

Off-Highway Motorcycle (OHMC) Workshop: Assessment Update

February 27, 2014 - El Monte
March 6, 2014 - Sacramento



Presentation Outline

Section 1: Assessment Overview

Section 2: Emissions Testing

Section 3: OHMC Procurement

Section 4: Owner Survey

Test Plan and the Survey Questions are available at:
<http://www.arb.ca.gov/msprog/offroad/orrec/orrec.htm>

Section 1

Assessment Overview

Board-Directed OHMC Assessment

December 2013:
Workshop held to kickoff
assessment

November 2014:
Update Board on
assessment findings

July 2013:
Board directed staff to conduct
red sticker OHMC assessment

February/March 2014:
Assessment update
workshop

December 2015:
Propose comprehensive
solution at Board Hearing

Need for Assessment

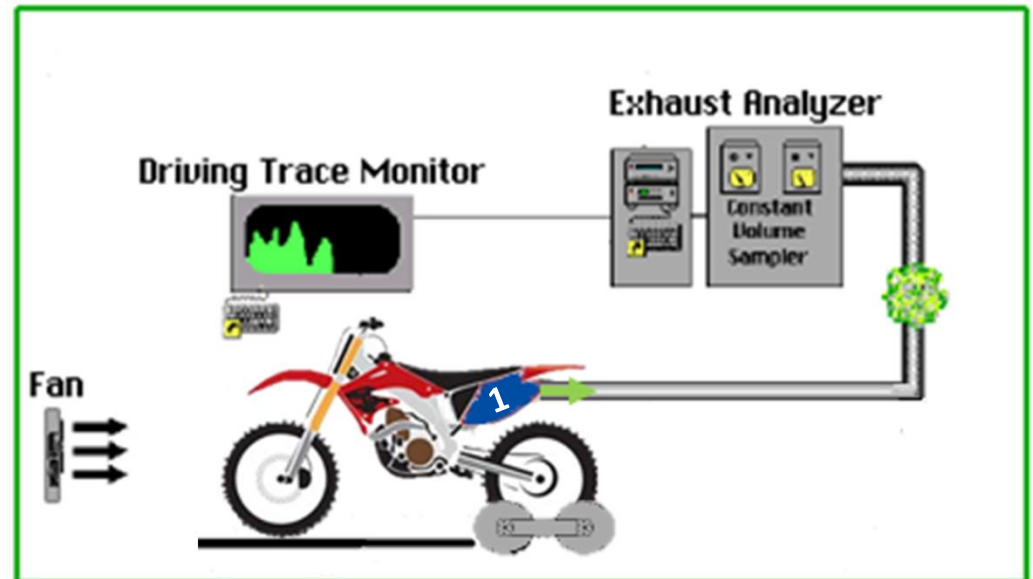
- OHMCs that do not meet exhaust or evaporative emission standards are certified as red sticker
- Percentage of red sticker OHMC sales have increased in recent years
- Exhaust and evaporative emission impacts of uncontrolled OHMCs must be determined
- Limited data available for emissions and activity

Section 2

Emissions Testing

Emissions Testing Objectives

- Better understand OHMC evaporative and exhaust emissions
- Generate red and green sticker OHMC data for:
 - Two-stroke/four-stroke
 - Carbureted/fuel-injected
 - Unmodified/modified

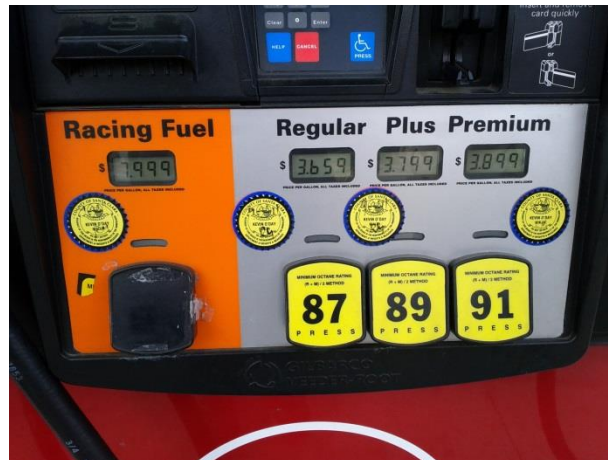


Vehicle Preconditioning

- Pre-test - Fuel Soak Preconditioning
 - Fuel tank full
 - 30 days for in-use OHMCs
 - 140 days for new OHMCs
 - Soak at 68°F to 86°F
- Cold Soak - Running Loss “Conditioning”
 - Fuel tank at 50% capacity
 - Soak for 12 to 36 hours
- Cold Soak - Normal “Test”
 - Fuel tank at 50% capacity
 - Perform one UDDS cycle
 - Soak at 68°F to 86°F for up to 36 hours

