Chapter 204-21 WAC
LIGHTING REQUIREMENTS

WAC

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WAC 204-21-010 Purpose and authority. The purpose of this chapter is to outline additional lighting requirements in an effort to reduce motor vehicle collisions caused by improper lighting.

By authority of RCW 46.37.005, 46.37.185, 46.37.190, 46.37.194, 46.37.280, 46.37.290, 46.37.300, 46.37.310, 46.37.320, and chapter 119, Laws of 1984, the Washington state patrol adopts the following rules pertaining to the mounting, adjusting, and aiming of lamps used upon motor vehicles.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-010, filed 9/17/08, effective 10/18/08.]

WAC 204-21-020 Definitions. (1) "Agricultural equipment" means any farm vehicle required by RCW 46.37.160 to have hazard warning lamps.

(2) "Animal control vehicle" means any vehicle, either publicly or privately owned, which is used primarily for transportation of animals to or from animal shelters, humane society facilities, or veterinary medicine facilities.

(3) "Authorized emergency vehicle" means any vehicle of any fire department, police department, sheriff's office, coroner, prosecuting attorney, Washington state patrol, ambulance service, public or private, licensed by the department of social and health services or operated by any of the agencies named above, or any other vehicle authorized in writing by the state patrol.

(4) "C.F.R." means the Code of Federal Regulations.

(5) "Deceleration warning light," excluding stop lamps, means a device that indicates to a following driver the deceleration of the vehicle ahead.

(6) "Electronic light modulation" means the periodic change in intensity of light, controlled by an all electric modulating device in the electrical circuit of the lighting system.

(7) "Electronic modulation" means using one hundred percent electronic circuitry instead of mechanical metallic switches.

(8) "Emergency tow truck" means a motor vehicle that is especially designed and constructed principally for the purpose of recovery and/or towing of disabled, abandoned or damaged vehicles and not otherwise generally used in transporting goods or persons.

(9) "Flashing" means any lamp which emits a beam of light which is broken intermittently and regularly by use of an electronic or electric switch, a rotating reflector, a rotating lamp, or a strobe lamp; or a lamp which emits a steady beam of light which is intermittently and regularly directed away from any viewer by means of a rotating or oscillating reflector or lamp assembly. Flashing lamps are not to be confused with modulated lamps which intermittently and regularly decrease the power to the lamp filament so as to dim the light output but do not cause a total break in the light beam.

(10) "FMVSS" means the Federal Motor Vehicle Safety Standards 49 Code of Federal Regulations (C.F.R.) Part 571.

(11) "Hazardous materials response team vehicle" means any vehicle either publicly or privately owned which is used for responding to hazardous materials incidents.

(12) "Headlamp flashing system" means an automatic method for controlling the high beams from the headlamps so that they can be alternately flashed in sequence on opposite sides of the front of the vehicle as a warning signal.

(13) "Industrial equipment" means any vehicle which is authorized to use amber lamps under WAC 204-21-130 for the purpose of landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

(14) "Law enforcement agency" means any municipal, port district or tribal police department, county police department or sheriff's office, the Washington state patrol, or any other state or federal agency which is publicly authorized to carry out law enforcement duties which include the authority to stop and detain motor vehicles on the public highways of this state.

(15) "Law enforcement vehicle" means a publicly owned or leased vehicle operated by a law enforcement agency and which is used for the law enforcement functions of the agency.

(16) "Other construction and maintenance vehicle" means any vehicle owned or operated by a private company which is in the process of providing highway construction or maintenance services or is working in conjunction with any public utility.

(17) "Oversize unit" means any vehicle towing a load that exceeds legal dimensions which may be equipped with

flashing amber lights in addition to any other lights required by law.

(18) "Percent modulation" equals time-weighted power input with modulation to headlamp divided by time-weighted power input without modulation to headlamp times one hundred.

(19) "Pilot car" means any vehicle which is used to provide escort for overlegal size loads upon the roadways of this state.

(20) "Private carrier bus" means every motor vehicle designed for the purpose of carrying passengers (having a seating capacity for eleven or more persons) used regularly to transport persons in furtherance of any organized agricultural, religious or charitable purpose. Such term does not include buses operated by common carriers under a franchise granted by any city or town or the Washington public utilities commission.

(21) "Public utilities vehicle" means any vehicle used for construction, operations, and maintenance, and which is owned or operated by a public or private utility, including, but not limited to, companies providing water, electricity, natural gas, telephone, television cable services, and railroads.

(22) "Rural newspaper carrier vehicle" means any vehicle driven on rural roads by carriers delivering newspapers on their route.

(23) "SAE" means the Society of Automotive Engineers. Copies of SAE Standards are available for review at the Washington State Patrol, P.O. Box 42600, Olympia, WA 98504-2600, and may also be ordered from the Society of Automotive Engineers International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

(24) "Search and rescue team vehicle" means any vehicle either publicly or privately owned which is used for responding to search and rescue situations.

(25) "Signal lamps" means red lamps mounted on the vehicle to be used in conjunction with the "stop signal" when the bus is loading or unloading passengers under certain conditions.

(26) "Tow truck" means any vehicle engaged in removing disabled or abandoned vehicles from the roadway and which is used primarily for that purpose.

[Statutory Authority: RCW 46.37.320 and 46.37.005. 10-19-074, § 204-21-020, filed 9/16/10, effective 10/17/10; 08-19-104, § 204-21-020, filed 9/17/08, effective 10/18/08.]

WAC 204-21-030 General lighting requirements. (1) All lighting equipment must be mounted:

(a) Securely on a rigid part of the vehicle to prevent noticeable vibration of the beam.

(b) At the height prescribed as measured from the center of the lamp or reflector to the level surface upon which the vehicle stands when it is without load.

(c) In accordance with orientation markings such as "top" if such markings exist.

(d) Installed with the lettering on the lens face right side up if the lamp has a sealed or semisealed optical unit.

