RDW

Vehicle Technology Division

THE NETHERLANDS
(NEDERLAND)

E4

COMMUNICATION

Concerning: APPROVAL GRANTED
~~APPROVAL EXTENDED~~
~~APPROVAL REFUSED~~
~~APPROVAL WITHDRAWN~~
~~PRODUCTION DEFINITELY DISCONTINUED~~

of a type of device pursuant to Regulation No. 7

Approval No.: E4 - 7R - 02 10208 Extension No.: --

Approval mark:

R-S1
02
E4
10208

or

R-S1
02
E4
10208

1	Trade name or mark of the device	:	HELLA
2	Manufacturer's name for the type of device	:	2SB 959 821; 2SB 959 020
3	Manufacturer's name and address	:	Hella KG Hueck & Co. Rixbecker Straße 75 59552 Lippstadt Germany
4	If applicable, name and address of the manufacturer's representative	:	Sluyter B.V. Celsiusbaan 2 3430 BJ Nieuwegein The Netherlands
5	Submitted for approval on	:	16 June 2004
6	Technical service responsible for conducting approval tests	:	N.V. KEMA
7	Date of report issued by that service	:	8 July 2004

RDW

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Vehicle Approval and Information

Approval No.: E4 – 7R – 02 10208 Extension No.: --

8	Number of report issued by that service	:	2070616-QUA/LTL 04-103
9	Concise description:		
	By category of lamps	:	R-S1
	For mounting either outside ~~or inside or both~~		
	Colour of light emitted	:	Red/~~selective yellow/white~~
	Number and category of filament lamp(s)	:	For type 2SB 959 821: 1 LED 12V/2.5W or 1 LED 24V/2.5W For type 2SB 959 020: 24 LED's 24V/6W for the stoplamp 12 LED's 24V/1W for rear position lamp
	Special supply voltage	:	--
	Application of additional supply system	:	~~yes~~/no
	Specification of this supply system	:	--
	Switched power supply:		
	Duty cycle	:	--
	Peak to peak voltage and/or effective voltage	:	--
	Geometrical conditions of installation and relating variations if any	:	--
	Only for limited mounting height of equal to or less than 750 mm above the ground	:	~~yes~~/no
	Light source module	:	~~yes~~/no
	Light source module specific identification code	:	--
10	Position of the approval mark	:	See annexed drawings
11	Reason(s) for extension (if applicable)	:	--
12	Approval granted/~~refused/extended/withdrawn~~		
13	Place	:	Zoetermeer
14	Date	:	15 JULI 2004
15	Signature	:	ing. A.M. Boekestein RDW

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:

- 2 Drawings 2SB 959 821 dated 2004-06-01 and 2SB 959 020 dated 2004-06-01 (annexed).
- 2 Tables with the outlines of the illuminating surface table 2SB 959 821 dated 09.06.2004 and table 2SB 959 020 dated 09.06.2004 (annexed).
- Test report as mentioned in item 8

Hella New Zealand

Typbezeichnung: 2SB 959 821
Euro LED – Single LED

Gehört zur G. Nr.: 10208 E4 **Anbauanweisung Nr.:**

Schluss-Bremsleuchte für Kraftfahrzeuge.

Lichtquelle: **1 nicht austauschbare Leuchtdiode**

⌑ = **Bezugspunkt** nach den ECE-Regelung 7.

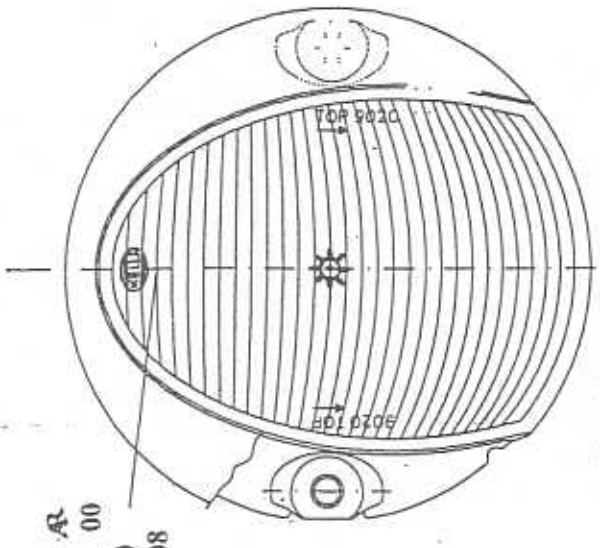
✧ = **Bezugspunkt** zur Bestimmung der Grenzen der leuchtenden Fläche nach 76/756 EWG bzw. ECE-Regelung Nr. 48. Markierung siehe auf der Abschluss-Scheibe. Maße siehe Anlage A.

Bezugsachse: Parallel zur Fahrzeuglängsachse und parallel zur Fahrbahn.

Rechtsanbau dargestellt. Der Linksanbau erfolgt 180° um die Bezugsachse gedreht.

