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# Technical Component Requirement Specifications

## Rear lamp

Design versions: A,C 217 facelift OLED  
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	Technical Component Requirement Specifications Rear lamp  QEVI11AGEGLV	

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# 1

## Introduction (STLH-5)

STLH-8

These component requirement specifications (KLH) describe the requirements of Daimler AG (in the following referred to as the "client") for the provision of services within the framework of the development or series production of component parts, modules, software or components (all referred to as the "component" or the "scope of supply" in the following) by the supplier (referred to as the "contractor" in the following).

### 1.1

#### Documents Landscape (STLH-4636)

STLH-1984

Together with all other documents referenced here, these requirement specifications form the basis of the scope of supply to be provided by the contractor.

HL-3352

**The German-language version of these requirement specifications shall be the sole binding version. Other language versions of the requirement specifications that are made available to suppliers shall not be binding.**

STLH-5472

*References to other documents are shown in square brackets, e.g. [LHV 310 00x]. Documents referenced this way are to be found in Chapter "Other Applicable Documents" (see DOORS ID STLH-319). The download options using the DocMaster system are also described there.*

#### 1.1.1

##### Document Creation with DOORS (STLH-4648)

STLH-4649

*This document was generated from a database (DOORS). Maintenance and updating of this document is performed in this database.*

STLH-4650

*In order to uniquely identify document contents, the database assigns identifiers (IDs). The following forms of the identifier can appear in the document depending on the formatting used:*

- *ID on the left, text on the right (requirement)*
- *ID below the text (requirement)*
- *ID in brackets following a heading*

STLH-4651

*The requirements contained in this document may be acquired by the contractor as a DOORS export.*

#### 1.1.2

##### Common Requirements (STLH-4639)

STLH-4708

The document "Common Requirements Pertaining to the Component Requirement Specifications" [LHV 310 00x] contains requirements that are valid for all client services.

STLH-4387

In the case of deviations between the provisions of the requirement specifications and those in the Common Requirements [LHV 310 00x], the provisions described in the requirement specifications shall apply.

STLH-5456

Chapters or requirements in the Common Requirements [LHV 310 00x] are referenced not by chapter number, but by the corresponding requirement ID, e.g. "Scheduling in the Project" CRQ-162.

STLH-5540

*The common requirements are available in versions containing different scopes, for example with or without E/E requirements. In such a case, the final digit of the document numbers differs (placeholder "x" in [LHV 310 00x]).*

- *LHV 310 001 = E/E + Software + Mechanical Scopes*

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- LHV 310 002 = Software Scopes Only
- LHV 310 003 = Mechanical Scopes Only

*The documents can be found in the DocMaster system using these document numbers.*

STLH-5545

*Section CRQ-3149 of the Common Requirements contains the essential changes made to the various versions of the standard component requirement specifications template. This overview is for information only to facilitate orientation in the document. It does not release the contractor from the duty to undertake a detailed examination of the requirements with regard to any changes.*

### 1.1.3

#### **Logistics Component Requirement Specifications** (STLH-259)

STLH-260

*For each parts family, the contractor is provided with a logistics concept by the client's purchasing agent. This concept is specific to the particular component part, contractor and delivery location.*

STLH-261

The contractor shall fulfill the requirements pertaining to the logistics concept as described in the separate Logistics KLH.

STLH-3773

As regards the general logistics requirements, the contractor shall comply with the requirements given in the Chapter "Logistics" of the Common Requirements [LHV 310 00x] under Requirement ID CRQ-2498.

STLH-4643

*The Logistics KLH documents can be obtained by the contractor via the "Source Package" system.*

### 1.1.4

#### **Excerpt from the Process Master Plan for Suppliers** (STLH-4640)

STLH-4641

*The document "Excerpt from the Process Master Plan for Suppliers" contains the most important skeleton schedule dates of the leading model series project for this scope of supply.*

STLH-4642

*The contractor can obtain the "Excerpt from the Process Master Plan for Suppliers" via the "Source Package" system.*

### 1.1.5

#### **Other Documents Pertaining to these Requirement Specifications** (STLH-4644)

STLH-9

These requirement specifications and the other documents cited refer to various types of document, such as e.g.:

- Implementation regulations (AVs)
- Function specifications (FVs)
- Drawings
- Standards and plant standards (MBNs)
- Supply specifications (DBLs)
- Legislation
- Other component-specific specification documents

These types of document are referred to in the following as "Other Applicable Documents" (MGUs) pertaining to the requirement specifications and to the other cited documents.

STLH-4645

The documents referenced in Chapter "Other Applicable Documents" supplement the requirements described in the present document. The requirements set forth in these documents are hence likewise binding in the development of the scope of supply.

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STLH-4646

If the present requirement specifications or the Common Requirements contain more stringent or less stringent specifications than are found in the Other Applicable Documents, the specifications contained in the requirement specifications and/or Common Requirements shall apply.

## 1.2

### General Specifications (STLH-4652)

STLH-13

The contractor shall treat all information and documents pertaining to development as confidential.

STLH-2666

If the cited documents do not define requirements or define these differently, and these requirements are required for the flawless and unimpeded function and quality of the scope of supply, then the contractor shall reveal this to the client in writing.

STLH-10

If in the course of performance the contractor wishes to deviate from the requirements described in the cited documents, the contractor shall require the written consent of the client.

STLH-2667

If the contractor is familiar with quality or reliability-enhancing or cost-reducing alternatives to the content of the cited documents, the contractor shall reveal these alternatives to the client in writing.

STLH-2670

The contractor shall critically analyze the client's proposals and specifications and, if necessary, shall jointly develop improved solutions (shared responsibility).

STLH-4653

The contractor shall ensure that the scope of supply meets all the requirements set forth in the requirement specifications. In particular, the contractor shall ensure that the planned tests and checks are suited to and sufficient for the development and delivery of a specification-compliant scope of supply, even in such cases where the type or number of tests and checks is proposed by the client. Should the contractor deem further tests and checks to be necessary, the contractor shall notify the client of this without delay and take appropriate action. Neither the performance of tests and checks by the contractor or client nor compliance with such tests and checks shall ever relieve the contractor of the obligation to fulfill the requirements of the requirement specifications. The contractor shall document fulfillment of the requirements in writing by means of test plans and reports.

STLH-5510

The client is at all times authorized to demand changes and additions to the project description.

STLH-5511

The contractor is obliged to propose to the client technical changes that the contractor deems necessary or practical. The contractor shall implement these changes after receiving the written approval of the client.

STLH-5512

The contractor may reject changes or additions if these are deemed unreasonable and provided that notice of such rejection is immediately submitted to the client. The reasons for deeming them unreasonable shall be presented in writing.

STLH-5513

To the extent that changes affect costs and/or deadlines, the contractor shall immediately upon receipt of the demand for changes or additions, or together with the contractor's proposal for changes, submit a cost estimate to the client with an itemized and justified listing of higher or lower costs as well as information on how deadlines may change. In such cases, the contractor shall not implement changes and additions until the parties to the contract have reached written agreement on cost reductions or increases and on deadline changes. Where extra costs are involved, the written order to implement the changes may only be issued through the client's material supply process.

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- STLH-2672 When designing the component parts, the contractor shall take all boundary conditions given by the overall vehicle into consideration. This refers in particular to space requirement investigations and associated tolerance considerations, assembly, feasibility of assembly, ease of servicing, visual matching with trim parts (inside and outside), environmental compatibility, country variants and the use of modular systems.
- STLH-2674 To meet the customer's demand for functionality and quality at the lowest possible cost, the contractor should submit its own proposals, stating the risks and potential benefits.
- STLH-12 The contractor shall select all component elements and suppliers in such a way that life cycle support is ensured for 15 years following the end of series production.
- STLH-2682 The client reserves the right to use the scope of supply in other vehicle/engine model series as well.*
- STLH-2680 The contractor shall not make changes to the scope of supply that limit the use of the scope of supply in the vehicle/engine model series.
- STLH-5493 Changes made by suppliers of parts to both the contractor and the client shall be agreed between the client and the general contractor. They will be prioritized by the client.
- STLH-79 The contractor shall coordinate the market-specific start-up curves with the market launch deadline in detail with the client.
- STLH-2671 Throughout the entire development period, the contractor shall analyze and reveal weight-reducing measures.
- STLH-776 Weight figures shall be broken down by the contractor on the basis of the parts list. They serve as the basis for future optimizations and the documentation thereof. Note that the component parts/item numbers at interfaces to adjacent modules are to be given full consideration.
- STLH-4549 The contractor shall reveal the weight reduction potential and any additional costs of the lightweight solution versus the conventional manufacturing process to the client.

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## 2 Scope of Supply (STLH-3972)

### 2.1 Component-Specific Requirements (STLH-4735)

#### 2.1.1 Short Description and Development Scope (STLH-2675)

STLH-2676 The component described in these Requirement Specifications is referred to as "rear lamp" or sidewall lamp and trunk lid lamp.

STLH-2677 "*TL and SWL/TLL*" has been defined as the mandatory abbreviation for the component.

#### 2.1.2 Project Specifications (STLH-3)

##### 2.1.2.1 Assignment of the Component to the Vehicle/Engine Model Series (STLH-69)

###### 2.1.2.1.1 Assignment (STLH-70)

STLH-74 The use of the component described in these requirement specifications is planned for "A/C 217 facelift".

###### 2.1.2.1.2 Market Launch (STLH-75)

STLH-78 A distinction is made between a "USA/Canada" version of the component described, an ECE/"Rest of World" version and an ECE/LV version.

###### 2.1.2.2 Part ID Number (STLH-389)

STLH-394 The following part ID number is defined:

###### Mercedes-Benz part ID no.: A2179067900

Designation: ZB rear lamp LH ECE

Quantity: 1

###### Mercedes-Benz part ID no.: A2179068000

Designation: ZB rear lamp RH ECE

Quantity: 1

###### Mercedes-Benz part ID no.: A2179068100

Designation: ZB rear lamp LH SAE

Quantity: 1

###### Mercedes-Benz part ID no.: A2179068200

Designation: ZB rear lamp RH SAE

Quantity: 1

###### Mercedes-Benz part ID no.: A2179068300

Designation: ZB rear lamp combination LH trunk lid SAE

Quantity: 1

###### Mercedes-Benz part ID no.: A2179068400

Designation: ZB rear lamp combination RH trunk lid SAE

Quantity: 1

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	Technical Component Requirement Specifications Rear lamp QEVI11AGEGLV	

HL-5563	<b>Mercedes-Benz part ID no.: A2179068500</b> Designation: ZB rear lamp combination LH trunk lid Quantity: 1
HL-5564	<b>Mercedes-Benz part ID no.: A2179068600</b> Designation: ZB rear lamp combination RH trunk lid Quantity: 1
HL-5565	<b>Mercedes-Benz part ID no.: A2179068700</b> Designation: ZB rear lamp combination LH LV trunk lid Quantity: 1
HL-5566	<b>Mercedes-Benz part ID no.: A2179068800</b> Designation: ZB rear lamp combination RH LV trunk lid Quantity: 1
<b>2.1.2.3</b>	<b>Variants to be Offered</b> (STLH-836)
<b>2.1.2.4</b>	<b>Installation Location in the Vehicle</b> (STLH-428)  <i>The component is installed "in the rear end" (sidewall and trunk lid).</i>
<b>2.1.3</b>	<b>System Context</b> (STLH-3970)  <i>This chapter is not relevant for this component.</i>
<b>2.1.4</b>	<b>Functions</b> (STLH-435)
<b>2.1.4.1</b>	<b>Event Data Recorder</b> (STLH-2263)  STLH-2264 This component shall not have event data recorder (EDR) functionality. In control units without event data recorder (EDR) functionality, dynamic vehicle data with time reference to a crash event shall not be stored in a non-volatile memory.
<b>2.1.5</b>	<b>Properties</b> (STLH-747)  <b>2.1.5.1</b> <b>Target Weight Specification</b> (STLH-772) STLH-775 Weight SWL max.: 1.5 kg, TLL max.: 0.5 kg
<b>2.1.5.2</b>	<b>Corrosion Protection</b> (STLH-777)  STLH-4723 The contractor shall comply with the standardized requirements in Chapter CRQ-2261 "Corrosion Protection" of the Common Requirements [LHV 310 00x].
<b>2.1.5.3</b>	<b>Material Selection/Material Specification</b> (STLH-2781)  STLH-4691 When selecting substances, the contractor shall observe the common requirements [LHV 310 00x], Chapter CRQ-605 "Substance Bans" and Chapter CRQ-2651 "Substance Requirements".

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## **2.1.5.4**

### **Tolerance Requirements** (STLH-2822)

STLH-4724

*General tolerance requirements are to be found in the common requirements [LHV 310 00x] in Chapter CRQ-2306 "Tolerances".*

## **2.1.6**

### **Interfaces** (STLH-3973)

#### **2.1.6.1**

#### **Defining the Implementation Regulations (AV) and Connector Components** (STLH-2027)

STLH-5520

"General Connection Requirements" are described in Chapter STLH-2026. Compliance with these requirements is mandatory.

#### **2.1.6.2**

#### **Mechanical Interfaces (Fixation Concept)** (STLH-2824)

STLH-4721

General requirements pertaining to mechanical interfaces are to be found in the common requirements [LHV 310 00x] in Chapter CRQ-2334 "Mechanical System Assembly Requirements".

## **2.1.7**

### **Testing and Validation** (STLH-5543)

HL-3354

*Refer to the corresponding sections of the requirements derived from the lighting system, electronics and mechanical engineering.*

## **2.1.8**

### **Requirement Derived from the Lighting System** (HL-3355)

#### **2.1.8.1**

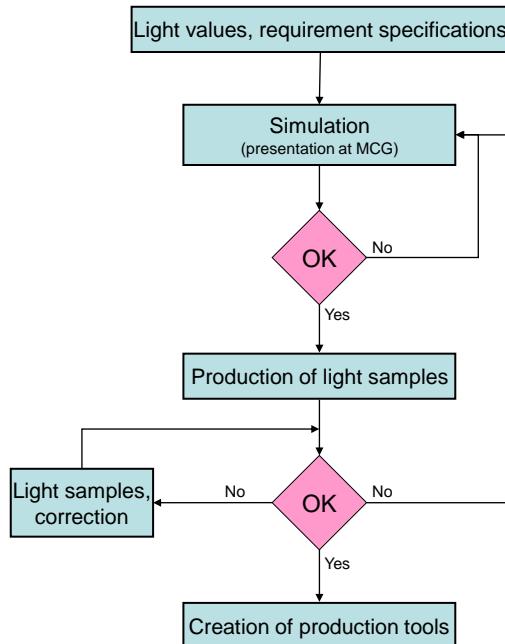
#### **General** (FI\_LT-148)

FI\_LT-411

*This module contains all the information about the functional requirements of the tail lamps.*

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### Creating light samples



## 2.1.8.2

### Photometric Requirements (FI\_LT-10)

FI\_LT-11

*The values defined below apply to the legally required minimum values, not to any permitted deviations in production (e.g. COP values).*

#### 2.1.8.2.1

#### General Requirements for the Signal Light Functions (FI\_LT-463)

FI\_LT-464

All actuation values (PWM / root mean square voltage) of the individual signal light functions and combined functions (e.g. tail lamp / brake light) shall be provided by the deadlines specified below.

In addition, by these deadlines the actuation values (PWM/root mean square voltage) and the implemented light values for high-level /HV value = 120cd-170cd) and low-level (HV value = 63-77cd) shall be available for multi-level functions (brake light/direction indicator lamp).

FI\_LT-465

Actuation values (work status/not final): Confirmation vehicle (with parts provision)

FI\_LT-466

Actuation values (final status): 8 weeks before PRO1

FI\_LT-7

All technical light requirements shall be verified using simulations and light samples (photometric measurement results). All other requirements, e.g. homogeneity shall be coordinated with DAG using samples and confirmed.

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- FI\_LT-9      The supplier is not permitted to design individual measuring points to be just over the legally required minimum values and all other measuring points significantly over the required level.  
 Example: Only +5% of the light values at measuring point "5 down - 20 left" and +70% of the light values at all other measuring points  
 Note: In this case, design optimization shall be introduced for better light distribution.
- FI\_LT-428      It is not permissible for the lamps to emit diffused light which can be seen on the road surface or surroundings.
- FI\_LT-481      In the event of two-part lamps (sidewall +trunk lid), the parking lamp shall only be approved with the sidewall.

### **2.1.8.2.2 Signal Light Functions with LED (FI\_LT-51)**

#### **2.1.8.2.2.1 General (FI\_LT-330)**

- FI\_LT-52      Photometric minimum = legal minimum values + 10%
- FI\_LT-54      Photometric maximum values = legal maximum values -10%
- FI\_LT-55      The supplier shall measure the respective light function with the test voltage specified in the E-E slides.
- FI\_LT-495      The supplier shall maintain the registration document in the E-E slides and inform DAG of the type of registration.
- FI\_LT-56      The supplier shall agree the test voltage with the contact person from the client's Development department.
- FI\_LT-57      The supplier shall design the LED functions in such a way that an even luminance level is attained at the respective measuring points.
- FI\_LT-58      The supplier must agree the measuring points for LED functions with the contact person from the client's Development department.
- FI\_LT-344      For light samples and initial sample inspection report light samples, the reference points shall be marked on the lamp lens for every light function.
- FI\_LT-486      Only LEDs of the same brightness class may be used within a light function for a lamp.
- FI\_LT-487      In general, it shall not be possible to see an optical difference in the brightness of the left and right-hand lamps - e.g. adjustment of different brightness classes using series resistors.

#### **2.1.8.2.3 Light Values Corridor Specification (FI\_LT-482)**

- FI\_LT-484      In the event of two-part light functions (across the sidewall and trunk lid lamp), the delta between the light values for the sidewall and the trunk lid shall not be >30% (e.g. sidewall -15% and trunk lid +15%).

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## 2.1.8.2.4 Single-Part Lamps (FI\_LT-474)

### 2.1.8.2.4.1 LED Brake Lamp and LED Direction Indicator Lamp (FI\_LT-452)

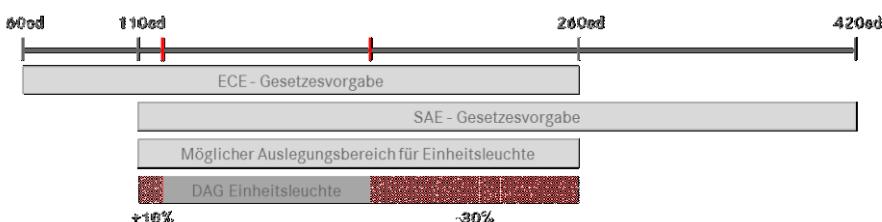
FI\_LT-453

A single-part lamp shall be implemented for which the photometric light values of the LED brake lamp and LED direction indicator lamp function of the tail lamp lie between the Daimler minimum (legal minimum +10%) and the Daimler maximum (legal maximum - 30%).

FI\_LT-457

Diagram with respect to the HV value:

FI\_LT-455



FI\_LT-456

In general, for all light value requirements, it is necessary to assume the world's highest legal minimum requirement (110 cd here, for example) and the lowest legal maximum requirement (260 cd here, for example).

## 2.1.8.2.4.2 Other Signal Light Functions (FI\_LT-458)

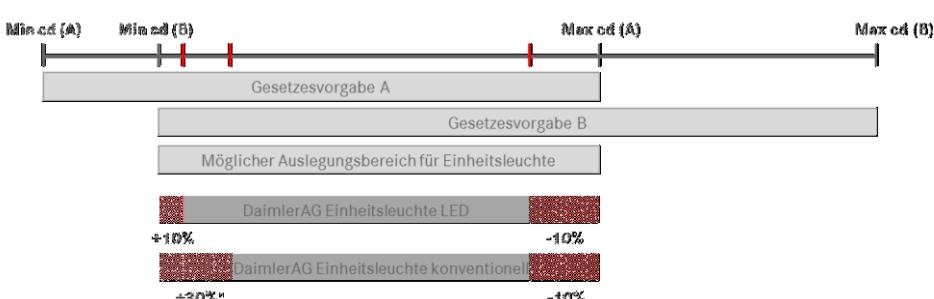
FI\_LT-459

A single-part lamp shall be implemented for which the photometric light values of the tail lamp function lie between the Daimler minimum (legal minimum + 10% (LED) / legal minimum + 30% (conventional)) and the Daimler maximum (legal maximum - 10%).

FI\_LT-460

Diagram with respect to the HV value:

FI\_LT-462



FI\_LT-461

In general, for all light value requirements, it is necessary to assume the world's highest legal minimum requirement (min cd(B) here, for example) and the lowest legal maximum requirement (max cd(A) here, for example).

\*Exception: rear fog light = legal minimum values +10%)

## 2.1.8.2.5

### Harmonization of Light Distribution in Order to Guarantee Multi-Level Functionality (FI\_LT-229)

FI\_LT-440

The supplier shall design the signal light functions so that the multi-level lamps can be implemented.

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FI\_LT-242

To better adapt the lamps to the ambient conditions, the light intensity conditions between the HV values and the angle values need to be harmonized. For this purpose, the ratio between the HV values and the angle values is determined. Operation of the lamp can thus be improved with the PWM signal in order to reduce any dazzling effect.

FI\_LT-241

Definition:

M-hv	=	measured value in HV
M-hv-min	=	legal minimum value in HV
M-n	=	measured value in the measuring point n
M-n-min	=	legal minimum value in the measuring point n

Specification of light intensity ratio:  $M\text{-hv} / M\text{-hv-min} \leq M\text{-n} / M\text{-n-min}$

The measuring points of geometrical visibility are to be taken into account. In addition, a linear performance of the light function must be assumed.

FI\_LT-425

Percentage specification for the brake lamp and direction indicator lamp: HV = 100% ( $> 120$  cd)

Min-VORGABE (Referenz HV > 120cd)															
	Linke Heckleuchte								Rechte Heckleuchte						
	20L	10L	5L	V	5R	10R	20R		20L	10L	5L	V	5R	10R	20R
%			20		20			10U			20		20		
%	10	20		70		20	10	5U	10	20	70		20	10	
%		35	90	100	90	35		H		35	90	100	90	35	
%	10	20		70		20	10	5D	10	20	70		20	10	
%			20		20			10D			20		20		

FI\_LT-478

The low-level in multi-level functions shall be approximately 70 cd in HV (+/- 10%) and shall never be below the minimum requirement for the respective point at a legally required measuring point.

The exact value of the intensity of light and the corresponding voltage and timing (PWM) shall be coordinated with DAG.

FI\_LT-490

For the mid-level, the timing (PWM) at which 90 cd is set in HV shall be determined and communicated to DAG.

FI\_LT-479

The high-level for multi-level functions shall be  $\geq 120$  cd in HV but shall never be above 180 cd at a legally required measuring point.

The exact value of the intensity of light and the corresponding voltage and timing (PWM) shall be coordinated with DAG.

FI\_LT-480

The final multi-level values (high, mid, low) shall be coordinated with DAG using samples.

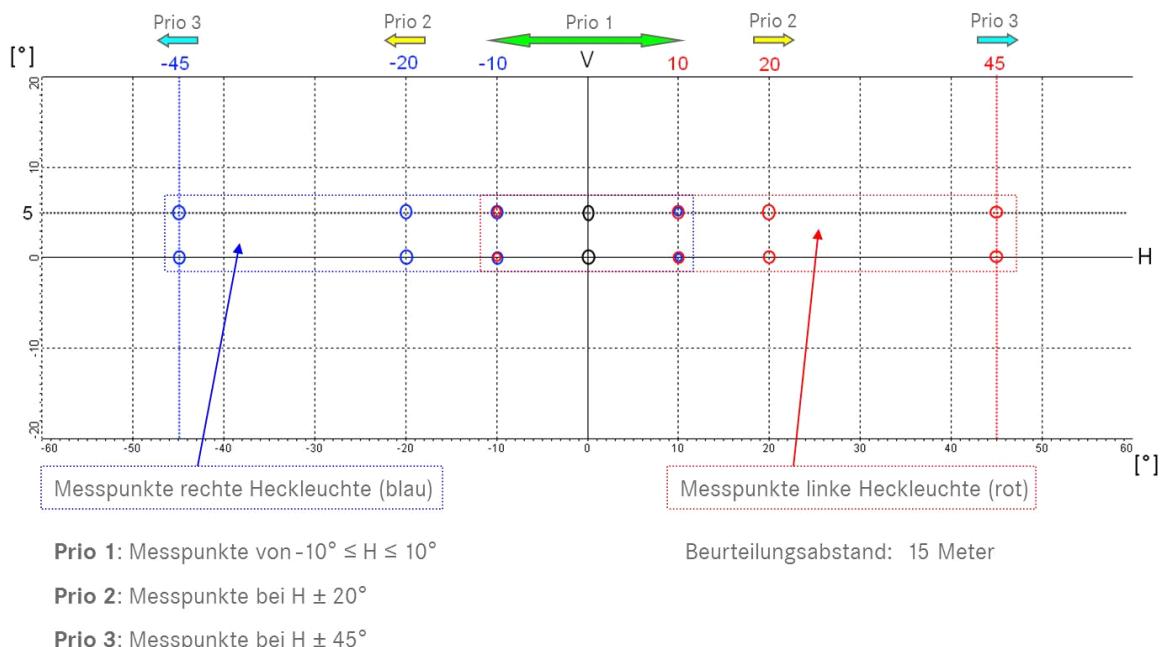
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	Technical Component Requirement Specifications Rear lamp QEY111AGEGLV	

## 2.1.8.2.6

## Measurement/Simulation Setup for Geometrical Resolution of Luminance and Color Measuring Technology (FI\_LT-492)

FI\_LT-493

### Visual Assessment Directions Signal Lights



FI\_LT-494

### Simulations and Measurements

Shall be carried out in line with the following configuration:

The measuring distance between the measurement object/light function and the luminance camera is 3,083 mm.

The object shall be aligned and measured in the vehicle installation position or using a suitable measuring frame, e.g. on the photogoniometer.

The following lenses with the focuses  $f = 8\text{ mm}$ ,  $f = 25\text{ mm}$ ,  $f = 50\text{ mm}$  or  $f = 100\text{ mm}$  shall be selected accordingly depending on the object size.

If gray filters are used, filters with an optical density of 1, 2 or 3 shall be selected.

The object or the light function shall be measured depending on the assessment directions for signal lamps and the corresponding directions for inherently conspicuous areas.

For example, a suitable measuring setup can be checked with the client.

Simulations shall be carried out in consultation with the client. Measurements shall be submitted for each hardware sample.

The measurement/simulation results shall be used for the objective and reproducible assessment and documentation of the light functions.

In particular, the luminance gradient course, the homogeneity, spots and diffused light, light leakage, color and color variation, dazzling and the overall appearance are assessed and documented, as well as other factors.

The results and analysis shall be transmitted to the client as a technical document and in camera file format.

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## 2.1.8.2.7

### Color Selection (FI\_LT-475)

FI\_LT-488

There shall be no visible color difference within a light function for a lamp.

FI\_LT-489

In general, it shall not be possible to see an optical difference in the color from the left to the right-hand side.

## 2.1.8.2.7.1

### Side Marker Light

The dominant wavelength (color) of the LEDs shall be between 620 nm and 635 nm (model).

The final dominant wavelength shall be coordinated with tail lamp

The final dominant wavelength shall be coordinated with DAG

## 2.1.8.2.7.2

### Tail lamp

Tail lamp in OLED technology as described in the inquiry drawing.

The dominant wavelength (color) of the OLEDs shall be between 620 nm and 635 nm (model).

The final dominant wavelength shall be coordinated with side marker lamp

The final dominant wavelength shall be coordinated with DAG

The tail lamp shall feature a 'Coming Home' function.

The final function shall be coordinated with DAG.

