

R.48xxx

DRAFT

GRE-AFS Working Paper No. 5-2

5th GRE-AFS Informal meeting
28-30 October 2003, Bonn

p. 1 /16

~~GRE AFS Working Paper No. 4-5
(4th session of the GRE Informal
Group on AFS, 15-17 July 2003)~~

~~Informal Document No. 6
(50th GRE, 7-11 April 2003,
agenda item 3.2.)~~

28. February 2003

ENGLISH ONLY

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Lighting and Light-Signalling (GRE)

~~(Fiftieth session, 07 April – 11 April 2003,
agenda item 3.2.)~~

PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 48

(Installation of lighting and light-signalling devices)

Transmitted by the Expert from the Working Party "Brussels 1952" (GTB)

Note: At its second session on 28-30 January 2003 the GRE Informal Group on AFS discussed, as informal document No. 3 for that session, the proposal by GTB for amendments to Regulation No.48 concerning AFS. The text reproduced below represents the outcome of the session; it incorporates the decisions and amendments /alternatives, as indicated in the report (informal document No. 5 for the 50th GRE session). The amendments /alternatives to individual paragraphs have been set out in bold characters. Section B has been updated accordingly.

This document was presented, but not discussed, as working paper No. 4-5 at the fourth session of the GRE Informal Group on AFS on 15-17 July 2003.

A. PROPOSAL

Insert new paragraphs 2.6.1. and 2.6.2., to read:

- "2.6.1. *"Lighting function" means the light emitted by a device to illuminate the road and objects in the direction of vehicle movement;*
- 2.6.2. *"Light-signalling function" means the light emitted or reflected by a device to give to other road users visual information on the presence, identification and/or the change of movement of the vehicle;"*

Insert new paragraphs 2.7.26. to 2.7.26.7., to read

- "2.7.26. *"Adaptive front lighting system" (AFS) means a lighting device, type-approved according to Regulation No. xxx providing two or more differing modes for automatic adaptation of the beam characteristics to varying conditions of use of the dipped-beam and, if it applies, the main-beam; such systems consist of the 'system control', one or more 'supply and operating device(s)', if any, and the 'installation units' of the right and of the left side of the vehicle;*
- 2.7.26.1. *"Lighting unit" means a light-emitting component designed to provide or contribute to one or more front lighting or light-signalling function(s) provided by the AFS;*
- 2.7.26.2. *"Installation unit" means an indivisible housing (lamp body) with one or more lighting unit(s) being contained;*
- 2.7.26.3. *"Lighting mode" means a state of a front lighting function provided by the system, as specified by the manufacturer and intended for adaptation to specific vehicle and ambient conditions;*
- 2.7.26.4. *"System control" means that part(s) of the AFS receiving the AFS control signals from the vehicle and controlling the operation of the lighting units automatically;*
- 2.7.26.5. *"AFS control signal" (**V-signal for the mode(s) of class V (town) passing beam, E-signal for the mode(s) of class E (motorway) passing beam, W-signal for the mode(s) of class W (wet road) passing beam, T-signal for the bending mode(s) of any passing beam class**) means the input to control the system in accordance with the relevant paragraphs of this Regulation;*
- 2.7.26.6. *"Neutral state" means the state of the AFS when **the system produces the basic class C passing beam and no AFS signal for other classes or any lighting mode is applied,**~~specified by the manufacturer for adjustment of the AFS or parts thereof;~~"*
- 2.7.26.7. *(transferred to paragraph 6.20.4.1.1. below)*

Paragraph 2.9.1., amend to read:

"2.9.1. "Illuminating surface of a lighting device" (paragraphs 2.7.9., 2.7.10., 2.7.18. and 2.7.20.) means the orthogonal projection of the full aperture of the reflector, or in the case of headlamps with an ellipsoidal reflector of the "projection lens" on a transverse plane. If the is taken into account.

In the case of a dipped-beam headlamp the mean adjustment should be used.

