Service Information

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Coverage	Date Issued
☐ Distributor only ■ Please inform your dealers	December 5, 2017
Please convey this information to your ☐ Director ■ General Manager ■ Warranty Dept. ■ Parts Dept. ■ Training Dept. ■ Field Rep.	Date Revised

Applicable Model	Applicable Countries and/or Vehicle Specifications
All models with LED Headlights	Worldwide

Subject: Colors of light emitted from LED Headlights are different between left and right

DESCRIPTION

Some customers may complain about a difference between colors of light emitted from the left and right headlights. On side is tinged with yellow.

-Tinged with yellow-

This is a common condition on headlights using a white LED light source. With a present production technology of white LED and optical construction of headlights, it is difficult to eliminate light color differences of LED headlights completely.

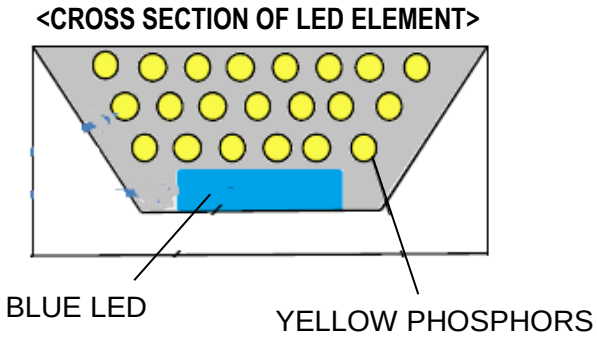
When you receive the customer complaint, please explain that this is a normal condition and does not affect the headlights performance. As necessary explain more details about the mechanism why light color differences occur on LED headlights in the following pages.

WHY LIGHT COLOR DIFFERENCES OCCUR

1. LED light source factors

(Mechanism to generate white light)

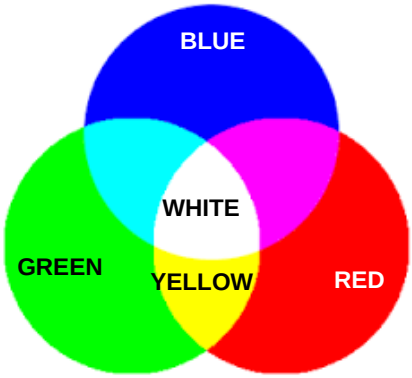
True white light emitting LEDs are not available. To generate white light, yellow phosphors are used together with blue LED as shown in figure.

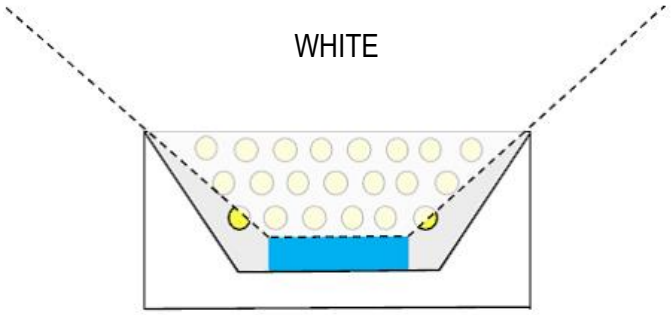


If an electrical current is applied to the blue LED, some of the blue light is converted to yellow light by phosphors. When the remaining LED blue light and the yellow light converted by phosphors are mixed, it is perceived by the eye as white.

-Three-Primary-Colors of Light-

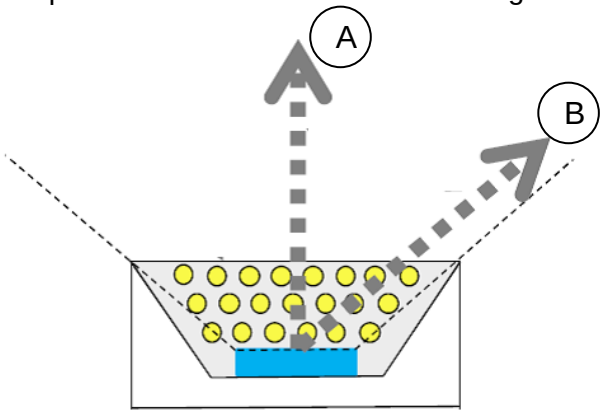
('BLUE + YELLOW →WHITE)



