



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF21F10112424A1C

Applicant : Mid Ocean Brands B.V.

Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Manufacturer : 115164

Sample Name : Wireless headphone with pouch

Model No. : MO6350

Sample Receiving Date.... : 2021-11-29 & 2021-12-08

Testing Period..... : 2021-11-29 to 2021-12-02 & 2021-12-08 to 2021-12-13

Date of Issue : 2021-12-17

Test Result : Please refer to next page (s)

Remarks:

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- Test Requested**..... : In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.
- Test Method**..... :
 - 1) With reference to IEC 62321-2:2013, disassembly, disjunction and mechanical sample preparation
 - 2) With reference to IEC 62321-3-1:2013, screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry
 - 3) With reference to IEC 62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES
 - 4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES
 - 5) With reference to IEC 62321-7-2: 2017 and IEC 62321-7-1: 2015, determination of Hexavalent Chromium by UV-Vis
 - 6) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS
 - 7) With reference to IEC 62321-8:2017, determination of Phthalates content by GC-MS.
- Test Conclusion**..... : **Pass** (Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)

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**Test Results:****1. Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs and PBDEs**

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	Black plastic shell	BL	BL	BL	BL	BL	NA
2	Black fibrous wire	BL	BL	BL	BL	BL	NA
3	Black cloth	BL	BL	BL	BL	BL	NA
4	White sponge sheet	BL	BL	BL	BL	BL	NA
5	Black leather	BL	BL	BL	BL	BL	NA
6	White sponge sheet	BL	BL	BL	BL	BL	NA
7	White plastic holder	BL	BL	BL	BL	BL	NA
8	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
9	Silvery metal sheet	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
10	Black plastic wire covering	BL	BL	BL	BL	BL	NA
11	Red plastic wire covering	BL	BL	BL	BL	BL	NA
12	Silvery metal screw	BL	BL	BL	BL	BL	NA
13	Chip IC	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
14	Silvery metal sheet	BL	BL	BL	BL	BL	NA
15	Chip capacitor	BL	BL	BL	BL	BL	NA
16	Chip resistor	BL	BL	BL	BL	BL	NA
17	Green PCB	BL	BL	BL	BL	BL	NA
18	Solder	BL	BL	BL	BL	BL	NA
19	Black plastic sheet	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
20	Black plastic button	BL	BL	BL	BL	BL	NA
21	Black plastic button	BL	BL	BL	BL	BL	NA
22	Silvery metal strip	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
23	Silvery metal screw with black plating	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
24	Silvery metal screw with black plating	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
25	Solder	BL	BL	BL	BL	BL	NA
26	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
27	Yellow plastic adhesive tape	BL	BL	BL	BL	BL	NA
28	Red plastic wire covering	BL	BL	BL	BL	BL	NA
29	Black plastic wire covering	BL	BL	BL	BL	BL	NA
30	Silvery metal wire	BL	BL	BL	BL	BL	NA
31	Black paper adhesive tape of MIC	BL	BL	BL	BL	BL	NA
32	Golden metal shell of MIC	BL	BL	BL	BL	BL	NA
33	Silvery plastic film of MIC	BL	BL	BL	BL	BL	NA
34	Black metal ring of MIC	BL	BL	BL	BL	BL	NA
35	White plastic ring of MIC	BL	BL	BL	BL	BL	NA
36	Chip audion of MIC	BL	BL	BL	BL	BL	NA
37	Red plastic film of MIC	BL	BL	BL	BL	BL	NA
38	Green PCB of MIC	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
39	Chip capacitor of MIC	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
41	Solder	BL	BL	BL	BL	BL	NA
42	Red metal wire	BL	BL	BL	BL	BL	NA
43	Black body of resistor	BL	BL	BL	BL	BL	NA
44	Chip IC	BL	BL	BL	BL	BL	NA
45	Chip IC	BL	BL	BL	BL	BL	NA
46	Black plastic shell of socket	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
47	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
48	Black plastic key of button	BL	BL	BL	BL	BL	NA
49	Silvery metal shell of button	BL	BL	BL	BL	BL	NA
50	Silvery metal sheet of button	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
51	White plastic base of button	BL	BL	BL	BL	BL	NA
52	Silvery metal pin of button	BL	BL	BL	BL	BL	NA
53	Silvery metal body of crystal oscillator	BL	BL	BL	BL	BL	NA
54	Black plastic base of crystal oscillator	BL	BL	BL	BL	BL	NA
55	Black plastic button of switch	BL	BL	BL	BL	BL	NA
56	Silvery metal shell of switch	BL	BL	BL	BL	BL	NA
57	Silvery metal sheet of switch	BL	BL	BL	BL	BL	NA
58	Silvery metal pin of switch	BL	BL	BL	BL	BL	NA
59	Beige plastic base of switch	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
60	Chip LED	BL	BL	BL	BL	BL	NA
61	Silvery metal shell of socket	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
62	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
63	Black plastic core of socket	BL	BL	BL	BL	BL	NA
64	Chip LED	BL	BL	BL	BL	BL	NA
65	Chip resistor	BL	BL	BL	BL	BL	NA
66	Chip LED	BL	BL	BL	BL	BL	NA
67	Chip capacitor	BL	BL	BL	BL	BL	NA
68	Black magnetic core	BL	BL	BL	BL	BL	NA
69	Silvery metal sheet	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
70	Coppery metal winding	BL	BL	BL	BL	BL	NA
71	Black plastic holder	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 139
72	Beige glue	BL	BL	BL	BL	BL	NA
73	Transparent plastic film	BL	BL	BL	BL	BL	NA
74	Black plastic wire covering	BL	BL	BL	BL	BL	NA
75	Solder	BL	BL	BL	BL	BL	NA
76	Green PCB	BL	BL	BL	BL	BL	NA
77	Black fibrous sheet	BL	BL	BL	BL	BL	NA
78	Red plastic wire covering	BL	BL	BL	BL	BL	NA
79	Silvery metal wire	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
80	Black glue	BL	BL	BL	BL	BL	NA
81	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
82	Red metal wire	BL	BL	BL	BL	BL	NA
83	Green metal wire	BL	BL	BL	BL	BL	NA
84	White fibrous wire	BL	BL	BL	BL	BL	NA
85	White plastic wire covering	BL	BL	BL	BL	BL	NA
86	Red plastic wire covering	BL	BL	BL	BL	BL	NA
87	Silvery metal pin	BL	OL	BL	BL	BL	#Pb : 2.29×10^4
88	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
89	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
90	Black plastic wire covering	BL	BL	BL	BL	BL	NA
91	Coppery metal wire	BL	BL	BL	BL	BL	NA
92	Silvery metal shell	BL	BL	BL	BL	BL	NA
93	Solder of plug	BL	BL	BL	BL	BL	NA
94	Black plastic holder of plug	BL	BL	BL	BL	BL	NA
95	Silvery metal shell of plug	BL	BL	BL	BL	BL	NA
96	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
97	Solder of plug	BL	BL	BL	BL	BL	NA
98	White plastic core of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
99	Black glue of plug	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
100	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
101	Black plastic wire covering	BL	BL	BL	BL	BL	NA
102	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
103	Coppery metal wire	BL	BL	BL	BL	BL	NA
104	Red plastic wire covering	BL	BL	BL	BL	BL	NA
105	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
106	Solder of plug	BL	BL	BL	BL	BL	NA
107	Green PCB of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
108	Silvery metal shell of plug	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
109	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
110	Black plastic holder of plug	BL	BL	BL	BL	BL	NA
111	Chip resistor	BL	BL	BL	BL	BL	NA
112	Solder	BL	BL	BL	BL	BL	NA

Remark:

- (1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr⁶⁺) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$LOD < IN < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < IN < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < IN < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < IN$	$BL \leq (700-3\sigma) < IN$	$BL \leq (500-3\sigma) < IN$
Br	$BL \leq (300-3\sigma) < IN$	--	$BL \leq (250-3\sigma) < IN$

BL= Below Limit

OL= Over Limit

LOD = Limit of Detection

-- = Not Regulated



- (2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.
- (3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition.
- (4) mg / kg =milligram per kilogram=ppm, $\mu\text{g}/\text{cm}^2$ = Micrograms per square centimetre.
- (5) ND = Not Detected or lower than limit of quantitation.
- (6) NA = Not Applicable, as the XRF screening test result was below the limit or as the XRF screening directly determine that test result was over the limit, it was not need to conduct the wet chemical testing.
- (7) LOQ = Limit of quantitation.

