

**November 2012**  
MANUFACTURER & VEHICLE RANKINGS



# CarMD® VEHICLE HEALTH INDEX™ :

## 2012 MANUFACTURER & VEHICLE RANKINGS

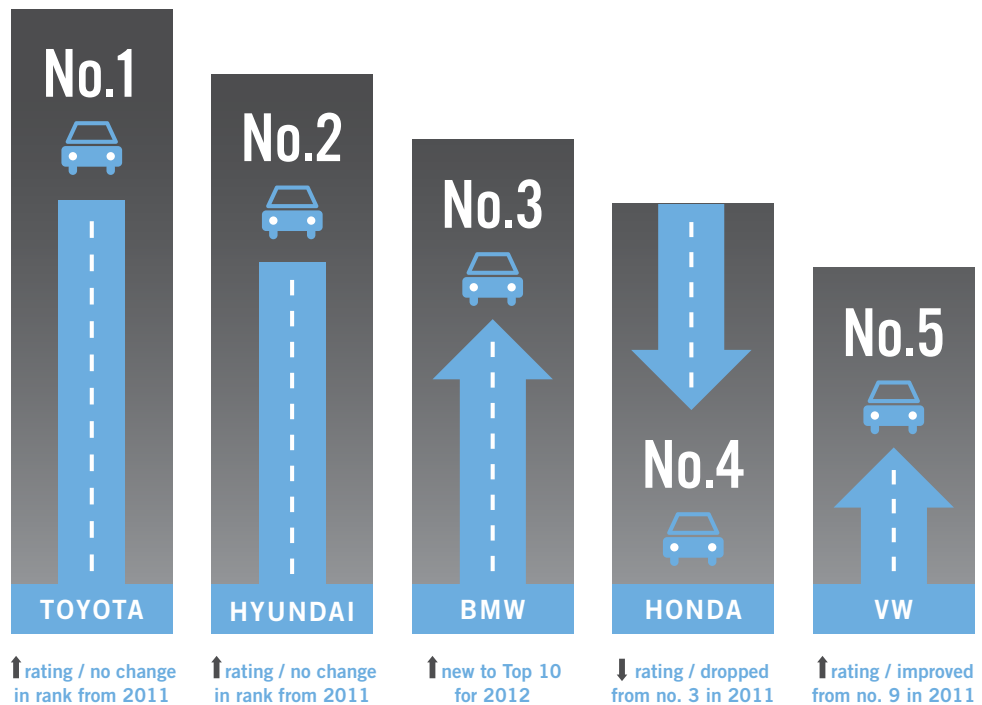
CarMD.com Corporation is pleased to release its second annual CarMD® Vehicle Health Index™ Manufacturer & Vehicle Reliability Rankings – the only Index to offer an annual ranking of manufacturers and vehicles using statistically-based “check engine”-related failures and repair costs. As the first ever year-over-year comparison of makes and models, CarMD provides drivers a transparent view into the reliability of their own vehicle, or one they intend to purchase. The rankings are based on a combined average rating of fewest “check engine”-related problems and lowest repair costs. This Index also ranks the top 100 vehicles overall, top vehicles by category and lists the most common repair problems by make. CarMD currently has 3 million verified repairs in its proprietary database that apply to approximately 200 million on-board diagnostic (OBD2) vehicles on the road in the U.S, including an estimated 136 million Model Year 2002-2012 vehicles, from which the 2012 CarMD® Vehicle Health Index Manufacturer and Vehicle Rankings were procured.

“Sourced directly from CarMD’s growing network of thousands of certified automotive technicians, this ranking of top manufacturers and vehicles takes an unbiased unprecedented approach to vehicle reliability, using total vehicle population and real-life repairs,” said Art Jacobsen, vice president, CarMD. “Unlike any other ranking or award, CarMD’s Index transcends the new car ‘honeymoon’ period to help car shoppers get a true picture of what to expect as vehicles age. Our index is a data driven index not a consumer opinion or survey. Our data comes from the best possible sources—the vehicles themselves and the certified technicians who work on these cars every day.”













### SUMMARY:

#### Top Manufacturers

For the second consecutive year, Toyota is the no. 1 manufacturer in the U.S., based on a ranking derived from the fewest percentage of “check engine”-related problems and lowest average repair cost. Toyota earns the top spot with the lowest Index rating of 0.58, which is an improvement from its 0.67 rating in 2011 (the lower the rating, the better the overall ranking). Rounding out the top five vehicle manufacturers of 2012 are No. 2 Hyundai, No. 3 BMW, No. 4 Honda and No. 5 Volkswagen. Domestic manufacturers dropped out of the top five, with Ford moving from no. 4 to no. 9 and GM dropping from no. 5 to no. 8.



## TOP 10 MANUFACTURERS – 2012

RANK	MANUFACTURER	% CarMD Red Light Reports / Problems Seen	Average Repair Cost (Parts & Labor)	Overall CarMD 2012 Index Rating (2011 Index Rating Score Shown in Parentheses)	Year-Over-Year Comparison  Improvement  Decline
1	TOYOTA	6.77%	\$490.72	0.58 (0.67)	 rating / no change in rank
2	HYUNDAI	2.38%	\$271.86	0.67 (0.85)	 rating / no change in rank
3	BMW	1.38%	\$502.48	0.84 (DNQ*)	 new to Top 10
4	HONDA	7.89%	\$466.77	0.98 (0.89)	rating / dropped from no. 3 in 2011 
5	VOLKSWAGEN	2.34%	\$392.00	0.99 (1.38)	 rating / improved from no. 9 in 2011
6	NISSAN	6.21%	\$366.53	1.00 (1.04)	 rating / improved from no. 7 in 2011
7	KIA	2.18%	\$320.08	1.04 (1.16)	 rating / improved from no. 8 in 2011
8	General Motors	29.27%	\$290.50	1.12 (0.97)	rating / dropped from no. 5 in 2011 
9	FORD	19.18%	\$340.96	1.17 (0.95)	rating / dropped from no. 4 in 2011 
10	CHRYSLER	15.63%	\$287.93	1.23 (1.97)	 rating / no change in rank

The lower the Index rating, the higher reliability ranking.

*(Top 10 vehicle manufacturers based on model year 2002-2012 vehicles needing repairs between Sept. 1, 2011 and Sept. 1, 2012, and determined by the manufacturers whose vehicles had the fewest percentage of CarMD repair incidents combined with the lowest cost per repair, per number of registered vehicles on the road. Sources: CarMD.com Corp., with vehicle population data provided by R.L. Polk. \* DNQ means there were insufficient data records to include manufacturer in rankings.)*

## HIGHLIGHTS: TOP 10 MANUFACTURERS

Overall, most of today's vehicle manufacturers continue to improve reliability.

- Toyota and Hyundai each held their spots as the top two ranked manufacturers, with Toyota's Index rating score improving from 0.65 to a record low 0.58, helped by lower repair incidents.
- Hyundai's score improved from 0.85 to 0.67, which is the exact score that earned Toyota the no. 1-ranked manufacturer spot in 2011.
- Honda, Volkswagen, Nissan, Kia and Chrysler also earned better overall index rating scores in 2012.



### TOYOTA RANKED No.1

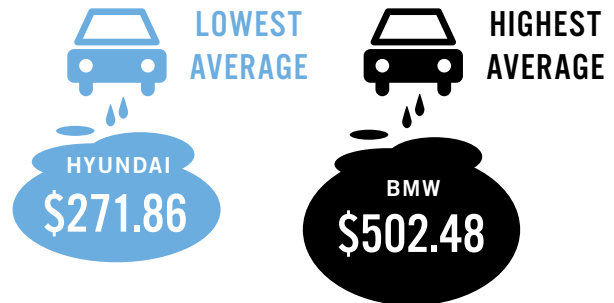
Based on Fewest  
"Check Engine"  
Failures & Lowest  
Repair Costs

Hyundai had the lowest average repair cost among the top 10-ranked manufacturers (\$271.86).

The manufacturer with the highest overall repair cost was BMW (\$502.48); however BMW had a very low repair incidence rate, contributing to its no. 3 ranking among the top vehicle manufacturers for 2012.

