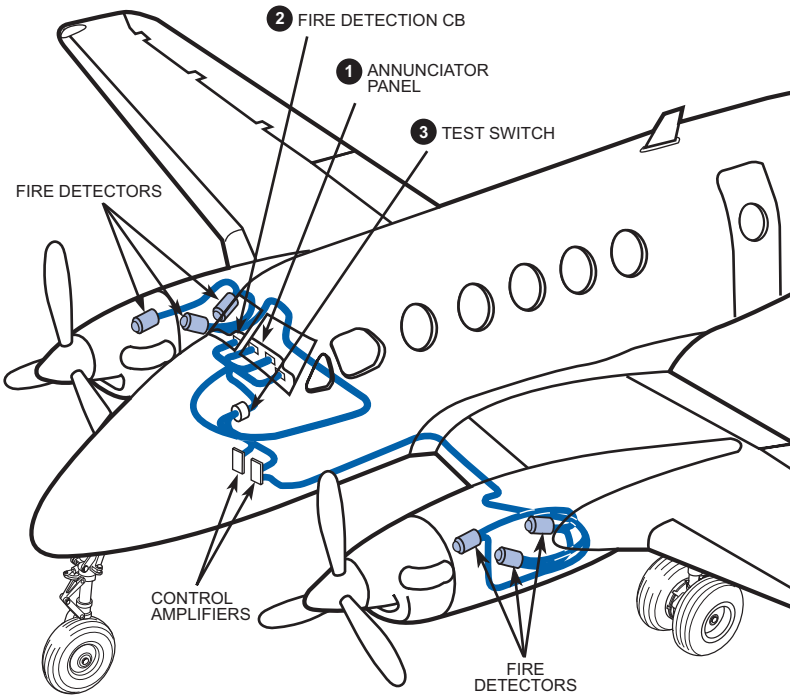
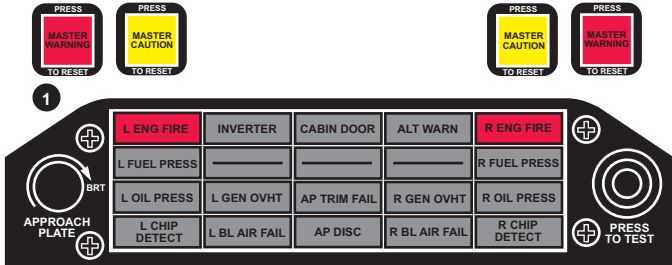


# Fire Detection System

## Prior to BB-1439

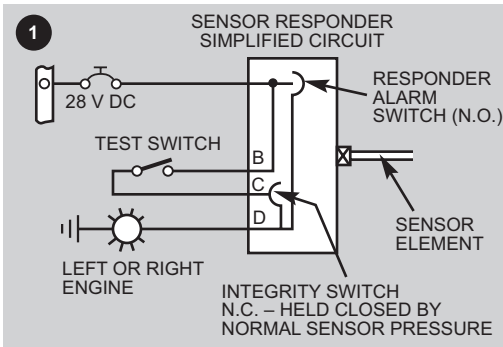
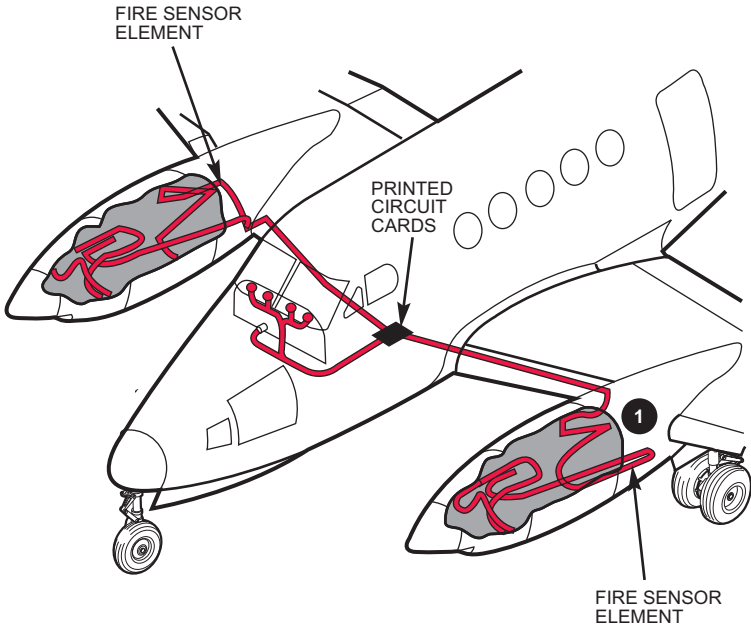