Test Items	Pb	Cd	Hg	Cr ⁶⁺		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	$\mu\text{g}/\text{cm}^2$	mg/kg	mg/kg
LOQ	2	2	2	8	0.1	5	5

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8mg/kg and LOQ of Cr⁶⁺ for metal sample is 0.1 $\mu\text{g}/\text{cm}^2$.

- (8) RoHS Requirement

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)

- (9) According to IEC 62321-7-1:2015, determined of Cr⁶⁺ on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is less than 0.10 $\mu\text{g}/\text{cm}^2$.

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13 $\mu\text{g}/\text{cm}^2$.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr⁶⁺ results represent status of the sample at the time of testing.

- (10) Abbreviation:

"Pb" denotes Lead, "Cd" denotes Cadmium, "Hg" denotes Mercury, "Cr" denotes Chromium, "Cr (VI)" denotes Hexavalent Chromium, "Br" denotes Bromine, "PBBs" denotes Total Polybrominated Biphenyls, "PBDEs" denotes Total Polybrominated Diphenyl Ethers.

- (11)[#] = According to the declaration from client, the source of lead in test sample is from copper alloy while lead as copper alloy containing up to 4% lead by weight is exempted by Directive 2011/65/EU ANNEX III.



2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+7+19+20+21 [△]	<50	<50	<50	<50
T02	2	<50	<50	<50	<50
T03	3	<50	<50	<50	<50
T04	4	<50	<50	<50	<50
T05	5	<50	<50	<50	<50
T06	6	<50	<50	<50	<50
T07	8	<50	<50	<50	<50
T08	10	115	<50	<50	<50
T09	11	68	<50	<50	<50
T10	13+15+16+36+39 [△]	<50	<50	<50	<50
T11	17+37+64+65+66 [△]	<50	<50	<50	<50
T12	26	<50	<50	89	<50
T13	27	<50	<50	<50	<50
T14	28	<50	<50	137	<50
T15	29	<50	<50	125	<50
T16	31	<50	<50	<50	<50
T17	33+38+67+68+111 [△]	<50	<50	<50	<50
T18	35	<50	<50	<50	<50
T19	40+76+107 [△]	<50	<50	<50	<50
T20	43+44+45+60 [△]	<50	<50	<50	<50
T21	46+51 [△]	<50	<50	<50	<50
T22	48	<50	<50	<50	<50
T23	54	<50	<50	<50	<50
T24	55	<50	<50	<50	<50
T25	59	<50	<50	<50	<50
T26	63	<50	<50	<50	<50
T27	71	<50	<50	<50	<50
T28	72	<50	<50	<50	<50
T29	73	<50	<50	<50	<50
T30	74	<50	<50	<50	<50
T31	77	<50	<50	<50	<50
T32	78	<50	<50	<50	<50
T33	80	<50	<50	<50	<50
T34	81	<50	<50	321	<50
T35	84	<50	<50	<50	<50
T36	85	<50	<50	<50	<50
T37	86	<50	<50	<50	<50
T38	88	<50	<50	<50	<50
T39	89	<50	<50	<50	<50
T40	90	<50	<50	<50	<50
T41	94+98 [△]	<50	<50	92	<50
T42	99	<50	<50	<50	<50
T43	100	<50	<50	77	<50



Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T44	101	<50	<50	<50	<50
T45	102	<50	<50	<50	<50
T46	104	<50	<50	<50	<50
T47	105	<50	<50	<50	<50
T48	110	<50	<50	<50	<50

Note:

- (1) "<" = less than
- (2) mg/kg = milligram per kilogram= ppm
- (3) Abbreviation:
 "DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.

- (4) RoHS requirement

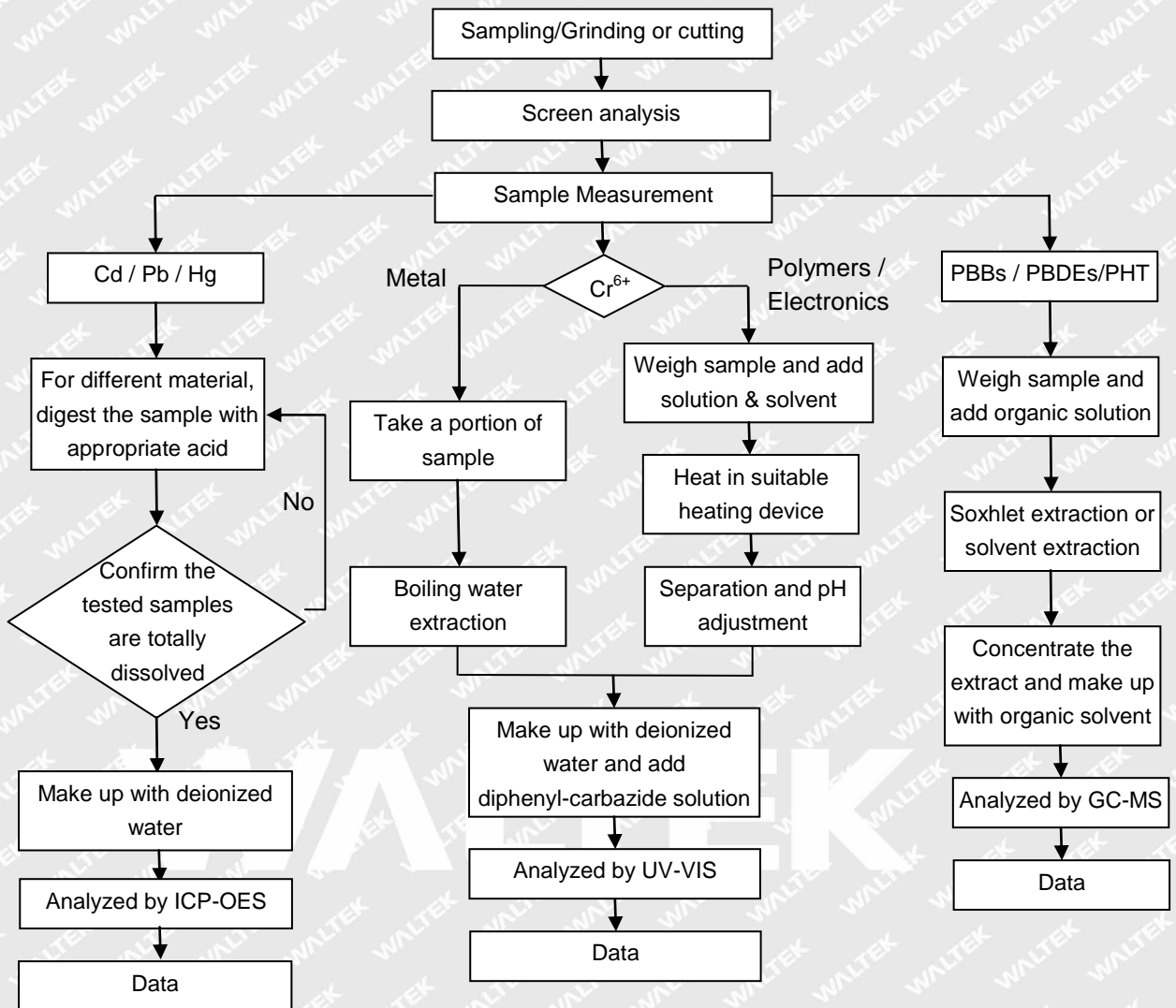
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

- (5) "△" = As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

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Measurement Flowchart:





Sample Photo(s):

