

Want an alternator that runs at 24V with 50A, that should work for our project.

Picked up a Brushless DC Motor Speed Controller. A possibility could be to hook up a function generator to the hall sensor. Need more details about this controller.

We can take our alternator and design a controller from the ground up. Couple of stopping points would be getting the alternator to minimum speed under smallest load. Second option, we can put greater loads and see if we can speed up to a decent speed. Third, can perform vary rapid speeds and determine whether our controller can perform under these conditions.

Subprojects

1. Building an inverter circuit that takes in DC supply rails and a micro controller PWM input and successfully gives us the PWM out. Needs amplification built in there. Must be designed to spec, needs to handle to voltage and current speed.
2. Do system identification on our alternative.
3. Research on synchronous machine modeling. Maybe coming up with state variable representation of our motor. If particular size is allowed to IEEE standards.

Micro-controller identification and get the PWM on the micro controller would be a good first step.

DC-AC converter, which sends signals to DC-AC converter which is sent to our motor. Possibly DC-DC converter for the purpose of regenerative braking. For now, we can run it off DC power supplies.

Last would be integrating the field strength into our controller design. Field strength set by V/Hz , which is going be variable. At any given speed we can have more torque if needed so were not going up hills at 5MPH. Torque is proportion to current.

Can do an average model of the motor, switching model might be time consuming. If we make input variable voltage, AC. We can also build an inverter.

Ideas

1. Brushless DC
2. Permanent magnet machine with permanent drive
3. Inverter

If we want to design an Alternator from scratch, what is decent performance, speed? Torque? What do we want for power input and power output. Getting one started, get it

running. Start it with low frequency, let it lock in and go. If so, we need to design what happens: input sources, loads, design. Keep it simple.