

Textron Aviation Examination Report

Examination of N400LE (ERA18LA010) on 11-28-17.

No damaged wires were observed forward of the firewall.

Overvoltage relay ground wire:

The ground wire for the voltage regulator was found separated. The separated appeared similar to a pinched cut (i.e. not a tool cut). No evidence of arching was observed. Avionics boxes in the area had been displaced during the impact sequence. The area of the separation was near the top of the instrument panel.

Avionics switch wires:

The avionics switch was located at the top center of the instrument panel above the autopilot control unit. Two wires were connected to it. One wire was attached to the electrical bus bar. The connection was co-located with the landing gear circuit breaker. The other wire was attached to the "COM 2" circuit breaker. This connection was then daisy chained to the other avionics circuit breakers forming an avionics bus. After leaving the avionics switch the wires traveled across the back of the autopilot control unit and around a vertical support member (made of a thin sheet of aluminum) before reaching the circuit breaker panel. No mechanical protection or supports were present on the wires. The two wires were tie wrapped together at various places. They were also tie wrapped to a larger wire bundle near the bus bar.

When the switch and wires were removed from the aircraft it was observed the wires had a distinct bend where they passed around the vertical support member

A majority of the insulation on the wire from the bus bar to the avionics switch was melted or completely missing. Evidence of arching was observed on the wire and the autopilot control unit where the wire crossed over the back of the autopilot control unit. Evidence of arching was also observed on the wire and the vertical support member where the wire passed around the support member. The wire had separated into two pieces under the instrument panel.

Portions of the wire from the avionics switch to the COM 2 circuit breaker exhibited melting where it was located near the other wire. Evidence of arching was observed on the wire and the autopilot control unit where the wire crossed over the back of the autopilot control unit. Evidence of arching was also observed on the wire and the vertical support member where the wire passed around the support member.

The avionics switch was not originally installed in the aircraft. The wiring was not marked in the same manner as the originally installed wires. The wire insulation was marked M22759/16-14; indicating the wire was 14 gauge. Using an aviation grade wire stripper the size was confirmed to be 14 gauge.

No circuit protection was observed between the avionics switch and the bus bar.

Cut ground wires:

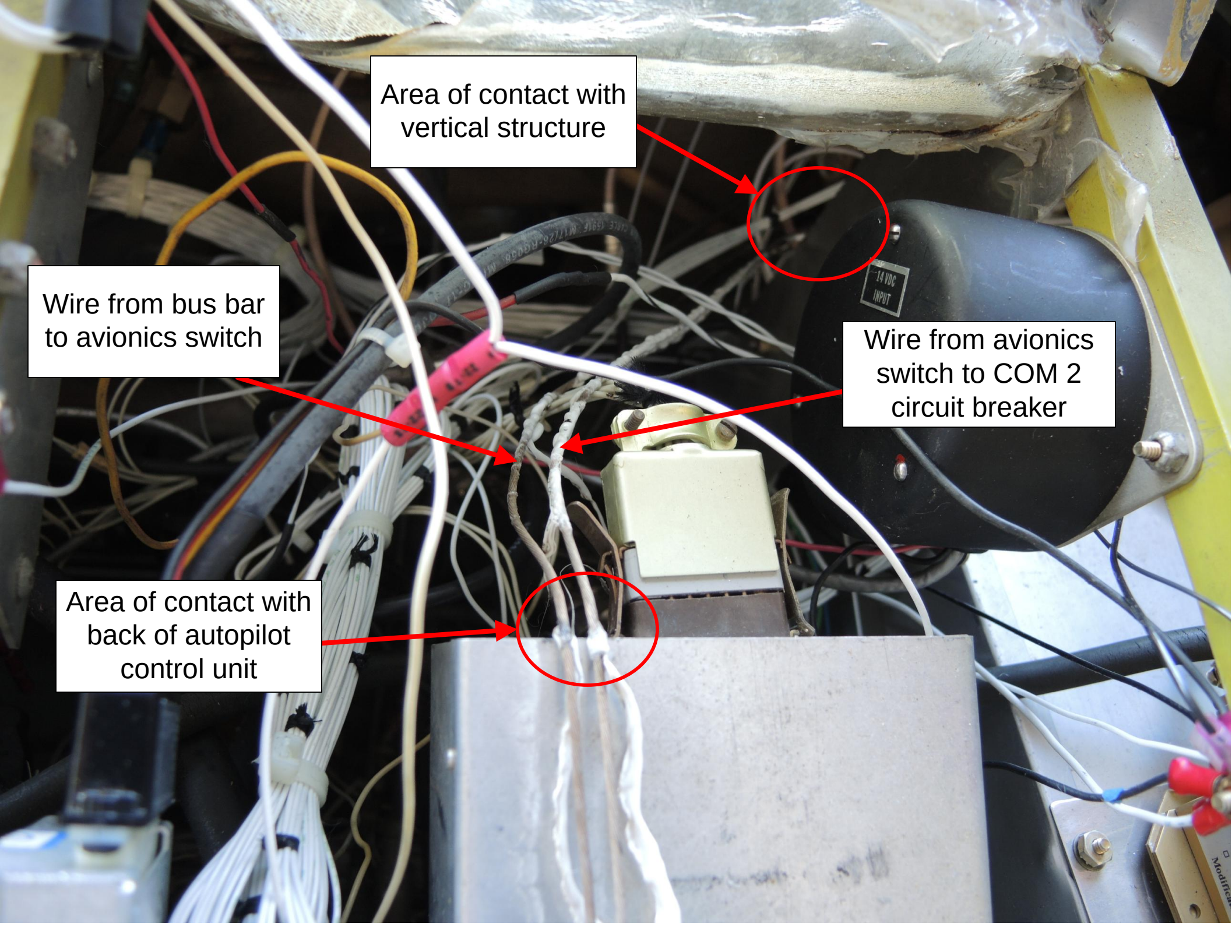
Two ground wires were found cut and not in use that did not have caps on the exposed ends. They were located in tie wrapped bundles with their other ends attached to grounding studs.