(e) At the same angle as originally intended for the vehicle for which they were designed, unless the lamps are designed for a particular make of vehicle and installed on another vehicle, then the lamp does not need to be mounted at the same height or lateral spacing as the original vehicle so long as the height and lateral spacing comply with the requirements outlined in 49 C.F.R. Part 571.108 (FMVSS 108), chapter 46.37 RCW, and this title.

(f) Maintained with the proper aim when the vehicle is stationary and in motion.

(2) All lighting equipment must be aimed so the center of the beam produced by the major filament is parallel to the road and projects directly to the front, side, or rear, depending on mounting location, unless otherwise outlined in 49 C.F.R. Part 571.108 (FMVSS 108), chapter 46.37 RCW, or this title. The lamps must be aimed with only the driver in the vehicle, except that lamps on vehicles which normally carry a load should be aimed with the vehicle so loaded. Enforcement agencies that inspect vehicles may establish aiming tolerances to allow for variations in inspection procedures and in vehicle loading.

(a) If the road lighting device is visually aimed, it must be aimed as specified in the following sections of this rule on a vertical aiming screen at a distance of twenty-five feet from the front of the lens surface or with an optical aimer meeting SAE J600a (March 1965) with the aiming line on the screen adjusted to the level of the surface upon which the vehicle stands or with an optical aimer designed to aim headlamps complying with Canadian Standards Association Regulation D106.2.

(b) If the road lighting device is mechanically aimed, it must be set at 0-0 with a mechanical aimer meeting SAE J602c (December 1974).

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-030, filed 9/17/08, effective 10/18/08.]

WAC 204-21-040 Headlamps. Headlamps must be mounted as specified in FMVSS 108, chapter 46.37 RCW, and as follows:

(1) On motor vehicles:

(a) If installed after November 15, 1975, the headlamps must not be closer than twelve inches to the centerline of the vehicle. This distance must be measured from the center of the lens. Except motorcycles, motor-driven cycles, and motorized bicycles must have the headlamps spaced as far apart as practicable.

(b) Adjusting and aiming of headlamps:

(i) If the headlamp is a Type 1 sealed beam headlamp unit (including those with any suffix letters and numbers such as 1A and 1C1) the lamp must be aimed with the center of the high intensity zone on the vertical line straight ahead of the lamp center and at the level of the lamp center.

(ii) If the headlamp is a Type 2 sealed beam headlamp unit (including those with any suffix letters and numbers such as 2A1 and 2B) the lamp must be aimed with the left edge of the high intensity zone on the vertical line straight ahead of the lamp center and with the top edge of the high intensity zone at the level of the lamp center.

(iii) If the headlamp is quartz halogen nonsealed beam meeting the requirements of the Canadian Standards Association: The high beam lamp must be aimed as specified for Type 1 headlamps in (b)(i) of this subsection; the low beam lamps must be aimed so that the top edge of the low beam cutoff is three inches below the level of the lamp center, and

the point which the cutoff rises to the right must be on the vertical line with the center of the lamp.

(c) In cases of customized headlamp installation, headlamps must not be mounted closer together than requirements outlined for the year or original manufacture of the vehicle body.

(2) On motorcycles or motor-driven cycles with multiple beam lamps, the lamps must be aimed on the upper beam as specified for Type 1 units in subsection (1)(b)(i) of this section. As an alternative, motorcycle headlamps or motor-driven cycles with multiple beam headlamps with a well-defined lower beam may be aimed on the lower beam as specified for Type 2 units in subsection (1)(b)(ii) of this section with the vehicle upright and the front wheel facing straight ahead.

(3) On motor-driven cycles with single beam headlamps, the lamps must be aimed with the center of the high intensity zone on a vertical centerline straight ahead of the lamp center and with the top edge of the high intensity zone at the level of the lamp center.

(4) On motorcycles and motor-driven cycles with electronic headlamp modulators.

(a) The headlamp modular must:

(i) Be inserted in the high beam headlight circuit on motorcycles between the high beam hand switch and high beam filament in the lamp.

(ii) Be located on a frame bar or other substantial structure number, easily accessible to the operator for quick access to a bypass switch. The device should be air cooled, if necessary.

(iii) Be designed to continuously operate 60 watt headlamps.

(iv) Have an electrical bypass switch rated at 6 amps, 12.8 volts.

(v) Be made to change modulation amplitude:

(A) Daytime - modulation depth should be at least 50% but not more than 80%.

(B) Nighttime - not more than 20% modulation.

(C) At no time while the light modulator is being used should the percent modulation become 100%. This condition switches off the light intermittently and leads to premature filament failure.

(vi) Have No. 16 AWG stranded copper interconnecting wire.

(vii) Not make changes that would render ineffective any portion of 49 C.F.R. Part 571.108 (FMVSS 108).

(b) The headlamp modular should:

(i) Not use potentially dangerous voltages, i.e., above 50 volts, in the light modulator.

(ii) Operate within a frequency band of one cycle every two seconds to not more than four times per second.

(iii) Be sealed to prevent water intrusion.

(iv) Be designed to withstand intense vibration at 130°F.

(v) Be capable of operating over a voltage range of from 8 to 14 volts with no discernible change in its operating characteristics other than in headlamp brightness.

(vi) Not alter the low beam headlight circuit so that it may be used as backup in case of modulator malfunction.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-040, filed 9/17/08, effective 10/18/08.]

WAC 204-21-050 Clearance lamps, side marker lamps and identification lamps. Clearance lamps, side marker lamps, and identification lamps must be mounted as specified in 49 C.F.R. Part 571.108 (FMVSS 108) unless other requirements are outlined in RCW 46.37.090 or this section.

(1) Clearance lamps on vehicles manufactured prior to May 1, 1980, do not need to be visible at the inboard angles and need not comply with the mounting height requirements of 49 C.F.R. Part 571.108 (FMVSS 108).

(2) Specialized combination lamps designed to be mounted with the base at angles other than 0, 45, or 90 degrees from the longitudinal axis of the vehicle must be installed in accordance with the manufacturer's instructions.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-050, filed 9/17/08, effective 10/18/08.]

