



OBSERVATIONS

Dennis DesRosiers

Thoughts on Fuel Efficiency

A common misconception among new vehicle consumers is that today's cars are less fuel efficient than their 1980s and 1990s-era counterparts. An adjunct to this belief is that vehicle manufacturers have traded fuel efficiency (FE) for performance, choosing to apply new technologies towards the advancement of horsepower instead of resource conservation. While it would be reckless to say something like, "Nothing could be further from the truth," it's tough to argue with certain statements when viewed in conjunction with hard numbers:

Statement #1: The cars and trucks for sale in 2007 are generally more fuel efficient than equivalent vehicles from the mid-1990s.

Statement #2: Automakers have increased power levels considerably, but fuel consumption has been kept on a short leash. In most cases, today's vehicles generate better FE numbers than less powerful vehicles from the last decade.

Statement #3: Whether or not a technology is applied in furtherance of performance or FE, it still has a generally positive effect on FE.

Statement #4: As with all areas of life in a liberal democracy, personal responsibility plays a role in vehicle FE. A car is ultimately as fuel efficient as its driver allows, so it is rather interesting that no wholehearted campaigns have been

undertaken to educate people about the FE benefits of a modified driving style. Furthermore, governments at all levels have a role to play in the streamlining of infrastructure to create a more FE-friendly driving environment.

For the purposes of this article, we compared the 1995 and 2006 versions of ten different vehicles. If an optional engine existed in either timeframe, that data was also thrown into the mix. Some of the vehicles we selected were/are top-sellers while others are more limited in their appeal, but all were chosen because they variously represent the ongoing march of progress being made at all strata of the automotive industry.

Among the ten we compared, unlikely heroes emerged with some startling results. For example, over the past decade the base model Chevrolet Suburban has become 47 percent more powerful (295 hp in 2005 vs. 200 hp in 1995), but GM has also managed to improve its FE by 12.9 percent.

Other major success stories include the VW Golf Diesel/TDI (11.1% improvement in hp; 14.8% improvement in FE), Honda Accord V6 (43.5% improvement in hp, 10.5% improvement in FE), and Chevrolet Cavalier Z24/Chevrolet Cobalt SS (36.7% improvement in hp, 10.2% improvement in FE). The 2006

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Horsepower vs. Fuel Economy

Year	Make	Model	Trim	Engine Type	Engine Size	Horsepower	Horsepower % Change	City FE	Highway FE	Average FE	Average FE % Change
1995	Chevrolet	Cavalier	base	I4	2.2L	120		10.1	6.1	8.3	
2006	Chevrolet	Cobalt	base	I4	2.2L	145	20.8%	9.5	6.1	8.0	-4.0%
1995	Chevrolet	Cavalier	Z24	I4	2.3L	150		12.0	7.2	9.8	
2006	Chevrolet	Cobalt	SS	I4	2.0L	205	36.7%	10.1	7.3	8.8	-10.2%
1995	Honda	Civic	base	I4	1.5L	102		6.6	5.0	5.9	
2006	Honda	Civic	base	I4	1.8L	140	37.3%	7.8	5.7	6.9	16.6%
1995	Honda	Civic	Si	I4	1.6L	125		8.3	6.1	7.3	
2006	Honda	Civic	Si	I4	2.0L	197	57.6%	10.2	6.8	8.7	18.6%
1995	Chevrolet	Suburban	base	V8	5.7L	200		18.1	12.7	15.7	
2006	Chevrolet	Suburban	base	V8	5.3L	295	47.5%	15.9	10.9	13.7	-12.9%
1995	Lexus	LS400	base	V8	4.0L	260		12.8	9.1	11.1	
2006	Lexus	LS430	base	V8	4.3L	278	6.9%	12.8	8.5	10.9	-2.4%
1995	Nissan	Pathfinder	base	V6	3.0L	153		15.9	12.0	14.1	
2006	Nissan	Pathfinder	base	V6	4.0L	270	76.5%	15.7	10.6	13.4	-5.2%
1995	Honda	Accord	base	I4	2.2L	130		9.5	6.9	8.3	
2006	Honda	Accord	base	I4	2.4L	166	27.7%	9.1	6.4	7.9	-5.3%
1995	Honda	Accord	LX-V6	V6	2.7L	170		12.5	8.8	10.8	
2006	Honda	Accord	EX-V6	V6	3.0L	244	43.5%	11.5	7.5	9.7	-10.5%
1995	VW	Golf	GL Diesel	I4	1.9L	90		7.2	5.5	6.4	
2006	VW	Golf	TDI	I4	1.9L	100	11.1%	6.2	4.6	5.5	-14.8%
1995	Chevrolet	Corvette	base	V8	5.7L	300		14.0	8.6	11.6	
2006	Chevrolet	Corvette	base	V8	6.0L	400	33.3%	13.2	7.6	10.7	-7.7%
1995	Chevrolet	Corvette	ZR1	V8	5.7L	405		14.8	8.7	12.1	
2006	Chevrolet	Corvette	Z06	V8	7.0L	505	24.7%	14.3	8.2	11.6	-4.1%
1995	Jeep	Grand Cherokee	base	I6	4.0L	190		16.0	11.0	13.8	
2006	Jeep	Grand Cherokee	base	V6	3.7L	210	10.5%	14.2	10.3	12.4	-9.5%
1995	Jeep	Grand Cherokee	Limited	V8	5.2L	260		17.2	12.0	14.9	
2006	Jeep	Grand Cherokee	Limited	V8	5.7L	330	26.9%	16.5	11.2	14.1	-5.0%
1995	Mercedes-Benz	S500	base	V8	5.0L	315		15.9	11.2	13.8	
2006	Mercedes-Benz	S500	base	V8	5.0L	302	-4.1%	14.7	9.1	12.2	-11.6%
1995	Mercedes-Benz	S600	base	V12	6.0L	389		18.7	13.2	16.2	
2006	Mercedes-Benz	S65 AMG	base	V12	6.0L	604	55.3%	18.5	11.1	15.2	-6.5%

