

Headlight Modulators

Official U.S. Code of Federal Regulations Governing Motorcycle Headlight Modulators

Printer Friendly Version: Print this [smaller version of the regulation](#) page to keep with you on your motorcycle in case you get stopped by the Police.

Headlight modulators are now legal in Canada.

This Federal law supersedes all state laws and makes motorcycle headlight modulators legal in all 50 states. FMVSS 108 (Federal Motor Vehicle Safety Standards) (49 CFR Part 571.108 S7.9.4) allows motorcycle headlight modulation systems all 50 states provided they comply with the standards set forth in this section.

Title 49 USC [30103 \(b1\)](#) (US Codes) prohibits any state from forbidding a system that conforms to FMVSS 108 (see copy below). [Here is](#) a web page with all of Part 571 and all of the subsections; they've now broken it up by section to make it easier to read. The Legal Information Institute at Cornell University also has a [nice website](#) where you can read the various sections of the entire Title 49 USC.

Code of Federal Regulations

Title 49, Volume 5, Parts 400 to 999

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From the U.S. Government Printing Office via GPO Access [CITE: 49CFR571.108] [Page 236-307]

TITLE 49 TRANSPORTATION
CHAPTER NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
V DEPARTMENT OF TRANSPORTATION
PART 571 FEDERAL MOTOR VEHICLE SAFETY STANDARDS

Subpart B--Federal Motor Vehicle Safety Standards

Sec. 571.108 Standard No. 108;

Lamps, reflective devices, and associated equipment.

S7.9.4 Motorcycle headlamp modulation system.

S7.9.4.1 A headlamp on a motorcycle may be wired to modulate either the upper beam or the lower beam from its maximum intensity to a lesser intensity, provided that:

- (a) The rate of modulation shall be 240 <plus-minus> 40 cycles per minute.
- (b) The headlamp shall be operated at maximum power for 50 to 70 percent of each cycle.
- (c) The lowest intensity at any test point shall be not less than 17 percent of the maximum intensity measured at the same point.

(d) The modulator switch shall be wired in the power lead of the beam filament being modulated and not in the ground side of the circuit.

(e) Means shall be provided so that both the lower beam and upper beam remain operable in the event of a modulator failure.

(f) The system shall include a sensor mounted with the axis of its sensing element perpendicular to a horizontal plane. Headlamp modulation shall cease whenever the level of light emitted by a tungsten filament light operating at 3000 deg. Kelvin is either less than 270 lux (25 foot-candles) of direct light for upward pointing sensors or less than 60 lux (5.6 foot-candles) of reflected light for downward pointing sensors. The light is measured by a silicon cell type light meter that is located at the sensor and pointing in the same direction as the sensor. A Kodak Gray Card (Kodak R-27) is placed at ground level to simulate the road surface in testing downward pointing sensors.

(g) When tested in accordance with the test profile shown in Figure 9, the voltage drop across the modulator when the lamp is on at all test conditions for 12 volt systems and 6 volt systems shall not be greater than .45 volt. The modulator shall meet all the provisions of the standard after completion of the test profile shown in [Figure 9](#).

(h) Means shall be provided so that both the lower and upper beam function at design voltage when the headlamp control switch is in either the lower or upper beam position when the modulator is off.

S7.9.4.2(a) Each motorcycle headlamp modulator not intended as original equipment, or its container, shall be labeled with the maximum wattage, and the minimum wattage appropriate for its use. Additionally, each such modulator shall comply with S7.9.4.1 (a) through (g) when connected to a headlamp of the maximum rated power and a headlamp of the minimum rated power, and shall provide means so that the modulated beam functions at design voltage when the modulator is off.

(b) Instructions, with a diagram, shall be provided for mounting the light sensor including location on the motorcycle, distance above the road surface, and orientation with respect to the light.

Here is a copy of the relevant section of **Title 49, United States Code, Chapter 301 Motor Vehicle Safety. This law prohibits states from forbidding a system that complies with FMVSS 108.** The full document can be found [at this link](#).

TITLE 49, UNITED STATES CODE CHAPTER 301 MOTOR VEHICLE SAFETY

SUBCHAPTER I GENERAL

Sec. 30101. Purpose and policy.

Sec. 30102. Definitions.

Sec. 30103. Relationship to other laws.

UNIFORMITY OF REGULATIONS The Secretary of Transportation may not prescribe a safety regulation related to a motor vehicle subject to subchapter II of chapter 105 of this title that differs from a motor vehicle safety standard prescribed under this chapter.

However, the Secretary may prescribe, for a motor vehicle operated by a carrier subject to subchapter II of chapter 105, a safety regulation that imposes a higher standard of performance after manufacture than that required by an applicable standard in effect at the time of manufacture.

