brushes and holders, remove any burrs	31	
32 Brushes too loose in brush holder(holders worn?)	X	X	XX	X	XX	Replace holders, or order brushes of correct dimension	32	
 33 Terminal connections loose or dirty 24 Example 1 (1997) 	X X X	X	X		X	Clean terminals and terminal block. Lighten screws	33	
Brush holder mounted too far from commutator or slip ring		XX	XXXXX	X	ХХ	Adjust holder to be 2mm from commutator	34	
 Incorrect brush position 	XXX	X	XX	XX	X	Adjust holders to correct position	35	
Jo Unequal brush holder spacing or alignment	X X X X X	X	XX	X		Correct spacing and alignment of holders	36	
 Humidity of atmosphere low 		x	X		XX	Humidity the cooling air or draw air from normal humidity source	37	
38 Humidity of atmosphere excessive		X	XX	X		Enclose machine or draw cooling air from normal humidity source	38	
Justy atmosphere		x x x			X	Remove cause it possible or install filter	39	
Gas or acid fumes in atmosphere	X	x x	XX	XX	XX	Arrange clean air cooling	40	
41 Long periods of low or steady loads	X X X X	X X	XX	X	ххх	Change brush grade, ask for recommendation	41	

Technical training courses available

For a more comprehensive insight into carbon brushes and electrical machines request price and availability of our 300 page Carbon Brushes and Electrical Machines Manual from Morgan Advanced Materials