Source: DesRosiers Automotive Consultants Inc.

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Nissan Pathfinder is 76.5 percent more powerful than its 1995 forebear, but it manages to consume fuel at a rate 5.2 percent slower than the older SUV.

Higher end cars have also shown marked improvements in power and efficiency. The base 2006 Chevrolet Corvette is 33.3 percent more powerful than the base 1995 Corvette, and it is 7.7 percent more fuel efficient. The ultra-high-performance 2006 Corvette Z06 is also more efficient (and significantly more powerful) than the 1995 Corvette ZR-1. Even no-compromise luxury machines have

posted gains, with outrageously-powerful V12-motivated cars such as the Mercedes-Benz S65 AMG posting better average gas mileage than decade-old equivalent products.

Clearly, cake is being had and eaten at all levels of the new vehicle market.

These advances and improvements have come courtesy of a slew of new technologies and refinements of existing designs. I believe this is a testament to the Japanese principle of Kaizen - continuous

improvement at all levels - that products fundamentally similar to those of the last decade have reached a higher state of evolution without any sacrifice whatsoever in terms of usability or environmental friendliness. Much of the technical wizardry implemented in recent years (e.g. variable valve timing, 6-speed automatic transmissions, direct fuel injection, etc.) has quantifiable performance benefits, but each development also contributes a small amount of FE savings. Through incremental improvements, we've arrived at a situation where a 400

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horsepower Corvette gets better highway gas mileage than a 1995 Honda Accord.

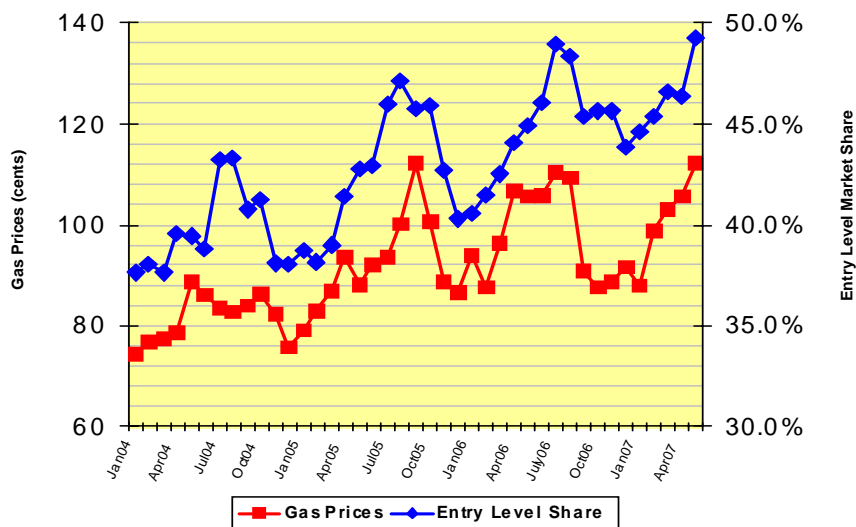
Of the statements made near the top of this article, I've addressed one-through-three. Statement four is a bit trickier, since it relies more on gut instinct and anecdotal evidence. Still, the idea of personal responsibility in the FE debate is a concept worth exploring.

