

REPORT ON THE SIXTH SESSION OF THE INFORMAL GROUP  
ON ADAPTIVE FRONT-LIGHTING SYSTEMS (AFS)

(17 - 19 February 2004)

1. The GRE Informal Group on Adaptive Front-Lighting Systems (AFS) held its sixth session from 17-19 February 2004 in Bonn at the invitation of the German government, under the chairmanship of Mr. M. Lowe (United Kingdom). Experts from the following countries participated in the work: France; Germany; Italy; Japan; Netherlands; United Kingdom. Experts from the following non-governmental organizations also participated: International Organization of Motor Vehicle Manufacturers (OICA); European Association of Automobile Suppliers (CLEPA); Working Party "Brussels 1952" (GTB), including experts from the AFS Group; International Electrotechnical Commission (IEC).

ADOPTION OF THE AGENDA

Documentation: Working Paper No. 6-8/Rev.1

2. The Informal Group adopted the agenda. Following comments from the experts from France, Germany, Japan and OICA, it also approved the report on its fifth session (WP No. 6-1).

PROPOSAL FOR A NEW DRAFT REGULATION ON AFS

Documentation: WP No. 6-1 (GTB), WP No. 6-3 (GTB/AFS), WP No. 6-7 (GTB/AFS), WP No. 6-7/Add.1 (GTB/AFS), WP No. 6-9 (United Kingdom), WP No. 6-12 (France), WP No. 6-13 (GTB/AFS)

Aftermarket systems (WP No. 6-9, item 1.; WP No. 6-7/Add.1)

3. The Informal Group resumed discussion on a more precise specification of the practical tests according to paragraph 5.11.2.(b), drawing attention to

- the definition of "vehicle type(s)";
- the availability of test facilities at Technical Services;
- the configuration of aftermarket AFS, which could either act independently from vehicle sensors, or rely on signals from the vehicle;
- the option of aftermarket systems, if provided by the Regulation, being open to all manufacturers;
- the interference of aftermarket systems with other electric/electronic systems of the vehicle;
- the merits and drawbacks of test drives on the road vs. simulation tests;
- the status of the revised EMC Directive.

4. Considering the request by CLEPA to include provisions regarding aftermarket systems in the draft Regulation, the Informal Group agreed on the proposal in WP No. 6-7/Add.1, with the following modification:

Paragraph 5.11.2. (b), amend to read:

"...of Regulation No. 48; a test drive to confirm compliance with the provisions of paragraph 6.20.7.4. is mandatory."

5. The experts from Italy and Netherlands would have preferred an additional requirement to check interference of aftermarket systems with electric/electronic systems of the vehicle, and entered study reservations

Passing beam cut-off and aiming provisions (WP No. 6-9, item 2.)

6. The Informal Group agreed to leave Annex 8 unchanged for the time being, and to await the outcome of discussion on cut-off provisions for Regulations Nos. 98 and 112 in GRE. In order to draw attention to this status it was agreed to add a footnote to the title of Annex 8:

“Annex 8 <sup>1/</sup>“

<sup>1/</sup> Optionally to be completed by additional general provisions under study in GRE.”

Light sources (WP No. 6-7, WP No. 6-12)

7. After an exchange of views regarding the use of replaceable and non-replaceable light sources in AFS lighting units, the Informal Group agreed on the following amendments to the draft Regulation:

Paragraph 2.1.4., read:

“2.1.4. the category, as listed in Regulation No. 37 or 99, of replaceable and/or non-replaceable light sources used;

Paragraph 2.1.5.1., read:

“2.1.5.1. identification of the lighting unit(s) of which said light sources are non-replaceable parts:”

Paragraph 5.3., read:

“5.3. The system shall not be equipped with light sources that are not approved to Regulations Nos. 37 or 99.

5.3.1. If a light source is replaceable its lamp holder shall conform to the dimensional characteristics given on the data sheet of IEC Publication No. 60061-2, as referred to in the relevant light source Regulation.

5.3.2. If a light source is non-replaceable, it shall not be part of a lighting unit that provides the passing beam in the neutral state.”

Lighting units to be included in automatic leveling (WP No. 6-7, item 3.)

8. The expert from GTB/AFS introduced the proposal to restrict the cut-off zone indicated in paragraph 6.4.6. He noted that

-automatic leveling was now mandatory for such lighting units;

-a reduction of the horizontal limits was acceptable, considering the actual lighting on the road and the lighting range;

-for systems using several contributors on each side, cost-effective designs would be possible.

