



Frequently Asked Questions

In-Depth Information for Motorcycle Owners on EPA's New Emission Standards for Highway Motorcycles

In December 2003, the U.S. Environmental Protection Agency (EPA) published a Final Rulemaking (FRM) establishing more stringent emission standards for highway motorcycles. This information sheet addresses questions raised by concerned motorcycle owners.

Why is EPA adopting new emission standards for highway motorcycles?

Motorcycles are regulated under section 202 of the Clean Air Act which calls for EPA to consider the need to achieve equivalent emission reductions from both motorcycles and other vehicles as much as possible. The Clean Air Act also requires EPA to set new standards for off-road motorcycles, which we did in 2002. EPA has not revised the on-road motorcycle emission standards for over 20 years. While there have been many vehicle emission control technology advances over the past two decades, today's motorcycles produce more harmful emissions per mile than driving a car or even a large sport utility vehicle (SUV). The current federal motorcycle emission standard for hydrocarbon emissions is about 90 times the hydrocarbon standard for today's passenger cars. And, although many of today's motorcycles actually meet the current California emission standards, the current California hydrocarbon standard is still about 20 times the current federal passenger car limits. The new standards will also reduce motorcycle riders' exposure to air toxics and particulate matter. Some states have also said that new motorcycle standards will help them achieve their air quality goals.

What kind of emission controls may be used by manufacturers?

We are adopting standards that manufacturers can meet on an average basis, which may encourage manufacturers to use a broader array of technologies across their product line. The standards will generally be effective in two “tiers,” a Tier 1 that will take effect in the 2006 model year and a Tier 2 that will take effect in the 2010 model year. We don’t specify what emission controls manufacturers must use to comply with the regulations, but we anticipate many manufacturers will choose to meet them by increasing their use of secondary air injection, electronic fuel injection, and catalytic converters. These technologies are used to varying degrees on current highway motorcycles. An averaging standard allows manufacturers some flexibility to choose how and on which motorcycles to use certain technologies by balancing more-polluting models with less-polluting models.

Will catalytic converters be required on all highway motorcycles?

Motorcycles are unique vehicles, and the application of some passenger car technologies will raise unique issues when applied to motorcycles. These issues may be more critical with some makes, models, or styles than with others. About twenty percent of the 2002 and 2003 motorcycles certified by manufacturers to emission standards already incorporate catalytic converters. We project that this will increase to about 50 percent when the second Tier of standards takes effect in 2010. Our Regulatory Impact Analysis contains a detailed discussion of the technologies expected to be used to meet the proposed standards. At this time small volume manufacturers are required only to meet the Tier 1 standard, which is achievable without the use of catalytic converters. The Tier 1 standard for small manufacturers takes effect in the 2008 model year.

Will new highway motorcycle emission standards affect motorcycles on the road today?

The new regulations will only affect *new* motorcycles produced for the 2006 and later model years. Anything manufactured prior to the 2006 model year will not be affected and will remain legal to own and operate. EPA generally provides several years of lead time between publication of a final rule and the effective date of new standards. Thus, new standards for motorcycles will not have any effect on motorcycles purchased prior to the 2006 model year.

Does the term “useful life” mean that my motorcycle must be scrapped or turned over to the government after certain mileage limits are reached?

EPA uses the term “useful life” to describe the period (usually years and/or miles) over which the manufacturer must demonstrate the effectiveness of the emission control system. For example, the “useful life” of current passenger cars is 10 years or 100,000 miles, whichever occurs first. It does not mean that a vehicle is no longer useful or that the vehicle must be scrapped once these limits are reached. The term has no effect on the owners’ ability to ride or keep their motorcycles for as long as they want.

The current useful life for motorcycles with engines over 279cc is 5 years or 30,000 kilometers (about 18,640 miles), whichever first occurs. In the proposed rule we requested comment on whether this is a representative number, or whether motorcycles are driven longer and last longer relative to twenty years ago when these numbers were established. Although we suspect that motorcycles and their emission controls frequently last more than 30,000 kilometers, the final rule does not make any changes to the useful life definitions.

Are motorcycles a less-polluting alternative to cars and SUVs?

