INTRODUCTION TO NEW VEHICLE CERTIFICATION

HIGHWAY MOTORCYCLE (HMC) AND OFF-HIGHWAY RECREATIONAL VEHICLE (OHRV)

October 18, 2019
What is an HMC & OHRV?

• Highway Motorcycle (HMC) [Ref. CA HSC § 39041 & CA VC §400]
  – Seat or saddle for rider
  – 3 or fewer wheels (4 wheels if 2 wheels are part of sidecar)

• On-road motor scooters that meet the definition of a HMC are certified for emissions compliance as a HMC.

• Off-Highway Recreational Vehicle (OHRV) [Ref. 13 CCR §2411]
  – All-Terrain Vehicle (ATV), width ≤ 50 inches, 4 or more low pressure tires, 1 operator-straddled seat, or 1 operator-straddled seat plus 1 passenger seat, handlebar, IC engine
  – Off-Road Motorcycle (OFMC), a.k.a., “trail bike” or “dirt bike”

• Other OHRV Classifications, Off-Road Sport Vehicle (OFRSV), Off-Road Utility Vehicle (OFRUV), Sand Car (SCAR), Electric Golf Cart (eGC)
Examples Of HMC & OHRV

HMC

ATV

OFRUV

SCAR

eGC

OFMC

OFRSV
Certification Process

Manufacturer Submits Letter of Intent

Manufacturer Submits Complete Application

CARB Reviews Application For Completeness And Compliance With Standards

All Certification Requirements Are Met

No

CARB Requests Further Info. From Manufacturer

Yes

CARB Elects To Conduct Confirmatory Test

No

CARB Issues Executive Order (EO) (Up to 90 Days)

Yes

Vehicle Passes Confirmatory Test

No

Application Is Rejected

Yes

CARB May Conduct “Screening” Tests

No

Unexplainable Emissions Behavior

Further Action From Manufacturer Is Required
<table>
<thead>
<tr>
<th>EXHAUST (g/km.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>HC</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>HC+NO\textsubscript{x}</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>CO</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Class I &amp; II [50-279 cc]</strong></td>
</tr>
<tr>
<td>1.0</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td><strong>Class III [280+ cc]</strong></td>
</tr>
<tr>
<td>0.8\textsuperscript{(1)}</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td><strong>2008 And Later</strong></td>
</tr>
<tr>
<td>0.8\textsuperscript{(1)}</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td><strong>2008 And Later For SVM</strong></td>
</tr>
<tr>
<td>1.4\textsuperscript{(1)}</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

**EVAPORATIVE (grams per 1-hr. diurnal + hot soak SHED test)**

| **All**                                             |
| 2.0                                                 |

\(\textsuperscript{(1)}\) May be met on a corporate average basis.

\(\textsuperscript{(2)}\) If evaporative emissions are at or below 1.8 grams/test, the HMC does not need to meet CARB’s fuel fill pipe specifications.
## CA OHRV Emission Standards

### EXHAUST EMISSION STANDARDS BASED ON CHASSIS-BASED TESTING (g/km.)

<table>
<thead>
<tr>
<th>Vehicle Classification</th>
<th>HC</th>
<th>HC+NOₓ</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFMC, ATV, OFRUV, OFRSV, SCAR</td>
<td>1.2 (1)</td>
<td>-</td>
<td>15.0</td>
</tr>
</tbody>
</table>

### EXHAUST EMISSION STANDARDS BASED ON ENGINE-BASED TESTING (g/kW-hr.)

<table>
<thead>
<tr>
<th>Vehicle Classification</th>
<th>HC</th>
<th>HC+NOₓ</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATV &lt; 225cc</td>
<td>-</td>
<td>16.1 (1)</td>
<td>400</td>
</tr>
<tr>
<td>ATV ≥ 225cc</td>
<td>-</td>
<td>13.4 (1)</td>
<td>400</td>
</tr>
<tr>
<td>OFRUV, OFRSV</td>
<td>-</td>
<td>12.0 (1)</td>
<td>400</td>
</tr>
<tr>
<td>SCAR</td>
<td>-</td>
<td>13.4 (1)</td>
<td>400</td>
</tr>
</tbody>
</table>

(1) May be met on a corporate average basis.
### CA OHRV Emission Standards
2018 Model Year and Later

#### EVAPORATIVE EMISSIONS - PERMEATION FROM FUEL TANK AND FUEL HOSE

<table>
<thead>
<tr>
<th>Vehicle Classification</th>
<th>Emission Component</th>
<th>Permeation Standard (g/m²/day)</th>
<th>Test Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>All OHRVs</td>
<td>Fuel Tank</td>
<td>1.5</td>
<td>28 °C (82 °F)</td>
</tr>
<tr>
<td></td>
<td>Fuel Hose</td>
<td>15.0</td>
<td>23 °C (73 °F)</td>
</tr>
</tbody>
</table>

