	inima to the second	December of control of the control o					
	UN Regulation No. 48	Proposed amendments to UN Regulation No. 53 (GRE-82-13)					
2 2.7.28.	"Adaptive front lighting system" (or "AFS") means a lighting device type-	2 2.5.20.	Adaptive Driving Beam (or "ADB") means one of the system of AFS type-				
	approved according to Regulation No. 123, providing beams with differing		approved according to UN Regulation No. [149], which is a driving-beam system				
	characteristics for automatic adaptation to varying conditions of use of the dipped-beam (passing-beam) and, if it applies, the main-beam (driving-beam).		that adapts its beam pattern to the presence of oncoming and preceding vehicle in order to improve the long-range visibility for the driver without causing				
	dipped-beam (passing-beam) and, in it applies, the main-beam (driving-beam).		discomfort, distraction or glare to other road users.				
2.7.28.6.		2.5.20.1.	ADB neutral state means the state of the ADB when the driving-beam is in the				
	passing beam ("basic passing-beam") or of the main beam in the maximum		maximum condition of activation.				
	condition of activation, if any, is produced, and no AFS control signal applies.	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.				
3		3					
3.2.6.	Where an AFS is fitted on the vehicle, the applicant shall submit a detailed	3.2.6.	Where an ADB is fitted on the vehicle, the applicant shall submit a detailed				
3.2.6.2.	description providing the following information:  The related AFS control signals and their technical characteristics as defined	3.2.6.1.	description providing the following information:  The related ADB control signals and their technical characteristics as defined				
	according to Annex 10 to Regulation No. 123;		according to UN Regulation No. [149];				
3.2.6.4.	, ,,	3.2.6.2.	Special instruction, if any, for the inspection of the light sources and the visual				
3.2.6.6.	observation of the beam; The lamps that are grouped or combined with or reciprocally incorporated in the	3.2.6.3.	observation of the beam;  The lamps that are grouped or combined with or reciprocally incorporated in th				
	AFS;		ADB.				
5		5					
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,	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,				
	in the condition defined in paragraphs 2.24., 2.24.1. and 2.24.2. and, in the case		its median longitudinal plane being vertical and the handlebars being in the				
	where an AFS is installed, with the system in its neutral state.		position corresponding to the straight ahead movement. The tyre pressures sha				
			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:	5.13.	Colours of the lights.				
	Adaptive front-lighting systems (AFS):White	5.15.7.	Adaptive Driving Beam (ADB):White Adaptive Driving Beam (paragraph 6.15.).				
5.25.	Where an AFS is fitted, it shall be considered equivalent to a pair of dipped-beam		Where an ADB is fitted, it shall be considered equivalent to the driving-beam				
	headlamps and, if it provides main-beam function(s), it shall be considered		headlamp(s).				
-	equivalent to a pair of main-beam headlamps.	6					
5.1.7.		6.1.6.	Electrical connections				
		6.1.6.1.	The passing-beam(s) may remain illuminated with the driving-beam(s).				
5.1.7.2.		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:		activation and deactivation, the control signals being produced by a sensor system which is capable of detecting and reacting to each of the following input				
	(a) Ambient lighting conditions;		(a) Ambient lighting conditions;				
	(b) The light emitted by the front lighting devices and front light-signalling		(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.		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.		Additional sensor functions to improve performance are allowed.				
	For the purpose of this paragraph, "vehicles" means vehicles of categories L, M,		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,		N, O, T, as well as bicycles, such vehicles being equipped with retro-reflectors,				
	with lighting and light-signalling devices, which are switched ON.		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	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 main-beam		manually and to manually switch OFF the automatic control of the driving-beam				
	headlamps. Moreover, the switching OFF, of the main-beam headlamps and of		headlamp(s). Moreover, the switching OFF, of the driving-beam headlamp(s) and				
	their automatic control, shall be by means of a simple and immediate manual operation; the use of submenus is not allowed.		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.		6.1.7.3.	If the control of the driving-beam headlamp(s) is automatic, an indication shall b				
	paragraph 6.1.7.1. above an indication shall be provided to the driver that the		provided to the driver that the automatic control of the driving-beam function is				
	automatic control of the main-beam function is activated. This information shall		activated. This information shall remain displayed as long as the automatic operation is activated.				