#### 2.1.8.2.7.2.1 Requirements of the OLED

The OLED in the rear lamp assembly must pass the tests defined in the requirement specifications and the function specification.

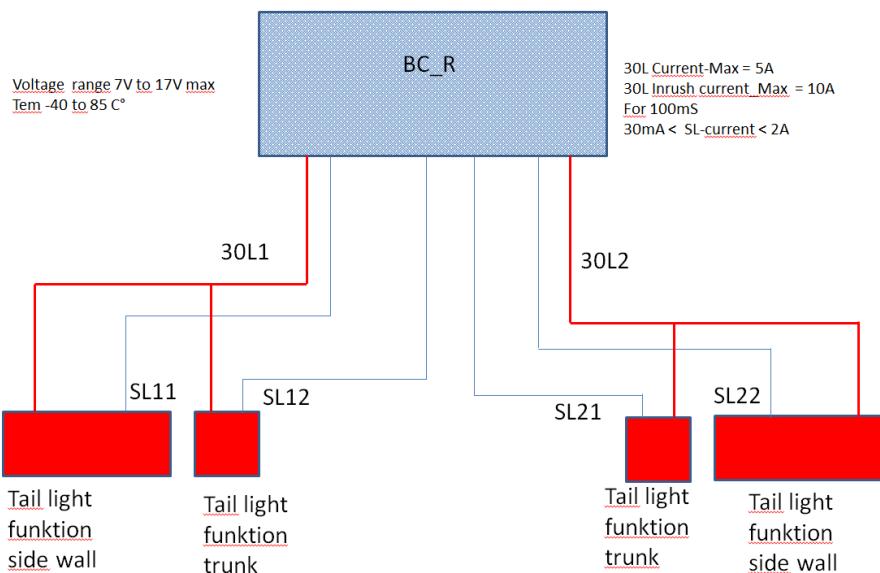
Further Requirements of the OLED:

- The LED difference/contrast between individual OLEDs must not exceed 10%. Measured over a temperature range of -40°C to +70°C, from HV between the brightest zone, e.g. 100%, and the darkest tone, e.g. 90%.
- The LED difference/contrast of the OLEDs tail lamp function must not exceed 10%. Measured over a temperature range of -40°C to +70°C, from HV between the mean luminance of the brightest OLED, e.g. 100%, and the darkest OLED, e.g. 90%.
- Luminance measurement as per point 2.1.8.2.6 (measurement/simulation setup for locally resolved luminance and color measurement equipment (FI\_LT-492))
- The OLED tail lamp function must attain the minimum light value required by law within 0.5 sec across a temperature range of -40°C to 70°C.
- The OLED needs tube UV resistance in the tail-lamp during the request lifetime point 2.1.9.1.4 (Service Life)

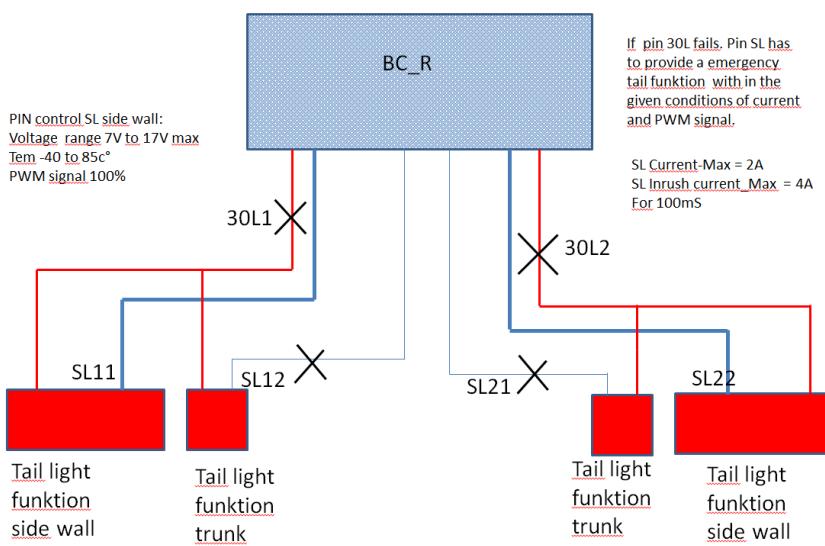
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## 2.1.8.2.7.2.2 Tail Lamp Body controller interface

State of Tail light function in normal operation



State defect pin 30L from BC\_R

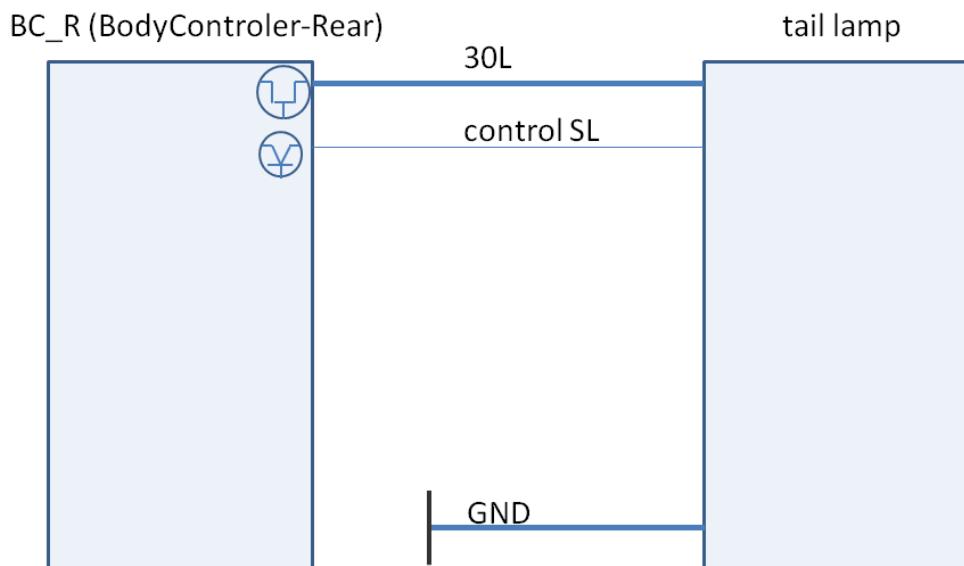


### 2.1.8.2.7.2.3 Coming Home Tail Lamp and wipe action animation's

An animation of the TL function is described here. The animation is called up every time the vehicle is opened or closed.

- It must be possible to actuate each OLED individually.
- It must be possible to dim each OLED individually, independently of any other OLED
- There are two animations for coming home: open and close
- Later, there will also be coming home animation for the C217 coupé and another coming home animation for the A217 convertible. Further item numbers will be defined at a later date.
- Animation of wipe action turn indicator example: if the vehicle turns right the lights flow to the right.
- Animated wipe action OLED stop light example: When the car is braked, LED stop light state on immediately than the OLED's flow rapidly from bottom to top.
- All actuation scenarios' (animation) shall be coordinated with Daimler Development.

#### Connection Scheme:



Operating voltage range: 7V bis 17V

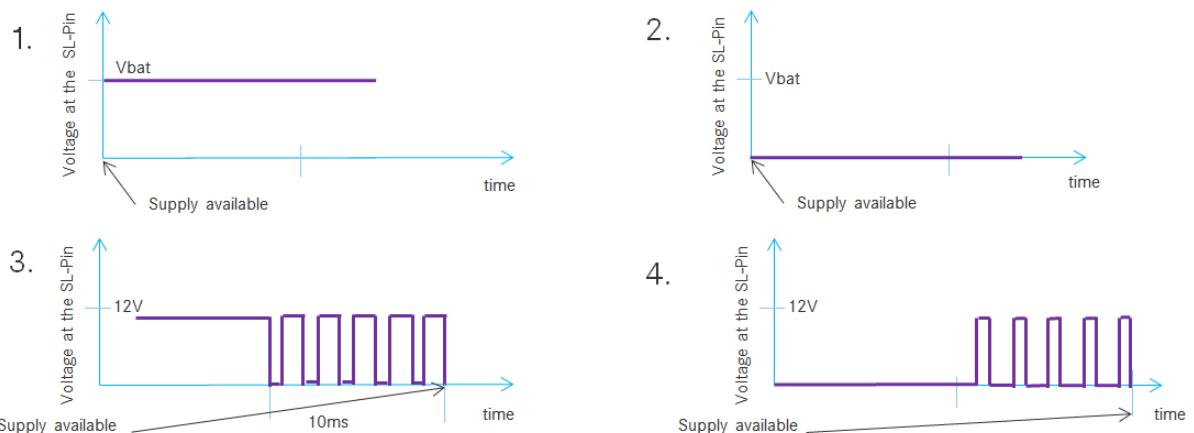
Temperature range: -40°C bis +80°C

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## State Information:

$1 \rightarrow V_{bat}$   
 $0 \rightarrow GND$

No.	State	SL-Pin
1.	Tail Lamp On	1
2.	Tail Lamp Off	0
3.	Animate Coming Home and go to the state „On“	PWM 300Hz 80% for 10ms then 1
4.	Animate Coming Home and go to the state „Off“	PWM 300Hz 20% for 10ms then 0
5.	wipe-action indicators SAE as arrow	PWM 300Hz 40%
6.	Wipe- action stoplight on	PWM 300Hz 60%
7.	Wipe- action stock	PWM 300Hz 10%

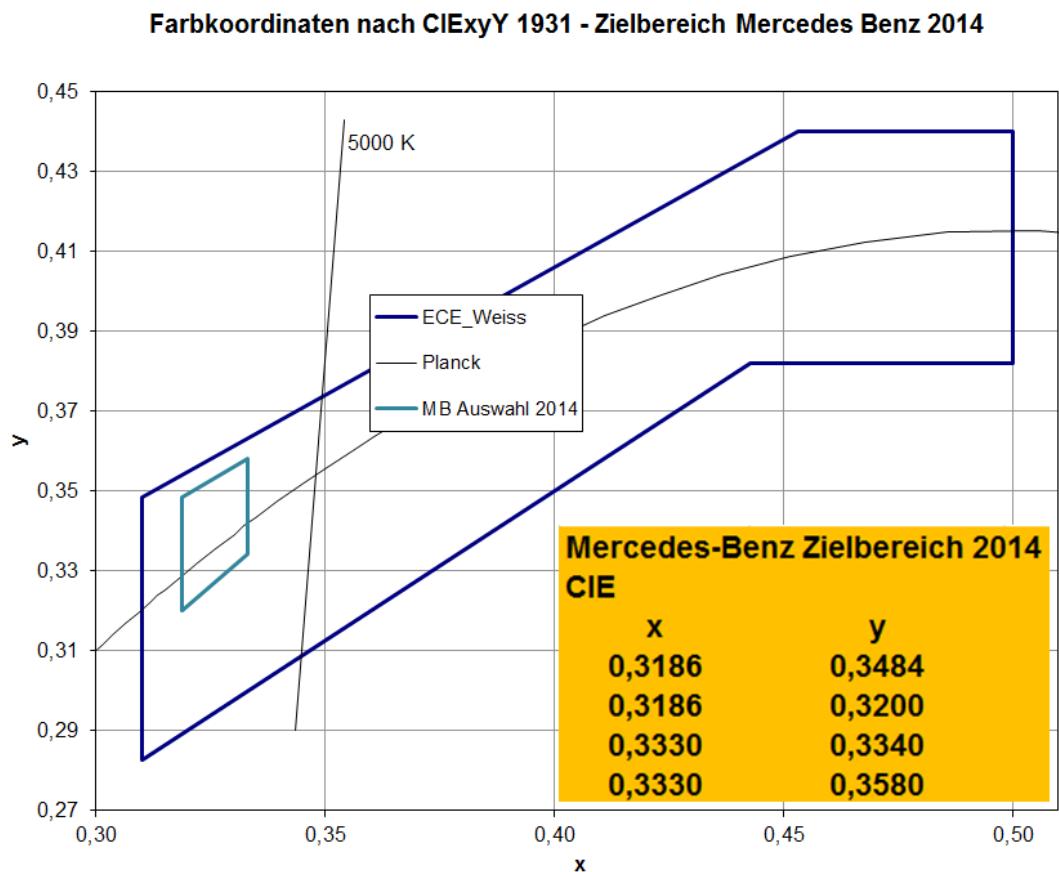


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	<b>Technical Component Requirement</b> <b>Specifications</b> <b>Rear lamp</b> QEV111AGEGLV	

### 2.1.8.2.7.3

### Functions with White LED (FI\_LT-476)

The color impression of white LED light functions shall correspond to the Mercedes-Benz color selection specified here.



FI\_LT-467

Within the defined time window, a color bin shall be selected in cooperation with the client.

FI\_LT-468

For functions in fiber optic technology, with optical lenses or similar, the effect of the color shall be taken into account for the material used.

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Technical Component Requirement  
Specifications  
Rear lamp  
QEVI11AGEGLV

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## 2.1.8.2.8

### Increased Technical Light Requirements for the Reversing Light (FI\_LT-237)

FI\_LT-244

To meet the requirements for the rear-view camera, the following technical light requirements (for vehicles with rear-view camera) shall be complied with.

FI\_LT-243

For the calculation of the minimum light intensity (cd) of the rear lamp for the relevant range for the rear-view camera, a minimum light intensity of 3 lux is used as the basis at distances of 150 (25D), 300 (15D) and 500 cm (10D) behind the vehicle.

	Linke Heckleuchte [cd]								Rechte Heckleuchte [cd]								
	30L	20L	10L	V	10R	20R	30R	45R		45L	30L	20L	10L	V	10R	20R	30R
Gesetzlicher Bereich	min			10	15	10			10U				10	15	10		
	max			300	300	300							300	300	300		
	min			20	25	20			15		15		20	25	20		
	max			300	300	300			300	5U	300		300	300	300		
	min	25		50	80	50			25	15	25		50	80	50		25
	max	300		300	300	300			300	300	H	300	300	300	300		300
Relevant Bereich für Rückfahrkamera	min	25		50	80	50			25	15	15	25		50	80	50	25
	max	600		600	600	600			600	600	5D	600	600	600	600		600
	min		50	80	80	80	50					50	80	80	80	50	
	max		300	300	300	300	300				10D		300	300	300	300	
	min		30		30		30					30		30		30	
	max		300		300		300			15D		300		300		300	
	min	12			12			12			25D		12		12		12
	max	300			300			300				300		300		300	

FI\_LT-345

The reversing light shall have a homogeneous appearance on the road, behind the vehicle (no formation of spots or stripes).

## 2.1.8.2.9

### Disguise Design (FI\_LT-498)

FI\_LT-499

The supplier shall send a disguise proposal to the DAG lighting system representative by 8 weeks before the first off-standard-tool parts deadline at the latest.

FI\_LT-500

The disguise proposal shall protect the design and cover all design surfaces.

## 2.1.9

### Requirements Derived from the Electronics (HL-3356)

#### 2.1.9.1

##### General (FI\_EE-1737)

FI\_EE-1787

*This chapter contains all information on the electrical and electronic requirements and tests for lamps on Daimler AG vehicles.*

FI\_EE-1788

*Therefore, the focus is on the description of the properties, interfaces and components used.*

#### 2.1.9.1.1

##### Functional Reliability (FI\_EE-3551)

FI\_EE-3835

The functional reliability requirements as per ISO26262 are described in the OLC\_Star1\_Star2\_system req document.

FI\_EE-3911

The functional reliability contact can be found in the "Contacts and Responsibilities" chapter.

#### 2.1.9.1.2

##### E-E Coordination Document (FI\_EE-3942)

FI\_EE-3943

The E-E coordination document is a mandatory document concerning the E-E requirements, which is to be used an exchange document between the supplier and Daimler AG from the kick-off to the green release.

FI\_EE-3956

The supplier is responsible for its actuality and the content with respect to the lamp.

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FI_EE-3957	Every change has to be noted in the history with the date, description and page number. The Daimler AG contact shall then be informed of the change immediately.
FI_EE-3944	The following shall be maintained by the supplier in the E-E coordination:
FI_EE-3945	Supplier contact (name, phone number e-mail)
FI_EE-3946	Function description of the lamp for each variant (basic type,/optional extra, ECE/SAE) with corresponding function distribution.
FI_EE-3947	Type of plug connection (central connector) including coding and variant description.
FI_EE-3948	Central connector pinning
FI_EE-3950	Wiring concept (interconnection of the individual circuit boards) for each variant
FI_EE-3949	Electric wiring diagrams of all functions
FI_EE-3951	"Lamp technical parameters" table: <ul style="list-style-type: none"> <li>- Light source (number, exact designation)</li> <li>- Output per function/pin</li> <li>- Voltage values for each function/pin (effective value + timing)</li> <li>- Current values (Imin, Ityp, Imax)</li> <li>- Current values in the event of a defective LED</li> </ul>
FI_EE-3953	Multi-level overview (if available) Level description: <ul style="list-style-type: none"> <li>- Voltage (high, mid, low)</li> <li>- Timing (high, mid, low)</li> <li>- H-V light value in cd (high, mid, low)</li> <li>- Duration of measurement (high, mid, low)</li> </ul>
FI_EE-3952	Registration document: <ul style="list-style-type: none"> <li>- Registration function (e.g. tail lamp)</li> <li>- Registration area (e.g. ECE)</li> <li>- Registration voltage (effective value + timing)</li> <li>- Registration type (e.g. single compartment lamp)</li> <li>- Circuit type (e.g. matrix circuit)</li> <li>- Failure detection in the lamp yes/no</li> </ul>
FI_EE-3955	Description of the failure detection (n-1 rule)

### 2.1.9.1.3

#### E-E Drawing Content (FI\_EE-3825)

FI_EE-3826	The E-E drawing (Sheet m) shall contain the items listed in the following:
FI_EE-3827	Wiring concept (interconnection of the individual circuit boards) for each variant
FI_EE-3828	Electric wiring diagrams of all functions, fully labeled with units
FI_EE-3830	Image of the plug connection (central connector) including coding and variant description
FI_EE-3831	Central connector pinning
FI_EE-3832	Table with traffic variants (e.g. ECE/SAE; with rear foglamp/without rear foglamp)
FI_EE-3833	Connections table (pins, coding, implementation regulation, connector numbers)
FI_EE-3834	Electrical Key Data table:

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- Light source (number, exact designation)
- Output per function
- Operating voltage range
- Registration voltage
- Multi-level function registration voltage (high level, mid level, low level)
- Amperage (Imin, Ityp, Imax)
- LED characteristics (color bin, brightness bin, current feed by the LED)
- Failure detection in the lamp yes/no

#### 2.1.9.1.4

##### **Service Life** (FI\_EE-3892)

Designed for 15 years

Adapted for constant headlamp mode or daytime light requirement.

The service life is also valid for OLED requirements specified in point 2.1.8.2.7.2.1 (Requirements of the OLED). Deviations shall be coordinated with Daimler Development.

**The respective function shall be designed for the service life listed in the table at minimum.**

Designation	Switch-on time [h]	Number of cycles
Terminal 15 ON, engine running	8,000	54,000
Tail lamp, left and right	8,000	54,000
Turn indicators, left and right	500	2,700,000
Brake light, left and right	1,467	1,800,000
Reversing light, left and right	74	74,400
Rear fog lights, left/right/center	74	74,400
Side markers, left and right	8,000	54,000
Center high-mounted brake light	1,467	1,800,000
License plate lamp, left/right/(center)	8,000	54,000

#### 2.1.9.2

##### **Properties** (FI\_EE-1743)

###### 2.1.9.2.1

###### **Features of the contact systems** (FI\_EE-100)

FI\_EE-3837

Connections requirements are described in the implementation regulation A 221 000 26 99 and shall be complied with.

FI\_EE-3932

The function specification and MBN 10 384 (LV214) shall be observed.

###### 2.1.9.2.1.1

###### **Mechanical/Design Features** (FI\_EE-101)

FI\_EE-102

The supplier shall ensure that the contact systems are not damaged on delivery.

FI\_EE-103

The supplier shall ensure that the contact systems are not soiled on delivery.

FI\_EE-3714

None of the plugs of plug connections may have any burrs.

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- FI\_EE-106 Plugging reliability of the plugs shall be ensured at all times.
- FI\_EE-107 The form fitting of the connectors shall be ensured at all times.
- FI\_EE-3718 Faulty or incorrect assembly shall be ruled out.  
If incorrect assembly or misuse occurs despite this, no electrical connection shall be established.
- FI\_EE-114 The contact carrier parts must be engaged directly with each other (not via "third components").  
Reason: minimum clearance of the contact surfaces is to be achieved.
- FI\_EE-115 The supplier shall design the cable cross-section in the lamp according to the current consumption and coordinate this with the client.

#### **2.1.9.2.1.2 Contact Material Features (FI\_EE-117)**

- FI\_EE-119 The supplier shall have the contact surfaces tin-plated. Identical material pairing with the counterpart (tin / tin).
- FI\_EE-123 The contact-bearing material must be CuNiSi.

#### **2.1.9.2.1.3 Current and Temperature Strain Features (FI\_EE-131)**

- FI\_EE-132 The supplier shall design the continuous current capacity of contacts for the maximum switch-on current.
- FI\_EE-133 Heating of the contacts caused by the current at rated current shall be below 20 K ( $\Delta T < 20$  K).
- FI\_EE-136 The supplier shall measure the limit temperature of contacts.
- FI\_EE-137 The limit temperatures shall be below the specification of the manufacturer.
- FI\_EE-138 The supplier shall provide a data sheet (incl. derating curve, limit temperature, contact force drawing) for every contact system used.

#### **2.1.9.2.1.4 Other Features (FI\_EE-139)**

- FI\_EE-140 After 15 years of operation in the motor vehicle, sockets/plugs must not be scorched.
- FI\_EE-141 After 15 years of operation in the motor vehicle, plastics must not melt.
- FI\_EE-142 After 15 years of operation in the motor vehicle, there must be no contact corrosion.
- FI\_EE-143 After 15 years of operation in the motor vehicle, there must be no pitting at the contact surfaces.
- FI\_EE-144 After 15 years of operation in the motor vehicle, contacts not connected must not be scorched or heated up under voltage.

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<b>2.1.9.2.2</b>	<b>Voltages and Currents</b> (FI_EE-168)																																				
<b>2.1.9.2.2.1</b>	<b>Voltage Range</b> (FI_EE-169)																																				
FI_EE-170	<i>The voltage values are those values measured at the terminals of the lamp.</i>																																				
FI_EE-171	The supplier shall coordinate the actual voltage values during the development process with the client (E-E slides) and, after their final definition, or at the latest by the green release, document them on the drawing.																																				
FI_EE-3721	<b>On-board voltage range</b> <i>Voltage range within which the vehicle's component on-board electrical system may fluctuate</i>																																				
FI_EE-174	<b>Voltage range for logical function</b> <i>Voltage range at the component within which the function (recognizable signal representation, no failure of individual ranges) is ensured.</i>																																				
FI_EE-2867	<b>Diagnostic voltage range</b> <i>Voltage range at the component in which a diagnosis is carried out by the control unit.</i>																																				
FI_EE-175	<b>Test voltage</b> <i>Voltage for the technical light type test for which the light values of the corresponding function need to be fulfilled.</i> <i>If a voltage range is specified, the test voltage will still need to be defined in coordination with the client in order that the light values are complied with and the vehicle has a harmonious appearance. If the test voltage is below the on-board voltage, it is limited using pulse width modulation (PWM).</i>																																				
FI_EE-2860	Standard voltage values																																				
	<table border="1"> <thead> <tr> <th>Name</th> <th>Symbol</th> <th>Min. Value</th> <th>Type Value</th> <th>Max. Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>On-board voltage range</td> <td><math>U_{bat}</math></td> <td>6</td> <td>-</td> <td>17</td> <td>R</td> </tr> <tr> <td>Voltage range for logical function</td> <td><math>U_{log}</math></td> <td>7</td> <td>-</td> <td>17</td> <td>R</td> </tr> <tr> <td>Diagnostic voltage range</td> <td><math>U_d</math></td> <td>9</td> <td>-</td> <td>17</td> <td>R</td> </tr> <tr> <td>Test voltage for all functions with resistor circuit</td> <td><math>U_{typ}</math></td> <td>-</td> <td>12.8</td> <td>-</td> <td>R</td> </tr> <tr> <td>Test voltage for all functions with constant current circuit</td> <td><math>U_{typ}</math></td> <td>7</td> <td>12.8</td> <td>17</td> <td>R</td> </tr> </tbody> </table>	Name	Symbol	Min. Value	Type Value	Max. Value	Unit	On-board voltage range	$U_{bat}$	6	-	17	R	Voltage range for logical function	$U_{log}$	7	-	17	R	Diagnostic voltage range	$U_d$	9	-	17	R	Test voltage for all functions with resistor circuit	$U_{typ}$	-	12.8	-	R	Test voltage for all functions with constant current circuit	$U_{typ}$	7	12.8	17	R
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Diagnostic voltage range	$U_d$	9	-	17	R																																
Test voltage for all functions with resistor circuit	$U_{typ}$	-	12.8	-	R																																
Test voltage for all functions with constant current circuit	$U_{typ}$	7	12.8	17	R																																
FI_EE-2135	In general, a voltage of 12.8 V is specified for all functions with a resistor circuit (see Table FI_EE-2860). Exception: combined functions, such as tail lamp / brake light on one channel (pin). Here, the highest voltage shall be set to 12.8 V and DAG shall be informed of the lower root mean square voltage and its timing.																																				
FI_EE-3941	If, for technical reasons, it is necessary to use a constant current circuit, this shall be coordinated with DAG. It is possible to deactivate the effective value timing and supply the lamp with on-board voltage. Here, the constant current circuit shall supply the lamp with a constant current independently of the strength of the on-board voltage.																																				

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## 2.1.9.2.2.2

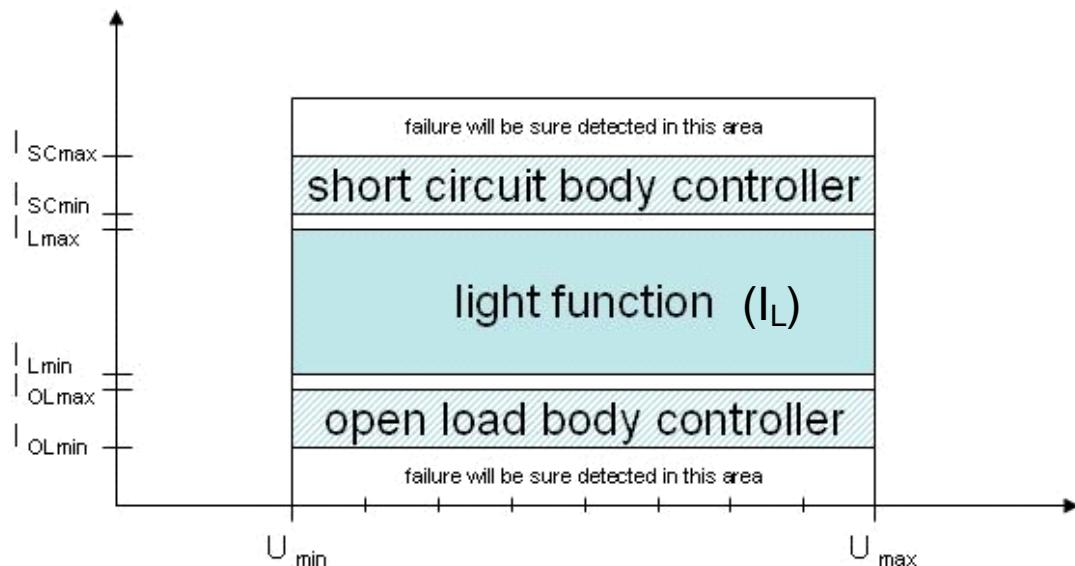
### Current Consumption (FI\_EE-180)

FI\_EE-3845

All current values apply to the diagnostics voltage range for temperatures of between Tmin and Tmax (see current function specification A 000 003 07 99)

FI\_EE-3846

*Overview description lamp current consumption:*



#### 2.1.9.2.2.2.1

##### Light Function Current Consumption (FI\_EE-3844)

FI\_EE-3851

The light function current consumption including all tolerances (worst case) shall be within the control unit's current limits.

$$I_{OLmax} < I_L < I_{SCmin}$$

FI\_EE-1998

The current values for the control unit ( $I_{OLmax}/I_{SCmin}$ ) can be found in the inquiry drawing.

