

November 22, 2009

For the Volt, How's Life after 40 (Miles)?

By LINDSAY BROOKE

Milford, Mich. SITTING behind the wheel of a 2011 Chevrolet Volt prototype on Wednesday, I found myself confronting what may be the greatest fear that future owners of [electric vehicles](#) will face: a battery-charge indicator showing just a few miles of remaining range.



If I were out on a desolate Interstate in a vehicle powered solely by batteries, I'd be praying to the god of electrons for a place to pull off and plug in a charging cord. But my drive is at [General Motors'](#) proving grounds here, and I'm about to experience what the Volt's vehicle line director (and my passenger), Tony Posawatz, says is the car's trump card: a gasoline-powered generator under the hood.

Like other reporters, I had already driven Volt prototypes in the battery-powered mode, and they were predictably smooth and silent. But for eventual Volt owners, a crucial — and so far unanswered — question is how the car will perform when the battery's charge is depleted and all electricity is provided by an onboard generator, driven by a gasoline engine, that has no mechanical connection to the wheels.



Will it be a slug? How annoying will the noise of the generator's engine be in an otherwise mute car?

G.M. engineers say that a fully charged Volt is capable of 40 miles of purely electric driving before the computer calls for the generator, which has an output of 53 kilowatts (about 71 horsepower), to start and sustain the battery's minimum charge level — the "extended range" operating mode.

So what is life after 40 like in the Volt? It takes a few laps of Milford's twisty, undulating 3.7-mile road course to deplete the remaining eight miles of battery charge. With the dashboard icon signaling my final mile of range, I point the Volt toward a hill and wait for the sound and feel of the generator engine's four pistons to chime in.

But I completely miss it; the engine's initial engagement is inaudible and seamless. I'm impressed. G.M. had not previously made test drives of the Volt in its extended-range mode available to reporters, but I can see that in this development car, at least, the engineers got it right.

I push the accelerator and the engine sound does not change; the "gas pedal" controls only the flow of battery power to the electric drive motor. The pedal has no connection to

the generator, which is programmed to run at constant, preset speeds. This characteristic will take some getting used to by a public accustomed to vroom-vroom feedback.

A few hundred yards later, as we snake through the track's infield section, the engine r.p.m. rises sharply. The accompanying mechanical roar reminds me of a missed shift in a manual-transmission car. For a moment the sound is disconcerting; without a tachometer, I guess that it peaked around 3,000 r.p.m.

I asked what was going on. "The system sensed that it's dipped below its state of charge and is trying to recover quickly," Mr. Posawatz said. "The charge-sustaining mode is clearly not where we want it to be yet."

Immediately the engine sound disappeared, although it was still spinning the generator. A few times later in our test, the generator behaved in similar fashion — too loud and too unruly for production — but there is time for the programmers to find solutions. Volt engineers are revising the car's control software, which will have the effect of "feathering" the transition from the nearly silent all-electric mode to the charge-sustaining mode, when the generator will be operating.

"We're designing a software set of rules, which will just require more seat time for the engineers to finish," Mr. Posawatz said. "We have nine months to work this out."

The sound of the generator running at steady highway speeds is something Volt owners, and others who appreciate the flexibility and efficiency of this type of hybrid system, may have to accept.

Unlike many electrics, including the Tesla Roadster, the Volt's electric drive has no whine. The car feels solid and planted on the road. Clicking the Sport button on the dashboard releases a bit more oomph than when in Normal mode; in terms of efficiency, there isn't much difference between the two except at peak power.

The Low mode— Chevrolet plans a flashier name for it by next fall — is unique in the electric-car world, and a useful feature. While coasting, it applies electric motor braking, then smoothly blends in the regular brakes.

Even beyond the regenerative function, Low mode offers one-pedal driving in slow speed, stop-and-go, and downhill environments. The regenerative braking, whether applied through the Volt's foot pedal or by pulling the shift lever down into Low mode, is both progressive and predictable. This is in stark contrast to the harsh, abrupt regenerative braking delivered by [BMW](#)'s all-electric Mini-E, for example.

There is minimal body lean in the tight corners. The low-rolling-resistance Goodyear tires created specifically for the Volt provide excellent grip.

Throughout my test, the prototype behaves admirably. At its current state of development, the Volt is an extremely refined vehicle.