6.1.9.3.	remain displayed as long as the automatic operation is activated.  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 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 driving beam headlamp(s) shall comply with the following requirements:				
5.1.9.3.1.1.	the following requirements:  The boundaries of the minimum fields in which the sensor is able to detect light	6.1.8.3.1.	The boundaries of the minimum fields in which the sensor is able to detect light				
3.1.3.3.1.1.	emitted from other vehicles defined in paragraph 6.1.7.1. above are defined by	0.1.0.5.1.	emitted from other vehicles defined in paragraph 6.1.6.2. above are defined by				
- 4	the angles indicated below.	64.0 -	the angles indicated below.				
5.1.9.3.1.1.1	. Horizontal angles: 15 deg. to the left and 15 deg. to the right.  Vertical angles:	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				
	· Upward angle 5deg.		(centre of the sensor aperture above the ground) is less than 2 m downward				
	· Mounting height of the sensor (centre of		angle is 2 degrees.				
	sensor aperture above the ground) ① Less than 2 m ② Between 1.5 m and 2.5 m		These angles are measured from the centre of the sensor aperture relative to a				
	③Greater than 2.0 m · Downward angle①2 deg. ②2 deg. to 5 deg. ③5 deg.		horizontal straight line through its centre and parallel to the longitudinal median plane of the vehicle.				
	These angles are measured from the centre of the sensor aperture relative to a		plane of the vertice.				
	horizontal						
	straight line through its centre and parallel to the longitudinal median plane of the						
	vehicle.						
5.1.9.3.1.1.2	·	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;		(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		(b) A preceding power driven vehicle or a vehicle-trailers combination at a distance extending to at least 100 m;				
	extending to at least 100 m;		(c) An oncoming bicycle at a distance extending to at least 75 m, its illumination				
	(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				
	represented by a white lamp with a luminous intensity of 150 cd with a light emitting area of 10 cm2 +/- 3 cm2 and a height above a ground of 0.8 m.		emitting area of 10± 3cm2 and a height above a ground of 0.8 m.  To verify compliance with (a) and (b) above, the oncoming and preceding power				
	To verify compliance with (a) and (b) above, the oncoming and preceding power		driven vehicle (or vehicle-trailer combination) shall have position lamps (if				
	driven		applicable) and passing-beam headlamp(s) switched ON.				
	vehicle (or vehicle-trailer combination) shall have position lamps (if applicable)						
	and						
	and dipped-beam headlamps switched ON.						
	and dipped-beam headlamps 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. 6.1.9.3.3.1.	The overall performance of the automatic control shall be verified by:  Means of simulation or other means of verification accepted by the Type  Approval	6.1.8.3.3. 6.1.8.3.3.1.	The overall performance of the automatic control shall be verified by:  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.	Authority, as provided by the applicant.  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 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.				
6.22.3.	Arrangamant	6.15.1.2.	Number of lighting unit shall be one or two.				
0.22.3.	Arrangement  No special requirements.	6.15.2.	Arrangement  No special requirements.				
6.22.4.	Position  The AFS shall, prior to the subsequent test procedures, be set to the neutral state;	6.15.3.	Position 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).	6.15.3.1.1.	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).  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 medium 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:  All lighting units of an AFS shall be mounted at the front. This requirement is deemed to be 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.	6.15.3.2.	In length: 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  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.	6.15.4.	Geometric visibility  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  Towards the front.  The AFS shall, prior to the subsequent test procedures, be set to the neutral state, emitting the basic passing-beam.	6.15.5.	Orientation Towards the front.				
6.22.7. 6.22.7.1.1.	Electrical connections  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. 6.15.6.1.	Electrical connections  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.	6.15.62.	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	6.15.6.4.	The passing-beam(s) may remain switched ON at the same time as the ADB.					
6.22.7.5	lt 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. 6.22.8.1.	Tell-tale: 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.		Tell-tale: 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. 6.22.9.2.1.	Verification of compliance with AFS automatic operating requirements  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	6.15.8.1.1.	Verification of compliance with ADB automatic operating requirements  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.	paragraphs 6.22.7.4.1. through 6.22.7.4.5. above.  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.		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 packag 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 drive 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.					