FI\_EE-3839

If the current values are not included in the inquiry drawing, they shall be coordinated with the E-E contact.

FI\_EE-2853

Due to the thermal behavior of the connection, the total maximum overall current for the tail lamp and brake lamp light functions shall not exceed a total of 3.5 A.

FI\_EE-3852

The light function current consumption shall be within the  $I_{OLmax}$  and  $I_{SCmin}$  limits within 100 µs in order to guarantee a clear diagnosis of the control unit.

#### 2.1.9.2.2.2.2

##### Current Consumption in the Event of a Defective Light Function (FI\_EE-188)

FI\_EE-1758

All current values shall be fallen short of (open load) or exceeded (short circuit) in the event of a defective light function to ensure reliable fault detection in the vehicle's electrical system.

FI\_EE-3868

This excludes light functions where the light values are still achieved if individual light sources fail and the function is not completely deactivated.

FI\_EE-3481

Open load defect: The maximum current value in the event of a defect in the light function shall not exceed the minimum open load value for the control unit.

$$I_{Lmax} < I_{OLmin}$$

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- FI\_EE-3840 Short circuit defect: The minimum current value in the event of a defect in the light function shall not fall below the maximum short circuit values for the control unit.  
 $I_{L\min} > I_{SC\ max}$
- FI\_EE-3842 The minimum open load values and the maximum short circuit values for the control unit can be found in the inquiry drawing.
- FI\_EE-3841 If the current values are not included in the inquiry drawing, they shall be coordinated with the E-E contact.

### **2.1.9.2.2.2.3 Switch-on Currents** (FI\_EE-3847)

- FI\_EE-3848 The switch-on current shall be below 7 Ampere with every function.

### **2.1.9.2.2.2.4 Leakage Currents from the Vehicle** (FI\_EE-3849)

- FI\_EE-3853 Leakage currents up to  $200\mu\text{A}$  must not result in any illumination/flashing of the function. They must be absorbed within the lamp.

### **2.1.9.2.2.3 Documentation of Key Data and Corresponding Documents** (FI\_EE-222)

- FI\_EE-223 The supplier shall maintain the voltages and currents for the light functions in the E-E slides and document the final status on the drawing.
- FI\_EE-3855 The supplier shall maintain the cycle ratio (for PWM) for the light functions in the E-E slides and document the final status on the drawing.
- FI\_EE-9 The supplier shall make the electrical data of the component for the operating voltage range and the operating temperature available to the contact from the client's development department.
- FI\_EE-6 The supplier shall make the fully labeled circuit diagram of the electronic lamp component available to the contact from the client's development department.
- FI\_EE-3910 The supplier shall make the fully labeled circuit board layout of the electronic lamp component available to the contact from the client's development department.

### **2.1.9.2.2.4 In-line Check During Series Production** (FI\_EE-240)

- FI\_EE-3857 The supplier shall check light functions for individual light source failures using optical detection in an in-line check.
- FI\_EE-241 The supplier shall conduct an in-line current measurement (room temperature) for each light function to prove that the current consumption is within the specified range between  $I_{L\min}$  and  $I_{L\max}$ .
- FI\_EE-3930 The supplier shall use measurements/checks to ensure that all components are installed in line with the specifications and that all circuit parts are fulfilling their function. The corresponding concept shall be revealed to DAG.
- FI\_EE-244 If failure detection by means of a diagnostics pin is used, the function shall be checked by means of a voltage measurement ( $< 1\text{V}$ ).

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### **2.1.9.2.3**

#### **Cable Routing** (FI\_EE-245)

- FI\_EE-2855 All electrical lines shall pass the tests as per MBN LV 112-1.
- FI\_EE-247 The supplier shall design the installation of the cables in such a way that any chafing of cables is not possible.
- FI\_EE-248 The lines shall be fastened mechanically.
- FI\_EE-3933 The use of splices is not permitted.
- FI\_EE-249 The lines shall not be visible through the cover plate.
- FI\_EE-250 The lines shall not be visible through the gap
- FI\_EE-251 The lines shall not be visible when the trunk lid is open
- FI\_EE-252 The supplier shall combine cables with a length  $\geq 10$  cm using a suitable cable sheath.
- FI\_EE-253 The supplier shall design the installation of lines in terms of EMC aspects in the optimum manner.

### **2.1.9.2.4**

#### **Printed Circuit Board** (FI\_EE-255)

- FI\_EE-256 If fastened to the housing base, the PCB must not be positioned at the lowest point to be protected from stagnant moisture.
- FI\_EE-3928 Moisture on the circuit board, e.g. as a result of condensation, shall not impair the circuit.
- FI\_EE-1429 In the case of safety-relevant components, no signal conductors may be routed under ceramic capacitors.

### **2.1.9.2.5**

#### **Requirements for Electronic Components** (FI\_EE-1409)

- FI\_EE-1410 Electronic components shall be qualified according to AEC-Q (100/101/200).
- FI\_EE-3912 In order to prevent the silver corrosion of LEDs, either LEDs with silver-lead frames + resin grouting or LEDs with gold-lead frames may be used.
- FI\_EE-3861 Only those component elements may be used for which it has been ascertained that their use entails no risk in the vehicle as far as application profile (component specification), workmanship (processing procedure and/or parameters), and service life are concerned and that they are suitable for vehicle use.
- FI\_EE-3862 It shall be ensured that the failure of a component element cannot lead to irreparable thermal damage to the component.
- FI\_EE-3863 Further design rules are documented in *Implementation Regulation on Design Rules for External E/E Components (A 211 003 98 99)* and shall be taken into consideration.

### **2.1.9.3**

#### **Interfaces** (FI\_EE-1742)

##### **2.1.9.3.1**

#### **Lamp/Vehicle Electrics Interface (Control Unit)** (FI\_EE-4)

- FI\_EE-5 *To ensure the function of the lamp/vehicle electrics interface and to adapt the electrical functions of the lamp to the control unit, the following measures are to be carried out by the supplier:*
- FI\_EE-7 The supplier shall coordinate the electronic interfaces of the lamp with the contact from the client's development department.

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- FI\_EE-1651 Different functions must not have any mutual effects, i.e. the internal interconnection of functions/channels must not result in any feedback on other channels.
- FI\_EE-1650 The outputs actuated by the control unit with PWM may not have specified capacitive loads at the input of the lamps, i.e. if special input circuits are used the capacitive loads need to be adapted to the individual components/drivers of the control unit.
- FI\_EE-1976 The supplier must make board designs (1 set per variant) of the electronic components of the lamp available to the client's development department contact for the HIL (hardware-in-the-loop) test.  
The corresponding costs are included in the supplier development costs.
- FI\_EE-3870 The electronics alone are sufficient for the board designs (circuit board, components, wiring, original connector plugs, etc.).  
If failure detection is included, it shall be possible to simulate the failure of an LED using a switch/jumper.
- FI\_EE-13 The board designs shall be provided by the test vehicle deadline at the latest.

### 2.1.9.3.2 Control Unit Requirements (FI\_EE-162)

- FI\_EE-1489 The following requirements do not apply if it is determined during the course of the development process that the light function is actuated without timing.
- FI\_EE-163 The control unit times the voltage of the corresponding light function to an effective value ( $U_{eff}$ ) by means of pulse width modulation (variable pulse duty factor)
- Ueff is a value that can be set in the control unit and which is kept constant by adjusting the pulse width*
- FI\_EE-3923 Calculation of the effective value regulation (timing) using the formula  
->  $PWM = (U_{eff})^2/(U_{bat})^2$
- FI\_EE-3924 The basic frequency of the PWM signal is  $f \geq 100$  Hz).
- FI\_EE-165 The component shall be designed for PWM frequencies  $f \geq 100$  Hz.
- FI\_EE-166 The pulse width generated by a pulse width modulation depends on the current on-board voltage.  
In the event of a minor voltage increase, the negative pulse width is reduced to almost zero.  
Due to the finite edge steepness, it is possible that the voltage does not reach the zero value during the "OFF time".  
The component shall be designed in such a way that individual circuit components (e.g. a failure detection) do not have any malfunction in this case.
- FI\_EE-3737 From a voltage of over 17 V on the control unit, there is a fixed timing of 40% PWM. That means the effective lamp value increases and cannot be kept at a constant level.

### 2.1.9.4 Component Design (FI\_EE-1741)

#### 2.1.9.4.1 Central Plug for Lamps (FI\_EE-42)

- FI\_EE-52 The plug is engaged in the lamp socket as a separate part or shall be an encapsulated component.
- FI\_EE-1951 The exact design of the central connector is defined on the inquiry drawing

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FI\_EE-3866 If the central connector is not included in the inquiry drawing, it shall be coordinated with the E-E contact.

## **2.1.9.4.2 Pin Assignment of Lamps (FI\_EE-56)**

FI\_EE-57 Pin 1 must be the ground pin.

The supplier shall label the pin assignment at the lamp, next to the plug.

FL\_EE-1952 The exact pin assignment is defined on the inquiry drawing

FI\_EE-1994 If the pin assignment is not included in the inquiry drawing, it shall be coordinated with the E-E contact.

#### **2.1.9.4.3 Circuit Specifications (FI\_EE-3858)**

### **2.1.9.4.3.1 General Requirements (FI\_EE-3880)**

FI\_EE-3881 The current is set by the resistor circuit.

FI\_EE-3882 The circuit shall be provided with a diode to protect against connecting the wrong poles.

FI\_EE-3883 The defined LED surge current shall not be exceeded with a voltage of up to 17 V.

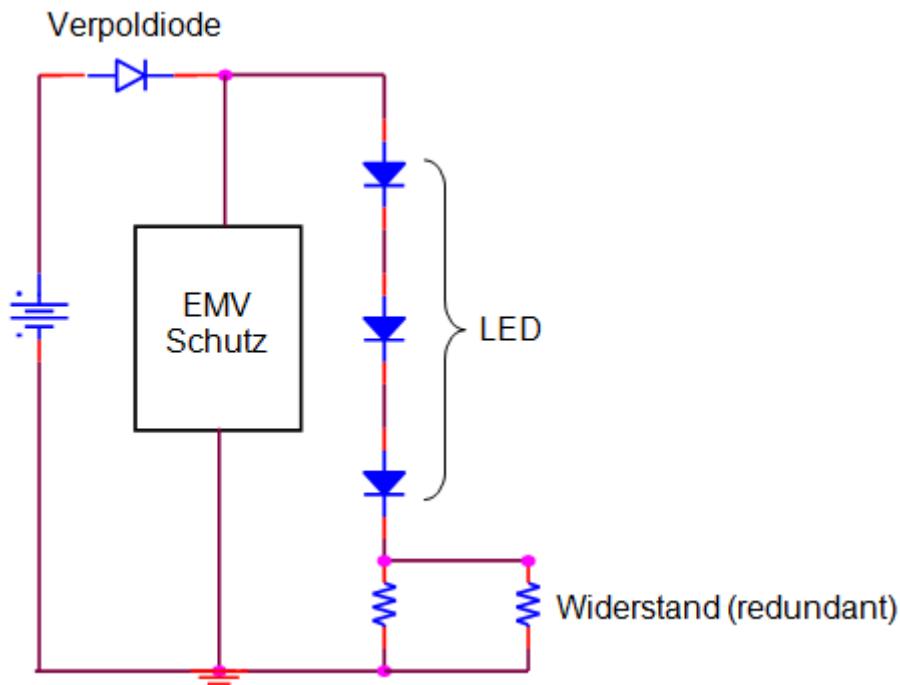
FI\_EE-3891 An EMC protection shall be provided on the circuit board for circuits that are EMC critical. This then only has to be implemented if the EMC vehicle measurements are not passed.

The use of a failure detection is only permissible if it is legally required.

FI\_EE-3926 If, for technical reasons, it is necessary to deviate from the circuit specifications, this shall be coordinated with DAG in advance.

#### **2.1.9.4.3.2 Circuit Configuration Without Diagnostic Circuit (FI\_EE-3920)**

FI\_EE-3921

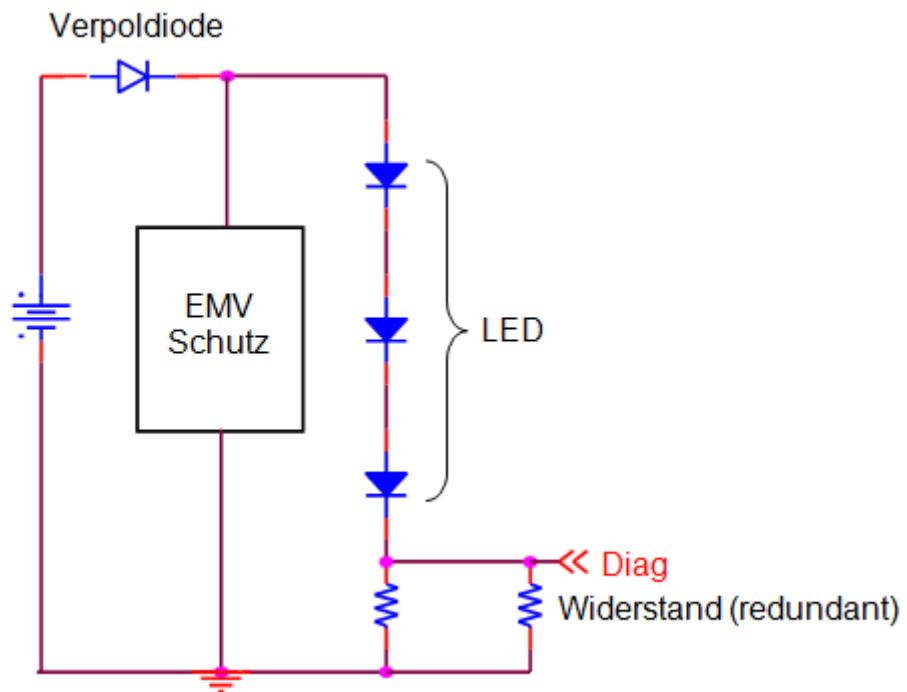


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#### 2.1.9.4.3.3

#### Circuit Configuration With Diagnostic Circuit (FI\_EE-3871)

FI\_EE-3914



#### 2.1.9.4.3.4

#### Diagnostic Pin (FI\_EE-3878)

FI\_EE-3885

There is a separate diagnostic line.

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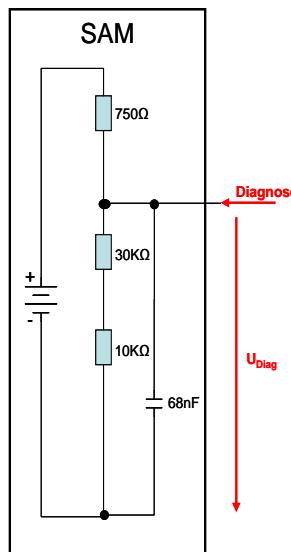
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## Control unit interface (diagnostic pin)

The input on the control unit is applied at  $U_{\text{Bat}}$  with a pull-up resistance. In the OK case, the lamp switches this input to ground. Ground refers to the ground potential in the lamp.

### Circuit diagram of control unit



## Rear lamp requirements (diagnostics pin)

Diagnostics voltage range : 9 - 17 volt

Voltage at the diagnostic pin when OK (no LED failure): < 1 volt

Voltage at the diagnostic pin when not OK: > 5 volt

Time between the high-level input at the lamp and the response on the diagnostic pin (fall time): 100 µs

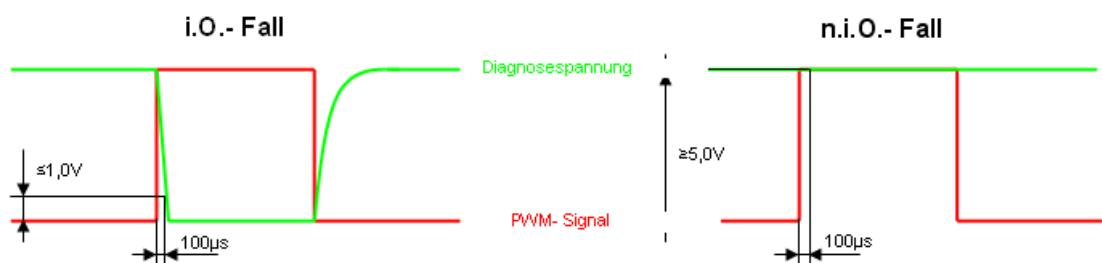
The requirement applies to the ambient temperature range Tmin to Tmax (see FuVo)

Short circuit resistance (see FuVo)

Reverse polarity protection: -17 V

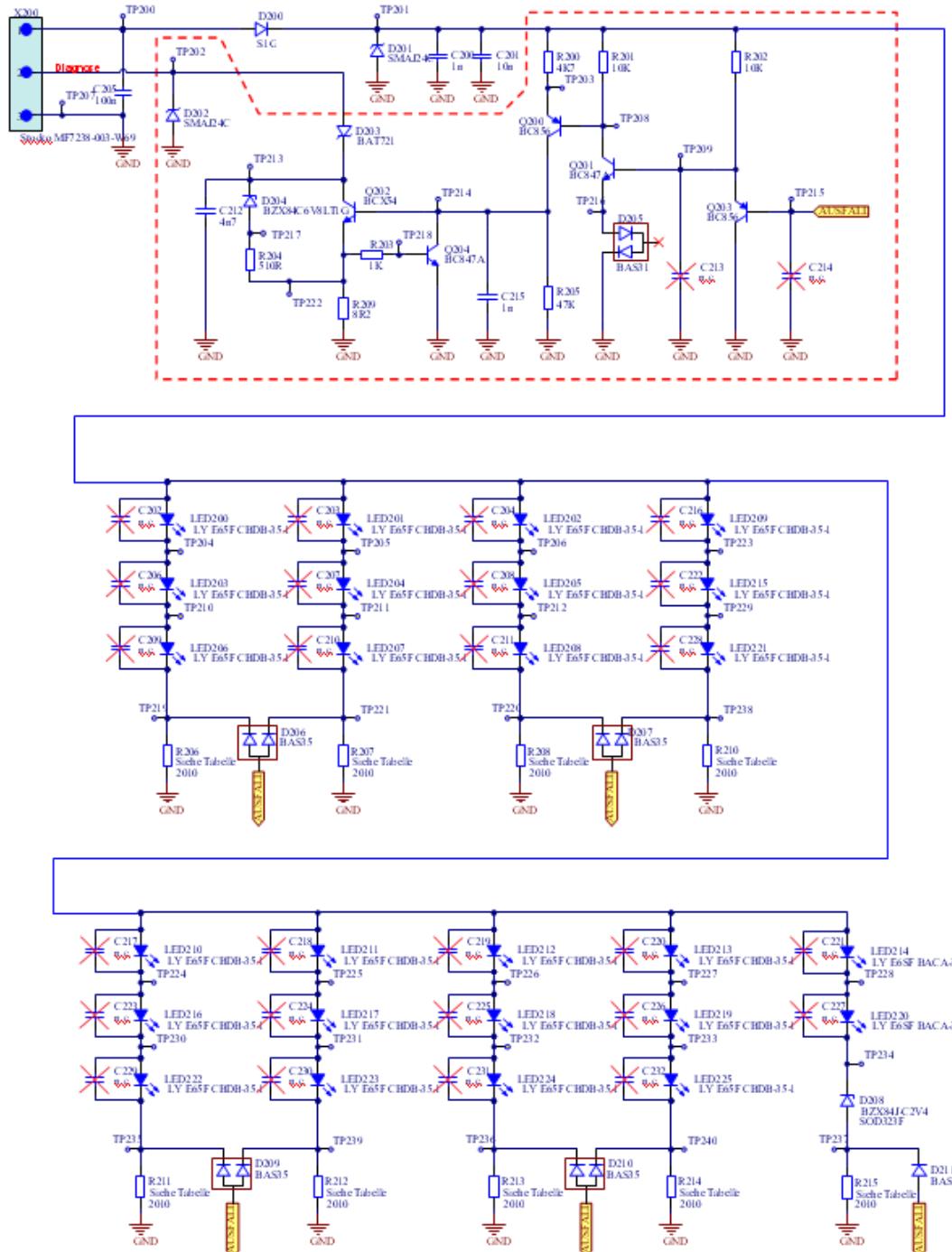
Vibration response (e.g. undefined transistor switching) shall not occur.

## Time-specific performance at the diagnostic pin



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# Example of a circuit diagram of the direction indicator lamp with diagnostic pin



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**Technical Component Requirement  
Specifications  
Rear lamp**  
**QEVI11AGEGLV**

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## Component specifications for diagnostic pin

Qty.	Component part	Name	Comment
5	Diode	BAS35	D205, D206, D207, D209, D210
1	Diode	BAS16	D211
1	Protective diode	SMAJ24C	D202
1	Z diode	BAT721	D203
1	Z diode	BZX84C6V8LTIG	D204
1	Transistor	BCX54	Q202
2	Transistor	BC847A	Q204,Q201
2	Transistor	BC856	Q200,Q203

**Passive component elements may be added by the supplier if they are necessary for the circuits.**

### 2.1.9.5

#### Testing and Validation (FI\_EE-1740)

FI\_EE-3931

The supplier shall send a disguise proposal to the DAG lighting system representative by 8 weeks before the first off-standard-tool parts deadline at the latest.

FI\_EE-3900

All required information, e.g. function statuses, operating modes, etc. shall be taken from the function specification if they are not explicitly listed.

FI\_EE-3901

The component statuses, deadlines and results of these tests shall be comprehensively reported in the testing matrix.

FI\_EE-3902

The test matrix shall be provided with test deadlines and sent to the contact at Daimler AG 4 weeks before first off-standard-tool parts at the latest.

### 2.1.9.5.1

#### General On-Board Electrical System Requirements (FI\_EE-1371)

FI\_EE-3732

The scope of MBN LV 124-1 is described in the function specification.

FI\_EE-1377

The contractor shall use the template provided by the client's On-Board Electrical System department when drawing up the test plan and the component test report. The template for the test plan is attached to the standard.

FI\_EE-1376

On completion of the test, the contractor shall document the test results in a component test report. The component test report shall be submitted to the responsible development engineer and to the client's contact for the on-board electrical system.

FI\_EE-1960

The submission date for the coordinated schedule is 10 weeks before off-tool parts

FI\_EE-1961

Submission date for the component test report: at least 4 weeks before the vehicle test.

### 2.1.9.5.2

#### Environmental Reviews (FI\_EE-2887)

FI\_EE-3895

The scope of MBN LV 124-2 is described in the function specification.

### 2.1.9.5.3

#### EMC/ESD Requirements (FI\_EE-1491)

FI\_EE-3903

The scope of the EMC/ESD tests is described in the function specification.

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### **2.1.9.5.3.1 ESD Requirements (FI\_EE-1502)**

#### **2.1.9.5.3.1.1 General (FI\_EE-1503)**

- FI\_EE-3786 Bi-polar technology shall be used for linear LED actuation (current restriction, current source).
- FI\_EE-3787 All the components used shall be qualified as per category AEC-Q (H3B 8KV or M4 400V).
- FI\_EE-3792 All vaporized parts/reflectors within the lamp shall have a low-impedance (< 10 Ohm) connection to ground (reflector grounding).
- FI\_EE-3793 The circuit board/electronics are not freely accessible and cannot be touched when installed. Direct ESD discharge on the circuit board is not possible at a test voltage of ±15 kV when installed.

#### **2.1.9.5.3.1.2 Electrostatic Sensitivity (Classification/Measures) (FI\_EE-1508)**

- FI\_EE-3796 If one of the requirements prescribed in "FI\_EE-1503 General" is not complied with or the ESD tests in function specification A 000 003 07 99 are not fulfilled, the component is electrostatically sensitive and ESD load carriers/packaging is required.
- FI\_EE-1507 ESD requirements on packaging for series production and replacement parts are described in STLH-1191 Chapter "Storage Life, Packaging and Transportation".
- FI\_EE-1504 To ensure ESD compliance in the production/assembly of ESD sensitive components, certification shall be submitted in the form of an ESD audit (set forth in Quality Management Standard: Electrics/Electronics for Mercedes-Benz Cars [STLH-2448]).

### **2.1.10 Requirements Derived from the Mechanical System (HL-3357)**

#### **2.1.10.1 General (FI MH-2286)**

##### **2.1.10.1.1 Contents of the "'Rear-End' Mechanical Components" FI Module (FI MH-2287)**

- FI MH-10 Requirements and objectives for the components are described in detail in the following chapter. The devices are designed by the supplier taking into account all basic conditions for the entire vehicle. This refers in particular to installation studies and associated tolerance considerations, assembly, feasibility of assembly, ease of servicing, visual matching with trim parts (inside and outside), environmental compatibility, national variants and the use of modular systems.
- FI MH-9 The supplier shall take the inquiry drawing and 3D data from Daimler into account as the basis for the tender. If not all technical issues are described or perceivable, the supplier shall obtain the corresponding information from the client.
- FI MH-1844 The contractor shall reveal measures for the reduction of parts to the contact of the client's development department.

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## 2.1.10.1.2

### Overview of Variants (FI MH-2289)

FI MH-1813

*The variants are to be taken from the (inquiry) drawing.*

FI MH-1880

The supplier may not create any additional specific national variants in addition to those defined on the drawing.

FI MH-1881

The development services consist of the re-design and its revision, creating drawings, PT tool design and the necessary supervision costs, development project management, etc. for the project.

FI MH-2185

If there are different lamps for ECE and SAE, openings for LEDs and attachment openings need to be covered, for example.

FI MH-2855

If there are different lamps for ECE and SAE, all the country-specific characteristics may only exist in the affected country variants. I.e. side reflectors, side marker lamps, lamp holes (e.g. for USA direction indicator lamp chamber without lamps since "turn signal operation" is carried out using the brake lamp), openings for LEDs, attachment openings, markings for interchangeable inserts/sliders etc. shall not exist or not be visible in the country variant that is not affected.

## 2.1.10.1.3

### Approval Procedures (FI MH-2344)

FI MH-2345

*A distinction needs to be made between different approval procedures.*

FI MH-2435

The certification/certificate requirements are described briefly below for the most important markets.

FI MH-2432

Light equipment and its parts need to be identified, labeled and marked in such a way according to the legal requirements, that all requirements of all supplier countries are fulfilled.

FI MH-2433

The resulting national versions shall be clarified with the client in due time.

FI MH-2434

All certification-relevant data shall be made available by the PPA deadline according to the data requirement and form (Excel list).

FI MH-2346

All costs/samples required for certification shall be provided to the client, including measurement reports. The costs for the samples and any other costs are covered by the supplier development costs.

FI MH-2404

All certificates/reports/approvals are to be kept up-to-date throughout the duration of production. The corresponding costs are covered by the supplier development costs.

FI MH-1819

The lamp shall be approval capable worldwide.

FI MH-2349

The certification approval shall be achieved in the following regions:

FI MH-2350

#### **EC/ECE:**

Appropriate ECE design approvals need to be obtained and provided for all headlamps and lamps. All certified parts shall be labeled according to the ECE specifications.

FI MH-2351

#### **USA/Canada:**

Certification of fulfillment of FMVSS 108 [L\_R-247] and all applicable SAE standards by an independent inspection institution (e.g. ETL/ITS). All parts shall be labeled according to the USA specifications.

FI MH-2352

**Japan:**

For all light equipment for which the presentation of an ECE approval is not sufficient, appropriate approvals need to be obtained and/or the required data and test samples provided that meet the Japanese specifications.

