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**Rolling stock—Test methods of
static load for body structures**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Land, Infrastructure, Transport and Tourism through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Association of Rolling Stock Industries (JIRI)/Japanese Standards Association (JAS) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently JIS E 7105:1989 is replaced with this Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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Rolling stock — Test methods of static load for body structures

1 Scope This Japanese Industrial Standard specifies the test methods of static load (hereafter referred to as “test”) for confirming strength, rigidity and the like of body structures for passenger stock such as electric railcars, internal-combustion railcars and passenger cars principally.

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0153 *Glossary of terms used in mechanical vibration and shock*

JIS B 0155 *Industrial-process measurement and control — Terms and definitions*

JIS B 7505 *Bourdon tube pressure gauges*

JIS B 7516 *Metal rules*

JIS E 4001 *Railway rolling stock — Vocabulary*

JIS E 4208 *Test methods of static load for truck frames and truck bolsters of railway rolling stock*

JIS E 7106 *Rolling stock — General requirements of carbody structures for passenger car*

JIS Z 2300 *Terms and definitions of nondestructive testing*

3 Terms and definitions For the purposes of this Standard, the definitions given in JIS E 4001 and JIS B 0153, and the following definitions apply.

- a) **body structure for testing** assembly of main body structures such as underframe, side body structure, end body structure and roof body structure, and other components which affect the strength and rigidity

Regarding 5.6.7, the assembly whose opening is sealed with genuine parts or temporary caulking components so that the homogeneous setting pressure is maintained inside the air-tight body structure during the measurement.

- b) **strain gauge** in accordance with 5 (8) of JIS Z 2300
- c) **load cell** in accordance with 2 C) 2.2) of JIS B 0155
- d) **stress** product of the strain measured by strain gauge and the modulus of elasticity of the component on which the strain gauge is attached

NOTE : 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.

4 Test type The tests shall usually be classified into the following seven types. When different tests are necessary, the test methods shall be upon the agreement between the purchaser and the supplier.

- a) Vertical load test
- b) Compression load test at carbody end.
- c) Torsion load test
- d) Three-point support test
- e) Measurement (test) of natural frequency of bending
- f) Measurement (test) of natural frequency of torsion
- g) Air-tightness strength test ⁽¹⁾

Note ⁽¹⁾ Applicable to the rolling stock of air-tight structure upon the agreement between the purchaser and the supplier.

5 Test method

5.1 Measurement item The measurement item for each test type shall be as shown in table 1.

Table 1 Measurement item

Test type	Measurement item				
	Stress	Displacement	Natural frequency	Load applied	Pressure in air-tight chamber
Vertical load test	○	○		○	
Compression load test at carbody end	○	○		○	
Torsion load test	○	○		○	
Three-point support test	○	○		○	
Measurement (test) of natural frequency of bending			○		
Measurement (test) of natural frequency of torsion			○		
Air-tightness strength test	○	○			○