ASEAN NCAP
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ASEAN NCAP PROTOCOL

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TEST PROTOCOL – AUTO HIGH BEAM

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Preface

Where text is contained within square brackets, this denotes that the procedure being discussed is currently being trialled in ASEAN NCAP. Its incorporation in the Test Protocol will be reviewed at a later date.

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any parameter that will influence the test, such as dummy positioning, vehicle setting, laboratory environment etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of ASEAN NCAP. Where a disagreement exists between the laboratory and manufacturer, the ASEAN NCAP secretariat should be informed immediately to pass final judgement. Where the laboratory staff suspect that a manufacturer has interfered with any of the setup, the manufacturer's representatives should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer’s representatives will be told to leave the test

site and the Secretariat should be immediately informed. Any such incident may be reported by the Secretariat to the manufacturer and the persons concerned may not be allowed to attend further ASEAN NCAP tests.

DISCLAIMER: ASEAN NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, ASEAN NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

In addition to the settings specified in this protocol, the following information will be required from the manufacturer of the car being tested in order to facilitate the vehicle preparation. A vehicle handbook should be provided to the test laboratory prior to preparation.

TEST PROTOCOL –
AUTO HIGH BEAM

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NEW CAR ASSESSMENT PROGRAM FOR SOUTHEAST ASIAN COUNTRIES (ASEAN NCAP)

TEST PROTOCOL – AUTO HIGH BEAM

1 INTRODUCTION

Each year, passenger vehicles are produced with new innovative mechanical and electronic features installed to enhance drivability and safety. Auto High Beam (AHB) technology is an example of such a feature. Automatic High Beam technology is part of ADAS (automatic driver assistance system) which detects oncoming and preceding vehicles and automatically switches between high and low beams during night driving, making it easier for the driver to recognize hazards such as motorcyclist.

Moreover, widespread popularity of the motorcycle presents a totally different problem compared to the car. It is found that in certain areas, the condition of motorcycles on the road is not up to the mark whereby some of the equipment is not in working order. For example, the headlight or the tail light might not work. Such an issue pertaining to conspicuousness of motorcyclists will definitely result in a dangerous situation; which could eventually lead to road crashes. This stems from the difficulty faced by car drivers to notice the presence of nearby motorcyclists. Regardless, with the Auto High Beam function in a new car, this problem may reach a

solution and in turn may result in a reduction of motorcyclist fatality in the ASEAN region.

This protocol describes a test procedure for measuring and rating the on-road illumination provided by passenger vehicle headlight system. The procedure is based on illumination measurements on road sections with a horizontal distance of 80 to 150m. Visibility illumination distances are assessed for low and high beams, with additional credit given for systems that automatically switch between high and low beam.

2 DEFINITIONS

In this document, references are made to the following terms, namely:

'High-performance headlamp' which refers to devices which possess either the 'automatic anti-glare type' or 'automatic switching type' function with the aim to automatically change the headlamp beam illumination range depending on the condition of traffic in front at night.

'**Automatic switching type**' referring to the function which has the capability to automatically switch the High beam and the low beam.

'**Main driving beam (high beam)**' is the illuminating light ray of the front headlamps, for the purpose of checking for obstacles in the traffic path at night.

‘**Operation speed**’ which refers to the driving velocity range at which the automatic switch to the low beam or the partial light ray blocking function operates (works) for each device.

3 TEST VEHICLE PREPARATION

The AHB Assessment shall be undertaken using a vehicle in the “as received” condition. Prior to the testing, ASEAN NCAP shall ensure that:

Tires are inflated to the manufacturer’s recommended cold inflation pressure. If more than one recommendation is provided, the tires are inflated to the lightly loaded condition.

The fuel tank is filled to 100% capacity with the appropriate fuel and maintained to at least 75% capacity throughout the testing.

Instrumentation is installed in the vehicle. With the driver and all required equipment, the vehicle test weight should not exceed the vehicle curb weight by more than 125kg.

3.1 Instrumentations

The measurement of position and distance will be adjusted to reflect the center of the vehicle’s leading edge.

3.1.1 Photometry Equipment

A lux meter will be placed at the measured location of the test track. This lux meter will record the light intensities

[lux] with respect to the distances from test vehicle leading edge.

Figure 1-1: Lux meter

4 TEST CONDITIONS

The test location shall be on a flat, dry asphalt or concrete surface. The ambient temperature during testing shall be within the range of 5°C - 40°C. The test shall be conducted at night.

4.1 Test Track

4.1.1 The test is conducted on a dry (with no visible moisture on the surface), uniform, solid-paved surface with a consistent slope between level and 1%.

4.1.2 The surface must be paved and may not contain any irregularities (e.g. large dips or cracks, manhole covers or reflective studs) that may give rise to abnormal sensor measurements within a lateral distance of 3.0m to either side of the test path and with a longitudinal distance of 10m ahead of the VUT when the test ends.

