

Cobra RTV interference study on rail

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Background

Two production Cobras were brought in during fit check of COB and rails, then it was discovered that these two Cobras (s/n C1004 and C1124) made contact at RTV, even though the body diameters of these Cobras were checked upon receiving. This study is to further evaluate the severity of interference between Cobras on rail.



Fig 1: Two Cobras making contact with each other when installed in adjacent positions on 2 separate rails on COB

Method of evaluation

Two sets of Cobras (s/n C1004 and C1124, as well as C1377 and 1311) were placed in adjacent positions of a single rail and driven in 3 different rail positions while being observed by low power USB microscope around RTV. Observation was made from the side, and from the bottom.

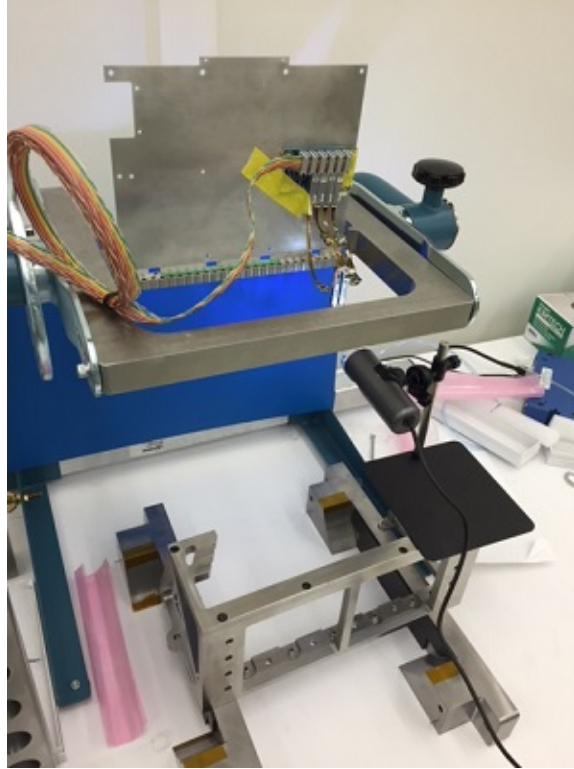


Fig 2: Rail in turn over fixture, 2 Cobras installed, driving electronics attached, and USB microscope set up for observation from side

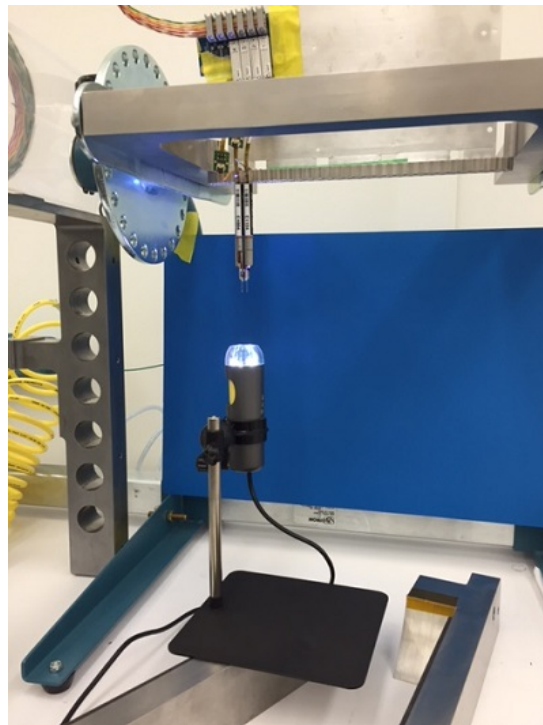


Fig 3: Observing from bottom

Fig 5: Left C1004, Right C1124, Rail Position #1 (Contact) Fig 6: Bottom C1004, Top C1124, Rail Position #1 (Contact)

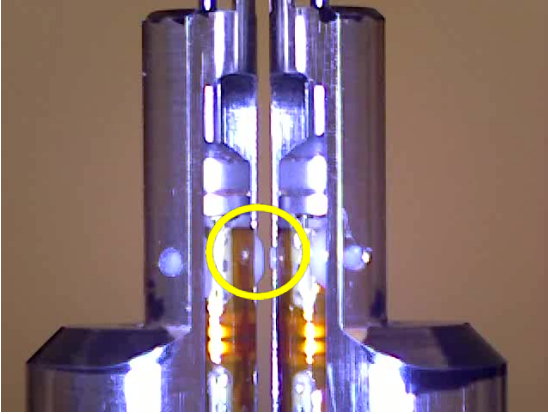


Fig 7: Left C1377, Right C1311, Rail Position #1
(No contact)