## Fire Detection System

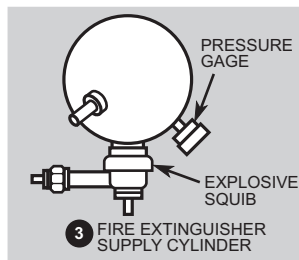
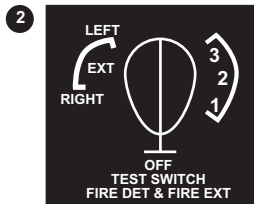
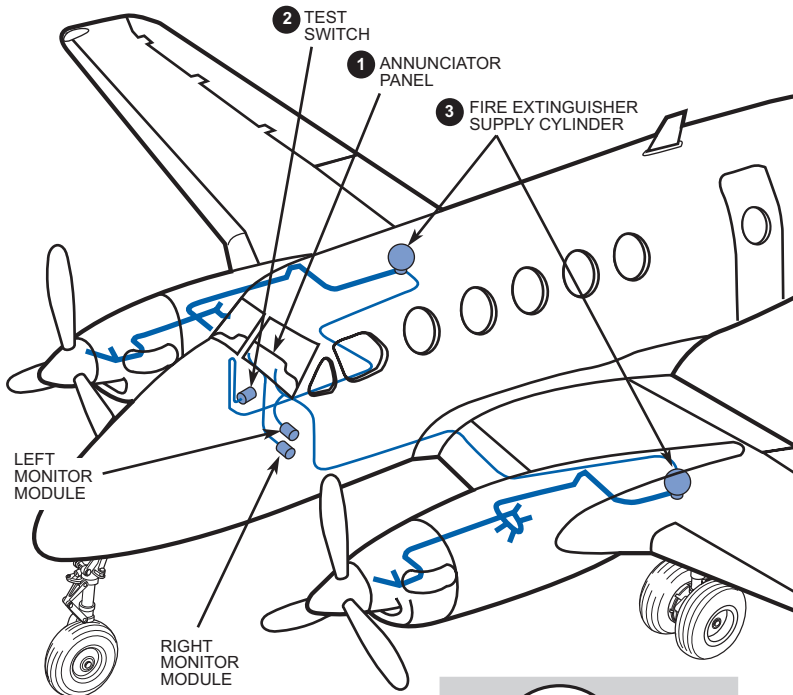
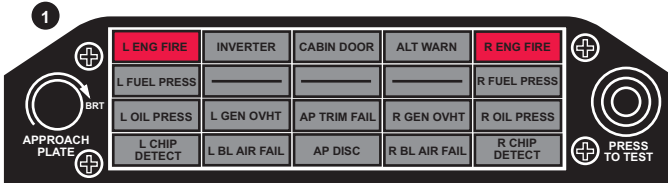
BB-1439, 1444 and subsequent;

BT-35 and subsequent;

BL-139 and subsequent



# Fire Extinguishing System





# Fire Protection Systems

Fire protection systems include:

- engine fire detection
- engine fire extinguishing
- bleed air warning.

## Engine Fire Detection

Engine fire detection consists of either infrared sensitive photo-cells or temperature sensing elements. With either system, an engine fire illuminates the respective ENG FIRE or FIRE ENG light on the glareshield panel.

On **S/Ns BB-2 to 1438; BB-1440 to 1443; BL-1 to 138**, the detection system consists of three photo-cells strategically placed in each engine compartment. When sufficient infrared radiation strikes a cell, a control amplifier relay closes to illuminate the respective ENG FIRE or FIRE ENG light and the MASTER WARNING flashing lights. Once the fire extinguishes and infrared radiation decreases below a set level, the system resets and the FIRE light extinguishes.