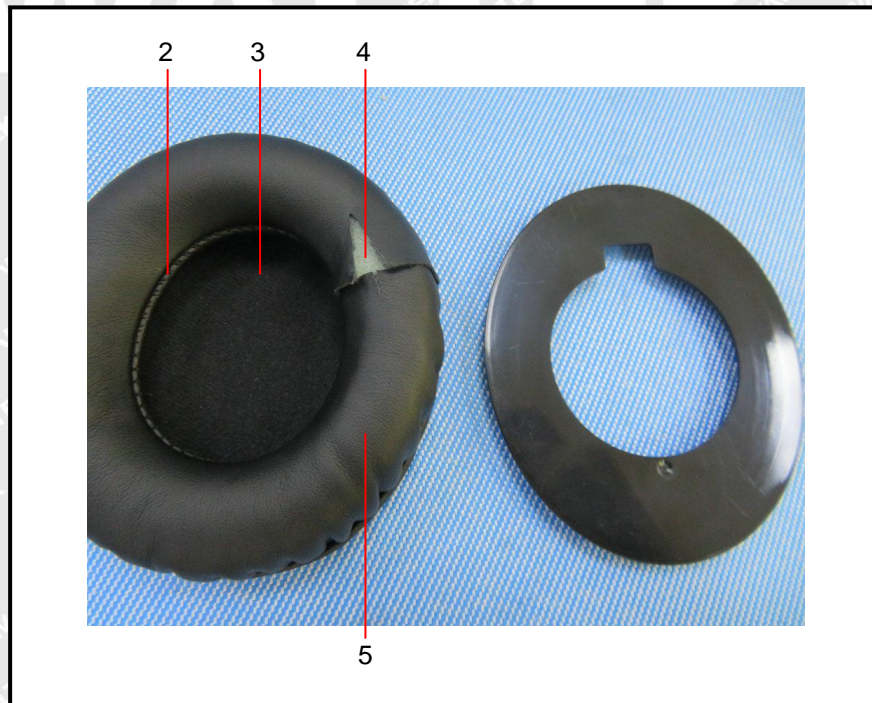


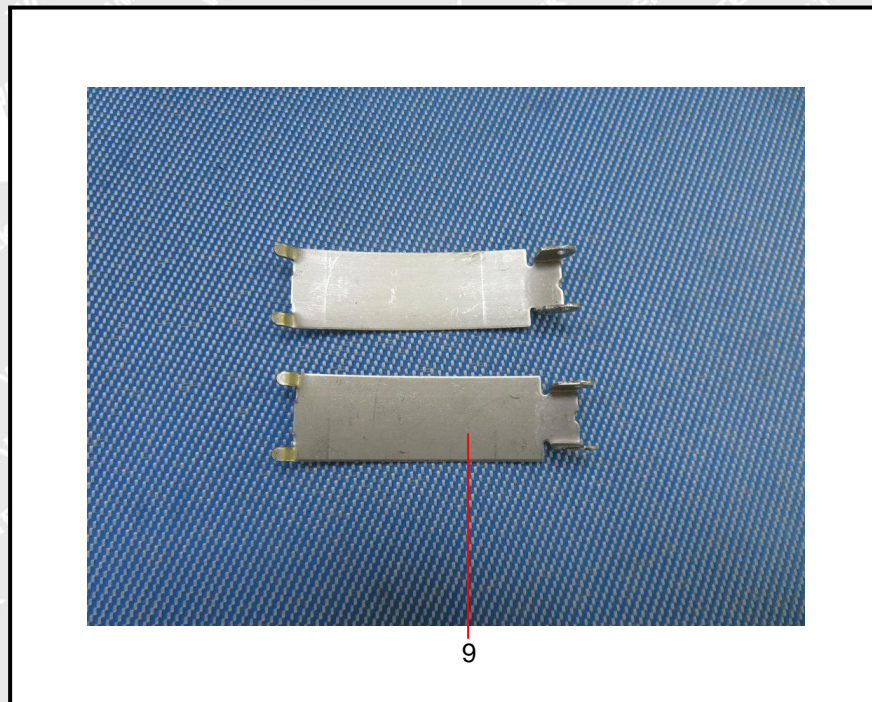
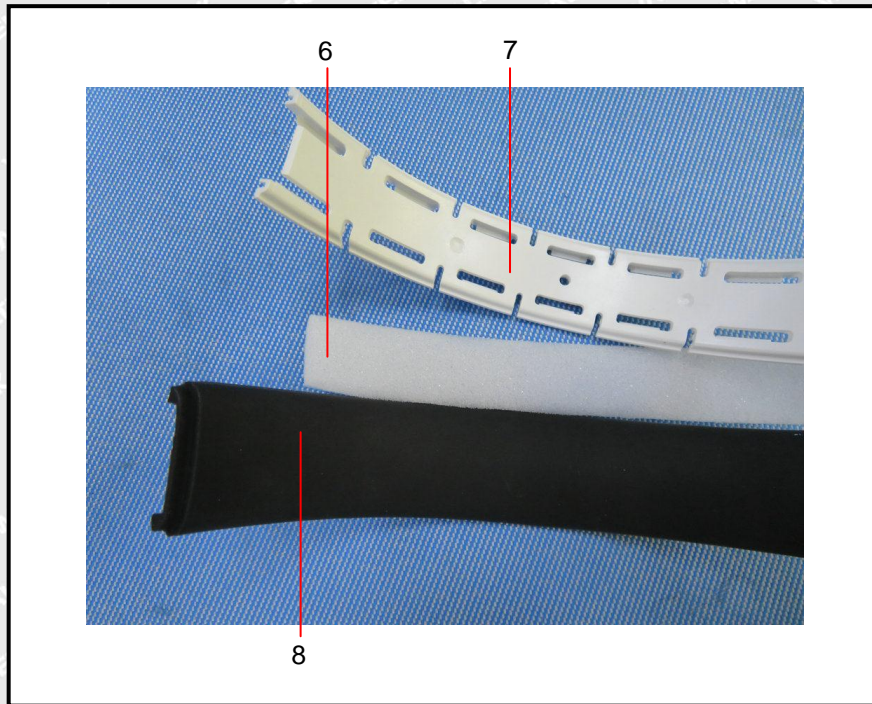


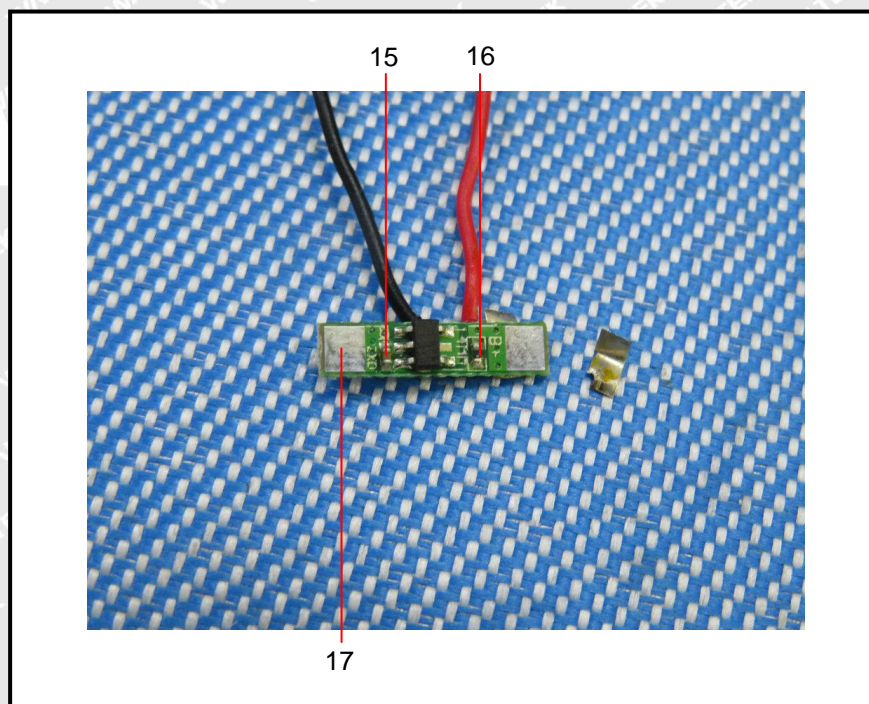
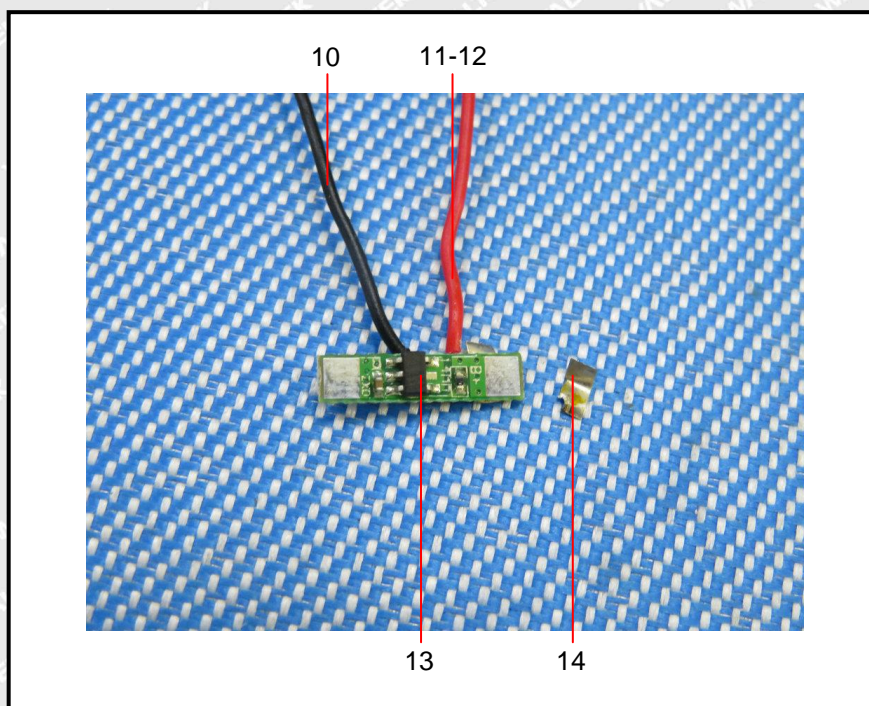
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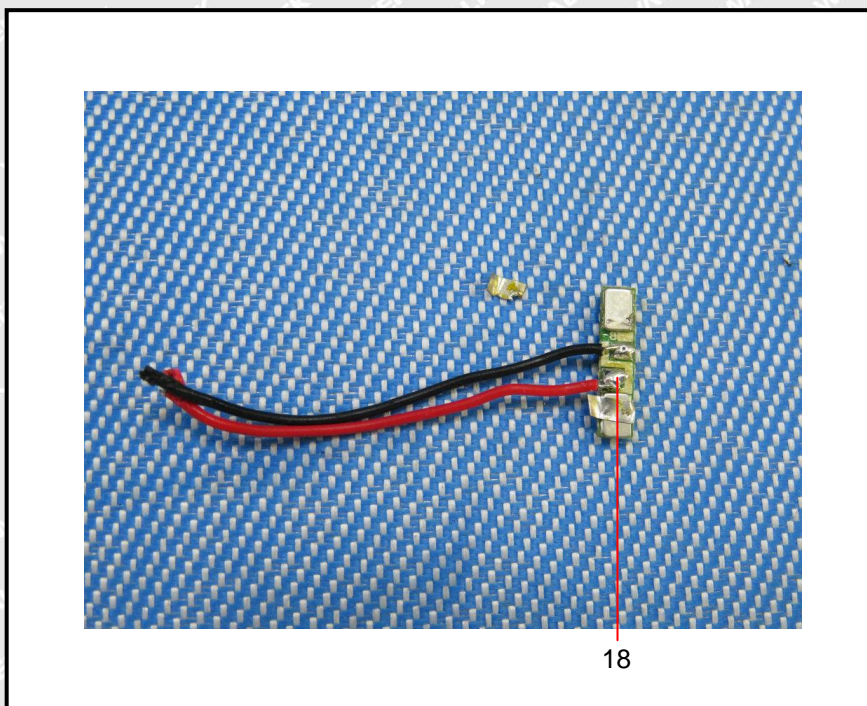