In fact, motorcycles produce more harmful emissions per mile than a car, or even a large SUV. The current federal motorcycle standard for hydrocarbon emissions is about 90 times the hydrocarbon standard for today’s passenger cars. Although many of today’s motorcycles will actually meet the current California standards, the California hydrocarbon standard is still 18 to 24 times the current federal passenger car limit, depending on the displacement of the motorcycle engine.

Beginning in 2004, all passenger cars, light trucks, and SUVs will be required to meet even more stringent standards. When these standards become effective, new SUVs will be meeting hydrocarbon standards about 95 percent cleaner than today’s typical motorcycle.

The current certified emission levels of motorcycles, cars, and trucks are available in the EPA Annual Certification Test Results Report on EPA’s Web site at: www.epa.gov/otaq/crttst.htm. These emission tests are performed by the vehicle manufacturers. For example, the following comparisons can be made from the data on this Web site (these vehicles do not represent either the best or the worst emissions within their vehicle type):

2002 Model Year Vehicle	Cars and Trucks			Motorcycles		
	Ford Expedition 4WD	Dodge Durango 4WD	Subaru Forester AWD	Yamaha YZF-R6	Honda VTX1800C	BMW R1200C
Hydrocarbon Emissions (grams per mile)	0.15	0.073	0.048	4.19	0.48	0.97

Would new emission standards make it illegal to customize my motorcycle?

Many motorcycle owners personalize their motorcycles. Indeed, this is one of the joys of owning a motorcycle, and owners take their freedom to customize motorcycles very seriously. We are not changing existing provisions of section 203(a) of the Clean Air Act, as established in 1977, which states that it is illegal “for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title...after such sale and delivery to the ultimate purchaser...”. In other words, owners of motor vehicles cannot legally make modifications that cause the emissions to exceed the applicable emissions standards, and they cannot remove or disable emission control devices installed by the manufacturer.

We use the term “tampering” to refer specifically to actions that are illegal under section 203 of the Clean Air Act; the term, and the prohibition, do not apply generally to the wide range of things that a motorcycle enthusiast can do to legally personalize their vehicle, only to actions that cause the emissions to exceed the standards. The new emissions standards do not change this “tampering” prohibition. In fact, it is not within EPA’s ability or discretion to change this statutory prohibition, which Congress put in place more than 20 years ago. Owners are still free generally to customize their motorcycles in any way, as long as they do not disable emission controls or cause the motorcycle to exceed the emission standards.

A July 2002 EPA Press Release stated that “Motorcycle owners may make cosmetic changes such as the color and chrome.” This was interpreted by some owners as meaning that they could *only* change “color and chrome,” and the motorcycling community quickly picked up this as a rallying cry and suggested that EPA was attempting to limit the ways

in which a motorcycle could be customized. In fact, there are many things beyond “color and chrome” that a motorcycle owner can legally modify, and this list of legal modifications *will not change* as a result of this final rule. We cannot be more clear about this: the laws regarding what you can and can not do to your motorcycle will be the same under the new emission standards as they are today.

How much will new emission controls cost?

Your cost for emission controls depends on the control technologies used, manufacturing processes, the size of the manufacturer, and other issues. We estimate increased costs on average of about \$30 per motorcycle for the 2006-2009 model year standards, then an incremental \$45 for the 2010 model year standards. The average cost of a 2002 motorcycle was approximately \$10,000. As noted above, the 2010 standards do not apply to small manufacturers. In addition, research and development costs for small manufacturers will be partially or even mostly borne by the engine manufacturers that supply engines to the small motorcycle manufacturers.

How will the new emission controls affect performance?

When advanced emission controls such as catalytic converters were initially suggested for passenger cars there was a great deal of suspicion regarding the impacts on performance and safety. Today cars are meeting the lowest emission levels in history, yet performance is at unprecedented high levels. Since 1981, the average vehicle today has 93 percent more horsepower and is 29 percent faster in going from 0 to 60 miles per hour. These improvements have occurred even in the context of the trend towards heavier sport utility vehicles.

