How AAA Chooses, Tests, and Scores Vehicles

For a vehicle to be included in the *AAA Green Car Guide*, it must be one or more of the following:

- A gas-powered vehicle with EPA category-leading fuel economy or with a fuel-economy rating within 10 percent of the leader
- A hybrid or plug-in hybrid vehicle
- A battery-electric vehicle
- A zero-emission (ZEV) or partial-zero-emission (PZEV) vehicle
- A diesel vehicle that meets California emission standards
- A vehicle that runs on CNG
- A vehicle that runs on hydrogen.

For the category-leading fuel-economy group, the ARC staff chooses the leading internal combustion, gasoline-powered vehicles from the categories established by the EPA and published on its website, fueleconomy.gov.

Based on its research, the ARC compiles a list of potential vehicles to be tested for the current Guide (model years 2016 and 2017), then updates and changes the list as additional information about vehicles comes in. For this year’s Guide, only vehicles available for sale by January 1, 2017, were tested. The Guide also includes models from 2016, but only if no significant changes were made to a car’s powertrain for 2017. No reviews of vehicles older than model year 2016 are included in the current Guide.

ARC staff then asks automakers to lend it vehicles to test. Manufacturers don’t always have the requested vehicles, either because they’re not yet in press fleets or simply not available. If the ARC is unable to acquire a vehicle from a manufacturer, it attempts to obtain it from rental companies or other sources.

The ARC makes every attempt to acquire a vehicle or powertrain that fits within the guidelines described above. If a vehicle isn’t reviewed, it’s because we weren’t able to acquire it by the publishing deadline. Look for capsule reviews of such vehicles in the “But Wait, There’s More” section of Chapter 4, “What’s on the Horizon.”
SCORING

After the ARC completes vehicle testing, it ranks the scores for each test area on a 0- to 10-point basis. The best-scoring vehicle receives 10 points and the lowest receives 0 points. Then the scores from all the tests for a particular vehicle are totaled to determine its overall score. The maximum possible score is 130.

The following are the 13 criteria ARC staff use to evaluate and score vehicles:

EMISSION SCORE. A vehicle’s emission score is taken directly from the EPA’s ratings. It’s the equivalent of the EPA’s smog rating, which is found on all new-vehicle window stickers. The rating is on a scale of 1 through 10 (with 10 being the best), determined by the vehicle’s emission levels. All vehicles have a federal rating, and all vehicles sold in California must pass California exhaust-emission standards. So most vehicles will have both a federal and a California rating, although the EPA window sticker shows only the federal rating.

In some cases, automakers send dealers in California (and the other states that share the same emission standards) vehicles that produce lower exhaust emissions than the same vehicles sold in other states. The AAA Green Car Guide uses the federal rating in its calculations, unless the vehicle is one with a drivetrain configuration sold only in California.

BRAKING. The braking score is based on recorded stopping distances measured by an optical fifth wheel (a device used to measure time, distance, and speed) attached to vehicles when testing them at the Auto Club Speedway. The braking-distance score is the average of three sudden-stopping distances from 50 to 0 mph.

ACCELERATION. A vehicle is given an acceleration score based on its 0-to-60 mph and 40-to-60 mph elapsed times, which are measured using an optical fifth wheel. A total of 12 acceleration tests per vehicle at each speed interval are performed on the drag strip at the Auto Club Speedway, six heading west and six heading east. ARC staff then average the best two times in each direction. The vehicles with the best and worst elapsed times are rated with a 5 or a 0, respectively.

All vehicles are then rated on the basis of both components on a scale from 0 to 5 each, relative to the other vehicles included in the Guide. The maximum number of points a vehicle can earn is 10; that means it has both the best 0-to-60 mph and 40-to-60 mph times.

HANDLING. The handling score consists of three parts, each based on a slalom-course evaluation. A minimum of two ARC evaluators drive a vehicle through the slalom course at least six times each. The average of the top three slalom times overall is used to obtain the slalom time for that vehicle. The two other subscores that make up the overall handling score are derived from subjective ratings of control and ease of operation.
CRASHWORTHINESS. A vehicle’s crashworthiness score is calculated based on the weight of the vehicle and the number of air bags. Typically, each vehicle is weighed on a public scale with a full tank of gas and no occupants. In some cases, the weight is obtained from the manufacturer. The maximum score based on weight is 5 points.