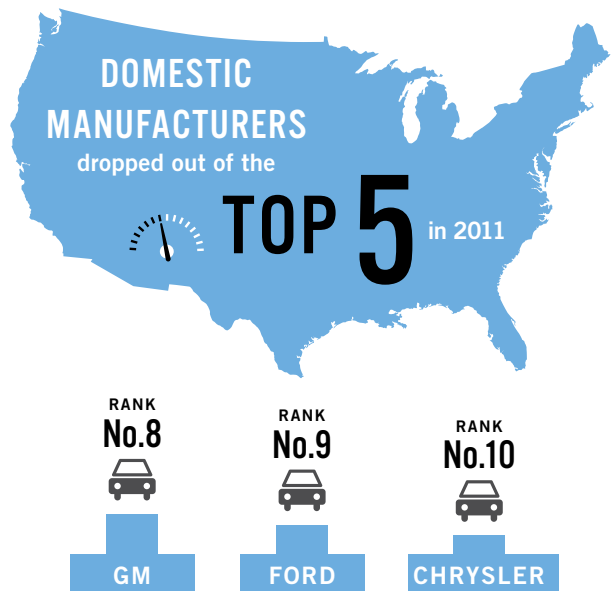
No. 1-ranked Toyota's average repair cost rose 17.5% from \$417.37 to \$490.72, which was offset by a decrease in repair incidents.

### AVERAGE REPAIR COST



Domestic manufacturers dropped out of the top 5 with Ford moving from no. 4 to no. 9 and GM decreasing from no. 5 to no. 8 in the overall manufacturer rankings.

- Both GM and Ford experienced a slight drop in repair incidents, but an increase in average repair costs. GM's average cost for "check engine" repairs rose from \$245.47 in 2011 to \$290.50 in 2012. Ford's average repair costs increased from \$240.68 to \$340.96.
- However, several domestic vehicles stood out. The 2008 Ford Taurus ranked no. 1 in the Sedan category and no. 2 overall, beating out historical quality stalwarts Camry and Accord. The 2011 Chevrolet Impala ranked no. 9 overall. And Ford trucks swept all three of the top spots in the Truck category.

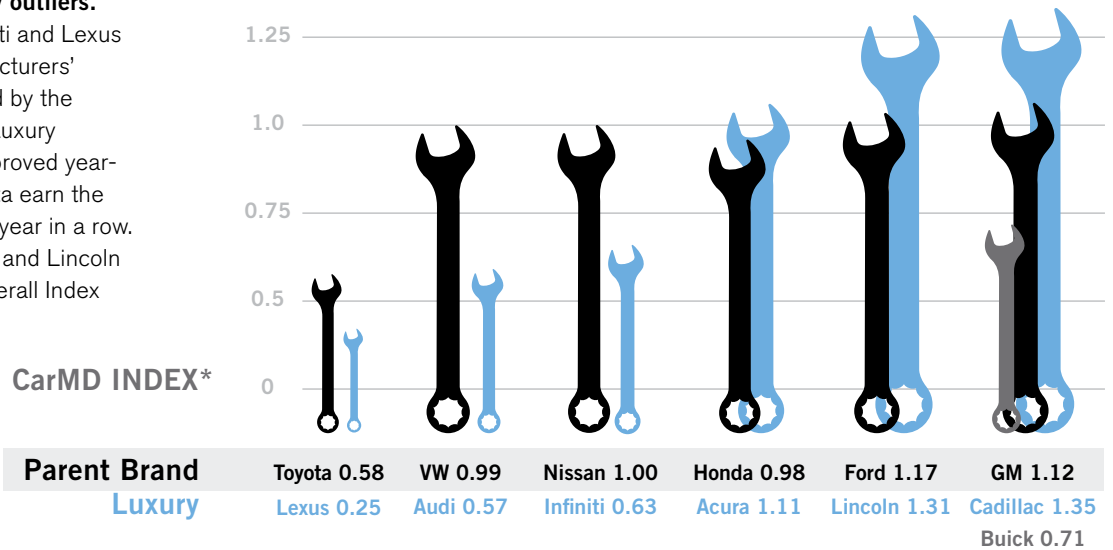


## HIGHLIGHTS: TOP 10 MANUFACTURERS

**In 2011 luxury brands generally hurt their parent company's score, with Buick and Infiniti the only outliers.**

However, Audi, Buick, Infiniti and Lexus helped their parent manufacturers' overall scores this year. Led by the 2007 ES 350 (first in the Luxury category), Lexus' rating improved year-over-year, and helped Toyota earn the top ranking for the second year in a row. Conversely, Acura, Cadillac and Lincoln hurt their parent brand's overall Index rating in 2012.

### PARENT BRANDS vs. LUXURY BRANDS



\*the lower the rating number, the higher the ranking

## SUMMARY TOP RANKED VEHICLES – 2012

**Sourcing the largest database of problems and repairs of vehicles on the road today,**

CarMD is able to provide fact-based transparency into a wide range of vehicles, including a combination of new and used cars and trucks. CarMD provides the only Index that allows consumers to statistically analyze how vehicles age, and see real-life data on trends related to repair frequency and costs for a decade of makes and models. New to the top 100 list this year are BMW, Dodge, Lexus, Mazda, Mercedes-Benz, Mini and Pontiac.

Four sedans, two compacts, two wagons, one SUV and a luxury vehicle make up this year's top 10 list, with Toyota leading the pack with three vehicles (two Toyotas and one Lexus), including the no. 1 ranked 2010 Toyota Corolla. Subaru and Honda each have two vehicles in the top 10, followed by Ford, Hyundai and Chevrolet with one each. Seven of the top 10 vehicles are not only new to the top 10 list this year, but also new to the top 100 as well.

The CarMD® Vehicle Health Index™ also ranks the top three vehicles by category: Compact, Minivan, Sedan, Full-Sized SUV, Wagon/Crossover SUV, Truck and Luxury. This year marks the first time that a manufacturer earned all three of the top spots in their respective category, and it happened not once – but twice.

# SUMMARY TOP RANKED VEHICLES – 2012

## TOP 10 MOST RELIABLE VEHICLES

RANK	YEAR	BRAND/MAKE	MODEL	Overall CarMD 2012 Index Rating Score	Year-Over-Year Comparison
				(2011 Index Rating Score Shown in Parenthesis)	Improvement  Decline
1	2010	Toyota	Corolla	0.080	New to Top Ranked Vehicles
2	2008	Ford	Taurus	0.083	New to Top Ranked Vehicles
3	2008	Toyota	Yaris	0.087 (0.163)	rating / improved from no. 32 in 2011
4	2009	Honda	Pilot	0.093 (0.121)	rating / improved from no. 8 in 2011
5	2009	Honda	Accord	0.099 (0.108)	rating / dropped from no. 4 in 2011
6	2010	Subaru	Forester	0.099	New to Top Ranked Vehicles
7	2007	Lexus	ES 350	0.106	New to Top Ranked Vehicles
8	2010	Hyundai	Sonata	0.111	New to Top Ranked Vehicles
9	2011	Chevrolet	Impala	0.111	New to Top Ranked Vehicles
10	2010	Subaru	Outback	0.111	New to Top Ranked Vehicles

### HOW DOES YOUR VEHICLE RANK?

For the first time, drivers can see how reliable their vehicle is through the **FREE** online CarMD® Vehicle Health ScoreCard™ tool, available at [www.carmd.com/ScoreCard](http://www.carmd.com/ScoreCard).

By inputting the year, make, model and mileage of your vehicle (or the one you're evaluating), consumers can access a CarMD Vehicle Health grade, along with the most common repairs/repair costs for the specific model year vehicle and reported mileage. The ScoreCard also alerts drivers of any recalls of service bulletins, which often lead to free- or-low-cost repairs, and spotlights important known safety issues.

# HIGHLIGHTS TOP RANKED VEHICLES – 2012

The top 100 most reliable vehicles represent the best vehicles from nearly 3,000 different registered vehicle types on the road today.

