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# NOTE

## THE NEED FOR A NOISE POLLUTION ABATEMENT ACT

Noise pollution has recently become a problem of national concern. The National Council on Environmental Quality in its first annual report has concluded that annoyance is not the only price we pay for excessive noise as it has been proven that prolonged exposure to intense noise produces permanent hearing loss.<sup>1</sup> The purpose of this article is to briefly outline the seriousness of the problem and present a plan to control and reduce this type of pollutant.

In the United States as of 1967 there were 11 million adults and three million children suffering some sort of diagnosed hearing loss.<sup>2</sup> Until recently, it was believed that loss of hearing was a natural process of aging. Studies have now shown that this is not true. Mabaan tribesmen retain remarkably good hearing at 70 to 80 years of age<sup>3</sup> while in the United States there is a loss of hearing particularly of the higher frequencies at the age of 32 for men and 37 for women.<sup>4</sup> The loss of hearing at higher frequencies is explained by the working process of the ear.

In the process of hearing, sound waves are transmitted to the inner ear's cochlea, a shell-like chamber which is lined with hair-like sensors. High frequency sounds are analyzed by the sensors at the end of this chamber, while low frequency sounds are handled all along the path of the inner cochlea. Consequently, there is persistent wear in one small area where high frequency sounds impact. This area wears out first. Hair cells do regenerate themselves after noise exposure; however, after long-term exposure it appears likely that they wear out altogether.<sup>5</sup>

Loss of hearing and annoyance are not the only two results of excessive noise. Some physicians have reported a causal relationship between exposure to excessive noise and the incidence of heart

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1. Council on Environmental Quality, *Environmental Quality: The First Annual Report* (Aug. 1970) [hereinafter cited as *Env. Q.*].

2. Brower, *Noise Pollution: A Growing Menace*, *Saturday Rev.*, May 27, 1967, at 17.

3. Rosen, Bergman, Plester, Aly El-Mofty, and Satti, *Prebycusis Study of a Relatively Noise Free Population of the Sudan*, 71 *Annals of Otology, Rhinology, and Laryngology* 727 (1962).

4. Rosen, *Hearing Studies in Selected Urban and Rural Populations*, 29 *Transactions of N.Y. Academy of Sci.* 9 (1966).

5. Dougherty and Welsh, *Environmental Hazards*, 275 *New England J. of Med.* 759 (1966).

disease, migraine headaches, gastrointestinal disorders and allergies.<sup>6</sup> Other demonstrable biological effects include interference with speech communications, disturbances of concentration and interference with sleep.<sup>7</sup>

The results of this annoyance caused by excessive noise are very real. It has been shown that workers in offices and factories are less efficient, make more mistakes and their thinking gets slow and fuzzy when they work in noisy surroundings. Often such workers carry a burden of resentment and irritation and have more social conflicts at home and on the job than their counterparts working in an atmosphere with lower noise levels.<sup>8</sup> It should be emphasized, however, that loss of hearing is not an occupational health problem alone (see Appendix A).

Although the problem is one of national concern it is also one of local concern. President Nixon in his message to Congress in February of 1971 stated that it was the state and local government's responsibility to play a major role in legislating and enforcing noise control strategies. Some states have already acted and it seems clear that if a majority of the states do not enact meaningful legislation in this area in the near future, Congress will act in a manner similar to the action taken by enactment of the Clean Air Act of 1970.

#### REGULATION OF NOISE

The traditional type of anti-noise law limiting noise which is "excessive or unusual" may be attacked as unconstitutional on grounds of arbitrariness and vagueness.<sup>9</sup> The New York court in *Kenville Realty Corp. v. Board of Zoning of the Village of Briarcliff Manor*,<sup>10</sup> held that an ordinance reading ". . . no operation shall be permitted which would be offensive, obnoxious or detrimental by reason of vibration, dust, fumes, odor, noise, lights, or traffic generation and resultant congestion," is invalid with respect to noise control for want of proper standards. A board must be furnished a sufficient standard or rule by which its actions are to be governed. The court, referring to the N.Y. Vehicle and Traffic Law, Section 386 (Appendix B), ruled that more effective standards are feasible and necessary in the area of noise control than were presented by the ordinance under consideration.

6. N.Y. Times, Mar. 19, 1967, § 1, at 42, col. 1; Ragon, *Impact*, World Health, Feb.-Mar. 1966, at 28; N.Y. Times, June 23, 1967, at 22, col. 2.

