

Comparison of ADB provisions between current R48 and R53 proposal			
UN Regulation No. 48		Proposed amendments to UN Regulation No. 53 (GRE-82-13)	
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2.7.28.	"Adaptive front lighting system" (or "AFS") means a lighting device type-approved according to Regulation No. 123, providing beams with differing characteristics for automatic adaptation to varying conditions of use of the dipped-beam (passing-beam) and, if it applies, the main-beam (driving-beam).	2.5.20.	Adaptive Driving Beam (or "ADB") means one of the system of AFS type-approved according to UN Regulation No. [149], which is a driving-beam system that adapts its beam pattern to the presence of oncoming and preceding vehicles in order to improve the long-range visibility for the driver without causing discomfort, distraction or glare to other road users.
2.7.28.6.	"Neutral state" means the state of the AFS when a defined mode of the class C passing beam ("basic passing-beam") or of the main beam in the maximum condition of activation, if any, is produced, and no AFS control signal applies.	2.5.20.1.	ADB neutral state means the state of the ADB when the driving-beam is in the maximum condition of activation.
		2.5.20.2.	ADB control signal means the input signal to the ADB in accordance with the paragraph 6.15.7.2. of this Regulation.
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3.2.6.	Where an AFS is fitted on the vehicle, the applicant shall submit a detailed description providing the following information:	3.2.6.	Where an ADB is fitted on the vehicle, the applicant shall submit a detailed description providing the following information:
3.2.6.2.	The related AFS control signals and their technical characteristics as defined according to Annex 10 to Regulation No. 123;	3.2.6.1.	The related ADB control signals and their technical characteristics as defined according to UN Regulation No. [149];
3.2.6.4.	Special instruction, if any, for the inspection of the light sources and the visual observation of the beam;	3.2.6.2.	Special instruction, if any, for the inspection of the light sources and the visual observation of the beam;
3.2.6.6.	The lamps that are grouped or combined with or reciprocally incorporated in the AFS;	3.2.6.3.	The lamps that are grouped or combined with or reciprocally incorporated in the ADB.
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5.4.4	In the absence of specific instructions, the height and orientation of the lamps shall be verified with the vehicle unladen and placed on a flat, horizontal surface, in the condition defined in paragraphs 2.24., 2.24.1. and 2.24.2. and, in the case where an AFS is installed, with the system in its neutral state.	5.4.	In the absence of specific instructions, the height and orientation of the lamps shall be verified with the vehicle unladen and placed on a flat horizontal surface, its median longitudinal plane being vertical and the handlebars being in the position corresponding to the straight ahead movement. The tyre pressures shall be those prescribed by the manufacturer for the particular conditions of loading required in this Regulation. In the case where an ADB is installed, with the system in its ADB neutral state.
5.15.	The colours of the light emitted by the lamps are the following: Adaptive front-lighting systems (AFS):White	5.13.	Colours of the lights. Adaptive Driving Beam (ADB):White
		5.15.7.	Adaptive Driving Beam (paragraph 6.15.).
5.25.	Where an AFS is fitted, it shall be considered equivalent to a pair of dipped-beam headlamps and, if it provides main-beam function(s), it shall be considered equivalent to a pair of main-beam headlamps.	5.21.	Where an ADB is fitted, it shall be considered equivalent to the driving-beam headlamp(s).
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6.1.7.		6.1.6.	Electrical connections
		6.1.6.1.	The passing-beam(s) may remain illuminated with the driving-beam(s).
6.1.7.2.	The control of the main-beam headlamps may be automatic regarding their activation and deactivation, the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs: (a) Ambient lighting conditions; (b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles; (c) The light emitted by the rear light-signalling devices of preceding vehicles. Additional sensor functions to improve performance are allowed. For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, T, as well as bicycles, such vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.	6.1.6.2.	The control of the driving-beam headlamp(s) may be automatic regarding their activation and deactivation, the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs: (a) Ambient lighting conditions; (b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles; (c) The light emitted by the rear light-signalling devices of preceding vehicles. Additional sensor functions to improve performance are allowed. For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, T, as well as bicycles, such vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.
