6.1 Auxiliaries

If the electric and mechanic drives are preferably studied, it is totally false to neglect the auxiliary devices which are necessary for the operation of traction.

When using energy from contact line (or diesel motor), the auxiliaries have to execute two types of missions:

1. Provide services necessary to a good operation of traction equipment and a good circulation of train, including the brakes.
2. Provide power to comfort equipment for the passengers (lights, heating – air conditioning, doors movements, etc.).

The first type is essentially studied, which is necessary for all the train.

On traction engine is often parked with down-placed pantographs. It is necessary to hold energy on board to prepare the engine until the pantograph will be pressed on contact line and the main circuit breaker will be closed. This energy is stored on an accumulator which is charged through a dedicated device from contact line. On an autonomous engine, the stored energy must start the diesel motor.

The train braking must be guaranteed all times. Generally, pneumatic energy is used (vacuum or air). The compressor, or the vacuum pump, has to guarantee a full availability of this pneumatic energy.

At last, the cooling and the lubrication of all devices of the traction drive have to be done surely. The motors of fans et pumps must be functional at all contact line voltages (standard: from –30 % to +20 % of nominal value).

In the modern vehicles (from about 1990), a board static converter produces a three-phase network at constant frequency (for ex. 400V 50 Hz) from the intermediate circuit à continuous voltage of the electric drive. Often, two static converters are installed, to guarantee a certain redundancy to cover the essential functions in case of failure of one. This 3-phase network allow to choice industrial components in place of specially developed ones.

In older vehicles, some complex and ingenious solution were found to insure security and availability.