16-1118 Westinghouse Type CCL Polyphase Induction Motors

shafts of all sizes. These outboard bearings are carried in pedestals which can be nounted on the frame of the driven machine.

Outboard rotor bearings are especially recommended for the large frames where service conditions are severe. Outboard countershaft bearings are recommended in all cases where the countershaft drives through a pinion or gear, and forsbelt drive from frames larger than No. 9 (standard 20 h.p.).

Mounting. Back geared motors are usually mounted on the frames or extended bedplates of the driven machines, hence motor bedplates are not supplied except on order. Frames not larger than No. 5 can be bolted directly to a wall or ceiling; larger sizes can be supplied with suspension bedplates, and oil drip pans for wall or ceiling mounting.

Operating Characteristics

Squirrel cage induction motors are essentially constant speed machines. At no load, that is, running light, the speed is sychronous, depending on the frequency of the supply of the current and the number of poles for which the motor stator is wound. When the motor is driving a load the speed is less than synchronous, the decrease from synchronous speed being known as the slip. The slip of any induction motor varies with the load and depends on the resistance of the secondary, that is, of the rotor conductors and their short-circuiting end rings. The greater the load the greater the slip, and the higher the resistance of the secondary the greater is the slip at any given load. The slip is usually expressed in per cent. of synchronous speed; thus, 5 per cent, slip means that the speed is 5 per cent, less than synchronous speed.

The greater the slip of an induction motor the greater is the starting torque, or turning moment, per unit current. On the other hand, large slip is accompanied by increased losses and decreased efficiency. In the type CCL motors a conservative medium course has been adopted. The slip is high enough to give good starting torque without requiring excessive starting current, while at the same time good commercial efficiencies are obtained. The slip at full load varies with the size of the motors between the approximate limits, 7 per cent, in the smallest size down to 3 per cent, in the larger sizes.

Torque. The starting torque per ampere current input compares very favorably with that of any other squirrel cage induction motor on the market. The maximum running torque, or the pull-out torque, is from two to two and three-fourths times the full load torque. Type CCL motors are therefore especially adapted for service where they may be subjected to sudden and heavy overloads.