



新版中国汽车信号灯法规草案的热点问题

Some hot topics in the drafting process of new GB Regulation on Light Signalling Devices





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汽车的发展历程

The development of automobile

在过去100年中，汽车行业的发展一直由动力总成的发展推动，但“新四化”给汽车产业带来颠覆性的发展。

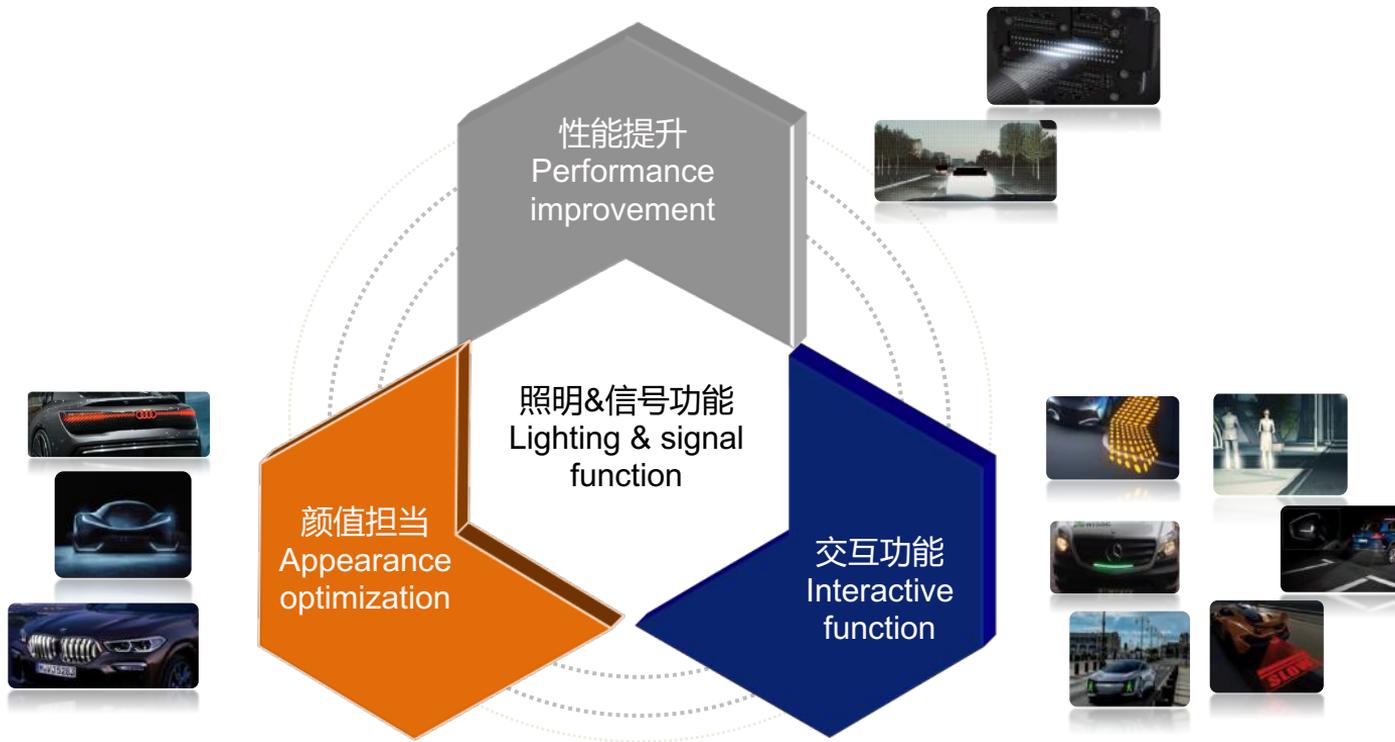
In the past 100 years, the development of the automotive industry has been driven by the development of powertrain, but the "new four modernizations" has brought disruptive development to the automotive industry.





车灯的演化

The evolution of vehicle lamps





车灯服务对象

Object that uses Automotive Lightings

人工驾驶
Manual driving



Eyes + brain



自动驾驶
Automatic driving



Visual sensors, radars, LiDAR... + Artificial intelligence
(AI)





■ 基于性能 Based on the performance

从使用者角度出发，而不是基于产品。

From the perspective of users, not based on the product.

■ 技术中性 Technology neutral

适应技术进步，不阻碍技术创新。

Adapt to technological progress without hindering technological innovation.