9. As a compromise, the Informal Group agreed on the following text:

“6.4.6. It shall be stated...into a zone extending from 6 deg left to 4 deg right and...positioned at 0.8 deg down.”

The experts from Japan and Netherlands noted their preference for the previous values of 8 deg left and right and entered a study reservation.

Definitions (WP No. 6-12)

10. Considering the proposal by France regarding the definitions of “AFS” and “mode” in the draft Regulation and in the amendments to Regulation No. 48, the Informal Group agreed to maintain the existing versions, and to review the text at a later date, if necessary.

Editorial amendments (WP No. 6-7, items 4 and 5)

11. The Informal Group accepted the proposal from GTB/AFS; it was also agreed to amend Annex 10, Form No. 2 by inserting the word “master” in the heading of columns 4 and 6 and adding a footnote 6/ to read:

“6/ The adjustment of a “master” lighting unit may also adjust (an)other lighting unit(s).”

12. The Informal Group also accepted the proposal by France to provide a more general wording for paragraph 2.2.2.1. (iii); the text was amended to read as follows:

“2.2.2.1. ....

- (iii) gives access to the relevant documents demonstrating the system`s performance concerning sufficient reliability and safe operation of the measures specified according to paragraph (i) above, e.g. an FMEA (Failure Mode and Effect Analysis), an FTA (Fault Tree Analysis) or any other similar process appropriate to system safety considerations.”

Proposal by Japan (WP No. 6-14)

13. The Chairman drew attention to a proposal by Japan regarding paragraphs 5.9.1., 5.9.2. and 5.7.2., which, due to its late arrival, had only been put on the GRE website after the start of the session. The expert from Japan was invited to present this proposal at the fifty-second GRE session.

PROPOSAL FOR AMENDMENTS TO REGULATION No. 48

Documentation: WP No. 6-1 (GTB), WP No. 6-2 (GTB/AFS), WP No. 6-4 (IEC), WP No. 6-6 (GTB/AFS), WP No. 6-9 (United Kingdom), WP No. 6-10 (United Kingdom), WP No. 6-11 (United Kingdom), WP No. 6-12 (France), WP No. 6-13 (GTB/AFS)

Class V mode(s) – Paragraph 6.20.7.4.2. (WP No. 6-2, WP No. 6-6, WP No. 6-9, item 1., WP No. 6-12)

14. The expert from Japan suggested to increase the reference speed in item (a) to 80 km/h. Other experts doubted whether it would be possible to detect the parameter “built-up area” and preferred to delete this item.

15. The expert from France proposed a revised editorial and substantial presentation for paragraphs 6.20.7.4.2. to 6.20.7.4.5., as indicated in WP No. 6-12. The Chairman and the expert from GTB/AFS noted that the actual text had been the result of careful discussion at the fifth session of the Informal Group and should be maintained.

16. In consideration of all comments, the Informal Group agreed to leave the text unchanged and recommended that any additional proposals should be submitted at the fifty-second GRE session.

Class E mode(s) – Paragraph 6.20.7.4.3. (WP No. 6-2, WP No. 6-9, item 1., WP No. 6-12, WP No. 6-13)

17. Following a comment by the expert from France, the Informal Group decided to delete the word “and” at the end of item (a) in both proposals A and B. The expert from Germany suggested to insert in this item a speed of 110 km/h.

18. The expert from Germany introduced WP No. 6-13 which would specify a correlation between vehicle speed and Class E mode passing beam photometric values, to be inserted in a new Table 6 of Annex 3 to the draft Regulation on AFS. The expert from GTB/AFS pointed out that separation of traffic directions, according to footnote 1/, is considered to be the basic parameter; it is assumed that the speed of 110 km/h is permitted only on roads/motorways with such separation.

19. The expert from Germany proposed to define the following activation conditions:

- Motorway, speed  $\geq 70$  km/h (signal E);
- speed  $> 110$  km/h (signal E);
- speed  $> 100/90/80$  km/h (signals E1/E2/E3), where the mode of the class E passing beam intended to be activated must comply with the respective additional photometric data set.

20. It was noted that, although any of the AFS activation signals (E, E1, E2, E3) could be provided by the vehicle system, the actual E mode being emitted would comply with the requirements of the relevant photometric data set.

21. The Informal Group provisionally agreed the proposal in WP No. 6-13. The experts from Japan and Netherlands entered study reservations, as they were concerned about separation of traffic directions and glare.

