

CHAPTER IV

CONCLUSION AND DISCUSSION.



The starting torque of the induction motor squirrel-cage type is governed by the rotor resistance. The high rotor resistance is desirable from the stand point of starting torque and current per unit starting torque, but leads to a high slip and low efficiency at full load. Therefore calculation of rotor resistance is very important in starting torque calculation.

The starting torque obtained by calculation from motor equivalent circuits, motor physical parameters and from actual measurement plotted in Fig. 3.6 were quite satisfactory although there were some differences between these results. From Fig. 3.6 the maximum starting torque obtained from three methods of investigation were nearly equal but the value of capacitance required for maximum starting torque were different.

The starting torque obtained by measurement, i.e., multiplying the reading on balance dial by the arm length were used as an averaged result in this test. But some errors occurred in measurement due to:

1. The reading on the balance dial had vibration this due to flux pulsation on the stator teeth and rotor.
2. Starting torque was maximum at the instant the rated voltage was applied. The torque then decreased as time increased from point of power application. Because the maximum-

value reading balance was not available. The investigated starting torque were less than the actual starting torque. The starting torque decreased due to capacitive reactance of starting condenser decreased.

From Fig. 3.6 , the starting torque obtained by calculation from motor physical parameters was less than that of the measurement starting torque due to the following:

1. The constant terms used in calculation of motor parameters were varied within a specific limit. Selection of a specific value might cause error.
2. The rotor slot punching was small and covered with rotor end ring. The exact dimensions were very difficult to obtain.
3. The measured starting torque was less than the actual starting torque as previous described.

From Fig. 3.6 the starting torque obtained by calculation from the no load and locked-rotor test had nearly equal in maximum starting torque but different in capacitance required for maximum starting torque. The difference were due to followings:

1. In order to obtain the motor equivalent circuit parameters, some items were assumed and some were neglected. Therefore the motor equivalent circuit had error.
2. The reading on the measuring instrument had small error. This error could be seen by reading the same amount of quantity at different scale the reading obtained were difference.

From practical point of view the calculation of starting torque from the motor physical parameters can only use in design purpose. The calculation of starting torque by torque measurement can be used only when the motor is small. For large motor the calculation of starting torque by no load and locked-rotor test is more practical, but in order to perform the test the accurate measuring instrument is required.