

Reprinted from **Real Answers**

---

The Mathematics  
of Fuel Economy

Special Edition Four

real QUESTIONS  
real ANSWERS

---

**BRIDGESTONE**

***BridgestoneTrucktires.com***

1-800-543-7522

**Percentage fuel savings DOES NOT equal percentage mpg improvement**

PERCENT FUEL SAVINGS	PERCENT MPG IMPROVEMENT
1.00	1.01
2.00	2.04
3.00	3.09
4.00	4.17
5.00	5.26
6.00	6.38
7.00	7.53
8.00	8.70
9.00	9.89
10.00	11.11
11.00	12.36
12.00	13.64
13.00	14.94
14.00	16.28
15.00	17.65
16.00	19.05
17.00	20.48
18.00	21.95
19.00	23.46
20.00	25.00
21.00	26.58
22.00	28.21
23.00	29.87
24.00	31.58
25.00	33.33

For any given percentage improvement in mpg, the fuel savings percentage is less.

# The Mathematics of Fuel Economy

In addition, as The Technology & Maintenance Council points out, when you are calculating miles per gallon, or comparing data with someone else, “even the smallest oversight can result in large errors.”

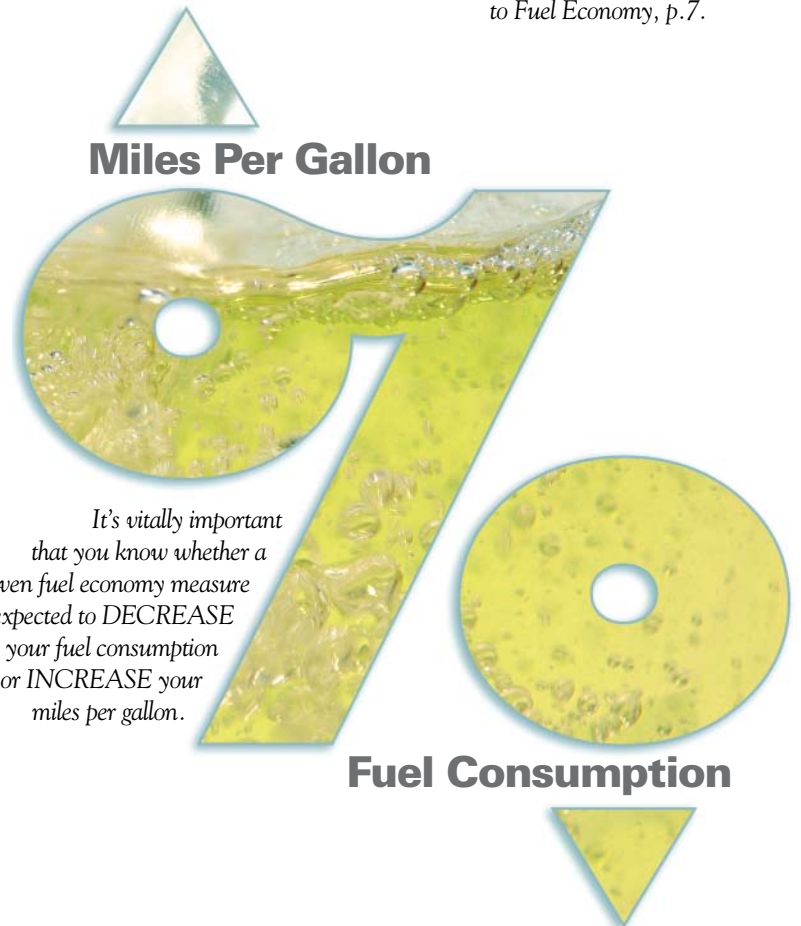
TMC continues, “a five-percent initial-fill fueling recording error of a Class 8 truck can invalidate consumption comparisons between units *for a year or more.*” (Italics ours.) They’re talking about a one-time error of just five percent!

And, TMC goes on to list a dozen other sources of error that can render fuel economy calculations worthless.\*

Because of the way the mathematics work, it’s vitally important that you know whether a given fuel economy measure is expected to **DECREASE** your fuel consumption or **INCREASE** your miles per gallon.

For example, about 18 percent increase in miles per gallon represents only about 15 percent savings in fuel. The bigger the numbers, the bigger the difference.

\*The Fleet Manager’s Guide to Fuel Economy, p.7.



It’s vitally important that you know whether a given fuel economy measure is expected to **DECREASE** your fuel consumption or **INCREASE** your miles per gallon.

## Fuel Savings & MPG Changes

ORIGINAL MPG	IMPROVED MPG					
	5.5	6.0	6.5	7.0	7.5	8.0
	% IMPROVEMENT IN MPG					
GALLONS SAVED IF 100,000 MILES PER YEAR						
% FUEL SAVED						
5.0	10%	20%	30%	40%	50%	60%
	1,818	3,333	4,615	5,714	6,667	7,500
	9.1%	16.7%	23.1%	28.6%	33.3%	37.5%
5.5		9%	18%	27%	36%	45%
		1,515	2,797	3,896	4,848	5,682
		8.3%	15.4%	21.4%	26.7%	31.3%
6.0			8%	17%	25%	33%
			1,282	2,381	3,333	4,167
			7.7%	14.3%	20.0%	25.0%
6.5				8%	15%	23%
				1,099	2,051	2,885
				7.1%	13.3%	18.8%
7.0					7%	14%
					952	1,786
					6.7%	12.5%
7.5						7%
						833
						6.3%

Some sample mpg changes, the amount of fuel saved over one year (assuming 100,000 miles traveled), and percentage changes.

## Who benefits most?

Fleets with the most to gain from improving their fuel economy are the ones who use the most fuel.

If you use \$1 million worth of fuel each year, and save just one percent, that's \$10,000. If you use \$100,000 worth of fuel, that same one percent saves you \$1,000.

The good news is, the worse your fuel economy, the more you have to gain by improving it. For

example, let's compare two fleets, one with relatively poor fuel economy (5 mpg) and one with relatively good fuel economy (7 mpg).

If both fleets make just a one percent improvement and run about 100,000 miles per year on each tractor, the fleet with the poorer fuel economy will save 200 gallons per year per tractor, while the one with better initial fuel economy will save 143 gallons per year per tractor.

So, if you use a lot of fuel and have relatively poor fuel economy, you have much to gain by improving it. **FA**

## Sample Fuel Economy Calculations

MILES PER YEAR	100,000	100,000	100,000	100,000	100,000	100,000	100,000
MILES PER GALLON	5.0	5.5	6.0	6.5	7.0	7.5	8.0
GALLONS PER YEAR	20,000	18,182	16,667	15,385	14,286	13,333	12,500
1% Fuel Savings	<b>200</b>	182	167	154	<b>143</b>	133	125
2% Fuel Savings	400	364	333	308	286	267	250
5% Fuel Savings	1,000	909	833	769	714	667	625
7% Fuel Savings	1,400	1,273	1,167	1,077	1,000	933	875
10% Fuel Savings	2,000	1,818	1,667	1,538	1,429	1,333	1,250