Prüfspannung:	*Versorgungsspannung*	*Nennleistung*
13,5 bzw. 28 Volt	9 bis 33 Volt	2,5 Watt

Ansicht von vorn



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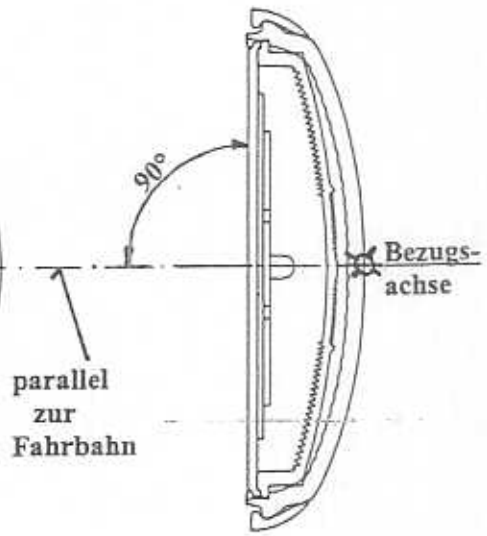
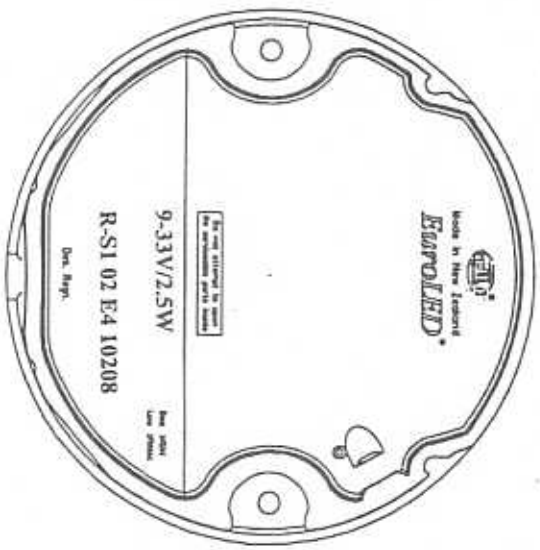


Ansicht von unten



RDW

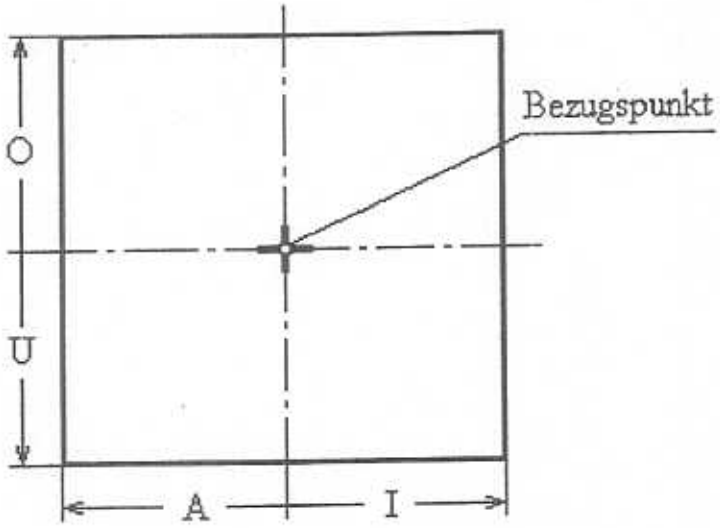
2004-06-01

Der An- bzw. Einbau der Geräte hat nach anliegenden An- bzw. Einbauunterlagen (z.B. Skizze und Anlage A) zu erfolgen.

Hella New Zealand	Typbezeichnung: 2SB 959 821	Anlage A

Gehört zur G. Nr.: **Einbauanweisung Nr.:**

Bestimmung der Grenzen der leuchtenden Fläche einer Leuchte gemäß den Richtlinien des Rates der Europäischen Gemeinschaften „**Anbau von Beleuchtungs- und Lichtsignaleinrichtung**“ nach 76/756/EWG bzw. ECE-Regelung Nr. 48, Absatz 2.9.2..



Gerätebezeichnung	Obere Grenze (O) mm	Untere Grenze (U) mm	Äußere Grenze (A) mm	Innere Grenze (I) mm
Bremsleuchte	20	32	38	38
Schlussleuchte	20	32	38	38

09.06.2004

RDW

KEMA

2070616-QUA/LTL 04-103

Approval testing of two versions of a LED rear combination of devices, marked HELLA type 2SB 959 821 and type 2SB 959 020.

Arnhem, 8 July 2004

Author G.C. Muda
QUA/LTL

By order of Hella Leuchten-Systeme GmbH in Paderborn, Germany

author : G.C. Muda		07-07-2004	reviewed : W van Laarhoven		07-07-2004
B	26 pages 4 annexes	GCM	approved : W van Laarhoven	(product manager)	07-07-2004

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Telephone +31 26 3 56 91 11. Telefax + 31 26 3 51 56 06.

CONTENTS

SUMMARY

The tested samples of the rear combination of devices marked Hella types 2SB 959 821 and 2SB 959 020 were found to comply with the requirements of ECE Regulation No. 7-02.

1 APPLICATION FOR APPROVAL TESTING

On 16 June 2004, Hella New Zealand, sent in through Hella Leuchten-Systeme GmbH, Paderborn in Germany, two samples of a rear combination of devices marked HELLA, type 2SB 959 821 and two samples of a rear combination of devices marked HELLA, type 2SB 959 020. The rear combination of devices consits of a rear position lamp reciprocally incorporated with a stoplamp.

