

Glossary of Terms Relating to Vibration and Noise of Automobiles

1. Scope

This standard specifies the terms relating to vibration and noise of automobiles (hereinafter referred to as "terms") and their definitions.

2. Purpose

This standard aims to standardize the terms relating to vibration and noise.

3. Classification

Classification of the terms shall be as follows:

- (1) Basic terms commonly used in both vibration and noise
- (2) Basic terms mainly used in vibration
- (3) Basic terms mainly used in sound
- (4) Terms for phenomena
- (5) Terms for testing methods, evaluating methods and testing equipment
- (6) Terms for preventative measures against vibrational and noise pollution
- (7) Terms for vibration and sound insulating materials

4. Terms and Definitions

Terms and their definitions are as follows:

Additionally, English equivalents, customary words and related materials are shown. The customary words shall not be used hereafter.

- Remarks**
1. When two words are shown for a term, the precedent one shall have priority.
 2. The words inside [] in the column of terms are usually omitted.
 3. When partial letters of a term are enclosed in (), these letters may be either included in the term or omitted.
 4. Terms and definitions, which are described as "Reference" in the column of Number, are transferred from the standards shown in the "Relating materials".
 5. Descriptions listed under the heading numbers (1), (2), etc. in the "Definition" show the multiple meanings (1), (2), etc. of the corresponding term.

Reference Standard:

(1) Basic Terms Common for Both Vibration and Noise

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
101	shûki 周 期	Minimum time interval passed over until the same condition reappears in a periodic phenomenon.	period		JIS Z 8106
102	kihon shûki 基 本 周 期	(1) Minimum increments of independent variables required for returning periodic functions to the completely same conditions as the original states. (2) The inverse of the definition (2) for Kihon shindôsû (Fundamental frequency)	fundamental period		JIS B 0153
103	shindôsû shûhasû 振動数, 周波数	Number of cycles per unit time.	(cyclic) frequency		JIS B 0153
104	kihon shindôsû 基本振動数	(1) Inverse of the fundamental period. (2) The lowest natural frequency in a vibration system. The normal mode corresponding to this frequency is called as the fundamental natural mode of vibration. (3) The frequency of the fundamental used for harmonic analysis of a periodic quantity.	fundamental frequency		JIS B 0153
105	kaku shindôsû en shindôsû 角振動数, 円振動数	Frequency multiplied by 2π Remark The unit for angular frequencies is rad/S.	angular frequency, circular frequency		JIS B 0153
106	saikuru サ イ ク ル	All states, or the whole range of value through which a periodic phenomenon or a periodic function returns to the original state.	cycle		JIS B 0153
107	hachô 波 長	The distance through which a wave motion propagates in a period.	wave length		JIS B 0153
108	seigen ryô, chôwa tyô 正弦量, 調和量	Periodic quantities represented by sinusoidal functions of independent variables. These quantities can be expressed by the following equation: $y = A \sin (wt + \varphi)$ where y : Sinusoidal quantity t : Independent variable A : Amplitude w : Angular frequency φ : Phase angle	sinusoidal quantity, simple harmonic quantity		JIS B 0153
109	shinpuku 振 幅	The maximum values of sinusoidal quantities Remark It is not appropriate to use the "amplitude" for quantities other than the maximum value of a sinusoidal quantity, e.g. compound amplitude.	amplitude		JIS B 0153
110	isô kaku, isô 位相角, 位相	The angle of lead of a sinusoidal quantity determined from a given value of the independent variable.	phase angle, phase		JIS B 0153
111	isô sa 位 相 差	The difference between phase angles of two periodic quantities having a same frequency. For sinusoidal quantity, the difference between phase angles measured from the same reference value.	phase difference		JIS B 0153
112	kihon ha 基 本 波	A sinusoidal quantity having a frequency equal to the fundamental frequency.	fundamental		JIS B 0153
113	kôchô ha 高 調 波	Sinusoidal quantities having frequencies as high as the excitation fundamental frequency multiplied by integers 2 and more.	higher harmonic		JIS B 0153
114	tate nami 縦 波	Wave motions in which the direction of displacement is parallel to the direction of propagation.	longitudinal wave		JIS B 0153
115	yoko nami 横 波	Wave motions in which the direction of displacement is vertical to the direction of propagation.	transverse wave		JIS B 0153

