2014 CarMD® VEHICLE HEALTH INDEX™

INTRODUCTION

This CarMD® Vehicle Health Index™ reports on the most common check engine light-related problems, repairs and associated repair costs over the previous calendar year. Now in its fourth consecutive year, the CarMD Index provides consumers, media and the automotive industry with year-over-year car repair data, shedding light on trends impacting the type and cost of repairs.

SUMMARY

For the second year in a row, 2013 saw an increase in car repair costs that were up 6.7 percent overall, including a 13 percent uptick in labor costs and 3 percent increase in parts costs. The oxygen sensor, which can negatively impact fuel economy by as much as 40 percent, remained the most common reason for check engine light repairs. Although the average cost for a gallon of gas in 2013 was on average 12 cents per gallon less than the previous year, CarMD reminds drivers that ignoring a check engine light problem can negatively impact a vehicle's fuel economy, increasing how much you spend at the gas pump every month.

Repair costs were up across each U.S. region, but the Polar vortex-stricken Northeast and Midwest regions saw a 9 percent increase in average car repair costs, while the South and West only incurred a 5 percent increase. Visits to the repair shop were down in the Northeast and Midwest regions whose drivers took their cars in for diagnosis and repairs 26 percent and 17 percent less respectively. Drivers in the West also had fewer check engine-related problems repaired, but car repairs were up 8 percent in the South. CarMD will report in more detail on this in our June 2014 state-by-state ranking report, but initial indications point toward weather extremes playing a role in these figures. New car sales increased in 2013, with a reported 15 million new vehicles sold for the first time since 2007 (source: Kelly Blue Book Seasonally Adjusted Annual Rate), which also impacted the number and type of auto repairs.

"Replace thermostat" moved up five spots from no. 18 to no. 13 among most common repairs in 2013. The thermostat is responsible for allowing coolant to flow in and out of the car's engine. It can be susceptible to overheating, sludge, age and can even freeze up during very cold weather. The two repairs that dipped the most in CarMD's Index ranking were "remove aftermarket alarm" and "inspect for faulty wiring," both of which dropped 8 spots to no. 15 and no. 20 respectively, a trend CarMD attributes to improvements in features and quality by the automotive manufacturers on newer-model vehicles. New to the top 25 is "replace Throttle Position Sensor (TPS)," which monitors the position and rate of the throttle as it opens and closes, helping the vehicle's computer monitor engine load, acceleration and deceleration, and how much fuel it needs. A faulty TPS can result in incorrect fuel mixture adjustments and lead to stalling, hesitation, air/fuel ratio problems and reduced fuel economy.

Costs increased with all but two of the top 25 most common repairs, with the bright spot being "replace oxygen sensor" with an 11 percent decrease in average repair cost from $293.88 a year ago to $261.61. The most expensive repair seen by CarMD's network of technicians was "Replace Transmission Assembly and Reprogram ECM" costing $5,984.50. Transmission-related repairs accounted for six of the 10 most expensive repairs, but had a roughly 10 percent reduction in frequency, likely a result of the surge in number of newer cars on the road. For the fourth consecutive year hybrid repair costs declined – this year by as much as 28 percent.

WHAT ARE THE MOST COMMON REPAIRS FOR YOUR CAR?

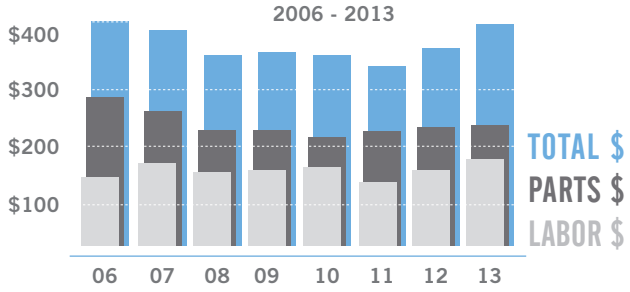
Available at www.carmd.com/ScoreCard is a **FREE** online CarMD® Vehicle Health ScoreCard™ tool. Input the year, make, model and mileage of any vehicle, and you'll see how that car compares to other vehicles on the road as well as the most common repairs/repair costs by reported mileage, which is useful to budget cost of ownership or a used car purchase.

HIGHLIGHTS

Car repair costs across the U.S. were **up 6.7 percent in 2013 on top of a 10 percent** year-over-year rise from 2011 to 2012.

- Average repair costs in 2013 were $392.49 still short of their high of $422.36 in 2006.
- Average labor costs were up 13 percent and parts costs were up 3 percent over the previous year.

RISING REPAIR COSTS



NINE IN TEN TOP REPAIRS SEE PRICE INCREASE

All but one of the 10 most common repairs saw an increase in repair costs.

- The no. 1 most common repair "Replace Oxygen Sensor" decreased 11 percent in 2013 over the previous year.

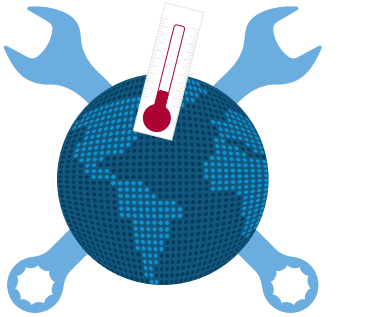
TEMPERATURE EXTREMES CONTRIBUTE TO PARTS FAILURE

Weather can affect repair costs.

- Drivers in the Northeast and Midwest experienced 9 percent increases in average repair costs.
- The West and South only had a 5 percent uptick.

Weather can also affect car parts. 2013 saw temperature extremes with the fourth warmest year on record. It also had more daily record lows than highs for the first time in 20 years*, with record-breaking cold across much of the East, Midwest and parts of the South.

- Battery and thermostat-related repairs are among the parts that saw an increase in repair frequency, which can be partially attributed to their sensitivity to heat and cold.
- "Replace thermostat" experienced the largest jump in rank among most common repairs.
- Battery inspections/replacements were new to the top 10 repairs in the Midwest this year, possibly a result of cold weather.