6.1.7.3.	It shall always be possible to switch the main-beam headlamps ON and OFF manually and to manually switch OFF the automatic control of the main-beam headlamps. Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.	6.1.6.3.	It shall always be possible to switch the driving-beam headlamp(s) ON and OFF manually and to manually switch OFF the automatic control of the driving-beam headlamp(s). Moreover, the switching OFF, of the driving-beam headlamp(s) and of their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.
6.1.8.1.	If the control of the main-beam headlamps is automatic as described in paragraph 6.1.7.1. above an indication shall be provided to the driver that the automatic control of the main-beam function is activated. This information shall remain displayed as long as the automatic operation is activated.	6.1.7.3.	If the control of the driving-beam headlamp(s) is automatic, an indication shall be provided to the driver that the automatic control of the driving-beam function is activated. This information shall remain displayed as long as the automatic operation is activated.
6.1.9.3.	Automatic activation and deactivation of the main-beam headlamps:	6.1.8.3.	Automatic activation and deactivation of the driving-beam headlamp(s):
6.1.9.3.1.	The sensor system used to control the automatic activation and deactivation of the mainbeam headlamps, as described in paragraph 6.1.7.1., shall comply with the following requirements:		The sensor system used to control the automatic activation and deactivation of the driving beam headlamp(s) shall comply with the following requirements:
6.1.9.3.1.1.	The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles defined in paragraph 6.1.7.1. above are defined by the angles indicated below.	6.1.8.3.1.	The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles defined in paragraph 6.1.6.2. above are defined by the angles indicated below.
6.1.9.3.1.1.1.	Horizontal angles: 15 deg. to the left and 15 deg. to the right. Vertical angles: · Upward angle 5deg. · Mounting height of the sensor (centre of sensor aperture above the ground)①Less than 2 m ②Between 1.5 m and 2.5 m ③Greater than 2.0 m · Downward angle①2 deg. ②2 deg. to 5 deg. ③5 deg. These angles are measured from the centre of the sensor aperture relative to a horizontal straight line through its centre and parallel to the longitudinal median plane of the vehicle.	6.1.8.3.1.1.	Horizontal angles: 15 degrees to the left and 15 degrees to the right. Vertical angles: The upward angle is 5 degrees mounting height of the sensor (centre of the sensor aperture above the ground) is less than 2 m downward angle is 2 degrees. These angles are measured from the centre of the sensor aperture relative to a horizontal straight line through its centre and parallel to the longitudinal median plane of the vehicle.
6.1.9.3.1.1.2.	The sensor system shall be able to detect on a straight level road: (a) An oncoming power driven vehicle at a distance extending to at least 400 m; (b) A preceding power driven vehicle or a vehicle-trailers combination at a distance extending to at least 100 m; (c) An oncoming bicycle at a distance extending to at least 75 m, its illumination represented by a white lamp with a luminous intensity of 150 cd with a light emitting area of 10 cm <sup>2</sup> +/- 3 cm <sup>2</sup> and a height above a ground of 0.8 m. To verify compliance with (a) and (b) above, the oncoming and preceding power driven vehicle (or vehicle-trailer combination) shall have position lamps (if applicable) and dipped-beam headlamps switched ON.	6.1.8.3.1.2.	The sensor system shall be able to detect on a straight level road: (a) An oncoming power driven vehicle at a distance extending to at least 400 m; (b) A preceding power driven vehicle or a vehicle-trailers combination at a distance extending to at least 100 m; (c) An oncoming bicycle at a distance extending to at least 75 m, its illumination represented by a white lamp with a luminous intensity of 150 cd with a light emitting area of 10± 3cm <sup>2</sup> and a height above a ground of 0.8 m. To verify compliance with (a) and (b) above, the oncoming and preceding power driven vehicle (or vehicle-trailer combination) shall have position lamps (if applicable) and passing-beam headlamp(s) switched ON.

6.1.9.3.2.	The transition from main-beam to dipped-beam and vice versa according to the conditions indicated in paragraph 6.1.7.1. above may be performed automatically and shall not cause discomfort, distraction or glare.	6.1.8.3.2.	The transition from driving-beam to passing-beam and vice versa may be performed automatically and shall not cause discomfort, distraction or glare.
6.1.9.3.3.	The overall performance of the automatic control shall be verified by:	6.1.8.3.3.	The overall performance of the automatic control shall be verified by:
6.1.9.3.3.1.	Means of simulation or other means of verification accepted by the Type Approval Authority , as provided by the applicant.	6.1.8.3.3.1.	Means of simulation or other means of verification accepted by the Type Approval Authority , as provided by the applicant.
