

NATIONAL TRANSPORTATION SAFETY BOARD

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



06/08/2021

MATERIALS LABORATORY FACTUAL REPORT

Report No. 21-045

A. ACCIDENT

Place : Sioux Falls, South Dakota
Date : June 7, 2020
Vehicle : MU-28-60
NTSB No. : CEN20LA215
Investigator : Shaun Williams
AS-CEN

B. COMPONENTS EXAMINED

1) Master Warning annunciator; 2) Autopilot Controller panel; 3) Mode Selector panel; 4) Main annunciator panel and 5) LH and RH Beta Range annunciators

C. DETAILS OF THE EXAMINATION

The annunciators panels listed above were submitted to the Materials Laboratory for examination. The individual annunciator lights were x-rayed to examine the filament in each bulb. Each annunciator light contained two bulbs except for the MASTER WARNING annunciator which contained three bulbs. The status for each annunciator light is found in the tables below. Radiographs of the bulbs exhibited hot filament stretching are shown in Figures 1-5.

Master Caution

Left Bulb	Middle Bulb	Right Bulb
Intact, stretched	Intact, stretched	Intact, stretched

Autopilot Controller

Annunciator	Bulb #1	Bulb #2
TRIM UP	Broken, not stretched	Broken, not stretched
TRIM DOWN	Broken, not stretched	Broken, not stretched
AP ENGAGED	Broken, not stretched	Missing
YD ENGAGED	Broken, not stretched	Intact, not stretched

Mode Selector Annunciator

Annunciator	Bulb #1	Bulb #2
HDG	Missing	Broken, not stretched
NAV ARM	Broken, not stretched	Broken, not stretched
APR ARM	Broken, not stretched	Intact, not stretched
BC ARM	Broken, not stretched	Intact, not stretched
VOR APR ARM	Intact, not stretched	Intact, not stretched
ALT	Missing	Broken, not stretched
ATL SEL ARM	Broken, not stretched	Broken, not stretched
VS	Missing	Missing
IAS	Missing	Broken, not stretched
VNAV	Missing	Missing

Left side of Annunciator Panel

Annunciator	Bulb #1	Bulb #2
FUEL LOW LEVEL	Missing	Missing
L H/W OVER TEMP	Intact, not stretched	Intact, not stretched
L BOOST PUMP FAIL	Broken, not stretched	Broken, not stretched
L FUEL FIL BYPASS	Intact, not stretched	Intact, not stretched
CABIN PRESS LOW	Intact, not stretched	Broken, not stretched
L DC GEN OUT	Intact, not stretched	Intact, not stretched
L FEEDER OUT	Intact, not stretched	Intact, not stretched
BAT TEMP 120°	Intact, not stretched	Intact, not stretched
L SRL FAIL	Intact, not stretched	Broken, not stretched
INVERTER FAIL	Intact, not stretched	Intact, not stretched
P T/B PWR FAIL	Intact, not stretched	Broken, not stretched
INST VAC FAIL	Intact, not stretched	Intact, not stretched

Right Side of Annunciator Panel

Annunciator	Bulb #1	Bulb #2
ENT DOOR OPEN	Intact, not stretched	Intact, not stretched
R H/W OVER TEMP	Intact, not stretched	Intact, not stretched
R BOOST PUMP FAIL	Broken, stretched	Intact, stretched
R FUEL FIL BYPASS	Intact, not stretched	Intact, not stretched
AIR COND SYS FAIL	Intact, not stretched	Intact, not stretched
R DC GEN OUT	Intact, not stretched	Intact, not stretched
R FEEDER OUT	Intact, not stretched	Intact, not stretched
BATTERY OVER TEMP	Intact, not stretched	Intact, not stretched
R SRL FAIL	Intact, not stretched	Intact, not stretched
SPARE	Missing	Intact, not stretched
CP T/B PWR FAIL	Intact, not stretched	Intact, not stretched
DEFOG OVER TEMP	Broken, not stretched	Intact, not stretched

Beta Range Annunciators

Annunciator	Bulb #1	Bulb #2
LH	Missing	Intact, not stretched
RH	Intact, not stretched	Intact, not stretched