Likewise, motorcycle manufacturers have been unanimous in telling us that the performance of future motorcycles will be equal to or better than current motorcycles. Advancements in engine technologies in recent years should allow the use of new emission control technologies with little to no impact on performance. Motorcycles meeting the new standards should perform as well or better than current motorcycles. The use of some of these technologies, such as fuel injection, may even improve reliability, fuel consumption, and some aspects of performance. These advancements are already being seen today. Consider the redesigned 2003 Yamaha YZF-R6, a 600cc high performance motorcycle in the

highly competitive middleweight super-sport/racing category. Relative to the 2002 model, the 2003 YZF-R6 is eight pounds lighter, several horsepower stronger, is being very well-reviewed in the press, and has about one quarter the emissions of the 2002 federal model (0.6 g/km HC in 2003 versus 2.6 g/km HC in 2002). It's also being sold at the same price as the 2002 model. Emission-related improvements for 2003 include the addition of fuel injection and a catalytic converter. Even with the addition of a catalytic converter, the use of advanced materials enables the exhaust system of the 2003 model to be more than two pounds lighter than the 2002 model.

There are numerous other examples that demonstrate that better emissions can go hand-in-hand with better performance, and as more 2004 and later motorcycles are introduced this will become even more clear. It may be more difficult to achieve results as dramatic as in the Yamaha cited above for some motorcycles, but we place significant weight on what we have heard from the manufacturers, who have significant technical expertise and are clearly highly qualified to address this issue.

How will these controls affect safety?

Some people have expressed concern about the high temperatures from catalytic converters posing a safety hazard to motorcycle riders. It is a fact of motorcycling that riders are in close proximity to their engine and exhaust system, both of which can generate enough heat to cause severe burns whether or not a catalytic converter is present. Manufacturers have always had to consider how to best protect riders from extremes of exhaust and engine heat, and in recent years they have had to consider catalytic converters in the equation as well. Manufacturers clearly do not want to build and market an unsafe product, and we believe that if they thought catalytic converters would result in injuries to their customers they would have objected strongly to their use. In fact, however, they unanimously stated that motorcycles complying with the new standards would be as safe as motorcycles are today. Although we place a great deal of weight on what the manufacturers tell us regarding these concerns, our ultimate response to these concerns is based on several other factors as well.

Current U.S. Use of Catalytic Converters

Catalytic converters are found on all motorcycle categories - cruisers, touring, sport touring, sport and super sport, standard, and even many scooters - and on motorcycles from at least 16 manufacturers represented in the United States. Near one fifth of motorcycles sold in recent years in

the United States (or near 100,000 per year) have been equipped with the emission control devices, meaning that there are likely near 200,000 or more motorcycles with catalysts on the road today. This level of penetration results in hundreds of millions of miles of riding experience per year. This significant real-world experience has produced no indication that catalytic converters present a danger to motorcyclists.

Worldwide Use of Catalytic Converters

Catalyst technology has been applied to more than 15 million two- and three-wheelers worldwide, and some nations are far more dependent on both motorcycles and catalytic converters than the United States. In some of these nations, it is not unusual to see two-up riding with riders in all manners of clothing, yet these nations have not reported any problems with the use of catalytic converters.

Analysis of Consumer Complaints and Defects Investigations

We analyzed 2000 consumer complaints regarding motorcycles filed with the National Highway Traffic Safety Administration's Office of Defects Investigation. Of these 2000, 28 were specific to exhaust system components, and seven of these were specifically regarding heat from the exhaust pipe. We were able to determine that two of the seven motorcycles did not have catalytic converters, another two clearly did have catalysts, and the remaining three could not be determined. Two complaints did involve some personal injury. In one case the injury resulted from a motorcycle without a catalyst. In the other case we could not determine whether a catalytic converter was on the motorcycle, but the consumer's description of the problem indicated that it was occurring along a section of the exhaust pipe far from where a converter would be, if present.

Another two complaints were regarding motorcycles with catalysts, although these complaints noted damage to clothing and not injury to the rider. In summary, we do not believe that the data available from NHTSA demonstrates that a catalytic converter constitutes a significant safety risk. These complaints represent a minority of the near six million motorcycles on the road in the United States today, which would not be the case if there was a generalized problem with excessive heat from catalyst-equipped motorcycles.

