UN EPPR Update on CARB Tentative Regulatory Proposal
For Amendments to California ONMC Certification Standards

December 10, 2020
California’s ~700,000 motorcycles produce an estimated 27 tons per day of smog forming emissions.

Evaporative emissions are a significant portion of 2020 emissions inventory estimates.*

*Draft EMFAC 2020 emissions model, will be finalized in January 2021
# CURRENT CALIFORNIA AND EU MOTORCYCLES REGULATIONS

<table>
<thead>
<tr>
<th></th>
<th>Current CARB Requirements</th>
<th>Euro 5 Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exhaust Limits</strong></td>
<td>0.8 g/km HC + NOx</td>
<td>0.100 g/km HC</td>
</tr>
<tr>
<td></td>
<td>12 g/km CO</td>
<td>0.060 g/km NOx</td>
</tr>
<tr>
<td></td>
<td>No NMHC limits</td>
<td>1 g/km CO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.068 g/km NMHC</td>
</tr>
<tr>
<td><strong>Exhaust Drive Cycle</strong></td>
<td>UDDS (passenger car, lower speeds)</td>
<td>WMTC (motorcycle, higher speeds)</td>
</tr>
<tr>
<td><strong>OBD</strong></td>
<td>Not Required</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Evaporative Test Procedure</strong></td>
<td>1-hour heat build, 1-hour hot soak, UDDS Prep Cycle, 10% Ethanol Fuel</td>
<td>1-hour heat build, 1-hour hot soak, WMTC Prep Cycle, 5% Ethanol Fuel</td>
</tr>
<tr>
<td><strong>Evaporative Limit</strong></td>
<td>2.0 g / test</td>
<td>1.5 g/test</td>
</tr>
</tbody>
</table>
REGULATORY PROPOSAL - OBJECTIVES

• Quickly bring lower emissions motorcycles to California market
  o Euro 5 exhaust and OBD will provide real emissions reductions for California
  o Harmonizing with existing standards reduces development costs and implementation time

• Require additional cost-effective reductions in subsequent years
  o Focus on evaporative emissions, which make up the majority of ONMC ROG

• Ensure compliance with emissions standards over the vehicle’s useful life
  o Increase useful life mileage, in-use verification, anti-tampering

• Transition towards zero emissions motorcycles (ZEMs) as technology improves and costs decrease
• MY 2023 - **50%** of sales must meet Euro 5 exhaust requirements
• MY 2024+ - **All** motorcycles must meet Euro 5 exhaust requirements
• Manufacturers may use their EU test data if engine family has EU Type Approval
  - EU spec fuel may be used for testing if manufacturer is using EU Type Approval data
  - Vehicle must also comply using CARB LEVIII fuel
  - CARB confirmatory and compliance testing will be conducted using CARB LEVIII fuel
  - Testing need not be witnessed by an EU Technical Services representative

• Exhaust testing must be conducted as prescribed in Euro 5 regulations, except as follows:
  - Bikes with displacement between 50cc and 150cc, and max speed of > 85km/h, shall use WMTC Subclass 2-1 (max speed 82.5 km/h) instead of Subclass 1-3 (max speed 50 km/h)

Tentative proposal - All effective dates subject to change
• MY 2023-2024 – Manufacturers must meet either Euro 5 or CARB durability requirements
• MY 2025+ – CARB durability procedures will be harmonized with Euro 5
• Manufacturers using catalyst bench aging must conduct in-use verification testing and meet evaporative component durability requirements

<table>
<thead>
<tr>
<th>Durability Method</th>
<th>Current CARB</th>
<th>Current EU</th>
<th>EU 2024+</th>
<th>CARB 2025+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Mileage</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Partial Mileage</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bench Aging</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mathematical (fixed)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Tentative proposal - All effective dates subject to change
TENTATIVE PROPOSAL – INCREASE USEFUL LIFE MILEAGE

• MY 2025+ - All **NEW** engine families are subject to increased useful life distance

<table>
<thead>
<tr>
<th>CARB/EPA Class</th>
<th>Most Common Comparable EU Class</th>
<th>Current EPA/CARB Distance (kilometers)</th>
<th>Current Euro 5 Distance (kilometers)</th>
<th>Proposed CARB Distance for MY 2025+ (kilometers)</th>
<th>% Increase over current CARB/EPA Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA (&lt;50cc)</td>
<td>L1e-B, L2e</td>
<td>6,000</td>
<td>5,500</td>
<td>6,000</td>
<td>0%</td>
</tr>
<tr>
<td>IB (50-169 cc)</td>
<td>L3e-A1</td>
<td>12,000</td>
<td>11,000</td>
<td>15,000</td>
<td>25%</td>
</tr>
<tr>
<td>II (170-279 cc)</td>
<td>L3e-A2</td>
<td>18,000</td>
<td>20,000</td>
<td>25,000</td>
<td>38.8%</td>
</tr>
<tr>
<td>III (279+ cc)</td>
<td>L3e-A3</td>
<td>30,000</td>
<td>35,000</td>
<td>50,000</td>
<td>66.6%</td>
</tr>
</tbody>
</table>

• Median age of motorcycles dropping from California DMV registration = 18.5 years
• Median age of motorcycles with 50,000km = 10.5 years*

* 2017 NHTSA Motorcycle Safety Survey

Tentative proposal - All effective dates subject to change
• MY 2023 - **50%** of all new motorcycles must meet Euro 5 OBD requirements

• MY 2024-25 - **All** new motorcycles must meet Euro 5 OBD requirements

• MY 2026+ - All new Class III motorcycles must meet Euro 5 OBD plus additional CARB-specific requirements:
  - New OBD Monitors will be based on CARB light duty vehicle OBD requirements
  - Evaporative system, cold start, crank case ventilation, fuel system, engine cooling, and variable valve timing
  - When OBD system detects catalyst removal, vehicle speed must be limited to 40 MPH max
    - Discourages tampering, prompts owners to make timely repairs

Tentative proposal - All effective dates subject to change
• MY 2023-2024: All motorcycles must meet either Euro 5 or current CARB evaporative system requirements

• MY 2025-26: All motorcycles must meet either Euro 5 or current CARB evaporative system requirements, plus additional evaporative component performance specifications
  o U.S. EPA tank and hose permeation requirements
  o Minimum ratio requirement for carbon canister working capacity to fuel tank volume
  o Maximum carbon canister bleed emissions

• MY 2027+: All motorcycles must meet full vehicle diurnal SHED standard
  o SHED test protocol based on CARB TP-933 and LDV requirements

Tentative proposal - All effective dates subject to change
• Compliance with current CARB evaporative requirements does not correlate with low diurnal emissions
• Euro 5 evaporative requirements are similar to CARB, so no benefit expected by simply harmonizing
TENTATIVE PROPOSAL:
TRANSITION TO ZERO EMISSIONS

CARB will establish a zero-emissions credit trading program to help manufacturers comply with these requirements.

Tentative proposal - All effective dates subject to change
ESTIMATED TIMELINE

May 2021: Draft Proposed Regulatory Language

February 2020: Complete Emissions Testing

July 2021: Workshop Draft Regulatory Language

December 2021: Board Hearing
Please Contact Us With Any Questions or Concerns Regarding CARBs Tentative Regulatory Proposal for California ONMC Certification Standards

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