Nancy B McAtee
Senior Chemist

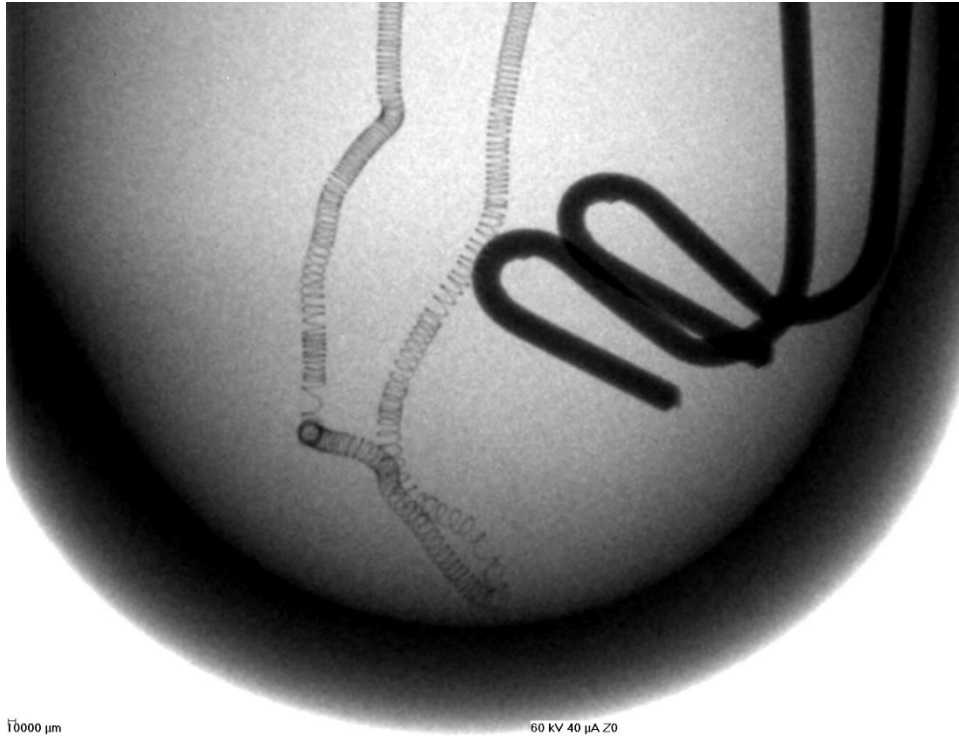


Figure 1. Radiograph of left bulb in Master Warning Annunciator.

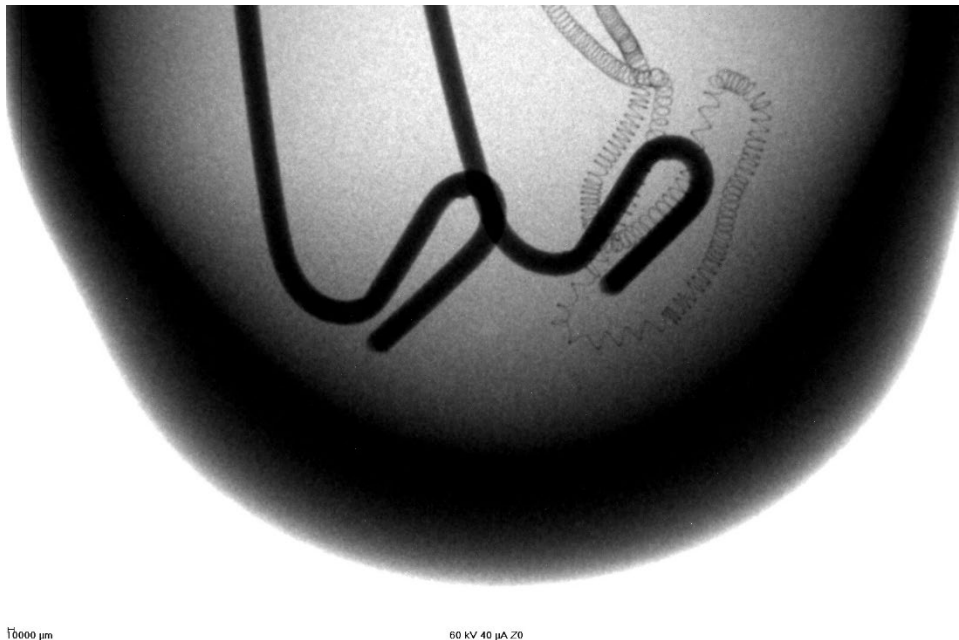


Figure 2. Radiograph of center bulb of Master Warning annunciator.



Figure 3. Radiograph of right bulb of Master Warning annunciator.

