



**BRUXELLES MOBILITÉ**  
**BRUSSEL MOBILITEIT**

**SERVICE PUBLIC RÉGIONAL DE BRUXELLES**  
**GEWESTELIJKE OVERHEIDSDIENST BRUSSEL**

Directie Verkeersveiligheid, Vooruitgangstraat 80 bus 1, 1035 Brussel  
Direction Sécurité Routière, Rue du Progrès 80 boîte 1, 1035 Bruxelles  
homologation@sprb.irisnet.be

Index du dossier de réception d'une homologation par type en application d'un Règlement  
*Index to the information package of a type approval with regard to a Regulation*

Dernière Série d'amende- ments applicable <i>Last applicable Series of amendments</i>	N° de la réception de base et mise à jour <i>Base approval and update No</i>	Extension N° <i>Extension No</i>	Révision N° <i>Revision No</i>	Date d'émission <i>Issue date</i>	Fiche de renseignements <i>Information document</i>	
					Référence <i>Reference</i>	Nombre de pages <i>Number of pages</i>
113-01	00	-	-	23.02.2017	FUAN 0348 / 00	5

301

Vu pour être annexé à la fiche de réception,  
*Approved and to be attached to the approval certificate,*  
Le Directeur,  
*The Director,*

Laurence LEROY

N° d'homologation mis à jour : <i>Updated Approval No</i>	E6-113R-010261	BEVASYS : 201618465
Mise à jour N° : <i>Update No</i>	00	Date d'émission : <i>Issue date</i>
	23.02.2017	

[www.bruxellesmobilitate.irisnet.be](http://www.bruxellesmobilitate.irisnet.be)

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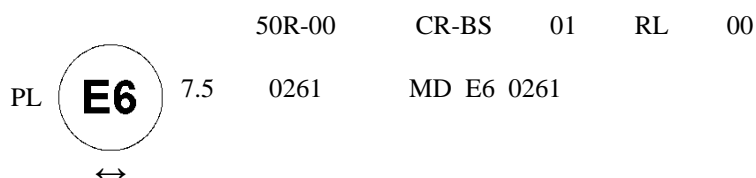
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**COMMUNICATION CONCERNANT L'HOMOLOGATION D'UN TYPE DE PROJECTEUR**  
*COMMUNICATION CONCERNING THE APPROVAL OF A TYPE OF HEADLAMP*  
**EN APPLICATION DU REGLEMENT N° 113-01**  
*PURSUANT TO REGULATION NO. 113-01*

**N° d'homologation : E6-113R-010261**  
*Approval No.*

**Marque d'homologation :**  
*Approval mark*



1. Marque de fabrique ou de commerce du dispositif : FUAN  
*Trade name or mark of the device*

2. Désignation du type de dispositif par le fabricant : 0348  
*Manufacturer's name for the type of device*

3. Nom et adresse du fabricant :  
*Manufacturer's name and address*

[Redacted manufacturer name and address]

4. Nom et adresse du mandataire du fabricant (le cas échéant) : -  
*If applicable, name and address of manufacturer's representative*

5. Soumis à l'homologation entre le : 01.12.2016 ~ 16.12.2016 ; 30.12.2016 ~ 11.01.2017  
*Submitted for approval on*

6. Service technique chargé des essais :  
*Technical service responsible for conducting approval tests*

VINCOTTE nv  
Jan Olieslagerslaan 35  
1800 VILVOORDE  
BELGIUM

7. Date du procès-verbal d'essai : 23.02.2017  
*Date of report issued by that service*

8. Numéro du procès-verbal d'essai : H1660549761/641  
*Number of report issued by that service*



9. Brève description : voir fiche de renseignements  
9. Brief description : see information document

Catégorie, comme indiquée par le marquage pertinent <sup>1</sup> : CR-BS PL  
Category as described by the relevant marking

Nombre et catégorie(s) de la (des) lampe(s) à incandescence, si elles existent :  
Number and category(ies) of filament lamp(s), if any :  
1 LED module, 12V, 9W for passing beam  
1 LED module, 12V, 19W for driving beam

Nombre et catégorie(s) de sources lumineuses à décharge, si elles existent: -  
Number and category (ies) of gas-discharge light source, if any:

Nombre de modules à DEL et code(s) d'identification proper(s) à ce(s) module(s) et pour chaque module à DEL la mention indiquant s'il est remplaçable : ~~oui~~ non <sup>1</sup>  
Number and specific identification code(s) of LED module(s) and for each LED module a statement whether it is replaceable or not : ~~yes~~ no <sup>1</sup>

Nombre et code(s) d'identification particulier(s) des modules électroniques de régulation de source lumineuse: -  
Number and specific identification code(s) of electronic light source control gear(s), if any:

Nombre et code(s) d'identification particulier(s) des unités d'éclairage et pour chaque module DEL une attestation si c'est remplaçable ou pas, si elles existent : -  
Number and specific identification code(s) of additional lighting unit(s) and for each LED module a statement whether it is replaceable or not, if any:  
1 x MD E6 0261, non-replaceable (not replaceable)

Un contrôle de la netteté de la coupure a été effectué oui ~~non~~ <sup>2</sup>  
The determination of cut-off sharpness yes ~~no~~

Si oui, il a été effectué à ~~10 m~~ 25m <sup>2</sup>  
If yes, it was carried out at ~~10m~~ 25m

Appellation commerciale et numéro d'identification du ou des modules d'amorçage-ballast distincts ou d'un ou des éléments du ou des modules d'amorçage-ballast: -  
Trade name and identification number of separate ballast(s) or part(s) of ballast(s):

La source lumineuse du feu de croisement peut/~~ne peut pas~~ <sup>2</sup> s'allumer simultanément avec celle du feu de route et/ou de tout autre projecteur mutuellement incorporé.  
The passing beam light source may/~~may not~~ <sup>2</sup> be lit simultaneously with the driving-beam light source and/or another reciprocally incorporated headlamp.

Le minimum angle d'inclinaison pour satisfaire la nécessité de paragraphe 6.2.8.1., si elles existent : -  
The minimum bank angle(s) to satisfy the requirement of paragraph 6.2.8.1., if any:

- 9.1 Feu de route primaire: oui ~~non~~ <sup>2</sup>  
9.1 Primary driving beam: yes ~~no~~ <sup>2</sup>

Feu de route secondaire: ~~oui~~ non <sup>2</sup>  
Secondary driving beam: ~~yes~~ no <sup>2</sup>

Le feu de route secondaire doit être opéré que avec le feu de croisement ou le feu de route primaire.  
The secondary driving beam shall only be operated together with a passing beam or a primary driving beam.

<sup>1</sup> Indiquer le marquage adéquat comme défini dans le règlement R113, Annexe 1 - Indicate the appropriate marking as defined in Regulation No 113, Annex 1

10. Position de la marque d'homologation : sur la lampe  
10. *Approval mark position: on the lamp*
11. Motif(s) de l'extension d'homologation : -  
11. *Reason(s) for extension of approval*
12. Homologation accordée / étendue<sup>2</sup>  
12. *Approval granted / ~~extended~~<sup>1</sup>*
13. Lieu : Bruxelles  
13. *Place*
14. Date : 23.02.2017  
14. *Date*
15. Signature :  
15. *Signature*

AU NOM DU MINISTRE :  
*ON BEHALF OF THE MINISTER*  
Pour le Directeur Général,  
*For the Director General,*  
Le Directeur,  
*The Director,*



Laurence LEROY

16. Est annexée la liste des pièces constituant le dossier d'homologation déposé au Service administratif ayant délivré l'homologation et pouvant être obtenu sur demande.  
16. *The list of documents deposited with the Administrative Service which has granted approval is annexed to this communication and may be obtained on request.*

<sup>2</sup> Rayer les mentions inutiles - *Strike out which does not apply*



**VINÇOTTE nv**

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ISO/IEC 17020 Accredited inspection body - Accreditation certificate BELAC No. 016-INSP

**1. SUBJECT : HEADLAMPS**

R113-01

<b>2. REF. :</b>	Report number : <b>H1660549761/641</b>	No. of pages : 1 of 40	No. of annexes : -
	Bevasys : 201618465	Approval No. : (0261 00)	Update : 00

**3. GENERALITIES :**

Make of Device : FUAN

Commercial Type : -

Manufacturer's Type : 0348

Name and address of the manufacturer :

**4. TESTS :** Date and place : 2016.12.30 to 2017.01.11

Applied document(s) : FUAN 0348 / 00

Inspector : LU Wan-Ching

Persons witnessing the tests : LU Wan-Ching

Location of E-mark : On the lamp

**5. CONCLUSIONS :**

The tests were carried out according to the following specifications :

- UNECE Regulation No. 113 incorporating supplement 05 to the 01 series of amendments.

The models presented comply with the requirements to be applied.

Date : 2017.02.23

Signature :

VINÇOTTE nv/sa  
LU Wan-Ching  
Automotive Certification

2BH/LWC

R11301-AI

## DESCRIPTION OF THE TESTED HEADLAMP

Headlamp type : ~~passing beam~~ / ~~driving beam~~ / passing and driving beam  
Headlamp class : ~~A~~ / B / ~~C~~ / ~~D~~ / E  
Category and kind of light source(s) : 1 LED module, 12V, 9W / 19W for passing beam and driving beam  
The luminous flux of LED module 12V / 371.6 lm for passing beam  
12V / 853.6 lm for driving beam

## GENERAL SPECIFICATIONS <sup>1</sup>

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
Each sample shall conform to the specifications set forth in §§ 6. to 8. below.	5.1.	X	
Headlamps shall be so made as to retain their prescribed photometric characteristics and to remain in good working order when in normal use, in spite of the vibrations to which they may be subjected.	5.2.		
Headlamps shall be fitted with a device enabling them to be so adjusted on the vehicles as to comply with the rules applicable to them. Such a device may or may not provide horizontal adjustment, provided that the headlamps are so designed that they can maintain a proper horizontal aiming even after the vertical aiming adjustment. Such a device need not be fitted on units in which the reflector and the diffusing lens cannot be separated, provided the use of such units is confined to vehicles on which the headlamp setting can be adjusted by other means.	5.2.1.		X
Where a headlamp providing a passing beam and a headlamp providing a driving beam, each equipped with its own filament lamp(s), gas-discharge light source or LED module(s), are assembled to form a composite unit the adjusting device shall enable each optical system individually to be duly adjusted.			
However, these provisions shall not apply to headlamp assemblies whose reflectors are indivisible. For this type of assembly the requirements of § 6.3. of this Regulation apply.	5.2.2.	X	
Class A, B, C or D	5.3.		
Headlamps shall be equipped with filament lamp(s) approved according to Regulation No. 37 and/or, with (an) LED module(s). In the case of the use of additional light source(s) and/or additional lighting unit(s) to provide bend lighting, only categories of filament lamps covered by Regulation No. 37, provided that no restriction on the use for bending light is made in Regulation No. 37 and its series of amendments in force at the time of application for type approval, and/or LED modules(s) shall be used.	5.3.1	X	

<sup>1</sup> Technical requirements for filament lamp: see Regulation No. 37. Technical requirements for gas-discharge light sources: see Regulation No. 99

