COMMONWEALTH OF AUSTRALIA

AUSTRALIAN DESIGN RULE 28
FOR
MOTOR VEHICLE NOISE

As endorsed by the
Australian Transport Advisory Council.

The intention of this Australian Design Rule is to define limits on external noise emitted from motor vehicles in order to limit the contribution by motor traffic to community noise.

The Australian Transport Advisory Council has recommended to Commonwealth, State and Territory Governments that all motor vehicles specified below shall comply with Australian Design Rule 28 - Motor Vehicle Noise.

VEHICLE CATEGORY	RULE	AMENDMENT	
	MANUFACTURED ON OR AFTER		
	28		
Passenger Cars			
Forward Control Passenger Vehicles up to 8 seats	N/A		
9 seats	N/A		
Other Passenger Cars	1 Jan 1974		
Passenger Car Derivatives	1 Jan 1974		
Multi-Purpose Passenger Cars	1 Jan 1974		
Omnibuses up to 3.5 tonnes GVM			
up to 12 seats	1 July 1974#	1 July 1975	
over 12 seats	1 July 1974#	1 July 1975	
Other Vehicles up to 4.5 tonnes GVM	1 July 1974#	1 July 1975	
Other Vehicles over 4.5 tonnes GVM	1 July 1974#	1 July 1975	
Motorcycles		1 July 1975	
Mopeds		1 July 1975	
Specially Constructed Vehicles	N/A		
Other Vehicles not listed above			
up to 4.5 tonnes GVM	1 July 1974#	1 July 1975	
over 4.5 tonnes GVM	1 July 1974#	1 July 1975	

\# Petrol engined vehicles only
N/A-Not Applicable
GROSS VEHICLE MASS - abbreviated to 'GVM'

The Australian Transport Advisory Council has also recommended to Commonwealth, State and Territory Governments that motor vehicles which comply with the requirements of ADR 28A - Motor Vehicle Noise need not comply with the requirements of ADR 28.

The Australian Transport Advisory Council has also recommended to Commonwealth, State and Territory Governments that motorcycles and mopeds which comply with the requirements of ADR 39 - Motorcycle and Moped Noise need not comply with the requirements of ADR 28. *

* Amended February 1984

Issued by: Department of Transport
P.O. Box 594,
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AUSTRALIA
Issued: February 1984

AUSTRALIAN DESIGN RULE NO. 28 - MOTOR VEHICLE NOISE

28.1 Definitions

28.1.1 Net Engine Power (N.E.P.) means the maximum output at the fly wheel of an engine representing a standard version in all parts, including intake and exhaust system, the fan, water pump or cooling blower, as the case may be, fuel pump, injection pump and unloaded generator with standard carburettor adjustment and ignition or injection timing as the case may be, using a commercial fuel as prescribed for the vehicle, and at the coolant and lubricant temperatures occurring in noraml operation.

The measured output shall be converted to standard conditions of barometric pressure and temperature (760mm mercury, 20° Celsius) according to the following formula:

$$\text{N.E.P.} = \frac{760}{b} \sqrt{\frac{273 + t}{273 + 20}} \times \text{(Measured Power)}$$

Where b = the observed barometric pressure in the laboratory in millimetres of mercury

t = the temperature of the air at the engine air intake in °C

28.2 Requirements

When any vehicle is operated in accordance with the requirements of Clause 28.4 the sound level at a point between 7.3m and 7.7m from the path of the centre line of the vehicle and 1.1m and 1.3m above ground level shall not exceed by more than 1dB(A) the limits specified for the vehicle in Table 1.

TABLE 1.

