

Will Alcohol Mixtures Rule?

by KEITH J. FANSHIER

And now politics is again trying to meddle with aviation, this time with the fuels employed for driving the ships through the air. Alcohol-gasoline mixtures may help the farmer, but—!

SETTING—Time, the present; place, a Middle Western American countryside and the air above it.

CHARACTERS—Yourself and your sweet-running plane, your motor functioning perfectly, the country slipping by below you, and your feeling of exaltation which never quite separates itself from flying.

Suddenly your power fails, the motor dies, you are unable to re-start it. You prepare for a forced landing and you make a fairly decent job of it in an open field. Your suspicions of an empty gasoline tank prove too true—bone dry! You hitch-hike your way to the nearest filling station and hitch-hike back with ten gallons of gasoline, pour it in, off you go.

And you arrive at the nearest airport without further incident.—Or do you?

Are you sure of what you poured in your tank? The chances are that, under such conditions, you are not sure.

Here is the point: You have been hearing a lot about the plan for alcoholized motor fuels. You have felt that this was idle chatter, or at least something for consideration in the far future. But you are wrong. The fact is that alcohol-gasoline blends are being sold as motor fuel in numerous cases in the Middle West and even in some other parts of the country today. It is not something which may be coming. It is something which is here.

Hence this article. In view of the serious handicaps from a utility and operating standpoint, which such a fuel as an alcohol-gasoline blend yet has to overcome, it should be used in aircraft engines only under the most extreme cases of necessity and then the user should go into the thing with his eyes wide open, knowing what he is doing.

The outcome of your little episode, described above, may well have been serious indeed if the new material you poured into your tank happened to be an alcohol blend. The result might have been a sputtery dying engine and another forced landing, under circumstances not so fortuitous as those governing the first one. All of which is by way of warning aviation to watch for alcoholized motor fuel and to be alive to its possibilities at present; to regard it not as something which may eventualize and should be dealt with in the future but something that is here now.

Therefore, aviation should be making up its mind as to what it wishes to do about it, and without any extensive delay.



In time of war, a well developed alcohol base fuel may be of great importance for military planes of this type at a time when the gasoline production is over-taxed, but until then, we still have faith in straight gasoline.

This writer has several times called attention to the seriousness to aviation of the possibilities devolving from the use of alcohol-gasoline blends. The facts as presented in those articles so far as is known continue to apply today but even more so because the whole question has withdrawn itself from the somewhat vague and hazy outlines of the remote future and has plumped down into our laps today.

It is true that the leading units of the major oil companies today are not selling such products. Yet such products are being sold in some cases. The cases are those of several chain station owners, especially in the Middle West where the grain belt agitation for cereal grain alcohol blending has been hottest.

At the moment there is little danger that alcohol-gasoline motor fuel will be foisted off upon aviation without notice at any well-regulated airport or landing field. However, it is well to keep the situation in mind, because every conceivable effort is being made by a lobby and organized group of interests favoring blending of alcohol to force such blends upon the motorists and upon all users of motor fuel.

It probably is not necessary at this time to go over extensively the technical reasons why an alcohol-gasoline blend under present conditions is a motor fuel totally unsuited and actually dangerous for aviation use. Those reasons advanced previously will probably hold good in most cases today. What happened to "you" in the little scene pictured above was the result of the long-known tendency of alcohol to stratify when mixed with another product in which there is the presence of only an extremely small amount of water.

Since it is next to impossible to

conceive of an alcohol-gasoline blend without existence of at least a little water, such stratification is seen as a serious matter, especially since it is generally agreed that somewhat extensive adjustment of fuel system or perhaps even more far-reaching modifications of engine and supplementary items is required in switching over from a straight petroleum product to such a blend.

Leading the fight for a blending program now is none other than the Chemical Foundation of New York City, which holds patent interests in connection with various chemical processes, uses, formulas, etc. The corn processing people are vitally interested. All the farm associations, and farm "relievers," both national and state, are heavily involved. Many state legislatures in the farm regions are becoming greatly involved, and legislation now is pending in congress which virtually would force the use of the blended products on a vast, tremendous scale.

The most common proposal is for compelling use of blended gasoline on the basis of a high tax rate on sale of gasoline not so blended. The blending campaign backers assert that their principal interest in the whole thing is in improving the lot of agriculture, in enlarging and extending the demand for their products—thus improve the lot of agriculture and you improve much else in the economic scheme of things.

Of course, the whole project is highly theoretical. All its phases are surrounded with doubt and question. It is difficult to believe, for example, that the price of such a product would be sufficiently low to avoid knocking out a vast volume of motor fuel consumption now existing, and thus tending

to kill the goose that has been laying the golden eggs.