(1) Basic Terms Common for Both Vibration and Noise (Continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
116	teijō ha teizai ha 定常波, 定在波	Periodic wave motions having constant frequency distributions fixed in the space. Remarks 1. It may be considered that the stationary wave results from superposition of the same type progressive waves having same frequency. 2. The stationary wave is characterized by the fixed positions of nodes and antinodes. 3. Teizaiha is equivalent to Teijōha.	stationary wave, standing wave		JIS B 0153
117	fushi, setsu 節 (ふし, せつ)	Points, lines or surfaces where the amplitude, i.e. the quantity representing the characteristics of stationary waves, is zero. Remark To clarify the property of the node, it may be designated by such terms with proper modifier as displacement node, velocity node and pressure node.	node		JIS B 0153
118	hara 腹 (はら)	Points, lines or surfaces where the amplitude, i.e. the quantity representing the characteristics of stationary waves, becomes maximum. Remark To clarify the property of the antinode, it may be designated by such terms with proper modifier as displacement antinode, velocity antinode and pressure antinode.	antinode, loop		JIS B 0153
119	jiyūdo 自 由 度	The number of independent variables required for completely determining the positions of all parts of a mechanical system at a given time. This number is equal to the number of possible independent displacements.	degree of freedom		JIS B 0153
120	1 jiyūdo kei 1 自 由 度 系	A system requiring one coordinate for defining the configuration of the system at a given time.	single degree of freedom system		JIS B 0153
121	ta jiyūdo kei 多 自 由 度 系	A system requiring two or more coordinates for defining the configuration of the system at a given time.	multi degree of freedom system		JIS B 0153
122	rensei shindō 連 成 振 動	Vibration produced by two or more combined vibration systems affecting each other.	coupled vibration		JIS B 0153
123	unari う な り	Periodic change of an amplitude caused by superposition of two sinusoidal waves having frequencies slightly different from another one. The number of changes appearing per second is equal to the difference between the frequencies of the original waves.	beats		JIS B 0153
124	reishin, kashin 励 振	External forces acting on the system, or input.	excitation, etimulus		JIS B 0153
125	chōwa reishin, chōwa kashin, seigen ha kashin 調 和 励 振	External forces or inputs which can be represented by harmonic functions of time.	harmonic excitation		JIS B 0153
126	inparusu reishin (dagekikashin) インパルス励振	Instantaneous external forces or inputs.	impulse excitation		JIS B 0153
127	suteppu reishin ス テ ッ プ 励 振	External forces or inputs which suddenly change from a certain value to another certain value in a stepwise mode.	step excitation		
128	fukisoku reishin 不 規 則 励 振	External forces or inputs of which magnitude at a given time cannot be predicted.	random excitation		JIS B 0153

