

**US Proposal for GTR48
Unresolved Issues for GTR on Lighting and Light Signalling Devices**

Submitted by the United States of America

This review and proposal was undertaken to highlight the differences in GTR48 versus the requirements in United States Federal Motor Vehicle Safety Standard for Lighting. It highlights where differences or conflicts exist, and where the possibility of options may achieve useful solutions. Its purpose is to facilitate greater discussion at GRE so that a single, justified, best safety regulation can be achieved and accepted.

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2. Application	Type of motor vehicle/characteristics	Highway motor vehicles with design speed ≥ 25 km/h, except motorcycles	All highway motor vehicles, with actual speed ≥ 32 km/h, including motorcycles	Delete speed and existing vehicle categorization. Instead, include categories 1, 2 and [3] etcetera, as intended for the GTR Zero. This means for all highway motor vehicles including motorcycle and heavy trucks and trailers. However, when GTR is carried into an ECE regulation or any National regulation, any category can be exempted, for example, if it has a separate regulation such as for [motorcycles] in ECE. Additionally, the maximum design/top speed above which regulations would apply, would be regulated at the regional or national level, in this case 25 kph for ECE and 35 kph for US. Regarding whether a particular region or country would exempt a particular class or specific vehicle type, a note about such a requirement could be added to an Annex to this regulation .
3. Definitions	Front fog lamp, rear fog lamp, parking lamp, triangular retroreflectors, cornering lamp, and etc.	Defined	Undefined, unregulated	For these lighting devices, include language for each as follow: "If a contracting party requires mandatory regulation of [front fog lamp], [rear fog lamp], [triangular retro reflectors] and [cornering lamp], and [etc.] the following requirements apply...." Thus, in ECE, which does or is expected to regulate these lamps, the GTR would have regulatory language that would accommodate regulating them. Regarding whether a particular region or country would mandate their presence, a note about such a requirement could be added to an Annex to this regulation .
4. General Specifications	Measurements methods	Measures to edge of lamp	Measures to center of lamp, where a measurement is specified, otherwise "as far apart, or high as practicable" language is used.	Use the GTR method of measurements (to lamp edge).

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4. General Specifications	Measurements methods	Prohibition of visibility of light of certain colors from directions other than normally required	No similar provision	Use GTR requirements.
4. General Specifications	Tell-tales	Many required	Few required	Use GTR requirements, with reference to GTR "Controls and Displays" for placement, color, symbol and etc..
4. General Specifications	The colours of the light emitted by the lamp (this latest version of GTR48 has provisions for options regarding colours where conflict exists between ECE R48 and North American rules)	Original conflicts are: DI=only amber on rear ID&P=only white on front End-Outline marker(clearance) at front=white only Rear side RR=amber, may be red only if part of another red lamp Rear side marker =amber, unless part of a red lamp	DI=red or amber on rear ID=only amber on front P=amber or white Clearance at front=amber only Rear side RR=must be red Rear side marker=must be red	The US proposes to include the widest range of colors in the GTR for each lamp to accommodate regional or national adoption of the colors to meet its regulatory needs. Thus, for example, in the GTR for rear DI, the color would be red or amber; for front position, the color would be white or amber, and for rear side marker and retroreflectors, the color would be red or amber. Regarding whether a particular region or country would mandate a particular color, a note about such a requirement could be added to an Annex to this regulation .
4. General Specifications	Number of lamps	Fixed number specified	Minimum number specified	Use GTR requirements, unless otherwise noted.
4. General Specifications	Geometric visibility	Very specific	Much less so.	Use GTR requirements, unless otherwise noted,.
5.1 Driving Beam Headlamp	Number	2 or 4	2	For Category 1 and 2, use GTR requirement: 2 or 4; for Category 3 use 1 or 2. However, because of glare considerations, a switching requirement needs to be resolved in GRE, or the issue of the switching of additional driving beams could/should be resolved by the national or regional authority at the time of acceptance of the GTR. A note about such a requirement could be added to an Annex to this regulation .