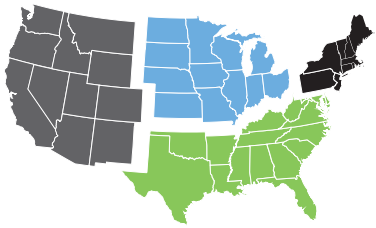


HIGHLIGHTS

REGIONAL REPAIR COSTS EQUALIZING

The gap between regions continues to close.

- In 2013, drivers in the Western U.S. paid the most for car repairs at an average cost of $404.53, which was only 9 percent more than drivers in the Midwest who paid the least ($368.04) and in line with drivers in the Northeast ($402.73).
- Two years ago in 2011 drivers in the West paid 17 percent more than drivers in the Midwest for repairs.



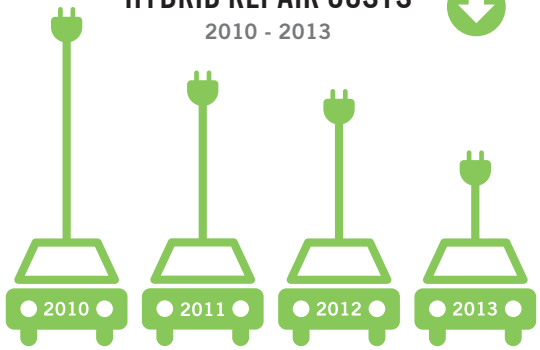
WEST // MIDWEST // SOUTH // NORTHEAST

HYBRID REPAIR COSTS

2010 - 2013

Hybrid repairs continue to drop with increased volume of hybrids on the road, as well as more parts available and people trained to service them.

- Hybrids only accounted for three of the top 10 most expensive repairs in 2013 as opposed to four of the top 10 the previous year.
  - In 2011, the most expensive repair was “replace hybrid inverter assembly” ($4,098). In 2013 this repair now cost $2,826.
  - For 2013, the most expensive repair was “Replace Transmission Assembly and Reprogram Electronic Control Module” (>$5,900) – up 10 percent from 2012.

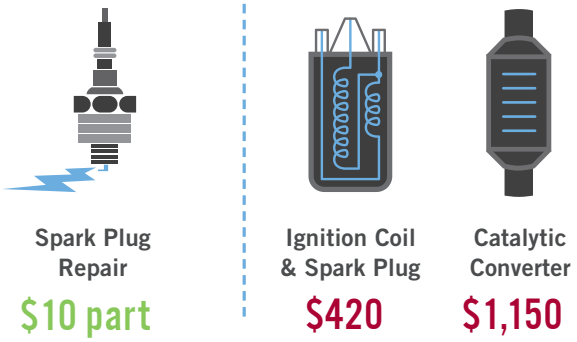


Cost to replace inverter assembly falls for third consecutive year.

TIMELY REPAIRS SAVE CASH

Paying attention to small problems and recommended maintenance schedules extend the life of your car and minimize check engine-related repairs.

- Each of the top 10 most common check engine problems can negatively impact your car’s fuel economy.
- The O2 sensor’s life can be extended by using factory-recommended fuel types, and getting regular oil and spark plug changes.
- April Car Care Awareness Month is a good time to address problems. Ignore a spark plug and a $10 part can turn into a $420 ignition coil and spark plug repair. Ignore that and you risk damaging your car’s catalytic converter at an average cost of $1,150, not to mention reduced MPG.



THE TOP TEN
CHECK ENGINE LIGHT REPAIRS

1 **The most common car repair (7.55 percent) in 2013 was "replace oxygen sensor."** Extremely important to a car's engine performance and to the environment, the O2 sensor measures the amount of unburned oxygen in the exhaust and tells a car's computer when there is either too much, or not enough fuel as compared with oxygen for ideal operation. O2 sensors fail prematurely due to a variety of causes, including lack of maintenance such as neglecting oil changes or engine contamination from burning oil or internal coolant leaks. A faulty O2 sensor costs less than $300 to fix but can lead to as much as a 40 percent reduction in gas mileage if ignored. Many drivers ignore the O2 sensor because their car often seems like it's driving just fine, but in reality it's reducing your fuel economy and slowly doing more damage to your car.

- The average cost to replace O2 sensor decreased 11 percent from $293 in 2012 to $261 in 2013, comprised of $116 for labor and $145 in parts.

2 **"Tighten or replace fuel cap" remains the second most common repair, but continues to drop in percentage of repairs.** In 2010 it accounted for 9.28 percent of repairs. In 2011 the gas cap accounted for 8.26 percent of repairs. In 2012, it dropped to 7.21 percent. And in 2013 it was 7.17 percent. Missing or damaged gas caps can cost time and money, triggering the check engine light and a repair shop visit. Faulty gas caps allow millions of gallons of fuel to evaporate every year, and gas evaporates much quicker when it's warm. Simply tightening the cap for free or replacing it for a few dollars is the repair, but if left unchecked can result in a decrease in gas mileage and harm the environment.

- The average cost to diagnose a loose gas cap is only $0.11, meaning most just need to be tightened versus replaced.

3 **The third most common repair, "replace catalytic converter(s)," accounted for 6.10 percent of repairs in 2013, dropping slightly from 6.26 percent of repairs the previous year.** In most cases, a catalytic converter won't fail unless a related part – such as a spark plug – is ignored for too long. According to AAA, catalytic converters are among the top five most stolen car parts because they contain precious metals, which contribute to their high price tag.

- The average cost to replace a catalytic converter rose 5 percent from $1,101.44 in 2012 to $1,154 in 2013.

4 **The spark plug moves up to the fourth most common check engine-related repair (3.35 percent).** Responsible for igniting a car's air/fuel ratio, spark plugs are essential and when they fail they can cause a "misfire," reduce gas mileage and eventually damage a catalytic converter. When the weather turns cold fuel doesn't vaporize as easily so droplets can form and foul the plug. The cost to replace a spark plug yourself can be as little as $10, but can save thousands down the road.

- The average cost to replace spark plug(s) and spark plug wire(s) jumped nearly 6 percent from $342 in 2012 to $361 in 2013.