(1) Basic Terms Common for Both Vibration and Noise (Continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
129	kyôshin (kyômei) 共振	The state or the phenomenon of systems vibrated forcedly which shows the decrease of the system response caused by even a slight change in excitation frequencies in either direction.	resonance		JIS B 0153
130	kyôshin kyokusen 共振曲線	Curves which show the responses to forced vibrations including resonance.	resonance curve		JIS B 0153
131	kyôshin shindôsu 共振振動数	Frequency at resonance Remarks 1. Resonance frequencies may vary depending on the properties of the measured quantities. For example, velocity resonance may appear at a frequency different from one for displacement resonance. 2. When the mode of resonance is ambiguous, it must be denoted with such an expression as, for example, velocity resonance frequency.	resonance frequency		JIS B 0153
132	han kyôshin 反共振	The state or the phenomenon of systems vibrated forcedly which shows the increase of the system response caused by even a slight change in excitation frequencies in either direction.	antiresonance		JIS B 0153
133	han kyôshin shindôsu 反共振振動数	Frequencies at antiresonance. Remarks 1. Antiresonance frequencies may vary depending on the properties of the measured quantities. For example, velocity antiresonance may appear at a frequency different from one for displacement resonance. 2. When the mode of antiresonance is ambiguous, it must be denoted with such an expression as, for example, velocity antiresonance frequency.	antiresonance frequency		JIS B 0153
134	Q (kyû) Q (きゅう)	Quantity showing the sharpness of resonance in a vibration system. It is defined as 2π times the ratio of the energy of vibration system (sum of the kinetic energy and the potential energy in a mechanical vibration system) and the energy given from external per cycle to maintain a certain amplitude. This is equal to π times the inverse of the logarithmic decrement.	Q factor, Q		JIS B 0153
135	shindô môdo 振動モード	The pattern of vibration or equivalent damped vibration showing the intrinsic configuration of nodes and antinodes when each point in a vibrating system vibrates in simple harmonic motion (for linear systems). Remark In multi-degree-of-freedom systems, vibrations of two or more modes may simultaneous by overlap.	mode of vibration		JIS B 0153
136	shindô no koyû môdo 振動の固有モード	Mode of vibration corresponding to a specially observed natural frequency. Remarks 1. If no damping exists in the system, the natural mode is equal to the normal mode. 2. Existing natural modes of vibration correspond to each freedom of the system respectively.	natural mode of vibration		JIS B 0153

(1) Basic Terms Common for Both Vibration and Noise (continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
137	koyô shindôsû 固有振動数	Frequencies of free vibrations in a vibration system. Remark There exist, generally, n natural frequencies in a n -degree of freedom system.	natural frequency		JIS B 0153
138	risāju no zukei リサージュの図形	A stationary figure drawn by combining two simple harmonic motions which are perpendicular to each other and have frequencies in a small integer ratio. Remark The Lissajous' figure varies depending on the phase angles of each simple harmonic motion.	Lissajous' figure		JIS B 0153
139	inpîdansu インピーダンス	The ratio of excitation to output. Excitation and output are complex quantities and both their arguments increase at the same ratio in proportion to time. Remarks 1. The term and definition of impedance shall be applied to stationary states of quantities oscillating at a single frequency. 2. This term shall be generally applied to linear systems. The use of concept of the impedance, however, may be extended even to the non-linear system, as seen from the example of incremental impedance used for explaining the ratio of excitation to output in nonlinear systems.	impedance		JIS B 0153
140	kikai inpîdansu 機械インピーダンス	The complex number ratio of force at a certain point of a mechanical system in simple harmonic motion to velocity at the same or other point. Remark For torsional vibration systems, force and velocity are replaced with torque and angular velocity respectively.	mechanical impedance		JIS B 0153
141	jiko inpîdansu, kudôten inpîdansu 自己インピーダンス 駆動点インピーダンス	The complex number ratio of force to velocity at the same point of a mechanical system in simple harmonic motion.	direct impedance, driving-point impedance		JIS B 0153
142	dentatsu inpîdansu, sôgo inpîdansu 伝達インピーダンス 相互インピーダンス	The complex number ratio of force to velocity at different points of a mechanical system in simple harmonic motion.	transfer impedance		JIS B 0153
143	mobiriti モビリティ	The reciprocal of the impedance. The complex number ratio of velocity at a certain point of a mechanical system in simple harmonic motion to force at the same or other point.	mobility (mechanical) mobility		JIS B 0153
144	jiko mobiriti kudô ten mobiriti 自己モビリティ 駆動点モビリティ	The complex number ratio of velocity to force at the same point of a mechanical system in simple harmonic motion.	direct (mechanical) mobility, driving-point (mechanical) mobility		JIS B 0153
145	dentatsu mobiliti sôgo mobiriti 伝達モビリティ 相互モビリティ	The complex number ratio of velocity to force at different points of a mechanical system in simple harmonic motion.	transfer (mechanical) mobility		JIS B 0153
146	Ôtô 応答	Changing state of output caused by input change.	response		JIS Z 8103