On **S/Ns BB-1439; BB-1444 and subsequent; BL-130 and subsequent**, each engine's temperature sensing element consists of a sealed stainless steel tube. Within this tube is an inert gas and an inner core with an active gas. The sensing element connects to a responder that contains an alarm switch for detection and an integrity switch for testing.

Exposing a sensing element to temperatures of 450°F (232°C) along its entire length or 900°F (482°C) along a one-foot section expands the element's core gases. This closes the responder alarm switch to illuminate the respective ENG FIRE light and trigger the MASTER WARNING flashing lights. Once the sensing element cools below its trigger temperature, the ENG FIRE light extinguishes. The MASTER WARNING lights, however, do not extinguish until they are reset.

## Engine Fire Extinguishing

If installed, the engine fire extinguishing system consists of a fire extinguisher bottle in each main wheel well. Spray nozzles connected to each bottle direct fire extinguishing agent to the engine accessory section and power sections. Each bottle contains approximately 2.5 lbs of Halon 1301 pressurized with dry nitrogen to 450 PSI at 60°F (pressurization is directly proportional to OAT).

The fire detection system illuminates the ENG FIRE PUSH TO EXT light. Pressing that light supplies DC power to the extinguisher bottle's explosive squib. The squib's detonation dislodges a sealing disc so that bottle contents flow to the spray nozzles. Once a bottle discharges, the respective D or DISCH caption illuminates.

## Testing

Aircraft with a photo-cell detection system have a rotary TEST SWITCH with six positions: L and R EXT on left side of switch; 3, 2, 1 on right side of switch, and OFF. Aircraft with sensing elements have a switch labeled TEST SWITCH FIRE DET & EXT with positions of EXT L-R and DET L-R (**BB-1439, BB-144 to 1462**) or a switch labeled TEST SWITCH ENG FIRE SYS with OFF, EXT L-R and DET L-R positions (**BB-1463 and subsequent; BL-139 and subsequent**). Aircraft without extinguishing systems eliminate the EXT labels on the switches.

Rotating the TEST switch through positions 3, 2, and 1 or DET L-R illuminates the left and right red MASTER WARNING flashers, the red L and R ENG FIRE annunciators, and the red L and R ENG FIRE PUSH TO EXT lights (if installed). If any of the fire detection annunciators fail to illuminate at each test position, a malfunction exists in the detector circuits.

Rotating the switch to the L/R EXT or EXT L-R positions tests the fire extinguishing system. Illumination of the ENG FIRE light's D (DISCH) caption indicates the bulb is functioning; illumination of the OK caption indicates detector circuitry and squib-firing circuits are operational.

### Engine Bleed Air Warning

Polyflow tubing that parallels the bleed air lines from the firewall into the cabin provides a warning system for a bleed air leak. These parallel tubing lines are pressurized with instrument bleed air at approximately 18 PSI.

If a bleed air line ruptures, excessive heat (200°F) melts the adjacent tubing to release pressure. When pressure is reduced, a switch in the line under the copilot floor closes to illuminate the respective BL AIR FAIL annunciator.

## Fire Protection System

<b>Power Source</b>	No. 1 Dual-Fed bus – fire detection Hot Battery bus – optional fire extinguishing Portable hand fire extinguishers
<b>Distribution</b>	Extinguisher bottle to corresponding engine (no crossfiring)
<b>Control</b>	TEST SWITCH FIRE DET (& EXT, if installed) ENG FIRE-PUSH TO EXT (L/R) lens/switch (if installed)
<b>Monitor</b>	ENG FIRE (L/R) annunciators Red ENG FIRE-PUSH TO EXT (L/R) lens (if installed) Amber D lens to confirm electrical wiring continuity (if installed) Green OK lens to test system (if installed) MASTER WARNING (L/R) flashers
<b>Protection</b>	FIRE DET CB (5A) FIRE extinguisher fuse (if installed) <b>(prior to BB-1096)</b> FIRE EXTINGUISHER CB (5A) (if installed) <b>(BB-1096 and subsequent)</b>