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5.1 Driving Beam Headlamp	Arrangement	None beyond the general specifications	Main beam must be below or inboard of the passing beam	Use US requirement to assure the passing beam remains outboard most, and use the GTR requirement to allow the passing beam to be the lower of the two.
5.1 Driving Beam Headlamp	Position: Height	None beyond the general specifications	560 – 1370 mm to CL	Use GTR which does not have a height requirement.
5.2 Passing Beam Headlamp	Arrangement	None beyond the general specifications	Must be outboard most or uppermost of the headlamps	Use US requirement to assure that the passing beam is outboard most.
5.2 Passing Beam Headlamp	Position: Width	#400mm from edge of lamp to edge of vehicle	As far apart as practicable	Use GTR requirement.
5.2 Passing Beam Headlamp	Position: Height	≧500 to the bottom edge, and ≧560 mm to center, and #[950] mm if high intensity lamps, otherwise to 1200 mm	560 to 1370 mm	Using GTR Zero categories as follows: Category 1 and 2 – [≧500 to the bottom edge], and [≧560 mm to center], and [950 mm to top] [850 mm to center] for gross mass #5455 kg. (12,000 pounds); 1200 mm to top for gross mass >5455 kg. (12,000 pounds). [Category 3 –≧500 to the bottom edge, and ≧560 mm to center, and [950 mm to top] [850 mm to center]]
5.2 Passing Beam Headlamp	Geometric Visibility	Specific requirement	Only the photometry angles	This should be eliminated by GRE from the GTR or the GTR should use the photometric angles.
5.2 Passing Beam Headlamp	Electrical Connections	May be on w/ main beam	May be on w/ main beam only under certain specified photometric prescriptions	Use GTR requirement but with a note stating that a particular region or country could mandate a particular electrical connection. That regional/national requirement would be added to an Annex to this regulation .
5.2 Passing Beam Headlamp	Aiming provisions	Specific aiming specification is required	Not required	Use GTR requirement but with a note stating that a particular region or country would choose a particular aim which is specified in the GTR that is pertinent to its passing beam photometric specification. That regional/national choice could be added to an Annex to this regulation .

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5.2 Passing Beam Headlamp	Aiming provisions	Manual (driver operated) aiming (leveling) is required; automatic aiming is optional, except mandatory for headlamps with high flux light sources	Not required or prohibited	Use GTR requirement.
5.3 Front Fog Lamp	Wiring	Regulated	Currently unregulated at the Federal level. but regulated at the state level. Each state can have a different requirement.	Add the following: "If a contracting party requires mandatory regulation of front fog lamps, the following requirements apply...." Thus, in ECE, which does regulate these lamps, the GTR would have regulatory language that would accommodate regulating them. The US, concerned about glare, may need requirements that have the effect of minimizing misuse. Regarding whether a particular region or country would mandate their regulation or presence, a note about such a requirement could be added to an Annex to this regulation .
5.4 Reversing Lamp	Height	250 mm to 1200 mm	No requirement	Delete requirement; height requirement not necessary if adoption of US visibility requirement occurs.
5.4 Reversing Lamp	Geometric visibility	Considers only target illumination	Considers target illumination and conspicuity for observers	Use US requirement.
5.5 Direction Indicator (DI) Lamp 5.6 Hazard Warning Signal	Number	Minimum of 6, maximum of 8	At least 4	Minimum of 4, maximum of 8, and regarding whether a particular region or country would mandate a particular number or type, a note about such a requirement could be added to an Annex to this regulation .
5.5 Direction Indicator (DI) Lamp 5.6 Hazard Warning Signal	Position: Width	#400mm from edge of lamp to edge of vehicle and ≥ 600 between edges	As far apart as practicable	Use GTR requirement