(1) Basic Terms Common for Both Vibration and Noise (Continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
147	shôhasû ôtd 周波数応答	Quantitative expression for output represented as a function of the input frequency. This is usually illustrated with a graph.	frequency response		JIS B 0153
148	Kato ôtd 過度応答	Response in a period until the output reaches the other stationary state when the input changes from a stationary state to other stationary state.	transient response		JIS Z 8103
149	inparusu ôtd インパルス応答	The response of a system to the impulse excitation.	impulse response		JIS Z 8103
150	suteppu ôtd ステップ応答	The response of a system to the step excitation. It is also called as the indicial response.	step response		JIS Z 8103
151	dentatsu ritsu 伝達率	The nondimensional ratio of response amplitude to excitation amplitude in forced vibrations. Remark The term of transmissibility may be used not only for forces but also for the non-dimensional ratio of displacement, velocity or acceleration.	transmissibility		JIS B 0153
152	dentatsu kansû 伝達関数	The mathematical relation between output and input of a system Remark The transfer function is usually given as a function of frequency which is generally a complex function.	transfer function		JIS B 0153
153	jiko sôkan kansû 自己相関関数	The function of the drift τ representing the average value of the product of $f(t)$ and $f(t+\tau)$ which are the values of the quantity changing with time and spatial position at t and $t+\tau$ respectively.	autocorrelation function		JIS B 0153
154	sôgo sôkan kansû 相互相関関数	For two quantities $f(t)$ and $g(t)$ changing with time and spatial position, the function of the drift τ which represents the average value of product of the value $f(t)$ at t and $g(t+\tau)$ at $t+\tau$.	crosscorrelation function		JIS B 0153
155	shôhasû bunseki 周波数分析	Spectral analysis of vibrational phenomena.	frequency analysis		JIS B 0153
156	supekutoru スペクトル	Description of a certain quantity as a function of frequency or wave length.	spectrum		JIS B 0153
157	pawâ supekutoru パワースペクトル	Frequency distribution of the root mean square value of the quantity changing with time or spatial position.	power spectrum		JIS B 0153
158	pawâ supekutoru mitsudo パワースペクトル密度	The root mean square value of amplitudes of irregular vibration in a given frequency band divided by the band width.	power spectral density		JIS B 0153
159	sôgo supekutoru mitsudo 相互スペクトル密度	Fourier transformed cross-relation function.	cross spectral density		JIS B 0153
160	kohîrensu kansû コヒーレンス関数	The function of frequency representing the ratio of square of the cross spectral density for two signals to the product of each power spectral density. Remark The coherence function $\gamma^2(f)$ is expressed by the cross spectral densities $G_{XY}(f)$ for two signals $x(t)$ and $y(t)$ and the respective power spectral densities $G_{XX}(f)$ and $G_{YY}(f)$ as follows: $\gamma^2(f) = \frac{ G_{XY}(f) ^2}{G_{XX}(f) \cdot G_{YY}(f)}$	coherence function		JIS B 0153