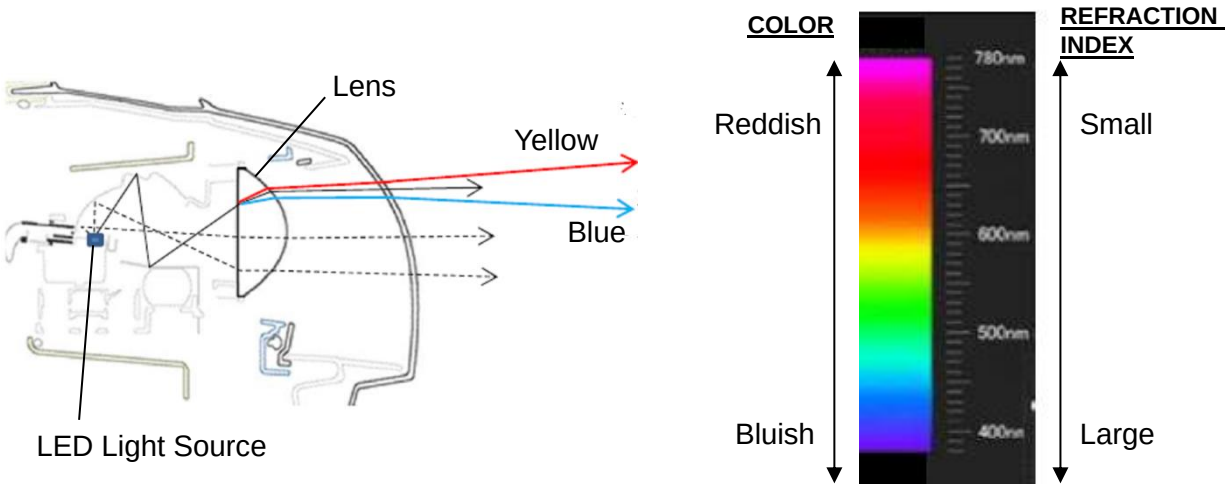


(Why do color differences occur?)

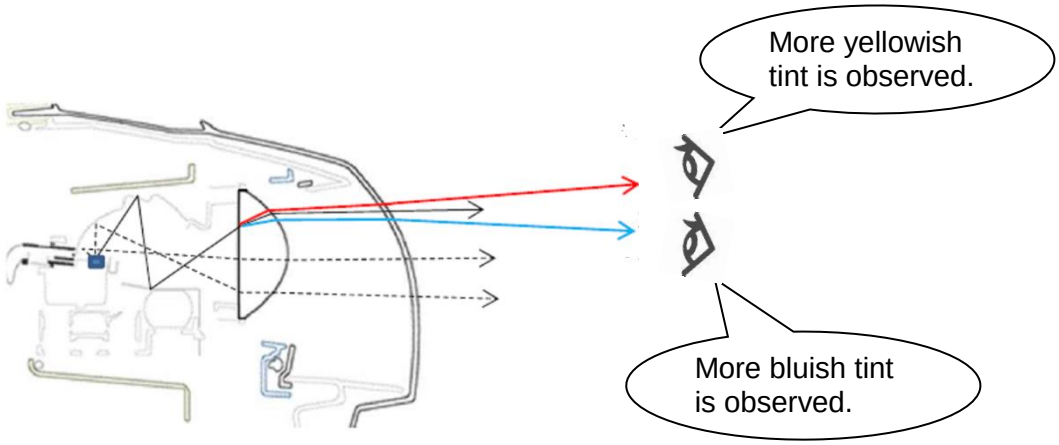
- Amount of phosphors coated in LED elements is different due to production variation.
- As shown in figure, distances of blue light crossing through phosphors are different between the direction A and B for example. The blue light emitted toward the direction B crosses a longer distance of phosphors and in this case the color of light turns to more yellowish tint.



2. Optical structure of headlights factors
A LED light ray emitted is refracted when passing through the lens. At this time, a minor color breakup occurs because refraction indexes are different by colors. Refraction index is smaller for reddish colors and larger for bluish colors as shown in figure.



As such, a LED white light color (mix of blue and yellow color) is separated into different colors, more yellowish tint at the upper and bluish tint at the lower side. So, depending on viewing positions, the light color is observed differently as shown in figure.



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