5 **The fifth most common repair (3.35 percent) is replace the Mass Air Flow Sensor (MAF),** which is responsible for metering the air coming into your car's engine and determining how much fuel to inject into the engine. When malfunctioning, it can lower fuel economy by 10 percent to 25 percent. It costs just over $420 on average to repair, but is vital to saving dollars at the pump.

- Mass air flow sensor replacement costs have jumped roughly 3 percent from $410 to $423 over the past year.

THE TOP TEN

CHECK ENGINE LIGHT REPAIRS

6 **"Replace Ignition Coil is the sixth most common repair accounting for 3.00 percent of repairs in 2013.** Ignition coils help the engine start and keep running. They take the battery's 12-volt current and step it up to ignite the spark plugs. Your car may have only one ignition coil, or as many as it has cylinders. Several conditions can contribute to its failure, including faulty spark plugs, high underhood temperatures and age. A driver should pay attention to possible symptoms surrounding engine coil failure as it will soon affect other vehicle systems, such as the costly catalytic converter, and can leave them stranded by the roadside.

- The average cost to replace ignition coil(s) in 2013 was $250.

7 **The no. 7 most common repair (2.89 percent) in 2013 was a combined "Replace Ignition Coil(s) and Spark Plug(s).** This is an example of how ignoring a smaller problem like a spark plug can snowball into the need for more than one repair.

- The cost to replace both ignition coil(s) and spark plug(s) is $420 on average.

8 **At no. 8 in 2013 was "Inspect Battery and Charging System and Repair/Replace as Necessary" jumping from no. 10 in 2012.** Computers on today's high tech cars are able to monitor voltage on charging systems and trigger the check engine light when it isn't correct, which contributes to the increase in battery and charging system repair incidents reported to CarMD. Extreme temperatures can also result in premature aging of parts such as car batteries, resulting in the need for more frequent replacement than the typical recommended 3-year time period.

- The average cost to address a battery and charging system problem rose 10 percent from $100 in 2012 to $110 in 2013.

9 **The ninth most common check engine-related repair is "Replace Exhaust Gas Recirculation (EGR) Valve and Clean EGR Ports."** EGR helps your car run more efficiently and helps control emissions. The EGR valve re-circulates a portion of the exhaust back through the combustion process, lowering the combustion temperature and the formation of nitrous oxide emissions. A faulty EGR valve or blocked EGR passage can cause rough idling, engine hesitation, misfire and poor fuel economy.

- The average cost to replace an EGR valve in 2013 was $352 – up 8 percent from $325 the year prior.

10 **Rounding out the top 10 is "Inspect for Faulty Vacuum Hose(s) and Repair/Replace as Necessary."** The hoses connect to the intake manifold and vacuum the extra air from parts of the engine. Vacuum hoses heat up when the engine is running. When they heat, they can crack and leak. This lets excess air get into the engine and can cause engine hesitation, stalling and rough idling, plus damage to the oxygen sensor and eventually the engine itself.

- The average cost to have a vacuum hose replaced by a professional is $122, but you can do it yourself for as little as $5.

THE TOP TEN

CHECK ENGINE LIGHT REPAIRS

1 **Replace 02 Sensor**
$261.61 AVG repair
7.55% of CEL repairs

2 **Inspect Gas Cap**
11¢ AVG repair
7.17% of CEL repairs

3 **Replace Catalytic Converter**
$1,154.23 AVG repair
6.10% of CEL repairs

4 **Replace Spark Plug(s) and Wire(s)**
$361.95 AVG repair
3.35% of CEL repairs

5 **Replace Mass Airflow Sensor**
$423.61 AVG repair
3.35% of CEL repairs

6 **Replace Ignition Coil(s)**
$250.94 AVG repair
3.00% of CEL repairs

7 **Replace Ignition Coil(s) and Spark Plug(s)**
$420.34 AVG repair
2.89% of CEL repairs

8 **Inspect/Replace Battery/Charging System**
$110.82 AVG repair
2.54% of CEL repairs

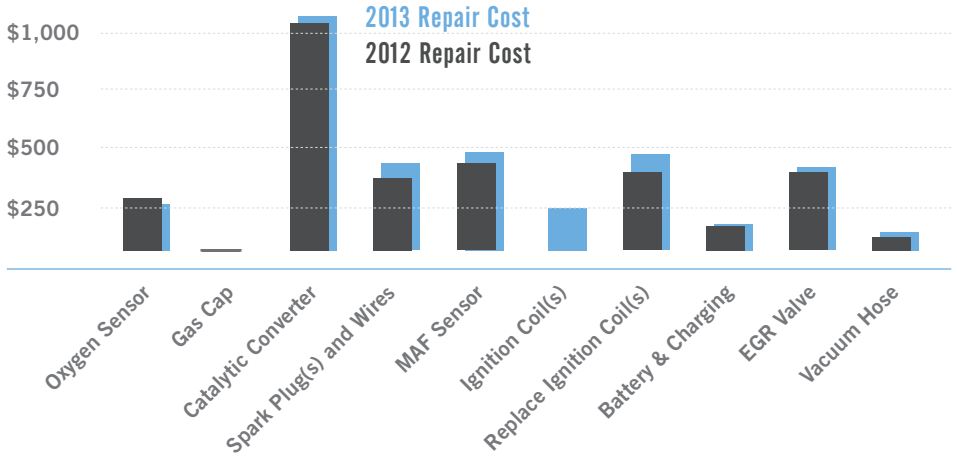
9 **Replace EGR Valve and Clean EGR Ports**
$351.97 AVG repair
2.32% of CEL repairs

10 **Inspect/Replace Vacuum Hose(s)**
$122.52 AVG repair
2.22% of CEL repairs

THE TOP TEN
CHECK ENGINE LIGHT REPAIRS

Increase / Decrease In Cost To Repair 10 Most Common Check Engine-Related Car Repairs 2012 vs. 2013

Rank	Vehicle Repair	2012	2013	% Change in Repair Cost Over Prior Year
1	Replace Oxygen Sensor(s) (O2S)	$293.88	$261.61	10.9% ↓
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$ 0.10	$0.11	No Change
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$ 1,101.44	$1,154.23	4.8% ↑
4	Replace Spark Plug Wires and Spark Plugs	$342.55	$361.95	5.7% ↑
5	Replace Mass Air Flow (MAF) Sensor	$410.17	$423.61	3.2% ↑
6	Replace Ignition Coil(s)	No Change	$250.94	No Change
7	Replace Ignition Coil(s) and Spark Plug(s) if needed	$316.58	$420.34	32.7% ↑
8	Inspect Battery and Charging System and Repair/Replace as Necessary	$100.63	$110.82	10.1% ↑
9	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	$325.95	$351.97	7.9% ↑
10	Inspect Faulty Vacuum Hose(s) and Repair/Replace as Necessary	$107.32	$122.52	14.1% ↑



WHERE DOES CarMD's INDEX DATA ORIGINATE?