Other electrical system notes:

The avionics switch and the two associated wires were removed from the aircraft. The aircraft battery was reinstalled in the aircraft. When the power leads were attached with the aircraft battery switch in the OFF position nothing happened. When the battery switch was placed in the ON switch the landing gear pump became active and other aircraft electrical systems activated. No circuit breakers activated nor was any smell or smoke observed with the battery switch in the ON position.

Avionics switch





Area of contact with
vertical structure

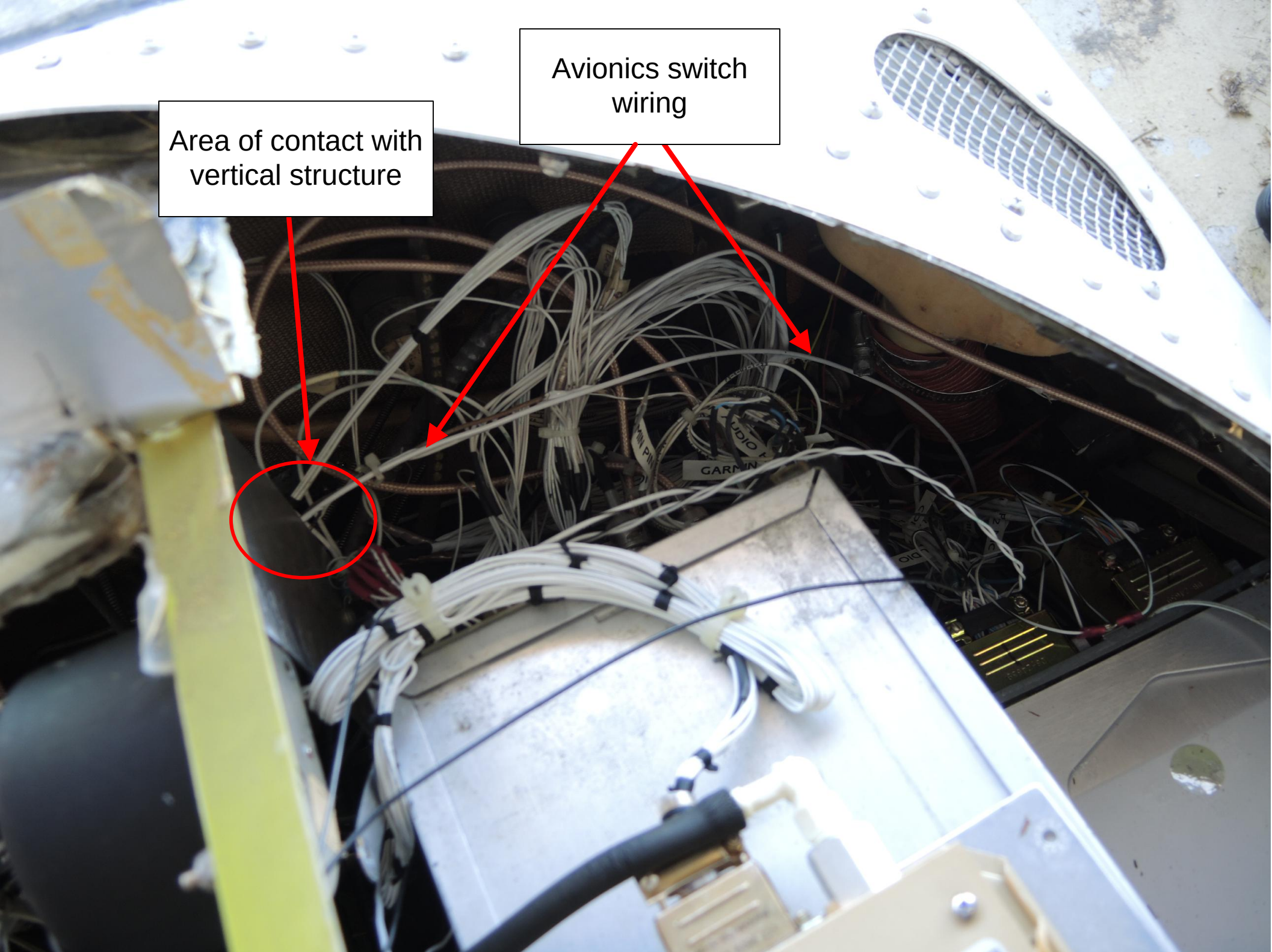
Wire from bus bar
to avionics switch

Wire from avionics
switch to COM 2
circuit breaker

Area of contact with
back of autopilot
control unit

Area of contact with
vertical structure

Avionics switch
wiring



Wire to avionics
switch

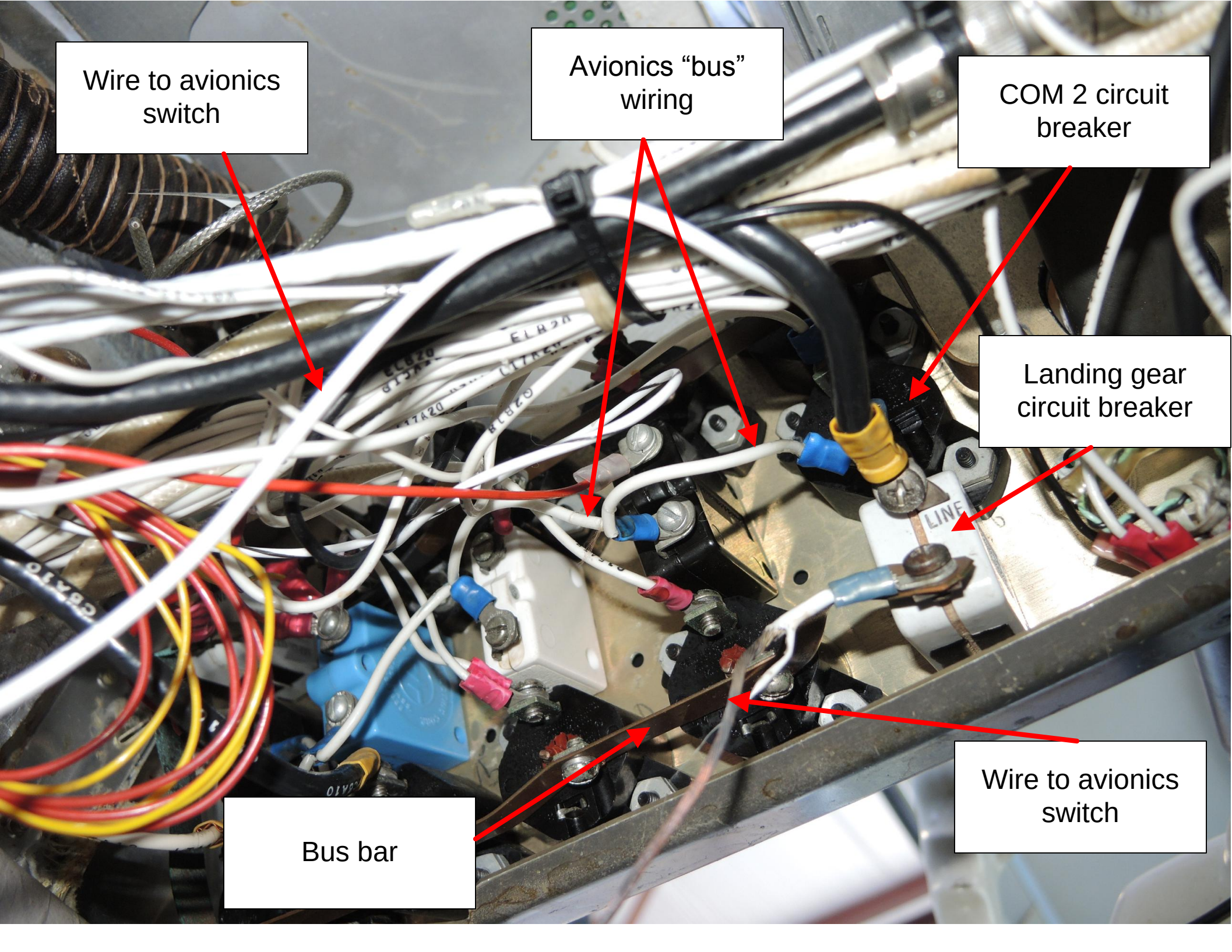
Avionics "bus"
wiring

COM 2 circuit
breaker

Landing gear
circuit breaker

Wire to avionics
switch

Bus bar



Bend where wires
passed around
vertical structural
member

Switch to Bus Bar

Switch to COM 2
breaker

Bus
Bar

Com 2

