

## Chapter Four

According to engine manufacturer Avco Lycoming, momentary overboosts are generally acceptable, but no more than three inches Hg. for five seconds. An overboost of five inches for ten seconds indicates the engine should be inspected for possible damage, and overboosts of up to ten inches anytime mandate a teardown for detailed inspection. Anything more than ten inches requires an overhaul and crankshaft replacement. A good rule of thumb is never allow m.p. to be greater than RPM by more than a factor of four—meaning that if the m.p. is 24 inches Hg., then the RPM shouldn't be lower than 2000 (24-20 forgetting the last two zeros). Similarly, if it were 26 inches Hg., then the limit would be 2200 RPM.

Occasionally, manifold pressure gauges will behave erratically due to moisture condensation in the gauge line. To solve this problem, most manufacturers put a purge valve between the manifold pressure line and the atmosphere. Pressing the purge button opens the valve and the higher ambient air pressure enters and forces the water into the cylinder.

### OIL PRESSURE GAUGE

Oil pressure, indicated in pounds per square inch (psi), is measured at the outlet of the engine-driven oil pump. Like the oil temperature gauge, the oil pressure gauge employs two red lines that indicate the maximum and minimum permissible pressure, a green arc that shows the normal operating range, and a yellow arc that indicates a cautionary range of potential hazard due to cold-start overpressure and engine-idle low pressure.

Normally, the pressure should be in the green arc within 30 seconds of engine start, slightly longer if it's very cold outside. During cold start there may be an indication of excessive oil pressure, but it should decrease when the oil warms up. If not, the engine should be shut down and the pressure valve checked for proper setting or the oil grade checked with regard to ambient temperature. Excessively high pressure leads to oil-system failure. If that occurs, engine power must be minimized until the pressure is corrected and stabilized. Prior to takeoff, the pilot always should make one last check of the oil pressure.

In flight, a fluctuating oil pressure indication probably means a malfunctioning gauge. However, it is possible the thermostatic bypass valve is not properly seated. While this is not a significant problem, a cautious eye should be kept on oil pressure and temperature to be safe, with a checkup by a qualified mechanic made as soon as practical. A low oil pressure indication in flight could be the result of several problems, the most common being insufficient oil, excessive blow-by past piston rings, and oil leaks. Other causes may be a clogged oil-pressure relief valve or incorrect setting, high oil temperature caused by improper oil grade or quantity, cooling air obstructed to oil cooler, or a dirty oil pickup screen, which restricts oil flow to the pump inlet. Because the instrument is basically reliable, if not particularly accurate, any indication of zero oil pressure should be taken seriously and warrants an immediate landing. It may be of some comfort to know that while not recommended for normal operations, most engines will develop oil pressure with as little as two to three quarts of oil. Excessive oil pressure probably is