

can be used as a way to determine the annoyance qualities of a sound. The values from a one-third-octave analysis can also be

easily presented in tabular form (Table 1), while those from a full-spectrum cannot.

**TABLE 8—EXAMPLE OF ONE-THIRD-OCTAVE DATA IN TABULAR FORM: SUMMARY OF AMBIENT LEVELS DURING ICE MEASUREMENTS, A-WEIGHTED LEVEL, DB(A)**

1/3 octave band center frequency, Hz	Linear average (1/3 octave band)	Min (overall A-weighted)	Max (overall A-weighted)	Min (1/3 octave band)	Max (1/3 octave band)
100 to 20k .....	49.6	46.1	53.4	45.3	54.7
100 .....	34.6	30.7	34.1	30.7	38.4
125 .....	35.5	32.4	36.8	32.4	42.1
160 .....	36.1	32.1	37.9	32.0	41.5
200 .....	36.9	32.7	37.9	32.7	41.2
250 .....	36.5	33.9	38.1	33.1	40.7
315 .....	36.5	32.5	37.6	32.1	41.5
400 .....	36.0	31.9	38.1	31.8	39.7
500 .....	36.7	33.6	39.8	33.1	41.1
630 .....	38.2	34.4	41.7	34.0	42.2
800 .....	40.2	36.0	46.1	35.8	46.1
1k .....	41.1	36.4	46.4	36.4	46.4
12.5k .....	40.0	35.3	45.1	35.3	45.1
16k .....	37.6	32.9	43.1	32.9	43.1
2k .....	34.7	30.3	37.8	30.3	37.8
2.5k .....	34.5	32.8	35.4	30.8	42.1
3.15k .....	35.5	36.9	37.1	30.0	39.6
4k .....	34.0	33.0	34.3	28.3	40.2
5k .....	29.0	25.0	29.8	24.3	32.8
6.3k .....	25.7	22.3	26.9	19.7	31.7
8k .....	20.2	16.6	22.4	14.1	24.2
10k .....	14.4	10.3	17.3	7.6	18.3
12.5k .....	8.9	5.0	11.7	3.2	13.0
16k .....	3.1	0.7	5.6	−0.8	8.7
20k .....	−1.9	−3.1	−0.4	−3.5	2.0

## Summary

The acoustic science described above was intended to provide novices enough knowledge to understand the data and discussions put forth in the NPRM. Sound is a form of energy that is created when a medium vibrates, creating pressure variations (compressions and rarefactions of molecules) within a medium (such as air) which creates a pattern called a wave. Sound pressure over time creates peaks and valleys which make up the wavelength. The difference in acoustic pressure from the ambient pressure (no contraction of the medium) to the peak or valley of a wavelength is called the amplitude; the higher the amplitude, the louder the sound. The period of a wave is the time it takes for a cycle (a peak and a valley) to complete; a longer period indicates a lower pitch. The frequency of a sound is the number of complete wave cycles that pass by a given point in space every second; the higher the frequency, the higher the pitch.

The wavelength, amplitude, period and frequency are physical attributes of a sound wave that affect the human perception of loudness, pitch and timbre. These perceptions can be quantified using psychoacoustics. Psychoacoustics is the study of how humans perceive sound and forms the basis for extracting objective data from the physical characteristics of acoustic pressure (sound). Using the physical characteristics and psychoacoustic analysis, a sound is usually measured in decibels (dBs) within an octave. Octaves can be further broken down into one-third octave bands

which provide more information about the spectral content of sound being analyzed. After reading this primer, the reader should understand what “sound” is, identify its different components, and understand how humans perceive sound and how each of these contributes to measuring sound.

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## DEPARTMENT OF TRANSPORTATION

### National Highway Traffic Safety Administration

#### 49 CFR Parts 571 and 585

[Docket No. NHTSA–2011–0100]

### Draft Environmental Assessment for Rulemaking To Establish Minimum Sound Requirements for Hybrid and Electric Vehicles

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Notice of availability.

**SUMMARY:** NHTSA is announcing the availability of a Draft Environmental Assessment (EA) to evaluate the potential environmental impacts of a proposed rule establishing a Federal Motor Vehicle Safety Standard (FMVSS) setting minimum sound requirements for hybrid and electric vehicles.

**DATES:** Comments must be received on or before March 15, 2013.

**ADDRESSES:** You may submit comments on the EA to the docket number identified in the heading of this document using any of the following methods:

- *Federal eRulemaking Portal:* go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility, M-30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- *Hand Delivery or Courier:* West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.
- *Fax:* (202) 493-2251.

Regardless of how you submit your comments, you should mention the docket number of this document.

You may call the Docket at 202-366-9324.

*Instructions:* For detailed instructions on submitting comments and additional

information on the rulemaking process, see the Public Participation heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided.

**FOR FURTHER INFORMATION CONTACT:** For non-legal issues, Ms. Gayle Dalrymple, Office of Crash Avoidance Standards, National Highway Traffic Safety Administration, NVS-112, 1200 New Jersey Avenue SE., Washington, DC 20590. Telephone: 202-366-5559; fax: 202-493-2990.

For legal issues, Mr. Russell Krupen, Office of the Chief Counsel, National Highway Traffic Safety Administration, NCC-113, 1200 New Jersey Avenue SE., Washington, DC 20590. Telephone: 202-366-1834; fax: 202-366-3820.

**SUPPLEMENTARY INFORMATION:** Pursuant to the National Environmental Policy Act, NHTSA has prepared a Draft EA analyzing the potential environmental impacts of the agency's proposed action to establish minimum sound requirements for hybrid and electric vehicles. The Draft EA is being issued together with the agency's Notice of Proposed Rulemaking for FMVSS No.141, *Minimum Sound Requirements for Hybrid and Electric Vehicles*. The proposal would require hybrid and electric passenger cars, light trucks, medium and heavy duty trucks and

buses, low speed vehicles, and motorcycles to meet certain minimum sound requirements and would apply to electric vehicles and to those hybrid vehicles that are capable of propulsion in any forward or reverse gear without operation of the vehicle's internal combustion engine.

On July 12, 2011, the agency published a Notice of Intent to Prepare an Environmental Assessment, which sought comment on the scope of the environmental analysis, the significant issues to be analyzed, and the nature of the analysis to be conducted. NHTSA received comments to the Notice of Intent from 35 individuals and organizations. NHTSA developed the alternatives analyzed in the Draft EA based on the comments received and further research and analysis conducted by the agency.

NHTSA invites interested parties to comment on the Draft EA by following the instructions under **ADDRESSES** above. The Draft EA is available on the agency's Web site at <http://www.nhtsa.gov> or on the public docket at <http://www.regulations.gov> (Docket No. NHTSA-2011-0100).

Issued on: January 7, 2013.

**Christopher J. Bonanti,**

*Associate Administrator for Rulemaking.*

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