FI MH-2353

**China:**

China certification of all headlamps and lamps in question shall be performed by the manufacturer. The prerequisite is accrediting and auditing, which are to be performed by the corresponding manufacturer for his production plant (s) before the certification of parts. All certified parts shall be marked according to the Chinese specifications (CCC).

FI MH-2354

**Taiwan:**

The certification of all headlamps and lamps in question shall be performed by the manufacturer. The certificates shall be provided in due time. The prerequisite for certification is the accreditation and registration to be performed in advance by the corresponding manufacturer.

FI MH-2355

**India:**

The certification of all headlamps and lamps in question is currently performed by the client. The manufacturer shall provide the test samples required for this that comply with the Indian specifications, according to the corresponding requirements. If the India certification needs to be performed by the manufacturer of the light equipment in the future, the certificates shall be provided in due time. All prerequisites for this shall be provided by the manufacturer in due time on request by the client.

FI MH-2356

**Other countries:**

In particular in Asia, new regulations are increasingly being ratified that also make additional tests and/or verifications necessary. Test samples required for this and/or data are to be provided according to the corresponding requirement. If certifications are to be performed by the manufacturer of the light equipment, all corresponding prerequisites are to be fulfilled in due time by the manufacturer of the light equipment at the request of Daimler AG.

## 2.1.10.1.4 Laws, Standards and Regulations (FI MH-2358)

FI MH-2359

These requirement specifications list laws, standards and regulations that are to be observed. This list may be incomplete. The contractor is responsible for adhering to all laws, standards and regulations and for carrying out development according to the state-of-the-art. It must be taken into account that the vehicles which contain this component will be sold all over the world.

### 2.1.10.1.4.1 General (FI MH-2361)

FI MH-2362

*For the homologation of a vehicle for road traffic all applicable laws and regulations must be fulfilled.*

FI MH-2363

The ECE function approval (type test) shall be provided by the contractor no later than by the production process and product approval.

FI MH-2364

With the PPA, the contractor confirms the certification capability as per FMVSS 108 [L\_R-247] and provides the confirmation by a recognized independent inspection institute (e.g. ETL, ITS) by the end of the design phase.

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## **2.1.10.1.4.2**

### **Vehicle and Parts Development** (FI MH-2365)

FI MH-2366

For the development of vehicles, all components and systems, the developer/contractor shall comply with all specifications listed in the table.

FI MH-2367

It must be ensured that all regulations can be completely fulfilled with the series production parts (without special treatment or preparation).

## **2.1.10.1.4.3**

### **Legal Texts** (FI MH-2368)

FI MH-2369

*The legal texts required world-wide and the respective translations in English and German can be opened in the online law collection (ALO) at the following address in the intranet/Internet: <http://cis-gso.daimler.com> (subject to a charge outside Daimler AG PC).*

## **2.1.10.1.4.4**

### **Regulations** (FI MH-2370)

FI MH-2371

*The different regulations for the individual markets generally differ in the type of test procedure and the applicable general conditions.*

FI MH-2372

*In the case of regulations not explicitly stated (empty field) reference is generally made to regulations of "markets" not explicitly stated.*

FI MH-2373

*In part, the different national regulations differ from one another only slightly, as in the case of USA (FMVSS) and Canada (SR S).*

FI MH-2374

*The differences between EU and ECE are due to the applying states and to the different updating of the regulations.*

FI MH-2375

Compliance with all legal specifications

Approval under ECE/Japan/SAE/worldwide

See function specification(s) as per Chapter "Function Specifications".

The contractor is responsible for the timely provision of the relevant certificates:

EC/ECE: ECE type approvals for Europe and associated countries

USA/Can.: Certification of fulfillment of FMVSS 108 [L\_R-247] and SAE (overall functionality)

Japan: Legal requirements shall be fulfilled. Inspection at the overall vehicle at the client's location (some ECE approvals are recognized).

FI MH-2376

*Specifications, see Chapter <Other Applicable Documents>.*

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No.	Documents
1	ECE R 98 Xenon headlamp
2	ECE R 99 Xenon light source
2	ECE R 37 Exchangeable light sources
3	ECE R 112 Halogen headlamp
4	ECE R 87 Daytime driving lamp (if present)
5	ECE R3 Rear reflector
6	ECE R6 Direction indicator lamp
7	ECE R 7 Position light
8	ECE R23 Backup lamp (reversing light)
9	ECE R38 Rear fog lamp
10	ECE R 48
11	FMVSS 108, CFR 564, Relevant SAE standards (USA)
12	CMVSS 108 (Canada)
13	Relevant Jigi, Jischa, Koshin and TRIAS rules

## 2.1.10.2 Functions (FI MH-2290)

### 2.1.10.2.1 General Appearance or Signal Representation (FI MH-67)

- FI MH-68      *The following requirements apply to the functions described in Chapter "Function Block Diagram" (FI MH-13ff).*
- FI MH-81      The illumination of all optical fibers shall be homogeneous.
- FI MH-2463     The illumination of all individual reflectors shall be homogeneous.
- FI MH-134      *Homogeneous means that no spots are visible in the signal representation.*
- FI MH-2213     Within an optical fiber, a light density difference with a maximum ratio of 1:3 is permitted.
- FI MH-2464     A maximum light density difference ratio of 1:3 is permissible within a light function for the illumination of the corresponding individual reflectors.
- FI MH-2447     If the tail lamp is made up of 2 or more light functions, all lights shall have the same brightness. That also applies if one or more of these light functions are only approved as side marker light.
- FI MH-82      The illumination of the light function shall be independent of the angle of vision.
- FI MH-89      *The CAD data for the lamp lenses, the design specifications in terms of the distribution of the compartments and the available installation space (bodyshell) are sent via RDT for the inquiry.*

### 2.1.10.2.2 Day Design (FI MH-111)

- FI MH-112     The lamp lens shall not have any sunk spots. Exceptions shall be coordinated with the client in writing.
- FI MH-113     The contractor shall avoid weld seams in the lamp concept.
- FI MH-116     *Labeling requirements are available in the document "Common Requirements Pertaining to the Component Requirement Specifications"[STLH-3791].*

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FI MH-117	The lamp may not have any visible slide contours. Exception: If the supplier is able to arrive at an agreement with the contact from the client's development department, visible slide contours may be used for the lamp.
FI MH-2107	In installed condition, the lamp unit technology must not be visible. This includes e.g. engagements, cables, plugs, connection points, lamp holders, sockets, LEDs, PCBs, screws etc.
FI MH-121	The supplier shall design the lamp in such a way that any view of the joint is covered.
FI MH-122	The supplier shall design the lamp in such a way that a consistent appearance of the joints next to adjacent components is ensured.
FI MH-123	All ejector points on the cover plate must not be visible from the outside
FI MH-124	The supplier shall coordinate all ejector points on the cover plate with the contact from the client's development department.
FI MH-125	All openings (e.g. for light sources and cooling) are to be developed in such a way that open spaces not necessary are not created in the openings.
FI MH-126	Any openings for cooling shall be arranged in such a way that any shadow formation is prevented in brilliant design. Assessment by Daimler AG required.
FI MH-2861	Openings, circuit boards and other technical parts shall not reflect in visible areas.
FI MH-129	The connection between lamp lens and reflector housing shall be free of blistering and designed as a visibly homogeneous, continuous line.
FI MH-2338	There shall be no welding wires in the visible areas.
FI MH-2058	Reflections of red areas of the lamp lens in crystal clear/gray areas shall be prevented in coordination with the client (development/design) using suitable measures (e.g. divider ribs).
FI MH-2539	In the visible area (this also applies if the trunk lid or rear-end door is open), no manufacturer logo of the contractor is permitted.

### 2.1.10.2.3 Night Design (FI MH-132)

FI MH-137	The interruption of the illuminating surfaces between the sidewall lamp and the trunk lid lamp may not exceed a maximum width of 14 mm.
FI MH-138	The supplier shall design the lamp in such a way that the illumination at the lamp's side is maximum and homogeneous for every lamp function.
FI MH-142	<i>Maximum refers to the expansion of the lamp compartments.</i>
FI MH-2059	<i>Maximum refers to the contour of the lamp and the expansion of the lamp compartments specified by the development/design departments.</i>
FI MH-143	The edges of the illuminated surfaces of the lamp shall be illuminated precisely and correctly.
FI MH-144	No white light must be visible in the red fields of the lamp. Reason: compartment separation

### 2.1.10.2.4 Emergency Operation (FI MH-669)

FI MH-671 See <Substitute Light Guideline> [L\_R-238]

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<b>2.1.10.3</b>	<b>Properties</b> (FI MH-2291)
<b>2.1.10.3.1</b>	<b>Environmental Issues</b> (FI MH-1928)
FI MH-1929	In terms of environmental protection, the material selection in Chapter "Material Selection/Material Specification" [FI MH-1550] is to be observed in particular.
FI MH-1985	The contractor shall check the use of recycled material, offer alternatives and discuss this with Daimler's development department.
FI MH-1572	The supplier shall design all parts of the lamp in a recycling compatible manner. (See also [L_R-206])
FI MH-1573	When selecting materials, the supplier shall take recycling criteria, material variety and material compatibility into account, as well as technical requirements (see VDI guidelines 2243 [L_R-230]).
FI MH-1574	The supplier shall observe the legal specifications for the selection of the material.
FI MH-1575	The supplier shall mark all plastic parts as per "MBN 33035" [ L_R-206].
<i>FI MH-1576</i>	<i>Responsibility for remanufacturability (recycling):</i> <i>Together with the development partner, the Daimler AG development department is responsible for the reprocessability of new components. Restrictions relating to recycling capability are only permitted due to necessary and unavoidable design features (e.g. hermetically sealed housing) or for safety reasons.</i>
FI MH-1577	The supplier shall define the costs for the recycling capability of the lamp with the purchasing department.
<b>2.1.10.3.2</b>	<b>General Requirements for Plastic Injection Molded Parts</b> (FI MH-99)
FI MH-100	Only those materials are permitted that meet the requirements in the Function Specification for Signal Lamps [L_R-228] and in particular the requirements for the function test.
FI MH-2323	The material shall be selected by the contractor.
FI MH-2321	If ABS is used as the material, version 41 as per DBL5404 [L_R-251] shall be used.
FI MH-2061	The engagements of the lamp shall not be visible.
FI MH-101	The contractor shall design the lamp in such a way that no sunk spots are visible.
FI MH-102	All lamp outlets and borders shall be precise.
FI MH-103	All plastic weld seams shall be free of blisters.
FI MH-104	All plastic weld seams shall be visibly homogeneous and implemented as a continuous line.
FI MH-105	The supplier shall avoid the occurrence of welding foam and welding wires on all plastic weld seams.
<i>FI MH-106</i>	<i>The supplier may choose the plastic welding method.</i>
FI MH-108	All vaporized surfaces shall be implemented precisely using a stenciling technique.
FI MH-2339	Vaporized plastic parts may not have any direct contact with electronic components.
FI MH-109	Flow lines are only permitted in non-visible areas and must be coordinated with Daimler's development department.

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- FI MH-110 For complex, design-relevant or decisive plastic parts, mold-flow investigations shall be performed and presented to Daimler's development department.
- FI MH-2340 The surfaces must not be vaporized in areas welded.
- FI MH-2408 No stress-whitened points are permitted on engagements/latches.
- FI MH-2725 To reduce internal stress, the rear lamps shall be tempered before the final inspection.

### **2.1.10.3.3 Light Sources Used (General) (FI MH-1992)**

- FI MH-1995 The supplier shall optimize the number and type of light sources used in terms of costs.
- FI MH-1996 If the supplier uses LEDs, the supplier shall state the quantity and type of the LEDs in the tender and hand out the data sheets.
- FI MH-1997 *The supplier may define how many and which LEDs are to be used. This decision shall be coordinated with Daimler's development department.*
- FI MH-1998 If light sources are **not** relevant from a technical light viewpoint, they shall be noted/listed separately in the tender.

### **2.1.10.3.4 Requirements for Powerful LED Functions (LED Module) (FI MH-569)**

- FI MH-603 The LED module shall have overvoltage protection.
- FI MH-604 The LED module shall have reverse polarity protection.
- FI MH-605 The LED module shall be protected against thermal damage.
- FI MH-2262 The LED module shall be protected against moisture/condensation damage.
- FI MH-606 The supplier shall provide information on the efficiency and power loss of the electrical actuation in the technical specifications.

### **2.1.10.3.5 Requirements for Flame Retardant Properties (FI MH-616)**

- FI MH-617 In terms of their flame retardant properties, the materials used shall meet the following legal specifications and the derived DBL:
- FI MH-618
- FMVSS 302 "Flammability" [L\_R-235]
  - EEC 95/28 "Material Combustion Characteristics" [L\_R-236]
- FI MH-619

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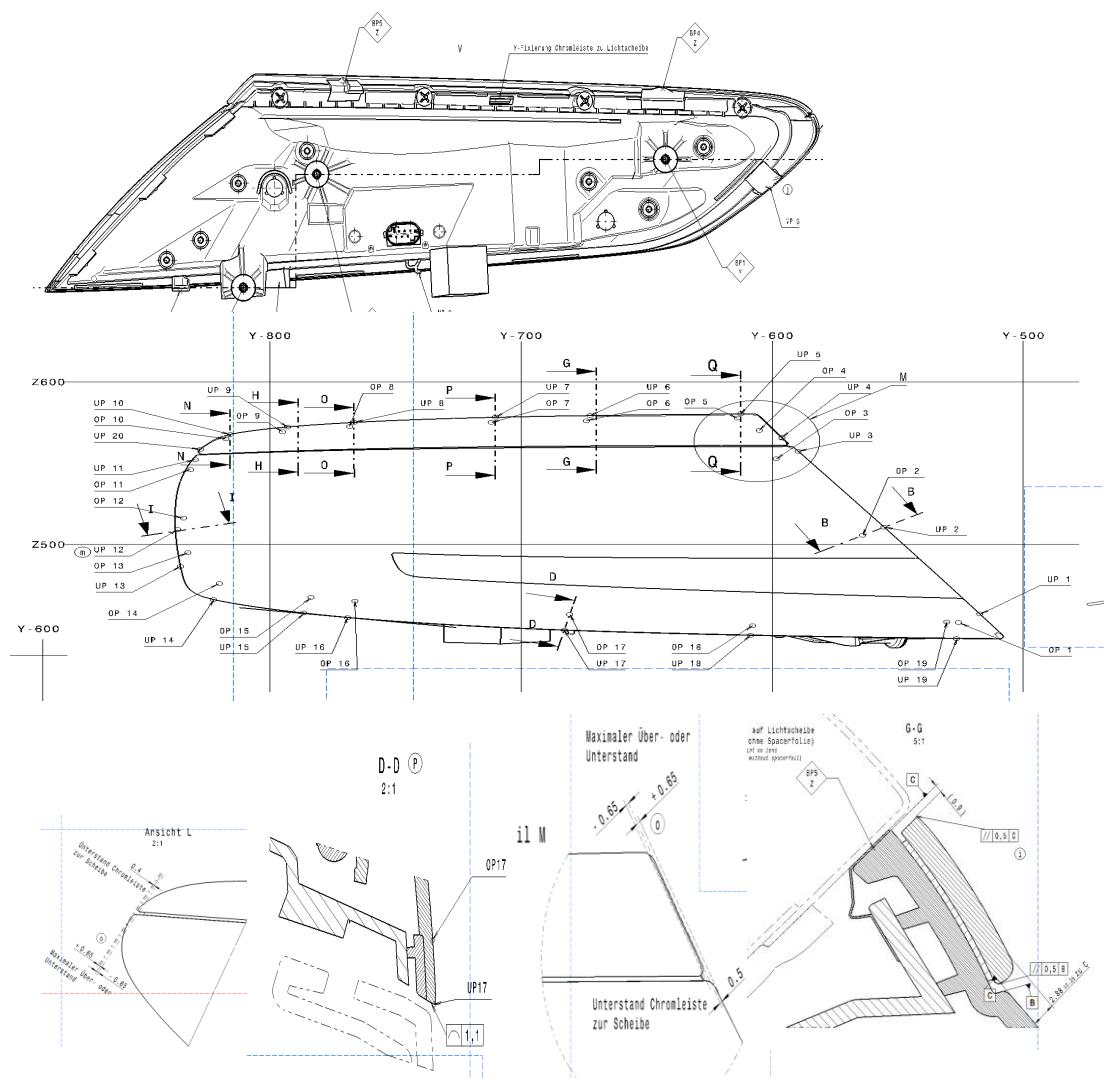
## 2.1.10.3.6

## Component-Specific Tolerance Data (FI MH-1641)

FI MH-3059

Draft

Vertraulich



1 Serientoleranzen | Gross, Thomas (RD/KEL) | 17.11.2014

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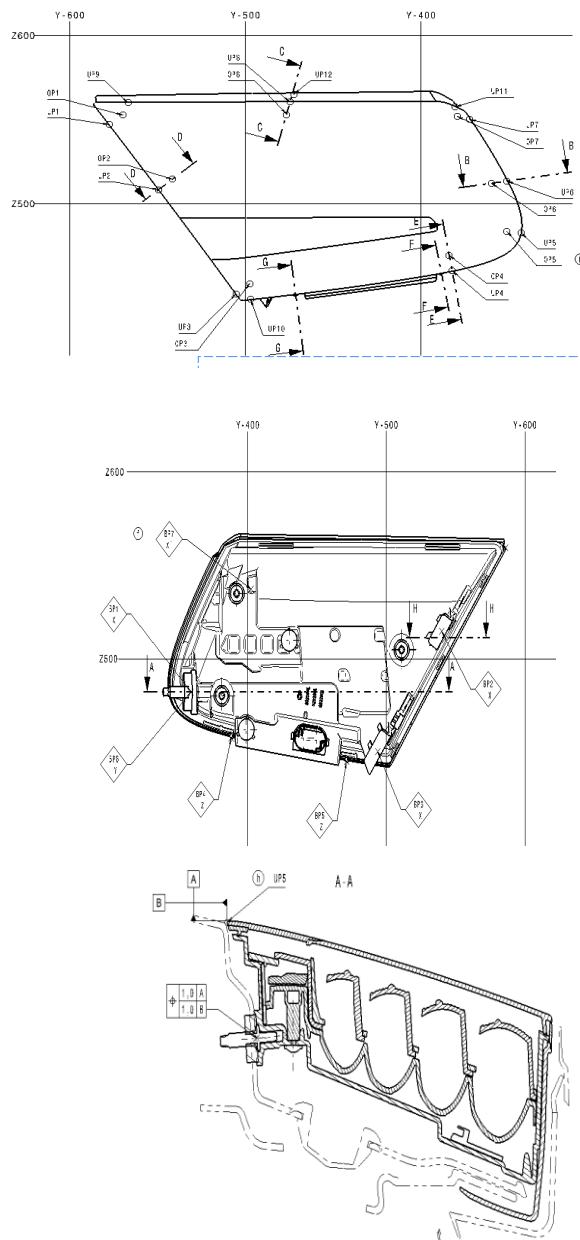
Technical Component Requirement  
Specifications  
Rear lamp  
QEVI11AGEGLV

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Messplan ZB Heckleuchte schedule of measurements ZB tail lamp							
Messpunkte Oberfläche SWL measuring points surface							
Pkt.-Nr. point-no.	Sollwert nominal value			Startpunkt (Vektor) starting point (vector)		Toleranz tolerance	
	X	Y	Z	X	Y	Z	
OP1	3943,96	-525,75	451,9	3944,86	-526	452,26	±0,9
OP2	3905,18	-563,96	505,56	3905,99	-564,24	506,07	±0,9
OP3	3857,08	-598,3	552,57	3857,8	-598,61	553,19	±0,9
OP4	3844,67	-605,11	570,2	3845,12	-604,67	570,71	±1,1
OP5	3838,03	-613,92	577,64	3838,78	-614,29	578,18	±1,1
OP6	3801,94	-673,98	576,1	3802,61	-674,47	576,66	±1,1
OP7	3768,96	-711,88	574,97	3769,51	-712,5	575,53	±0,9
OP8	3678,15	-768,33	572,45	3678,47	-769,09	573,02	±0,9
OP9	3609,97	-795,1	569,31	3610,21	-795,89	569,87	±0,8
OP10	3540,16	-817,58	564,96	3540,38	-818,42	565,46	±0,8
OP11	3517,81	-831,47	545,93	3518,03	-832,37	546,3	±0,6
OP12	3550,44	-834,57	516,2	3550,66	-835,5	516,5	±0,6
OP13	3585,64	-832,67	494,76	3585,87	-833,61	495,02	±0,6
OP14	3650,25	-820,06	476,01	3650,54	-820,98	476,26	±0,6
OP15	3752,97	-783,82	467,6	3753,38	-784,68	467,9	±0,7
OP16	3787,95	-768,14	465,06	3788,44	-768,95	465,39	±0,7
OP17	3880,77	-680,6	456,84	3881,55	-681,09	457,22	±0,7
OP18	3918,65	-607,8	450,03	3919,52	-608,13	450,39	±0,7
OP19	3942,47	-530,47	452,31	3943,37	-530,72	452,67	±0,9

Messpunkte Umriß SWL measuring points contour							
Pkt.-Nr. point-no.	Sollwert nominal value			Startpunkt (Vektor) starting point (vector)		Toleranz tolerance	
	X	Y	Z	X	Y		
UP1	3943,17	-517,35	457,31	3943,19	-516,54	457,89	±0,8
UP2	3903,89	-555,41	510,61	3903,91	-554,61	511,21	±0,8
UP3	3855,6	-589,58	557,25	3855,61	-588,78	557,85	±0,8
UP4	3849,05	-586,13	565,84	3849,13	-595,34	566,45	-
UP5	3832,9	-612,5	580,25	3832,21	-612,19	580,91	±0,5
UP6	3799,86	-672,57	579,24	3799,34	-672,22	580,02	±0,5
UP7	3767,31	-710,2	578,18	3766,9	-709,78	578,99	±0,5
UP8	3677,22	-766,47	575,03	3678,94	-765,91	575,81	±0,5
UP9	3609,1	-792,98	572,24	3608,87	-792,41	573,03	±0,5
UP10	3539,31	-815,86	567,67	3539,04	-815,3	568,46	±0,5
UP11	3509,12	-829,8	552,14	3508,23	-829,37	552,22	±0,4
UP12	3545,64	-836,67	509,06	3545,09	-836,44	508,26	±0,4
UP13	3580,96	-835,61	486,43	3580,45	-835,38	485,6	±0,4
UP14	3649,92	-822,39	466,13	3649,8	-822,33	465,14	±1,1
UP15	3753,39	-786,48	457,75	3753,28	-786,42	456,76	±1,1
UP16	3788,78	-769,04	455,03	3788,67	-768,98	454,04	±1,1
UP17	3883,24	-682,79	447,24	3883,08	-682,74	446,25	±1,1
UP18	3920,23	-608,61	444,1	3920,04	-608,57	443,12	±1,1
UP19	3946,89	-526,73	442,12	3946,7	-526,69	441,14	±1,1
UP20	3512,65	-827,59	558,54	3511,77	-827,14	558,98	-

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	Technical Component Requirement Specifications Rear lamp  QEVI11AGEGLV	



### Messplan ZB Heckleuchte schedule of measurements ZB tail lamp

#### Messpunkte Oberfläche HDL measuring points surface HDL

Pkt.-Nr. point-no.	Sollwert nominal value			Startpunkt (Vektor) starting point (vector)			Toleranz tolerance
	X	Y	Z	X	Y	Z	
DP1	3868,78	-589,67	552,61	3869,52	-589,95	553,23	±0,5
DP2	3906,9	-541,52	514,49	3907,71	-541,78	515,01	±0,5
DP3	3950,37	-497,52	452,47	3951,29	-497,75	452,8	±0,5
DP4	3968,58	-383,86	469,16	3969,5	-384,03	469,5	±0,5
DP5	3967,88	-350,95	483,47	3968,79	-351,05	483,87	±0,5
DP6	3952,93	-359,81	512,14	3953,81	-359,93	512,6	±0,5
DP7	3926,25	-379,43	551,9	3925,91	-379,18	552,61	±0,5
DP8	3899,75	-476,6	552,75	3900,52	-476,83	553,34	±0,5

#### Messpunkte Umriss HDL measuring points contour HDL

Pkt.-Nr. point-no.	Sollwert nominal value			Startpunkt (Vektor) starting point (vector)			Toleranz tolerance
	X	Y	Z	X	Y	Z	
UP1	3869,16	-577,63	546,94	3869,23	-578,47	546,4	±0,6
UP2	3906,97	-549,67	508,65	3907,04	-550,51	508,11	±0,6
UP3	3949,66	-505,49	446,49	3949,63	-506,33	445,94	±0,6
UP4	3971,76	-382,25	459,82	3971,59	-382,03	458,86	±0,5
UP5	3968,22	-342,84	482,5	3967,9	-341,95	482,18	±0,4
UP6	3949,02	-350,77	513,91	3948,48	-349,93	513,94	±0,4
UP7	3918,64	-372,03	550,61	3918,07	-371,21	550,62	±0,4
UP8	3892,72	-474,51	560,32	3892,47	-474,44	561,29	±0,6
UP9	3861,82	-566,72	559,94	3861,47	-566,59	560,87	±0,6
UP10	3953,33	-497,06	442,93	3953,14	-496,91	441,96	±0,5
UP11	3915,81	-380,41	557,5	3915,62	-380,06	558,42	±0,6
UP12	3887,21	-472,61	565,76	3886,54	-472,42	566,48	=0,65

1 Serientoleranzen | Gross, Thomas (RD/KEL) | 17.11.2014

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FI MH-1656

A tolerance study shall be compiled for the entire lamp prior to planning release. The tolerance study is a component of the release drawing.

FI MH-3066

The supplier shall undertake to reduce tolerance limits on the basis of Piweb evaluations after a production period of 6 months.

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		<b>Technical Component Requirement Specifications Rear lamp</b>  QEY111AGEGLV	

### **2.1.10.3.7**

### **Rigidity/Spring Characteristics (FI MH-658)**

FI MH-660

The requirements of the US/Canadian pendulum test (CMVSS 215) [L\_R-237] shall be fulfilled across the entire vehicle.

### **2.1.10.3.8**

### **Material Selection/Material Specification (FI MH-1550)**

FI MH-1991

If the supplier uses auxiliary materials (sliding compound, etc.) for production, these auxiliary materials shall be approved by the contact from the client's development department.

FI MH-1558

If the supplier uses auxiliary materials (sliding compound, etc.) for production, these auxiliary materials shall not impair the lamp function.

#### **2.1.10.3.8.1**

#### **Material (FI MH-1552)**

FI MH-1553

The supplier may only use materials approved by the client.

FI MH-1554

Information: See the function specification "Signal Lamps" regarding the material selection [L\_R-228].

FI MH-1555

For material selection, see (inquiry) drawings

FI MH-1556

The supplier shall select all materials for lamp components, paying careful attention to overall pollution and energy balance, and emissions and resources shall be taken into account.

FI MH-1557

The supplier shall avoid substances with known risk potential.

FI MH-1560

Recycled plastic parts	All plastic components are to be checked to see whether they can be produced from recycling material (DBL 5490) [L-R-178]. All plastic components, which are not in the visible area, are to be produced from recycled materials according to planning (15% of total plastic application in vehicle must be made from recycled materials). Reasons must be provided for any exceptions.
Material compatibility	Devices must be segregated for recycling or disassembly into segregated fractions must be easy. Avoid metal inserts in plastic parts or design them for easy detachment. Identification of plastic components: All components from 100 g weight must be accordingly identified (VDA 260) [L-R-179]. If possible, devices < 100 g should also be identified.
Fluids	It must be possible to completely empty any devices or assemblies containing fluids with a minimum of effort. A concept for the removal of service fluids must be drawn up for these deices.
Hazardous materials	Avoidance of materials with a known risk potential. Limit values as per DBL 8585 [L-R-163] are to be adhered to. In addition, the materials mercury, cadmium, lead, chromium (VI) are banned in accordance with Article 4.2. of the EU ELV Directive 53/2000/EC [L-R-193], notwithstanding the exceptions mentioned in Appendix 2 of the Directive.
Replenishable raw materials	The use of renewable raw materials (flax, sisal hemp, cotton, etc.) is to be increased.