#### Class W mode(s) – Paragraph 6.20.7.4.4.

22. The Informal Group confirmed its approval of the text established at its fifth session.

#### Bending mode(s) – Paragraph 6.20.7.4.5.

23. The Informal Group agreed to accept the text provisionally established at its fifth session.

#### Tell-tale (WP No. 6-2, WP No. 6-6, WP No. 6-9, item 2., WP No. 6-10)

24. The expert from the United Kingdom introduced WP No. 6-10, which addresses the detailed specifications for an AFS failure tell-tale. The expert from GTB/AFS introduced the proposal in WP No. 6-6, which refers to tell-tale operation with regard to a failure in the AFS control signals and to a failure signal according to an AFS light source failure (paragraph 5.9.1. of the AFS draft Regulation). The expert from Italy mentioned the draft Regulation on location and identification of hand controls, tell-tales and indicators (TRANS/WP.29/2002/67 and Rev.1, TRANS/WP.29/2004/23). Certain characteristics of tell-tales were addressed in the discussion:

- should a tell-tale be required to be non-flashing? A flashing tell-tale may distract the driver, in particular when it is operating permanently;
- should self-checking of the tell-tale be required?
- should a tell-tale signal be permanent, or self-canceling after a certain period, or be able to be canceled by the driver? Should it be activated after re-start?

25. As a compromise solution, the Informal Group accepted the following text:

##### “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) above apply to the respective parts of an AFS.

6.20.8.2. A failure tell-tale for AFS is mandatory. It shall be non-flashing. It shall be illuminated whenever a failure is detected with respect to the AFS control signals or when a failure signal is received in accordance with paragraph 5.9.1. of Regulation No. ....It shall remain illuminated while the failure is present, but may be cancelled temporarily.

6.20.8.3. A tell-tale to indicate that the driver has set the system into a state according to paragraph 5.8. of Regulation No. ...is optional.”

26. The experts from Germany, Italy and Netherlands noted their concerns and reserved to re-address this item in GRE.

Verification of AFS technical requirements by the Technical Service (WP No. 6-2, WP No. 6-9, item 4., WP No. 6-6)

27. The expert from GTB/AFS introduced the proposal in WP No. 6-6, which reflects the discussion at the fifth session of the Informal Group regarding paragraph 6.20.9.2. As regards practical tests, the experts from Germany, Italy and Netherlands referred to the discussion on AFS aftermarket systems (see paragraph 4 above) and considered that a minimum extent for such tests should be specified.

28. The expert from the United Kingdom noted that an actual road test would not be necessary, if a suitable witness test in a laboratory would be carried out, e.g. to check actual AFS mode activation thresholds. The expert from CLEPA pointed out that a road test would not provide information on photometry or other specific AFS data.

29. The Informal Group accepted the proposal in WP No. 6-6. The experts from Netherlands and the United Kingdom stated their preference for mandatory witness testing.

Headlamp cleaning (WP No. 6-6, WP No. 6-12)

30. The Informal Group reviewed the proposals by GTB/AFS (WP No. 6-6) and France (WP No. 6-12) and noted that the principal issue was the condition for requiring installation of headlamp cleaning devices:

a) According to the GTB/AFS proposal such devices would be mandatory for lighting units which are required to have automatic leveling;

b) According to the proposal by France headlamp cleaning would only be required if the objective luminous flux of the respective light sources would exceed 2000 lm.

31. As a compromise, OICA offered proposal c) which would maintain the requirements according to a), but add a restriction referring to a luminous flux exceeding 2000 lm; the text would read as follows:

c) “6.20.9.1. An AFS ....at least those lighting units, which....in Annex 1 to Regulation No. ...., and which have light sources with a total objective luminous flux exceeding 2000 lm.”

32. During the discussion attention was drawn to the problems which might arise in practical verification of the 2000 lm limit value with regard to AFS lighting units and their light sources.

33. The experts from France, Italy, Japan and OICA stated their preference for the proposal under c) and announced a study reservation in case this would not be accepted. The experts from Germany, Netherlands and CLEPA stated their preference for the proposal under a). CLEPA offered to provide a document with detailed supporting explanations for the fifty-second GRE session.

Driver`s intervention in automatic operation (WP No. 6-6)

34. The expert from GTB/AFS introduced the proposal regarding paragraph 6.20.7.4. which is intended to create a possibility for the driver to select a mode in a class. As several government experts objected to the proposal, it was not adopted. In addition, the Informal Group agreed to amend paragraph 6.20.7.4. to read:

First sentence: ”The changes within and between the provided classes and their modes....”

Last sentence: “The following conditions apply for the activation of the classes and their modes....”