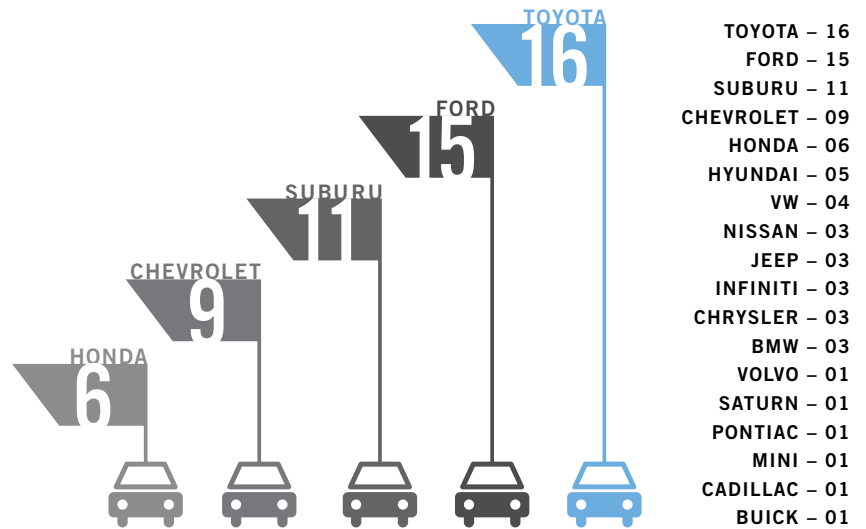
- It is important to remember that even the 99<sup>th</sup> or 100<sup>th</sup> ranked vehicle on this list is a significant achievement, ranking in the top 5% of all vehicles on the road today.
- Thanks to on-board diagnostic technology and improved vehicle quality, the days of avoiding one brand of vehicle because of lesser reliability are in the past. The worst car on the list today is still more reliable than cars were 20 years ago.

The top 100 vehicles were more evenly spread between brands in 2012 as compared with the previous year.

Last year, 73% of the top 100 vehicles came from the top 5 ranked manufacturers.

## TOP 100 VEHICLES

Evenly spread between brands in 2012 as compared with the previous year. This year, 37% of the top 100 vehicles come from the top 5 ranked manufacturers.



This year marks the first time that a manufacturer earned all of the top spots in their respective category, and it happened not once – but twice.

- Subaru swept the Wagon/Crossover SUV category with its 2010 Forester (no. 6 overall and no. 1 in its category), 2010 Outback and 2011 Forester.
- Ford earned all three top spots in the Truck category with its 2008 Ranger, 2009 F150 and 2008 F150.

Two of the most well-known and established domestic vehicle brands beat out their competitors. The 2010 Chrysler Town & Country and 2010 Dodge Grand Caravan ranked no. 1 and no. 2 respectively among minivans and the 2008 Ford Taurus took the no. 1 spot for sedans.

## WAGON/CROSSOVER SUV CATEGORY



- #1: 2010 SUBARU FORESTER
- #2: 2010 SUBARU OUTBACK
- #3: 2011 SUBARU FORESTER

## TRUCK CATEGORY

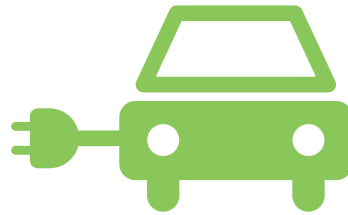


- #1: 2008 FORD RANGER
- #2: 2009 FORD F150
- #3: 2008 FORD F150

## HIGHLIGHTS TOP RANKED VEHICLES – 2012

**The top two ranked hybrid vehicles on the list come from Toyota.** The 2009 and 2008 Prius rank no. 70 and no. 80 respectively. While the repair incidents for the Prius remain very low, its average repair cost is over \$700, demonstrating how an extended warranty can make sense for hybrid shoppers as these vehicles age.

### TOP RANKED HYBRID = FEW BUT COSTLY REPAIRS



> **\$700**

2008 & 2009 PRIUS  
AVERAGE REPAIR COST

**Strong scores on older vehicles demonstrate that as manufacturers improve vehicle longevity, it's possible to have a healthy vehicle for 10+ years.**


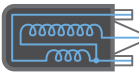



Some of the oldest vehicles in the top 100 are the no. 31-ranked 2005 Lexus ES 330, no. 59-ranked 2005 Mercury Grand Marquis, no. 93-ranked 2003 Subaru Legacy, no. 98-ranked 2004 Mercedes-Benz E Class and no. 99-ranked 2004 Toyota Camry Solara.

Subaru's vehicles stood out for longevity; its 2003 Legacy and 2006 Outback are among the older vehicles in the top 100. With Subaru owners holding onto their vehicles longer than most, this explains why the most common repair on Subaru vehicles is "Replace Catalytic Converter" – a part that fails only after extensive wear and tear.

### VEHICLE LONGEVITY



**Different vehicle makes tend to have unique sets of problems and common failures.** The CarMD Vehicle Health Index points out common problems by manufacturer, providing a helpful resource for vehicle owners as they maintain and repair their vehicles. (Details shown on pages 18-35).

MANUFACTURER	SUBARU	SAAB	SCION	MINI	LAND ROVER
<b>MOST COMMON REPAIR</b>	Replace Catalytic Converter 	Replace Ignition Control Module 	Inspect Gas Cap 	Replace Oxygen Sensor 	Replace Spark Plugs & Wire 
<b>% OF REPAIR</b>	22%	26%	21%	28%	15%



**Top 3 Ranked Vehicles by Category (MY2002 – 2012) – November 2012 CarMD® Vehicle Health Index Rankings & Lists. Top 3 Ranked Vehicles by category; based on combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012):**

**Compact Car**

1. 2010 Toyota Corolla
2. 2008 Toyota Yaris
3. 2010 Volkswagen Jetta



**Minivan**

1. 2010 Chrysler Town & Country
2. 2010 Dodge Grand Caravan
3. 2010 Honda Odyssey



**Sedan**

1. 2008 Ford Taurus
2. 2009 Honda Accord
3. 2010 Hyundai Sonata



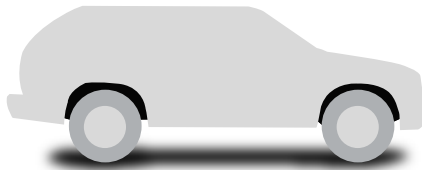
**Wagon/Crossover SUV**

1. 2010 Subaru Forester
2. 2010 Subaru Outback
3. 2011 Subaru Forester



**Full-sized SUV**

1. 2009 Honda Pilot
2. 2011 Hyundai Santa Fe
3. 2007 Toyota 4Runner



**Luxury**

1. 2007 Lexus ES350
2. 2006 Lexus ES 330
3. 2006 Infiniti G35



**Truck**

1. 2008 Ford Ranger
2. 2009 Ford F150
3. 2008 Ford F150



## — Nov. 2012 Report – Detailed Summary of Findings – Top 10 Vehicles Manufacturers —

**No. 1 Toyota**, which includes Toyota, Lexus and Scion brands, had a very low incident rating (0.477) and low cost ranking.

- Toyota had 18 vehicles in the top 100, led by the 2010 Corolla. Other top-ranking Toyota vehicles include the 2008 Toyota Yaris (no. 2), 2009 Toyota Camry (no. 13), 2007 Toyota 4Runner (no. 18) and the 2009 Toyota Matrix (no. 25). Toyota has long been known for making reliable, solid compact cars and sedans, but the addition of the Matrix and Yaris to the top 100 list show the brand is making a mark in the crossover/compact SUV category.
- Toyota achieves the no. 1 ranking despite recent recalls such as the unintended acceleration problem, which was ruled by the DOT to be a sticky gas pedal, unrelated to the vehicles' computer. Toyota's failure to take responsibility early and get in front of the issue was the problem. Not the vehicle.

**Hyundai's No. 2** ranking is attributable to the lowest average repair costs of any manufacturer and low Sonata and Santa Fe model scores, each appearing twice on the top 100 list: 2010 Sonata (no. 8), 2011 Santa Fe (no. 14), 2009 Sonata (no. 49) and 2009 Santa Fe (no. 74). Hyundai's rise to the top tier of manufacturers can really be traced back to their engineering. Their vehicles are designed with Service and maintenance taken into consideration. This leads to lower average repair costs and greatly helps their scoring.

- New to the top 100 list this year is the Genesis luxury sedan, whose 2010 model landed at no. 36.
- While its CarMD Index scores continue to improve, Hyundai is still outranked by Toyota this year because Toyota has a lower percentage of incidents per number of vehicles on the road.

**BMW debuted on the CarMD Manufacturer and Vehicle reliability rankings this year as the no. 3-ranked manufacturer.**

Previously, BMW did not meet CarMD's minimum requirement for vehicle population, but with the sales growth of Mini, the manufacturer now qualifies. BMW includes Mini in its calculations.

- Top-ranked BMWs include the 2008 5 Series (no. 65), 2008 3 Series (no. 78) and 2007 5 Series (no. 86).
- The 2008 Mini Cooper ranks no. 60 on the CarMD top 100.