5 PROVISION OF DATA FROM MANUFACTURER

5.1 Manufacturers shall provide ASEAN NCAP inspector one of the following documentations necessary for the confirmation of device function and operation speed of the vehicle undergoing the equipment check, or documentation that is the equivalent thereof performance test required.

5.1.1 Standard certified test results of UNECE Regulation No. 48-06 (or later), section 6.1.9.3.3.2 – Uniform provisions concerning the approval of vehicles with regard to the installation of lighting and light-signalling devices' or 'automatic control of the main-beam headlamps' (as found in the UN ECE R48), that are applicable to the model of the car undergoing equipment check, or equivalent documents.

5.1.2 Standard certified test results of UNECE Regulation No. 122-01 (or later), section 6.3.3 class B – Uniform provisions concerning the approval of motor vehicle headlamps emitting an asymmetrical passing beam or a driving beam or both and equipped with filament lamps and/or light-emitting diode (LED) modules.

5.1.3 A technical report from a laboratory witnessed by technical services provider is acceptable. Refer to ASEAN NCAP Guideline In-House Test Report Documentation Submissions Version 1.0.

5.1.4 Instruction manual (owner's manual) associated with the model of the car undergoing the equipment check, or other documentation equivalent to this.

6 TEST PROCEDURE

6.1 High-performance headlamp function and equipment check

If, according to the Standard certified test result documentation, the authentication of the 'automatic control of the main-beam headlamps' is confirmed, in the attached Appendix 2, state 'Yes' in the 'automatic switching type' column. For devices that fall outside of this category, state 'No' in the columns for each device type.

6.2 Checks of operation speed

In the event that 'yes' was recorded for the device as stated in 6.1, record the operation speed stated in the

corresponding device's instruction manual in the column marked 'speed range'.

Vehicles with automatic control of the main-beam headlamps will be tested with the systems enabled. Vehicle will be tested as refer to Annex 1.

All vehicles will be started on a level surface at the final loading condition for the test and the ignition will remain on during testing.

Table 1.0: AHB operation speed requirements

Test	Headlight	Activated Start Speed	Requirement
Operational Speed	Low to High Beam	< 50 km/h	Must automatic switching
	High to Low Beam	< 50 km/h	Detect oncoming vehicle

Three (3) runs shall be completed to determine repeatability.

If test vehicle does not meet the requirement as described in Table 1.0, no point shall be rewarded.

6.3 Illuminance Measurements

The test vehicle will be positioned in a static condition with the high beam as the main driving beam turned **ON**.

The distance of lux meter will be measured from the leading edge of test vehicle as described in Figure 2-1.

Lux meters are placed at each measured location on the test track to record the visibility and illuminance of the test vehicle driving beam.

In order to compromise for changes in illumination that are due to changes in vehicle pitch, two lux meters are used at each measurement location to capture illuminance readings at different heights. Visibility illuminance values are assessed at heights of 25 and 110cm from the ground, respectively.

The height of lux meters used at each point in the assessment are based on the visibility height of a motorcyclist riding a motorcycle (height closest to ideal).

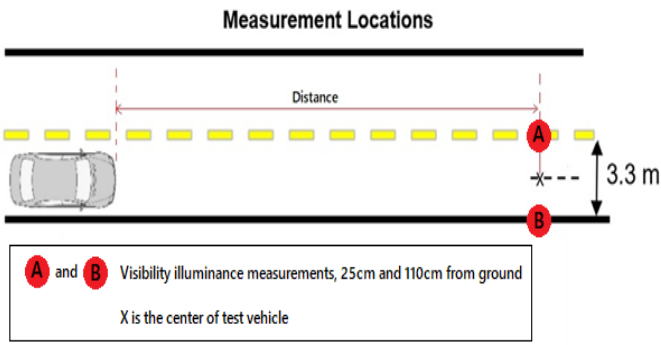


Figure 2-1: Illuminance measurements assessment

ASEAN NCAP shall determine the functionality; whether the AHB system provides adequate illuminance when the test is performed according to the procedure.

Table 1.1: AHB Illuminance measurements requirements

Test	Head light	Lux meter	Distance (m)	Height (cm)	Require-ments
Illumi-nance	High Beam	A	100	25 from ground	5 Lux (Min)
				110 from ground	5 Lux (Min)
		B	100	25 from ground	5 Lux (Min)
				110 from ground	5 Lux (Min)

For each visibility illuminance measurement point listed in Table 1.1, the minimum value of 5 lux must be obtained.

If the test vehicle does not meet all the requirements as described in Table 1.1, no point will be rewarded.

6.4 Equivalent Test Procedure

At the request of the manufacturer, the above test set procedure can be replaced by the test procedure described in UNECE Regulation No. 48-06 (or later), section 6.1.9.3.3.2 and UNECE Regulation No. 122-01 (or later), section 6.3.3 class B or UNECE Regulation No. 123, section 6.3.2. Manufacturer shall submit certification of

the abovementioned regulations or test report witnessed by technical services provider.