In case an AFS is installed:

*where a lighting function is produced by two or more simultaneously operated lighting units on a given side of the vehicle, the individual illuminating surfaces, **taken together, constitute** the illuminating surface to be considered (for example, in the figure of paragraph 6.20.4. below: the individual illuminating surfaces of the lighting units 8, 9 and 11, regarded together and taking into account their respective location, constitute the illuminating surface to be considered for the right hand side of the vehicle)."*

Insert new paragraphs 3.2.6. to 3.2.6.7., to read:

"3.2.6. *where an AFS is fitted on the vehicle, the applicant shall submit a detailed description providing the following information:*

3.2.6.1. *the lighting functions and modes for which the AFS has been approved;*

3.2.6.2. *the related AFS control signals and their technical characteristics as defined according to annex 11 of Regulation No. xxx;*

3.2.6.3. *the provisions being applied to adapt automatically the front lighting functions and modes according to paragraph 6.20.7.2. of this Regulation;*

~~3.2.6.4. *the fail safe provisions adopted according to paragraph 6.20.9.2.1.2. of this Regulation and/or according to paragraph 5.9.1. of Regulation No. xxx;*~~

3.2.6.5. *the documents according to paragraph 6.20.9.2. of this Regulation;*

3.2.6.6. *the lamps that are grouped or combined with or reciprocally incorporated in the AFS;*

3.2.6.7. *lighting units which are designed to comply with the requirements of paragraph 6.20.5. of this Regulation."*

Paragraph 5.4., amend to read:

"5.4. In the absence of specific instructions, the height and orientation of the lamps shall be verified with the vehicle unladen and placed on a flat, horizontal surface, in the condition defined in paragraphs 2.24., 2.24.1. and 2.24.2. and, in the case where an AFS is installed, **with the system** in its neutral state."

Paragraph 5.15., amend to read:

.... Adaptive Front Lighting Systems: white

Paragraph 5.16.1., amend to read:

The number of lamps mounted on the vehicle ***shall*** be equal to the number indicated in the ***individual specifications of this Regulation.***

Insert new paragraph 5.24., to read:

"5.24. *Where an AFS is fitted, it shall be considered equivalent to a pair of dipped-beam headlamps and, if it provides main-beam function(s), it shall be considered equivalent to a pair of main-beam headlamps.*"

Paragraph 6.3.6., amend to read, including two new sub-paragraphs

"6.3.6. Orientation

Towards the front.

They must be directed forward without causing undue dazzle or discomfort to oncoming drivers and other road users.

6.3.6.1. Horizontal orientation

The *horizontal* alignment of the front fog lamps must not vary according to the angle of lock of the steering.

When a beam from a front fog lamp is activated as part of another lighting function provided by an AFS the axis of this beam may be automatically moved sideways.

6.3.6.2. Vertical orientation

When a beam from a front fog lamp is activated as part of a dipped beam provided by an AFS it has to comply with the requirements of paragraph 6.20.6.1. of this Regulation.

Paragraph 6.3.7., amend to read:

"6.3.7. Electrical connections

It must be possible to switch the front fog lamps ON and OFF independently of the main-beam headlamps, the dipped-beam headlamps or any combination of main- and dipped-beam headlamps, *unless the front fog lamps are used as part of another lighting function in an AFS; however, the switching ON of the front fog lamps function shall have the priority over the function for which the front fog lamps are used as a part.*"

Paragraph 6.5.3., amend to read:

".....on all vehicles in categories O₂ O₃ and O₄.

Where an AFS is fitted, the distance to be considered for the choice of the category is the distance between the front direction indicator lamp and the closest lighting unit in its closest position contributing to or performing a passing beam mode."

Paragraph 6.9.9., amend to read:

"6.9.9. Other requirements

In case an AFS providing a bending mode is installed, the front position lamp may be swivelled together with a lighting unit to which it is reciprocally incorporated."

Insert new paragraphs 6.20. to 6.20.9.4., to read; (Note: final numbering to be actualized, e.g. 6.22...)