■ 与安全相关 Related to security

严格限定在保障人身健康和生命财产安全、国家安全、生态环境安全和满足社会经济管理基本要求的范围之内。

It is strictly limited to ensuring the safety of personal health and life, national security, ecological environment and social and economic management.

■ 立足国情，与国际协调 Based on China condition, harmonized with UN & SAE

考虑中国特色，同时与UN法规和SAE充分协调。

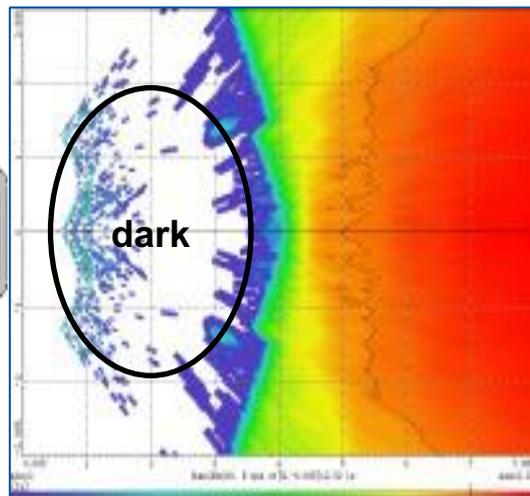
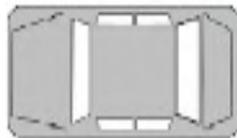
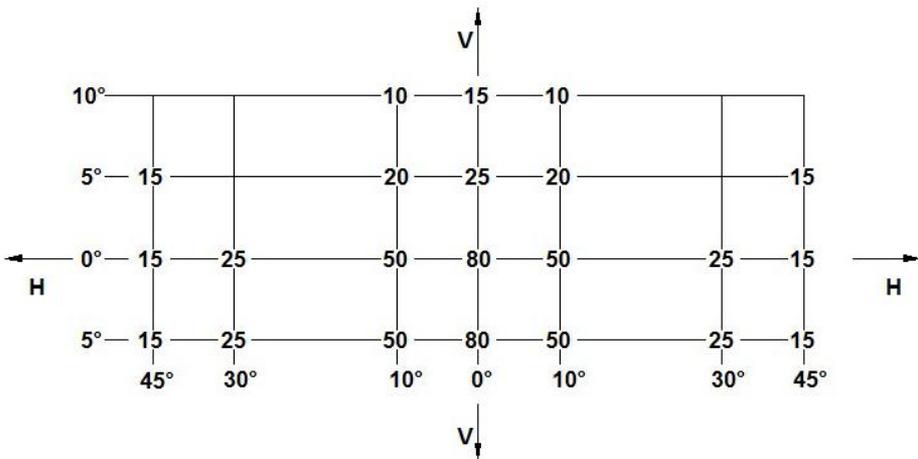
Considering the Chinese characteristic, at the same time, fully coordinated with UN & SAE regulations.



性能提升 Performance improvement

满足现行GB & ECE法规要求的倒车灯

Reversing lamp meeting the requirements of current GB & ECE regulations



存在问题 Problem :

