ENDGAME:

(INSTALLING AND RIDING AN ENDURALAST CHARGING SYSTEM)

By

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This is an unusual essay in that it is partly a ride, partly a mechanical procedure and partly a testimonial. I hope its mixed format is as much fun to read as it was to write.

I take this trip from Fargo to Minneapolis on the third Friday of each month, virtually year-around. From April (usually) through October (almost always) I take the bike. From November-March, I am forced to take the car. Each fall, for almost ten years, I have been saying to Susan that some year I will get lucky, and will get to take the bike for the November meeting. Each Spring I say to Susan that some year, I will get lucky enough to ride to the March meeting. My March hopes were drowned in the Fargo flood of 2009, and this certainly did not look like the November it would happen either. We had October weather in September, and November weather in October, and there was no reason not to expect December weather in November. But about a week ago, they began predicting 50 degrees for Friday, 20th November, and so for a week I had been salivating about the possibility of taking the bike. But there was a wrinkle. My bike was sitting on the lift in the shop with a half-installed EnDuraLast charging system. I had been in no hurry to complete the job, believing that I wouldn't be riding again until spring. So I really had to put the wood to it to get it finished.

As I cautiously minimize my lean angle on the bridged entrance ramp for east I-94, bound for Minneapolis, I cannot help but think that this is not really the way I like testing new equipment—a long trip in the early morning dark. The new equipment I am testing is an EnDuraLast charging system from Euro MotoElectrics (EME), which I just finished installing yesterday afternoon to replace the original BMW charging system on my 1983 R-65. The equipment is new; the trip is old and familiar

It is only 4:45 a.m., and it is pitch dark. And, at only 27 degrees, frost is a real fear—especially on bridge decks. I carefully keep my speed at the 55MPH limit imposed by the Fargo-Moorhead metropolitan area. My ancient and reliable jacket liner—even at 27 degrees—is too hot to leave on high, and so I turn it down a bit. Just after clearing the outer marker for Moorhead, I wick it up to 75 miles per hour—a scant 5 MPH above the posted speed--as I make the leisurely right-hand curve toward the Twin Cities, some 250 miles distant. I look at my gauges to reassure myself that all is well, but the bike seems to be running to its usual perfection, with no problem indicators of any sort. Especially important, the charge light is not on!

I had been thinking for a long time about upgrading the charging system on my bike. In some ways the decision was difficult because, for the most part, I agree with the notion that BMW engineers knew what they were doing when they designed these bikes. For that reason, and with certain notable exceptions, I tend to stick with original equipment. Besides, I have had very little trouble with my charging system, even when employing a heated jacket liner and gloves (part of my good fortune with my stock charging system may be owing to the fact that 90+% of my riding is done at tachometer indications above 5,000). Still, I drive a lot at night (or in the pre-dawn), and I wanted to add some better lighting. Plus, I drive a lot in the cold, and I wanted something that I was certain could adequately support my heated garment needs. Not coincidentally, the cold *and* dark—in other words, the two *individual* conditions when I need the most juice—frequently collide, creating a sort of mega-need for power. So it was back and forth, back and forth.

I had already made up my mind that *if* I chose to upgrade, of the two major systems available for airheads (EME & Omega), I preferred the EME system because it eliminates the brushes and slip rings, and combines and relocates the regulator and rectifier unit outside of the front cover. I had even called John at Euro MotoElectrics (EME) to ask him questions. I think part of me was hoping that I would be dissatisfied with the answers, and would, thereby, be able to talk myself out of it (I did the same thing in '03 with Jerry Heil, at Hannigan fairings. Now I own one, so you know how *that* turned out). I had the same result at EME. John was friendly, knowledgeable and easy to work with. But in the end, it was the bike itself which made-up my mind.

A few weeks ago I was riding a 600 mile there-and-back day, mostly on side roads at about 60mph (say, 4,000rpm), with gloves and jacket-liner on full power for most of the day. About 40 miles from home I sensed that my heated stuff didn't seem to feel quite as heated. But the day had grown fairly warm, so I wasn't uncomfortable. About three miles from home I had to stop for a red light, and the bike just killed. The starter produced not even that "solenoid click" and I knew the battery was dead. I also knew that the battery was not the problem. That left the charging system as the culprit. Either I had simply overloaded the charging system, in which case the system was inadequate for my needs, or the diode board was failing. Either way, my decision was made.

I pass Barnesville, with all systems go. The night sky is mostly clear of cloud-cover, but is dimmed by a kind of haze. Nearing the Pelican Rapids exit, I pass through dense-but-brief banks of fog, which necessitate temporarily scrubbing some speed. It is a cool feeling to break out of the fog and into the clear again each time. At Rothsay I notice that the fog banks are getting both denser and deeper. The headlight serves only to emphasize the limited visibility. When a semi approaches from behind, I can see my

shadow projected on the white screen in front of me, which feels kind of ethereal in a dangerous sort of way.