6.1.9.3.3.2.	A test drive according to paragraph 1 in Annex 12. The performance of the automatic control shall be documented and checked against the applicant's description. Any obvious malfunctioning shall be contested (e. g. excessive angular movement or flicker).	6.1.8.3.3.2.	A test drive according to paragraph 1 in Annex 7. The performance of the automatic control shall be documented and checked against the applicant's description. Any obvious malfunctioning shall be contested (e. g. excessive angular movement or flicker).
6.1.9.3.4.	The control of the main-beam headlamps may be such that the main-beam headlamps are switched ON automatically only when: (a) No vehicles, as mentioned in paragraph 6.1.7.1. above, are detected within the fields and distances according to paragraphs 6.1.9.3.1.1. and 6.1.9.3.1.2.; and (b) The detected ambient lighting levels are as prescribed in paragraph 6.1.9.3.5. below.	6.1.8.3.4.	The control of the driving-beam headlamp(s) may be such that the driving-beam headlamp(s) are switched ON automatically only when: (a) No vehicles, as mentioned in paragraph 6.1.6.2. above, are detected within the fields and distances according to paragraphs 6.1.8.3.1.1. and 6.1.8.3.1.2.; and (b) The detected ambient lighting levels are as prescribed in paragraph 6.1.8.3.5. below.
6.1.9.3.5.	In the case where main-beam headlamps are switched ON automatically, they shall be switched OFF automatically when oncoming or preceding vehicles, as mentioned in paragraph 6.1.7.1. above, are detected within the fields and distances according to paragraphs 6.1.9.3.1.1. and 6.1.9.3.1.2. Moreover, they shall be switched OFF automatically when the illuminance produced by ambient lighting conditions exceeds 7000 lx. Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the Type Approval Authority. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the Type Approval Authority.	6.1.8.3.5.	In the case where driving-beam headlamp(s) are switched ON automatically, they shall be switched OFF automatically when oncoming or preceding vehicles, as mentioned in paragraph 6.1.6.2. above, are detected within the fields and distances according to paragraphs 6.1.8.3.1.1. and 6.1.8.3.1.2. Moreover, they shall be switched OFF automatically when the illuminance produced by ambient lighting conditions exceeds 7000 lx. Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the Type Approval Authority. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the Type Approval Authority.
6.22.	Adaptive front lighting system (AFS) (Regulation No. 123)	6.15.	Adaptive Driving Beam (ADB) (UN Regulation No. [149])
	Where not otherwise specified below, the requirements for main-beam headlamps (paragraph 6.1.) and for dipped-beam headlamps (paragraph 6.2.) of this Regulation apply to the relevant part of the AFS.		Where not otherwise specified below, the requirements for driving-beam headlamp(s) (paragraph 6.1.) of this Regulation apply to the ADB.
6.22.1.	Presence		
	Optional on motor vehicles. Prohibited on trailers.		
6.22.2.	Number	6.15.1.	Number
	One.	6.15.1.1.	One as a system.
		6.15.1.2.	Number of lighting unit shall be one or two.
6.22.3.	Arrangement	6.15.2.	Arrangement
	No special requirements.		No special requirements.
6.22.4.	Position	6.15.3.	Position
	The AFS shall, prior to the subsequent test procedures, be set to the neutral state;		The ADB shall, prior to the subsequent test procedures, be set to the neutral state;
6.22.4.1.	In width and height:	6.15.3.1.	In width and height:
	For a given lighting function or mode the requirements indicated in the paragraphs 6.22.4.1.1. through 6.22.4.1.4. below shall be fulfilled by those lighting units which are energized simultaneously for that lighting function or mode of a function, according to the applicant's description. All dimensions refer to the nearest edge of the apparent surface(s) observed in the direction of the reference axis, of the lighting unit(s).		All dimensions refer to the nearest edge of the apparent surface(s) observed in the direction of the reference axis, of the lighting unit(s).
		6.15.3.1.1.	An independent ADB lighting unit may be fitted above or below or to one side of another front lamp: if these lamps are on top of the other the reference centre of the ADB lighting unit must be located within the median longitudinal plane of the vehicle; if these lamps are side by side their reference centre must be symmetrical in relation to the median longitudinal plane of the vehicle.
