



February 16, 1942

SERVICE BULLETIN NO. 16

CONCERNING THE USE OF GASOLINE WITH HIGH LEAD CONTENT

Gasoline producers advise that in order to provide the necessary high octane gasolines in quantities sufficient to meet the requirements of our armed forces, the amount of tetraethyl lead per gallon will be greatly increased in aviation gasolines of 73 and 80 octane ratings. Amounts have not yet been determined nor have we been advised definitely what octane gasolines will be available.

This increased lead content will not immediately cause detrimental effects but undoubtedly it will be necessary to top overhaul all small aircraft engines more frequently than has been customary in the past in order to remove lead and carbon deposits from valves, valve seats, valve guides, cylinder heads and spark plugs. This must be done to prevent valve sticking, with resultant burning, and to permit engines to operate at top efficiency and full power.

An explanation concerning the purpose of tetraethyl lead and its results, as prepared by a fuel expert, follows: -

"Tetraethyl lead is the trade name given to a special fluid which is added to gasoline for the purpose of suppressing detonation. This fluid consists of approximately 63% tetraethyl lead as such, and 36% ethylene dibromide and ethylene dichloride. A trace of organic dye is added for the purposes of identification. Ethylene dibromide and ethylene dichloride serve to combine with the lead and prevent the deposition of lead in the combustion chamber and upon the valve seat and stem. This reaction, however, is only partially complete, with the result that a portion of the lead is actually deposited on the exhaust equipment. The unreacted bromine and chlorine combines with the hydrogen in the fluid to form hydrobromic and hydrochloric acids. Naturally these acids are extremely corrosive. The presence of these acids with attendant high temperatures is extremely harmful to the life of the valve equipment."

Recommendations contained in previous service bulletins and operators' handbooks should be adhered to insofar as octane ratings are concerned and operators should continue to purchase aviation gasoline with the lowest lead content possible

in the octane ratings specified. Under no circumstances should lower-than-specified ratings be used - a higher rating is preferable.

In view of this unavoidable condition, it will be necessary for all owners and operators to carefully note the performance of their engines and at the first indication of falling off in RPMs or sticking valves, the cylinders should be removed and given a thorough top overhaul. It is impossible for us to recommend a definite period for top overhaul inasmuch as operating conditions vary with each installation, particularly with regard to engine cooling, but under severe operating conditions when using highly leaded gasoline, it may be found necessary to top overhaul as frequently as every 100 hours.

If you have sold your airplane since the original red engine card was mailed to us, kindly advise the name and address of the new owner, together with NC number of the airplane and serial number of the engine so that we can mail him a copy of this bulletin.

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