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p>It is possible to use two filament light sources for the principal passing-beam and several filament light sources for the driving-beam.</p> <p>Any Regulation No. 37 filament lamp may be used, provided that:</p> <p>(a) No restriction on the use is made in Regulation No. 37 and its series of amendments in force at the time of application for type approval;</p> <p>(b) For Classes A and B, its reference luminous flux at 13.2V for principal dipped-beam does not exceed 900 lm;</p> <p>(c) For Class C and D, its reference luminous flux at 13.2V for principal dipped-beam does not exceed 2,000 lm.</p> <p>The design of the device shall be such that the filament lamp can be fixed in no other position but the correct one<sup>2</sup></p> <p>The filament lamp holder shall conform to the characteristics given in IEC Publication 60061. The holder data sheet relevant to the category of filament lamp used, applies.</p> <p>For lamps equipped with (an) LED module(s):</p> <p>The electronic light source control gear(s), if applicable, shall be considered as being part of the headlamp; they may also be part of the LED module(s);</p> <p>The headlamp and the LED module(s) themselves shall comply with the relevant requirements specified in Annex 12 of this Regulation. The compliance with the requirements shall be tested.</p> <p>The total objective luminous flux of all LED modules producing the principal passing beam shall be measured as described in § 5. of Annex 12. The minimum and maximum limits mentioned in §5.3.3.3. shall apply.</p> <p>In the case of a replaceable LED module, the removal and replacement of this LED module, as described in Annex 12, § 1.4.1, shall be demonstrated to the satisfaction of the Technical Service</p> <p><b>Class E headlamps</b></p> <p>The headlamp shall be equipped with (a) gas-discharge light source(s) approved according to Regulation No. 99 and/or (an) LED module(s).</p> <p>In the case of the use of additional light source(s) and/or additional lighting unit(s) to provide bend lighting, only categories of filament lamps covered by Regulation No. 37, provided that no restriction on the use for bending light is made in Regulation No. 37 and its series of amendments in force at the time of application for type, and/or LED modules(s) shall be used.</p> <p>In the case of replaceable gas-discharge light sources the lamp holder shall conform to the dimensional characteristics as given on the data sheet of IEC Publication 60061-2, relevant to the category of gas-discharge light source used. The gas-discharge light source shall fit easily into the headlamp.</p>	<p>5.3.2.</p> <p>5.3.3.</p> <p>5.3.3.1.</p> <p>5.3.3.2.</p> <p>5.3.3.3.</p> <p>5.3.3.4.</p> <p>5.4.</p> <p>5.4.1.</p> <p>5.4.2.</p>	<p></p> <p></p> <p></p> <p>X</p> <p>X</p> <p></p> <p></p> <p></p> <p></p>	<p>X</p> <p></p> <p>X</p> <p></p> <p></p> <p>X</p> <p></p> <p>X</p>

<sup>2</sup> A headlamp is regarded as satisfying the requirements of this § if the filament lamp can be easily fitted into the headlamp and the positioning lugs can be correctly fitted into their slots even in darkness.

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
In the case of (an) LED module(s) the following requirements apply:	5.4.3.		
The electronic light source control gear(s), if applicable, shall be considered as being part of the headlamp; they may also be part of the LED module(s);	5.4.3.1.		
The headlamp and the LED module(s) themselves shall comply with the relevant requirements specified in Annex 12 to this Regulation. The compliance with the requirements shall be tested.	5.4.3.2.		
The total objective luminous flux of all LED modules producing the principal passing beam shall be measured as described in § 5. of Annex 12. The minimum limit mentioned in §5.4.3.3 shall apply:	5.4.3.3.		
In addition, Class B or C or D or E headlamps shall be complementary tested according to the requirements of Annex 4 to ensure that in use there is no excessive change in photometric performance.	5.5.	X	
If the lens of a Class B, C, D or E headlamp is of plastic material, tests shall be done according to the requirements of Annex 6.	5.6.	X	
On headlamps designed to provide alternately a driving beam and a passing beam, or headlamp systems including additional light source(s) and/or additional lighting unit(s) used to produce bend lighting, any mechanical, electromechanical or other device incorporated in the headlamp for these purposes shall be so constructed that:	5.7.		X
The device is robust enough to withstand 50,000 operations under normal conditions of use. In order to verify compliance with this requirement, the Technical Service responsible for approval tests may:	5.7.1.		
(a) Require the applicant to supply the equipment necessary to perform the test;			
(b) Forego the test if the headlamp presented by the applicant is accompanied by a test report, issued by a Technical Service responsible for approval tests for headlamps of the same construction (assembly), confirming compliance with this requirement.			
Except for additional light source(s) and additional lighting unit(s) used to produce bend lighting, in the case of failure it must be possible to obtain automatically a passing-beam or a state with respect to the photometric conditions which yields values not exceeding 1,200 cd in Zone 1 and at least 2,400 cd at 0,86D-V by such means as e.g. switching off, dimming, aiming downwards, and/or functional substitution.	5.7.2.		
Except for additional light source(s) and additional lighting unit(s) used to produce bend lighting, either the passing-beam or the driving-beam shall always be obtained without any possibility of the mechanism stopping in between the two positions.	5.7.3.		
The user cannot, with ordinary tools, change the shape or position of the moving parts.	5.7.4.		
For Class E, the headlamp and ballast system shall not generate radiated or power line disturbances to cause a malfunction of other electric/electronic systems of the vehicle <sup>3</sup>	5.8.		X

<sup>3</sup> Compliance with the requirements for electromagnetic compatibility is relevant to the individual vehicle type



Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
The definitions in §2.7.1.1.3 and 2.7.1.1.7., in Regulation No. 48 allow the use of LED module, which may contain holders for other light sources. Notwithstanding this provision a mixture of LED'(s) and other light sources for the passing beam or each driving beam, as specified by this Regulation is not allowed.	5.9.		X
A LED module shall be:	5.10.		
(a) Only removable from its device with the use of tools, unless it is stated in the communication sheet that the LED module is non replaceable and;		X	
(b) So designed that regardless of the use of tool(s), it is not mechanically interchangeable with any replaceable approved light source.			X

## ILLUMINATION

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p><b>General provisions</b></p> <p>Headlamps shall be so made that they give adequate illumination without dazzle when emitting the passing beam, and good illumination when emitting a driving beam.</p> <p>The luminous intensity produced by the headlamp shall be measured at 25 m distance by means of a photoelectric cell having a useful area comprised within a square of 65 mm side. The point HV is the centre-point of the coordinate system with a vertical polar axis. Line H is the horizontal through HV (see Annex 3 to this Regulation).</p> <p>For Class A or B or C or D</p> <p>Apart from (an) LED module(s), the headlamps shall be checked by means of an uncoloured standard (étalon) filament lamp designed for a rated voltage of 12 V. During the checking of the headlamp, the voltage at the terminals of the filament lamp shall be regulated so as to obtain the reference luminous flux at 13.2V as indicated at the relevant data sheet of Regulation No. 37.</p> <p>In order to protect the standard (etalon) filament lamp during the process of photometric measurement it is permissible to carry out the measurements at a luminous flux that differs from the reference luminous flux at 13.2 V. If the test laboratory chooses to carry out measurements in such a manner the luminous intensity shall be corrected by multiplying the measured value by the individual factor <math>F_{\text{lamp}}</math> of the standard (etalon) filament lamp in order to verify the compliance with the photometric requirements where:</p> <p><math>F_{\text{lamp}} = \Phi_{\text{reference}} / \Phi_{\text{test}}</math></p> <p><math>\Phi_{\text{reference}}</math> is the reference luminous flux at 13,2 V as specified in the relevant data sheet of Regulation No. 37</p> <p><math>\Phi_{\text{test}}</math> is the actual luminous flux used for the measurement.</p> <p>Depending on the number of filament lamps for which the headlamp is designed, it shall be considered acceptable if it meets the requirements of § 6 with the same number of standard (étalon) filament lamp(s), which may be submitted with the headlamp.</p> <p>LED module(s) shall be measured at 6.3 V or 13.2 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.</p>	<p>6.1.</p> <p>6.1.1.</p> <p>6.1.2.</p> <p>6.1.3.</p> <p>6.1.3.1.</p> <p>6.1.3.2.</p> <p>6.1.3.3.</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	<p></p> <p></p> <p></p> <p>X</p> <p></p> <p>X</p>

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
For Class E with (a) gas-discharge light source(s) according to Regulation No. 99	6.1.4.		X
The headlamp shall be deemed satisfactory if the photometric requirements set in the present § 6. are met with one light source, which has been aged during at least 15 cycles, in accordance with Annex 4, § 4. of Regulation No. 99.	6.1.4.1.		
Where the gas-discharge light source is approved according to Regulation No. 99 it shall be a standard (étalon) light-source and its luminous flux may differ from the objective luminous flux specified in Regulation No. 99. In this case, the illuminances shall be corrected accordingly.			
The above correction does not apply to distributed lighting systems using a non-replaceable gas-discharge light source or to headlamps with the ballast(s) totally or partially integrated.			
Where the gas-discharge light source is not approved according to Regulation No. 99 it shall be a production non-replaceable light source.			
The voltage applied to the terminals of the ballast(s) is: either 13.2V ± 0.1 V for 12 V systems or: as otherwise specified (see Annex 11).			
The dimensions determining the position of the arc inside the standard gas-discharge light source are shown in the relevant data sheet of Regulation No. 99.	6.1.4.2.		
Four seconds after ignition of a headlamp which has not been operated for 30 minutes or more, at least 37,500 cd must be reached at point HV of a driving beam and 3,750 cd at point 2 ( 0. 86D-V) of a passing beam for headlamps incorporating driving beam and passing beam functions, or 3,750 cd at point point 2 ( 0. 86D-V) for headlamps having only a passing beam function. The power supply shall be sufficient to secure the quick rise of the high current pulse.	6.1.4.3.		
For Class E with (an) LED module(s)	6.1.5.		X
LED module(s) shall be measured at 6.3 V or 13.2 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.	6.1.5.1.		
In the case of headlamp systems having additional light source(s) and/or additional lighting unit(s) used to produce bend lighting, the additional light source(s) shall be measured according to the §'s 6.1.3., 6.1.4. and 6.1.5."	6.1.6.		X

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<b>Provisions concerning passing beams</b> <p>For a correct aiming the principal passing beam shall produce a sufficiently sharp "cut-off" to permit a satisfactory visual adjustment with its aid as indicated in § 6.2.2. below. The aiming shall be carried out using a flat vertical screen set up at a distance of 10 or 25 m forward of the headlamp and at right angles to set the H-V. The screen shall be sufficiently wide to allow examination and adjustment of the "cut-off" of the passing beam over at least 3° on either side of the V-V line. The "cut-off" shall be substantially horizontal and shall be as straight as possible from at least 3° L to 3° R. In case the visual aim leads to problems or ambiguous positions, the instrumental method as specified in Annex 9, §§ 2. and 4., shall be applied and the quality or rather the sharpness of the "cut-off" and the linearity shall be checked on performance.</p> <p>The principal passing-beam shall be aimed so that:</p> <p>For horizontal adjustment: The beam is as symmetrical as possible with reference to line V-V;</p> <p>For vertical adjustment: the horizontal part of the "cut-off" line is adjusted to its nominal position (0.57 degree) below the H-H line.</p> <p>If, however, vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the instrumental method of Annex 9, §§ 4. and 5. shall be applied to test compliance with the required minimum quality of the "cut-off" line and to perform the beam vertical adjustment.</p>	6.2. 6.2.1.   6.2.2. 6.2.2.1. 6.2.2.2.	 X    X X	