Proponents of blending now tell us that means have just been devised whereby such a blended product will not stratify. This statement has an extremely specious sound, in view of the fact that two years ago, at the height of the preliminary campaign for blending, it was emphatically denied that stratification would result. Of course, stratification is only one objection to an alcohol-blended motor fuel. One is the effect on the parts of the motor from coming in contact with the motor fuel or its exhaust gases. Another would be the difficulty of obtaining uniformity and the need for constant engine adjustments. Such a situation, it is easily seen, could play havoc with aviation.

The petroleum industry has been fighting determinedly the blending program, and probably will continue to do so. It is not known whether or not the bills now pending in congress are to be regarded as having a fair chance of passage. But even so, there are numerous state legislatures considering alcohol gasoline blending proposals.

One state, Iowa, has established preferential freight rates for railroad movement of alcohol to be used for such purposes, and at least one important alcohol-gasoline blending plant has been set up in the state. Nebraska also is active along the same line. The whole proposal, of course, took its birth from Illinois and it is receiving strong sponsorship in this state.

The question of the competitive claims of those who are promoting alcohol blends as motor fuels raises some interesting angles. For example, while these interests universally assert that such blends constitute motor fuels of superior qualities in comparison with gasoline, there is no thought on their part that such products should be placed on the market in a competitive battle with gasoline and allowed to sink or swim on the basis of the decision of the consumer as to which he desired.

The only basis on which these interests are willing to rest their case is one of compulsion. There shall be no free choice. The legislative proposals to date are mainly of two kinds—that a vast, extensive machinery shall be set up to drive from the field all motor fuel excepting that which contains a substantial percentage of alcohol, or that the straight gasoline shall be taxed varying amounts, so as to persuade the consumer to use the blended material.

Of course, in the case of the blended products now being sold by the scattered concerns mentioned above, there is no effort at compulsion and the material is being offered for sale on the basis of support for farm belt industries.

In these days when the young industry of aviation is finding many dif-

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Progress of the Amateur Aircraft League

by LESLIE LONG, Chairman



The amateur is the backbone of aviation and has been, ever since the Wrights—themselves amateurs—made the first flight.

WELL, here we are back with good old P. A. again. Most of you will remember that P. A. was the magazine that gave this amateur organization its first start in life.

This League is strictly an amateur affair. It specializes on the true light-plane. Its principal purpose is to obtain more liberal and just laws and regulations for the amateur aviation group.

As this is being written, most of the states are holding legislative sessions. In the state of Washington, which has been under Federal regulations for several years, a bill is under consideration which will bring control back to the state. If it goes through it will mean that between 50 and 60 wrongly grounded airplanes will once more take wing.

Here in Oregon, the big battle is all over. And we WON! The amateur David walked out and smote the commercial and political Goliath hip and thigh. If private flying is to live, the same thing will have to be done in every state in this Union.

A campaign was mapped out several months ago. The first thing we did was to get out a little pamphlet, stating the case of the amateur flyer and the harm that was being done by putting him out of existence without just cause. One of these pamphlets, with a personal letter, was sent to every Senator and Congressman in the state.

Three bills were introduced, all by the commercial group. They were of the usual type, and plain dynamite to the amateur. Knowing of the interest in these bills, the aviation committee set a date for a public hearing and that was where things happened. Between 75 and 100 earnest and determined men, every one a pilot or owner, swooped down on that meeting and it was soon over. After listening to the testimony no just man on earth could demand that these men be deprived of their property and rights simply because some one wanted it done. The bills were tabled then and there and everybody went home happy.

The outstanding speech for the amateurs was made by none other than Tex Rankin, noted pilot and aviation executive. He spoke with clearness and authority and his remarks carried great weight. Representative E. L. Ross spoke directly of and for the A.A.L. and his speech was good. Senator Zimmerman was of great help to us, as were many others.

There is no reason why every state in the Union can not do the same thing. As the membership fee for joining the A.A.L. is but 10 cents. There is no fund for such work. Expenses must be paid by local members as was done here, but the cost is not great. The great advantage lies in the fact you have justice on your side. The demand for a Federal license from an amateur builder simply means prohibition and denial of rights for him and an outright loss to the industry and the future welfare of the country.

It was brought out at the committee meeting that, although Oregon has permitted the flying of unlicensed ships ever since the Department of Commerce took control about eight years ago, only six fatal accidents had occurred in the state that were in unlicensed planes. All but one or two of these were in ships that had once been commercial or military machines, such as the old Jenny and other similar types. That is a fine record, and speaks well for the amateur's ability and the efficiency of the State Inspection department.

