CIRCULAR 46/00-9-1

TEST PROCEDURES

ADR 46/00 -HEADLAMPS

“A Guide for Inspectors”

This Circular is relevant to the Third Edition of the
Australian Design Rules gazetted as
National Standards under the Motor Vehicle Standards Act 1989
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1 SCOPE

This procedure, when read in conjunction with the ADR and other Circulars issued by the Administrator provides sufficient information, without reference to other standards, to conduct and audit tests related to Headlamps as described in Australian Design Rule No. 46/00.

The equipment, orders of accuracy and step by step actions described in this procedure are drawn from the standards and recommended practices quoted in the ADR and from accepted laboratory and testing practices. While conformance with this procedure is sufficient to demonstrate compliance with the ADR, other equipment, orders of accuracy and procedures may be used provided it can be shown that they demonstrate compliance with the ADR.

This ADR requires validation by test in two specific areas, these being:

(i) Illuminated beam geometry in both the driving and passing modes

(ii) Illumination or Luminous intensity within the beam geometry

This procedure is intended primarily as a guide for Officers of the Australian Department of Transport and Communication or Agents acting on behalf of the Administrator when they carry out audit inspections of Test Facilities or witness tests for compliance with the ADR. This and other Circulars dealing with Test Procedures for ADRs may also be useful to vehicle manufacturers and testing organisations.

Nothing in these Circulars, however, absolves the manufacturer from complying with the requirements as specified in the ADR which always remains the primary reference.

2 SELECTION OF TEST COMPONENTS

In general only production components are satisfactory for testing to these requirements as the optical characteristics of a glass or plastics lens are dependent on the detail dimensioning of the production moulding die. However, prototypes may be tested provided that they are fully representative of the production components.

3 IDENTIFICATION OF TEST COMPONENTS

All test related components shall be representative of the design condition as reflected in the production drawings.

In most cases the test components will be assembled using production parts which have passed through approved quality assurance procedures. They should then be identified against production drawings. If prototype components are used they should be individually inspected for both dimensional and material specification compliance given in their respective drawings.

For each test program all relative components are to be uniquely identified by part number, drawing number and revision or issue status. Such information is to be included in all test records and reports.

4 NUMBER OF TEST COMPONENTS

The number of components to be tested will depend on the method of manufacture. Where the lens is a glass or plastics moulding, one component from each moulding die should be tested. Where lamps are handed at least one lamp of each hand should be tested.

5 EQUIPMENT

The equipment required to conduct tests to ADR 46/00, including its orders of accuracy and calibration, is described in Sections 3 and 7 of Circular 0-12-5. Alternate equipment or system test procedures would be valid if the system accuracy and response, as applicable, meet the minimum standard described in those Sections.

6 PROCEDURE

The test procedure is described in Sections 3 and 7 of Circular 0-12-5 with the following additional requirements.

Uncolored Standard (reference) globes are to be used for all test procedures relating to this ADR. These components are defined in Clause 46.2.6.1.3 of Appendix A of the ADR. (Standard filament lamps specified in paragraph 3.9 of Appendix A of ADR 51—he Filament Globes)

6.1 Geometry of Illuminating Beam

6.1.1 Setting up. The test lamp assembly is to be mounted to the goniometer by a jig. This jig must locate the lamp assembly so that the ‘centre of reference’ of the lamp is co-incident with the centre of rotation of the goniometer. The ‘centre of reference’ should be checked against the production drawings. Ensure that the test globe is of a category nominated in ADR 51/00, that it has been calibrated to the reference luminous flux nominated in Appendix A Clause 6.1.3 and that its filament position and size is within the tolerances permitted for a standard filament globe of that category. The globe category is nominated by the lamp manufacturer and should be recorded in the test results.

6.1.2 Test distance Appendix A. Clause 6.1.2 requires that the test screen be set up at a distance of 25 m from the centre of reference of the test lamp. Clause 6.2 and Annex 4 then specify dimensional requirements for beam geometry based on that test distance. Clause 46.2.6.1.2 and 46.2.6.2.5 permit the test to be done at a lesser distance, to a limit of 5 m, provided that the same angular dimensions are maintained. If this option is used it is also necessary to ensure that the test distance is sufficient to ensure that the beam pattern is fully developed. All relevant dimensions, including those relating to adjustment of the position of the lamp cutoff elbow should be appropriately scaled.