A vehicle is also awarded points based on its number of air bags, with a maximum of 5 points. The number of air bags in our scoring often differs from what’s reported by the manufacturer. For example, a manufacturer typically counts a full side-curtain air bag as one air bag, but because it protects both the front and rear passengers, the ARC counts it as two.

CARGO CAPACITY. This refers to the trunk area, or for vehicles such as hatchbacks, the area behind the second seat. In most cases, this number is taken from the current EPA Fuel Economy Guide. The vehicle with the smallest cargo capacity is given a score of 0, and the vehicle with the largest capacity is given a 10. All other vehicle scores are then rated relative to these minimum and maximum cubic-feet values.

RIDE QUALITY. This measurement is derived from subjective scores of eight ride qualities: bump-impact noise, bump-impact feel, dip response, body shake (smooth road), body shake (rough road), ride firmness, sway (pitch), and sway (cornering). Each ARC evaluator rates the vehicles using scores from 0 to 10 for each attribute. The overall average is the ride-quality score.

EASE OF ENTRY AND EXIT. The driver’s seat of the vehicle is set to the comfort level of each evaluator, who then rates nine attributes associated with the difficulty level of exiting and entering the vehicle’s front and rear seats. The vehicle is also given a score based on the door swing or door angle for both the front and rear seats, which is factored into the overall rating for the front and rear. The average of the two overall ratings (front and rear) given by each evaluator becomes the overall score, on a scale from 0 to 10.

ROOMINESS. This score is based on measurements for leg, head, and shoulder room in the front and rear seat, a total of 10 possible points. After all vehicles have been tested, the minimum and maximum values for each measurement are calculated. The vehicles
are then scored relative to the other vehicles in
the Guide. Legroom and headroom can receive
a maximum of 2 points, and shoulder room can
receive up to 1 point.

**INTERIOR NOISE.** ARC evaluators measure inte-
rior noise with a decibel meter inside the vehicle
at idle, at steady-state 30 mph, at steady-state
55 mph, and during an acceleration run from 0
to 60 mph. The vehicle with the noisiest interior
at each measured interval receives a subscore of 0; the vehicle
with the quietest interior receives a 10. All other vehicles are then
scored relative to the minimum and maximum decibel values, and
an overall score for interior noise is calculated.

**VISIBILITY.** There are four subjective visibility categories that
each evaluator rates: forward, rear, and side visibility, each with
their own set of attributes, and the side-mirror controls. Each
individual attribute (for example, forward distance visibility) is
rated on a scale from 0 to 10. A vehicle gets additional points in
each category if it has a rear-window defroster, rear-window wiper, heated windshield, heated
side mirrors, or if the right-side mirror tilts down
when the vehicle is in reverse. Some attributes,
including headlight illumination, are weighted
more heavily. The ARC calculates an average
based on all evaluator ratings and uses the
overall average of all the scores to obtain the
raw score.

**FUEL ECONOMY.** The ARC uses EPA estimates of combined mpg,
and the ratings are ranked from highest to lowest. The vehicle with
the best fuel economy gets 10 points; the vehicle with the lowest
gets 0. All EVs get a score of 10. For gasoline vehicles, if a vehicle
uses regular fuel, it receives 2 additional points (1 for midgrade).
The high, low, and average on-the-road fuel economy for gasoline
and hybrid vehicles obtained during the test vehicle’s evaluation is
also noted, but is not included in the fuel-economy score. Generally,
at least three evaluators drive each test vehicle over a weeklong
period.

**TURNING CIRCLE.** A vehicle’s turning
circle is measured at the Auto Club
Speedway. The right and left turn-
ing radiuses are measured, and the
average becomes the turning circle.
The vehicle with the largest circle re-
ceives a score of 0, and the one with
the smallest circle receives a 10. All
other vehicles are then scored rela-
tive to the minimum and maximum
radiuses.