The Oregon system is distinctly practical and should be the basis for a uniform National law. It is much like the Canadian law. Under it, no commercial work of any kind is permitted and pilots are required to be competent and careful. Several states have sent for copies of our law and it is to be hoped they will adopt similar ones.

It is hard to understand why the Department of Commerce has so persistently refused to relax its restrictions on the amateur group. If they had been as liberal as this state the private flying class would be ten times as large as it is.

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Gasoline

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difficulties placed in its path of development, it does seem a shame that one more such obstacle should be brought up for it to overcome. These are the things which always detract attention of those in the industry away from what would be constructive activities and cause them to be dissipated in worry over possibilities which never should be in the picture.

It has been claimed by some authorities that from a technical standpoint, an alcohol-gasoline blend has much to commend it, even when compared to a refinery gasoline not containing alcohol. These statements all have been criticized and to a great extent refuted by the impressive showings made by technical figures of high standing. However, to point out some of these claims, they include those that the blend has fine burning properties and results in the production of comparatively little carbon monoxide. Extensive claims also are being put forth to the effect that it is a superior product from the standpoint of detonation.

This is a vital point to aviation, since the increasing trend toward greater horsepower rating of power-plants and higher compression ratios and pressures, continues to bring out a greater demand for high anti-knock value motor fuel. This particular point is decidedly in dispute but there are so many eminent authorities on the negative side of the detonation aspect of the dispute that it would seem to leave much doubt still to be settled.

If this were all, though, it might not be quite so bad. There remain many other questions. One is the matter of price. It is generally conceded that one of the objectives of the whole plan is to maintain corn and other cereal grain products in this country at a high price level for the farmer's benefit. This would mean that the raw material being used for the production of the alcohol to be used in the motor fuel would be kept at a high price.

Even at the low prices ruling for corn, wheat and rye a few years ago, it was figured that any substantial percentage blending of alcohol would involve an increase in the ultimate consumer's price. With corn selling at higher prices, also wheat, today, such differential would be still higher.

Then there is another important physical operating consideration. Everyone knows that the motor fuel to be used successfully in aviation must be clean, pure and non-clogging. Let us look for a moment at an important quality of alcohol—namely, its solvent property. The effect of blending has been well stated by an authority as follows:

"When blended with gasoline, it has a solvent, cleansing and loosening action on the metal parts of the tank, fuel lines and carburetor, particularly when the float is of cork shellaced type.

The blend is also markedly corrosive to galvanized parts. The sediment carried down by the alcohol fuel tends to plug up the feed lines, filters and jets." —Something nice to have in the tank of your plane, eh? Perhaps it was due to this and not to the stratification that your plane stalled in the air, as mentioned at the beginning of this article. And again, in the words of a noted authority of a foreign university (blends have been used extensively under certain restricted circumstances in foreign countries)—

"When using alcohol fuels, considerable trouble was experienced with the choking of filters and jets. The alcohol seemed to have a scouring action on the pipes, picking up any scale and dirt and carrying these forward to the carburetor. After running for some time on alcohol this feature became less troublesome, but at best there was always more trouble and stoppage than with petrol."

There are other troubles encountered in using alcohol as a fuel, it is pointed out by authorities. For example—

"With alcohol's high flash point and ignition temperature, the heat units required to vaporize an equivalent quantity of alcohol are about 250 percent more than those for gasoline. The ignition temperature for alcohol is about 975 degrees F., while that for gasoline is 750; the flash points are likewise favorable to gasoline. This tends toward a sluggish and harsh running motor until it is thoroughly heated up. Further difficulties have arisen due to a tendency of the motor to run hot with alcohol fuels."

Results obtained at the University of South Africa are interesting: "Harshness of running is so marked when starting up that the engine will not carry anything like its full load for some time. An examination of the engine always showed that the moving parts were much drier and free from lubricant than when petrol was used. Alcohol has a very detrimental effect upon the oil film on the walls of the cylinders." Some lubricating oils tend to emulsify in the crank case when using alcohol fuel in the motor.

These and other considerations would seem certainly to call for caution from any industry requiring motor fuel as its life-blood as aviation does. It should be more especially and more keenly interested in it than even the automobile and the petroleum industries since both the latter are not so insistent as is aviation on extremely high quality motor fuel first, last and always. Alcohol in the engine of an automobile might cause trouble with the resultant inconvenience, annoyance and loss of time, perhaps money, to the driver. But alcohol in the engine of an airplane, it can be seen, might cause such trouble as would have ghastly consequences, beside which that in automobiles would be puny in comparison.

END.