- The type 2SB 959 821 is intended for use in combination with one non-replaceable Light Emitting Diode (1 LED). The design voltage is marked "9 - 33 V" and the device has been approved at a rated voltage of 12V and 24V. The rated wattage is 2.5 W.
- The type 2SB 959 020 is intended for use in combination with 24 non-replaceable Light Emitting Diodes (24 LED). All 24 LED's are in use for operating the stoplamp and only 12 LED's are in use for operating the rear position lamp. The rated voltage is 24 V, the rated wattage is 6W for the stoplamp using 24 LED's and 1W for the rear position lamp using 12 LED's.

The samples were accompanied by a brief technical description (Annex 1) and drawings (Annex 2), which are sufficiently detailed to permit identification of the models.

The samples were mounted on testfixtures simulating the mounting position on the vehicle.

The applicant desired an examination to check whether these types of rear combination of devices are in compliance with the requirements of the ECE Regulation No. 7-02.

2 EXAMINATION

The examination was carried out in accordance with the relevant clauses of the regulation concerned.

The photometric measurements were performed using a test voltage of 13.5 V or 28 V and taking into consideration the manufacturer's information concerning centre and axis of reference. The distance of measurement was 3.16 m and the diameter of the sensitive area of the receiver was 30 mm. The chromaticity co-ordinates of the light emitted were measured by means of a trichromatic colorimeter.

No measurements were performed on the rear combination of devices with 24 LED's (2SB 959 020) when 1 light source is failing, because an internal electrical circuit will compensate a possible failure, see the technical description in Annex 1.

3 RESULTS OF EXAMINATION

The results of the examination are summarised in Annex 3. Detailed results of the photometric tests on the rear combination of devices are presented in Annex 4 tables 1 up to 12 inclusive:

Table 1: Photometry rear position lamp (1 LED), left mounting, at a voltage of 13.5 V
Table 2: Photometry rear position lamp (1 LED), left mounting, at a voltage of 28.0 V
Table 3: Photometry rear position lamp (12 LED), left mounting, at a voltage of 28.0 V
Table 4: Photometry rear position lamp (1 LED), right mounting, at a voltage of 13.5 V
Table 5: Photometry rear position lamp (1 LED), right mounting, at a voltage of 28.0 V
Table 6: Photometry rear position lamp (12 LED), right mounting, at a voltage of 28.0 V

Table 7: Photometry stop lamp (1 LED), left mounting, at a voltage of 13.5 V
Table 8: Photometry stop lamp (1 LED), left mounting, at a voltage of 28.0 V
Table 9: Photometry stop lamp (24 LED), left mounting, at a voltage of 28.0 V
Table 10: Photometry stop lamp (1 LED), right mounting, at a voltage of 13.5 V
Table 11: Photometry stop lamp (1 LED), right mounting, at a voltage of 28.0 V
Table 12: Photometry stop lamp (24 LED), right mounting, at a voltage of 28.0 V

4 SUPPLEMENTARY REMARKS

The approval having been granted, the product shall bear, besides other markings prescribed, the approval mark as indicated below.

left side	right side
R-S1 02  10208	R-S1 02  10208

These markings must be indicated on the rear combinationof devices, in the space detailed in the drawings of Annex 2.

The vertical and horizontal outlines of the illuminating surfaces, in accordance with ECE Regulation No. 48-02, clause 2.9.2, and corresponding Council Directive 76/756/EEC (and 97/28/EEC), are shown in Annex 1 of this report.

Hella New Zealand Ltd.

Technische Beschreibung
für Gerät: 2SB 959 821

HLS-TLLTP Bö/PS
2004-06-16

Beantragte Funktion(en): Schluss- / Bremsleuchte

Form des Gerätes: Rund

Bemerkung: Ausführung mit einer LED

Beschreibung der Abschlußscheibe(n):

Funktion	Material	Farbe	Optisches System	Lampentyp
Schluss- / Bremsleuchte	Kunststoff	Gelb	Aussen: Senkrechte Prismen Innen: Fresnelscheibe	*

*1 nicht austauschbare LED 9 - 33V / 2,5W

Beschreibung der Reflexeinrichtung(en):-

Funktion	Art	Material	Optisch wirksame Fläche

Technische Merkmale:

Grundplatte, Material:	Kunststoff
Grundplatte, Oberfläche:	Unbehandelt
Platine, Material:	Kunststoff
Platine, Oberfläche:	Unbehandelt
Befestigungsart der Platine:	Wird mit der Grundplatte verschweißt
Abdichtung zwischen Abschluss-Scheibe und Gehäuse:	Teile sind verschweißt
Befestigungsart der Abschluss-Scheibe an der Grundplatte:	Teile sind verschweißt
Befestigungsart des Gerätes an der Karosserie:	Mit 2 Schrauben

Hella New Zealand Ltd.