6.22.9.3. 6.22.9.3.	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).  Adaptation of the main-beam  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:	6.15.8.1.3. 6.15.8.2. 6.15.8.2.1.	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).  Adaptation of the driving-beam  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.	emitted from other vehicles as defined in paragraph 6.22.7.1.2. above are given	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					
6.22.9.3.1.2.	by the angles indicated in paragraph 6.1.9.3.1.1. of this Regulation.  The sensor system sensitivity shall comply with the requirements in paragraph	6.15.8.2.1.2.	the angles indicated in paragraph 6.1.8.3.1.1. of this Regulation.  The sensor system sensitivity shall comply with the requirements in paragraph					
6.22.9.3.1.3.	6.1.9.3.1.2. of this Regulation.  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.	6.1.8.3.1.2. of this Regulation.  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.	6.15.83.	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		e specifications for the au	f the driving	-beam	1	Test drive specifications for the automatic control of the driving-beam headlamp(s).								
1.1.	headlamp(s).  The test drive shall be carried out in clear atmosphere1 and with clean						1.1.	The test drive shall be carried out in clear atmosphere1 and with clean					ean	
	headlamp(s).							headlamp(s).					cuii	
1.2.		course shall comprise test			•	1.2.	The test course shall comprise test sections with traffic conditions, at speed							
Table 1	Согтезро	corresponding to the relevant type of road, as described in Table 1 below:					Table 1	corresponding to the relevant type of road, as described in Table 1 below:						
		Traffic conditions			Road type Multi-lane				Traffic conditions			d type ti-lane		
		1 raine conditions	Urba	n areas	road, e.g. motorway	Country road			1 Failic conditions	Urban		d, e.g. Country orway	road	
	Test Section	Speed		0 km/h	100 ± 20 km/h	80 ± 20 km/h			Speed	50 ± 10		20 km/h 80 ± 20 k	m/h	
		Average percentage of the full course length	test 10 p	er cent	20 per cent	70 per cent		Test Section	Average percentage of the full test course length	10 per	cent 20 p	er cent 70 per c	ent	
		Single oncoming vehicle or sing							Single oncoming vehicle or single					
	A	preceding vehicle in a frequence that the driving beam will swit ON and OFF.			X	X		A	preceding vehicle in a frequency s that the driving beam will switch ON and OFF.	·		X X		
		Combined oncoming and prece traffic situations, in a frequence							Combined oncoming and preceding					
	В	that the driving beam will swit ON and OFF.			X	X		В	traffic situations, in a frequency so that the driving beam will switch ON and OFF.			X X		
		Active and passive overtaking manoeuvres, in a frequency so	that						Active and passive overtaking manoeuvres, in a frequency so tha	.   _				
	С	the driving beam will switch O and OFF.	N		X	X		С	the driving beam will switch ON and OFF.	`		X X		
	D	Oncoming bicycle, as described paragraph 6.1.8.3.1.2.	l in			x		D	Oncoming bicycle, as described in paragraph 6.1.8.3.1.2.			х		
	E	Combined oncoming and precent contractions	eding	X				E	Combined oncoming and preceding traffic situations	g X				
1.3.	Urban ar	Urban areas shall comprise roads with and without illumination.						Urban are	eas shall comprise roads v	vith and	without il	umination.		
1.4.	_	oads shall comprise secti					1.3. 1.4.	Country r	oads shall comprise secti	ons havi	ng two lan	es and section	s having four	
	or more roads.	anes and shall include jur	nctions, hi	ls and/c	or slopes, di	ps and winding		or more la	anes and shall include jur	ictions, h	nills and/o	r slopes, dips a	ind winding	
1.5.		e roads (e.g. motorways)	and count	ry roads	s shall com	orise sections	1.5.		e roads (e.g. motorways)	and cou	ntry roads	shall comprise	e sections	
	having st	having straight level parts with a length of more than 600 m. Additionally they							raight level parts with a le	ngth of	more than	600 m. Additi	onally they	
	shall com	prise sections having cur	ves to the	left and	to the righ	t.		shall com	prise sections having cur	es to th	e left and	to the right.		