WAC 204-21-060 Turn signal lamps. (1) Turn signal lamps visible to approaching or following drivers must:

(a) Flash at a rate of sixty to one hundred twenty flashes per minute.

(b) Flash in unison. Except that a turn signal consisting of two or more units mounted horizontally may flash in sequence from inboard to outboard. The lamps may either be extinguished simultaneously or lighted simultaneously.

(c) Be mounted and operated as follows:

(i) On motor vehicles, turn signal systems must:

(A) Have four separate lamps consisting of at least two single-faced or double-faced turn signal lamps on or near the front and at least two single-faced lamps on the rear. Except that a truck-tractor or a truck chassis without a body or load may be equipped with one double-faced turn signal lamp on each side in lieu of the four separate lamps otherwise required on motor vehicles. If double-faced turn lamps are used, they must be mounted ahead of the center of the steering wheel or the center of the outside rearview mirror, whichever is rearmost.

(B) Be spaced as far apart as practical.

(C) Have the optical center of the front turn signal at least four inches from the inside diameter of the retaining ring of the lower beam headlamp unit, fog lamp unit, or passing lamp unit. Except original equipment turn signals that emit two and one-half times the minimum candela requirements may be closer.

(ii) For motorcycles, the front and rear turn signal lamps must be at least nine inches apart, except that front turn signals on motorcycles manufactured after January 1, 1973, must be at least sixteen inches apart.

(iii) On the rearmost towed vehicle in combination of vehicles, turn signal systems must be equipped with at least two single-faced turn signal lamps on the rear. The signal system on a combination of vehicles towed by a motor vehicle equipped with double-faced front turn signal lamps may be connected so only the double-faced turn signal lamps on the towing vehicle and the signal lamps on the rear of the rearmost vehicle are operative.

(2) Side turn signal lamps must:

(a) Meet SAE Standard J914.

(b) Be mounted on the side not lower than twenty inches or higher than seventy-two inches.

(c) Flash with the front and rear turn signal lamps on their respective sides of the vehicle. On vehicles with sequential turn signal lamps, the side turn signal lamps must flash with the front turn signal lamps.

(d) Flash with the rear turn signal lamps, if the side lamps flash when the hazard warning switch is actuated.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-060, filed 9/17/08, effective 10/18/08.]

WAC 204-21-070 Supplemental high-mounted stop and rear turn signal lamps. Supplemental high-mounted stop and rear turn signal lamps must meet requirements of SAE J1957 and J2068.

(1) Supplemental high-mounted stop and rear turn signal lamps must:

(a) Be single-faced.

(b) Be actuated in the same manner and at the same time as the required stop lamps or turn signal lamps.

(c) Be mounted not lower than thirty-five inches nor higher than fifty-five inches. Except that standard stop or turn signal lamps not combined with tail lamps or reflex reflectors may be used respectively as supplemental lamps in which case they must be mounted at any height not lower than fifteen inches or higher than seventy-two inches.

(d) Not be used in lieu of required stop and turn signal lamps.

(2) Supplemental turn signal lamps and combination stop-and-turn signal lamps must be mounted in pairs facing the rear with one lamp near each side of the vehicle, at the same height and equally spaced from the vehicle centerline.

(3) Supplemental stop lamps must be mounted in pairs as specified above or with not more than two lamps on or adjacent to the centerline of the vehicle.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-070, filed 9/17/08, effective 10/18/08.]

WAC 204-21-080 Fog lamps. (1) Fog lamps must:

(a) Meet SAE Standard J583.

(b) Be white to amber in color.

(c) Be mounted in accordance with RCW 46.37.180 and so the inner edge of the lens retaining ring is no closer than four inches to the optical center of the front turn signal lamp to provide illumination in front of the vehicle under conditions of rain, snow, dust or fog.

(d) Not be used alone in lieu of headlamps, but may be used with lower head lamp beams as specified in RCW 46.37.220.

(2) Fog tail lamps must meet standards set by SAE J1319.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-080, filed 9/17/08, effective 10/18/08.]

WAC 204-21-090 Auxiliary driving lamps. Auxiliary driving lamps must:

(1) Meet SAE Standard J581.

(2) Be white in color.

(3) Provide illumination forward the vehicle.

(4) Be wired so that the taillights are lighted whenever the driving lamps are lighted. If driving lamps are not wired to operate only with headlamp high beams, a separate switch and indicator lamp must be provided to operate the driving lamps.

(5) Be aimed with the center of the high intensity zone on a vertical line straight ahead of the lamp center and at the level of the lamp center.

(6) Not be used alone in lieu of headlamps, but may be used to supplement the upper beam of a standard headlight system as specified in RCW 46.37.220, and may only be used to supplement the upper beam of a standard headlamp system.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-090, filed 9/17/08, effective 10/18/08.]

WAC 204-21-100 Auxiliary passing lamps. Auxiliary passing lamps must:

(1) Meet SAE Standard J582a.

(2) Be white to amber in color.

(3) Be mounted in accordance with RCW 46.37.180 and so the inner edge of the lens retaining ring is no closer than four inches to the optical center of the front turn signal lamp.

(4) Be aimed with the top edge of the high intensity zone one inch above the level of the lamp center and with the left edge of the high intensity zone five inches to the left of a vertical line straight ahead of the lamp center.

(5) Not be used alone in lieu of headlamps, but may be used at the driver's discretion with either low or high beam headlamps as specified in RCW 46.37.220.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-100, filed 9/17/08, effective 10/18/08.]

WAC 204-21-110 Spot lamps. Spot lamps must meet SAE Standard J591.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-110, filed 9/17/08, effective 10/18/08.]

WAC 204-21-120 Cornering lamps. Cornering lamps:

(1) Must meet SAE Standard J852a.

(2) Must be on the front of the vehicle near the side or the side near the front.

(3) Must be mounted no lower than twelve inches nor higher than thirty inches.

(4) Must, if they have means to adjust and aim the lamp, be mounted so the center of the high intensity portion of the beam is within forty to fifty degrees from the longitudinal axis of the vertical toward the front. The vertical aim must be within the center of the high intensity zone, ten to fourteen inches below the level of the lamp center.

