Product/Process Change Notification

Initiation Date	27 June 2019	**Notification No.**	20190614
Implementation Date	27September 2019	**Initiator's Name**	Sharon Tomo-Bustamante
Beginning Date Code of Implemented Change			WW39

CHANGE DESCRIPTION:

Knowles is making a change to the RAB receiver family. This change is to go from a "wet wound" Coil to a Thermo-bond Coil.

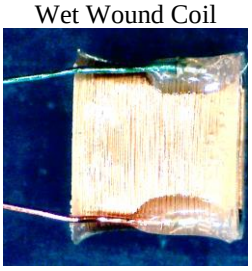
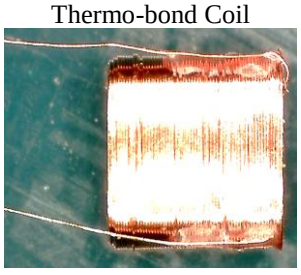
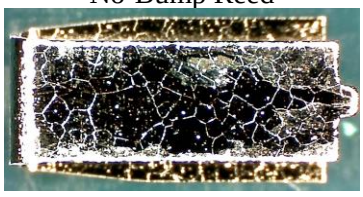
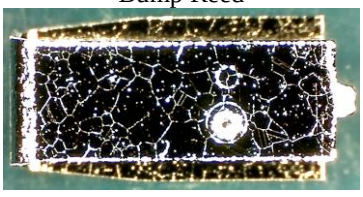
This will be an alternate component to the current RAB Coil design to increase capacity and assure adequate parts supply. These changes apply to the models shown on the next page.

This change also requires a modification of the RAB reed to be compatible within this design.

Note: There are no significant changes in the product fit, acoustic performance & reliability. There is no change to the external appearance of the receiver.

Please continue to work with your local Knowles Sales Manager if you have any questions, concerns or require samples for evaluations related to this product change notification.

Changes are shown below.

CURRENT	NEW
Wet Wound Coil 	Thermo-bond Coil 
No-Bump Reed 	Bump Reed 

MODELS AFFECTED: Below part numbers are covered within this PCN

RECEIVER PN	Item Where used(VAM)
RAB-62001-000	none
RAB-32037-000	RAB-32037-P01
RAB-61434-000	RAB-61434-P180 RAB-61434-P01 RAB-61434-P203 RAB-61434-P204 RAB-61434-P207 RAB-61434-P209 RAB-61434-P216 RAB-61434-P217
RAB-61546-000	RAB-61546-P149
RAB-62043-000	RAB-62043-P149
RAB-32016-000	none
RAB-33458-000	none
RAB-32146-000	none
RAB-32667-000	RAB-61250-P152
RAB-32257-000	TC-32211-B92 RAB-32257-P155 TC-32282-B92 TC-32277-B92 RAB-32257-P183 RAB-32257-P194 RAB-32257-P195 RAB-32257-P214
RAB-32063-000	RAB-32063-P143 TC-32126-000 TC-32211-B86 RAB-32063-P155 TC-32282-B86 RAB-32063-P166 RAB-32063-P168 RAB-32063-P177 RAB-32063-P183 RAB-32063-P161

SUPPORT INFORMATION:

The following qualification testing has been performed and shows no significant change in the performance. The test model is RAB-62001-000 receiver.

Group Identification:

Control: Current RAB construction.
Trial: Thermo-Bond Coil and Bump Reed.

