TELEDYNE CONTINENTAL® AIRCRAFT ENGINE

service bulletin

M90-11
Supersedes M89-12

Technical Portions Are FAA Approved

5 September 1990

SUBJECT: TORSIONAL VIBRATION

MODELS AFFECTED: GTSIO520 (All) - This engine is installed in but not limited to the Cessna 411, 421, 404, and Aero Commander 685

COMPLIANCE: Per Text of this Bulletin

Service history on these engines suggests that certain flight operations and maintenance practices are resulting in premature damage to various parts of the drive train from excessive torsional vibration. This bulletin augments information previously provided in TCM applicable Operator's Manual, Overhaul Manuals, and Service instructions.

OPERATION

Excessive torsional excitation to the drive train can be induced with transient or continuous operation of the engine at high RPM and low manifold pressure, low RPM and high manifold pressure, and with rough running at all engine speeds.

Although the engine is designed and certified to operate satisfactorily at all rated RPM and manifold pressures, operation at the extreme of these parameters should be avoided except in an emergency or when safety concerns exist. These areas of operations should be minimized during take off and landings.

I. High propeller RPM (above 1700*) and low manifold pressure (below 17 in. Hg.)

   A. Rapid deceleration of the engine from high RPM ("throttle chops") can create transient low manifold pressure running and should always be avoided.

   B. Descent from altitude and approach to the runway should be accomplished with propeller speed governed at or below 1700* RPM, mixtures adjusted for smooth operation or 1400* to 1500* TIT and throttle positioned to maintain required power.

   C. During the **BEFORE LANDING** phase, the propeller levers should not be moved forward until just prior to touchdown.

II. Low propeller RPM (below 1400*) and high manifold pressure (above 24 in. Hg.)

   A. Rapid acceleration from idle RPM can create transient high manifold pressure running and should, except in an emergency, always be avoided.

NOTE. . . All throttle movements should be smooth and steady.

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B. Magneto checks should be conducted at 1500° RPM.

C. Prop governor checks should be conducted at 1500° RPM and the RPM drop should be kept to a minimum and not allowed to drop below 1000 RPM.

D. Starting the engine with a feathered propeller should be avoided whenever possible.

III. Rough running at all speeds

The drive train components of this engine are particularly susceptible to damage when running the engine with one cylinder inoperative. Should roughness be encountered during any ground operation, flight consideration should be abandoned. Should roughness occur in flight (that cannot be corrected with mixture adjustment or shutting off one magneto) feather the engine. If some power is required for safe continued flight, govern the engine at or below 1800° RPM, at or below 32.5 in. Hg. manifold pressure, with mixture adjusted for smoothest operation. Avoid caution range (yellow arc) of tachometer.

*NOTE...On Cessna 411 aircraft add 200 RPM on referenced speeds.

A. NTENANCE

I. Repair of engine with reported rough operation at power

When a roughness report is traced to a cylinder malfunction such as inoperative spark plug, plugged fuel nozzle, inoperative exhaust or intake valve, etc.; in addition to normal cylinder repair procedures, check engine for possible torsional damage. Inspect torsionally critical items per the following:

A. Magneto drive coupling bushings (rubbers).

NOTE. . . If the magneto drive coupling bushings (rubbers) are not damaged, no further inspection is required.

If they are damaged proceed with the inspection of items B through E.

B. Starter adapter drive gear.

C. Crankshaft accessory drive gear.

D. Quill shaft.

E. Propeller attaching bolts or studs as applicable.

If damage to any of the parts B through E are apparent contact your local TCM representative for recommended corrective action.

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