



**NTSB** National Transportation Safety Board

*Office of Aviation Safety*



## **ABX Air Ground Fire**

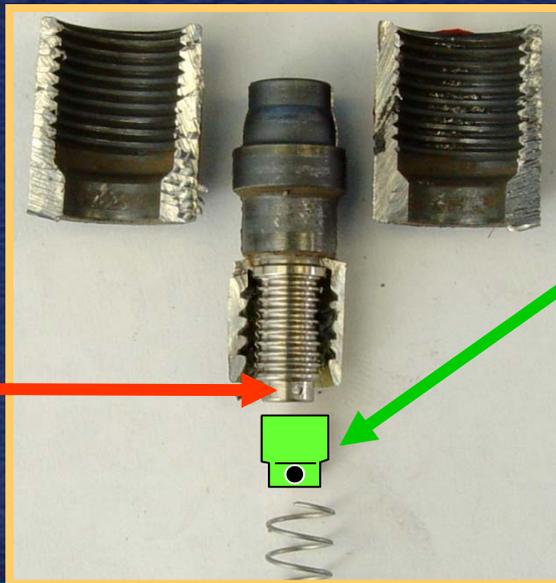
Bob Swaim

Airworthiness

# Conductivity of Oxygen Hoses

- In mid-1990s, Boeing received leakage reports
  - Electrical current heated internal spring
  - PVC hose material melted
- Hose redesign
  - Plastic spacer added to interrupt current path
  - Production change and service bulletins issued in 1999

Original conductive hose hooked spring to hole



New plastic spacer with hole to attach spring

# Airworthiness Directive (AD) Process

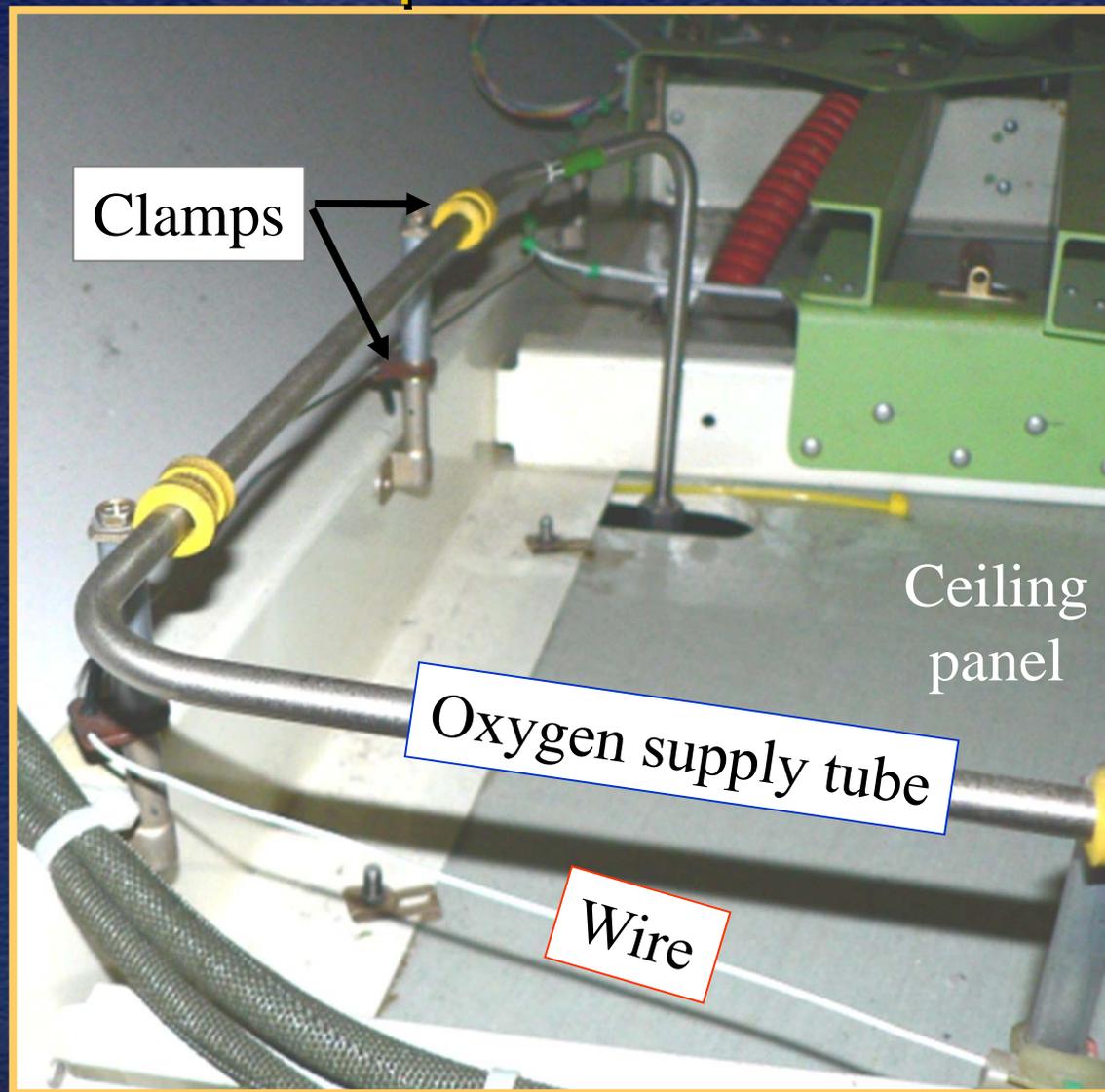
- FAA reviewed Boeing's Service Bulletin (SB) but did not issue ADs
  - Issuance of AD mandates compliance with SB
- FAA now mandating SB compliance
  - Expected to cite specific Boeing cockpit use of part numbers
  - Would not cite same parts used in non-cockpit installations or address hose manufacturer's other customers