(1) Basic Terms Common for Both Vibration and Noise (continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
161	kepusutoramu ケプストラム	Power spectral expressed by the logarithm of the power spectral density. Remarks 1. If the power spectral density of the signal $x(t)$ is $G_{xx}(f)$, the cepstrum $C_x(\tau)$ is given by $C_x(\tau) = \left \int_{-\infty}^{\infty} \{ \log G_{xx}(f) \} X_e^{-j2\pi f\tau} df \right ^2$ 2. The drift τ is called as the quefrency.	cepstrum		JIS B 0153
162	takuetsu shindōsō 卓越振動数	The frequency at which the spectrum shows the maximum value in the frequency analysis.	dominant frequency		JIS B 0153
163	shunji chi 瞬時値	The value of a quantity at a given time.	instantaneous value, instantaneous magnitude		JIS B 0153
164	pīku chi ピーク値	The maximum value in a given region. Remark The peak value of vibrating quantities means, generally, the maximum difference from the average value in a given region, and the positive maximum difference is called as the positive peak value and the negative maximum difference as the negative peak value.	peak value, peak magnitude		JIS B 0153
165	P-P chi (pīpī chi) P-P 値 (ピーピーち)	The maximum value in the algebraic differences between the local maximum values of a vibrating quantity in a given region.	peak-to-peak value		JIS B 0153
166	rms chi, (Aru emu esu chi), jikkō chi rms値(あるえむすち)	The root of the average value of squares.	root-mean-square value, rms value		JIS B 0153
167	Gensui 減衰	The energy consumption by resisting forces against the motion of the elements or parts of them in a vibration system.	damping		JIS B 0153
168	tachiagari jikan 立上り時間	(1) The time interval required for raising the pulse height from the lower value to the higher value, where both values are specified by the ratio to the maximum value. (2) For the step response, the time interval required for raising the response from the specified lower value to the specified higher value. Remark In the case of (2), it is usually the time required for the rise from 10% to 90% of the final stationary value.	rise time		JIS B 0153, JIS Z 8103
169	zatsuon, noizu 雑音, ノイズ	Signals generally having irregular properties and no definite frequency component. Remark Undesirable sound is called as noise (¹) with relation to acoustics. Note (¹) See JIS Z 8106 [Glossary of Acoustical Terms (General)]	noise		JIS B 0153
170	hakushoku zatsuon 白色雑音	The noise of which the energy per constant frequency bandwidth (or frequency band of unit width) in an arbitrary section is equal all over the whole frequency region. Remark The white irregular vibration means generally one which has a constant spectral density of acceleration rms over the whole frequency region under consideration.	white noise		JIS B 0153

(2) Basic Terms Used Mainly in Vibration

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
171	pinku noizu ピンクノイズ	The noise of which the energy within the bandwidths in a certain ratio to their center frequency is equal in an arbitrary section all over the whole frequency region under consideration. Remark The energy spectrum produced by filtering the pink noise through the octave band width (or any parts of it) is always constant (independent of frequency).	pink noise		JIS B 0153
172	okutābu オクターブ	The interval between the two frequencies in the ratio of 2:1.	octave		JIS B 0153
201	senkei kei 線形系 (せんけいけい)	The system in which the response is proportional to the magnitude of excitation. Remark According to this definition, the dynamic characteristics of each element in the system can be represented by a series of linear differential equations, and the principle of superposition can be applied to the system.	linear system		JIS B 0153
202	tōka kei 等価系	The equivalently replaced system for convenience of analysis. Remark There are various forms of equivalent quantities or systems in the fields of vibration and impulse as follows: (1) Equivalent stiffness (2) Equivalent damping (3) Torsional system equivalent to translational system (4) Electric or acoustic system equivalent to mechanical system	equivalent system		JIS B 0153
203	shindō moderu 振動モデル	The model constructed with mathematical expressions to approximately reproduce the actual vibration system for convenience of analysis. It is also called as a mathematical model (of vibration).	vibration model		
204	tan shindō 単振動	The motion represented by a sinusoidal function of time.	simple harmonic motion		JIS B 0153
205	fukisoku shindō 不規則振動	The vibration of which the magnitude cannot be precisely predicted at a given time. Remark The probability that the magnitude of irregular vibration is within a certain region depends on the probability density function.	random vibration		JIS B 0153
206	teijō shindō 定常振動	Continuous periodic vibration.	steady-state vibration		JIS B 0153
207	kato shindō 過渡振動 (かとしんどう)	Vibration in the transient course to the stationary state.	transient vibration		
208	jiyū shindō 自由振動	Vibration occurring after the excitation is removed. Remark In the free vibration, the system vibrates with its natural frequency.	free vibration		JIS B 0153
209	Gensui jiyū shindō 減衰自由振動	The free vibration of the system with damping.	damped free vibration		JIS B 0153