I ordered the new charging system the very next day. Two days later it was delivered to my door. The first thing that impressed me was the high-quality appearance of the unit. The machining was exquisite, and the weight put me in mind of the scene from Jurassic Park where the kids in the car with the lawyer find night-vision goggles. The dialogue goes something like:

Tim: "Look what I found!"

Lawyer: "Are they heavy?"

Tim: "Yeah."

Lawyer: "Then they're expensive. Put them back!"

There's something to be said for that observation.

My faced shield seems to be fogging up, and that means trouble! But when I try to clear the inside, nothing seems to happen. Finally, I take off my glove for a better feel; the problem is not steam on the inside of the visor, but frost on the outside. I am riding through ice-fog! I slow my pace to 55. The 19 miles remaining to Alexandria seem an eternity and, with my face shield raised, I am cold for the first time on this trip. Finally, I can see the city's glow against the whiteness ahead. I exit to the right, turn right into the big Holiday Station, fill the tank, and head for some breakfast. When I get into the restaurant and take off my rain suit, I can see that it is covered with frost, which melts into little puddles as I eat. Back at the bike, I dress again for the road. The feeling of warmth sweeping over my shoulders and down my arms, as I plug back into the bike, is exquisite! When I start the motor I notice that my charge light goes off, even at idle with the gloves and jacket-liner on.

I am not a natural mechanic, so I have to work very hard at it. And electrics are even more of a mystery to me, so when I got my charging system I was nervous. At first I had decided to drive or haul my bike to my friend Charlie's for help and supervision of the installation procedure. But after I got to looking at the truly excellent directions, I began to think that maybe I could do it myself. I like to read when I am eating by myself, so at every meal on my own I brought in the installation instructions and read them again. In total, before I ever laid a wrench to my bike, I had read the installation instructions cover to cover at least ten times. As I kept re-reading, I discovered that I was able to reason-out things which had originally confused me. The instructions are so well designed, and written at such a basic level that for someone who *is* mechanically inclined, I'll bet a single reading of the document will suffice.

There are several things about the installation instructions that I really liked:

- The information contained therein is *always* presented in multiple formats. For example, there is a color picture of all of the parts, laid out and numbered, followed by an explanation of each, which also corresponds to the description in the written directions. There is another color picture of that same group of parts laid-out in progression, showing how each will fit into the other when applied to the bike.
- They also contain a wiring graph listing each wire by color and part-location, and indicate which color wire it plugs into on the bike.
- When there is a choice to be made (such as where to tap into the system to find a "keyed" hot wire) the choices are clearly laid-out, and parts are included to complete the task, regardless of which option you chose.
- The instructions are divided into three parts: 1) removal of old system; 2) mechanical installation of the new system and; 3) electrical installation of the new system.

After Alexandria, several good things start to happen. The sky is getting lighter and dawn is on the way, and the fog seems to have diminished, so I am able to pick up to my former speed again. On the slightly negative side (oh, the puns, the puns) the temperature has taken a nose dive, and is down to 22 degrees. But this is why I have heated clothing, and one of the reasons I have spent the money to buy a charging system which will support that clothing. So, I just add a few watts of power to jacket-liner and gloves, and motor cozily on my way, thinking that as long as the pavement stays dry I can ride in about anything.

Removal of old system is just a matter of unbolting the regulator, the stator, rotor, diode board and the gob of attendant wiring. This part of the installation (shouldn't there be such a word as "out-stillation?") took me less than an hour. If you have ever had your rotor, stator, and/or diode board off, or even installed new brushes in your stator, you will have no problems with this part. Laid out on a bench, the resultant pile of parts looks like something a Far Side surgeon would pull out of a patient.

It is light now, and I am within the gravity field of the Twin Cities. Looks like I'll make the University at about 8:45—right on time for my 9:00 meeting. It is still cold, but the day is bright and sunny. Now that I am able to ride with my face shield down, I am completely warm again. Jacket and gloves are at about ¾ power. I am pleased and amazed that I am able to make this trip in November. Having no snow this late will shorten winter by a month's time. Being able to take a long ride this late will help me stave off the winter doldrums.

I pull into the East Bank Parking Garage and keep making lefts until I am at the exit level. It takes me a few minutes to disrobe, and another 15 to walk to my meeting at the Walter Library.

The mechanical installation of the EME EnDuraLast charging system is every bit as straightforward as the directions suggest. It involves installation of the new rotor, stator brackets and stator, and the remote mounting of the new rectifier/regulator. It is rare, in this day and age, that something can be improved while simultaneously simplified, but the EME charging upgrade appears to manage that very thing. A tangle of wiring and sundry parts, along with no fewer than eight spade connections under the front cover are replaced by a single unit with two bound-wires. In fairness, the voltage regulator and rectifier still exist, but are now grouped, and located in a different spot. But even in this remote placement it remains, in my opinion, a much simpler arrangement than the original diode board and regulator.