**No. 4 ranked Honda's** overall manufacturer Index ranking fell from no. 3 to 4 due to a slightly higher score of 0.98.

- Honda is led by the 2009 Pilot, which ranks no. 4 in the top 100 vehicles, as well as no. 1 in the full-sized SUV category. Over the past two years, the Pilot has earned solid scores and led the SUV category.
- Poor scores on the 2003 and 2004 Odyssey, which are in the bottom 10th percent of all vehicles ranked by CarMD, hurt Honda's ranking the most. But newer Odyssey vans are much improved with the 2010 Honda Odyssey ranked no. 33 overall and the second best ranked vehicle in the Minivan category.

**Ranked no. 5 Volkswagen** enters the top five this year with an overall CarMD Index score of 0.99.

- VW improved its overall Index score rating from 1.38 and moved four spots up from no. 9 in 2011.
- VW is led by the Jetta, which was listed four times in the top 100, including 2010 (no. 15); 2008 (no. 38); 2007 (no. 43) and the 2009 Jetta (no. 45). This enduring 6th generation model dates back to 1979 – before on-board computers were standard on vehicles.
- VW includes luxury brand Audi in its rating. The 2008 Audi A4 missed the top 100 list by a slim margin, coming in at no. 104.

## — Nov. 2012 Report – Detailed Summary of Findings – Top 10 Vehicles Manufacturers —

**No. 6-ranked Nissan** moves up from last year's no. 7 spot with an overall score of 1.00.

- Nissan includes Infiniti, which significantly helped Nissan's overall Index score and ranking. The G35 appears three times in the top 100 and the 2006 G35 earned a spot as the no. 3 ranked luxury vehicle.
- The top-ranked Nissan is the 2007 Versa (no. 41) thanks to a very low average repair cost.

**Kia ranked no. 7** with a score of 1.04, and moved up from no. 8 in 2011.

- Kia's average repair cost is up from \$257.73 in 2011 to \$320.08 in 2012, but repair incidences remain unchanged.
- Kia now has two vehicles in the top 100, including the 2011 Kia Sorento (no. 17) and the 2009 Rio (no. 76). The Kia Sorento has seen vast improvements in its rating since first-generation. For instance, the 2003 Kia Sorento ranks in the no. 1112 spot, while its second-generation counterpart is in the top 20.

**No. 8-ranked GM** earns an overall index score of 1.12 and falls from its no. 5 spot in the top five.

- GM's decline in ranking is due in large part to an 18% increase in average repair costs.
- Bright spots are the 2011 Chevrolet Impala, which ranks no. 9 among most reliable vehicles on the road today, and the 2010 Chevrolet Malibu at no. 11.
- Buick continues to help its GM parent brand with the 2007 LaCrosse ranked in the top 100 at no. 88.

**Ford, along with Honda and GM, declined in overall CarMD Index score and rating, dropping from no. 4 in 2011 to no. 9.**

- Ford's overall score and ranking were hurt by older model minivans such as the 2002 Ford Windstar, which ranks among the bottom 1% of all vehicles on the road. But Ford strengths in SUVs swept the entire category.
- The 2008 Taurus broke through in both rankings, taking the no. 1 in the Sedan category and no. 2 overall.

**Chrysler improved its overall index rating score from 1.97 to 1.23, holding steady at no. 10.**

- Chrysler saw a slight increase in average repair incidents and costs since 2011, but introduced three vehicles to the top 100 list: 2010 Town + Country (no. 21), 2010 300 (no. 48) and the 2009 Town + Country (no. 67).

## Nov. 2012 Report – Detailed Summary of Findings – Top 100 Vehicles Rankings & Lists

### **No.1-ranked manufacturer Toyota accounts for two of the top 10 ranked vehicles model year 2002 to 2012 and 18 of the top 100 vehicles (16 Toyota-branded vehicles and 2 Lexus vehicles).**

- The no. 1 ranked 2010 Toyota Corolla, had the lowest combined repair incidents and lowest average repair costs per number of registered vehicles, and the best CarMD Index rating of 0.80.
  - It should be noted; however, that the no.1-ranked vehicle on the 2011 Index was the 2009 Toyota Corolla, which has fallen off the top 100 list due to a recent increase in average repair cost from only \$45.84 in 2011 to \$232.50.
- Other top-ranking Toyota vehicles include the 2009 Toyota Camry (no. 13) and the 2007 Toyota 4Runner (no. 18).
- The top-ranked Lexus vehicles are the 2007 Lexus ES350 (no. 7 overall and no. 1 among luxury vehicles) and the 2005 ES330 (no. 31 overall and no. 2 in the luxury category).
- Scion fell short of making the top 100 list with the highest ranking Scion being the 2004 xB, which ranked no. 204.

### **Ford has 15 vehicles in the top 100; including one in the top 10 (Ford had 13 vehicles in the top 100 in 2011).**

- Ford is led by the no. 2-ranked 2008 Ford Taurus, which has a very low average repair cost of \$141.17 per incident.
- The Ford Escape appears twice on the top 100 list, including the 2008 Escape (no. 23) and 2010 Escape (no. 26).
- Other top-ranking Ford vehicles include the 2008 Expedition (no. 24); and the 2008 and 2007 Edge that rank no. 34 and no. 35 respectively.
- Additionally, Ford took the top three spots among the CarMD list of top trucks, led by the 2008 Ranger, 2009 F150 and 2008 F150.

### **Subaru has 11 vehicles in the top 100, including two in the top 10. The brand also earned all three of the top-ranked vehicles in the Wagon/Crossover SUV category.**

- The 2010 Subaru Forester ranked no. 6 and the 2010 Outback ranked no. 10.
- Subaru's vehicles stood out for longevity; its 2003 Legacy and 2006 Outback are among the older vehicles in the top 100. With Subaru owners holding onto their vehicles longer than most, this explains why the most common repair on Subaru vehicles is "Replace Catalytic Converter" – a part that fails only after extensive wear and tear.

### **Chevrolet ranks fourth among manufacturers with the most vehicles in the top 100 with nine.**

- Its 2011 Chevrolet Impala ranks no. 9 among most reliable vehicles.
- 2010 was a good year for Chevrolet, as six of the top 100 vehicles are model year 2010 Chevy vehicles: Malibu (no. 11), Cobalt (no. 27), Traverse (no. 53), Equinox (no. 63), Camaro (no. 64) and Silverado (no. 92).

### **Rounding out the brands with the most vehicles in the top 100 is Honda with six overall.**

- In 2011, Honda had four vehicles in the top 10. However, this year, Honda had only two of the top 10: the 2009 Pilot (no. 4 overall and no. 1 in the Full-Sized SUV category) and 2009 Accord (no. 5 overall and no. 2 in the Sedan category).
- Honda was hurt by its Acura brand, which did not have any vehicles listed in the top 100. The highest ranking Acura was the 2006 TSX (no. 159).
- Older-model vehicles that had both a high number of problems and high repair costs hurt Honda's 2012 ranking. These include the 2003 and 2004 Odyssey as well as the 2003 Civic and 2002 CR-V, all of which fall in the bottom 5% of vehicles on the road today.

## Nov. 2012 Report – Detailed Index Data – Top 100 Vehicles Rankings & Lists

The Top 100 Vehicles in the U.S. with the lowest overall CarMD Index ranking based on the combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012) from Sept. 1, 2011 and Sept. 1, 2012

Rank	Year	Brand/Make	Model	Avg. Repair Cost	Index Rating (Repair Incidents)	Index Rating (Repair Costs)	Overall CarMD Index Rating Score (Repairs and Costs)
1	2010	Toyota	Corolla	\$283.13	0.088	0.073	0.080
2	2008	Ford	Taurus	\$141.17	0.117	0.048	0.083
3	2008	Toyota	Yaris	\$259.33	0.100	0.075	0.087
4	2009	Honda	Pilot	\$141.00	0.132	0.054	0.093
5	2009	Honda	Accord	\$201.74	0.125	0.073	0.099
6	2010	Subaru	Forester	\$116.33	0.148	0.050	0.099
7	2007	Lexus	ES 350	\$377.71	0.101	0.111	0.106
8	2010	Hyundai	Sonata	\$336.30	0.112	0.110	0.111
9	2011	Chevrolet	Impala	\$184.30	0.144	0.078	0.111
10	2010	Subaru	Outback	\$110.43	0.168	0.054	0.111
11	2010	Chevrolet	Malibu	\$238.36	0.136	0.095	0.115
12	2010	Dodge	Challenger	\$64.17	0.199	0.037	0.118
13	2009	Toyota	Camry	\$270.35	0.133	0.105	0.119
14	2011	Hyundai	Santa Fe	\$170.83	0.160	0.080	0.120
15	2010	VW	Jetta	\$202.45	0.153	0.090	0.122
16	2011	Subaru	Forester	\$178.86	0.169	0.088	0.128
17	2010	Jeep	Wrangler	\$106.20	0.197	0.061	0.129
18	2007	Toyota	4Runner	\$375.17	0.127	0.140	0.134
19	2011	Kia	Sorento	\$424.92	0.123	0.152	0.138
20	2009	Subaru	Forester	\$232.75	0.169	0.114	0.141
21	2010	Chrysler	Town & Country	\$123.06	0.210	0.075	0.143