倒车灯照明效果不佳，在车辆后方存在暗区，不利于夜晚摄像头以及传统后视镜的视野照明。

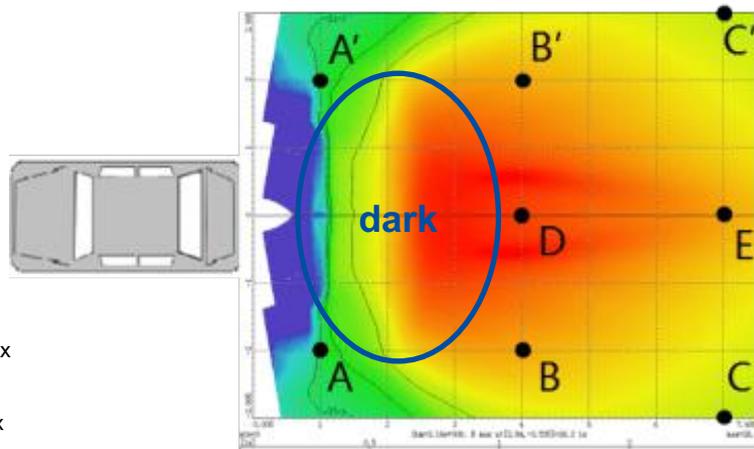
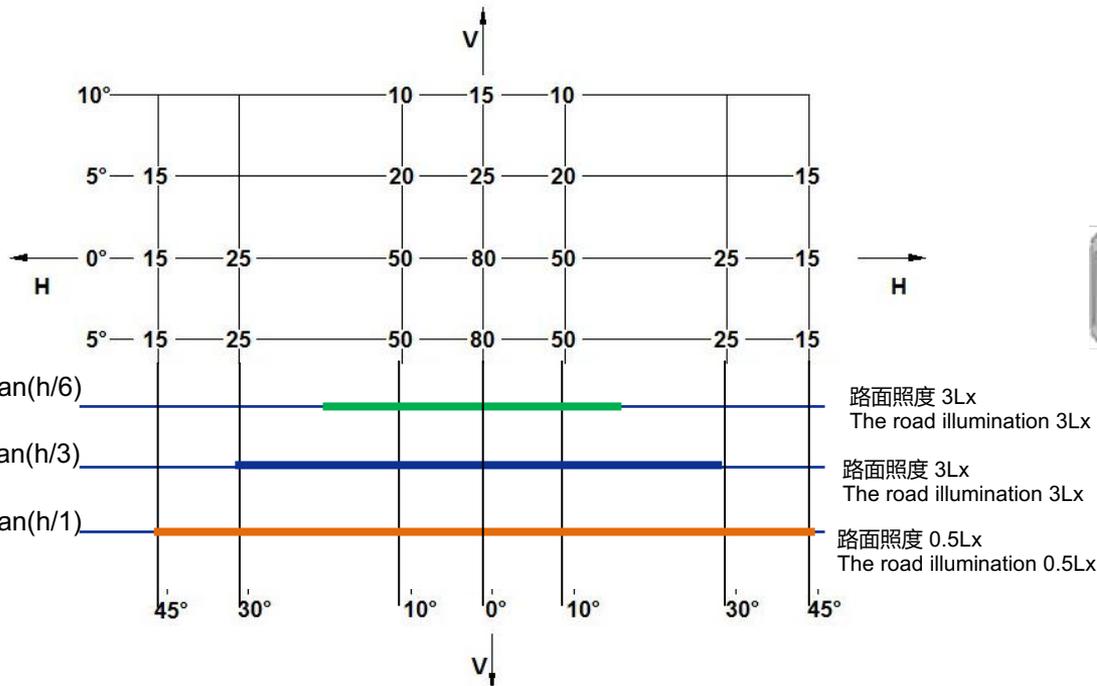
The lighting effect of reversing lamp is not good. There is a dark area behind the vehicle, which is not conducive to illuminating the field of vision of camera, reversing image system and traditional rearview mirror at night.



性能提升 Performance improvement

增加测试点，提升夜晚倒车时后视摄像头的视野性能

In order to augment the ability of rear view camera systems to provide a reasonable view of the road scene behind a vehicle during backing events at night. The new regulations envisage additional test points.



h : 倒车灯离地高度 Mounting height of reversing lamp



最小面积 The minimum area

现行法规对制动灯的发光面积没有要求，造型越来越小。

The current regulations have no requirements on the luminous area of stop lamps; the sizes are becoming smaller and smaller.



潜在风险Potential risks :

1、同等发光强度下，面积越小越容易引起后车驾驶员的眩目。

Under the same luminous intensity, the smaller the area is, the more easily the driver will dazzle.

2、降低车辆刹车的可识别性。

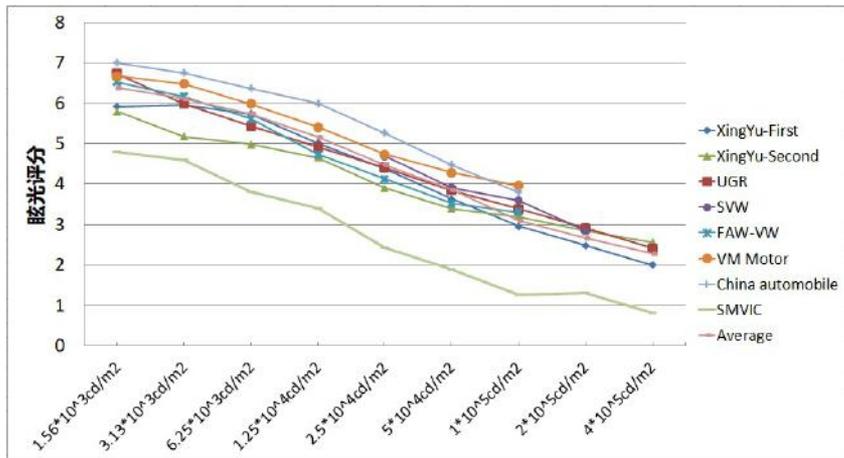
The identifiability of vehicle brake will be reduced.