7. Beranek, *Noise*, Scientific Am., Dec. 1966, at 68.

8. *Urban Noise Control*, in *Noise Pollution and the Law* 64 (J. Hildebrand ed. 1970).

9. Hildebrand, *Noise Pollution: An Introduction to the Problem and a Guide for Future Legal Research*, 70 Colum. L. Rev. 652 (1970).

10. 265 N.Y.S.2d 522, 523, 48 Misc.2d 666 (1965).

In *People v. Byron*,<sup>11</sup> the court interpreted the N.Y. Vehicle and Traffic Law, Section 375(31) (Appendix B) and Section 386 to mean that it is the duty of each motor vehicle operator to minimize the noise emission of his particular vehicle within the limitations of Section 386. Relying on *People v. Byron, supra*, the court held in *People v. Meyer*,<sup>12</sup> that to establish a violation of a motorcycle equipment statute providing, among other things, that motorcycles shall have a suitable muffler or device to prevent unnecessary noise, the people must show either a decibel rating above that allowed by law (Section 386) or that the vehicle in question made noise in excess of what is usual for vehicles in its class.

It is difficult to establish any exact system to regulate noise. The human response to noise is subjective and thus varies with frequency of sound, personal taste and nature of the individual. However, we cannot use the human subjective reaction to evaluate noise. Studies have been conducted comparing the various types of measuring systems to human response and from these studies it has been concluded that the dB(A) scale system is the most closely related to human response (see Appendix C for correlation of noise levels with human response). In addition, it is the simplest to use and allows the utilization of available equipment.<sup>13</sup>

The decibel (dB) is a unit measure of sound intensity and is derived from the level at which sound becomes audible to the human ear. One decibel represents the lowest audible sound and each decibel then represents a logarithmic increase in volume. Decibels are not intended to measure either the subjective impression of noise perceived or the degree of mental disturbance caused. Intensity is not proportional to loudness, but loudness roughly doubles for each 10 dB (at 1000 cycles per second). Regardless of the level of intensity, doubling a source increases the intensity by 3 dB, thus two 90 dB motorcycles would result in 93 dB. Doubling the distance between source and observer reduces the intensity 6dB.<sup>14</sup>

It is generally accepted that steady exposure to 80 dB can cause permanent hearing loss. Temporary deafness can occur from a short-term exposure to 100-125 dB, and listening is painful at 125-140 dB.<sup>15</sup> The new U.S.A. Standards Institute standard is roughly 85 dB. This standard will not prevent any hearing loss but rather is intended

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11. 268 N.Y.S.2d 24, 17 N.Y.2d 64 (1966).

12. 313 N.Y.S.2d 93, 63 Misc.2d 580 (1970).

13. Env. Q. *supra* note 1, at 125.

14. Hildebrand, *supra* note 9; Anthrop, *The Noise Crisis*, in *Noise Pollution and the Law* 4 (J. Hildebrand ed. 1970).

15. Hildebrand, *supra* note 9.

to prevent loss to the extent that understanding of conversation is not impaired. This standard will probably allow a loss of 10 dB at frequencies below 1000 cycles per second (cps), 15 dB at 2000 cps, and 20 dB at 3000 cps and above.<sup>16</sup>

The Air Force *requires* hearing protection at any level 85 dB or greater.<sup>17</sup>

California, in setting up their law, conducted a series of tests on their highways to determine the actual noise levels in existence. Appendix D shows the results of these tests. The graph indicates that the vast majority of automobiles created 77 dB or less, that gasoline trucks are not much higher than automobiles, and that the majority of diesel trucks create less than 90 dB. Thus, the law as proposed would affect only those vehicles which create an unusual amount of noise for their particular class. After these tests California enacted their law (Appendix F) with limits far above the average current level. That the California limits are much too high is concurred in by the fact that an acoustical consulting firm hired by the state to study motor vehicle noise and its control recommended maximum limits of 87 dB for motorcycles and trucks and 77 dB for all other vehicles.<sup>18</sup> This firm considered these levels to be easily attainable with the then existing technology, and indeed even a cursory study of the survey report indicates a close relation with the levels actually found. To establish levels higher than those proposed would render the law ineffective against almost all automobiles and most trucks.