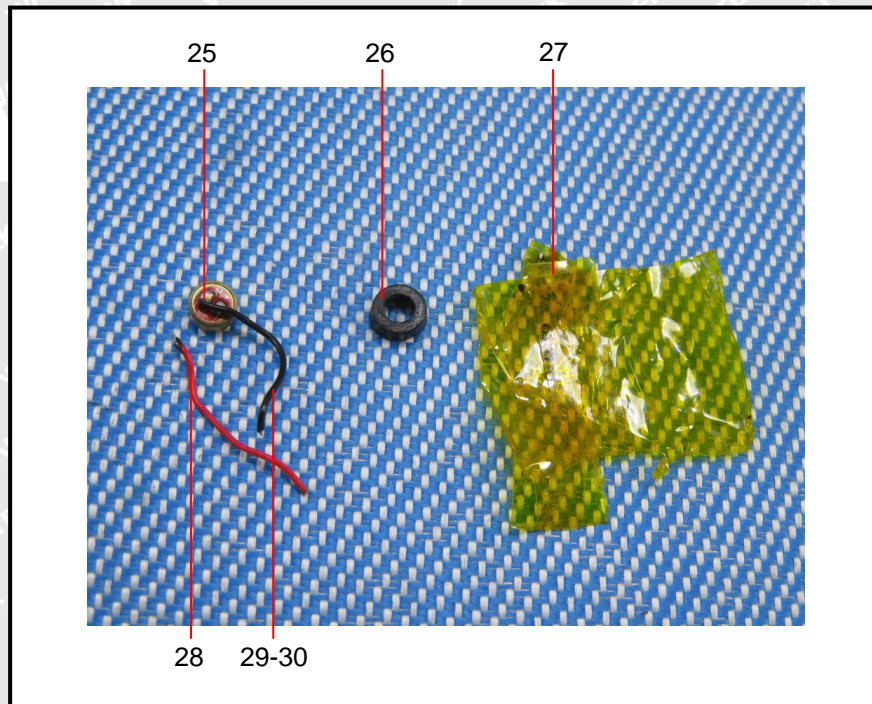
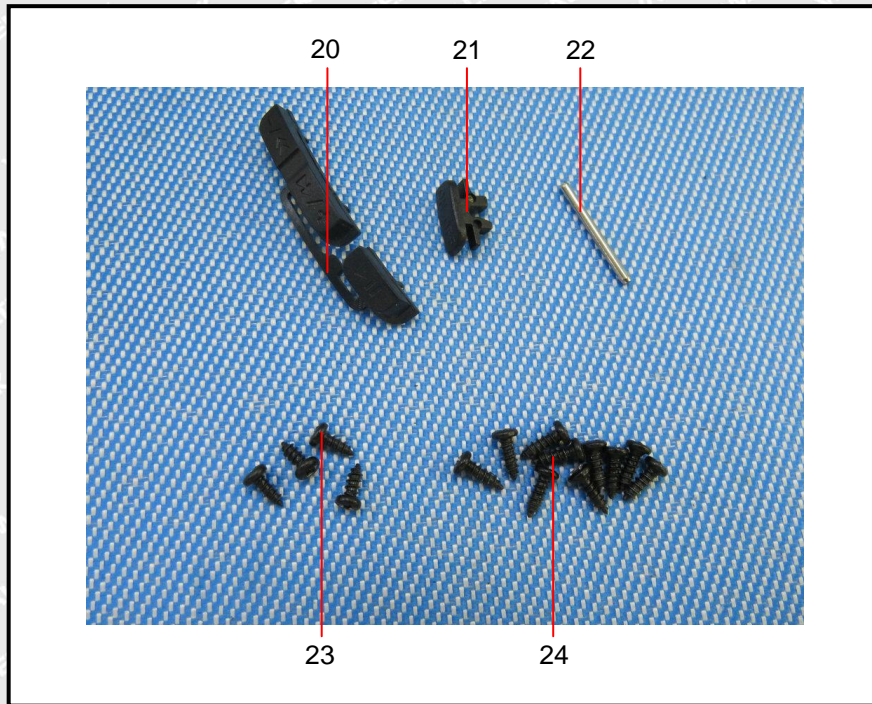
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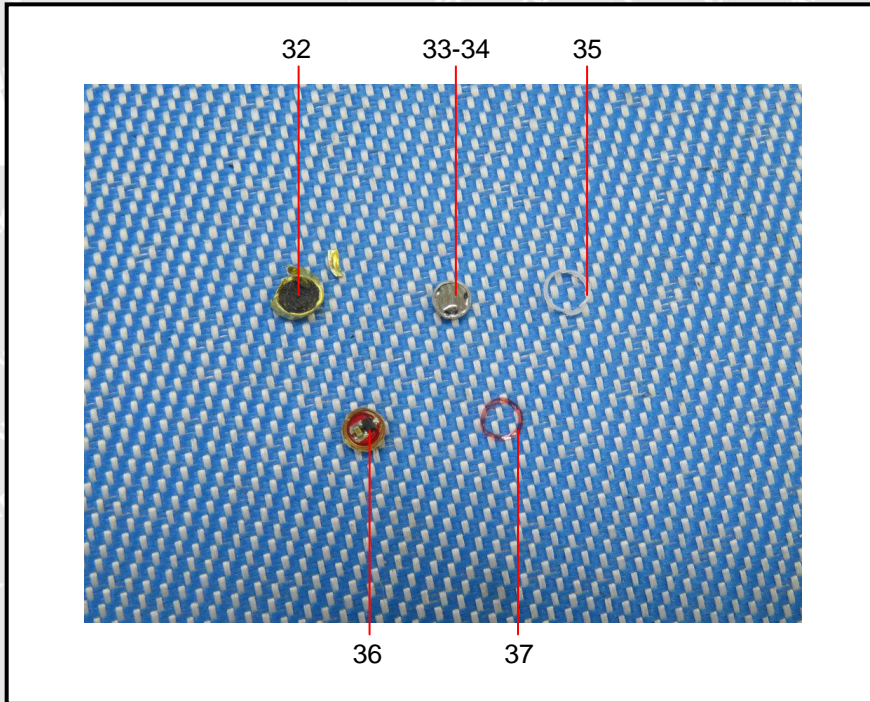
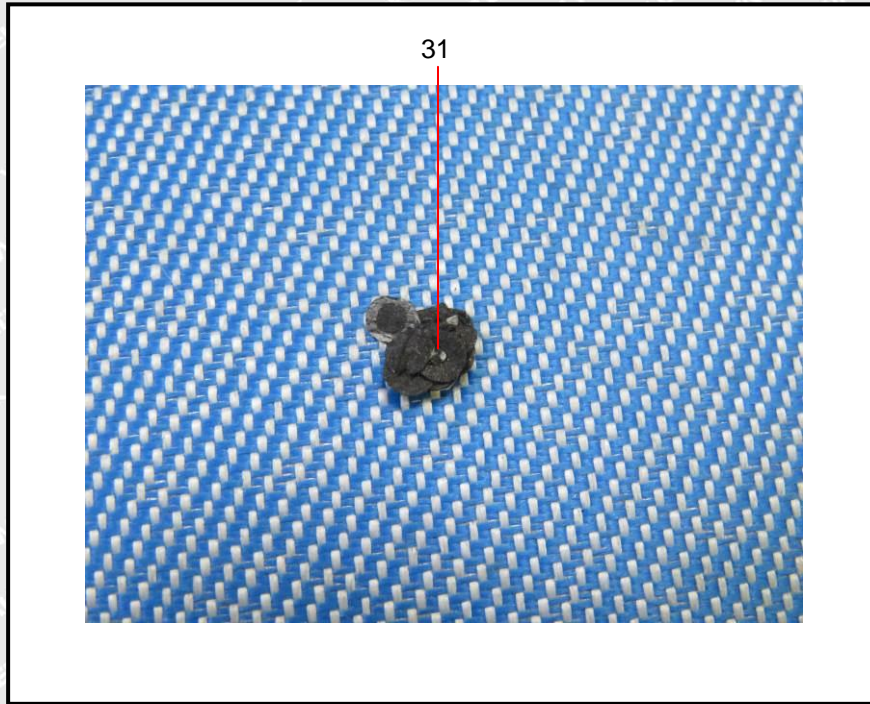


