

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

**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.** [Click here](#) to see the regulation.

**Code of Federal Regulation** - Title 49, Volume 5, Parts 400 to 999 - Revised as of October 1, 2000

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TITLE 49: TRANSPORTATION - CHAPTER V, NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, 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.