Beginning in 1996, the U.S. government mandated on-board diagnostics (OBD2) for all foreign and domestic cars, light trucks, minivans and SUVs sold in the United States. This universal technology detects malfunctions, sets a diagnostic trouble code (DTC) and turns on the check engine light if a problem (or potential problem) is detected. The system provides vital health and safety information for approximately 80 percent of a vehicle's systems, and is currently installed on more than 85 percent of vehicles nationwide, including newer hybrids and diesels. It can be accessed by a range of diagnostic tools used throughout the industry.

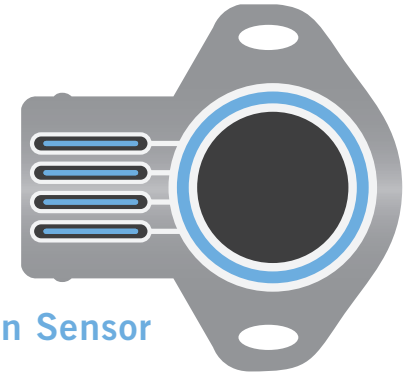
Since 1996, CarMD has been building the most comprehensive database of diagnostic trouble codes; expert fixes and repair costs. These repairs come directly from the cars themselves and the professionals who service them. As a result, CarMD is able to provide unbiased data on repair costs and trends. This 2014 Index statistically analyzes more than 145,500 repairs that apply to more than 200 million vehicles on the road in the U.S. CarMD's network of thousands of Automotive Service Excellence (ASE)-certified, factory-trained technicians recommend, confirm and upload new repair scenarios daily to the CarMD database, which are then validated by the company's Master Tech committee of top industry professionals. This data is used to compile the CarMD® Vehicle Health Index™.

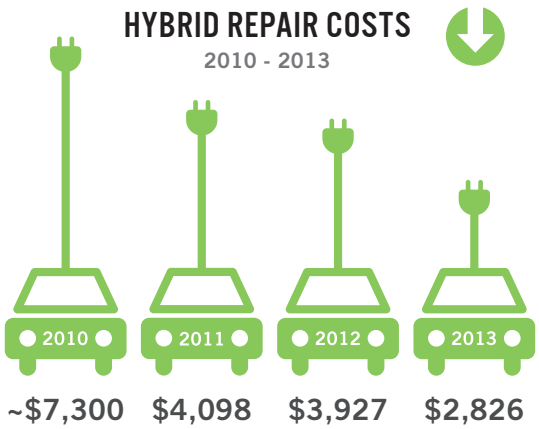
WHAT'S NEW?

New to the top 25 for 2014 is "Replace Throttle Position Sensor (TPS)" (no. 25). Not to be confused with Tire Pressure Monitoring Sensor (TPMS), the throttle position sensor plays an important role in engine efficiency by measuring and reporting the amount of throttle opening to the engine control computer the computer uses this information to make adjustments to the mixture of fuel and air used for combustion. As the throttle is opened, the engine requires more fuel in the mixture to provide needed power. When the TPS begins to fail it can cause rough idling, stalling and increase in fuel consumption by as much as 10 percent, costing driver extra at the pump. Newer-model vehicles are more likely to be equipped with TPS, which may explain its new spot on the top 25.

#25

The Throttle Position Sensor





MOST/LEAST EXPENSIVE CAR REPAIRS

The CarMD® Vehicle Health Index™ illustrates that while **hybrid repairs can still be very pricey, the costs continue to come down with increased volume of hybrids on the road, as well as parts and people trained to service them.**

- In 2013, "replace hybrid inverter assembly" dropped to the no. 11 most expensive repair at roughly $2,800. In 2012 that repair ranked no. 3 at $3,900. In 2011 that repair was the no. 1 most expensive repair at $4,000, and that same hybrid inverter assembly repair would have cost as much as $7,000 historically.
- CarMD projects the cost of hybrid repairs will continue to come down as hybrid vehicle registration grows. According to Ward's Automotive, hybrid sales were up 15.3 percent to 489,413 in 2013. Also, plug-in electric vehicle sales jumped 84 percent in 2013, a trend CarMD will watch to see how repairs are affected in the future.

The **most expensive repair** in the CarMD database in 2013 was "Replace Transmission Assembly and Reprogram Electronic Control Module" ($5,984). This repair, which applies to select Honda Civics and some Jaguar X-Type, Range Rover and Volvo vehicles, is indicative of the fact that cars are being made to outlast parts such as their transmission. When 2001 vehicles were being designed, it was uncommon for a car to last an average of 11.4 years and beyond, as is now reported by R.L. Polk as the average vehicle age.

- Remaining the second most expensive repair is "Replace Transmission and Torque Converter." The average cost for this repair jumped from $3,980 in 2011 to $4,467 in 2012 to $5,143 in 2013.
- The good news is that most expensive repairs remain extremely rare in terms of percentage of occurrence. The top 15 most expensive repairs combined only account for less that 1 percent of all repairs seen by CarMD's network of thousands of certified technicians last year.
- The **least expensive repair** is "inspect engine oil for correct level and viscosity," which is a fancy way of saying "check the oil. The cost? Free.
- The second least expensive repair is "inspect for loose fuel cap and tighten or replace as necessary" at an average repair cost of only 11 cents, illustrating how rarely a gas cap is actually damaged along with the importance of having the tools such as a code reader to diagnose this type of problem from home versus wasting time having it diagnosed at a dealership or repair cost.

