



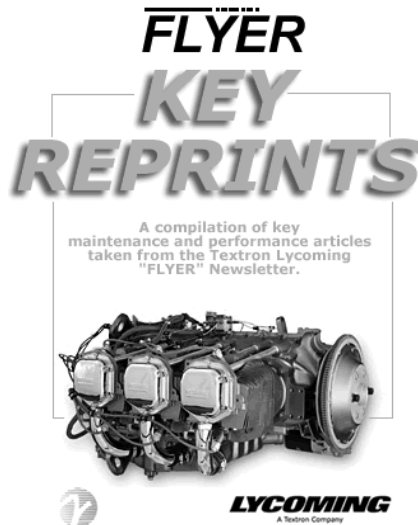
LYCOMING

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Note: The following information was obtained from the Key Reprints of the Lycoming Flyer.

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The lobes of the camshaft, and the tappets that they continually operate against, have always been subject to wear. Someone recently stated that in recent years, there has been an unacceptable rise in the occurrence of spalling tappets and worn cam lobes. Is this a factual statement? Perhaps it may help if we take a look at one or two of the causes of wear on these parts. From this, we may reach a conclusion about why this statement could possibly be true today. Corrosion is a known cause of tappet and cam lobe wear. The engines of aircraft that are not flown regularly may be extremely

vulnerable to corrosion. When the film of oil drains from the interior parts of the engine after it has been run, those parts become prey to the chemical changes that are caused by moisture, acids and oxygen. Tappets from engines which have not been operated for long periods have been closely examined. Under a microscope, it is not unusual to find microscopic pits on the face of the tappet. This is the beginning of trouble. Starting with these very tiny pits, tiny particles of rust also affect the cam lobes. Once started, the process is not likely to stop until the wear reaches a point where these parts are doing an unacceptable job. Some people might question the assertion that engines can attract unusually large amounts of moisture: brief operating periods, low engine oil operating temperatures and condensation all contribute. It might be very surprising to take an engine which has flown 15 to 25 hours over the course of four to six months and drain the oil into a clear container. The amount of water which settles to the bottom is likely to be more than one would expect. Also remember that combustion causes acids to collect in the oil. When these are not removed by regular oil changes, the acids, as well as the moisture, will promote the growth of microscopic pitting which eventually leads to excessively worn tappets and cam lobes. Another factor in the unacceptable rise of tappet spalling in general

aviation engines may be the product that is put into many of those engines at overhaul. To reduce the costs of overhaul, there is an increasing tendency to put reground camshafts and tap-pets into these engines. Although camshafts may be reground, there is a very strict limit on the amount of grinding which can be tolerated. Grind too much, and the hardened surface of the cam lobe is gone. After this kind of grinding, the cam may look great, but it will be wearing on the soft metal which was once protected by a hardened surface. Lycoming does not recommend the use of reground tappets under any circumstances, but many engines overhauled in the field today come back to the owner with reground tappets and camshaft. In some cases at least, these items are nothing more than good-looking junk. Because of the high percentage of refurbished used parts that go into many overhauls, and the many airplanes that sit for long periods without being flown, there could be more tappet spalling today than in the past. These are some of the reasons why the statement that there has been an unacceptable rise in spalled tap-pets and worn cam lobes in recent years might just be true. Ask about the parts which are going into your overhaul. It may be less expensive to pay for new parts at the time of overhaul than it is to pay for replacing worn-out parts before your engine has reached its expected TBO.