Category of Vehicle	Maximum Sound Level in dB(A)
A Mopeds	82 *
B Motor Cycles With engine capacity:	
Not exceeding 125ml	82
Over 125ml but not exceeding 500ml	84
Over 500ml	86
C Three Wheeled Motor Vehicles	85
D Motor Vehicles with Four or More Wheels	
(a) Passenger cars, passenger car derivatives and multi-purpose passenger cars	84
(b) Omnibuses with a gross vehicle mass	
(i) not exceeding 3.5t	85
(ii) over 3.5t - with an engine of not more than 150 kW N.E.P.	89
(iii) over 3.5t - with an engine of more than 150 kW N.E.P.	92
(c) Other vehicles with gross vehicle mass	
(i) not exceeding 3.5t	85
(ii) over 3.5t but not exceeding 12t	89
(iii) Over 12t - with an engine of not more than 150 kW N.E.P.	89
(iv) over 12t - with an engine of more than 150 kW N.E.P.	92

28.3 Sound Level Measuring Instruments

28.3.1 Sound level measurements shall be carried out using a sonometer designed to have a weighting network conforming to the curve in Figure 1 and response characteristics as specified in 28.3.2 and 28.3.3.

28.3.2 If a pulse of sinusoidal signal having a frequency of 1kHz and a duration of 200 milliseconds is applied, the maximum reading shall be 1 ± 1dB(A) less than the reading for a steady signal of the same frequency and amplitude.

28.3.3 If a sinusoidal signal, at any frequency between 100Hz and 12.5kHz is suddenly applied and thereafter held constant, the maximum reading shall exceed the final steady reading by 0.6 ± 0.5dB(A).

Note: A sonometer designed to meet the requirements of Publication 179(1965) 'Precision sonometers' of the International Electrotechnical Commission (IEC) will meet the requirements of 28.3

* Amended July 1980

28.4 Test Procedure

28.4.1 Measurement shall be performed with the vehicle at the unladen weight plus driver and on a sealed surface consisting of concrete, bitumen or other approved material. The wind velocity shall be not greater than 15 km/h.

28.4.2 The engine shall be tuned to the vehicle manufacturer's specifications and brought to normal operating temperature.

28.4.3 The vehicle shall approach the test area at a steady speed and cross a line (depicted as line AA' in Figure 2) under the following conditions.

28.4.3.1 Vehicle with no gear box - The vehicle speed shall be within a tolerance of + 5km/h and - 1km/h of 50km/h or the speed which corresponds to 75% of the engine speed at which the engine develops its NEP or to 75% of the maximum engine speed permitted by the engine governor, whichever is the lowest.

28.4.3.2 Vehicle with manually-operated gear box - If the vehicle is fitted with a two-speed, three-speed, or four-speed gear box, the second gear shall be used. If the vehicle has more than four speeds, the third gear shall be used. If, by following the above procedure, the engine speed developed during the test run exceeds the manufacturer's recommended maximum, the first higher gear which ensures that this maximum is no longer exceeded may be used. Auxiliary step-up ratios ('overdrive') shall not be engaged. If the vehicle is fitted with a final drive of more than one gear ratio, the ratio selected shall be that allowing the highest vehicle speed. The vehicle approach speed shall be within a tolerance of + 5km/h and - 1km/h of 50km/h or the speed which corresponds to 75% of the engine speed at which the engine develops its NEP or to 75% of the maximum engine speed permitted by the engine governor, whichever is the lowest.

28.4.3.3 Vehicle with an automatic gear box - Where several forward drive selector positions are available, the position selected shall be that which results in the highest mean acceleration of the vehicle during the full throttle section of the test except that in the case of a vehicle with more than 2 selector positions any selector position which restricts operation to the lowest gear ratio shall not be used and any device which would automatically select the lowest ratio may be disconnected. The vehicle approach speed shall be within a tolerance of + 5km/h and - 1km/h of 50km/h or 75% of the maximum speed of the vehicle whichever is the lower.

28.4.4 When the most forward point of the vehicle reaches the line depicted as line AA' in Figure 2, the throttle shall be fully opened.

28.4.5 When the most rearward point of the vehicle reaches the line depicted as line BB' in Figure 2 the throttle shall be fully closed.

28.4.6 At lease two measurements shall be made on each side of the vehicle

28.5 Interpretation of Results

28.5.1 A set of two measurements shall be considered valid if the difference between the two consecutive measurements on the same side of the vehicle is not more than 2dB(A).

28.5.2 The noise level of the vehicle shall be the highest measurement of a set of measurements which shall include at least two consecutive measurements on each side of the vehicle except that if the set includes not more than one measurement which exceeds by more than 1dB(A) the maximum noise level specified for the vehicle in Table 1 then the set may be replaced by a second series of measurements including at least two consecutive measurements on each side of the vehicle.