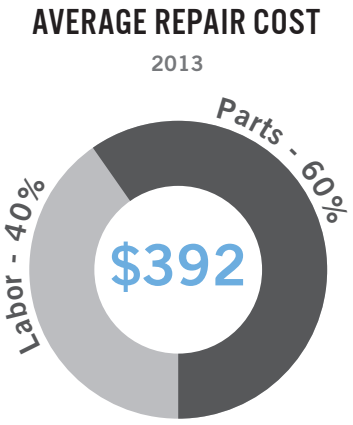
REPAIR COSTS/NATIONAL TRENDS

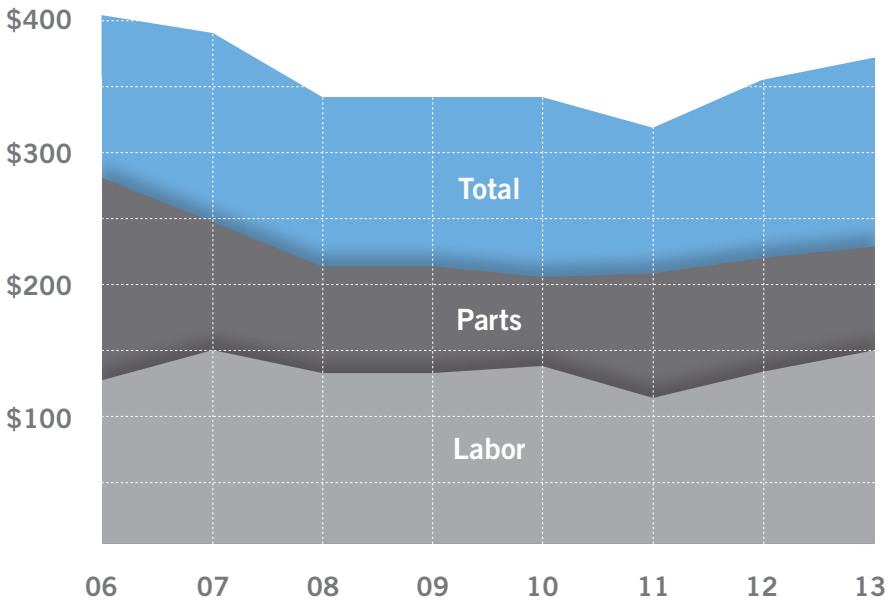
Car repair costs are on the rise after a two-year dip in overall check engine-related repair costs.

- In 2013, the average repair including parts and labor jumped 6.7percent from $367.84 to $392.49.
  - Average repair costs are now more in line with 2009 averages but still 7 percent less than their high in 2006 ($422.36).

U.S. Average Car Repair Cost Trends (8-Year History, 2006 – 2013) Source: CarMD.com Corp.

Year	Labor	Parts	Total Avg. Repair Cost
2013	$157.23	$235.26	$392.49
2012	$138.96	$228.88	$367.84
2011	$118.61	$215.32	$333.93
2010	$143.61	$212.44	$356.04
2009	$138.37	$221.13	$359.50
2008	$135.21	$220.98	$356.19
2007	$152.92	$256.98	$409.91
2006	$131.06	$291.30	$422.36



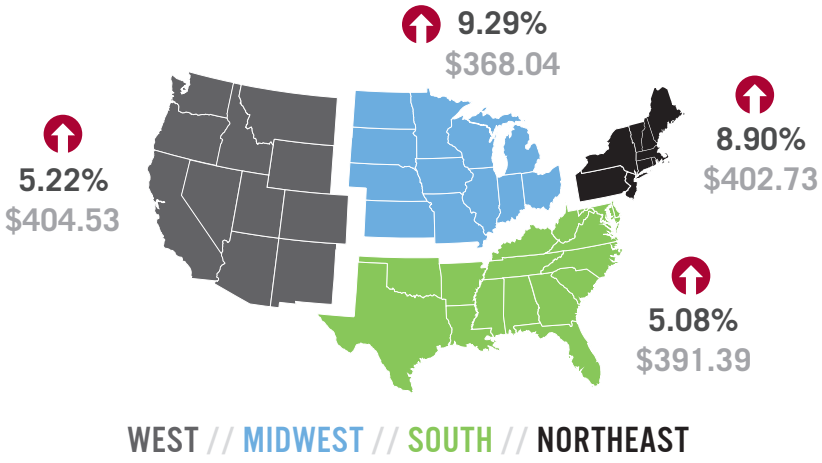


REPAIR COSTS/REGIONAL TRENDS

In 2013, the national average for automotive repair labor costs increased 13 percent from the previous year. Parts costs jumped 3 percent from the previous year.

Car repair costs were up across all regions of the U.S., but the Midwest and Northeast got hit the hardest with a 9 percent increase in repair costs, which may be a result of the record low temperatures caused by the Polar vortex, although the South that also experienced temperature extremes only incurred a 5 percent increase in average check engine-related repair costs.

Vehicle owners in the West paid the most for check engine-related car repair – 9 percent more than drivers in the Midwest, who paid the least, but a gap is closing between the regions with the highest and lowest average car repair costs.



U.S. National Average Repair Costs – 2013 vs. Previous Year (Source: CarMD.com Corp.)