### **2.1.10.3.8.2 Properties of Initial and Final Product** (FI MH-1561)

FI MH-2179

Physical properties	Not-conductive, light permeability with specific components
Chemical properties	Reliability, see signal lamp function specifications [L-R-175]

### **2.1.10.3.8.3 Specified Materials/Materials to be Used** (FI MH-1568)

FI MH-1569

Fire behavior	See [FI MH-616ff]
Material standardization	Materials preferred by Daimler AG

### **2.1.10.3.9 Thermal Management** (FI MH-750)

FI MH-751

Extended temperature simulation and measurements on samples shall be performed.

FI MH-752

The results shall be discussed promptly with the client (no later than by the concept approval).

### **2.1.10.3.10 Other** (FI MH-1512)

FI MH-757

Noises	Body distortion and vibrations shall not result in any development of noise in the lamp or in the lamp/body unit.
Aerodynamics	If necessary, specific requirements will be specified during the development process.
Leakproofness	See signal lamp function specifications [L-R-175]
Interior ventilation	Not relevant
Quality	See general requirements in Chapter 3 [STLH-2683]ff
Theft protection	It shall not be possible to remove the lamp from the outside. Entering the vehicle interior (e.g. manipulation of the locking system using wire or similar) without causing damage is to be prevented effectively.

### **2.1.10.3.11 Corrosion Protection** (FI MH-2666)

FI MH-2667

Following installation in the vehicle, the components will receive no further protection by means of preservation or painting. The materials and surfaces of the components shall be selected and designed for suitability to the installation location in the vehicle.

### **2.1.10.3.12 General Requirements Regarding the Definition of Corrosion Protection for the Overall Vehicle** (FI MH-2668)

FI MH-2669

During component development, the contractor shall observe the following requirements:

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- FI MH-2671 The contractor shall reliably rule out any chafing of attached parts.
- FI MH-2672 Steel components of the lamp shall be fully galvanized.
- FI MH-2673 Within a period of three years, no corrosive effects shall appear in the areas visible to the customer.
- FI MH-2674 For a period of 7 years, there shall be no significant corrosion on the lamps.
- FI MH-2675 The corrosion protection for the body shall be designed to last for 15 years without perforation through corrosion (Mobil Life).
- FI MH-2676
- Protection against stone chipping (thrown by vehicle)**
- The contractor shall ensure protection against stone chipping from stones thrown up by the vehicle by the use of covers or suitable design measures or by the avoidance of chipping-prone surfaces.
- FI MH-2677
- Testing**
- With regard to the testing of corrosion protection within the MDS, a dynamic Mercedes corrosion endurance test (MeKO-D) is carried out. On successful completion of the MeKO-D, development release, i.e. release with regard to the corrosion protection of the overall vehicle, will be granted.
- FI MH-2678 In the case of the material/corrosion protection which is used, the contractor shall ensure that the corrosion protection requirements of the defined DBL (see also Chapter "Testing of Corrosion Resistance") and those in the MeKO are met.
- FI MH-2679 The DBL/supply specification valid at the time that the component requirement specifications are drafted shall be observed.

### **2.1.10.3.13 Avoidance of Contact Corrosion Between Metals and Plastics/Elastomers**

(FI MH-2684)

- FI MH-2686 Any conductive connection to steel, stainless steel or other higher grade materials is to be ruled out.
- FI MH-2687 Inserts in rubber seals shall be completely glazed. If this is not possible, the insert materials shall be coordinated with the Overall Vehicle Corrosion Protection department with respect to application and material pairing.

### **2.1.10.3.14 Small Parts and Fasteners**

(FI MH-2688)

- FI MH-2689 For fasteners, the contractor shall apply corrosion protection coatings that at least fulfill the requirements of "Supply Specification: Fasteners with Metric Thread; Surface Protection and Supplementary Technical Delivery Conditions" [STLH-2228], Version .40, .43, .47, .49. "Supply Specification: Threaded Fasteners with Microencapsulated Liquid Adhesive" [STLH-2451] **Version .42** and "Supply Specification: Surface Protection for Fasteners" [STLH-2230] Version .50.
- FI MH-2938 The contractor shall comply with the corrosion requirements as per STLH-777 Corrosion Protection Chapter 8.5.1 for fasteners.
- FI MH-2690 Other corrosion protection coatings are only possible with the previous approval of the client's Overall Vehicle Corrosion Protection department.
- FI MH-2691 The requirements of "Supply Specification; Testing of the Corrosive Effect of Elastomers on Hose Clamps" [STLH-4622] shall be taken into consideration when fastening elastomer hoses with CrNi-steel hose clamps.

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### 2.1.10.3.15

#### Detachable Body Components/Assembly Parts (FI MH-2693)

FI MH-2694

The contractor shall always design the mounting for attached parts on coated and painted surfaces so that no chafing will occur during exposure to dynamic driving load.

FI MH-2695

If chafing stress cannot be ruled out, the contractor shall provide for appropriate measures such as the application of chafe protective films.

FI MH-2969

"In the event of the force-locked or form-locked connection of two different materials (different thermal expansion coefficient), the components (e.g. plastic housing to heat shield) shall have sufficient clearance between them in order to counteract the thermal loads and the resulting material expansions. If the two components are connected to each other, the diameter of the clearance holes, for example, shall be designed so that the components can expand and contract without setting the counterpart under strain."

### 2.1.10.3.16

#### Component-Specific Requirements (FI MH-2698)

FI MH-2699

The use of Mg, corrosion-resistant CrNi steel and CFK materials is not permitted.

FI MH-2700

The component shall not contain any crevices in which fluid may get trapped.

FI MH-2701

No moisture (water, fuels and lubricants) shall accumulate in the component.

FI MH-2702

The component shall provide suitable drainage options (paint drain holes, radii, holes, swage lines, etc.) so that the moisture (water, fuels and lubricants, etc.) or dirt can drain out from the inside of the component.

FI MH-2703

Non-approved materials shall only be used with the consent of the client's department.

FI MH-2704

All edges shall be deburred. If necessary, the cut edges shall be designed in such a way that they do not damage other components. The cut edges shall not be visible.

FI MH-2705

The connection to the body shall be coordinated with the client's Overall Vehicle Corrosion Protection department according to the material used on the body.

FI MH-2706

Plastic clips shall be used to fasten the lines.

FI MH-2707

All individual part coatings of components are to be listed in a table in the drawing. The entry on the drawing for the ZB component examination is to be agreed with the client's department Corrosion Protection, Overall Vehicle.

FI MH-2709

Manufacturing defects of any kind that adversely affect function and appearance are not acceptable.

### 2.1.10.3.17

#### Testing of Corrosion Resistance (FI MH-2710)

FI MH-2711

The corrosion tests are carried out in line with the DBLs and DIN standards used.

FI MH-2712

Corresponding test parts shall be made available in coordination with the overall vehicle corrosion protection department at the client. Surface variations that exceed those of the approved reference samples are not permitted.

FI MH-2713

The specification of the surface quality and design of the components shall take place in accordance with the adjacent components and according to the drawing specifications.

FI MH-2714

*Note: Using the materials and coatings mentioned here does not guarantee long-term functionality during operation of the vehicle. For this, in particular for new developments, a practical corrosion inspection is required consisting both of the "Mercedes-Benz static corrosion test" in the laboratory, as well as during the vehicle corrosion endurance test, MeKo-D.*

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## **2.1.10.4 Interfaces** (FI MH-2292)

### **2.1.10.4.1 Overview of Interfaces** (FI MH-2297)

FI MH-634      *The interfaces of the lamp are:*

FI MH-635      • *Bodyshell*

FI MH-636      • *Interior trim*

FI MH-2540      • *Rear-end door*

FI MH-637      • *Rear Bumper*

FI MH-639      • *Wiring harness for electrical components*

FI MH-640      • *Electrical system*

FI MH-642      • *Weld cover*

FI MH-643      • *Signal acquisition and actuation module (SAM)*

### **2.1.10.4.2 Mechanical Loads** (FI MH-649)

FI MH-650      For tool release, the supplier shall perform an FEM calculation in the vicinity of the connection points for the vehicle.

FI MH-651      *The boundary conditions for FEM calculations are defined in the function specification for indicator lamps [L\_R-228].*

FI MH-652      The supplier shall make the results of the simulation available to the contact from the client's development department in ODB format.

### **2.1.10.4.3 Fording Specification** (FI MH-729)

### **2.1.10.4.4 Lamp Ventilation** (FI MH-737)

FI MH-739      Ventilation with nitro elements and a splash protection cover are to be provided on the housing to de-mist the lamp, with a diagonal ventilation system in the airflow range, whereby the elements must not be located on the underside of the housing.

FI MH-2507      The penetration of environmental influences (such as dust and dirt particles or insects) shall be prevented effectively.

FI MH-746      The ventilation must be designed so that condensation is removed from the cover lens as per function specification A 000 003 03 99 [L-R-159].

FI MH-747      The openings must be laid out on the standard profile.

FI MH-748      The openings shall be designed for standard sections or for the requirements and attachment of pressure equalization elements (Nitto elements).

## **2.1.10.5 Component Design** (FI MH-2293)

### **2.1.10.5.1 General Design Guidelines** (FI MH-2478)

#### **2.1.10.5.1.1 Geometry** (FI MH-1493)

FI MH-1494      The geometrical specifications are to be taken from the CAD drawing.

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FI MH-47	The supplier shall design the lamp in such a way that it can be replaced without the end customer having to remove the lamp (Exception: "Closed lamp system" [FI MH-59] et seq.)
<b>2.1.10.5.1.2</b>	<b>Technical Content of the Lamp</b> (FI MH-2927)
FI MH-2528	Further information and specifications can be found on the inquiry drawing.
FI MH-2626	The parts list of the inquiry drawing only includes the main components. Any necessary additional parts for technical realization and the implementation of the design (acc. to the rough volume model with internal design) are to be listed in the tender draft and in the price breakdown.
FI MH-2627	<p>The material data in the parts list represents the minimum requirements.</p> <p>If the preparation of the tender for a component results in a material of higher quality, this material shall be taken as the basis for the tender.</p> <p>If the preparation of the tender for a component results in it being possible to use a material of lower quality, this shall be listed as an option with potential cost savings.</p>
FI MH-2628	<p>The LED type data on the inquiry drawing represents the minimum requirement.</p> <p>If the preparation of the tender shows that more powerful LEDs are necessary, these shall be used as the basis for the tender and listed in the price breakdown.</p> <p>If the preparation of the tender for a component results in it being possible to use less powerful LEDs, this shall be listed as an option with potential cost savings.</p>
FI MH-3017	The distance between the bodyshell/seam seal and the lamp shall be at least 3 mm. Exception: attachment and reference points.
FI MH-3064	If the distance is less than 3 mm, the bottleneck shall be measured and tolerated by means of random measurement positions.
<b>2.1.10.5.2</b>	<b>Fastening</b> (FI MH-2976)
<b>2.1.10.5.2.1</b>	<b>General</b> (FI MH-2978)
FI MH-2954	Non-destructive removal and installation of lamps < 10 min without the removal or installation of adjacent components
FI MH-2992	After insertion into the body, the lamp shall retain its position independently. (Background: the worker shall implement the tool with the fastener).
<b>2.1.10.5.2.2</b>	<b>Spacers</b> (FI MH-2076)
FI MH-2161	The spacer color is transparent.
FI MH-2829	The dimensions of the spacer tape are (LxBxH) 30x20x0.2
FI MH-3001	Spacer tape manufactured by 3M with the designation PU8592 E shall be used.
FI MH-3002	The spacer tape shall not protrude beyond the lens tool separation.
FI MH-2963	The spacer dimensions shall be taken from the inquiry drawing (parts list).
FI MH-2617	The spacer(s) is/are self-adhesive.
FI MH-2832	Sufficiently large bonding surfaces shall be provided to the left and right of the stop rib on the rear lamp housing.
FI MH-2834	The tape manufacturer's bonding specification shall be complied with.

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FI MH-2409	The number and position of spacers shall be taken from the inquiry drawing.
FI MH-2509	The spacer(s) shall not be released during transport from the load container to the installation location (assembly line).
FI MH-2510	The spacer(s) shall not be released during installation in the body.
FI MH-2492	The spacer/paint material combination shall not result in any development of noise while driving.
FI MH-2494	No paint discoloration by spacer material permitted.

### **2.1.10.5.2.3 Lamp Variant: "Closed Lamp System" (FI MH-59)**

FI MH-61	The lamp shall feature ventilation diaphragms.
FI MH-62	The number of ventilation diaphragms shall be defined by the supplier.

### **2.1.10.5.2.4 Fasteners (FI MH-2513)**

#### **2.1.10.5.2.4.1 Double-Threaded Bolt (FI MH-2979)**

FI MH-2514	<p>The fasteners (e.g. double-threaded bolts or injection screws) for assembling the rear lamp on the body shall be designed so that they have a collar that rests on the body sheet (lamp support in the bodyshell). The dimension of the collar diameter shall be such that the collar rests on the sheet all round in all tolerance and assembly positions.</p> <p>A bolt form in which the contact surface is formed not by the bolt but by the plastic of the lamp housing, e.g. the fastening dome, is not permissible.</p>
FI MH-2619	The fasteners are designed with seals.
FI MH-3052	The double-threaded bolt shall feature two additional sealing washers.
FI MH-2623	The thread run-out of metric threads shall be designed as an MA-Thread thread.
FI MH-2664	The exact screw-in depth for the threaded bolts into the housing shall be guaranteed using suitable measures in the process (e.g. torque and tightening angle monitoring) and the design (e.g. sufficiently large screw dome contact surface). The permissible tolerances shall be coordinated with the client.
FI MH-2624	For minimization of the assembly time, threaded bolts shall be as short as possible. The bolt length shall be specified in coordination with Daimler's development department.

### **2.1.10.5.3 Overview of Component Design (FI MH-2298)**

#### **2.1.10.5.3.1 Functional Block Diagram (FI MH-13)**

FI MH-14	The supplier shall define exactly and explicitly for all functions of the lamp, in which compartment or by which area this function is to be implemented.
FI MH-15	The supplier shall define exactly and explicitly for all functions of the lamp, which type of light source is to be used.
FI MH-17	The supplier shall submit the assignment of the compartments to the specified functions in table form to the contact from the client's development department.
FI MH-2336	For the individual functions of the overall signal lamp function, see the information on the inquiry drawing

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<b>2.1.10.5.4</b>	<b>Technical Description of the Lamp</b> (FI MH-2317)
FI MH-1806	The lamp shall have a two-piece design.
FI MH-38	The arrangement shall be defined in coordination with the design department and the lighting system department.
FI MH-39	Package, arrangement and installation location shall be taken into account.
FI MH-2160	If any specifications are not clear, the supplier is obliged to query and clarify the corresponding points with the client.
<b>2.1.10.5.5</b>	<b>Basic Design of Lamp</b> (FI MH-43)
<b>2.1.10.5.6</b>	<b>Light Sources Used (Component-Specific)</b> (FI MH-148)
FI MH-150	The table with the list of light sources shall be taken from the client's inquiry drawing.
FI MH-149	The same specifications apply as already listed in the previous Chapter "Light Sources Used (General)" [FI MH-1992] ff.
FI MH-2024	The light source shall fit tightly, taking all tolerances into account.
FI MH-2025	Any twisted insertion of the lamp shall not be possible.
FI MH-2062	The lamp base shall engage reliably (lamp replacement)
<b>2.1.10.5.7</b>	<b>Exterior Lamp Lens</b> (FI MH-183)
FI MH-2063	in 3C injection-molding technology
FI MH-189	The exterior lamp lens of the lamp shall be without lens.
FI MH-190	The supplier shall prevent any color reflections (e.g. signs of red in the white field).
FI MH-192	The areas for covering the welded area (outside and inside the lamp) shall be structured.
FI MH-193	The supplier shall coordinate the structure for the area for covering the welded area with the contact from the client's development department.
FI MH-198	The exterior lamp lens of the lamp shall be without burrs.
FI MH-199	The supplier shall coordinate the gate marks of the lamp with the contact from the client's development department.
FI MH-200	The tool parting line of the exterior lamp lens shall be minimized.
FI MH-2503	The ejector marks shall not be visible.
FI MH-201	The tool parting line of the exterior lamp lens shall not cause any damage to the adjacent exterior components during installation.
FI MH-202	If the supplier uses lamp lenses without opaque edge, the supplier shall design the outer edge of the lamp lens in such a way that any formation of drops on the outer edge of the lamp lens (e.g. by rainwater) is avoided.
FI MH-203	If the supplier uses lamp lenses without opaque edge, the supplier shall design the outer edge of the lamp lens in such a way that any dirt deposits on the outer edge of the lamp lens are avoided.
FI MH-204	If the supplier uses lamp lenses without opaque edge, the lamp lens outer edge dimension towards the lamp lens base shall be smaller than 5 mm.

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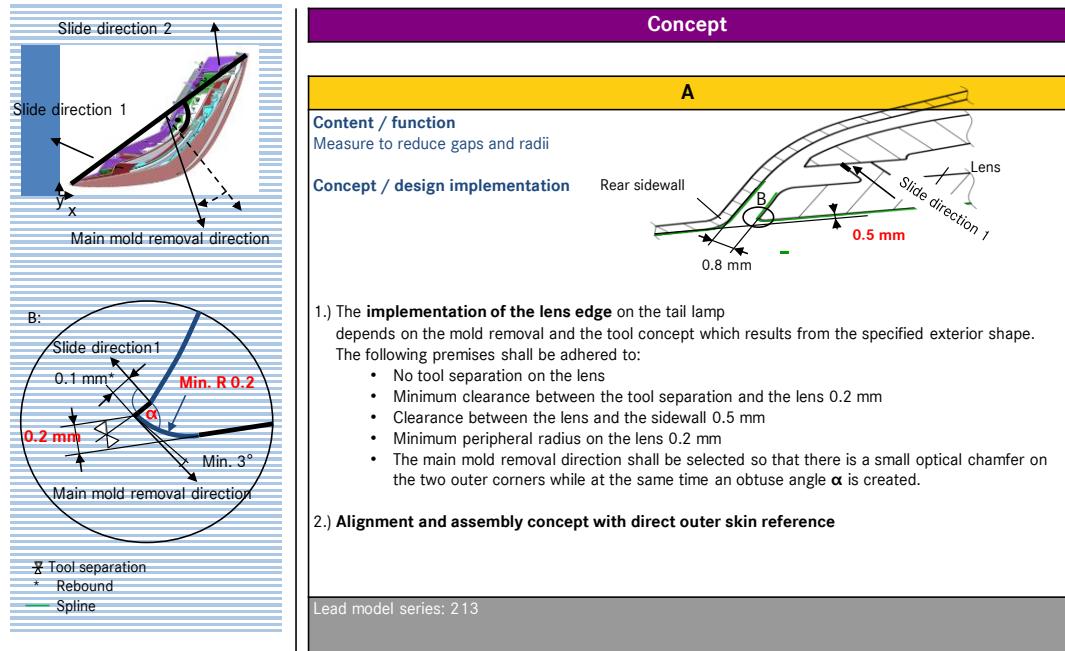


Figure: Guideline for implementing the lens design

FI MH-3065

The all-round outer edges of the lamp lens shall be manufactured free of burrs using the IR (infrared) smoothing process.

### 2.1.10.5.8 Additional Lamp Lenses (FI MH-206)

FI MH-2516

The supplier shall select and design the type of attachment for the additional lamp lens(es) in such a way that the connection points are not visible.

FI MH-2547

The additional lamp lens shall be without clearance and fit tightly.

FI MH-2558

The additional lamp lens shall be damped on both sides.

FI MH-2559

If the intermediate lamp lens is vaporized, there shall be no partial "light leakage".

### 2.1.10.5.9 Lamp Housing (FI MH-213)

#### 2.1.10.5.9.1 General (FI MH-2766)

FI MH-214

*Definition of "visible": The area of the lamp which lies outside of the sealed area following lamp assembly is referred to as visible.*

*This definition applies to all requirements within this section.*

FI MH-217

The lamp housing shall be produced using injection-molding technology.

FI MH-2942

The gate mark(s) shall not be visible from the exterior or interior (for interior lamps) (looking at the lamp when installed).

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- FI MH-3030 In the event of reflectors being integrated into the housing, a grain shall be taken into account for the reflector base surfaces in the tool costs.
- FI MH-2947 All metalized areas of the lamp housing shall be connected to the ground (prevention of ESD damage)
- FI MH-230 The supplier shall design all openings on the housing and its subcomponents (e.g. for lamps, cooling, plug connection) so that there are no unnecessary open spaces.
- FI MH-231 The supplier shall design all openings in the lamp so that no "shadow formations" are possible in the illuminated area.
- FI MH-234 The housing shall be designed so that it is not possible for foreign matter (e.g. insects) to ingress into the lamp.
- FI MH-243 The supplier shall verify the strength of the lamp's individual fastening points via a FEM simulation.
- FI MH-250 The supplier shall optimize the lamp design in terms of the temperature load.  
Reason: avoiding damage by the deformation of components.
- FI MH-252 The supplier shall optimize the lamp design in terms of the process-validated vapor depositing.  
Reason: So that vapor depositing is carried out completely.
- FI MH-253 The supplier must design the lamp in such a way that no surrounding surfaces, bars, partition walls, etc. are damaged by the heat from bulbs.
- FI MH-2413 All the connectors installed on the lamp shall be protected against accidental disconnection. This shall withstand a pull of at least 40 N.

### **2.1.10.5.9.2 Lettering and Labels (FI MH-2773)**

- FI MH-2468 A label with variant specification, e.g. W213 LI ECE RV ET (= model W213, left-hand side, ECE, right-hand traffic, basic type version) MB item number, change status (ZGS = drawing and geometry status), release no. (KEM = engineering change notice), manufacture date and quality status (or test status before initial sampling) shall be affixed to the housing.  
This shall take place in coordination with Daimler's development department.  
For additional information about this, see Common Requirements Pertaining to the Component Requirement Specifications LHV 310001 (see STLH-3791J Other Applicable Documents) Chapter 4.10 Identification of Test Parts.
- FI MH-2901 Affixing the supplier logo and/or the supplier part number is not permissible.
- FI MH-266 There is an identification field on the housing; this shall be filled with the relevant information for traceability.
- FI MH-268 The supplier is not permitted to affix cp specifications to the housing.
- FI MH-265 The identifications are described in "Common Requirements Pertaining to the Component Requirement Specifications" [STLH-3791].
- FI MH-2775 The voltage and power specification for the light functions shall be affixed to the rear of the lamp housing.

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### **2.1.10.5.9.3 Fastening/Screw-on Points/Centering Ribs** (FI MH-2772)

### **2.1.10.5.9.4 Connection for Bumper Bracket** (FI MH-2771)

FI MH-2905 The housing of the sidewall lamp has two integrated fitting molds underneath for the Z-positioning of the basic bumper bracket.

FI MH-2904 The housing of the side panel lamp has integrated guides underneath for the Y-positioning of the basic bumper carrier.

FI MH-2903 Slides are provided in the tool concept for these supports or guides.

### **2.1.10.5.9.5 Color and Surface** (FI MH-2767)

FI MH-2972 The color and surface shall be taken from the tender drawing.

FI MH-2064 All visible surfaces shall be high-gloss polished in the tool.  
Exception: surfaces with a deviating client specification (e.g. for decorative purposes)

FI MH-2180 An erosion structure or ripple look shall be provided at the bordering areas at the side.  
Reason: reflections may result in the multiple appearance of LED spots.

FI MH-226 If necessary in terms of the technical light requirements, the lamp's visible surfaces shall be painted with a base coat.

FI MH-219 The housing of the lamp shall be red.

FI MH-2524 The color is determined in coordination with the client's design department.

### **2.1.10.5.10 Luggage Compartment Panel on the Lamp** (FI MH-341)

FI MH-344 The supplier shall give the panel on the lamp housing on the luggage compartment side a grain.

FI MH-345 The supplier shall adapt the grain for the luggage compartment panel to the lamp housing with the contact from the client's development department.

FI MH-346 The lamp shall have a precise surface progression between the reflector housing and the panel.

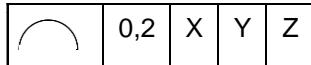
FI MH-347 The supplier shall design the side panel in such a way that there are no gaps/holes > 3 mm to the adjacent components.

FI MH-348 The area between the reflector housing and the panel shall not have any discontinuities, e.g. gaps.

FI MH-2495 No diffused light may be emitted at the separating point between lamp lens and panel.  
Example: Lamp lens with opaque edge and an optical fiber function ends in the vicinity of the partition between edge of the lamp lens and the panel. Required result: no emission of diffused light permitted at this point.

FI MH-2611 The nominal dimension of the joint between lamp lens and panel is 0.5 +0.2 mm

FI MH-2612 The wedge shape of the joint between lamp lens and panel is:



FI MH-349 The supplier shall attach the labels (approval) to the panel.

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- FI MH-2036      The panel on the luggage compartment side shall go completely up to the bodyshell (clearance 3 mm), therefore no holes are permitted.
- FI MH-2560      The panel shall be a 2C part with soft component.
- FI MH-2561      The soft component of the 2C panel shall have full contact with the bodyshell completely in all tolerance positions.
- FI MH-3054      The 2K soft component shall be present all round the panel.
- FI MH-2562      The weld joint between cover plate and lamp housing shall be covered completely by the panel.

#### **2.1.10.5.11 Threaded Connections and Fasteners Made of Steel in the Wet Area** (FI MH-2739)

- FI MH-2740      The surface of the threaded connections shall be designed according to DBL 8451.76

#### **2.1.10.5.12 Reflectors (Additional Reflectors)/Cover Frame** (FI MH-281)

- FI MH-2973      The color and surface shall be taken from the tender drawing.
- FI MH-2911      All vaporized component parts within the lamp shall be connected electrically to the ground line. (ESD protection).
- FI MH-288      The supplier shall attempt to reduce the number of individual reflectors.
- FI MH-2525      The additional reflectors are aluminum vaporized in parts
- FI MH-2548      If the additional reflector is vaporized, covers/templates shall be provided.
- FI MH-290      *Definition of "visible": the area of the lamp is called visible that can still be seen from the outside after installation of the lamp in the vehicle (outside the vehicle). This definition applies to all requirements within this section.*
- FI MH-291      All visible surfaces shall be high-gloss polished in the tool.
- FI MH-2181      An erosion structure or ripple look shall be provided by the supplier at the bordering areas at the side.  
Reason: reflections may result in the multiple appearance of LED spots.
- FI MH-293      If necessary in terms of the technical light requirements, the lamp's visible surfaces shall be painted with a base coat.
- FI MH-2502      Graduated parabolic reflectors shall be avoided if possible.  
The technical light inspection with the simulation result shall be presented to the development department in due time before creating the light samples for every light function in order that any necessary revision of the reflector design/s can be implemented for the light sample without any delay in the schedule.  
For more details, see Chapter 8.11.3. Lighting System Requirements, Testing and Validation
- FI MH-296      The supplier shall implement the connection via latch mechanisms.
- FI MH-297      The supplier shall implement the connection via threaded connections.

#### **2.1.10.5.13 Optical Fibers** (FI MH-302)

- FI MH-2035      No LED spots may be visible in illuminated condition.