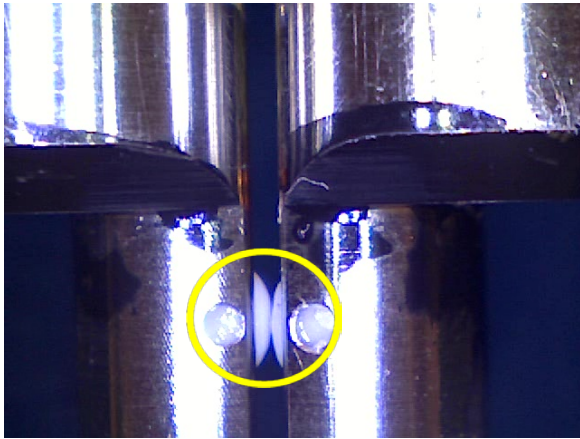


Fig 8: Left C1004, Right C1124, Rail Position #2
(Contact)

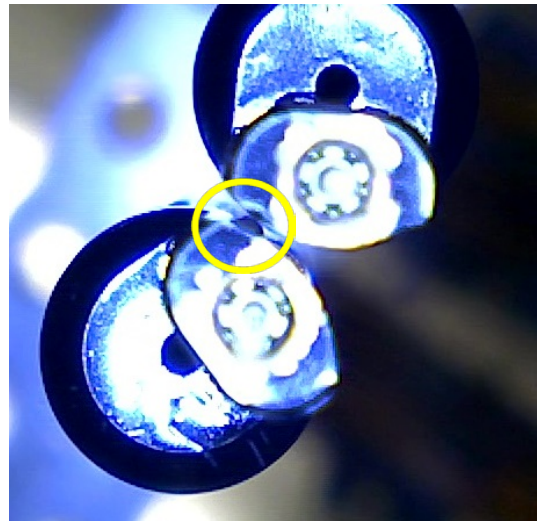


Fig 9: Bottom C1004, Top C1124, Rail Position #2
(Contact)

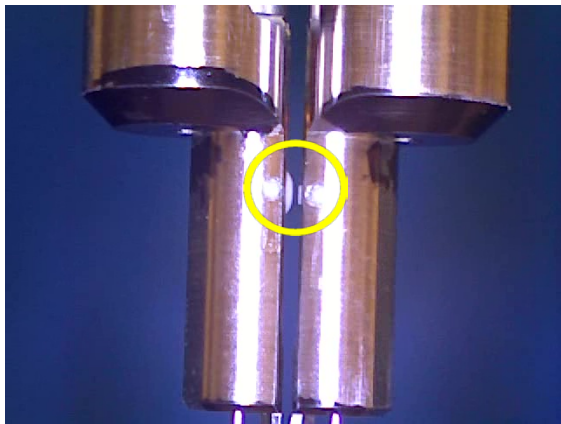


Fig 10: Left C1377, Right C1311, Rail Position #2
(No contact)

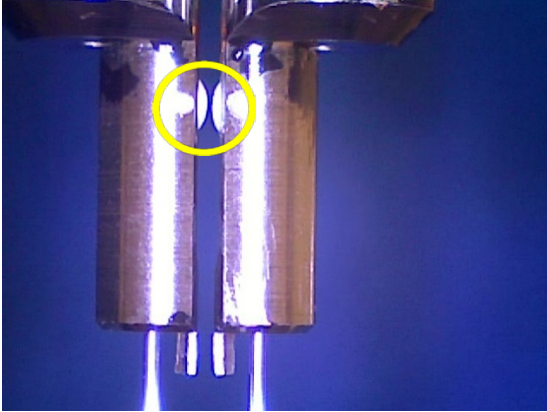


Fig 11: Left C1004, Right C1124, Rail Position #3
(No contact)