Technische Beschreibung für Gerät: 2SB 959 020

HLS-TLLTP B6/PS
2004-06-16

Beantragte Funktion(en): Schluss- / Bremsleuchte

Form des Gerätes: Rund

Bemerkung: Ausführung mit einer 24 LEDs

Beschreibung der Abschluss-Scheibe(n):

Funktion	Material	Farbe	Optisches System	Lampentyp
Schluss- / Bremsleuchte	Kunststoff	Gelb	Vertikale Prismen	*

- *Schlussleuchte: 12 nicht auswechselbare LEDs 24V / 1W*
- *Bremsleuchte: 24 nicht auswechselbare LEDs 24V / 6 W*

Der Ausfall einer oder mehrerer LEDs wird durch eine eingebaute Schaltung kompensiert.

Beschreibung der Reflexeinrichtung(en):

Funktion	Art	Material	Optisch wirksame Fläche
-	-	-	-

Technische Merkmale:

Grundplatte, Material:	Kunststoff
Grundplatte, Oberfläche:	Unbehandelt
Platine, Material:	Kunststoff
Platine, Oberfläche:	Unbehandelt
Befestigungsart der Platine:	Wird mit der Grundplatte verschweißt
Abdichtung zwischen Abschluss-Scheibe und Gehäuse:	Teile sind verschweißt
Befestigungsart der Abschluss-Scheibe an der Grundplatte:	Teile sind verschweißt
Befestigungsart des Gerätes an der Karosserie:	Mit 2 Schrauben

Hella New Zealand Ltd.

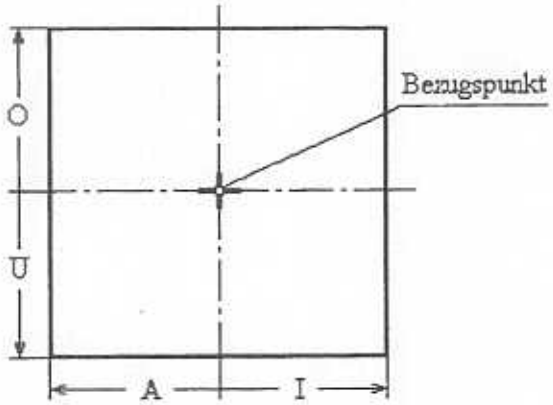
Blatt	2
Empfänger	KEMA
Unser Zeichen	HLS-TLLTP Bö/PS
59552 Lippstadt	16.06.2004
Betreff:	***Ausführungsformen für die Geräte Typ 2SB 959 020 / 2SB 959 821***

- Mit Befestigungsmitteln oder ohne solche,
- mit unterschiedlichen Mitteln zur Befestigung der Leuchte am Fahrzeug und zur Verbindung einzelner Leuchtenteile miteinander ohne Beeinträchtigung der Wirkung der Leuchte,
- mit geringfügig unterschiedlicher Ausbildung und Formgebung der lichttechnisch unwirksamen Leuchtenteile bei grundsätzlich gleicher Bauart,
- mit unterschiedlichen Kabelsätzen, -zuführungen und –anschlüssen,
- mit unterschiedlicher Oberflächenbehandlung und Farbe der lichttechnisch unwirksamen Leuchtenteile ohne Beeinträchtigung der Korrosionsbeständigkeit,
- mit einer Abschluss-Scheibe, bei der die Übergänge zwischen den Zonen unterschiedlicher Profilierung unbedeutende Unterschiede aufweisen,
- mit unterschiedlichen Leuchtdioden jedoch gleicher optischer Wirkung,
- mit unterschiedlichem metallischen Werkstoff für die lichttechnisch nicht wirksamen Teile bei gleicher Güte,
- mit unterschiedlicher Kontaktgebung
- mit in Form, Farbe und Werkstoff unterschiedlicher Dichtung gleicher Güte und Wirkung,
- mit zusätzlicher und unterschiedlicher Anbringung ausländischer Zulassungszeichen und fremder Firmenzeichen ohne Beeinträchtigung der lichttechnischen Wirkung,
- mit unterschiedlich eingefärbten Gehäusen

Hella New Zealand	Typbezeichnung: 2SB 959 821	Anlage A

Gehört zur G. Nr.: **Einbauanweisung Nr.:**

Bestimmung der Grenzen der leuchtenden Fläche einer Leuchte gemäß den Richtlinien des Rates der Europäischen Gemeinschaften **„Anbau von Beleuchtungs- und Lichtsignaleinrichtung"** nach 76/756/EWG bzw. ECE-Regelung Nr. 48, Absatz 2.9.2..



