Ratings

Allowances for engine driven auxiliary equipment

If the engine operates in the ambient conditions shown on the power curve, the only allowances which must be made, are for the power used by accessories such as the fan and the alternator. The amount of power used by accessories driven by the engine must be decided so that the net power available at the flywheel can be found.

De-rating

If the engine operates in ambient conditions other than the conditions shown on the power curve, then suitable allowances must be made for any change in intake air temperature, barometric pressure or humidity.

1 Intake air temperature

High intake air temperature to the engine can cause loss of power and heat problems with the cooling system, the lubricating oil and hydraulic oil systems. This may be either due to high ambient temperatures, or because the engine is being used inside a building, or within the structure of a machine that requires more air flow.

For naturally aspirated engines, the loss of power will be approximately 2-2,5% for every 10 °C (18 °F) rise above the reference temperature specified on the power curve.

2 Barometric pressure

For every 25 mm (1 in) Hg reduction of barometric pressure within the normal range of changes at sea level, the rated output of a naturally aspirated engine will decrease by approximately 1-1,5%.

3 Altitude

The naturally aspirated engine will run correctly up to an altitude of 600 m (2000 ft). If the engine is to operate at an altitude above this, an increase in smoke may be seen. This is normal for a naturally aspirated engine.

Turbocharged engines have been developed to operate up to an altitude of 3000 m (9842 ft). Contact Perkins Applications Department if the engine is to operate above this height.

For reference, the curves 3893 and 3952 show how the power of a typical naturally aspirated engine can change with altitude and different ambient air temperatures, see page 324 and page 325.

4 Humidity

The amount by which the rating will be reduced because of humidity, will be according to the percentage humidity and the ambient temperature (not the intake air temperature).

Curves 3892 and 3953 show the loss of power due to humidity at different ambient temperatures, see page 326 and page 327. High percentage humidity does not normally occur with very high temperatures. A rating reduction of 6% should be used as the maximum reduction in power.

Note: Engine ratings given by Perkins are corrected to the reference conditions shown in the rating standards.