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
When so aimed, the headlamp must, if its approval is sought solely for provision of a passing beam <sup>4</sup> , comply with the requirements set out in §§ 6.2.5. to 6.2.6. below; if it is intended to provide both a passing beam and a driving beam, it shall comply with the requirements set out in §§ 6.2.5., 6.2.6. and 6.3.	6.2.3.	X	
Where a headlamp so aimed does not meet the requirements set out in §§ 6.2.5., 6.2.6. and 6.3., its alignment may be changed, except for headlamps that have no mechanism to adjust horizontal aim, on condition that the axis of the beam is not displaced laterally by more than 0.5 degree to the right or left and vertically by not more than 0.25 degree up or down. To facilitate alignment by means of the "cut-off", the headlamp may be partially occulted in order to sharpen the "cut-off". However, the "cut-off" should not extend beyond the line H-H.	6.2.4.		X
The passing beam shall meet the requirements as shown in the applicable table and the applicable figure as shown in Annex 3.	6.2.5.		
For Class A headlamps see the table in §6.2.5.1 and figure B in Annex 3.	6.2.5.1.		X
For Class B headlamps see the table in §6.2.5.2 and figure C in Annex 3.	6.2.5.2.	X	
For Class C, D or E headlamp see the table in §6.2.5.3 and figure D in Annex 3.	6.2.5.3.		X
UN ECE type approval at reference luminous flux according to Regulation No. 37.			
Nominal aim for photometry:			
Vertical: 1 per cent D (0.57°D) Horizontal: 0°			
Allowed tolerances for photometry			
Vertical: 0.3°D to 0.8°D Horizontal: ± 0.5°D L-R			
The light shall be as evenly distributed as possible within zones 1 and 2 for class C, D or E headlamps.	6.2.6.		X
However, the additional light source(s) or additional lighting unit(s) shall not be activated when the bank angle is less than 3 degrees.	6.2.6.1		
Either one or two filament light sources (Classes A, B, C, D) or one gas discharge light source (Class E) or one or more LED module(s) (Classes C, D, E) are permitted for the principal passing beam.	6.2.7.		X

<sup>4</sup> Such a special "passing beam" headlamp may incorporate a driving beam not subject to requirements.

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>Additional light source(s) and/or additional lighting unit(s) used to produce bend lighting is (are) permitted, provided that:</p> <p>The following requirement regarding illumination shall be met, when the principal passing beam(s) and corresponding additional light source(s) used to produce bend lighting are activated simultaneously:</p> <p>(a) Left bank (when the motorcycle is rotated to the left about its longitudinal axis) the luminous intensity values shall not exceed 900 cd in the zone extending from HH to 15 degrees above HH and from VV to 10 degrees left.</p> <p>(b) Right bank (when the motorcycle is rotated to the right about its longitudinal axis) the luminous intensity values shall not exceed 900 cd in the zone extending from HH to 15 degrees above HH and from VV to 10 degrees right.</p> <p>This test shall be carried out with the minimum bank angle specified by the applicant simulating the condition by means of the test fixture etc.</p> <p>For this measurement, at the request of the applicant, principal passing beam and additional light source(s) used to produce bend lighting, may be measured individually and the photometric values obtained combined to determine compliance with the specified luminous intensity values."</p> <p><b>Provisions concerning driving beams</b></p> <p>In the case of a headlamp designed to provide a driving beam and a passing beam, measurements of the luminous intensity of the driving beam shall be taken with the same headlamp alignment as applied to the condition of § 6.2. above; in the case of a headlamp providing a driving beam only, it shall be so adjusted that the area of maximum illumination intensity (<math>I_M</math>) is centred on the point of intersection of lines H-H and V-V; such a headlamp need only meet the requirements referred to in § 6.3.</p> <p>Irrespective of the type of light source (LED module(s) or filament light source(s) or gas discharge light source) used to produce the passing beam, several light sources either:</p> <p>(a) One or more filament light sources listed in Regulation No. 37 (classes A, B, C, D); or</p> <p>(b) Gas discharge light sources listed in Regulation No. 99 (class E); or</p> <p>(c) LED module(s) (class C, D, E) may be used for each individual driving beam.</p>	<p>6.2.8.</p> <p>6.2.8.1</p> <p>6.2.8.2</p> <p>6.2.8.3</p> <p>6.3.</p> <p>6.3.1.</p> <p>6.3.2.</p>	<p>X</p> <p>X</p>	<p>X</p> <p>X</p>

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
Except for Class A headlamp, the luminous intensity produced by the driving beam shall either conform to the requirements of § 6.3.3.1 (primary driving beam) or § 6.3.3.2. can only be approved in the case where the driving beam is operated together with a passing beam or a primary driving beam. This shall be clearly indicated in the communication form of Annex 1, under item 9.1.	6.3.3.		
The luminous intensity of a primary driving beam shall conform to table §6.3.3.1 and figure E in Annex 3	6.3.3.1.	X	
The luminous intensity of a secondary driving beam shall conform to table §6.3.3.2 and figure F in Annex 3	6.3.3.2		X
The reference mark ( $I'_M$ ) of the maximum luminous intensity ( $I_M$ ) , referred to in §'s 4.2.2.6. and 6.3.3.1. or 6.3.3.2. shall be obtained by the ratio: $I'_M = I_M / 4300$	6.3.4	X	
This value shall be rounded off to the value 7.5 - 10 - 12.5 - 17.5 - 20 - 25 - 27.5 - 30 - 37.5 - 40 - 45 - 50.			
In the case of headlamps with an adjustable reflector, additional tests shall be made after the reflector has been moved vertically $\pm 2^\circ$ or at least into the maximum position, if less than $2^\circ$ , from its initial position by means of the headlamp adjusting device. The whole headlamp shall then be re-positioned (for example by means of the goniometer) by moving it through the same number of degrees in the opposite direction to the movement of the reflector. The following measurements shall be made and the points shall be within the required limits:	6.4		X
Passing beam: points HV and 0.86 D-V			
Driving beam: $I_M$ and point HV (percentage of $I_M$ )			
The screen illumination values mentioned in §s 6.2. and 6.3. above shall be measured by means of a photoreceptor, the effective area of which shall be contained within a square of 65 mm side.	6.5.	X	

## COLOUR

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
The colour of the light emitted shall be white.	7.1.	X	

**TESTS FOR STABILITY OF PHOTOMETRIC PERFORMANCE OF HEADLAMPS IN OPERATION (ANNEX 4)**

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p><b>Tests on complete Class B, C, D and headlamps</b></p> <p>Once the photometric values have been measured according to the prescriptions of this Regulation, in the point for <math>I_{\max}</math> for driving beam and in points 0.50U/1.5L and 0.50U/1.5R, 50R, 50L for class B passing-beam and in points 0.86D-3.5R, 0.86D-3.5L, 0.50U-1.5L and 0.50U-1.5R for classes C, D and E, for passing beam a complete headlamp sample shall be tested for stability of photometric performance in operation. "Complete headlamp" shall be understood to mean the complete lamp itself, including those surrounding body parts, filament lamps, gas discharge light sources or LED module(s) which could influence its thermal dissipation.</p> <p>The tests shall be carried out:</p> <p>(a) In a dry and still atmosphere at an ambient temperature of <math>23\text{ °C} \pm 5\text{ °C}</math>, the test sample being mounted on a base representing the correct installation on the vehicle;</p> <p>(b) In case of replaceable light sources: using mass production filament light sources, which have been aged for at least one hour, or mass production gas-discharge light sources, which have been aged for at least 15 hours or mass production LED modules which have been aged for at least 48 hours and cooled down to ambient temperature before starting the tests as specified in this Regulation. The LED modules supplied by the applicant shall be used.</p> <p>The measuring equipment shall be equivalent to that used during headlamp type-approval tests.</p> <p>The test sample shall be operated without being dismantled from or readjusted in relation to its test fixture. The light source used shall be a light source of the category specified for that headlamp.</p> <p><b>Test for stability of photometric performance</b></p> <p><i>Clean headlamp</i></p> <p>The headlamp shall be operated for 12 hours as described in § 1.1.1. and checked as prescribed in § 1.1.2.</p> <p>Test procedure<sup>5</sup></p> <p>The headlamp shall be operated for a period according to the specified time, so that:</p>	<p>1.</p> <p>1.1.</p> <p>1.1.1.</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	

<sup>5</sup> For the test schedule see Annex 8 to this Regulation.



Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p>(a) In the case where only one lighting function (driving or passing beam or front fog lamp) is to be approved, the corresponding light source is lit for the prescribed time<sup>6</sup>,</p> <p>(b) In the case of a headlamp with a passing beam and one or more driving beams or in case of a headlamp with a passing beam and a front fog lamp:</p> <p>(i) The headlamp shall be subjected to the following cycle until the time specified is reached:</p> <p>a. 15 minutes, passing-beam lit;</p> <p>b. 5 minutes, all functions lit.</p> <p>(ii) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) lit<sup>7</sup> at a time, the test shall be carried out in accordance with this condition, activating<sup>6</sup> successively the passing beam half of the time and the driving beam(s) (simultaneously) for half the time specified in § 1.1. above.</p> <p>(c) In the case of a headlamp with a front fog lamp and one or more driving beams:</p> <p>(i) The headlamp shall be subjected to the following cycle until the time specified is reached:</p> <p>a. 15 minutes, front fog lamp lit;</p> <p>b. 5 minutes, all functions lit.</p> <p>(ii) If the applicant declares that the headlamp is to be used with only the front fog lamp lit or only the driving beam(s) lit<sup>7</sup> at a time, the test shall be carried out in accordance with this condition, activating<sup>6</sup> successively the front fog lamp half of the time and the driving beam(s) (simultaneously) for half the time specified in § 1.1. above.</p> <p>(d) In the case of headlamp with a passing beam, one or more driving beams and a front fog lamp:</p> <p>(i) The headlamp shall be subjected to the following cycle until the time specified is reached:</p> <p>a. 15 minutes, passing-beam lit;</p> <p>b. 5 minutes, all functions lit.</p> <p>(ii) if the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s)<sup>3</sup> lit at a time, the test shall be carried out in accordance with this condition, activating<sup>2</sup> successively the passing beam half of the time and the driving beam(s) for half the time specified in § 1.1. above, while the front fog lamp is subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the driving beam;</p>	1.1.1.1	X	X

<sup>6</sup> When the tested headlamp includes signalling lamps, the latter shall be lit for the duration of the test. In the case of a direction indicator lamp, it shall be lit in flashing mode with an on/off time of approximately one to one.

<sup>7</sup> Should two or more lamp light source be simultaneously lit when headlamp flashing is used, this shall not be considered as being normal use of the light source simultaneously.

