

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594



December 05, 2021

MATERIALS LABORATORY FACTUAL REPORT

Report No. 21-082

A. ACCIDENT INFORMATION

Place : Coral Gables, Florida
Date : 09/13/2021
Vehicle : 2021 Tesla Model 3
NTSB No. : HWY21FH011
Investigator : Thomas Barth

B. COMPONENTS EXAMINED

1. Front passenger seatbelt buckle and clip.

C. DETAILS OF THE EXAMINATION

Multiple views of the as-received seatbelt clip are shown in Figures 1-3. No deformation or mechanical damage to the clip or tongue was noted.

Multiple views of the as-received seatbelt buckle are shown in Figures 4-9. The seatbelt buckle assembly was imaged by x-ray CT using a 450 kV micro-focus x-ray CT imager at NTS Chesapeake Labs, Belcamp, MD. X-ray CT radiographs of the high radio-opaque (e.g., steel) components within the buckle are shown in Figures 10-12. Based on the radiographs, the buckle is an end-release, tongue-eject design. The spring is out of place due to the post-crash fire damage to the organic and polymeric components. No deformation or mechanical damage was noted for the channel or latch.

Michael Budinski
Chief, Materials Laboratory Division

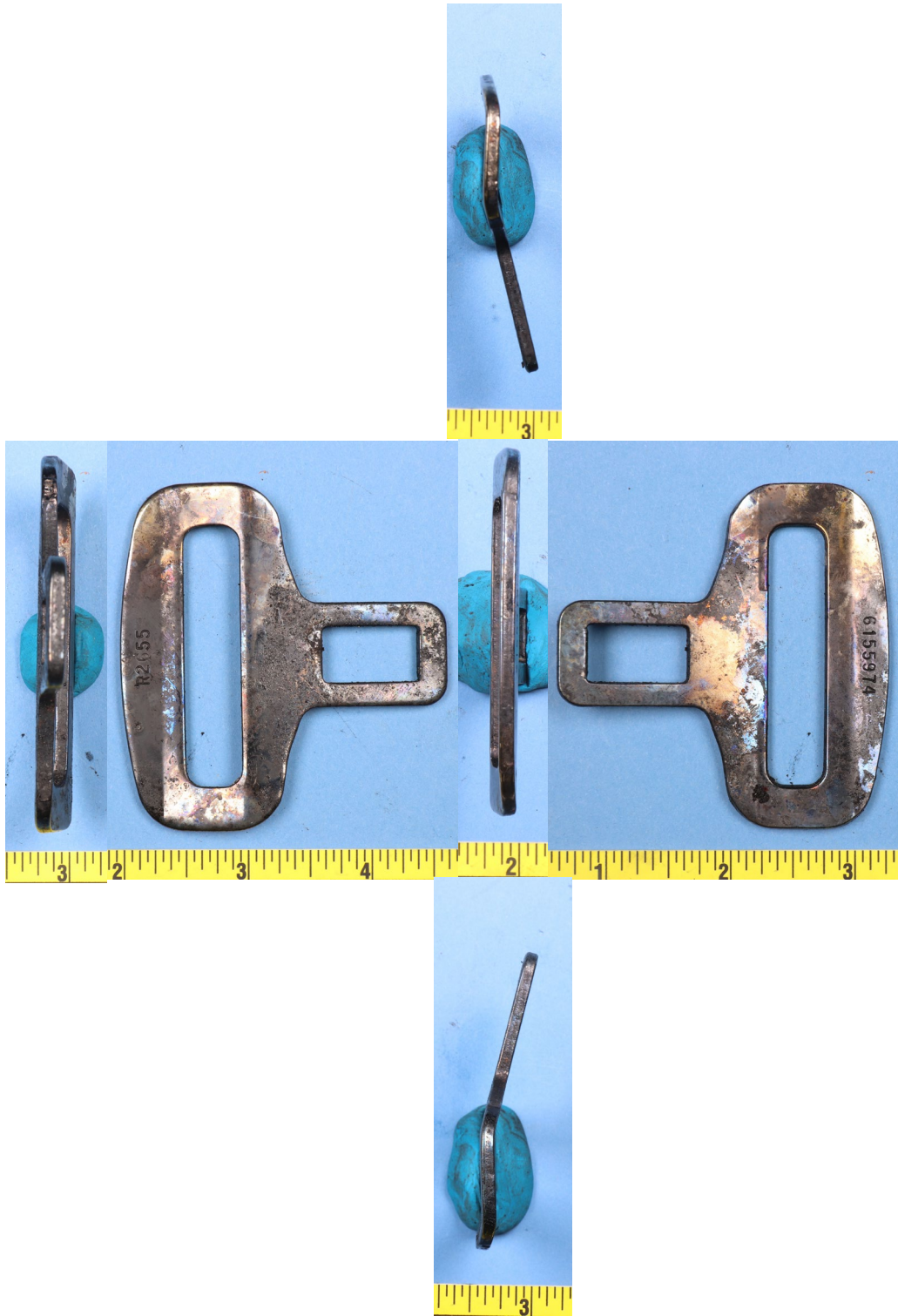


Figure 1 Orthogonal arrangement of the seat belt clip images shown in Figures 2 and 3.



Figure 2 Views of the top and bottom of the seat belt clip with the tongue identified.



Figure 3 Views of the sides or edges of the seat belt clip.

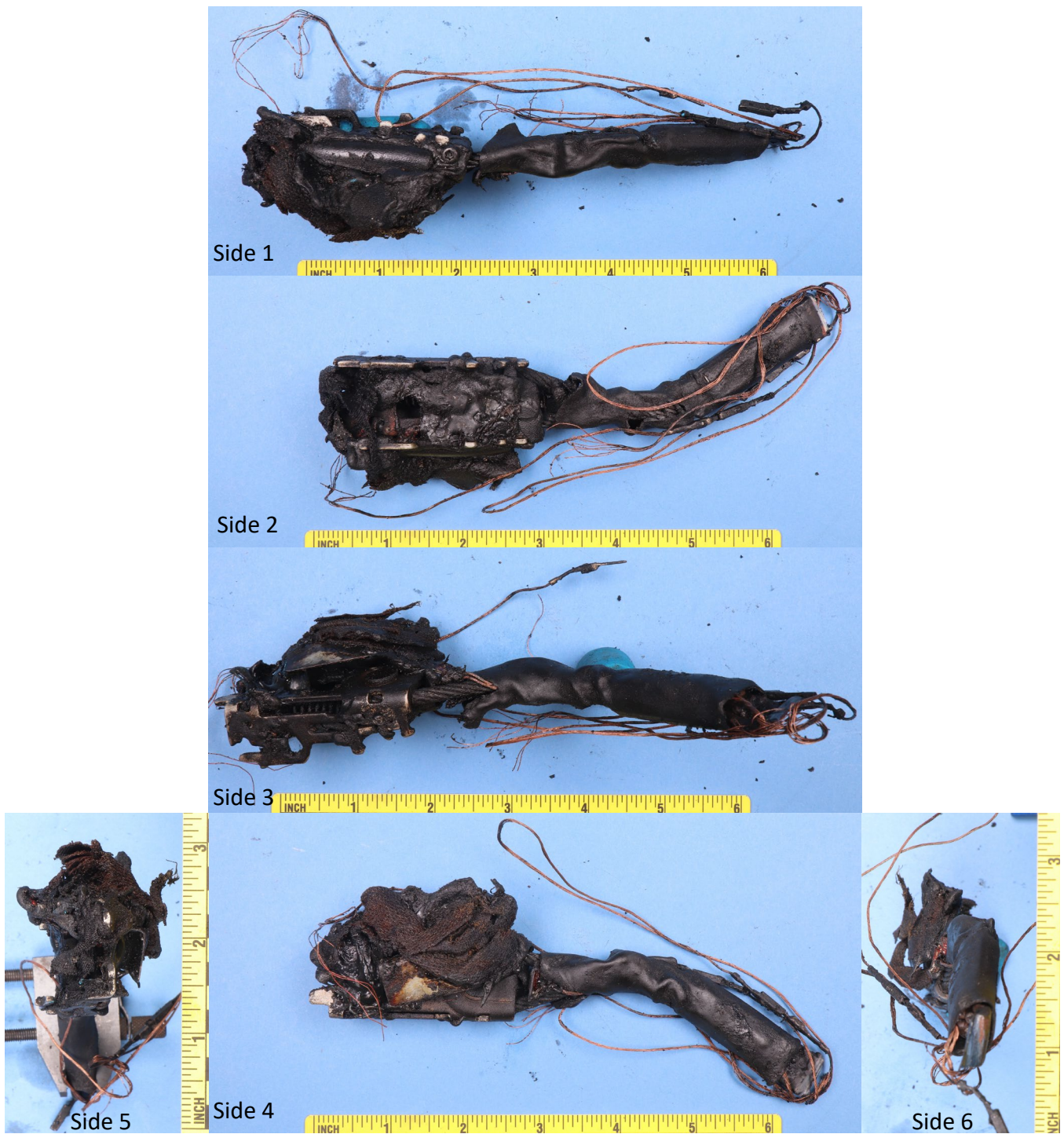


Figure 4 Orthogonal arrangement of the seatbelt buckle images are shown in Figures 5-9.