(5) Must, if they don't have aiming mechanisms, be mounted in a fixed position on the vehicle in accordance with the manufacturer's instructions.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-120, filed 9/17/08, effective 10/18/08.]

WAC 204-21-130 Emergency lamps. (1) All emergency lamps must meet the criteria established in RCW 46.37.320. In descending order of preference, these are:

(a) Conformance to Federal Motor Vehicle Safety Standards, or, if none,

(b) Conformance to current standards and specifications of the Society of Automotive Engineers, or, if none,

(c) Certified for compliance by any recognized organization or agency such as, but not limited to, the American National Standards Institute, the Society of Automotive Engineers, or the American Association of Motor Vehicle Administrators.

(2) Headlamp flashing systems may be used for authorized emergency vehicles owned and operated by law enforcement agencies, licensed ambulance companies, and fire departments. Headlamp flashing systems must:

(a) Have a circuit that alternately flashes only the high beams from the headlamps at a rate of sixty to one hundred twenty flashes per minute per side.

(b) Be so designated that any failure to flash the lamps will not result in failure of the headlamp system to operate normally.

(c) Incorporate an override feature which must stop the flashing and provide full illumination from both high beam headlamps when the dimmer switch is in the high-beam mode.

(d) Have an indicator lamp included in the circuit to give a visible and unmistakable indication to the driver that the system is turned on.

(3) The following table outlines the color of emergency lamp to be used for each type of emergency vehicle.

Vehicle Type	Lighting Required	Other Lighting Allowed
Authorized Emergency	1 red lamp	Flashing amber or white lamps
Law Enforcement Vehicle	1 blue lamp	Flashing red, amber or white lamps
Volunteer Firefighter		If approved by the chief of their respective service, green lamps may be installed on the vehicle provided that the requirements outlined in subsection (4) of this section are met.
Public utilities vehicles, other construction and maintenance vehicles, pilot cars, tow trucks, animal control vehicles, hazardous materials response team vehicles, search and rescue team vehicles, and rural newspaper carrier vehicles, and vehicles towing a load that exceeds legal dimensions.		One or more flashing amber lamps provided that the requirements of subsection (5) of this section are met.

(4) Green lights for volunteer firefighter vehicles must:

(a) Meet the requirements of SAE J595 except that the color of the lamp must be green as the color described in SAE J578.

(b) Be visible for a distance of two hundred feet under normal atmospheric conditions.

(c) Not have a maximum light projected in any one direction exceeding three hundred candle power.

(d) Be mounted no less than twenty-four inches above the level surface upon which the vehicle stands, or may be placed on the forward portion of the top above the windshield.

(e) Be mounted anywhere from the center of the vehicle to the left side thereof.

(f) Be used only for the purpose of identification and the operator of a vehicle so equipped must not be entitled to any of the privileges provided in RCW 46.61.035 for the operators of authorized emergency vehicles.

(5) Amber lamps must:

(a) Be mounted and be of sufficient intensity so as to be clearly visible to approaching traffic for at least five hundred feet in normal sunlight.

(b) Be mounted as outlined in WAC 204-21-020 and as follows:

(i) Must be mounted so that the entire projected area of the lens is visible from all eye heights of drivers of other vehicles at angles within forty-five degrees left to forty-five degrees right of the front of the vehicle. If the light within these required angles is blocked by the vehicle or any substantial object on it, an additional warning lamp must be displayed within the obstructed angle.

(ii) May be mounted at any height.

(c) Only be used on the vehicles described in subsection (3) of this section, when such vehicles are actually involved in construction, maintenance, or operations which require that warning be given to ensure the protection of the motoring public or the work crew. Warning lamps must not be illuminated while traveling to or from the site of operations. For the purposes of tow truck operations, the site of operations must be only that place where vehicles are attached to or detached from the tow truck. Lamps on pilot cars must be illuminated only while the vehicle is actually providing escort service. Lamps on rural newspaper delivery vehicles must only be illuminated when the vehicle is traveling on the delivery route. Lamps on oversize units may be illuminated when traveling on public roadways. The operator of these vehicles must not be entitled to any of the privileges provided in RCW 46.61.035 for the operators of authorized emergency vehicles.

(6) Three hundred sixty degree emergency warning lamps must meet SAE Standard J845.

(7) Nothing in this section relieves the operator of any vehicle from displaying any other light or warning device required by statute or regulation.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-130, filed 9/17/08, effective 10/18/08.]

WAC 204-21-140 Flashing warning lamps. Flashing warning lamps may be mounted at any height and must:

(1) Meet the SAE Standards outlined for the type of vehicle as outlined in the table below.

Vehicle Type	Standard Adopted
Agricultural equipment	SAE J974
Industrial equipment	SAE J96

(2) Be mounted so that the entire projected area of the lens is visible from all eye heights of drivers of other vehicles at angles within forty-five degrees left to forty-five degrees right of the front of the vehicle. If the light within these required angles is blocked by the vehicle or any substantial object on it, an additional warning lamp must be displayed within the obstructed angle.

[Statutory Authority: RCW 46.37.320 and 46.37.005. 10-19-074, § 204-21-140, filed 9/16/10, effective 10/17/10; 08-19-104, § 204-21-140, filed 9/17/08, effective 10/18/08.]

WAC 204-21-150 Side cowl fender or running board courtesy lamps. Side cowl, fender, or running board courtesy lamps must meet SAE Standard J575.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-150, filed 9/17/08, effective 10/18/08.]

WAC 204-21-160 Slow-moving vehicle emblems. (1) Every farm tractor, every self-propelled unit of farm equipment, every implement of husbandry designed for operation at speeds not in excess of twenty-five miles per hour and every combination of farm tractor and towed farm equipment or towed implement of husbandry normally operated at speeds not in excess of twenty-five miles per hour shall at all times be equipped with a slow-moving vehicle emblem.