1.6.		affic situations shall be tal					1.6.	-	ffic situations shall be tal					
2		e specifications for adapti					2	-	specifications for adapti					
2.1.	headlam	drive shall be carried out	in clear at	mospne	rei and wit	n ciean	2.1.	headlamp	drive shall be carried out	n ciear a	itmospner	er and with ci	ean	
2.2.		course shall comprise test	t sections	with tra	ffic conditio	ns at sneed	2.2.	The test course shall comprise test sections with traffic conditions, at speed						
2.2.		•				•			nding to the relevant type			•	•	
Table 2	corresponding to the relevant type of road, as described in Table 2 below:										Road type			
		Traffic conditions	Urban areas	Multi-la road,		road			Traffic conditions	Jrban areas	Multi-lane road,	Country road		
		Speed	$50 \pm 10$ km/h	e.g. motor		km/h			Speed	0 ± 10 km/h	e.g. motorway 100 ± 20 km/h	80 ± 20 km/h		
	Test Section	Average percentage of the full test course length	10 per cent	20 per c	ent 70 per	cent		Test Section	Average percentage of the full test	10 per cent	20 per cent	70 per cent		
		Single oncoming vehicle or single preceding vehicle in a frequency so							Single oncoming vehicle or single preceding vehicle in a frequency so					
	A	that the adaptive driving beam will		x	x			A	that the adaptive driving beam will		x	x		
		react to demonstrate the adaptation							react to demonstrate the adaptation			0000		
		process.  Combined oncoming and preceding							process.  Combined oncoming and preceding					
		traffic situations. In a frequency so that the adaptive driving beam will							traffic situations. In a frequency so that the adaptive driving beam will					
	В	react to demonstrate the adaptation		X	X			В	react to		X	X		
		process.							demonstrate the adaptation process.					
		Active and passive overtaking manoeuvres, in a frequency so that							Active and passive overtaking manoeuvres, in a frequency so that					
	C	the adaptive driving beam will react to		X	X			C	the adaptive driving beam will react to		x	X		
									demonstrate the adaptation					
		demonstrate the adaptation process.						11 1	process					
	D	process. Oncoming bicycle, as described in			X			D	Oncoming bicycle, as described in			X		
	D E	process.  Oncoming bicycle, as described in paragraph 6.15.8.2.1.2.  Combined oncoming and preceding	x		X			D E	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding	X		X		
	E	process.  Oncoming bicycle, as described in paragraph 6.15.8.2.1.2.  Combined oncoming and preceding traffic situations						E	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations					
2.3.	E Urban ar	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads	with and w		llumination		2.3.	E Urban are	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations cas shall comprise roads	vith and		umination.	a hand of	
2.3. 2.4.	Urban ar	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads violates shall comprise sections.	with and w	g two lai	Ilumination	tions having four	2.3. 2.4.	Urban are	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads voods shall comprise secti	vith and ons havi	ng two lan	lumination.	_	
	Urban ar Country or more	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads	with and w	g two lai	Ilumination	tions having four	<b>+</b>	Urban are Country r or more la	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations cas shall comprise roads	vith and ons havi	ng two lan	lumination.	_	
	Urban ar Country or more roads.	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads of coads shall comprise sections.	with and wons having	g two lar Is and/c	Ilumination nes and sec or slopes, di	tions having four ps and winding	<b>+</b>	Urban are Country r or more la	Oncoming bicycle, as described in paragraph 6.15.8.21.2. Combined oncoming and preceding traffic situations eas shall comprise roads voads shall comprise sections and shall include juriances and shall include juriances.	vith and ons havi	ng two lan nills and/o	umination. es and section r slopes, dips a	ind winding	
2.4.	Urban ar Country or more roads. Multi lan	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads violates shall comprise sections.	with and wons having nctions, hill	g two lai ls and/c	Illumination nes and sec or slopes, di s shall comp	tions having four ps and winding orise sections	2.4.	Urban are Country r or more la roads.	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads voods shall comprise secti	vith and ons havions, h	ng two lan nills and/o ntry roads	lumination. es and section r slopes, dips a	e sections	
2.4.	Urban ar Country or more roads. Multi lan	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads viroads shall comprise section and shall include juried to the process of	with and wons having nctions, hill and count	g two lar ls and/o ry roads ore than	Ilumination nes and sec or slopes, di s shall comp n 600 m. Ao	tions having four ps and winding orise sections lditionally they	2.4.	Urban are Country r or more la roads. Multi land having str	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  eas shall comprise roads of comparts of the comp	vith and ons havin actions, had counted	ng two lan nills and/o ntry roads more than	umination. es and section r slopes, dips a shall comprise 600 m. Additi	e sections onally they	
