

## Baseline Performance (EV America) Testing Trends

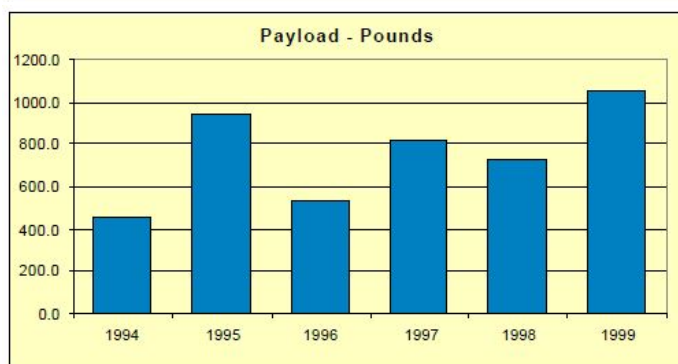
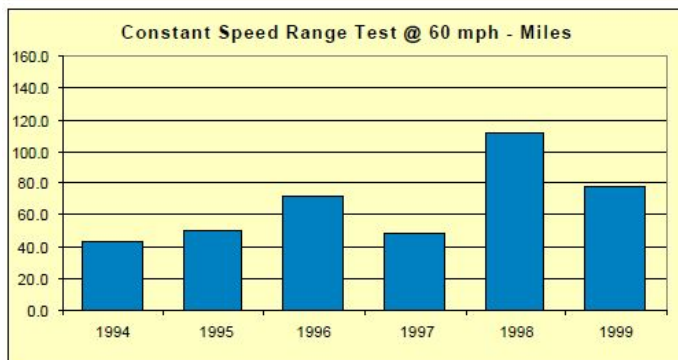
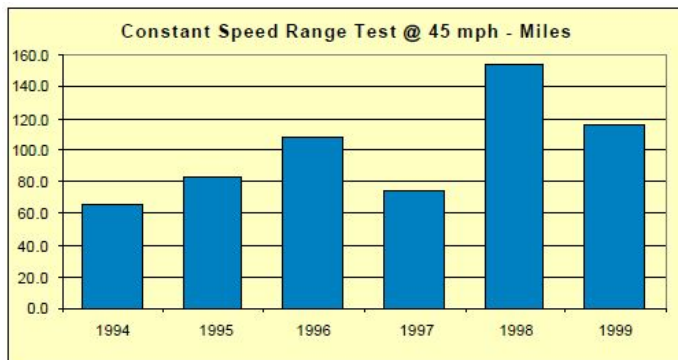
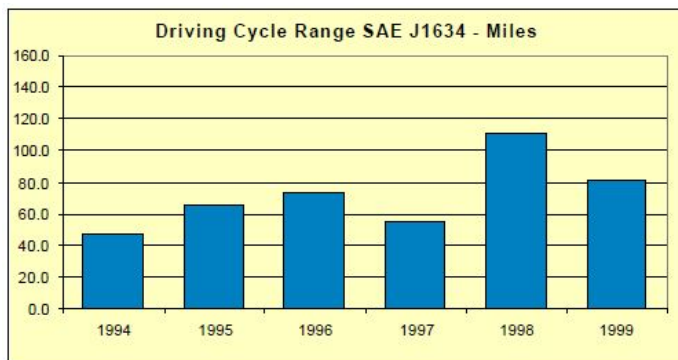
A commonly asked question is whether electric vehicle performance is improving. In an effort to answer this question, the EV America Baseline Performance electric vehicle testing results have been averaged on an annual basis and the results are presented here. The EV America Baseline Performance testing is sponsored by the U.S. Department of Energy’s Field Operations Program.

The average annual testing results presented in the graphs incorporate the testing results for the 21 vehicles that have undergone Baseline Performance testing from 1994 through 1999. The number of vehicles tested each year includes 1994 - 9 vehicles, 1995 – 3 vehicles, 1996 – 2 vehicles, 1997 – 2 vehicles, 1998 - 3 vehicle, and 1999 – 2 vehicles. The averages are the numerical means. The vehicles tested, the Baseline Performance test procedures, and a testing fact sheet for each vehicle are available from the Field Operations Program’s web page (<http://ev.inel.gov/sop>).

When comparing the latest generations of electric vehicles to the earliest generations, all three of the Range Tests (Driving Cycle, Constant Speed at 45 mph, and Constant Speed at 60 mph) exhibit an upward trend in the average miles an electric vehicle can be driven on a single charge. The highest average range results were obtained for the 1998 test vehicles. The 1998 results were driven by the Nickel-Metal-Hydrate (NiMH) battery equipped EV1. The EV1 had the highest test results ever; it went 221 miles in the 45-mph constant speed test, 161 miles in the 60-mph constant speed test, and 140 miles in the drive-cycle range test. The 1999 test vehicles had the second highest average ranges after the 1998 vehicles.