(2) Other classes of vehicles not covered by RCW 46.37.160 such as road construction vehicles and road maintenance vehicles which normally operate at a speed of twenty-five miles per hour or less may be equipped with slow-moving vehicle emblems meeting the requirements of this section.

(3) In order to comply with the provisions of RCW 46.37.160(6), slow-moving vehicle emblems:

(a) Must be constructed in conformance with SAE Standard J943.

(b) Must be mounted point up in plane perpendicular to the direction of travel of the vehicle so that the reflectorized side of the emblem is facing to the rear.

(c) Must be mounted, as nearly as is practicable, centrally at the rear of the vehicle in an unobscured location.

(d) Must be mounted not less than two feet nor more than six feet above the ground on which the vehicle stands measured from the lower edge of the emblem.

(e) May be permanently attached to the vehicle. Where portable brackets are used, they must be so constructed that they will hold the emblem securely and in a position meeting the requirements of all other mounting instructions under this section.

If the towed unit is sufficiently large to obscure the slow-moving vehicle emblem on the farm tractor, the towed unit must be equipped with a slow-moving vehicle emblem. In such cases, the towing vehicle need not display the emblem. Where the slow-moving vehicle emblem on the farm tractor unit is not obscured by the towed unit, then either or both may be equipped with the required emblem.

(f) Must not replace any of the required lamps or other devices required in chapter 46.37 RCW.

(g) Must not be used as a clearance marker for wide equipment.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-160, filed 9/17/08, effective 10/18/08.]

WAC 204-21-170 Additional lighting for snow removal, highway maintenance and refuse haulers. (1) Additional headlamps may be positioned sufficiently high enough to clear operating equipment provided they are aimed at an angle to avoid blinding oncoming traffic while on their routes, involved in construction, maintenance, and/or operations. Except, refuse haulers must:

(a) Use regular mounted headlamps when transporting refuse to the dump site. Auxiliary headlamps may be used if necessary.

(b) Use the alternate lights when the refuse haulers' collections container is in a position to obscure the headlamps, and will not exceed twenty miles per hour.

(2) Additional operating lamps may be located on the top of the cab or at other locations to illuminate plowing, abrasive spreading or other equipment.

(3) No flashing red warning signal except those required by RCW 46.37.150 shall be displayed or used on any highway equipment.

(4) Amber colored lamps must:

(a) Be mounted on the cab or other high point of the equipment so as to be visible at all times, at least from the front and rear of the vehicle, from a distance of five hundred feet in normal sunlight, unless otherwise prescribed below.

(b) Have a minimum light intensity of the lamp filament not be less than twenty-one candle power.

(c) Be used on the following vehicles:

(i) Power shovels or other similar highway maintenance equipment. The amber lamp and a red flag are to indicate an extension which designates the maximum danger limit created by the swing of the cab while operating along the traffic lane.

(ii) Other highway equipment which creates a potential hazard to traffic including those vehicles and trailers for construction, maintenance, and operations.

(iii) Knuckle of all man lift-type platform trucks with articulating boom, where the knuckle is capable of being rotated beyond the side of the truck.

(d) Only be illuminated:

(i) When the equipment is actually involved in construction, maintenance, collecting refuse, and/or operations.

(ii) When the equipment is traveling to or from the job site and is unable to maintain, either because of equipment limitations, or other reasons, at least one-half posted or prevailing speed.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-170, filed 9/17/08, effective 10/18/08.]

WAC 204-21-180 Deceleration alert lamp system. (1) Deceleration warning lights must:

(a) Be installed as follows:

(i) Only one such system may be mounted on a motor vehicle, trailer, semitrailer, truck tractor, or pole trailer.

(ii) Provision must be made for rigid or shock-absorbing mounting.

(iii) The axis of the light beam must be parallel to the roadway and the longitudinal axis of the vehicle.

(iv) The lamp must be mounted on the centerline of the rear exterior of the vehicle or with the optical center of the lamp not more than fifteen inches from the centerline.

(v) The deceleration warning light system must be mounted as nearly as practicable at the same height as the existing stop lamps on the vehicle.

(vi) Visibility of the deceleration lamps to the rear must not be obstructed by any part of the vehicle or load thereon.

(b) Meet Type I or Type II requirements and test methods for a deceleration alert system.

(i) Type I - the system must:

(A) Be mounted on the rear of the vehicle as close as possible to the vertical centerline of the vehicle.

(B) Be mounted at a height of not more than seventy-two inches nor less than fifteen inches.

(C) Center-to-center (optical axis) distance between two adjacent compartments should not exceed six inches.

(D) Have three compartments. The center compartment emits a green light and is energized when the vehicle operator has the accelerator depressed. The two outer compartments emit an amber light and are energized when the operator releases the accelerator and prior to applying pressure to the foot brake pedal. When the amber lights are energized, the green light is deenergized. When pressure is applied to the foot brake pedal, the amber lights are deenergized and the vehicle's stop lamps operate in the normal manner. SAE Standard J578d is adopted for color chromaticity boundaries.

(E) Meet the requirements under the following sections of SAE J575g: Section B, samples for test; Section C, lamp bulbs; Section D, laboratory facilities; Section E, vibration test; Section F, moisture test; Section G, dust test; Section H, corrosion test; and Section J, photometry. If plastic material is used in optical parts it must comply with the requirements set forth in SAE J576c.

(F) Measure the beam candle power with the H-V axis taken as paralleled to the longitudinal axis of the vehicle. The candle power measurements for the center green compartment must be made with the incandescent filament of the lamp at least ten feet from the photometric screen.

Beam candle power measurements of the two amber compartments shall be made by either of the following methods:

(I) The two compartments may be photometered together provided that a line from the optical axis (filament centers) of each compartment to the center of the photometer sensing device does not make an angle of more than 0.6° with the photometer (H-V) axis.

(II) Each compartment may be photometered separately by aligning its axis with the photometer and adding the value at each test point.

Table 1 lists the design candle power requirements for the two outer amber lights, and Table 2 lists the design candle power requirements for the center green light.