Region	2012 Total Avg. Repair Cost	2013 Total Avg. Repair Cost	% Increase From Previous Year
Nationwide	$367.84	$392.49	6.70%
West	$384.46	$404.53	5.22%
South	$372.44	$391.39	5.08%
Northeast	$369.81	$402.73	8.90%
Midwest	$336.75	$368.04	9.29%

DETAILED INDEX DATA

Nationwide 2013: Top 25 Most Common Check Engine Vehicle Repairs

Rank	Vehicle Repair	Total Average Repair Cost (Parts&Labor)	% 2013 Repairs	Change In Rank Since 2013
1	Replace Oxygen Sensor(s) (O2S)	$261.61	7.55%	1 - No Change
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.11	7.17%	2 - No Change
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$1,154.23	6.10%	3 - No Change
4	Replace Spark Plug Wires and Spark Plugs	$361.95	3.35%	5 ↑
5	Replace Mass Air Flow (MAF) Sensor	$423.61	3.35%	6 ↑
6	Replace Ignition Coil(s)	$250.94	3.00%	New Line Item
7	Replace Ignition Coil(s) and Spark Plug(s)	$420.34	2.89%	4 ↓
8	Inspect Battery and Charging System and Repair as Necessary	$110.82	2.54%	10 ↑
9	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	$351.97	1.93%	9 - No Change
10	Inspect for Faulty Vacuum Hose(s)and Repair As Necessary	$122.52	1.89%	8 ↓
11	Replace Positive Crankcase Ventilation (PCV) Valve and Hose & Grommet	$131.59	1.80%	11 - No Change
12	Replace Wheel Speed Sensor(s)	$245.45	1.75%	13 ↑
13	Replace Thermostat	$199.78	1.73%	18 ↑
14	Replace ABS Control Module	$841.28	1.67%	14 - No Change
15	Remove Aftermarket Alarm System	$108.77	1.66%	7 ↓
16	Replace Intake Manifold Gasket(s)	$430.68	1.57%	16 - No Change
17	Replace Fuel Injector(s)	$536.46	1.57%	17 - No Change
18	Replace Camshaft Position Sensor (CMP)	$223.15	1.55%	15 ↓
19	Replace Engine Coolant Temperature Sensor (ECT)	$180.27	1.34%	19 ↑
20	Inspect for Faulty Wiring and Repair as Necessary	$138.09	1.19%	12 ↓
21	Replace Evaporative Emissions (EVAP) Purge Solenoid	$179.10	1.10%	20 ↓
22	Replace Crankshaft Position Sensor (CKP)	$244.54	0.86%	23 ↑
23	Replace Throttle Body Assembly	$576.05	0.85%	25 ↑
24	Replace ABS Modulator Assembly	$1,420.04	0.82%	21 ↓
25	Replace Throttle Position Sensor (TPS)	$235.21	0.75%	New to Top 25

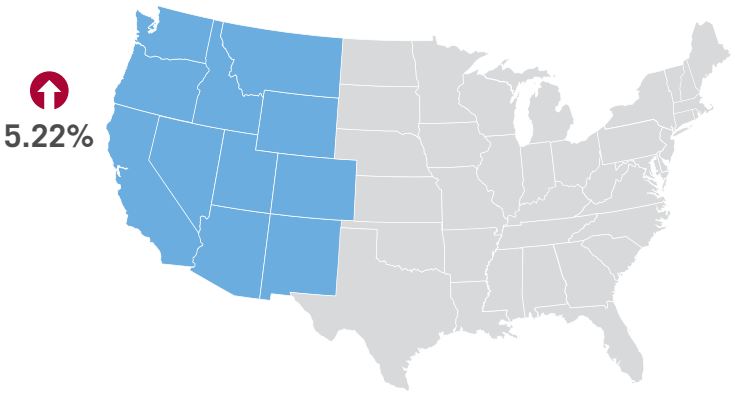
(Top 25 most common vehicle repairs are based on 145,571repairs made in calendar year 2013 on 1996-2014 model year vehicles. This data applies to roughly 85 percent of cars, light trucks, minivans, SUVs and hybrids on the road in the U.S. – foreign and domestic. Source: CarMD.com Corp.)

DETAILED INDEX DATA

Western U.S. 2013: Top 10 Most Common Check Engine Vehicle Repairs

Rank	Vehicle Repair	Total Average Repair Cost (Parts & Labor)	% 2013 Western U.S. Repairs	Change In Western Rank Since 2012
1	Replace Oxygen Sensor(s) (O2S)	$269.47	7.18%	1 – No Change
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.08	6.65%	2 – No Change
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$1,164.36	5.59%	3- No Change
4	Replace Mass Air Flow (MAF) Sensor	$433.55	4.01%	5 - ↑
5	Replace Spark Plug Wires and Spark Plugs	$366.03	3.36%	6 - ↑
6	Replace Ignition Coil(s)	$242.07	2.99%	Reported as Coil / Plug
7	Inspect Battery and Charging System and Repair/ Replace as Necessary	$111.85	2.59%	9 - ↑
8	Replace Ignition Coil(s) and Spark Plug(s)	$408.85	2.38%	6 - ↓
9	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	$365.43	2.11%	7 - ↓
10	Replace Camshaft Position Sensor (CMP)	$224.03	1.85%	New to West Top 10

(Top 10 most common vehicle repairs in the Western U.S. are based on 31,782 repairs in 2013 in AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY. This data applies to roughly 85 percent of cars, light trucks, minivans and SUVs on the road in the U.S. – foreign and domestic. Source: CarMD.com Corp.)



$404.53

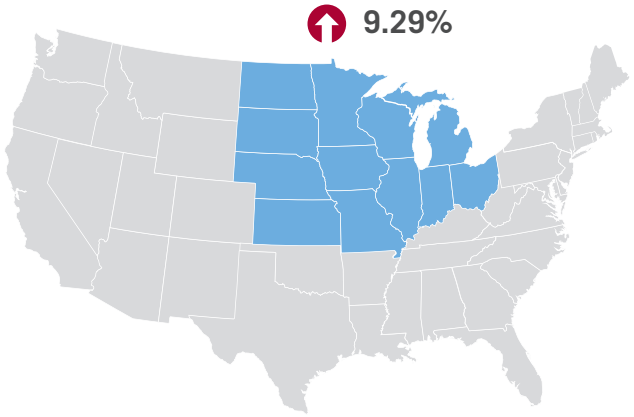
Average cost to repair the most common check engine vehicle problems in the Western United States in 2013.