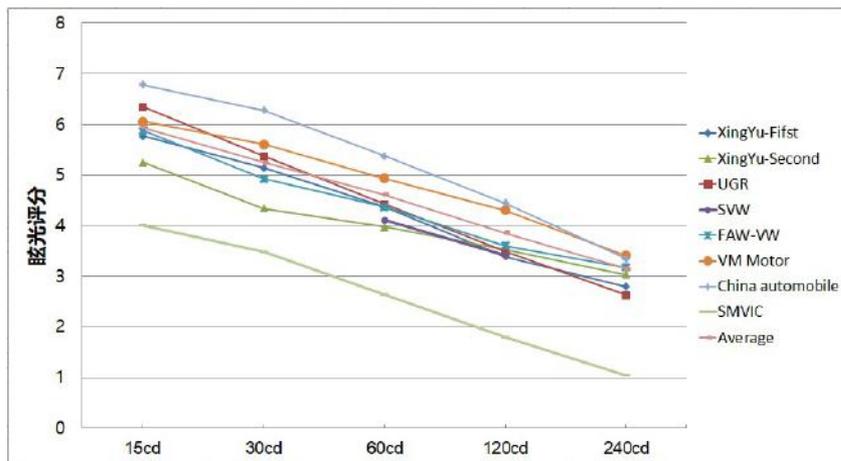
试验结果 The test results

在环境照度 $E=11.4lx$ 、 $r=3m$ 的条件下，灯具光强大于 $150cd$ 或亮度超 $10 \times 10^4 cd/m^2$ 时，会对人眼造成不舒适的眩光。
under the condition of environmental illumination $E=11.4lx$ 、 $r=3m$, when the light intensity of lamp is greater than $150cd$ or the brightness is greater than $10 \times 10^4 cd/m^2$, it will cause uncomfortable glare to human eyes.

亮度Light intensity -评分score



光强brightness -评分score



结论Conclusion :

后车紧跟前车^[1]距离约为2.2m，则制动灯最小可视发光面积需要 $\geq 15cm^2$ 。

if the distance between the rear vehicle and the front vehicle is about 2.2m, the minimum visible luminous area of the stop lamp should be $\geq 15cm^2$, so as to avoid driver discomfort glare.



带发光徽标的位置灯 Position with the luminous LOGO

当前法规current regulations

如果发光徽标满足位置灯下列条件，则被认为是符合法规要求。

If the luminous logo meets the following conditions for the position lamp, it is considered to meet the requirements of the regulations.

1.发光徽标满足位置灯的单灯定义；且

The luminous logo meets the definition of single lamp for position lamp; and

2.发光徽标是对称的；

The luminous logo is symmetrical;



新法规草案New draft regulations :

为消除法规带来的不公平性，新法规会增加“包含发光徽标的位置灯”的条款要求。

In order to eliminate the unfairness, new regulation add "the position lamp containing the luminous logo" item requirements.

不管发光徽标是否对称，都允许安装。

Installation is allowed regardless of whether the luminous logo is symmetrical or not.



可变光强的前位置灯 front position lamp with variable light intensity

现行法规Current regulations:

- a. 可变光强的信号灯仅适用于尾部的信号灯（后位/后雾/制动功能）；
The variable light intensity signal lamp is only applicable to the tail signal lamps (rear position / rear fog / braking function);
- b. 前位置灯允许在白天单独点亮；
The front position light is allowed to be on alone in the daytime;
- c. 昼间行驶灯在中国是非强制安装；
DRL installation is not mandatory in China;

从中国市场的实际情况出发，及从环保节能方面考虑，在新法规草案中增加：

In view of the actual situation of the Chinese market and in consideration of environmental protection and energy conservation, the following items are added to the draft new regulations:

- a. 可变光强前位置灯A2的性能要求；
The performance requirements of variable intensity front position lamp A2;
- b. 可变光强前位置灯A2的安装要求；
The installation requirements of variable intensity front position lamp A2;



