Drive computing

The traction motors are computed for the current at continuous work point (●, with a limit in blue dot-dashed line) or nominal current. Motors can be overloaded during a limited time, using the thermic inertia of metellic parts, without overheating of the most delicate parts (red hatching on the diagram). More the work point is distant from the continuous regime, shorter is the time to reach the maximal heating of components.

At the higher transformation ratio, the motors are on the last full-field step **(** - - - -). The across voltage at motor group is defined by the transformer secondary and the diode rectifier: U_d. Voltage is about constant, but not exactly, beecause the transformer is not an ideal voltage-source and has its own losses. The characteristc at constant voltage is only available at builder's test bank (— · · — · · —):

$$U_d = k_m I_a V - R_a I_a \qquad Z = k_t I_a - I_0 \qquad Z = k_t \frac{U_d}{k_m V - R_a} - I_0$$

At weakened field, the torque characteristic versus current is a little lower and shifted right versus speed (in green on characteristics).

In drives with current converter (controlled rectifier), the full-field limit **(**- - - -) tie in the minimal trigerring angle (~ 0°) of the main rectifier. For the semiconductors devices, chopper in this case, ther is not thermic inertia. The converter has to be computed for the maximal power. (♦ - - ♦).

In most of case, the motor vehicle rolls under its continuous work-point. With the great thermical inertia of the transformer, it can be computed for a lower nominal power as the sum of motor nominal powers. Exception: commuter trains.

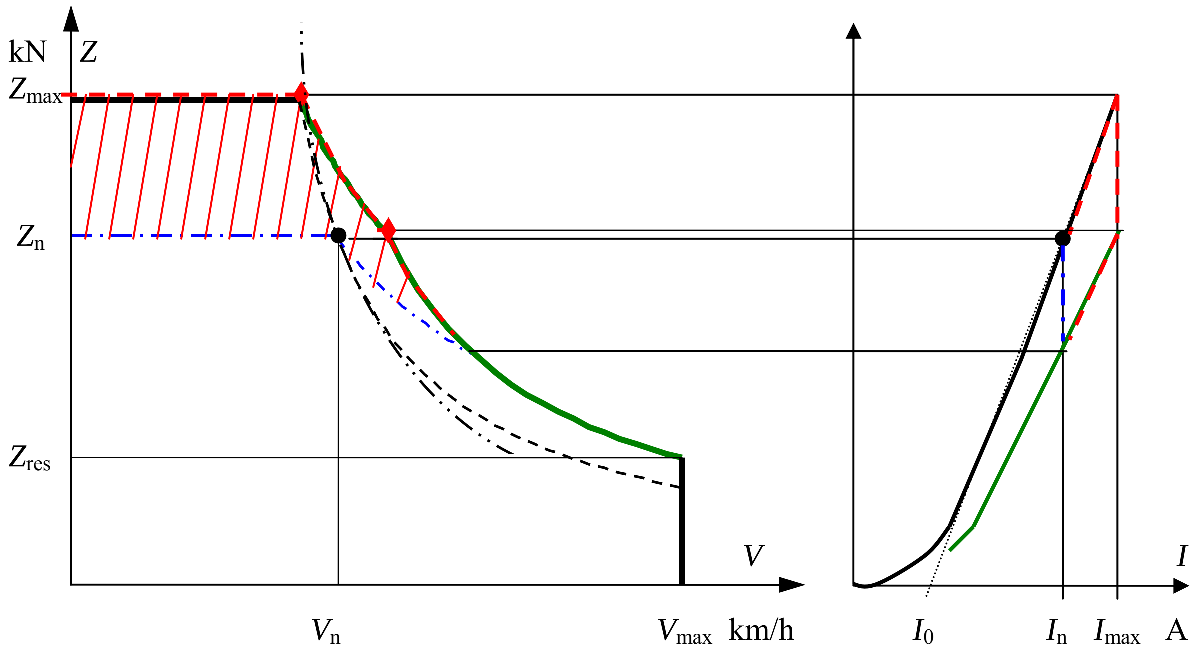

Fig. 4.143B Characteristics for series motor s powered through rectifier.