**The Top 100 Vehicles in the U.S. with the lowest overall CarMD Index ranking based on the combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012) from Sept. 1, 2011 and Sept. 1, 2012 (cont’d.)**

Rank	Year	Brand/Make	Model	Avg. Repair Cost	Index Rating (Repair Incidents)	Index Rating (Repair Costs)	Overall CarMD Index Rating Score (Repairs and Costs)
22	2009	Ford	Fusion	\$187.86	0.186	0.102	0.144
23	2008	Ford	Escape	\$281.28	0.159	0.130	0.144
24	2008	Ford	Expedition	\$171.86	0.197	0.099	0.148
25	2009	Toyota	Matrix	\$227.83	0.179	0.119	0.149
26	2010	Ford	Escape	\$172.79	0.199	0.101	0.150
27	2010	Chevrolet	Cobalt	\$125.00	0.224	0.082	0.153
28	2010	Toyota	Camry	\$261.75	0.175	0.134	0.154
29	2010	Dodge	Grand Caravan	\$100.08	0.242	0.071	0.156
30	2007	Honda	CR-V	\$261.38	0.181	0.138	0.160
31	2005	Lexus	ES 330	\$43.15	0.284	0.036	0.160
32	2008	Toyota	4Runner	\$8.18	0.317	0.008	0.162
33	2010	Honda	Odyssey	\$196.31	0.209	0.120	0.165
34	2008	Ford	Edge	\$262.69	0.189	0.145	0.167
35	2007	Ford	Edge	\$394.40	0.156	0.180	0.168
36	2010	Hyundai	Genesis	\$299.50	0.180	0.157	0.169
37	2009	Ford	Focus	\$181.26	0.225	0.119	0.172
38	2008	Volkswagen	Jetta	\$192.27	0.224	0.126	0.175
39	2008	Honda	CR-V	\$269.67	0.199	0.157	0.178
40	2006	Subaru	Outback	\$301.14	0.190	0.167	0.179
41	2009	Nissan	Versa	\$63.11	0.303	0.056	0.179
42	2008	Ford	Ranger	\$225.00	0.217	0.143	0.180

**The Top 100 Vehicles in the U.S. with the lowest overall CarMD Index ranking based on the combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012) from Sept. 1, 2011 and Sept. 1, 2012 (cont’d.)**

Rank	Year	Brand/Make	Model	Avg. Repair Cost	Index Rating (Repair Incidents)	Index Rating (Repair Costs)	Overall CarMD Index Rating Score (Repairs and Costs)
43	2007	VW	Jetta	\$269.30	0.208	0.163	0.186
44	2006	Infiniti	G35	\$369.50	0.179	0.193	0.186
45	2009	VW	Jetta	\$251.79	0.216	0.159	0.187
46	2011	Subaru	Outback	\$151.25	0.263	0.116	0.190
47	2010	Jeep	Liberty	\$87.88	0.303	0.078	0.190
48	2010	Chrysler	300	\$319.50	0.199	0.185	0.192
49	2009	Hyundai	Sonata	\$333.22	0.197	0.191	0.194
50	2009	Nissan	Altima	\$763.63	0.120	0.268	0.194
51	2009	Ford	Econoline	\$197.63	0.247	0.142	0.195
52	2008	Infiniti	G35	\$288.57	0.212	0.179	0.195
53	2010	Chevrolet	Traverse	\$416.88	0.180	0.219	0.200
54	2009	Ford	F150	\$250.79	0.231	0.169	0.200
55	2008	Honda	Accord	\$219.57	0.245	0.157	0.201
56	2007	Toyota	Yaris	\$271.76	0.225	0.179	0.202
57	2008	Ford	Econoline	\$296.38	0.219	0.190	0.205
58	2008	Ford	F150	\$264.95	0.232	0.179	0.205
59	2005	Mercury	Grand Marquis	\$238.67	0.244	0.170	0.207
60	2008	MINI	Cooper	\$219.33	0.253	0.162	0.208
61	2008	Mazda	3	\$126.90	0.304	0.113	0.208
62	2007	Ford	Five Hundred	\$157.90	0.287	0.132	0.210
63	2010	Chevrolet	Equinox	\$300.88	0.224	0.197	0.210

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**The Top 100 Vehicles in the U.S. with the lowest overall CarMD Index ranking based on the combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012) from Sept. 1, 2011 and Sept. 1, 2012 (cont’d.)**

Rank	Year	Brand/Make	Model	Avg. Repair Cost	Index Rating (Repair Incidents)	Index Rating (Repair Costs)	Overall CarMD Index Rating Score (Repairs and Costs)
64	2010	Chevrolet	Camaro	\$251.38	0.243	0.178	0.210
65	2008	BMW	5 series	\$220.92	0.259	0.167	0.213
66	2008	Mercedes-Benz	E-Class	\$394.17	0.200	0.230	0.215
67	2009	Chrysler	Town & Country	\$101.83	0.332	0.099	0.215
68	2008	Cadillac	DTS	\$241.83	0.253	0.178	0.216
69	2010	Nissan	Sentra	\$109.11	0.337	0.107	0.222
70	2009	Toyota	Prius	\$698.71	0.147	0.300	0.224
71	2009	Subaru	Impreza	\$291.67	0.242	0.206	0.224
72	2007	Volvo	XC90	\$79.67	0.365	0.085	0.225
73	2010	GMC	Terrain	\$244.86	0.266	0.190	0.228
74	2009	Hyundai	Santa Fe	\$141.79	0.327	0.135	0.231
75	2009	Mazda	3	\$57.60	0.396	0.067	0.231
76	2009	Kia	Rio	\$184.33	0.302	0.162	0.232
77	2008	Ford	Mustang	\$143.92	0.327	0.137	0.232
78	2007	BMW	3 series	\$308.39	0.246	0.222	0.234
79	2009	Saturn	VUE	\$82.00	0.378	0.090	0.234
80	2008	Toyota	Prius	\$791.21	0.142	0.327	0.234
81	2011	Jeep	Grand Cherokee	\$649.00	0.164	0.311	0.237
82	2007	Toyota	Highlander	\$137.00	0.348	0.139	0.243
83	2009	GMC	Acadia	\$255.14	0.281	0.209	0.245
84	2008	Toyota	RAV4	\$381.00	0.232	0.258	0.245



**The Top 100 Vehicles in the U.S. with the lowest overall CarMD Index ranking based on the combined fewest and lowest cost “check engine”-related problems (Model Year 2002-2012) from Sept. 1, 2011 and Sept. 1, 2012 (cont’d.)**

Rank	Year	Brand/Make	Model	Avg. Repair Cost	Index Rating (Repair Incidents)	Index Rating (Repair Costs)	Overall CarMD Index Rating Score (Repairs and Costs)
85	2007	Chevrolet	Corvette	\$45.56	0.434	0.058	0.246
86	2007	BMW	5 series	\$226.44	0.298	0.197	0.248
87	2008	Toyota	Avalon	\$257.80	0.284	0.214	0.249
88	2007	Buick	LaCrosse	\$198.30	0.315	0.183	0.249
89	2007	Infiniti	G35	\$313.78	0.262	0.240	0.251
90	2008	Subaru	Impreza	\$385.75	0.236	0.265	0.251
91	2011	Subaru	Impreza	\$385.86	0.240	0.270	0.255
92	2010	Chevrolet	Silverado	\$249.38	0.296	0.215	0.256
93	2003	Subaru	Legacy	\$415.00	0.232	0.281	0.257
94	2009	Pontiac	G6	\$375.69	0.250	0.274	0.262
95	2007	Subaru	Outback	\$216.56	0.331	0.209	0.270
96	2009	Chevrolet	Express	\$239.22	0.319	0.223	0.271
97	2006	Toyota	Sienna	\$261.50	0.308	0.235	0.272
98	2004	Mercedes-Benz	E-Class	\$188.44	0.351	0.193	0.272
99	2004	Toyota	Camry Solara	\$540.00	0.215	0.339	0.277
100	2007	Toyota	RAV4	\$459.05	0.238	0.319	0.279