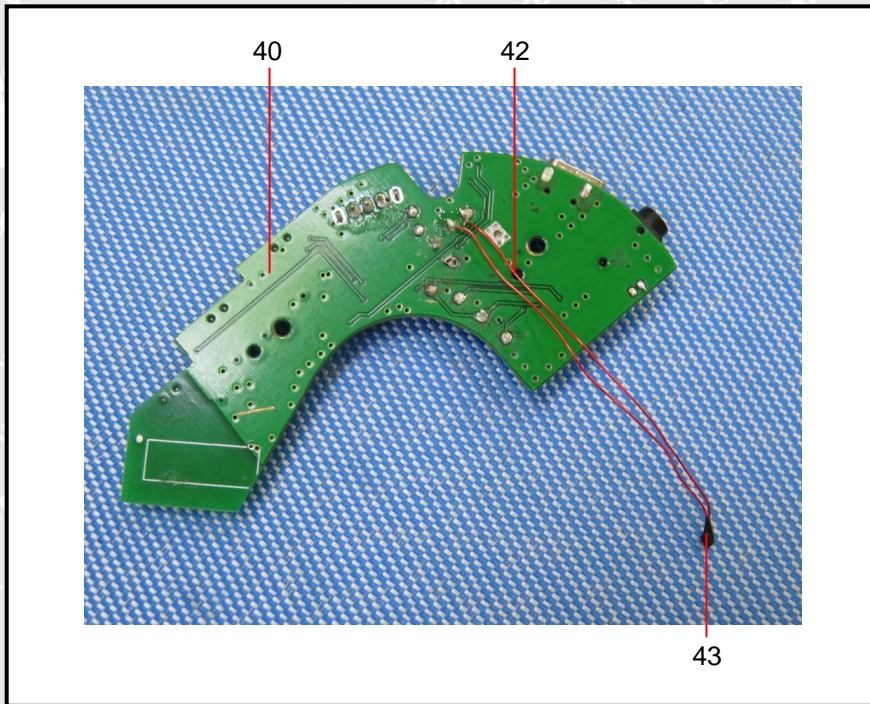
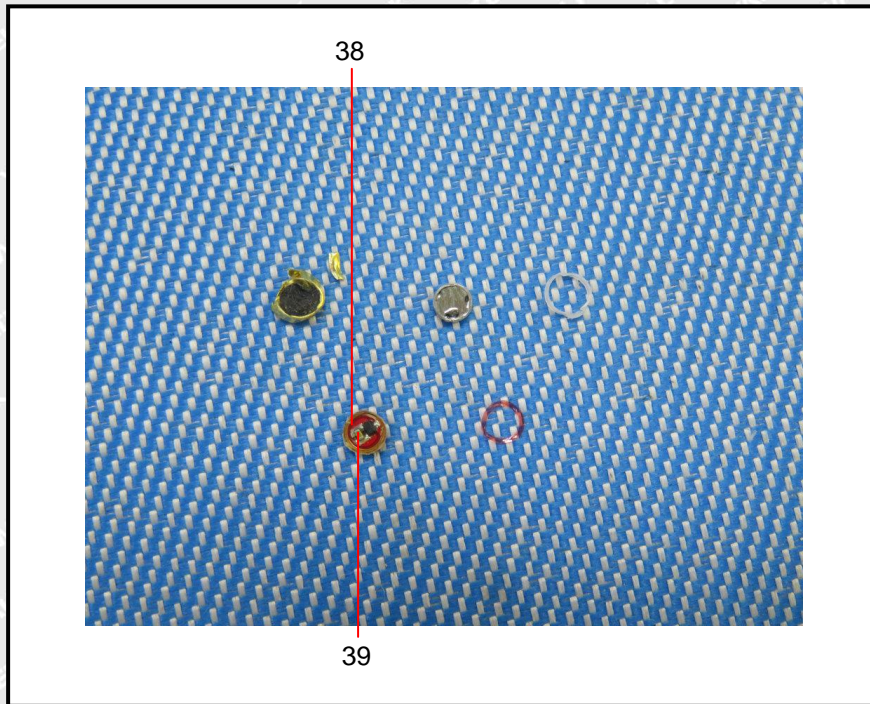