Table 1

Minimum Design Candle power Requirements for Amber Light

Test	Points	Candle power
10 up	10L	25
and	V	65
10 down	10R	25
	20L	25
	10L	65
5 up	5L	85
and	V	125
5 down	5R	85
	10R	65
	20R	25
	20L	25
	10L	75
	5L	125
	H-V	175
	5R	125
	10R	75
	20R	25
Maximum		450

Table 2

Minimum Design Candle power Requirements for Green Light

Test	Points	Candle power
10 up	10L	1
and	V	1.5
10 down	10R	1
	20L	1
	10L	2
5 up	5L	4
and	V	4
5 down	5R	4
	10R	2
	20R	1
	20L	2
	10L	3
	5L	5
	H-V	5
	5R	5
	10R	3
	20R	2
Maximum		45

(ii) Type II - the system must:

(A) Operate so as to indicate a component of deceleration of the vehicle on which it is installed by varying the flashing rate of a yellow lamp when the service brakes are applied.

(B) Incorporate an automatic means for reducing the intensity of the lamp during darkness. The system must cause the voltage to the deceleration lamps to decrease to 5.0 V ± 10% at 0 g deceleration during darkness. The specified voltage must be reached when the illumination on the sensor is not more than 5 lm/sq. ft., nor less than 0.5 lm/sq. ft.

(C) Have an output voltage, duty cycle, and flash rate of the control unit as a temperature of 24° ± 5.5°C (75° ± 10°F), when 12.8 V dc is applied to the input terminal, as shown in Table I when the control sensor is placed on a tilt table and slightly vibrated as the table is slowly rotated through the angles representing the specified vehicle deceleration rates.

TABLE I

Test Requirements for Deceleration Lamps

Deceleration (g)	Output (V)	Peak Relative Brightness	Flash Rate (Hz)	On Time (%)
0.0	7.0	1.0	1.0	50
0.1	—-	1.0	1.5	48
0.2	—-	1.0	2.3	46
0.3	—-	1.2	3.4	44
0.4	—-	1.4	5.0	42
0.5	—-	1.7	7.6	40

(D) Have a deceleration at which the unit switches from a lower to a higher flash rate that is within ± 0.05 g of the rate specified in Table I. If the unit operates at more steps than the required minimum, the additional values for each column shall lie on the smooth curve connecting the indicated values within the specified tolerances. The values specified in Table II apply to ramp-type inertial sensors for which the downward angles correspond to the deceleration and a tolerance of 3.0° applies to the tilt angle.

TABLE II

Test Requirements for Deceleration Sensors

Deceleration (g)	DEGREES Forward Tilt Angle	Dip Correction	Corrected Tilt Angle
0.0	0.0	0.0	0.0
0.1	5.7	0.8	6.5
0.2	11.3	1.6	12.9
0.3	16.7	2.4	19.1
0.4	21.8	3.2	25.0
0.5	26.6	4.0	30.6

(E) Have the rms of the output voltage during the on portion of the flash cycle at the 1 Hz flash rate within ± 5% of the specified value, measured at the lamp bulbs with daytime illumination on the automatic darkness sensor.

(F) Have a relative brightness of the lamp or bulbs at the decelerations within ± 25% of the specified values after the fifth flash with the brightness of the lamp or its bulbs taken as 1.0 when measured with the rms output voltage specified for 0 g deceleration.

(G) Have a flash rate within ± 15% of the specified value. The percent on time must be within ± 10% of the specified value.

(H) Have linear dip corrections varying from 4° at 0.5 g or more deceleration to 0° at 0 g on passenger vehicles and pickup trucks that have substantial front end dip upon braking.

(I) Comply with the following mechanical tests in SAE Standard J575g (tests for motor vehicle lighting devices and components): Corrosion, dust, moisture, vibration, and warpage (at a flashing rate of 1 Hz when a plastic lens or housing is used).

(J) Meet the following control system requirements at both 11 V and 15 V:

(I) Low temperature test. The control system must be placed in its normal operating position in a circulating air cabinet at -32° ± 3°C (-25° ± 5°F) for 2 hours. At the end of that period and while still at that temperature, the unit must meet the requirements in Table I at 0 g and 0.3 g.

(II) High temperature test. The control system must be placed in its normal operating position in a circulating air cabinet at 74° 0°, -2.8°C (165° 0°, -5°F) for 2 hours. At the end of that period and while at that temperature, the unit must meet the requirements in Table I at 0 g and 0.3 g.

(K) Operate the control system continuously at a supply voltage of 12.8 V dc for 200 hours with no failure (except bulb replacement), after which it must meet the requirements in Table I at 0 g and 0.3 g.

(L) Meet the photometric requirements in Table III after the sample has been mechanically tested in the order shown in (b)(ii)(J) of this subsection for the luminous intensity of a deceleration lamp with the bulbs operated at mean spherical candela.

TABLE III

Photometric Requirements for Deceleration Signal Lamps

Test Point Coordinates		Max Cd		Min	
Vertical	Horizontal	Amber	Red	Amber	Red
	10L	70	35	25	12.5
10U	V	200	100	60	30
	10R	70	35	25	12.5

Photometric Requirements for Deceleration Signal Lamps

Test Point Coordinates		Max Cd		Min	
Vertical	Horizontal	Amber	Red	Amber	Red
	20L	40	20	15	7.5
	10L	200	100	60	30
	5L	600	300	200	100
5U	V	800	400	350	175
	5R	600	300	200	100
	10R	200	100	60	30
	20R	40	20	15	7.5
	20L	40	20	15	7.5
	10L	200	100	60	30
	5L	800	400	350	175
H	V	1,300	650	600	300
	5R	800	400	350	175
	10R	200	100	60	30
	20R	40	20	15	7.5
	20L	40	20	15	7.5
	10L	200	200	60	30
	5L	600	300	200	100
5D	V	800	400	350	175
	5R	600	300	200	100
	10R	200	100	60	30
	20R	40	20	15	7.5
	10L	70	35	25	12.5
10D	V	200	100	60	30
	10R	70	35	25	12.5

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-180, filed 9/17/08, effective 10/18/08.]