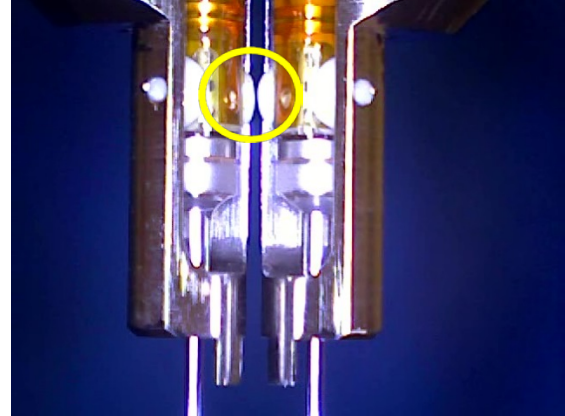


Fig 12: Left C1124, Right C1004, Rail Position #3
(No contact)

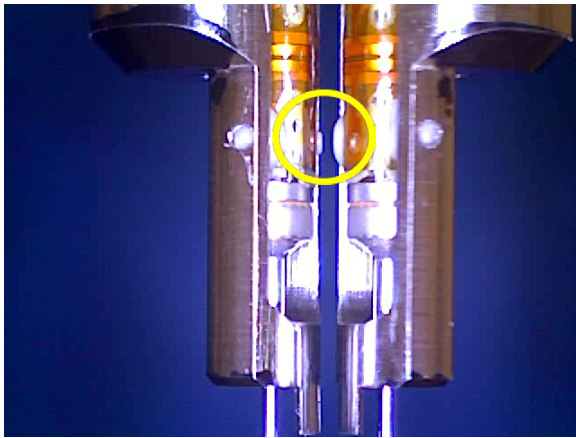


Fig 13: Left C1311, Right C1377, Rail Position #3
(No contact)

As reference, the stage 2 core of the 4 units are shown in figures 14-17. None of eight photographs of figure 14 and 15 shows significant difference among the four Cobras. However, eight photographs of figure 16 and 17 show that C1311 and C1377 have lower profile RTV.

