



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS E 4208-1 : 2021

(JARI/JSA)

**Rolling stock — Bogie — Strength test —
Part 1: Methods for static load testing**

ICS 45.060.01

Reference number : JIS E 4208-1 : 2021 (E)

PROTECTED BY COPYRIGHT

E 4208-1 : 2021

Date of Establishment: 2021-02-19

Date of Public Notice in Official Gazette: 2021-02-19

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

JIS E 4208-1 : 2021, First English edition published in 2022-05

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2022

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

HN
 **Documents**
Document Sharing Hub

Contents

	Page
1 Scope	1
2 Normative reference	1
3 Terms and definitions	1
4 Test type	2
5 Test items and test load	2
6 Test method	3
6.1 Measurement items and measuring method	3
6.2 Measurement point	4
6.3 Gauge using method	4
6.4 Supporting method of bogie frame and beam and applying method of test load	5
7 Presentation method of test results	11
7.1 Stress calculation method	11
7.2 Allowable stress	11

Foreword

This Japanese Industrial Standard has been established by the Minister of Land, Infrastructure, Transport and Tourism through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard submitted by Japan Association of Rolling Stock Industries (JARI)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act. This edition replaces **JIS E 4208** : 2004, which has been withdrawn.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

JIS E 4208 series consists of the following 2 parts under the general title *Rolling stock-Bogie-Strength test* :

Part 1 : Methods for static load testing

Part 2 : Methods for on-track testing

Rolling stock — Bogie — Strength test — Part 1 : Methods for static load testing

1 Scope

This Japanese Industrial Standard specifies the methods of static load tests (hereafter referred to as test) for confirming the strength of bogie frames, beams or the combination of bogie frames and beams (hereafter referred to as bogie frames, etc.) of bogies used for a rolling stock.

This Standard does not apply to the bogie frames and beams used for special railway cars (such as a trolleybus, a monorail car, a modified-personal-rapid-transit car and a magnetically supported vehicle) which use e.g. a rubber tire; however, this Standard may apply to the use of strain gauges on the bogie frames of these cars.

2 Normative reference

Part or all of the provisions of the following standard, through reference in this text, constitute provisions of this Standard. The most recent edition of the standard (including amendments) indicated below shall be applied.

JIS E 4207 *Rolling stock — Bogie — General rules for design of bogie frame strength*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in JIS E 4207 apply.

3.1

product for testing

bogie frame after the completion of machining, or bogie frame in a state in which parts and the like are incorporated

3.2

strain gauge

strain gauge using a metallic resistor of foil state in gauge sensitive parts (hereafter referred to as gauges)

3.3

stress concentration gauge

gauge with multiple gauge sensitive parts continuously arranged in close proximity to measure strain in areas where the strain distribution changes rapidly

3.4

load cell

device to produce signals with a defined relationship to the applied force

3.5**stress**

product of the strain measured by a gauge and the longitudinal elastic modulus of the component on which the gauge is attached

Note 1 to entry It is fundamentally impossible to measure the stress directly; however in this Standard, such an expression of “stress” measurement in common use is used instead of “strain” measurement.

3.6**liner**

plates to be inserted for dimensional adjustment or load adjustment

Note 1 to entry Liners are generally used in combination of several types of thin sheets of different thicknesses so that fine adjustment can be made.

4 . Test type

The test type shall be as follows and shall be selected according to the structure of bogie.

- a) Vertical load test
- b) Lateral load test
- c) Longitudinal load test
- d) Torsional load test
- e) Traction motor load test
- f) Driving gear load test
- g) Brake equipment load test
- h) Damper load test
- i) Lateral stopper load test
- j) Anti-rolling device load test
- k) Mounting components load test

NOTE Mounting components shall be as agreed between the interested parties.

5 . Test items and test load

The load test items shall be as shown in Table 1 and items marked with a circle “○” for the bogie frame, etc. are standard test items. The items to be adopted shall be upon the agreement between the interested parties. The magnitude of the test load shall be