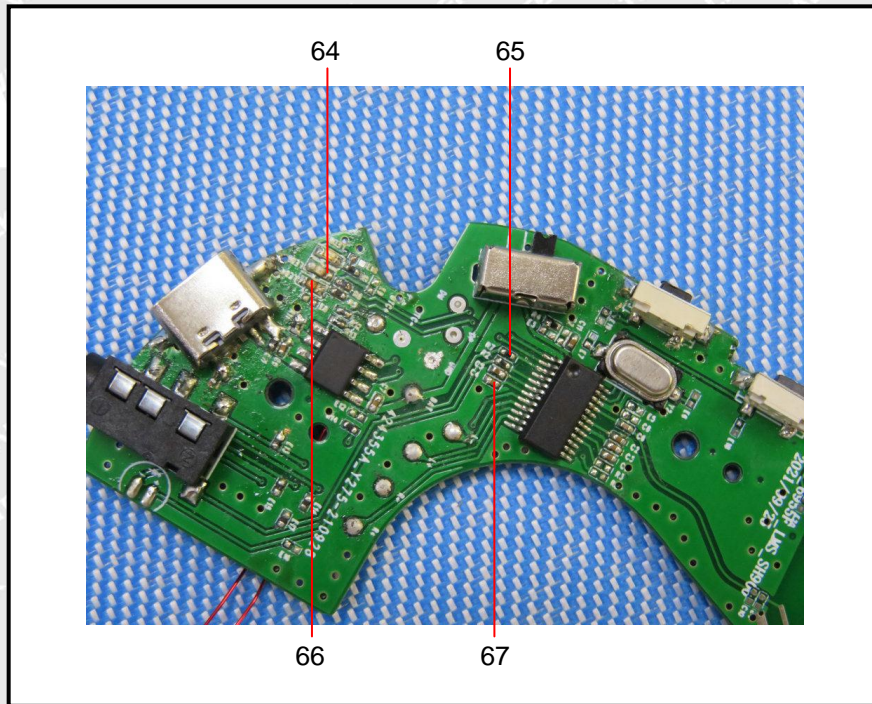
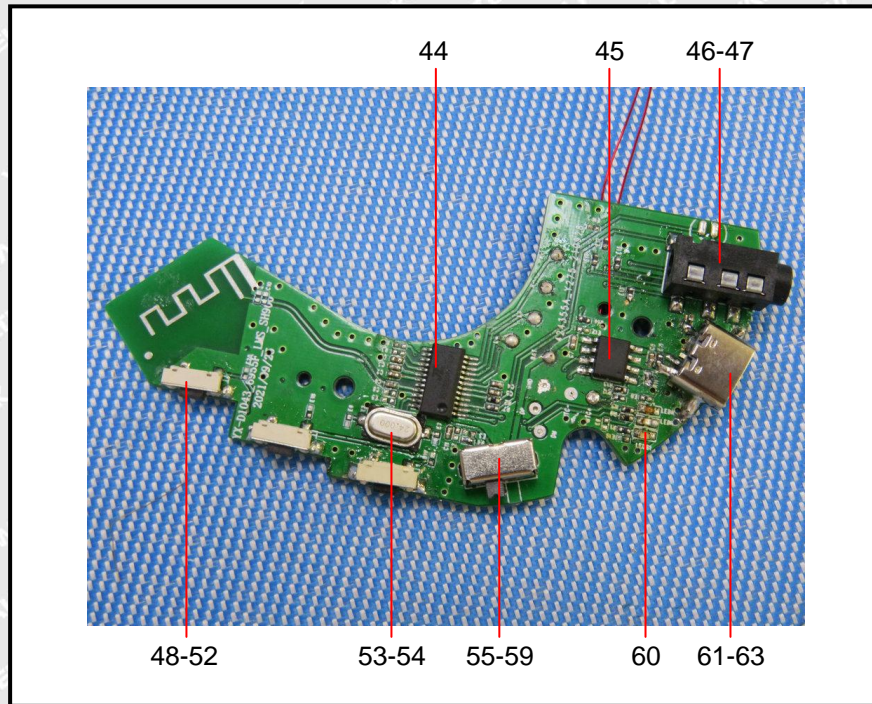


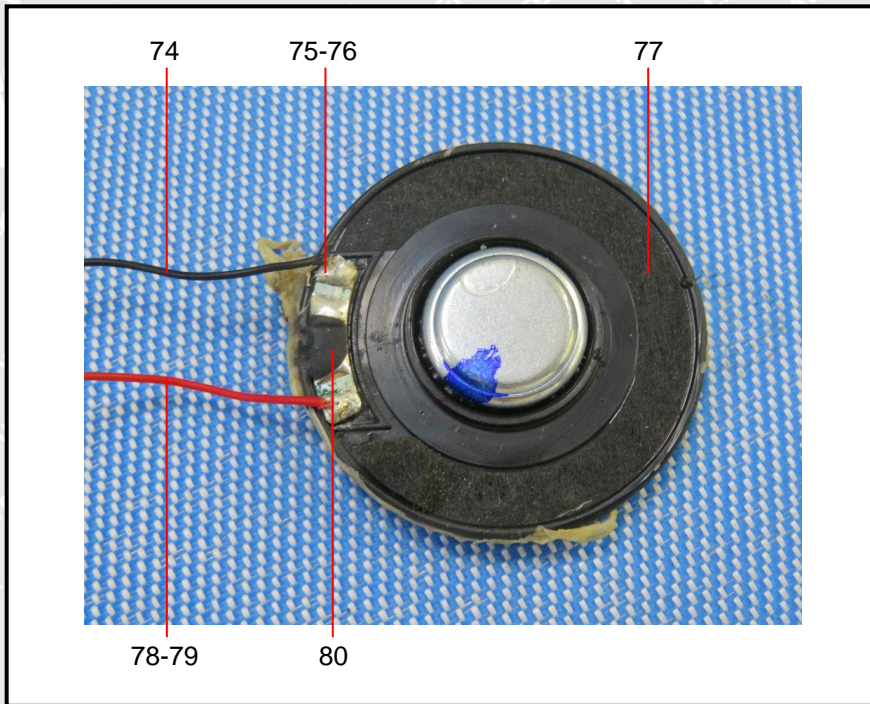
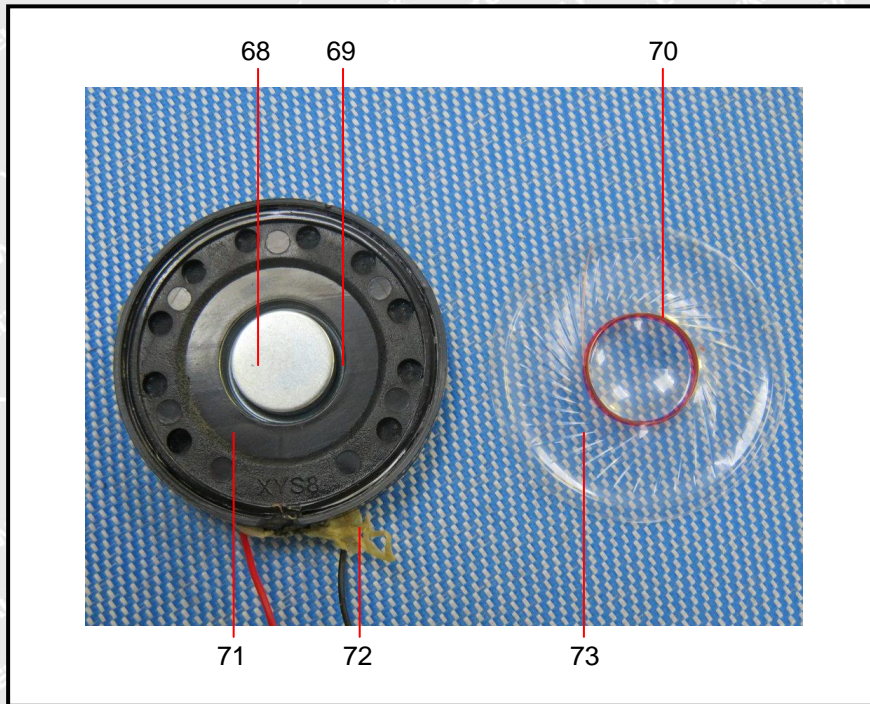