"6.20. *ADAPTIVE FRONT LIGHTING SYSTEM (AFS)*

Where not otherwise specified below, the requirements for main-beam headlamps (paragraph 6.1.) and for dipped-beam headlamps (paragraph 6.2.) of this Regulation apply to the relevant part of the AFS.

6.20.1. Presence

Optional on motor vehicles. Prohibited on trailers.

6.20.2. Number

One.

6.20.3. Arrangement

No special requirements.

6.20.4. Position

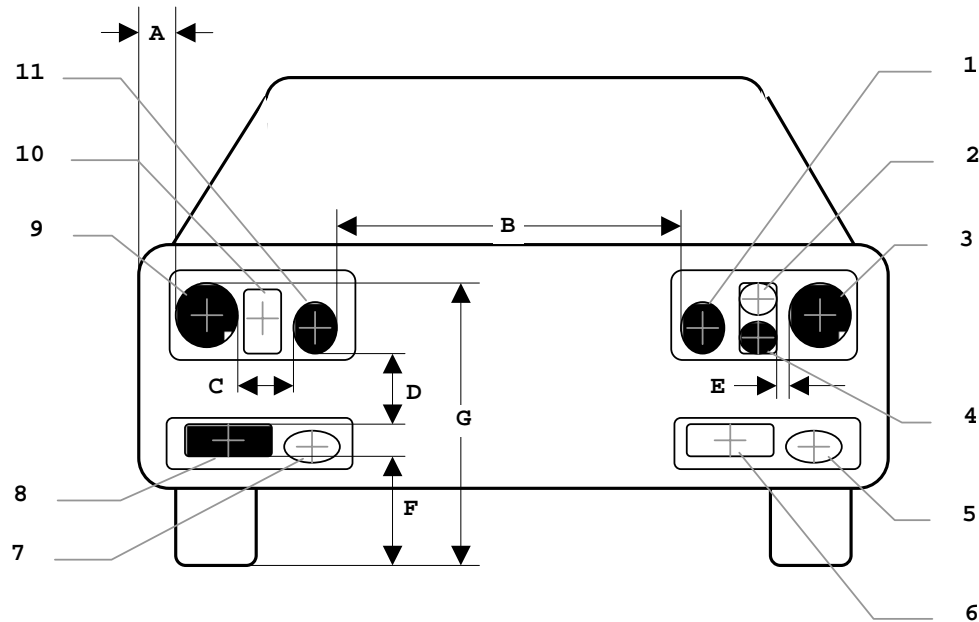
The AFS shall, prior to the subsequent test procedures, be set to the neutral state, emitting the basic passing beam;


6.20.4.1. *In width and height:*

for a given lighting function or mode the requirements indicated in the paragraphs 6.20.4.1.1. through 6.20.4.1.4. below shall be fulfilled by those lighting units which are energized simultaneously for that lighting function or mode of a function, according to the applicant's description.

6.20.4.1.1. *Two symmetrically placed lighting units shall be positioned at a height in compliance with the requirements of the relevant paragraphs 6.1.4. and 6.2.4.,*

where "Two symmetrically placed lighting units" shall be understood to be two lighting units, one on each side of the vehicle, positioned such that the (geometric) centres of gravity of their apparent surfaces are at the same height and at the same distance from the vehicle's longitudinal median plane within a tolerance of 50 mm, each; their light emitting surfaces, illuminating surfaces, and light outputs, however, may differ.