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p>(iii) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the front fog lamp<sup>3</sup> lit at a time, the test shall be carried out in accordance with this condition, activating<sup>2</sup> successively the passing beam half of the time and the front fog lamp for half of the time specified in § 1.1. above, while the driving beam(s) is(are) subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the passing beam;</p> <p>(iv) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s)<sup>3</sup> lit or only the front fog lamp<sup>3</sup> lit at a time, the test shall be carried out in accordance with this condition, activating<sup>2</sup> successively the passing beam one third of the time, the driving beam(s) one third of the time and the front fog lamp for one third of the time specified in § 1.1. above.</p> <p>(e) In the case of a headlamp having additional light source(s) used to produce bend lighting, except for additional lighting unit(s), it (they) shall be switched on for one minute, and switched off for nine minutes during the activation of the principal passing beam.</p> <p>If the headlamp has several additional light sources used to produce bend lighting, the test shall be carried out with the combination of light source(s) that represents the most severe operating condition.</p> <p>Test voltage</p> <p>The voltage shall be applied to the terminals of the test sample as follows:</p> <p>(a) In case of replaceable filament light source(s) operated directly under vehicle voltage system conditions: the test shall be performed at 6.3 V, 13.2 V or 28.0 V as applicable except if the applicant specifies that the test sample may be used at a different voltage. In this case, the test shall be carried out with the filament light source operated at the highest voltage that can be used.</p> <p>(b) In case of replaceable gas discharge light source(s): The test voltage for the electronic light source control-gear or the light source in case the ballast is integrated with the light source, is <math>13.2 \pm 0.1</math> volts for 12 V vehicle voltage systems, or otherwise specified in the application for approval.</p> <p>(c) In the case of non-replaceable light sources operated directly under vehicle voltage system conditions: all measurements on lighting units equipped with non-replaceable light sources (filament light sources and/or others) shall be made at 6.3 V, 13.2 V or 28.0 V or at other voltages according to the vehicle voltage system as specified by the applicant respectively.</p> <p>(d) In the case of light sources, replaceable or non-replaceable, being operated independently from vehicle supply voltage and fully controlled by the system, or, in the case of light sources supplied by a supply and operating device, the test voltages as specified above shall be applied to the input terminals of that device. The test laboratory may require from the manufacturer the supply and operating device or a special power supply needed to supply the light source(s).</p>	1.1.1.2.		X
			X
			X
			X

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>(e) LED module(s) shall be measured at 6.75 V, 13.2 V or 28.0 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.</p> <p>(f) Where signalling lamps are grouped, combined or reciprocally incorporated into the test sample and operating at voltages other than the nominal rated voltages of 6 V, 12 V or 24 V respectively, the voltage shall be adjusted as declared by the manufacturer for the correct photometric functioning of that lamp.</p>		X	
Test results	1.1.2.		X
Visual inspection	1.1.2.1.	X	
<p>Once the headlamp has been stabilized to the ambient temperature, the headlamp lens and the external lens, if any, shall be cleaned with a clean, damp cotton cloth. It shall then be inspected visually; no distortion, deformation, cracking or change in colour of either the headlamp lens or the external lens, if any, shall be noticeable.</p>			
Photometric test	1.1.2.2.	X	
<p>To comply with the requirements of this Regulation, the photometric values shall be verified in the following points:</p> <p>For Class B headlamp:</p> <p>Passing beam: 50R – 50L – 0.50U/1.5L and 0.50U/1.5R.</p> <p>Driving beam: Point of <math>I_{max}</math></p> <p>For Class C, D and E headlamp:</p> <p>Passing beam: 0.86D/3.5R - 0.86D/3.5L - 0.50U/1.5L and 1.5R.</p> <p>Driving beam: Point of <math>I_{max}</math></p> <p>Another aiming may be carried out to allow for any deformation of the headlamp base due to heat (the change of the position of the "cut-off" line is covered in § 2. of this annex).</p> <p>Except for points 0.50U/1.5L and 0.50U/1.5R, a 10 per cent discrepancy between the photometric characteristics and the values measured prior to the test is permissible including the tolerances of the photometric procedure. The value measured at points 0.50U/1.5L and 0.50U/1.5R shall not exceed the photometric value measured prior to the test by more than 225cd.</p>			

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p><i>Dirty headlamp</i></p> <p>After being tested as specified in § 1.1. above, the headlamp shall be operated for one hour as described in § 1.1.1., after being prepared as prescribed in § 1.2.1., and checked as prescribed in § 1.1.2.</p> <p>Preparations of the headlamp</p> <p>Test mixture</p> <p>For headlamp with the outside lens in glass:</p> <p>The mixture of water and a polluting agent to be applied to the headlamp shall be composed of:</p> <ul style="list-style-type: none"> <li>(a) 9 parts by weight of silica sand with a particle size of 0-100 µm,</li> <li>(b) 1 part by weight of vegetal carbon dust produced from beech wood with a particle size of 0-100 µm,</li> <li>(c) 0.2 parts by weight of NaCMC<sup>8</sup>, and</li> <li>(d) 5 parts by weight of sodium chloride (pure at 99 per cent),</li> <li>(e) An appropriate quantity of distilled water, with a conductivity of ≤ 1 µS/m.</li> </ul> <p>The mixture shall not be more than 14 days old.</p> <p>For headlamp with outside lens in plastic material:</p> <p>The mixture of water and polluting agent to be applied to the headlamp shall be composed of:</p> <ul style="list-style-type: none"> <li>(a) 9 parts by weight of silica sand with a particle size of 0-100 µm,</li> <li>(b) 1 part by weight of vegetal carbon dust produced from beech wood with a particle size of 0-100 µm,</li> <li>(c) 0.2 part by weight of NaCMC<sup>8</sup>,</li> <li>(d) 5 parts by weight of sodium chloride (pure at 99 per cent),</li> <li>(e) 13 parts by weight of distilled water with a conductivity of ≤ 1 mS/m, and</li> <li>(f) 2 ± 1 parts by weight of surface-actant<sup>9</sup>.</li> </ul> <p>The mixture shall not be more than 14 days old.</p>	<p>1.2.</p> <p>1.2.1.</p> <p>1.2.1.1.</p> <p>1.2.1.1.1.</p> <p>1.2.1.1.2.</p>	<p></p> <p></p> <p></p> <p></p> <p>X</p>	<p></p> <p></p> <p>X</p> <p></p> <p></p>

<sup>8</sup> NaCMC represents the sodium salt of carboxymethylcellulose, customarily referred to as CMC. The NaCMC used in the dirt mixture shall have a degree of substitution (DS) of 0.6 - 0.7 and a viscosity of 0.2 - 0.5 Pa.s for a 1 per cent solution at 20 °C.

<sup>9</sup> The tolerance on quantity is due to the necessity of obtaining a dirt that correctly spreads out on all the plastic lens.

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>Application of the test mixture to the headlamp</p> <p>The test mixture shall be uniformly applied to the entire light-emitting surface of the headlamp and then left to dry.</p> <p>This procedure shall be repeated until the illumination value has dropped to 15-20 per cent of the values measured for each of the following points under the conditions described in this annex:</p> <p>For Class B headlamp:</p> <p>Passing beam/driving beam and driving beam only: Point of <math>E_{max}</math></p> <p>Passing beam only: B 50 and 50 V</p> <p>For Class C, D and E headlamp:</p> <p>Passing beam/driving beam and driving beam only: Point of <math>E_{max}</math></p> <p>Passing beam only: 0.50U/1.5L and 1.5R and 0.86D/V</p>	1.2.1.2.	X	
<p>Test for change in vertical position of the "cut-off" line under the influence of heat</p> <p>This test consists of verifying that the vertical drift of the "cut-off" line under the influence of heat does not exceed a specified value for an operating headlamp producing a passing beam.</p> <p>The headlamp tested in accordance with § 1., shall be subjected to the test described in § 2.1., without being removed from or readjusted in relation to its test fixture.</p>	2.	X	
<p>Test</p> <p>The test shall be carried out in a dry and still atmosphere at an ambient temperature of <math>23^{\circ}\text{C} \pm 5^{\circ}\text{C}</math>.</p> <p>Using a mass production filament lamp(s) which has been aged for at least one hour or a mass production gas-discharge light source which has been aged for at least 15 hours or the LED module(s) as submitted with the headlamps, which has (have) been aged for at least 48 hours, the headlamp shall be operated on passing beam without being dismounted from or readjusted in relation to its test fixture. (For the purpose of this test, the voltage shall be adjusted as specified in § 1.1.1.2.). The position of the "cut-off" line in its horizontal part (between the vertical lines passing through point 50 L and 50 R for Class B headlamp, 3.5 L and 3.5 R for Class C, D and E headlamp) shall be verified 3 minutes (<math>t_3</math>) and 60 minutes (<math>t_{60}</math>) respectively after operation.</p> <p>The measurement of the variation in the "cut-off" line position as described above shall be carried out by any method giving acceptable accuracy and reproducible results.</p>	2.1	X	

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p><i>Test results</i></p> <p>The result in milliradians (mrad) shall be considered as acceptable for a headlamp producing a passing beam, only when the absolute value <math>\Delta r_I =  r_3 - r_{60} </math> recorded on the headlamp is not more than 1.0 mrad (<math>\Delta r_I \leq 1.0</math> mrad).</p> <p>However, if this value is more than 1.0 mrad but not more than 1.5 mrad (<math>1.0 \text{ mrad} &lt; \Delta r_I \leq 1.5 \text{ mrad}</math>) a second headlamp shall be tested as described in § 2.1. after being subjected three consecutive times to the cycle as described below, in order to stabilize the position of mechanical parts of the headlamp on a base representative of the correct installation on the vehicle:</p> <p>Operation of the passing beam for one hour, (the voltage shall be adjusted as specified in § 1.1.1.2.),</p> <p>Period of rest for one hour.</p> <p>The headlamp type shall be considered as acceptable if the mean value of the absolute values <math>\Delta r_I</math> measured on the first sample and <math>\Delta r_{II}</math> measured on the second sample is not more than 1.0 mrad.</p>	<p>2.2.</p> <p>2.2.1.</p> <p>2.2.2.</p>	<p>X</p> <p>X</p>	<p>X</p>

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# **REQUIREMENTS FOR LAMPS INCORPORATING LENSES OF PLASTIC MATERIAL - TESTING OF LENS OR MATERIAL SAMPLES AND OF COMPLETE LAMPS (ANNEX 6)**

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<b>General specifications</b> <p>The samples supplied pursuant to § 2.2.4. of this Regulation shall satisfy the specifications indicated in §§ 2.1. to 2.5. below.</p> <p>The two samples of complete lamps supplied pursuant to § 2.2.3. of this Regulation and incorporating lenses of plastic material shall, with regard to the lens material, satisfy the specifications indicated in § 2.6. below.</p> <p>The samples of lenses of plastic material or samples of material shall be subjected, with the reflector to which they are intended to be fitted (where applicable), to approval tests in the chronological order indicated in table A reproduced in Appendix 1 to this annex.</p> <p>However, if the lamp manufacturer can prove that the product has already passed the tests prescribed in §§ 2.1. to 2.5. below, or the equivalent tests pursuant to another Regulation, those tests need not be repeated; only the tests prescribed in Appendix 1, table B, shall be mandatory.</p>	1. 1.1. 1.2. 1.3. 1.4.	  X  X <sup>(1)</sup>	 X  X
<b>Tests</b> <p><i>Resistance to temperature changes</i></p> <p>Tests</p> <p>Three new samples (lenses) shall be subjected to five cycles of temperature and humidity (RH = relative humidity) change in accordance with the following programme:</p> <ul style="list-style-type: none"> <li>(a) 3 hours at 40 °C ± 2 °C and 85-95 per cent RH;</li> <li>(b) 1 hour at 23 °C ± 5 °C and 60-75 per cent RH;</li> <li>(c) 15 hours at -30 °C ± 2 °C;</li> <li>(d) 1 hour at 23 °C ± 5 °C and 60-75 per cent RH;</li> <li>(e) 3 hours at 80 °C ± 2 °C;</li> <li>(f) 1 hour at 23 °C ± 5 °C and 60-75 per cent RH;</li> </ul> <p>Before this test, the samples shall be kept at 23 °C ± 5 °C and 60-75 per cent RH for at least four hours.</p> <p><i>Note:</i> The periods of one hour at 23 °C ± 5 °C shall include the periods of transition from one temperature to another which are needed in order to avoid thermal shock effects.</p>	2. 2.1. 2.1.1.	   	 X

