3.3 Calculation of the engine power output at actual atmospheric conditions

The disposable power output N_e on the engine shaft at actual atmospheric conditions is defined by the formula:

$$N_e = \frac{N_{eo}}{A} \qquad \text{/kW, KM or BHP/}$$

where: N_{eo} - engine power output /kW, KM or BHP/ at Standard Atmosphere Conditions at sea level, i.e. at the ambient temperature t_o = +15°C /59°F/ and at the barometric pressure B_o = 760 mm Hg /29.92 in.Hg/, read-out from the engine performance curve.

A - reduction coefficient, depending on the throttle opening:

a/ at full opened throttle /full power/:

$$A_1 = \frac{500 + t}{515} \times \frac{760}{B - \Delta p}$$

b/ at partially opened throttle /throttled power/

$$A_2 = \frac{500 + t}{515} \times \frac{B}{B - \Delta p}$$

where: t - actual temperature at the carburettor inlet /°C/

B - actual barometric pressure /mm Hg/

Δp - actual absolute humidity of the ambient air /mm Hg/

3.2. Engine performance

3.2.1. Engine performance at full and throttled power.

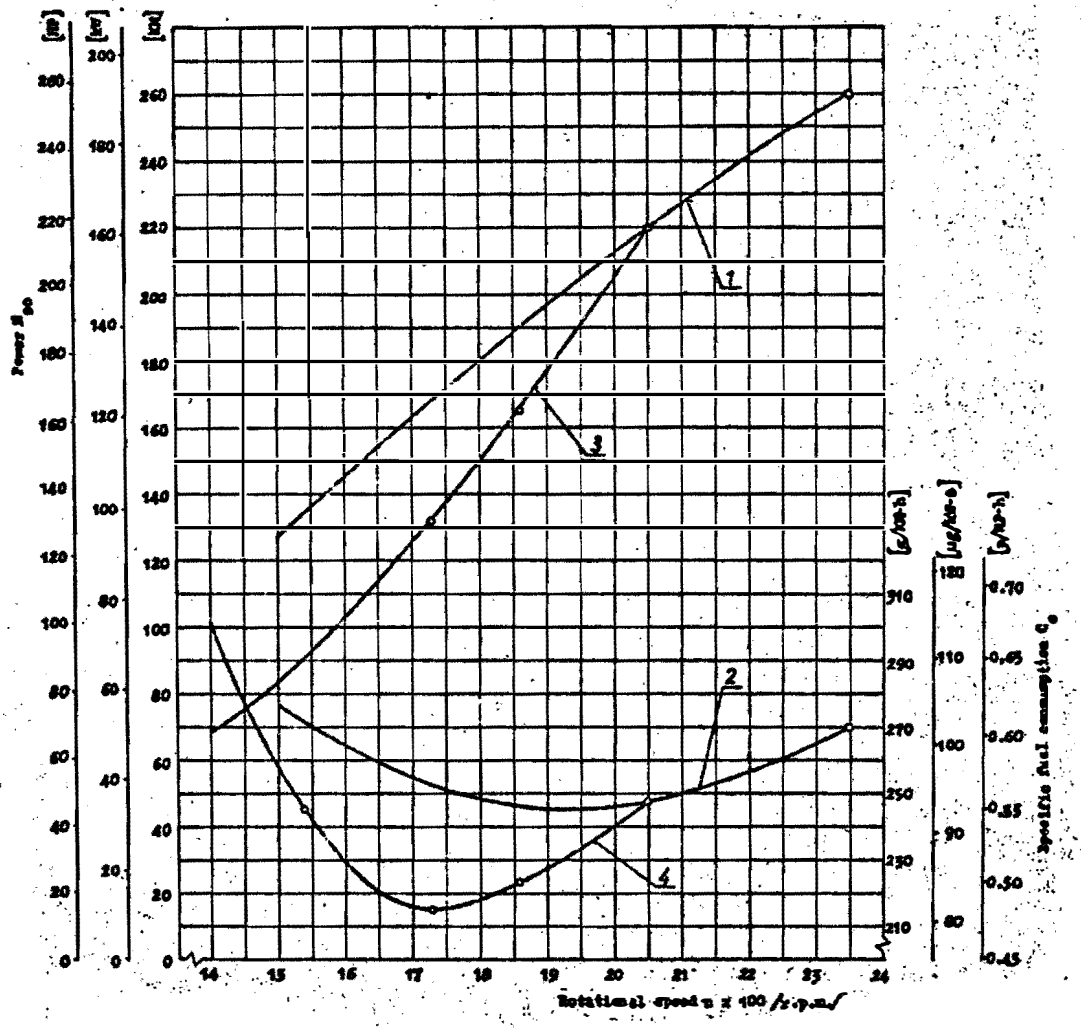

Fig. 3-1. Engine performance at full and throttled power AI-14RA and AI-14 RC engines

