MAE156a lab: Motor startup dynamics

Here are some representative measured data for Case 4 on the Motor Response Tests worksheet:

Initial Voltage (V):	12.1
Minimum Voltage (V):	7.1
Final Voltage (V):	8.2

Maximum Current (amps):	0.928V/0.1 ohms = 9.28 amps
Final Current (amps):	0.03V/0.1 ohms = 0.3 amps

Approximate oscilloscope settings:

Vertical:	200 mV/div to 2 volts/div
Horizontal:	50ms/div
Probe:	10X (on the physical probe and on oscilloscope setting)

Notes:
"Current" measurements are made with the oscilloscope probe clipped to the "top" of the 0.1-ohm current sense resistor. The ground clip of the probe clips to the "bottom" (ground) side of the sense resistor. You should expect to see an initial spike in current as the motor is initially connected to the supply, followed by a few oscillations and finally coming to steady-state.

Voltage measurements are made with the scope probe clipped to the 12 volt output of the power supply. You want to see how the motor "stresses" the power supply. Application of power should show an initial drop in supply voltage followed by s steady-state voltage somewhat lower than the unloaded supply voltage.

Both the above observations will vary with using or not using the capacitor (quick availability of charge), and whether the motor is driving the potentiometer or not (friction).