It is difficult to justify a higher level of noise for motorcycles than for automobiles. The California law would permit one motorcycle to make as much noise as four large, controlled automobiles. The problem here is an ancient one wherein many people relate noise with power. It has been shown that a motorcycle producing 100 dB 60 feet away converts less than 0.04 hp to acoustical power.<sup>19</sup>

In most cases, for passenger cars the maximum noise is emitted in the upper one-third of the speed range usually at maximum revolutions per minute (rpm). The maximum torque is produced usually at 50-70 percent of maximum rpm, with an average of 60 percent. In addition, it has been noted that although roadside testing is not very effective due to the heavy traffic competition, effect of car design, degree of acceleration of the subject, and position of the exhaust system, it is a valid indication of the actual noise produced at high-

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16. Anthrop, *supra* note 14.

17. USAF Reg. 160 § 3:5 Hazardous Noise Exposure (1956).

18. Bolt, Beranek, and Newman, Inc., *Objective Limits for Motor Vehicle Noise*, Dec. 1962 (Calif. Highway Patrol, Rep. 824).

19. Anthrop, *supra* note 14, at 13.

way speeds if the U.S.A. Standards Institute procedures are used.<sup>2 0</sup> Due to these variations any valid legislation must include levels for both methods, *i.e.*, controlled stationary measurement, possibly in conjunction with motor vehicle inspection programs, and for while the vehicle is actually in motion.

In addition, to protect against hearing loss to non-occupationally exposed personnel in an area, any valid legislation should include levels for non-vehicular noise sources. These levels should be based on the approach that hearing loss can result from exposure to greater than 80 dB for any extended period of time. The technology for the control of industrial noise is developing and controls for the most serious offender, the air compressor and jackhammer, are currently available.<sup>2 1</sup>

Traffic can be silenced by better mufflers on motorcycles and more careful control on other vehicles and by better tire treads and highway surfaces,<sup>2 2</sup> or by depressing the highways into the ground or building sound barriers along the sides of the highways.<sup>2 3</sup>

At the Symposium on Acceptability Criteria the Society of Automotive Engineers and the Automobile Manufacturers Association stated that they had accepted an active role in the reduction of

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20. Venema, *Surface Transportation Noise*, in *Transportation Noises* 19 (J. Chalupnik ed. 1970).

21. Brower, *supra* note 2, at 19; *Muffling the Clamor of Urban Construction*, *Business Week*, Dec. 14, 1968, at 168; Hildebrand, *supra* note 8, at 671; excerpt from *Anthrop*, *supra* note 14, at 11:

Existing technology is capable of providing substantial relief from construction noise, but unfortunately this technology is not being adequately employed. In December 1967 Citizens for a Quieter City in New York demonstrated a muffled air compressor developed in Great Britain and used there for the past five years which reduced the noise level from 86 to 79dB(A) at a distance of 25 feet. This compressor is enclosed in a plastic housing lined with foam plastic. This organization also demonstrated a muffled jack hammer which produced 82dB(A) at 25 feet instead of the usual 96dB(A). British Building Research Station tests have shown that jack hammer noise can be muffled considerably without any significant impairment of performance. Many European cities are already using muffled jack hammers and air compressors equipped with sound attenuating devices. Some of the presently available techniques were illustrated by the Diesel Construction Co. when it recently constructed a 52-story office building in lower Manhattan. Foundation blasting was muffled with special steel wire mesh blankets, and steel beams were welded rather than riveted together, a procedure which eliminated the riveting machines that emit 94dB(A).

Thus, for a relatively modest cost, substantial reduction in construction noise levels could be achieved very quickly. But unless city and other governmental agencies enact appropriate ordinances, building contractors will continue to find the production of noise more profitable than its abatement.

22. Hildebrand, *supra* note 8, at 672.

23. *Id.* at 673.