Altitude - curve 3952

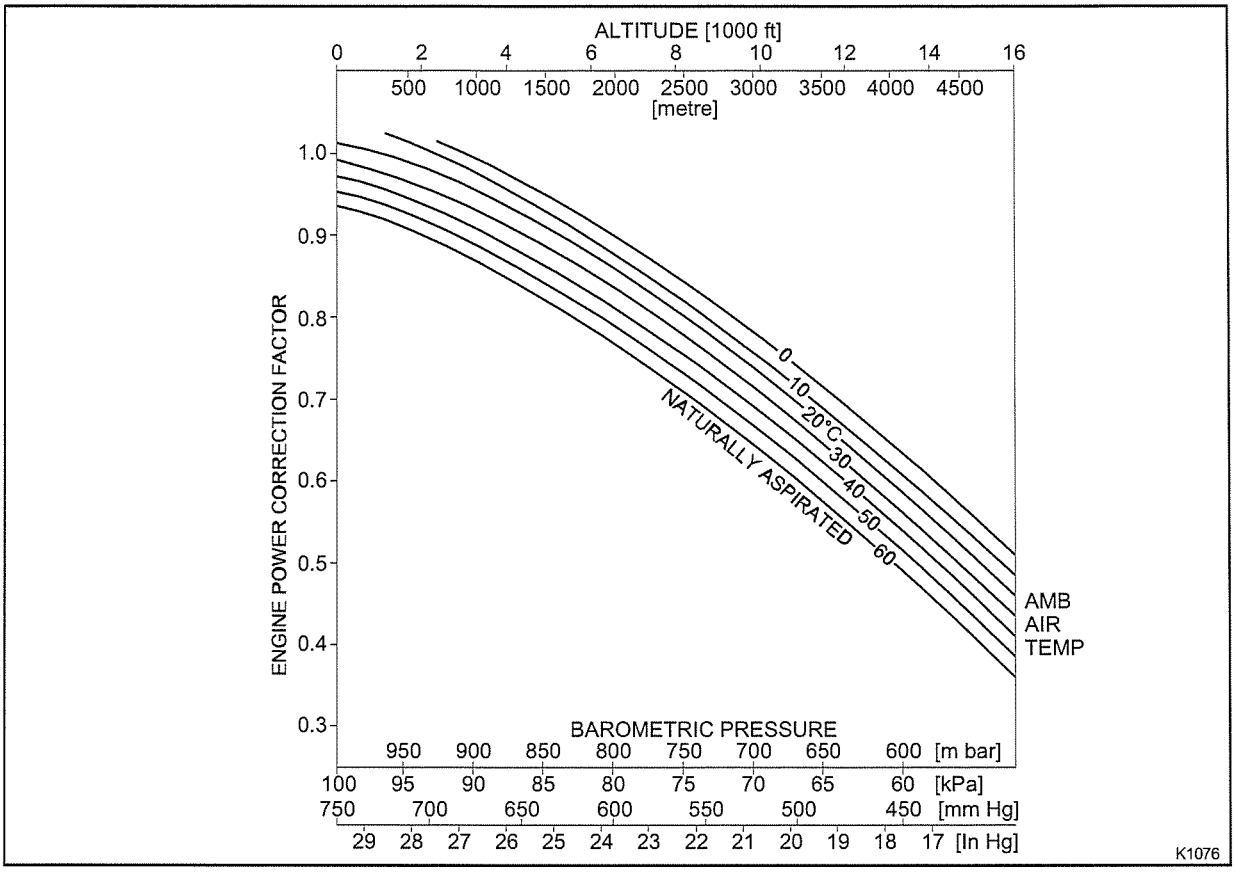
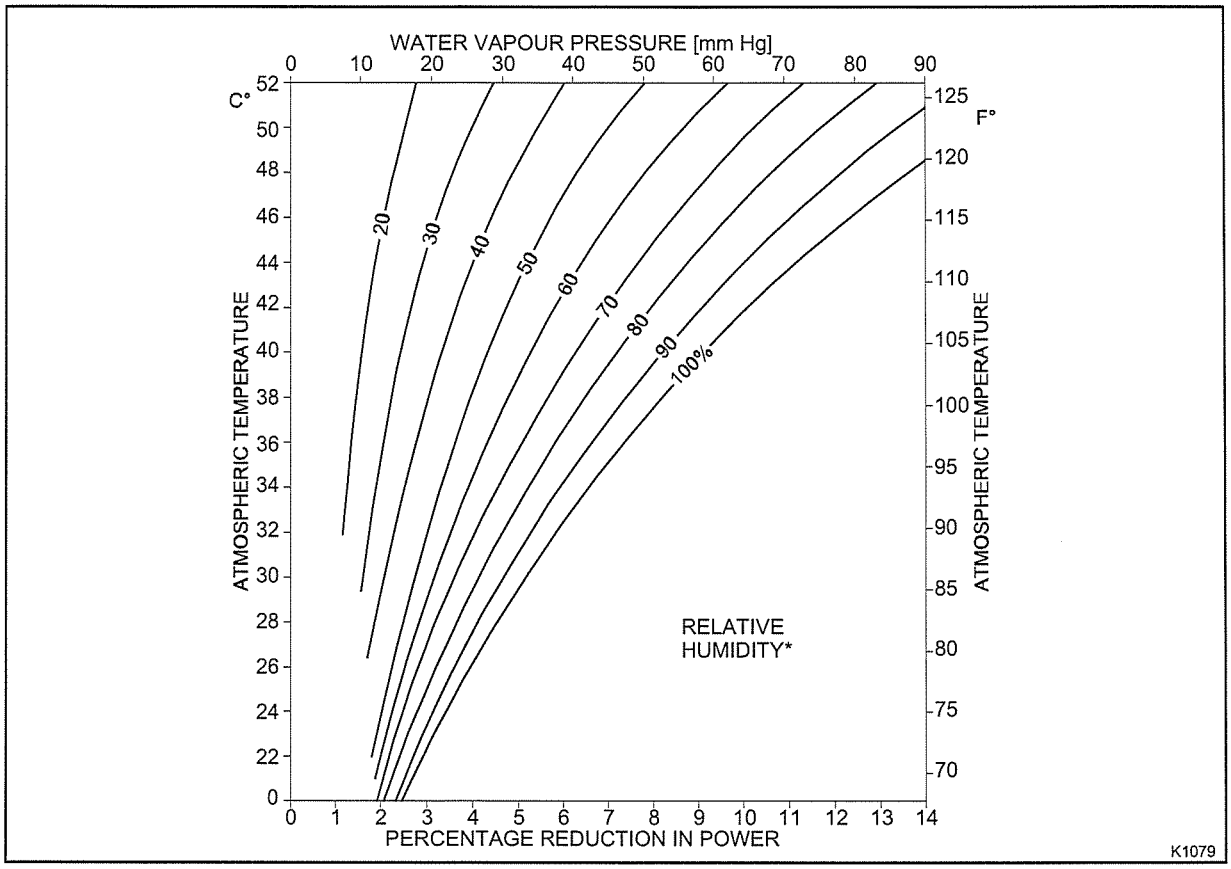


DIAGRAM FOR ESTIMATING EFFECTS OF ALTITUDE AND TEMPERATURE ON POWER OUTPUT RELATIVE TO BS 5514 REFERENCE CONDITIONS.
(27 °C (68 °F) and 100,0 kPa [750 mm Hg])
Effects relative to BS 649 conditions (29,4 °C (84.9 °F) and 99,9 kPa [749 mm Hg]) will be similar.

Humidity - curve 3953



Note: When estimating the percentage reduction in power due to humidity, the relative humidity must be coupled with the ATMOSPHERIC AIR TEMPERATURE, and not the air intake temperature which might be locally heated. The effect of intake air temperature on power output must be considered separately using diagram 3952.

Where humidity is expressed in terms of water vapour pressure, the percentage reduction in power can be read directly from the chart.

DIAGRAM FOR ESTIMATING EFFECT OF HUMIDITY ON POWER OUTPUT
RELATIVE TO BS 5514 REFERENCE CONDITIONS.
(27 °C (80.6 °F) and 60% RH)
Effect relative to BS 649 conditions (29,4 °C (84.9 °F) and 15 mm Hg VP) will be similar.