

Safety Notice SN-37

Issued: Dec 01

EXCEEDING APPROVED LIMITATIONS CAN BE FATAL

Many pilots do not understand metal fatigue. Each time a metal component is loaded to a stress level above its fatigue limit, hidden damage occurs within the metal. There is no inspection method which can detect this invisible fatigue damage. The first indication will be a tiny microscopic crack in the metal, often hidden from view. The crack will grow with each repetition of the critical stress until the part suddenly breaks. Crack growth will occur quite rapidly in drive system parts from the high frequency torsional loads. It will also occur rapidly in rotor system components due to the high centrifugal force on the blades and hub. Damaging fatigue cycles occur with every revolution of an overload drive shaft or rotor blade.

If a pilot exceeds the power or airspeed limits on a few occasions without failure, he may be misled into believing he can safely operate at those high loads. Not true. Every second the limitations are exceeded, more stress cycles occur and additional fatigue damage can accumulate within the metal. Eventually, a fatigue crack will begin and grow until a sudden failure occurs. If the pilot is lucky, the part will have reached its approved service life and be replaced before failure. If not, there will likely be a serious or fatal accident.

WARNING

- 1) Always operate the aircraft well below its approved Vne (never exceed speed), especially in turbulent wind conditions.
- 2) Do not operate the engine above its placarded manifold pressure limits.
- 3) Do not load the aircraft above its approved gross weight limit.
- 4) The most damaging conditions occur when flying or maneuvering at high airspeeds combined with high power settings.