(2) Basic Terms Used Mainly in Vibration (continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
210	kyōsei shindō 強制振動	Stationary vibration generated by excitation. Remarks 1. The forced vibration has the same frequency as the excitation. 2. The transient vibration generated by excitation is not called as the forced vibration.	forced vibration		JIS B 0153
211	jirei shindō 自励振動	The vibration generated by the excitation into which the non-vibratory energy is converted in the system.	self-induced vibration, self-excited vibration		JIS B 0153
212	shōgeki 衝撃	The excitation of which the force, position, velocity and or acceleration changes in a shorter time interval than the natural period of a system resulting in a transient dynamic change.	shock		JIS B 0153
213	kowasa, bane teisū こわさ, ばね定数 (ばね定数)	The ratio of the change in the force (or torque) to the corresponding linear (or rotational) displacement of a spring element.	stiffness, spring constant		JIS B 0153
214	konpuraiansu コンプライアンス	Characteristic value representing the flexibility. Reciprocal of the stiffness.	compliance		JIS B 0153
215	sei kowasa, sei bane teisū 静こわさ, 静ばね定数	The ratio of the force increment to the displacement increment in static conditions.	static stiffness, static spring constant		
216	dō kowasa, dō bane teisū 動こわさ, 動ばね定数	(1) The ratio of the force increment to the displacement increment in dynamic conditions. (2) The complex ratio of the force to the displacement in simple harmonic motions.	dynamic stiffness, dynamic spring constant		JIS B 0153
217	dansei shu jiku 弾性主軸	The axis along which the force is applied on a spring of a system in either direction so as to make the direction of the displacement of the point of application coincide with that of the force as well as not so as to rotate the spring surface containing the point of application.	principal elastic axis		JIS B 0153
218	gōtai mōdo 剛体モード	The vibration mode represented by rigid body motions.	rigid body mode		
219	mage shindō 曲げ振動	Vibrations appearing as variations in deflection of elastic bodies.	flexural vibration, bending vibration		JIS B 0153
220	nejiri shindō ねじり振動	Vibrations appearing as variation in torsion of elastic bodies.	torsional vibration		JIS B 0153
221	kiken sokudo 危険速度	The rotating speed at resonance of a rotation system. Remark There are respective critical speeds for each natural mode of the whole system in the case of a system consisting of several rotating systems.	critical speed		JIS B 0153
222	shindō zetsuen 振動絶縁	The function for preventing vibration in a certain region of frequency, i.e. the function to make the transmissibility of vibration lower than 1.	vibration isolation		JIS B 0153
223	senkei nensei gensui, nensei gensui 線形粘性減衰, 粘性減衰	The energy consumption dissipated when an element or its part of a vibration system receives resistant force which is proportional and opposite to the velocity (⁽²⁾) of the element. Note (²) This means the relative velocity of the element to the viscous medium.	linear viscous damping, viscous damping		JIS B 0153

(2) Basic Terms Used Mainly in Vibration (continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
224	senkei nensei gensui keisô, nensei gensui keisô 線形粘性減衰係数, 粘性減衰係数	The ratio of damping force to the velocity of a system with the linear viscous damping.	linear viscous damping coefficient, viscous damping coefficient		JIS B 0153
225	rinkai gensui, rinkai nensei gensui 臨界減衰, 臨界粘性減衰	Damping at the boundary which determines whether the transient motion becomes oscillatory or non-oscillatory for the free vibration in a certain mode of a system with the linear viscous damping.	critical damping, critical viscous damping		JIS B 0153
226	gensui hi 減衰比	The ratio of actual viscous damping coefficient to the critical damping coefficient in a system with the linear viscous damping. Remark The damping ratio is expressed by percentage to the critical damping coefficient.	damping ratio, fraction of critical damping		JIS B 0153
227	sonshitsu keisô 損失係数, ヒステリシス減衰係数	The nondimensional coefficient indicating the magnitude rate of the damping force free from the affection of the excitation angular frequency ω in forced vibrations. When the sum of restoring force and damping force is expressed by the restoring force of a complex spring $(1+\eta)x$, η is the loss factor.	loss factor, hysteretic damping coefficient		
228	taisô gensui ritsu 対数減衰率	The natural logarithm of the ratio of an arbitrary maximum value to the adjacent one of the same sign in free damped vibrations of linear 1-degree-of-freedom systems.	logarithmic decrement		JIS B 0153
229	môdo gensui ritsu モード減衰比	The damping ratio of each natural mode of vibration.	modal damping ratio		JIS B 0153
230	môdo kaiseiki モード解析	(1) The process to obtain response wave form of the whole system by adding every response wave form given from the response analysis on each mode. (2) The process to obtain the estimated value of the maximum response for the whole system by an appropriate addition of the maximum response values for every mode. Remark This is a technique to obtain the response of a multi-degree-of-freedom system or a continuum and applicable to a system of which every mode can be dealt independently of each other.	modal analysis		JIS B 0153
231	môdo gyôretsu, môdo matorikkusu モード行列, モードマトリックス	n -column n -row square matrices of which the row consists of n natural forms in a n -degree-of-freedom system.	modal matrix		JIS B 0153
232	shu zahyô 主座標 (しゅざひょう)	The linearly transformed coordinates from independent generalized coordinates by mean of the modal matrix.	principal coordinate		JIS B 0153
233	môdo paramêta モードパラメータ	The generic name for natural frequencies, natural modes, modal mass, modal damping and modal stiffness. There are the parameters used for representing the characteristics of each natural mode when describing the vibration in a multi-degree-of-freedom system with the principal coordinates.	modal parameter		JIS B 0153

