



NTSB National Transportation Safety Board

Office of Aviation Safety

Wiring, Circuit Breakers, and Training Presentation

Fire Group Findings

- Potential evidence of arcing, but not of wire source or timing
- Most electrical system components missing or severely damaged
- A few small wire fragments exhibited copper globules consistent with electrical arcing
- Not possible to positively identify which systems involved from wire remains

Wiring Routed Beneath Fire Damage

Heat damage (behind)

Radar display



Circuit breaker panel

VIEW ON NEXT SLIDE

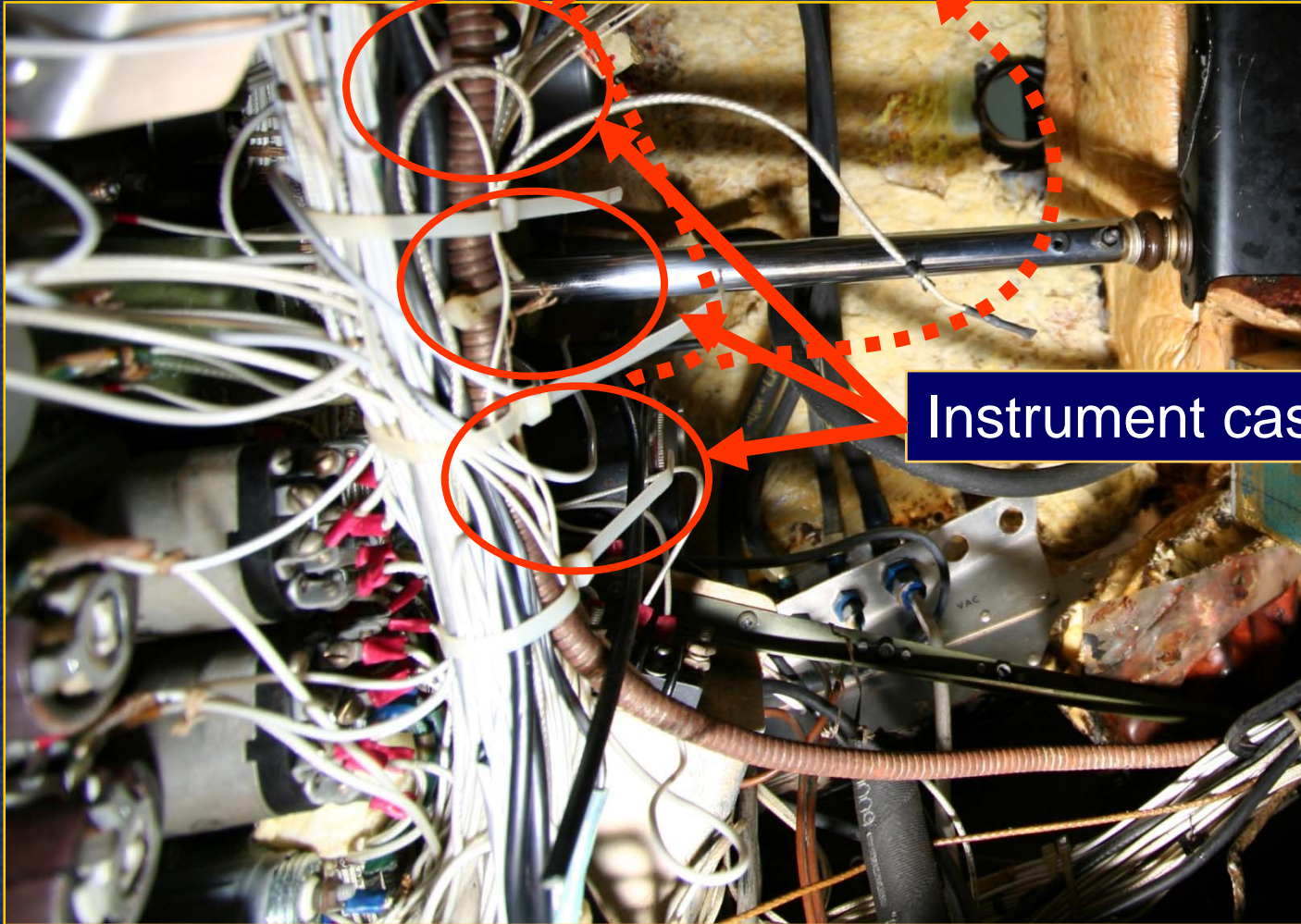
The dashed line shows the wiring path behind the instrument panel of a similar airplane

Wiring Behind Instrument Panel

(Exemplar airplane)