PREEMPTION

When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter. However, the United States Government, a State, or a political subdivision of a State may prescribe a standard for a motor vehicle or motor vehicle equipment obtained for its own use that imposes a higher performance requirement than that required by the otherwise applicable standard under this chapter.

A State may enforce a standard that is identical to a standard prescribed under this chapter.

HOV Lanes

Although it seems obvious to most of us, there are those who doubt the eligibility of motorcycles to use High Occupancy Vehicle, or "diamond", lanes. In fact, and logically, motorcycles are indeed eligible (by Federal mandate, in cases of Federally-funded highways). Here is the official word from the CVC:

21655.5.

(a) The Department of Transportation and local authorities, with respect to highways under their respective jurisdictions, may authorize or permit exclusive or preferential use of highway lanes for high-occupancy vehicles. [...]

(b) [...] A motorcycle, a mass transit vehicle, or a paratransit vehicle that is clearly and identifiably marked on all sides of the vehicle with the name of the paratransit provider may be operated upon those exclusive or preferential use lanes unless specifically prohibited by a traffic control device.

Motorcycles pulling trailers are restricted from using HOV lanes, see below.

Motorcycling Trailer Laws (Trailer pulled by a Motorcycle)

Information regarding Speed limits and Lane Control.

[Click here for a printable letter from the California Highway Patrol](#)

California Earplug Law

California passed bill SB 315 to amend Vehicle Code Section 27400. The revised law took effect January 1, 2004 and allows the use of foam, "non custom" earplugs by motorcyclists.

Thanks to California State Senator Debra Bowen (D-Redondo Beach) (send an email thank-you to senator.bowen@sen.ca.gov) and the American Motorcyclist Association for their work on getting this law amended!

The State of California passed a law in January of 1986 (Vehicle Code - see Section 27400) that apparently prohibited motorcyclists from using over-the-counter earplugs, but allows them to use "custom earplugs or molds".

Here is the OLD California regulation (1986), see section D:

27400. No person operating any motor vehicle or bicycle shall wear any headset covering, or any earplugs in, both ears. The prohibition of this section does not apply to any of the following:

(a) Persons operating authorized emergency vehicles, as defined in Section 165.

(b) Any person engaged in the operation of either special construction equipment or equipment for use in the maintenance of any highway.

(c) Any person engaged in the operation of refuse collection equipment who is wearing a safety headset or safety earplugs.

Lane Splitting

Many motorcyclists new to California ask about "lane splitting". There is no "lane splitting" law as such. Perhaps the most relevant statute is CVC 21658, below. Be aware that phrasing like "...entirely

within a single lane..." has been used to justify ticketing motorcyclists with their handlebars (or some other bike component) partly in each lane.

21658. Whenever any roadway has been divided into two or more clearly marked lanes for traffic in one direction, the following rules apply:

(a) A vehicle shall be driven as nearly as practical entirely within a single lane and shall not be moved from the lane until such movement can be made with reasonable safety.

(b) Official signs may be erected directing slow-moving traffic to use a designated lane or allocating specified lanes to traffic moving in the same direction, and drivers of vehicles shall obey the directions of the traffic device.

But don't despair. The official website of the California Highway Patrol includes a page of frequently asked questions. Among them:

Can motorcycle riders "split" lanes and ride between other vehicles?

Lane splitting by motorcycles is permissible but must be done in a safe and prudent manner.

<http://www.chp.ca.gov/html/answers.html>

Flashing Brake Lights

California Vehicle Code 25250. Flashing lights are prohibited on vehicles except as otherwise permitted.

There are a lot of regulations regarding "FLASHING" lights in California, This section is within the context of "Flashing Brake Lights Only" in California.

Unlike the federal headlight Modulator code, there is no such standard at this time for "Flashing Brakelights", each state has it's own laws.

Deceleration flasher, amber flashing brake lights, red flashing brake light

25251.5. (a) Any motor vehicle may also be equipped with a system in which an amber light is center mounted on the rear of a vehicle to communicate a component of deceleration of the vehicle, and which light pulses in a controlled fashion at a rate which varies exponentially with a component of deceleration.

(b) Any motor vehicle may be equipped with two amber lamps on the rear of the vehicle which operate simultaneously with not more than four flashes within four seconds after the accelerator pedal is in the deceleration position and which are not lighted at any other time. The lamps shall be mounted at the same height, with one lamp located on each side of the vertical centerline of the vehicle, not higher than the bottom of the rear window, or if the vehicle has no rear window, not higher than 60 inches. The light output from each of the lamps shall not exceed 200 candlepower at any angle horizontal or above. The amber lamps may be used either separately or in combination with another lamp.

(c) Any stoplamp or supplemental stoplamp required or permitted by Section 24603 may be equipped so as to flash not more than four times within the first four seconds after actuation by application of the brakes.