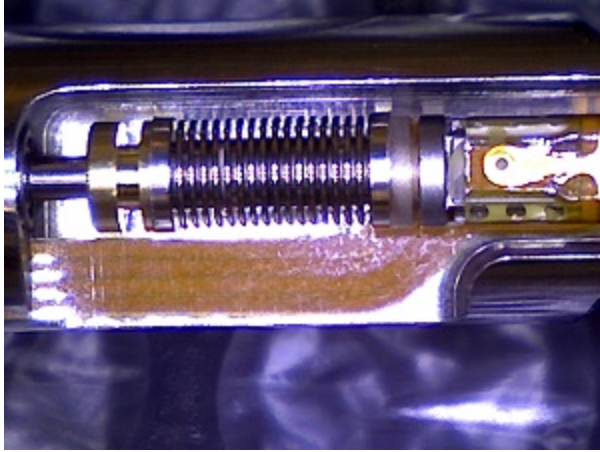


Figure 14-1: C1004

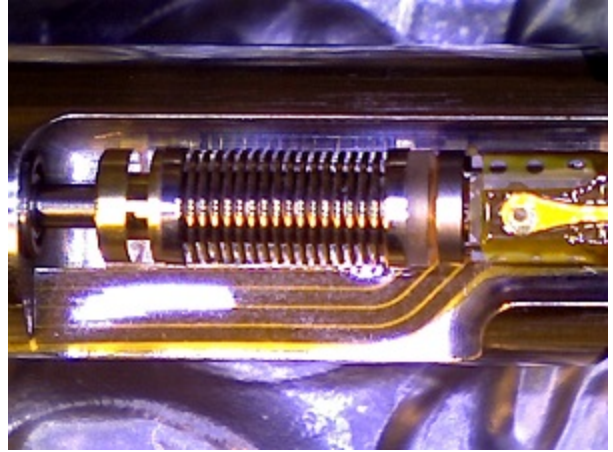


Figure 14-2: C1124

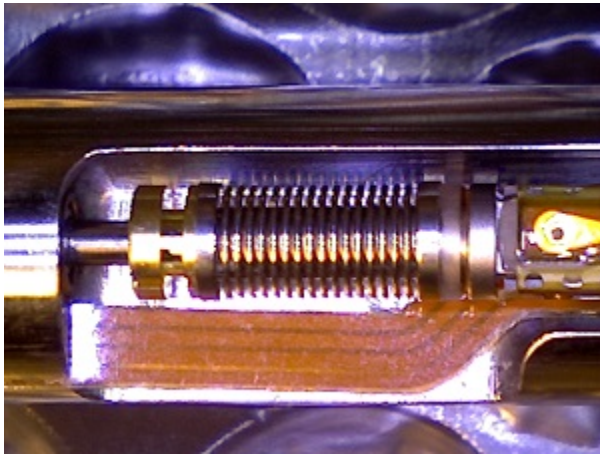


Figure 14-3: C1377

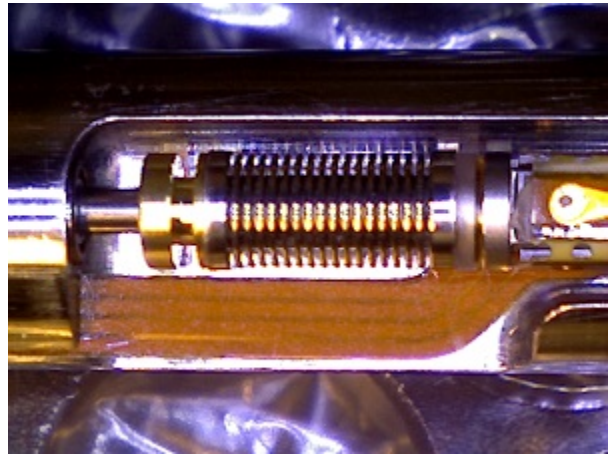


Figure 14-4: C1311

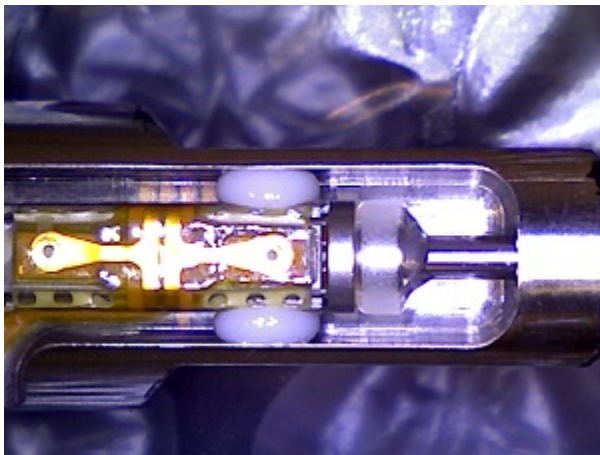


Figure 15-1 C1004

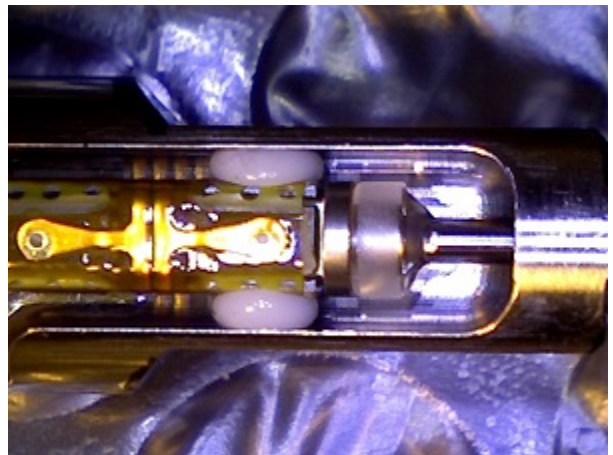


Figure 15-2: C1124



Figure 15-3: C1377

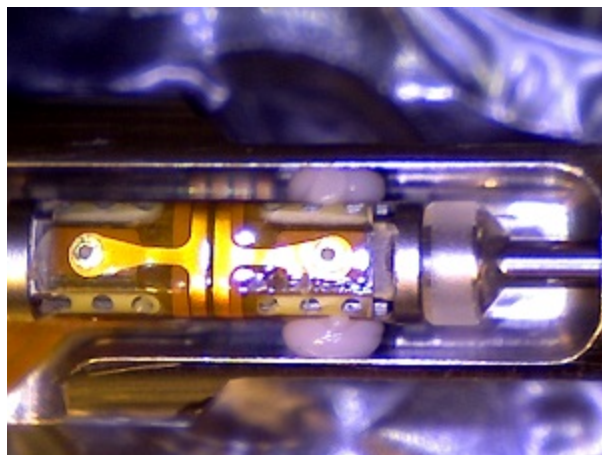


Figure 15-4: C1311



Figure 16-1: C1004



