Fig. 5.15. Equivalent circuit to a winding of a motor.

The diagram shows the most important motor and operating characteristics.
Directional Control of DC Motors

Dual Power Supply

Single Power Supply

Pulse Width Modulation

Applied Voltage

Time

Perceived Voltage

Time

Applied Voltage

Time

Perceived Voltage

Time
You have been assigned to follow up on the design of former employee who had not taken ME118. Your supervisor suspects that they didn't know what they were doing. The only documentation that you can find shows that the motor chosen has \( K_t = 9.33 \text{ in.-oz./A} \) and produces 2.8 in.-oz. at stall. The design requires that the motor deliver 0.4 in.-oz. at 1500 rpm. The motor was supposed to be driven from a 12V supply and switched by a DS3658. Your boss has asked you:

a) Can the DS3658 safely switch the required current?

b) Will the design meet the requirements for torque & speed? If not, what changes could you suggest?

c) To estimate the current required when running at the design point.

You may assume that there are no internal losses within the motor.

How can I find out how much current it draws at stall?

How can I find the no-load speed?

How can I find coil resistance?

How can I find torque at given speed?