Electric motor load resistance

Gillish · Feb 3, 2003

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Gillish
New Member

Feb 3, 2003 #1

Is there any way to derive the load resitance of an electric motor under a certain mechanical load when it's running, from a specsheet like ***broken link removed***? I want to know the electrical resistance....the Ohms value....
The reason is, I'm making a solar powered car and the solar panel produces the most power when it's connected to a motor with a certain resistance. I have one motor for example that, when spinning freely, takes 0.25A at 18V from the solar panel (4.5watts), but when loaded that goes to 0.5A at 16V, (8watts) because the motor's resistance changes. That motor, when messuring its resistance with a simple ohm-meter, of course completely stalled, has about 19 Ohms of resistance, but it's clearly much higher when it's spinning freely at max revs. In this case 18/.25 = 72 Ohms, and when loaded 16/.5= 32 Ohms. (which seems like a good value for the solar panel)
The specs of the solar panel are **broken link removed**.

Pommie

kinjalgp
Active Member

Feb 3, 2003 #2

The resistance at any instant will be R = V/I. Fix up your load to the motor and measure the current and voltage. The ratio of voltage to current will be the dynamic resistance of your motor.

"There is no way to peace, peace is the way!"

G

Gillish
New Member

Feb 3, 2003 #3

How does that give me more information when all I know about the motor is what's on its specsheet? Am I missing something? I can't try it out simply because I don't have it...

A

AdamH
New Member

Feb 21, 2003 #4

The less load there is the higher the resistance seems. In material terms the winding resistance never changes, back-emf inside the motor accounts for this difference you see.

> Pommie

kinjalgp
Active Member

Feb 22, 2003 #5

Yes, exactly!

"There is no way to peace, peace is the way!"

bogdanfirst
New Member

Feb 23, 2003 #6

talking about motors....
for a stepper motor, does it have the same power at low and high tuartion?

kinjalgp
Active Member

Feb 23, 2003 #7

Stepper motor is an open loop system. It doens't work on concept of back-EMF and thus the current always remains constant no matter what load you connect of what speed you drive it. But yes, there will always be the transient response associated with the inductors which depends upon the applied signal frequency. So if your excitation sequence is very fast the inital peak current may vary but average cuurent will almost be constant over all frequencies.

"There is no way to peace, peace is the way!"

bogdanfirst
New Member

Feb 23, 2003 #8

i knew that the current remains the same, but in conclusion, if i use a stepper motor to make something moove, and i use a highter ferquency(highter turation) does it have more power so it can moove a highter load?

kinjalgp
Active Member

Feb 23, 2003 #9

As I said earlier its an open loop system. There is almost no effect of load on the power consumption. If your load exceeds the torque capacity of your motor, it will just stop rotating without a bit of increase in power consumption. But I have never seen such case because even tiniest motor I have used was of 1.5kg/m and thats good enough for driving most of the robotics and other related mechanical stuff. Steppers have very high starting torque.

"There is no way to peace, peace is the way!"

bogdanfirst
New Member

Feb 23, 2003 #10

ok. i got that.
well, if it doesnt have enough torcue it judt doesnt turn. period.

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