1 - Full power curve

2 - Specific fuel consumption curve at full power

3 - Throttled power curve /on propeller/

4 - Specific fuel consumption curve at throttled power

1 3.2.2. Engine altitude and pressure performance

AI-14RA and AI-14RC are standard sea level engines /normally aspirated engines/

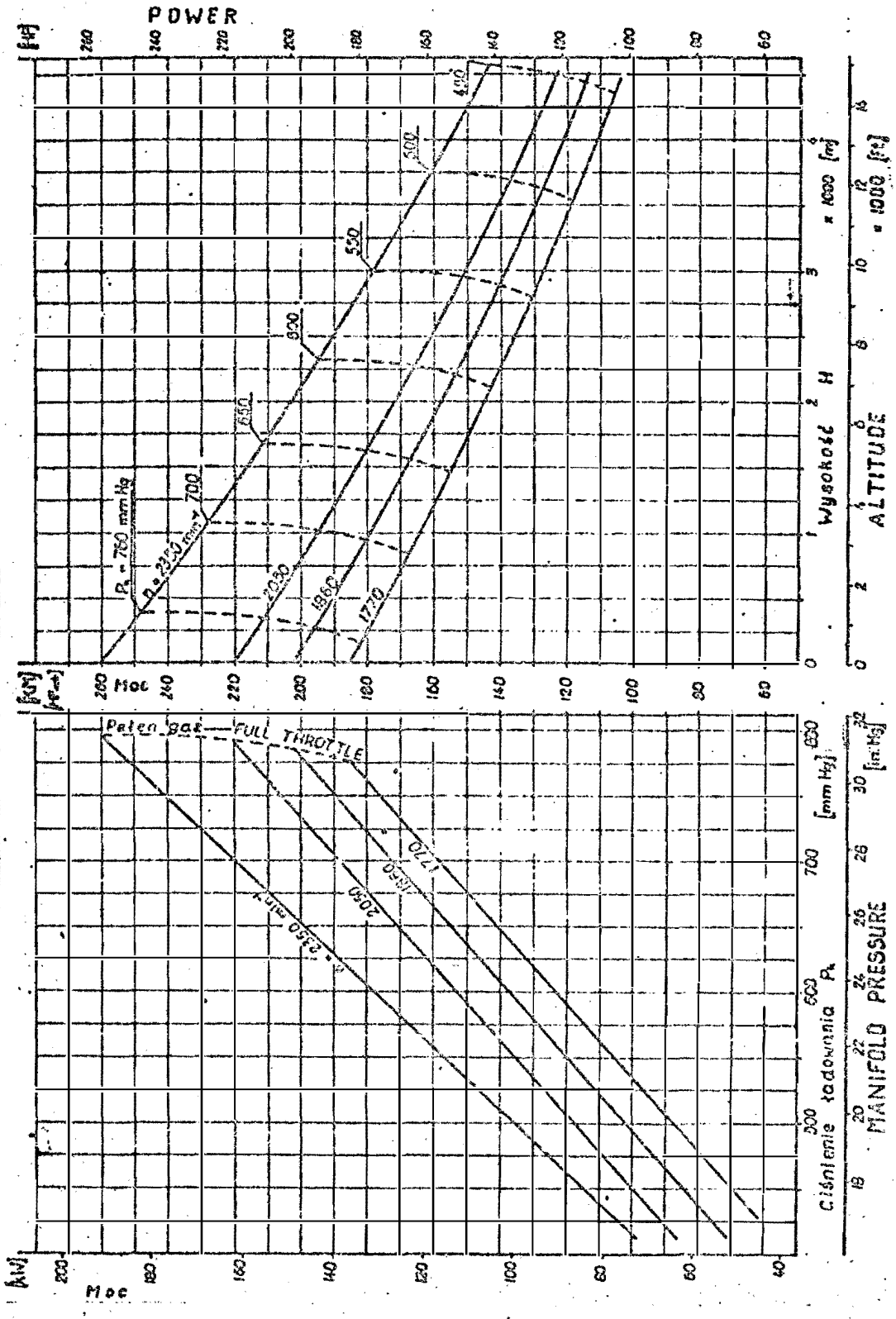

Fig. 3-2 AI-14RA/RC Engines altitude and pressure charakteristic

Power values on the engine performance charts are reduced to standard day on sea level.