

2013 Chevrolet Malibu Hybrid ECO

Advanced Vehicle Testing – Vehicle Testing Summary



VEHICLE SPECIFICATIONS¹

Vehicle

VIN: 1G11D5RRXDF106605

Class: Midsize

Seatbelt Positions: 5

Type: HEV

CARB²: AT-PZEVEPA City/Hwy/Combined:
25/37/29 mpg

Engine

Model: ECOTEC

Output: 136 kW @ 6200 rpm

Configuration: Inline 4-Cylinder

Displacement: 2.4 L

Fuel Tank Capacity: 15.8 gal

Fuel Type: Reg. Unleaded

Tires

Manufacturer: Goodyear

Model: Assurance Fuel Max

Size: P225/55R17

Pressure F/R: 35/35 psi

Spare Installed: N/A - Tire sealant
and inflator

Battery

Manufacturer: Hitachi

Type: Lithium-ion

Cathode/Anode Material:
LiMn₂O₄/Hard Carbon

Number of Cells: 32

Cell Config.: Two 16-cell modules
in series

Nominal Cell Voltage: 3.6 V

Nominal System Voltage: 115 V

Rated Pack Capacity: 4.4 Ah

Rated Pack Energy: 0.5 kWh

Weight of Pack: 65 lb

Pack Location: Trunk/Rear Seat

Cooling: Active – Fan cooled

Motor/Generator

Max. Power/Torque: 15 kW/107 Nm

Max. Generator Speed: 6000 rpm

Cooling: Active – Liquid cooled

Weights

Design Curb Weight: 3,620 lb

Delivered Curb Weight: 3,566 lb

Distribution F/R (%): 60/40

GVWR: 4,533 lb

GAWR F/R: 2,331/2,202 lb

Max. Payload: 913 lb

Dimensions

Wheelbase: 107.8 in

Track F/R: 62.2 / 62.0 in

Length/Width: 191.5 in/73.0 in

Height: 57.6 in

Ground Clearance: 6.0 in

NOTES:

1. Vehicle specifications were supplied by the manufacturer, measured, or derived from a literature review.
2. The vehicle was certified as an Advanced Technology Partial Zero Emission Vehicle by the California Air Resources Board (CARB).

PERFORMANCE STATISTICS ¹		
BEGINNING OF TEST TRACK TESTING ²	END OF TEST TRACK TESTING ³	DIFFERENCE
<u>Acceleration 0-60 mph⁴</u> Measured Time: 8.8 s Performance Goal: ≤13.5 s Peak DC Power from Battery: 8.3 kW	<u>Acceleration 0-60 mph⁴</u> Measured Time: 8.8 s Performance Goal: ≤13.5 s Peak DC Power from Battery: 12.4 kW	Time: 0.0 s 0% Power: +3.9 kW 39.6%
<u>Maximum Speed</u> At ¼ Mile: 84.8 mph Maximum Speed ⁵ : 119.9 mph Performance Goal: ≥90 mph at 1-mile mark	<u>Maximum Speed</u> At ¼ Mile: 84.2 mph Maximum Speed ⁵ : 120.1 mph Performance Goal: ≥90 mph at 1-mile mark	¼ Mile: -0.2 s -0.7% Max Speed: +0.2 mph 0.2%
<u>Braking from 60-0 mph⁶</u> Measured Time: 3.2 s Distance: 115 ft Peak DC Power into Battery: 3.0 kW	<u>Braking from 60-0 mph⁶</u> Measured Time: 3.4 s Distance: 136 ft Peak DC Power into Battery: 3.6 kW	Time: +0.2 s 6.1% Distance: +21 ft 16.7% Power: +0.6 kW 18.2%
<u>Deceleration 60-10 mph⁷</u> Measured Time: 57.3 s Distance: 2,723 ft Peak DC Power into Battery: 3.6 kW Total DC Energy into Battery: 21 Wh	<u>Deceleration 60-10 mph⁷</u> Measured Time: 60.8 s Distance: 2,892 ft Peak DC Power into Battery: 6.3 kW Total DC Energy into Battery: 20 Wh	Time: +3.5 s 5.9% Distance: +169 ft 6.0% Power: +2.7 kW 54.5% Energy: -1 Wh -4.9%
NOTES: <ol style="list-style-type: none"> Performance numbers based on “Normal” vehicle mode. Performance numbers are averages from multiple tests. Electricity values are AC values unless otherwise indicated. Vehicle Beginning of Test track testing occurs when the vehicle has achieved its “break-in mileage” of between 4,000 to 6,000 miles. The vehicle is tested at the delivered curb weight plus 332 ± 10 lb (including driver and test equipment), distributed in a manner similar to the original curb loading of the vehicle. Track testing began on December 20, 2012 with the vehicle odometer reading 4,028 miles. No accessories were used except for headlights as required by track regulation. The results provided are from multiple runs unless otherwise indicated; if taken from a single run, the result is the maximum value over the set of runs. Vehicle End of Test track testing occurs when the vehicle has completed the accelerated mileage fleet testing of at least 3 years and 160,000 miles. Vehicle is tested at the delivered curb weight plus 332 ± 10 lb (including driver and test equipment), distributed in a manner similar to the original curb loading of the vehicle. Track testing began on December 15, 2016 with the vehicle odometer reading 163,974 miles. No accessories were used except for headlights as required by track regulation. The results provided are from multiple runs unless otherwise indicated; if taken from a single run, the result is the maximum value over the set of runs. The acceleration is measured from the point at which the vehicle begins to move. The peak power value was taken from a single run. The maximum speed was reached before the one-mile mark. Controlled braking on dry surface. The peak power into the battery value was taken from a single run. Coasting in drive on dry surface. Test run data were cut off when the vehicle reached 10 mph, as vehicle creep speeds are typically below this threshold. The peak power into the battery value and total energy into the battery results were both taken from a single (but different) run. <p style="text-align: center;">Values in red indicate that the Performance Goal was not met.</p>		