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5.5 Direction Indicator (DI) Lamp 5.6 Hazard Warning Signal	Position: Height	350-1500 mm, and optionally to 2100 mm if necessary	380-2110 mm	Use GTR requirement
5.5 Direction Indicator (DI) Lamp 5.6 Hazard Warning	Geometric visibility	Two means of determination of compliance	One method of determining compliance	Use GTR requirement
5.6 Direction Indicator (DI) Lamp 5.6 Hazard Warning Signal	Electrical connection	All lamps must flash in phase	Side mounted lamps may flash in or out of phase with front and rear lamps	Use US requirement; GRE should discuss/resolve this in/out of phase issue, in the absence of safety evidence.
5.7 Stop Lamp	Number	Only 3 for light duty, or 2, 3, or 4 for heavy duty veh.	At least 3 for light duty, at least 2 for heavy duty veh.	Minimum of 3, maximum of 5 for [Category xxx] [vehicles of overall width <2032 mm] and [minimum of 2, maximum of 4 for Category yyy] [vehicles of overall width ≥2032 mm]. Regarding whether a particular region or country would mandate a particular number or type, a note about such a requirement could be added to an Annex to this regulation .
5.7 Stop Lamp	Position: Width	#400mm from edge of lamp to edge of vehicle	As far apart as practicable	Use GTR requirement

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5.7 Stop Lamp	Position: Height	350-1500 mm and optionally to 2100 mm, however, the center third lamp only must no less than 150 mm below the rear glazing and ≥ 850 mm above the ground	380-1830 mm, the center third lamp however must be no lower than 75 mm below the glazing of a fixed rear window or no lower than 150 mm of the glazing in a convertible, and any height on a truck or multipurpose passenger vehicle.	Use GTR requirement, but with the range of 350-1830 mm.
5.7 Stop Lamp	Geometric Visibility	Two means of determination of compliance	One method of determining compliance	Use GTR requirement
5.7 Stop Lamp	Electrical Connections	Besides service brake application, retarders and active braking by computer must light the stop lamps or alternatively, by exceeding 2.2 m/s/s deceleration.	The additional means for lighting a stop lamp are not prohibited.	Use GTR requirement
5.9 Front Position Lamp	Presence	Mandatory on all but ≤ 1500 mm wide trailers	Mandatory on all vehicles ≤ 2032 mm except trailers (in US, front parking lamp)	Unless there are safety reasons for mandating additional lamps for certain vehicles, this applicability issue should be left to the national or regional authority, and listed in an Annex to this regulation .
5.9 Front Position Lamp	Number	Only 2	At least 2	Use GTR requirement

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5.9 Front Position Lamp	Position: Width	≤400 mm from edge of vehicle	As close as practicable to edge of vehicle	Use GTR requirement
5.9 Front Position Lamp	Position: Height	≥350 mm to bottom edge of lamp and ≥380 mm to center of lamp, to #1500 mm, unless a trailer or it is difficult, then 2100 mm.	380-1830 mm	Use 350 to 1830 mm
5.9 Front Position Lamp	Geometric Visibility	Two means of determination of compliance and different angles.	One method of determining compliance and different angles	Use GTR requirement
5.9 Front Position Lamp	Tell-tale	Mandatory if IP lamps not illuminated	Mandatory that IP lamps must be illuminated, and as such, it is not a tell-tale.	Use US requirement
5.10 Rear Position Lamp	Number	Only 2, with 2 optional if no end outline marker (clearance) lamps are present	At least 2	Minimum of 2, maximum of 4, without regard to end outline marker (clearance) lamp presence.
5.10 Rear Position Lamp	Position: Height	≥350 mm to bottom edge of lamp and ≥380 mm to center of lamp, to #1500 mm, unless a trailer or it is difficult, then 2100 mm.	380-1830 mm	Use 350 to 1830 mm.
5.10 Rear Position Lamp	Geometric Visibility	Two means of determination of compliance	One method of determining compliance	Use GTR requirement
5.10 Rear Position Lamp	Tell-tale	Mandatory if IP lamps not illuminated	Mandatory that IP lamps must be illuminated, and as such, it is not a tell-tale.	Use US requirement