Test Fuels

- Unmodified OHMCs
 - E10 certification fuel
 - 2-stroke premix: E10 blended with 2-cycle oil of engineering spec. & ratio recommended by mfg.
- Modified OHMCs
 - Fuel specified by owner
 - 2-stroke premix: fuel, 2-cycle oil and ratio specified by OHMC owner



Exhaust Testing

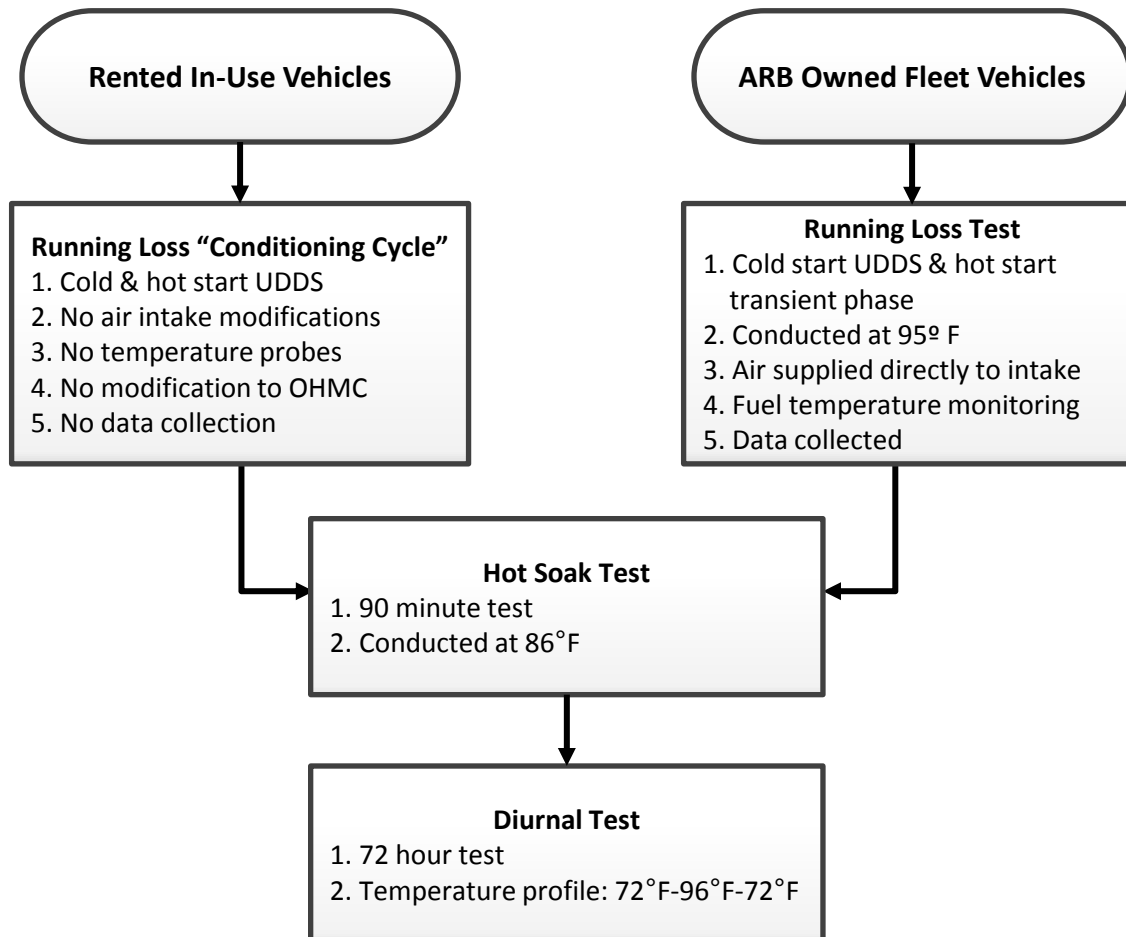
- Three-phase Federal Test Procedure (FTP) cycle consisting of:
 - A cold start UDDS
 - A hot start transient phase
- Speed profiles are specified in 40 CFR §86.515-78*
- Pollutants measured for each phase of the FTP cycle will include:
 - Total hydrocarbon (THC)
 - Methane (CH₄)
 - Non-methane hydrocarbon (NMHC)
 - Carbon monoxide (CO)
 - Carbon dioxide (CO₂)
 - Nitrogen oxides (NO_x)



