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ARMY AIR FORCES
HEADQUARTERS
AIR TECHNICAL SERVICE COMMAND

TSEPL-5L:JD:lbb

Wright Field, Dayton, Ohio

17 MAY 1945

SUBJECT: Use of AN-F-33, Grade 115/145 Fuel.

TO: Commanding General
Army Air Forces
Washington 25, D. C.
Att: AC/AS - M&S - Lt Col C D Gasser

1. This is in reference to telephone conversation between your office and Colonel D. J. Keirn of the Power Plant Laboratory, on the above subject.

2. It is the opinion of this office that of the aircraft considered for possible use of fuel Grade 115/145, P-51 aircraft will most nearly realize the potential advantages by virtue of permitted increased power.

3. On the basis of service tests conducted in this country, on B-29 aircraft with fuel 115/145, it is to be expected that maintenance difficulties would be decreased through the use of this fuel. (See enclosure to the 73rd Special Fuel Test Progress Report dated 5 May 1945). On this basis, B-29 aircraft are listed as second choice for service use of this fuel.

4. For P-51 aircraft it is expected that the advantages obtained from 115/145 fuel will be at War Emergency Rating. At this time increased economy in the cruise range cannot be realized. For all P-51 aircraft using V-1650 engines to H model, the following power settings may be used:

| | Maximum HP | | Maximum MAP | |
|---|---|---|---|---|
| | AN-F-28 | AN-F-33 | AN-F-28 | AN-F-33 |
| | 100/130 | 115/145 | 100/130 | 115/145 |
| V-1650-7 (low blower) | 1720 | 1905 | 67" Hg. | 75" Hg. |
| V-1650-7 (high blower) | 1505 | 1690 | 67" Hg. | 75" Hg. |
| V-1650-3 (low blower) | 1600 | 1760 | 67" Hg. | 75" Hg. |
| V-1650-3 (high blower) | 1330 | 1510 | 67" Hg. | 75" Hg. |

NOTE: Above ratings are dry since water-alcohol injection has not been provided for aircraft prior to H model. It is impractical to provide

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for the use of water-alcohol on these aircraft since there are no water regulator or automatic boost controls available for use on these engines. Modifications would also be required on the airplane.

5/ P-51H aircraft and V-1650-9 engine development have been predicated on available supplies of 115/145 fuel for service use. These aircraft may use water-alcohol injection in conjunction with fuel 115/145 at the following power settings:

| | Maximum HP | | Maximum MAP | |
|---|---|---|---|---|
| | AN-F-33 115/145 | AN-F-33 plus water-alcohol | AN-F-33 115/145 | AN-F-33 plus water-alcohol |
| V-1650-9 (low blower) | 1760 | 2280 | 75" Hg. | 90" Hg. |
| V-1650-9 (high blower) | 1510 | 1905 | 75" Hg. | 90" Hg. |

6. For P-51H aircraft the use of Grade 100/130 fuel plus water-alcohol injection would require modifications to the boost control, water regulator and carburetor setting. These modifications are major in nature and would require approximately six months to complete. With above necessary changes it is expected the following power settings would apply:

| | Maximum HP | | Maximum MAP |
|---|---|---|---|
| | AN-F-28 100/130 | AN-F-28 plus water-alcohol | AN-F-28 plus water-alcohol |
| V-1650-9 (low blower) | 1600 | 2060 | 80" Hg. |
| V-1650-9 (high blower) | 1330 | 1760 | 80" Hg. |

7. It should be pointed out that all ratings listed for P-51 aircraft have been proved and no additional test work will be required. However, extensive modifications for the P-51H will be necessary to use 100/130 plus water-alcohol as outlined in paragraph 6 above.

8. All applicable Technical Orders for the P-51H airplane have been written giving operating instructions and ratings for both AN-F-28 and AN-F-33 fuel except that no ratings have been included for AN-F-28 plus water-alcohol since modifications are required to use this combination. Instruments and placards are also marked to the use of AN-F-33 fuel or AN-F-28 fuel with no water-alcohol injection. Thus no modifications of instruments or change in Technical Orders will be required for the use of AN-F-33 fuel and the fuel can be used immediately upon being made available.

9. In the event that AN-F-33 fuel is available for P-51 aircraft, all P-51 airplanes with V-1650-3 and -7 engines will require that Technical Orders be issued which give the information that AN-F-33 fuel can be used with the same modifications and operating instructions as those given for PPF 44-1 fuel. An early reply is required on the use of AN-F-33 fuel so that these instructions can be issued in time to reach the service at the same time as the fuel.

FOR THE ACTING DIRECTOR:

P. H. ROBEY
Colonel, Air Corps
Chief, Propulsion &
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