WAC 204-21-190 School bus warning lamps. (1) If the bus is a privately owned school bus or private carrier bus, then it must not use the eight lamp warning system unless such use is in conformance with the rules and regulations set forth by the superintendent of public instruction in chapters 392-143 and 392-145 WAC. The requirements for private carrier buses may be found under chapter 204-32 WAC.

(2) If the bus is a school bus owned and operated by any public school district and all privately owned school buses operated under contract with a school district in the state and used for the transportation of public school children, then the warning lamp system must:

(a) Be operated in accordance with the regulations set forth in chapter 392-145 WAC.

(b) Consist of a total of eight lamps conforming to SAE Standard J887 or the standard in effect for such lamp at the time it was manufactured. Two amber and two red on both the front and rear of the bus. The amber lamps must be mounted inboard of the red lamps.

(c) Be mounted as high as practicable on the bus body and as near the outside edges of the body as curvature permits.

(d) Have shielding to protect the lamps from the elements and/or be mounted flush with the body surface.

(e) Be mounted on a background that is painted black and extends a minimum of three inches outward from the lamps.

(f) Be mounted and aimed as specified in 49 C.F.R. Part 571.108 (FMVSS 108) and SAE Standard J887a.

(g) Be clearly visible from a distance of at least five hundred feet in normal sunlight.

(h) Be activated only by means of a manually operated switch. Such activation will cause the right and left amber lamps to flash alternately until the stop signal arm is extended, or the bus entrance door is opened, at which time the amber lamps must be automatically deactivated and the

right and left red lamps must be automatically activated. Whenever the warning lamp system has been activated, opening of the entrance door must automatically deactivate the amber lamps, cause the stop signal arm to extend, and activate the red lamps. Automatic extension of the stop signal arm does not apply to systems equipped with a manually operated stop signal arm.

(i) Have all lamps flashing at a rate from sixty to one hundred twenty times per minute and must reach full brilliance during each cycle.

(j) Have lamp controls which must consist of:

(i) The master or sequencing switch which must be in plain view and mounted within easy reach of the driver, and which must activate the system sequencing and deactivate the system at any time during the sequence.

(ii) An override switch which must automatically activate the red lamps whenever the stop signal arm is extended even though the master control switch is turned off, and which must automatically deactivate the amber lamps if previously activated regardless of the then present normal state of sequencing or entrance door position. Such override switch must be designed and installed so as to function with air, vacuum, electric, or manually operated stop signal arms. The stop signal arm must be capable of being extended at any time, regardless of the position of the entrance door. The opening of the entrance door must not cause extension of the stop signal arm, or the activation of the red lamps unless the master switch has been activated.

(iii) A minimum of two pilot lamps, one amber and one red, each of which must flash when the like colored warning lamps are in operation. Pilot lamps which show the operation of each individual lamp are permissible. All pilot indicators must be located so as to be clearly visible to the driver.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 12-03-084, § 204-21-190, filed 1/13/12, effective 2/13/12; 08-19-104, § 204-21-190, filed 9/17/08, effective 10/18/08.]

WAC 204-21-200 Private carrier bus lamps. (1) All signal lamps on private carrier buses must be constructed in conformance with the SAE Standard for "school bus red signal lamps," in effect at the time of manufacture of such lamps, and must:

(a) Be mounted on the front and rear of the bus, above the windows, as high and as widely spaced laterally as practicable but in no case shall the lateral spacing of these lamps be less than forty inches.

(b) Be mounted so that the vision of front signals to the front and rear signals to the rear are not unobstructed by any part of the vehicle from 5° above to 10° below the horizontal and from 30° to the right to 30° to the left of the centerline of the bus.

(c) Have the switch which activates the signal lamps be actuated by movement of the stop signal to the extended position.

(d) Be no switch between the signal lamps and the switch which activates these lamps when the stop signal is extended.

(e) Be a flashing red indicator lamp on the instrument panel of the vehicle which will indicate to the driver that the signal lamps are operating.

(f) Operate through a flasher unit which will cause the front signal lamps to flash alternately and the rear signal lamps to flash alternately at a rate no slower than sixty nor faster than one hundred twenty times per minute. The "on" period of the flasher must be long enough to permit the bulb filament to come up to a full brightness.

(g) Signal lamps must be aimed two inches below level at twenty-five feet and straight ahead. An aiming tolerance of from three inches up to seven inches down and ten inches right or left will be allowed.

(h) Only be actuated by the driver of a private carrier bus whenever such vehicle is stopped on the highway for the purpose of receiving or discharging passengers, except:

(i) When the passengers boarding or alighting do not have to cross a highway and the bus is stopped completely off the main traveled portion of the roadway; or

(ii) When the bus is stopped at an intersection or place where traffic is controlled by a traffic officer or official control signal.

EXCEPTION: Buses that do not stop upon the roadway to load or discharge passengers are exempt from the requirements of this section.

(2) Rear turn signal lamp and stop lamp lenses must be amber in color to avoid confusion with signal lamps and the message on the warning sign.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-200, filed 9/17/08, effective 10/18/08.]

WAC 204-21-210 Bus hazard warning strobe lamp. All bus hazard warning strobe lamps must meet the Class 2 requirements of SAE Standard J1318, and may only be used as follows:

(1) School buses may be equipped with a single additional hazard strobe lamp in addition to the eight lamp warning system. Such lamps must:

(a) Not be mounted any closer than six feet from the rear of the bus measured from a vertical plane tangent to the rearmost point of the bus body. However:

(i) If the bus is equipped with a roof hatch falling within the above mentioned measurements, the strobe lamp may be located directly behind the roof hatch.

(ii) If the bus has a clear lens strobe lamp, less than eight inches in height, it may be mounted on the centerline of the roof in the rear one-half of the bus.

(b) Be activated by a switch independent of all other lamp switches. This switch must be plainly labeled and have a pilot lamp that must indicate when the lamp is in operation.