35. OICA inquired whether a system would be permitted where the driver would enter an AFS mode (be it within the main beam or a given passing beam class) to his personal selection in advance while the vehicle was stationary. The Informal Group was not prepared to amend the text at this time, but recommended that OICA should submit a written proposal to GRE.

Automatic activation of front lighting functions (WP No. 6-6)

36. The expert from GTB/AFS introduced the proposal regarding paragraph 6.20.7.3. which would permit automatic activation/de-activation of the main beam and the passing beam. As several government experts objected to automatic activation of the main beam, which at present is not covered in paragraph 6.1.7. of Regulation No. 48, the proposal was not adopted. The Informal Group agreed to amend paragraph 6.20.7.3. to read:

“6.20.7.3. Switching ON and OFF the passing beam may be automatic, however...”

The Informal Group also noted that automatic activation of the main beam could be discussed later in GRE if a suitable proposal, including performance requirements, would be submitted.

Traffic change provisions (WP No. 6-6)

37. The Informal Group agreed to the proposal by GTB/AFS to delete paragraph 6.20.7.5. and to replace it by a new paragraph 6.20.9.4.; the text would read as follows:

“6.20.9.4. The means according to the provisions of paragraph 5.8. of Regulation No. ...which allow the vehicle to be used temporarily in a territory with the opposite direction of driving than that for which approval is sought shall be explained in detail in the owner’s handbook.”

The expert from Germany entered a study reservation.

Editorial and other amendments (WP No. 6-6, WP No. 6-9, item 5., WP No. 6-11)

38. Provisions for headlamp leveling: The Informal Group adopted the proposal by the expert from the United Kingdom in WP No. 6-11.

39. Setting of the AFS to the neutral state: The Informal Group adopted the proposal by the expert from GTB/AFS in WP No. 6-6 to insert a new paragraph 6.20.7.6., which replaces several other paragraphs on the same subject; the text would read.

“6.20.7.6. It shall always be possible for the driver to set the AFS to the neutral state and to return it to its automatic operation.”

40. Maximum height of lighting units: The Informal Group agreed on the value of 1200 mm in paragraph 6.20.4.1.3. The expert from Japan drew attention to the draft gtr on installation (TRANS/WP.29/GRE/2001/6/Rev.2) and proposed a limit of 950 mm.

41. Requirements for geometric visibility: The Informal Group adopted the text of paragraph 6.20.5. as proposed by the expert from GTB/AFS in WP No. 6-6.

Definitions (WP No. 6-4)

42. The proposal by IEC regarding paragraph 2.7.1.1.2. was not discussed in detail, due to lack of time. It will be inserted by the small editorial group (see paragraph 44 below) for a final decision by GRE.

PROPOSAL FOR AMENDMENTS TO REGULATION No. 45

Documentation: WP No. 6-5 (GTB/AFS), WP No. 6-12 (France)

43. The expert from GTB/AFS introduced the proposal in WP No. 6-5 and noted that it would be necessary to adapt the provisions in Regulation No. 45 to the particular characteristics of AFS. In a first exchange of views, the Informal Group agreed that additional references to lighting units according to Regulation No. ....should be included, e. g. in the scope/definitions and in paragraph 6.1. of Regulation No. 45.

## DOCUMENTS TO BE SUBMITTED TO THE FIFTY-SECOND GRE SESSION

44. The expert from GTB/AFS was invited to prepare revised versions of  
-the draft Regulation on AFS;  
-the amendments to Regulation No. 48;  
-the amendments to Regulation No.45;  
study reservations to individual paragraphs being indicated on the cover page of each document.  
An editorial review of the three documents will be carried out by a small group consisting of the Chairman, the expert from GTB/AFS and the Secretary in a telephone conference. (Note: This is to be held on 3 March 2004).. The final versions will then be submitted to the ECE Secretariat and put on the GRE website as informal documents for the fifty-second GRE session.

## OTHER BUSINESS

45. The Informal Group noted the recommendation by WP.29 at its one-hundred-and-thirty-first session on development of new Regulations concerning new lighting functions, and the incorporation of new technology into existing Regulations (TRANS/WP.29/953, paragraph 34). The expert from Germany stated that this issue had been examined by his administration with respect to the new Regulation on AFS and eventual amendments to Regulations Nos. 98 and 112. As a conclusion, he proposed to proceed with a new AFS Regulation and to avoid dismantling the existing text. Due to lack of time, the Informal Group did not go further into this matter and recommended to discuss it in GRE.

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