Figure 5 Image of Side 1 of the buckle (see Figure 4 for orientation).



Figure 6 Image of Side 2 of the buckle (see Figure 4 for orientation).



Figure 7 Image of Side 3 of the buckle (see Figure 4 for orientation).



Figure 8 Image of Side 4 of the buckle (see Figure 4 for orientation).



Figure 9 Images of Sides 5 and 6 of the buckle (see Figure 4 for orientation).

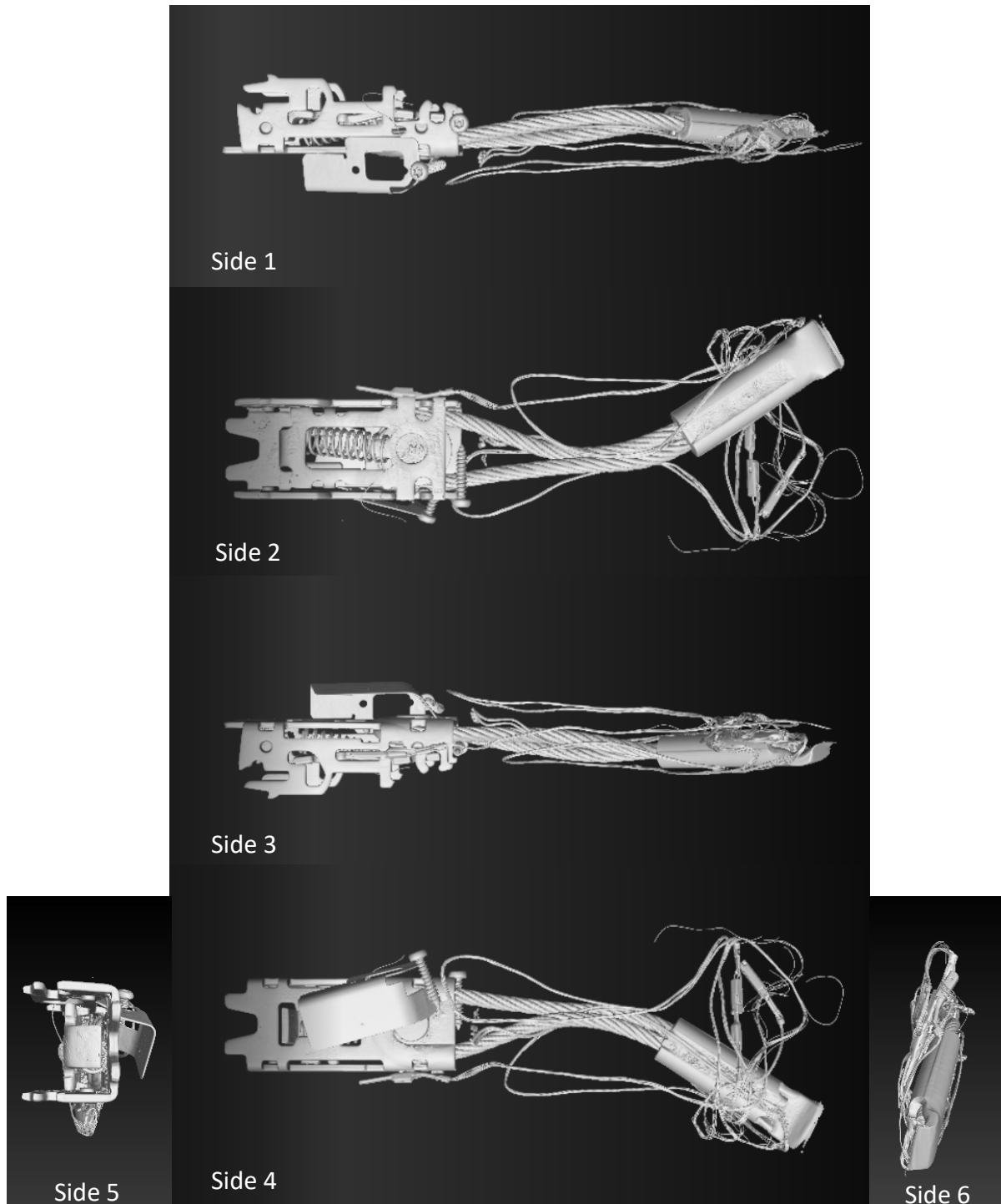


Figure 10 Orthogonal arrangement of x-ray CT radiographs of the seat belt buckle images shown in Figure 4.

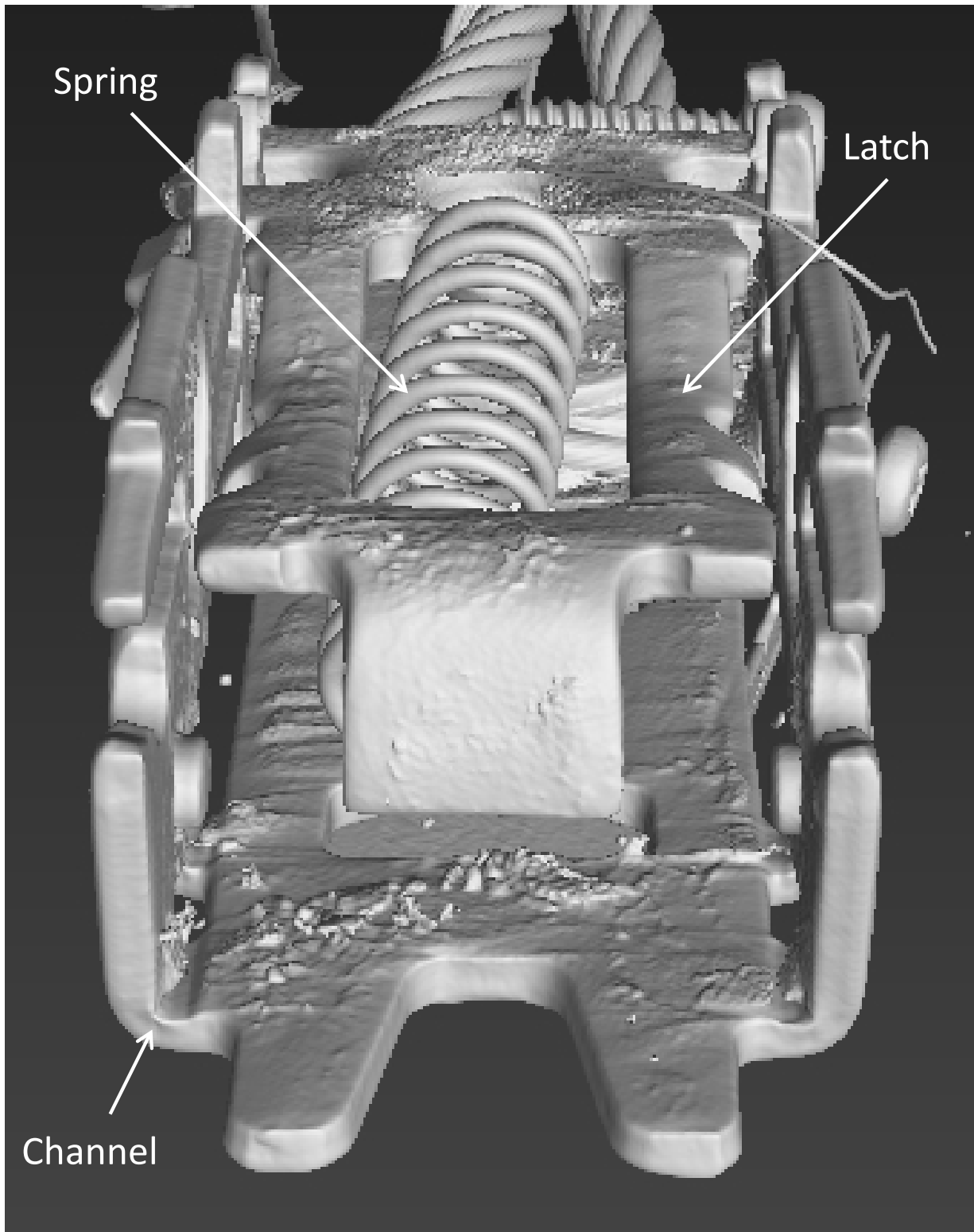


Figure 11 X-ray CT radiograph image of the internal ferrous buckle components—oblique view from the insertion end.