# Airworthiness Directive Process

- AD types: aircraft, engine, propeller, or appliances
  - Appliances are not unique to one airplane design
  - Appliance ADs address individual parts and assemblies
- FAA to coordinate with makers of vended parts
- Part makers to provide FAA with list of customers using similar parts
- FAA to check for additional applications using part

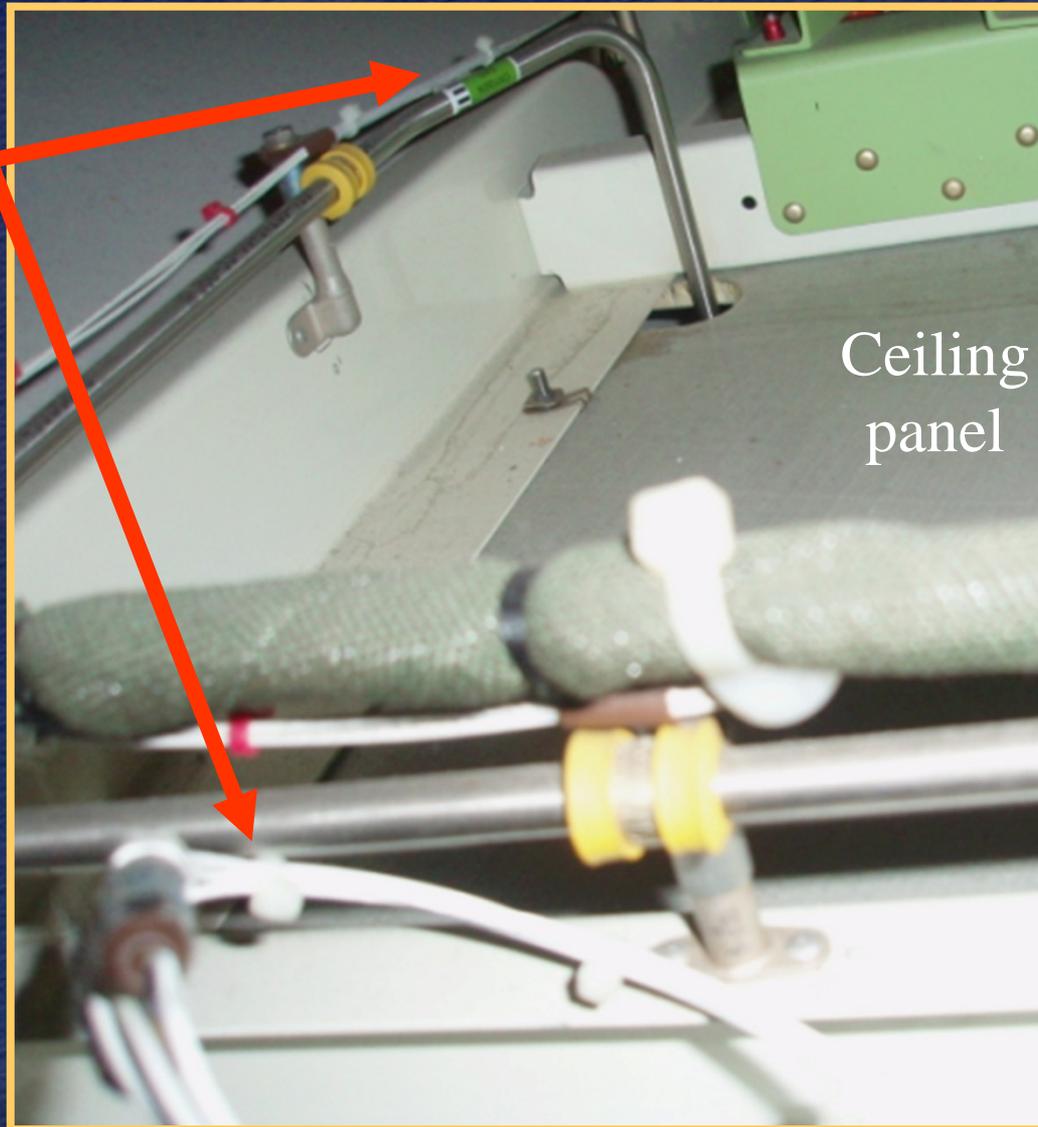
# Proximity of Oxygen Components to Wires