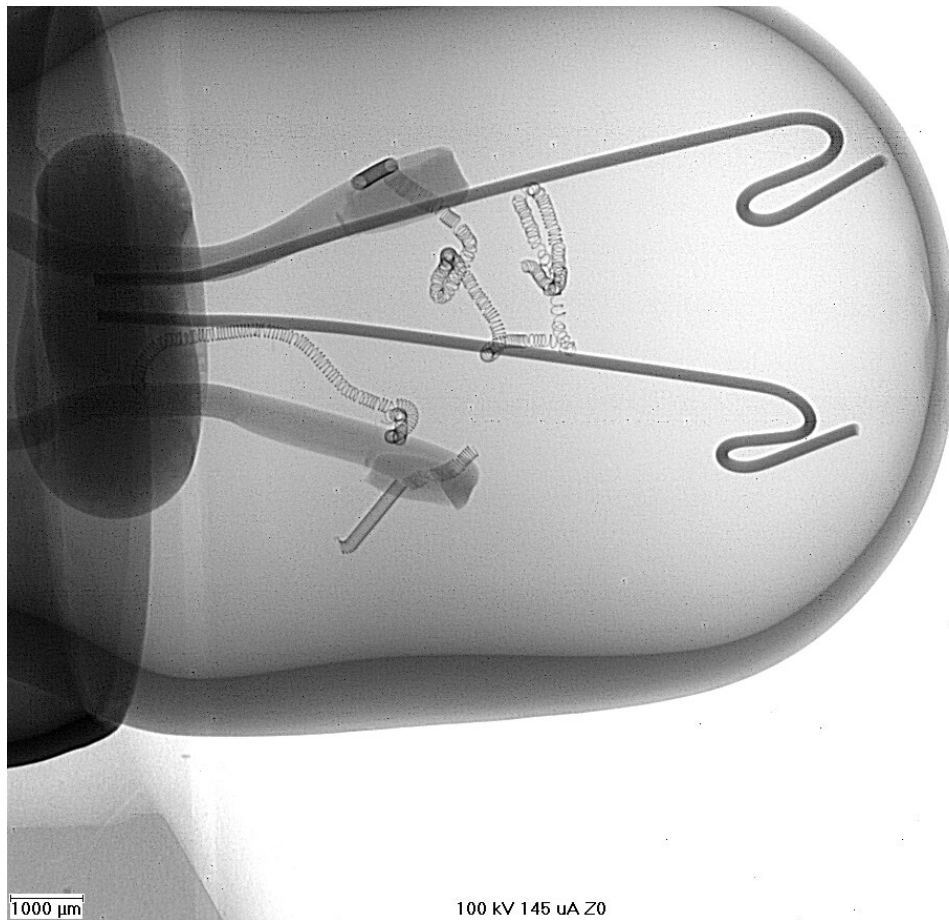


Figure 4. Radiograph of bulb 1 from Right Fuel Boost Pump Fail.

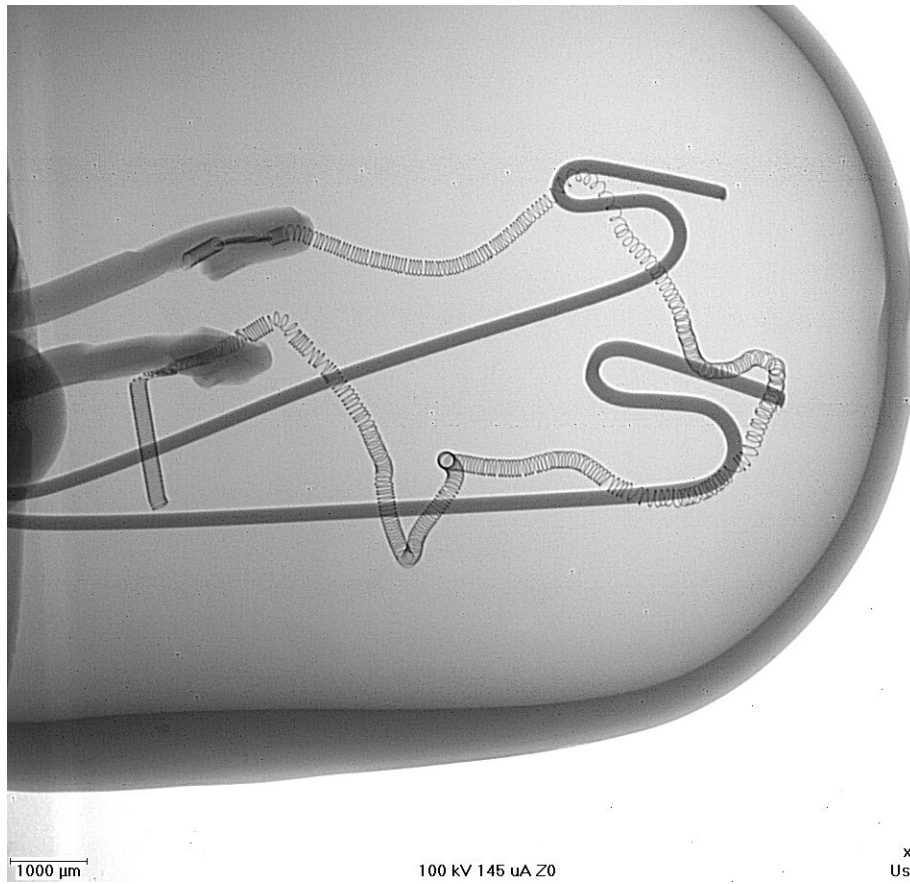


Figure 5. Radiograph of bulb 2 from Right Fuel Boost Pump Fail.