The directions suggested mounting the regulator/rectifier to the upper rear mount of the battery tray but, as always, gave several options. I liked the suggested option, so even though the anatomy of my bike was different than the one in the diagram, I adapted. This involved "cold-setting" (an engineer's term for "bending") the battery tray mounting tab slightly inward to clear the frame tube, and then using a longer bolt, with spacers. I also took the step of painting the outboard surface of the rectifier with heat-resistant paint so that the part exposed below the side-cover looks less conspicuous.

With my meeting over, and now being back on the bike, the fun really begins. I had a great time this morning but now it's lighter, warmer, and I have no time constraints. As I am waiting to turn onto Washington Ave., a guy in the crosswalk keeps looking at me. Finally, he comes over and says over the sound of the idling motor, "I have a K-100…" I nod and smile. The light changes. I turn left onto west Washington, cross the Mississippi again, and sweep onto I-94 west. I toy briefly with the idea of heading for Duluth, but with darkness coming on at 5:00 I don't relish four hours in complete darkness on wooded roads to get home. Instead, I stroll along at a relaxed 70mph, under the late autumn sun. I sweep left onto I-694 and cross the Mississippi once more, and make for the open prairie…

The electrical installation took me longer, but part of that was an obsessive checking and rechecking of wiring and connections. Plus the electrical installation is *a little* more complex. The first scary thing (and thus the thing in the instructions I re-read the most) was the directive to cut the electrical plug fittings off the ends of the stator and the regulator/rectifier pig-tails. I suppose the simple answer is that these parts are out-sourced from other manufacturers, from other uses, and therefore have other fittings installed. Nonetheless, when I am instructed to desecrate my brand new, $500.00

charging system, you can bet I am going to make sure of myself before I proceed. I felt a little like Fred Haise and Jim Lovell in the book *Lost Moon,* upon which the movie Apollo 13 was based, when they were instructed to shut down fuel cell three just after the explosion:

Haise: “Did I hear you right?”

Haise: “You want me to shut the reac valve on fuel cell three?!”

Houston: “That’s affirmative.”

Haise: You want me to go through the whole smash for fuel cell shut-down?”

Houston: “That’s affirmative

Fortunately, there is a picture right in the instructions, showing a wire-cutter poised to cut off the ends. So I did it. After that, it was just a few hours’ work with a cutter, stripper, crimper, and the supplied dielectric grease and Posi-lock connectors.

In the upper Midwest, in late fall and early spring, virtually all color disappears from the land. All that is left are tones. With no leaves, grass or greenery, everything is a sort of a brownish grey and, if it is clear, the blueness of the sky. This can cause it to look gloomy or, like today in the late autumn sunshine, a sort of warm, rich yellow-gold, something like the color of Jamison Irish whiskey. Because I have the time and the desire, I stop at Moon Motor Sales (BMW et al) at Monticello just to look around. Susan and I used to come here on Saturday mornings to lust after bikes before we could afford one of our own.

All that remained was my initial testing of the system. The biggest test was to confirm 14.2 volts across the battery terminals with the motor running. I called Charlie Coons for some guidance. He let me know that the multi-meter I was using was not precise enough to confirm 14.2 exactly, but that it would at least prove that the system was charging, and confirm that I was in the ball-park. With some trepidation, I started the bike. The first thing I noticed was that the charge-indicator lamp went out at idle. This was a good sign, as on my stock system the light didn’t go out until about 1,300RPM. Although it was difficult to read the analog meter, I could at least see that the system was charging at 14+. Next, I plugged in my gloves and jacket liner and turned them both on and ran up the RPM. The system kept charging at the same rate. The last test, before making the decision to take the bike to Minneapolis the next day, was my test ride. I needed to do some errands and, as the day was nice, it was the perfect chance to test my ride. Everything seemed to work fine, and I committed myself to the bike for tomorrow.

After stopping at Moon Motors, I feel tugged in a number of different directions. Because this is almost certainly the last ride of the year, I want to make it last. On the other hand, it gets dark so early that, I don't want to range too far afield. Besides, I am very much enjoying the open freeway today. So I keep motoring northwest on I-94.

People who are naturally gifted mechanics *expect* their repairs, projects or modifications to work the first time. I can almost always get it right—although often with some extra work and worry. So when something works correctly for me the first time, there is an enormous sense of satisfaction and pleasure. The EME EnDuraLast charging system is just such a product. It is a simple, elegant improvement on original equipment, and I am an example that its installation instructions are foolproof! Although I have not yet been able to test the system over the long-haul, that will come with time. In the mean time, if you need to make a charging system improvement on your BMW Airhead, or old Moto Guzzi, this is the one for you.

The afternoon is waning. There has been a real joy present in this day's ride; but it has been imbrued by the gentle melancholy of a riding season's end. I make the final westward turn directly into the setting sun, and I raise the chin bar on my helmet to shade my eyes. I have finally done something I have been waiting a decade to do: to ride to my November meeting. All I can do now is to keep hoping that some year, it will be nice enough to ride to my ***March*** *meeting.*