(2) Basic Terms Used Mainly in Vibration (continued)

Number	Term	Definition	Reference		
			English equivalent	Customary term	Related materials
234	jikoku reki ôtô kaiseki 時刻歴応答解析	The process to obtain the system response to the external force varying as the time elapses of using the quantities varying as the time elapses. Remark The direct integral method or the modal analysis may be applied to the time history response analysis.	time history response analysis		JIS B 0153
235	chôwa bunseki 調 和 分 析	The process to obtain the characteristics of a periodic oscillation with respect to the fundamental and higher harmonics. It is also called as the Fourier analysis.	harmonic analysis		JIS B 0153
236	bunsô chôha 分 数 調 波	The sinusoidal quantities having the period as high as 2 or more integral multiple of the fundamental period of excitation.	subharmonic		JIS B 0153
237	hakô ritsu 波 高 率	The ratio of the peak value to the rms value.	crest factor, peak-to-rms ratio		JIS B 0153
238	hisuterisisu, rireki genshō ヒステリシス	The phenomenon appearing when a force is applied to an object, the course of increasing force differs from that in the course of decreasing force in characteristic curves showing the relation between force and deflection.	hysteresis		JIS B 0153
239	chōyaku genshō 跳 躍 現 象	The phenomenon that the response changes discontinuous by during the continuous change of excitation to an element such as mass springs or external excitation.	jumping phenomena		JIS B 0153
240	rimitto saikuru リミットサイクル	The limit periodic vibration to which all adjacent vibrations converge in self induced vibrations.	limit cycle		JIS B 0153
241	sutikku surippu スティックスリップ	The phenomenon consisting of adhesion of elements in a vibration system for one period and relative sliding motion between the elements for another period. Remark This phenomenon results from the frictional force between elements.	stick-slip		
242	kanshō sōchi 緩 衝 装 置	The device for absorbing the energy in order to minimize the response (generally the maximum absolute value) of a system to shock. Remark The absorbed energy consists of elastic energy and consumed energy.	shock absorber		JIS B 0153
243	danpā gensui ki seishinki ダ ン パ	The device for generating damping to diminish (converge) free vibration or transient vibration, reduce the amplitude in resonance state and prevent the self-induced vibration.	damper, absorber		JIS B 0153
244	dasshupotto ダ シ ュ ポ ッ ト	The damper generating linear (viscous) damping.	dash pot		JIS B 0153
245	dō kyūshin ki 動 吸 振 器	The equipment for reducing the vibration of principal vibration systems by adjusting the forces of additional vibration systems applied to the principal system so as to make the phase angles of both forces opposite to each other.	dynamic vibration absorber, dynamic damper		
246	kauntā ueito カ ウ ン タ ウ ェ イ ト	The added weight for an object to diminish the calculated unbalance at a desired location.	counterweight		JIS B 0153