## Proper Installation



# Proximity of Oxygen Components to Wires Improper Installation

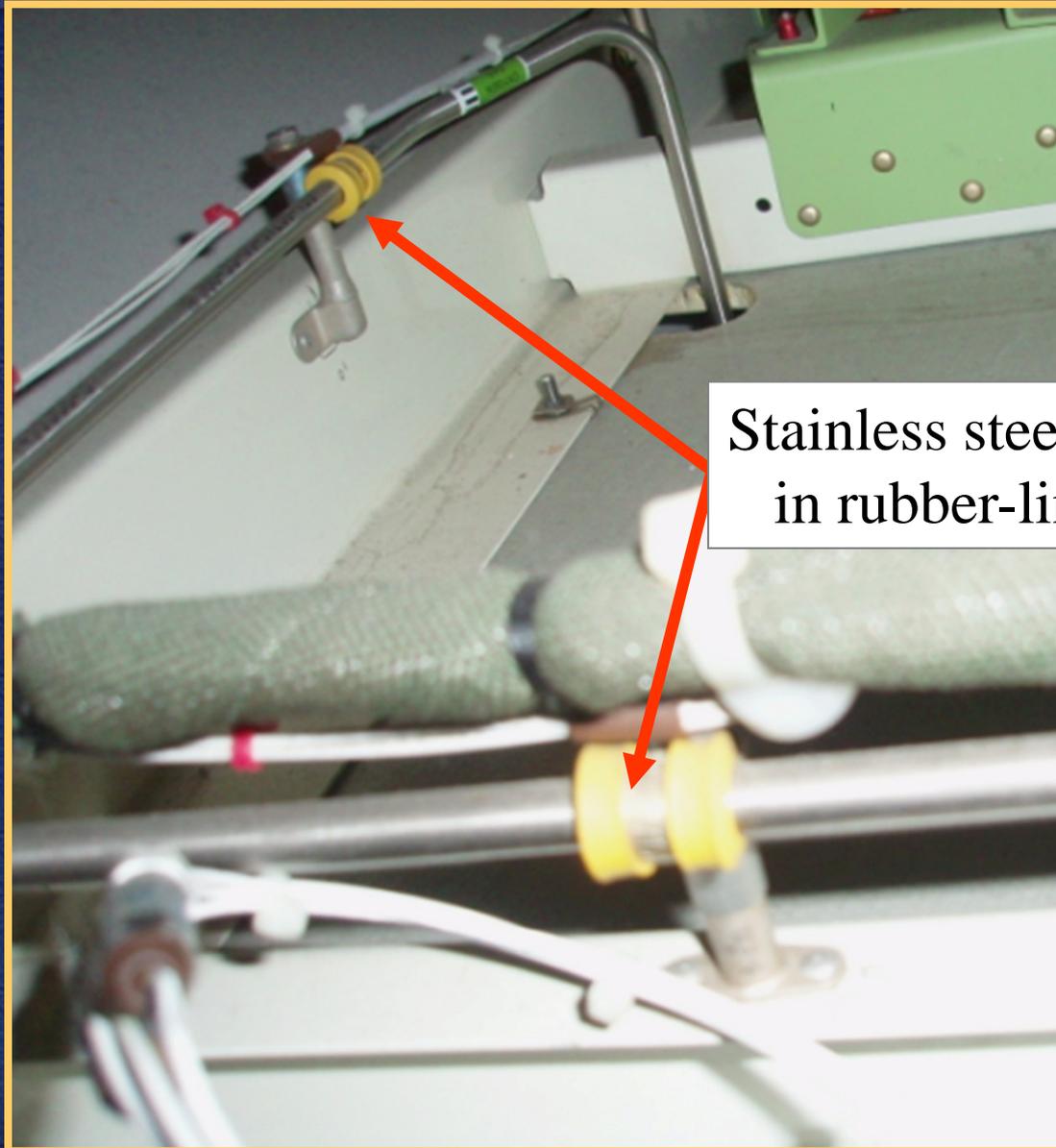
Wires  
touch  
oxygen  
supply tube



# Proximity of Oxygen Components to Wires

- Inadvertent wire contact found previously
- Wires contacted critical oxygen tubing
  - Continuing problem
- Conductive oxygen tubing needs protection
  - Physical isolation
  - Nonconductive sleeving
  - Nonconductive coating

# Electrical Grounding of Oxygen System



Stainless steel supply tube  
in rubber-lined clamps

# Aging Oxygen Hoses

- Potential for cracks and oxygen leaks