*Appendix I (c) for Class 1 MCs and Appendix I (b) for Class II and Class III MCs

Evaporative Testing Test Paths

Two test paths:



Section 3

OHMC Procurement

OHMC Test Matrix

- Development:
 - Based on 2004 - 2012 DMV registration data
 - 2- and 4-stroke OHMCs from the most common displacement ranges
 - Excluded discontinued models*
 - OHMCs available with EFI, restricted to EFI equipped model years*
 - Carbureted vehicles restricted to 3 most recent model years*
- Matrix Includes:
 - 12 red sticker and 6 green sticker OHMCs
 - 4 of the 18 vehicles are in ARB's vehicle fleet

*Not applicable to existing ARB fleet vehicles

Proposed OHMC Test Matrix

Vehicle Category	Model Year Range	Make	Model	Engine Type	Fuel Delivery System
Red Sticker OHMCs	2009 - 2014	Honda	CRF450R	4-Stroke	EFI**
	2012 - 2014	Honda	CRF150R	4-Stroke	Carbureted
	2011 - 2014	Kawasaki	KX250F	4-Stroke	EFI
	2012 - 2014	Kawasaki	KX85	2-Stroke	Carbureted
	2012 - 2014	KTM	300 XC	2-Stroke	Carbureted
	2011 - 2014	KTM	250 SX-F	4-Stroke	EFI
	2012 - 2014	KTM	SX 50	2-Stroke	Carbureted
	2008 - 2014	Suzuki	RMZ450	4-Stroke	EFI
	2010 - 2014	Yamaha	YZ450F	4-Stroke	EFI
	2012 - 2014	Yamaha	YZ250	2-Stroke	Carbureted
	2012 - 2014	Yamaha	YZ125	2-Stroke	Carbureted
Green Sticker OHMCs	2000*	Suzuki	RM250	2-Stroke	Carbureted
	2012 - 2014	Yamaha	WR450F	4-Stroke	EFI
	2012 - 2014	Honda	CRF250X	4-Stroke	Carbureted
	2012 - 2014	KTM	250XCF-W	4-Stroke	EFI
	2003*	Honda	XR50R	4-Stroke	Carbureted
	2007*	Yamaha	WR250FW	4-Stroke	Carbureted
	2007*	Honda	CRF450X7	4-Stroke	Carbureted
* ARB's Fleet Vehicles					
** Electronic Fuel Injection					

Alternative OHMC Test Matrix

Vehicle Category	Model Year Range	Make	Model	Engine Type	Fuel Delivery System
	2011 - 2013	Honda	CFR 150 RB	4-Stroke	Carbureted
	2011 - 2013	Honda	CRF 250 R	4-Stroke	EFI
	2011 - 2013	Kawasaki	KX 450F	4-Stroke	EFI
	2011 - 2013	Kawasaki	KX 100	2-Stroke	Carbureted
	2011 - 2013	KTM	300 XC W	2-Stroke	Carbureted
Red Sticker OHMCs	2011 - 2013	KTM	250 XC	2-Stroke	Carbureted
	2011 - 2013	KTM	250 XC W	2-Stroke	Carbureted
	2011 - 2013	KTM	250 XC F	4-Stroke	EFI
	2011 - 2013	KTM	65 SX	2-Stroke	Carbureted
	2011 - 2013	KTM	85 SX	2-Stroke	Carbureted
	2011 - 2013	Suzuki	RMZ 250	4-Stroke	EFI
	2011 - 2013	Yamaha	YZ250F	4-Stroke	Carbureted
	2011 - 2013	Yamaha	YZ85	2-Stroke	Carbureted
	2011 - 2013	Honda	CRF 110F	4-Stroke	Carbureted
	2011 - 2013	Honda	CRF 100F	4-Stroke	Carbureted
	2011 - 2013	Honda	CRF 150F	4-Stroke	Carbureted
Green Sticker OHMCs	2011 - 2013	Honda	CRF 230F	4-Stroke	Carbureted
	2011 - 2013	KTM	350 XCF-W	4-Stroke	EFI
	2011 - 2013	Yamaha	WR250F	4-Stroke	Carbureted
	2011 - 2013	Yamaha	TT-R125LE	4-Stroke	Carbureted

OHMC Procurement

- In-Use OHMCs
 - Contacting owners of makes and models in test matrix
 - Targeting newer model year OHMCs
- New OHMCs
 - Exploring multiple options to procure new OHMCs
 - May approach dealers to rent new/lightly used unmodified OHMCs



In-Use OHMC Procurement Process

Stage 1:

Solicitation package mailed to OHMC owners

Stage 2:

Completed packages reviewed by ARB staff

Stage 3:

Field inspection conducted on pre-approved OHMCs

Stage 1: Solicitation Package

- Solicitation packages will be sent out to owners of OHMCs within 50 miles of El Monte
- Solicitation package will include:
 - Cover letters from ARB and logistics contractor
 - OHMC owner reply form
 - OHMC screening questionnaire
 - Owner activity survey
- Responses must be received within 30 days
- Monetary incentive offered to owners of OHMCs selected to participate in testing



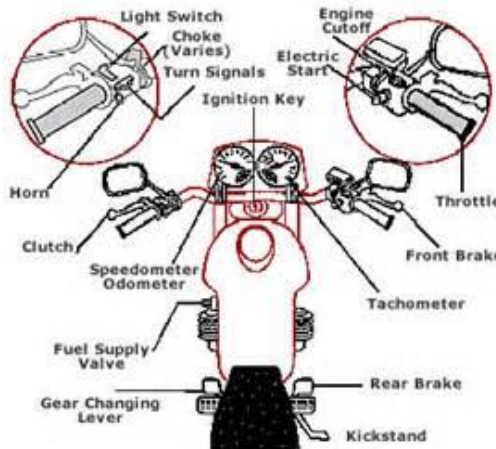
Stage 2: Solicitation Package Review

- ARB Staff will review responses received
- OHMC screening questionnaire responses received will be segregated into 2 categories:
 - Modified
 - Unmodified
- OHMCs will be disqualified based on:
 - Safety concerns
 - Operational defects
 - Structural alterations



Stage 3: Field Inspection

- OHMCs that pass the initial screening will proceed to field inspection stage
- During the field inspection a qualified ARB contractor will:
 - Verify the vehicle make, model, model year and VIN
 - Verify that the OHMC is in proper operating condition
 - Conduct an inspection based on the Motorcycle Safety Foundation's T-CLOCS form (www.msf-usa.org)



Section 4

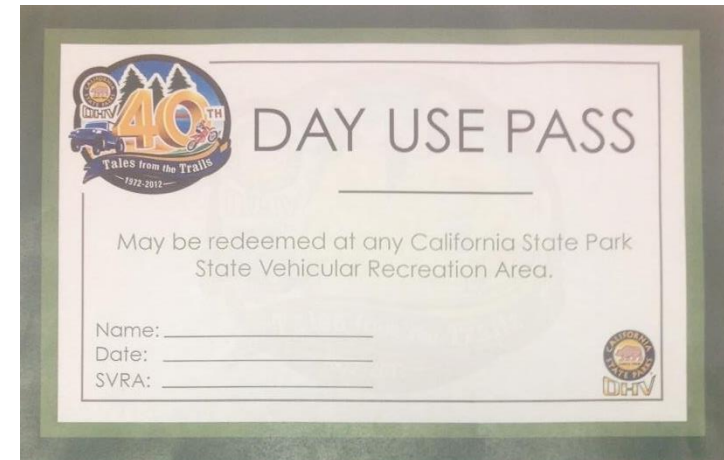
Owner Survey

OHMC Owner Survey Overview

- Purpose: To better understand the vehicle characteristics, usage, and activity of OHMCs
- Population:
 - 1,000 red sticker; 1,000 green sticker; 500 dual sport
 - Participants randomly selected by CSUS from DMV database
- Outreach:
 - Online survey invitation sent out via post card and text message
 - Free day pass to State OHV Park provided as incentive

Owner Survey Structure

- 25 question online survey
 - Specific vehicle identified at beginning of survey
 - Single question to appear on screen at a time
 - Questions available on ARB's website
- 100 participant pilot study
 - Questions may be revised based on pilot responses
- Incentive
 - Emailed to OHMC owner
 - Any name can be requested for pass
 - Clear expiration date



Owner Survey Significance

- The OHMC owner survey results will be used to:
 - Determine the range of modifications on OHMCs
 - Define the fraction of OHMCs modified
 - Update the emissions inventory
- Findings made on modifications will help ARB staff determine the in-use OHMCs selected for testing
- Results will provide better understanding of how red sticker program limits OHMC operation



Next Steps- 2014

March 13:

Comments on test plan and survey due to ARB

May:

Evaporative and exhaust testing begins

November:

Evaporative testing ends

March - April:

Vehicle procurement begins/
Owner survey begins

August - September:

Exhaust testing and
owner survey end

November 20:

Update Board on
assessment findings

ARB Staff Contact Information

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Questions?