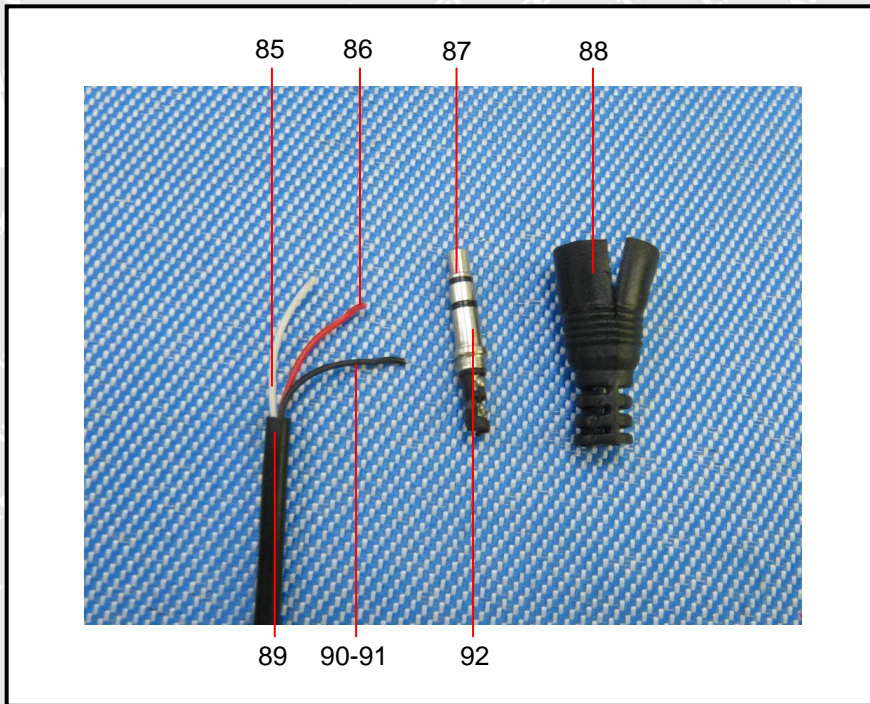
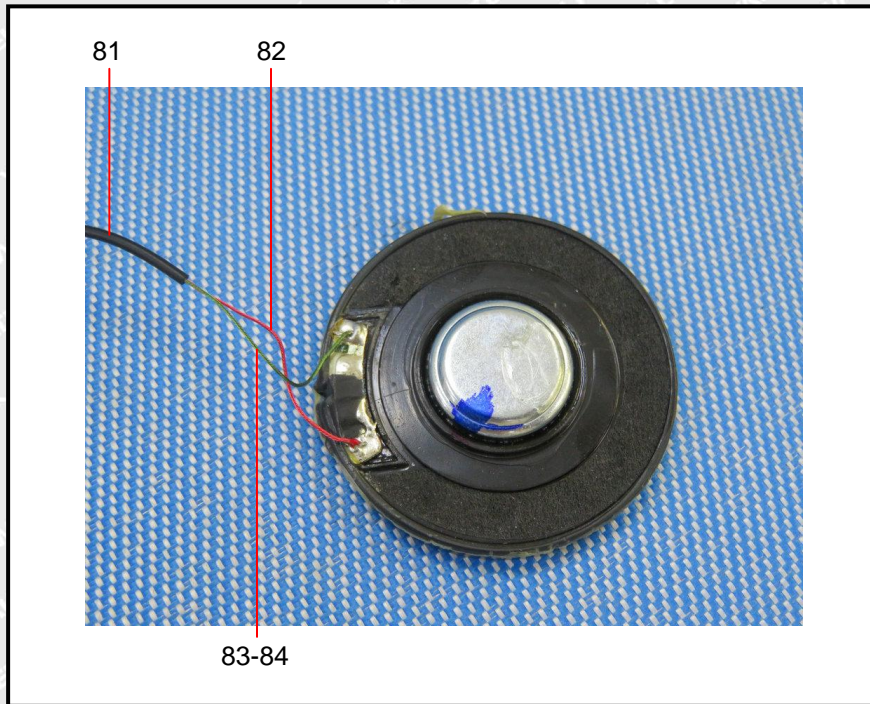


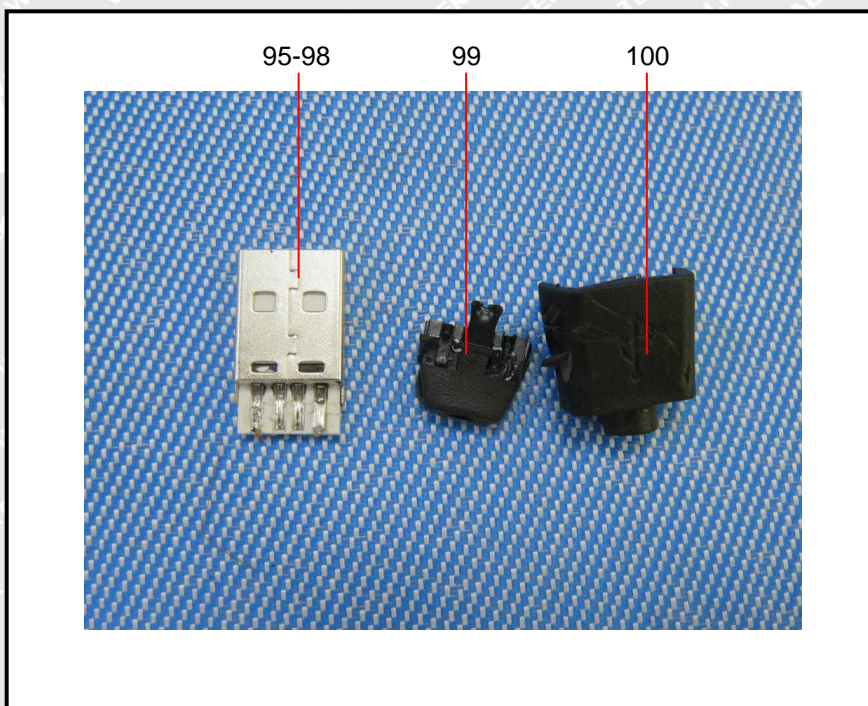
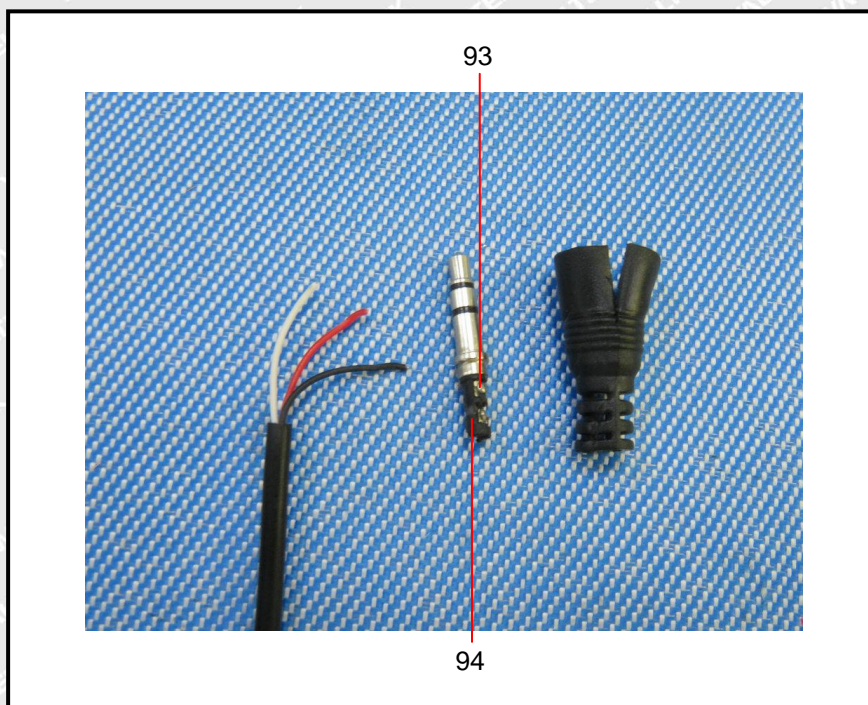


