


Chapter Eleven

Exhaust Manifold Heater

The exhaust manifold heater, used exclusively by reciprocating, single-engine aircraft, is the simplest. Working on a simple heat-transfer principle, a shroud is placed around the engine exhaust stack as illustrated in Figure 11-1. Fresh outside air is forced by ram pressure through the shroud and around the exhaust stack. The stack isolates the exhaust gas from the fresh air but allows the heat to transfer. To vary the temperature the pilot controls a source of additional outside air that mixes with the heated air to cool it to the desired temperature.

The main advantages of the exhaust manifold heater are simplicity, low maintenance, and virtually no reduction in flight performance. It doesn't consume fuel, reduce engine power, or decrease airspeed by any detectable amount. The disadvantages, however, are obvious to anyone who has ever flown in a lightplane during winter. An exhaust manifold heater is a very ineffective system on the ground because minimal ram air moves through the shroud. Not only does this mean the cabin tends to stay cold during ground operations, it also means poor windshield defrosting. Because windshield defrosting is accomplished by the rechanneling of cabin heat, it is common for pilots to taxi and take off with fogged windshields, peering through small circles smeared away with the back of their hands, leaving nose prints on the acrylic.



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Fig. 11-1. Exhaust manifold heater.