Lighting units being simultaneously energized for a given lighting **mode**: 

No.3 and 9: two symmetrically placed lighting units

No.4 and 8: two additional lighting units

No.1 and 11: two symmetrically placed lighting units

Lighting units not being energized for said lighting **mode**: 

No.2 and 10: (two symmetrically placed lighting units)

No.5: (additional lighting unit)

No.6 and 7: (two symmetrically placed lighting units)

horizontal dimensions in mm:

$$A \leq 400$$

$B \geq 600$ or ≥ 400 if vehicle overall width < 1300 mm, however
no requirement for category M1 and N1 vehicles

$$C \leq 200$$

$$E \leq 140$$

vertical dimensions in mm:

$$D \leq 400$$

$$F \geq 250$$

$$G \leq [950 / 1200 / 1500]$$

Apparent surfaces of lighting units 1 through 11 of an AFS (example)

6.20.4.1.2. *Additional lighting units, if any, on either side of the vehicle shall be positioned at a distance not exceeding 140 mm 7/ in horizontal direction (E in the figure) and 400 mm in vertical direction above or below (D in the figure) from the nearest lighting unit;*

6.20.4.1.3. *None of the additional lighting units described in paragraph 6.20.4.1.2. above shall be positioned lower than 250 mm (F in the figure) nor higher than [950 /1200 /1500] mm (G in the figure) above the ground;*

6.20.4.1.4. *Additionally, in width:*

for each mode of the passing beam lighting, when measured in direction of the reference axis:

the outer edge of the apparent surface of at least one lighting unit on each side of the vehicle shall not be more than 400 mm from the extreme outer edge of the vehicle (A in the figure); and,

the distance between the inner edges of the apparent surfaces of the lighting units on the right and left hand side of the vehicle (B in the figure) shall be not less than 600 mm, or, except for category M₁ and N₁ vehicles not less than 400 mm when the overall width of the vehicle is less than 1300 mm.

6.20.4.2. *In length:*

all lighting units of an AFS shall be mounted at the front. This requirement is deemed to be satisfied if the light emitted does not cause discomfort to the driver either directly, or indirectly through the rear-view mirrors and/or other reflecting surfaces of the vehicle.

6.20.5. Geometric visibility

On each side of the vehicle, for each lighting function and mode provided:

*[the angles of geometric visibility prescribed for the respective lighting and light-signalling functions in paragraphs 6.1.5. and 6.2.5. of this Regulation, shall **[for each direction]** be met by **at least** one lighting unit or by the assembly of the lighting units that are simultaneously energized to perform said function and mode(s), according to the description of the applicant.]*

6.20.6. Orientation

Towards the front.

The AFS shall, prior to the subsequent test procedures, be set to the neutral state, emitting the basic passing beam.

7/ In case of additional "two symmetrically placed lighting units" the horizontal distance may be 200 mm (C in the figure).

6.20.6.1. *Vertical orientation:*

- 6.20.6.1.1. *The initial downward inclination of the cut-off of the basic passing beam to be set in the unladen vehicle state with one person in the driver's seat shall be specified with a precision of 0.1 per cent by the manufacturer and indicated in clearly legible and indelible manner on each vehicle, close to either the front lighting system or the manufacturer's plate, by the symbol shown in annex 7.*

Where differing initial downward inclinations are specified by the manufacturer for different lighting units that provide or contribute to the cut-off of the basic passing beam, these values of downward inclination shall be specified with a precision of 0.1 per cent by the manufacturer and indicated in clearly legible and indelible manner on each vehicle, close to either the relevant lighting units or on the manufacturers plate, in such a way that all the lighting units concerned can be unambiguously identified.

- 6.20.6.1.2. *The downward inclination of the horizontal part of the "cut-off" of the basic passing beam shall remain between the limits indicated in paragraph 6.2.6.1.2. of this Regulation under all the static loading conditions of the vehicle of annex 5 of this Regulation;*

- 6.20.6.1.2.1. *in case the basic passing beam is generated by several beams from different lighting units, the provisions according to paragraph 6.20.6.1.2. above apply to each said beam's "cut-off" (if any), which is designed to project into the angular zone, as indicated under item 9.4.1. of the communication form conforming to the model in annex 1 to Regulation No. xxx.*

- 6.20.6.1.3. *passing beam levelling device*

The provisions of paragraph 6.2.6.2.2. above are not applicable.