6.2 Illumination or Luminous Intensity

The illumination provided by the lamp can be measured
either by placing a photoreceptor at the test locations given by the table at Clause 46.3.2 of the ADR and measuring luminous intensity or by using a luminance meter and a screen of calibrated reflectance. In the latter case, the luminance values, in lux, given in the table attached to Appendix A clause 6.2.5, corrected if necessary for the test distance, are to be used.

6.3 Colour of emitted light
ADR 46/00 requires that the colour of light emitted by lamps complying with this Rule shall be white. It is not mandatory that a test be conducted to demonstrate compliance with this requirement but if a test is conducted it should be done in accordance with Circular 0-12-5 Section 4. The trichromatic coordinates for white light are given in Annex A.

7 ANALYSIS OF RESULTS
The Headlamp assembly as tested is deemed to satisfy the requirements of ADR 46/00 if the minimum conditions as described in the ADR are met by the test results achieved.

8 REPORTING OF RESULTS
A complete internal report giving a full description of the material tested, equipment used, results and order of accuracy is to be prepared. For submission to the Administrator the report number(s) for the above tests is to be entered in the appropriate section of the Summary of Evidence Report.

9 SUMMARY OF EVIDENCE REPORT
The Summary of Evidence Report SE 46/00 is the only document to be sent to the Administrator for demonstration of compliance to ADR 46/00. The original test report identification number, the location of the test report, the test facility identification number and the determined results are to be recorded in the appropriate place in the SE 46/00 form for each relevant clause of the ADR.

10 PROCEDURE FOR DESIGNS WITH CERTIFICATION TO ALTERNATIVE STANDARDS

10.1 The following Alternative Standards are deemed to comply with the technical requirements of ADR 46/00 provided that the lamps are suitably handed for right hand drive vehicles and the colour of the light emitted is white.
ECE R 1/01 Headlights
ECE R 5/01 or 5/02 Sealed Beam Headlamps
ECE R 8/03 or 8/04 H1, H2 or H3 Lamps
ECE R 20/01 or 20/02 H4 Lamps
ECE R 31/01 or 31/02 Halogen Sealed Beam (HS4) Headlights

NOTE In the case of ECE R 5/02, 8/04, 20/02 and 31/02 it is necessary for the relevant requirements of ECE R 37/03 to have been complied with.

10.2 The technical requirements of SAE Standard J579c, December 1978, “Sealed Beam Headlamps Units for Motor Vehicles” (Clause 46.4.2).

10.3 The technical requirements of JIS D5500-1984, “Lighting and Signalling Equipment for Automobiles” for asymmetric Grade A, B1 and B2 headlamps. In these cases the relevant parts of SE 46/00 shall be completed.

11 REFERENCES

ADR References
ADR Definitions
ADR 46/00 - Headlamps For Other Than L-Group Vehicles
Circulars
Circular 0-12-2 - General Requirements for Test Facilities
Circular 0-12-3 - General Requirements for Calibration of Test Equipment and Instrumentation
Circular 0-12-5 - General Photometric Test Requirements
Other Standards
ECE R 1/01 - Headlights
ECE R 5/01 and 5/02 - Sealed beam headlamps
ECE R 8/03 and 8/04 - H1, H2 or H3 Lamps
ECE R 20/01 and 20/02 - H4 Lamps
ECE R 31/01 and 31/02 - Halogen sealed beam (HS4) Headlights
JIS D5500-1984, “Lighting and Signalling Equipment for Automobiles”
**ANNEX A**

**COLOUR OF WHITE LIGHT**

(Trichromatic coordinates)

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<thead>
<tr>
<th>Limit towards</th>
<th>Blue</th>
<th>Yellow</th>
<th>Green</th>
<th>Purple</th>
<th>Red</th>
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<tr>
<td></td>
<td>:x 0.310</td>
<td>:x 0.500</td>
<td>:y 0.150 + 0.640x</td>
<td>:y 0.050 + 0.750x</td>
<td>:y 0.382</td>
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For checking these colorimetric characteristics, a source of light at a colour temperature of 2,854° K corresponding to illuminant A of the International Commission on Illumination (ICI) shall be used.