

Proposed amendments to Regulation No. 53 for headlamp corresponding to inclination

The modifications to the current text of Regulation No.53 are marked in **bold** characters.

A. PROPOSAL

Insert new paragraph 2.21. to read:

“2. Definitions

“2.21. “Headlamp inclination adjustment system” means a device that adjusts the illumination area of a headlamp by adjusting the variation in the horizontal inclination of the headlamp as the illumination area of a headlamp horizontally inclines and changes according to the change in the vehicle posture when the vehicle horizontally inclines from the condition as specified in paragraph 5.4..”

Paragraphs 6.1.5., 6.1.8., 6.1.9., 6.2.5.,6.2.8. and 6.2.9. amend to read: (Modify where necessary, according to the following.)

“6.1. Driving Beam Headlamp

6.1.5. Orientation

6.1.5.1. Forwards. The lamp(s) may move with the steering angle.

6.1.5.2. **A headlamp inclination adjustment system may be adopted. However, the headlamp’s illumination area adjustment angle of the system shall not exceed the variation caused by the vehicle’s horizontal inclination angle.**

6.1.8. ”Circuit-closed” tell-tale

6.1.8.1. Mandatory, non-flashing blue signal lamp.

6.1.8.2. **If a headlamp inclination adjustment system is adopted, the vehicle must be equipped with a flashing warning lamp that lights in the event of a failure of the system. This warning lamp shall emit an amber-colored signal and may be combined with the tell-tale as specified in paragraph 6.2.8.**

6.1.9. Other requirements

6.1.9.1. Aggregate maximum intensity of the driving beam headlamps which can be switched on simultaneously shall not exceed 225,000 cd. (The approval value).

6.1.9.2. **If a headlamp inclination adjustment system is adopted, the system shall be enabled to use continuously by adjusting its illumination area to the condition as specified in paragraph 5.4. without the use of any special tools in the event of a failure of the system.**

6.2. Passing Beam Headlamp

6.2.5. Orientation

6.2.5.3. **A headlamp inclination adjustment system may be adopted. However, the headlamp's illumination area adjustment angle of the system shall not exceed the variation caused by the vehicle's horizontal inclination.**

6.2.8. "Circuit-closed" tell-tale

6.2.8.1. Optional; non-flashing green signal lamp.

6.2.8.2. **If a headlamp inclination adjustment system is adopted, the vehicle must be equipped with a flashing warning lamp that lights in the event of a failure of the system. This warning lamp shall emit an amber-colored signal.**

6.2.9. Other requirements

~~None.~~

If a headlamp inclination adjustment system is adopted, the system shall be enabled to use continuously by adjusting its illumination area to the condition as specified in paragraph 5.4. without the use of any special tools in the event of a failure of the system."

B. JUSTIFICATION

This proposal specifies the requirements concerning the vehicle's horizontal inclination angle adjustment-type headlamps installed on motorcycles.

The Adaptive Front Lighting System (AFS), which improves the visibility by controlling the optical axis with the steering angle and providing additional light sources, has been incorporated into the headlamps for four-wheel vehicles.

In the case of a motorcycle, due to its driving characteristics, the headlamp inclines with the vehicle when the vehicle is running on a curved road, narrowing the illumination area of the headlamp in the traveling direction. Therefore, by adjusting the variation of the headlamp's light distribution from that when the vehicle is upright, *i. e.*, in the standard condition, to keep the illumination area wide enough, the visibility is expected to improve.

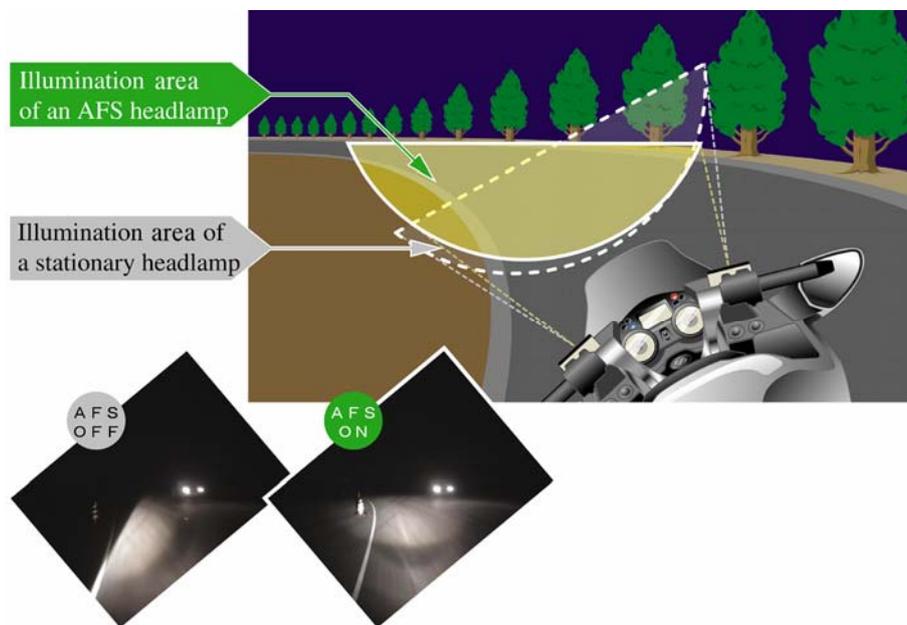


Figure 1. Description of the Function of the Inclination Angle adjustment-Type AFS

To submit this proposal for amendments, we conducted a research on the “vehicle's horizontal inclination angle adjustment-type headlamps for motorcycles” at the Japan Automobile Research Institute (JARI) to confirm the validity by conducting an “evaluation of the visibility” and an “evaluation of the effect on glare”. The result is outlined below.

1. Evaluation of the visibility

It was confirmed that the visibility has improved when the vehicle is running on a curved road and when turning right and left by adjusting the change in the light distribution from when the vehicle is upright.

2. Evaluation of the effect on glare

It was found that generation of glare against oncoming vehicle, which may be caused by this device, can be avoided by ensuring that the maximum adjustment amount of the light distribution of the headlamp is the variation caused by the vehicle inclination.

As for the details of the research at JARI, see Informal Document GRE-59-17.

This proposal lays the foundation for the dissemination of vehicle's horizontal inclination angle adjustment-type headlamps that always correct the illumination area to that when the vehicle is upright regardless of the vehicle inclination posture. A widespread use of this device will improve the night-time visibility of motorcycles and contribute to the prevention of traffic accidents.
