Shunt Motor Characteristics

Main Observation: Shunt motor speed stays almost constant over wide range of mechanical loads.

Also, as torque developed increases so does motor armature current.

In shunt motor field developed from same voltage source as is connected to armature (Parallel = Shunt)

Motor Connection

Separately Excited dc generator used as mechanical load. Connecting resistor load box makes load adjustable.

Separately Excited Generator

Note: that N is almost constant less than 10% variation over wide load change.

Armature current $I_a$ increases proportionally with torque.

$I_a \propto T$

$K_T = $ Torque Constant
SHUNT MOTOR CHARACTERISTICS

1. Explain how a DC Machine is connected as a Shunt Motor.

2. Describe the mathematic relationship between the motor’s output torque and the armature current. Does the collected data support the theory.

3. Explain the process that causes the Shunt Motor to have almost constant speed.

4. Define motor speed regulation using both words and a formula.

5. Explain the meaning of speed regulation. Is a higher or lower value better?

6. From the Speed vs. Torque graph, what type of mechanical load would be a good match for the Shunt Motor. (See class notes)