Figure 16-2: C1124

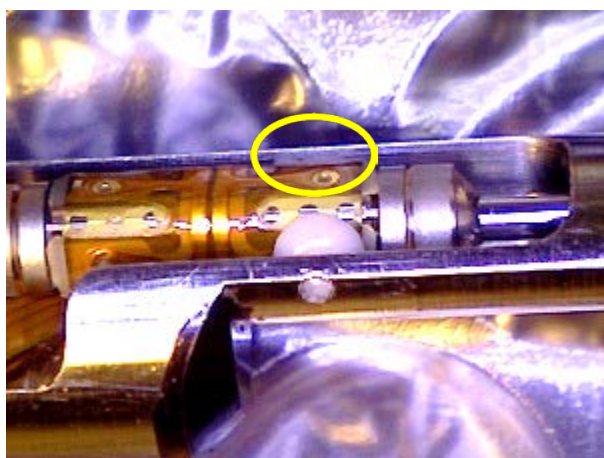


Figure 16-3: C1377



Figure 16-4: C1311

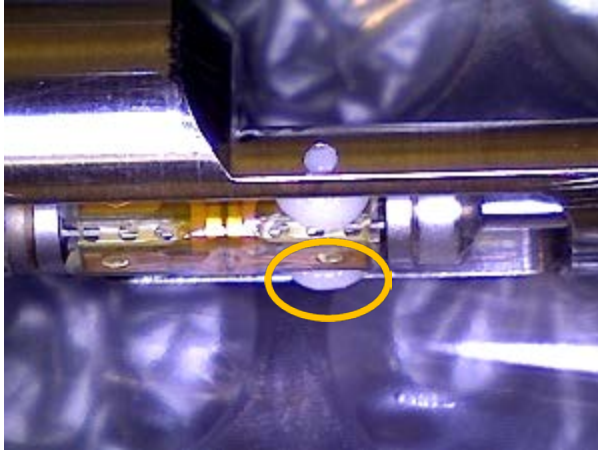


Figure 17-1: C1004

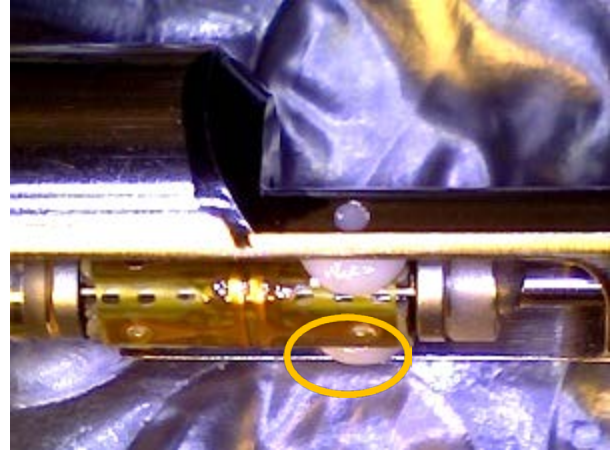


Figure 17-2: C1124

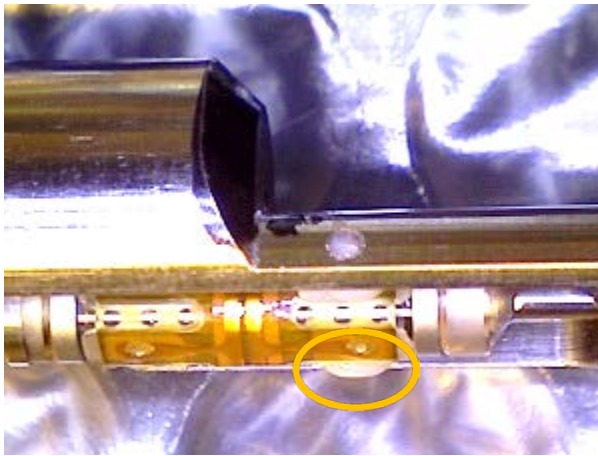


Figure 17-3: C1377



Figure 17-4: C1311

Conclusion

Current receiving inspection process at Caltech is not capable of detecting the height of RTV. This incapability resulted in the unexpected interference between Cobras at RTV.