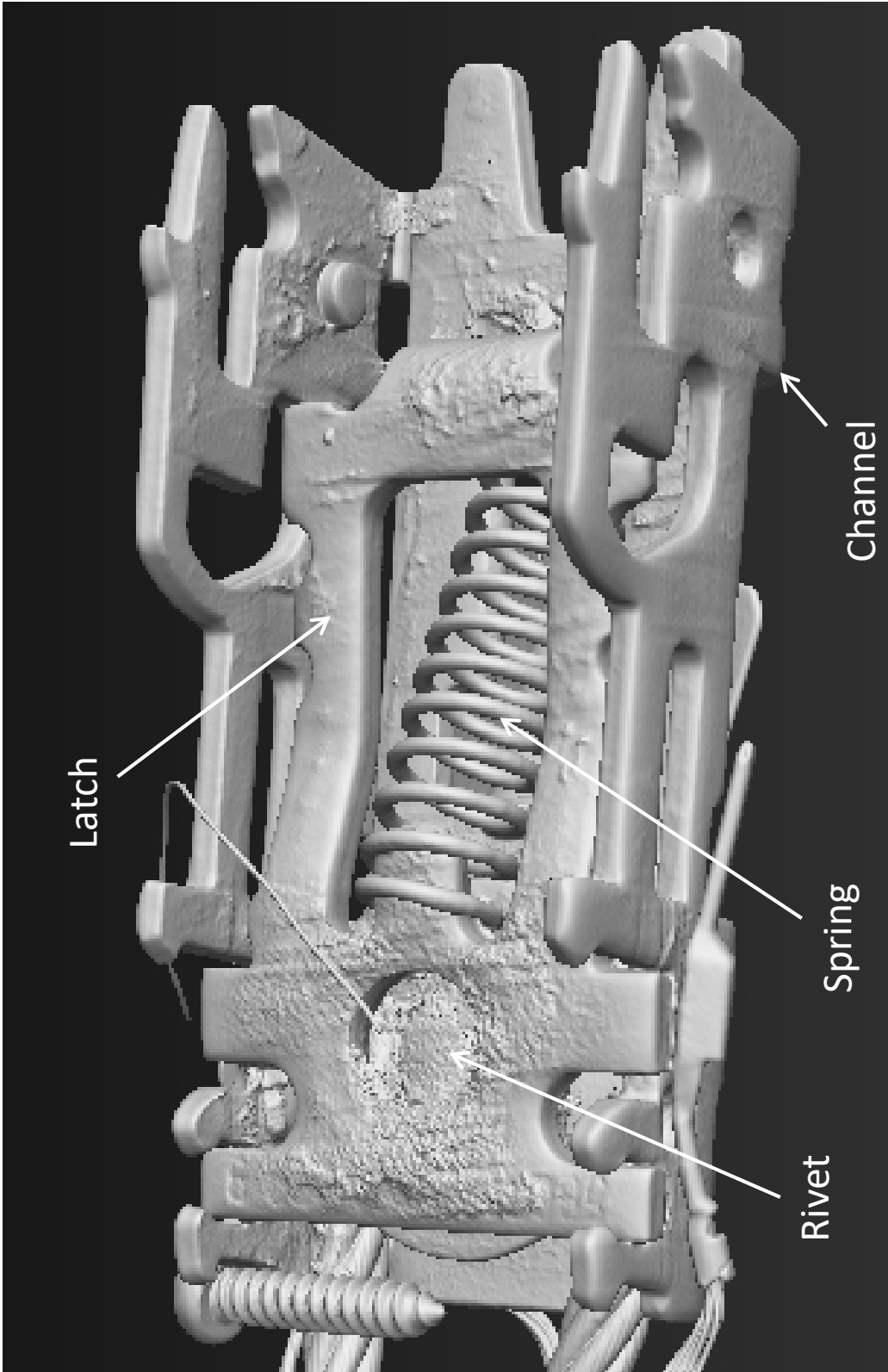


Figure 12 X-ray CT radiograph image of the internal ferrous buckle components—oblique side view.