*(Top 100 vehicles based on CarMD diagnostic reports generated from Oct. 1, 2010 – Oct. 1, 2011, representing an estimated 136 million model year 2001 – 2010 vehicles on the road in the U.S., and determined by those that had the fewest number of CarMD repair incidents combined with the lowest cost per repair, per number of registered vehicles on the road. Sources: CarMD.com Corp., with vehicle population data provided by R.L. Polk)*

## Nov. 2012 Report – Detailed Index Data – Common Repairs by Brand

### Common Repairs by Brand/Make (MY 1996-2012)

- Different vehicle makes tend to have a unique set of problems and common failures. The CarMD Vehicle Health Index points out common problems by brand, providing a helpful resource for vehicle owners as they maintain and repair their vehicles.
- For instance “Replace Oxygen Sensor” accounted for 28 percent of Mini repairs in 2012. Earlier this year, CarMD revealed that the no. 1 most common repair on vehicles in the U.S. is “replace O2 sensor.” O2 sensors measure the amount of unburned oxygen in the exhaust and tell a car’s computer when there is either too much or not enough fuel as compared with oxygen for ideal operation. If a faulty O2 sensor is not repaired, the car’s gas mileage can drop by as much as 40 percent.
- Other examples: “Replace Ignition Control Module” accounted for 26 percent of Saab repairs last year; Subaru had a tendency to require the replacement of the catalytic converter (22%); and Scion was susceptible to loose or damaged gas caps (20%).

### 5 Most Common Acura “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Acura repairs Oct. 1, 2011 - Oct. 1, 2012
1	% Acura repairs Sept. 1, 2011 - Sept. 1, 2012	\$92.87	\$0.00	\$92.87	15.93%
2	Replace ABS Modulator Assembly	\$99.83	\$992.98	\$1,092.81	8.34%
3	Inspect for Faulty Wiring and Repair as Necessary	\$132.92	\$0.00	\$132.92	7.21%
4	Replace Oxygen Sensor(s) (O2S)	\$90.44	\$271.49	\$361.93	6.64%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$99.43	\$785.99	\$885.42	5.47%

**5 Most Common Audi “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Audi repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Faulty Vacuum Hose(s) and Repair as Necessary	\$95.93	\$ -	\$95.93	13.14%
2	Replace Mass Air Flow (MAF) Sensor	\$94.42	\$254.16	\$348.58	11.65%
3	Inspect for Faulty Vacuum Hose(s) at Air Injection System (AIR) and Repair as Necessary	\$91.65	\$ -	\$91.65	9.48%
4	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$248.75	\$1,216.54	\$1,465.30	7.15%
5	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	6.49%

**5 Most Common BMW “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% BMW repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Vacuum Leak and Repair as Necessary	\$91.95	\$0.21	\$92.16	14.21%
2	Replace Mass Air Flow (MAF) Sensor	\$90.61	\$450.09	\$540.70	11.30%
3	Replace Ignition Coil(s)	\$94.10	\$95.57	\$189.67	7.95%
4	Replace Camshaft Position Sensor (CMP)	\$ 95.01	\$133.54	\$228.55	7.51%
5	Replace Oxygen Sensor(s) (O2S)	\$98.35	\$289.73	\$388.08	6.39%

**5 Most Common Buick “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Buick repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	9.35%
2	Remove Aftermarket Alarm System	\$89.90	\$ -	\$89.90	6.79%
3	Adjust Tire Pressure and Relearn Tire Pressure Sensor(s)	\$90.94	\$ -	\$90.94	6.62%
4	Replace Oxygen Sensor(s) (O2S)	\$90.87	\$125.49	\$216.36	6.30%
5	Replace Evaporative Emissions (EVAP) Purge Solenoid	\$89.15	\$40.50	\$129.65	5.64%

**5 Most Common Cadillac “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Cadillac repairs Sept. 1, 2011 - Sept. 1, 2012
1	Remove Aftermarket Alarm System	\$91.09	\$ -	\$91.09	8.06%
2	Replace Mass Air Flow (MAF) Sensor	\$89.25	\$301.64	\$390.89	7.40%
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$118.65	\$898.33	\$1,016.98	7.04%
4	Replace Oxygen Sensor(s) (O2S)	\$92.64	\$148.26	\$240.90	6.60%
5	Clean Fuel Injector(s)	\$97.99	\$20.84	\$118.83	6.16%

### 5 Most Common Chevrolet “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Chevrolet repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$94.05	\$134.11	\$228.16	9.40%
2	Remove Aftermarket Alarm System	\$91.18	\$ -	\$91.18	8.30%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ 0.05	\$ -	\$0.05	7.70%
4	Replace Evaporative Emissions (EVAP) Purge Solenoid	\$102.40	\$65.44	\$167.85	4.44%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$104.49	\$804.00	\$908.49	4.40%

### 5 Most Common Chrysler “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Chrysler repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$0.13	\$0.13	10.57%
2	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	\$111.06	\$97.29	\$208.35	10.24%
3	Replace Spark Plug Wires and Spark Plugs	\$191.64	\$99.63	\$291.27	7.51%
4	Replace Oxygen Sensor(s) (O2S)	\$100.86	\$96.95	\$197.81	6.97%
5	Replace Camshaft Position Sensor (CMP)	\$97.94	\$65.65	\$63.59	5.86%

### 5 Most Common Dodge “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Dodge repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$96.29	\$99.70	\$195.99	9.10%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ 0.13	\$ 0.13	7.86%
3	Replace Spark Plug Wires and Spark Plugs	\$160.84	\$99.50	\$260.33	7.45%
4	Inspect for Faulty Vacuum Hose(s) at Evaporative Emissions (EVAP) System	\$114.97	\$ 0.29	\$115.26	6.50%
5	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	\$106.87	\$101.57	\$208.44	5.08%

### 5 Most Common Ford “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Ford repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Ignition Coil(s) and Spark Plug(s)	\$244.31	\$170.63	\$414.94	5.77%
2	Replace ABS Control Module	\$131.39	\$781.80	\$913.19	5.36%
3	Replace Oxygen Sensor(s) (O2S)	\$94.72	\$86.89	\$181.61	5.10%
4	Replace Positive Crankcase Ventilation (PCV) Valve and Hose or Tube and Grommet	\$89.88	\$16.97	\$106.85	4.91%
5	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$0.53	\$ -	\$0.53	4.73%

### 5 Most Common GMC “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% GMC repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$96.24	\$118.69	\$214.93	9.99%
2	Remove Aftermarket Alarm System	\$91.22	\$ -	\$91.22	9.80%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	7.00%
4	Replace Engine Coolant Temperature Sensor (ECT)	\$133.87	\$57.68	\$191.56	5.41%
5	Replace Evaporative Emissions (EVAP) Purge Solenoid	\$106.27	\$66.07	\$172.35	4.65%

### 5 Most Common Honda “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Honda repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect Battery and Charging System and Repair as Necessary	\$96.22	\$ -	\$96.22	9.48%
2	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$115.88	\$945.84	\$1,061.72	8.82%
3	Replace ABS Modulator Assembly	\$155.86	\$868.59	\$1,024.46	7.80%
4	Replace Oxygen Sensor(s) (O2S)	\$91.47	\$205.57	\$297.04	6.26%
5	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$0.03	\$0.03	6.11%

**5 Most Common Hyundai “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Hyundai repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$95.89	\$124.79	\$220.68	13.46%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	11.40%
3	Replace Spark Plug Wires and Spark Plugs	\$165.07	\$104.33	\$269.41	9.78%
4	Replace Mass Air Flow (MAF) Sensor	\$90.48	\$303.74	\$394.22	7.37%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$108.67	\$861.75	\$970.42	6.79%

**5 Most Common Infiniti “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Infiniti repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$103.90	\$204.80	\$308.70	9.97%
2	Replace Ignition Coil(s)	\$97.11	\$151.63	\$248.74	8.13%
3	Replace Mass Air Flow (MAF) Sensor	\$89.42	\$575.09	\$664.51	6.61%
4	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$1.82	\$ -	\$1.82	6.39%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$186.44	\$976.97	\$1,163.41	5.85%



