Prevent Sticking Valves

Do Not Neglect the Warning Signs

TIPS

Knowledge gained from the experience of others is usually the easy way to learn. In the case of sticking valves that may damage an engine or cause it to fail, it is surely best if the knowledge is not acquired firsthand. The experience of others is related in the following paragraphs.

One of the regional service managers here at the Lycoming factory indicated that his experience over the years included working on engines with sticking valves. He commented that the engine would almost always provide a warning by running very rough at start-up. As the engine warms up, it may then smooth out after a few seconds and run normally, but the initial roughness is a warning that preventive maintenance action is required.

Just a few days after these comments were made, a conversation with an aircraft owner confirmed that the regional manager's comments were right on target. This is the story which the aircraft owner related.

An aircraft had been purchased recently, and the owner flew it to altitude in the vicinity of his home airport to satisfy himself of the aircraft capability to fly over mountainous terrain during a planned vacation trip. Content that the aircraft and engine were capable of meeting his requirements, the vacation trip was undertaken. All went smoothly on the first 300-mile leg of the trip which ended with a planned overnight stop.

When the engine was started the next day, it was very, very rough, but smoothed out and ran normally after a short time. With the engine running smoothly, the vacation trip continued to its destination. The aircraft was then tied down and not operated until it was time for the return trip – a period of about one week.

As the engine was started for the return trip, it again gave indications that a valve was momentarily sticking ... it ran very rough for several seconds, but then smoothed out. With the engine running smoothly again, the return trip was started. After one to two hours of flight at altitude, over mountainous terrain, the engine ran very rough again for a short period of time and then smoothed out. The pilot decided to land at the nearest airport.

Examination of the engine revealed a considerable amount of oil leakage. The cause – a valve which had stuck solidly and caused the pushrod to bend. This bending ruptured the pushrod shroud tube and allowed oil to escape. This is a classic example of the damage that sticking valves can cause.

The lesson to be learned is quite simple. Do not neglect the warning signs. Perhaps the experience related here will allow others to recognize a rough-running engine at start-up as a possible indication of sticking valves. The next step is to take immediate action to prevent damage.

Although there may be an occasional exception, it is almost always an exhaust valve that sticks. To prevent further valve sticking and to reduce the possibility of damage, all exhaust valve guides should be cleaned of any carbon, varnish or other contamination buildups. This is accomplished by reaming the guides to their original size as specified in Lycoming Publication SSP 1776, Table of Limits. The latest revision of Lycoming Service Instruction 1425 provides recommendations to reduce the possibility of valve sticking. In particular, Part III of the instruction gives a procedure for reaming valve guides that can be accomplished without removing the engine from the aircraft or the cylinders from the engine.

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Service Instruction No. 1425

For more recommendations on valve sticking, please refer to Lycoming Service Instruction No. 1425.

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