FIG. 1.— Weighting curve A.

(As taken from Publication 179 (1965) of the International Electrotechnical Commission (IEC)).

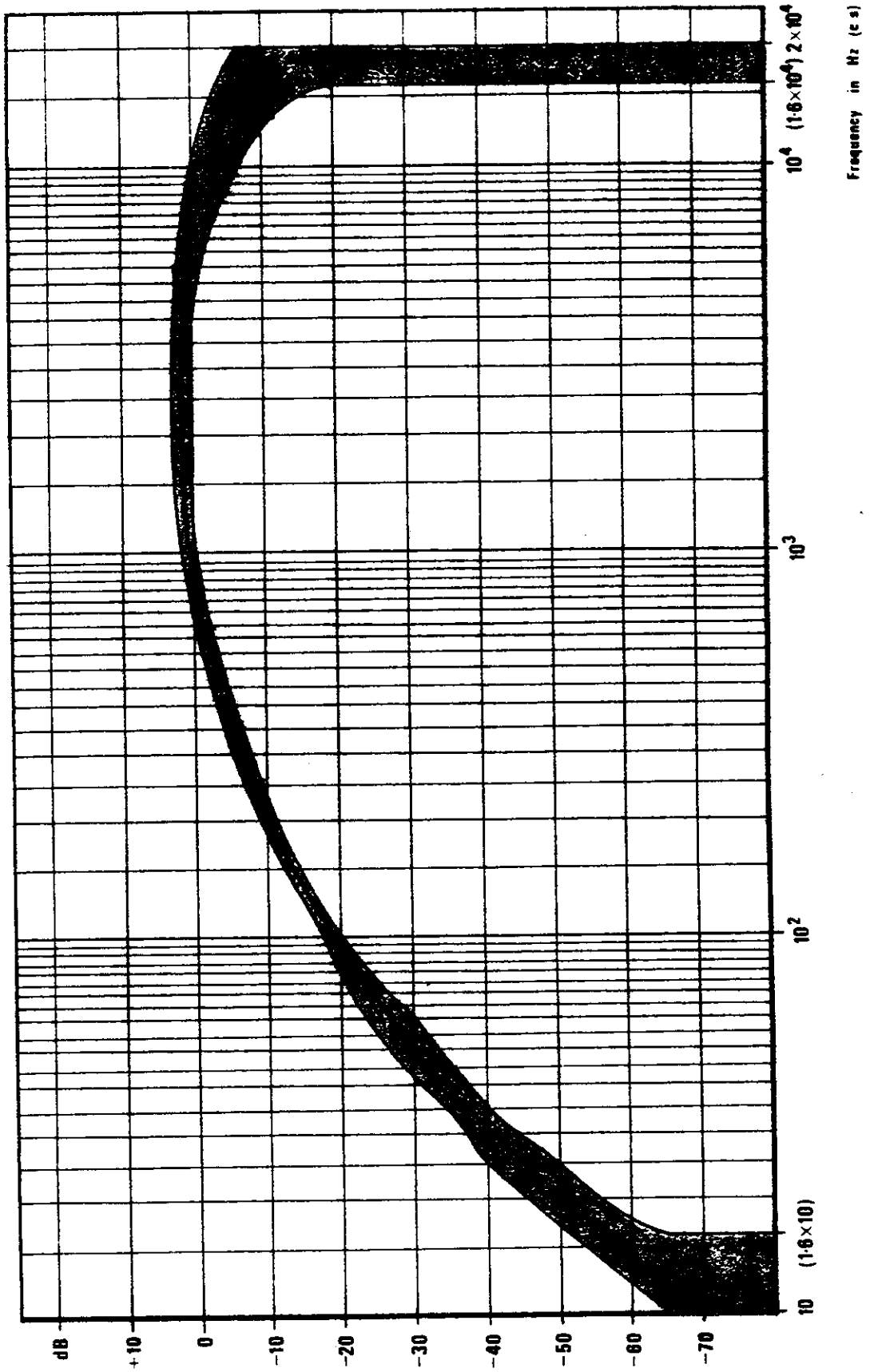

FIG 2