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Superseding J1385 JUN1983

**Classification of Earthmoving Machines for
Vibration Tests of Operator Seats**

1. Scope—This SAE Recommended Practice pertains to operator seats for the earthmoving category of off-road self-propelled work machines as defined in SAE J1116 JUN81. This recommended practice defines classes of earthmoving machines having similar characteristics which affect the vibration transmitted to the operator through the operator seat. This recommended practice establishes input data parameters for conducting operator seat vibration tests for the various classes. The purpose is to aid in the selection of an operator seat for a specific machine model and to reduce the amount of testing necessary to determine compliance with applicable standards and/or recommendations. Test procedures are specified in SAE J1384. Instrumentation and measurement procedures are specified in SAE J1013 JAN80.

2. References

2.1 Applicable Publications—The following publications form 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 PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1013 JAN80—Measurement of Whole Body Vibration of the Seated Operator of Off-Highway Work Machines

SAE J1057 JUN81—Identification Terminology of Earthmoving Machines

SAE J1116 JUN81—Categories of Off-Road Self-Propelled Work Machines

SAE J1384—Vibration Performance Evaluation of Operator Seats

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

ISO 7096—Earth-moving machinery—Operator sSeat—Measurement of transmitted vibration

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3. Definitions

3.1 Letter Symbols

B_e - resolution bandwidth of a frequency analysis, Hz

PSD - Power Spectral Density expressed as mean square acceleration per unit bandwidth $(m/s^2)^2/Hz$

rms - root-mean-square

T - analysis time duration, seconds

3.2 Operator Seat—That portion of the machine provided for the purpose of supporting the seated operator, including the seat suspension system, if any.

3.3 Earthmoving Machine Class—Machines having sufficiently similar vibration characteristics in representative working conditions that they can be represented by a standard vibration in a laboratory dynamic test for operator vibration.

4. Machine Classification

4.1 Basic specifications for machines defined as having similar vibration characteristics are identified by class in Table 1. The machine terminology is defined in SAE J1057 JUN81.

TABLE 1—EARTHMOVING MACHINE CLASSES

Class	Machine	Configuration
1	Tractor-Scraper	Open bowl or elevating Two axles, articulated steer Front axle or two axle drive No axle suspension and no vibration absorbing hitch
2	Tractor-Scraper	Same as Class 1, except with either front axle suspensions or vibration absorbing hitch
3	Wheel Loader Wheel Tractor	Rigid or articulated frame Two wheel or four wheel drive Excluding three wheel machines, skid-steer machines, and utility under 5000 kg operating weight Same configuration range as Wheel Loader
4	Crawler Tractor Crawler Tractor	All All

4.2 The earthmoving machine classes of Table 1 include a broad range of machine sizes within each class. The vibration spectra of Section 4 are representative envelopes for the various size machines within the class to allow a single test to evaluate a single operator seat suitable for use on any machine within the class.

5. Vibration Characteristics

5.1 The vibration spectra for each class of machine are shown in Figures 1–4. Exact equations for the acceleration power spectral density curves of Figures 1–4 are included as Tables 2 and 3. These curves, defined by these equations, are the target spectra to be produced at the base of the seat for the random vibration tests of SAE J1384.

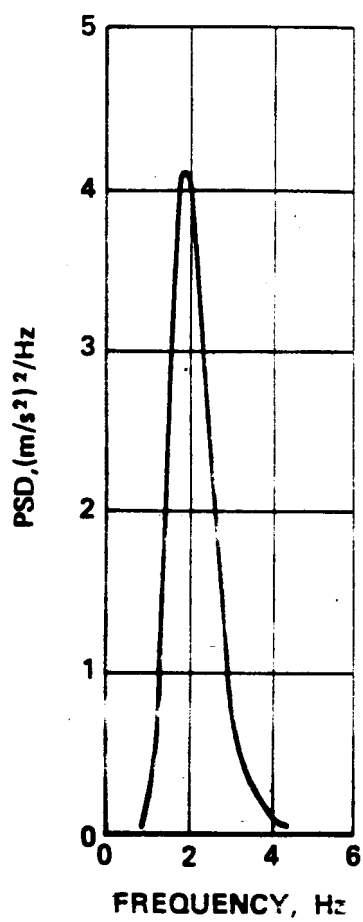


FIGURE 1—Class 1 - 2.35 m/s² True RMS Acceleration