6.20.6.2. *Horizontal orientation:*

For each lighting unit the kink of the elbow of the cut-off line, if any, when projected on the screen, shall coincide with the vertical line through the reference axis of said lighting unit. A tolerance of 0.5 degrees to that side which is the side of the traffic direction shall be allowed. Other lighting units shall be adjusted according to the applicant's specification, as defined according to annex 11 of Regulation No. xxx.

6.20.6.3. *Measuring procedure:*

After adjustment of the initial setting of beam orientation, the vertical inclination of the passing beam or, when applicable, the downward inclinations of all the different lighting units that provide or contribute to the cut-off(s) according to paragraph 6.20.6.1.2.1. above of the basic passing beam, shall be verified for all loading conditions of the vehicle in accordance with the specifications in paragraphs 6.2.6.3.1. and 6.2.6.3.2. of this Regulation.

6.20.7. *Electrical connections*

~~[6.20.7.1. The provisions of paragraphs 6.1.7. (for the main beam headlamp) and 6.2.7. (for the passing beam headlamp) of this Regulation apply to the respective parts of an AFS.]~~

6.20.7.1. Main beam lighting (if provided by the AFS)

- (a) *The lighting units for the main-beam may be activated either simultaneously or in pairs. For changing over from the dipped-beam to the main-beam at least one pair of lighting units for the main-beam shall be activated. For changing over from the main-beam to the dipped-beam all lighting units for the main-beam shall be de-activated simultaneously.*
- (b) *The dipped-beams may remain switched on at the same time as the main-beams.*
- (c) *Where four concealable lighting units are fitted their raised position must prevent the simultaneous operation of any additional headlamps fitted, if these are intended to provide light signals consisting of intermittent illumination at short intervals (see paragraph 5.12.) in daylight.*
- (d) *Where, for the purpose of adjusting the beam orientation, the AFS cannot set itself automatically in the neutral state, means shall be provided to set the AFS to its neutral state.*

6.20.7.2. Passing beam lighting

- (a) *The control for changing over to the dipped-beam must switch off all main-beam headlamps or de-activate all AFS lighting units for the main-beam simultaneously.*
- (b) *The dipped-beam may remain switched on at the same time as the main-beams.*
- (c) *In the case of lighting units for the dipped-beam being equipped with gas discharge light sources, the gas-discharge light sources shall remain switched on during the main-beam operation.*
- (d) ~~6.20.7.3.~~ *It shall always be possible for the driver to manually switch the AFS from any of the passing beam modes to the basic passing beam (neutral state?) and to manually return it to automatic AFS operation.*
- (e) *Where, for the purpose of adjusting the beam orientation according to paragraph 6.20.6. above, the AFS cannot set itself automatically in the neutral state, means shall be provided to set the AFS to its neutral state.*
~~6.20.7.3.1.~~ *Concerning the bending mode(s): the vehicle's steering wheel may be regarded to be the respective mean according to paragraph 6.20.7.3. above, provided that the reproducibility of the horizontal adjustment does not exceed [0.2 deg]; this shall be verified by the Technical Service responsible for the Type Approval tests.*

6.20.7.3. ~~6.20.7.2.~~ **Switching ON and OFF the lighting functions may be automatic, however subject to the requirements for "Electrical connection" in paragraphs 5.11. and 5.12. of this Regulation.**

6.20.7.4. *Automatic operation of the AFS lighting functions and modes*

*The changes within and between the provided modes of the AFS lighting functions as specified below, shall be performed automatically, without any possibility of intervention by the driver, with exception of the provisions set out in paragraphs ~~6.20.7.3.~~ **6.20.7.1.(d), 6.20.7.2.(d) and (e)** and 6.20.7.5. of this Regulation.*

[These automatic changes shall be such that no discomfort, neither for the driver nor for other road users, is caused.]

The following conditions apply for the activation of the modes of the passing beam and, where applicable, of the main-beam.