<ul><li>2.4.</li><li>2.5.</li><li>2.6.</li></ul>	Urban ar Country or more roads. Multi lan having st shall com	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads or roads shall comprise section and shall include juried in the process of the process o	with and wons having nctions, hill and count ength of marries to the	g two laid is and/control in and/control in and/control in and in an and in and in an another and in an an and in an another an another and in an another and in an another ano	Ilumination nes and sec or slopes, di s shall comp n 600 m. Ao	tions having four ps and winding orise sections lditionally they	2.4.	Urban are Country r or more la roads. Multi land having str shall com	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  eas shall comprise roads to coads shall comprise section and shall include juries and shall include juries e roads (e.g. motorways) raight level parts with a let	with and ons havin actions, h and coun ength of urves to	ng two lan nills and/o ntry roads more than the left ar	umination. es and section r slopes, dips a shall comprise 600 m. Additi	e sections onally they	
2.4.	Urban ar Country or more roads. Multi lan having st shall com	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  eas shall comprise roads or coads shall comprise sections and shall include juries and shall include juries roads (e.g. motorways) raight level parts with a leaprise of sections having of	with and wons having nctions, hill and count ength of meturves to taken into accept the country of the country	two laids and/cory roads to the left account.	Illumination nes and sec or slopes, di s shall comp n 600 m. Ac nd to the ri	tions having four ps and winding prise sections lditionally they ght.	2.4.	Urban are Country r or more la roads. Multi land having str shall com Dense tra	Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  cas shall comprise roads voads shall comprise sections and shall include juries and shall include juries roads (e.g. motorways) raight level parts with a leprise of sections having of	with and ons having the court of the court o	ng two lan nills and/o ntry roads more than the left ar account.	lumination. es and section r slopes, dips a shall comprise 600 m. Additi nd to the right.	e sections onally they	
<ul><li>2.4.</li><li>2.5.</li><li>2.6.</li></ul>	Urban ar Country or more roads. Multi lan having st shall com Dense tra	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  eas shall comprise roads or oads shall comprise sections and shall include jurie e roads (e.g. motorways) raight level parts with a least sections having confict situations shall be tallest sections A and B in the lill evaluate and record the	with and wons having nctions, hill and count ength of mourves to the ken into acceptable.	ry roads fore that he left a ccount.	Illumination nes and secon slopes, di s shall comp n 600 m. Ac nd to the ri engineers che perform	tions having four ps and winding prise sections ditionally they ght.	2.4. 2.5. 2.6. 2.7.	Urban are Country r or more la roads. Multi land having str shall com Dense tra For the te tests shal	Oncoming bicycle, as described in paragraph 6.15.8.21.2. Combined oncoming and preceding traffic situations  eas shall comprise roads of comparagraph of the comprise section and shall include juries and shall include juries eroads (e.g. motorways) raight level parts with a leprise of sections having conffic situations shall be tallest sections A and B in the levaluate and record the	with and ons having and coursength of urves to see into a table all accepta	ng two lan nills and/o ntry roads more than the left ar account. bove the e bility of th	lumination. es and section r slopes, dips a shall comprise 600 m. Additi nd to the right. ngineers cond e performance	e sections onally they ucting the	
<ul><li>2.4.</li><li>2.5.</li><li>2.6.</li></ul>	Urban ar Country or more roads.  Multi lan having st shall com Dense tra For the to tests shall adaptation	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads of coads shall comprise sections and shall include jurie e roads (e.g. motorways) raight level parts with a least sections having coaffic situations shall be tallest sections A and B in the least sections A and B in the level parts of process in relation to comprise sections to compress the control of the contro	with and wons having nctions, hill and count ength of meurves to the ken into ace table about acceptabuncoming a	ry roads ore that he left a count. ove the count and precipity of the	Illumination nes and sec or slopes, di s shall comp n 600 m. Ac nd to the ri engineers c he perform.	