How will the rule affect the motorcycle aftermarket industry?

New emission standards, which are directed at manufacturers of new motorcycles, will not cause the demise of the motorcycle aftermarket industry. Automobiles have now had catalytic converters and other

emission controls for decades, yet a robust automobile aftermarket continues to thrive. The aftermarket parts industry is a substantial part of the motorcycle industry and can readily and successfully adapt to any changes that might result from this rule. The motorcycle aftermarket has had to abide by the tampering prohibition since the standards were first implemented, and there is no evidence that this has had any effect on the viability or growth of the aftermarket.

The motorcycle aftermarket successfully adapted to the disappearance of 2-stroke engines and the appearance of 4-stroke engines in street bikes which occurred in the 1980s. We have neither found nor been provided with any evidence that the motorcycle aftermarket will be affected to any significant degree by new emission standards. In addition, we believe that the vast majority of aftermarket items have nothing to do with emissions, and will thus be unaffected. There is no reason to believe that parts manufacturers and designers will not design and offer compliant parts where there is a demand for such parts. Finally, there are currently tampering prohibitions regarding noise control equipment on motorcycles, and even though it is very common to install aftermarket exhaust pipes on street bikes, the market for aftermarket exhaust systems continues to thrive and does not appear to be harmed or otherwise restricted by these existing prohibitions.

How closely do the new rules follow the California rules?

The new rules directly parallel the California model with several exceptions. First, we proposed regulations to control permeation emissions - a type of evaporative emission in which fuel is lost through permeation of plastic fuel tanks and fuel hoses. California currently has more stringent evaporative emission control regulations, which in some cases require the use of a charcoal canister on the motorcycle to receive fuel vapors. We expect California to maintain these provisions. Second, we proposed standards for motorcycles with engines less than 50cc displacement. Like the current federal regulations, California does not regulate these two-wheelers, though we expect they will ultimately choose to harmonize with federal regulations for these vehicles. Third, we proposed to alter the timing, making federal standards effective after manufacturers have had two years of experience meeting new emission limits in California.

There are other more subtle differences as well. For example, under the emissions averaging program, we allow motorcycles to emit up to 5.0 grams/kilometer hydrocarbons + nitrogen oxides (HC+NO_x) during the

period of 2006-2009, after which the “cap” becomes harmonized with California’s 2.5 gram/kilometer upper limit. California does not provide such an “interim” cap during the comparable time period; instead their upper limit goes right to 2.5 grams/kilometer HC+NOx. We are also optionally allowing averaging of emissions between and within each of the three motorcycle classes, whereas California only allows averaging in the context of the Class III standards (greater than 279cc).

What are the differences between EPA’s proposed rule and the final rule?

There are very few differences between the proposed and final rules. The final rule has some provisions not seen in the proposal to address kit and custom motorcycles. For example, we are expanding the currently available display exemption to make it easier for small manufacturers to build and sell custom motorcycles without coming into conflict with the regulatory requirements. Today, motorcycles cannot be sold without a certificate of conformity with emission standards from the EPA. The new provisions remove this burden for small numbers of these high-custom motorcycles which are built for show and display purposes and are unlikely to spend much time on the road.

What are the most significant differences between the new rule and the pre-existing rules?

We consider several aspects of the new regulations to be a significant improvement relative to the current rules. First, we are reducing the emission standards to levels that are consistent with the capabilities of technology today. No one can reasonably argue with the fact that the existing standards—set by a final rule that was signed by the EPA Administrator 27 years ago—make sense in the context of the technological advancements since that last action. Second, we are incorporating NOx in the new standards. NOx is an ozone precursor, and as such has been regulated in automobiles for decades. Third, the new program makes the transition from a program where every motorcycle had to meet a specified emission limit to an averaging program, in which manufacturers have the flexibility to balance more polluting motorcycles with less polluting ones as long as their overall fleet meets a given average emissions limit.

Where can I get more information?

Keep an eye on the EPA highway motorcycle Web page (www.epa.gov/otaq/roadbike.htm) for more information and any developments. For further information, please contact the Assessment and Standards Division at:

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