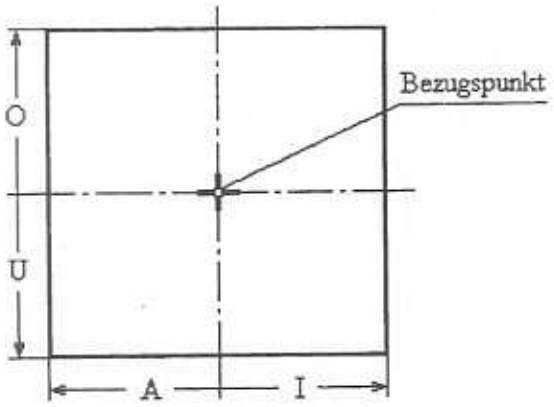
Gerätebezeichnung	Obere Grenze (O) mm	Untere Grenze (U) mm	Äußere Grenze (A) mm	Innere Grenze (I) mm
Bremsleuchte	20	32	38	38
Schlussleuchte	20	32	38	38

09.06.2004

Hella New Zealand	Typbezeichnung: 2SB 959 020	Anlage A

Gehört zur G. Nr.: **Einbauanweisung Nr.:**

Bestimmung der Grenzen der leuchtenden Fläche einer Leuchte gemäß den Richtlinien des Rates der Europäischen Gemeinschaften „**Anbau von Beleuchtungs- und Lichtsignaleinrichtung**“ nach 76/756/EWG bzw. ECE-Regelung Nr. 48, Absatz 2.9.2..



Gerätebezeichnung	Obere Grenze (O) mm	Untere Grenze (U) mm	Äußere Grenze (A) mm	Innere Grenze (I) mm
Bremsleuchte	34	34	43	49
Schlussleuchte	20	20	43	31

09.06.2004

Hella New Zealand	Typbezeichnung: 2SB 959 821 Euro LED – Single LED	

Gehört zur G. Nr.: 10208 E4 **Anbauanweisung Nr.:**

Schluss-Bremsleuchte für Kraftfahrzeuge.

Lichtquelle: **1 nicht austauschbare Leuchtdiode**

⌑ = **Bezugspunkt** nach den ECE-Regelung 7.

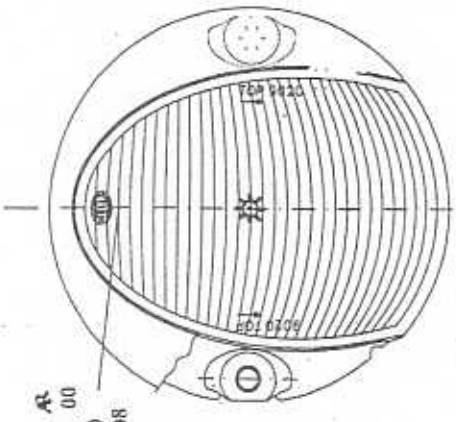
◈ = **Bezugspunkt** zur Bestimmung der Grenzen der leuchtenden Fläche nach 76/756 EWG bzw. ECE-Regelung Nr. 48. Markierung siehe auf der Abschluss-Scheibe. Maße siehe Anlage A.

Bezugsachse: Parallel zur Fahrzeuglängsachse und parallel zur Fahrbahn.

Rechtsanbau dargestellt. Der Linksanbau erfolgt 180° um die Bezugsachse gedreht.

Prüfspannung:	*Versorgungsspannung*	*Nennleistung*
13,5 bzw. 28 Volt	9 bis 33 Volt	2,5 Watt

Ansicht von vorn



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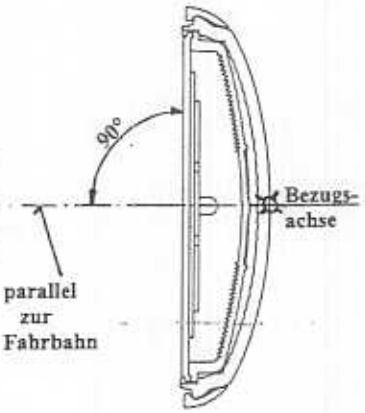


Ansicht von unten

2004-06-01

Der An- bzw. Einbau der Geräte hat nach anliegenden An- bzw. Einbauunterlagen (z.B. Skizze und Anlage A) zu erfolgen.

Hella New Zealand	Typbezeichnung: 2SB 959 020 Euro LED – 12 LED / 24 LED	

Gehört zur G. Nr.: 10208 E4 **Anbauanweisung Nr.:**

Schluss-Bremsleuchte für Kraftfahrzeuge.

Lichtquellen:

Schlussleuchte: ***12 nicht austauschbare Leuchtdioden.***

Bremsleuchte: ***24 nicht austauschbare Leuchtdioden.***

⌑ = ***Bezugspunkt*** nach den ECE-Regelung 7.

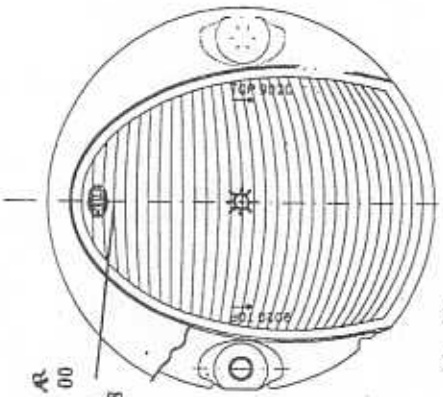
✧ = ***Bezugspunkt*** zur Bestimmung der Grenzen der leuchtenden Fläche nach 76/756 EWG bzw. ECE-Regelung Nr. 48. Markierung siehe auf der Abschluss-Scheibe. Maße siehe Anlage A.

Bezugsachse: Parallel zur Fahrzeuglängsachse und parallel zur Fahrbahn.

