

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
IN MANUFACTURING AND ASSEMBLY PROCESSES
(PROCESS FMEA)**

FMEA Number MM-2000

Item MM-2X

Process Responsibility Goodson

Prepared By R. Yates/867-5309

Model Year(s)/Program(s) 2001/N/A

Key Date 4/24/2001

FMEA Date (Orig.) 2/2/1999

(Rev.) 03/02/2001

Core Team Sam and Janet Eveling

Process Function Requirements	Potential Failure Mode	Potential Effect(s) of Failure	S e v	Class	Potential Cause(s)/ Mechanism(s) of Failure	O c c	Current Process Controls - Prevention - Detection	D e t	R P N	Recommended Action(s)	Resp. & Target Compl. Date	Action Results							
												Actions Taken	S e v	O c c	D e t	R P N			
010 - Wind wire around index finger																			
001 - Coil diameter	Diameter too large	- Coil hits battery during operation - Rotor is short because too much material is used in coils	8	U	Wire wound loosely	3	>Char Control 1: Measure with gage.	4	96	None		None							
	Diameter too small	- Weak motor - Difficult removal from finger	6		Finger too small	4		3	72	None		None							
	Diameter too large	- Coil hits battery during operation - Rotor is short because too much material is used in coils	8		Finger too large	5		3	120	None		None							
	Diameter too small	- Weak motor - Difficult removal from finger	6		Wire wound tight	8		3	144	Provide operator with a tool for grasping the wire that limits the tension.	Tool Engineering 6/6/1999	Tool developed, tested, and implemented at process step 010.	6	3	3	54			
002 - # of coils	Too few coils	- Motor too weak	5	U	Operator miscounts	2	>Char Control 1: Operator counts number of coils out loud.	3	30	None		None							
					Not enough wire	3		4	60	None		None							
	Too many coils	- Rotor too short to reach supports - Motor too powerful - Wasted material	8		Operator miscounts	2		3	48	None		None							
110 - Coil starting position	Starting position too incorrect (long or short)	- Opposing wire end too short to reach support - Not enough wire to wind all coils	7		Light dim so ruler hard to read	2	>Char Control 1: Use ruler to locate start position.	3	42	None		None							
					Ruler worn so hard to read	3		3	63	None		None							

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
IN MANUFACTURING AND ASSEMBLY PROCESSES
(PROCESS FMEA)**

FMEA Number MM-2000

Item MM-2X

Process Responsibility Goodson

Prepared By R. Yates/867-5309

Model Year(s)/Program(s) 2001/N/A

Key Date 4/24/2001

FMEA Date (Orig.) 2/2/1999

(Rev.) 03/02/2001

Core Team Sam and Janet Eveling

Process Function Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s)/ Mechanism(s) of Failure	Occ	Current Process Controls - Prevention - Detection	Det	RPN	Recommended Action(s)	Resp. & Target Compl. Date	Action Results							
												Actions Taken	Sev	Occ	Det	RPN			
020 - Slip wound wire off finger																			
111 - Maintain rotor shape	Rotor mis-shapen		0							None		None							
030 - Sand coating off wire ends																			
004 - Length of coating removed	Bare wire too long		0							None		None							
	Bar wire too short		0							None		None							
113 - Sanding time	Sanding time too long		0							None		None							
	Sanding time too short		0							None		None							
040 - Store finished wire (rotor)																			
100 - Maintain lot ID	Lot ID lost		0							None		None							
111 - Maintain rotor shape	Rotor mis-shapen		0							None		None							
050 - Bend clips to make supports																			
005 - Rotor support shaped like print	Support mis-shapen		0							None		None							
060 - Store rotor supports																			
100 - Maintain lot ID	Lot ID lost		0							None		None							
112 - Maintain support shape	Support mis-shapen		0							None		None							