



The Atkins Family

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Serving in Guinea-Bissau,
West Africa

October 2025

The rains are lessening
enough to let us make
our first blocks of the
season!

Electrifying Machines *by Jason*

The rainy season has inhibited our ability to move forward on some aspects of construction by preventing us from making blocks. I was able to turn my attention (in short bursts between keeping my crew busy on other things) to a pair of projects that I've been planning for some time but haven't managed to get to. The site has used the off-grid solar power system we set up for its electricity since the beginning. However, we have an assortment of small gas engines running various things, as construction sites tend to do. Several of these engines have been problematic, largely owing to how dusty the processes they're driving are. It's a constant struggle to keep filters and spark plugs changed to keep them running, and we've frequently had to work around downtime because of lack of replacement parts or fuel shortages.

I've been planning for more than a year to convert several of the most important and most problematic of these machines over to use electric motors instead of the gas engines they came with. A proper industrial electric motor has only one moving part and doesn't need to breathe, so it doesn't suck dust in along with air. The expanded solar system on my office's roof has given us some breathing room in the electricity we have available, so the time was right to convert several machines.

The first target was our second cement mixer. We have a pair of old (70's-80's era) cement mixers, one from Europe and one from the U.S. Since the arrival of the second, I've never had both of them working at the same time, most recently because of a dead gas engine. So, while one needs to be mobile and has a nice Honda engine in it, the second has now been converted to electric with the addition of a surplus electric motor and a custom jackshaft to reduce the motor's output to the correct speed. The project has been a smashing success. My guys, who I could tell were initially skeptical that an electric motor could be powerful enough, are now in love with how easy it is to start ("you just push the button!"), not having to worry about fuel, and how quiet it is!



The roto-tiller being converted to use an electric motor has saved a lot of maintenance headaches in such a dusty environment!

The second machine has historically been one of our least reliable, and for good reason. We use an old Craftsman roto-tiller to mix the bagged cement into the dirt we use to make blocks. The little bit of cement makes them rain-proof and also (importantly) termite-resistant. However, because the block making machine requires the dirt be only slightly moist, the mixing process is dusty and the gas motor was constantly down because of the dust despite several attempts to modify the air filter (cont'd)



The newly-electrified old cement mixer is lessening our dependence on gas that's sometimes not available, and much quieter to boot!

Electrifying Machines *by Jason*

(...) to make it more robust. So, another surplus electric motor, a custom mount, and upgrading the wiring to the mine behind the site where they make the blocks, and we were off to the races! The pulley I had available means it mixes a little more slowly than we were used to until I can arrange a faster replacement, but the reliability of knowing the machine is going to turn on and do its job when we push the button is amazing! And, just like the cement mixer, you can actually have a conversation near it when it's running!

First Part From CNC Lathe *by Jason*

One fun side quest this month was the first part made (actually only modified) on the computer-controlled lathe that arrived in the container early this year! The modification was a pretty simple one, just enlarging the mounting hole in a pulley, so it would have been easier to do on the manual lathe. However, with the manual lathe still in the unpowered old shop, I was forced to learn how to write my first simple program for the new lathe. After some study and a few nerve-wracking trial runs, the machine cut the part perfectly! I'm really looking forward to some downtime eventually to fully learn how to make this machine sing—it's going to be a huge addition to our capabilities!



Enlarging the bore of a pulley to fit a new motor was the first job I'd ever tackled on our new CNC lathe!

Last Shop Column Up! *by Jason*

October saw several changes on the shop building. First off, we were able to set the final steel column. This process has taken quite a while, partially because of the actual work involved and partially because the columns were all salvaged from scrap yards in Bissau, and it isn't every day that beams like we needed are available. With the column up, several sections of block wall which previously couldn't be built (needing to be tied to the column as they were laid) were now available to put up. We had used up our stock of blocks though, and watched the weather carefully hoping for a few dry days in a row. With the rains beginning to taper off, we had a short window where the ground dried out enough to be able to make a few batches of new compressed earth blocks. Those few days (before more rains came and turned everything to mud again) were enough to make several hundred more blocks, which the masons set right to work laying, finalizing the footprint of the rooms of the shop.



The final steel column of the shop is up, bond beams are being formed and poured between them, and the masons are using the first batch of blocks of this dry season to fill in the final shop walls! So exciting!



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