  - Older hoses not as flexible as new hoses
  - PVC can harden with exposure to light and some chemicals
- Inspection requirements
  - Periodic system leakage and general visual inspections
  - No tests or inspections for material properties
- Operators could install older hoses into newly delivered airplanes

# Passenger Service Unit Reading Lights

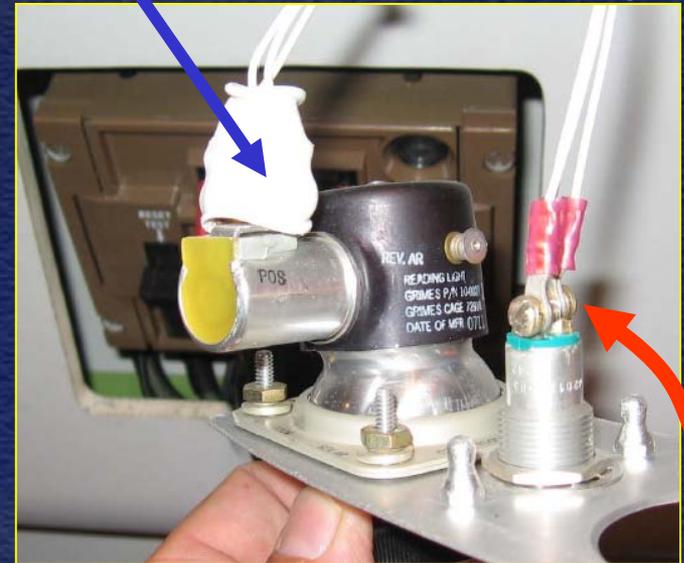


Potential arc

Switch

Rotation of light assembly

Rubber boot, per design



Boot missing from switch



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