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p>Photometric measurements</p> <p>Method</p> <p>Photometric measurements shall be carried out on the samples before and after the test.</p> <p>These measurements shall be made using a standard (étalon) lamp, a standard gas-discharge light source or (an) LED module(s) as present in the headlamp, at the following points:</p> <p>B 50, 50L and 50R for Class B headlamp, 0.86D/3.5R, 0.86D/3.5L, 0.50U/1.5L and 1.5R for Class C, D and E headlamp for the passing beam or a passing/driving lamp;</p> <p><math>I_{max}</math> for the driving beam of a driving lamp or a passing/driving lamp;</p> <p>Results</p> <p>The variation between the photometric values measured on each sample before and after the test shall not exceed 10 per cent including the tolerances of the photometric procedure.</p> <p><i>Resistance to atmospheric and chemical agents</i></p> <p>Resistance to atmospheric agents</p> <p>Three new samples (lenses or samples of material) shall be exposed to radiation from a source having a spectral energy distribution similar to that of a black body at a temperature between 5,500 K and 6,000 K. Appropriate filters shall be placed between the source and the samples so as to reduce as far as possible radiations with wave lengths smaller than 295 nm and greater than 2,500 nm. The samples shall be exposed to an energetic illumination of <math>1,200 \text{ W/m}^2 \pm 200 \text{ W/m}^2</math> for a period such that the luminous energy that they receive is equal to <math>4,500 \text{ MJ/m}^2 \pm 200 \text{ MJ/m}^2</math>. Within the enclosure, the temperature measured on the black panel placed on a level with the samples shall be <math>50^\circ\text{C} \pm 5^\circ\text{C}</math>. In order to ensure a regular exposure, the samples shall revolve around the source of radiation at a speed between 1 and <math>5 \text{ min}^{-1}</math>.</p> <p>The samples shall be sprayed with distilled water of conductivity lower than <math>1 \text{ mS/m}</math> at a temperature of <math>23^\circ\text{C} \pm 5^\circ\text{C}</math>, in accordance with the following cycle:</p> <p>Spraying: 5 minutes; drying: 25 minutes.</p> <p>Resistance to chemical agents</p> <p>After the test described in § 2.2.1. above and the measurement described in § 2.2.3.1. below have been carried out, the outer face of the said three samples shall be treated as described in § 2.2.2.2. with the mixture defined in § 2.2.2.1. below.</p>	<p>2.1.2.</p> <p>2.1.2.1.</p> <p>2.1.2.2.</p> <p>2.2.</p> <p>2.2.1.</p> <p>2.2.2.</p>		<p>X</p>



Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>Test mixture</p> <p>The test mixture shall be composed of 61.5 per cent n-heptane, 12.5 per cent toluene, 7.5 per cent ethyl tetrachloride, 2.5 per cent trichloroethylene and 6 per cent xylene (volume per cent).</p> <p>Application of the test mixture</p> <p>Soak a piece of cotton cloth (as specified in ISO 105) until saturation with the mixture defined in § 2.2.2.1. above and, within 10 seconds, apply it for 10 minutes to the outer face of the sample at a pressure of 50 N/cm<sup>2</sup>, corresponding to an effort of 100 N applied on a test surface of 14 x 14 mm.</p> <p>During this 10-minute period, the cloth pad shall be soaked again with the mixture so that the composition of the liquid applied is continuously identical with that of the test mixture prescribed.</p> <p>During the period of application, it is permissible to compensate the pressure applied to the sample in order to prevent it from causing cracks.</p> <p>Cleaning</p> <p>At the end of the application of the test mixture, the samples shall be dried in the open air and then washed with the solution described in § 2.3. (resistance to detergents) 23 °C ± 5 °C.</p> <p>Afterwards the samples shall be carefully rinsed with distilled water containing not more than 0.2 per cent impurities at 23 °C ± 5 °C and then wiped off with a soft cloth.</p> <p>Results</p> <p>After the test of resistance to atmospheric agents, the outer face of the samples shall be free from cracks, scratches, chipping and deformation, and the mean variation in transmission <math>\Delta t = \frac{T_2 - T_3}{T_2}</math>, measured on the three samples according to the procedure described in Appendix 2 to this annex shall not exceed 0.020 (<math>\Delta t_m &lt; 0.020</math>).</p> <p>After the test of resistance to chemical agents, the samples shall not bear any traces of chemical staining likely to cause a variation of flux diffusion, whose mean variation <math>\Delta t = \frac{T_5 - T_4}{T_2}</math>, measured on the three samples according to the procedure described in Appendix 2 to this annex shall not exceed 0.020 (<math>\Delta t_m \leq 0.020</math>).</p>	<p>2.2.2.1.</p> <p>2.2.2.2.</p> <p>2.2.2.3.</p> <p>2.2.3.</p> <p>2.2.3.1.</p> <p>2.2.3.2.</p>		

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p><i>Resistance to detergents and hydrocarbons</i></p> <p>Resistance to detergents</p> <p>The outer face of three samples (lenses or samples of material) shall be heated to 50 °C ± 5 °C and then immersed for five minutes in a mixture maintained at 23 °C ± 5 °C and composed of 99 parts distilled water containing not more than 0.02 per cent impurities and one part alkylaryl sulphonate.</p> <p>At the end of the test, the samples shall be dried at 50 °C ± 5 °C.</p> <p>The surface of the samples shall be cleaned with a moist cloth.</p> <p>Resistance to hydrocarbons</p> <p>The outer face of these three samples shall then be lightly rubbed for one minute with a cotton cloth soaked in a mixture composed of 70 per cent n-heptane and 30 per cent toluene (volume per cent), and shall then be dried in the open air.</p> <p>Results</p> <p>After the above two tests have been performed successively, the mean value of the variation in transmission <math>\Delta t = \frac{T_2 - T_3}{T_2}</math>, measured on the three samples according to the procedure described in Appendix 2 to this annex shall not exceed 0.010 (<math>\Delta t_m \leq 0.010</math>).</p> <p><i>Resistance to mechanical deterioration</i></p> <p>Mechanical deterioration method</p> <p>The outer face of the three new samples (lenses) shall be subjected to the uniform mechanical deterioration test by the method described in Appendix 3 to this annex.</p> <p>Results</p> <p>After this test, the variations:</p> <p>in transmission: <math>\Delta t = \frac{T_2 - T_3}{T_2}</math>,</p> <p>and in diffusion: <math>\Delta t = \frac{T_5 - T_4}{T_2}</math>,</p> <p>shall be measured according to the procedure described in Appendix 2 in the area specified in § 2.2.4.1.1. of this Regulation. The mean value of the three samples shall be such that:</p> <p><math>\Delta t_m \leq 0.100</math>;</p> <p><math>\Delta d_m \leq 0.050</math></p>	<p>2.3.</p> <p>2.3.1.</p> <p>2.3.2.</p> <p>2.3.3.</p> <p>2.4.</p> <p>2.4.1.</p> <p>2.4.2.</p>		<p>X</p> <p>X</p>

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p>Test of adherence of coatings, if any</p> <p>Preparation of the sample</p> <p>A surface of 20 mm x 20 mm in area of the coating of a lens shall be cut with a razor blade or a needle into a grid of squares approximately 2 mm x 2 mm. The pressure on the blade or needle shall be sufficient to cut at least the coating.</p> <p>Description of the test</p> <p>Use an adhesive tape with a force adhesion of 2 N/(cm of width) <math>\pm 20</math> per cent measured under the standardized conditions specified in Appendix 4 to this annex. This adhesive tape, which shall be at least 25 mm wide, shall be pressed for at least five minutes to the surface prepared as prescribed in § 2.5.1.</p> <p>Then the end of the adhesive tape shall be loaded in such a way that the force of adhesion to the surface considered is balanced by a force perpendicular to that surface. At this stage, the tape shall be torn off at a constant speed of 1.5 m/s <math>\pm</math> 0.2 m/s.</p> <p>Results</p> <p>There shall be no appreciable impairment of the gridded area. Impairments at the intersections between squares or at the edges of the cuts shall be permitted, provided that the impaired area does not exceed 15 per cent of the gridded surface.</p> <p><i>Tests of the complete headlamp incorporating a lens of plastic material</i></p> <p>Resistance to mechanical deterioration of the lens surface</p> <p>Tests</p> <p>The lens of lamp sample No. 1 shall be subjected to the test described in § 2.4.1. above.</p> <p>Results</p> <p>After the test, the results of photometric measurements carried out on the headlamp in accordance with this Regulation shall not exceed:</p> <p>(a) By more than 30 per cent the maximum values prescribed at point HV and not be more than 10 per cent below the minimum values prescribed at point 50 L and 50 R for Class B headlamp, 0.86D/3.5R, 0.86D/3.5L for Class C, D and E headlamp.</p> <p>(b) By more than 10 per cent below the minimum values prescribed for HV in the case of a headlamp producing driving beam only.</p> <p>Test of adherence of coatings, if any</p> <p>The lens of lamp sample No. 2 shall be subjected to the test described in § 2.5. above.</p>	<p>2.5.</p> <p>2.5.1.</p> <p>2.5.2.</p> <p>2.5.3.</p> <p>2.6.</p> <p>2.6.1.</p> <p>2.6.1.1.</p> <p>2.6.1.2.</p> <p>2.6.2.</p>	<p>X<sup>(2)</sup></p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	<p>X</p>

<sup>(1)</sup> According to the §s 1.4, the lamp manufacturer can prove that the product has already passed the tests prescribed in §s 2.1. to 2.5, the tests have been performed by ARTC and TUV: test report No. A97CCCEJM1 and 5353777.

<sup>(2)</sup> Tests of the complete headlamp incorporating a lens of plastic material have been tested by SUN-JET VALLAB and test results have been attached within this report.

