

Re: Split Phase Motor/Generator

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" Doug Goncz " <dgoncz@aol.com> wrote in message
news:20041012035617.05436.00001348@mb-m20.aol.com...
> *In an earlier thread, "Impedance Protection of Ceiling Fan Motor" (sic),
and
> other threads here and in other newsgroups, I have considered the
possibility of
> using a split phase capacitor run AC motor as a generator.
>
> I have assembled the motor to my bicycle and it runs the cranks just fine.
I
> don't intend to build an AC motor powered bicycle with it. After all, what
> would you do when the required extension cord pulled out of the wall? :)*
It is
> *useful to have an AC motor on a bicycle. When in the shop for maintenance,
all
> one need do is plug in the motor and spend a few minutes tuning the
> transmission for maximum shift efficiency, saving much time.
>
> From my EET 350 (Fundamentals of Electrical Technology) textbook,
"Introduction
> to Electricity, Electronics, and Electromagnetism", I see that the torque
curve
> as a function of speed is sharply sloped near synchronous speed and
understand
> that it pretty much reflects across the speed axis into the region of
negative
> (that is, applied) torque, allowing the motor to act as a generator.
>
> I plan to use AC excitation but don't understand how to connect the load
so
> that the generator will drive it. Certainly the impedance of the wall
socket is
> very low, while the impedance of my onboard sine wave inverter, which
supplies
> AC excitation to the motor, may be higher or lower. In any case, I suspect
the
> impedance of this impedance protected motor to be rather high.*

- >
- > *The proposed loads are two: one, a highly efficient white LED signal light*
- > *donated by John Viselli at Dialight for this R&D project, and two, an even*
- more
- > *efficient high pressure sodium fixture to be purchased at The Home Depot*
- or
- > *from Grainger when the LED light goes on line.*
- >
- > *The LED light is 8W, and is entirely suitable for use as a road headlight,*
- with
- > *its trapezoidal beam pattern, sealed construction, and easy mounting into*
- a
- > *fairing. It can be mounted directly to the motor, for now, it is so light.*
- I
- > *have fabricated one such adapter already, and two model adapters of foam*
- to
- > *carry the "guts" of a similar light, a green LED traffic light. These weigh*
- > *grams.*
- >
- > *The sodium fixture is a little heavier, but not too bad. It is rated 35 W*
- and
- > *is entirely suitable for navigating difficult terrain at night, at high*
- speeds.
- > *It's a flood light.*
- >
- > *I finished the plastic shell for the road wheel powered DC motor/generator*
- the
- > *other day. This generator will power the inverter, and the inverter will*
- excite
- > *the AC generator. Rider power will be transformed by the generator into AC*
- power
- > *to power the lamp. That's a jump from 60 Hz mechanical power to 60 Hz AC,*
- then
- > *around 33 octaves to visible light. No, this isn't a perpetual motion*
- machine
- > *or a dynamic brake. The AC motor is being used as a generator with AC*
- > *excitation supplied by the inverter, which is in turn supplied by the 30*
- VDC,
- > *12 A stall motor/generator. There's very little drag in the mechanicals.*
- There
- > *are losses, though. Compared to a CVT hub, these losses are acceptable.*
- That
- > *is, rideability has not been affected. I road with the AC generator on*
- chain
- > *drive for several miles the other day. I didn't generate any power but*
- losses
- > *were low.*
- >
- > *So how do I establish load sharing between the inverter and AC generator?*
- >
- > *That is, how do I excite the generator and seamlessly make use of the*

generated
> *power?*

As was said before, i dont think an induction motor is at all suitable for a stand alone generator, its ok if you have a AC supply, but if you want to power a load independantly you need an exciting voltage supply wich is not only almost powerfull enough in itself to power the load anyway but cope with corecting the power factor of the generator, ie produced curent is not in phase with voltage. its all very messy tbh.

Im sure you would be better off just using one DC motor/generator that was big enough, and use an inverter for 60hz power if needed. maybe get an old car dc dynamo? ive seen some powerfull permanent magnet motors used in washing machines, also maybe you could power the sodium lamp from DC using a converter/inverter to drive the lamp directly.

if youve got some realy strong magnets lying around maybe you could take the induction motor apart and put them in the rotor, might make an ok generator then although probably not a very good motor, as stall curent might well demagnetize the magnets.

Colin =^.=