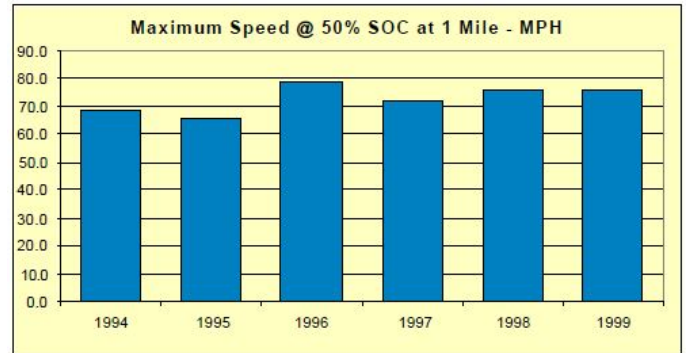
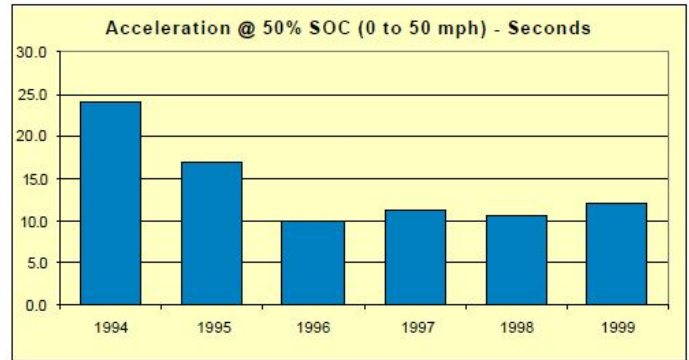
The averages for 1997 were lower than the previous 2 years, when the only vehicles tested were pickup trucks from Ford and Chevrolet. These vehicles were equipped with lead-acid batteries and they averaged 55 miles for the drive-cycle test, 74 miles in the 45-mph constant speed test, and 48 miles in the 60-mph constant speed test. In addition to the lead acid batteries, the 1997 decrease can be partially attributed to the type of vehicles tested during 1997.

Both of the 1997 test vehicles were pickups, intended for use in utility types of fleet applications, with an average



payload of 825 pounds. A single vehicle, the Baker pickup and its 1,719- pound payload, drove the payload average for the 1995 vehicles, while the other two 1995 test vehicles had an average payload of 546 pounds. The two 1996 test vehicles had an average payload of 533 pounds. One of these, the EV1, has a payload of 440 pounds. However, the EV1 is a sports coupe that clearly is not intended as a utility work vehicle with its light payload.

The average annual acceleration tests performed when each vehicle's battery pack is at a 50% state-of-charge also shows an overall increase in vehicle performance when comparing the nine vehicles tested from 1996 through 1999 (10.9 seconds), to the twelve vehicles tested during 1994 and 1995 (22.2 seconds). The quickest vehicle is the 1999 NiMH EV1, with a 0 to 50-mph acceleration time of 6.5 seconds. At 100% state-of-charge (not shown), both the NiMH EV1 and the lead acid EV1 accelerated from 0 to 50 mph in 6.3. The average maximum-speed test results shows a slight upward trend, especially when comparing the 1994 and 1995 averages to the 1996 through 1999 averages. Both the NiMH EV1 and lead-acid EV1 averaged 80 mph.



The graphs provide a brief snapshot of several performance characteristics. These testing parameters suggest that the Baseline Performance tested electric vehicles continue to exhibit annual improvements in their performance capabilities. In addition, other factors such as the warranties offered by the original equipment manufacturers (OEM) support the belief that overall vehicle performance continues to improve. The OEMs are now warranting their vehicles for 3 years and 36,000 miles, with most of the vehicles only being available as 3-year leases. During the next few years, the Field Operations Program will continue to test electric vehicles with advanced battery technologies as well as other advanced technology vehicles such as hybrid vehicles. To obtain additional Baseline Performance vehicle testing results, including information on newly tested vehicles, visit the Field Operations Program's web page (<http://ev.inel.gov/sop>).

For further information, please contact:

U. S. Department of Energy  
DOE Field Operations Program  
Web page: <http://ev.inel.gov/sop>  
National Alternative Fuels Hotline  
<http://www.afdc/doe.gov>