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p><i>Resistance to light source radiations</i></p> <p>The following test shall be done:</p> <p>Flat samples of each light transmitting plastic component of the headlamp are exposed to the light of the LED module(s) or the gas-discharge light source. The parameters such as angles and distances of these samples shall be the same as in the headlamp. These samples shall have the same colour and surface treatment, if any, as the parts of the headlamp.</p> <p>After 1,500 hours of continuous operation, the colorimetric specifications of the transmitted light must be met, and the surfaces of the samples shall be free of cracks, scratches, scalings or deformation.</p>	2.7.		X
<p>Verification of the conformity of production</p> <p>With regard to the materials used for the manufacture of lenses, the lamps of a series shall be recognized as complying with this Regulation if:</p> <p>After the test for resistance to chemical agents and the test for resistance to detergents and hydrocarbons, the outer face of the samples exhibits no cracks, chipping or deformation visible to the naked eye (see §s 2.2.2., 2.3.1. and 2.3.2.);</p> <p>After the test described in § 2.6.1.1., the photometric values at the points of measurement considered in § 2.6.1.2. are within the limits prescribed for conformity of production by this Regulation.</p> <p>If the test results fail to satisfy the requirements, the tests shall be repeated on another sample of headlamps selected at random.</p>	<p>3.</p> <p>3.1.</p> <p>3.1.1.</p> <p>3.1.2.</p> <p>3.2.</p>		X

**DEFINITION AND SHARPNESS OF THE CUT-OFF LINE FOR SYMMETRICAL PASSING BEAM HEADLAMPS AND AIMING PROCEDURE BY MEANS OF THIS CUT-OFF LINE (ANNEX 9) N.A.**

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
<p><b>General</b></p> <p>The luminous intensity distribution of the symmetrical passing-beam headlamps shall incorporate a "cut-off" line which enables the symmetrical passing-beam headlamp to be adjusted correctly for the photometric measurements and for the aiming on the vehicle. The characteristics of the "cut-off" line shall comply with the requirements set out in §'s 2. to 4.</p> <p><b>Shape of the "cut-off" line</b></p> <p>For visual adjustment of the symmetrical passing-beam headlamp the "cut-off" line shall provide a horizontal line for vertical adjustment of the symmetrical passing-beam headlamp extending to either side of the V-V line as specified in § 6.2.1. of this Regulation.</p> <p><b>Adjustment of the symmetrical passing-beam headlamp</b></p> <p>Horizontal adjustment: the beam with the "cut-off" line shall be so positioned that the projected beam pattern appears approximately symmetrical to the V-V line.</p> <p>Vertical adjustment: after horizontal adjustment of the symmetrical passing-beam headlamp according to § 3.1., the vertical adjustment shall be performed in such a way that the beam with its "cut-off" line is moved upwards from the lower position until the "cut-off" line is situated at nominal vertical position. For nominal vertical adjustment the "cut-off" line is positioned on the V-V line at 1 per cent below the h-h line.</p> <p>If the horizontal part is not straight but slightly curved or inclined, the "cut-off" line shall not exceed the vertical range formed by two horizontal lines which are situated from 3° left to 3° right of the V-V line at 0.2° for Class B and 0.3° for Classes A, C, D and E headlamps above and below the nominal position of the "cut-off" as applicable on the figure in this annex.</p> <p>When the vertical adjustments of three different individuals differs by more than 0.2° for Class B and 0.3° for Classes A, C, D and E head lamps, the horizontal part of the "cut-off" line is assumed not to provide sufficient linearity or sharpness for performing visual adjustment. In this case the quality of "cut-off" shall be tested instrumentally for compliance with requirements as follows.</p> <p><b>Measurement of the quality of "cut-off"</b></p> <p>Measurements shall be performed by vertically scanning through the horizontal part of the "cut-off" line in angular steps not exceeding 0.05°:</p> <ul style="list-style-type: none"> <li>(a) At either a measurement distance of 10 m and a detector with a diameter of approximately 10 mm;</li> <li>(b) Or at a measurement distance of 25 m and a detector with a diameter of approximately 30 mm.</li> </ul> <p>The measurement of the "cut-off" quality shall be considered acceptable if the requirements of the § 4.1.2. of this annex shall comply with at least one measurement at 10 m or 25 m.</p> <p>The measuring distance at which the test was determined shall be noted down in § 9., Annex 1 "Communication form" of this Regulation.</p>	<p>1.</p> <p>1.1.</p> <p>2.</p> <p>2.1.</p> <p>3.</p> <p>3.1.</p> <p>3.2.</p> <p>3.3.</p> <p>4.</p> <p>4.1.</p>		

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>The scanning is performed from its lower position upwards through the "cutoff" line along the vertical lines at <math>-3^{\circ}</math> to <math>-1.5^{\circ}</math> and <math>+1.5^{\circ}</math> to <math>+3^{\circ}</math> from the VV line. When so measured, the quality of the "cut-off" line shall meet the following requirements:</p> <p>Not more than one "cut-off" line shall be visible<sup>10</sup>.</p> <p>Sharpness of "cut-off": if scanned vertically through the horizontal part of the "cut-off" line along the <math>\pm 2.5</math> -lines, the maximum value measured for:</p> $G = (\log E_v - \log E_{(v + 0.1^{\circ})})$ <p>is called the sharpness factor G of the "cut-off" line. The value of G shall not be less than 0.13 for Class B and 0.08 for Classes A, C, D and E.</p> <p>Linearity: the part of the "cut-off" line which serves for vertical adjustment shall be horizontal from <math>3^{\circ}L</math> to <math>3^{\circ}R</math> of the V-V line. This requirement is deemed to be met if the vertical positions of the inflection points according to § 3.2. above at <math>3^{\circ}</math> left and right of the V-V line do not differ by more than <math>0.2^{\circ}</math> for Class B and <math>0.3^{\circ}</math> for Classes A, C, D and E headlamps from the nominal position at the V-V line.</p> <p><b>Instrumental vertical adjustment</b></p> <p>If the "cut-off" line complies with the above quality requirements, the vertical beam adjustment can be performed instrumentally. For this purpose the inflection point where <math>d_2(\log E) / dv_2 = 0</math> is positioned on the V-V line in its nominal position below the h-h-line. The movement for measuring and adjusting the "cut-off" line shall be upwards from below the nominal position.</p>	<p>4.1.1</p> <p>4.1.2</p> <p>4.1.3</p> <p>5.</p>		

<sup>10</sup> This paragraph will be amended, if an objective test method is available

## REQUIREMENTS FOR LED MODULES AND HEADLAMPS INCLUDING LED MODULES (ANNEX 12)

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
General specifications	1.		
Each LED module sample submitted shall conform to the relevant specifications of this Regulation when tested with the supplied electronic light source control-gear(s), if any.	1.1.	X	
LED module(s) shall be so designed as to be and to remain in good working order when in normal use. They shall moreover exhibit no fault in design or manufacture. A LED module shall be considered to have failed if any one of its LEDs has failed.	1.2.	X	
LED module(s) shall be tamperproof.	1.3.	X	
The design of removable LED module(s) shall be such that:	1.4.		X
When the LED module is removed and replaced by another module provided by the applicant and bearing the same light source module identification code, the photometric specifications of the headlamp shall be met;	1.4.1.		
LED modules with different light source module identification codes within the same lamp housing, shall not be interchangeable.	1.4.2.		
Manufacture	2.		
The LED(s) on the LED module shall be equipped with suitable fixation elements.	2.1.	X	
The fixation elements shall be strong and firmly secured to the LED(s) and the LED module.	2.2.	X	
Test conditions	3.		
Application	3.1.		
All samples shall be tested as specified in § 4. below.	3.1.1.	X	
The kind of light sources on a LED MODULE shall be light-emitting diodes (LED) as defined in Regulation No. 48 § 2.7.1. in particular with regard to the element of visible radiation. Other kinds of light sources are not permitted.	3.1.2.	X	
Operating conditions	3.2.		
LED module operating conditions	3.2.1.	X	
All samples shall be tested under the conditions as specified in § 6.1.3. of this Regulation. If not specified differently in this annex LED modules shall be tested inside the headlamp as submitted by the manufacturer.			

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>Ambient temperature</p> <p>For the measurement of electrical and photometric characteristics, the headlamp shall be operated in dry and still atmosphere at an ambient temperature of 23 °C ± 5 °C.</p> <p>Ageing</p> <p>Upon the request of the applicant the LED module shall be operated for 48 h and cooled down to ambient temperature before starting the tests as specified in this Regulation.</p> <p>Specific specifications and tests</p> <p>Colour rendering</p> <p>Red content</p> <p>In addition to measurements as described in § 7. of this Regulation, the minimum red content of the light of a LED module or headlamp incorporating LED module(s) tested at 50 V shall be such that:</p> $k_{\text{red}} = \frac{\int_{\lambda=610 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda}{\int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda} \geq 0.05$ <p>where:</p> <p><math>E_e(\lambda)</math> (unit: W) is the spectral distribution of the irradiance;</p> <p><math>V(\lambda)</math> (unit: 1) is the spectral luminous efficiency;</p> <p><math>(\lambda)</math> (unit: nm) is the wavelength.</p> <p>This value shall be calculated using intervals of one nanometre.</p>	<p>3.2.2.</p> <p>3.3.</p> <p>4.</p> <p>4.1.</p> <p>4.1.1.</p>	<p>X</p> <p>X</p> <p></p> <p></p> <p>X</p>	



Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
<p>UV-radiation</p> <p>The UV-radiation of a low-UV-type LED module shall be such that:</p> $k_{UV} = \frac{\int_{\lambda=250nm}^{400nm} E_e(\lambda) S(\lambda) d\lambda}{k_m \int_{\lambda=380nm} E_e(\lambda) V(\lambda) d\lambda} \leq 10^{-5} \text{ W / lm}$ <p>where:</p> <p>S(λ)(unit: 1) is the spectral weighting function;</p> <p>k<sub>m</sub> = 683 lm/W is the maximum value of the luminous efficacy of radiation. (For definitions of the other symbols see § 4.1.1. above).</p> <p>This value shall be calculated using intervals of one nanometer. The UV-radiation shall be weighted according to the values as indicated in the Table UV in §4.2.</p> <p>Temperature stability</p> <p>Illuminance</p> <p>A photometric measurement of the headlamp shall be made after 1 minute of operation for the specific function at the test point specified below. For these measurements, the aim can be approximate but must be maintained for before and after ratio measurements.</p> <p>Test points to be measured:</p> <p>Passing beam 50 V</p> <p>Driving beam H – V</p> <p>The lamp shall continue operation until photometric stability has occurred. The moment at which the photometry is stable is defined as the point in time at which the variation of the photometric value is less than 3 per cent within any 15 minute period. After stability has occurred, aim for complete photometry shall be performed in accordance with requirements of specific device. Photometer the lamp at all test points required for the specific device.</p>	<p>4.2.</p> <p>4.3..</p> <p>4.3.1.</p> <p>4.3.1.1.</p> <p>4.3.1.2.</p>	<p>X</p> <p>X</p> <p>X</p>	

Characteristics concerned and prescriptions to apply	References	Conformity	Not applied
Calculate the ratio between the photometric test point value determined in § 4.3.1.1. and the point value determined in § 4.3.1.2.	4.3.1.3.	X	
Once stability of photometry has been achieved, apply the ratio calculated above to each of the remainder of the test points to create a new photometric table that describes the complete photometry based on one minute of operation.	4.3.1.4.	X	
The luminous intensity values, measured after one minute and after photometric stability has occurred, shall comply with the minimum and maximum requirements.	4.3.1.5.	X	
Colour	4.3.2.	X	
The colour of the light emitted measured after one minute and measured after photometric stability has been obtained, as described in § 4.3.1.2. of this annex, shall both be within the required colour boundaries.			
The measurement of the objective luminous flux of LED module(s) producing the passing beam shall be carried out as follows:	5.		
The LED module(s) shall be in the configuration as described in the technical specification as defined in § 2.2.2. of this Regulation. Optical elements (secondary optics) shall be removed by the Technical Service at the request of the applicant by the use of tools. This procedure and the conditions during the measurements as described below shall be described in the test report.	5.1.	X	
One LED module of each type shall be submitted by the applicant with the light source control gear, if applicable, and sufficient instructions.	5.2.	X	
Suitable thermal management (e.g. heat sink) may be provided, to simulate similar thermal conditions as in the corresponding headlamp application.			
Before the test the LED module shall be aged at least for seventy-two hours under the same conditions as in the corresponding headlamp application.			
In the case of use of an integrating sphere, the sphere shall have a minimum diameter of one meter, and at least ten times the maximum dimension of the LED module, whichever is the largest. The flux measurements can also be performed by integration using a goniophotometer. The prescriptions in CIE – Publication 84 – 1989 shall be taken into consideration.			
The LED module shall be burned in for approximately one hour in the closed sphere or goniophotometer.			
The flux shall be measured after stability has occurred, as explained in § 4.3.1.2. of this Annex.			