		6.15.3.1.2.	An ADB lighting unit, that is reciprocally incorporated with another front lamp, must be fitted in such a way that its reference centre lies within the median longitudinal plane of the vehicle. However, when the vehicle is also fitted with an independent principal passing-beam headlamp, or a principal passing-beam headlamp that is reciprocally incorporated with a front position lamp alongside the ADB lighting unit, their reference centres must be symmetrical in relation to the median longitudinal plane of the vehicle.
		6.15.3.1.3.	Two ADB lighting units of which either one or both are reciprocally incorporated with another front lamp must be fitted in such a way that their reference centres are symmetrical in relation to the median longitudinal plane of the vehicle.
6.22.4.2.	In length:	6.15.3.2.	In length:
	All lighting units of an AFS shall be mounted at the front. This requirement is regarded as satisfied if the light emitted does not cause discomfort to the driver either directly or indirectly through the devices for indirect vision and/or other reflecting surfaces of the vehicle.		All lighting units of an ADB shall be mounted at the front. This requirement is regarded as satisfied if the light emitted does not cause discomfort to the driver either directly or indirectly by means of the rear-view mirrors and/or reflective surfaces on the vehicle.
6.22.5.	Geometric visibility	6.15.4.	Geometric visibility
	On each side of the vehicle, for each lighting function and mode provided: The angles of geometric visibility prescribed for the respective lighting functions according to paragraphs 6.1.5. and 6.2.5. of this Regulation, shall be met by at least one of the lighting units that are simultaneously energized to perform said function and mode(s), according to the description of the applicant. Individual lighting units may be used to comply with the requirements for different angles.		The angles of geometric visibility specified in paragraph 6.1.4. of this Regulation, shall be met by at least one of the lighting units said function, according to the description of the applicant. Individual lighting units may be used to comply with the requirements for different angles.
6.22.6.	Orientation	6.15.5.	Orientation
	Towards the front. The AFS shall, prior to the subsequent test procedures, be set to the neutral state, emitting the basic passing-beam.		Towards the front.
6.22.7.	Electrical connections	6.15.6.	Electrical connections
6.22.7.1.1.	The lighting units for the main-beam may be activated either simultaneously or in pairs. For changing over from the dipped-beam to the main-beam at least one pair of lighting units for the main-beam shall be activated. For changing over from the main-beam to the dipped-beam all lighting units for the main-beam shall be de-activated simultaneously.	6.15.6.1.	For changing over from the ADB to the passing-beam all lighting units for the driving-beam shall be de-activated simultaneously.

6.22.7.1.2.	The main-beam may be designed to be adaptive, subject to the provisions in paragraph 6.22.9.3., the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs: (a) Ambient lighting conditions; (b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles; (c) The light emitted by the rear light-signalling of preceding vehicles; additional sensor functions to improve performance are allowed. For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, T, as well as bicycles, such vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.	6.15.6..2.	The ADB shall be designed to be adaptive, subject to the provisions in paragraph 6.15.8.2., the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following inputs: (a) Ambient lighting conditions; (b) The light emitted by the front lighting devices and front light-signalling devices of oncoming vehicles; (c) The light emitted by the rear light-signalling of preceding vehicles; Additional sensor functions to improve performance are allowed. For the purpose of this paragraph, "vehicles" means vehicles of categories L, M, N, O, T, as well as bicycles, such vehicles being equipped with retro-reflectors, with lighting and light-signalling devices, which are switched ON.
6.22.7.1.3.	It shall always be possible to switch the main-beam headlamps, adaptive or nonadaptive, ON and OFF manually and to manually switch OFF the automatic control. Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.	6.15.6.3.	It shall always be possible to switch the ADB, adaptive or non-adaptive, ON and OFF manually and to manually switch OFF the automatic control. Moreover, the switching OFF, of the ADB and of their automatic control, shall be by means of a simple and immediate manual operation; the use of sub-menus is not allowed.
6.22.7.1.4.	The dipped-beams may remain switched ON at the same time as the main beams.	6.15.6.4.	The passing-beam(s) may remain switched ON at the same time as the ADB.
6.22.7.5	It shall always be possible for the driver to set the AFS to the neutral state and to return it to its automatic operation.	6.15.6.5	It shall always be possible for the driver to set the ADB to the neutral state and to return it to its automatic operation.