6.20.7.4.1. *The **class C** (basic) mode(s) of the passing beam provided by the AFS shall be activated when conditions according to paragraphs 6.20.7.4.2. to 6.20.7.4.5. below do not apply or are not provided.*

6.20.7.4.2. *[The **class V** mode(s) of the passing beam, (V-signal, V in the Approval Mark) may optionally be activated instead the **class C** basic mode(s) only **on roads with a reduced need for road illumination by front lighting of the vehicle and** at low speed; this condition shall be deemed to be satisfied if the vehicle's speed does not exceed 60 km/h **and/or fixed road lighting is present.**]*

or

6.20.7.4.2. *[The **class V** mode(s) of the passing beam shall only be active when the vehicle is in a town/ built-up area and the speed does not exceed 70 km/h.]*

6.20.7.4.3. *[The **class E** mode(s) of the passing beam (E-signal, E in the Approval Mark) may optionally be activated instead the basic mode(s) only when the vehicle's speed is not less than **80 km/h** and the road characteristics correspond to motorway conditions 8/. **This latter condition shall be deemed to be satisfied if a continuous evaluation of one or more sets of information data is provided that can indicate motorway conditions, (e.g. the vehicle's speed being essentially steady together with steering parameters, or, the width and the course of the road lanes as indicated by means of optical detection).**"]*

6.20.7.4.4. *The **class W**-mode(s) of the passing beam (W-signal / W in the Approval Mark) may optionally be activated instead the basic mode(s) only*
(a) when the front fog lamps, if any, are switched OFF and,
(b) when the road is wet and/or rain or snow fall is present;
where said condition according to (b) above shall be deemed to be satisfied if:
*(i) the windshield wiper is switched ON and its **continuous or automatically controlled** operation has occurred for a period of at least 2 minutes, and[/or]*

8/ Such conditions can be found in Chapter I, Article 1 of the Convention on Road Traffic (Vienna Agreement, 1968)

(ii) *a corresponding wetness of the road has been detected automatically.*

- 6.20.7.4.5. *The **bending mode(s) of the class C/E/V/W passing beam (T-signal, (one common) suffix T** in the Approval Mark) may be activated in combination with any of the above passing beam modes according to paragraphs 6.20.7.4.2. to 6.20.7.4.4.; ~~however, only in/for curves or during/for cornering at intersections; this condition shall be deemed to be satisfied if:~~*
[however, this is only permitted according to the angle of lock of the steering and/or the road curvature (optionally including other information, e.g. the road curvature).]

In addition the following provisions apply:

- (a) *one or more lighting units may be additionally energized only when the horizontal radius of curvature of the trajectory of the centre of gravity of the vehicle is 500 m or less;*
- (b) *a horizontal movement of the asymmetric cut-off sideways from the longitudinal axis of the vehicle, if any, is allowed only when the vehicle is in forward motion 9/ and shall be such that the longitudinal vertical plane through the kink of the elbow of the cut-off does not intersect the line of the trajectory of the centre of gravity of the vehicle at distances from the front of the vehicle which are larger than 100 times the mounting height of the respective lighting unit.*

- 6.20.7.5. ***[Concerning the "traffic change mode" according to the provisions of paragraph 5.4.1. of Regulation No.xxx, if any: where the AFS cannot set itself automatically into the corresponding correct state, means shall be provided which allow the driver to activate the "traffic change mode"; these means shall be designed so, that it can be operated only when the vehicle is not in normal condition of use; the state being activated shall be indicated in clearly legible and indelible manner [with the letters "R/D" for the position for right-hand traffic and the letters "L/G" for the position for left-hand traffic].]***

6.20.8. ***Tell-tale:***

- 6.20.8.1. *The provisions of paragraphs 6.1.8. (for the main-beam headlamp) and 6.2.8. (for the dipped-beam headlamp) of this Regulation apply to the respective parts of an AFS.*

- 6.20.8.2. ***[A tell-tale (visual or auditory, or any equivalent signal) shall be provided, to be activated whenever a failure signal is received, in accordance with paragraph 5.9.1. of Regulation No. xxx.]***