DYNAMOMETER TESTING¹

Cycle Results²

	72 °F	20 °F	95 °F + 850 W/m ²
UDDS (Cold Start)	27.8 mpg	21.5 mpg	21.9 mpg
UDDS	30.3 mpg	28.1 mpg	23.2 mpg
HWFET	48.0 mpg	44.5 mpg	45.0 mpg
US06	30.5 mpg	28.8 mpg	27.1 mpg
SC03	29.7 mpg		22.8 mpg

Fuel Economy at Steady-State Speed, 0% Grade

15 mph	29.0 mpg
30 mph	46.1 mpg
45 mph	50.2 mpg
60 mph	46.6 mpg
75 mph	38.0 mpg

Duration of Passing Maneuver at Grade³

	0% Grade	3% Grade	6% Grade
35-55 mph	5.0 s	5.7 s	6.4 s
55-65 mph	4.1 s	4.8 s	5.3 s
35-70 mph	9.2 s	10.7 s	13.6 s
55-80 mph	8.9 s	10.9 s	13.7 s
Maximum Speed at 25% Grade from Stop: 49.1 mph			

NOTE: Dynamometer testing was completed with the beginning of test vehicle after track testing concluded. The vehicle did not undergo dynamometer testing following end of test track testing.

NOTES (also from previous page):

1. Dynamometer testing occurs after the beginning of test track testing is complete. Dynamometer testing began on February 11, 2013, with the vehicle odometer reading 4,354 miles. A comprehensive explanation of the dynamometer facility and methodology can be found at <http://www.transportation.anl.gov/D3/>, titled "Chassis Dynamometer Testing Reference Document". The ABC coefficients derived from track coastdown testing and matched on the dynamometer were A: 30.4035 lb, B: 0.27113 lb/mph, and C: 0.01444 lb/mph².
2. The Cycle Results table presents the fuel economy achieved by the vehicle on five EPA drive cycles at three different ambient temperatures: (1) 72 °F with vehicle climate-control off, (2) 20 °F with vehicle climate-control set to 72 °F Auto, and (3) 95 °F with vehicle climate-control set to 72 °F Auto. The vehicle is also subjected to 850 W/m² of solar load at 95 °F to simulate direct sunlight. The drive cycles include a hot start unless otherwise indicated.
3. The passing maneuver value indicates the amount of time required for the vehicle to transition from the first to the second speed, at the specified grade.

Values in red indicate that the Performance Goal was not met.

As a production vehicle, this vehicle is assumed to meet all Federal Motor Vehicle Safety Standards (FMVSS) for Battery Electric Vehicles.

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