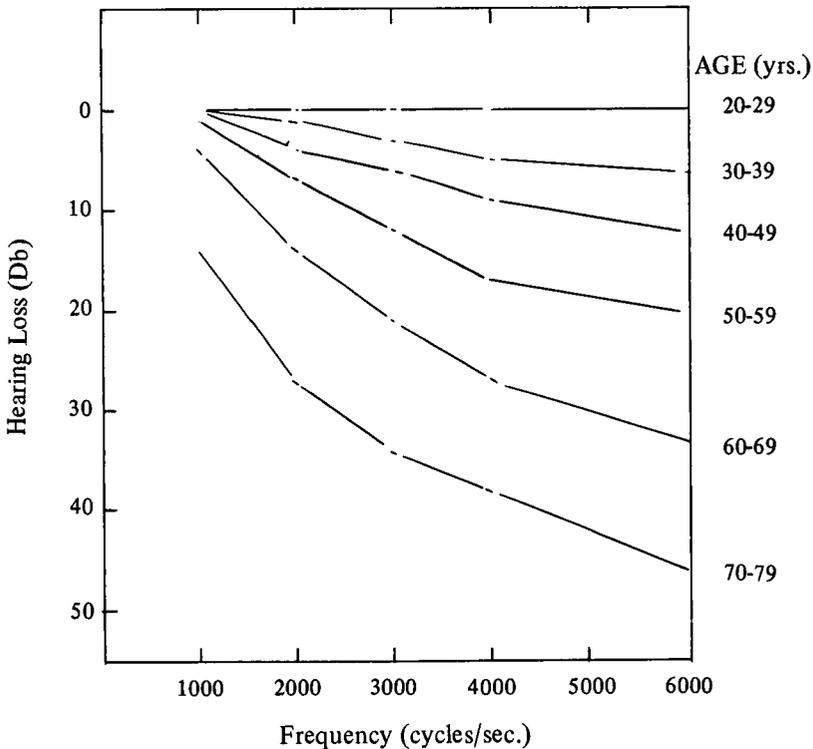
offensive highway noise.<sup>24</sup> Noise pollution abatement laws would lend support to these organizations in their role.

In 1970 Congress enacted the Noise Pollution Abatement Act of 1970 creating within the Environmental Protection Agency an Office of Noise Abatement and Control. This office has appropriated \$30 million to make a complete investigation and study of noise and to report the results of this study to the President and Congress.<sup>25</sup> Presumably, this report will result in further federal legislation in this area and will produce federal minimum standards regulating all sources of noise pollution.

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#### APPENDIX A

Average hearing loss as a function of frequency in different age groups among 2,518 professional men who had no occupational noise exposure.\*



\*Anthrop, *The Noise Crisis*, in *Noise Pollution and the Law* at 10 (J. Hildebrand ed. 1970).

24. Venema, *supra* note 20, at 38.

25. Noise Pollution Abatement Act, ch. 403, Title IV, 43 Stat. 486 (1970).

## APPENDIX B

## NEW YORK VEHICLE AND TRAFFIC LAW

## SECTION 386

N.Y. Veh. & Traffic L. § 386 (McKinney Supp. 1968-69):

1. No motor vehicle, other than an authorized emergency vehicle or a vehicle moving under special permit, which makes or creates excessive or unusual noise, shall operate upon a public highway.

2. A motor vehicle which produces a sound level of eighty-eight decibels or more on the "A" scale shall be deemed to make or create excessive or unusual noise.

(a) Sound pressure levels in decibels shall be measured on the "A" scale of a standard sound level meter having characteristics defined by American Standards Association specification S 1.4-1961 "General Purpose Sound Level Meter." Measurements of sound pressure level shall be made in accordance with applicable measurement practices outlined in the Society of Automotive Engineers Standard J672 "Measurement of Truck and Bus Noise" as approved January, nineteen hundred fifty-seven. The microphone shall be placed at a distance of fifty feet plus or minus two feet from the center of the lane in which the vehicle is traveling.

(b) Measurements of sound pressure level shall be made at speeds of less than thirty-five miles per hour.