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- FI MH-2489      The light's power supply area shall be designed in such a way that the flame point(s) of the LEDs are not visible.
- FI MH-2490      Unless specified otherwise by the client, the uncoupling lenses  
                   - of the fiber-optic cable(s) shall be vertical with H/V 0 direction of vision  
                   - shall have the same orientation if there are multiple fiber-optic cables.
- FI MH-2526      The fasteners for attaching the optical fibers shall not be visible in illuminated and non-illuminated condition.
- FI MH-310        All optical fiber outlets and borders shall be precise.

#### **2.1.10.5.14 Lamp Housing/Exterior Lamp Lens Connection (FI MH-2070)**

- FI MH-2071      The connection points between housing and additional elements are to be designed taking the following into account:
- FI MH-2493      The connection between the lamp housing and the lamp lens shall be established using the friction welding method with infrared pre-heating. Welding burrs shall be minimized.
- FI MH-2915      The sealed area shall be free of blow holes.
- FI MH-2917      The sealed area shall be leaktight. The leak test is carried out using excess pressure.
- FI MH-2332      They shall not be visible from the outside.
- FI MH-2333      There shall be no development of noise while driving (e.g. squeaking).
- FI MH-2335      There shall be no abrasion.
- FI MH-312        The supplier shall provide lamination with decorative ribbing.
- FI MH-315        See Chapter "Exterior Lamp Lens" (FI MH-183).

#### **2.1.10.5.15 Rear Reflector/Side Reflector (FI MH-316)**

- FI MH-2918      The side reflector is part of the SAE variant of the lamp.
- FI MH-2919      The side reflector is integrated into the lens.
- FI MH-320        The supplier shall coordinate the technical light calculations for the rear reflector with the rear reflector electroplating manufacturer before starting tool production
- FI MH-321        The supplier shall present the technical light calculations for the rear reflector to the contact from the client's development department.

#### **2.1.10.5.16 Seals (FI MH-357)**

- FI MH-2277      This chapter is not relevant in this case.

#### **2.1.10.5.17 LED Boards (FI MH-408)**

- FI MH-2804      Within a lamp pair, the brightness classes shall be coordinated so that no light density difference can be seen.
- FI MH-2190      The color of the LED circuit board shall be white.
- FI MH-2453      The color of the LED board behind crystal clear or gray-tinted end plates shall be white.  
                   Reason: Only white board material may be visible in the reflector openings for the LEDs.

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FI MH-2630	Labeling of the PCBs shall not be visible.
FI MH-2454	The openings (e.g. on the reflector) for the LEDs shall be as small as possible.
FI MH-2537	With LEDs with an indirect effect (i.e. the entire visible light is emitted via reflectors), the LED board(s) is/are to be arranged in such a way that the LED board is not visible at close range in the normal direction of vision. Normal direction of vision at close range means: direction of vision above a height of 1.5 m at a distance of 0 - 5 m from the lamp.
FI MH-2538	With LEDs with an indirect effect (i.e. the entire visible light is emitted via reflectors), the LED board(s) is/are to be designed in such a way that the reflector(s) appears(s) bright in the "cold" design (light function off). "Bright" appearance means: the LED board shall not be reflected in the reflector (i.e. the board shall be covered with a metallic panel). As an alternative, the surface of the LED board is to be designed in such a way that the reflector does not lose any brightness or brilliance in the "cold" design due to reflections of the reflector.
FI MH-410	<i>For electrical connection values (voltage range/current consumption), see Chapter "Voltages and Currents" [FI_EE-168]</i>
FI MH-411	The LED boards shall be connected to the reflector insert in a suitable manner. While driving, there shall be no noise development or abrasion in visible areas.
FI MH-412	If required, cooling shall be provided for the LEDs.
FI MH-416	A consistent appearance of the color spot between left and right lamps shall be ensured using limit samples (the limit sample shall be provided by the supplier).
FI MH-2121	The selection of the binning shall be coordinated with the client. For this, the graphical representation of the binning shall be provided in a color coordinate system.
FI MH-419	The color spot shall be within the legal limits throughout the required service life.
FI MH-420	The color impression of the LEDs shall be independent of the angle of vision. This shall be shown on samples to ensure concept suitability.
FI MH-421	The homogeneity of individual functions and of the overall appearance shall be developed in cooperation with Daimler using limit sample and is to be monitored automatically during the series production process.
FI MH-424	A consistent appearance of left TL and right TL shall be ensured.
FI MH-426	Any LED flickering shall not be visible to the human eye.
FI MH-429	The LED board shall not be strained in assembled condition.
FI MH-3009	In the context of certification, the supplier shall ensure that all substructure components specific to replacement parts are also certified.

### 2.1.10.5.18 Molding to Lamp (FI MH-2549)

FI MH-2550	The molding shall be glued to the cover plate with double-sided adhesive tape.
FI MH-2844	The molding shall be connected to the lens/housing unit by spring clips.
FI MH-2554	The molding shall be joined with double-sided adhesive tape (thickness approx. 0.8 mm , 3M EX4008 Acrylic Plus adhesive tape or equivalent), DBL 7906.10

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- FI MH-2576 If the molding is screwed to the rear lamp, no sunk spots shall be visible on the visible surface of the molding.
- FI MH-2578 The molding shall not rub on the rear lamp and shall not produce abrasion.
- FI MH-2579 No noises shall be caused by the molding (e.g. creaking).
- FI MH-2580 The molding shall be fixed and mounted with zero clearance on the rear lamp.
- FI MH-2581 The molding shall be completely chrome-plated.
- FI MH-2552 Should any adjacent moldings also have the same surface as the molding (e.g. chrome-plated), the choice of supplier for the surface manufacturer shall be agreed jointly with the client.
- FI MH-2555 If the molding is chrome-plated, the surface shall be compliant with DBL 5416.01.
- FI MH-3053 The adhesive tape shall be 0.8 mm thick.

### **2.1.10.5.19 Self-Adhesive Components (FI MH-2582)**

- FI MH-2583 Self-adhesive components shall comply with DBL 7906.10.
- FI MH-2584 If the bonded component has to be dismantled again, no adjacent component parts may be damaged.
- FI MH-2585 The protective foil shall have a break-off clip.
- FI MH-2587 The bonding shall not permanently damage the bonding surface on the opposite side.
- FI MH-2586 It shall be possible to remove the adhesive residue for new bonding without exception.

### **2.1.10.5.20 Replacement parts(FI MH-2988)**

- FI MH-2990 Every part that can be dismantled from the lamp is a replacement part.
- FI MH-2989 Every replacement part shall be marked with an MB number.
- FI MH-2595 The rear lamp is split up into the following replacement parts: ZB rear lamp (combination), seal(s), lamp, side panel (if bolted on), fasteners and lamp holders or individual sockets.
- FI MH-2456 With the LED version of the function, the light sources are omitted as replacement parts!

### **2.1.10.6 Testing and Validation (FI MH-2294)**

#### **2.1.10.6.1 In-Series Development Measurements (FI MH-1616)**

- FI MH-1617 During production of the lamp, the supplier shall perform an automatic 100% function test (including the current consumption of the lamps).
- FI MH-1618 The supplier shall mark the lamp visibly after passing the function test.
- FI MH-1619 During production of the lamp, the supplier shall perform an automatic 100% check for the presence of all parts.
- FI MH-1620 During production of the lamp, the supplier shall perform a 100% leak test and mark this visibly on the lamp.
- FI MH-1622 During production of the lamp, the supplier shall have "not OK parts" automatically removed

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FI MH-1626	During production of the lamp, the supplier shall check the defined geometrical measuring points "in-line" and evaluate them statistically.
FI MH-2166	<i>The in-line measurement represents the 100% inspection of all lamps during production.</i>
FI MH-2543	The in-line measuring unit shall have at least 10 measuring points (5 contour points and 5 surface measuring points per individual lamp)
FI MH-3062	The inline measuring unit shall have 8 measuring points (4 contour points and 4 surface measuring points) on the chromium molding
FI MH-1627	The supplier shall coordinate the frequency of random samples and the measuring points with the contact from the client's development department.
FI MH-1630	The measuring points for proof of process and machine capability are to be defined in cooperation with Daimler's development department and shall be entered in the drawing.

## 2.1.10.6.2 Design of Jigs, Fixtures and Aids (FI MH-1508)

### 2.1.10.6.2.1 Jigs and Other Test Fixtures (FI MH-2564)

FI MH-1509

33	Clamping and fixation concept	Consistent clamping and fixing concept	A
34	Process reliability of the jigs and fixtures	The process reliability of the jigs and fixtures and automatic systems must be verified according to the specified cmk and cpk values.	A
35	Tolerance concept	Existing automation/component carriers must be considered in the tolerance concept (mounting points)	Z

## 2.1.10.6.3 CIP (FI MH-1510)

FI MH-1511 The continuous acquisition and analysis of required values and actual values shall be performed, the resulting improvements introduced.

## 2.1.10.6.4 Type Test/Certification (FI MH-2378)

### 2.1.10.6.4.1 Definition (FI MH-2379)

FI MH-2380 "*Certification/type approval*" refers to the examination and official approval of new vehicles/components/systems regarding the fulfillment of the applicable laws and regulations.

### 2.1.10.6.4.2 Time Frame (FI MH-2381)

FI MH-2382 *The time frame for certification is integrated into development within the MDS and is based on the corresponding quality gates.*

FI MH-2383 *The following milestones are particularly important for the operative certification of vehicles/components:*

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Months	Name	Description	Target
-28	Data Model Release	Conclusion of the exterior forming, including data model	The geometry-dependent certification scope has been checked and confirmed.
-26	Data Model Release	Conclusion of the interior forming, including data model	The geometry-dependent certification scope has been checked and confirmed.
-15	Requirement on technical documents	Definition and specification of the documents required to start certification (-9 months)	Request to the department to prepare all required data, drawings and documents.
-9	Development conclusion	Definition including national versions completely concluded. Provision of type approval capable vehicles, including national versions.	All design type approvals are available. Technical data and documents for the type approval are available.
-2	End of Testing	Conclusion of all operational certification activities.	Vehicle description for the approval/official processing completed.
0	Job no. 1	Start of interior construction of 1st external customer vehicle.	EC type approval (CoC data) available to the plant.

#### 2.1.10.6.4.3 Supplements to the Above Milestones (FI MH-2385)

FI MH-2386

*Data model release:*

FI MH-2387

*At this time, the forming process has been concluded. The geometry-dependent certification scope is being checked. This includes all tests covering geometry-dependent specifications, such as the vehicle exterior dimensions and edges, wheel covers, radii in the interior, head impact zones, etc.*

FI MH-2388

Components, drawings and documents, suitable for this purpose, shall be prepared.

FI MH-2389

*Requirement for technical documents:*

FI MH-2390

*As the basis for the operational certification, components, data, drawings and other documents are necessary.*

FI MH-2391

This scope of requirements will be required 9 months before Job No.1 and shall be submitted in the required form by this time.

FI MH-2392

*15 months before Job No. 1, a corresponding list of requirements will be distributed with a detailed description of the documents to be provided and with appropriate examples.*

FI MH-2393

*Completion of development:*

FI MH-2394

*The development is completely concluded at this time.*

FI MH-2395

No more modifications may be performed on the scope relevant for certification.

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- FI MH-2396      9 months before Job No.1, type test capable vehicles, components and the required documents shall be provided.
- FI MH-2397      The quality of these vehicles/components or parts shall functionally correspond to the later series quality and shall not deviate from the later series in the points relevant for the certification. The parts shall have at least the quality status of "yellow/green".
- FI MH-2398      All design type approvals to be applied for by the contractor shall also be available at this point in time.
- FI MH-2399      End of testing:*
- FI MH-2400      By this date all certification tests shall be successfully concluded and the corresponding description sheets be prepared for the subsequent approval/official procedures.*

## 2.1.10.7 Assembly Requirements (FI MH-2295)

FI MH-1496      In addition to the top priority subjects of "avoiding variants" and "reducing the number of components", development shall also pursue the goal of creating an "assembly-friendly product".

### 2.1.10.7.1 Component-Specific Assembly Requirements (FI MH-1514)

- FI MH-1518      The supplier shall design the component in such a way that assembly procedures are used that save as much time and costs as possible, taking production cycle times into account.
- FI MH-1519      The supplier shall design the lamp in such a way that installation and removal of the component are possible preferably with manual force or - if that is not possible and this is verified - with commercially available tools.
- FI MH-1520      The supplier shall design the lamp in such a way that no additional safety equipment is required during installation and removal.
- FI MH-1521      The supplier shall design the lamp in such a way that during correct installation and removal of the lamp or fasteners according to the instructions, damage to the peripheral parts is not possible.
- FI MH-1522      Bolts (e.g. from MA-Thread) shall be provided for the bolt-on points, for which any manual application of the nuts is not necessary. They can be applied and tightened directly using a screwdriver.

### 2.1.10.7.2 Ease of Installation and Removal of the Lamp (FI MH-1537)

- FI MH-1540      The supplier shall design the lamp in such a way that the tightening torque is 5 Nm +/- 1 Nm.
- FI MH-1544      The supplier shall design the components of the lamp in such a way that during removal, the components can be separated into the substances/materials used.
- FI MH-1545      The contractor shall design the lamp with minimum material costs.  
Implementation proposal: by a high degree of component and function integration
- FI MH-1546      Single-material systems shall be preferred by the supplier in the context of functionality and economic efficiency.
- FI MH-1547      The supplier shall design the lamp in such a way that fast removal is possible.

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- FI MH-1548      The supplier shall design the lamp in such a way that the fasteners can be accessed by the person fitting the lamp.
- FI MH-1549      The supplier shall design the lamp in such a way that sufficient free space is available for installation with standard tools.

## **2.2 Service Life and Reliability** (STLH-2862)

- STLH-4725      Further requirements can be found in the common requirements [LHV 310 00x] in Chapter "Testing, Validation, Release", under requirement ID CRQ-2007.

## **2.3 General E/E Requirements** (STLH-5473)

### **2.3.1 E/E Properties** (STLH-591)

#### **2.3.1.1 Electrical Requirements** (STLH-873)

##### **2.3.1.1.1 Energy Management** (STLH-2265)

- STLH-5483      The contractor shall give highest priority to implementing all measures specified by the client for reducing electrical power requirements as well as weight.
- STLH-5484      The contractor shall indicate the electrical power requirements and the weight of the component to the client. The contractor shall submit to the client, without specific request, any further ideas for reducing weight and electrical power requirements.
- STLH-5485      The contractor shall point out to the client any specifications made by the client that would impair a minimum energy design for the component.
- STLH-5486      The client and the contractor shall agree on the permitted electrical power requirements and permitted weight of the component and specify these as objectives to be achieved. The client shall monitor compliance with the agreed objectives.
- STLH-5487      The assessment of the tenders by the client will also include an evaluation of the electrical power requirements and the weight of the component.

##### **2.3.1.2 Protection against External Influences** (STLH-1937)

- STLH-594      If specific hardware measures are required to protect the component from manipulation or other external influences, these shall be coordinated with the client and the corporate/legal regulations shall be adhered to.

### **2.3.2 E/E Interfaces** (STLH-715)

#### **2.3.2.1 Electrical Interfaces** (STLH-5514)

- STLH-722      Electrical interfaces should always be designed so that there is no loss or falsification of information.
- STLH-724      Electrical interfaces shall be designed to prevent irreparable damage due to any short circuiting that may occur during adaptation or when handling live components.
- STLH-4722      General requirements pertaining to electrical interfaces are found in the Common Requirements [LHV 310 00x] in Chapter "E/E Assembly Requirements" under Requirement ID CRQ-2380.

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## 2.3.2.2

### General Connection Requirements (STLH-2026)

- STLH-2031 The "Design Guidelines for Connection Systems" [A2210002699] shall be applied to connection systems.
- STLH-2032 The connection systems shall be qualified as per "Automotive Connectors Test Specification" [MBN 10384], [MBN 10384-1], [MBN 10384-2], [MBN 10384-3].
- STLH-2033 When the component is inserted and removed during the manufacturing process (e.g. during testing), the requirements described in [MBN 10447] "Quality Management Standard: Electrics/Electronics for Mercedes-Benz Cars" shall be fulfilled.
- STLH-2034 The forces produced during plugging shall be absorbed within the component.
- STLH-2035 In case of changes to the component connections during series production (e.g. tool wear, duplication, etc.), the contractor shall check whether the relevant implementation regulation (AV) still corresponds to the current status.
- STLH-2036 If a revised AV exists, the client shall consult the contractor to determine which AV is to be used.
- STLH-2028 The pins shall be designed such that the maximum possible currents cannot cause irreparable damage to the connection system. This is, for instance, to be taken into account in the protection concepts (selection of fuses), or when selecting the driver output stages.
- STLH-2030 The pin assignment for all connections shall be documented on the release drawing.

## 2.3.3

### E/E Component Elements (STLH-281)

#### 2.3.3.1

#### Component Element Selection (STLH-1966)

- STLH-1967 In building components, the contractor shall only use component elements which, under consideration of the component design, are verifiably suitable for achieving the mission profile required for the component.
- STLH-2693 *In the implementation regulation "Recommended Qualification of Semiconductor Devices" [A0000029699], the client describes a procedure for verifying the automotive suitability of semiconductor elements.*
- STLH-2694 The contractor shall derive the scope of qualification for the semiconductor elements on the basis of the component's mission profile.

#### 2.3.3.2

#### Critical Parts Management (CPM) (STLH-279)

##### STLH-4520

##### Contact for CPM

Last name, first name: Nebl, Herbert  
Department, HPC: PSQ/EV1, G032  
Telephone: +49 151 58604190  
E-mail: herbert.nebl@daimler.com

##### STLH-280

Component elements classified as critical from the client's perspective due to various risks may not be used. Risks may include cyclical technology change, single source/line, procurement, etc.

##### STLH-2690

The contractor shall coordinate with the client's staff member responsible for Critical Parts Management (CPM) as to which component elements may be used.

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STLH-282 If the use of "critical parts" is unavoidable, the contractor shall agree on validating measures for the development and/or production phase with the client's Development department.

STLH-2691 The contractor bears responsibility for component element selection.

### **2.3.3.3 Risk Component Elements (STLH-274)**

STLH-275 The contractor is obliged to provide the data and information required for risk component element evaluation.

STLH-276 The contractor shall classify as risk component elements such new component elements/component element technologies that are used for the first time in a vehicle application by the client.

STLH-277 *In addition, known component elements used in new or modified operating conditions (e.g. in another installation zone in the vehicle) shall be deemed to be risk component elements.*

STLH-278 When analyzing risk component elements, the contractor shall carry out the following tasks:

- Determine the limits of the component elements
- Evaluate the technology in terms of the mission profile
- Eliminate the risks through preventive measures

### **2.3.3.4 Rare Earths (STLH-5488)**

STLH-5476 Where rare earths are used, the contractor shall disclose the composition used in the application (e.g. in magnets), in particular the specific weight fractions of dysprosium and terbium as well as neodymium. When submitting the tender, the contractor shall present the sourcing concept for these materials throughout the life cycle. Alternative concepts requiring no or only minimal amounts of rare earths shall also be offered.

### **2.3.4 E/E Tolerance Calculations (STLH-3943)**

STLH-3944 For certain functions to be determined in coordination with the client, the contractor shall verify the operational robustness and provide data and models for calculating tolerances. The contractor shall, in consultation with the client, incorporate data and models of peripheral components involved in the function.

With regard to the methods and procedures to be used by the contractor in carrying out E/E tolerance calculations, the binding basis for such work is Implementation Regulation [A1660014399] "Absicherung der Robustheit von Fahrzeugfunktionen durch Elektrik/Elektronik – Toleranzrechnung" (English translation not available).

### **2.3.5 E/E Design Rules and Lessons Learned (STLH-424)**

STLH-4389 During product design and manufacturing processes, the contractor shall implement the "lessons learned" from the client's predecessor projects and from the contractor's own projects and processes.

STLH-425 The client takes the knowledge gained from further technological developments and from customer complaint analyses and summarizes this knowledge to form design rules. The design rules for E/E components are documented in [MBN 10463] "Design Rules for E/E Components" and shall be taken into consideration during development of the component.

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## 2.3.6

### E/E Component Remanufacturing (STLH-303)

STLH-308

#### Contact for E/E component remanufacturing

Last name, first name: Fahrion, Dieter  
Department, HPC: RD/EEB, X975  
Telephone: +49-7031-90-49264  
E-mail: dieter.fahrion@daimler.com

## 2.3.6.1

### Remanufacturing Process Requirements (STLH-317)

STLH-318

The remanufacturing process is described in [A0000011299]"Reprocessing of E/E Components".

## 2.3.7

### E/E Processes (STLH-5475)

STLH-4313

Risk management shall be carried out as per Chapter "Risk Management" of the Common Requirements [LHV 310 00x] under Requirement ID CRQ-1914.

STLH-4361

A traceability workshop shall be carried out as per Chapter "Traceability Workshop" of the Common Requirements [LHV 310 00x] under Requirement ID CRQ-1986.

## 2.3.8

### E/E Data (STLH-145)

STLH-1970

Further requirements are found in the Common Requirements [LHV 310 00x] in Chapter "Product Data Management" at CRQ-292, and in particular in Chapter "Supplements for E/E Processes" at CRQ-486.

STLH-1416

As verification of adherence to the requirement specifications, the contractor shall submit its test results to the client.

STLH-1417

For each sample phase, the contractor shall continuously submit drawings, wiring diagrams, layout diagrams, parts lists, the relevant data sheets and E/E data, on request, to the client's responsible Development departments via the Engineering Portal of the E/E product data management system (EPDM).

STLH-2735

For each component change, the contractor shall, without specific request, submit drawings, wiring diagrams, layout diagrams, parts lists and the relevant data sheets to the client's responsible Development departments.

STLH-2736

Prior to the execution of changes, the contractor shall, without specific request, submit drawings and data to the client.

## 2.3.9

### E/E Documentation (STLH-151)

STLH-152

The following items for hardware documentation shall be prepared by the contractor:

STLH-153

- Design drawings

STLH-154

- Circuit diagram

STLH-155

- Layout diagram

STLH-157

- Connector assignment(s)

STLH-156

- Parts list

STLH-158

- Specification and data sheets for the component parts

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- STLH-2741
  - Parts history (see chapter in Common Requirements [LHV 310 00x] under Requirement ID CRQ-2235).
- STLH-160
  - Component part tolerance calculation
- STLH-163
  - Voltage level definition of inputs and outputs
- STLH-5490
  - Internal circuit diagram of bus interface (CAN, LIN, FlexRay)
- STLH-164
  - Results of EMC tests (on the component and in the vehicle)
- STLH-5491
  - Heat distribution on PCB at rated load and at room/maximum temperature
- STLH-5492
  - Thermal management
- STLH-161
  - Function description (incl. circuit parts)
- STLH-162
  - Storage allocation
- STLH-2737
  - Description of variables with normalization and value range
- STLH-166
  - Test and inspection concept (function test, in-circuit test, run-in, burn-in, etc.)
- STLH-2739
  - Test specification
- STLH-167
  - Qualification results
- STLH-159
  - Product FMEA down to component element level (multipoint connector, housing, etc.) (see chapter in Common Requirements [LHV 310 00x] under Requirement ID CRQ-249).
- STLH-165
  - Process FMEA (see chapter in Common Requirements [LHV 310 00x] under Requirement ID CRQ-249).
- STLH-1955
  - If further methods (event tree analysis, fault tree analysis, etc.) are employed for analysis, the contractor shall document these.

## 2.4

### Installation (STLH-768)

- STLH-2976
- The contractor shall adhere to the general assembly requirements in the Chapter "Assembly Requirements" of the Common Requirements document [LHV 310 00x] under Requirement ID CRQ-2480.

## 2.5

### Shelf Life, Packaging, and Transportation (STLH-1191)

- STLH-4709
- The contractor shall adhere to the standardized after-sales requirements given in the Chapter "Storage Life, Packaging and Transportation" of the Common Requirements document [LHV 310 00x] under Requirement ID CRQ-2435.

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## 2.6

### After-Sales (STLH-821)

- STLH-832 The contractor shall adhere to the standardized after sales requirements provided in the Chapter "After-Sales and Service" of the Common Requirements [LHV 310 00x] under the requirement ID CRQ-2008.
- STLH-5546 For CCC certification (see requirement ID CRQ-363 in the common requirements [LHV 310 00x]), it shall be noted that certification is required for all variants and sub-components (substructure parts) defined as replacement parts of these components.
- STLH-5550 The requirements listed below define supplements and modifications to the standardized requirements from the previous chapter taking into consideration the special properties of the target vehicle model series.
- STLH-2979 If special and standardized requirements cannot be implemented simultaneously, the contractor shall coordinate with the client's responsible department on the design of the component with regard to critical points.
- HL-3359 In the context of certification, the supplier shall ensure that all substructure components specific to replacement parts are also certified.

#### 2.6.1

### Component-Specific After-Sales Requirements (HL-3360)

- HL-3361 The main light equipment tools (housing, reflector, lens) and the corresponding secondary tools are to be equipped with a shot counter of the "mold mind" brand before the start of production. The final definition of the tools to be equipped with shot counters shall take place in consultation with Technology After-Sales department (GSP/TPE). The shot counters and the tools are to be given Daimler inventory numbers and documented in the tool tracking sheet under the corresponding tools.
- HL-3362 The light equipment is identified on the inside with the "Mercedes-Benz" logo in consultation with the relevant design department. In line with MBN 10435-C-A-8, the lamp unit lens is countersunk, in line with MBN 10435-C-B-6 the tail light lenses are countersunk with a Mercedes-Benz star.
- HL-3363 All component parts of the light equipment shall be identified off-tool as per MBN 10435. Deviation is permissible if there is limited space available or if the component part is used for different item numbers. All deviations from this identification shall be coordinated with the corresponding component design manager of the technology after-sales department (GSP/TPE), which is also responsible for approving them."
- HL-3364 The manufacturer's trademark may be applied on request; the manufacturer's trademark shall not be larger than the Daimler trademark. The defined protection zones of the Daimler trademarks shall be complied with in this connection. Additional other manufacturer's specifications, in particular the manufacturer's item number, are not permitted. Legally required identification has priority over other information. If there is little space available, the Daimler trademark and item number have priority over other information. It is not permitted that solely the manufacturer's trademark is visible in the installed status.
- HL-3365 Adhesive labels on the headlamps/rear lamps which do not comply with the MBN 10435 specifications are not permissible and have to be adjusted subsequently free of charge where applicable.