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5.11 Rear Fog Lamp	Wiring	Mandatory	Currently unregulated at the Federal level, but regulated at the state level, and with differing requirements.	Add the following: "If a contracting party requires mandatory regulation of rear fog lamps, the following requirements apply...." Thus, in ECE, which does regulate these lamps, the GTR would have regulatory language that would accommodate regulating them. The US, concerned about glare, may need requirements that have the effect of minimizing misuse. Regarding whether a particular region or country would mandate their regulation or presence, a note about such a requirement could be added to an Annex to this regulation .
5.12 Parking lamp	Presence	Mandatory (for illuminating a parked vehicle, as opposed to a front or rear position lamp used for driving)	Not regulated	Include these devices with language for GTR to be written before each section as follow: "If a contracting party requires mandatory regulation of the parking lamp, the following requirements apply...." Thus, in ECE, which does or is expected to regulate these lamps, the GTR would have regulatory language that would accommodate regulating them. Regarding whether a particular region or country would mandate their presence, a note about such a requirement could be added to an Annex to this regulation .
5.13 End-Outline Marker Lamp (in US, clearance lamps)	Presence	Mandatory on ≥ 2100 mm, Optional on 1800-2100 mm, and Prohibited on ≤ 1800 mm	Mandatory on ≥ 2032 mm, not prohibited on others	Use GTR requirement (see identification lamps, there is a conflict.)
5.13 End-Outline Marker Lamp (in US, clearance lamps)	Number	2 on front and 2 on rear	At least 2 on front and at least 2 on rear	Minimum of 2, maximum of 4. on front, and minimum of 2, maximum of 4 on the rear.
5.13 End-Outline Marker Lamp (in US, clearance lamps)	Arrangement: width	As close as practicable to extreme outer edge, but may be up to 400 mm inboard on front and 100 mm on rear	Must indicate overall width, but in no case be inboard more than 100 mm to edge illuminated lens of lamp	Must be no more than 100 mm. from the edge of the illuminated lens of lamp to the extreme edge of the vehicle.

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5.13 End-Outline Maker Lamp (in US, clearance lamps)	Arrangement: height	As high as practicable, but no lower than the top of the windshield for motor vehicles, and anywhere for trailers	As high as practicable, but must indicate overall width, may be lower if identification lamps are at the top.	Must be no more than [100] mm. lower than the highest extreme width.
5.13 End-Outline Maker Lamp (in US, clearance lamps)	Geometric Visibility	80 degrees outboard, 5 degrees above and 20 degrees below the horizontal.	45 degrees inboard and outboard, 10 degrees above and below horizontal	Use US
5.13 End-Outline Maker Lamp (in US, clearance lamps)	Tell-tale	Mandatory if IP lamps not illuminated	Mandatory that IP lamps must be illuminated, and as such, it is not a tell-tale.	Use US requirement
5.14 Rear Retro-Reflector, Non-Triangular	Presence	Mandatory on all vehicles but trailers	Mandatory on all vehicles, and may be eliminated on vehicles required to have conspicuity treatment if it is a large trailer (2032 mm wide and over 4545 Kg gross mass (10,000 pounds))	Require for all vehicles, with two exceptions: <ol style="list-style-type: none"> 1. For trailers where regional or national rules require conspicuity retro-reflective treatments instead, a note about such a requirement could be added to an Annex to this regulation. 2. For trailers where regional or national rules require a triangular retro-reflector, a note about such a requirement could be added to an Annex to this regulation.
5.14 Rear Retro-Reflector, Non-Triangular	Number	Only two	At least 2	At least 2.
5.14 Rear Retro-Reflector, Non-Triangular	Position: Width	≤400 mm from edge	As close as practicable to edge	Use GTR requirement
5.14 Rear Retro-Reflector, Non-Triangular	Position: Height	250-900 mm above ground	380-1530 mm above ground	Use 350 to 1530 mm