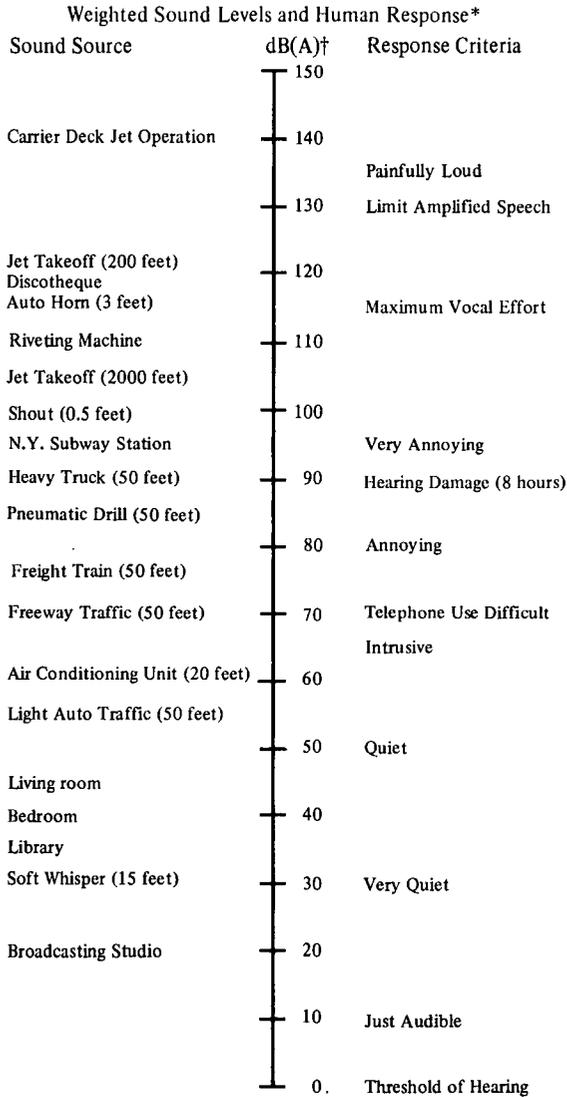
(c) No arrest shall be made in cases where the noise limit is exceeded by less than a two decibel tolerance.

## SECTION 375

31. Mufflers. Prevention of noise. Every motor vehicle, operated or driven upon the highways of the state, shall at all times be equipped with an adequate muffler in constant operation and properly maintained to prevent any excessive or unusual noise and no such muffler or exhaust system shall be equipped with a cut-out, bypass, or similar device. No person shall modify the exhaust system of a motor vehicle in a manner which will amplify or increase the noise emitted by the motor of such vehicle above that emitted by the muffler originally installed on the vehicle and such original muffler shall comply with all the requirements of this section.

A muffler is a device consisting of a series of chamber or baffle plates, or other mechanical design for the purpose of receiving exhaust gas from an internal combustion engine, and effective in reducing noise.

APPENDIX C



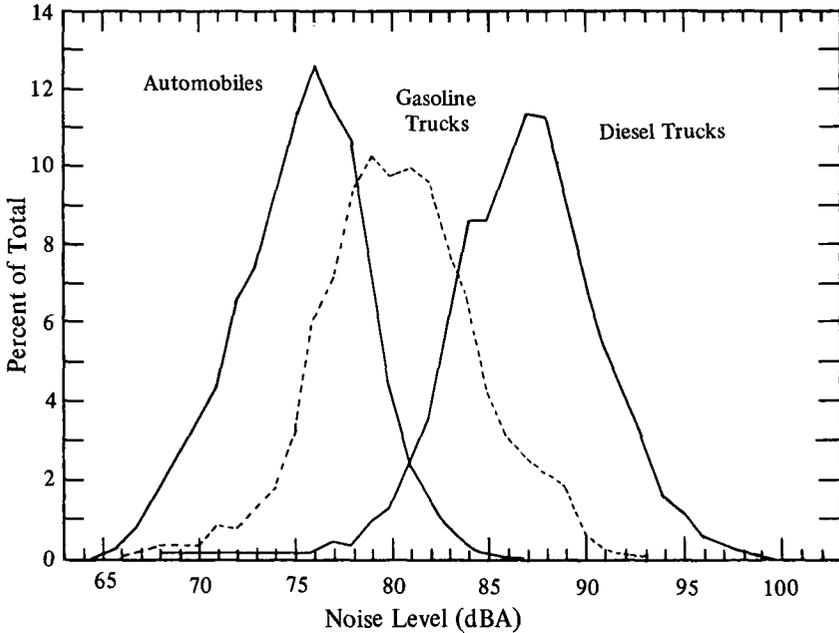
†Typical A-Weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The "A" scale approximates the frequency response of the human ear.

Source: Department of Transportation

\*Council of Environmental Quality, Environmental Quality: The First Annual Report at 125 (Aug. 1970).

