US: MOTORCYCLES: EMISSIONS

History

Motorcycles are regulated under section 202 of the Clean Air Act, which calls for EPA to consider the need to achieve equivalent emissions reductions from vehicles, including motorcycles, as much as possible. Motorcycles were regulated by a single unchanging set of standards for all model years from 1978-2005. On 15 January 2004, EPA's Control Of Emissions From Highway Motorcycles Rule (69 FR 2398)established 2 tiers of conventional pollutant exhaust emissions standards for highway motorcycles in the United States. Tier 1 came into effect in 2006, and remains in effect for Class I and II motorcycles. In 2010, standards for Class III motorcycles were updated to Tier 2 standards. EPA provides a summary of motorcycle emission standards.

Highway motorcycle standards adopted by EPA are in line with California's motorcycle standards, but typically with a two-year delay in implementation.

Technical Standards

Applicability

The following table outlines motorcycle classes.

Motorcycles and Moped Definitions	
Class	**Engine size**
Class I-A	<50 cc
Class I-B	50-169 cc
Class II	170-279 cc
Class III	280+ cc

1978-2005 Highway Motorcycle Standards

The table below lists motorcycle emission standards for MYs 1978-2005.

1978-2005 Highway Motorcycle Exhaust Emission Standards					
Class	**Engine Displacement (cc)**	**Useful Life/Warranty***	**HC (g/km)**	**CO (g/km)**	**NOx (g/km)**
Class I	50-169	5 yr/12,000 km	5.0	12.0	n/a
Class II	170-279	5 yr/18,000 km	5.0	12.0	n/a
Class III	>279	5 yr/30,000 km	5.0	12.0	n/a
Note: *Useful life and warranty period, whichever comes first					

Tier 1 Exhaust Program (2006)

Starting with the 2006 model year, EPA re-defined Class I to include motorcycles with engines smaller than 50 cc. These new previously unregulated vehicles are Class I-A, and the pre-existing Class I became Class I-B. The standards began in 2008 for small manufacturers.

The following table shows the exhaust standards for highway motorcycles, including scooters and mopeds.

Tier 1 Highway Motorcycle Exhaust Emission Standards

Class	Engine Displacement (cc)	Useful Life/Warranty*	HC (g/km)	HC + NOx** (g/km)	CO (g/km)
Class I-A	< 50 (mopeds and scooters)	5 yr/6,000 km	-	-	-
Class I-B	50-169	5 yr/12,000 km	1.0	1.4	12.0
Class II	170-279	5 yr/18,000 km	1.0	1.4	12.0
Class III	> 279	5 yr/30,000 km	-	1.4	12.0

Notes:
* Useful life and warranty period, whichever comes first
** This is an optional standard that allows manufacturers to average their emissions or transfer emission credits across classes.

Tier 2 Exhaust Program (2010)

Tier 2 emission standards affect Class III motorcycles and took effect in 2010. Small manufacturers (less than 3000 US sales and fewer than 500 employees) are currently exempt from Tier 2.

Tier 2 Highway Motorcycle Exhaust Emission Standards					
Class	**Engine Displacement (cc)**	**Useful Life/Warranty***	**HC+NOx (g/km)**	**CO (g/km)**	**NOx (g/km)**
Class III	> 279	5 yr/30,000 km	0.8	12.0	n/a
Note:* Useful life and warranty period, whichever comes first					

Additional provisions of the Tier 2 standards are as follows:

Averaging

- Manufacturers may meet the HC+NOx standard on average, which enables them to sell motorcycles using a range of technologies.

Additional Requirements

Effective in 2008 (2010 for small manufacturers)

- Low permeation fuel tanks and hoses required
  - metal tanks meet the standards by definitions (90%+ of motorcycles have metal fuel tanks)

- plastic tanks can use several existing barrier technologies to meet the standards (~10% of motorcycles have plastic tanks)
- existing fuel hose technology using barrier treatments or materials qualify as low permeation hoses

Hardship Provisions

- Unusual circumstances, accompanied with good faith efforts to comply with standards (and if solvency is in jeopardy), may result in the waiving of requirements for any sized manufacturer.
- Upon demonstration of good faith efforts to comply with standards(and if solvency is in jeopardy), the 2008 deadline for compliance for small bike makers may be extended if the burden of compliance is a problem.

Test Procedures

Test procedures for motorcycles from MY 1978 and later are detailed in 40 CFR Part 86 Subpart F. This outlines sections on test procedure specifics including dynamometers, exhaust gas sampling and analytical systems, fuel and engine lubrication and lubricant specifications, analytical gases, calibrations, frequency and overview, transmissions, vehicle preparations, analysis, and calculations.

Source: http://transportpolicy.net/index.php?title=US:_Motorcycles:_Emissions