**5 Most Common Jaguar “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Jaguar repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Ignition Coil(s) and Spark Plug(s)	\$192.91	\$290.54	\$483.45	12.50%
2	Replace Oxygen Sensor(s) (O2S)	\$95.98	\$312.27	\$408.25	8.88%
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$158.97	\$1,267.23	\$1,426.20	8.55%
4	Replace Ignition Coil(s)	\$121.36	\$117.12	\$238.48	6.58%
5	Replace Positive Crankcase Ventilation (PCV) Tube	\$304.36	\$56.46	\$360.82	6.25%

**5 Most Common Jeep “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Jeep repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$91.12	\$93.93	\$185.05	12.97%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	9.23%
3	Inspect for Faulty Vacuum Hose(s) at Evaporative Emissions (EVAP) System	\$118.12	\$1.05	\$119.17	7.32%
4	Replace Leak Detection Pump (LDP)	\$96.93	\$102.63	\$199.56	5.69%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$135.83	\$904.54	\$1,040.37	5.52%

### 5 Most Common Kia “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Kia repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	9.41%
2	Replace Oxygen Sensor(s) (O2S)	\$93.80	\$187.63	\$281.43	8.97%
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$151.18	\$870.49	\$1,021.67	8.67%
4	Replace Spark Plug Wires and Spark Plugs	\$196.45	\$108.59	\$305.04	7.89%
5	Inspect for Faulty Vacuum Hose(s) and Repair as Necessary	\$90.43	\$ -	\$90.43	6.24%

### 5 Most Common Land Rover “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Land Rover repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Spark Plug Wires and Spark Plugs	\$351.61	\$399.96	\$751.57	15.01%
2	Replace Oxygen Sensor(s) (O2S)	\$91.17	\$200.53	\$291.70	12.66%
3	Replace Mass Air Flow (MAF) Sensor	\$91.21	\$255.65	\$346.86	10.85%
4	Inspect for Faulty Vacuum Hose(s) at Air Injection System (AIR) and Repair as Necessary	\$123.23	\$46.39	\$169.62	9.04%
5	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	8.32%

**5 Most Common Lexus “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Lexus repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$104.03	\$195.07	\$299.10	12.46%
2	Replace Air/Fuel Ratio Sensor (AFR)	\$102.28	\$236.42	\$338.70	11.67%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$0.56	\$ -	\$0.56	9.86%
4	Replace Mass Air Flow (MAF) Sensor	\$94.95	\$218.88	\$313.82	9.13%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$111.92	\$1,155.61	\$1,267.52	8.62%

**5 Most Common Lincoln “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Lincoln repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Ignition Coil(s) and Spark Plug(s)	\$207.15	\$169.17	\$376.32	14.31%
2	Replace Ignition Coil(s)	\$100.00	\$88.76	\$188.76	9.57%
3	Replace Oxygen Sensor(s) (O2S)	\$90.42	\$82.14	\$172.56	8.70%
4	Replace Air Bag Module	\$127.09	\$379.27	\$506.35	6.58%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$141.77	\$1,105.20	\$1,246.97	5.80%

**5 Most Common Mazda “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Mazda repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$154.97	\$783.47	\$938.44	12.67%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$0.77	\$ -	\$0.77	9.63%
3	Replace Mass Air Flow (MAF) Sensor	\$90.41	\$239.24	\$329.66	9.36%
4	Replace Spark Plug Wires and Spark Plugs	\$134.45	\$140.49	\$274.94	7.52%
5	Replace Oxygen Sensor(s) (O2S)	\$97.57	\$174.22	\$271.78	7.33%

**5 Most Common Mercedes “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Mercedes repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Mass Air Flow (MAF) Sensor	\$93.54	\$427.88	\$521.42	13.89%
2	Replace Oxygen Sensor(s) (O2S)	\$96.38	\$260.15	\$356.53	10.77%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	6.69%
4	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	\$131.58	\$226.31	\$357.89	6.24%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$261.10	\$1,422.14	\$1,683.24	4.61%

**5 Most Common Mercury “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Mercury repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Positive Crankcase Ventilation (PCV) Valve and Hose	\$89.15	\$16.43	\$105.58	9.49%
2	Replace Spark Plug Wires and Spark Plugs	\$169.49	\$212.92	\$382.41	9.00%
3	Replace Oxygen Sensor(s) (O2S)	\$95.15	\$95.45	\$190.60	7.74%
4	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	5.99%
5	Replace Ignition Coil(s) and Spark Plug(s)	\$199.36	\$154.77	\$354.13	5.70%

**5 Most Common Mini “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Mini repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$92.08	\$261.36	\$353.44	28.07%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	11.40%
3	Replace Spark Plug Wires and Spark Plugs	\$98.82	\$56.43	\$155.25	8.77%
4	Inspect for Vacuum Leak and Repair as Necessary	\$130.67	\$ -	\$130.67	7.89%
5	Replace Ignition Coil(s)	\$90.59	\$115.44	\$206.03	5.26%

**5 Most Common Mitsubishi “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Mitsubishi repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$ 100.20	\$242.53	\$342.73	20.22%
2	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$119.98	\$879.28	\$999.27	13.08%
3	Replace Spark Plug Wires and Spark Plugs	\$199.33	\$175.00	\$374.33	9.00%
4	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	8.41%
5	Replace Mass Air Flow (MAF) Sensor	\$90.78	\$562.32	\$653.10	5.54%

**5 Most Common Nissan “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Nissan repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$180.48	\$659.80	\$840.28	14.93%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	9.55%
3	Replace Oxygen Sensor(s) (O2S)	\$99.81	\$196.20	\$296.01	6.32%
4	Replace Ignition Coil(s)	\$98.22	\$143.28	\$241.50	6.04%
5	Replace Crankshaft Position Sensor (CKP)	\$92.16	\$53.57	\$145.74	3.28%

**5 Most Common Pontiac “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Pontiac repairs Sept. 1, 2011 - Sept. 1, 2012
1	Remove Aftermarket Alarm System	\$89.69	\$ -	\$89.69	9.06%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	8.62%
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$107.69	\$655.26	\$762.95	8.17%
4	Replace Oxygen Sensor(s) (O2S)	\$90.82	\$142.92	\$233.74	7.25%
5	Replace Fuel Injector(s)	\$199.17	\$404.18	\$603.35	4.95%

**5 Most Common Porsche “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Porsche repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Mass Air Flow (MAF) Sensor	\$93.97	\$610.23	\$704.20	12.20%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	10.98%
3	Inspect for Vacuum Leak and Repair as Necessary	\$190.10	\$28.77	\$218.87	9.76%
4	Replace Oil Filler Vacuum Hose	\$148.60	\$32.58	\$181.18	8.54%
5	Replace Oxygen Sensor(s) (O2S)	\$113.11	\$630.86	\$743.97	7.32%

### 5 Most Common Saab “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Saab repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Ignition Control Module (ICM)	\$90.43	\$344.89	\$435.32	25.56%
2	Replace Oxygen Sensor(s) (O2S)	\$91.76	\$279.05	\$370.81	12.41%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	10.67%
4	Replace Thermostat	\$105.00	\$28.73	\$133.73	5.96%
5	Replace Throttle Body Assembly	\$96.21	\$481.69	\$577.90	5.96%

### 5 Most Common Scion “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Scion repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	20.58%
2	Replace Evaporative Emissions (EVAP) Vacuum Switching Valve (VSV)	\$93.56	\$54.93	\$148.49	16.62%
3	Inspect Battery and Charging System and Repair as Necessary	\$93.73	\$ -	\$93.73	13.19%
4	Replace Camshaft Timing Gear	\$191.32	\$255.21	\$446.53	6.33%
5	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$94.48	\$842.69	\$937.17	6.07%



### 5 Most Common Subaru “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Subaru repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$101.40	\$833.30	\$934.70	22.04%
2	Replace Knock Sensor(s)	\$111.34	\$111.05	\$222.39	12.67%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$2.38	\$ -	\$2.38	10.98%
4	Replace Oxygen Sensor(s) (O2S)	\$144.18	\$164.90	\$309.08	9.54%
5	Replace Spark Plug Wires and Spark Plugs	\$185.20	\$91.90	\$277.10	8.02%

