



**SUBJ:** Turbocharged Engines

*This is information only. Recommendations aren't mandatory.*

## **Introduction**

This Special Airworthiness Information Bulletin (SAIB) is to provide operational information to registered owners and operators of aircraft that are equipped with turbocharged engines that may experience turbocharger system malfunction or failure during operation.

## **Background**

The National Transportation Safety Board (NTSB) cited the seized turbocharger on a Cessna T206H aircraft as a factor in the fatal accident. The seized turbocharger led to loss of engine power during cruise and eventual loss of both the aircraft and the pilot.

A turbocharger system works by increasing the manifold pressure above a normal aspirated engine. The manifold pressure indicator is the key instrument in determining what your turbocharger system is doing. Often, a failure in the turbocharger system, such as overboost or underboost (loss of power), is indicated by the manifold pressure indicator.

At this time, this airworthiness concern is not an unsafe condition that would warrant AD action under Title 14 of the Code of Federal Aviation Regulations (14 CFR) part 39.

## **Recommendations**

We recommend that the pilots:

- Consult the airplane flight manual (AFM) or pilot operating handbook (POH) for proper turbocharger system operation especially engine warm-up and cool-down times. Consider any abnormal indication of manifold pressure during takeoff roll as a turbocharger failure and abort the takeoff. Also, be familiar with AFM/POH emergency procedures for Engine Power Loss, Engine Fire, and Forced Landings.
- Consider the following as typical action when a power loss occurs:
  - ✓ Do the engine power loss checklist.
  - ✓ If power is not restored and manifold pressure remains low, secure the engine and if multi-engine, feather propeller.
  - ✓ Land as soon as practical and investigate the problem, or if single engine, proceed to forced landing.
- Include the manifold pressure indicator in their normal scan of the instrument panel. This is especially true during take-off and when there is indication of an engine power concern.

- Follow the procedure of allowing a turbocharged engine(s) to sufficiently warm up prior to applying full power or making abrupt engine power settings. It is also important to allow a turbocharged engine to cool down to prevent the high turbocharger temperatures to cook the oil in the turbocharger. This is called coking and can lead to premature failure of the turbocharger and degradation of the oil itself. Allow the engine to cool down 3 to 5 minutes after touchdown to allow the turbocharger temperatures to stabilize.
- Consider the advice of engine overhaul shops that advocate shorter engine oil change intervals. With the high operating temperatures of a turbocharged system, oil can breakdown faster and with the high speeds and temperatures of a turbocharger, the oil is the life blood of both the turbocharger and the engine.
- Notify your mechanic anytime a turbocharger system malfunctions or abnormal operation is observed. The turbocharger system should be inspected for obvious defects and any defects noted should be corrected prior to any ground run or further flight. Once the system is returned to service it is recommended that the maximum power critical altitude flight check prescribed by the manufacture's maintenance documents be performed. Sometimes called a bootstrapping check, this test procedure is a true performance check of the turbocharger system and should be used whenever the system components have been replaced, repaired, or adjusted.
- Consider any sudden unexpected loss or erratic indication of manifold pressure in-flight as a possible turbocharger/exhaust system failure and land as quickly as possible. The turbocharger system is part of the engine's exhaust system so high temperatures and pressures along with corrosive gases are a constant source of wear and tear. If the turbocharger system is breached, the escape of hot exhaust gases can create dangerous conditions.

### **For Further Information Contact**

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