Knowles Qualification Plan Number: P-R-19039

Acoustic Performance

Note: Sensitivity is measured as dB relative to 20 µPa.		**Average**	**Std. Dev**	**Cpk**
RELSENS @200 Hz	New	3.98	0.19	4.27
	Current	3.63	0.18	5.23
RELSENS @500 Hz	New	2.26	0.1	9.074
	Current	2.07	0.09	10.25
SENSITIVITY @1000 Hz	New	101.28	0.12	8.17
	Current	101.27	0.1	8.22
PKREL1 Amp	New	3.75	0.48	4.35
	Current	3.5	0.37	3.45
PK1 Freq	New	2625	25.0	2.75
	Current	2613	27.6	2.26
VLREL1 Amp	New	-9.62	0.2	1.41
	Current	-9.52	0.25	1.34
PKREL2 Amp	New	-7.75	0.44	2.59
	Current	-7.76	0.42	2.41
PK2 Freq	New	5831	58.3	1.74
	Current	5780	53.6	2.32
THD 1/3rd PK @ Nom Drive	New	0.97	0.35	3.42
	Current	0.9	0.35	4.02

Note: Sensitivity is measured as dB relative to 20 µPa.		**Average**	**Std. Dev**	**Cpk**
THD ½ PK @ Nom Drive	New	1.25	0.66	1.69
	Current	1.14	0.59	2.22
THD 1/3rd PK @ +9dB Drive	New	1.68	0.75	3.81
	Current	1.43	0.74	4.27
THD ½ PK @ +9dB Drive	New	2.26	1.29	1.95
	Current	1.77	1.13	2.66
THD 500Hz @ 0.4 Vrms	New	1.33	0.58	1.99
	Current	1.14	0.59	2.23
THD 800Hz @ 0.4 Vrms	New	1.38	0.54	2.08
	Current	1.19	0.55	2.35
THD 1.6KHz @ 0.25 Vrms	New	0.7	0.38	3.43
	Current	0.64	0.34	4.27
IMPEDANCE @ 500Hz	New	129.48	2.48	2.55
	Current	139.32	1.89	2.26
IMPEDANCE @ 1KHz	New	205.06	7.82	1.8
	Current	212.35	4.57	2.09

Reliability Tests

Test	Acceptance Criteria	Model Tested	Sample Size	Result
Acoustical Characteristics	Performance to be comparable to current product	RAB-62001-000	control = 150 trial = 150	PASSED
HALT Condition A: 63°C / 95% RH, 1008 hours total exposure, biased.	Units shall compare favourably to historical data from similar model and shall change ≤ 3.0dB change in sensitivity at the adjust frequency; ≤5% distortion changes at the nominal drive ; ≤10% distortion changes at the high drive.	RAB-62001-000	control = 30 trial = 30	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = -0.04 dB New = -0.03 dB			
Stress Test 1Hr at High Drive @ Motor Resonance. Drive Train Integrity Test.	Sensitivity change ≤ 3dB at the adjust frequency.	RAB-62001-000	control = 20 trial = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = 101.12 dB New = 101.14 dB			
Composite Temperature Humidity Cyclic Test Test 2b (10 cycles of 24 hrs each) 25°C / 80-100% RH for 3 h 65°C / 90-100% RH for 5 h -10°C / 0% RH for 5 h	Sensitivity changes at the adjustment frequency< 1.5 dB(FF model 3dB)	RAB-62001-000	control = 20 trial = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = 101.04 dB New = 101.18 dB			

Test	Acceptance Criteria	Model Tested	Sample Size	Result
Aggressive Sweat Cond 4 -10 Day exposure to sweat vapor in 38°C oven (1.8PH±.2.)	No visual signs of corrosion, Sensitivity to change < 4 dB	RAB-62001-000	control = 20 trial = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = 101.01 dB New = 101.15 dB			
Powered Salt Fog Test 4 Weeks exposure to 35°C salt fog chamber with salt deposition 20~50g/sq.m/24 hours. Units powered with 0.289Vrms@1kHz	Comparable to similar coils.	RAB-62001-000	control = 20 trial = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = 101.01 dB New = 101.15 dB			
Mechanical Shock Shock at progressively higher heights until failure. "Failure" means that a unit changes >3dB from initial, THD at nominal drive at 1/3 resonance > 10% or THD at nominal drive at 1/2 resonance > 20%.	90% Survivability @14.1kG	RAB-62001-000	control = 20 trial = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Current = above 90% survivability @14.1kG New = above 90% survivability @14.1kG			

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