Rechtsanbau dargestellt. Der Linksanbau erfolgt 180° um die Bezugsachse gedreht.

Prüfspannung:	*Nennspannung*	*Nennleistung*
28 Volt	24 Volt	6 Watt

Ansicht von vorn



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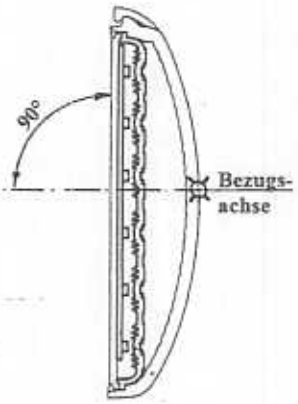

Ansicht von unten

2004-06-01

Der An- bzw. Einbau der Geräte hat nach anliegenden An- bzw. Einbauunterlagen (z.B. Skizze und Anlage A) zu erfolgen.

Examination of the rear combination of devices marked Hella type 2SB 959 821 and 2SB 959 020 carried out according to the relevant clauses of Regulation No. 7-02.

Clause No.	Subject of the relevant clause	Judgement of the device	Remark
3	Markings:		
	a trade name or mark	complies	
	b indication of the recommended lamp type	complies	
	c space reserved for the approval mark, including number and symbol	complies	
5	General specifications:		
	a intensity and colour of the light emitted	complies	see below under 6 and 8
	b maintenance of satisfactory operation and of photometric characteristics	complies	by visual inspection only
6	Intensity of the light emitted	complies	1) 2)
8	Colour of the light emitted	complies	

1) See also the photometric tables 1 up to 12 inclusive of Annex 4. For type 2SB 959 821 the ratio between the luminous intensities of the stop lamp and the rear position lamp was 10 for sample LM and 11 for sample RM (required ratio: more than 5). For type 2SB 959 020 this ratio was 19 for sample LM and 18 for sample RM.

2) The LED's are connected in series and therefore considered to be one light source.

KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t1 LM

Date 01. Jul 2004
Time 12:45:25
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 1
- Rear position lamp rpi. type no. 2SB 959 821
- Single LED measured at 13.5 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Rear position lamp reciprocally incorporated with a stoplamp "LM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.42**		**2.49**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.81**	**4.82**		**6.34**		**5.62**	**3.10**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**8.34**	**10.73**	**11.36**	**11.82**	**10.99**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**4.06**	**6.99**		**9.31**		**7.44**	**4.12**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**3.89**		**4.21**		
max			60.00		60.00		

Maximum above 5° down level **12** cd at H 5.43 V -0.85
Max. Limit 12 cd
Maximum under 5° down level **9.31** cd at H 0.00 V -5.00
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
D15,L45-R80	min	80.00	-15.00	0.05		**0.07**	cd

Pass

KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t2 LM

Date 01. Jul 2004
Time 14:14:45
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
Page 1

- Table 2
- Rear position lamp rpi. type no. 2SB 959 821
- Single LED measured at 28.0 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

ECE Reg 7 "Rear position lamp RPI with a stoplamp" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.43**		**2.50**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.77**	**4.76**		**6.28**		**5.57**	**3.08**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**8.14**	**10.48**	**11.16**	**11.64**	**10.84**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**4.00**	**6.85**		**9.13**		**7.26**	**4.03**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**3.87**		**4.16**		
max			60.00		60.00		

Maximum above 5° down level **12** cd at H 5.52 V -0.85
Max. Limit 12 cd
Maximum under 5° down level **9.51** cd at H -2.07 V -5.00
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
D15,L45-R80	min	80.00	-15.00	0.05		**0.07**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t3 LM

Date 02. Jul 2004
Time 15:44:20
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 3
- Rear position lamp rpi. type no. 2SB 959 020
- 24 LED's measured at 28.0 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Rear position lamp reciprocally incorporated with a stoplamp "LM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**1.31**		**1.45**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**1.52**	**2.71**		**3.59**		**2.69**	**1.63**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**3.88**	**4.86**	**5.49**	**5.23**	**4.23**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**2.04**	**3.44**		**4.58**		**3.68**	**2.09**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**2.54**		**2.49**		
max			60.00		60.00		

Maximum above 5° down level **6.49** cd at H -2.04 V -1.65
Max. Limit 12.00 cd
Maximum under 5° down level **4.58** cd at H -0.10 V -5.00
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
D15,L45-R80	min	80.00	-15.00	0.05		**0.16**	cd

Pass

KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t4 RM

Date 02. Jul 2004
Time 11:00:53
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 4
- Rear position lamp rpi. type no. 2SB 959 821
- Single LED measured at 13.5 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Rear position lamp reciprocally incorporated with a stoplamp "RM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.34**		**2.27**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.36**	**4.81**		**6.23**		**6.08**	**3.25**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**8.10**	**9.70**	**10.00**	**8.87**	**8.09**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**2.19**	**4.21**		**4.79**		**4.27**	**2.22**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**1.98**		**1.82**		
max			60.00		60.00		

Maximum above 5° down level **10.42** cd at H -1.04 V 0.46
Max. Limit 12.00 cd
Maximum under 5° down level **4.83** cd at H 4.86 V -5.02
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
U15-D15,L80	min	-80.00	-15.00	0.05		**0.06**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t5 RM