6.22.8.	Tell-tale:	6.15.7.	Tell-tale:
6.22.8.1.	The provisions of paragraphs 6.1.8. (for the main-beam headlamp) and 6.2.8. (for the dipped-beam headlamp) of this Regulation apply to the respective parts of an AFS.	6.15.7.1.	The provisions of paragraphs 6.1.7. (for the driving-beam headlamp(s)) of this Regulation apply to the respective parts of an ADB.
6.22.8.2.	A visual failure tell-tale for AFS is mandatory. It shall be non-flashing. It shall be activated whenever a failure is detected with respect to the AFS control signals or when a failure signal is received in accordance with paragraph 5.9. of Regulation No. 123. It shall remain activated while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the device which starts and stops the engine is switched on and off.	6.15.7.2.	A visual failure tell-tale for ADB is mandatory. It shall be non-flashing. It shall be activated whenever a failure is detected with respect to the ADB control signals or when a failure signal is received in accordance with paragraph 4.13. of Regulation No. 149. It shall remain activated while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the device which starts and stops the engine is switched on and off.
6.22.8.3.	If the main-beam is adaptive, a visual tell-tale shall be provided to indicate to the driver that the adaptation of the main beam is activated. This information shall remain displayed as long as the adaptation is activated.	6.15.7.3.	If the driving-beam is adaptive, a visual tell-tale shall be provided to indicate to the driver that the adaptation of the driving beam is activated. This information shall remain displayed as long as the adaptation is activated.
6.22.9.	Other requirements	6.15.8.	Other requirements
6.22.9.2.	Verification of compliance with AFS automatic operating requirements	6.15.8.1.	Verification of compliance with ADB automatic operating requirements
6.22.9.2.1.	The applicant shall demonstrate with a concise description or other means acceptable to the Type Approval Authority: (a) The correspondence of the AFS control signals i) To the description required in paragraph 3.2.6. of this Regulation; and ii) To the respective AFS control signals specified in the AFS type approval documents; and (b) Compliance with the automatic operating requirements according to paragraphs 6.22.7.4.1. through 6.22.7.4.5. above.	6.15.8.1.1.	The applicant shall demonstrate with a concise description or other means acceptable to the Type Approval Authority: The correspondence of the ADB control signals i) To the description required in paragraph 3.2.6. of this Regulation; and ii) To the respective ADB control signals specified in the ADB type approval documents
6.22.9.2.3.	The overall performance of the automatic control shall be demonstrated by the applicant by documentation or by other means accepted by the Type Approval Authority. Furthermore the manufacturer shall provide a documentation package which gives access to the design of "the safety concept" of the system. This "safety concept" is a description of the measures designed into the system, for example within the electronic units, so as to address system integrity and thereby ensure safe operation even in the event of mechanical or electrical failure which could cause any discomfort, distraction or glare, either to the driver or to oncoming and preceding vehicles. This description shall also give a simple explanation of all the control functions of the "system" and the methods employed to achieve the objectives, including a statement of the mechanism(s) by which control is exercised. A list of all input and sensed variables shall be provided and the working range of these shall be defined. The possibility of a fall-back to the basic passing-beam (class C) function shall be a part of the safety concept. The functions of the system and the safety concept, as laid down by the manufacturer, shall be explained. The documentation shall be brief, yet provide evidence that the design and development has had the benefit of expertise from all the system fields which are involved. For periodic technical inspections, the documentation shall describe how the current operational status of the "system" can be checked. For Type Approval purposes this documentation shall be taken as the basic reference for the verification process.	6.15.8.1.2.	The overall performance of the automatic control shall be demonstrated by the applicant by documentation or by other means accepted by the Type Approval Authority. Furthermore the manufacturer shall provide a documentation package which gives access to the design of "the safety concept" of the system. This "safety concept" is a description of the measures designed into the system, for example within the electronic units, so as to address system integrity and thereby ensure safe operation even in the event of mechanical or electrical failure which could cause any discomfort, distraction or glare, either to the driver or to oncoming and preceding vehicles. This description shall also give a simple explanation of all the control functions of the "system" and the methods employed to achieve the objectives, including a statement of the mechanism(s) by which control is exercised. A list of all input and sensed variables shall be provided and the working range of these shall be defined. The functions of the system and the safety concept, as laid down by the manufacturer, shall be explained. The documentation shall be brief, yet provide evidence that the design and development has had the benefit of expertise from all the system fields which are involved. For periodic technical inspections, the documentation shall describe how the current operational status of the "system" can be checked. For Type Approval purposes this documentation shall be taken as the basic reference for the verification process.