As with any complicated system, the user is often the weak link. This is true in the realm of automobile accidents, and it holds equally with regard to

Mild hypermilers employ nothing out of the ordinary; momentum conservation and the avoidance of needless acceleration are the discipline's pillar concepts

vehicle fuel efficiency. Aside from shopworn (but nonetheless important) fundamentals like maintaining proper tire pressure and being frugal with the air conditioning, there are a number of skills normal people can add to their driving portfolios that can potentially reap major mileage rewards. A dedicated fringe of mileage enthusiasts - self-styled "hypermilers" - have proven that the adoption of common-sense-based driving techniques can yield FE results approaching twice the manufacturers' mileage

Entry Level Market Share vs. Gas Prices Jan. 2004 – May. 2007



Source: MJ Ervin & Associates, DesRosiers Automotive Consultants Inc.

claims. If done casually (i.e., without the all-consuming devotion common to fanatics of any stripe), regular drivers can achieve FE improvements anywhere between 15 and 30 percent.

How are these incredible results achieved? Mild hypermilers employ nothing out of the ordinary; momentum conservation and the avoidance of needless acceleration are the discipline's pillar concepts. By increasing one's following distance on the highway and avoiding the constant slow-down/speed-up exercise that virtually defines big-city freeway commuting, you can travel the same distance at the same speed while using less fuel.

Hypermilers also heed the dying words of Charlemagne: "Let my

armies be the rocks and the trees and the birds in the sky."

Mileage enthusiasts take full advantage of natural terrain features, gaining "free" momentum on downgrades and carefully bleeding off speed on uphill portions. Could these basics not be taught in driving schools? Teenage drivers are already taught to internalize a number of good habits, like placing a hand over the horn while negotiating tricky situations. Integrating the basics of fuel-efficient driving seems like an obvious addition to any driving curriculum.

What's needed at all levels of government is a wholesale review of laws, policies, and future plans related to our transportation infrastructure. Thousands of litres of gasoline could be saved by reconsidering

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ideas that have been grandfathered into the current decade solely through the force of historical inertia. If some of the principles of Kaizen were applied to our driving culture - if the things we take for granted were re-examined and improved upon - the average driver of the average vehicle could lower his average fuel usage without knowing it. Just as the automakers have brought about major FE improvements through a potent cocktail of countless incremental changes, so can government.

In laboratory tests conducted in the mid-1980s (when average vehicles were far less aerodynamic than modern offerings), front license plates were found to account for 0.25 percent of a car's total aerodynamic drag. Given the greater aerodynamic efficiency of today's vehicles, it is reasonable to assume that front license plates may have a greater (though still small) effect on fuel economy in 2007 than in 1985. The majority of Canadian provinces already make-do with a single rear plate, and it is our belief that resistance among the holdouts in the halls of government and the ranks of law enforcement is unfounded. If lawmakers in British Columbia, Manitoba, New Brunswick, and Ontario take the step of eliminating the front plate requirement, drivers in those provinces will realize an

incremental increase in FE - perhaps not measurable by the individual, but potentially quantifiable at the macro level.

In the United Kingdom, there exists an openness to yield signs and roundabouts (traffic circles), whereas Canadians know only the stop sign. It takes far more energy to create motion than maintain it, so it makes a great deal of sense to limit the number of situations where a car is required to come to a complete halt. At present, the stop sign is

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used as an all-purpose traffic calmer, but we think that diligent placement of yield signs and roundabouts could have a beneficial effect on FE and traffic flow without compromising motorist or pedestrian safety.

Vehicle circulation in the downtown cores of cities across Canada and the US is often brought to a standstill because cars waiting to turn must break through heavy pedestrian traffic. Anyone who has attempted to

make a right turn at Yonge and Front, Peel and St. Catherine, or Robson and Burrard can relate to the "one car per light" phenomenon that often crops up during the morning, lunch, or evening rushes. A few strategically-placed arch-style footbridges could speed traffic and eliminate a few moments of wasteful idling.

I am not an urban planner, an engineer, a scientist, or a mileage zealot. The above ideas arrived at my doorstep through the general zeitgeist, not through some special understanding of traffic science. If these are the suggestions of a man trained in business analysis - suggestions that have been proven effective in laboratory testing and real-world implementation - imagine what the boffins at Transport Canada and Natural Resources Canada could put together if they applied the basics of Kaizen. Real-world programs with real-world benefits might emerge - unlike the toothless and expensive feebate debacle. Parliament Hill is working plenty hard right now, but it's about time our leaders started working smart. **DAR**