DETAILED INDEX DATA

Midwestern U.S. 2013: Top 10 Most Common Check Engine Vehicle Repairs

Rank	Vehicle Repair	Total Average Repair Cost (Parts & Labor)	% 2013 Midwestern U.S. Repairs	Change In Midwestern Rank Since 2012
1	Replace Oxygen Sensor(s) (O2S)	$247.34	8.22%	1 – No Change
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.02	7.32%	2 – No Change
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$1,149.05	5.44%	3 – No Change
4	Replace Spark Plug Wires and Spark Plugs	$361.76	3.58%	5 - ↑
5	Replace Mass Air Flow (MAF) Sensor	$405.65	2.98%	6 - ↑
6	Replace Ignition Coil(s)	$255.41	2.57%	Reported as Coil / Plug
7	Replace Wheel Speed Sensor(s)	$269.28	2.52%	9 - ↑
8	Replace Ignition Coil(s) and Spark Plug(s)	$436.39	2.44%	4 - ↓
9	Remove Aftermarket Alarm System	$108.60	2.33%	7 - ↓
10	Inspect Battery and Charging System and Repair as Necessary	$109.78	2.22%	New To Mid-West Top 10

(Top 10 most common vehicle repairs in the Midwestern U.S. are based on 23,271 repairs in 2013 in IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD and WI. This data applies to roughly 85 percent of cars, light trucks, minivans and SUVs on the road in the U.S. – foreign and domestic. Source: CarMD.com Corp.)



$368.04

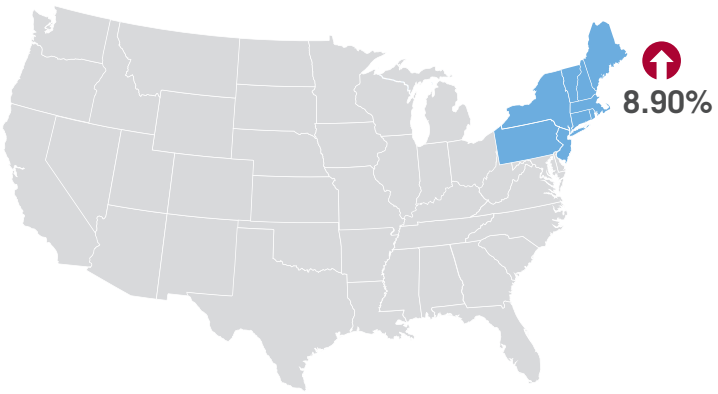
Average cost to repair the most common check engine vehicle problems in the Midwestern United States in 2013.

DETAILED INDEX DATA

Northeastern U.S. 2013: Top 10 Most Common Check Engine Vehicle Repairs

Rank	Vehicle Repair	Total Average Repair Cost (Parts & Labor)	% 2013 Northeastern U.S. Repairs	Change In NE Rank Since 2012
1	Replace Oxygen Sensor(s) (O2S)	$268.55	8.69%	1 – No Change
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.00	8.10%	2 – No Change
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$1,153.45	6.27%	3 – No Change
4	Replace Mass Air Flow (MAF) Sensor	$422.90	3.02%	6 - ↑
5	Replace Ignition Coil(s)	$257.41	2.98%	Reported as Coil / Plug
6	Replace Spark Plug Wires and Spark Plugs	$359.21	2.97%	5 - ↓
7	Inspect Battery and Charging System and Repair as Necessary	$109.83	2.81%	8 - ↑
8	Replace Ignition Coil(s) and Spark Plug(s)	$410.38	2.54%	4 - ↓
9	Replace Wheel Speed Sensor(s)	$224.42	2.46%	7 - ↓
10	Replace ABS Control Module	$750.54	1.93%	New to NE Top 10

(Top 10 most common vehicle repairs in the Northeastern U.S. are based on 23,562 repairs in 2013 in CT, MA, ME, NH, NJ, NY, PA, RI and VT. This data applies to roughly 85 percent of cars, light trucks, minivans and SUVs on the road in the U.S. – foreign and domestic. Source: CarMD.com Corp.)



$402.73

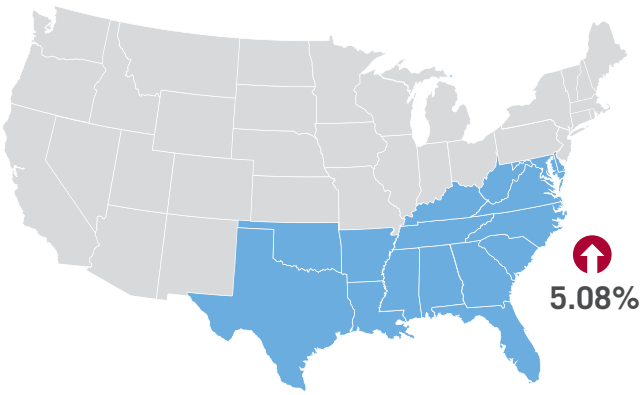
Average cost to repair the most common check engine vehicle problems in the Northeastern United States in 2013.

DETAILED INDEX DATA

Southern U.S. 2013: Top 10 Most Common Check Engine Vehicle Repairs

Rank	Vehicle Repair	Total Average Repair Cost (Parts & Labor)	% 2012 Southern U.S. Repairs	Change In Southern Rank Since 2012
1	Replace Oxygen Sensor(s) (O2S)	$260.69	7.09%	1 – No Change
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.19	7.05%	3 - ↑
3	Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	$1,151.93	6.53%	2 - ↓
4	Replace Ignition Coil(s) and Spark Plug(s)	$422.76	3.43%	6 - ↑
5	Replace Spark Plug Wires and Spark Plugs	$361.10	3.40%	5 – No Change
6	Replace Mass Air Flow (MAF) Sensor	$422.85	3.27%	4 - ↓
7	Replace Ignition Coil(s)	$251.82	3.16%	Reported As Coil / Plug
8	Inspect Battery and Charging System and Repair as Necessary	$111.05	2.52%	7 - ↓
9	Replace Thermostat	$195.77	1.92%	New to South Top 10
10	Replace Exhaust Gas Recirculation (EGR) Valve and Clean All EGR ports	$356.68	1.87%	9 - ↓

(Top 10 most common vehicle repairs in the Southern U.S. are based on 66,378 repairs in 2013 in AL, AR, DC, DE, FL,GA, KY, LA, MD, MS, NC, OK, TN, VA, SC, TX and WV. This data applies to roughly 85 percent of cars, light trucks, minivans and SUVs on the road in the U.S. – foreign and domestic. Source: CarMD.com Corp.)