Date 02. Jul 2004
Time 11:26:54
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
- Table 5
- Rear position lamp rpi. type no. 2SB 959 821
- Single LED measured at 28.0 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Page 1

Rear position lamp reciprocally incorporated with a stoplamp "RM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.34**		**2.26**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.36**	**4.81**		**6.21**		**6.07**	**3.25**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**8.10**	**9.70**	**10.00**	**8.86**	**8.08**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**2.18**	**4.19**		**4.76**		**4.26**	**2.21**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**1.97**		**1.81**		
max			60.00		60.00		

Maximum above 5° down level **10.41** cd at H -0.93 V 0.62
Max. Limit 12.00 cd
Maximum under 5° down level **4.82** cd at H 4.70 V -5.02
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
U15-D15,L80	min	-80.00	15.00	0.05		**0.06**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t6 RM

Date 02. Jul 2004
Time 13:58:55
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 6
- Rear position lamp RPI type no. 2SB 959 020
-24 LED's measured at 28.0 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Rear position lamp reciprocally incorporated with a stoplamp "RM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.55**		**2.73**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.06**	**3.47**		**5.60**		**3.81**	**2.24**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**3.84**	**4.81**	**5.39**	**5.29**	**4.21**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**1.51**	**2.46**		**3.68**		**2.98**	**1.78**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**1.40**		**1.34**		
max			60.00		60.00		

Maximum above 5° down level **6.83** cd at H 1.81 V 2.78
Max. Limit 12.00 cd
Maximum under 5° down level **3.72** cd at H 2.19 V -5.05
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
D15,L80-R45	min	-80.00	-15.00	0.05		**0.17**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t7 LM

Date 01. Jul 2004
Time 15:58:38
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 7
- Stoplamp type No. 2SB 959 821
- Single LED measured at 13.5 V
- The stoplamp complies after 1 min. and after 30 min. of operation

Stop lamp (S1) Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			12.00		12.00		
10.0			**25.20**		**26.00**		
max			185.00		185.00		
min	6.00	12.00		42.00		12.00	6.00
5.0	**28.80**	**49.50**		**65.30**		**57.60**	**31.90**
max	185.00	185.00		185.00		185.00	185.00
min		21.00	54.00	60.00	54.00	21.00	
0.0		**83.90**	**108.30**	**116.00**	**121.10**	**112.60**	
max		185.00	185.00	185.00	185.00	185.00	
min	6.00	12.00		42.00		12.00	6.00
-5.0	**41.50**	**71.30**		**95.10**		**75.10**	**41.80**
max	185.00	185.00		185.00		185.00	185.00
min			12.00		12.00		
-10.0			**40.40**		**43.40**		
max			185.00		185.00		

Maximum overall **129.70** cd at H 5.63 V -0.83
Max. Limit 185.00 cd

Minimum overall

		H	V	MIN	MAX	SAMPLE	
U15-D15,L45	min	-45.00	-15.00	0.30		**2.39**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t8 LM

Date 01. Jul 2004
Time 17:23:46
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 8
- Stop lamp type no. 2SB 959 821
- Single LED measured at 28.0 V
- The stoplamp complies after 1 min. and after 30 min. of operation

Stop lamp (S1) Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			12.00		12.00		
10.0			**23.70**		**24.60**		
max			185.00		185.00		
min	6.00	12.00		42.00		12.00	6.00
5.0	**27.10**	**46.70**		**61.70**		**54.00**	**30.00**
max	185.00	185.00		185.00		185.00	185.00
min		21.00	54.00	60.00	54.00	21.00	
0.0		**78.50**	**101.80**	**109.80**	**114.70**	**106.60**	
max		185.00	185.00	185.00	185.00	185.00	
min	6.00	12.00		42.00		12.00	6.00
-5.0	**38.90**	**66.80**		**89.20**		**70.00**	**39.10**
max	185.00	185.00		185.00		185.00	185.00
min			12.00		12.00		
-10.0			**37.80**		**40.70**		
max			185.00		185.00		

Maximum overall **123.50** cd at H 5.60 V -0.77
Max. Limit 185.00 cd

Minimum overall

		H	V	MIN	MAX	SAMPLE	
U15-D15,L45	min	-45.00	-15.00	0.30		**2.31**	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t9 LM

Date 02. Jul 2004
Time 16:27:42
Department QUA/LTL
Name G.C. Muda

Mounting : LM
Project : 2070616-QUA/LTL 04-103
- Table 9
- Stoplamp type no. 2SB 959 020
- 24 LED's measured at 28.0 V
- The stoplamp complies after 1 min. and after 30 min. of operation

Page 1

Stop lamp (S1) Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			12.00		12.00		
10.0			**24.20**		**27.50**		
max			185.00		185.00		
min	6.00	12.00		42.00		12.00	6.00
5.0	**30.20**	**52.20**		**68.40**		**52.60**	**33.30**
max	185.00	185.00		185.00		185.00	185.00
min		21.00	54.00	60.00	54.00	21.00	
0.0		**80.90**	**108.20**	**123.70**	**104.10**	**75.90**	
max		185.00	185.00	185.00	185.00	185.00	
min	6.00	12.00		42.00		12.00	6.00
-5.0	**37.60**	**70.30**		**95.40**		**73.50**	**38.60**
max	185.00	185.00		185.00		185.00	185.00
min			12.00		12.00		
-10.0			**47.20**		**45.50**		
max			185.00		185.00		