#### EVAPORATIVE EMISSIONS (1) - WHOLE VEHICLE SHED-BASED TEST

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Mfr. Selects Option 1 or Option 2</th>
<th>72-Hour Diurnal (Option 1)</th>
<th>24-Hour Steady State (Option 2)</th>
<th>Fuel Leakage Tip Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>All OHRVs</td>
<td>1 g/test TOG/day</td>
<td>1 g/test TOG/day</td>
<td>No visible fuel leakage</td>
<td></td>
</tr>
</tbody>
</table>

(1) Additionally, ATVs with fuel tanks that are re-designed to be geometrically different from 2017 and earlier model years and have nominal capacity > 3.5 gallons must meet CARB’s fuel filler pipe sealing surface requirement.
HMC and OHRV Confirmatory Test Program

- Approximately 250 HMCs and 250 OHRVs are certified each year
- About 120 vehicles brought in for testing since 2009

Vehicles Arriving at CARB

- 2009: 2 HMC, 1 OHRV
- 2010: 5 HMC, 5 OHRV
- 2011: 15 HMC, 10 OHRV
- 2012: 2 HMC, 1 OHRV
- 2013: 1 HMC, 1 OHRV
- 2014: 25 HMC, 10 OHRV
- 2015: 20 HMC, 10 OHRV
- 2016: 10 HMC, 5 OHRV
- 2017: 5 HMC, 2 OHRV
- 2018: 5 HMC, 3 OHRV
- 2019: 5 HMC, 2 OHRV
HMC and OHRV Confirmatory Test Program

• Selection Criteria of candidate HMC and OHRV
  - Certification values close to the standard
  - Sales
  - Testing laboratory
  - New engine or emissions control technology

• Test Procedure
  - Ensure vehicles are properly equipped for testing
  - Verify part numbers
  - Confirmatory testing (FTP for all vehicles, 1 hour diurnal + hot soak test for HMC)
  - Screening tests- Started 2016. Testing on modified and alternate cycles to look for unapprovable or undisclosed AECDs or defeat devices.
HMC and OHRV Confirmatory Test Program

CONFIRMATORY TESTING RESULTS

<table>
<thead>
<tr>
<th>CY</th>
<th>Arrived at Lab</th>
<th>Passed</th>
<th>Failed</th>
<th>Not Testable</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>24</td>
<td>19</td>
<td>4</td>
<td>1</td>
<td>79%</td>
</tr>
<tr>
<td>2016</td>
<td>16</td>
<td>14</td>
<td>0</td>
<td>2</td>
<td>88%</td>
</tr>
<tr>
<td>2017</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>2018</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>2019</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Total 15-19CY</td>
<td>57</td>
<td>50</td>
<td>4</td>
<td>3</td>
<td>88%</td>
</tr>
</tbody>
</table>

HMC/OHRV Confirmatory Testing at CARB: 2015-2019

- Passed: 88%
- Failed: 7%
- Not Testable: 5%
Contacts for HMC/OHRV Certification

- **Jackie Lourenco, Chief**  
  New Vehicle/Engine Programs Branch  
  Phone: (626) 450-6152  
  Email: jackie.lourenco@arb.ca.gov

- **Duc Nguyen, Manager**  
  On-Road Light Duty Certification  
  Phone: (626) 575-6844  
  Email: duc.nguyen@arb.ca.gov
Extra Slides
California Air Resources Board

Office of the Chair

Executive Office

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Office of Legal Affairs

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Monitoring and Laboratory Division

Air Quality Planning & Science Division

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Enforcement Division

Sustainable Transportation and Communities Division

Mobile Source Control Division

Emissions Certification and Compliance Division

Mobile Source Laboratory Division
California Air Resources Board
Mobile Source Divisions

Steven Cliff
Deputy Executive Officer
Annette Hebert
Assistant Executive Officer

Jennifer Gress
Sustainable Transportation and Communities Division

Core Activities
- Climate Investments
- Transportation Planning
- Development of Advance Clean Cars Regulations
- Mobility Analysis

Jack Kitowski
Mobile Source Control Division

Core Activities
- Technology Assessment
- Regulatory Development
- Incentives
- Implementation of Fleet Rules

Allen Lyons
Emissions Certification and Compliance Division

Core Activities
- Certification of New Vehicles and Engines
- OBD Systems
- In-Use Compliance
- Aftermarket Parts
- Evaporative

Mark Fuentes
Mobile Source Laboratory Division

Core Activities
- LD Testing
- HD Testing
- PEMS Testing
- Motorcycles and Off-Road Testing

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Dynamometer for Motorcycles/ATVs

Simulation of real-world operation including speed variations moving through an air mass and road resistance (chassis dynamometer)

- dyno roller
- exhaust to CVS
- proportional fan
- vehicle restraints
- protective gear
- drivers aid