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Fig. 12-1. *Cessna 340 controller face.*

designed. An aircraft such as the Beech Baron 58P, which has a maximum cabin differential pressure of 3.65 pounds per square inch (psi), is limited to a difference of 3.65 psi between the ambient air pressure and the cabin air pressure. On the ground, there is a 1:1 cabin-pressure-to-ambient-air-pressure ratio, but as the Baron 58P climbs, that ratio changes until there is a 3.65-psi pressure difference. Table 12-1 shows that the 58P is capable of maintaining sea-level pressure up to approximately 7000 feet. At that altitude the difference between sea-level pressure and the 7000-foot atmospheric pressure is 3.4 psi (14.7 psi – 11.3 psi), nearly the maximum pressure differential. At 21,000 feet and maximum cabin differential pressure, the cabin altitude would be approximately 10,000 feet.

Another factor that determines the maximum possible cabin pressure is the type of pressurization system used. The higher the aircraft is designed to operate, the greater the maximum differential needed, and the stronger the compressor output capacity required. Turbine engines can maintain high-pressure airflow into the cabin up to very high altitudes by using air from the compressor bleed-air section of the engine. Aircraft with reciprocating engines use air from the compressor section of a turbocharger similar to the system illustrated in Figure 12-2.

In light, twin-engine aircraft, powerplant failure—or even a significant, intentional power reduction—can cause the cabin altitude to rise when there is a high cabin pressure differential. This can occur because the turbocharger, which is the source of the pressurizing air, is powered by the engine. Power reductions in single-engine aircraft have the same effect, so descents should be initiated far enough in advance so the