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5.15 Rear Retro-Reflector, Triangular	Presence	Required on the rear of trailers	Unregulated, not prohibited.	Require for trailers, with two exceptions: <ol style="list-style-type: none"> 1. For trailers where regional or national rules require conspicuity retro-reflective treatments instead, a note about such a requirement could be added to an Annex to this regulation. 2. For trailers where regional or national rules require a retro-reflector of no specific shape, a note about such a requirement could be added to an Annex to this regulation.
5.16 Front Retro-Reflector, Non-Triangular	Presence	Required on the front of vehicles having forward facing lamps without reflectors or with reflectors concealed.	Unregulated, not prohibited.	Use GTR but need a more objective statement of the requirement. However, where regional or national rules permit optional fitment or have no requirement, a note about such a requirement could be added to an Annex to this regulation .
5.17 Side Retro-Reflector, Non-Triangular	Number	2 per side for vehicles \leq 6000mm, and as many as dictated by vehicle length and position in length such that they are installed at least every 3 meters.	At least 2 per side, and 3 if the vehicle is \geq 9134mm in length	Use GTR requirement. However, where a regional or national requirement exists that mandates a conspicuity retro-reflective treatment be present instead of side retro-reflectors, this note shall be added to an Annex to this regulation .
5.17 Side Retro-Reflector, Non-Triangular	Position: Height	250-900 mm above ground	380-1530 mm above ground	Use 350 to 1530 mm.
5.17 Side Retro-Reflector, Non-Triangular	Position: Length	One in front of front axle, one behind rear axle for PC, and \leq 400mm to front or rear for other vehicles, and in no account, not more than 3000mm apart if the vehicle is \geq 6000mm long	As far forward and rearward as practicable, and at the mid-point if a third must be installed	Use GTR requirement as amended: One at the front \leq 400 mm from the front, and one at the rear \leq 400 mm from the rear, and for vehicles \geq 6000 mm long, additional devices must be installed such that the devices not more than 3000 mm apart from the nearest adjacent device.

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5.18 Side Marker Lamps	Number	2 per side for vehicles \leq 6000mm, and as many as dictated by vehicle length and position in length for vehicles \geq 6000 mm, except that a chassis-cab may have 1 per side	At least 2 per side, and 3 if the vehicle is \geq 9134mm in length, except that a chassis-cab may have 1 per side	Use GTR requirement
5.18 Side Marker Lamps	Position: Height	250-1500 mm above ground, and 2100 mm if necessary	\geq 380 mm above ground	\geq 350 mm above ground
5.18 Side Marker Lamps	Position: Length	One in front of front axle, one behind rear axle for PC and as close to the end as practicable, and \leq 400mm to front or rear for other vehicles, and in no account, not more than 3000mm apart if the vehicle is \geq 6000mm long	As far forward and rearward as practicable, and at the mid-point if a third if vehicle is \geq 9134 mm long.	Use GTR requirement as amended: One at the front \leq 400 mm from the front, and one at the rear \leq 400 mm from the rear, and for vehicles \geq 6000 mm long, additional devices must be installed such that the devices not more than 3000 mm apart from the nearest adjacent device.
5.18 Side Marker Lamps	Electrical Connections	Amber lamps may flash in phase with DI and hazard,	Amber or red lamps may flash in or out of phase with DI and hazard.	Use US requirement; GRE needs to resolve this in/out of phase issue, in the absence of safety evidence. The color of lamps was resolved above in the "General" section.
5.18 Side Marker Lamps	Tell-tale	Mandatory if IP lamps not illuminated	Mandatory that IP lamps must be illuminated, and as such, it is not a tell-tale.	Use US requirement

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5.19 Daytime Running Lamp (dedicate lamp)	Position: Height	250-1500mm	No higher than 1067 mm to center of lamp	[∃500 to the bottom edge], and [∃560 mm to center], and [950 mm to top] [850 mm to center] (essentially the headlamp mounting requirement that limits glare issues.)
5.20 Identification Lamps (Front and Rear)	Presence	Three options: mandatory on all vehicles over 2032 mm, or, optional, or prohibited	Mandatory on all vehicles over 2032mm wide.	Use GTR requirements, and regarding whether a particular region or country would mandate, allow or prohibit, a note about such a requirement could be added to an Annex to this regulation .
5.xx Conspicuity Treatment	Presence	Not specified	Mandatory for trailers ∃2032mm and ∃4536 kg.	Allow as an option, and as an alternative to rear and side retro-reflectors. Specifics of installation to be provided in an annex to this regulation, with the fitment being mandatory, optional, or prohibited by adopting regions or nations, noted in the annex .