tions having four ps and winding orise sections lditionally they ght.	2.4. 2.5. 2.6. 2.7.	Urban are Country r or more la roads. Multi lane having str shall com Dense tra For the te tests shal adaptatio	Oncoming bicycle, as described in paragraph 6.15.8.21.2. Combined oncoming and preceding traffic situations  cas shall comprise roads of comparagraph of the comprise section and shall include juries and shall include juries and shall include juries of sections having of the comprise of sections having of the comparagraph of sections shall be tall est sections A and B in the levaluate and record the in process in relation to other sections of the comprocess in relation to other sections.	with and ons having and course and course and course to see into a caccepta accepta	ng two lan nills and/o ntry roads more than the left ar account. bove the e bility of the	dumination. es and section r slopes, dips a shall comprise 600 m. Additi nd to the right. ngineers cond e performance eding road use	e sections onally they ucting the e of the rs. This means	
<ul><li>2.4.</li><li>2.5.</li><li>2.6.</li></ul>	Urban ar Country or more roads.  Multi lan having st shall com Dense tra For the to tests sha adaptation that the shall come is the shall	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations  eas shall comprise roads of coads shall comprise sections and shall include jurie eroads (e.g. motorways) raight level parts with a least sections having coaffic situations shall be tallest sections A and B in the latest sections A and B in the latest sections in relation to occess the engineers shall be sections to coast engineers shall be sections.	with and wons having nctions, hill and count ength of meurves to the ken into ace table about acceptabon coming a ated in the	ry roads ore than ne left a count. ove the e ility of the and prece	Illumination nes and secon slopes, di s shall comp n 600 m. Ac nd to the ri engineers cohe performateding road	tions having four ps and winding orise sections lditionally they ght.	2.4. 2.5. 2.6. 2.7.	Urban are Country r or more la roads. Multi lane having str shall com Dense tra For the te tests shal adaptatio that the t	Oncoming bicycle, as described in paragraph 6.15.3.1.2. Combined oncoming and preceding traffic situations  cas shall comprise roads voads shall comprise sections and shall include jurie roads (e.g. motorways) raight level parts with a leprise of sections having offic situations shall be tall est sections A and B in the levaluate and record the on process in relation to dest engineers shall opera	vith and ons having the country of t	ng two lan hills and/o htry roads more than the left araccount. bove the ebility of the and precenticle bein	dumination. es and section r slopes, dips a shall comprise 600 m. Additi nd to the right. ngineers cond e performance eding road use	e sections onally they ucting the e of the rs. This means	
<ul><li>2.4.</li><li>2.5.</li><li>2.6.</li></ul>	Urban ar Country or more roads.  Multi lan having st shall com Dense tra For the to tests sha adaptation that the shall come is the shall	process. Oncoming bicycle, as described in paragraph 6.15.8.2.1.2. Combined oncoming and preceding traffic situations eas shall comprise roads of coads shall comprise sections and shall include jurie e roads (e.g. motorways) raight level parts with a least sections having coaffic situations shall be tallest sections A and B in the least sections A and B in the level parts of process in relation to comprise sections to compress the control of the contro	with and wons having nctions, hill and count ength of meurves to the ken into ace table about acceptabon coming a ated in the	ry roads ore than ne left a count. ove the e ility of the and prece	Illumination nes and secon slopes, di s shall comp n 600 m. Ac nd to the ri engineers cohe performateding road	tions having four ps and winding orise sections lditionally they ght.	2.4. 2.5. 2.6. 2.7.	Urban are Country r or more la roads. Multi lane having str shall com Dense tra For the te tests shal adaptatio that the t operate t	Oncoming bicycle, as described in paragraph 6.15.8.21.2. Combined oncoming and preceding traffic situations  cas shall comprise roads of comparagraph of the comprise section and shall include juries and shall include juries and shall include juries of sections having of the comprise of sections having of the comparagraph of sections shall be tall est sections A and B in the levaluate and record the in process in relation to other sections of the comprocess in relation to other sections.	vith and ons having the country of t	ng two lan hills and/o htry roads more than the left araccount. bove the ebility of the and precedence being les.	umination. es and section r slopes, dips a shall comprise 600 m. Additi nd to the right. ngineers cond e performance eding road use g tested and a	e sections onally they ucting the e of the rs. This means dditionally	