APPENDIX D

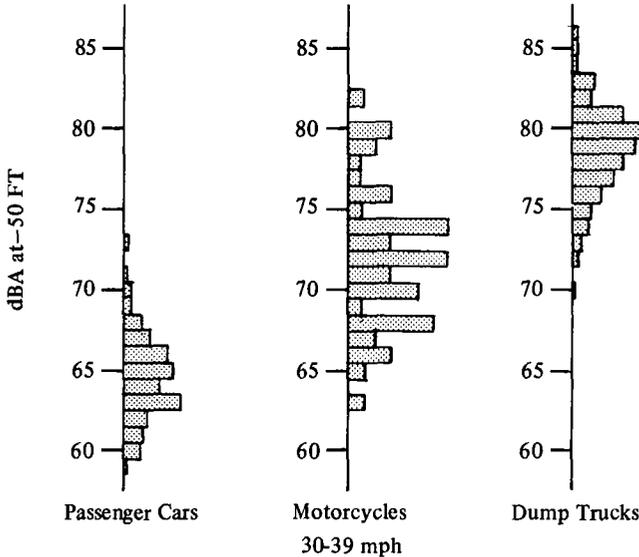
Results of tests conducted along California highways in 1964, the California Highway Patrol measured the noise levels of 25,351 passenger cars, 4,656 gasoline trucks, and 5,838 diesel trucks. The sound level instruments were actually located 25 feet from the center of the righthand traffic lane and the data were corrected to 50 feet to allow a direct comparison with the California noise code.\*



\*Anthrop, *The Noise Crisis*, in *Noise Pollution and the Law* at 12 (J. Hildebrand ed. 1970). at 12.

APPENDIX E

Statistical distribution of sound pressure levels of cars, motorcycles and trucks at a distance of 50 feet and travelling between 30 and 39 miles per hour.\*



\*Thiessen, *Community Noise Levels, in Transportation Noises—A Symposium on Acceptability Criteria at 25* (J. D. Chalupnik ed. 1970).

APPENDIX F

California Vehicle Code

Cal. Veh. Code § 23130 (West Supp. 1969): Approved 1970.

(a) No person shall operate either a motor vehicle or combination of vehicles of a type subject to registration at any time or under any condition of grade, load, acceleration or deceleration in such a manner as to exceed the following noise limit for the category of motor vehicle based on a distance of 50 feet from the center of the lane of travel within the speed limits specified in this section:

Speed limit  
of 35 mph  
or less

Speed limit  
of more  
than 35 mph

(1) Any motor vehicle with a manufacturer's gross vehicle weight of 6,000 pounds or more, any combination of vehicles towed by such motor vehicle, and any motorcycle other than a motor-driven cycle:

- |                                       |        |        |
|---------------------------------------|--------|--------|
| (A) Before January 1, 1973 .....      | 88 dbA | 90 dbA |
| (B) On or after January 1, 1973 ..... | 86 dbA | 90 dbA |

(2) Any other motor vehicle and any combination of vehicles towed by such motor vehicle . . . . . 82 dbA 86 dbA

(b) The department shall adopt regulations establishing the test procedures and instrumentation to be utilized.

(c) This section applies to the total noise from a vehicle or combination of vehicles and shall not be construed as limiting or precluding the enforcement of any other provisions of this code relating to motor vehicle exhaust noise.

(d) For the purpose of this section, a motortruck, truck tractor, or bus that is not equipped with an identification plate or marking bearing the manufacturer's name and manufacturer's gross vehicle weight rating shall be considered as having a manufacturer's gross vehicle weight rating of 6,000 pounds or more if the unladen weight is more than 5,000 pounds.

(e) No person shall have a cause of action relating to the provisions of this section against a manufacturer of a vehicle or a component part thereof on a theory based upon breach of express or implied warranty unless it is alleged and proved that such manufacturer did not comply with noise limit standards of the Vehicle Code applicable to manufacturers and in effect at the time such vehicle or component part was first sold for purposes other than resale.

§ 27160. Motor vehicle noise limits

(a) No person shall sell or offer for sale a new motor vehicle which produces a maximum noise exceeding the following noise limit at a distance of 50 feet from the centerline of travel under test procedures established by the department:

- (1) Any motorcycle manufactured before January 1, 1970 . . . . . 92 dbA
- (2) Any motorcycle, other than a motor-driven cycle, manufactured on or after January 1, 1970, and before January 1, 1973 . . . . . 88 dbA
- (3) Any motorcycle, other than a motor-driven cycle, manufactured on or after January 1, 1973 . . . . . 86 dbA
- (4) Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured on or after January 1, 1968, and before January 1, 1973 88 dbA
- (5) Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured on or after January 1, 1973 . . . . . 86 dbA
- (6) Any other motor vehicle manufactured on or after January 1, 1968, and before January 1, 1973 . . . . . 86 dbA
- (7) Any other motor vehicle manufactured after January 1, 1973 . . . . . 84 dbA