

Chapter Fifteen

Early pump failure is most often caused by the wrong pump being installed; check the part number of the pump. Otherwise, a thorough investigation of all pneumatic components is in order, including gyros, de-ice boots and valves, door seal valves, and the pneumatic autopilot system. Contamination can overload a pump, causing it to fail early, sometimes within hours of installation! If there are high, low, or erratic gauge indications, check for hose problems, clogged filters, oil in the system, or loose fittings. If absolutely everything else checks out, then it could be a simple regulator-setting problem.

Excessive gyro precession is probably caused by dirty filters. If the problem continues after changing them, you almost certainly have a bad gyro. If the gauge indication varies with engine RPM, it is the result of regulator-seat contamination, which prevents constant pressure as the pump speed varies with engine RPM. If you find the mechanic is frequently making small regulator adjustments to correct the gauge reading, the filters probably are becoming clogged. This is particularly common in aircraft that carry smokers and eventually will result in premature pump failure. But replacing a pump doesn't necessarily mean the system problem has been cured.

Short pump life should be like a red flag to a pilot or mechanic, as it indicates that there is something wrong with the system. I knew of an aircraft owner who experienced seven pump failures, one after only six hours of operation! Finally, the pilot contacted the manufacturer directly and the problem, which was related to the de-ice boots, was cured in one day.

Once in flight, there is nothing the pilot can do about a pneumatic-system failure. The simple fact is pump rotors are designed to break if there is any trouble; otherwise they might cause an engine problem. While twin-engine aircraft pilots have the edge afforded by redundancy, the single-engine aircraft pilot is typically backed against a wall in the event of system failure. For the single-engine pilot who must rely on an aircraft for business, it may be worthwhile to have a standby vacuum system (SVS) installed. One such SVS uses engine manifold pressure, which is diverted to the instruments by a valve connected to the cockpit with a push/pull cable. It operates on the differential between the engine manifold pressure and ambient atmospheric pressure. An SVS offers many advantages, as it is simple and requires no electricity or maintenance.