Maximum overall **146.10** cd at H -0.92 V -1.78
Max. Limit 185.00 cd

Minimum overall

		H	V	MIN	MAX	SAMPLE	
U15-D15,L45	min	-45.00	-15.00	0.30		3.93	cd

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KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t10 RM

Date 02. Jul 2004
Time 09:23:28
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 10
- Stoplamp type no. 2SB 959 821
- Single LED measured at 13.5 V
- The stoplamp complies after 1 min. and after 30 min. of operation

Stop lamp (S1) Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			12.00		12.00		
10.0			**24.90**		**24.00**		
max			185.00		185.00		
min	6.00	12.00		42.00		12.00	6.00
5.0	**25.30**	**51.50**		**66.40**		**65.20**	**34.90**
max	185.00	185.00		185.00		185.00	185.00
min		21.00	54.00	60.00	54.00	21.00	
0.0		**87.60**	**105.40**	**108.90**	**95.90**	**87.20**	
max		185.00	185.00	185.00	185.00	185.00	
min	6.00	12.00		42.00		12.00	6.00
-5.0	**23.27**	**44.60**		**50.40**		**45.40**	**23.50**
max	185.00	185.00		185.00		185.00	185.00
min			12.00		12.00		
-10.0			**20.95**		**19.29**		
max			185.00		185.00		

Maximum overall **114.10** cd at H -0.91 V 0.56
Max. Limit 185.00 cd

Minimum overall

		H	V	MIN	MAX	SAMPLE	
D15,L45-R45	min	45.00	-15.00	0.30		**1.62**	cd

Pass

KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t5 RM

Date 02. Jul 2004
Time 11:26:54
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
Page 1

- Table 5
- Rear position lamp rpi. type no. 2SB 959 821
- Single LED measured at 28.0 V
- The rear position lamp complies after 1 min. and after 30 min. of operation

Rear position lamp reciprocally incorporated with a stoplamp "RM" Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			0.80		0.80		
10.0			**2.34**		**2.26**		
max			12.00		12.00		
min	0.40	0.80		2.80		0.80	0.40
5.0	**2.36**	**4.81**		**6.21**		**6.07**	**3.25**
max	12.00	12.00		12.00		12.00	12.00
min		1.40	3.60	4.00	3.60	1.40	
0.0		**8.10**	**9.70**	**10.00**	**8.86**	**8.08**	
max		12.00	12.00	12.00	12.00	12.00	
min	0.40	0.80		2.80		0.80	0.40
-5.0	**2.18**	**4.19**		**4.76**		**4.26**	**2.21**
max	12.00	12.00		12.00		12.00	12.00
min			0.80		0.80		
-10.0			**1.97**		**1.81**		
max			60.00		60.00		

Maximum above 5° down level **10.41** cd at H -0.93 V 0.62
Max. Limit 12.00 cd
Maximum under 5° down level **4.82** cd at H 4.70 V -5.02
Max. Limit 60.00 cd

Overall minimum

		H	V	MIN	MAX	SAMPLE	
U15-D15,L80	min	-80.00	15.00	0.05		**0.06**	cd

Pass

KEMA Quality B.V.

Photometric Test Report
According to ECE Reg. No. 7-02
Hella Leuchten Systeme GmbH. t12 RM

Date 02. Jul 2004
Time 14:43:42
Department QUA/LTL
Name G.C. Muda

Mounting : RM
Project : 2070616-QUA/LTL 04-103
Page 1
- Table 12
- Stoplamp type No. 2SB 959 020
-24 LED's measured at 28.0 V
- The stoplamp complies after 1 min. and after 30 min. of operation

Stop lamp (S1) Table

Unit : cd

deg	-20.0	-10.0	-5.0	0.0	5.0	10.0	20.0
min			12.00		12.00		
10.0			**44.30**		**47.10**		
max			185.00		185.00		
min	6.00	12.00		42.00		12.00	6.00
5.0	**34.50**	**63.40**		**106.20**		**73.20**	**42.00**
max	185.00	185.00		185.00		185.00	185.00
min		21.00	54.00	60.00	54.00	21.00	
0.0		**70.10**	**96.30**	**120.70**	**120.90**	**96.20**	
max		185.00	185.00	185.00	185.00	185.00	
min	6.00	12.00		42.00		12.00	6.00
-5.0	**32.10**	**51.60**		**70.00**		**57.00**	**36.30**
max	185.00	185.00		185.00		185.00	185.00
min			12.00		12.00		
-10.0			**28.70**		**27.20**		
max			185.00		185.00		

Maximum overall **139.30** cd at H 2.72 V 2.12
Max. Limit 185.00 cd

Minimum overall

		H	V	MIN	MAX	SAMPLE	
D15,L45-R45	min	45.00	-15.00	0.30		3.83	cd

Pass