OR

The test may be performed by different test procedure, provided that such test procedure fulfils the requirement of 6.1, 6.2 and 6.3 above.

However, other tests may be permitted at the discretion of the ASEAN NCAP provided equivalence can be demonstrated. In such a case a report shall be attached the methods describing the procedure used and the results obtained.

ANNEX 1

Reference
E/ECE/324/Rev.1/Add.47/Rev.9
E/ECE/TRANS/505/Rev.1/Add.47/Rev.9

Test drive

1. Test drive specifications for the automatic control of the main-beam headlamp and adaptive main-beam headlamps

1.1 The test drive shall be carried out in clear atmosphere and with clean head-lamps

1.2 Urban areas shall comprise roads with and without illumination.

1.3 Country roads shall comprise sections having two lanes or more lanes.

1.4 For the test sections A and B in the Table 1, the engineers/inspectors conducting the tests shall evaluate and record the acceptability of the performance of the adaptation process in relation to oncoming and preceding road users. This means that the test engineers/inspectors shall be seated in the vehicle being tested and additionally be seated in the oncoming and preceding vehicles.

1.5 The test course shall comprise test sections with traffic conditions, at speed corresponding to the relevant type of road, as described in Table 1 below.

Table 1

Test Section	*Traffic conditions*	*Road type*	
		Urban areas	*Country road*
	Speed	*50 ± 10 km/h*	*80 ± 20 km/h*
	Average percentage of the full test course length	*10 per cent*	*70 per cent*
A	Single oncoming vehicle or single preceding vehicle in a frequency so that the main beam will switch ON and OFF.	X	X
B	Single oncoming vehicle or single preceding vehicle in a frequency so that the adaptive main beam will react to demonstrate the adaptation process.	X	X

Automatic switching conditions dipped-beam headlamps

Automatic switching conditions dipped-beam headlamps[1]		
Ambient light outside the vehicle[2]	Dipped-beam headlamps	Response time
less than 1,000 lux	ON	no more than 2 seconds
between 1,000 lux and 7,000 lux	at manufacturer's discretion	at manufacturer's discretion
more than 7,000 lux	OFF	more than 5 seconds, but no more than 300 seconds

1 Compliance with these conditions shall be demonstrated by the manufacturer, by simulation or other means of verification accepted by the authority responsible for the assessment.

2 The illuminance shall be measured on a horizontal surface, with a cosine corrected sensor on the same height as the mounting position of the sensor on the vehicle. This may be demonstrated by the manufacturer by sufficient documentation or by other means accepted by the authority responsible for the assessment.

APPENDIX 1

HIGH-PERFORMANCE HEADLAMP EQUIPMENT CHECK

(To be filled out by the manufacturer)

Specifications of the car being assessed

1. Make/Type (Model name): _____/ _____/_____

2. Declaration from Car Manufacturer

Automatic switching type

Yes (Operating speed): _____ km/h to _____ km/h / No

3. Supporting documents

Function and equipment documents: R48 certified test results / Other: _____

Operation speed documents: Instructional manual / Other: _____

APPENDIX 2

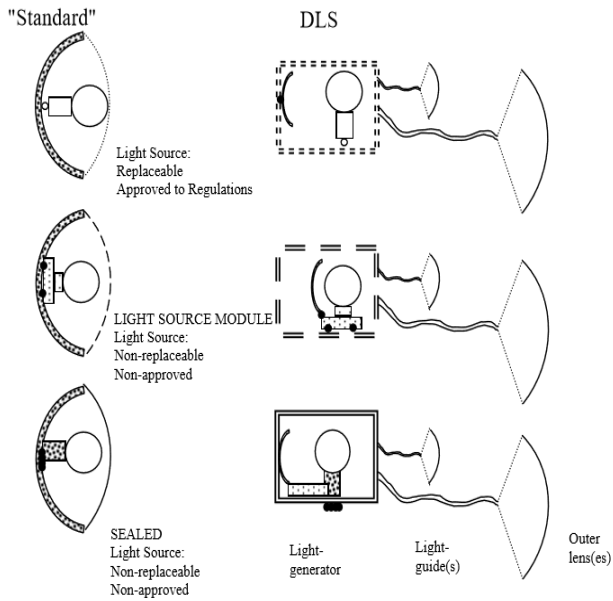
Operation Speed Assessment
RESULT (To be filled out by ASEAN NCAP)

		'Automatic switching type'
Equipment	Yes or no	Yes · No
	Primary documents	(corresponding)
Operation Speed	Speed range	km/h ～ km/h
	Primary documents	(corresponding)

APPENDIX 3

E/ECE/324
Rev.1/Add.47/Rev.5 E/ECE/TRANS/505
Regulation No. 48
page 110

EXAMPLES OF LIGHT SOURCE OPTIONS



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