



OFFICE OF THE DCA	
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J15/12 Gen
Mr. Dean Khumalo
Senior Manager Airworthiness

Tel: +27115451000

AIRWORTHINESS DIVISION

MAINTENANCE ADVISORY NOTICE # 047

GENERAL: Top overhaul of aircraft piston engines

Purpose of this maintenance advisory notice

To clarify any confusion that may exist with regards to who may perform and certify "top overhauls" on aircraft piston engines

Background

It has come to this Authority's attention that a certain amount of confusion exists surrounding the "top overhaul" of aircraft piston engines and in specific confusion regarding who may actually certify the work done during a "top overhaul" event.

Firstly it should be mentioned that the "top overhaul" of an aircraft piston engine constitutes the removal of valve gear, cylinder assemblies and piston ring assemblies. The cylinder assemblies are then stripped, cleaned, inspected (Which may include NDT) and then reassembled. These tasks must form part of a work shop function as there are many overhaul specific tool and equipment requirements. The physical teardown and inspection of a cylinder assembly is considered to be invasive maintenance to be done in an adequately set up work shop and not just on the side of the hanger where the aircraft is maintained.

The complexity of such maintenance also depends on the type of engine undergoing such maintenance. A "top overhaul" on a Lycoming O-320 is not nearly as involved as a "top overhaul" on a Lycoming TIO-540 for various reasons.

A "top overhaul" is not considered to be a scheduled maintenance event as such the reason for the so called premature removal of cylinder assemblies must be investigated during a "top overhaul" to prevent reoccurrence of such maintenance in future. Aircraft piston engines are designed to achieve their specific recommended TBO periods without the removal of cylinders out of phase with the major overhaul requirement. This assessment may fall better within the capability of a category "D" licensed or approved individual who is considered to be an engine specialist.

Regulatory background and discussion

When we consider the regulatory background to this issue it becomes quite clear as to what the specific requirements are for a "top overhaul".

In CAR 66.03.8 (1) (iv) that deals with the privileges of an Aircraft Maintenance Engineer with a category "C" rating, it is allowed for the replacement of external components and piston and cylinder assemblies, if such replacement **does not involve dismantling the engine or engines for purposes other than to obtain access to the components and assemblies.** (This means that an individual with a Category "C" rating can not certify the overhaul of a part or component).

CAR 145.04.8 (b) (iii) is written in line with CAR 66 in this regard.

CAR 66.06.8 (b) that deals with the privileges of an Aircraft Maintenance Engineer with a Category "D" rating, makes provision for the replacement of all other components to certify an overhaul of a part or complete engine. (This means that an individual with a Category "D" rating can in fact certify the overhaul of a part or component).

Based on the above mentioned facts, it is clear that the privileges of the two separate individual licenses are different. CAR 145 provides for the same privileges as Part 66 in this regard under an Aircraft Maintenance organization approval for category "D".

In practical terms the following can be interpreted:

1. Only an Aircraft Maintenance Engineer with a category "D" rating or with company approval employed by an Aircraft Maintenance organization with a category "D" Aircraft Maintenance organization approval can actually remove, inspect and replace individual cylinder parts to certify the overhaul of a cylinder assembly when completed, and in addition may re install the subject cylinder assemblies in question. (CAR 66.06.8).
2. An Aircraft Maintenance Engineer with a category "C" rating can only remove external components and piston and cylinder assemblies to gain access to components and assemblies, and in addition may re install the subject cylinder assemblies in question. (CAR 66.03.8 (1) (iv)).

Limitations of an approved Aircraft Maintenance Organisation

CAR 145.01.9 (1) & (2) details the limitations imposed on an approved organization when performing maintenance on aircraft.

- (2) The holder of an approval shall not maintain an aircraft or aircraft component for which it is approved unless such holder has available all the facilities, equipment, tooling, airworthiness data and certifying personnel necessary to maintain the aircraft or aircraft component in accordance with its manual of procedure and the requirements prescribed in this part.

Conclusion

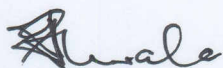
In conclusion it can be said that the regulations are very clear on the privileges of Aircraft Maintenance Engineers and Aircraft Maintenance organizations with either category "C" or "D" ratings. This is a practical standard and sets the requirements to maintain the required level of safety.

The removal and replacement of cylinder assemblies falls well within the scope of a category "C" license holder and so do the privileges to overhaul and certify a cylinder assembly for a category "D" license holder being part of an approved maintenance organization.

This maintenance advisory notice is issued in the interest of promoting aviation and public safety.

Compliance

Compliance with this Maintenance Advisory Notice is considered mandatory by this Authority.



Director of Civil Aviation

Date 04-02-11