(c) Only be used when the bus is occupied with school children and one or more of the following conditions exists:

(i) The bus is in motion in inclement, sight obscuring conditions, including but not limited to rain, fog, snow, and smoke;

(ii) There is a need to improve the visibility of the bus when stopping, standing, or starting onto a highway;

(iii) There is limited visibility caused by geographic hazards such as winding roadways, hills, trees, buildings, etc.

The strobe lamp shall not be activated solely because of darkness.

(2) Municipal transit vehicles (as defined in RCW 46.04.355) may be equipped with a single additional hazard strobe lamp. Such lamps:

(a) May be mounted on the centerline of the roof in the rear one-half of the bus so long as the lamp is clear and less than eight inches in height.

(b) Be activated by a switch independent of all other lamp switches. The hazard strobe lamp switch must be plainly labeled and have a pilot lamp that must indicate when the lamp is in operation.

(c) Only be used when the bus is occupied with passengers and one or more of the following conditions exists:

(i) The bus is in motion in inclement, sight obscuring conditions, including but not limited to rain, fog, snow, and smoke;

(ii) There is a need to improve the visibility of the bus when stopping, standing, or starting onto a highway;

(iii) There is limited visibility caused by geographic hazards, such as winding roadways, hills, trees, etc.

The strobe lamp must not be activated solely because of darkness.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 12-03-084, § 204-21-210, filed 1/13/12, effective 2/13/12; 08-19-104, § 204-21-210, filed 9/17/08, effective 10/18/08.]

WAC 204-21-220 Trailer tongue lamps. A lamp must be used on the tongue of any trailer where the distance between the front of the trailer body and the rear of the body of the towing vehicle is fifteen feet or greater, and where the top of the tongue is less than twenty-four inches above the ground at any point between the front of the body of the trailer and the rear of the body of the towing vehicle. This lamp must:

(1) Be amber in color and be in operation whenever the combination of vehicles is in motion, and must be visible to each side of the combination.

(2) Have a minimum diameter of two and one-half inches.

(3) Have a steady burn or may be flashing provided that the flashing lamp only flashes by means of an electronic or electric flasher. Strobe lamps and rotating type lamps are not permitted.

(4) Be mounted as nearly as practicable in the center of the distance between the vehicle bodies. Lamps mounted on extendable tongues will necessarily vary in distance between the bodies in relation to the amount of extension used; however, in no case shall the lamp be over five feet from the center of the distance between vehicle bodies nor more than fifteen feet from either of the vehicle bodies.

(5) Be mounted at a minimum height of twenty-one inches above the roadway, and maximum height of forty-eight inches above the roadway.

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-220, filed 9/17/08, effective 10/18/08.]

WAC 204-21-230 Lighting equipment prohibited. (1) The addition of a lamp, reflective device or other motor vehicle equipment must not impair the effectiveness of lighting equipment required by 49 C.F.R. Part 571.108 or chapter 46.37 RCW.

(a) If a vehicle is in motion on a public roadway, the vehicle must not:

(i) Display aftermarket neon lighting devices.

(ii) Combine any type of letter, number, sign, symbol or combination thereof with an eye level brake light meeting the standards of 49 C.F.R. Part 571.108 (FMVSS 108). No function other than red reflex reflectors shall be combined in eye level brake lights.

(iii) Have a lighted or electrically/mechanically powered sign or message board enabling change or movement of any displayed message to be displayed or affixed to the vehicle. Except:

(A) Vehicles that are used in conjunction with officially sanctioned or sponsored motor vehicle traffic control or movement may display lighted or electrically powered signs to assist in the efficient control of traffic movement on public roadways. The signs must be designed, worded, and located to limit misinterpretation and confusion by the motoring public.

(B) Electric signs may be unitized to identify taxicabs and the destinations of mass transportation vehicles. These signs must not contain any commercial or personal message and must be designed, worded, and located so that it is clearly differentiated from other required motor vehicle lights.

(b) If a vehicle is not in motion and parked on private property, the vehicle may use aftermarket lighting except as outlined under RCW 47.36.180.

(c) This section is not intended to prohibit a scrolling sign provided that the scrolling sign must:

(i) Be powered by an external source or in a manner which does not cause the required equipment on the vehicle to be out of compliance with 49 C.F.R. Part 571, chapter 46.37 RCW or Title 204 WAC.

(ii) Not be lit.

(iii) Not have continual motion.

(2) Pursuant to Title 49 C.F.R. Part 571.108, the addition of an aftermarket style ornament or other feature such as tinted plastic glass covers, a grille or allotted covers must not be placed in front of the headlamp lens, or in front of any other lighting devices installed on motor vehicles which impair the effectiveness of lighting equipment required under 49 C.F.R. Part 571.108 (FMVSS 108) or chapter 46.37 RCW. Except:

(a) Clear aftermarket headlamp covers.

(b) Headlamp wipers may be used in front of the lens provided that the headlamp system is designed to conform to all applicable photometric requirements in 49 C.F.R. Part 571.108 (FMVSS 108) with the wiper stopped in any position in front of the lens.

(c) A bike rack may be installed on the front of a municipal transit vehicle (as defined under RCW 46.04.355) provided that even with the bike rack installed, loaded or unloaded with bicycles, the headlight system still conforms with all applicable photometric requirements in 49 C.F.R. Part 571.108 (FMVSS 108).

(3) Red emergency lights are prohibited on any vehicle other than an authorized emergency vehicle, a law enforcement vehicle, an emergency tow truck as defined in WAC 204-88-030 (1), (2), and (5), school buses, and private carrier buses.

(4) Blue lights are prohibited on any vehicle other than a law enforcement vehicle as defined in WAC 204-21-010.

(5) Flashing white lights are prohibited on any vehicle other than authorized emergency vehicles, law enforcement

vehicles, school buses, and emergency tow trucks as defined in WAC 204-88-030 (1), (2), and (5).

[Statutory Authority: RCW 46.37.005 and 46.37.320. 08-19-104, § 204-21-230, filed 9/17/08, effective 10/18/08.]