- 6.20.8.3. ***[In addition, a tell-tale (visual or auditory, or any equivalent signal) shall be provided to indicate that the driver has set the system into a state according to the paragraph 5.4.1. of Regulation No. xxx (TRANS/WP.29/GRE/2002/18/Rev.1);***
or;

9/ *This provision does not apply for passing beam lighting when bend lighting is produced for a right turn in right hand traffic (left turn in left-hand traffic).*

~~6.20.8.3.1. a warning label...]~~

6.20.9. Other requirements

6.20.9.1. *Lighting units which, according to the provisions of paragraphs 6.20.6.1.2., 6.20.6.1.2.1. and 6.20.6.1.3. of this Regulation, need to be installed with an automatic levelling device, shall only be permitted in conjunction with the installation of headlamp cleaning device(s) according to Regulation No. 45 10/.*

~~[6.20.9.2. Provisions in the case of failure~~ **Substitution Provisions...** ~~]~~

6.20.9.2. ~~6.20.9.3.~~ *Verification of compliance with AFS automatic operating requirements*

*[Compliance with the requirements indicated in paragraphs 6.20.9.2.1. through 6.20.9.2.2. below, shall be demonstrated by the manufacturer with [brief] descriptions or by other means **acceptable to** the Authority responsible for type approval. At the discretion of the technical service responsible for the type approval tests, practical testing **may** be carried out:*

6.20.9.2.1. ~~6.20.9.3.1.~~ *the AFS control signals correspondence to the description required in paragraph 3.2.6. of this Regulation and with the respective AFS control signals and to the, if any, that were applied / specified for type approval of the AFS as listed in the AFS type approval documents;]*

6.20.9.2.3. ~~6.20.9.3.2.~~ *type and value of the relevant environmental conditions of use for which the transitions between the AFS lighting modes according to paragraph 6.20.7.4. of this Regulation have been designed and verified by tests, including, if applicable, information such as threshold hysteresis and/or delay values specified; where a specification requires a dynamic test, verification on the basis of the Applicants documentation of such testing shall be sufficient;*

~~6.20.9.3.3. the fail safe provisions according to paragraph 6.20.9.2. of this Regulation. ...~~

6.20.9.3. ~~6.20.9.4.~~ *The aggregate maximum intensity of the lighting units that can be energized simultaneously to provide the main-beam lighting or its modes, if any, shall not exceed 225 000 cd, which corresponds to a reference value of 75.*

This maximum intensity shall be obtained by adding together the individual reference marks indicated on the several installation units that are simultaneously used to provide the main-beam.

6.20.9.4. ~~6.20.9.5.~~ *Means for a 'traffic change mode' according to the provisions of paragraph 5.4.1. of Regulation No. xxx, if any, shall be explained in the owner's handbook."*

Annex 1.

10/ Contracting Parties to the respective Regulations can still prohibit the use of mechanical cleaning systems when headlamps with plastic lenses, marked 'PL', are installed.

Insert new item 9.22., to read:

"9.22. *Adaptive front lighting system (AFS): yes/no 2/*"

Items 9.22. (former) and 9.23., renumber as items 9.23. and 9.24.

Insert new item 10.4., to read:

"10.4. *Comments concerning AFS (according to paragraphs 3.2.6. and 6.20.7.4. of the Regulation):*"

Annex 6, insert new paragraph 5.1.1., to read:

"5.1.1. *Where an AFS is fitted, the measurements shall be carried out with the AFS in its neutral state.*"

B. JUSTIFICATION

Explanatory notes

The transformation of the technical specifications for AFS into the system of ECE Regulations has been carefully considered by the AFS Group and GTB.

In the meantime extended discussions in a GRE informal group has taken place. The conclusion was to prepare a new draft Regulation No. xxx, which is submitted as a separate document, and amendments to Regulation No. 48.