## FACILITIES AND EQUIPMENT

The facilities and equipment used to carry out the inspections are in compliance with the requirements of the applied Regulatory Act(s).

1. Tested by [REDACTED]
2. The complete headlamp incorporating a lens of plastic material and LED module tested by Sun-Jet Visible Laboratory.  
The facilities and equipment were below:

Equipment Description	Model Number
SJTC-O-017 Multi channel photo detector	OTSUKA MCPD-9800(2480)
SJTC-O-018 Multi channel photo detector	OTSUKA GP-1000
SJTC-O-022 65 inch integrating sphere	LABSPHERE LMS-650
SJTC-O-014 KMS 10	OPTRONIK
SJTC-M-014 Mechanical Deterioration Tester	GIANT FORCE
SJTC-M-025 Power Supply	IDRC CD-035-030PR

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## TEST RESULTS :

Light source : 1 LED module , Rated voltage and wattage : 12V, 9W

<u>Test Results of Photometric Measurement</u>						
Lamp Function	: Passing Beam			Test Voltage	: 13.2 V	
Headlamp Class	: Class B			Test Distance	: 25 m	
Requirement	: ECE Reg. 113 Para. 6.2					
Point on Measuring Screen	Requirement ( cd )		Sample A Measurement (cd)		Sample B Measurement (cd)	
	Min	Max	1 Minute	Stability	1 Minute	Stability
Zone 1	-	700	249.5	243.1	221.4	219.4
50L - 50R ( Line )	1100	-	2129.4	2075.2	1952.6	1934.8
50V ( Point )	2200	-	4893.8	3556.3	3368.2	3337.5
25L - 25R ( Line )	2200	-	4258.7	4150.4	4040.8	4003.9
Zone 2	1100	-	1872.6	1824.9	1730.8	1715.1
Test Results	<div><input checked="" type="checkbox"/> Passed</div> <div><input type="checkbox"/> Failed</div>					

( Null below )

### Test Results of Colour Measurement

Lamp Function : Passing Beam  
Requirement : ECE Reg. 113 Para.7

Light Emitted Color : White

Color Boundaries

- limit towards blue :  $x \geq 0.310$
- limit towards yellow :  $x \leq 0.500$
- limit towards green :  $y \leq 0.150 + 0.640 x$
- limit towards green :  $y \leq 0.440$
- limit towards purple :  $y \geq 0.050 + 0.750 x$
- limit toward red :  $y \geq 0.382$

Test Points	Sample A Measurement				Sample B Measurement			
	1 Minute		Stability		1 Minute		Stability	
	Colour x	Colour y	Colour x	Colour y	Colour x	Colour y	Colour x	Colour y
0.86D - V	0.3610	0.3342	0.3586	0.3313	0.3430	0.3368	0.3210	0.3029
Test Result	<input checked="" type="checkbox"/> Passed				<input type="checkbox"/> Failed			

(Null below)

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## TEST RESULTS :

Light source : 1 LED module , Rated voltage and wattage : 12V, 19W

Test Results of Photometric Measurement						
Lamp Function : Driving Beam			Test Voltage : 13.2 V			
Headlamp Class : Class B			Test Distance : 25 m			
Requirement : ECE Reg. 113 Para. 6.3						
Point on Measuring Screen	Requirement ( cd )		Sample A Measurement (cd)		Sample B Measurement (cd)	
	Min	Max	1 Minute	Stability	1 Minute	Stability
H – V ( Point )	16000	-	27937.5	27375.0	27625.0	27000.0
H – 2.5L ( Point )	9000	-	22400.4	22000.0	22124.5	21625.0
H – 2.5R ( Point )	9000	-	15336.6	15062.5	15090.7	14750.0
H – 5L ( Point )	2500	-	11893.9	11681.3	11682.5	11418.8
H – 5R ( Point )	2500	-	8005.6	7862.5	7877.9	7700.0
Maximum (Imax) (Zone)	20000	215000	29718.7	29187.5	29414.1	28750.0
Maximum Intensity, I <sub>M</sub> <sup>(1)</sup>	I <sub>M</sub> = Imax/4300		6.9	6.8	6.9	6.7
Rounded off to the reference mark of			7.5			
Test Results	<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed					

<sup>(1)</sup> The reference mark ( $I'_M$ ) of the maximum luminous intensity ( $I_M$ ), referred to in paragraphs 4.2.2.6. and 6.3.3.1. or 6.3.3.2. shall be obtained by the ratio:  $I'_M = I_M/4300$  This value shall be rounded off to the value 7.5 - 10 - 12.5 - 17.5 - 20 - 25 - 27.5 - 30 - 37.5 - 40 - 45 - 50.

### Test Results of Colour Measurement

Lamp Function : Driving Beam

Requirement : ECE Reg. 113 Para.7

Light Emitted Color : White

Color Boundaries

- limit towards blue :  $x \geq 0.310$
- limit towards yellow :  $x \leq 0.500$
- limit towards green :  $y \leq 0.150 + 0.640 x$
- limit towards green :  $y \leq 0.440$
- limit towards purple :  $y \geq 0.050 + 0.750 x$
- limit toward red :  $y \geq 0.382$

Test Points	Sample A Measurement				Sample B Measurement			
	1 Minute		Stability		1 Minute		Stability	
	Colour x	Colour y	Colour x	Colour y	Colour x	Colour y	Colour x	Colour y
H - V	0.3196	0.3272	0.3294	0.3150	0.3231	0.3255	0.3169	0.3396
Test Results	<input checked="" type="checkbox"/> Passed				<input type="checkbox"/> Failed			

(Null below)

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## TEST RESULTS :

<u>Test Results for Stability of Photometric Performance</u>						
Lamp Function : Passing Beam			Test Voltage : 13.2 V			
Headlamp Class : Class B			Test Distance : 25 m			
Requirement : ECE Reg. 113 Annex 4						
Tests Points		Requirement			Measurement	
		Min (cd)	Max (cd)	Discrepancy (%)	Sample C (cd)	Discrepancy (%)
Clean headlamp test before shall be operated for 12 hours						
Passing Beam	0.5U-1.5 L	-	700	-	94.4	-
	0.5U-1.5 R	-	700	-	98.1	-
	50 L	1100	-	-	3343.8	-
	50 R	1100	-	-	3187.5	-
Clean headlamp test after shall be operated for 12 hours						
Passing Beam	0.5U-1.5 L	-	700	-	93.1	-1.3 cd*
	0.5U-1.5 R	-	700	-	96.2	-1.9 cd*
	50 L	1100	-	10	3237.5	3.2
	50 R	1100	-	10	3050.0	4.3
Dirty headlamp test after shall be operated for 1 hour						
Passing Beam	0.5U-1.5 L	-	700	-	91.2	-1.9 cd*
	0.5U-1.5 R	-	700	-	95.0	-1.2 cd*
	50 L	1100	-	10	3118.7	3.7
	50 R	1100	-	10	2931.2	3.9
Test Results		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed				

\* The value measured at points 0.50U/1.5L and 0.50U/1.5R shall not exceed the photometric value measured prior to the test by more than 255 cd.



### Test Results for Stability of Photometric Performance

Lamp Function : Driving Beam Test Voltage : 13.2 V  
Headlamp Class : Class B Test Distance : 25 m  
Requirement : ECE Reg. 113 Annex 4

Tests Points		Requirement			Measurement	
		Min (cd)	Max (cd)	Discrepancy (%)	Sample C (cd)	Discrepancy (%)
Clean headlamp test before shall be operated for 12 hours						
Driving Beam	Point of I <sub>max</sub>	20000	215000	-	27187.5	-
Clean headlamp test after shall be operated for 12 hours						
Driving Beam	Point of I <sub>max</sub>	20000	215000	10	26875.0	1.1
Dirty headlamp test after shall be operated for 1 hour						
Driving Beam	Point of I <sub>max</sub>	20000	215000	10	26750.0	0.5
Test Results		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed				

### Test Results for Change in Vertical Position of the Cut – Off Line Under the Influence of Heat

Lamp Function : Passing Beam Test Voltage : 13.2 V  
Headlamp Class : Class B Test Distance : 25 m  
Requirement : ECE Reg. 113 Annex 4

Test Position of the cut-off line in its horizontal part	Requirement ( $\Delta r_1$ )	Measurement
	Max (mrad)	Sample C ( $\Delta r_1$ ) (mrad)
H-V	1.0	0.42
Test Results		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed

### **Test Results of Photometric for Resistance to Mechanical Deterioration of the Lens Surface**

Lamp Function : Passing Beam

Test Voltage : 13.2 V

Requirement : ECE Reg. 113 Annex 6

Test Distance : 25 m

Test Points	Requirement		Measurement
	Min (cd)	Max (cd)	Sample D (cd)
H - V	-	910	110.0
50L	990	-	1793.8
50R	990	-	1900.0
Test Results	<div> <div><input checked="" type="checkbox"/> Passed</div> <div><input type="checkbox"/> Failed</div> </div>		

### Test Results of Adherence of Coatings

Requirement : ECE Reg. 113 Annex 6

Test Requirement	There shall be no appreciable impairment of the gridded area. Impairments at the intersections between squares or at the edges of the cuts shall be permitted, provided that the impaired area does not exceed 15 % of the gridded surface.
Test Results	<input checked="checked" type="checkbox"/> Passed <input type="checkbox"/> Failed

## TEST RESULTS :

### Test Results of LED Modules for the Color Rendering and UV Radiation

Lamp Function : Passing Beam Test Voltage : 13.2 V  
Requirement : ECE Reg. 113 Annex 12 Test Distance : 316 mm

Requirement	Measurement
	Sample I
$K_{red} \geq 0.05$	0.083
$K_{UV} \leq 10^{-5}$ (W/lm)	$1.04 \times 10^{-6}$
Test Results	<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed

### Test Results of LED Modules for the Luminous Flux

Lamp Function : Passing Beam Test Voltage : 13.2 V  
Headlamp Class : Class B  
Requirement : ECE Reg. 113 Annex 12

Requirement		Measurement (lm)
Min	Max	Sample I
350	1000	371.6
Test Results		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed

(Null below)

### Test Results of LED Modules for the Color Rendering and UV Radiation

Lamp Function : Driving Beam Test Voltage : 13.2 V  
Requirement : ECE Reg. 113 Annex 12 Test Distance : 3.16 mm

Requirement	Measurement
	Sample I
$K_{red} \geq 0.05$	0.083
$K_{UV} \leq 10^{-5} \text{ (W/lm)}$	$3.9 \times 10^{-7}$
Test Results	<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed

### Test Results of LED Modules for the Luminous Flux

Lamp Function : Driving Beam Test Voltage : 13.2 V  
Requirement : ECE Reg. 113 Annex 12

Requirement		Measurement (lm)
Min	Max	Sample I
-	-	853.6

(Null below)



## COMBINATION HEADLAMP OF CATEGORY L

**FUAN 0348**

**Application: original**

**Date: November 22, 2016**

**Total number of pages: 5**

301

Manufacturer name and address :



Trade name or mark : FUAN

Type of device : 0348



## SPECIFICATIONS

Function-Application-class category lamp and colour

Trade name or mark		FUAN			
Function		Headlamp		Front <sup>(1)</sup> Position Lamp	Daytime <sup>(1)</sup> Running Lamp
		Passing Beam	Driving Beam		
ECE Regulation		113-01 Supplement 05	113-01 Supplement 05	50-00 Supplement 18	87-00 Supplement 17
Class		B	B	-	-
Category		-	-	-	-
Number, category and kind of lamp source(s)		1 LED module	1 LED module	1LED / 1 light source	1LED / 1 light source
The total objective luminous flux of all LED		12V / 371.6 lm	12V / 853.6 lm	-	-
Voltage and wattage		12V, 9W	12V, 19W	12V, 1W	12V, 8W
Lens	Outer	Clear	Clear	Clear	Clear
	Filter (Inner)	-	-	Clear	Clear
Colour of light emitted		White	White	White	White

<sup>(1)</sup> Front position lamp, which is reciprocally incorporated with daytime running lamp.