### 5 Most Common Suzuki “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Suzuki repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Oxygen Sensor(s) (O2S)	\$89.51	\$ 295.46	\$ 384.97	23.49%
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$ -	\$ -	\$ -	20.64%
3	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	\$103.00	\$436.49	\$539.48	9.96%
4	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$95.38	\$1,020.04	\$1,115.42	6.05%
5	Replace Ignition Coil(s) and Spark Plug(s)	\$126.54	\$279.47	\$406.01	4.27%

**5 Most Common Toyota “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Toyota repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$101.48	\$1,157.16	\$1,258.65	12.97%
2	Replace Oxygen Sensor(s) (O2S)	\$96.12	\$ 182.66	\$278.77	12.54%
3	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$0.08	\$ -	\$0.08	10.06%
4	Replace Air/Fuel Ratio Sensor (AFR)	\$97.06	\$216.49	\$313.56	7.49%
5	Inspect for Faulty Vacuum Hose(s) at Evaporative Emissions (EVAP) System	\$92.71	\$ -	\$92.71	5.19%

**5 Most Common Volkswagen “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% VW repairs Sept. 1, 2011 - Sept. 1, 2012
1	Replace Mass Air Flow (MAF) Sensor	\$92.75	\$241.09	\$333.83	11.49%
2	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	\$146.92	\$884.40	\$1,031.32	10.72%
3	Replace Engine Coolant Temperature Sensor (ECT)	\$92.70	\$32.37	\$125.07	7.10%
4	Replace Ignition Coil(s)	\$90.15	\$139.44	\$229.59	6.60%
5	Replace Oxygen Sensor(s) (O2S)	\$97.09	\$221.17	\$318.26	6.10%

**5 Most Common Volvo “Check Engine” Light Repairs (Sept. 1, 2011 - Sept. 1, 2012)**

Rank	Repair	Labor	Parts	Total Repair Cost (Parts & Labor)	% Volvo repairs Sept. 1, 2011 - Sept. 1, 2012
1	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	\$0.38	\$ -	\$0.38	15.88%
2	Replace Mass Air Flow (MAF) Sensor	\$90.22	\$309.36	\$399.59	9.43%
3	Replace Oxygen Sensor(s) (O2S)	\$113.11	\$329.51	\$442.62	7.31%
4	Inspect for Faulty Vacuum Hose(s) and Repair as Necessary	\$94.24	\$ -	\$94.24	6.37%
5	Replace Thermostat	\$88.95	\$28.03	\$116.98	3.54%

## Nov. 2012 Report – CarMD® Vehicle Health Index™ – Overview

Over the past 16 years, CarMD has compiled and maintained the industry's largest and most comprehensive database of "check engine" light-related problems and repairs. The database is procured from CarMD's nationwide network of Automotive Service Excellence (ASE)-certified technicians, who recommend, validate and upload repairs and costs to the database on a daily basis for 1996 vehicles to present. CarMD currently has 3 million verified repairs in its proprietary database that apply to roughly 200 million on-board diagnostic, second generation (OBD2) vehicles on the road in the U.S. This includes an estimated 136 million Model Year 2002-2012 vehicles, from which the 2012 CarMD® Vehicle Health Index Manufacturer and Vehicle Rankings were procured. Subsequent CarMD Vehicle Health Index reports will draw from a larger sampling of diagnostic trouble codes and expert fixes as the database grows.

- Beginning in 1996, the U.S. government mandated that OBD2 be included on all foreign and domestic cars, light trucks, vans, SUVs and now hybrids driven in the U.S. This universal technology is designed to detect malfunctions, set a diagnostic trouble code (DTC) and turn on the "check engine" light if there is a problem. This system provides vital health and safety information for roughly 80 percent of a vehicle's systems, and is installed on just over 82 percent of the vehicles in the U.S. today.
- As a result of compiling the industry's most comprehensive database of diagnostic trouble codes and repairs for "check engine"-related problems, CarMD is uniquely able to provide statistics on a wide range of vehicles and manufacturers.
  - By offering this unbiased and unprecedented repair and reliability information over time, CarMD is able to present an unparalleled view of reliability over the lifecycle of vehicles, enabling consumers and the industry to compare and contrast makes based on facts and not just opinion surveys.
- The top 100 vehicles represent the best vehicles out of nearly 3,000 different types of registered vehicles on the road today and the top 10 manufacturers represent the best out of more than 30 parent manufacturers.
  - It is important to remember that even the 99th or 100th ranked vehicle on the top 100 list is a significant achievement, as this puts it in the top 5% of all vehicles on the road.
- Each April, the company also releases its CarMD® Vehicle Health Index™ of unbiased statistical information covering the most common "check engine" light-related car repairs and associated costs, on a national basis. Each June, CarMD shares state-by-state rankings of car repairs and costs to help motorists better understand how geography and climate play a role in car maintenance and repairs.
- Current and archived indices are available at <http://corp.carmd.com>.

*(MEDIA NOTES: This document is provided on an embargoed basis to allow you to research and file your stories before this is posted to the <http://corp.carmd.com> website. Additional information, including Index news release, detailed data, logos, graphics and interviews are available upon request.)*

## Nov. 2012 Report – CarMD® Vehicle Health Index™ – Methodology

CarMD has compiled the industry's most comprehensive database of diagnostic trouble codes and repairs for "check engine"-related problems downloaded by automotive technicians and vehicle owners. The company has been collecting data since 1996, and includes data for model year 1996 to current model year vehicles. The data for the 2012 CarMD® Vehicle Health Index™ Manufacturer & Vehicle Rankings was procured from CarMD's network of thousands of independent and original equipment Automotive Service Excellence (ASE)-certified technicians who have input and validated failures and fixes into the CarMD diagnostic database from 1996 to 2012.

The 2012 Index statistically analyzes more than 163,000 specific repairs that apply to roughly 136 million model year 2002 to 2012 vehicles, taking place in the United States during the Sept. 1, 2011 to Sept. 1, 2012 time period. The data for the 2012 CarMD® Vehicle Health Index was pulled, analyzed and validated between Sept. 1, 2012 and Sept. 12, 2012, by CarMD's internal team plus third party experts. The Index is based on downloaded information from each vehicle's government-mandated onboard diagnostic computer, combined with uploaded repair information from CarMD's network of automotive technicians. Repair costs are based on original equipment retail MSRP plus 10% markup. Labor rates are procured from several sources, including the Undercar Digest National and Regional Hourly Shop Labor Rate reports, as well as the average amount of time required for each repair. Both are updated annually.

Virtually all 2002 to 2012 makes and models of cars, light trucks, minivans, SUVs and hybrids – foreign and domestic – with on board diagnostic second generation (OBD2) technology are included in the Index. For the 2012 Vehicle Health Index, CarMD focused on model year 2002-2012 vehicles, since the average age of a vehicle is now just under 11 years old, and these are the vehicles that will be of interest to new and used car buyers. In determining the Top 10 manufacturers and Top 100 vehicles, CarMD included all makes and models that were listed among the U.S. vehicle population, according to R.L. Polk data, and had a CarMD diagnostic report. In determining the Top 10 manufacturers, brands were grouped under their parent manufacturer (i.e. Lexus and Scion under Toyota; Mini under BMW; Acura under Honda; Buick, Chevrolet, Cadillac, GMC, Hummer, Oldsmobile, Pontiac and Saturn under GM; Audi under Volkswagen; etc.) The data in the Index is applicable to more than 82 percent of the vehicles on the road, giving a unique perspective on vehicles driven and repaired in the U.S. In determining the most common repairs by manufacturer, this Index looked at the entire OBD2 vehicle population (1996-current) vehicles for each manufacturer from Sept. 1, 2011 - Sept. 1, 2012.

CarMD contracted with a third party web-based project management company to program a formula that factored in the number of registered vehicles on the road for each manufacturer, make, model and year. A CarMD Vehicle Health Index rating was then assigned using the total number of red reports (or failures) per vehicle (or manufacturer) divided by the total number of vehicles in the population. Percentage of problems and average repair costs have been equally weighted in the CarMD Overall Index rating. The overall Index ranking for the Top Ranked Manufacturers and Vehicles were derived by the average of the Index and cost ranking and reliability scores.

On a daily basis, CarMD's nationwide network of thousands of OE (original equipment) and independent automotive repair technicians recommend, confirm and upload repairs and costs by region to the CarMD database. As a result, subsequent CarMD Vehicle Health Index reports will draw from a larger sampling of diagnostic trouble codes, expert fixes and repair costs.

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