6.22.9.2.4.	To verify, that the adaptation of the main-beam does not cause any discomfort, distraction or glare, neither to the driver nor to oncoming and preceding vehicles, the technical service shall perform a test drive according to paragraph 2. in Annex 12. This shall include any situation relevant to the system control on the basis of the applicant's description. The performance of the adaptation of the main-beam shall be documented and checked against the applicant's description. Any obvious malfunctioning shall be contested (e.g. excessive angular movement or flicker).	6.15.8.1.3.	To verify, that the adaptation of the driving-beam does not cause any discomfort, distraction or glare, neither to the driver nor to oncoming and preceding vehicles, the technical service shall perform a test drive according to paragraph 2. in Annex 7. This shall include any situation relevant to the system control on the basis of the applicant's description. The performance of the adaptation of the driving-beam shall be documented and checked against the applicant's description. Any obvious malfunctioning shall be contested (e.g. excessive angular movement or flicker).
6.22.9.3.	Adaptation of the main-beam	6.15.8.2.	Adaptation of the driving-beam
6.22.9.3.1.	The sensor system used to control the adaptation of the main-beam, as described in paragraph 6.22.7.1.2., shall comply with the following requirements:	6.15.8.2.1.	The sensor system used to control the adaptation of the driving-beam, as described in paragraph 6.15.6.2., shall comply with the following requirements:
6.22.9.3.1.1.	The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles as defined in paragraph 6.22.7.1.2. above are given by the angles indicated in paragraph 6.1.9.3.1.1. of this Regulation.	6.15.8.2.1.1.	The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles as defined in paragraph 6.15.6.2. above are given by the angles indicated in paragraph 6.1.8.3.1.1. of this Regulation.
6.22.9.3.1.2.	The sensor system sensitivity shall comply with the requirements in paragraph 6.1.9.3.1.2. of this Regulation.	6.15.8.2.1.2.	The sensor system sensitivity shall comply with the requirements in paragraph 6.1.8.3.1.2. of this Regulation.
6.22.9.3.1.3.	The adaptive main-beam shall be switched off when the illuminance produced by ambient lighting conditions exceeds 7,000 lx. Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the Type Approval Authority. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the Type Approval Authority.	6.15.8.2.1.3.	The adaptive driving-beam shall be switched off when the illuminance produced by ambient lighting conditions exceeds 7,000 lx. Compliance with this requirement shall be demonstrated by the applicant, using simulation or other means of verification accepted by the Type Approval Authority. If necessary the illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the Type Approval Authority.
6.22.9.4.	The aggregate maximum intensity of the lighting units that can be energized simultaneously to provide the main-beam lighting or its modes, if any, shall not exceed 430,000 cd, which corresponds to a reference value of 100. This maximum intensity shall be obtained by adding together the individual reference marks indicated on the several installation units that are simultaneously used to provide the main-beam.	6.15.8.3.	The aggregate maximum intensity of the lighting units that can be energized simultaneously to provide the driving-beam lighting or its modes, if any, shall not exceed 430,000 cd, which corresponds to a reference value of 100. This maximum intensity shall be obtained by adding together the individual reference marks indicated on the several installation units that are simultaneously used to provide the driving-beam.

Annex12		Annex7																																																																																			
Test drive		Test drive																																																																																			
1	Test drive specifications for the automatic control of the driving-beam headlamp(s).	1	Test drive specifications for the automatic control of the driving-beam headlamp(s).																																																																																		
1.1.	The test drive shall be carried out in clear atmosphere <sup>1</sup> and with clean headlamp(s).	1.1.	The test drive shall be carried out in clear atmosphere <sup>1</sup> and with clean headlamp(s).																																																																																		
1.2.	The test course shall comprise test sections with traffic conditions, at speed corresponding to the relevant type of road, as described in Table 1 below:	1.2.	The test course shall comprise test sections with traffic conditions, at speed corresponding to the relevant type of road, as described in Table 1 below:																																																																																		
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