

Reliability

Hybrids are a new technology with minimal long term data available about reliability and cost and frequency of repairs. This is especially the case with respect to the new hybrid components. Vehicle manufacturers have attempted to address these concerns by offering long-term, high kilometer warranties on hybrid components but questions remain about issues such as battery lifetime beyond the warranty period.

2001 Toyota Prius

The detailed maintenance/repair records for the 64 Toyota Prius in the BC Government Fleet were analyzed and the following conclusions can be made from this data:

- The average maintenance cost for the 64 vehicles was \$1268. Based on the 2.57 million kilometres (Average of 40,293 km per vehicle) traveled, the maintenance costs were an average of \$.0336 per kilometre. Note: Two vehicles had charges for accident repairs totaling \$10,630 and \$7,097. These costs were removed from the average maintenance/repair costs to more fairly represent typical maintenance costs.
- The remainder of the costs were related to normal type costs for items such as winter tires, preventative maintenance, and windshield repairs.
- There were no costs identified that were specific to the hybrid components of the vehicles.

A review of the detailed maintenance records (pdf) for Andrew Grant's 2001 Prius Yellow Taxi in Vancouver, which traveled more than 332,000 km, also shows that no hybrid related repairs were required over this usage period. The vehicle simply required the regular maintenance recommended by Toyota.

Mr. Grant's 2004 Prius had a problem with its fly-by-wire throttle, which was covered under the vehicle's warranty.

Maintenance Costs

The City of Toronto Fleet Services Division compared the preventative and non-scheduled maintenance costs for the Honda Insight and two Toyota Prius to four 2000 Chevrolet Cavaliers. The Hybrids were found to have higher preventative maintenance costs but lower non-scheduled maintenance costs for their Cavaliers. Read their detailed report "Greening Our Fleet" Technology Testing Report. (pdf)

The report states that the hybrids required a similar amount of preventative maintenance as the Cavalier and that the source of the higher costs was taking the hybrids to a certified dealer rather than having staff perform the maintenance in house. Vehicle Type Preventative Maintenance (Average \$/100km) % Change Non-Scheduled Maintenance (Average \$/100km) % Change Comparison Vehicle- Chevrolet Cavalier*

\$1.76

\$2.69

2001 Honda Insight

\$3.01

+71%

\$1.78

-34%

2001 Toyota Prius

\$2.21

+26%

\$0.19

-93%

*Average of 4 Chevrolet Cavaliers

Prius owners that are using the vehicles as high mileage taxis have commented that their brake replacement costs are much less due to the regenerative braking system. One taxi operator in Victoria, BC reported that they had not replaced their rear brakes after 435,000 kilometres of use. Longer term there is a possibility that the gasoline engine in a hybrid may have a longer repair free life since, in some models, hours of use are less than in a comparable conventional vehicle.

Battery Life

For many consumers the life and replacement cost of the hybrid battery pack has been of concern. Toyota has issued the following statement about battery life:

"The Prius battery (and the battery-power management system) has been designed to maximize battery life. In part this is done by keeping the battery at an optimum charge level - never fully draining it and never fully recharging it. As a result, the Prius battery leads a pretty easy life. We have lab data showing the equivalent of 180,000 miles with no deterioration and expect it to last the life of the vehicle. We also expect battery technology to continue to improve: the second-generation model battery is 15% smaller, 25% lighter, and has 35% more specific power than the first. This is true of price as well. Between the 2003 and 2004 models, service battery costs came down 36% and we expect them to continue to drop so that by the time replacements may be needed it won't be a much of an issue. Since the car went on sale in 2000, Toyota has not replaced a single battery for wear and tear."

In the future if a battery needs replacement out of warranty, it may be replaced either with a new battery pack or with a reconditioned/overhauled unit. Given that each battery pack consists of individual cells it may be possible to just replace these. See photo below of battery cells in the Prius battery.

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