

Excerpts from Raytheon Aircraft, Beech Super King Air B200/B200C Airplane Flight Manual.

Electrical system description

The airplane electrical system is a 28-VDC (nominal) system with the negative lead of each power source grounded to the main airplane structure. DC electrical power is provided by one 34-ampere-hour, air cooled, 20-cell, nickel-cadmium battery, and two 250-ampere starter/generators connected in parallel. The system is capable of supplying power to all subsystems that are necessary for normal operation of the airplane. A hot battery bus is provided for emergency operation of certain essential equipment and the cabin entry threshold light circuit. Power to the main bus from the battery is routed through the battery relay which is controlled by a switch placarded BAT - ON - OFF, located on the pilot's subpanel. Power to the bus system from the generators is routed through reverse-current-protection circuitry. The generators are controlled by switches, placarded GEN 1 and GEN 2, located on the pilot's subpanel.

Power is supplied from three sources: the battery, the right generator, and the left generator. The generator buses are interconnected by two 325-ampere current limiters. The entire bus system operates as a single bus, with power being supplied by the battery and both generators. There are four dual-fed sub-buses. Each sub-bus is supplied power from either generator main bus through a 60-amp limiter, a 70-amp diode, and a 50-amp circuit breaker.

The equipment on the buses is arranged so that all items with duplicate functions (such as right and left landing lights) are connected to different buses. Among the loads on the generator buses are the number 1 and number 2 inverters. Through relay circuitry, the INVERTER selector switch activates the selected inverter, which provides 400-hertz, 115volt, alternating current to the avionics equipment, and 400hertz, 26 VAC to the torquemeters. The volt/frequency meter indicates the voltage and frequency of the alternating current being supplied to the avionics equipment.

A three-position switch in the ICE group on the pilot's subpanel identified: DEICE CYCLE - SINGLE - OFF - MANUAL, controls the deicing operation. The switch is spring-loaded to return to the OFF position from SINGLE or MANUAL. When the SINGLE position is selected, the distributor valve opens to inflate the wing boots. After an inflation period of approximately 6 seconds, an electronic timer switches the distributor to deflate the wing boots, and a 4-second inflation begins in the horizontal stabilizer boots. When these boots have inflated and deflated, the cycle is complete. When the switch is held in the MANUAL position, all the boots will inflate simultaneously and remain inflated until the switch is released. The switch will return to the OFF position when released. After the cycle, the boots will remain in the vacuum hold-down condition until again actuated by the switch.

ICE PROTECTION SYSTEMS

WINDSHIELD HEAT

Windshield heat switches are located on the pilot's subpanel (inboard) and are placarded ICE - WSHLD ANTI-ICE – NORMAL - OFF - HI - PILOT - COPILOT. Two levels of heat are provided. When the switches are in the NORMAL (up) position, heat is supplied to the major portion of the windshields. When they are in the HI (down) position, a higher level of heat is supplied to a smaller area of the windshields. Each switch must be lifted over a detent before it can be moved into the HI position. This lever-lock feature prevents inadvertent selection of the HI position when moving the switches from NORMAL to the OFF (center) position. Controllers with temperature-sensing units provide for proper heat at the windshield surfaces. Five-ampere circuit breakers, located on a panel on the forward pressure bulkhead, protect the control circuits. The power circuit of each system is protected by a 50-ampere circuit breaker located in the power distribution panel under the floor forward of the main spar.

PROPELLER ELECTRIC DEICE SYSTEM

PRIOR TO BB-829, AND PRIOR TO BL-37:

The propeller electric deice system includes: an electrically heated boot with two elements, (inner and outer) for each propeller blade, brush assemblies, slip rings, an ammeter, a timer for automatic operation, and a circuit for manual control for backup. A 20-ampere circuit breaker switch on the pilot's subpanel, placarded PROP - AUTO - OFF, is provided to activate the automatic system. A deice ammeter on the right subpanel registers the amount of current (14 to 18 amperes) passing through the system being used. During AUTO operation, power to the timer will be cut off if the current rises above the circuit breaker switch rating. Current flows from the timer to the brush assembly and then to the slip rings installed on the spinner backing plate. The slip rings carry the current to the deice boots on the propeller blades. Heat from the boots reduces the grip of the ice, which is then thrown off by centrifugal force aided by the air blast over the propeller surfaces. Power to the two heating elements on each blade, the (inner and outer element, is cycled by the timer in the following sequence: right propeller outer elements, right propeller inner elements, left propeller outer elements, and left propeller inner elements. Loss of one heating element on one side does not mean that the entire system will be inoperative. The surface deice system removes ice accumulations from the leading edges of the wings and horizontal stabilizers. Ice removal is accomplished by alternately inflating and deflating the deice boots. Pressure-regulated bleed air from the engines supplies pressure to inflate the boots. A venturi ejector, operated by bleed air, creates vacuum to deflate the boots and hold them down while not in use. To assure operation of the system in the event of failure of one engine, a check valve is incorporated in the bleed air line from each engine to prevent loss of pressure through the compressor of the inoperative engine. Inflation and deflation phases are controlled by a distributor valve.