## THECNICAL DATA

Part		Material	Remark
Lens	Outer	PC	SABIC <sup>(2)</sup>
	Filter (Inner)	PMMA	-
Reflector		PC	-
Housing		STELL <sup>(3)</sup>	-

<sup>(2)</sup> The basis-material of lens: Type is PC, LEXAN LS2 from SABIC.

The coating: Type is JETCOAT, WIWH UV COATING from SHIE CHENG CHAI.

<sup>(3)</sup> There are two kinds of housing, one is electroplate silver and the other is black.

## MARKING

Marking		Location
Trade name or mark	FUAN	See drawing
Approval marks	0261	See drawing <sup>(4)(5)</sup>

<sup>(4)</sup> E6 approval marks for the specific identification code of LED module and marking required should be show in the attached drawing.

<sup>(5)</sup> One LED module for passing beam and driving beam.



DRAWINGS	
Reference	Version
FUAN 0348 PAGE 1/2	2017.01.17
FUAN 0348 PAGE 2/2	2017.01.17

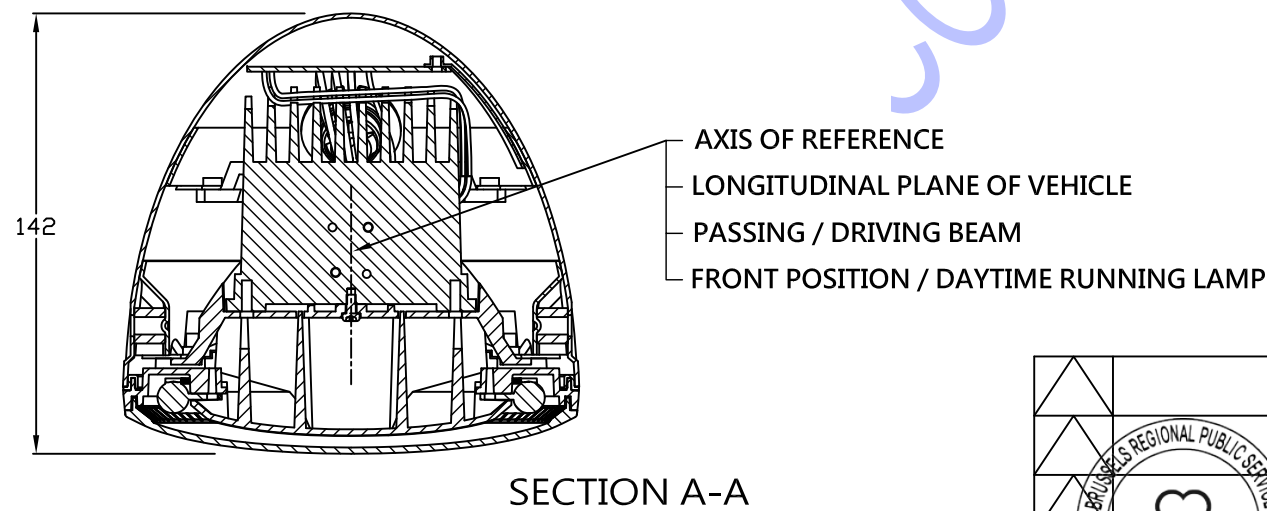
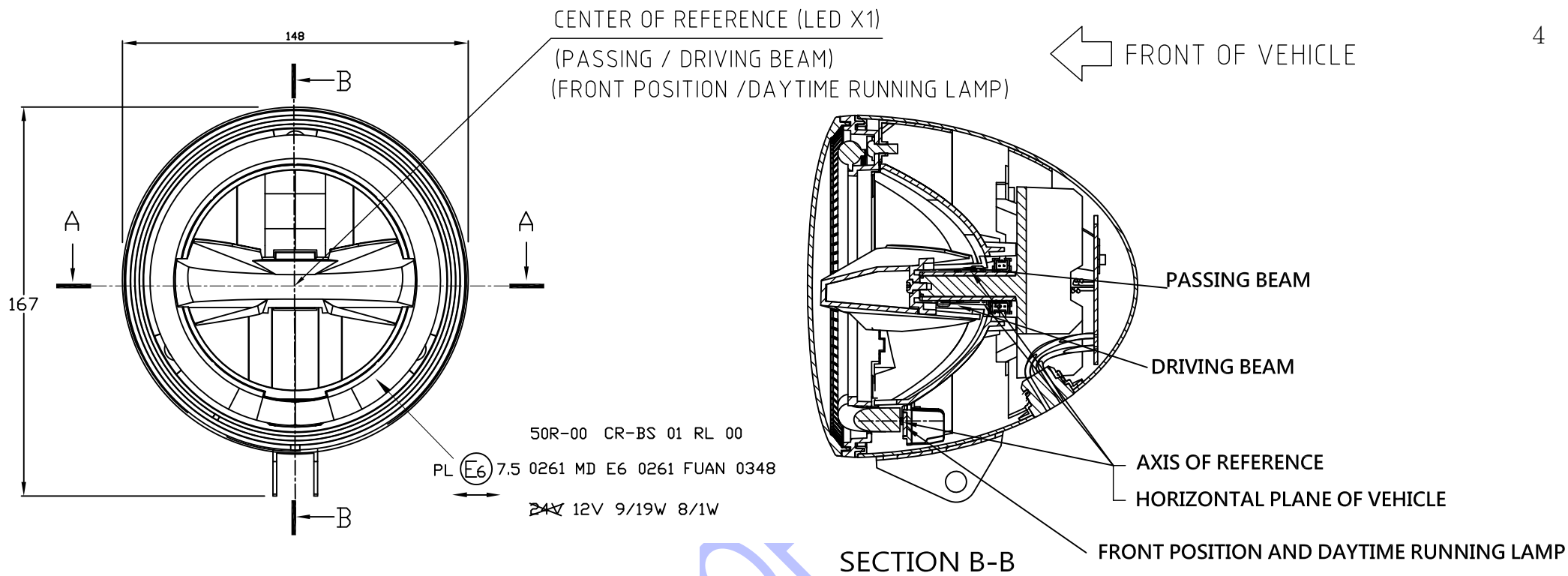
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301



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2017.02.23



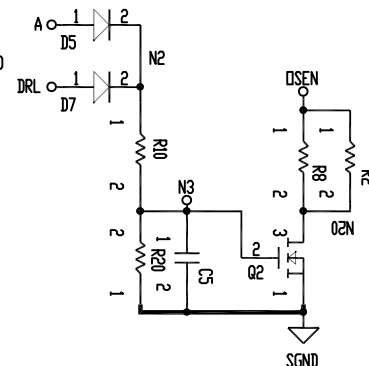
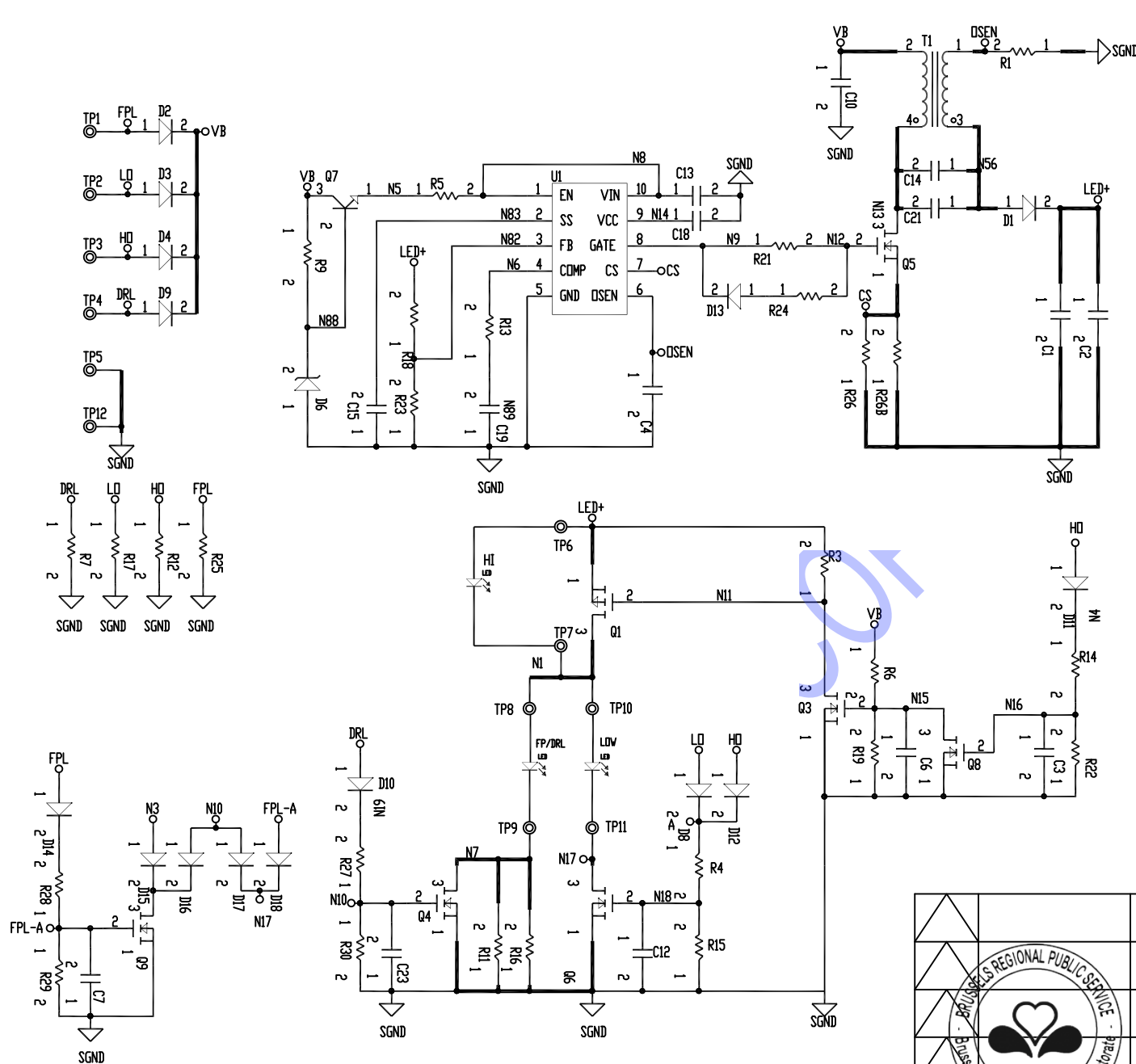


NOTE: 1. OUTER LENS IS FIXED TO THE HOUSING BY USING GLUE.  
2. ONE LED MODULE FOR PASSING BEAM (1 LED) AND  
DRIVING BEAM (1 LED)



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 2017.02.23

**PASSING / DRIVING BEAM**  
**FRONT POSITION / DAYTIME RUNNING BEAM**

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