

cc: Dr. G. Edgar
Dr. R. A. Kehoe

ETHYL GASOLINE CORPORATION

CHEMICAL RESEARCH LABORATORY

1600 WEST EIGHT MILE ROAD

DETROIT, MICHIGAN

June 13, 1941

Dr. Willard Machle
College of Medicine
Eden Avenue
University of Cincinnati
Cincinnati, Ohio

Dear Bill:

I read with great interest the report on your test of the Army Field Range M-1937. Your method of testing is certainly first class, and your results are quite illuminating. I am at a loss to understand why we never recovered more than 70% of the lead in this laboratory. I doubt whether individual stoves could vary that much, and if they did, it certainly would be a matter of great concern to us. If the large discrepancy is due to loss during the analysis, the only place where this can occur and account for such a large amount, is the filter disc. The analysis of the disc is a painstaking operation because of the dense structure and chemical inertness of the disc. We did, however, steep it in hot nitric for days and days, and felt pretty confident that we had effected substantially quantitative recovery. I would appreciate, for future use, your sending us a quite detailed description of your procedure, including the appearance, state of subdivision, etc., of the disc during the analysis.

The method of testing for volatile lead in the unburned vaporized fuel between the filter and the jets is quite informative and should probably be used in all further tests.

Now that your tests have definitely established the present normal operating characteristics of the unit, I wonder whether some more work is not in order. Insufficient heat on the generator tube during the first 30 minutes of operation seems to be the main, if not the only trouble. We might experiment with either or both keeping the tube longer than 2 minutes in the actual flame during the starting up period, and designing a bigger and better tube to insure more efficient heating of the fuel to the cracking temperature of TEL. We might do some of that work in this laboratory, following it up mostly by tests for TEL in the unburned fuel. If and when we think we have achieved some improvement, we might pass the information on to you for final testing in your own set up.

Another point, which might be investigated, but which can possibly wait until we can make suggestions for improvements, is the behavior of the unit under conditions differing from those stipulated in the instructions. The most obvious one there would be what happens if the filter

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Dr. W. Machle

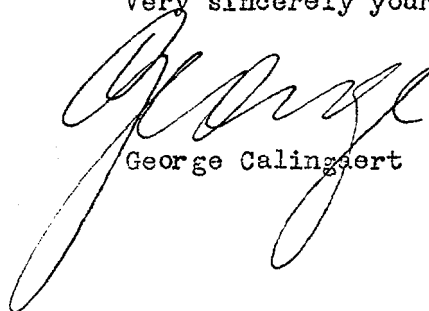
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should be left in the unit over extended periods beyond the specified 4 hours.

I am a little disappointed at the analytical results on the blended fuel, and I am sorry that you did not bring this to my attention at an earlier date. I see no reason at all why duplicate samples of gasoline should analyze as far apart as 2.86 and 3.15 ml. TEL/gal. In control work we hope to get as close as 0.02 or 0.01, and we certainly should be able to get all the results within 0.05 in any case. If and when you do more work along these lines, I suggest that we get together and I will have your samples analyzed in my own laboratory instead of in the Gasoline Testing Laboratory.

Very sincerely yours,



George Calingaert

C:G

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