现行法律法规调查 Investigation of current laws and regulations

ADAS standards plan

No.	Standard item	Referenced international standard
1-01	Performance requirements and test methods for automatic emergency braking system (AEB) of passenger vehicles 《乘用车自动紧急制动系统 (AEB) 性能要求及试验方法》	UN R131 (Not defined yet)
1-02	Performance requirements and test methods for automatic emergency braking system (AEB) of commercial vehicles 《商用车自动紧急制动系统 (AEB) 性能要求及试验方法》	UN R131 (Not defined yet)
1-03	Performance requirements and test methods for lane keeping assist system (LKA) of passenger vehicles 《乘用车车道保持辅助系统 (LKA) 性能要求及试验方法》	ISO 11270-2014, UN R130 (Not defined yet)
1-04	Performance requirements and test methods for lane keeping assist system (LKA) of commercial vehicles 《商用车车道保持辅助系统 (LKA) 性能要求及试验方法》	ISO 11270-2014, UN R130
1-05	Automation Level of Vehicle Driving 《汽车驾驶自动化等级划分》	SAE J3016 "Intelligent & Connected Vehicles Technology Roadmap"
1-06	Performance requirements and test methods of BSDs for vehicles 《汽车盲区监测系统 (BSD) 性能要求与检测方法》	ISO 17387, SAE J2802(BSMS), NHTSA-2015-0119, UN Rxxx-BSIS
1-07	Performance requirements and test methods of Parking assistance system 《智能泊车辅助系统性能要求及试验方法》	Not defined yet
1-08	Performance requirements and test methods of EBSs for commercial vehicles 《商用车电子稳定性控制制动系统 (EBS) 性能要求及试验方法》	Not defined yet
1-08	Performance requirements and test methods of ESCs for commercial vehicles 《商用车电子稳定性控制制动系统 (ESC) 性能要求及试验方法》	FMVSS136, UN R13 Annex 1
1-09	Terminology and definition of ADAS 《先进驾驶辅助系统 (ADAS) 术语及定义》	-
1-10	Communication demands of intelligent & connected vehicles 《智能网联汽车通讯需求》	NHTSA-2016-0126

ADAS以为驾驶员服务，
控制车辆动作为主
ADAS serves the driver
and controls the
movement of the vehicle



现行法律法规调查 Investigation of current laws and regulations

中华人民共和国道路交通安全法

Road Traffic Safety Law of the people's Republic of China

第二十八条 任何单位和个人不得擅自设置、移动、占用、损毁交通信号灯、交通标志、交通标线。



中华人民共和国道路交通安全法实施条例

Regulations for the implementation of the road traffic safety law of the people's Republic of China

第四十五条 机动车在道路行驶不得超过限速标志、标线标明的速度。在没有限速标志、标线的道路上，机动车不得超过下列最高行驶速度：

(一) 没有道路中心线的道路，城市道路为每小时30公里，公路为每小时40公里

(二) 同方向只有1条机动车道的道路，城市道路为每小时50公里。公路为每小时70公里。

第四十六条 机动车行驶中遇有下列情形之一的，最高行驶速度不得超过每小时30公里，其中拖拉机、电瓶车、轮式专用机械车不得超过每小时15公里；

(一) 进出非机动车道，通过铁路道口、急转弯、窄桥时；

(二) 掉头、转弯、下坡时；

(三) 遇雾、雨、雪、沙尘、冰雹，能见度在50米以内时

(四) 在冰雪、泥泞的道路上行驶

(五) 牵引发生故障的机动车时



现行法律法规调查 Investigation of current laws and regulations

道路交通标志和标线GB 5768中规定标线的基本形式 (具体如下)

Basic forms of road traffic signs and markings specified in GB 5768 (specific as follows)

表 B.1 道路交通标志和标线基本图形

序号	图 形	说 明
1		直行, 车道或道路的行驶方向
2		向左, 车道或道路的行驶方向
3		向右, 车道或道路的行驶方向
4		车道指示, 正对车道, 指明车道属性或目的地

表 B.1 (续)

序号	图 形	说 明
5		向左转弯方向, 车道或道路的行驶方向, 可反向
6		掉头
7		道路作业区绕行指引箭头(橙色)
8		机动车
9		小客车
10		客车、公共汽车; 标识长途汽车时见下图:
11		校车, 也可以表示为:



有效应用场景：道路通行困难、人车混行、驻车状态下使用

Effective application scenarios: heavy road traffic, mixed traffic and parking

01

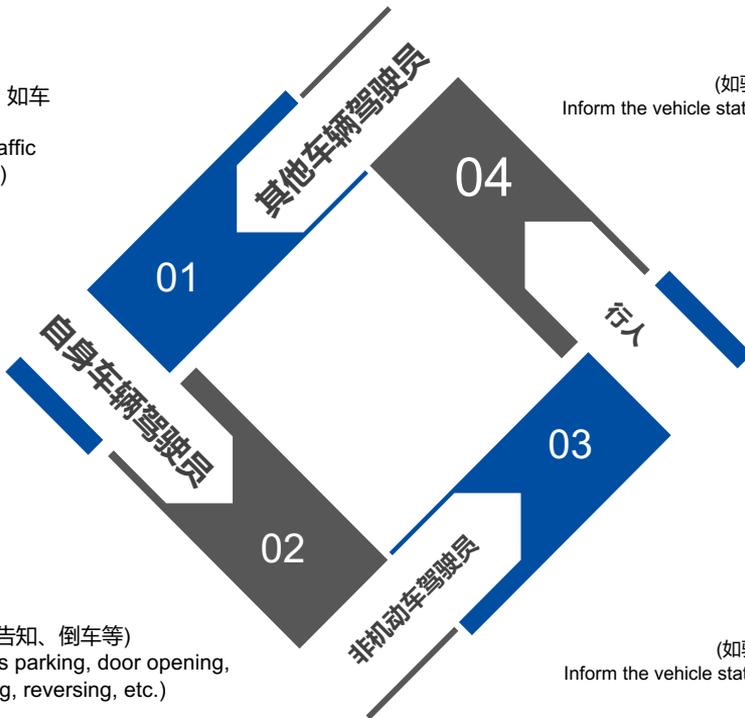
自身车辆驾驶员 Driver

道路通行困难时，帮助驾驶判断（如车宽标尺）
Help drivers to judge when the traffic is heavy (e.g. vehicle width scale)

02

非机动车驾驶员 Non-Motor Vehicle driver

告知车辆状态
(如驻车、开门、转向、危险区域告知、倒车等)
Inform the vehicle status (such as parking, door opening, turning, dangerous area informing, reversing, etc.)



其他车辆驾驶员 Other vehicle drivers

告知车辆状态
(如驻车、开门、转向、危险区域告知、倒车等)
Inform the vehicle status (such as parking, door opening, turning, dangerous area informing, reversing, etc.)



行人 pedestrian

告知车辆状态
(如驻车、开门、转向、危险区域告知、倒车等)
Inform the vehicle status (such as parking, door opening, turning, dangerous area informing, reversing, etc.)

04

03



新法规草案规定The new draft regulation states that :

a.和现有信号灯功能配套使用，颜色和现有性能灯功能一致；

It is used with the existing signal lamp function, and the color is consistent with the function of the existing performance lamp;

b.可与信号灯组合安装也可以单独安装；

It can be installed in combination with signal lamp or separately

c.投射图号为简单图案；

The projection pattern is simple;

d.车辆低速时使用；

Use at low speed;





现行法规N-1的要求：

The requirements of current regulation on n-1 are as follows:

a. 满足配光值的100% (适用所有功能) ；

meet 100% of light distribution value (applicable to all functions)

b. 基准轴线满足配光值的50% + 故障指示器显示失效 (仅适用2个光源的位置/制动/示廓/转向)

The reference axis meets 50% of the light distribution value + the fault indicator show failure (only applicable to turn signal lamps, and position / stop / end-outline marker lamps that have 2 light sources)

c. 满足配光值的80% (适用DRL) ；

meet 80% of the light distribution value (applicable to DRL);

是否基于性能、技术中立？ Is performance based, technology neutral?

应仅定义性能要求，且仅存在满足和不满足性能2种状态；当不满足性能时可以通过以下方式通知用户：

Only performance requirements shall be defined. And There are only two states of meeting and not meeting performance; If the performance is not met, the user can be notified by:

a. 所有光源熄灭；或

All light sources are off; or

b. 部分光源仍处于工作状态但故障指示器应显示失效；

Some light sources are still on, but the fault indicator shall show failure;



ADS标志灯与其他信号灯混合时的优先点灯条件

Lighting Priority of ADS sign lamps reciprocally incorporated with other signal lamps

- **与位置灯混合 If ADS lamps reciprocally incorporate with position lamps**
与前位置灯混合，ADS灯优先；不可以和后位置灯混合；
If ADS lamps reciprocally incorporated with front position lamps, ADS lamps have priority;
ADS lamps can not be reciprocally incorporated with rear position lamps;
- **与转向灯混合 If ADS lamps reciprocally incorporate with turn signal lamps**
转向灯优先
Turn signal lamps have priority
- **与DRL混合 If ADS lamps reciprocally incorporate with DRL**
ADS灯优先
ADS lamps have priority



- 新标准草案的验证试验工作.
Verification test related to the integration of regulations is carried out.
- 新标准草案的公开征求意见
Public consultation on draft new regulations



谢 谢