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### 3

## Contacts and Responsibilities (STLH-2695)

### 3.1

#### Client's Contacts (STLH-23)

FI-PI-149

*The following table lists the client's contacts.*

##### 3.1.1

##### Component Manager (FI-PI-150)

FI-PI-155

»**Component manager**«

*Last name, first name: »Tebbe«, »Frank«*

*Department, HPC: »EP/GEL«, »X632«*

*Telephone: 015158601615*

*E-mail: »frank.tebbe@daimler.com«*

##### 3.1.2

##### Light Technician (FI-PI-163)

FI-PI-164

»**Lighting systems**«

*Last name, first name: Herrmann, Bernd*

*Department, HPC: RD/KEL, X632*

*Telephone: +49 151 586 26 171*

*E-mail: bernd.u.herrmann@daimler.com*

##### 3.1.3

##### E/E Interface (FI-PI-170)

FI-PI-411

»**E/E interface**«

*Last name, first name: Herrmann, Bernd*

*Department, HPC: RD/KEL, X632*

*Telephone: +49 151 586 26 171*

*E-mail: bernd.u.herrmann@daimler.com*

##### 3.1.4

##### Special E/E Interfaces (FI-PI-177)

FI-PI-310

»**EMC interface**«

*Last name, first name: Boettcher, Frank*

*Department, HPC: RD/KTL, X903*

*Telephone: 07031 90 87579*

*E-mail: frank.f.boettcher@daimler.com*

FI-PI-181

»**Exterior lights control interface**«

*Last name, first name: Bader, Jochen*

*Department, HPC: RD/EEA, X919*

*Telephone: +49176 30900833*

*E-mail: jochen.bader@daimler.com*

##### 3.1.5

##### Quality (FI-PI-185)

FI-PI-189

»**Quality**«

*Last name, first name: »Vent«, »Peter«*

*Department, HPC: PSQ/XE2, »X469«*

*Telephone: +49 160 8688296*

*E-mail: »peter.p.vent@daimler.com«*

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### **3.1.6**

#### **Purchasing** (FI-PI-191)

FI-PI-381

##### **»Purchasing«**

Last name, first name: Farwick, Jennifer  
Department, HPC: PSQ/XG2, G034  
Mobile: +49 151 58609170  
E-mail: jennifer.farwick@daimler.com

### **3.1.7**

#### **Cost Planning** (FI-PI-201)

FI-PI-209

##### **»Cost planning«**

Last name, first name: Kling, Sebastian  
Department, HPC: PP/PCEX, B653  
Telephone: +49 151 5860 6554  
E-mail: sebastian.kling@daimler.com

### **3.1.8**

#### **Service/After Sales** (FI-PI-210)

FI-PI-212

##### **»Service/After Sales«**

Last name, first name: Niggel, Andreas  
Department, HPC: GSP/TPE, H206  
Telephone: 07031 90 46204  
E-mail: andreas.niggel@daimler.com

FI-PI-320

##### **»Service/After Sales«**

Last name, first name: Elser, Fred  
Department, HPC: GSP/TPE, H800  
Telephone: +49 151 5861 1929  
E-mail: fred.elser@daimler.com

### **3.1.9**

#### **Assembly Planning** (FI-PI-215)

FI-PI-222

##### **»Assembly planning«**

Last name, first name: Boos, Karlheinz  
Department, HPC: ML/FW, B603  
Telephone: +49 176 30917024  
E-mail: karlheinz.boos@daimler.com

FI-PI-226

##### **»Logistics«**

Last name, first name: »Haase«, »Rüdiger«  
Department, HPC: »PF/LPM1«, »B613«  
Telephone: 07031 90 61152  
E-mail: »ruediger.haase@daimler.com«

FI-PI-401

##### **»Logistics«**

Last name, first name: Streicher, Peter  
Department, HPC: LOG/MPA, B613  
Telephone: +49 162 2469594  
E-mail: [protema.streicher@daimler.com](mailto:protema.streicher@daimler.com)

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Technical Component Requirement  
Specifications  
Rear lamp  
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### 3.1.11

#### Miscellaneous (FI-PI-238)

FI-PI-240

##### »KTO«

Last name, first name: Herre, Martin  
Department, HPC: RD/OES, X759  
Telephone: +49 7031 90-48080  
E-mail: Martin.herre@daimler.com

FI-PI-242

##### »Tolerance management«

Last name, first name: »Marahiel«, »Yassir Abu«  
Department, HPC: RD/KRR, »X607«  
Telephone: +49-7031-90-48772  
E-mail: »yassir\_abu.marahiel@daimler.com«

FI-PI-250

##### »Prototype Tools«

Last name, first name: »Schanz«, »Thomas«  
Department, HPC: »RD/KRU«, »X202«  
Telephone: »+49 7031 90-82232«  
E-mail: »thomas.schanz@daimler.com«

## 3.2

#### Project Responsibilities (STLH-31)

FI-PI-253

Which project partner assumes which responsibilities in the project is defined in the following list. The exception is the attribute "I". This is assigned to the project partner which is to be informed, i.e. the information recipient.

FI-PI-254

The following designations are used in the responsibilities list.

- R Responsible for development
- E Executes development
- C Cooperates in development
- C/A Checks/approves development
- A Performs acceptance procedures
- I Receives information

FI-PI-255

##### Design

Scope: Model validation, evaluation of alternative, surface creation

Client: A, C/A, I

Contractor: R, E

FI-PI-256

##### Design

Scope: ZB lamps, CAX process data, evaluation of alternatives

Client: A, C/A, I

Contractor: R, E

FI-PI-257

##### Function

Scope: Adherence to the other applicable documents, function specifications, guidelines, specifications, implementation regulations, requirement specifications, standards and laws listed

Client: A, C/A, I

Contractor: R, E

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- FI-PI-258 Assembly  
 Scope: Compliance with Daimler AG assembly requirements  
 Client: A, C/A, I  
 Contractor: R, E
- FI-PI-259 Change assessment  
 Scope: Tool changes, part and assembly change  
 Client: A, C/A, I  
 Contractor: R, E
- FI-PI-260 Costs, weight  
 Scope: Compliance with Daimler AG cost and weight targets  
 Client: C/A, I  
 Contractor: R, E
- FI-PI-261 Quality  
 Scope: Compliance with Daimler AG quality and tolerance requirements on the vehicle  
 Client: A, C/A, I  
 Contractor: R, E
- FI-PI-262 Deadlines  
 Scope: Compliance with the master schedule, notification in the event of any changes to the schedule  
 Client: C/A, I  
 Contractor: R, E
- FI-PI-263 EMC  
 Scope: EMC components  
 Client: A, C/A, I  
 Contractor: R, E
- FI-PI-264 Testing  
 Scope: Function test and documentation  
 Client: A, C/A, C, I  
 Contractor: R, E
- FI-PI-265 Crash  
 Scope: AZT repair crash, pedestrian protection  
 Client: A, C/A, E, I  
 Contractor: R
- FI-PI-266 Process system FMEA  
 Scope: Process system FMEA  
 Client: C/A, I  
 Contractor: R, E
- FI-PI-267 Product system FMEA  
 Scope: Process system FMEA (for component /scope of delivery)  
 Client: C/A, I, C  
 Contractor: R, E
- FI-PI-268 Logistics  
 Scope: LOG concept  
 Client: A, C/A, I  
 Contractor: R, E

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- FI-PI-269 At the award of contract, the duties and responsibilities can be defined separately between client and contractor for
  - System suppliers with the ability to intervene in the supply chain
  - A solution where parts are placed at disposal, or
  - A solution with directed parts.
- FI-PI-270 In the case of deviations from the provisions in the Technical KLH or in the "Common Requirements Pertaining to the Component Requirement Specifications" [STLH-3791], the provisions of these separate responsibility matrices as agreed between the client and contractor shall apply.
- STLH-15 The contractor shall maintain an "open points" list, to include a measure tracking system. On request, the contractor shall allow the client to inspect the open points list and the measure tracking system. On request, the contractor shall provide the scopes relevant to the client once or at intervals to be defined (e.g. weekly) to the client in electronic form.
- STLH-5419 The contractor shall designate a project manager for the project who shall coordinate and monitor the processes within the contractor's organization and act as the interface to the client.

### 3.3

## Requirements for Development-Related Services (STLH-4658)

- STLH-4659 The following section describes tasks that shall be performed by the contractor as part of the development of the scope specified in these requirement specifications.
- STLH-4660 The tasks relate directly to the development and integration services of the client. When performing this work, the specified response or processing times shall be observed and complied with.
- STLH-4661 Specification of a response time means that the contractor, following receipt of the facts of the situation from the client, shall be able to carry out the described task or to begin processing by no later than the end of the required response time.
- STLH-4662 Specification of a processing time means that the contractor, following receipt of the facts of the situation from the client, shall have fully completed the given task within the given processing time.
- STLH-4663 In cases where a processing time is given but the contractor is not able to complete the task within the requirement processing period, the contractor shall provide prompt notification of this to the client.
- STLH-4664 The communication of problems or feedback on results must often be done using vehicle parts or measuring equipment located on the premises of the client. For the following tasks, it shall be ensured that communication can take place on the premises of the client.
- STLH-4667 The contractor shall assist in the identification of faulty components that are involved in the overall system.  
Response time: define in the individual case
- STLH-4668 The contractor shall assist in the detection and description of faulty performance, in particular in cases of failures in the field, in such a way that the fault can be processed in an optimum manner using the contractor's procedures.  
Response time: define in the individual case
- STLH-4669 The contractor shall collaborate in the execution of vehicle campaigns/vehicle updates aimed at the elimination of identified faults by the client's workshops.

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	<p>Response time: define in the individual case</p> <p>STLH-4670</p> <p>The contractor shall participate in and/or execute board tests and system/vehicle integration tests, including EMC vehicle tests.</p> <p>Response time: define in the individual case</p>
STLH-4671	<p>In cases where the expertise of the contractor is absolutely essential as part of a test drive, the contractor shall provide a contact to participate in such a test drive.</p> <p>Response time: define in the individual case</p>
STLH-4672	<p>The contractor shall carry out the flash programming and coding of development samples on the client's premises.</p> <p>Response time: "One workday"</p>
STLH-4673	<p>The contractor shall prepare, check and maintain vehicle checklists for the scopes concerning the contractor.</p> <p>Processing time: »Within one work week«</p>

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## 4 Deadlines, Tools and Component Parts in Development Process (STLH-2701)

### 4.1 Documentation Maturity Level Release Deadlines (STLH-89)

FI-PI-272

*In the maturity evaluation certain indicators of the component are evaluated; these indicators shall be agreed upon separately. For the product maturity levels, the binding services / states of development of the supplier and the client are measured and assessed in terms of their quality and completeness by the client (PRG assessment: see also Common Requirements, Chapter "Product Maturity Evaluation").*

FI-PI-273

The supplier shall provide the client's development manager with the data records in adequate quality 6 weeks before the deadlines listed in the following table. Requirements on the data format are given in the Chapter on "Order-specific Definitions Regarding Product Data Management and Documentation".

FI-PI-525

Product maturity level	Deadline	Condition of the component (see also Module 4, Chapter "Product Maturity Evaluation")
Appr. S inner area ABEL	2015-11-02*	Approval of spline inner surfaces, exterior lighting
Start workflow "-"	2015-11-10*	Start workflow "-" (production maturity design status)
"_" (blank) Start special tools creation	2016-03-01*	Release of production maturity design status Start of production tools
ESWFT	2016-09-01*	First off-tool parts (ZB) are available
PPFB	2017-02-05	Parts with PPAR before inclusive approval documentation
100 % green	2017-04-09	100 % green sampled parts are available

\* The deadline will be updated, if necessary, in the context of the component's scheduled deadlines.

Product maturity levels model series A/C 217 facelift rear lamp

FI-PI-276

#### Documentation maturity level: "P"

Release deadline: see Excerpt from Process Master Plan for Suppliers  
»Bodyshop/Assembly«

Confirmed deadline for the provision of the data records by the contractor: 6 weeks before "P" release

Process step: Design release for test vehicle scopes.

FI-PI-277

#### Documentation maturity level: „W“

Release deadline: see Excerpt from Process Master Plan for Suppliers  
»Bodyshop/Assembly«

Confirmed deadline for the provision date of the data records by the contractor: 6 weeks before "W" release

Process step: start production tool process / procurement of production machines

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**Documentation maturity level:** "\_" (blank)

Release deadline: see Excerpt from Process Master Plan for Suppliers

»Bodyshop/Assembly«

Confirmed deadline for the provision date of the data records by the contractor: 6 weeks before "\_" release

Process step: Fit-for-series-production design status

STLH-3024

*A precise definition of the data provision deadlines and documentation maturity levels is given in Chapter "Product Data Management" in the Common Requirements [LHV 310 00x] under Requirement ID CRQ-292.*

STLH-3025

*If necessary, the release deadlines will be updated by the client during plan scheduling.*

## 4.2

### Tools and Component Parts in the Development Process (RD Requirements) (STLH-129)

#### 4.2.1

##### General Requirements (STLH-5610)

STLH-2702

Following receipt of an order, the contractor shall supply all components to the client on the agreed delivery dates.

STLH-3953

Regarding the requirements pertaining to the component parts and their implementation, the contractor shall coordinate with the client's development manager in a timely manner. For general requirements pertaining to sample statuses, see Chapter "Sample Statuses" in the Common Requirements [LHV 310 00x] under requirement ID CRQ-75.

STLH-1395

If concrete unit numbers are specified in this chapter, the stated quantities are to be understood as guideline values and apply subject to further additions and/or separate orders. The demand assessment (BE) shall apply. The contractor will be informed by the client's development engineer in good time of the delivery date and implementation of the component (hardware release, software release, etc.) and the FINAS number assigned to the sample part (for tracing the sample part at the client's premises during the development phase). FINAS is the client's vehicle and test parts information and administration system.

STLH-1401

Prices for parts and tools apply only to scopes meeting all requirements with regard to function and feasibility. In case of non-adherence, the contractor shall immediately supply a free replacement. This applies until the part has been shown to comply.

STLH-3027

The contractor shall coordinate with the client's development manager as regards the requirements pertaining to the parts for validating the testworthiness during the respective development phases.

STLH-1396

The commissioning of component parts as part of the development process is usually performed by the MTC Logistics unit and may vary from the series production process. The exact quantity per ordering window is also defined here.

STLH-1397

In the case of an order by the MTC Logistics division, the contractor shall ensure that components are always delivered with the delivery note and complete parts labeling in accordance with "MTC Specification 1/2" [MTCSPEC] via the unloading station specified in the order.

STLH-1398

With regard to electronic ordering and supply agreements, corresponding preparations must be made by the contractor. Further information can be found at:

<https://daimler.covisint.com> or is available by e-mail from [befo\\_info@daimler.com](mailto:befo_info@daimler.com).

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## 4.2.2

### Borderline between Prototype Parts and (First) Off-Standard-Tool Parts (STLH-5611)

STLH-5612

As a rule, prototype parts made using prototype tools and processes are required prior to the confirmation vehicle (CVeh) phase of the development process (both B0 vehicle phase and the pure confirmation vehicle phase if there is no B0 vehicle phase). From the confirmation vehicle phase onward (both C0 vehicle phase and the pure confirmation vehicle phase if no C0 vehicle phase exists), the component parts used shall be taken from standard production tools (if applicable, (first) off-tool parts) (cf. [MBST] 37/03). The tool specifications for each case are described below.

## 4.2.3

### Prototype Parts in the Development Process (STLH-5613)

STLH-5614

In general, the highest possible maturity level available must always be provided. If (first) off-standard-tool parts are not available prior to the B0 vehicle or confirmation vehicle phase, the requirements for this scope shall be met by prototypes.

## 4.2.3.1

### Tool Specification for Prototype Parts (STLH-2703)

STLH-2708

Prototype parts shall generally be manufactured using series production material. Potential benefits of using alternative materials, or of applying rapid prototyping or rapid tooling processes, shall be taken into consideration in coordination with the client.

STLH-2709

Prototype tools shall be simply designed tools made to the client's quantity requirements (see "General tool specification for prototype parts" table, STLH-2713). Deviations from these specifications, or non-specified scopes, shall be coordinated by the contractor with the specified contact (see above).

STLH-2710

For the construction of prototype tools and jigs and fixtures, the contractor shall wherever possible use existing, standard elements (e.g. master molds, standard profiles, etc.) that remain the contractor's property.

STLH-2711

The contractor shall check the possibility of bringing the series production tool forwards.

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STLH-2713

STLH-2714

Table: General tool specification for prototype parts

Component part class	Standard specification
Plastic injection-molded component part (single and multiple components)	Aluminum tool with loose parts, cold channel distributor
Rubber molded parts	Aluminum tool with loose parts
2D sheet metal blanks (e.g. meshing elements, etc.)	Laser trim
Sheet metal drawn parts	Two-part steel tool, laser trim
Forged parts	Straightforward forming tools with number of dies reduced to a minimum, deburring tool if economically sensible.
Al and Fe cast component parts	Sand-cast tool
Mg cast component parts	PT die-cast tool (soft inserts)
Joining devices	Only necessary actuators - with manual operation - are to be described
Measuring devices/ gauges	In general, measuring devices (standard elements, see above) are to be offered. In the event that a gauge would achieve an economic advantage, a gauge may be offered instead.

#### 4.2.3.2

#### Sourcing of Prototype Tools and Prototype Parts (STLH-5420)

STLH-132

The prices of prototype parts shall be defined between the contractor and the client in separate agreements.

STLH-1399

The contractor shall define in detail the specifications and costs for prototype tools, jigs, fixtures and all cost-relevant equipment and for prototype parts (see Table "Description of Tender"; the MS Excel template is available via the Source Package application /General Information/RFQ Materials/RFQ Documents/Technical RFQ Documents/Technical RFQ Documents/1.1 Quotation Template for Prototype Tools and Parts/Quotation Template for Prototype Tools and Parts).

Deviations from these specifications shall be coordinated by the contractor with the client and shall be offered as options.

Setup costs, freight costs and support costs shall be disclosed separately. Delivery shall be free of charge to the buyer ("Frei Haus"). If the client's regional freight forwarding system can be used, deliveries should be made ex works (EXW). This should then be indicated separately in the tender.

The tool and die maker quotations (multiple RFQs) shall be accordingly processed and compared. As part of partnership-based collaboration, the system/development supplier (tier 1) shall grant access to the original tool and die maker quotations.

STLH-5421

For the sourcing of prototype tools and prototype parts, the relevant contents of the general RFQ documents apply as described in the following. Excerpt from the general RFQ documents:

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"... Test tools are all jigs, fixtures and tools required to create test parts. This term also includes all auxiliary and prototype tools plus preproduction tools. The development costs for test tools will be remunerated directly by Daimler. Daimler reserves the right to negotiate test tool and part costs directly with the prototype manufacturer (tier 2, ...) and also to pay this party directly. The system/development supplier (tier 1) is obliged to provide logistical and technical support for the test tools/parts. As part of the development order, Daimler grants the development supplier the right of access to the tools and the related expertise at any time. ..."

STLH-2715

Table: Prototype quotation description template

STLH-2716

Component part (item no.)	Designation	Procedure	Tool specification	Tool	Component part
AXXX XXX XX XX	Example component part	Injection molding	Aluminum tool in master mold with open hot runner, loose parts, visible side line polished, split line on visible side permissible.	€ xxx,xxx	€ xxx

STLH-5422

Specifically, the following provisions apply for the contract award process:

- Specification: The prototype tools and parts are specified by the system/development supplier (tier 1) in consultation with Daimler subject to the premises cited above.
- Tool and die maker set coordination: Coordination of the tool and die maker set and the establishment of contact with the tool and die makers is carried out between the system/development supplier (tier 1) and Daimler prior to the RFQ phase.
- Data exchange: Data management is ensured by the system/development supplier (tier 1). Deviations are possible by means of separate agreements.
- RFQ for the prototype tools and prototype parts: The RFQs are forwarded to the tool and die makers by the system/development supplier (tier 1) in consultation with Daimler. As part of partnership-based collaboration, the system/development supplier (tier 1) shall allow inspection of the original tool and die maker quotations. Daimler reserves the right to request quotations directly from tool and die makers and to commission their services (direct contracting of prototype part tool and die makers).
- Area of responsibility (responsibility matrix): Responsibilities are coordinated between the system/development supplier (tier 1) and Daimler as required. A corresponding standard responsibility matrix is available to the relevant prototype part contact at Daimler.
- Commissioning: In the case of general commissions, the system/development supplier (tier 1) will be commissioned by Daimler. In the event of direct contracting of the tool and die maker, the commission for the agreed services is awarded directly by Daimler to the tool and die maker or the system/development supplier (tier 1) and the commission for the agreed support services is awarded directly to the system/development supplier (tier 1).

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#### 4.2.3.3

#### Sample and Delivery Dates (HL-3366)

FI-PI-282

The corresponding deadlines are to be taken from the MDS plan/process master plan for suppliers.

#### 4.2.3.4

#### Tool Concept and Controlling (HL-3367)

FI-PI-284

The tool concepts shall be coordinated with the client.

FI-PI-285

Tool supplier definition, tool production and tracking (tool controlling) are coordinated with the client.

FI-PI-286

Appropriate schedules are to be kept and presented to the client at regular intervals or in the event of changes.

FI-PI-287

Tools shall be designed in such a way that changes are possible at low cost.

FI-PI-288

Examples: layout of fastening points, introduction of wheel, additional ribbing or stiffening measures, corrugation, etc.

#### 4.2.3.5

#### Pricing of Prototype Parts (STLH-5615)

STLH-5616

The prototype parts prices negotiated shall become binding with the award of the contract. They shall apply for all orders placed by the client in this project phase regardless of the intended purpose and place of delivery.

In the event that parts from other model series or projects are used which already have a higher maturity level or development status (e.g. (first) off-standard-tool parts), the conditions agreed for the original model series or original project shall apply.

STLH-5423

The contractor shall include in its quotation any fixed prices specified in the "Fixed prices" table.

STLH-3028

Table: Fixed prices

STLH-3029

Component part (item no.)	Designation	Procedure	Tool specification	Period/phase	Component part
AXXX XXX XX XX	Rear lamp	Injection molding	Series production tool	ESWFT by B-Fzg.	1 times series production price
AXXX XXX XX XX	Rear lamp	Injection molding	Series production tool	As of confirmation vehicle	1 times series production price
AXXX XXX XX XX	Rear lamp with Adaptations	Injection molding	Series production tool	Special sample with additional requirements	Ordering at 1 times series production price + additional expenses, explicitly detailed and offered (like MMK)

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#### 4.2.3.6

#### Quantities and Delivery Dates for Component Parts before the C0 or Confirmation Vehicle Phase (STLH-5617)

STLH-5618

The quantities and delivery dates given here are to be interpreted as guideline values and apply subject to further additions and/or separate orders. The demand assessment (BE) shall apply. For general deadlines, see "Excerpt from the Process Master Plan for Suppliers".

STLH-5619

Quantity forecast before the B0 or confirmation vehicle phase:

STLH-5620

Component part (item no.)	Designation	Version	Comment	Quantity	Deadline	Purpose / phase
AXXX XXX XX XX	Rear lamp	ESWFT	RD/KEL requirements	20	From ESWFT	Miscellaneous
etc.						

#### 4.2.4

#### (First) Off-Standard-Tool Parts during the C0 or C Vehicle Phase (STLH-5621)

STLH-5622

Commissioning of component parts during the C0 and confirmation vehicle phases may be placed by the Logistics department of the series production plants or by the MTC Logistics unit and may differ from the series production ordering process.

##### 4.2.4.1

##### Tools Specification during the C0 or Confirmation Vehicle Phases (STLH-5623)

STLH-5624

In line with the above-mentioned component requirements and the Excerpt from the Project Master Plan, the contractor shall provide on-time delivery of first off-standard-tool parts (C0 vehicle phase) or off-standard-tool parts (confirmation vehicle phase). The specification corresponds to the production specification as per [MBST]. Deviations herefrom are only permitted in coordination with the client and with the explicit approval of Daimler's QM.

STLH-5625

In the event of changes, additional costs shall be covered through the change management system and the contractor shall account for and include these costs in the quotation early on at the time of the product change request assessment.

STLH-5626

##### Definition of First Off-Standard-Tool Parts

STLH-5627

Manufacturing of first off-standard-tool parts: These parts are manufactured using series production tools; individual processes may deviate from the series production process (e.g. manufacture may be done on the premises of the tool and die maker using the machines and installations found there; assemblies may be produced by hand on assembly islands off the continuous production chain). Initial optimizations have at this point already been made to the machine parameters. Wiring harnesses can be produced on breadboards; for punched and stamped parts, laser or water-jet cutting is possible; control unit circuit board assembly can be done using patterning machines and away from the series production location.

STLH-5628

ESWFT logistics process: The bought-in scope of delivery is based on series production requirements, but may deviate in individual cases and is coordinated separately. The use of load carriers and packaging is governed by separate agreement. Delivery to the client following a delivery release order to the production supplier can be made by the tool maker to the agreed receiving area of the client.

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- STLH-5629      **ESWFT functional scope:** Unless otherwise agreed, the parts perform the full scope of mechanical, electrical or electromechanical functions as defined in the specifications. For control units, the software conforms with the agreed function rollout requirements. The realized functions conform to specifications; parameterization can be updated by means of flash programming.
- STLH-5630      **ESWFT geometry, material and surface quality:** Unless otherwise agreed, the installation dimensions comply with specifications. The part materials and weight conform to series production specifications. The appearance with respect to grain, roughness, gloss, color, etc. may deviate from the specifications; visible injection-molded parts have no grain. Material distribution and the surface and material characteristics may fluctuate slightly.
- STLH-5631      **ESWFT qualification and safety:** Function tests/endurance tests have been carried out only on a small scale. The use of safety-relevant parts during vehicle testing is only possible with the approval of the client's development department; alternatively, the parts are identified as non-functional.

#### **4.2.4.2 Pricing of Component Parts and Samples during the C0 or Confirmation Vehicle Phases (STLH-5632)**

- STLH-5633      Series production prices shall apply to parts ordered or called by the client during the C0 and confirmation vehicle project phases (see [MBST] 37 "Regulations on the Payment of Start-up Costs and Additional Material Costs"). This shall apply for all orders placed by the client in these project phases regardless of the intended purpose and place of delivery.
- STLH-5634      Any plannable start-up costs and non-plannable start-up costs (additional material costs) can be asserted using the process described in [MBST] 37 "Regulations on the Payment of Start-up Costs and Additional Material Costs".
- STLH-5635      Technical requirements for development needs that differ greatly from the component requirement specifications must be offered in detail in accordance with the specifications given in the Chapter "Awarding Contracts for Prototype Tools and Prototype Parts". Such parts will be ordered and called off at series production prices. Additional costs will be negotiated and reimbursed separately.

#### **4.2.4.3 Quantities and Delivery Dates for Component Parts during the C0 or Confirmation Vehicle Phases (STLH-5636)**

- STLH-5637      The quantities and delivery dates given here are to be interpreted as guideline values and apply subject to further additions and/or separate orders. The demand assessment (BE) shall apply.  
For general deadlines, see "Excerpt from the Process Master Plan for Suppliers".

STLH-5639      Preview of quantities during the B0 and confirmation vehicle phases

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STLH-5638

Component part (item no.)	Designation	Version	Comment	Quantity	Deadline	Purpose / phase
AXXX XXX XX XX	Rear lamp	ESWFT	B0 vehicle	100	From ESWFT	Vehicle body
AXXX XXX XX XX	Rear lamp	SWFT	Confirmation vehicle	200	As of confirmation vehicle	Vehicle body

#### 4.2.5

#### PPA Sampling (STLH-3957)

STLH-3958

The contractor shall provide the samples with PPA report for sampling to the client in accordance with "MB Special Terms 13" [MBST] by the following deadline: 16 weeks before the MDS milestone "100% PPA-capable parts with PPA report (PPAR) provided in accordance with ramp-up" (see: "Excerpt from the Process Master Plan for Suppliers")

STLH-5417

*The PPA report deadline may be updated by the client as part of plan scheduling.*

STLH-5547

The contractor shall report back the PPA report deadlines in the "start" system (Common Requirements [LHV 310 00x] under Requirement ID CRQ-2759). Before reporting back, the contractor shall coordinate the deadlines with the client's responsible quality engineer.

STLH-5548

The contractor shall take part in sampling coordination talks in a timely manner prior to the scheduled deadline. Here, the cornerstones of the sampling process will be defined.

## 5

# Documentation (STLH-2718)

STLH-16

The contractor shall continuously document the development status of the scope of supply as specified in the requirements given here. On request, the contractor shall allow the client to inspect this documentation.

## 5.1

### Safety and Certification Relevant Features (STLH-193)

STLH-5544

The contractor shall observe the general certification requirements (e.g. CCC) in Chapter "Laws, Standards and Regulations" of the common requirements [LHV 310 00x] under the requirement ID CRQ-313.