To radar display

Soot flow paths



Aft,
toward
pilot seat

Forward,
toward
nose

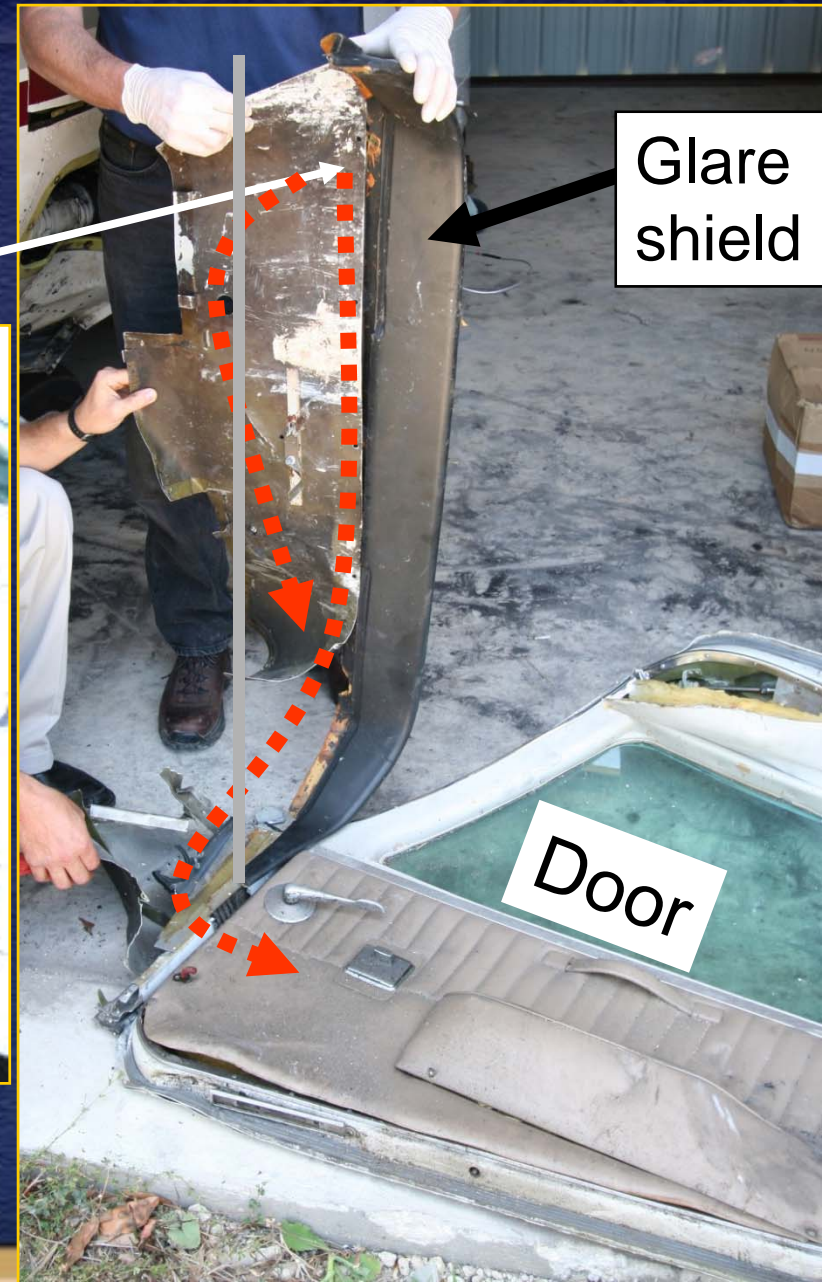
To circuit breaker panel

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Soot Flow

Heat damage
on bottom surface



Polyvinyl Chloride Wire Insulation

- PVC wire insulation found in wing remnant
- PVC-insulated wiring may or may not have been involved with initial failure
- Irritant of throat, eyes, and skin
- Full-airplane rewiring impractical

Wire Insulation Damage

- Pilot of previous day stopped the symptoms by pulling circuit breaker
- Insulation damage cumulative
- Once damaged, insulation not same as when approved for use
- Maintenance action needed

Circuit Breaker Theory

- Classic Theory
 - One circuit breaker reset allowable
 - If true problem exists, breaker will trip again
- Fact
 - Pulling and resetting circuit breaker may stop symptoms, but may also allow further wire damage to develop

Circuit Breaker Usage

- TWA 800 and SW 111 investigations identified circuit breaker hazards
- Part 121 operations no longer permit resetting circuit breakers unless critical
- General aviation community unaware of recent circuit breaker information
- Critical and noncritical circuit breakers should be identified

Wiring Information

- Wire aging and maintenance research resulted in extensive changes
- Training developed for transport operators, not for general aviation
- No equivalent initial and/or proficiency training for general aviation mechanics



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