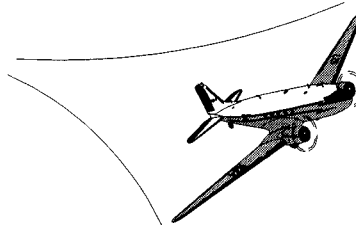


# SPECIAL AIRWORTHINESS INFORMATION BULLETIN

Aircraft Certification Service  
Washington, DC



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

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*This is information only. Recommendations are not mandatory.*

## **Introduction**

This Special Airworthiness Information Bulletin recommends that you, an owner of **Teledyne Continental Motors (TCM) model O-200-A, -B or -C engines**, become aware of the relationship between oil change intervals, oil additives, condensation, etc. and common problems with these engines.

## **Background**

A review of Service Difficulty Reports, NTSB Database and the FAA Incident Reporting System, since 1994, reveals approximately 22 engine failures due to a stuck exhaust valve and associated valve failure. The TCM O-200 engine was used in the Cessna 150 and has been adopted for other airframes including both certificated and amateur built.

The O-200 engine is a reliable engine when properly maintained and operated; however, there are many operational and environmental factors that will have a detrimental effect over the life cycle of a given engine. Such things as type of engine lubricating oil, frequency of oil changes, use of oil additives, aircraft utilization, engine operation and type of fuel used greatly affect the mechanical health and reliability of an engine.

TCM Service Information Letter (SIL) SIL99-2A lists currently approved lubricants, sealants and adhesives. It also gives the recommended oil change intervals and states that these intervals are minimum requirements and operational considerations may dictate more frequent oil change intervals.

The use of oil additives is an area of concern. This is a very "hot topic" and there are pros and cons on both sides of this issue. Without getting bogged down in claims and counter claims, it should be noted that few, if any, of the readily available oil additives are FAA approved, much less, TCM approved. The use of an additive not approved by the FAA can result in enforcement action against the airplane owner and the use of such materials may void any warranty with TCM on your engine. The decision to use any additive, including those that are FAA approved, should be researched thoroughly and completely before proceeding.

TCM SIL99-1 gives important information for engines that are to be placed in temporary (30 to 90 day) storage and indefinite (more than 90 days) storage. Allowing an engine to sit idle, especially in coastal regions, can result in extreme corrosion damage in relatively short time periods. Water condenses and forms on the inside of an engine due to the fluctuations of outside air temperature,

relative humidity, etc. This condensation forms acids when mixed with combustion by-products and replaces the oil coating on internal parts, resulting in the formation of rust and/or corrosion. TCM recommends that an engine should be flown, at least, one (1) hour per week to evaporate moisture from the engine's oil system. This hour of operation also allows oil to coat the internal engine parts. According to TCM technical data, "Engines flown less than 100 hours a year are strong candidates for corrosion formation." TCM also states that ground running of the engine is not a substitute for flying as higher operational temperatures and the duration of these higher temperatures are required to evaporate the moisture. Likewise, "turning the prop through a few revolutions" once or twice a month makes matters worse by stirring up the water/acid and does nothing to get oil on the engine components.

The use of automobile gasoline (auto gas) is another "hot topic". There are FAA Supplemental Type Certificates (STCs) for the use of auto gas for virtually every low compression engine. However, most, if not all, of the STCs now specify that approximately 10 % of the fuel used in an engine must be aviation grade gasoline. It has been determined that the aircraft engine needs some lead to prevent excessive valve seat wear and sticking valves. Anyone who has an auto fuel STC should strictly follow the latest fuel recommendations of the STC.

Maintenance of these engines is of paramount concern, especially where sticking valves are concerned. Unfortunately, the O-200 manual does not have any specific information on the cause or the actions necessary to prevent valve sticking.

One item that does not receive the attention it deserves is the mixture setting. Many engines are operated with the mixture set too rich. Operating the engine with mixture settings higher than best power will result in the production of more combustion by-products than with a leaner mixture. These higher concentrations of combustion by-products lead to the build-up of these materials in the valve guides, which can lead to sticking valves. Current TCM production cylinders for the O-200 series engines utilize different type valves/inserts, in addition to other improvements, to resist valve sticking. TCM recommends that for fixed pitch propeller installations regardless of altitude, when operating the engine at 75% power or less, lean for peak RPM. This results in running at best power. As always, operate at this mixture setting only if you have smooth engine operation.

All of the factors listed above can contribute to valve sticking. In addition, "dirty" induction air can be a factor. If the induction air filter is not maintained properly so that a good seal is formed with the filter holder, then dirt particles can enter the engine. Air leaks in the induction system can allow the entry of dirt particles as well. These dirt particles mix with the oil resulting in excessive wear and can collect in areas such as the valve guides contributing to sticking valves.

### **Recommendation**

The foregoing discussion merely touches on some of the things that can affect the efficient use of an engine. Additional information can be obtained from the TCM Customer Service Department or various type clubs that provide maintenance information/tips to their members. The FAA recommends compliance with the operational and maintenance aspects of this SAIB as a minimum in maintaining the O-200 series engines.

The complete text of TCM SIL99-1 and SIL99-2A are available on the TCM website: [www.TCMLINK.com](http://www.TCMLINK.com). For a free printed copy of either document call the TCM Customer Service Department at (888) 826-2325 or write them at Teledyne Continental Motors, P.O. Box 90, Mobile, AL 36601.

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