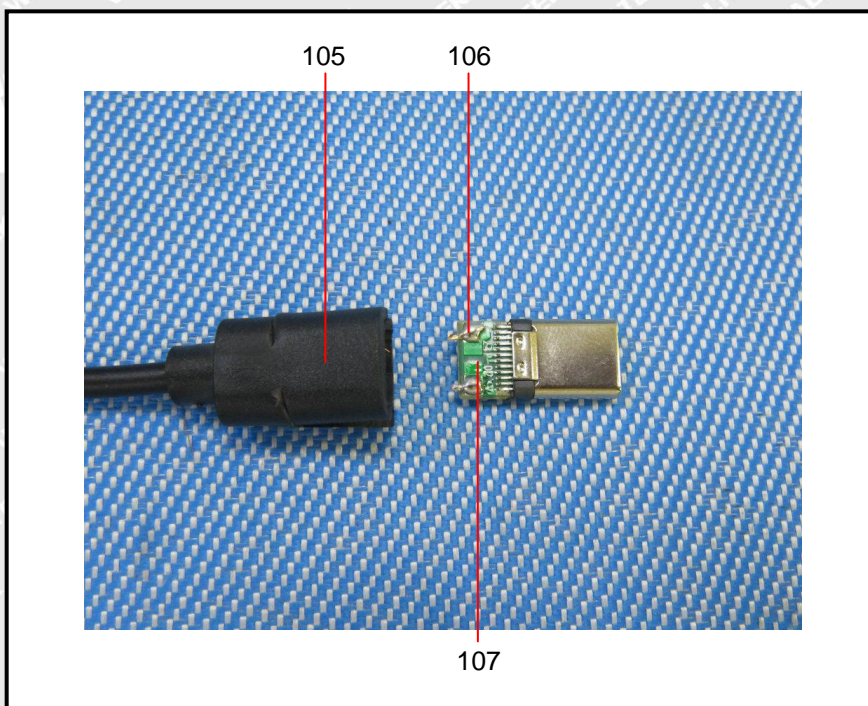
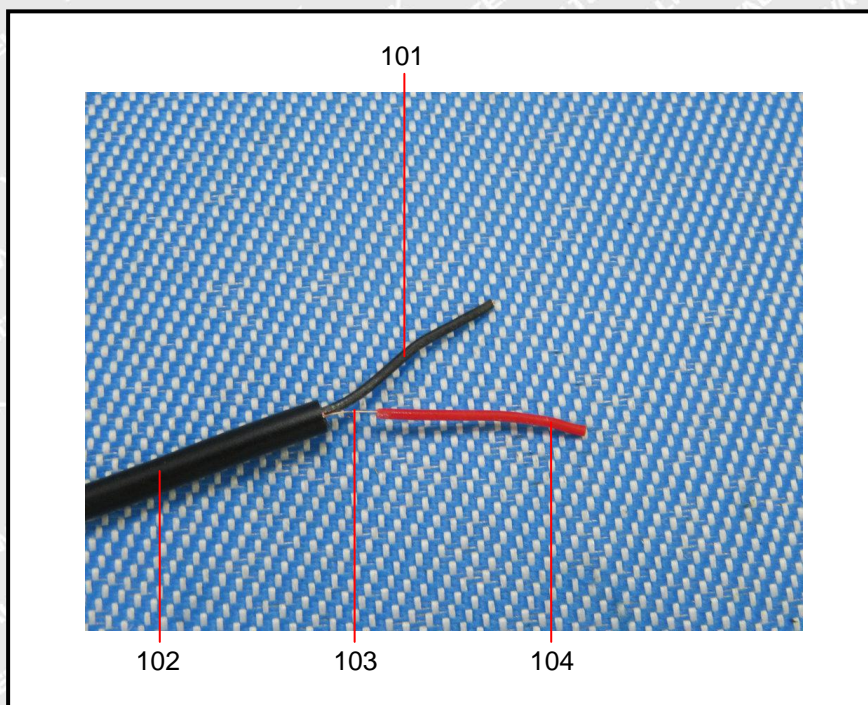


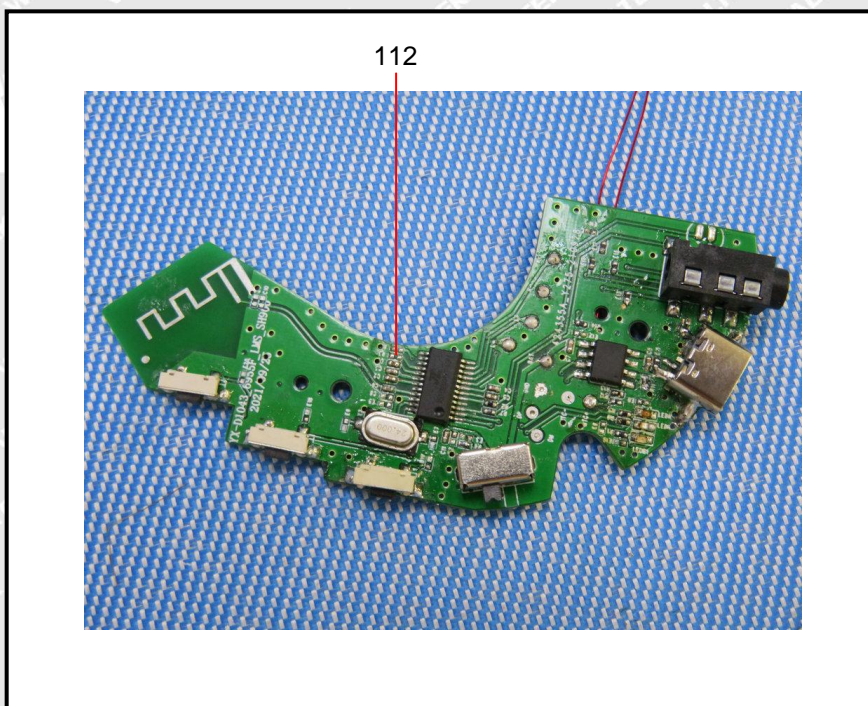
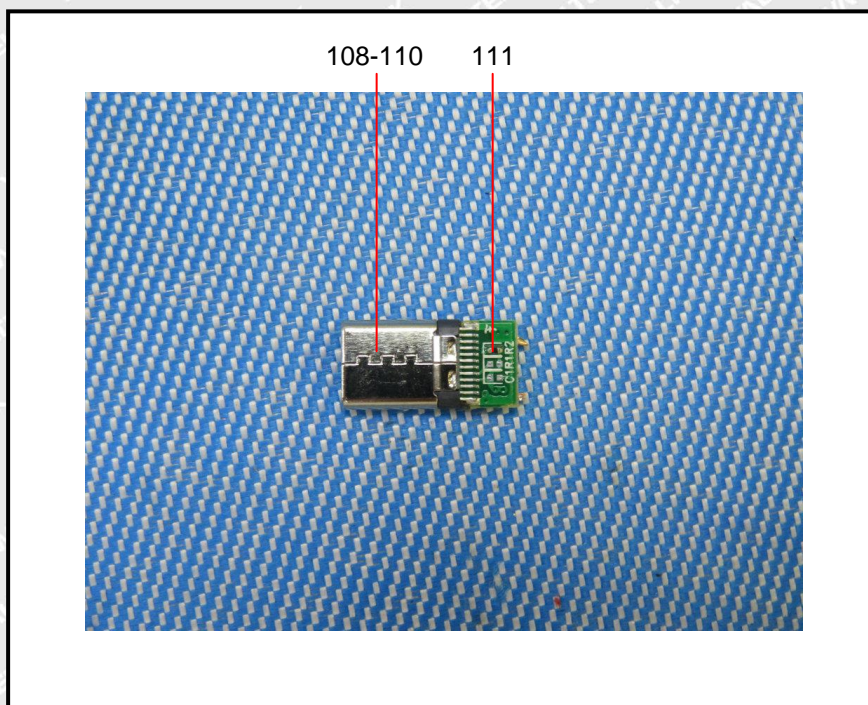


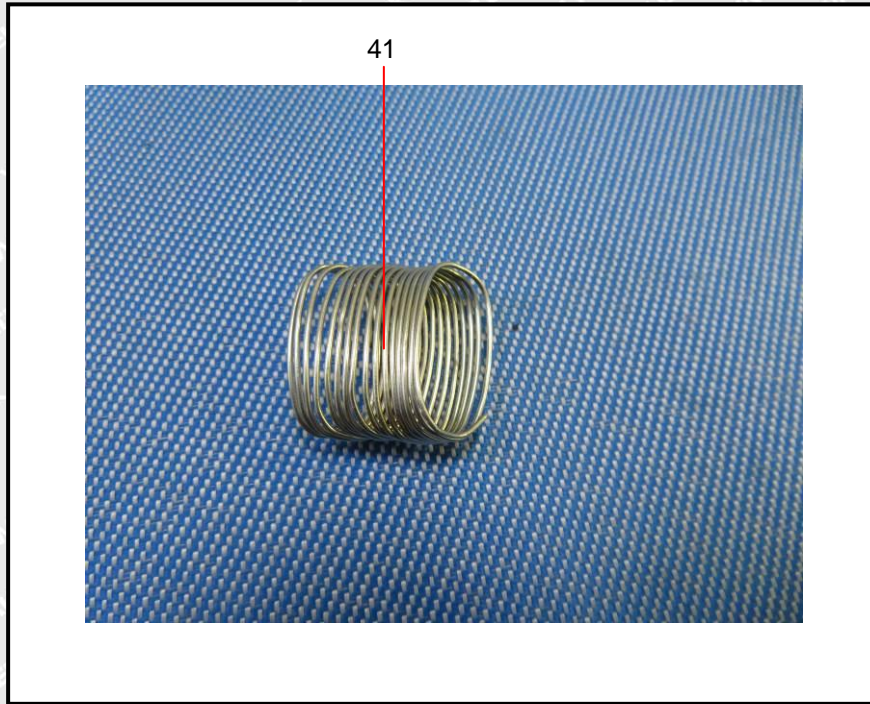












===== End of Report =====

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