SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J1060

REAF. MAY2000

Issued 1973-11
Reaffirmed 2000-05

Superseding J1060 NOV1973

Submitted for recognition as an American National Standard

Subjective Rating Scale for Evaluation of Noise and Ride Comfort Characteristics Related to Motor Vehicle Tires

***Foreword*—**This Document has not changed other than to put it into the new SAE Technical Standards Board Format. References were added as Section 2. Terminology was changed to Section 3.

***1. Scope*—**This SAE Recommended Practice establishes a rating scale for subjective evaluations of noise and discomfort in motor vehicles. Through test procedures utilizing specific vehicles on specific roads, the scale may be utilized to assess the relative contributions of tires to noise and discomfort. The noise and ride comfort characteristics attributed to automotive tires have traditionally been estimated by subjectively assigning number designations (commonly on a 1 to 10 scale) to the audible and tactile sensations observed while traversing a given road course in a vehicle equipped with the tires under evaluation. Regardless of advances in objective measurements of tire properties related to noise and discomfort, subjective evaluation will continue to be necessary for the purpose of establishing the significance of such measurements. The rating scale of this recommendation is applicable to assessment of each of the wide variety of audible and tactile disturbances referred to by such terms as bump, thump, slap, shake, etc.

2. References

2.1 Applicable Publication—The following publication forms a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J670d—Vehicle Dynamics Terminology

***3. Terminology*—**Terminology for basic tire characteristics is contained in the SAE J670d and in a forthcoming revision expanding the tire section.

4. Rating Scale

4.1 General—The subjective rating system (Figure 1) is based in a 1 to 10 scale, with 10 representing the least perceptible level of disturbance. An orderly procedure is described whereby judgments of increasing precision are required. Correlations of the subjective impression with estimates of typical observer sensitivity and qualitative descriptors lead to final judgment of a corresponding number designation.

4.2 Use of the Rating System

4.2.1 INTERFERENCES—Individuals rating disturbances differ from one another in tactile and aural perceptions. Individual evaluations are also modifiable by environmental conditions surrounding and within the vehicle—which may be independent of the magnitudes or characteristics of the physical events being assessed subjectively. Consequently, appropriate statistical or systematic procedures are recommended to yield aggregate ratings which are insensitive to these individual differences and extraneous influences. Jury evaluations, multiple evaluations under varying influences, and other devices may be utilized for the purpose. The choice of device for reducing interferences is beyond the scope of this recommendation.

1	2	3	4	5	6	7	8	9	10
UNACCEPTABLE				BORDER LINE	ACCEPTABLE				
CONDITION NOTED BY									
ALL OBSERVERS		MOST OBSERVERS		SOME OBSERVERS	CRITICAL OBSERVERS		TRAINED OBSERVERS		NOT OBSERVED
INTOLERABLE	SEVERE	VERY POOR	POOR	MARGINAL	BARELY ACCEPTABLE	FAIR	GOOD	VERY GOOD	EXCELLENT
1	2	3	4	5	6	7	8	9	10

FIGURE 1—SUBJECTIVE RATING SYSTEM FOR VEHICLE EVALUATIONS OF NOISE AND RIDE COMFORT CHARACTERISTICS RELATED TO AUTOMOTIVE TIRES

4.2.2 COMPOSITE DISTURBANCE—When several identifiable disturbances occur simultaneously, it is necessary to estimate an isolated effect for the disturbance of primary interest. The nature of the disturbance being rated and the existence of the secondary, potentially confounding phenomena should be reported along with the numerical rating.

4.2.3 THE NUMERICAL RATING—The rating procedure is performed in three steps of progressive refinement. The first step is the judgment of whether the disturbance is unacceptable, borderline, or acceptable. In accordance with Figure 1, this procedure selects a broad range of numerical categories. The next step of the rating procedure concerns the estimated reactions of various classes of raters, and in accordance with Figure 1, leads to narrowed numerical categories. The final step is the judgment involving the most appropriate descriptor, and this leads to the final numerical rating in accordance with Figure 1.

PREPARED BY THE SAE MOTOR VEHICLE COUNCIL SOUND LEVEL COMMITTEE