These amendments cover the aspects of installation of AFS and the interaction between the AFS and the vehicle. They have been drafted in line with the general structure of ECE Regulations on lighting and light-signalling. Therefore the following principal items have been included:

- A new set of definitions;
- Additional requirements regarding type approval;
- A new paragraph 6.20. which covers AFS as a separate system/device and incorporates the necessary requirements for installation; particular attention has been devoted to provisions regarding
 - position of lighting units and symmetrical appearance of the vehicle;
 - activation of the modes of lighting functions;
 - system failure **or exceptional state indications**.

As regards terminology, and pending a decision by GRE, the term "passing beam" has been used whenever such beams are addressed which are specifically defined in the draft Regulation on AFS, e.g. "class C (basic) passing beam" or "passing beam mode".

Remarks to individual paragraphs:

Paragraph 2.1.1./ 2.7.26.

Regulation No.48 does not require that lighting and light-signalling devices covered by the Regulation must be approved or must be approved to a Regulation annexed to the 1958 Agreement. On the other hand, it is understood that application of the requirements is linked to compliance of devices with such Regulations. Examples are references to marking of main-beam headlamps in paragraph 6.1.9., categories of direction indicators in paragraph 6.5., and categories of stop lamps in paragraph 6.7. In the case of AFS it is important to ensure that approval of a vehicle is granted only if the AFS has been approved to the applicable Regulation annexed to the 1958 Agreement. As this is a matter of principle, a general provision is proposed. If however the requirement is to be restricted to AFS, paragraph 2.7.26. could be amended to read: " 'Adaptive front lighting system' means a lighting/light signalling device approved according to Regulation No. xxx and providing ..."

Paragraph 6.3.7.

A requirement giving priority to the front fog lamp function where the front fog lamps are used as part of another function is deemed necessary; this could be made by modifying paragraph 6.3.7. for electrical connection or, as an alternative, adding in paragraph 6.3.9. a specific sentence.

A further alternative applicable to all lamps used as part of another function is given in the note to paragraph 6.3.6.1. above.

Paragraph 6.20.6.2.

Changes to the requirements of this new paragraph could be made in function of the final agreement on the "verification of the cut-off" requirements presently under discussion in the GTB - SVP WG.

Paragraph 6.20.7.

Former paragraph 6.20.7.1. which referred to the provisions of paragraphs 6.1.7. and 6.2.7. has been replaced by new paragraphs 6.20.7.1. and 6.20.7.2. which include the provisions regarding electrical connections for main beam and passing beam lighting adapted to AFS terms. Former paragraph 6.20.7.3. has been incorporated in paragraph 6.20.7.2. (new).

Paragraph 6.20.7.4.3.

One major aspect of the Class E (motorway) passing beam is a somewhat higher aiming of the cut-off, but it still remains a passing beam designed to be used with opposing or preceding traffic.

The higher aiming is the reason why the use of the Class E (motorway) passing beam is restricted to roads where the dynamic influence is reduced or a separation of the different driving directions is given. Both requirements are expressed in the requirement of "motorway conditions" and guarantee that not only the speed criterion is used for switching on the Class E (motorway) passing beam.

The general specification "motorway conditions" included in the draft for the automatic activation of the Class E (motorway) passing beam, implies by definition all major respective criteria for the design of that beam: a flat and less bended road of enlarged width, normally with a separation between the driving directions, without intersections and usually designed, constructed and maintained for motor traffic at enhanced speed even during night-time, and, excluding all non-motorized traffic such as cyclists and pedestrians.

The technical development of road identification systems as well as advanced sensor devices may allow in near future to distinguish clearly this type of road from others.

Paragraph 6.20.7.4.4.

The road areas intended to be illuminated when the class W (wet road) passing beam is emitted are essentially complementary to those illuminated by a front fog lamp according to ECE Regulation No. 19.

If a driver, due to an actual fog situation, decides to switch on the front fog lamps, the passing beam, when operated simultaneously, should not activate the mode(s) of the class W (wet road) passing beam (if any), even if the road is wet and/or the windshield wiper is operated. This should be required notwithstanding the proposed amendments to paragraph 6.3.7.