$391.39

Average cost to repair the top 10 most common check engine vehicle problems in the Southern United States.

DETAILED INDEX DATA

Nationwide 2013: The 10 Most Expensive Check Engine Vehicle Repairs

Rank	Vehicle Repair	Type of Vehicle(s)	Total Repair Cost (Parts & Labor)
1	Replace Transmission Assembly and Reprogram Electronic Control Module (ECM)	Honda Civic 2001-2004 Jaguar X-Type 2002-2008 Range Rover 2003-2009 Volvo 2001-2006	> $5,900
2	Replace Transmission and Torque Converter	Various makes and models	~ $5,140
3	Replace Engine	Chevrolet Geo Prizm 2001 Chevrolet Cruz 2011-2012 Dodge Caliber, Jeep Compass, and Patriot 2007-2009 Mazda RX8 2004-2005	> $5,100
4	Replace Hybrid Battery and Reprogram Engine Control Module (ECM)	Honda Hybrid Vehicles 2000-2010 Saturn Vue Hybrid 2007-2009	~ $4,000
5	Repair Transmission Assembly	Various Dodge, Jeep, Lincoln, and VW Vehicles 2000-2009	> $3,600
6	Replace Transmission Assembly	Dodge Stratus 2000 Jeep Wrangler 2005-2006 Lincoln Aviator 2003-2005 VW Routan 2009	~ $3,635
7	Replace Transmission Case and Torque Converter	Saturn Vue 2004-2004	~ $3,490
8	Replace Transmission Valve Body Assembly and Engine Control Module (ECM)	Ford Focus 2007 Jaguar S-Type 2005 Toyota Trucks 2001-2002	> $3,150
9	Replace Hybrid Battery	Various Ford, Honda, Nissan & Toyota Hybrid Vehicles 2000-2009	> $3,140
10	Replace Integrated Motor Assist (IMA) Battery	Various Hybrid Vehicles	~ $2,900

(Top 10 most expensive repairs are based on 145,571 verified repairs made and input into the CarMD database by the company's team of factory trained repair professionals in 2013. This data is for model year 1996 to 2014 OBD2 cars, light trucks, minivans and SUVs in the U.S. – foreign and domestic. Although these are the most expensive repairs, very few are common. Source: CarMD.com Corp.)

DETAILED INDEX DATA

Nationwide 2013: The 10 Least Expensive Check Engine-Related Vehicle Repairs

Rank	Vehicle Repair	Total Cost (Parts & Labor)
1	Inspect Engine Oil for Correct Level and Viscosity	$0.00
2	Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	$0.11
3	Replace Fuel Tank Gas Cap	$26.42
4	Inspect Air Filter	$107.17
5	Inspect Exhaust System	$107.17
6	Inspect for Faulty Wiring at Powertrain Control Module (PCM)	$107.17
7	Inspect for Vacuum Leak at Air Injection (AIR) System and Repair as necessary	$107.17
8	Inspect Exhaust Waste Gate Actuator and Repair as Necessary	$107.98
9	Inspect for Faulty Wiring at Air/Fuel Ratio Sensor(s) (AFR) and Repair as Necessary	$107.98
10	Disable Air Injection (AIR) System and Reprogram Powertrain Control Module (PCM)	$108.25

(Top 10 least expensive repairs are based on 145,571 verified repairs made and input into the CarMD database by the company's team of factory trained repair professionals in 2013. This data is for model year 1996 to 2014 OBD2 cars, light trucks, minivans and SUVs in the U.S. – foreign and domestic. Source: CarMD.com Corp.)

INDEX METHODOLOGY

CarMD has compiled the industry's most comprehensive database of Diagnostic Trouble Codes (DTCs) uploaded by automotive technicians and vehicle owners since 1996. The data for the 2014 CarMD® Vehicle Health Index™ was procured from CarMD's network of thousands of automotive service excellence (ASE)-certified technicians who input and verified failures and repairs into the CarMD diagnostic database from Jan. 1, 2013 to Dec. 31, 2013. This same database is also used to support the consumer automotive solutions sold by CarMD, as well as CarMD's software and services for connected cars.

The data was pulled and analyzed between Feb. 28, 2014 and Mar. 9, 2014.

Virtually all makes and models of cars, light trucks, minivans, SUVs and hybrids made since 1996 – foreign and domestic – with on board diagnostic second generation (OBD2) technology are included in the Index. Those makes and models with more registered vehicles on the road may have a larger statistical weighting in the Index findings, as will those vehicles that experience more failures.

In addition to DTC data, CarMD has compiled the most comprehensive database of "fixes" or recommended repairs that correspond to each trouble code scenario. The 2014 Index statistically analyzes 145,571 repairs. Each repair has also been reviewed and validated by CarMD's team of ASE-certified Master Technicians and then output based on a probability algorithm that takes into account the vehicle's year, make, model, mileage, zip code, DTCs and similar vehicle problems to produce a most likely repair. Because the data stems from those U.S. vehicle owners and automotive technicians who elected to use the diagnostic devices and/or upload data into the CarMD database; no estimates of theoretical sampling error can be calculated.

All 50 U.S. states, plus the District of Columbia, are represented in this Index. The states with larger registered vehicle populations and participating ASE-certified technicians may have a larger quantity of logged repairs; however, all have been averaged into the overall Index findings. The data in the Index is applicable to roughly 85 percent of the vehicles on the road, giving a unique perspective on vehicles driven in the U.S. For regional data, CarMD used the U.S. Census Bureau Regions and Division Map to define regions.

Repair costs are based on parts and dealer list plus 10 percent 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.

CarMD has contracted with an independent consulting company to create and maintain the database for compiling and generating this Index. In most cases, percentages were rounded to the nearest tenth. In the instances of a tie for most common fix percentages were expanded by rounding to the nearest 100th.

On a daily basis, CarMD's nationwide network of thousands of automotive service excellence (ASE)-certified technicians recommend, confirm and upload repairs and costs by region to the CarMD database, with the database growing in size each year. 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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