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AERONAUTICAL STANDARD AS 20B

DEFINITIONS, AIRCRAFT RECIPROCATING ENGINE PERFORMANCE

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The following definitions are those of commonly used terms relating to power output and methods of supercharging. These definitions are considered necessary for a more thorough understanding of commercial aircraft engine terms.

1. Standard Atmosphere shall be a dry, perfect gas as defined by NACA Report No. 218. When required, the standard for atmospheric moisture content shall be 80 percent relative humidity at all altitudes.

2. Brake Horsepower is the power delivered at the propeller shaft of the engine.

3. Manifold Pressure is the absolute pressure measured at the appropriate point in the induction system, usually in inches of mercury.

4. Take-off Power is the brake horsepower developed at standard sea level atmospheric conditions as defined in Par. 1, under the maximum conditions of crankshaft rotational speed and engine manifold pressure approved for use in the normal take-off, and limited in use to a maximum continuous period as indicated in the engine manufacturer's engine specification.

5. Maximum Continuous Power is the brake horsepower developed under standard atmospheric conditions as defined in Par. 1, at a specified altitude under the maximum conditions of crankshaft rotational speed and manifold pressure approved for use during periodsof unrestricted duration.

6. Critical Altitude is the maximum altitude in feet under standard atmospheric conditions as defined in Par. 1, at which it is possible to maintain a specified brake horsepower, or a specified manifold pressure, at a specified crankshaft rotational speed and without ram air pressure.

7. Maximum Continuous Altitude is the critical altitude in feet at which maximum continuous power defined in Par. 5, above is developed at full throttle. An engine with a multi-speed or multi-stage supercharger has two or more maximum continuous altitudes.

8. A Sea Level Engine is one which is rated at full throttle at sea level.

9. An Altitude Engine is one which is sufficiently supercharged to be rated at full throttle at some altitude or altitudes above sea level. Full throttle operation at sea level is restricted. This type is sometimes termed a "supercharged" engine.

10. Actual or Observed Brake Horsepower is the uncorrected horsepower output of the engine under the prevailing test conditions.

11. Scoop Pressure is the average static absolute pressure measured at the exit of the air intake scoop and after the screen when a screen is installed. This is preferably done at four points on the periphery. This pressure is identical with carburetor or air throttle entrance pressure.

12. Carburetor or Air Throttle Entrance Temperature is the average temperature in °F at the entrance to the carburetor or air throttle. This shall be measured at a sufficient number of points to insure an average measurement in case of stratification.

13. Ram Pressure is the differential between the observed static scoop pressure and ambient atmospheric pressure.

14. Carburetor Setting is a combination of jets and metering controls intended to provide the fuel air ratio suitable to a specific engine type.

15. Mixture Control Settings - Carburetor or master control:

15.1 Full Rich is the setting providing maximum fuel flow. On fuel metering systems having "Auto Rich - Auto Lean" type settings, maximum fuel flow is provided by the "Auto Rich" mixture control position. On systems having "Rich-Normal" settings, maximum fuel flow is provided by the "Rich" mixture control position.

15.2 Best Power is the manually selected setting which gives the least fuel flow when maximum power is developed at constant manifold pressure.

15.3 Best Economy is the manually selected setting which gives minimum fuel flow for a specific power output.

15.4 Auto Rich - Auto Lean Settings:

15.41 Auto Rich is the mechanically preset setting which provides maximum fuel flow while automatically compensating for changes in atmospheric conditions and load.