

SUBJECT: Grade 150 Aviation Fuel... Colonel S.F. Early, Chief, Supply Division, AFSC, APO 140, U.S. Army.

For purpose of clarity the questions listed by Colonel Early are repeated below and will be answered in the same order.

1. Availability of Fuel

(a) For Ninth Air Force: At the present time Grade 150 aviation fuel is blended in U.K. refineries using normal aviation fuel components plus 3% Monomethyl Aniline and 1.0 cc per Tetra Ethyl Lead per U.S. gallon. A similar fuel is prepared in the U.S.A. by substituting Xylidine for the Monomethyl Aniline.

The total production of Monomethyl Aniline in the U.K. amounts to 15,000 tons per annum. This entire production is required to meet the requirements of the Night Fighter Command (approximately 20,000 tons per month of finished Grade 150 fuel) and the Day Fighter Command (Air Defense of Great Britain) (who have a requirement of approximately 12,000 tons per month of finished Grade 150 fuel).

Therefore, in order to provide an additional quantity of Grade 150 aviation fuel it will be necessary to import the finished fuel from the U.S.A., either to the U.K. for trans-shipment or direct from the U.S.A. to the continent. There is no question about this fuel being made available in the U.S.A. since there is ample Xylidine, and the 150 Grade merely replaces the 150 Grade without any corresponding loss in overall production.

(b) For Far shore only: It would not be a difficult task to replace the present 150 Grade fuel now being used on the continent with the 150 Grade, but it is strongly recommended, that if such replacement is necessary, it be complete, since there would be some difficulty if it were necessary to carry two grades of aviation fuel. It might be mentioned that two grades are now being distributed in the U.K. by static installations, and with the many years experience in distributing fuel under conditions in the U.K. it is not too difficult a supply problem. It is thought it might be extremely difficult in a mobile air force.

(c) For fighters only and all far shore. Medium and Heavy bombers have not been cleared for using 150 Grade fuel. The 150 Grade fuel is essentially a fighter grade fuel and there is very little improvement in performance to be gained by using same in either medium or heavy bombers. It should be noted

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...that the gain is in rich mixture performance and there is no gain whatever in the lean mixture performance which in turn might give increased range.

2. When Can It Be Obtained.

(a) Far shore distribution problems, if any. It is estimated that 150 Grade fuel could be made available within a period of 45/60 days. This would allow for shipments either direct to the U.K. from the U.S.A. or direct to the continent. Until such time as there is deep water available on the continent it would appear that all shipments of this fuel would have to be made through the U.S.A.

(b) Any problems in change over. As stated before, the far shore distribution problem would definitely be complicated if it were necessary to carry two grades. If one grade of fuel were carried then the change over could be made relatively quickly, providing the continent is then entirely on bulk distribution, which is likely to be the case.

3. Technical Aspects.

(a) What advantages. Tests to date in this theater indicate there is a appreciable increase in lead fouling of spark plugs and deleterious effect on synthetic rubber parts. However, it has been stated by the U.S.A. that kerosene fuels might have a tendency to affect the synthetic parts to some extent after a period of prolonged usage.

The following Rating War Emergency Rating Manifold Pressures have been established by the Eighth Air Force for the different aircraft:

Aircraft	Old W.E.R.	New W.E.R.
P-51	58"	65"
P-47B without water	52"	61"
P-47B with water	57"	67"
P-51B	57"	72"

It is thought that the above manifold pressures may even be increased to some extent using 150 Grade fuel, and roughly speaking the increase in speed of fighter aircraft at altitudes below 20,000 ft. is approximately 25 miles per hour. The increase in the rate of climb is approximately 800 ft. per minute. In addition, manifold pressures can be used at the higher ratings without danger of reaching incipient detonations, this gives a greater factor of safety.

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