

Fusing Characteristics

The third rating, fusing characteristics, deals with the speed at which a fuse will break the circuit. There are two basic categories: normal blow and slow blow. The normal blow fuse may be further divided into fast acting and medium acting. These types of fuses would be used in circuits where no surges or transient voltages are expected. If a circuit is normally subjected to transient voltage or surges such as engine starting loads, then the slow blow fuse should be utilized. Incorporating a built-in time delay, the slow blow fuse will not immediately fail if the maximum temperature is reached for a short period of time.

Circuit Breakers

The circuit breaker (CB) is a newer type of circuit protection. In principle, the CB performs the same task as the replaceable fuse but has the convenience of being able to be reset. In the CB the element also reacts to heat, but rather than melting, it expands, causing the circuit to open (trip). Approximately two minutes after it trips it will have sufficiently cooled down so that the pilot may reset it. Resetting a CB is a simple matter of pushing it back to its original position.

When a CB rated under 20 amps trips, it is typically considered a “nuisance” trip and is simply reset. Nuisance trip means the reason for it tripping could be a host of transient reasons, none of which are a real problem. CBs with a rating over 20 amps are normally not considered a nuisance trip and should not be reset. It is assumed there is a problem in that case.

The only real problem with this type of CB is that because they are flush mounted, it is impossible to intentionally deactivate an entire circuit. All equipment must be shut off individually. One note of caution: Never hold a CB in if it wants to pop; that will almost certainly lead to further damage of the circuit and a probable fire.

CHANGING FROM DC TO AC

While the aircraft electrical system utilizes DC voltage, some equipment requires 26 or 115 VAC. To accommodate this, an inverter is used to change DC into AC. In light, single, and multiengine aircraft, the need for AC is very limited, so an actual inverter is seldom used. Rather, any equipment that requires AC voltage has a type of miniature inverter in the instrument, greatly reducing the cost and weight associated with installing an actual inverter.

STARTERS

A smoothly running engine is about as close to perpetual motion as you can get. It automatically meters the correct amount of fuel; times the ignition, intake, and exhaust valves; and produces sufficient electrical energy to continue running. One thing it cannot do is start itself. Some force must rotate the engine to make the valves, fuel flow, ignition, and magnetos begin operation. The starter—sometimes referred to as a cranking