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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18707.2-2010

**Mechanical vibration -- Laboratory method for evaluating
vehicle seat vibration -- Part 2: Application to railway vehicle**

机械振动 评价车辆座椅振动的实验室方法 第2部分：应用于机车车辆

(English Translation)

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Table of Contents

- Preface
- Introduction
- 1 Scope
- 2 Normative references
- 3 Terms and definitions, symbols and abbreviated terms
- 4 Vibration direction

Foreword

GB/T 18707 "Mechanical vibration laboratory methods evaluating vehicle seat vibration" is divided into two parts.

--- Part 1. General requirements;

--- Part 2. apply to rolling stock.

This section is GB/T Part of 218,707.

This part identical with ISO 10326-2:2001 "Mechanical vibration laboratory evaluating vehicle seat vibration - Part 2. Application in rolling stock "(in English).

This section is equivalent translation ISO 10326-2:2001.

For ease of use, the use of ISO 10326-2:2001 when made the following editorial changes.

--- Deleted international standards foreword;

--- For some punctuation modified and deleted;

--- For ISO 10326-2:2001 and other international standards referenced in our country has been adopted as a standard by our standards instead of the corresponding International standards. It has not been adopted as the standard of a direct reference to international standards.

Appendix A of this section is informative appendix.

This part of the National mechanical vibration, shock and condition monitoring Standardization Technical Committee (SAC/TC53) and focal points.

This part of the main drafting unit. China Academy of Railway Sciences, Zhengzhou Machinery Research Institute, Beijing Institute of Technology.

Introduction

Although passenger railway vehicle always feel the vibration of low amplitude, but in fact in contact with the seat cushion and the seat back surface shape Acceleration into the body frame than is sometimes passed to encourage the acceleration is much greater. Therefore, the seat rail projects were the most fundamental test it is to get a seat and its overall dynamic aspects of component characteristics; these components include. a seat frame, suspension systems, bushings, seat surface and so on.

These features will eventually select the most suitable seat assembly and further improve passenger comfort provide useful guidance.

Laboratory tests have to clearly define and tested under reproducible excitation conditions. Thus, these tests provides the current Research complementary basic research methods course implementation.

Vibration railway vehicle seat bottom is random, broadband type belongs. Its spectrum of complex forms and non-stationary vehicle depends on self Body structure, self-loading, wheels section condition, track geometry and quality status and other factors. Therefore, this section provides for a test Staff take a seat in the three directions X, Y and Z axes continuous wide-band pseudo-random vibration excitation. It's quite simple vibration spectrum and has a sufficient magnitude, it can cover the track of the observed spectrum of most real, but the latter has a very different place.

In the laboratory test results under different environmental conditions in the human body - seat system data at different points in response to the measured and used to limit Comparison value or an acceptable value. Therefore, this section provides the use of these test data to determine the human body - seat system in the seat cushion and chair Frequency in the back three directions X, Y and Z axis on the response function. These are sufficient to describe the vibration frequency response function with the occupant of the seat Dynamic characteristics. Thereby clearly demonstrated the direction of excitation, favorable or unfavorable frequency and corresponding gain. These input parameters with different structures Comparative seat related.

Automatic calculation of the frequency response function can be used to evaluate a seat on the actual use of the vehicle suffered a similar incentive the inherent characteristics of the particular seat. Ultimately, they must be determined by the modulus and phase. Direct and cross-ratios are related, as vertical, horizontal as a coupling between the longitudinal movement. In this part of the test procedure allows these interactions.

However, the effectiveness of such calculations is only based on human assumptions considered - seating system is fully linear case. To laboratory conditions Member under test this hypothesis, the provisions of this section to add a test cycle. In the test, a peak in the pseudo-random excitation frequency obtained Rate as sinusoidal excitation frequency and

high amplitude mode for testing.

Frequency range limitations associated with the condition of the railway between 0.5Hz ~ 50Hz. When the seat rail is not conveyed below 0.5Hz vibration Plus modulation correction. However, above the vibration of 50Hz, since in practical use the seat is isolated, usually not too small an amount of vibration of the seat Passengers on the perceived.

Mechanical vibration Evaluating vehicle seat vibration - Laboratory method Part 2. Apply rolling stock

1 Scope

This section GB/T 18707 specifies the railway motor car and trailer vehicle passengers and crew to take the seat of laboratory tests method.

This section relates to the frequency of the three-axis linear vibration of 0.5Hz ~ 50Hz. This section provides the input for the test seat Vibration test methods.

This section makes the frequency response function in the form of how to characterize the vibrations transmitted to the passenger manner possible. However, this characterization only There are people in the - under the seat system is seen as sufficient linear condition was completely valid.

2 Normative references

The following documents contain provisions which, through reference GB/T 18707 in this section, constitute provisions of this part. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 2298 Mechanical vibration, shock and condition monitoring of vocabulary (GB/T 2298-2010, ISO 2041:2009, IDT) GB/T 13441.1 Mechanical vibration and impact evaluation of human exposure to whole body vibration - Part 1. General requirements (GB/T 13441.1-2007, ISO 2631-1:1997, IDT) GB/T 13823 (all parts) calibration methods (ISO 5347, IDT) vibration and shock sensor GB/T 14412 Mechanical vibration and shock - Mechanical mounting of accelerometers (GB/T 14412-2005, ISO 5348:1998, IDT) GB/T 18707.1 Mechanical vibration laboratory evaluating vehicle seat vibration - Part 1. General requirements (GB/T 18707.1-2002, ISO 10326-1:1992, IDT) GB/T 23716 body vibration response of measuring instruments (GB/T 23716-2009, ISO 8041:2005, IDT) GB/T 20485 (all parts) calibration of vibration and shock sensor (ISO 16063, IDT) ISO 13090-1 Mechanical vibration and shock tests and live tests Safety Guide Part 1. body mechanical vibration and repeated shock

3.1 Terms and Definitions

GB/T 2298 as determined by the terms and definitions apply to this section.

3.2 Symbols and abbreviated terms

This section uses the following symbols and abbreviated terms.

arms --- rms acceleration, m/s^2 ;

$a(t)$ --- the instantaneous value of the acceleration time history, m/s^2 ;

$a(t, B, f)$ --- frequency ($f - B/2$) is the filtered $\sim (f - B/2)$ the range of the time history of acceleration $a(t)$ is the instantaneous Value, m/s^2 ;

$b(t)$ --- acceleration time history of the instantaneous value, m/s^2 ;