#### 5.1.1

#### Implementation of Special Verification (STLH-1957)

STLH-202

This component is subject to obligatory identification and documentation with regard to safety relevance with DS and/or certification relevance (incl. emissions relevance), with DZ at drawing level and in the documentation systems in accordance with Chapter "Documentation Requirement - Identification and Documentation of Systems and Components" in the Common Requirements document [LHV 310 00x] under Requirement ID CRQ-1659

STLH-203

The following list contains further subdivisions and the corresponding characteristics to be identified and documented for the client in accordance with "Documentation Requirement - Identification of Parts, Assemblies and Special Characteristics - Principles - Safety Relevant, Certification Relevant" [MBN 10317], "Documentation Requirement - Identification of Parts, Assemblies and Special Characteristics - Example Catalog - DOCUMENT 1" [MBN 10317-1] and "Documentation Requirement, Identification of Parts, Assemblies and Special Characteristics, Specific Values and Application Cases" [MBN 10317-2]. If, during the course of development (incl. further development during the series production phase), further characteristics prove identification- and documentation-relevant for the client or the contractor, the type and time of identification shall be coordinated and documented in writing in an agreement.

#### Part: e.g. rear lamp (STLH-1545)

STLH-1548

Feature with DZ\*: DZ1 table with certification-relevant data (size of the areas illuminated, edges of the illuminated areas relative to the reference point, specifications of operating parameters in certification), DZ2 ...

STLH-1550

\* DS, DZ in accordance with [MBN 10317]: DS = identification and documentation of safety relevance, DZ = identification and documentation of certification relevance, including emission relevance, multiple designation is possible.

#### 5.1.2

#### Overview of Safety and Certification-Relevant Features in These Component Requirement Specifications (STLH-1958)

STLH-1959

*Features which are relevant to safety (marked with DS) and / or certification (marked with DZ) are described in these component requirement specifications. The following lists reference identified chapters (IDs in chapter heading) or chapters containing identified paragraphs.*

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Fachgebiet [40]	Merkmalsname [60]	Markt (gem ISO 3166)/Market (acc. to ISO 3166)	Vorschrift [max. 30 Zeichen/Markt]
		AUS=Austr., BRA=Bras, CAN=Kanada, CHN=China, ECE=ECE, EU=EU, GCC=Gulf, HKG=Hongkong, IND=Indien, INT=International, JPN=Japan, KOR=Korea	Regulation [max. 30 chars/market]
Beleuchtung - Brems-/Schlussleuchten	CCC-Genehmigungszeichen (Factory Code)	CHN	CNCA-02C-058, GB 5920
Beleuchtung - Brems-/Schlussleuchten	ECE-Genehmigungszeichen (E-Nr)	ECE	ECE-R 7
Beleuchtung - Brems-/Schlussleuchten	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Fahrrichtungsanzeiger	CCC-Genehmigungszeichen (Factory Code)	CHN	CNCA-02C-058, GB 17509
Beleuchtung - Fahrrichtungsanzeiger	ECE-Genehmigungszeichen (E-Nr)	ECE	ECE-R 6
Beleuchtung - Fahrrichtungsanzeiger	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Leuchte allgemein	Begrenzung Lichtaustrittsflaeche oben/unten/innen/aussen	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Leuchte allgemein	Bezugspunkt	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Leuchte allgemein	Flaeche	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Leuchte allgemein	Hersteller/Warenzeichen	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Leuchte allgemein	Modellbezeichnung Leuchte	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Leuchte allgemein	Elektrische Kenndaten	CAN;CHN;ECE;USA	CMVSS 108;CNCA-02C-056, CNCA-02C-058;ECE-R3/6/7/19/23/38/77/87/91.;FMVSS 108
Beleuchtung - Nebelschlussleuchte	CCC-Genehmigungszeichen (Factory Code)	CHN	CNCA-02C-058, GB 11554
Beleuchtung - Nebelschlussleuchte	ECE-Genehmigungszeichen (E-Nr)	ECE	ECE-R 38
Beleuchtung - Nebelschlussleuchte	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Rueckfahrscheinwerfer	CCC-Genehmigungszeichen (Factory Code)	CHN	CNCA-02C-058, GB 15235
Beleuchtung - Rueckfahrscheinwerfer	ECE-Genehmigungszeichen (E-Nr)	ECE	ECE-R 23
Beleuchtung - Rueckfahrscheinwerfer	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Rueckstrahler	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Seitenmarkierungsluechten	SAE-Genehmigungszeichen (DOT-Nr)	CAN;USA	CMVSS 108;FMVSS 108
Beleuchtung - Rueckstrahler	KC-Genehmigungszeichen	KOR	IMLTM-Notif. 2013-70, Attach. 2

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<b>Technical Component Requirement Specifications Rear lamp</b>  <b>QEVI11AGEGLV</b>		

## 5.2

## Vehicle Documentation in VeDoc for Passenger Cars (STLH-225)

HL-3368

*No data subject to compulsory documentation needs to be recorded for this component for traceability at the part level. If data subject to compulsory documentation in this sense arises during the course of development for the client or the contractor, the contractor shall coordinate the type and time of identification with the client and shall document these in writing in an agreement."*

## 5.3

## CAD Product Data (STLH-135)

STLH-3417

General requirements concerning CAD product data are described in the Common Requirements [LHV 310 00x] pertaining to these requirement specifications.

STLH-4630

The current version of the client's "CAD Handbook for Product Description Data" [CADHB], abbreviated as "CAD Handbook", serves as the substantive and binding basis for requirements pertaining to the documentation of CAD product data.

STLH-5556

For component part development, the client will accept the NX and JT/TIFF CAD data formats, with the NX data format being the primary process format and therefore preferred. The following sections specify the basic requirements pertaining to each of the CAD data formats used.

STLH-5600

If the JT/TIFF data format and the NX data format for "non-parameterized CAD models" are both requested, then the contractor has the choice, in coordination with the client, as to which data format to deliver.

Once selected, the data format may not be changed over the term of the contract.

### 5.3.1

### NX Data Format (STLH-1402)

#### 5.3.1.1

#### Parameterization (STLH-5557)

STLH-5451

Non-parameterized CAD models

#### 5.3.1.2

#### Prescribed Design Methodology (STLH-1408)

STLH-5454

Module CS082 of the "CAD Handbook" [CADHB] describes general procedures for working with NX. It contains references to the relevant NX design methods.

#### 5.3.1.3

#### Scope of Data to Be Delivered (STLH-4680)

STLH-1406

Single part

STLH-2722

Scope of delivery (assembly structure, stored in Smaragd under an item number)

HL-5567

All exchange formats shall contain a structure that can be dissolved into component part planes.

STLH-2724

Assembly drawing

HL-5568

Additional requirements on the data to be supplied:

The structure path in the CAD model shall correspond to the name designation of the components.

Components with all mold removal directions and tool separation lines.

Section folders with complete dimensioning.

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### **5.3.1.4**

#### **Reference System of the CAD Models** (STLH-5562)

STLH-5563

If a change is made to the component part, it is not permitted to change the reference system.

STLH-5564

The CAD models are described with reference to a base coordinate system (engineering design in the installation position).

### **5.3.2**

#### **JT and TIFF Data Format** (STLH-4679)

##### **5.3.2.1**

##### **Prescribed Preparation Methodology** (STLH-5567)

STLH-4689

Module CS059 in the "CAD Handbook" [CADHB] describes general procedures for working with JT and TIFF

##### **5.3.2.2**

##### **Scope of Data to Be Delivered** (HL-5569)

HL-5570

JT single part

HL-5571

Scope of delivery (assembly structure, stored in Smaragd under an item number. PLMXML file shall be supplied by the contractor)

HL-5572

TIFF assembly drawing

HL-5574

Additional requirements on the data to be supplied:

The structure path in the CAD model shall correspond to the name designation of the components.

Components with all mold removal directions and tool separation lines.

Section folders with complete dimensioning.

### **5.3.2.3**

#### **Reference System of the CAD Models** (STLH-5570)

STLH-5571

If a change is made to the component part, it is not permitted to change the reference system.

STLH-5572

The CAD models are described with reference to a base coordinate system (engineering design in the installation position).

### **5.3.3**

#### **Provided Data Scope** (STLH-2244)

STLH-2245

The client shall make CAD data available to the contractor that shall serve as the basis for the contractor to create its own CAD data and be used in downstream processes.

##### **5.3.3.1**

##### **Installation Space Environment** (STLH-2253)

STLH-2254

The client provides the contractor with the installation space environment, e.g. the adjoining geometry (unalterable). The contractor shall take account of the installation space and interfering geometries when producing CAD models.

### **5.3.3.2**

#### **Geometries as the Basis of Parts to Be Created / Changed** (STLH-5418)

STLH-4405

The reference system (coordinate systems) of the supplied CAD models shall not be changed.

STLH-2247

The client provides the contractor with 3D-CAD product description data. The contractor shall employ the provided data when producing CAD models.

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STLH-2248 The client provides the contractor with 2D-CAD product description data. The contractor shall employ the provided data when producing CAD models.

STLH-4522 Description of the scope provided »Example.: inquiry drawing or RFQ data record«

#### **5.3.4 CAD Qualification** (STLH-1987)

STLH-1988 Prior to the initial data interchange, the contractor shall provide verification of its CAD qualification for the required CAD data format (NX or JT/TIFF). The process is specified in the "CAD Handbook" [CADHB], Module CV001. Regular productive data interchange with the client may only take place once the contractor has verified its CAD qualification for the respective format.

### **5.4 Digital Development** (STLH-3573)

STLH-3574 The common requirements [LHV 310 00x] lists general requirements for the provision of simulation data.

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## **6 Supplementary Information** (STLH-1224)

### **6.1 Agreed Deviations** (STLH-1225)

### **6.2 Additional Information** (STLH-1230)

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## 7 List of Abbreviations (STLH-1234)

Abbreviation	Description
AV	Implementation regulation
CVeh	Confirmation vehicle
BR	Model series (vehicle)
CRQ	Common Requirements
DAI	Daimler
DBL	Daimler-Benz Supply Specification
DS	Identification and documentation of safety relevance
DZ	Identification and documentation of certification relevance, incl. emissions relevance
ECE	Economic Commission for Europe
EDM	Engineering Data Management
TVeh	Test vehicle
EN	European standard
FM	Production materials
FV	Function specification
Veh.	Vehicle
HIL	Hardware in the loop
HPC	In-house post code
HV	High voltage
IP	Ingress protection - protection against ingress by foreign objects
KLH	Component requirement specifications
LEK	Supplier development costs
LHV	Requirement specifications template (numbering system for documents)
LH	Left, left-hand
LHD	Left-hand drive
LU	Scope of delivery
MB	Mercedes-Benz
MBC	Mercedes-Benz Cars
MBN	Mercedes-Benz standard
MBST	Mercedes-Benz Special Terms
MDS	Mercedes-Benz Development System
MG	Module group
MGU	Other applicable document
CTR	Center/middle
ODX	Open Diagnostic Exchange
OLED	Organic light emitting diode
OOP	Out of position
Pa	Pascal
PPA	Production Process and Product Approval
PT	Prototyp
QM	Quality Management
Q Status	Quality status
RB	Bodyshell
RHD	Right-hand drive
SNR	Item number
STLH	Standard requirement specifications
SWFT	Off-standard-tool parts

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<b>Abbreviation</b>	<b>Description</b>
TAG	Thermal validation
Tmax	Maximum temperature
Tmin	Minimum temperature
To	Operating temperature
TOL	Transients on lines except supply lines
$T_{op, max}$	Maximum ambient temperature with no functional limitations
$T_{op, min}$	Minimum ambient temperature with no functional limitations
$T_{RT}$	Room temperature
TSUP	Transients on supply
TWC	Tubular wave coupler
UDS	Unified Diagnostic Services
$U_{T, max}$	Maximum test voltage applied as supply voltage
$U_{T, min}$	Minimum test voltage applied as supply voltage
$U_{T, typ}$	Typical test voltage applied as supply voltage
VA	Procedural instruction
VeDoc	Vehicle Documentation Online – Passenger Cars (IT system for Sales)
VPD	Variable product data
Tool	Tool
ZB	Assembly
ZGS	Drawing geometry status
ABL	Dipped beam
ABBL	Cornering lamp
AL	Aluminum
ALA	Adaptive Light Actor
ALWA	Control unit for: autom. dyn. headlamp range adjustment, + adaptive light distribution
BC_F	Body Controller Front
BC_F	Body Controller Front
BC_F	Body Controller Front
BGL	Position light
BL	Brake Light
CLA	Curve Light Actor
DPA	Daimler Process Audit
DRL	Day Running Light
FL	High beam
FRA	Direction indicator lamps
HDG	Bright-Dark border
HLC	HeadLamp Control
HLI	Headlamp, LED and ILS control module (replacement for LAM-S and HLC)
HLI MIN	Headlamp, LED and ILS control module (replacement for LAM-S and HLC) Minimum
HLI MAX	Headlamp, LED and ILS control module (replacement for LAM-S and HLC) Maximum
HV	Horizontal Vertical
IHC	Intelligent Headlamp Control
IHC +	Intelligent Headlamp Control Plus
IMDS	International Material Data System (end-of-life vehicle directive)
IRED	Infra-Red light
ILS	Intelligent Light System
KZ	No drawing

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<b>Abbreviation</b>	<b>Description</b>
LAM-B	Light Actuation Module, Basic
LAM-H	Light Actuation Module, Main light
LAM-S	Light Actuation Module, Signal light
LCU	LED Control Unit (replacement for LAM-H)
LED	Light Emitting Diode
HRA	Headlamp Range Adjustment
MEP	Passenger car material purchasing department
NSL	Rear fog light
PWM	Pulse Width Modulation
RFL	Reversing light
SCN	Software calibration number
SL	Tail lamp
SML	Side Marker Light
SoP	Start Of Production
SRA	Headlamp Cleaning System
STAR2	E/E standard architecture
STL	STereo Lithography
SRA	Headlamp Cleaning System
TFL	Daytime running lamp
VLA	<b>Vertical Leveling Actor</b>
XALWA	Control unit for: xenon, + autom. dyn. headlamp range adjustment, + adaptive light distribution
XCU	Xenon Control Unit

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## 8

## Other Applicable Documents (STLH-319)

STLH-331

The following list contains documents prepared by the client or by external entities. If a version or issue date is cited for a document, then this version shall apply.

If no version or issue date is cited for a document, the following rules apply:

- If the document is an external or internal standard (namely, an MBN or DBL), the latest version shall apply in order to ensure that the subject of the standard corresponds to the acknowledged state of the art at the time it is brought to market and following revision of the standard.
- If the document is of another type, that version of the document shall apply that was current at the time of signing of the development contract associated with the component requirement specifications.

Documents produced by the client will be made available to the contractor by the client.

STLH-5449

The contractor shall check that the referenced standards are up-to-date and take them into account in the tender. Should these standards change during the course of development, the contractor shall reveal the significance of such changes in terms of scheduling and costs.

STLH-2981

*The client's standards and other applicable documents will be made available to the contractor in the Standards Information System (DocMaster).*

STLH-2982

*The system can be accessed from the supplier portal in the Internet at the following link:*

<https://engineering.supplier.daimler.com>

STLH-2984

*Under the category Register – Direct entry – DocMaster – Start application.*

STLH-2985

*To access DocMaster, please register at the EngineeringPortal. You can register at <https://engineering.supplier.daimler.com> by clicking the link "Do you want to become a new user? – External application".*

STLH-2986

*Your login data for DocMaster are the same as for the EngineeringPortal. After gaining access, you have the option of displaying, printing or saving all standard folder documents (MB Special Terms, CAD Handbook, Logistics Handbook).*

STLH-5608

*The collections of Other Applicable Documents are filed in folders in DocMaster for requirement specifications (QEVS) and for component parts (A) represent only a pre-selection. No claim is made that these are exhaustive.*

STLH-332

*List of Other Applicable Documents:*

Reference	Item number	Issue date	Version	Other applicable document	Description
STLH-3791; LHV 310 00x	LHV 310 001	2013-10	6.2.3	Common Requirements Pertaining to the Component Requirement Specifications for E/E, SW and Mechanical Scopes	Common content
STLH-3941; A1660014399	A1660014399	2007-04		Absicherung der Robustheit von Fahrzeugfunktionen durch Elektrik / Elektronik - Toleranzrechnung (English translation not available)	Implementation regulations concerning E/E tolerance calculations
STLH-2173; A2210002699	A2210002699	2008-09-24		Design Guidelines for Connection Systems	Connection System Requirement Specifications for Mercedes-Benz Passenger Cars
STLH-5414; AV Bordnetz; AV Bordnetz	A2130020099	2011-11-11		Implementation Regulation: On-Board Electrical System - Model Series 213	Model series-specific requirements and additional boundary conditions for E/E

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Reference	Item number	Issue date	Version	Other applicable document	Description
213					components which are defined differently or not at all in MBN LV 124-1.
STLH-5414; AV Bordnetz; AV Bordnetz 247	A2470004099	2013-04		Ausführungs vorschrift Bordnetz BR 247 (English translation not available)	Model series-specific requirements and additional boundary conditions for E/E components which are defined differently or not at all in MBN LV 124-1.
STLH-2202; ASAP 2 IS	ASAP2 - INTERFACE SPECIFICATION	2003-03-11	1.51	ASAP 2 Interface Specification	Specification of the ASAP2 interface (see < <a href="http://www.asam.net/03_standards_06.php">http://www.asam.net/03_standards_06.php</a> >)
STLH-4631; CADHB	CAD HANDBOOK			CAD Handbook for Product Description Data	Online document provided through the client's Engineering Portal.
STLH-5516; DIN 40041	DIN 40041			Reliability – Concepts	
STLH-3749; DIN 75220	DIN 75220			Ageing of Automotive Components in Solar Simulation Units	
STLH-5405; DIN EN ISO 6270-2	DIN EN ISO 6270-2			Paints and Varnishes – Determination of Resistance to Humidity – Part 2: Procedure for Exposing Test Specimens in Condensation-Water Atmospheres	Paints and Varnishes – Determination of Resistance to Humidity – Part 2: Procedure for Exposing Test Specimens in Condensation-Water Atmospheres
STLH-5400; DIN EN 60068-2-14	DIN EN 60068-2-14			Environmental testing - Part 2-14: Testing procedures - Test N: Change in temperature	Environmental testing - Part 2-14: Testing procedures - Test N: Change in temperature
STLH-5401; DIN EN ISO 11124-2	DIN EN ISO 11124-2			Preparation of Steel Substrates before Application of Paints and Related Products – Specifications for Metallic Blast-Cleaning Abrasives – Part 2: Chilled-Iron Grit	Preparation of Steel Substrates before Application of Paints and Related Products – Specifications for Metallic Blast-Cleaning Abrasives – Part 2: Chilled-Iron Grit
STLH-5402; DIN EN ISO 20567-1	DIN EN ISO 20567-1			Paints and Varnishes – Determination of Stone-Chip Resistance of Coatings – Part 1: Multi-Impact Testing	Paints and Varnishes – Determination of Stone-Chip Resistance of Coatings – Part 1: Multi-Impact Testing
STLH-5404; ISO 12103-1	ISO 12103-1			Road Vehicles – Test Dust for Filter Evaluation – Part 1: Arizona Test Dust	Road Vehicles – Test Dust for Filter Evaluation – Part 1: Arizona Test Dust
STLH-5403; ISO 20653	ISO 20653			Road Vehicles – IP-Codes – Protection of Electrical Equipment Against Foreign Objects, Water and Access	Road Vehicles – IP-Codes – Protection of Electrical Equipment Against Foreign Objects, Water and Access
STLH-3785; MBN 10284-1	MBN 10284-1			EMC Performance Requirements – Vehicle Tests	
STLH-3787; MBN 10284-2	MBN 10284-2			EMC Performance Requirements – Component Tests	
STLH-4634; MBN 10284-3	MBN 10284-3			EMC Performance Requirements - Additional Requirements for High Voltage	
STLH-2221; MBN 10317	MBN 10317			Documentation Requirement - Identification of Parts, Assemblies and Special Characteristics - Principles - Safety Relevant, Certification Relevant	Implementation of procedure for identifying safety and certification relevant features.
STLH-4624; MBN 10317-1	MBN 10317-1			Documentation Requirement - Identification of Parts, Assemblies and Special Characteristics - Example Catalog	
STLH-4625; MBN 10317-2	MBN 10317-2			Documentation Requirement, Identification of Parts, Assemblies and Special Characteristics, Specific Values and Application Cases	
STLH-3792; MBN 10384; LV 214	MBN 10384			Automotive Connectors - Test Specification	Coordinated as LV 214 across OEMs
STLH-5446; MBN 10384-1; LV 214-1	MBN 10384-1			Automotive Connectors - Test Matrix	Coordinated as LV 214-1 across OEMs

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Reference	Item number	Issue date	Version	Other applicable document	Description
STLH-5447; MBN 10384-2; LV 214-2	MBN 10384-2			Automotive Wire-to-Contact Connections– Slow Motion Test	Coordinated as LV 214-2 across OEMs
STLH-5448; MBN 10384-3; LV 214-3	MBN 10384-3			Automotive Connectors - Test Procedures	Coordinated as LV 214-3 across OEMs
STLH-3942; MBN 10385	MBN 10385			CAD Drawings and 3D CAD Models - VeDoc Information on Drawings of Relevant Component Parts	Implementation of VPD identification marking
STLH-4623; MBN 10438	MBN 10438			Mechanical Vibration Requirements (Broadband Random Vibration) for Detachable Body Parts on Passenger Cars	
STLH-2448; MBN 10447	MBN 10447			Quality Management Standard: Electrics/Electronics for Mercedes-Benz Cars	QM requirements for E/E components
STLH-2166; MBN 10463	MBN 10463			MBN Design Rules for E/E Components	Design rules for E/E components
STLH-4629; MBN LV 123	MBN LV 123			Electrical Characteristics and Electrical Safety of High-Voltage Components in Road Vehicles - Requirements and Tests	
A 211 003 98 99	A 211 003 98 99			Design Rules	
STLH-5411; MBN LV 124-1	MBN LV 124-1			Electric and Electronic Components in Motor Vehicles up to 3.5t – General Requirements, Test Conditions and Tests, Part I: Electrical Requirements and Tests	Electrical Requirements (supersedes MBN 10615)
STLH-5383; MBN LV 124-2	MBN LV 124-2			Electric and Electronic Components in Motor Vehicles up to 3.5 t – General Requirements, Test Conditions and Tests - Part 2: Environmental Requirements	Environmental requirements and testing procedures (supersedes DC 10305)
MBN LV 148	MBN LV 148			Electric and Electronic Components in Motor Vehicles - 48V On-Board Electrical System	
STLH-3010; MBST	MBST 2012	2012		Mercedes-Benz Special Terms	See MB Special Terms, in particular MBST 13: Production Process and Product Approval
L_R-205	MBN 10 183			Design for Automobile Recovery	
L_R-206	MBN 33 035			Marking of Material	
L_R-207	MBN 33 015			Identification markings on product parts	
L_R-208	DIN EN 9001			DIN EN 9001	
L_R-209	VDA 16	2008		Decorative Surfaces of External Fittings and Functional Parts in the Internal and Externals of Automobiles	
L_R-210	ESD DIN 611340-5-1			DIN 611340-5-1	
L_R-211	A 000 003 03 99	2010-12-17		Function specification: Basic lamp unit requirements	
L_R-212	A 000 003 04 99	2010-12-17		Function specification: Lamp unit, extended requirements	
L_R-213	A 000 003 05 99	2008-04-15		Function specification: Front additional lamps	
L_R-214	A 221 000 26 99	2008-09-24		AV Connections	
L_R-215	DBL 5408.00			Thermoplastic Parts for Engine Air Management	
L_R-216	DBL 8585			Negative Substance List	
L_R-217	ISO 1101			Shape and position tolerances	
L_R-218	A 166 001 87 99	2007-10-19		Component requirement specifications for linear stepper motors	

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Reference	Item number	Issue date	Version	Other applicable document	Description
L_R-219	DCR-11291	2007-02-20		LIN2.1 Network Requirements	
L_R-220	Guideline on light sources	2005-07-16		Guideline for the selection of light sources	
L_R-221	A 000 003 06 99	2010-02-04		Function specification: Headlamp cleaning system	
L_R-222	DBL 5416.xx			Supply Specification Parts Manufactured from Thermoplastics for Paneling, Housings and Functional Parts for External Applications	
L_R-223	MBN-10615			Common Specification  ELECTRICAL SYSTEM PERFORMANCE REQUIREMENTS FOR ELECTRICAL AND ELECTRONIC COMPONENTS	
L_R-224	MBN-10614			Common Specification EMC PERFORMANCE REQUIREMENTS, COMPONENTS	
L_R-225	MBN-11223			EMC Performance Requirements - Vehicle	
L_R-226	ISO 16750-2	2010-03		Road Vehicles - Environmental Conditions and Testing for Electrical and Electronic Equipment - Electrical Loads	
L_R-227	DBL 8451			Supply Specification  Electrodeposited Zinc or Zinc Alloy Coatings for Components Manufactured from Ferrous Materials	
L_R-228	A 000 003 07 99	2014-02-21		Function specification: Signal lamps	ZGS 004
L_R-229	AS 10169	2004-08-26		SURFACE APPEARANCE REQUIREMENTS FOR FASCIAS AND EXTERIOR COMPONENTS	
L_R-230	VDI 2243	2002-07		VDI Guideline Recycling-oriented Product Development	
L_R-231	DBL 5490			Supply Specification Plastic Components Manufactured from Recycled Materials	
L_R-232	VDA 260	2007-04		Components of Motor Vehicles Marking of Material	
L_R-233	MBN 33035			Components of Motor Vehicles Marking of Material	
L_R-234	DBL 5620			Daimler-Benz Supply Specification Organic Glasses for Lighting Arrangements	
L_R-235	FMVSS 302			Flammability of Materials Used in the Occupant Compartments of Motor Vehicles	49 CFR 571 302
L_R-236	95/28/EC	2006-11-07		Directive on the Burning Behavior of Materials Used in the Interior Construction of Certain Categories of Motor Vehicles	
L_R-237	CMVSS 215	2008-08-29		Canadian Motor Vehicle Safety Standards - Standard 215 "Bumpers"	SR S 215
L_R-238	A 000 005 97 99	2010-08-16		Implementation specification: "Substitute light functions"	
L_R-239	AEC-Q 100			Failure Mechanism Based Stress Test Qualification for Integrated Circuits	

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L_R-240	AEC-Q 200			Stress Test Qualification for Passive Components	
L_R-241	AEC-Q 101			Stress Test Qualification	
L_R-242	A 001 008 01 99	2010-03-31		Standard fastening concept for the headlamp cleaning system	
L_R-243	A 166 001 87 99	2007-10-19		Component requirement specifications "LIN stepper motors"	
L_R-244	A 218 008 00 99	2010-01-22		Implementation regulation: Mech. interface for LAM control unit	
L_R-245	53/2000/EC			ELV directive	
L_R-246	70/156/EEC	2007-12-06		Vehicle Type Approval	
L_R-247	FMVSS 108			Mounting Lights	49 CFR 571.108
L_R-248	MBN 10230			Identification markings on product parts - Mercedes Star	
STLH-2191; MSS 10730	MSS 10730	2011-09	5.0	Electric and electronic (E/E) components – standard software for electronic control units (ECU)	General requirements pertaining to standard software for E/E components
STLH-3011; MTCSPEC	MTC - SPEZIFIKATION 1/2	2008-03-31		MTC Specification 1/2	Supply specification for prototype and sample parts
STLH-3793; VEDOC	POLICY VEDOC, FAHRZEUGDOKUMENTATION; ANLAGE 10	2011-02-14		Richtlinie zur Fahrzeugdokumentation in VeDoc-PKW für Lieferanten (English translation not available)	Information on the VeDoc for Passenger Cars process.

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